

### Miniature Circuit Breakers

#### Selection Guide ..... 2

#### QUICKLAG® Industrial Circuit Breakers

Circuit Breakers, Plug-on Types HQP, QPHW, QHPX, QHPW ..... 5

Ground Fault Circuit Breakers, Plug-on Types QPGF, QPHGF ..... 6

Ground Fault Equipment Protectors, Plug-on Types QPGFEP, QPHGFEP ..... 6

Circuit Breakers, Bolt-on Types BA, QBHW, HBAX, HBAW ..... 7

Ground Fault Circuit Breakers, Bolt-on Types QBGF, QBHGF ..... 8

Ground Fault Equipment Protectors, Bolt-on Types QBGFEP, QBHGFEP ..... 8

Circuit Breakers, Cable-in/Cable-out  
1-Inch per Pole Types QC, QCHW, QHCX, QHCW ... 9

1/2-Inch per Pole Types QCR, QCF, QCRH, QCFH ... 10

Ground Fault Circuit Breakers, Cable-in/Cable-out  
Types QCGF, QCHGF ..... 13

Ground Fault Equipment Protectors, Cable-in/  
Cable-out Types QPGFEP, QCHGFEP ..... 13

Solenoid-operated, Remote-controlled Types GHBS, GBHS ..... 14

International Rated Circuit Breakers ..... 16

Special Application Breakers ..... 17

Accessories ..... 18

Factory Modifications, Factory Installed Terminals ... 19

#### Supplementary Protectors

Type SPCL Current Limiting ..... 20

Type SPHM Hydraulic Magnetic ..... 23

#### Circuit Breaker Electronic Catalog

Navigation Chart of Attached CD-ROM ..... 192



- Product Guide
- Selection Data
- Time Current Curves
- Dimensions

Website: [www.cutlerhammer.eaton.com](http://www.cutlerhammer.eaton.com)

### Molded Case Circuit Breakers

#### Selection Guide ..... 3

#### Series C Circuit Breakers

G-Frame ..... 25

F-Frame ..... 31

J-Frame ..... 37

K-Frame ..... 43

L-Frame ..... 55

M-Frame ..... 67

N-Frame ..... 75

R-Frame ..... 89

#### Specific Application Circuit Breakers

Motor Circuit Protectors ..... 107

Earth Leakage ..... 113

Current Limiting

Non-fused ..... 115

Fused ..... 117

Engine Generator ..... 129

Direct Current ..... 133

Mining Service ..... See CD-ROM SA.74A.01.T.E

Navy ..... See CD-ROM SA.74A.01.T.E

Add-on Ground Fault Protection ..... 135

#### Internal Accessories

Alarm Switch ..... 139

Auxiliary Switch ..... 142

Auxiliary and Alarm Switch Combination ..... 145

Shunt Trip ..... 147

Low Energy Shunt Trip ..... 152

Undervoltage Release Mechanism ..... 153

Terminal Block ..... 160

Communication Kits ..... 160

#### External Accessories

Termination Hardware ..... 161

Mounting Hardware ..... 163

Locking Devices ..... 168

Interlocking Devices ..... 170

Electric Operators ..... 172

Plug-in Adapters ..... 174

Rear Connecting Studs ..... 175

Panelboard Connecting Straps ..... 177

Handle Mechanisms ..... 178

Circuit Breaker Enclosures ..... 187

Standards ..... 191

| Circuit Breaker Type | Circuit Breaker Type Code | Cont. Ampere Rating At 40°C | Number of Poles | Volts |    | Federal Spec. W-C-375b | Interrupting Ratings rms Symmetrical Amperes |         |     |       |      |    | Page Number |
|----------------------|---------------------------|-----------------------------|-----------------|-------|----|------------------------|----------------------------------------------|---------|-----|-------|------|----|-------------|
|                      |                           |                             |                 | Ac    | Dc |                        | Ac Ratings Volts                             |         |     | Dc②   |      |    |             |
|                      |                           |                             |                 |       |    |                        | 120                                          | 120/240 | 240 | 24-48 | 62.5 | 80 |             |

## Quicklag Industrial Circuit Breakers①

### Plug-in, Bolt-on, Cable-in/Cable-out

|         |         |        |         |         |              |               |        |        |        |       |       |       |    |
|---------|---------|--------|---------|---------|--------------|---------------|--------|--------|--------|-------|-------|-------|----|
| HQP     | P       | 10-70  | 1       | 120/240 | 24, 48, 62.5 | 10a, 11a, 12a | —      | 10,000 | —      | 5,000 | ③     | —     | 5  |
| HQP     | P       | 10-125 | 2       | 120/240 | 24, 48, 80   | 10a, 12a      | —      | 10,000 | —      | 5,000 | 5,000 | 5,000 | 5  |
| HQP     | P       | 10-100 | 2, 3    | 240     | —            | 10b, 11b, 12b | —      | —      | 10,000 | —     | —     | —     | 5  |
| QPHW    | P       | 15-70  | 1       | 120/240 | 24, 48, 62.5 | 14a           | —      | 22,000 | —      | 5,000 | ③     | —     | 5  |
| QPHW    | P       | 15-125 | 2       | 120/240 | 24, 48, 80   | 14a           | —      | 22,000 | —      | 5,000 | 5,000 | 5,000 | 5  |
| QPHW    | P       | 15-100 | 2, 3    | 240     | —            | 14b           | —      | —      | 22,000 | —     | —     | —     | 5  |
| QHPX    | P       | 15-70  | 1       | 120/240 | 24, 48, 62.5 | —             | —      | 42,000 | —      | 5,000 | ③     | —     | 5  |
| QHPX    | P       | 15-100 | 2       | 120/240 | 24, 48, 80   | —             | —      | 42,000 | —      | 5,000 | 5,000 | 5,000 | 5  |
| QHPX    | P       | 15-100 | 3       | 240     | —            | —             | —      | —      | 42,000 | —     | —     | —     | 5  |
| QHPW    | P       | 15-30  | 1       | 120/240 | 24, 48, 62.5 | 15a           | —      | 65,000 | —      | 5,000 | ③     | —     | 5  |
| QHPW    | P       | 15-30  | 2       | 120/240 | 24, 48, 80   | 15a           | —      | 65,000 | —      | 5,000 | 5,000 | 5,000 | 5  |
| QHPW    | P       | 15-20  | 3       | 240     | —            | 15b           | —      | —      | 65,000 | —     | —     | —     | 5  |
| QPGF    | P, GF   | 15-40  | 1       | 120     | —            | 10a, 11a, 12a | 10,000 | —      | —      | —     | —     | —     | 6  |
| QPGF    | P, GF   | 15-50  | 2       | 120/240 | —            | 10a, 11a, 12a | —      | 10,000 | —      | —     | —     | —     | 6  |
| QPHGF   | P, GF   | 15-30  | 1       | 120     | —            | 10a, 11a, 12a | 22,000 | —      | —      | —     | —     | —     | 6  |
| QPHGF   | P, GF   | 15-50  | 2       | 120/240 | —            | 10a, 11a, 12a | —      | 22,000 | —      | —     | —     | —     | 6  |
| QPGFEP  | P, GFEP | 15-40  | 1       | 120     | —            | —             | 10,000 | —      | —      | —     | —     | —     | 6  |
| QPGFEP  | P, GFEP | 15-50  | 2       | 120/240 | —            | —             | —      | 10,000 | —      | —     | —     | —     | 6  |
| QPHGFEP | P, GFEP | 15-30  | 1       | 120     | —            | —             | 22,000 | —      | —      | —     | —     | —     | 6  |
| QPHGFEP | P, GFEP | 15-30  | 2       | 120/240 | —            | —             | 22,000 | 22,000 | —      | —     | —     | —     | 6  |
| BAB     | B       | 10-70  | 1       | 120/240 | 24, 48, 62.5 | 10a, 11a, 12a | —      | 10,000 | —      | 5,000 | ③     | —     | 7  |
| BAB     | B       | 10-125 | 2       | 120/240 | 24, 48, 80   | 10a, 12a      | —      | 10,000 | —      | 5,000 | 5,000 | 5,000 | 7  |
| BAB     | B       | 10-100 | 2, 3    | 240     | —            | 10b, 11b, 12b | —      | —      | 10,000 | —     | —     | —     | 7  |
| QBHW    | B       | 15-70  | 1       | 120/240 | 24, 48, 62.5 | 14a           | —      | 22,000 | —      | 5,000 | ③     | —     | 7  |
| QBHW    | B       | 15-125 | 2       | 120/240 | 24, 48, 80   | 14a           | —      | 22,000 | —      | 5,000 | 5,000 | 5,000 | 7  |
| QBHW    | B       | 15-100 | 2, 3    | 240     | —            | 14b           | —      | —      | 22,000 | —     | —     | —     | 7  |
| HBAX    | B       | 15-70  | 1       | 120/240 | 24, 48, 62.5 | —             | —      | 42,000 | —      | 5,000 | ③     | —     | 7  |
| HBAX    | B       | 15-100 | 2       | 120/240 | 24, 48, 80   | —             | —      | 42,000 | —      | 5,000 | 5,000 | 5,000 | 7  |
| HBAX    | B       | 15-100 | 3       | 240     | —            | —             | —      | —      | 42,000 | —     | —     | —     | 7  |
| HBAW    | B       | 15-30  | 1       | 120/240 | 24, 48, 62.5 | 15a           | —      | 65,000 | —      | 5,000 | ③     | —     | 7  |
| HBAW    | B       | 15-30  | 2       | 120/240 | 24, 48, 80   | 15a           | —      | 65,000 | —      | 5,000 | 5,000 | 5,000 | 7  |
| HBAW    | B       | 15-20  | 3       | 240     | —            | 15b           | —      | —      | 65,000 | —     | —     | —     | 7  |
| QBGF    | B, GF   | 15-40  | 1       | 120     | —            | 10a, 11a, 12a | 10,000 | —      | —      | —     | —     | —     | 8  |
| QBGF    | B, GF   | 15-50  | 2       | 120/240 | —            | 10a, 11a, 12a | —      | 10,000 | —      | —     | —     | —     | 8  |
| QBHGF   | B, GF   | 15-30  | 1       | 120     | —            | 10a, 11a, 12a | 22,000 | —      | —      | —     | —     | —     | 8  |
| QBHGF   | B, GF   | 15-30  | 2       | 120/240 | —            | 10a, 11a, 12a | —      | 22,000 | —      | —     | —     | —     | 8  |
| QBGFEP  | B, GFEP | 15-40  | 1       | 120     | —            | —             | 10,000 | —      | —      | —     | —     | —     | 8  |
| QBGFEP  | B, GFEP | 15-50  | 2       | 120/240 | —            | —             | —      | 10,000 | —      | —     | —     | —     | 8  |
| QBHGFEP | B, GFEP | 15-30  | 1       | 120     | —            | —             | 22,000 | —      | —      | —     | —     | —     | 8  |
| QBHGFEP | B, GFEP | 15-30  | 2       | 120/240 | —            | —             | 22,000 | 22,000 | —      | —     | —     | —     | 8  |
| QC      | C       | 10-70  | 1       | 120/240 | 24, 48, 62.5 | 10a, 11a, 12a | —      | 10,000 | —      | 5,000 | ③     | —     | 9  |
| QC      | C       | 10-100 | 2       | 120/240 | 24, 48, 80   | 10a, 12a      | —      | 10,000 | —      | 5,000 | 5,000 | 5,000 | 9  |
| QC      | C       | 10-100 | 2, 3, 4 | 240     | —            | 10b, 11b, 12b | —      | —      | 10,000 | —     | —     | —     | 9  |
| QCF     | C       | 10-60  | 1, 2    | 120/240 | 24, 48, 62.5 | —             | 10,000 | 10,000 | —      | 3,000 | ③     | —     | 10 |
| QCF     | C       | 15-20  | 1, 2    | 120/240 | 24, 48, 62.5 | —             | 22,000 | —      | —      | 3,000 | 3,000 | —     | 10 |
| QCF     | C       | 15-30  | 2, 3    | 240     | 24, 48, 62.5 | —             | —      | 10,000 | —      | 3,000 | 3,000 | —     | 10 |
| QCR     | C       | 10-60  | 1, 2    | 120/240 | 24, 48, 62.5 | —             | 10,000 | 10,000 | —      | 3,000 | 2,000 | —     | 10 |
| QCR     | C       | 15-20  | 1, 2    | 120/240 | 24, 48, 62.5 | —             | 22,000 | —      | —      | 3,000 | 3,000 | —     | 10 |
| QCR     | C       | 15-30  | 2, 3    | 240     | 24, 48, 62.5 | —             | —      | 10,000 | —      | 3,000 | 3,000 | —     | 10 |
| QCHW    | C       | 15-70  | 1       | 120/240 | 24, 48, 62.5 | 14a           | —      | 22,000 | —      | 5,000 | ③     | —     | 9  |
| QCHW    | C       | 15-100 | 2       | 120/240 | 24, 48, 80   | 14a           | —      | 22,000 | —      | 5,000 | 5,000 | 5,000 | 9  |
| QCHW    | C       | 15-100 | 2, 3    | 240     | —            | 14b           | —      | —      | 22,000 | —     | —     | —     | 9  |
| QHCX    | C       | 15-70  | 1       | 120/240 | 24, 48, 62.5 | —             | —      | 42,000 | —      | 5,000 | ③     | —     | 9  |
| QHCX    | C       | 15-100 | 2       | 120/240 | 24, 48, 80   | —             | —      | 42,000 | —      | 5,000 | 5,000 | 5,000 | 9  |
| QHCX    | C       | 15-100 | 3       | 240     | —            | —             | —      | —      | 42,000 | —     | —     | —     | 9  |
| QHCW    | C       | 15-30  | 1       | 120/240 | 24, 48, 62.5 | 15a           | —      | 65,000 | —      | 5,000 | ③     | —     | 9  |
| QHCW    | C       | 15-30  | 2       | 120/240 | 24, 48, 80   | 15a           | —      | 65,000 | —      | 5,000 | 5,000 | 5,000 | 9  |
| QHCW    | C       | 15-20  | 3       | 240     | —            | 15b           | —      | —      | 65,000 | —     | —     | —     | 9  |
| QCGF    | C, GF   | 15-40  | 1       | 120     | —            | —             | 10,000 | —      | —      | —     | —     | —     | 13 |
| QCGF    | C, GF   | 15-50  | 2       | 120/240 | —            | —             | —      | 10,000 | —      | —     | —     | —     | 13 |
| QCHGF   | C, GF   | 15-30  | 1       | 120     | —            | —             | 22,000 | —      | —      | —     | —     | —     | 13 |
| QCHGF   | C, GF   | 15-30  | 2       | 120/240 | —            | —             | —      | 22,000 | —      | —     | —     | —     | 13 |
| QCGFEP  | C, GFEP | 15-40  | 1       | 120     | —            | —             | 10,000 | —      | —      | —     | —     | —     | 13 |
| QCGFEP  | C, GFEP | 15-50  | 2       | 120/240 | —            | —             | —      | 10,000 | —      | —     | —     | —     | 13 |
| QCHGFEP | C, GFEP | 15-30  | 1       | 120     | —            | —             | 22,000 | —      | —      | —     | —     | —     | 13 |
| QCHGFEP | C, GFEP | 15-30  | 2       | 120/240 | —            | —             | —      | 22,000 | —      | —     | —     | —     | 13 |

Circuit Breaker Type Codes: P Plug-in; B Bolt-on; C Cable-in/Cable-out; GF Ground Fault, 5 ma; GFEP Ground Fault, 30 ma.

For Types SPCL and SPHM Supplementary Protectors, see pages 20 and 23.

For Types GHBS and GBHS Solenoid-operated, Remote-controlled Circuit Breakers, see page 14.

① QUICKLAG circuit breakers are suitable for application in relative humidity 0-95% non-condensating.

② Two-pole dc interrupting ratings based on 2 poles connected in series.

③ 62.5 Vac interrupting rating is 3800 AIC 10-50 amperes and 2500 AIC 55-100 amperes continuous.

| Circuit Breaker Type | Cont. Amp Rating At 40°C | No. Poles | Volts |    | Type of Trip① | Federal Spec. W-C-375b | UL Listed Interrupting Ratings rms Symmetrical Amperes |         |     |     |     |     |     |     |         | Page Number |
|----------------------|--------------------------|-----------|-------|----|---------------|------------------------|--------------------------------------------------------|---------|-----|-----|-----|-----|-----|-----|---------|-------------|
|                      |                          |           | Ac    | Dc |               |                        | Ac Ratings Volts                                       |         |     |     |     |     | Dc② |     |         |             |
|                      |                          |           |       |    |               |                        | 120                                                    | 120/240 | 240 | 277 | 480 | 600 | 125 | 250 | 125/250 |             |

**Series C<sup>®</sup> Industrial Circuit Breakers****G-Frame**

|     |        |      |         |         |        |                         |        |   |        |        |        |   |        |   |        |    |
|-----|--------|------|---------|---------|--------|-------------------------|--------|---|--------|--------|--------|---|--------|---|--------|----|
| GB  | 15-100 | 1    | 120     | 125     | N.I.T. | 11a                     | 65,000 | — | —      | —      | —      | — | 14,000 | — | —      | 27 |
| GB  | 15-100 | 2, 3 | 240     | 125/250 |        | 10b, 11b, 12b, 14b, 15b | —      | — | 65,000 | —      | —      | — | —      | — | 14,000 | 27 |
| GHB | 15-100 | 1    | 120     | 125     | N.I.T. | 11a                     | 65,000 | — | —      | —      | —      | — | 14,000 | — | —      | 27 |
| GHB | 15-100 | 2, 3 | 240     | 125/250 |        | 10b, 11b, 12b, 14b, 15b | —      | — | 65,000 | —      | —      | — | —      | — | 14,000 | 27 |
| GHB | 15-100 | 1    | 277     | 125     |        | 12c, 13a                | —      | — | —      | 14,000 | —      | — | 14,000 | — | —      | 27 |
| GHB | 15-100 | 2, 3 | 277/480 | 125/250 |        | 13b                     | —      | — | —      | 14,000 | 14,000 | — | —      | — | 14,000 | 27 |

|     |        |      |         |         |        |                         |        |   |        |        |        |   |        |   |        |    |
|-----|--------|------|---------|---------|--------|-------------------------|--------|---|--------|--------|--------|---|--------|---|--------|----|
| GC  | 15-100 | 1    | 120     | 125     | N.I.T. | 11a                     | 65,000 | — | —      | —      | —      | — | 14,000 | — | —      | 28 |
| GC  | 15-100 | 2, 3 | 240     | 125/250 |        | 10b, 11b, 12b, 14b, 15b | —      | — | 65,000 | —      | —      | — | —      | — | 14,000 | 28 |
| GHC | 15-100 | 1    | 120     | 125     | N.I.T. | 12c, 13a                | 65,000 | — | —      | —      | —      | — | 14,000 | — | —      | 28 |
| GHC | 15-100 | 2, 3 | 240     | 125/250 |        | 13b                     | —      | — | 65,000 | —      | —      | — | —      | — | 14,000 | 28 |
| GHC | 15-100 | 1    | 277     | 125     |        | 12c, 13a                | —      | — | —      | 14,000 | —      | — | 14,000 | — | —      | 28 |
| GHC | 15-100 | 2, 3 | 277/480 | 125/250 |        | 13b                     | —      | — | —      | 14,000 | 14,000 | — | —      | — | 14,000 | 28 |

**F-Frame**

|     |         |      |     |     |        |     |   |   |         |        |         |        |        |        |   |    |
|-----|---------|------|-----|-----|--------|-----|---|---|---------|--------|---------|--------|--------|--------|---|----|
| GD  | 15-100  | 3    | 480 | 250 | N.I.T. | 13b | — | — | 65,000  | —      | 22,000  | —      | —      | 10,000 | — | 26 |
| ED  | 100-255 | 2, 3 | 240 | 125 | N.I.T. | 12b | — | — | 65,000  | —      | —       | —      | 10,000 | —      | — | 32 |
| EDH | 100-255 | 2, 3 | 240 | 125 |        | 14b | — | — | 100,000 | —      | —       | —      | 10,000 | —      | — | 32 |
| EDC | 100-255 | 2, 3 | 240 | 125 |        | 1   | — | — | 200,000 | —      | —       | —      | 10,000 | —      | — | 32 |
| EHD | 15-100  | 1    | 277 | 125 | N.I.T. | 13a | — | — | —       | 14,000 | —       | —      | 10,000 | —      | — | 32 |
| EHD | 15-100  | 2, 3 | 480 | 250 |        | 13b | — | — | 18,000  | —      | 14,000  | —      | —      | 10,000 | — | 32 |
| FDB | 15-150  | 2, 3 | 600 | 250 | N.I.T. | 18a | — | — | 18,000  | —      | 14,000  | 14,000 | —      | 10,000 | — | 32 |
| FDB | 15-150  | 4    | 600 | 250 |        | ③   | — | — | 18,000  | —      | 14,000  | 14,000 | —      | 10,000 | — | 32 |
| FD  | 15-150  | 1    | 277 | 125 | N.I.T. | 13a | — | — | —       | 25,000 | —       | —      | 10,000 | —      | — | 32 |
| FD  | 15-150  | 2, 3 | 600 | 250 |        | 22a | — | — | 65,000  | —      | 25,000  | 18,000 | —      | 10,000 | — | 32 |
| FD  | 15-150  | 4    | 600 | 250 |        | ③   | — | — | 65,000  | —      | 25,000  | 18,000 | —      | 10,000 | — | 32 |
| HFD | 15-150  | 1    | 277 | 125 | N.I.T. | 13a | — | — | —       | 65,000 | —       | —      | 10,000 | —      | — | 33 |
| HFD | 15-150  | 2, 3 | 600 | 250 |        | 22a | — | — | 100,000 | —      | 65,000  | 25,000 | —      | 20,000 | — | 33 |
| HFD | 15-150  | 4    | 600 | 250 |        | ③   | — | — | 100,000 | —      | 65,000  | 25,000 | —      | 20,000 | — | 33 |
| FDC | 15-150  | 2, 3 | 600 | 250 | N.I.T. | 24a | — | — | 200,000 | —      | 100,000 | 35,000 | —      | 20,000 | — | 33 |
| FDC | 15-150  | 4    | 600 | 250 |        | ③   | — | — | 200,000 | —      | 100,000 | 35,000 | —      | 20,000 | — | 33 |

**J-Frame**

|     |        |         |     |     |        |     |   |   |         |   |         |        |   |        |   |    |
|-----|--------|---------|-----|-----|--------|-----|---|---|---------|---|---------|--------|---|--------|---|----|
| JDB | 70-250 | 2, 3    | 600 | 250 | N.I.T. | 22a | — | — | 65,000  | — | 25,000  | 18,000 | — | 10,000 | — | 39 |
| JD  | 70-250 | 2, 3, 4 | 600 | 250 |        | 22a | — | — | 65,000  | — | 25,000  | 18,000 | — | 10,000 | — | 38 |
| HJD | 70-250 | 2, 3, 4 | 600 | 250 | I.T.   | 22a | — | — | 100,000 | — | 65,000  | 25,000 | — | 22,000 | — | 38 |
| JDC | 70-250 | 2, 3, 4 | 600 | 250 | I.T.   | 22a | — | — | 200,000 | — | 100,000 | 35,000 | — | 22,000 | — | 38 |

**K-Frame**

|      |         |         |     |     |        |     |   |   |         |   |         |        |   |        |   |            |
|------|---------|---------|-----|-----|--------|-----|---|---|---------|---|---------|--------|---|--------|---|------------|
| DK   | 250-400 | 2, 3    | 240 | 250 | N.I.T. | 14b | — | — | 65,000  | — | —       | —      | — | 10,000 | — | 47         |
| KDB  | 100-400 | 2, 3    | 600 | 250 | N.I.T. | 23a | — | — | 65,000  | — | 35,000  | 25,000 | — | 10,000 | — | 47         |
| KD   | 100-400 | 2, 3, 4 | 600 | 250 | I.T.   | 23a | — | — | 65,000  | — | 35,000  | 25,000 | — | 10,000 | — | 45, 46, 49 |
| CKD  | 100-400 | 2, 3, 4 | 600 | 250 | I.T.   | 23a | — | — | 65,000  | — | 35,000  | 25,000 | — | 10,000 | — | 48, 50     |
| HKD  | 100-400 | 2, 3, 4 | 600 | 250 | I.T.   | 23a | — | — | 100,000 | — | 65,000  | 35,000 | — | 22,000 | — | 45, 46, 49 |
| CHKD | 100-400 | 2, 3, 4 | 600 | 250 | I.T.   | 23a | — | — | 100,000 | — | 65,000  | 35,000 | — | 22,000 | — | 48, 50     |
| KDC  | 100-400 | 2, 3, 4 | 600 | 250 | I.T.   | 23a | — | — | 200,000 | — | 100,000 | 50,000 | — | 22,000 | — | 45, 46, 49 |

**L-Frame**

|      |         |         |     |     |        |     |   |   |         |   |         |        |   |        |   |        |
|------|---------|---------|-----|-----|--------|-----|---|---|---------|---|---------|--------|---|--------|---|--------|
| LDB  | 300-600 | 2, 3    | 600 | 250 | N.I.T. | 23a | — | — | 65,000  | — | 35,000  | 25,000 | — | 22,000 | — | 58     |
| LD   | 300-600 | 2, 3, 4 | 600 | 250 | I.T.   | 23a | — | — | 65,000  | — | 35,000  | 25,000 | — | 22,000 | — | 57, 59 |
| CLD  | 300-600 | 2, 3, 4 | 600 | 250 | I.T.   | 23a | — | — | 65,000  | — | 35,000  | 25,000 | — | 22,000 | — | 58, 61 |
| HLD  | 300-600 | 2, 3, 4 | 600 | 250 | I.T.   | 23a | — | — | 100,000 | — | 65,000  | 35,000 | — | 25,000 | — | 57, 59 |
| CHLD | 300-600 | 2, 3, 4 | 600 | 250 | I.T.   | 23a | — | — | 100,000 | — | 65,000  | 35,000 | — | 25,000 | — | 61     |
| LDC  | 300-600 | 2, 3, 4 | 600 | 250 | I.T.   | 23a | — | — | 200,000 | — | 100,000 | 50,000 | — | 25,000 | — | 57, 60 |
| CLDC | 300-600 | 2, 3, 4 | 600 | 250 | I.T.   | 23a | — | — | 200,000 | — | 100,000 | 50,000 | — | 25,000 | — | 62     |

① N.I.T. is non-interchangeable trip unit and I.T. is interchangeable trip unit.

② Two-pole circuit breaker, or two poles of three-pole circuit breaker at 250 Vdc.

③ Not defined in W-C-375b.

## Selection Guide, Continued

| Circuit Breaker Type | Cont. Amp Rating At 40°C | No. Poles | Volts |    | Type of Trip① | Federal Spec. W-C-375b | UL Listed Interrupting Ratings rms Symmetrical Amperes |         |     |     |     |     |     |     |         | Page Number |
|----------------------|--------------------------|-----------|-------|----|---------------|------------------------|--------------------------------------------------------|---------|-----|-----|-----|-----|-----|-----|---------|-------------|
|                      |                          |           | Ac    | Dc |               |                        | Ac Ratings Volts                                       |         |     |     |     |     | Dc② |     |         |             |
|                      |                          |           |       |    |               |                        | 120                                                    | 120/240 | 240 | 277 | 480 | 600 | 125 | 250 | 125/250 |             |

### Series C<sup>®</sup> Industrial Circuit Breakers

#### M-Frame

|       |         |      |     |     |      |     |   |   |         |   |        |        |   |        |   |        |
|-------|---------|------|-----|-----|------|-----|---|---|---------|---|--------|--------|---|--------|---|--------|
| MDL   | 300-800 | 2, 3 | 600 | 250 | I.T. | 23a | — | — | 65,000  | — | 50,000 | 25,000 | — | 22,000 | — | 69, 70 |
| CMDL  | 300-800 | 2, 3 | 600 | 250 | I.T. | 23a | — | — | 65,000  | — | 50,000 | 25,000 | — | 22,000 | — | 70     |
| HMDL  | 300-800 | 2, 3 | 600 | 250 | I.T. | 23a | — | — | 100,000 | — | 65,000 | 35,000 | — | 25,000 | — | 69, 70 |
| CHMDL | 300-800 | 2, 3 | 600 | 250 | I.T. | 23a | — | — | 100,000 | — | 65,000 | 35,000 | — | 25,000 | — | 70     |

#### N-Frame

|      |          |      |     |   |        |     |   |   |         |   |         |        |   |   |   |        |
|------|----------|------|-----|---|--------|-----|---|---|---------|---|---------|--------|---|---|---|--------|
| ND   | 600-1200 | 3, 4 | 600 | — | N.I.T. | 23A | — | — | 65,000  | — | 50,000  | 25,000 | — | — | — | 77, 83 |
| CND  | 600-1200 | 3, 4 | 600 | — | N.I.T. | 23A | — | — | 65,000  | — | 50,000  | 25,000 | — | — | — | 80, 84 |
| HND  | 600-1200 | 3, 4 | 600 | — | N.I.T. | 23A | — | — | 100,000 | — | 65,000  | 35,000 | — | — | — | 78, 83 |
| CHND | 600-1200 | 3, 4 | 600 | — | N.I.T. | 23A | — | — | 100,000 | — | 65,000  | 35,000 | — | — | — | 81, 84 |
| NDC  | 600-1200 | 3, 4 | 600 | — | N.I.T. | 23A | — | — | 200,000 | — | 100,000 | 50,000 | — | — | — | 79, 83 |
| CNDC | 600-1200 | 3, 4 | 600 | — | N.I.T. | 23A | — | — | 200,000 | — | 100,000 | 50,000 | — | — | — | 82, 84 |

#### R-Frame

|           |           |      |     |   |        |     |   |   |         |   |         |        |   |   |   |    |
|-----------|-----------|------|-----|---|--------|-----|---|---|---------|---|---------|--------|---|---|---|----|
| RD 1600   | 800-1600  | 3, 4 | 600 | — | N.I.T. | 24a | — | — | 125,000 | — | 65,000  | 50,000 | — | — | — | 91 |
| CRD 1600  | 800-1600  | 3, 4 | 600 | — | N.I.T. | 24a | — | — | 125,000 | — | 65,000  | 50,000 | — | — | — | 93 |
| RD 2000   | 1000-2000 | 3, 4 | 600 | — | N.I.T. | 24a | — | — | 125,000 | — | 65,000  | 50,000 | — | — | — | 91 |
| RD 2500   | 1000-2500 | 3, 4 | 600 | — | N.I.T. | 24a | — | — | 200,000 | — | 65,000  | 50,000 | — | — | — | 91 |
| CRD 2000  | 1000-2000 | 3, 4 | 600 | — | N.I.T. | 24a | — | — | 125,000 | — | 65,000  | 50,000 | — | — | — | 93 |
| RDC 1600  | 800-1600  | 3, 4 | 600 | — | N.I.T. | 25a | — | — | 200,000 | — | 100,000 | 65,000 | — | — | — | 92 |
| CRDC 1600 | 800-1600  | 3, 4 | 600 | — | N.I.T. | 25a | — | — | 200,000 | — | 100,000 | 65,000 | — | — | — | 93 |
| RDC 2000  | 1000-2000 | 3, 4 | 600 | — | N.I.T. | 25a | — | — | 200,000 | — | 100,000 | 65,000 | — | — | — | 92 |
| RDC 2500  | 1000-2500 | 3, 4 | 600 | — | N.I.T. | 25a | — | — | 200,000 | — | 100,000 | 65,000 | — | — | — | 92 |
| CRDC 2000 | 1000-2000 | 3, 4 | 600 | — | N.I.T. | 25a | — | — | 200,000 | — | 100,000 | 65,000 | — | — | — | 93 |

### Series C<sup>®</sup> HMCP Motor Circuit Protectors

107

#### Current Limit R Current Limiting Circuit Breakers – Non-Fused Type

|     |         |      |     |   |        |   |   |   |         |   |         |         |   |   |   |     |
|-----|---------|------|-----|---|--------|---|---|---|---------|---|---------|---------|---|---|---|-----|
| FCL | 15-100  | 2, 3 | 480 | — | N.I.T. | — | — | — | 200,000 | — | 150,000 | —       | — | — | — | 115 |
| LCL | 125-400 | 2, 3 | 600 | — | N.I.T. | — | — | — | 200,000 | — | 200,000 | 100,000 | — | — | — | 116 |

#### Tri-Pac Current Limiting Circuit Breakers – Fused Type

|    |          |      |     |     |        |                    |   |   |         |   |         |         |   |   |         |     |
|----|----------|------|-----|-----|--------|--------------------|---|---|---------|---|---------|---------|---|---|---------|-----|
| FB | 15-100   | 2, 3 | 600 | 250 | N.I.T. | 16a, 16b, 17a, 26a | — | — | 200,000 | — | 200,000 | 200,000 | — | — | 100,000 | 117 |
| LA | 70-400   | 2, 3 | 600 | 250 | I.T.   | 16a, 16b, 17a, 26a | — | — | 200,000 | — | 200,000 | 200,000 | — | — | 100,000 | 118 |
| NB | 300-800  | 2, 3 | 600 | 250 | I.T.   | 16b, 17a, 26a      | — | — | 200,000 | — | 200,000 | 200,000 | — | — | 100,000 | 119 |
| PB | 600-1600 | 2, 3 | 600 | 250 | I.T.   | 17a, 26a           | — | — | 200,000 | — | 200,000 | 200,000 | — | — | 100,000 | 120 |

① N.I.T. is non-interchangeable trip unit and I.T. is interchangeable trip unit.

② Two-pole circuit breaker, or two poles of three-pole circuit breaker at 250 Vdc.

## QUICKLAG Industrial Circuit Breakers Plug-on

### Description

#### Built and Listed to UL 489

#### QUICKLAG Circuit Breakers Plug-on Type

Type HQP: 10-150 Amperes,  
10,000 AIC

Type QPHW: 15-125 Amperes,  
22,000 AIC

Type QHPX: 15-100 Amperes,  
42,000 AIC

Type QHPW: 15-30 Amperes,  
65,000 AIC



QUICKLAG Type HQP 1-Pole



QUICKLAG Type HQP 2-Pole



QUICKLAG Type HQP 3-Pole

### Breaker Catalog Numbers

| Continuous Ampere Rating at 40°C | Catalog Number       |                      |         |                      |
|----------------------------------|----------------------|----------------------|---------|----------------------|
|                                  | 1-Pole <sup>①②</sup> | 2-Pole <sup>①②</sup> |         | 3-Pole <sup>①②</sup> |
|                                  | 120/240 Vac          | 120/240 Vac          | 240 Vac | 240 Vac              |

#### QUICKLAG Type: HQP 10,000 Ampere I.C. Thermal-Magnetic Breakers

|     |                       |         |          |          |
|-----|-----------------------|---------|----------|----------|
| 10  | HQP1010               | HQP2010 | HQP2010H | HQP3010H |
| 15  | HQP1015 <sup>③④</sup> | HQP2015 | HQP2015H | HQP3015H |
| 20  | HQP1020 <sup>③④</sup> | HQP2020 | HQP2020H | HQP3020H |
| 25  | HQP1025               | HQP2025 | HQP2025H | HQP3025H |
| 30  | HQP1030               | HQP2030 | HQP2030H | HQP3030H |
| 35  | HQP1035               | HQP2035 | HQP2035H | HQP3035H |
| 40  | HQP1040               | HQP2040 | HQP2040H | HQP3040H |
| 45  | HQP1045               | HQP2045 | HQP2045H | HQP3045H |
| 50  | HQP1050               | HQP2050 | HQP2050H | HQP3050H |
| 55  | HQP1055               | HQP2055 | HQP2055H | HQP3055H |
| 60  | HQP1060               | HQP2060 | HQP2060H | HQP3060H |
| 70  | HQP1070               | HQP2070 | HQP2070H | HQP3070H |
| 80  | —                     | HQP2080 | HQP2080H | HQP3080H |
| 90  | —                     | HQP2090 | HQP2090H | HQP3090H |
| 100 | HQP1100               | HQP2100 | HQP2100H | HQP3100H |
| 110 | —                     | HQP2110 | —        | —        |
| 125 | —                     | HQP2125 | —        | —        |
| 150 | —                     | HQP2150 | —        | —        |

#### QUICKLAG Type: QPHW 22,000 Ampere I.C. Thermal-Magnetic Breakers

|     |                       |          |           |           |
|-----|-----------------------|----------|-----------|-----------|
| 15  | QPHW1015 <sup>③</sup> | QPHW2015 | QPHW2015H | QPHW3015H |
| 20  | QPHW1020 <sup>③</sup> | QPHW2020 | QPHW2020H | QPHW3020H |
| 25  | QPHW1025              | QPHW2025 | QPHW2025H | QPHW3025H |
| 30  | QPHW1030              | QPHW2030 | QPHW2030H | QPHW3030H |
| 35  | QPHW1035              | QPHW2035 | QPHW2035H | QPHW3035H |
| 40  | QPHW1040              | QPHW2040 | QPHW2040H | QPHW3040H |
| 45  | QPHW1045              | QPHW2045 | QPHW2045H | QPHW3045H |
| 50  | QPHW1050              | QPHW2050 | QPHW2050H | QPHW3050H |
| 55  | QPHW1055              | QPHW2055 | QPHW2055H | QPHW3055H |
| 60  | QPHW1060              | QPHW2060 | QPHW2060H | QPHW3060H |
| 70  | QPHW1070              | QPHW2070 | QPHW2070H | QPHW3070H |
| 80  | —                     | QPHW2080 | QPHW2080H | QPHW3080H |
| 90  | —                     | QPHW2090 | QPHW2090H | QPHW3090H |
| 100 | —                     | QPHW2100 | QPHW2100H | QPHW3100H |
| 110 | —                     | QPHW2110 | —         | —         |
| 125 | —                     | QPHW2125 | —         | —         |

#### QUICKLAG Type: QHPX 42,000 Ampere I.C. Thermal-Magnetic Breakers

|     |                       |          |   |           |
|-----|-----------------------|----------|---|-----------|
| 15  | QHPX1015 <sup>③</sup> | QHPX2015 | — | QHPX3015H |
| 20  | QHPX1020 <sup>③</sup> | QHPX2020 | — | QHPX3020H |
| 25  | QHPX1025              | QHPX2025 | — | QHPX3025H |
| 30  | QHPX1030              | QHPX2030 | — | QHPX3030H |
| 35  | QHPX1035              | QHPX2035 | — | QHPX3035H |
| 40  | QHPX1040              | QHPX2040 | — | QHPX3040H |
| 45  | QHPX1045              | QHPX2045 | — | QHPX3045H |
| 50  | QHPX1050              | QHPX2050 | — | QHPX3050H |
| 55  | QHPX1055              | QHPX2055 | — | QHPX3055H |
| 60  | QHPX1060              | QHPX2060 | — | QHPX3060H |
| 70  | QHPX1070              | QHPX2070 | — | QHPX3070H |
| 80  | —                     | QHPX2080 | — | QHPX3080H |
| 90  | —                     | QHPX2090 | — | QHPX3090H |
| 100 | —                     | QHPX2100 | — | QHPX3100H |

#### QUICKLAG Type: QHPW 65,000 Ampere I.C. Thermal-Magnetic Breakers

|    |                       |          |   |           |
|----|-----------------------|----------|---|-----------|
| 15 | QHPW1015 <sup>③</sup> | QHPW2015 | — | QHPW3015H |
| 20 | QHPW1020 <sup>③</sup> | QHPW2020 | — | QHPW3020H |
| 25 | QHPW1025              | QHPW2025 | — | —         |
| 30 | QHPW1030              | QHPW2030 | — | —         |

### Shipping Data

| Poles | Carton Quantity | Approximate Weight Lbs. (Kgs) | Dimensions Inches (mm)                            |
|-------|-----------------|-------------------------------|---------------------------------------------------|
| 1     | 24              | 9.000 (4.09)                  | 12.500 (317.50) x 7.500 (190.50) x 5.000 (127.00) |
| 2     | 12              | 9.000 (4.09)                  | 12.500 (317.50) x 7.500 (190.50) x 5.000 (127.00) |
| 3     | 8               | 9.000 (4.09)                  | 12.500 (317.50) x 7.500 (190.50) x 5.000 (127.00) |

- ① All products UL and CSA listed.
- ② All products 15-100A are HACR rated.
- ③ Switching duty rated for 120 Vac fluorescent light applications.
- ④ For special low-magnetic breaker order HQP1015L1 or HQP1020L1

# Miniature Circuit Breakers QUICKLAG® Industrial Circuit Breakers

Cutler-Hammer

March 1999

## QUICKLAG Industrial Ground Fault Circuit Breakers and Equipment Protectors Plug-on

### Description

#### Plug-on Type

Built and Listed to UL 489

#### QUICKLAG Ground Fault Circuit Breakers, Class A GFCI

Built and Tested to UL 943

#### 5mA Trip Sensitivity

Type QPGF: 15-50 Amperes,  
10,000 AIC

Type QPHGF: 15-30 Amperes,  
22,000 AIC

#### QUICKLAG Ground Fault Equipment Protectors

Built and Listed to UL 1053

#### 30mA Trip Sensitivity

Type QPGFEP: 15-50 Amperes,  
10,000 AIC

Type QPHGFEP: 15-30 Amperes,  
22,000 AIC



QUICKLAG Type QPGF 1-Pole  
Ground Fault Circuit Breaker



QUICKLAG Type QPGF 2-Pole  
Ground Fault Circuit Breaker

### Shipping Data

Shipped individually or in carton quantities.

| Poles | Carton Quantity | Approximate Weight Lbs. (Kgs) | Dimensions Inches (mm)                            |
|-------|-----------------|-------------------------------|---------------------------------------------------|
| 1     | 20              | 11.000 (4.99)                 | 12.500 (317.50) x 6.500 (165.10) x 5.000 (127.00) |
| 2     | 5               | 5.000 (2.29)                  | 15.500 (393.70) x 6.000 (152.40) x 4.500 (114.30) |

### Breaker Catalog Numbers

| Continuous Ampere Rating at 40°C | Catalog Number |             |
|----------------------------------|----------------|-------------|
|                                  | 1-Pole         | 2-Pole      |
|                                  | 120 Vac        | 120/240 Vac |

#### Ground Fault Circuit Breakers – 5mA Sensitivity

QUICKLAG Type: QPGF 10,000 Ampere I.C. Thermal-Magnetic Breakers

|    |          |          |
|----|----------|----------|
| 15 | QPGF1015 | QPGF2015 |
| 20 | QPGF1020 | QPGF2020 |
| 25 | QPGF1025 | QPGF2025 |
| 30 | QPGF1030 | QPGF2030 |
| 40 | QPGF1040 | QPGF2040 |
| 50 | —        | QPGF2050 |

#### QUICKLAG Type: QPHGF 22,000 Ampere I.C. Thermal-Magnetic Breakers

|    |           |           |
|----|-----------|-----------|
| 15 | QPHGF1015 | QPHGF2015 |
| 20 | QPHGF1020 | QPHGF2020 |
| 25 | QPHGF1025 | QPHGF2025 |
| 30 | QPHGF1030 | QPHGF2030 |

#### Ground Fault Equipment Protectors – 30mA Sensitivity

QUICKLAG Type: QPGFEP 10,000 Ampere I.C. Thermal-Magnetic Breakers

|    |            |            |
|----|------------|------------|
| 15 | QPGFEP1015 | QPGFEP2015 |
| 20 | QPGFEP1020 | QPGFEP2020 |
| 25 | QPGFEP1025 | QPGFEP2025 |
| 30 | QPGFEP1030 | QPGFEP2030 |
| 40 | QPGFEP1040 | QPGFEP2040 |
| 50 | —          | QPGFEP2050 |

#### QUICKLAG Type: QPHGFEP 22,000 Ampere I.C. Thermal-Magnetic Breakers

|    |             |             |
|----|-------------|-------------|
| 15 | QPHGFEP1015 | QPHGFEP2015 |
| 20 | QPHGFEP1020 | QPHGFEP2020 |
| 25 | QPHGFEP1025 | QPHGFEP2025 |
| 30 | QPHGFEP1030 | QPHGFEP2030 |

#### Special Application Ground Fault Circuit Protectors – 5mA Sensitivity

QUICKLAG Type: QPGF 10,000 Ampere I.C. with Bell Alarm (W1) or Auxiliary Switch (W2)

|    |            |            |
|----|------------|------------|
| 15 | QPGF1015W1 | QPGF2015W1 |
| 20 | QPGF1020W1 | QPGF2020W1 |
| 25 | QPGF1025W1 | QPGF2025W1 |
| 30 | QPGF1030W1 | QPGF2030W1 |
| 40 | —          | QPGF2040W1 |
| 50 | —          | QPGF2050W1 |
| 15 | QPGF1015W2 | —          |
| 20 | QPGF1020W2 | —          |
| 25 | QPGF1025W2 | —          |
| 30 | QPGF1030W2 | —          |

#### Special Application Ground Fault Circuit Protectors – 30mA Sensitivity

QUICKLAG Type: QPGFEP 10,000 Ampere I.C. with Bell Alarm (W1) or Auxiliary Switch (W2)

|    |              |              |
|----|--------------|--------------|
| 15 | QPGFEP1015W1 | QPGFEP2015W1 |
| 20 | QPGFEP1020W1 | QPGFEP2020W1 |
| 25 | QPGFEP1025W1 | QPGFEP2025W1 |
| 30 | QPGFEP1030W1 | QPGFEP2030W1 |
| 40 | —            | QPGFEP2040W1 |
| 50 | —            | QPGFEP2050W1 |
| 15 | QPGFEP1015W2 | —            |
| 20 | QPGFEP1020W2 | —            |
| 25 | QPGFEP1025W2 | —            |
| 30 | QPGFEP1030W2 | —            |

### Bell Alarm and Auxiliary Contact Schematic



Single-throw double-pole contacts are UL and CSA listed for 5 Amperes at 250 Vac.  
Bell Alarm (W1) – contacts change state when breaker trips.  
Auxiliary Switch (W2) – contacts change state when breaker is opened (or tripped) or closed.  
14-inch long #18 AWG pigtail wire leads provided.



## QUICKLAG Industrial Circuit Breakers Bolt-on

### Description

#### Built and Listed to UL 489

#### QUICKLAG Circuit Breakers Bolt-on Type

Type BA: 10-125 Amperes,  
10,000 AIC

Type QBHW: 15-125 Amperes,  
22,000 AIC

Type HBAX: 15-100 Amperes,  
42,000 AIC

Type HBAW: 15-30 Amperes,  
65,000 AIC



QUICKLAG Type BA 1-Pole



QUICKLAG Type BA 2-Pole



QUICKLAG Type BA 3-Pole

### Breaker Catalog Numbers

| Continuous<br>Ampere<br>Rating at<br>40°C | Catalog Number       |  |                      |         |
|-------------------------------------------|----------------------|--|----------------------|---------|
|                                           | 1-Pole <sup>①②</sup> |  | 2-Pole <sup>①②</sup> |         |
|                                           | 120/240 Vac          |  | 120/240 Vac          | 240 Vac |

## QUICKLAG Type: BA 10,000 Ampere I.C. Thermal-Magnetic Breakers

|     |                       |         |          |          |
|-----|-----------------------|---------|----------|----------|
| 10  | BAB1010               | BAB2010 | BAB2010H | BAB3010H |
| 15  | BAB1015 <sup>③④</sup> | BAB2015 | BAB2015H | BAB3015H |
| 20  | BAB1020 <sup>③④</sup> | BAB2020 | BAB2020H | BAB3020H |
| 25  | BAB1025               | BAB2025 | BAB2025H | BAB3025H |
| 30  | BAB1030               | BAB2030 | BAB2030H | BAB3030H |
| 35  | BAB1035               | BAB2035 | BAB2035H | BAB3035H |
| 40  | BAB1040               | BAB2040 | BAB2040H | BAB3040H |
| 45  | BAB1045               | BAB2045 | BAB2045H | BAB3045H |
| 50  | BAB1050               | BAB2050 | BAB2050H | BAB3050H |
| 55  | BAB1055               | BAB2055 | BAB2055H | BAB3055H |
| 60  | BAB1060               | BAB2060 | BAB2060H | BAB3060H |
| 70  | BAB1070               | BAB2070 | BAB2070H | BAB3070H |
| 80  | —                     | BAB2080 | BAB2080H | BAB3080H |
| 90  | —                     | BAB2090 | BAB2090H | BAB3090H |
| 100 | BAB1100               | BAB2100 | BAB2100H | BAB3100H |
| 110 | —                     | BAB2110 | —        | —        |
| 125 | —                     | BAB2125 | —        | —        |

## QUICKLAG Type: QBHW 22,000 Ampere I.C. Thermal-Magnetic Breakers

|     |                       |          |           |           |
|-----|-----------------------|----------|-----------|-----------|
| 15  | QBHW1015 <sup>③</sup> | QBHW2015 | QBHW2015H | QBHW3015H |
| 20  | QBHW1020 <sup>③</sup> | QBHW2020 | QBHW2020H | QBHW3020H |
| 25  | QBHW1025              | QBHW2025 | QBHW2025H | QBHW3025H |
| 30  | QBHW1030              | QBHW2030 | QBHW2030H | QBHW3030H |
| 35  | QBHW1035              | QBHW2035 | QBHW2035H | QBHW3035H |
| 40  | QBHW1040              | QBHW2040 | QBHW2040H | QBHW3040H |
| 45  | QBHW1045              | QBHW2045 | QBHW2045H | QBHW3045H |
| 50  | QBHW1050              | QBHW2050 | QBHW2050H | QBHW3050H |
| 55  | QBHW1055              | QBHW2055 | QBHW2055H | QBHW3055H |
| 60  | QBHW1060              | QBHW2060 | QBHW2060H | QBHW3060H |
| 70  | QBHW1070              | QBHW2070 | QBHW2070H | QBHW3070H |
| 80  | —                     | QBHW2080 | QBHW2080H | QBHW3080H |
| 90  | —                     | QBHW2090 | QBHW2090H | QBHW3090H |
| 100 | —                     | QBHW2100 | QBHW2100H | QBHW3100H |
| 110 | —                     | QBHW2110 | —         | —         |
| 125 | —                     | QBHW2125 | —         | —         |

## QUICKLAG Type: HBAX 42,000 Ampere I.C. Thermal-Magnetic Breakers

|     |                       |          |   |           |
|-----|-----------------------|----------|---|-----------|
| 15  | HBAX1015 <sup>③</sup> | HBAX2015 | — | HBAX3015H |
| 20  | HBAX1020 <sup>③</sup> | HBAX2020 | — | HBAX3020H |
| 25  | HBAX1025              | HBAX2025 | — | HBAX3025H |
| 30  | HBAX1030              | HBAX2030 | — | HBAX3030H |
| 35  | HBAX1035              | HBAX2035 | — | HBAX3035H |
| 40  | HBAX1040              | HBAX2040 | — | HBAX3040H |
| 45  | HBAX1045              | HBAX2045 | — | HBAX3045H |
| 50  | HBAX1050              | HBAX2050 | — | HBAX3050H |
| 55  | HBAX1055              | HBAX2055 | — | HBAX3055H |
| 60  | HBAX1060              | HBAX2060 | — | HBAX3060H |
| 70  | HBAX1070              | HBAX2070 | — | HBAX3070H |
| 80  | —                     | HBAX2080 | — | HBAX3080H |
| 90  | —                     | HBAX2090 | — | HBAX3090H |
| 100 | —                     | HBAX2100 | — | HBAX3100H |

## QUICKLAG Type: HBAW 65,000 Ampere I.C. Thermal-Magnetic Breakers

|    |                       |          |   |           |
|----|-----------------------|----------|---|-----------|
| 15 | HBAW1015 <sup>③</sup> | HBAW2015 | — | HBAW3015H |
| 20 | HBAW1020 <sup>③</sup> | HBAW2020 | — | HBAW3020H |
| 25 | HBAW1025              | HBAW2025 | — | —         |
| 30 | HBAW1030              | HBAW2030 | — | —         |

### Shipping Data

| Poles | Carton<br>Quantity | Approximate<br>Weight Lbs. (Kgs) | Dimensions Inches (mm)                            |
|-------|--------------------|----------------------------------|---------------------------------------------------|
| 1     | 24                 | 9.000 (4.09)                     | 12.500 (317.50) x 7.500 (190.50) x 5.000 (127.00) |
| 2     | 18                 | 9.000 (4.09)                     | 12.500 (317.50) x 7.500 (190.50) x 5.000 (127.00) |
| 3     | 8                  | 9.000 (4.09)                     | 12.500 (317.50) x 7.500 (190.50) x 5.000 (127.00) |

- ① All products UL and CSA listed.
- ② All products 15-100A are HACR rated.
- ③ Switching duty rated for 120 Vac fluorescent light applications.
- ④ For special low-magnetic breaker order BAB1015L1 or BAB1020L1.

# Miniature Circuit Breakers QUICKLAG® Industrial Circuit Breakers

Cutler-Hammer

March 1999

## QUICKLAG Industrial Ground Fault Circuit Protectors Bolt-on

### Description

#### Bolt-on Type

Built and Listed to UL 489

#### QUICKLAG Ground Fault Circuit Breakers, Class A GFCI

Built and Tested to UL 943

5mA Trip Sensitivity

Type QBGF: 15-50 Amperes,  
10,000 AICType QBHGF: 15-30 Amperes,  
22,000 AIC

#### QUICKLAG Ground Fault Equipment Protectors

Built and Tested to UL 1053

30mA Trip Sensitivity

Type QBGFEP: 15-50 Amperes,  
10,000 AICType QBHGFEP: 15-30 Amperes,  
22,000 AIC

QUICKLAG Type QBGF 1-Pole  
Ground Fault Circuit Breaker



QUICKLAG Type QBGF 2-Pole  
Ground Fault Circuit Breaker

### Breaker Catalog Numbers

| Continuous<br>Ampere<br>Rating at<br>40°C | Catalog Number |             |
|-------------------------------------------|----------------|-------------|
|                                           | 1-Pole         | 2-Pole      |
|                                           | 120 Vac        | 120/240 Vac |

#### Ground Fault Circuit Breakers – 5mA Sensitivity

QUICKLAG Type: QBGF 10,000 Ampere I.C. Thermal-Magnetic Breakers

|    |          |          |
|----|----------|----------|
| 15 | QBGF1015 | QBGF2015 |
| 20 | QBGF1020 | QBGF2020 |
| 25 | QBGF1025 | QBGF2025 |
| 30 | QBGF1030 | QBGF2030 |
| 40 | QBGF1040 | QBGF2040 |
| 50 | —        | QBGF2050 |

#### QUICKLAG Type: QBHGF 22,000 Ampere I.C. Thermal-Magnetic Breakers

|    |           |           |
|----|-----------|-----------|
| 15 | QBHGF1015 | QBHGF2015 |
| 20 | QBHGF1020 | QBHGF2020 |
| 25 | QBHGF1025 | QBHGF2025 |
| 30 | QBHGF1030 | QBHGF2030 |

#### Ground Fault Equipment Protectors – 30mA Sensitivity

QUICKLAG Type: QBGFEP 10,000 Ampere I.C. Thermal-Magnetic Breakers

|    |            |            |
|----|------------|------------|
| 15 | QBGFEP1015 | QBGFEP2015 |
| 20 | QBGFEP1020 | QBGFEP2020 |
| 25 | QBGFEP1025 | QBGFEP2025 |
| 30 | QBGFEP1030 | QBGFEP2030 |
| 40 | QBGFEP1040 | QBGFEP2040 |
| 50 | —          | QBGFEP2050 |

#### QUICKLAG Type: QBHGFEP 22,000 Ampere I.C. Thermal-Magnetic Breakers

|    |             |             |
|----|-------------|-------------|
| 15 | QBHGFEP1015 | QBHGFEP2015 |
| 20 | QBHGFEP1020 | QBHGFEP2020 |
| 25 | QBHGFEP1025 | QBHGFEP2025 |
| 30 | QBHGFEP1030 | QBHGFEP2030 |

#### Special Application Ground Fault Circuit Protectors – 5mA Sensitivity

QUICKLAG Type: QBGF 10,000 Ampere I.C. with Bell Alarm (W1) or Auxiliary Switch (W2)

|    |            |            |
|----|------------|------------|
| 15 | QBGF1015W1 | QBGF2015W1 |
| 20 | QBGF1020W1 | QBGF2020W1 |
| 25 | QBGF1025W1 | QBGF2025W1 |
| 30 | QBGF1030W1 | QBGF2030W1 |
| 40 | —          | QBGF2040W1 |
| 50 | —          | QBGF2050W1 |
| 15 | QBGF1015W2 | —          |
| 20 | QBGF1020W2 | —          |
| 25 | QBGF1025W2 | —          |
| 30 | QBGF1030W2 | —          |

#### Special Application Ground Fault Circuit Protectors – 30mA Sensitivity

QUICKLAG Type: QBGFEP 10,000 Ampere I.C. with Bell Alarm (W1) or Auxiliary Switch (W2)

|    |              |              |
|----|--------------|--------------|
| 15 | QBGFEP1015W1 | QBGFEP2015W1 |
| 20 | QBGFEP1020W1 | QBGFEP2020W1 |
| 25 | QBGFEP1025W1 | QBGFEP2025W1 |
| 30 | QBGFEP1030W1 | QBGFEP2030W1 |
| 40 | —            | QBGFEP2040W1 |
| 50 | —            | QBGFEP2050W1 |
| 15 | QBGFEP1015W2 | —            |
| 20 | QBGFEP1020W2 | —            |
| 25 | QBGFEP1025W2 | —            |
| 30 | QBGFEP1030W2 | —            |

### Shipping Data

| Poles | Carton<br>Quantity | Approximate<br>Weight Lbs.<br>(Kgs) | Dimensions<br>Inches (mm)                               |
|-------|--------------------|-------------------------------------|---------------------------------------------------------|
| 1     | 20                 | 11.000 (4.99)                       | 12.500 (317.50)<br>x 6.500 (165.10)<br>x 5.000 (127.00) |
| 2     | 5                  | 5.000 (2.29)                        | 15.500 (393.70)<br>x 6.000 (152.40)<br>x 4.500 (114.30) |

### Bell Alarm and Auxiliary Contact Schematic



Single-throw double-pole contacts are UL and CSA listed for 5 Amperes at 250 Vac.

Bell Alarm (W1) – contacts change state when breaker trips.

Auxiliary Switch (W2) – contacts change state when breaker is opened (or tripped) or closed.  
14-inch long #18 AWG pigtail wire leads provided.



QUICKLAG Industrial Circuit Breakers Cable-in/Cable-out (1 inch per pole)

### Description

#### Built and Listed to UL 489

#### QUICKLAG Circuit Breakers Cable-in/Cable-out Type

Type QC: 10-100 Amperes,  
10,000 AIC

Type QCHW: 15-100 Amperes,  
22,000 AIC

Type QHCX: 15-100 Amperes,  
42,000 AIC

Type QHCW: 15-30 Amperes,  
65,000 AIC



QUICKLAG Type QC 1-Pole



QUICKLAG Type QC 3-Pole



QUICKLAG Type QC 4-Pole

### Breaker Catalog Numbers

| Continuous<br>Ampere<br>Rating at<br>40°C | Catalog Number       |                      |         |                      |                      |
|-------------------------------------------|----------------------|----------------------|---------|----------------------|----------------------|
|                                           | 1-Pole <sup>①②</sup> | 2-Pole <sup>①②</sup> |         | 3-Pole <sup>①②</sup> | 4-Pole <sup>①②</sup> |
|                                           | 120/240 Vac          | 120/240 Vac          | 240 Vac | 240 Vac              | 240 Vac              |

#### QUICKLAG Type: QC 10,000 Ampere I.C. Thermal-Magnetic Breakers

|     |                      |        |         |         |         |
|-----|----------------------|--------|---------|---------|---------|
| 10  | QC1010               | QC2010 | QC2010H | QC3010H | QC4010H |
| 15  | QC1015 <sup>③④</sup> | QC2015 | QC2015H | QC3015H | QC4015H |
| 20  | QC1020 <sup>③④</sup> | QC2020 | QC2020H | QC3020H | QC4020H |
| 25  | QC1025               | QC2025 | QC2025H | QC3025H | QC4025H |
| 30  | QC1030               | QC2030 | QC2030H | QC3030H | QC4030H |
| 35  | QC1035               | QC2035 | QC2035H | QC3035H | QC4035H |
| 40  | QC1040               | QC2040 | QC2040H | QC3040H | QC4040H |
| 45  | QC1045               | QC2045 | QC2045H | QC3045H | QC4045H |
| 50  | QC1050               | QC2050 | QC2050H | QC3050H | QC4050H |
| 55  | QC1055               | QC2055 | QC2055H | QC3055H | QC4055H |
| 60  | QC1060               | QC2060 | QC2060H | QC3060H | QC4060H |
| 70  | QC1070               | QC2070 | QC2070H | QC3070H | QC4070H |
| 80  | —                    | QC2080 | QC2080H | QC3080H | QC4080H |
| 90  | —                    | QC2090 | QC2090H | QC3090H | QC4090H |
| 100 | QC1100               | QC2100 | QC2100H | QC3100H | QC4100H |

#### QUICKLAG Type: QCHW 22,000 Ampere I.C. Thermal-Magnetic Breakers

|     |                       |          |           |           |           |
|-----|-----------------------|----------|-----------|-----------|-----------|
| 15  | QCHW1015 <sup>③</sup> | QCHW2015 | QCHW2015H | QCHW3015H | QCHW4015H |
| 20  | QCHW1020 <sup>③</sup> | QCHW2020 | QCHW2020H | QCHW3020H | QCHW4020H |
| 25  | QCHW1025              | QCHW2025 | QCHW2025H | QCHW3025H | QCHW4025H |
| 30  | QCHW1030              | QCHW2030 | QCHW2030H | QCHW3030H | QCHW4030H |
| 35  | QCHW1035              | QCHW2035 | QCHW2035H | QCHW3035H | QCHW4035H |
| 40  | QCHW1040              | QCHW2040 | QCHW2040H | QCHW3040H | QCHW4040H |
| 45  | QCHW1045              | QCHW2045 | QCHW2045H | QCHW3045H | QCHW4045H |
| 50  | QCHW1050              | QCHW2050 | QCHW2050H | QCHW3050H | QCHW4050H |
| 55  | QCHW1055              | QCHW2055 | QCHW2055H | QCHW3055H | QCHW4055H |
| 60  | QCHW1060              | QCHW2060 | QCHW2060H | QCHW3060H | QCHW4060H |
| 70  | QCHW1070              | QCHW2070 | QCHW2070H | QCHW3070H | QCHW4070H |
| 80  | —                     | QCHW2080 | QCHW2080H | QCHW3080H | QCHW4080H |
| 90  | —                     | QCHW2090 | QCHW2090H | QCHW3090H | QCHW4090H |
| 100 | —                     | QCHW2100 | QCHW2100H | QCHW3100H | QCHW4100H |

#### QUICKLAG Type: QHCX 42,000 Ampere I.C. Thermal-Magnetic Breakers

|     |                       |          |   |           |   |
|-----|-----------------------|----------|---|-----------|---|
| 15  | QHCX1015 <sup>③</sup> | QHCX2015 | — | QHCX3015H | — |
| 20  | QHCX1020 <sup>③</sup> | QHCX2020 | — | QHCX3020H | — |
| 25  | QHCX1025              | QHCX2025 | — | QHCX3025H | — |
| 30  | QHCX1030              | QHCX2030 | — | QHCX3030H | — |
| 35  | QHCX1035              | QHCX2035 | — | QHCX3035H | — |
| 40  | QHCX1040              | QHCX2040 | — | QHCX3040H | — |
| 45  | QHCX1045              | QHCX2045 | — | QHCX3045H | — |
| 50  | QHCX1050              | QHCX2050 | — | QHCX3050H | — |
| 55  | QHCX1055              | QHCX2055 | — | QHCX3055H | — |
| 60  | QHCX1060              | QHCX2060 | — | QHCX3060H | — |
| 70  | QHCX1070              | QHCX2070 | — | QHCX3070H | — |
| 80  | —                     | QHCX2080 | — | QHCX3080H | — |
| 90  | —                     | QHCX2090 | — | QHCX3090H | — |
| 100 | —                     | QHCX2100 | — | QHCX3100H | — |

#### QUICKLAG Type: QHCW 65,000 Ampere I.C. Thermal-Magnetic Breakers

|    |                       |          |   |           |   |
|----|-----------------------|----------|---|-----------|---|
| 15 | QHCW1015 <sup>③</sup> | QHCW2015 | — | QHCW3015H | — |
| 20 | QHCW1020 <sup>③</sup> | QHCW2020 | — | QHCW3020H | — |
| 25 | QHCW1025              | QHCW2025 | — | —         | — |
| 30 | QHCW1030              | QHCW2030 | — | —         | — |

### Shipping Data

| Poles | Carton<br>Quantity | Approximate<br>Weight Lbs. (Kgs) | Dimensions Inches (mm)                            |
|-------|--------------------|----------------------------------|---------------------------------------------------|
| 1     | 24                 | 9.000 (4.09)                     | 12.500 (317.50) x 7.500 (190.50) x 5.000 (127.00) |
| 2     | 18                 | 9.000 (4.09)                     | 12.500 (317.50) x 7.500 (190.50) x 5.000 (127.00) |
| 3     | 8                  | 9.000 (4.09)                     | 12.500 (317.50) x 7.500 (190.50) x 5.000 (127.00) |

① All products UL and CSA listed.

② All products 10-100A are HACR rated.

③ Switching duty rated for 120 Vac  
fluorescent light applications only.

④ For special low-magnetic breaker order  
QC1015L1 or QC1020L1.

## QUICKLAG Industrial Circuit Breakers Cable-in/Cable-out (1/2 inch per pole)

### Description

#### Built and Listed to UL 489

Type QCR and QCF Circuit Breakers are UL listed Circuit Breakers that are suitable for use as branch circuit protectors.

### Applications

QCR and QCF Circuit Breakers are only 1/2-inch wide per pole and are excellent for general purpose industrial applications where space savings is required.

### Product Features and Ratings

- 1/2-inch wide per pole
- Cable-in/Cable-out
- Black cases with black handles
- Three position handle: ON, Tripped (center), OFF
- Thermal-Magnetic Protection
- UL File E7819
- CSA File LR48907
- One, two and three pole
- 10 kAIC at 120/240 Vac, 10-60 Amperes
- 22 kAIC at 120/240 Vac, 15-20 Amperes
- 10 kAIC at 240 Vac, 10-30 Amperes
- 3 kAIC at 62.5 Vdc (1 Pole)
- 3 kAIC at 130 Vdc (2 Poles in Series)
- Normal Operating Environment:  
0-40°C  
5-95% Humidity  
(Non-Condensating)

### Additional Ratings

In addition to the ratings shown for the 1/2-inch wide QCR and QCF, the complete QC breaker line includes:

- 1-4 Poles
- 5-100 Amperes
- 10 through 65 kAIC
- 120/240 and 240 Vac
- 1-inch per pole



1-Pole 2-Pole  
*QCR (Rear-Mounted Breakers)*



3-Pole  
*QCR (Rear-Mounted Breakers)*

Type QCR have as a standard feature provisions for 35mm DIN-Rail rear mounting with a spring-loaded release. Optional clips for individual mounting are available as a separate accessory.



*QCR 1-Pole Breaker with QCRMTGFT Clips (Qty. 2) Individually Mounted*



1-Pole 2-Pole  
*QCF (Front-Mounted Breakers)*



3-Pole  
*QCF (Front-Mounted Breakers)*

Type QCF have two threaded steel inserts to facilitate front mounting with #6-32 steel screws. The clamp type terminals accessible from the rear of the breaker so that cables can be accessed without removal of the breaker from the front cover.



*QCF Breaker Front Panel Mounted*

## QUICKLAG Industrial Circuit Breakers Cable-in/Cable-out (1/2 inch per pole)

Breaker Catalog Numbers<sup>①②③④</sup>

| Continuous<br>Ampere<br>Rating at<br>40°C             | QCR Breaker 10 kAIC Interruption Ratings <sup>⑤</sup> |                                 |                            |                            | QCF Breaker 10 kAIC Interruption Ratings <sup>⑤</sup> |                          |                            |                            |
|-------------------------------------------------------|-------------------------------------------------------|---------------------------------|----------------------------|----------------------------|-------------------------------------------------------|--------------------------|----------------------------|----------------------------|
|                                                       | 120/240 Vac                                           | 120/240 Vac                     | 240 Vac <sup>⑥</sup>       |                            | 120/240 Vac                                           | 120/240 Vac              | 240 Vac <sup>⑥</sup>       |                            |
|                                                       | 1-Pole                                                | 2-Pole                          | 2-Pole                     | 3-Pole                     | 1-Pole                                                | 2-Pole                   | 2-Pole                     | 3-Pole                     |
| QCR Breaker 10 kAIC Interruption Ratings <sup>⑤</sup> |                                                       |                                 |                            |                            | QCF Breaker 10 kAIC Interruption Ratings <sup>⑤</sup> |                          |                            |                            |
| 10                                                    | QCR1010<br>QCR1010T<br>—                              | QCR2010<br>QCR2010T<br>QCR2010P | —<br>—<br>—                | —<br>—<br>—                | QCF1010<br>QCF1010T<br>—                              | QCF2010<br>QCF2010T<br>— | —<br>—<br>—                | —<br>—<br>—                |
| 15                                                    | QCR1015 <sup>⑦</sup><br>QCR1015T <sup>⑦</sup><br>—    | QCR2015<br>QCR2015T<br>QCR2015P | QCR2015H<br>QCR2015HT<br>— | QCR3015H<br>QCR3015HT<br>— | QCF1015 <sup>②</sup><br>QCF1015T <sup>②</sup><br>—    | QCF2015<br>QCF2015T<br>— | QCF2015H<br>QCF2015HT<br>— | QCF3015H<br>QCF3015HT<br>— |
| 20                                                    | QCR1020 <sup>⑦</sup><br>QCR1020T <sup>⑦</sup><br>—    | QCR2020<br>QCR2020T<br>QCR2020P | QCR2020H<br>QCR2020HT<br>— | QCR3020H<br>QCR3020HT<br>— | QCF1020 <sup>②</sup><br>QCF1020T <sup>②</sup><br>—    | QCF2020<br>QCF2020T<br>— | QCF2020H<br>QCF2020HT<br>— | QCF3020H<br>QCF3020HT<br>— |
| 25                                                    | QCR1025<br>QCR1025T<br>—                              | QCR2025<br>QCR2025T<br>QCR2025P | QCR2025H<br>QCR2025HT<br>— | QCR3025H<br>QCR3025HT<br>— | QCF1025<br>QCF1025T<br>—                              | QCF2025<br>QCF2025T<br>— | QCF2025H<br>QCF2025HT<br>— | QCF3025H<br>QCF3025HT<br>— |
| 30                                                    | QCR1030<br>QCR1030T<br>—                              | QCR2030<br>QCR2030T<br>QCR2030P | QCR2030H<br>QCR2030HT<br>— | QCR3030H<br>QCR3030HT<br>— | QCF1030<br>QCF1030T<br>—                              | QCF2030<br>QCF2030T<br>— | QCF2030H<br>QCF2030HT<br>— | QCF3030H<br>QCF3030HT<br>— |
| 35                                                    | QCR1035<br>—                                          | QCR2035<br>QCR2035P             | —<br>—                     | —<br>—                     | QCF1035<br>—                                          | QCF2035<br>—             | —<br>—                     | —<br>—                     |
| 40                                                    | QCR1040<br>—                                          | QCR2040<br>QCR2040P             | —<br>—                     | —<br>—                     | QCF1040<br>—                                          | QCF2040<br>—             | —<br>—                     | —<br>—                     |
| 45                                                    | QCR1045<br>—                                          | QCR2045<br>QCR2045P             | —<br>—                     | —<br>—                     | QCF1045<br>—                                          | QCF2045<br>—             | —<br>—                     | —<br>—                     |
| 50                                                    | QCR1050<br>—                                          | QCR2050<br>QCR2050P             | —<br>—                     | —<br>—                     | QCF1050<br>—                                          | QCF2050<br>—             | —<br>—                     | —<br>—                     |
| 55                                                    | QCR1055<br>—                                          | QCR2055<br>QCR2055P             | —<br>—                     | —<br>—                     | QCF1055<br>—                                          | QCF2055<br>—             | —<br>—                     | —<br>—                     |
| 60 <sup>⑧</sup>                                       | QCR1060<br>—                                          | QCR2060<br>QCR2060P             | —<br>—                     | —<br>—                     | QCF1060<br>—                                          | QCF2060<br>—             | —<br>—                     | —<br>—                     |
| QCR Breaker 22 kAIC Interruption Ratings              |                                                       |                                 |                            |                            | QCF Breaker 22 kAIC Interruption Ratings              |                          |                            |                            |
| 15                                                    | QCRH1015 <sup>⑦</sup><br>QCRH1015T <sup>⑦</sup>       | QCRH2015<br>QCRH2015T           | —<br>—                     | —<br>—                     | QCFH1015 <sup>⑦</sup><br>QCFH1015T <sup>⑦</sup>       | QCFH2015<br>QCFH2015T    | —<br>—                     | —<br>—                     |
| 20                                                    | QCRH1020 <sup>⑦</sup><br>QCRH1020T <sup>⑦</sup>       | QCRH2020<br>QCRH2020T           | —<br>—                     | —<br>—                     | QCFH1020 <sup>⑦</sup><br>QCFH1020T <sup>⑦</sup>       | QCFH2020<br>QCFH2020T    | —<br>—                     | —<br>—                     |

## Available QCR and QCF Breaker Accessories

| Catalog Number | Description                                                                                                                                               |
|----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|
| QCRMTGFT       | Steel mounting clip mounts QCR breaker if individual mounting is required. Quantity two required for 1- and 2-pole and four required for 3-pole breakers. |
| QCRFPL1P       | Removable padlock device for single-pole QCR or QCF breaker.                                                                                              |
| QCRFPLMP       | Removable padlock device for multi-pole QCR or QCF breaker.                                                                                               |
| QCRFLOFF       | Padlock bracket assembly for QCR or QCF single or multi-pole breakers (off only).                                                                         |

① Standard breaker terminals are box type lugs.

② Breakers with "T" Catalog Number Suffix are suitable for line and load side ring terminal connection (#10-32 plus/minus terminal screw provided).

③ Breakers with "P" Catalog Number Suffix are suitable for terminating 2 #10 AWG Quick-Connect Type Terminals per phase on breaker load side.

④ Breakers with Shunt Trip Attachment (extra pole required on breaker right-hand side) are available. Contact Cutler-Hammer.

⑤ All ratings 15 to 60 amperes are HACR rated.

⑥ Breakers with "H" Catalog Suffix have 240 Vac construction.

⑦ All 15 and 20 ampere single-pole breakers are SWD (Switching Duty) rated for fluorescent lighting applications.

⑧ 60/75°C Cu/Al wire on all ratings except 60 amperes which requires Cu only conductor.

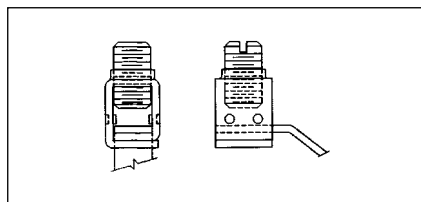
QUICKLAG Industrial Circuit Breakers Cable-in/Cable-out (1/2 inch per pole)

## QCR and QCF Breaker Factory Installed Terminals



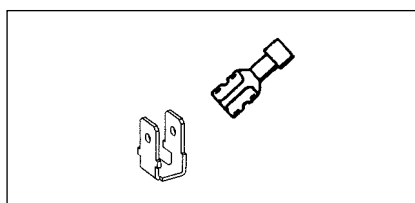
### QCR and QCF Standard Box Terminals

Factory installed line and load side breaker terminal to accommodate #14 AWG to #4 AWG wire.



### QCR Quick-Connect Terminals

Factory installed two-prong quick-connect terminal on breaker load side suitable for terminating two #10 AWG wire with insulated slip-on terminals as shown. Line side terminal is the standard type.

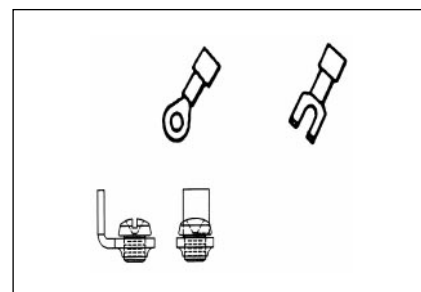


Catalog Suffix "P"



### QCR and QCF Ring or Spade Lug Terminals

(10 to 30 ampere ratings only): Factory installed line and load side terminals each equipped with a #10-32 screw suitable for terminating one #10 AWG wire with insulated ring or spade type terminal as shown.



Catalog Suffix "T"

### Description

#### Cable-in/Cable-out Type Built and Listed to UL 489

#### QUICKLAG Ground Fault Circuit Breakers, Class A GFCI Built and Tested to UL 943 5mA Trip Sensitivity

Type QCGF: 15-50 Amperes,  
10,000 AIC

Type QCHGF: 15-30 Amperes,  
22,000 AIC

#### QUICKLAG Ground Fault Equipment Protectors Built and Tested to UL 1053 30mA Trip Sensitivity

Type QCGFEP: 15-50 Amperes,  
10,000 AIC

Type QCHGFEP: 15-30 Amperes,  
22,000 AIC



*QUICKLAG Type QCGF 1-Pole  
Ground Fault Circuit Breaker*



*QUICKLAG Type QCGF 2-Pole  
Ground Fault Circuit Breaker*

### Shipping Data

| Poles | Carton Quantity | Approximate Weight Lbs. (Kgs) | Dimensions Inches (mm)                            |
|-------|-----------------|-------------------------------|---------------------------------------------------|
| 1     | 20              | 11.000 (4.99)                 | 12.500 (317.50) x 6.500 (165.10) x 5.000 (127.00) |
| 2     | 5               | 5.000 (2.29)                  | 15.500 (393.70) x 6.000 (152.40) x 4.500 (114.30) |

### Breaker Catalog Numbers

| Continuous Ampere Rating at 40°C | Catalog Number      |                     |
|----------------------------------|---------------------|---------------------|
|                                  | 1-Pole <sup>①</sup> | 2-Pole <sup>①</sup> |
|                                  | 120 Vac             | 120/240 Vac         |

#### Ground Fault Circuit Breakers – 5mA Sensitivity QUICKLAG Type: QCGF 10,000 Ampere I.C. Thermal-Magnetic Breakers

|    |          |          |
|----|----------|----------|
| 15 | QCGF1015 | QCGF2015 |
| 20 | QCGF1020 | QCGF2020 |
| 25 | QCGF1025 | QCGF2025 |
| 30 | QCGF1030 | QCGF2030 |
| 40 | QCGF1040 | QCGF2040 |
| 50 | —        | QCGF2050 |

#### QUICKLAG Type: QCHGF 22,000 Ampere I.C. Thermal-Magnetic Breakers

|    |           |           |
|----|-----------|-----------|
| 15 | QCHGF1015 | QCHGF2015 |
| 20 | QCHGF1020 | QCHGF2020 |
| 25 | QCHGF1025 | QCHGF2025 |
| 30 | QCHGF1030 | QCHGF2030 |

#### Ground Fault Equipment Protectors – 30mA Sensitivity QUICKLAG Type: QCGFEP 10,000 Ampere I.C. Thermal-Magnetic Breakers

|    |            |            |
|----|------------|------------|
| 15 | QCGFEP1015 | QCGFEP2015 |
| 20 | QCGFEP1020 | QCGFEP2020 |
| 25 | QCGFEP1025 | QCGFEP2025 |
| 30 | QCGFEP1030 | QCGFEP2030 |
| 40 | QCGFEP1040 | QCGFEP2040 |
| 50 | —          | QCGFEP2050 |

#### QUICKLAG Type: QCHGFEP 22,000 Ampere I.C. Thermal-Magnetic Breakers

|    |             |             |
|----|-------------|-------------|
| 15 | QCHGFEP1015 | QCHGFEP2015 |
| 20 | QCHGFEP1020 | QCHGFEP2020 |
| 25 | QCHGFEP1025 | QCHGFEP2025 |
| 30 | QCHGFEP1030 | QCHGFEP2030 |

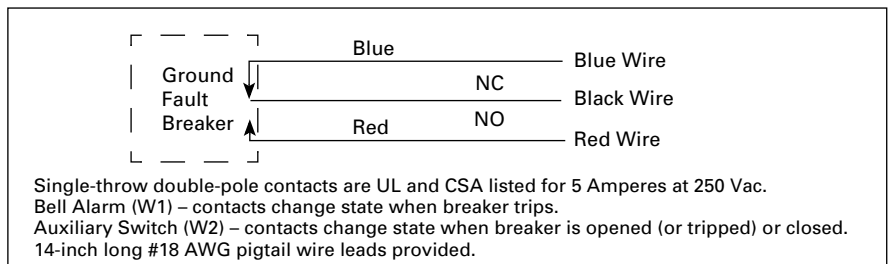
#### Special Application Ground Fault Circuit Protector – 5mA Sensitivity QUICKLAG Type: QCGF 10,000 Ampere I.C. with Bell Alarm (W1) or Auxiliary Switch (W2)

|    |            |            |
|----|------------|------------|
| 15 | QCGF1015W1 | QCGF2015W1 |
| 20 | QCGF1020W1 | QCGF2020W1 |
| 25 | QCGF1025W1 | QCGF2025W1 |
| 30 | QCGF1030W1 | QCGF2030W1 |
| 40 | —          | QCGF2040W1 |
| 50 | —          | QCGF2050W1 |
| 15 | QCGF1015W2 | —          |
| 20 | QCGF1020W2 | —          |
| 25 | QCGF1025W2 | —          |
| 30 | QCGF1030W2 | —          |

#### Special Application Ground Fault Equipment Protectors – 30mA Sensitivity QUICKLAG Type: QCGFEP 10,000 Ampere I.C. with Bell Alarm (W1) or Auxiliary Switch (W2)

|    |              |              |
|----|--------------|--------------|
| 15 | QCGFEP1015W1 | QCGFEP2015W1 |
| 20 | QCGFEP1020W1 | QCGFEP2020W1 |
| 25 | QCGFEP1025W1 | QCGFEP2025W1 |
| 30 | QCGFEP1030W1 | QCGFEP2030W1 |
| 40 | —            | QCGFEP2040W1 |
| 50 | —            | QCGFEP2050W1 |
| 15 | QCGFEP1015W2 | —            |
| 20 | QCGFEP1020W2 | —            |
| 25 | QCGFEP1025W2 | —            |
| 30 | QCGFEP1030W2 | —            |

### Bell Alarm and Auxiliary Contact Schematic



① All products UL and CSA listed.

## Types GHBS and GBHS Solenoid-Operated, Remote-Controlled

### Description

GHBS and GBHS circuit breakers are bolt-on branch circuit breakers designed for use in panelboards and are ideally suited for lighting control applications. In addition to providing conventional branch circuit protection, they include a unique solenoid-operated mechanism that provides for efficient breaker pulse-on and pulse-off operation when used with a suitable controller like the Cutler-Hammer Pow-R-Command lighting control system.

### Product Features

- Bolt-on Line-Side Terminal
- Cable Connected Load-Side Terminal
- 3-Prong Control Terminal (Common, Solenoid, Auxiliary Switch)
- Bi-Metal Assembly for Thermal Overload Protection
- Fast Acting Short Circuit Protection
- Arc-Runner and Arc-Chute Assembly for Fast Acting Arc Extinction
- Three Position Handle: OFF, TRIP (Center), ON
- Handle in "ON" Position Enables Remote Control
- Handle in "OFF" Position Disables Remote Control
- Handle Permits Manual Switching When Control Power is Lost
- Mechanical Trip Indicator Window (Red-ON, Green-OFF/TRIPPED)
- 15 and 20 Ampere Breakers SWD (Switching Duty) Rated
- HID Ratings for HID (High Intensity Discharge) Lighting
- Auxiliary Switch for Control Circuit Feedback



1-Pole



2-Pole

### GHBS UL 489 Interrupting Ratings

| Circuit Breaker Type <sup>①</sup> | Number of Poles | Interrupting Capacity (Symmetrical Amperes) |                     |        |         |
|-----------------------------------|-----------------|---------------------------------------------|---------------------|--------|---------|
|                                   |                 | Rating Amperes <sup>②</sup>                 | Volts Ac (50/60 Hz) |        |         |
|                                   |                 |                                             | 120                 | 240    | 277/480 |
| GHBS1015D                         | 1               | 15                                          | 65,000              | —      | 14,000  |
| GHBS1020D                         | 1               | 20                                          | 65,000              | —      | 14,000  |
| GHBS1030D                         | 1               | 30                                          | 65,000              | —      | 14,000  |
| GHBS2015D                         | 2               | 15                                          | —                   | 65,000 | 14,000  |
| GHBS2020D                         | 2               | 20                                          | —                   | 65,000 | 14,000  |
| GHBS2030D                         | 2               | 30                                          | —                   | 65,000 | 14,000  |

Instruction Leaflet/FRED Number 15546

### GBHS CSA 22.2 Interrupting Ratings

| Circuit Breaker Type | Number of Poles | Interrupting Capacity (Symmetrical Amperes) |                     |
|----------------------|-----------------|---------------------------------------------|---------------------|
|                      |                 | Rating Amperes <sup>②</sup>                 | Volts Ac (50/60 Hz) |
|                      |                 |                                             | 347/600             |
| GBHS1015D            | 1               | 15                                          | 10,000              |
| GBHS1020D            | 1               | 20                                          | 10,000              |
| GBHS2015D            | 2               | 15                                          | 10,000              |
| GBHS2020D            | 2               | 20                                          | 10,000              |



15-20 Amperes



30 Amperes

### Terminal Type

For load-side. Terminals are UL listed as suitable for wire type and size given below.

| Circuit Breaker Amperes | Terminal Type | Screw Head Type | Wire Type | AWG Wire Range |
|-------------------------|---------------|-----------------|-----------|----------------|
| 15-20                   | Clamp         | Slotted         | Cu/Al     | #14-#10        |
| 30                      | Box           | Slotted         | Cu/Al     | #14-#2         |

### Dimensions Per Pole, Inches (mm)

| Width            | Height            | Depth            |
|------------------|-------------------|------------------|
| 1.000<br>(25.40) | 4.125<br>(104.78) | 2.810<br>(71.37) |

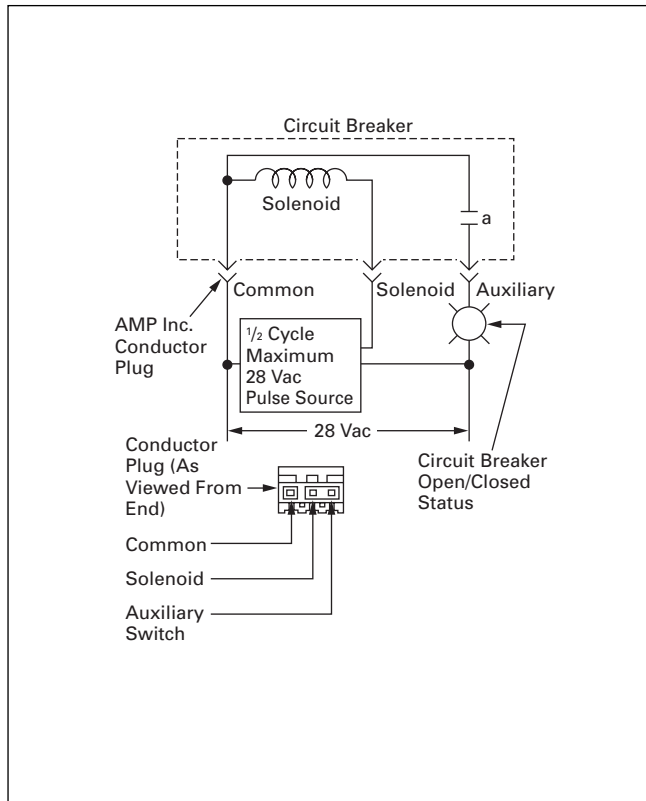
Dimensions in parentheses in millimeters.

① All UL listed circuit breakers are HID (High Intensity Discharge) rated.

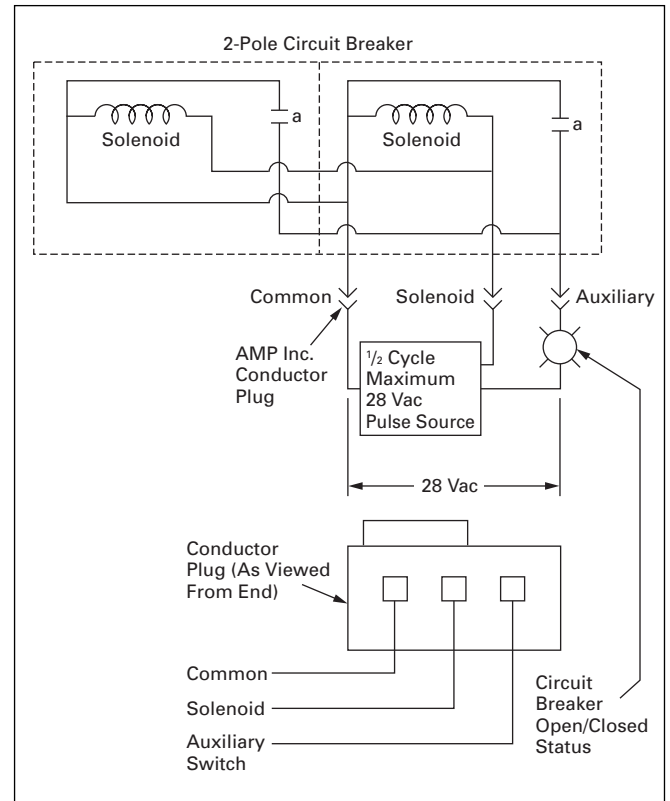
② Continuous current rating at 40°C.



## Wiring Diagrams



Typical Single-Pole Circuit Breaker Schematic Diagram and Conductor Plug Wiring Connections



Circuit Breaker Schematic Diagram and Conductor Plug Wiring Connections for 2-Pole

## Remote Control Operation

The remote-control capability of the breaker is "armed" when the breaker handle is manually switched to the "ON" position. Once armed, the breaker can be pulsed "ON" and "OFF" by a controller device which provides an ac pulse of specified magnitude and duration to the solenoid operated mechanism. Control connections to the breaker are provided through a male conductor plug (supplied by others) which

snaps into the female connector provided with the breaker.

A normally open (a) auxiliary contact provides for breaker "ON"/"OFF" status indication to the remote controller and/or indicating lamp.

The remote-control capability of the breaker is "disarmed" when the breaker handle is in the "OFF" or "TRIPPED" position. In the event the breaker automatically trips, the breaker must be reset manually.

## Breaker Solenoid and Operating Data

- Ambient Temperature: 0-40° C
- Nominal Pulse Magnitude: 28 volts ac RMS
- Tolerance: +10% to -15% of Nominal Voltage
- Pulse Duration: 1/2 cycle (8-10 ms)
- Minimum Recommended Pulse Current at Nominal Voltage:
  - 1-Pole: 4.9 Amperes Peak, 3.5 Amperes RMS
  - 2-Pole: 7.84 Amperes Peak, 5.6 Amperes RMS
- Breaker Operating Time: 20-40 ms
- Maximum Breaker Cycling: 6 Operations per Minute
- Humidity: 0-95% non-Condensing

# Miniature Circuit Breakers QUICKLAG® Industrial Circuit Breakers

Cutler-Hammer

March 1999

QUICKLAG International Rated Industrial Circuit Breakers Plug-on, Bolt-on and Cable-in/Cable-out

## Description

### QUICKLAG International Circuit Breakers

Plug-on Type HQP: 10-100 Amperes

Bolt-on Type BA: 10-100 Amperes

Cable-in/Cable-out Type QC:

10-100 Amperes

Built and Test Certified to BS3871,  
Pt. 1 50/60 Hz, 40°C

### Interrupting Ratings

|                                   | Suffix E   | Suffix HE  |
|-----------------------------------|------------|------------|
| NEMA<br>120/240 Vac               | 10,000 AIC | 10,000 AIC |
| BS3871<br>220/380,<br>240/415 Vac | 3,000 AIC  | 6,000 AIC  |

### QUICKLAG International Ground Fault Circuit Breakers

Plug-on Type GFXB: 10-40 Amperes

Bolt-on Type GFXBB: 10-40 Amperes

Cable-in/Cable-out Type GFXBC:

10-40 Amperes

Built and Test Certified to

BS3871, Pt. 1

BS3871, Section 31-C

BS4293

50/60 Hz, 40°C

30 mA Sensitivity

### Interrupting Rating

|                                |           |
|--------------------------------|-----------|
| BS3871<br>220/380, 240/415 Vac | 3,000 AIC |
|--------------------------------|-----------|

### Shipping Data

| Miniature<br>Circuit<br>Breaker    | No.<br>of<br>Poles | Std.<br>Carton<br>Qty. | Approx.<br>Carton<br>Weight<br>Lbs.<br>(Kgs) | Approx.<br>Standard<br>Carton<br>Dimensions<br>Inches (mm) |
|------------------------------------|--------------------|------------------------|----------------------------------------------|------------------------------------------------------------|
| QUICKLAG<br>Types B,<br>P, C – All | 1                  | 24                     | 9.000<br>(4.09)                              | 12.500 (317.50)<br>x 6.500 (165.10)<br>x 5.000 (127.00)    |
| QUICKLAG<br>Types B,<br>P, C – All | 2                  | 12                     | 9.000<br>(4.09)                              | 12.500 (317.50)<br>x 7.500 (190.50)<br>x 5.000 (127.00)    |
| QUICKLAG<br>Types B,<br>P, C – All | 3                  | 8                      | 9.000<br>(4.09)                              | 12.500 (317.50)<br>x 7.500 (190.50)<br>x 5.000 (127.00)    |

### QUICKLAG Ground Fault

|                           |   |    |                  |                                                         |
|---------------------------|---|----|------------------|---------------------------------------------------------|
| Type P –<br>All           | 1 | 20 | 11.000<br>(4.99) | 12.500 (317.50)<br>x 6.500 (165.10)<br>x 5.000 (127.00) |
| Types B<br>and<br>C – All | 1 | 20 | 11.000<br>(4.99) | 12.500 (317.50)<br>x 7.000 (177.80)<br>x 5.500 (139.70) |
| Types P<br>and<br>B – All | 2 | 5  | 5.000<br>(2.27)  | 12.500 (317.50)<br>6.000 (152.40)<br>4.500 (114.30)     |

## Breaker Catalog Numbers

| Continuous<br>Ampere<br>Rating at<br>40°C | Catalog Number |             |             |                                             |
|-------------------------------------------|----------------|-------------|-------------|---------------------------------------------|
|                                           | 1-Pole         | 2-Pole      | 3-Pole      | Ground Fault<br>1-Pole 30 mA<br>Sensitivity |
|                                           | 240/415 Vac    | 240/415 Vac | 240/415 Vac | 240/415 Vac                                 |

### 3,000 Amperes I.C. (M3) Plug-on Thermal-Magnetic Circuit Breakers

|     |          |          |          |           |
|-----|----------|----------|----------|-----------|
| 10  | HQP1010E | HQP2010E | HQP3010E | GFXB110B2 |
| 15  | HQP1015E | HQP2015E | HQP3015E | GFXB115B2 |
| 16  | —        | —        | —        | GFXB116B2 |
| 20  | HQP1020E | HQP2020E | HQP3020E | GFXB120B2 |
| 25  | HQP1025E | HQP2025E | HQP3025E | GFXB125B2 |
| 30  | HQP1030E | HQP2030E | HQP3030E | GFXB130B2 |
| 32  | —        | —        | —        | GFXB132B2 |
| 40  | HQP1040E | HQP2040E | HQP3040E | GFXB140B2 |
| 50  | HQP1050E | HQP2050E | HQP3050E | —         |
| 60  | HQP1060E | HQP2060E | HQP3060E | —         |
| 70  | HQP1070E | HQP2070E | HQP3070E | —         |
| 90  | —        | HQP2090E | HQP3090E | —         |
| 100 | —        | HQP2100E | HQP3100E | —         |

### 6,000 Ampere I.C. (M6) Plug-on Thermal-Magnetic Circuit Breakers

|     |           |           |           |   |
|-----|-----------|-----------|-----------|---|
| 15  | HQP1015HE | HQP2015HE | HQP3015HE | — |
| 20  | HQP1020HE | HQP2020HE | HQP3020HE | — |
| 25  | HQP1025HE | HQP2025HE | HQP3025HE | — |
| 30  | HQP1030HE | HQP2030HE | HQP3030HE | — |
| 40  | HQP1040HE | HQP2040HE | HQP3040HE | — |
| 50  | HQP1050HE | HQP2050HE | HQP3050HE | — |
| 60  | HQP1060HE | HQP2060HE | HQP3060HE | — |
| 70  | HQP1070HE | HQP2070HE | HQP3070HE | — |
| 90  | —         | HQP2090HE | HQP3090HE | — |
| 100 | —         | HQP2100HE | HQP3100HE | — |

### 3,000 Ampere I.C. (M3) Bolt-on Thermal-Magnetic Circuit Breakers

|     |          |          |          |            |
|-----|----------|----------|----------|------------|
| 10  | BAB1010E | BAB2010E | BAB3010E | GFXBB110B2 |
| 15  | BAB1015E | BAB2015E | BAB3015E | GFXBB115B2 |
| 16  | —        | —        | —        | GFXBB116B2 |
| 20  | BAB1020E | BAB2020E | BAB3020E | GFXBB120B2 |
| 25  | BAB1025E | BAB2025E | BAB3025E | GFXBB125B2 |
| 30  | BAB1030E | BAB2030E | BAB3030E | GFXBB130B2 |
| 32  | —        | —        | —        | GFXBB132B2 |
| 40  | BAB1040E | BAB2040E | BAB3040E | GFXBB140B2 |
| 50  | BAB1050E | BAB2050E | BAB3050E | —          |
| 60  | BAB1060E | BAB2060E | BAB3060E | —          |
| 70  | BAB1070E | BAB2070E | BAB3070E | —          |
| 90  | —        | BAB2090E | BAB3090E | —          |
| 100 | —        | BAB2100E | BAB3100E | —          |

### 6,000 Ampere I.C. (M6) Bolt-on Thermal-Magnetic Circuit Breakers

|     |           |           |           |   |
|-----|-----------|-----------|-----------|---|
| 15  | BAB1015HE | BAB2015HE | BAB3015HE | — |
| 20  | BAB1020HE | BAB2020HE | BAB3020HE | — |
| 25  | BAB1025HE | BAB2025HE | BAB3025HE | — |
| 30  | BAB1030HE | BAB2030HE | BAB3030HE | — |
| 40  | BAB1040HE | BAB2040HE | BAB3040HE | — |
| 50  | BAB1050HE | BAB2050HE | BAB3050HE | — |
| 60  | BAB1060HE | BAB2060HE | BAB3060HE | — |
| 70  | BAB1070HE | BAB2070HE | BAB3070HE | — |
| 90  | —         | BAB2090HE | BAB3090HE | — |
| 100 | —         | BAB2100HE | BAB3100HE | — |

### 3,000 Ampere I.C. (M3) Cable-in/Cable-out Thermal-Magnetic Circuit Breakers

|     |         |         |         |            |
|-----|---------|---------|---------|------------|
| 10  | QC1010E | QC2010E | QC3010E | GFXBC110B2 |
| 15  | QC1015E | QC2015E | QC3015E | GFXBC115B2 |
| 16  | —       | —       | —       | GFXBC116B2 |
| 20  | QC1020E | QC2020E | QC3020E | GFXBC120B2 |
| 25  | QC1025E | QC2025E | QC3025E | GFXBC125B2 |
| 30  | QC1030E | QC2030E | QC3030E | GFXBC130B2 |
| 32  | —       | —       | —       | GFXBC132B2 |
| 40  | QC1040E | QC2040E | QC3040E | GFXBC140B2 |
| 50  | QC1050E | QC2050E | QC3050E | —          |
| 60  | QC1060E | QC2060E | QC3060E | —          |
| 70  | QC1070E | QC2070E | QC3070E | —          |
| 90  | —       | QC2090E | QC3090E | —          |
| 100 | —       | QC2100E | QC3100E | —          |

### 6,000 Ampere I.C. (M6) Cable-in/Cable-out Thermal-Magnetic Circuit Breakers

|     |          |          |          |   |
|-----|----------|----------|----------|---|
| 15  | QC1015HE | QC2015HE | QC3015HE | — |
| 20  | QC1020HE | QC2020HE | QC3020HE | — |
| 25  | QC1025HE | QC2025HE | QC3025HE | — |
| 30  | QC1030HE | QC2030HE | QC3030HE | — |
| 40  | QC1040HE | QC2040HE | QC3040HE | — |
| 50  | QC1050HE | QC2050HE | QC3050HE | — |
| 60  | QC1060HE | QC2060HE | QC3060HE | — |
| 70  | QC1070HE | QC2070HE | QC3070HE | — |
| 90  | —        | QC2090HE | QC3090HE | — |
| 100 | —        | QC2100HE | QC3100HE | — |

## QUICKLAG Industrial Circuit Breakers Special Application Breakers

### Description

#### QUICKLAG Switching Neutral Circuit Breakers

Plug-on Type HQP: 10-30 Amperes, 1 and 2 Poles, 10,000 AIC  
 Bolt-on Type BA: 10-30 Amperes, 1 and 2 Poles, 10,000 AIC  
 Cable-in Type QC: 10-30 Amperes, 1 and 2 Poles, 10,000 AIC

Switching Neutral QUICKLAG Breakers available in one- and two-pole configurations, plus neutral pole for applications in accordance with NEC 514-5, 240-22, and 380-2. A one-pole device takes two pole spaces, and a two-pole device takes three pole spaces.



QUICKLAG Type P  
Switching Neutral

#### QUICKLAG HID (High Intensity Discharge) Breakers

Plug-on Type HQP: 15-60 Amperes, 1 and 2 Poles, 10,000 AIC  
 Bolt-on Type BA: 15-60 Amperes, 1 and 2 Poles, 10,000 AIC  
 Cable-in Type QC: 15-60 Amperes, 1 and 2 Poles, 10,000 AIC

Breakers designed specifically for use with high intensity discharge (HID) lighting applications. (UL listed as standard lighting breakers.)

#### Molded Case Switches

#### Non-Automatic QUICKLAG Molded Case Switch

Plug-on Type HQP: 50, 60, 100 Amperes, 1, 2 and 3 Poles  
 Bolt-on Type BA: 50, 60, 100 Amperes, 1, 2 and 3 Poles  
 Cable-in Type QC: 50, 60, 100 Amperes, 1, 2 and 3 Poles

#### Breaker Catalog Numbers

| Continuous<br>Ampere<br>Rating 40°C | Catalog Number      |                     |                     |         |
|-------------------------------------|---------------------|---------------------|---------------------|---------|
|                                     | 1-Pole <sup>①</sup> | 2-Pole <sup>①</sup> | 3-Pole <sup>①</sup> |         |
|                                     | 120/240 Vac         | 120/240 Vac         | 240 Vac             | 240 Vac |

#### QUICKLAG Type: HQP Switching Neutral Thermal-Magnetic Breakers

|    |          |          |   |   |
|----|----------|----------|---|---|
| 10 | HQP2010B | HQP3010B | — | — |
| 15 | HQP2015B | HQP3015B | — | — |
| 20 | HQP2020B | HQP3020B | — | — |
| 25 | HQP2025B | HQP3025B | — | — |
| 30 | HQP2030B | HQP3030B | — | — |

#### QUICKLAG Type: BA Switching Neutral Thermal-Magnetic Breakers

|    |          |          |   |   |
|----|----------|----------|---|---|
| 10 | BAB2010C | BAB3010C | — | — |
| 15 | BAB2015C | BAB3015C | — | — |
| 20 | BAB2020C | BAB3020C | — | — |
| 25 | BAB2025C | BAB3025C | — | — |
| 30 | BAB2030C | BAB3030C | — | — |

#### QUICKLAG Type: QC Switching Neutral Thermal-Magnetic Breakers

|    |         |         |   |   |
|----|---------|---------|---|---|
| 10 | QC2010B | QC3010B | — | — |
| 15 | QC2015B | QC3015B | — | — |
| 20 | QC2020B | QC3020B | — | — |
| 25 | QC2025B | QC3025B | — | — |
| 30 | QC2030B | QC3030B | — | — |

#### QUICKLAG Type: HQP HID (High Intensity Discharge) Thermal-Magnetic Breakers

|    |          |          |   |   |
|----|----------|----------|---|---|
| 15 | HQP1015D | HQP2015D | — | — |
| 20 | HQP1020D | HQP2020D | — | — |
| 25 | HQP1025D | HQP2025D | — | — |
| 30 | HQP1030D | HQP2030D | — | — |
| 35 | HQP1035D | HQP2035D | — | — |
| 40 | HQP1040D | HQP2040D | — | — |
| 50 | HQP1050D | HQP2050D | — | — |
| 60 | HQP1060D | HQP2060D | — | — |

#### QUICKLAG Type: BA HID (High Intensity Discharge) Thermal-Magnetic Breakers

|    |          |          |   |   |
|----|----------|----------|---|---|
| 15 | BAB1015D | BAB2015D | — | — |
| 20 | BAB1020D | BAB2020D | — | — |
| 25 | BAB1025D | BAB2025D | — | — |
| 30 | BAB1030D | BAB2030D | — | — |
| 35 | BAB1035D | BAB2035D | — | — |
| 40 | BAB1040D | BAB2040D | — | — |
| 50 | BAB1050D | BAB2050D | — | — |
| 60 | BAB1060D | BAB2060D | — | — |

#### QUICKLAG Type: QC HID (High Intensity Discharge) Thermal-Magnetic Breakers

|    |         |         |   |   |
|----|---------|---------|---|---|
| 15 | QC1015D | QC2015D | — | — |
| 20 | QC1020D | QC2020D | — | — |
| 25 | QC1025D | QC2025D | — | — |
| 30 | QC1030D | QC2030D | — | — |
| 35 | QC1035D | QC2035D | — | — |
| 40 | QC1040D | QC2040D | — | — |
| 50 | QC1050D | QC2050D | — | — |
| 60 | QC1060D | QC2060D | — | — |

#### QUICKLAG Type: HQP Non-Auto Molded Case Switches

|     |          |   |          |          |
|-----|----------|---|----------|----------|
| 50  | HQP1050N | — | HQP2050N | HQP3050N |
| 60  | HQP1060N | — | HQP2060N | HQP3060N |
| 100 | HQP1100N | — | HQP2100N | HQP3100N |

#### QUICKLAG Type: BA Non-Auto Molded Case Switches

|     |          |   |          |          |
|-----|----------|---|----------|----------|
| 50  | BAB1050N | — | BAB2050N | BAB3050N |
| 60  | BAB1060N | — | BAB2060N | BAB3060N |
| 100 | BAB1100N | — | BAB2100N | BAB3100N |

#### QUICKLAG Type: QC Non-Auto Molded Case Switches

|     |         |   |         |         |
|-----|---------|---|---------|---------|
| 50  | QC1050N | — | QC2050N | QC3050N |
| 60  | QC1060N | — | QC2060N | QC3060N |
| 100 | QC1100N | — | QC2100N | QC3100N |

#### Shipping Data

| Miniature Circuit Breaker          | No. of Poles | Standard Carton Quantity | Approximate Carton Weight Lbs. (Kgs) | Approximate Standard Carton Dimensions Inches (mm) |
|------------------------------------|--------------|--------------------------|--------------------------------------|----------------------------------------------------|
| QUICKLAG Types B, P, C – All       | 1            | 24                       | 9.000 (4.09)                         | 12.500 (317.50) x 7.500 (190.50) x 5.000 (127.00)  |
| QUICKLAG Types B, P, C – All       | 2            | 12                       | 9.000 (4.09)                         | 12.500 (317.50) x 7.500 (190.50) x 5.000 (127.00)  |
| QUICKLAG Types B, P, C – All       | 3            | 8                        | 9.000 (4.09)                         | 12.500 (317.50) x 7.500 (190.50) x 5.000 (127.00)  |
| QUICKLAG Ground Fault Type P – All | 1            | 20                       | 11.000 (4.99)                        | 12.500 (317.50) x 6.500 (165.10) x 5.000 (127.00)  |
| Types B and C – All                | 1            | 20                       | 11.000 (4.99)                        | 12.500 (317.50) x 7.000 (177.80) x 5.500 (139.70)  |
| Types P and B – All                | 2            | 5                        | 5.000 (2.27)                         | 12.500 (317.50) x 6.000 (152.40) x 4.500 (114.30)  |

① All products UL and CSA listed.

## QUICKLAG Industrial Circuit Breakers Accessories

| Accessory Type <sup>①</sup>      | Catalog Number | Description                                                          | Order in Multiples of |
|----------------------------------|----------------|----------------------------------------------------------------------|-----------------------|
| Handle Locks:<br>Non-padlockable | QL1NPL         | QUICKLAG Type P, B, C – 1 Pole                                       | 10                    |
|                                  | QL23NPL        | QUICKLAG Type P, B, C – 2, 3 Poles                                   | 10                    |
| Handle Locks:<br>Padlockable     | QL1PL          | QUICKLAG Type P, B, C – 1 Pole                                       | 10                    |
|                                  | QLPB123PL      | QUICKLAG Type P, B – 1, 2, 3 Poles                                   | 10                    |
|                                  | QC123PL        | QUICKLAG Type C – 1, 2, 3 Poles                                      | 10                    |
|                                  | QLGF12PL       | Ground Fault Padlock Device Type P, B – 1, 2 Poles                   | 10                    |
| Handle Tie                       | QL1HT          | QUICKLAG Handle Tie - 1 Pole                                         | 100                   |
| Mounting Hardware                | QCFCCLIP       | QUICKLAG Type C Face Mounting Clip                                   | 24                    |
|                                  | QC1FP          | QUICKLAG Type C Face Mounting Plate – 1 Pole                         | 10                    |
|                                  | QC2FP          | QUICKLAG Type C Face Mounting Plate – 2 Poles                        | 10                    |
|                                  | QC3FP          | QUICKLAG Type C Face Mounting Plate – 3 Poles                        | 10                    |
|                                  | QC1FPLOFF      | QUICKLAG Type C Face Mounting Plate and Lock-off (Off Only) – 1 Pole | 10                    |
|                                  | QC2FPLOFF      | QUICKLAG Type C Face Mounting Plate and Lock-off (Off Only) – 2 Pole | 10                    |
|                                  | QC3FPLOFF      | QUICKLAG Type C Face Mounting Plate and Lock-off (Off Only) – 3 Pole | 10                    |
|                                  | QCBCLIP        | QUICKLAG Type C Base Mounting Clamp                                  | 100                   |
|                                  | QC6BP          | QUICKLAG Base Mounting Plate – 6 Poles Total                         | 10                    |
|                                  | QC4CONB        | QUICKLAG Type C Single Point Connector                               | 10                    |
|                                  | QCDINADAPT     | QUICKLAG Type C DIN Rail Adapter                                     | 6                     |
| Dummy Breakers                   | HQP1000        | QUICKLAG Type P                                                      | 1                     |
|                                  | BAB1000        | QUICKLAG Type B                                                      | 1                     |
|                                  | QC1000         | QUICKLAG Type C                                                      | 1                     |
|                                  | QC30SAMPLE     | QUICKLAG Type C Clear Choice Breaker                                 | 4                     |



QL1NPL



QL23NPL



QL1PL



QLPB123PL



QC123PL



QL1HT



QCFCCLIP



QC1FP



QC2FP



QC3FP



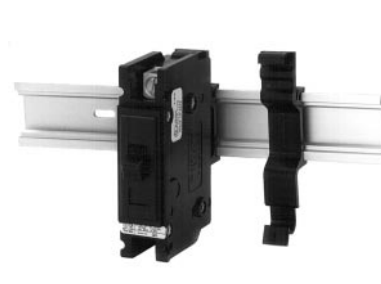
QCBCLIP



QC6BP



QC4CONB



QCDINADAPT

① See pages 7 and 8 for QCR and QCF accessories.

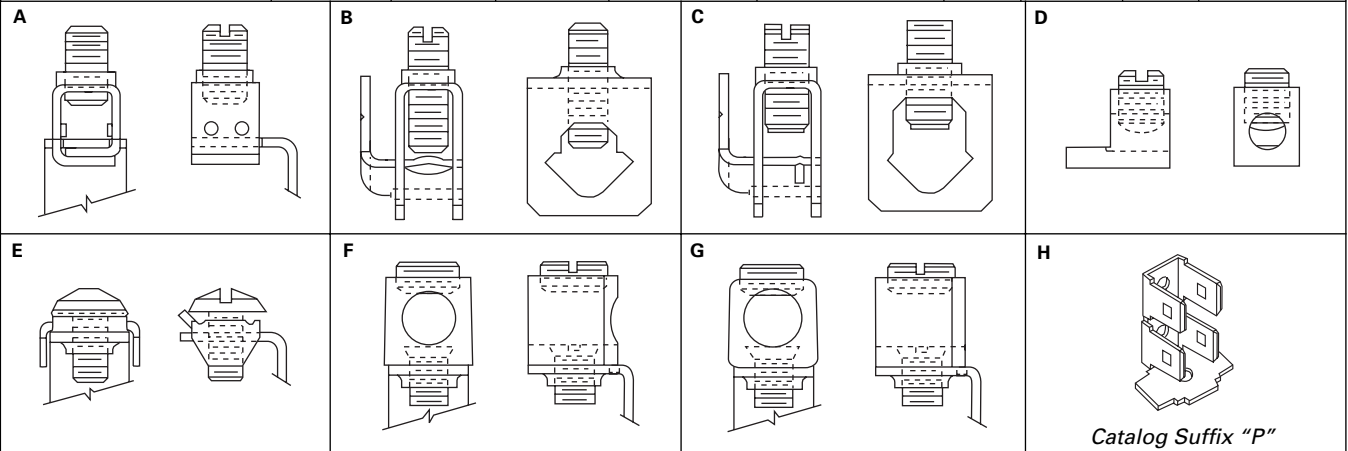
## QUICKLAG Industrial Circuit Breakers Modifications/Terminals

Factory Modifications<sup>①</sup>

| Type of Modification                                                                                                                         | Breaker Types                                          | Catalog Suffix |
|----------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------|----------------|
| Shunt Trip (Requires 1 extra pole space on right side)<br>120, 208, 240 Vac<br>12, 24, 48 Vac/dc<br>Draws 2.6A at 120V<br>Draws 11A at 24Vdc | QUICKLAG Types P, B and C<br>QUICKLAG Types P, B and C | S<br>S1        |
| Special Calibration (50°C)                                                                                                                   | QUICKLAG Types P, B and C                              | V              |
| Shock Testing                                                                                                                                | QUICKLAG Types P, B and C                              | L              |
| Freeze Testing                                                                                                                               | QUICKLAG Types P, B and C                              | Y              |
| Moisture-Fungus Treatment                                                                                                                    | QUICKLAG Types P, B, C and Ground Fault                | F              |

## Factory Installed Breaker Terminals

| Breaker Type                                             | Continuous<br>Ampere<br>Rating    | Standard Line Terminal                                |                         |               | Standard Load Terminal                |                         |                             | Optional Terminals<br>(20% List Price Adder) |                                  |
|----------------------------------------------------------|-----------------------------------|-------------------------------------------------------|-------------------------|---------------|---------------------------------------|-------------------------|-----------------------------|----------------------------------------------|----------------------------------|
|                                                          |                                   | Term<br>Type                                          | Wire<br>Type            | Wire<br>Range | Term<br>Type                          | Wire<br>Type            | Wire<br>Range               | Line                                         | Load                             |
| QUICKLAG Type P<br>HQP, QPHW,<br>QHPX, QHPW              | 10 to 30<br>35 to 50<br>55 to 125 | Plug-on female clips which mate<br>with the bus stabs |                         |               | A<br>B<br>C                           | Cu/Al<br>Cu/Al<br>Cu/Al | #14-#4<br>#14-#4<br>#8-1/0  | N/A                                          | C<br>C<br>—                      |
| QUICKLAG Ground Fault<br>QPGF, QPHGF,<br>QPGFEP, QPHGFEP | 10 to 30<br>40                    | Plug-on female clips which mate<br>with the bus stabs |                         |               | A – 1-pole<br>D – 2-pole<br>D         | Cu/Al<br>Cu/Al<br>Cu    | #14-#4<br>#14-#8<br>#14-#8  | N/A                                          | C<br>C<br>—                      |
| QUICKLAG Type B<br>BAB, QBHW,<br>HBAX, HBAW              | 10 to 30<br>35 to 50<br>55 to 125 | Extended tangs which bolt<br>directly to the bus      |                         |               | A – 1- and 2- pole<br>B – 3-pole<br>C | Cu/Al<br>Cu/Al<br>Cu/Al | #14-#4<br>#14-#4<br>#8-1/0  | N/A                                          | C<br>C<br>—                      |
| QUICKLAG Ground Fault<br>QBGF, QBHGF,<br>QBGFEP, QBHGFEP | 10 to 30<br>40                    | Extended tangs which bolt<br>directly to the bus      |                         |               | A – 1-pole<br>D – 2-pole<br>D         | Cu/Al<br>Cu/Al<br>Cu    | #14-#4<br>#14-#8<br>#14-#8  | N/A                                          | N/A                              |
| QUICKLAG Type C<br>QC, QCHW,<br>QHCX, QHCW               | 10 to 20<br>25 to 60<br>70 to 100 | E<br>F<br>G                                           | Cu/Al<br>Cu/Al<br>Cu/Al | #14-#10       | E<br>B<br>C                           | Cu/Al<br>Cu/Al<br>Cu/Al | #14-#10<br>#14-#4<br>#8-1/0 | F, G<br>E, G<br>E                            | F, G, H<br>E, F, G, H<br>E, G, H |
| QUICKLAG<br>QCR, QCF                                     | 10-55<br>60                       | A<br>A                                                | Cu/Al<br>Cu             | -#14<br>-#4   | A<br>A                                | Cu/Al<br>Cu             | #14<br>-#4                  | N/A                                          | N/A                              |
| QUICKLAG Ground Fault<br>QCGF, QCHGF,<br>QCGFEP, QCHGFEP | 10 to 20<br>25 to 50              | E<br>F                                                | Cu/Al<br>Cu/Al          | #14-#10       | A<br>A                                | Cu/Al<br>Cu/Al          | #14-#4<br>#14-#4            | F, G<br>E, G                                 | N/A                              |



## Spare Terminal Hardware Screws (Lugs not Included)

| Catalog Number | Order in Multiples of | Terminal Type | Description                                    |
|----------------|-----------------------|---------------|------------------------------------------------|
| QLD TSA        | 10                    | A             | QUICKLAG Terminal Screw                        |
| QLD TSB        | 10                    | B             | QUICKLAG Terminal Screw                        |
| QLD TSC        | 10                    | C             | QUICKLAG Terminal Screw                        |
| QLB HTSE       | 10                    | E             | QUICKLAG Binding Head Terminal Screw and Clamp |
| QLN TSFG       | 10                    | F and G       | QUICKLAG Terminal Screw                        |

① Contact Cutler-Hammer for factory modifications available for QCR and QCF breakers.



# Miniature Circuit Breakers SPCL Supplementary Protectors

Cutler-Hammer

March 1999

## Supplementary Protectors Current Limiting Type Cable-in/Cable-out DIN Rail



### Description

#### UL 1077 Supplementary Protectors

Type SPCL Supplementary Protectors are IEC circuit breakers that are recognized by UL under UL 1077. They are intended for use as over-current protection within an appliance or electrical equipment where branch circuit protection (for example a UL listed Molded Case Circuit Breaker) has already been provided or is not required.

#### Equipment and Control Circuit Protection

These protectors are ideal for replacing fuses in control circuits. Applications include protecting motor control circuits, small control circuit transformers, relays, contactor coils, power supplies, PLC I/O points, appliances, and electronic equipment.

### Product Features

The Type SPCL Supplementary Protectors are provided in light gray cases with charcoal gray handles.

**DIN-Rail Mounting:** A quick snap-on clip design allows easy installation on 35mm DIN Rail.

**Current-Limiting Design:** Fast short circuit interruption reduces let-through energy, reducing damage to the circuit.

#### Thermal-Magnetic Overcurrent

**Protection:** Types B and C overcurrent curves provide maximum reliability and accuracy. Type B protection is normally used for low inrush applications. Type C protection is used for general purpose industrial applications that require higher inrush tolerance.

**Center Trip Position:** The breaker handle has a unique center trip "Reset" position that indicates an overcurrent trip. "Off" (O) and "On" (I) handle positions are visually indicated by red and green flags.

### SPCL Specifications

| Standards and Approvals                                        | Number of Poles                                                                                                            | Electrical Ratings           |              |         |                              |
|----------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------|------------------------------|--------------|---------|------------------------------|
|                                                                |                                                                                                                            | Continuous Current (Amperes) | Vac 50/60 Hz | Vdc     | Ampere Interrupting Capacity |
| UL 1077<br>File No. E162396<br>CSA 22.2<br>File No. LR105580-1 | 1                                                                                                                          | 0.5-63                       | 120          | 12-65   | 10 kA                        |
|                                                                | 2                                                                                                                          | 0.5-63                       | 240          | 12-130① | 10 kA                        |
|                                                                | 3-4                                                                                                                        | 0.5-63                       | 240          |         | 10 kA                        |
|                                                                | 1                                                                                                                          | 0.5-63                       | 277          |         | 6 kA                         |
| EN60898<br>VDE0660                                             | 2-4                                                                                                                        | 0.5-63                       | 480          |         | 5 kA                         |
|                                                                | 1-4                                                                                                                        | 0.5-63                       | 240/415      |         | 10 kA                        |
| Overcurrent Curves                                             | Overcurrent Curve Type B (3-5X) and Type C (5-10X) per VDE 0641, Part 11.                                                  |                              |              |         |                              |
| Degree of Protection                                           | IP20.                                                                                                                      |                              |              |         |                              |
| Connecting Terminals                                           | Suitable for Single-Core, Standard, and Flexible Conductors from #14 to #6 AWG (Cu). Recommended Torque is 27 Inch-Pounds. |                              |              |         |                              |

### SPCL Supplementary Protector Catalog Numbers

| Continuous Ampere Rating | Catalog Number |        |        |        |
|--------------------------|----------------|--------|--------|--------|
|                          | 1-Pole         | 2-Pole | 3-Pole | 4-Pole |

#### C Curve

|     |           |           |           |           |
|-----|-----------|-----------|-----------|-----------|
| 0.5 | SPCL1C00⑤ | SPCL2C00⑤ | SPCL3C00⑤ | SPCL4C00⑥ |
| 1   | SPCL1C01⑤ | SPCL2C01⑤ | SPCL3C01⑤ | SPCL4C01⑥ |
| 2   | SPCL1C02⑤ | SPCL2C02⑤ | SPCL3C02⑤ | SPCL4C02⑥ |
| 3   | SPCL1C03⑤ | SPCL2C03⑤ | —         | —         |
| 4   | SPCL1C04⑤ | SPCL2C04⑤ | SPCL3C04⑤ | SPCL4C04⑥ |
| 5   | SPCL1C05⑤ | SPCL2C05⑤ | —         | —         |
| 6   | SPCL1C06⑤ | SPCL2C06⑤ | SPCL3C06⑤ | SPCL4C06⑥ |
| 7   | SPCL1C07⑤ | SPCL2C07⑤ | —         | —         |
| 8   | SPCL1C08⑤ | SPCL2C08⑤ | —         | —         |
| 10  | SPCL1C10⑤ | SPCL2C10⑤ | SPCL3C10⑤ | SPCL4C10⑥ |
| 13  | SPCL1C13⑤ | —         | —         | —         |
| 16  | SPCL1C16⑤ | SPCL2C16⑤ | SPCL3C16⑤ | SPCL4C16⑥ |
| 20  | SPCL1C20⑤ | SPCL2C20⑤ | SPCL3C20⑤ | SPCL4C20⑥ |
| 25  | SPCL1C25⑤ | SPCL2C25⑤ | SPCL3C25⑤ | SPCL4C25⑥ |
| 32  | SPCL1C32⑤ | SPCL2C32⑤ | SPCL3C32⑤ | SPCL4C32⑥ |
| 40  | SPCL1C40⑤ | SPCL2C40⑤ | SPCL3C40⑤ | SPCL4C40⑥ |
| 50  | SPCL1C50⑤ | SPCL2C50⑤ | SPCL3C50⑤ | SPCL4C50⑥ |
| 63  | SPCL1C63⑤ | SPCL2C63⑤ | SPCL3C63⑤ | SPCL4C63⑥ |

#### B Curve

|    |           |           |           |           |
|----|-----------|-----------|-----------|-----------|
| 6  | SPCL1B06⑤ | SPCL2B06⑥ | SPCL3B06⑥ | SPCL4B06⑥ |
| 10 | SPCL1B10⑤ | SPCL2B10⑥ | SPCL3B10⑥ | SPCL4B10⑥ |
| 13 | SPCL1B13⑤ | —         | —         | —         |
| 16 | SPCL1B16⑤ | SPCL2B16⑥ | SPCL3B16⑥ | SPCL4B16⑥ |
| 20 | SPCL1B20⑤ | SPCL2B20⑥ | SPCL3B20⑥ | SPCL4B20⑥ |
| 25 | SPCL1B25⑤ | SPCL2B25⑥ | SPCL3B25⑥ | SPCL4B25⑥ |
| 32 | SPCL1B32⑤ | SPCL2B32⑥ | SPCL3B32⑥ | SPCL4B32⑥ |
| 40 | SPCL1B40⑤ | SPCL2B40⑥ | SPCL3B40⑥ | SPCL4B40⑥ |
| 50 | SPCL1B50⑤ | SPCL2B50⑥ | SPCL3B50⑥ | SPCL4B50⑥ |
| 63 | SPCL1B63⑤ | SPCL2B63⑥ | SPCL3B63⑥ | SPCL4B63⑥ |

### Shipping Data

|              | Packed in Cartons of: | Carton Dimensions Inches (mm)                    | Approximate Weight Lbs. (Kgs) |
|--------------|-----------------------|--------------------------------------------------|-------------------------------|
| 1-Pole Units | 12                    | 9.000 (228.60) x 4.000 (101.60) x 4.000 (101.60) | 10.000 (4.54)                 |
| 2-Pole Units | 6                     | 9.000 (228.60) x 4.000 (101.60) x 4.000 (101.60) | 10.000 (4.54)                 |
| 3-Pole Units | 4                     | 9.000 (228.60) x 4.000 (101.60) x 4.000 (101.60) | 10.000 (4.54)                 |
| 4-Pole Units | 3                     | 9.000 (228.60) x 4.000 (101.60) x 4.000 (101.60) | 10.000 (4.54)                 |

- ① 130 Vdc rating based on 2 poles connected in series.
- ⑤ Normally stocked.
- ⑥ Special order, contact Cutler-Hammer. Minimum quantities apply.



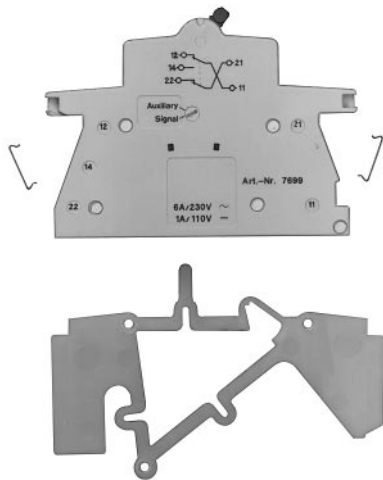
SPCL protectors carry the CE mark in accordance with Low Voltage Directive (LVD) (73/23/EEC)



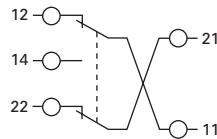
## SPCL Accessories

### Auxiliary/Signal Switch Kit

Catalog Number SPCLUAUX is a field mountable switch kit that attaches to the left side of a SPCL Protector. It is field selectable to auxiliary or signal (bell alarm) configuration. The switch is UL and CSA approved for general purpose ratings of 6 ampere at 240 Vac or 1 ampere at 125 Vdc. Contacts are provided as indicated on the wiring diagram. Screw-type terminals are provided to accommodate up to #16 AWG wire. Recommended torque is approximately 13 inch-pounds.



Wiring Diagram



### Contact Charts

| Contacts | Auxiliary Switch Mode |                  |
|----------|-----------------------|------------------|
|          | Protector Open        | Protector Closed |
| 11 to 12 | X                     | 0                |
| 11 to 14 | 0                     | X                |
| 21 to 22 | X                     | 0                |

| Contacts | Signal Switch Mode |                  |                   |
|----------|--------------------|------------------|-------------------|
|          | Protector Open     | Protector Closed | Protector Tripped |
| 11 to 12 | 0                  | 0                | X                 |
| 11 to 14 | X                  | X                | 0                 |
| 21 to 22 | 0                  | 0                | X                 |

### Technical Data

|                             |                                       |
|-----------------------------|---------------------------------------|
| Rated Voltage:              | 230 Vac/110 Vdc                       |
| Rated Current:              | 6A Ac/1A Dc                           |
| Conductor Cross Section:    | To 1.5 mm <sup>2</sup><br>(No 16 AWG) |
| Tightening Torque:          | 1 Nm<br>(13 inch-pounds)              |
| Product:                    | Catalog Number                        |
| Universal Auxiliary Switch: | <b>SPCLUAUX</b>                       |

Figure 1

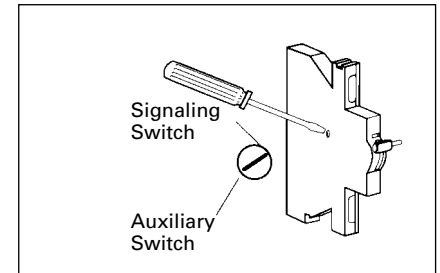


Figure 2

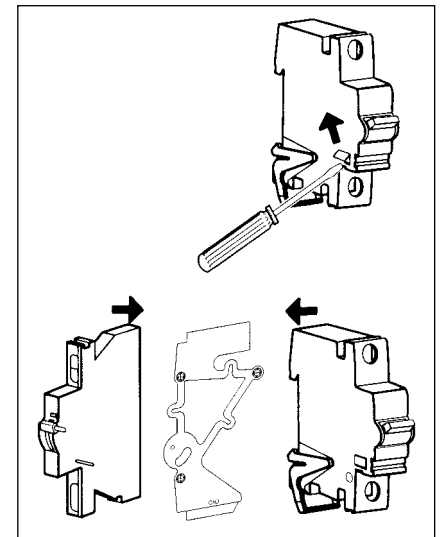
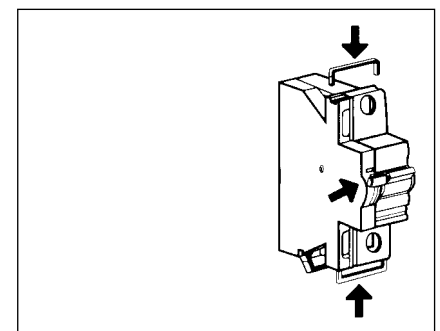


Figure 3



## Supplementary Protectors Current Limiting Type Cable-in/Cable-out DIN Rail

### SPCL Accessories

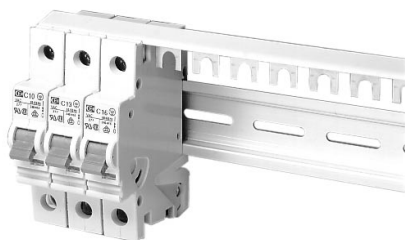
#### Lock-off Devices



#### Lock-off Devices

| Catalog Number    | Description                                                                                                 |
|-------------------|-------------------------------------------------------------------------------------------------------------|
| <b>SPCLPLDEV</b>  | Padlockable device, mounts on protector and includes provisions to accept catalog number SPCLOCKKEY Padlock |
| <b>SPCLOCKKEY</b> | Padlock with 3 keys                                                                                         |

#### Bus Bar Systems



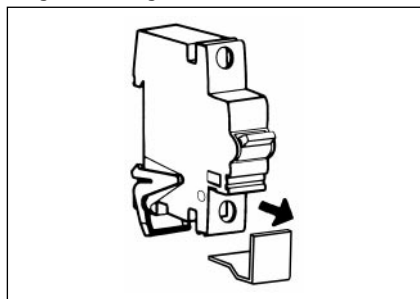
#### Bus Bar Systems

| Catalog Number     | Description                                                                             |
|--------------------|-----------------------------------------------------------------------------------------|
| <b>SPCLIPB10MM</b> | Single-phase 240 Vac VDE approved Bus Bar, 1 meter in length, 10mm <sup>2</sup> density |
| <b>SPCL1PB16MM</b> | Single-phase 240 Vac VDE approved Bus Bar, 1 meter in length, 16mm <sup>2</sup> density |

#### Maximum Bus Bar Current<sup>①</sup>

| Conductor Density | End Connect | Center Connect |
|-------------------|-------------|----------------|
| 10 sq. mm         | 50 Amperes  | 100 Amperes    |
| 16 sq. mm         | 65 Amperes  | 130 Amperes    |

#### Finger Proofing Shield



#### Finger Proofing Shield

| Catalog Number  | Description                                                                                                                                                          |
|-----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>SPCL2000</b> | Clip-on finger proofing shield to enhance finger protection on SPCL protectors. Plastic finger proofing shield clips into upper or lower terminal poles as required. |

<sup>①</sup> Per VDE 0606.

## Description

### UL 1077 Supplementary Protectors

Type SPHM Supplementary Protectors are IEC circuit breakers that are recognized by UL under UL 1077. They are intended for use as over-current protection within an appliance or electrical equipment where branch circuit protection (for example a UL listed Molded Case Circuit Breaker) has already been provided or is not required.

### Equipment and Control Circuit Applications

These protectors are ideal for protecting motor control circuits, CPTs, relays, contactor coils, power supplies, PLC I/O points, lighting circuits, appliances, electronic equipment, and replacing fuses.

## Product Features

The Type SPHM Supplementary Protectors are provided in light gray cases with charcoal gray handles. Handles are marked with "O" for "Off" and "I" for "On".

**DIN Rail Mounting:** Easy installation on 35mm DIN Rail. A spring loaded clip is provided for quick release from the DIN Rail mounting.

### Heat-Induced Nuisance Tripping Eliminated:

The protector is designed to "hold in" at 100% of continuous rated current regardless of ambient temperatures from -40 to +85°C.

**Immediate Reset After Trip:** The protector can be reset (closed) immediately after an overcurrent trip without a "cooling off" period.

**Precise Overcurrent Calibration:** The protector can be precisely calibrated to a wide variety of current ranges from 0.1 to 50 amperes continuous. For special ratings not shown, contact Cutler-Hammer.

**Flexible Time-Characteristic Curves:** Long, Medium, and Short Delay Curves are available. Long Delay are for special extended inrush, Medium

## Catalog Numbering System

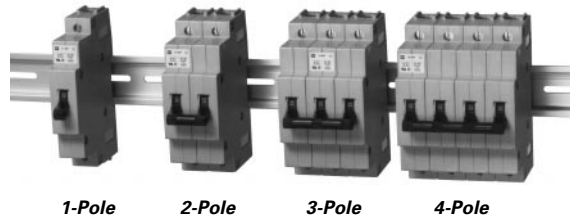
| S P H M                 |  |  | 3           |              | H      |  | M     |  | 0 0 3 0        |  | Auxiliary Switch |                  |
|-------------------------|--|--|-------------|--------------|--------|--|-------|--|----------------|--|------------------|------------------|
| Type                    |  |  | Poles       |              | Inrush |  | Delay |  | Current Rating |  | Code             |                  |
| Supplementary Protector |  |  | <u>Code</u> | <u>Poles</u> |        |  |       |  |                |  | <u>Code</u>      | <u>Current</u>   |
| Hydraulic               |  |  | 1           | 1-Pole       |        |  |       |  |                |  | A①               | Normally Open②   |
| Magnetic                |  |  | 2           | 2-Pole       |        |  |       |  |                |  | B①               | Normally Closed② |
|                         |  |  | 3           | 3-Pole       |        |  |       |  |                |  |                  |                  |
|                         |  |  | 4           | 4-Pole       |        |  |       |  |                |  |                  |                  |
|                         |  |  |             |              |        |  |       |  |                |  |                  |                  |
|                         |  |  |             |              |        |  |       |  |                |  |                  |                  |
|                         |  |  |             |              |        |  |       |  |                |  |                  |                  |
|                         |  |  |             |              |        |  |       |  |                |  |                  |                  |
|                         |  |  |             |              |        |  |       |  |                |  |                  |                  |
|                         |  |  |             |              |        |  |       |  |                |  |                  |                  |
|                         |  |  |             |              |        |  |       |  |                |  |                  |                  |
|                         |  |  |             |              |        |  |       |  |                |  |                  |                  |
|                         |  |  |             |              |        |  |       |  |                |  |                  |                  |
|                         |  |  |             |              |        |  |       |  |                |  |                  |                  |
|                         |  |  |             |              |        |  |       |  |                |  |                  |                  |
|                         |  |  |             |              |        |  |       |  |                |  |                  |                  |
|                         |  |  |             |              |        |  |       |  |                |  |                  |                  |
|                         |  |  |             |              |        |  |       |  |                |  |                  |                  |
|                         |  |  |             |              |        |  |       |  |                |  |                  |                  |
|                         |  |  |             |              |        |  |       |  |                |  |                  |                  |
|                         |  |  |             |              |        |  |       |  |                |  |                  |                  |
|                         |  |  |             |              |        |  |       |  |                |  |                  |                  |
|                         |  |  |             |              |        |  |       |  |                |  |                  |                  |
|                         |  |  |             |              |        |  |       |  |                |  |                  |                  |
|                         |  |  |             |              |        |  |       |  |                |  |                  |                  |
|                         |  |  |             |              |        |  |       |  |                |  |                  |                  |
|                         |  |  |             |              |        |  |       |  |                |  |                  |                  |
|                         |  |  |             |              |        |  |       |  |                |  |                  |                  |
|                         |  |  |             |              |        |  |       |  |                |  |                  |                  |
|                         |  |  |             |              |        |  |       |  |                |  |                  |                  |
|                         |  |  |             |              |        |  |       |  |                |  |                  |                  |
|                         |  |  |             |              |        |  |       |  |                |  |                  |                  |
|                         |  |  |             |              |        |  |       |  |                |  |                  |                  |
|                         |  |  |             |              |        |  |       |  |                |  |                  |                  |
|                         |  |  |             |              |        |  |       |  |                |  |                  |                  |
|                         |  |  |             |              |        |  |       |  |                |  |                  |                  |
|                         |  |  |             |              |        |  |       |  |                |  |                  |                  |
|                         |  |  |             |              |        |  |       |  |                |  |                  |                  |
|                         |  |  |             |              |        |  |       |  |                |  |                  |                  |
|                         |  |  |             |              |        |  |       |  |                |  |                  |                  |
|                         |  |  |             |              |        |  |       |  |                |  |                  |                  |
|                         |  |  |             |              |        |  |       |  |                |  |                  |                  |
|                         |  |  |             |              |        |  |       |  |                |  |                  |                  |
|                         |  |  |             |              |        |  |       |  |                |  |                  |                  |
|                         |  |  |             |              |        |  |       |  |                |  |                  |                  |
|                         |  |  |             |              |        |  |       |  |                |  |                  |                  |
|                         |  |  |             |              |        |  |       |  |                |  |                  |                  |
|                         |  |  |             |              |        |  |       |  |                |  |                  |                  |
|                         |  |  |             |              |        |  |       |  |                |  |                  |                  |
|                         |  |  |             |              |        |  |       |  |                |  |                  |                  |
|                         |  |  |             |              |        |  |       |  |                |  |                  |                  |
|                         |  |  |             |              |        |  |       |  |                |  |                  |                  |
|                         |  |  |             |              |        |  |       |  |                |  |                  |                  |
|                         |  |  |             |              |        |  |       |  |                |  |                  |                  |
|                         |  |  |             |              |        |  |       |  |                |  |                  |                  |
|                         |  |  |             |              |        |  |       |  |                |  |                  |                  |
|                         |  |  |             |              |        |  |       |  |                |  |                  |                  |
|                         |  |  |             |              |        |  |       |  |                |  |                  |                  |
|                         |  |  |             |              |        |  |       |  |                |  |                  |                  |
|                         |  |  |             |              |        |  |       |  |                |  |                  |                  |
|                         |  |  |             |              |        |  |       |  |                |  |                  |                  |
|                         |  |  |             |              |        |  |       |  |                |  |                  |                  |
|                         |  |  |             |              |        |  |       |  |                |  |                  |                  |
|                         |  |  |             |              |        |  |       |  |                |  |                  |                  |
|                         |  |  |             |              |        |  |       |  |                |  |                  |                  |
|                         |  |  |             |              |        |  |       |  |                |  |                  |                  |
|                         |  |  |             |              |        |  |       |  |                |  |                  |                  |
|                         |  |  |             |              |        |  |       |  |                |  |                  |                  |
|                         |  |  |             |              |        |  |       |  |                |  |                  |                  |
|                         |  |  |             |              |        |  |       |  |                |  |                  |                  |
|                         |  |  |             |              |        |  |       |  |                |  |                  |                  |
|                         |  |  |             |              |        |  |       |  |                |  |                  |                  |
|                         |  |  |             |              |        |  |       |  |                |  |                  |                  |
|                         |  |  |             |              |        |  |       |  |                |  |                  |                  |
|                         |  |  |             |              |        |  |       |  |                |  |                  |                  |
|                         |  |  |             |              |        |  |       |  |                |  |                  |                  |
|                         |  |  |             |              |        |  |       |  |                |  |                  |                  |
|                         |  |  |             |              |        |  |       |  |                |  |                  |                  |
|                         |  |  |             |              |        |  |       |  |                |  |                  |                  |
|                         |  |  |             |              |        |  |       |  |                |  |                  |                  |
|                         |  |  |             |              |        |  |       |  |                |  |                  |                  |
|                         |  |  |             |              |        |  |       |  |                |  |                  |                  |
|                         |  |  |             |              |        |  |       |  |                |  |                  |                  |
|                         |  |  |             |              |        |  |       |  |                |  |                  |                  |
|                         |  |  |             |              |        |  |       |  |                |  |                  |                  |
|                         |  |  |             |              |        |  |       |  |                |  |                  |                  |
|                         |  |  |             |              |        |  |       |  |                |  |                  |                  |
|                         |  |  |             |              |        |  |       |  |                |  |                  |                  |
|                         |  |  |             |              |        |  |       |  |                |  |                  |                  |
|                         |  |  |             |              |        |  |       |  |                |  |                  |                  |
|                         |  |  |             |              |        |  |       |  |                |  |                  |                  |

# Miniature Circuit Breakers SPHM Supplementary Protectors

Cutler-Hammer

March 1999

## Supplementary Protectors Hydraulic Magnetic Type Cable-in/Cable-out DIN Rail



### SPHM Catalog Numbers

| Continuous<br>Current<br>Rating<br>(Amperes) | Catalog Number                                      |                                              |                                              |                                              |
|----------------------------------------------|-----------------------------------------------------|----------------------------------------------|----------------------------------------------|----------------------------------------------|
|                                              | 8X (Standard Inrush Tolerance) Medium Delay Curve 2 |                                              |                                              |                                              |
|                                              | 1-Pole 277 Vac                                      | 2-Pole 277/480 Vac                           | 3-Pole 277/480 Vac                           | 4-Pole 277/480 Vac                           |
| 0.1                                          | SPHM1HM00R1Ⓢ                                        | SPHM2HM00R1Ⓢ                                 | SPHM3HM00R1Ⓢ                                 | SPHM4HM00R1Ⓢ                                 |
| 0.25                                         | SPHM1HM0R25Ⓢ                                        | SPHM2HM0R25Ⓢ                                 | SPHM3HM0R25Ⓢ                                 | SPHM4HM0R25Ⓢ                                 |
| 0.50                                         | SPHM1HM0R50Ⓢ                                        | SPHM2HM0R50Ⓢ                                 | SPHM3HM0R50Ⓢ                                 | SPHM4HM0R50Ⓢ                                 |
| 0.75                                         | SPHM1HM0R75Ⓢ                                        | SPHM2HM0R75Ⓢ                                 | SPHM3HM0R75Ⓢ                                 | SPHM4HM0R75Ⓢ                                 |
| 1                                            | SPHM1HM0001Ⓢ                                        | SPHM2HM0001Ⓢ                                 | SPHM3HM0001Ⓢ                                 | SPHM4HM0001Ⓢ                                 |
| 2.5                                          | SPHM1HM02R5Ⓢ                                        | SPHM2HM02R5Ⓢ                                 | SPHM3HM02R5Ⓢ                                 | SPHM4HM02R5Ⓢ                                 |
| 5.0                                          | SPHM1HM0005Ⓢ                                        | SPHM2HM0005Ⓢ                                 | SPHM3HM0005Ⓢ                                 | SPHM4HM0005Ⓢ                                 |
| 7.5                                          | SPHM1HM07R5Ⓢ                                        | SPHM2HM07R5Ⓢ                                 | SPHM3HM07R5Ⓢ                                 | SPHM4HM07R5Ⓢ                                 |
| 10                                           | SPHM1HM0010Ⓢ                                        | SPHM2HM0010Ⓢ                                 | SPHM3HM0010Ⓢ                                 | SPHM4HM0010Ⓢ                                 |
| 15                                           | SPHM1HM0015Ⓢ                                        | SPHM2HM0015Ⓢ                                 | SPHM3HM0015Ⓢ                                 | SPHM4HM0015Ⓢ                                 |
| 20                                           | SPHM1HM0020Ⓢ                                        | SPHM2HM0020Ⓢ                                 | SPHM3HM0020Ⓢ                                 | SPHM4HM0020Ⓢ                                 |
| 25                                           | SPHM1HM0025Ⓢ                                        | SPHM2HM0025Ⓢ                                 | SPHM3HM0025Ⓢ                                 | SPHM4HM0025Ⓢ                                 |
| 30                                           | SPHM1HM0030Ⓢ                                        | SPHM2HM0030Ⓢ                                 | SPHM3HM0030Ⓢ                                 | SPHM4HM0030Ⓢ                                 |
| Continuous<br>Current Rating<br>(Amperes)    | 8X (Standard Inrush Tolerance) Medium Delay Curve 2 |                                              |                                              |                                              |
|                                              | 1-Pole 250 Vac                                      | 2-Pole 250 Vac                               | 3-Pole 250 Vac                               | 4-Pole 250 Vac                               |
|                                              | 35<br>40<br>50                                      | SPHM1HM0035Ⓢ<br>SPHM1HM0040Ⓢ<br>SPHM1HM0050Ⓢ | SPHM2HM0035Ⓢ<br>SPHM2HM0040Ⓢ<br>SPHM2HM0050Ⓢ | SPHM3HM0035Ⓢ<br>SPHM3HM0040Ⓢ<br>SPHM3HM0050Ⓢ |
| SPHM4HM0035Ⓢ<br>SPHM4HM0040Ⓢ<br>SPHM4HM0050Ⓢ |                                                     |                                              |                                              |                                              |
| Continuous<br>Current Rating<br>(Amperes)    | 18X (High Inrush Tolerance) Medium Delay Curve 20   |                                              |                                              |                                              |
|                                              | 1-Pole 277 Vac                                      | 2-Pole 277/480 Vac                           | 3-Pole 277/480 Vac                           | 4-Pole 277/480 Vac                           |
| 0.1                                          | SPHM1RM00R1Ⓢ                                        | SPHM2RM00R1Ⓢ                                 | SPHM3RM00R1Ⓢ                                 | SPHM4RM00R1Ⓢ                                 |
| 0.25                                         | SPHM1RM0R25Ⓢ                                        | SPHM2RM0R25Ⓢ                                 | SPHM3RM0R25Ⓢ                                 | SPHM4RM0R25Ⓢ                                 |
| 0.50                                         | SPHM1RM0R50Ⓢ                                        | SPHM2RM0R50Ⓢ                                 | SPHM3RM0R50Ⓢ                                 | SPHM4RM0R50Ⓢ                                 |
| 0.75                                         | SPHM1RM0R75Ⓢ                                        | SPHM2RM0R75Ⓢ                                 | SPHM3RM0R75Ⓢ                                 | SPHM4RM0R75Ⓢ                                 |
| 1                                            | SPHM1RM0001Ⓢ                                        | SPHM2RM0001Ⓢ                                 | SPHM3RM0001Ⓢ                                 | SPHM4RM0001Ⓢ                                 |
| 2.5                                          | SPHM1RM02R5Ⓢ                                        | SPHM2RM02R5Ⓢ                                 | SPHM3RM02R5Ⓢ                                 | SPHM4RM02R5Ⓢ                                 |
| 5                                            | SPHM1RM0005Ⓢ                                        | SPHM2RM0005Ⓢ                                 | SPHM3RM0005Ⓢ                                 | SPHM4RM0005Ⓢ                                 |
| 7.5                                          | SPHM1RM07R5Ⓢ                                        | SPHM2RM07R5Ⓢ                                 | SPHM3RM07R5Ⓢ                                 | SPHM4RM07R5Ⓢ                                 |
| 10                                           | SPHM1RM0010Ⓢ                                        | SPHM2RM0010Ⓢ                                 | SPHM3RM0010Ⓢ                                 | SPHM4RM0010Ⓢ                                 |
| 15                                           | SPHM1RM0015Ⓢ                                        | SPHM2RM0015Ⓢ                                 | SPHM3RM0015Ⓢ                                 | SPHM4RM0015Ⓢ                                 |
| 20                                           | SPHM1RM0020Ⓢ                                        | SPHM2RM0020Ⓢ                                 | SPHM3RM0020Ⓢ                                 | SPHM4RM0020Ⓢ                                 |
| 25                                           | SPHM1RM0025Ⓢ                                        | SPHM2RM0025Ⓢ                                 | SPHM3RM0025Ⓢ                                 | SPHM4RM0025Ⓢ                                 |
| 30                                           | SPHM1RM0030Ⓢ                                        | SPHM2RM0030Ⓢ                                 | SPHM3RM0030Ⓢ                                 | SPHM4RM0030Ⓢ                                 |
| Continuous<br>Current Rating<br>(Amperes)    | 18X (High Inrush Tolerance) Medium Delay Curve 20   |                                              |                                              |                                              |
|                                              | 1-Pole 250 Vac                                      | 2-Pole 250 Vac                               | 3-Pole 250 Vac                               | 4-Pole 250 Vac                               |
|                                              | 35<br>40<br>50                                      | SPHM1RM0035Ⓢ<br>SPHM1RM0040Ⓢ<br>SPHM1RM0050Ⓢ | SPHM2RM0035Ⓢ<br>SPHM2RM0040Ⓢ<br>SPHM2RM0050Ⓢ | SPHM3RM0035Ⓢ<br>SPHM3RM0040Ⓢ<br>SPHM3RM0050Ⓢ |
| SPHM4RM0035Ⓢ<br>SPHM4RM0040Ⓢ<br>SPHM4RM0050Ⓢ |                                                     |                                              |                                              |                                              |

### Shipping Data

|              | Shipped in<br>Cartons of: | Carton Dimensions Inches (mm)                     | Approx. Weight<br>Lbs. (Kgs) |
|--------------|---------------------------|---------------------------------------------------|------------------------------|
| 1-Pole Units | 12                        | 10.500 (266.70) x 4.125 (104.78) x 4.500 (114.30) | 15.000 (6.81)                |
| 2-Pole Units | 6                         | 10.500 (266.70) x 4.125 (104.78) x 4.500 (114.30) | 15.000 (6.81)                |
| 3-Pole Units | 4                         | 10.500 (266.70) x 4.125 (104.78) x 4.500 (114.30) | 15.000 (6.81)                |
| 4-Pole Units | 3                         | 10.500 (266.70) x 4.125 (104.78) x 4.500 (114.30) | 15.000 (6.81)                |

Ⓢ Normally stocked.

Ⓢ Special order, contact Cutler-Hammer.  
Minimum quantities apply. Contact  
Cutler-Hammer for price and availability  
for 400 Hz, Dc, Auxiliary Switch, and other  
catalog number combinations not shown.

## Series C® G-Frame

- All two- and three-pole circuit breakers are of the common trip type. On all 3-phase Delta (240V) Grounded B phase applications, refer to Cutler-Hammer.
- Single-pole circuit breakers, 15 and 20 amperes. Switching duty rated (SWD) for fluorescent lighting applications.
- All G-frame circuit breakers are suitable for reverse feed use.
- HACR rated.

## Interrupting Capacity Ratings

## UL489 Interrupting Capacity Ratings

| Circuit Breaker Type | Number of Poles | Interrupting Capacity (Symmetrical Amperes) (kA) |     |     |     |          |       | Page Number |
|----------------------|-----------------|--------------------------------------------------|-----|-----|-----|----------|-------|-------------|
|                      |                 | Volts Ac (50/60 Hz)                              |     |     |     | Volts Dc |       |             |
|                      |                 | 120                                              | 240 | 277 | 480 | 125      | 250①② |             |
| GD                   | 3               | —                                                | 65  | —   | 22  | —        | 10    | 26          |

| Circuit Breaker Type | Number of Poles | Interrupting Capacity (Symmetrical Amperes) (kA) |         |         |          |                      |         | Page Number |
|----------------------|-----------------|--------------------------------------------------|---------|---------|----------|----------------------|---------|-------------|
|                      |                 | Volts Ac (50/60 Hz)                              |         |         |          | Volts Dc             |         |             |
|                      |                 | 120                                              | 240     | 277     | 480Y/277 | 125                  | 125/250 |             |
| GB                   | 1<br>2, 3       | 65<br>—                                          | —<br>65 | —<br>—  | —<br>—   | 14 <sup>③</sup><br>— | —<br>14 | 27<br>27    |
| GHB                  | 1<br>2, 3       | 65<br>—                                          | —<br>65 | 14<br>— | —<br>14  | 14 <sup>③</sup><br>— | —<br>14 | 27<br>27    |
| GC                   | 1<br>2, 3       | 65<br>—                                          | —<br>65 | —<br>—  | —<br>—   | 14 <sup>③</sup><br>— | —<br>14 | 28<br>28    |
| GHC                  | 1<br>2, 3       | 65<br>—                                          | —<br>65 | 14<br>— | —<br>14  | 14 <sup>③</sup><br>— | —<br>14 | 28<br>28    |

## Catalog Numbering System

This information is presented only as an aid to understanding catalog numbers. It is not to be used to build catalog numbers for circuit breakers or trip units.

## Circuit Breaker/Frame Catalog Number

|                      |                 |              |          |            |                     |
|----------------------|-----------------|--------------|----------|------------|---------------------|
|                      |                 | <b>GD</b>    | <b>3</b> | <b>100</b> |                     |
| Circuit Breaker Type | Number of Poles | Trip Amperes |          | Suffix     |                     |
| GD                   | 1: 1 Pole       | 15           |          | K:         | Molded Case Switch  |
| GB                   | 2: 2 Pole       | 20           |          | D:         | Ring Type Terminals |
| GHB                  | 3: 3 Pole       | 24           |          | C:         | Steel Collars       |
| GC                   |                 | 30           |          | V:         | 50°C                |
| GHC                  |                 | 35           |          | J01:       | Fungus Proofed      |
|                      |                 | 40           |          | R01:       | Shock Tested        |
|                      |                 | 45           |          | F01:       | Freeze Tested       |
|                      |                 | 50           |          |            |                     |
|                      |                 | 60           |          |            |                     |
|                      |                 | 70           |          |            |                     |
|                      |                 | 80           |          |            |                     |
|                      |                 | 90           |          |            |                     |
|                      |                 | 100          |          |            |                     |

## Terminal Types

For line and load-side. Terminals are UL listed as suitable for wire type and size given below.

| Circuit Breaker Amperes | Terminal Type Material   | Screw Head Type | Wire Type | AWG Wire Range | Metric Wire <sup>④</sup> Range (mm <sup>2</sup> ) |
|-------------------------|--------------------------|-----------------|-----------|----------------|---------------------------------------------------|
| <b>Standard</b>         |                          |                 |           |                |                                                   |
| 15-20                   | Clamp (Plated Steel)     | Slotted         | Cu/Al     | #14-10         | 2.5-4                                             |
| 25-100                  | Pressure (Aluminum Body) | Slotted         | Cu/Al     | #10-1/0        | 4-50                                              |
| <b>Optional</b>         |                          |                 |           |                |                                                   |
| 15-50                   | Pressure (Steel Body)    | Slotted         | Cu        | —              | —                                                 |

① Two poles of 3-pole circuit breaker.  
 ② Time constant is 8 milliseconds minimum.  
 ③ 15 through 70A breakers only.  
 ④ Not UL listed sizes.

# Molded Case Circuit Breakers 15-100 Amperes

Cutler-Hammer

March 1999

## Series C® G-Frame



Typical Series C G-Frame Circuit Breaker

## Type GD Thermal-Magnetic Circuit Breakers with Non-Interchangeable Trip-Units

|                                         |                                                   |                                               |
|-----------------------------------------|---------------------------------------------------|-----------------------------------------------|
| Maximum Continuous Ampere Rating @ 40°C | 480 Vac Maximum, 250 Vdc①                         | Catalog Number (Includes binding head screws) |
|                                         | 22 kAIC @ 480 Vac                                 |                                               |
|                                         | Catalog Number (Includes Line and Load Terminals) |                                               |

### 3-Pole

|     |        |         |
|-----|--------|---------|
| 15  | GD3015 | GD3015D |
| 20  | GD3020 | GD3020D |
| 25  | GD3025 | GD3025D |
| 30  | GD3030 | GD3030D |
| 35  | GD3035 | GD3035D |
| 40  | GD3040 | GD3040D |
| 45  | GD3045 | GD3045D |
| 50  | GD3050 | GD3050D |
| 60  | GD3060 | GD3060D |
| 70  | GD3070 | GD3070D |
| 80  | GD3080 | GD3080D |
| 90  | GD3090 | GD3090D |
| 100 | GD3100 | GD3100D |

Instruction Leaflet/FRED Number 29C102

## Molded Case Switches

|                                         |                                                   |
|-----------------------------------------|---------------------------------------------------|
| Maximum Continuous Ampere Rating @ 40°C | 480 Vac Maximum, 250 Vdc                          |
|                                         | Catalog Number (Includes Line and Load Terminals) |

### 3-Pole

|     |         |
|-----|---------|
| 60  | GD3060K |
| 100 | GD3100K |

Instruction Leaflet/FRED Number 29C102



## Series C® G-Frame

## Types GB and GHB Bolt-On Panelboard Circuit Breakers



Typical GB

These breakers meet the requirements of Federal Specification W-C-375b as follows:

Types GB, GHB, 120 and 240 Volts:

1 Pole: Class 11a.

2, 3 Poles: Classes 10b, 11b, 12b, 14b, 15b

Type GHB, 277 and 480Y/277 Volts:

1 Pole: Classes 12c, 13a

2, 3 Poles: Class 13b

## Type GB Thermal-Magnetic Circuit Breakers with Non-Interchangeable Trip Units

| Continuous<br>Ampere Rating<br>@ 40°C | 120 Vac Maximum,<br>125 Vdc Maximum <sup>①</sup> | 240 Vac Maximum,<br>125/250 Vdc Maximum | 240 Vac Maximum,<br>125/250 Vdc Maximum <sup>②</sup> |
|---------------------------------------|--------------------------------------------------|-----------------------------------------|------------------------------------------------------|
|                                       | 1-Pole                                           | 2-Pole                                  | 3-Pole                                               |
| Catalog Number                        |                                                  |                                         |                                                      |
| 15                                    | GB1015 <sup>③</sup>                              | GB2015 <sup>③</sup>                     | GB3015 <sup>③</sup>                                  |
| 20                                    | GB1020 <sup>③</sup>                              | GB2020 <sup>③</sup>                     | GB3020 <sup>③</sup>                                  |
| 25                                    | GB1025                                           | GB2025                                  | GB3025                                               |
| 30                                    | GB1030                                           | GB2030                                  | GB3030                                               |
| 35                                    | GB1035                                           | GB2035                                  | GB3035                                               |
| 40                                    | GB1040                                           | GB2040                                  | GB3040                                               |
| 45                                    | GB1045                                           | GB2045                                  | GB3045                                               |
| 50                                    | GB1050                                           | GB2050                                  | GB3050                                               |
| 60                                    | GB1060                                           | GB2060                                  | GB3060                                               |
| 70                                    | GB1070                                           | GB2070                                  | GB3070                                               |
| 80                                    | GB1080                                           | GB2080                                  | GB3080                                               |
| 90                                    | GB1090                                           | GB2090                                  | GB3090                                               |
| 100                                   | GB1100                                           | GB2100                                  | GB3100                                               |

Type GHB Thermal-Magnetic Circuit Breakers with Non-Interchangeable Trip Units<sup>④</sup>

| Continuous<br>Ampere Rating<br>@ 40°C | 277/480 Vac Maximum,<br>125 Vdc Maximum <sup>①</sup> | 277/480 Vac Maximum,<br>125/250 Vdc Maximum | 277/480 Vac Maximum,<br>125/250 Vdc Maximum <sup>②</sup> |
|---------------------------------------|------------------------------------------------------|---------------------------------------------|----------------------------------------------------------|
|                                       | 1-Pole                                               | 2-Pole                                      | 3-Pole                                                   |
| Catalog Number                        |                                                      |                                             |                                                          |
| 15                                    | GHB1015 <sup>③</sup>                                 | GHB2015 <sup>③</sup>                        | GHB3015 <sup>③</sup>                                     |
| 20                                    | GHB1020 <sup>③</sup>                                 | GHB2020 <sup>③</sup>                        | GHB3020 <sup>③</sup>                                     |
| 25                                    | GHB1025                                              | GHB2025                                     | GHB3025                                                  |
| 30                                    | GHB1030                                              | GHB2030                                     | GHB3030                                                  |
| 35                                    | GHB1035                                              | GHB2035                                     | GHB3035                                                  |
| 40                                    | GHB1040                                              | GHB2040                                     | GHB3040                                                  |
| 45                                    | GHB1045                                              | GHB2045                                     | GHB3045                                                  |
| 50                                    | GHB1050                                              | GHB2050                                     | GHB3050                                                  |
| 60                                    | GHB1060                                              | GHB2060                                     | GHB3060                                                  |
| 70                                    | GHB1070                                              | GHB2070                                     | GHB3070                                                  |
| 80                                    | GHB1080                                              | GHB2080                                     | GHB3080                                                  |
| 90                                    | GHB1090                                              | GHB2090                                     | GHB3090                                                  |
| 100                                   | GHB1100                                              | GHB2100                                     | GHB3100                                                  |

Instruction Leaflet/FRED Number 15547

## Type GHBGFEP Bolt-on Panelboard 30mA Industrial Ground Fault Circuit Protectors

15-60 Amperes, 277 Volt, 50/60 Hz

Single Phase  
(Requires 2 Poles)

These circuit breakers meet the requirements of UL489 and UL1053.

Operational voltage 240V to 305V.

## Interrupting Capacity Ratings

| Circuit<br>Breaker<br>Type | Number<br>of Poles | Interrupting Capacity<br>(Symmetrical Amperes) |
|----------------------------|--------------------|------------------------------------------------|
|                            |                    | 277 Volts Ac (50/60 Hz)                        |
| GHBGFEP                    | 2                  | 14,000                                         |

Type GHBGFEP Bolt-on Panelboard 30mA  
Industrial Ground Fault Circuit Protectors  
with Non-Interchangeable Trip Units

| Continuous<br>Ampere<br>Rating<br>@ 40°C | One Phase (Requires 2 Poles)<br>277V, 30mA |
|------------------------------------------|--------------------------------------------|
|                                          | Catalog Number                             |
| 15                                       | GHBGFEP1015                                |
| 20                                       | GHBGFEP1020                                |
| 30                                       | GHBGFEP1030                                |
| 40                                       | GHBGFEP1040                                |
| 50                                       | GHBGFEP1050                                |
| 60                                       | GHBGFEP1060                                |

Instruction Leaflet/FRED Number 29C193

- ① 15 through 70 ampere circuit breakers only.
- ② Use (2) outside poles.
- ③ Uses .190-32 screw type clamp terminals.
- ④ 480Y/277V, circuit breakers (Type GHB) not suitable for 3-phase Delta (480V).

# Molded Case Circuit Breakers 15-100 Amperes

Cutler-Hammer

March 1999

## Series C® G-Frame

### Types GC and GHC Circuit Breakers

15-100 Amperes, 120, 240, 277,  
480Y/277V, 50/60 Hz, 125, 125/250  
Vdc, 1, 2, and 3 Poles



Typical GC

These breakers meet the requirements of Federal Specification W-C-37b as follows:

Types GC, 120 and 240 Volts:

- 1 Pole: Class 11a
- 2, 3 Poles: Classes 10b, 11b, 12b, 14b, 15b

Type GHC, 277 and 480Y/277 Volts:

- 1 Pole: Classes 12c, 13a
- 2, 3 Poles: Class 13b

### Type GC Thermal-Magnetic Circuit Breakers with Non-Interchangeable Trip Units

| Continuous<br>Ampere Rating<br>@ 40°C | 240 Vac Maximum,<br>125 Vdc Maximum <sup>①</sup> | 240 Vac Maximum,<br>125/250 Vdc Maximum | 240 Vac Maximum,<br>125/250 Vdc Maximum <sup>②</sup> |
|---------------------------------------|--------------------------------------------------|-----------------------------------------|------------------------------------------------------|
|                                       | 1-Pole                                           | 2-Pole                                  | 3-Pole                                               |
| Catalog Number                        |                                                  |                                         |                                                      |
| 15                                    | GC1015 <sup>③</sup>                              | GC2015 <sup>③</sup>                     | GC3015 <sup>③</sup>                                  |
| 20                                    | GC1020 <sup>③</sup>                              | GC2020 <sup>③</sup>                     | GC3020 <sup>③</sup>                                  |
| 25                                    | GC1025                                           | GC2025                                  | GC3025                                               |
| 30                                    | GC1030                                           | GC2030                                  | GC3030                                               |
| 35                                    | GC1035                                           | GC2035                                  | GC3035                                               |
| 40                                    | GC1040                                           | GC2040                                  | GC3040                                               |
| 45                                    | GC1045                                           | GC2045                                  | GC3045                                               |
| 50                                    | GC1050                                           | GC2050                                  | GC3050                                               |
| 60                                    | GC1060                                           | GC2060                                  | GC3060                                               |
| 70                                    | GC1070                                           | GC2070                                  | GC3070                                               |
| 80                                    | GC1080                                           | GC2080                                  | GC3080                                               |
| 90                                    | GC1090                                           | GC2090                                  | GC3090                                               |
| 100                                   | GC1100                                           | GC2100                                  | GC3100                                               |

### Type GHC Thermal-Magnetic Circuit Breakers with Non-Interchangeable Trip Units

| Continuous<br>Ampere Rating<br>@ 40°C | 277 Vac Maximum,<br>125 Vdc Maximum <sup>①</sup> | 480Y/277 Vac Maximum,<br>125/250 Vdc Maximum | 480Y/277 Vac Maximum,<br>125/250 Vdc Maximum <sup>②</sup> |
|---------------------------------------|--------------------------------------------------|----------------------------------------------|-----------------------------------------------------------|
|                                       | 1-Pole                                           | 2-Pole                                       | 3-Pole                                                    |
| Catalog Number                        |                                                  |                                              |                                                           |
| 15                                    | GHC1015 <sup>③</sup>                             | GHC2015 <sup>③</sup>                         | GHC3015 <sup>③</sup>                                      |
| 20                                    | GHC1020 <sup>③</sup>                             | GHC2020 <sup>③</sup>                         | GHC3020 <sup>③</sup>                                      |
| 25                                    | GHC1025                                          | GHC2025                                      | GHC3025                                                   |
| 30                                    | GHC1030                                          | GHC2030                                      | GHC3030                                                   |
| 35                                    | GHC1035                                          | GHC2035                                      | GHC3035                                                   |
| 40                                    | GHC1040                                          | GHC2040                                      | GHC3040                                                   |
| 45                                    | GHC1045                                          | GHC2045                                      | GHC3045                                                   |
| 50                                    | GHC1050                                          | GHC2050                                      | GHC3050                                                   |
| 60                                    | GHC1060                                          | GHC2060                                      | GHC3060                                                   |
| 70                                    | GHC1070                                          | GHC2070                                      | GHC3070                                                   |
| 80                                    | GHC1080                                          | GHC2080                                      | GHC3080                                                   |
| 90                                    | GHC1090                                          | GHC2090                                      | GHC3090                                                   |
| 100                                   | GHC1100                                          | GHC2100                                      | GHC3100                                                   |

Instruction Leaflet/FRED Number 15548

### Type GHCGFEP Cable In/Cable Out 30mA Industrial Ground Fault Circuit Protectors

15-60 Amperes, 277 Volt, 50/60 Hz



Single Phase  
Requires 2 Poles)

These circuit breakers meet the requirements of UL489 and UL1053.

Operational voltage 240V to 305V.

#### Interrupting Capacity Ratings

| Circuit<br>Breaker<br>Type | Number<br>of Poles | Interrupting Capacity<br>(Symmetrical Amperes) |
|----------------------------|--------------------|------------------------------------------------|
|                            |                    | 277 Volts Ac (50/60 Hz)                        |
| GHCGFEP                    | 2                  | 14,000                                         |

### Type GHBGFEP Bolt-on Panelboard 30mA Industrial Ground Fault Circuit Protectors with Non-Interchangeable Trip Units

| Continuous<br>Ampere<br>Rating<br>@ 40°C | One Phase (Requires 2 Poles)<br>277V, 30mA |
|------------------------------------------|--------------------------------------------|
|                                          | Catalog Number                             |
| 15                                       | GHBGFEP1015                                |
| 20                                       | GHBGFEP1020                                |
| 30                                       | GHBGFEP1030                                |
| 40                                       | GHBGFEP1040                                |
| 50                                       | GHBGFEP1050                                |
| 60                                       | GHBGFEP1060                                |

Instruction Leaflet/FRED Number 29C193

① 15 through 70 ampere circuit breakers only.

② Use (2) outside poles.

③ Uses .190-32 screw type clamp terminals.

**Special Purpose Breakers**

These are Types GC and GHC circuit breakers with binding head screw-type terminals on line and load side. These circuit breakers with screw-type terminals (.190-32) will be

marked "Special purpose breaker not for general use." To order this special breaker, use the catalog number below.

**Type GC Thermal-Magnetic Circuit Breakers with Non-Interchangeable Trip Units**

| Continuous<br>Ampere Rating<br>@ 40°C | 120 Vac Maximum,<br>125 Vdc Maximum | 240 Vac Maximum,<br>125/250 Vdc Maximum | 240 Vac Maximum,<br>125/250 Vdc Maximum <sup>①</sup> |
|---------------------------------------|-------------------------------------|-----------------------------------------|------------------------------------------------------|
|                                       | 1-Pole                              | 2-Pole                                  | 3-Pole                                               |
|                                       | Catalog Number                      |                                         |                                                      |
| 25                                    | GC1025D                             | GC2025D                                 | GC3025D                                              |
| 30                                    | GC1030D                             | GC2030D                                 | GC3030D                                              |
| 35                                    | GC1035D                             | GC2035D                                 | GC3035D                                              |
| 40                                    | GC1040D                             | GC2040D                                 | GC3040D                                              |
| 45                                    | GC1045D                             | GC2045D                                 | GC3045D                                              |
| 50                                    | GC1050D                             | GC2050D                                 | GC3050D                                              |
| 55                                    | GC1055D                             | GC2055D                                 | GC3055D                                              |
| 60                                    | GC1060D                             | GC2060D                                 | GC3060D                                              |

**Type GHC Thermal-Magnetic Circuit Breakers with Non-Interchangeable Trip Units**

| Continuous<br>Ampere Rating<br>@ 40°C | 277 Vac Maximum,<br>125 Vdc Maximum | 480Y/277 Vac Maximum,<br>125/250 Vdc Maximum | 480Y/277 Vac Maximum,<br>125/250 Vdc Maximum <sup>①</sup> |
|---------------------------------------|-------------------------------------|----------------------------------------------|-----------------------------------------------------------|
|                                       | 1-Pole                              | 2-Pole                                       | 3-Pole                                                    |
|                                       | Catalog Number                      |                                              |                                                           |
| 25                                    | GHC1025D                            | GHC2025D                                     | GHC3025D                                                  |
| 30                                    | GHC1030D                            | GHC2030D                                     | GHC3030D                                                  |
| 35                                    | GHC1035D                            | GHC2035D                                     | GHC3035D                                                  |
| 40                                    | GHC1040D                            | GHC2040D                                     | GHC3040D                                                  |
| 45                                    | GHC1045D                            | GHC2045D                                     | GHC3045D                                                  |
| 50                                    | GHC1050D                            | GHC2050D                                     | GHC3050D                                                  |
| 55                                    | GHC1055D                            | GHC2055D                                     | GHC3055D                                                  |
| 60                                    | GHC1060D                            | GHC2060D                                     | GHC3060D                                                  |

Instruction Leaflet/FRED Number 15548

<sup>①</sup> Use (2) outside poles.

## Series C® G-Frame

## Dimensions/Weights

### Dimensions, Inches (mm)

| Number of Poles | Width          | Height           | Depth           |
|-----------------|----------------|------------------|-----------------|
| 1               | 1.0<br>(25.33) | 4.88<br>(123.95) | 2.81<br>(71.41) |
| 2               | 2.0<br>(50.78) | 4.88<br>(123.95) | 2.81<br>(71.41) |
| 3               | 3.0<br>(76)    | 4.88<br>(123.95) | 2.81<br>(71.41) |

### Approximate Shipping Weight, Lbs. (kg)

| Breaker Type | Number of Poles |               |                 |
|--------------|-----------------|---------------|-----------------|
|              | 1               | 2             | 3               |
| GD           | 1.0<br>(.454)   | 1.5<br>(.680) | 2.25<br>(1.021) |
| GHBGFEP      | —               | 1.2<br>(.545) | —               |
| GHCGFEP      | —               | 1.1<br>(.499) | —               |
| GB/GHC       | Carton Quantity |               |                 |
|              | 24              | 12            | 8               |
|              | 16<br>(7.264)   | 16<br>(7.264) | 16<br>(7.264)   |
| GC/GHC       | Carton Quantity |               |                 |
|              | 24              | 12            | 8               |
|              | 18<br>(8.172)   | 18<br>(8.172) | 18<br>(8.172)   |

## Accessories

### Internal

|                                         |     |
|-----------------------------------------|-----|
| Alarm Switch .....                      | 139 |
| Auxiliary Switch .....                  | 142 |
| Shunt Trip .....                        | 147 |
| Undervoltage Release<br>Mechanism ..... | 153 |

### External

|                                  |     |
|----------------------------------|-----|
| Base Mounting Hardware .....     | 163 |
| Base Mounting Plate .....        | 167 |
| DIN Rail Adapter .....           | 167 |
| Key Operated Attachment .....    | 167 |
| Lock Dog (non-padlockable) ..... | 168 |
| Padlockable Handle .....         | 168 |
| Handle Mechanisms .....          | 180 |

## Series C® F-Frame



Typical Series C F-Frame Breaker

- All Series C F-frame circuit breakers are HACR rated.
- All circuit breakers 10 through 50 amperes are suitable for HID (high intensity discharge) use.
- All F-frame circuit breakers are suitable for reverse feed use.

## Interrupting Capacity Ratings

## UL489 Interrupting Capacity Ratings

| Circuit Breaker Type | Number of Poles | Interrupting Capacity (Symmetrical Amperes) (kA) |     |     |     |           |       | Page Number        |
|----------------------|-----------------|--------------------------------------------------|-----|-----|-----|-----------|-------|--------------------|
|                      |                 | Volts Ac (50/60 Hz)                              |     |     |     | Volts Dc① |       |                    |
|                      |                 | 240                                              | 277 | 480 | 600 | 125       | 250②③ |                    |
| ED                   | 2, 3            | 65                                               | —   | —   | —   | 10        | —     | <a href="#">32</a> |
| EDH                  | 2, 3            | 100                                              | —   | —   | —   | 10        | —     | <a href="#">32</a> |
| EDC                  | 2, 3            | 200                                              | —   | —   | —   | 10        | —     | <a href="#">32</a> |
| EHD                  | 1               | —                                                | 14  | —   | —   | 10        | —     | <a href="#">32</a> |
|                      | 2, 3            | 18                                               | —   | 14  | —   | —         | 10    | <a href="#">32</a> |
| FDB                  | 2, 3, 4         | 18                                               | —   | 14  | 14  | —         | 10    | <a href="#">32</a> |
| FD                   | 1               | —                                                | 25  | —   | —   | 10        | —     | <a href="#">32</a> |
|                      | 2, 3, 4         | 65                                               | —   | 25  | 18  | —         | 10    | <a href="#">32</a> |
| HFD                  | 1               | —                                                | 65  | —   | —   | 10        | —     | <a href="#">33</a> |
|                      | 2, 3, 4         | 100                                              | —   | 65  | 25  | —         | 22    | <a href="#">33</a> |
| FDC                  | 2, 3, 4         | 200                                              | —   | 100 | 35  | —         | 22    | <a href="#">33</a> |

## IEC 157-1 (P1) Interrupting Capacity Ratings (P1)

| Circuit Breaker Type | Number of Poles | Interrupting Capacity (Symmetrical Amperes) (kA) |          |     |     |           |       | Page Number        |
|----------------------|-----------------|--------------------------------------------------|----------|-----|-----|-----------|-------|--------------------|
|                      |                 | Volts Ac (50/60 Hz)                              |          |     |     | Volts Dc① |       |                    |
|                      |                 | 220, 240                                         | 380, 415 | 440 | 500 | 125       | 250②③ |                    |
| ED                   | 2, 3            | 65                                               | —        | —   | —   | 10        | —     | <a href="#">32</a> |
| EDH                  | 2, 3            | 100                                              | —        | —   | —   | 10        | —     | <a href="#">32</a> |
| EDC                  | 2, 3            | 200                                              | —        | —   | —   | 10        | —     | <a href="#">32</a> |
| FDB                  | 2, 3, 4         | 18                                               | 14       | 14  | 14  | —         | 10    | <a href="#">32</a> |
| FD                   | 1               | 25                                               | —        | —   | —   | 10        | —     | <a href="#">32</a> |
|                      | 2, 3, 4         | 65                                               | 35       | 35  | 18  | —         | 10    | <a href="#">32</a> |
| HFD                  | 1               | 65                                               | —        | —   | —   | 10        | —     | <a href="#">33</a> |
|                      | 2, 3, 4         | 100                                              | 65       | 65  | 25  | —         | 22    | <a href="#">33</a> |
| FDC                  | 2, 3, 4         | 200                                              | 100      | 100 | 35  | —         | 22    | <a href="#">33</a> |

① Dc ratings apply to substantially non-inductive circuits.

② 2-pole circuit breaker, or two poles of 3-pole circuit breaker.

③ Time constant is 3 milliseconds minimum at 10 kA and 8 milliseconds minimum at 22 kA.

# Molded Case Circuit Breakers 10-225 Amperes

Cutler-Hammer

March 1999

## Series C® F-Frame

## Types ED, EDH, and EDC Thermal-Magnetic Circuit Breakers with Non-Interchangeable Trip Units Suitable for Reverse Feed

| Maximum Continuous Ampere Rating @ 40°C | 240 Vac Maximum, 125 Vdc                             |        |                    |         |                           |         |
|-----------------------------------------|------------------------------------------------------|--------|--------------------|---------|---------------------------|---------|
|                                         | 65 kAIC @ 240 Vac                                    |        | 100 kAIC @ 240 Vac |         | 200 kAIC @ 240 Vac        |         |
|                                         | Type ED                                              |        | Type EDH           |         | Type EDC Current Limiting |         |
|                                         | 2-Pole                                               | 3-Pole | 2-Pole             | 3-Pole  | 2-Pole                    | 3-Pole  |
|                                         | Catalog Number (Includes Terminals on Load End Only) |        |                    |         |                           |         |
| 100                                     | ED2100                                               | ED3100 | EDH2100            | EDH3100 | EDC2100                   | EDC3100 |
| 125                                     | ED2125                                               | ED3125 | EDH2125            | EDH3125 | EDC2125                   | EDC3125 |
| 150                                     | ED2150                                               | ED3150 | EDH2150            | EDH3150 | EDC2150                   | EDC3150 |
| 175                                     | ED2175                                               | ED3175 | EDH2175            | EDH3175 | EDC2175                   | EDC3175 |
| 200                                     | ED2200                                               | ED3200 | EDH2200            | EDH3200 | EDC2200                   | EDC3200 |
| 225                                     | ED2225                                               | ED3225 | EDH2225            | EDH3225 | EDC2225                   | EDC3225 |

Instruction Leaflet/FRED Number 29C101

## Type EHD Thermal-Magnetic Circuit Breakers with Non-Interchangeable Trip Units

|                                         |                                                      |                          |         |
|-----------------------------------------|------------------------------------------------------|--------------------------|---------|
| Maximum Continuous Ampere Rating @ 40°C | 277 Vac Maximum, 125 Vdc                             | 480 Vac Maximum, 250 Vdc |         |
|                                         | 14 kAIC @ 277 Vac                                    | 14 kAIC @ 480 Vac        |         |
|                                         | Type EHD                                             |                          |         |
|                                         | 1-Pole                                               | 2-Pole                   | 3-Pole  |
|                                         | Catalog Number (Includes Terminals on Load End Only) |                          |         |
| 10①                                     | EHD1010                                              | EHD2010                  | EHD3010 |
| 15                                      | EHD1015②                                             | EHD2015                  | EHD3015 |
| 20                                      | EHD1020②                                             | EHD2020                  | EHD3020 |
| 25                                      | EHD1025                                              | EHD2025                  | EHD3025 |
| 30                                      | EHD1030                                              | EHD2030                  | EHD3030 |
| 35                                      | EHD1035                                              | EHD2035                  | EHD3035 |
| 40                                      | EHD1040                                              | EHD2040                  | EHD3040 |
| 45                                      | EHD1045                                              | EHD2045                  | EHD3045 |
| 50                                      | EHD1050                                              | EHD2050                  | EHD3050 |
| 60                                      | EHD1060                                              | EHD2060                  | EHD3060 |
| 70                                      | EHD1070                                              | EHD2070                  | EHD3070 |
| 80                                      | EHD1080                                              | EHD2080                  | EHD3080 |
| 90                                      | EHD1090                                              | EHD2090                  | EHD3090 |
| 100                                     | EHD1100                                              | EHD2100                  | EHD3100 |

Instruction Leaflet/FRED Number 29C101

## Type FD Thermal-Magnetic Circuit Breakers with Non-Interchangeable Trip Units

| Maximum Continuous<br>Ampere<br>Rating<br>@ 40°C | 600 Vac Maximum, 250 Vdc                             |         |         | 277 Vac Maximum, 125 Vdc |        | 600 Vac Maximum, 250 Vdc |        |  |  |
|--------------------------------------------------|------------------------------------------------------|---------|---------|--------------------------|--------|--------------------------|--------|--|--|
|                                                  | 14 kAIC @ 600 Vac                                    |         |         | 25 kAIC @ 277 Vac        |        | 25 kAIC @ 480 Vac        |        |  |  |
|                                                  | Type FDB                                             |         |         | Type FD                  |        |                          |        |  |  |
|                                                  | 2-Pole                                               | 3-Pole  | 4-Pole  | 1-Pole                   | 2-Pole | 3-Pole                   | 4-Pole |  |  |
|                                                  | Catalog Number (Includes Terminals on Load End Only) |         |         |                          |        |                          |        |  |  |
| 10①                                              | FDB2010                                              | FDB3010 | FDB4010 | FD1010                   | —      | —                        | —      |  |  |
| 15                                               | FDB2015                                              | FDB3015 | FDB4015 | FD1015②                  | FD2015 | FD3015                   | FD4015 |  |  |
| 20                                               | FDB2020                                              | FDB3020 | FDB4020 | FD1020②                  | FD2020 | FD3020                   | FD4020 |  |  |
| 25                                               | FDB2025                                              | FDB3025 | FDB4025 | FD1025                   | FD2025 | FD3025                   | FD4025 |  |  |
| 30                                               | FDB2030                                              | FDB3030 | FDB4030 | FD1030                   | FD2030 | FD3030                   | FD4030 |  |  |
| 35                                               | FDB2035                                              | FDB3035 | FDB4035 | FD1035                   | FD2035 | FD3035                   | FD4035 |  |  |
| 40                                               | FDB2040                                              | FDB3040 | FDB4040 | FD1040                   | FD2040 | FD3040                   | FD4040 |  |  |
| 45                                               | FDB2045                                              | FDB3045 | FDB4045 | FD1045                   | FD2045 | FD3045                   | FD4045 |  |  |
| 50                                               | FDB2050                                              | FDB3050 | FDB4050 | FD1050                   | FD2050 | FD3050                   | FD4050 |  |  |
| 60                                               | FDB2060                                              | FDB3060 | FDB4060 | FD1060                   | FD2060 | FD3060                   | FD4060 |  |  |
| 70                                               | FDB2070                                              | FDB3070 | FDB4070 | FD1070                   | FD2070 | FD3070                   | FD4070 |  |  |
| 80                                               | FDB2080                                              | FDB3080 | FDB4080 | FD1080                   | FD2080 | FD3080                   | FD4080 |  |  |
| 90                                               | FDB2090                                              | FDB3090 | FDB4090 | FD1090                   | FD2090 | FD3090                   | FD4090 |  |  |
| 100                                              | FDB2100                                              | FDB3100 | FDB4100 | FD1100                   | FD2100 | FD3100                   | FD4100 |  |  |
| 110                                              | FDB2110                                              | FDB3110 | FDB4110 | FD1110                   | FD2110 | FD3110                   | FD4110 |  |  |
| 125                                              | FDB2125                                              | FDB3125 | FDB4125 | FD1125                   | FD2125 | FD3125                   | FD4125 |  |  |
| 150                                              | FDB2150                                              | FDB3150 | FDB4150 | FD1150                   | FD2150 | FD3150                   | FD4150 |  |  |
| 175                                              | —                                                    | —       | —       | —                        | FD2175 | FD3175                   | FD4175 |  |  |
| 200                                              | —                                                    | —       | —       | —                        | FD2200 | FD3200                   | FD4200 |  |  |
| 225                                              | —                                                    | —       | —       | —                        | FD2225 | FD3225                   | FD4225 |  |  |

Instruction Leaflet/FRED Number 29C101

① Not UL listed. 5 kAIC interrupting rating.

② UL listed for SWD applications, see NEC Article 240-83 (d).



## Series C® F-Frame

## Types HFD and FDC Thermal-Magnetic Circuit Breakers with Non-Interchangeable Trip Units

| Maximum Continuous Ampere Rating @ 40°C | 600 Vac Maximum, 250 Vdc                             |         | 277 Vac Maximum, 125 Vdc |         |                           |         | 600 Vac Maximum, 250 Vdc |  |  |
|-----------------------------------------|------------------------------------------------------|---------|--------------------------|---------|---------------------------|---------|--------------------------|--|--|
|                                         | 65 kAIC @ 277 Vac                                    |         | 65 kAIC @ 480 Vac        |         |                           |         | 100 kAIC @ 480 Vac       |  |  |
|                                         | Type HFD                                             |         |                          |         | Type FDC Current Limiting |         |                          |  |  |
|                                         | 1-Pole                                               | 2-Pole  | 3-Pole                   | 4-Pole  | 2-Pole                    | 3-Pole  | 4-Pole                   |  |  |
|                                         | Catalog Number (Includes Terminals on Load End Only) |         |                          |         |                           |         |                          |  |  |
| 15                                      | HFD1015                                              | HFD2015 | HFD3015                  | HFD4015 | FDC2015                   | FDC3015 | FDC4015                  |  |  |
| 20                                      | HFD1020                                              | HFD2020 | HFD3020                  | HFD4020 | FDC2020                   | FDC3020 | FDC4020                  |  |  |
| 25                                      | HFD1025                                              | HFD2025 | HFD3025                  | HFD4025 | FDC2025                   | FDC3025 | FDC4025                  |  |  |
| 30                                      | HFD1030                                              | HFD2030 | HFD3030                  | HFD4030 | FDC2030                   | FDC3030 | FDC4030                  |  |  |
| 35                                      | HFD1035                                              | HFD2035 | HFD3035                  | HFD4035 | FDC2035                   | FDC3035 | FDC4035                  |  |  |
| 40                                      | HFD1040                                              | HFD2040 | HFD3040                  | HFD4040 | FDC2040                   | FDC3040 | FDC4040                  |  |  |
| 45                                      | HFD1045                                              | HFD2045 | HFD3045                  | HFD4045 | FDC2045                   | FDC3045 | FDC4045                  |  |  |
| 50                                      | HFD1050                                              | HFD2050 | HFD3050                  | HFD4050 | FDC2050                   | FDC3050 | FDC4050                  |  |  |
| 60                                      | HFD1060                                              | HFD2060 | HFD3060                  | HFD4060 | FDC2060                   | FDC3060 | FDC4060                  |  |  |
| 70                                      | HFD1070                                              | HFD2070 | HFD3070                  | HFD4070 | FDC2070                   | FDC3070 | FDC4070                  |  |  |
| 80                                      | HFD1080                                              | HFD2080 | HFD3080                  | HFD4080 | FDC2080                   | FDC3080 | FDC4080                  |  |  |
| 90                                      | HFD1090                                              | HFD2090 | HFD3090                  | HFD4090 | FDC2090                   | FDC3090 | FDC4090                  |  |  |
| 100                                     | HFD1100                                              | HFD2100 | HFD3100                  | HFD4100 | FDC2100                   | FDC3100 | FDC4100                  |  |  |
| 110                                     | HFD1110                                              | HFD2110 | HFD3110                  | HFD4110 | FDC2110                   | FDC3110 | FDC4110                  |  |  |
| 125                                     | HFD1125                                              | HFD2125 | HFD3125                  | HFD4125 | FDC2125                   | FDC3125 | FDC4125                  |  |  |
| 150                                     | HFD1150                                              | HFD2150 | HFD3150                  | HFD4150 | FDC2150                   | FDC3150 | FDC4150                  |  |  |
| 175                                     | —                                                    | HFD2175 | HFD3175                  | HFD4175 | FDC2175                   | FDC3175 | FDC4175                  |  |  |
| 200                                     | —                                                    | HFD2200 | HFD3200                  | HFD4200 | FDC2200                   | FDC3200 | FDC4200                  |  |  |
| 225                                     | —                                                    | HFD2225 | HFD3225                  | HFD4225 | FDC2225                   | FDC3225 | FDC4225                  |  |  |

Instruction Leaflet/FRED Number 29C101

## Molded Case Switches

Molded case switches are used as compact switches in applications requiring high current switching capabilities. Molded case switches are constructed of circuit breaker components and are of the high instantaneous automatic type. Molded case switches are listed in accordance with Underwriters Laboratories, Inc., Standard UL 1087.

| Maximum Continuous Ampere Rating @ 40°C | 480 Vac Maximum, 250 Vdc                               | 600 Vac Maximum, 250 Vdc                               |
|-----------------------------------------|--------------------------------------------------------|--------------------------------------------------------|
|                                         | Complete Circuit Breaker with Load Side Terminals Only | Complete Circuit Breaker with Load Side Terminals Only |
|                                         | Catalog Number                                         |                                                        |

## 2-Pole

|     |          |         |
|-----|----------|---------|
| 100 | EHD2100K | FD2100K |
| 150 | —        | FD2150K |
| 225 | —        | FD2225K |

## 3-Pole

|     |          |         |
|-----|----------|---------|
| 100 | EHD3100K | FD3100K |
| 150 | —        | FD3150K |
| 225 | —        | FD3225K |

## 4-Pole

|     |   |         |
|-----|---|---------|
| 100 | — | FD4100K |
| 150 | — | FD4150K |
| 225 | — | FD4225K |

**Note:** Molded Case Switches may open above 1800 amperes.

Instruction Leaflet/FRED Number 29C101

## Series C® F-Frame

### Line and Load Terminals

Line and load terminals provide wire connecting capabilities for specific ranges of continuous current ratings and wire types. Except as noted, terminals comply with Underwriters Laboratories, Inc., Standards UL486A and UL486B. Unless otherwise specified, F-frame circuit breakers

are factory equipped with load terminals only.

### Ordering Information

F-frame circuit breakers and molded case switches have load terminals only as standard equipment. When standard line-end terminals (same as

standard load-end terminals) are required, add suffix L to the circuit breaker catalog number. When non-standard or optional line and/or load terminals are required, order by style number. Specify if factory installation is required.

### Line and Load Terminals

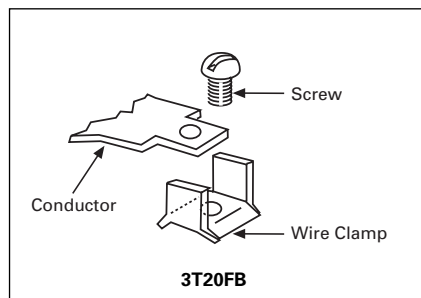
| Maximum Breaker Amperes | Terminal Body Material | Wire Type | AWG Wire Range | Metric Wire Range mm <sup>2</sup> | Package of 3 Terminals<br>Catalog Number |
|-------------------------|------------------------|-----------|----------------|-----------------------------------|------------------------------------------|
|-------------------------|------------------------|-----------|----------------|-----------------------------------|------------------------------------------|

#### Standard Pressure Type Terminals

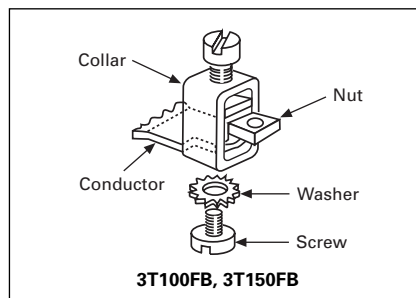
|          |          |       |         |        |                     |
|----------|----------|-------|---------|--------|---------------------|
| 20 (EHD) | Steel    | Cu/Al | #14-#10 | 2.5-4  | 3T20FB <sup>①</sup> |
| 100      | Steel    | Cu/Al | #14-1/0 | 2.5-50 | 3T100FB             |
| 225      | Aluminum | Cu/Al | #14-4/0 | 25-95  | 3TA225FD            |

#### Optional Pressure Terminals

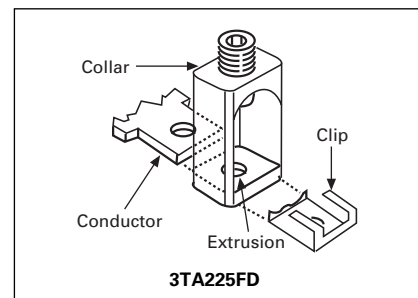
|     |                 |       |              |        |                        |
|-----|-----------------|-------|--------------|--------|------------------------|
| 50  | Aluminum        | Cu/Al | #14-#4       | 2.5-16 | 3TA50FB <sup>①</sup>   |
| 100 | Aluminum        | Cu/Al | #14-1/0      | 2.5-50 | 3TA100FD               |
| 200 | Stainless Steel | Cu    | #4-4/0       | 25-95  | 3T150FB                |
| 225 | Aluminum        | Cu/Al | #6-300 kcmil | 16-150 | 3TA225FDK <sup>②</sup> |



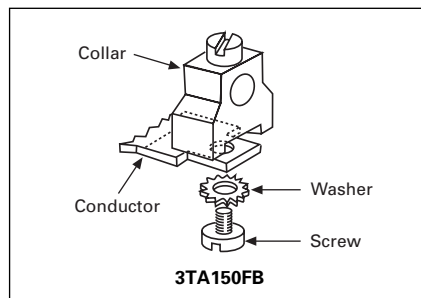
Assemble wire clamp to bottom of conductor as shown.



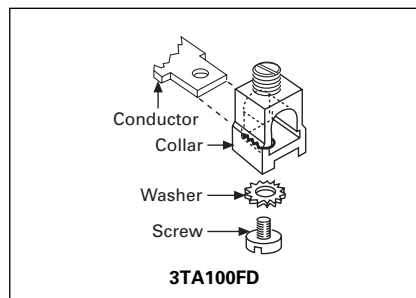
Insert collar enclosing conductor as shown. Locate nut on top of conductor and tighten securely with screw and washer. Caution: Collar must surround conductor.



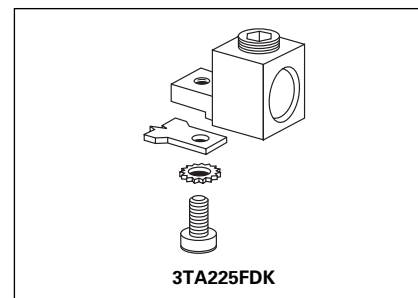
Insert collar enclosing conductor and center on extrusion on collar. Install clip with legs on top of conductor and snap end around bottom of collar.



Assemble collar on top of conductor as shown. Tighten securely with screw and washer.



Collar slides onto conductor and is held in position by a screw and lockwasher.



Assemble collar on top of conductor as shown. Tighten securely with screw and washer. Terminal shield must be used with this collar.

<sup>①</sup> Not for use with ED, EDH, EDC breakers.

<sup>②</sup> Includes terminal shield kit. Adds approximately 3 inches to breaker height. Available for use on 3-pole breaker only.

## Catalog Numbering System

This information is presented only as an aid to understanding catalog numbers. It is not to be used to build catalog numbers for circuit breakers or trip units.

### Circuit Breaker Catalog Number

| FDC 3 100 L          |                 |                                         |                                              |
|----------------------|-----------------|-----------------------------------------|----------------------------------------------|
| Circuit Breaker Type | Number of Poles | Trip Amperes                            | Suffix                                       |
| EHD                  | 1: 1 Pole       | 10                                      | E: 100% Protected (4-Pole only) Neutral Pole |
| FDB                  | 2: 2 Poles      | 15                                      | EH: 50% Protected (4-Pole only)              |
| FD                   | 3: 3 Poles      | 20                                      | K: High Magnetic Molded Case Switch          |
| HFD                  | 4: 4 Poles      | 25                                      | L: Line and Load Terminals                   |
| FDC                  |                 | 30                                      | S: Stainless Steel Terminals                 |
|                      |                 | 35                                      | V: 50°C Calibration                          |
|                      |                 | 40                                      | W: Without Terminals                         |
|                      |                 | 45                                      | Y: Line Terminals Only                       |
|                      |                 | 50                                      | Z: Aluminum Terminals (≤ 100 Amperes)        |
|                      |                 | 60                                      |                                              |
|                      |                 | 70                                      |                                              |
|                      |                 | 80                                      |                                              |
|                      |                 | 90                                      |                                              |
|                      |                 | 100                                     |                                              |
|                      |                 | 110                                     |                                              |
|                      |                 | 125                                     |                                              |
|                      |                 | 150                                     |                                              |
|                      |                 | 175 (FD, HFD, FDC, 2-, 3-, 4-Pole Only) |                                              |
|                      |                 | 200 (FD, HFD, FDC, 2-, 3-, 4-Pole Only) |                                              |
|                      |                 | 225 (FD, HFD, FDC, 2-, 3-, 4-Pole Only) |                                              |

| EDC 3 200 L          |                 |              |                                     |
|----------------------|-----------------|--------------|-------------------------------------|
| Circuit Breaker Type | Number of Poles | Trip Amperes | Suffix                              |
| ED                   | 2: 2 Poles      | 100          | L: Line and Load Terminals          |
| EDH                  | 3: 3 Poles      | 125          | W: Without Terminals                |
| EDC                  |                 | 150          | Y: Line Terminals Only              |
|                      |                 | 175          | Z: Aluminum Terminals (100 Amperes) |
|                      |                 | 200          |                                     |
|                      |                 | 225          |                                     |

## Dimensions/Weights

### Dimensions, Inches (mm)

| Number of Poles | Width          | Height     | Depth         |
|-----------------|----------------|------------|---------------|
| 1               | 1.375<br>(35)  | 6<br>(152) | 3.375<br>(86) |
| 2               | 2.75<br>(70)   | 6<br>(152) | 3.375<br>(86) |
| 3               | 4.125<br>(105) | 6<br>(152) | 3.375<br>(86) |
| 4               | 5.5<br>(140)   | 6<br>(152) | 3.375<br>(86) |

### Approximate Shipping Weight, Lbs. (kg)

| Breaker Type           | Number of Poles |              |                |              |
|------------------------|-----------------|--------------|----------------|--------------|
|                        | 1               | 2            | 3              | 4            |
| ED, EDH, EDC           | —               | 3<br>(1.361) | 4.5<br>(2.041) | —            |
| EHD, FDB, FD, HFD, FDC | 2<br>(.907)     | 3<br>(1.361) | 4.5<br>(2.041) | 6<br>(2.721) |

## Series C® F-Frame

### Allowable Accessory Combinations

Different combinations of accessories can be supplied, depending on the types of accessories and the number of poles in the circuit breaker.

|  | Reference Page | 1-Pole | 2-Pole |       | 3-Pole |        |       | 4-Pole |        |       |      |
|--|----------------|--------|--------|-------|--------|--------|-------|--------|--------|-------|------|
|  |                | Center | Left   | Right | Left   | Center | Right | Left   | Center | Right | Neu. |

#### Internal Accessories

|                                               |     |   |  |   |  |   |  |   |  |   |   |
|-----------------------------------------------|-----|---|--|---|--|---|--|---|--|---|---|
| Alarm Lockout Switch (Make Only)              | 139 | ■ |  |   |  |   |  |   |  |   |   |
| Alarm Lockout (Make/Break)                    | 139 |   |  | ■ |  | □ |  | □ |  | ■ |   |
| Alarm Lockout (2Make/2Break)                  | 139 |   |  | ■ |  | □ |  | □ |  | ■ |   |
| Auxiliary Switch (1A, 1B)                     | 142 |   |  | ■ |  | ■ |  | ■ |  | ■ | ■ |
| Auxiliary Switch (2A, 2B)                     | 142 |   |  | ■ |  | ■ |  | ■ |  | ■ | ■ |
| Auxiliary Switch and Alarm Switch Combination | 145 |   |  | ■ |  | □ |  | □ |  | ■ |   |
| Shunt Trip – Standard                         | 148 |   |  | ■ |  | ■ |  | ■ |  | ■ | ■ |
| Shunt Trip – Low Energy                       | 152 |   |  | ■ |  | ■ |  | ■ |  | ■ |   |
| Undervoltage Release Mechanism                | 154 |   |  | ■ |  | ■ |  | ■ |  | ■ |   |

#### External Accessories

|                                                |     |   |   |   |  |   |  |   |   |   |   |
|------------------------------------------------|-----|---|---|---|--|---|--|---|---|---|---|
| End Cap Kit                                    | 161 |   |   | ● |  | ● |  |   |   | ● |   |
| Keeper Nut                                     | 161 | ● |   | ● |  | ● |  |   |   | ● |   |
| Control Wire Terminal Kit                      | 162 | ● |   | ● |  | ● |  |   |   | ● |   |
| Multiwire Connectors                           | 162 | ● |   | ● |  | ● |  |   |   | ● |   |
| Base Mounting Hardware                         | 163 | ● |   | ● |  | ● |  |   |   | ● |   |
| Terminal Shields                               | 165 | ● |   | ● |  | ● |  |   |   | ● |   |
| Terminal End Covers                            | 166 |   |   |   |  | ● |  |   |   |   |   |
| Interphase Barriers                            | 166 |   |   | ● |  | ● |  |   |   | ● |   |
| Non-Padlockable Handle Block                   | 168 | ■ | ■ |   |  | ■ |  |   | ■ |   |   |
| Snap-on Padlockable Handle Lock Hasp           | 168 | ■ | ■ |   |  | ■ |  |   | ■ |   |   |
| Padlockable Handle Lock Hasp                   | 169 |   |   | ■ |  | □ |  | □ |   | □ | □ |
| Cylinder Lock                                  | 169 |   |   |   |  | ■ |  |   |   |   |   |
| Key Interlock Kit                              | 170 |   |   | ■ |  | □ |  | □ |   | □ | □ |
| Sliding Bar Interlock – Requires Two Breakers  | 171 |   |   |   |  | ● |  |   |   |   |   |
| Walking Beam Interlock – Requires Two Breakers | 171 |   |   |   |  | ● |  |   |   | ● |   |
| Electrical (Solenoid) Operator                 | 172 |   |   |   |  | ● |  |   |   | ● |   |
| Plug-in Adapters                               | 174 |   |   | ● |  | ● |  |   |   | ● |   |
| Rear Connecting Studs                          | 175 | ● |   | ● |  | ● |  |   |   | ● |   |
| Panelboard Connecting Straps                   | 177 | ● |   | ● |  | ● |  |   |   | ● |   |
| Handle Mechanisms                              | 178 |   |   |   |  | ● |  |   |   |   |   |
| Door Hardware/Accessories                      | 182 |   |   |   |  | ● |  |   |   | ● |   |
| LFD Current Limiter                            | 183 |   |   |   |  | ● |  |   |   |   |   |
| IQ Energy Sentinel                             | 184 |   |   | ● |  | ● |  |   |   |   |   |

#### Modifications (Refer to Cutler-Hammer)

|                                |     |   |  |   |  |   |  |  |  |   |  |
|--------------------------------|-----|---|--|---|--|---|--|--|--|---|--|
| Special Calibration            | 186 | ● |  | ● |  | ● |  |  |  | ● |  |
| Moisture Fungus Treatment      | 186 | ● |  | ● |  | ● |  |  |  | ● |  |
| Freeze-Tested Circuit Breakers | 186 | ● |  | ● |  | ● |  |  |  | ● |  |
| Marine Application             | 186 | ● |  | ● |  | ● |  |  |  | ● |  |

■ Applicable in indicated pole position

□ May be mounted on left or right pole – not both

● Accessory available/Modification available

## Series C® J-Frame



Typical Series C J-Frame Circuit Breaker

- All Series C J-frame Circuit Breakers are HACR rated.
- J-frame circuit breakers are available as individual components (Frame, Trip Unit, Terminals), or factory assembled complete breakers.
- J-frame circuit breakers with non-interchangeable trip units are suitable for reverse feed use.

## Interrupting Capacity Ratings

## UL489 Interrupting Capacity Ratings

| Circuit Breaker Type | Number of Poles | Interrupting Capacity (Symmetrical Amperes) (kA) |     |     |     |                   |                  | Page Number |
|----------------------|-----------------|--------------------------------------------------|-----|-----|-----|-------------------|------------------|-------------|
|                      |                 | Volts Ac (50/60 Hz)                              |     |     |     | Volts Dc          |                  |             |
|                      |                 | 240                                              | 480 | 600 | 125 | 250 <sup>①②</sup> | 500 <sup>③</sup> |             |
| JDB                  | 2, 3            | 65                                               | 35  | 18  | —   | 10                | —                | 39          |
| JD                   | 2, 3, 4         | 65                                               | 35  | 18  | —   | 10                | —                | 38          |
| HJD                  | 2, 3, 4         | 100                                              | 65  | 25  | —   | 22                | —                | 38          |
| JDC                  | 2, 3, 4         | 200                                              | 100 | 35  | —   | 22                | —                | 38          |

## IEC 157-1 (P1) Interrupting Capacity Ratings

| Circuit Breaker Type | Number of Poles | Interrupting Capacity (Symmetrical Amperes) (kA) |     |     |     |     |                   | Page Number |
|----------------------|-----------------|--------------------------------------------------|-----|-----|-----|-----|-------------------|-------------|
|                      |                 | Volts Ac (50/60 Hz)                              |     |     |     |     | Volts Dc          |             |
|                      |                 | 240                                              | 380 | 415 | 600 | 125 | 250 <sup>①②</sup> |             |
| JD                   | 2, 3, 4         | 65                                               | 35  | 35  | —   | —   | 10                | 38          |
| HJD                  | 2, 3, 4         | 100                                              | 65  | 65  | —   | —   | 22                | 38          |
| JDC                  | 2, 3, 4         | 200                                              | 100 | 100 | —   | —   | 22                | 38          |

- ① 2-pole circuit breaker or two outside poles of 3-pole circuit breaker.
- ② Time constant is 3 milliseconds minimum at 10 kA and 8 milliseconds minimum at 22 kA.
- ③ 8 milliseconds time constant.

# Molded Case Circuit Breakers 70-250 Amperes

Cutler-Hammer

March 1999

## Series C® J-Frame

## Types JD, HJD, and JDC Thermal-Magnetic Circuit Breakers with Interchangeable Trip Units

|                                         |                                                                         |            |                                                                         |            |                                                                                          |            |                                                                  |                                                                   |
|-----------------------------------------|-------------------------------------------------------------------------|------------|-------------------------------------------------------------------------|------------|------------------------------------------------------------------------------------------|------------|------------------------------------------------------------------|-------------------------------------------------------------------|
| Maximum Continuous Ampere Rating @ 40°C | Standard Interrupting Capacity<br>600 Vac Rated<br>25 kAIC @ 480 Vac    |            | High Interrupting Capacity<br>600 Vac Rated<br>65 kAIC @ 480 Vac        |            | Ultra High Interrupting Capacity Current Limiting<br>600 Vac Rated<br>100 kAIC @ 480 Vac |            | Thermal Magnetic Trip Unit Only                                  | Standard Terminals Only<br><br>See Page 40 for Optional Terminals |
|                                         | Factory Assembled Circuit Consisting of Frame, Trip Unit, and Terminals | Frame Only | Factory Assembled Circuit Consisting of Frame, Trip Unit, and Terminals | Frame Only | Factory Assembled Circuit Consisting of Frame, Trip Unit, and Terminals                  | Frame Only | For Use With: Standard or High or Ultra High Interrupting Frames |                                                                   |
|                                         | Catalog Number                                                          |            |                                                                         |            |                                                                                          |            |                                                                  |                                                                   |

## 2-Pole

|     |        |         |         |          |         |          |         |                      |
|-----|--------|---------|---------|----------|---------|----------|---------|----------------------|
| 70  | JD2070 | JD2250F | HJD2070 | HJD2250F | JDC2070 | JDC2250F | JT2070T | TA250KB <sup>①</sup> |
| 90  | JD2090 |         | HJD2090 |          | JDC2090 |          | JT2090T |                      |
| 100 | JD2100 |         | HJD2100 |          | JDC2100 |          | JT2100T |                      |
| 125 | JD2125 |         | HJD2125 |          | JDC2125 |          | JT2125T |                      |
| 150 | JD2150 |         | HJD2150 |          | JDC2150 |          | JT2150T |                      |
| 175 | JD2175 |         | HJD2175 |          | JDC2175 |          | JT2175T |                      |
| 200 | JD2200 |         | HJD2200 |          | JDC2200 |          | JT2200T |                      |
| 225 | JD2225 |         | HJD2225 |          | JDC2225 |          | JT2225T |                      |
| 250 | JD2250 |         | HJD2250 |          | JDC2250 |          | JT2250T |                      |

## 3-Pole

|     |        |         |         |          |         |          |         |                      |
|-----|--------|---------|---------|----------|---------|----------|---------|----------------------|
| 70  | JD3070 | JD3250F | HJD3070 | HJD3250F | JDC3070 | JDC3250F | JT3070T | TA250KB <sup>①</sup> |
| 90  | JD3090 |         | HJD3090 |          | JDC3090 |          | JT3090T |                      |
| 100 | JD3100 |         | HJD3100 |          | JDC3100 |          | JT3100T |                      |
| 125 | JD3125 |         | HJD3125 |          | JDC3125 |          | JT3125T |                      |
| 150 | JD3150 |         | HJD3150 |          | JDC3150 |          | JT3150T |                      |
| 175 | JD3175 |         | HJD3175 |          | JDC3175 |          | JT3175T |                      |
| 200 | JD3200 |         | HJD3200 |          | JDC3200 |          | JT3200T |                      |
| 225 | JD3225 |         | HJD3225 |          | JDC3225 |          | JT3225T |                      |
| 250 | JD3250 |         | HJD3250 |          | JDC3250 |          | JT3250T |                      |

4-Pole<sup>②③</sup>

|     |        |         |         |          |         |          |         |                      |
|-----|--------|---------|---------|----------|---------|----------|---------|----------------------|
| 70  | JD4070 | JD4250F | HJD4070 | HJD4250F | JDC4070 | JDC4250F | JT4070T | TA250KB <sup>①</sup> |
| 90  | JD4090 |         | HJD4090 |          | JDC4090 |          | JT4090T |                      |
| 100 | JD4100 |         | HJD4100 |          | JDC4100 |          | JT4100T |                      |
| 125 | JD4125 |         | HJD4125 |          | JDC4125 |          | JT4125T |                      |
| 150 | JD4150 |         | HJD4150 |          | JDC4150 |          | JT4150T |                      |
| 175 | JD4175 |         | HJD4175 |          | JDC4175 |          | JT4175T |                      |
| 200 | JD4200 |         | HJD4200 |          | JDC4200 |          | JT4200T |                      |
| 225 | JD4225 |         | HJD4225 |          | JDC4225 |          | JT4225T |                      |
| 250 | JD4250 |         | HJD4250 |          | JDC4250 |          | JT4250T |                      |

Instruction Leaflet/FRED Number 29C103 for Breaker; 29C600 for Thermal Magnetic Trip Unit

① Individually packed.

② Fully rated neutral pole with no protection.

③ Neutral is in right pole.

**Type JDB Thermal-Magnetic Circuit Breakers with  
Non-Interchangeable Thermal-Magnetic Trip Units**

|                                                  |                                    |                                               |
|--------------------------------------------------|------------------------------------|-----------------------------------------------|
| Maximum<br>Continuous<br>Ampere Rating<br>@ 40°C | 600 Vac Rated, 250 Vdc             |                                               |
|                                                  | Complete Circuit Breaker           |                                               |
|                                                  | Without Line and<br>Load Terminals | With Standard Line and Load<br>Terminals Only |
|                                                  | Catalog Number                     |                                               |

**2-Pole**

|     |          |         |
|-----|----------|---------|
| 70  | JDB2070W | JDB2070 |
| 90  | JDB2090W | JDB2090 |
| 100 | JDB2100W | JDB2100 |
| 125 | JDB2125W | JDB2125 |
| 150 | JDB2150W | JDB2150 |
| 175 | JDB2175W | JDB2175 |
| 200 | JDB2200W | JDB2200 |
| 225 | JDB2225W | JDB2225 |
| 250 | JDB2250W | JDB2250 |

**3-Pole**

|     |          |         |
|-----|----------|---------|
| 70  | JDB3070W | JDB3070 |
| 90  | JDB3090W | JDB3090 |
| 100 | JDB3100W | JDB3100 |
| 125 | JDB3125W | JDB3125 |
| 150 | JDB3150W | JDB3150 |
| 175 | JDB3175W | JDB3175 |
| 200 | JDB3200W | JDB3200 |
| 225 | JDB3225W | JDB3225 |
| 250 | JDB3250W | JDB3250 |

Instruction Leaflet/FRED Number 29C103 for Breaker

**Molded Case Switches**

Molded case switches are used as compact switches in applications requiring high current switching capabilities. Molded case switches are constructed of circuit breaker components and are of the high instantaneous automatic type. Molded case switches are listed in accordance with Underwriters Laboratories, Inc., Standard UL 1087.

|                                         |                                                               |                               |                                    |
|-----------------------------------------|---------------------------------------------------------------|-------------------------------|------------------------------------|
| Maximum Continuous Ampere Rating @ 40°C | 600 Vac Maximum, 250 Vdc                                      |                               | Standard Terminals Only            |
|                                         | Complete Circuit Breaker Only Without Line and Load Terminals |                               |                                    |
|                                         |                                                               | Suitable for Reverse Feed Use | See page 40 for Optional Terminals |
|                                         | Catalog Number                                                |                               |                                    |

**2-Pole**

|     |          |           |          |
|-----|----------|-----------|----------|
| 250 | JD2250WK | JDB2250WK | TA250KB① |
|-----|----------|-----------|----------|

**3-Pole**

|     |          |           |          |
|-----|----------|-----------|----------|
| 250 | JD3250WK | JDB3250WK | TA250KB① |
|-----|----------|-----------|----------|

**Note:** Molded case switches may open above 2500 amperes.

Instruction Leaflet/FRED Number 29C103

① Individually packed.



## Series C® J-Frame

### Line and Load Terminals

Line and load terminals provide wire connecting capabilities for specific ranges of continuous current ratings and wire types. All terminals comply with Underwriters Laboratories, Inc., Standards UL486A and UL486B and CSA Standard C22.2 No. 65, or Electrical Bulletin 1165. Unless otherwise specified, J-frame circuit breaker line and load terminals are shipped separately for field installation.

The bottom of the standard TA250KB terminal contains a recess which is positioned over the J-frame circuit breaker terminal conductor.

### Ordering Information

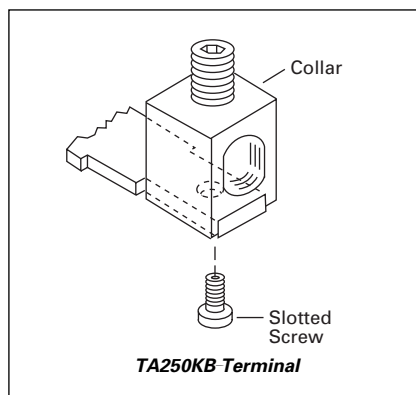
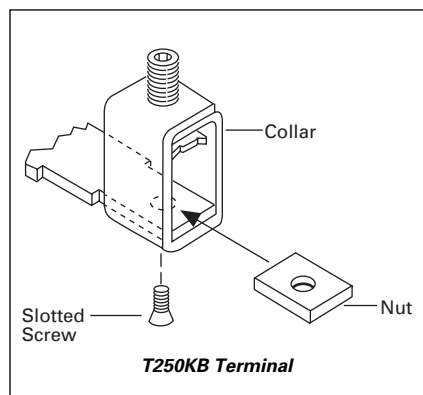
J-frame circuit breakers use Cu/Al terminals as standard. When optional copper-only terminals are required, order by catalog number. Specify if factory installation is required.

### Line and Load Terminals

| Maximum Breaker Amperes | Terminal Body Material | Wire Type | AWG Wire Range/<br>No. Conductors | Metric Wire Range mm <sup>2</sup> | Catalog Numbers |
|-------------------------|------------------------|-----------|-----------------------------------|-----------------------------------|-----------------|
|-------------------------|------------------------|-----------|-----------------------------------|-----------------------------------|-----------------|

#### Standard Cu/Al Pressure Terminals

|     |                 |       |              |        |                |
|-----|-----------------|-------|--------------|--------|----------------|
| 250 | Aluminum        | Cu/Al | #4-350 kcmil | 25-185 | <b>TA250KB</b> |
| 250 | Stainless Steel | Cu    | #4-350 kcmil | 25-185 | <b>T250KB</b>  |



## Catalog Numbering System

This information is presented only as an aid to understanding catalog numbers. It is not to be used to build catalog numbers for circuit breakers or trip units.

### Circuit Breaker/Frame Catalog Number

| Circuit Breaker/<br>Frame<br>Type | Number<br>of Poles | Circuit Breaker/<br>Frame<br>Ampere<br>Rating | Suffix                                 |
|-----------------------------------|--------------------|-----------------------------------------------|----------------------------------------|
| JDB                               | 2: 2 Poles         | 70                                            | C: Non-Aluminum<br>Terminals           |
| JD                                | 3: 3 Poles         | 90                                            | F: Frame Only                          |
| HJD                               | 4: 4 Poles         | 100                                           | K: High Magnetic Molded<br>Case Switch |
| JDC                               |                    | 125                                           | V: 50°C Calibration                    |
|                                   |                    | 150                                           | W: Without Terminals                   |
|                                   |                    | 175                                           | X: Load Side<br>Terminals Only         |
|                                   |                    | 200                                           | Y: Line Side<br>Terminals Only         |
|                                   |                    | 225                                           |                                        |
|                                   |                    | 250                                           |                                        |

### Trip Unit Catalog Number

| Trip Unit<br>Type        | Number<br>of Poles | Trip Unit/<br>Rating<br>Plug<br>Ampere<br>Rating          | Suffix                                                                                                                             |
|--------------------------|--------------------|-----------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------|
| JT: Thermal-<br>Magnetic | 2<br>3<br>4        | 70<br>90<br>100<br>125<br>150<br>175<br>200<br>225<br>250 | T: Trip Unit<br>Thermal-Magnetic<br>Fixed Thermal<br>Adj. Magnetic<br>V: 50°C Calibration<br>(Thermal-Magnetic<br>Trip Units Only) |

## Dimensions/Weights

### Dimensions, Inches (mm)

| Number of Poles | Width          | Height      | Depth          |
|-----------------|----------------|-------------|----------------|
| 2, 3            | 4.125<br>(105) | 10<br>(255) | 4.063<br>(103) |
| 4               | 5.5<br>(140)   | 10<br>(254) | 4.063<br>(103) |

### Approximate Shipping Weight, Lbs. (kg)

| Breaker Type | Complete Breaker |                 |                  | Frame Only    |               |                 | Trip Unit①  |             |                 |  |
|--------------|------------------|-----------------|------------------|---------------|---------------|-----------------|-------------|-------------|-----------------|--|
|              | Number of Poles  |                 |                  |               |               |                 |             |             |                 |  |
|              | 2                | 3               | 4                | 2             | 3             | 4               | 2           | 3           | 4               |  |
| JDB          | 11.25<br>(5.103) | 12.5<br>(5.670) | —                | —             | —             | —               | —           | —           | —               |  |
| JD           | 11.25<br>(5.103) | 12.5<br>(5.670) | 13.25<br>(6.010) | 9<br>(4.082)  | 10<br>(4.536) | 10.5<br>(4.763) | 2<br>(.907) | 2<br>(.907) | 2.25<br>(1.021) |  |
| HJD          | 11.25<br>(5.103) | 12.5<br>(5.670) | 13.25<br>(6.010) | 9<br>(4.082)  | 10<br>(4.536) | 10.5<br>(4.763) | 2<br>(.907) | 2<br>(.907) | 2.25<br>(1.021) |  |
| JDC          | 12.25<br>(5.103) | 13.5<br>(6.124) | 14.25<br>(6.470) | 10<br>(4.536) | 11<br>(4.990) | 11.5<br>(5.217) | 2<br>(.907) | 2<br>(.907) | 2.25<br>(1.021) |  |

## Series C® J-Frame

## Series C® J-Frame Allowable Accessory Combinations

Different combinations of accessories can be supplied, depending on the types of accessories and the number of poles in the circuit breaker.

|                                                             | Reference<br>Page |  | 2-, 3-Pole |        |       |  | 4-Pole |        |       |      |
|-------------------------------------------------------------|-------------------|--|------------|--------|-------|--|--------|--------|-------|------|
|                                                             |                   |  | Left       | Center | Right |  | Left   | Center | Right | Neu. |
| Internal Accessories (Only One Internal Accessory Per Pole) |                   |  |            |        |       |  |        |        |       |      |
| Alarm Lockout (Make/Break)                                  | 140               |  | ☐          |        | ☐     |  | ☐      |        | ☐     |      |
| Auxiliary Switch (1A, 1B)                                   | 142               |  | ■          |        | ■     |  | ■      |        | ■     |      |
| Auxiliary Switch (2A, 2B)                                   | 142               |  | ■          |        | ■     |  | ■      |        | ■     |      |
| Auxiliary Switch and Alarm Switch Combination               | 145               |  | ☐          |        | ☐     |  | ☐      |        | ☐     |      |
| Shunt Trip – Standard                                       | 148               |  | ■          |        | ■     |  | ■      |        | ■     |      |
| Shunt Trip – Low Energy                                     | 152               |  | ■          |        | ■     |  | ■      |        | ■     |      |
| Undervoltage Release Mechanism                              | 155               |  | ■          |        | ■     |  | ■      |        | ■     |      |
| External Accessories                                        |                   |  |            |        |       |  |        |        |       |      |
| End Cap Kit                                                 | 161               |  |            | ●      |       |  |        | ●      |       |      |
| Plug Nut                                                    | 161               |  |            | ●      |       |  |        | ●      |       |      |
| Control Wire Terminal Kit                                   | 162               |  |            | ●      |       |  |        | ●      |       |      |
| Multiwire Connectors                                        | 162               |  |            | ●      |       |  |        | ●      |       |      |
| Base Mounting Hardware                                      | 163               |  |            | ●      |       |  |        | ●      |       |      |
| Terminal Shields                                            | 165               |  |            | ●      |       |  |        | ●      |       |      |
| Interphase Barriers                                         | 166               |  |            | ●      |       |  |        | ●      |       |      |
| Non-Padlockable Handle Block                                | 168               |  |            | ■      |       |  |        | ■      |       |      |
| Padlockable Handle Block                                    | 168               |  |            | ■      |       |  |        | ■      |       |      |
| Padlockable Handle Lock Hasp                                | 169               |  | ☐          |        | ☐     |  | ☐      |        | ☐     |      |
| Cylinder Lock                                               | 169               |  | ☐          |        | ☐     |  |        |        |       |      |
| Key Interlock Kit                                           | 170               |  | ☐          |        | ☐     |  | ☐      |        | ☐     |      |
| Sliding Bar Interlock – Requires Two Breakers               | 171               |  |            | ●      |       |  |        |        |       |      |
| Electrical (Solenoid) Operator                              | 172               |  |            | ●      |       |  |        | ●      |       |      |
| Plug-in Adapters                                            | 174               |  |            | ●      |       |  |        | ●      |       |      |
| Rear Connecting Studs                                       | 176               |  |            | ●      |       |  |        | ●      |       |      |
| Panelboard Connecting Straps                                | 177               |  |            | ●      |       |  |        | ●      |       |      |
| Handle Mechanisms                                           | 178               |  |            | ●      |       |  |        | ●      |       |      |
| Door Hardware/Accessories                                   | 182               |  |            | ●      |       |  |        | ●      |       |      |
| Handle Extension                                            | 182               |  |            | ●      |       |  |        | ●      |       |      |
| IQ Energy Sentinel                                          | 184               |  |            | ●      |       |  |        |        |       |      |
| Modifications (Refer to Cutler-Hammer)                      |                   |  |            |        |       |  |        |        |       |      |
| Special Calibration                                         | 186               |  |            | ●      |       |  |        | ●      |       |      |
| Moisture Fungus Treatment                                   | 186               |  |            | ●      |       |  |        | ●      |       |      |
| Freeze-Tested Circuit Breakers                              | 186               |  |            | ●      |       |  |        | ●      |       |      |
| Marine/Naval Application                                    | 186               |  |            | ●      |       |  |        | ●      |       |      |

■ Applicable in indicated pole position

☐ May be mounted on left or right pole – not both

● Accessory available/Modification available

## Series C® K-Frame



Typical Series C K-Frame Circuit Breaker

- All Series C K-frame Circuit Breakers are HACR rated.
- K-frame circuit breakers are available as individual components (Frame, Trip Unit, Terminals), or factory assembled complete breakers. OPTIM circuit breakers are available as factory assembled only.
- K-frame circuit breakers with non-interchangeable trip units are suitable for reverse feed use.

## Interrupting Capacity Ratings

## NEMA/UL489/CSA Interrupting Capacity Ratings

| Circuit Breaker Type | Number of Poles | Interrupting Capacity (Symmetrical Amperes) (kA) |     |     |     |                   | Page Number |
|----------------------|-----------------|--------------------------------------------------|-----|-----|-----|-------------------|-------------|
|                      |                 | Volts Ac (50/60Hz)                               |     |     |     | Volts Dc          |             |
|                      |                 | 240                                              | 277 | 480 | 600 | 250 <sup>②③</sup> |             |
| DK                   | 2, 3            | 65                                               | —   | —   | —   | 10                | 47          |
| KDB                  | 2, 3, 4         | 65                                               | —   | 35  | 25  | 10                | 47          |
| KD                   | 2, 3, 4         | 65                                               | —   | 35  | 25  | 10                | 45, 46, 49  |
| HKD                  | 2, 3, 4         | 100                                              | —   | 65  | 35  | 22                | 45, 46, 49  |
| KDC                  | 2, 3, 4         | 200                                              | —   | 100 | 50  | 22                | 45, 46, 49  |
| CKD                  | 3               | 65                                               | —   | 35  | 25  | 10                | 48, 50      |
| CHKD                 | 3               | 100                                              | —   | 65  | 35  | 22                | 48, 50      |

## IEC 157-1 (P1) Interrupting Capacity Ratings

| Circuit Breaker Type | Number of Poles | Interrupting Capacity (Symmetrical Amperes) (kA) |     |     |     |     |          | Page Number |
|----------------------|-----------------|--------------------------------------------------|-----|-----|-----|-----|----------|-------------|
|                      |                 | Volts Ac (50/60Hz)                               |     |     |     |     | Volts Dc |             |
|                      |                 | 240                                              | 380 | 415 | 440 | 500 | 600      |             |
| DK                   | 2, 3            | 65                                               | —   | —   | —   | —   | —        | 10          |
| KDB                  | 2, 3, 4         | 65                                               | 40  | 40  | —   | —   | —        | 10          |
| KD                   | 2, 3, 4         | 65                                               | 40  | 40  | —   | —   | —        | 10          |
| HKD                  | 2, 3, 4         | 100                                              | 65  | 65  | —   | —   | —        | 22          |
| KDC                  | 2, 3, 4         | 200                                              | 100 | 100 | —   | —   | —        | 22          |

- ① Weights shown are for thermal magnetic trip units. 3-pole electronic trip units weigh 2.5 lbs. (1.134 kg).
- ② 2-pole circuit breaker or two outside poles of 3-pole circuit breaker.
- ③ Time constant is 3 milliseconds minimum at 10 kA and 8 milliseconds minimum at 22 kA.

## Series C® K-Frame

## K-Frame Digitrip Selection Guide

| Trip Unit Type                               | Digitrip RMS 310             |                              | Digitrip OPTIM 550                     |
|----------------------------------------------|------------------------------|------------------------------|----------------------------------------|
| RMS Sensing                                  | Yes                          |                              | Yes                                    |
| Breaker Type                                 |                              |                              |                                        |
| Frame                                        | K                            |                              | K                                      |
| Ampere Range                                 | 70-400A                      |                              | 70-400A                                |
| Interrupting Rating at 480V                  | 35, 65, 100 (kA)             |                              | 35, 65, 100 (kA)                       |
| Protection                                   |                              |                              |                                        |
| Ordering Options                             | LS, LSG                      | LSI, LSIG                    | LSI, LSI(A), LSIG                      |
| Fixed Rated Plug (I <sub>n</sub> )           | Yes                          | Yes                          | Yes                                    |
| Overtemperature Trip                         | Yes                          | Yes                          | Yes                                    |
| Long Delay Protection (L)                    |                              |                              |                                        |
| Adjustable Rating Plug (I <sub>n</sub> )     | Yes                          | Yes                          | No                                     |
| Long Delay Pickup                            | 0.5-1.0 (I <sub>n</sub> )①   | 0.5-1.0 (I <sub>n</sub> )①   | 0.4-1.0 x (I <sub>n</sub> )            |
| Long Delay Time I <sup>2</sup> T             | 12 Seconds                   | 12 Seconds                   | 2-24 Seconds                           |
| Long Delay Time I <sup>4</sup> T             | No                           | No                           | 1-5 Seconds                            |
| Long Delay Thermal Memory                    | Yes                          | Yes                          | Yes                                    |
| High Load Alarm                              | No                           | No                           | 0.5-1.0 x I <sub>r</sub>               |
| Short Delay Protection (S)                   |                              |                              |                                        |
| Short Delay Pickup                           | 200-800% x (I <sub>n</sub> ) | 200-800% x (I <sub>n</sub> ) | 150-800% x (I <sub>r</sub> )           |
| Short Delay Time I <sup>2</sup> T            | 100 ms                       | No                           | 100-500 ms                             |
| Short Delay Time Flat                        | No                           | Inst-300 ms                  | 100-500 ms                             |
| Short Delay Time Zone Selective Interlocking | No                           | No                           | No                                     |
| Instantaneous Protection (I)                 |                              |                              |                                        |
| Instantaneous Pickup                         | No                           | 200-800% x (I <sub>n</sub> ) | 200-800% x (I <sub>n</sub> )           |
| Discriminator                                | No                           | No                           | Yes                                    |
| Instantaneous Override                       | Yes                          | Yes                          | Yes                                    |
| Ground Fault Protection (G)                  |                              |                              |                                        |
| Ground Fault Alarm                           | No                           | No                           | 20-100% x (I <sub>s</sub> )            |
| Ground Fault Pickup                          | Varies by Frame              | Varies by Frame              | 20-100% x (I <sub>s</sub> )            |
| Ground Fault Delay I <sup>2</sup> T          | No                           | No                           | 100-500 ms                             |
| Ground Fault Delay Flat                      | Inst-500 ms                  | Inst-500 ms                  | 100-500 ms                             |
| Ground Fault Zone Selective Interlocking     | No                           | No                           | No                                     |
| Ground Fault Thermal Memory                  | Yes                          | Yes                          | Yes                                    |
| System Diagnostics                           |                              |                              |                                        |
| Status LEDs                                  | Yes                          | Yes                          | Yes                                    |
| Cause of Trip LEDs                           | No                           | No                           | Yes                                    |
| Magnitude of Trip Information                | No                           | No                           | Yes                                    |
| Remote Signal Contact – Ground Alarm         | Yes                          | Yes                          | No                                     |
| Local Auxiliary and Bell Alarm Contact       | Optional                     | Optional                     | Optional                               |
| System Monitoring                            |                              |                              |                                        |
| Digital Display                              | No                           | No                           | Yes②                                   |
| Current                                      | No                           | No                           | Yes                                    |
| Power and Energy                             | No                           | No                           | No                                     |
| Power Quality-Harmonics                      | No                           | No                           | No                                     |
| Power Factor                                 | No                           | No                           | No                                     |
| Communications                               |                              |                              |                                        |
| Cutler-Hammer PowerNet                       | No                           | No                           | No③                                    |
| Testing                                      |                              |                              |                                        |
| Testing Method                               | Test Set                     |                              | OPTIMizer, BIM, Cutler-Hammer PowerNet |

① Adjust by rating plug.

② By OPTIMizer/BIM.

③ Cutler-Hammer PowerNet kit for field upgrade.

BIM = Breaker Interface Module

(A) = GF Alarm

 $I_s$  = Sensor Rating $I_n$  = Rating Plug $I_r$  = Long Delay Pickup Setting

## Series C® K-Frame

## Types KD, HKD, and KDC Thermal-Magnetic Circuit Breakers with Interchangeable Trip Units

|                                         |                                                                         |            |                                                                         |            |                                                                                          |            |                                                                  |                                                                   |
|-----------------------------------------|-------------------------------------------------------------------------|------------|-------------------------------------------------------------------------|------------|------------------------------------------------------------------------------------------|------------|------------------------------------------------------------------|-------------------------------------------------------------------|
| Maximum Continuous Ampere Rating @ 40°C | Standard Interrupting Capacity<br>600 Vac Rated<br>35 kAIC @ 480 Vac    |            | High Interrupting Capacity<br>600 Vac Rated<br>65 kAIC @ 480 Vac        |            | Ultra High Interrupting Capacity Current Limiting<br>600 Vac Rated<br>100 kAIC @ 480 Vac |            | Thermal Magnetic Trip Unit Only                                  | Standard Terminals Only<br><br>See Page 51 for Optional Terminals |
|                                         | Factory Assembled Circuit Consisting of Frame, Trip Unit, and Terminals | Frame Only | Factory Assembled Circuit Consisting of Frame, Trip Unit, and Terminals | Frame Only | Factory Assembled Circuit Consisting of Frame, Trip Unit, and Terminals                  | Frame Only | For Use With: Standard or High or Ultra High Interrupting Frames |                                                                   |
|                                         | Catalog Number                                                          |            |                                                                         |            |                                                                                          |            |                                                                  |                                                                   |

## 2-Pole

|     |        |         |         |          |         |          |         |          |
|-----|--------|---------|---------|----------|---------|----------|---------|----------|
| 100 | KD2100 | KD2400F | HKD2100 | HKD2400F | KDC2100 | KDC2400F | KT2100T | TA300K①  |
| 125 | KD2125 |         | HKD2125 |          | KDC2125 |          | KT2125T | TA300K①  |
| 150 | KD2150 |         | HKD2150 |          | KDC2150 |          | KT2150T | TA300K①  |
| 175 | KD2175 |         | HKD2175 |          | KDC2175 |          | KT2175T | TA300K①  |
| 200 | KD2200 |         | HKD2200 |          | KDC2200 |          | KT2200T | TA300K①  |
| 225 | KD2225 |         | HKD2225 |          | KDC2225 |          | KT2225T | TA300K①  |
| 250 | KD2250 |         | HKD2250 |          | KDC2250 |          | KT2250T | TA350K①  |
| 300 | KD2300 |         | HKD2300 |          | KDC2300 |          | KT2300T | TA350K①  |
| 350 | KD2350 |         | HKD2350 |          | KDC2350 |          | KT2350T | TA350K①  |
| 400 | KD2400 |         | HKD2400 |          | KDC2400 |          | KT2400T | 2TA400K② |

## 3-Pole

|     |        |         |         |          |         |          |         |          |
|-----|--------|---------|---------|----------|---------|----------|---------|----------|
| 100 | KD3100 | KD3400F | HKD3100 | HKD3400F | KDC3100 | KDC3400F | KT3100T | TA300K①  |
| 125 | KD3125 |         | HKD3125 |          | KDC3125 |          | KT3125T | TA300K①  |
| 150 | KD3150 |         | HKD3150 |          | KDC3150 |          | KT3150T | TA300K①  |
| 175 | KD3175 |         | HKD3175 |          | KDC3175 |          | KT3175T | TA300K①  |
| 200 | KD3200 |         | HKD3200 |          | KDC3200 |          | KT3200T | TA300K①  |
| 225 | KD3225 |         | HKD3225 |          | KDC3225 |          | KT3225T | TA300K①  |
| 250 | KD3250 |         | HKD3250 |          | KDC3250 |          | KT3250T | TA350K①  |
| 300 | KD3300 |         | HKD3300 |          | KDC3300 |          | KT3300T | TA350K①  |
| 350 | KD3350 |         | HKD3350 |          | KDC3350 |          | KT3350T | TA350K①  |
| 400 | KD3400 |         | HKD3400 |          | KDC3400 |          | KT3400T | 3TA400K② |

## 4-Pole

|     |        |         |         |          |         |          |         |          |
|-----|--------|---------|---------|----------|---------|----------|---------|----------|
| 100 | KD4100 | KD4400F | HKD4100 | HKD4400F | KDC4100 | KDC4400F | KT3100T | TA300K①  |
| 125 | KD4125 |         | HKD4125 |          | KDC4125 |          | KT3125T | TA300K①  |
| 150 | KD4150 |         | HKD4150 |          | KDC4150 |          | KT3150T | TA300K①  |
| 175 | KD4175 |         | HKD4175 |          | KDC4175 |          | KT3175T | TA300K①  |
| 200 | KD4200 |         | HKD4200 |          | KDC4200 |          | KT3200T | TA300K①  |
| 225 | KD4225 |         | HKD4225 |          | KDC4225 |          | KT3225T | TA300K①  |
| 250 | KD4250 |         | HKD4250 |          | KDC4250 |          | KT3250T | TA350K①  |
| 300 | KD4300 |         | HKD4300 |          | KDC4300 |          | KT3300T | TA350K①  |
| 350 | KD4350 |         | HKD4350 |          | KDC4350 |          | KT3350T | TA350K①  |
| 400 | KD4400 |         | HKD4400 |          | KDC4400 |          | KT3400T | 4TA400K② |

Instruction Leaflet/FRED Number 29C104 for Breaker; 29C603 for Thermal Magnetic Trip Unit

① Individually packed.

② 2TA400K, 3TA400K, and 4TA400K terminal kits contain one terminal for each pole and one terminal cover.

# Molded Case Circuit Breakers 70-400 Amperes

Cutler-Hammer

March 1999

## Series C® K-Frame

## Types KD, HKD, and KDC Electronic Circuit Breakers with Interchangeable Trip Units

Order as individual components: Breaker Frame, Trip Unit, Rating Plug, Terminals.

| Maximum Continuous Ampere Rating @ 40°C① | Circuit Breaker Frame Only                                     |                                                            |                                                                                    | Digitrip RMS 310 Trip Unit Only②                      |                                                      |                                                                               |                                                                                  | Digitrip 310 Rating Plug Only |                   |                              | Standard Terminals Only            |
|------------------------------------------|----------------------------------------------------------------|------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------|------------------------------------------------------|-------------------------------------------------------------------------------|----------------------------------------------------------------------------------|-------------------------------|-------------------|------------------------------|------------------------------------|
|                                          | Standard Interrupting Capacity 600 Vac Rated 35 kAIC @ 480 Vac | High Interrupting Capacity 600 Vac Rated 65 kAIC @ 480 Vac | Ultra High Interrupting Capacity Current Limiting 600 Vac Rated 100 kAIC @ 480 Vac | Standard                                              | Options                                              |                                                                               |                                                                                  | Ampere Rating                 | Fixed Rating Plug | Adjustable Rating Plugs      | See Page 51 for Optional Terminals |
|                                          |                                                                |                                                            |                                                                                    | Adjustable Short Time Delay with I²t Short Delay Ramp | Independently Adjustable Short Time Pickup and Delay | Adjustable Short Time Pickup with I²t Short Delay and Ground Fault Protection | Independently Adjustable Short Time Pickup and Delay and Ground Fault Protection |                               |                   | Ampere Rating Catalog Number |                                    |
|                                          |                                                                |                                                            |                                                                                    |                                                       |                                                      |                                                                               |                                                                                  |                               |                   |                              |                                    |
| Catalog Number                           |                                                                |                                                            |                                                                                    |                                                       |                                                      |                                                                               |                                                                                  |                               |                   |                              |                                    |

3-Pole<sup>③</sup>

|     |         |          |          |           |            |            |             |                                                            |                                                                                                          |                               |                                                                                                                                         |
|-----|---------|----------|----------|-----------|------------|------------|-------------|------------------------------------------------------------|----------------------------------------------------------------------------------------------------------|-------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------|
| 125 | KD3400F | HKD3400F | KDC3400F | KES3125LS | KES3125LSI | KES3125LSG | KES3125LSIG | 70<br>90<br>100<br>110<br>125                              | 1KES070T<br>1KES090T<br>1KES100T<br>1KES110T<br>1KES125T                                                 | 70/90/100/125<br>A1KES125T1   | TA300K <sup>④</sup>                                                                                                                     |
| 250 | KD3400F | HKD3400F | KDC3400F | KES3250LS | KES3250LSI | KES3250LSG | KES3250LSIG | 70<br>100<br>125<br>150<br>160<br>175<br>200<br>225<br>250 | 2KES070T<br>2KES100T<br>2KES125T<br>2KES150T<br>2KES160T<br>2KES175T<br>2KES200T<br>2KES225T<br>2KES250T | 125/150/200/250<br>A2KES250T1 | TA300K <sup>④</sup>                                                                                                                     |
| 400 | KD3400F | HKD3400F | KDC3400F | KES3400LS | KES3400LSI | KES3400LSG | KES3400LSIG | 200<br>225<br>250<br>300<br>350<br>400                     | 4KES200T<br>4KES225T<br>4KES250T<br>4KES300T<br>4KES350T<br>4KES400T                                     | 200/250/300/400<br>A4KES400T1 | TA300K <sup>④</sup><br>TA300K <sup>④</sup><br>TA300K <sup>④</sup><br>TA300K <sup>④</sup><br>TA350K <sup>④</sup><br>3TA400K <sup>④</sup> |

4-Pole<sup>⑥⑦</sup>

|     |         |          |          |           |            |   |   |                                                            |                                                                                                          |                               |                                                                                                                                         |
|-----|---------|----------|----------|-----------|------------|---|---|------------------------------------------------------------|----------------------------------------------------------------------------------------------------------|-------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------|
| 125 | KD4400F | HKD4400F | KDC4400F | KES4125LS | KES4125LSI | — | — | 70<br>90<br>100<br>110<br>125                              | 1KES070T<br>1KES090T<br>1KES100T<br>1KES110T<br>1KES125T                                                 | 70/90/100/125<br>A1KES125T1   | TA300K <sup>④</sup>                                                                                                                     |
| 250 | KD4400F | HKD4400F | KDC4400F | KES4250LS | KES4250LSI | — | — | 70<br>100<br>125<br>150<br>160<br>175<br>200<br>225<br>250 | 2KES070T<br>2KES100T<br>2KES125T<br>2KES150T<br>2KES160T<br>2KES175T<br>2KES200T<br>2KES225T<br>2KES250T | 125/150/200/250<br>A2KES250T1 | TA300K <sup>④</sup>                                                                                                                     |
| 400 | KD4400F | HKD4400F | KDC4400F | KES4400LS | KES4400LSI | — | — | 200<br>225<br>250<br>300<br>350<br>400                     | 4KES200T<br>4KES225T<br>4KES250T<br>4KES300T<br>4KES350T<br>4KES400T                                     | 200/250/300/400<br>A4KES400T1 | TA300K <sup>④</sup><br>TA300K <sup>④</sup><br>TA300K <sup>④</sup><br>TA300K <sup>④</sup><br>TA350K <sup>④</sup><br>3TA400K <sup>④</sup> |

Instruction Leaflet/FRED Number 29C104 for Breaker; 29C614 for Electronic Trip Unit

- ① Ampere rating is established by rating plug.  
 ② For Ac use only.  
 ③ 3-pole KES Trip Units are for use in 3-pole frames only.  
 ④ Individually packed.

- ⑤ 3TA400K and 4TA400K terminal kits contain one terminal for each pole and one terminal cover.  
 ⑥ Trip unit includes protected neutral pole. Use corresponding 3-pole trip unit if protected neutral pole is not required.

- ⑦ Fully rated neutral pole protection is standard. For 50% rated protection on neutral pole, add suffix E to 4-pole trip unit catalog number.



## Types DK and KDB Thermal-Magnetic Circuit Breakers with Non-Interchangeable Trip Units

| Maximum Continuous Ampere Rating @ 40°C | 240 Vac Rated, 250 Vdc          |                          |                                            |
|-----------------------------------------|---------------------------------|--------------------------|--------------------------------------------|
|                                         | Complete Circuit Breaker        |                          |                                            |
|                                         | Without Line and Load Terminals | With Line Terminals Only | With Standard Line and Load Terminals Only |
|                                         | Catalog Number                  |                          |                                            |

## 2-Pole

|     |         |         |        |
|-----|---------|---------|--------|
| 100 | —       | —       | —      |
| 125 | —       | —       | —      |
| 150 | —       | —       | —      |
| 175 | —       | —       | —      |
| 200 | —       | —       | —      |
| 225 | —       | —       | —      |
| 250 | DK2250W | DK2250Y | DK2250 |
| 300 | DK2300W | DK2300Y | DK2300 |
| 350 | DK2350W | DK2350Y | DK2350 |
| 400 | DK2400W | DK2400Y | DK2400 |

## 3-Pole

|     |         |         |        |
|-----|---------|---------|--------|
| 100 | —       | —       | —      |
| 125 | —       | —       | —      |
| 150 | —       | —       | —      |
| 175 | —       | —       | —      |
| 200 | —       | —       | —      |
| 225 | —       | —       | —      |
| 250 | DK3250W | DK3250Y | DK3250 |
| 300 | DK3300W | DK3300Y | DK3300 |
| 350 | DK3350W | DK3350Y | DK3350 |
| 400 | DK3400W | DK3400Y | DK3400 |

| Maximum Continuous Ampere Rating @ 40°C | 600 Vac Rated, 250 Vdc          |                                       |
|-----------------------------------------|---------------------------------|---------------------------------------|
|                                         | Complete Circuit Breaker        |                                       |
|                                         | Without Line and Load Terminals | With Standard Line and Load Terminals |
|                                         | Catalog Number                  |                                       |

## 2-Pole

|     |          |         |
|-----|----------|---------|
| 100 | KDB2100W | KDB2100 |
| 125 | KDB2125W | KDB2125 |
| 150 | KDB2150W | KDB2150 |
| 175 | KDB2175W | KDB2175 |
| 200 | KDB2200W | KDB2200 |
| 225 | KDB2225W | KDB2225 |
| 250 | KDB2250W | KDB2250 |
| 300 | KDB2300W | KDB2300 |
| 350 | KDB2350W | KDB2350 |
| 400 | KDB2400W | KDB2400 |

## 3-Pole

|     |          |         |
|-----|----------|---------|
| 100 | KDB3100W | KDB3100 |
| 125 | KDB3125W | KDB3125 |
| 150 | KDB3150W | KDB3150 |
| 175 | KDB3175W | KDB3175 |
| 200 | KDB3200W | KDB3200 |
| 225 | KDB3225W | KDB3225 |
| 250 | KDB3250W | KDB3250 |
| 300 | KDB3300W | KDB3300 |
| 350 | KDB3350W | KDB3350 |
| 400 | KDB3400W | KDB3400 |

Instruction Leaflet/FRED Number 29C104

## Molded Case Switches

Molded case switches are used as compact switches in applications requiring high current switching capabilities. Molded case switches are constructed of circuit breaker components and are of the high instantaneous automatic type. Molded case switches are listed in accordance with Underwriters Laboratories, Inc., Standard UL 1087.

| Maximum Continuous Ampere Rating @ 40°C | 240 Vac Maximum, 250 Vdc                                       | 600 Vac Maximum, 250 Vdc                                       | 600 Vac Maximum, 250 Vdc                                                                      |
|-----------------------------------------|----------------------------------------------------------------|----------------------------------------------------------------|-----------------------------------------------------------------------------------------------|
|                                         | Complete Circuit Breaker with Standard Line and Load Terminals | Complete Circuit Breaker with Standard Line and Load Terminals | Complete Circuit Breaker with Standard Line and Load Terminals. Suitable for Reverse Feed Use |
|                                         | Catalog Number                                                 |                                                                |                                                                                               |

## 2-Pole

|     |         |         |          |
|-----|---------|---------|----------|
| 400 | DK2400K | KD2400K | KDB2400K |
|-----|---------|---------|----------|

## 3-Pole

|     |         |         |          |
|-----|---------|---------|----------|
| 400 | DK3400K | KD3400K | KDB3400K |
|-----|---------|---------|----------|

## 4-Pole

|     |   |         |   |
|-----|---|---------|---|
| 400 | — | KD4400K | — |
|-----|---|---------|---|

**Note:** Molded case switches may open above 4000 amperes.

Instruction Leaflet/FRED Number 29C104

# Molded Case Circuit Breakers 70-400 Amperes

Cutler-Hammer

March 1999

## Series C® K-Frame

## 100% Rated Types CKD and CHKD Electronic Circuit Breakers

The NEC allows the breaker to be rated at 100% of its frame size in an assembly, provided that 90°C wire is applied at the 75°C ampacity. All 100% rated circuit breakers have electronic trip units.

| Maximum Continuous Ampere Rating @ 40°C | Circuit Breaker Frame Only                              |                                                     | Digitrip RMS 310 Trip Unit Only                                    |                                                      |                                                                                            |                                                                                  | Digitrip 310 Rating Plug Only |                   |                              | Standard Terminals Only                            |
|-----------------------------------------|---------------------------------------------------------|-----------------------------------------------------|--------------------------------------------------------------------|------------------------------------------------------|--------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------|-------------------------------|-------------------|------------------------------|----------------------------------------------------|
|                                         | Standard Interrupting Capacity<br><br>35 kAIC @ 480 Vac | High Interrupting Capacity<br><br>65 kAIC @ 480 Vac | Standard                                                           | Options                                              |                                                                                            |                                                                                  | Ampere Rating                 | Fixed Rating Plug | Adjustable Rating Plug       | <a href="#">See Page 51 for Optional Terminals</a> |
|                                         |                                                         |                                                     | Adjustable Short Time Delay with I <sup>2</sup> t Short Delay Ramp | Independently Adjustable Short Time Pickup and Delay | Adjustable Short Time Pickup with I <sup>2</sup> t Short Delay and Ground Fault Protection | Independently Adjustable Short Time Pickup and Delay and Ground Fault Protection |                               |                   | Ampere Rating Catalog Number |                                                    |
|                                         |                                                         |                                                     |                                                                    |                                                      |                                                                                            |                                                                                  |                               |                   | Catalog Number               |                                                    |

## 3-Pole

|     |          |           |           |            |            |             |                                                            |                                                                                                          |                               |                                                                                                                                         |
|-----|----------|-----------|-----------|------------|------------|-------------|------------------------------------------------------------|----------------------------------------------------------------------------------------------------------|-------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------|
| 125 | CKD3400F | CHKD3400F | KES3125LS | KES3125LSI | KES3125LSG | KES3125LSIG | 70<br>90<br>100<br>110<br>125                              | 1KES070T<br>1KES090T<br>1KES100T<br>1KES110T<br>1KES125T                                                 | 70/90/100/125<br>A1KES125T1   | TA300K <sup>④</sup>                                                                                                                     |
| 250 | CKD3400F | CHKD3400F | KES3250LS | KES3250LSI | KES3250LSG | KES3250LSIG | 70<br>100<br>125<br>150<br>160<br>175<br>200<br>225<br>250 | 2KES070T<br>2KES100T<br>2KES125T<br>2KES150T<br>2KES160T<br>2KES175T<br>2KES200T<br>2KES225T<br>2KES250T | 125/150/200/250<br>A2KES250T1 | TA300K <sup>④</sup>                                                                                                                     |
| 400 | CKD3400F | CHKD3400F | KES3400LS | KES3400LSI | KES3400LSG | KES3400LSIG | 200<br>225<br>250<br>300<br>350<br>400                     | 4KES200T<br>4KES225T<br>4KES250T<br>4KES300T<br>4KES350T<br>4KES400T                                     | 200/250/300/400<br>A4KES400T1 | TA300K <sup>④</sup><br>TA300K <sup>④</sup><br>TA300K <sup>④</sup><br>TA300K <sup>④</sup><br>TA350K <sup>④</sup><br>3TA400K <sup>④</sup> |

Instruction Leaflet/FRED Number 29C104 for Breaker; 29C614 for KES Trip Unit

① Individually packed.

② TA400K, T400K and TA401K terminal kits contain one terminal for each pole and one terminal cover.

## Digitrip OPTIM 550 Electronic Circuit Breakers with Interchangeable Rating Plug

Order as individual components: Breaker Frame (which includes Trip Unit), Rating Plug, Terminals.

| Maximum Continuous Ampere Rating @ 40°C | Circuit Breaker Frame Only                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |      |      | Digitrip OPTIM Rating Plug Only |                   |
|-----------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|------|---------------------------------|-------------------|
|                                         | L – Adjustable Long Delay Pickup (I <sub>L</sub> ) with Adjustable Long Delay Time (I <sup>2</sup> t or I <sup>4</sup> t Response)①<br>S – Adjustable Short Delay Pickup with Adjustable Short Delay Time (I <sup>2</sup> t or Flat Response)<br>I – Adjustable Instantaneous Pickup<br>G – Adjustable Ground Fault Pickup with Adjustable Ground Fault Time (I <sup>2</sup> t or Flat Response)<br>A – Adjustable Ground Fault Alarm with Adjustable Ground Fault Time (I <sup>2</sup> t or Flat Response) |      |      | Ampere Rating                   | Fixed Rating Plug |
|                                         | OPTIM 550                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |      |      |                                 |                   |
|                                         | LSI                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | LSIG | LSIA |                                 |                   |
|                                         | Catalog Number                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |      |      |                                 |                   |

## 3-Pole Standard Interrupting Capacity 600 Volt Ac Rated 35 kAIC @ 480 Vac

|     |            |            |            |                                        |                                                                                        |
|-----|------------|------------|------------|----------------------------------------|----------------------------------------------------------------------------------------|
| 125 | KD3125T52W | KD3125T56W | KD3125T57W | 70<br>90<br>100<br>110<br>125          | ORPK125A070<br>ORPK125A090<br>ORPK125A100<br>ORPK125A110<br>ORPK125A125                |
| 250 | KD3250T52W | KD3250T56W | KD3250T57W | 125<br>150<br>175<br>200<br>225<br>250 | ORPK025A125<br>ORPK025A150<br>ORPK025A175<br>ORPK025A200<br>ORPK025A225<br>ORPK025A250 |
| 400 | KD3400T52W | KD3400T56W | KD3400T57W | 200<br>225<br>250<br>300<br>350<br>400 | ORPK40A200<br>ORPK40A225<br>ORPK40A250<br>ORPK40A300<br>ORPK40A350<br>ORPK40A400       |

## 3-Pole High Interrupting Capacity 600 Volt Ac Rated 65 kAIC @ 480 Vac

|     |             |             |             |                                        |                                                                                        |
|-----|-------------|-------------|-------------|----------------------------------------|----------------------------------------------------------------------------------------|
| 125 | HKD3125T52W | HKD3125T56W | HKD3125T57W | 70<br>90<br>100<br>110<br>125          | ORPK125A070<br>ORPK125A090<br>ORPK125A100<br>ORPK125A110<br>ORPK125A125                |
| 250 | HKD3250T52W | HKD3250T56W | HKD3250T57W | 125<br>150<br>175<br>200<br>225<br>250 | ORPK025A125<br>ORPK025A150<br>ORPK025A175<br>ORPK025A200<br>ORPK025A225<br>ORPK025A250 |
| 400 | HKD3400T52W | HKD3400T56W | HKD3400T57W | 200<br>225<br>250<br>300<br>350<br>400 | ORPK40A200<br>ORPK40A225<br>ORPK40A250<br>ORPK40A300<br>ORPK40A350<br>ORPK40A400       |

## 3-Pole Ultra High Interrupting Capacity Current Limiting 600 Volt Ac Rated 100 kAIC @ 480 Vac

|     |             |             |             |                                        |                                                                                        |
|-----|-------------|-------------|-------------|----------------------------------------|----------------------------------------------------------------------------------------|
| 125 | KDC3125T52W | KDC3125T56W | KDC3125T57W | 70<br>90<br>100<br>110<br>125          | ORPK125A070<br>ORPK125A090<br>ORPK125A100<br>ORPK125A110<br>ORPK125A125                |
| 250 | KDC3250T52W | KDC3250T56W | KDC3250T57W | 125<br>150<br>175<br>200<br>225<br>250 | ORPK025A125<br>ORPK025A150<br>ORPK025A175<br>ORPK025A200<br>ORPK025A225<br>ORPK025A250 |
| 400 | KDC3400T52W | KDC3400T56W | KDC3400T57W | 200<br>225<br>250<br>300<br>350<br>400 | ORPK40A200<br>ORPK40A225<br>ORPK40A250<br>ORPK40A300<br>ORPK40A350<br>ORPK40A400       |

Instruction Leaflet/FRED Number 29C104

① Long delay  $I^4t$  response selection limits short delay time to flat response.

# Molded Case Circuit Breakers 70-400 Amperes

Cutler-Hammer

March 1999

## Series C® K-Frame

## 100% Rated Digitrip OPTIM 550 Electronic Circuit Breakers with Interchangeable Rating Plug

Order as individual components: Breaker Frame (which includes Trip Unit), Rating Plug, Terminals.

| Maximum Continuous Ampere Rating @ 40°C | Circuit Breaker Frame Only                                                                                                                                                                                                                                                                                                                                                                                                                            |      |      | Digitrip OPTIM Rating Plug Only |                   |
|-----------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|------|---------------------------------|-------------------|
|                                         | L – Adjustable Long Delay Pickup ( $I_L$ ) with Adjustable Long Delay Time ( $I^2t$ or $I^4t$ Response)①<br>S – Adjustable Short Delay Pickup with Adjustable Short Delay Time ( $I^2t$ or Flat Response)<br>I – Adjustable Instantaneous Pickup<br>G – Adjustable Ground Fault Pickup with Adjustable Ground Fault Time ( $I^2t$ or Flat Response)<br>A – Adjustable Ground Fault Alarm with Adjustable Ground Fault Time ( $I^2t$ or Flat Response) |      |      | Ampere Rating                   | Fixed Rating Plug |
|                                         | OPTIM 550                                                                                                                                                                                                                                                                                                                                                                                                                                             |      |      |                                 |                   |
|                                         | LSI                                                                                                                                                                                                                                                                                                                                                                                                                                                   | LSIG | LSIA |                                 |                   |
| Catalog Number                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                       |      |      |                                 |                   |

### 3-Pole Standard Interrupting Capacity 600 Volt Ac Rated 35 kAIC @ 480 Vac

|     |             |             |             |                                        |                                                                                        |
|-----|-------------|-------------|-------------|----------------------------------------|----------------------------------------------------------------------------------------|
| 125 | CKD3125T52W | CKD3125T56W | CKD3125T57W | 70<br>90<br>100<br>110<br>125          | ORPK125A070<br>ORPK125A090<br>ORPK125A100<br>ORPK125A110<br>ORPK125A125                |
| 250 | CKD3250T52W | CKD3250T56W | CKD3250T57W | 125<br>150<br>175<br>200<br>225<br>250 | ORPK025A125<br>ORPK025A150<br>ORPK025A175<br>ORPK025A200<br>ORPK025A225<br>ORPK025A250 |
| 400 | CKD3400T52W | CKD3400T56W | CKD3400T57W | 200<br>225<br>250<br>300<br>350<br>400 | ORPK40A200<br>ORPK40A225<br>ORPK40A250<br>ORPK40A300<br>ORPK40A350<br>ORPK40A400       |

### 3-Pole High Interrupting Capacity 600 Volt AC Rated 65 kAIC @ 480 Vac

|     |              |              |              |                                        |                                                                                        |
|-----|--------------|--------------|--------------|----------------------------------------|----------------------------------------------------------------------------------------|
| 125 | CHKD3125T52W | CHKD3125T56W | CHKD3125T57W | 70<br>90<br>100<br>110<br>125          | ORPK125A070<br>ORPK125A090<br>ORPK125A100<br>ORPK125A110<br>ORPK125A125                |
| 250 | CHKD3250T52W | CHKD3250T56W | CHKD3250T57W | 125<br>150<br>175<br>200<br>225<br>250 | ORPK025A125<br>ORPK025A150<br>ORPK025A175<br>ORPK025A200<br>ORPK025A225<br>ORPK025A250 |
| 400 | CHKD3400T52W | CHKD3400T56W | CHKD3400T57W | 200<br>225<br>250<br>300<br>350<br>400 | ORPK40A200<br>ORPK40A225<br>ORPK40A250<br>ORPK40A300<br>ORPK40A350<br>ORPK40A400       |

Instruction Leaflet/FRED Number 29C104

① Long delay  $I^4t$  response selection limits short delay time to flat response.

## Series C® K-Frame

## Line and Load Terminals

Line and load terminals provide wire connecting capabilities for specific ranges of continuous current ratings and wire types. All terminals comply with Underwriters Laboratories, Inc., Standards UL486A and UL486B

and CSA Standard C22.2 No. 65, or Electrical Bulletin 1165. Unless otherwise specified, K-frame circuit breaker line and load terminals are shipped separately for field installation.

## Ordering Information

K-frame circuit breakers use Cu/Al terminals as standard. When optional copper or Cu/Al terminals are required, order by catalog number. Specify if factory installation is required.

## Line and Load Terminals

| Maximum Breaker Amperes                  | Terminal Body Material | Wire Type | AWG Wire Range/<br>No. Conductors | Metric Wire<br>Range mm <sup>2</sup> | Terminal<br>Catalog Number | Figure | Terminals with Control Wire<br>Termination Catalog Number | Figure |
|------------------------------------------|------------------------|-----------|-----------------------------------|--------------------------------------|----------------------------|--------|-----------------------------------------------------------|--------|
| <b>Standard Cu/Al Pressure Terminals</b> |                        |           |                                   |                                      |                            |        |                                                           |        |
| 225                                      | Aluminum               | Cu/Al     | 3-350/(1)                         | 35-185                               | TA300K <sup>①</sup>        | 4      | —                                                         | —      |
| 350                                      | Aluminum               | Cu/Al     | 250-500/(1)                       | 120-240                              | TA350K <sup>①</sup>        | 3      | —                                                         | —      |
| 400                                      | Aluminum               | Cu/Al     | 3/0-250/(2)                       | 95-120                               | 2TA400K <sup>④</sup>       | 2      | 2TA400KCW <sup>④</sup>                                    | 5      |
|                                          |                        |           |                                   |                                      | 3TA400K <sup>⑤</sup>       | 2      | 3TA400KCW <sup>⑤</sup>                                    | 5      |
|                                          |                        |           |                                   |                                      | 4TA400K <sup>⑥</sup>       | 2      | 4TA400KCW <sup>⑥</sup>                                    | 5      |

## Optional Copper and Cu/Al Pressure Type Terminals

|     |          |       |                                  |                  |                      |   |                        |   |
|-----|----------|-------|----------------------------------|------------------|----------------------|---|------------------------|---|
| 225 | Copper   | Cu    | 3-350/(1)                        | 35-185           | T300K <sup>①</sup>   | 4 | —                      | — |
| 350 | Copper   | Cu    | 250-500/(1)                      | 120-240          | T350K <sup>①</sup>   | 3 | —                      | — |
| 400 | Copper   | Cu    | 3/0-250/(2)                      | 95-120           | 2T400K <sup>④</sup>  | 2 | 2T400KCW <sup>④</sup>  | 5 |
|     |          |       |                                  |                  | 3T400K <sup>⑤</sup>  | 2 | 3T400KCW <sup>⑤</sup>  | 5 |
|     |          |       |                                  |                  | 4T400K <sup>⑥</sup>  | 2 | 4T400KCW <sup>⑥</sup>  | 5 |
| 400 | Aluminum | Cu/Al | 2/0-250/(2)<br>or<br>2/0-500/(1) | 70-120<br>70-240 | 2TA401K <sup>④</sup> | 1 | 2TA401KCW <sup>④</sup> | 5 |
|     |          |       |                                  |                  | 3TA401K <sup>⑤</sup> | 1 | 3TA401KCW <sup>⑤</sup> | 5 |
|     |          |       |                                  |                  | 4TA401K <sup>⑥</sup> | 1 | 4TA401KCW <sup>⑥</sup> | 5 |
| 400 | Aluminum | Cu/Al | 500-750/(1)                      | 300-400          | TA402K               | 6 | —                      | — |

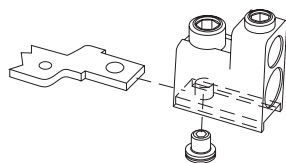


Figure 1. TA401K

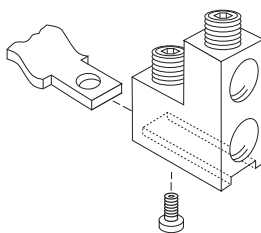


Figure 2. TA400K, T400K

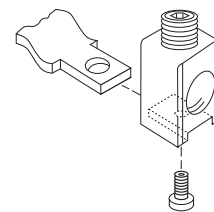


Figure 3. TA350K, T350K

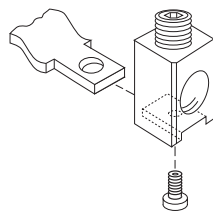


Figure 4. TA300K, T300K

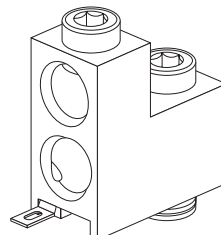


Figure 5. T400KCW, TA400KCW, TA401KCW

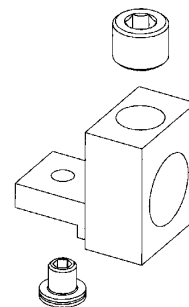


Figure 6. TA402K

See page 53 for other termination accessories.

- ① Individually packed.
- ② Terminal kits contain one terminal for each pole and one terminal cover.
- ③ Terminal kits contain one terminal for each pole and three interphase barriers.

- ④ 2-Pole Kit.
- ⑤ 3-Pole Kit.
- ⑥ 4-Pole Kit.

## Catalog Numbering System

This information is presented only as an aid to understanding catalog numbers. It is not to be used to build catalog numbers for circuit breakers or trip units.

### Circuit Breaker/Frame Catalog Number

| Circuit Breaker/Frame Type | Number of Poles | Circuit Breaker/Frame Ampere Rating | Suffix                                                          |
|----------------------------|-----------------|-------------------------------------|-----------------------------------------------------------------|
| DK                         | 2: 2 Poles      | 100                                 | C: Copper Terminals                                             |
| DKB                        | 3: 3 Poles      | 125                                 | E: 50% Protected                                                |
| KD                         | 4: 4 Poles      | 150                                 | Neutral Pole (4-Pole Electronic Trip Circuit Breaker Only)      |
| HKD                        |                 | 175                                 | F: Frame Only                                                   |
| KDC                        |                 | 200                                 | K: High Magnetic Molded Case Switch                             |
| CKD                        |                 | 225                                 | W: Without Terminals                                            |
| CHKD                       |                 | 250                                 | X: Load Side Terminals Only                                     |
|                            |                 | 300                                 | Y: Line Side Terminals Only                                     |
|                            |                 | 350                                 | No Suffix Number Indicates Standard Load and Lineside Terminals |
|                            |                 | 400                                 |                                                                 |

### OPTIM Circuit Breaker/Frame Catalog Number

| Circuit Breaker/Frame Type | Number of Poles | Circuit Breaker/Frame Ampere Rating | Trip Model | Trip Type | Suffix               |
|----------------------------|-----------------|-------------------------------------|------------|-----------|----------------------|
| KD                         | 3: 3 Poles      | 125                                 | T5 – Model | 2 – LSI   | W: Without Terminals |
| HKD                        |                 | 250                                 |            | 6 – LSIG  |                      |
| KDC                        |                 | 400                                 |            | 7 – LSIA  |                      |
| CKD                        |                 |                                     |            |           |                      |
| CHKD                       |                 |                                     |            |           |                      |

## Dimensions/Weights

### Dimensions, Inches (mm)

| Number of Poles | Width          | Height          | Depth          |
|-----------------|----------------|-----------------|----------------|
| 2, 3            | 5.5<br>(140)   | 10.125<br>(257) | 4.063<br>(103) |
| 4               | 7.219<br>(183) | 10.125<br>(257) | 4.063<br>(103) |

### Trip Unit Catalog Number

| Trip Unit Type       | Number of Poles | Trip Unit/ Rating Plug Ampere Rating | Suffix                                                                           |
|----------------------|-----------------|--------------------------------------|----------------------------------------------------------------------------------|
| KT: Thermal-Magnetic | 2: 2 Poles      | 70①                                  | LS: Electronic Trip Unit                                                         |
|                      | 3: 3 Poles      | 90①                                  | Adjustable Short Time Delay with I <sup>2</sup> t                                |
| KES: Electronic      | 4: 4 Poles      | 100                                  | Short Delay Ramp                                                                 |
|                      |                 | 125                                  | LSI: Electronic Trip Unit                                                        |
|                      |                 | 150                                  | Independently Adjustable Short Time Pickup and Delay                             |
|                      |                 | 175                                  | LSG: Electronic Trip Unit                                                        |
|                      |                 | 200                                  | Adjustable Short Time Pickup with I <sup>2</sup> t                               |
|                      |                 | 225                                  | Short Delay and Ground Fault Protection                                          |
|                      |                 | 250                                  | LSIG: Electronic Trip Unit                                                       |
|                      |                 | 300                                  | Independently Adjustable Short Time Pickup and Delay and Ground Fault Protection |
|                      |                 | 350                                  | V: 50°C Calibration (Thermal-Magnetic Trip Units Only)                           |
|                      |                 | 400                                  | E: 50% Protected Neutral Pole (4-Pole Electronic Trip Unit Only)                 |
|                      |                 |                                      | T: Terminals Only                                                                |
|                      |                 |                                      | T: Trip Unit Only                                                                |

### Approximate Shipping Weight, Lbs. (kg)

| Breaker Type | Complete Breaker |                 | Frame Only     |                | Trip Unit①    |               |
|--------------|------------------|-----------------|----------------|----------------|---------------|---------------|
|              | Number of Poles  |                 |                |                |               |               |
|              | 2                | 3               | 2              | 3              | 2             | 3             |
| DK           | 10<br>(4.536)    | 11.5<br>(5.216) | –              | –              | –             | –             |
| KDB          | 10<br>(4.536)    | 11.5<br>(5.216) | –              | –              | –             | –             |
| KD           | 10<br>(4.536)    | 11.5<br>(5.216) | 7.5<br>(3.402) | 8.5<br>(3.856) | 1.5<br>(.680) | 1.5<br>(.680) |
| HKD          | 10<br>(4.536)    | 11.5<br>(5.216) | 7.5<br>(3.402) | 8.5<br>(3.856) | 1.5<br>(.680) | 1.5<br>(.680) |
| KDC          | 10<br>(4.536)    | 11.5<br>(5.216) | 7.5<br>(3.402) | 8.5<br>(3.856) | 1.5<br>(.680) | 1.5<br>(.680) |

① Ampere rating available with electronic trip unit only.

## Allowable Accessory Combinations

Different combinations of accessories can be supplied, depending on the types of accessories and the number of poles in the circuit breaker.

|                                                             | Reference<br>Page | 2-Pole <sup>①</sup> |       |  | 3-Pole |        |       |  | 4-Pole |        |       |      |
|-------------------------------------------------------------|-------------------|---------------------|-------|--|--------|--------|-------|--|--------|--------|-------|------|
|                                                             |                   | Left                | Right |  | Left   | Center | Right |  | Left   | Center | Right | Neu. |
| Internal Accessories (Only One Internal Accessory Per Pole) |                   |                     |       |  |        |        |       |  |        |        |       |      |
| Alarm Lockout (Make/Break)                                  | 140               |                     | ■     |  | □      |        | □     |  | ■      |        |       |      |
| Alarm Lockout (2Make/2Break)                                | 140               |                     |       |  | □      |        | □     |  | ■      |        |       |      |
| Auxiliary Switch (1A, 1B)                                   | 143               |                     | ■     |  | ■      |        | ■     |  | ■      |        | ■     |      |
| Auxiliary Switch (2A, 2B)                                   | 143               |                     |       |  | ■      |        | ■     |  | ■      |        | ■     |      |
| Auxiliary Switch (3A, 3B)                                   | 143               |                     |       |  | ■      |        | ■     |  | ■      |        | ■     |      |
| Auxiliary Switch and Alarm Switch Combination               | 145               |                     |       |  | □      |        | □     |  | □      |        | □     |      |
| Shunt Trip – Standard                                       | 149               |                     | ■     |  | ■      |        | ■     |  | ■      |        | ■     |      |
| Shunt Trip – Low Energy                                     | 152               |                     |       |  | ■      |        | ■     |  | ■      |        |       |      |
| Undervoltage Release Mechanism                              | 156               |                     | ■     |  | ■      |        | ■     |  | ■      |        |       |      |
| Cutler-Hammer PowerNet Communications Kit (OPTIM 550)       | 160               |                     |       |  |        |        | ■     |  |        |        |       |      |

### External Accessories

|                                                |     |   |   |  |   |   |   |  |   |   |   |  |
|------------------------------------------------|-----|---|---|--|---|---|---|--|---|---|---|--|
| End Cap Kit                                    | 161 |   | ● |  |   | ● |   |  |   |   | ● |  |
| Keeper Nut                                     | 161 |   | ● |  |   | ● |   |  |   |   | ● |  |
| Control Wire Terminal Kit                      | 162 |   | ● |  |   | ● |   |  |   |   | ● |  |
| Multiwire Connectors                           | 162 |   | ● |  |   | ● |   |  |   |   | ● |  |
| Base Mounting Hardware                         | 163 |   | ● |  |   | ● |   |  |   |   | ● |  |
| Terminal Shields                               | 165 |   | ● |  |   | ● |   |  |   |   | ● |  |
| Interphase Barriers                            | 166 |   | ● |  |   | ● |   |  |   |   | ● |  |
| Non-Padlockable Handle Block                   | 168 | ■ |   |  |   | ■ |   |  |   | ■ |   |  |
| Padlockable Handle Block                       | 168 |   |   |  |   | ■ |   |  |   |   |   |  |
| Padlockable Handle Lock Hasp                   | 169 |   | ■ |  | □ |   | □ |  | □ |   | □ |  |
| Cylinder Lock                                  | 169 | □ | □ |  | □ |   | □ |  |   |   |   |  |
| Key Interlock Kit                              | 170 | ■ | □ |  | □ |   | □ |  | □ |   | □ |  |
| Sliding Bar Interlock – Requires Two Breakers  | 171 |   |   |  |   | ● |   |  |   |   |   |  |
| Walking Beam Interlock – Requires Two Breakers | 171 |   |   |  |   | ● |   |  |   |   | ● |  |
| Electrical (Solenoid) Operator                 | 172 |   |   |  |   | ● |   |  |   |   | ● |  |
| Plug-in Adapters                               | 174 |   | ● |  |   | ● |   |  |   |   | ● |  |
| Rear Connecting Studs                          | 176 |   | ● |  |   | ● |   |  |   |   | ● |  |
| Panelboard Connecting Straps                   | 177 |   | ● |  |   | ● |   |  |   |   | ● |  |
| Handle Mechanisms                              | 178 |   | ● |  |   | ● |   |  |   |   | ● |  |
| Door Hardware/Accessories                      | 182 |   | ● |  |   | ● |   |  |   |   | ● |  |
| Handle Extension                               | 182 |   | ● |  |   | ● |   |  |   |   | ● |  |
| IQ Energy Sentinel                             | 184 |   |   |  |   | ● |   |  |   |   | ● |  |
| Solid-State (Electronic) Portable Test Kit     | 184 |   | ● |  |   | ● |   |  |   |   | ● |  |

### OPTIM System Components 3-Poles

|                                 |     |  |  |  |  |  |  |  |  |  |  |  |
|---------------------------------|-----|--|--|--|--|--|--|--|--|--|--|--|
| Breaker Interface Module (BIM)  | 185 |  |  |  |  |  |  |  |  |  |  |  |
| Digitrip OPTIMizer              | 185 |  |  |  |  |  |  |  |  |  |  |  |
| Auxiliary Power Module          | 185 |  |  |  |  |  |  |  |  |  |  |  |
| Cutler-Hammer PowerNet Software | 185 |  |  |  |  |  |  |  |  |  |  |  |

### Modifications (Refer to Cutler-Hammer)

|                                |     |  |   |  |  |   |  |  |  |  |   |  |
|--------------------------------|-----|--|---|--|--|---|--|--|--|--|---|--|
| Special Calibration            | 186 |  | ● |  |  | ● |  |  |  |  | ● |  |
| Moisture Fungus Treatment      | 186 |  | ● |  |  | ● |  |  |  |  | ● |  |
| Freeze-Tested Circuit Breakers | 186 |  | ● |  |  | ● |  |  |  |  | ● |  |
| Marine Application             | 186 |  | ● |  |  | ● |  |  |  |  | ● |  |

■ Applicable in indicated pole position

□ May be mounted on left or right pole – not both

● Accessory available/Modification available

① 2-pole breaker supplied in 3-pole frame.  
Current carrying parts omitted from center pole.





## Series C® L-Frame



Typical Series C L-Frame Circuit Breaker

- All Series C L-frame circuit breakers are HACR rated.
- L-frame circuit breakers are available as individual components (Frame, Trip Unit, Terminals), or factory assembled complete breakers. OPTIM circuit breakers are available as factory assembled only.
- L-frame circuit breakers with non-interchangeable trip units are suitable for reverse feed use.

## Interrupting Capacity Ratings

UL489 Interrupting Capacity Ratings<sup>①</sup>

| Circuit Breaker Type | Number of Poles | Interrupting Capacity (RMS Symmetrical Amperes) (kA) |     |     |     |     |                   |     | Page Number |
|----------------------|-----------------|------------------------------------------------------|-----|-----|-----|-----|-------------------|-----|-------------|
|                      |                 | Volts Ac (50/60 Hz)                                  |     |     |     |     | Volts Dc          |     |             |
|                      |                 | 240                                                  | 277 | 480 | 600 | 125 | 250 <sup>②③</sup> | 500 |             |
| LDB                  | 2, 3            | 65                                                   | —   | 35  | 25  | —   | 22                | —   | 58          |
| LD                   | 2, 3, 4         | 65                                                   | —   | 35  | 25  | —   | 22                | —   | 57, 59      |
| CLD                  | 2, 3, 4         | 65                                                   | —   | 35  | 25  | —   | 22                | —   | 58, 61      |
| HLD                  | 2, 3, 4         | 100                                                  | —   | 65  | 35  | —   | 25                | —   | 57, 59      |
| CHLD <sup>④</sup>    | 2, 3, 4         | 100                                                  | —   | 65  | 35  | —   | 25                | —   | 61          |
| LDC                  | 2, 3, 4         | 200                                                  | —   | 100 | 50  | —   | 30                | —   | 57, 60      |
| CLDC <sup>④</sup>    | 2, 3, 4         | 200                                                  | —   | 100 | 50  | —   | 30                | —   | 62          |

IEC 947-2 Interrupting Capacity Ratings<sup>①</sup>

| Circuit Breaker Type | Number of Poles |                      | Interrupting Capacity (Symmetrical Amperes) (kA) |           |          |                   | Page Number |
|----------------------|-----------------|----------------------|--------------------------------------------------|-----------|----------|-------------------|-------------|
|                      |                 |                      | Volts Ac (50/60 Hz)                              |           |          | Volts Dc          |             |
|                      |                 |                      | 240                                              | 415       | 690      | 250 <sup>②③</sup> |             |
| LDB                  | 2, 3            | $I_{CU}$<br>$I_{CS}$ | 85<br>85                                         | 45<br>45  | 20<br>10 | 20<br>10          | 58          |
| LD                   | 2, 3, 4         | $I_{CU}$<br>$I_{CS}$ | 85<br>85                                         | 45<br>45  | 20<br>10 | 20<br>10          | 57, 59      |
| CLD <sup>④</sup>     | 2, 3, 4         | $I_{CU}$<br>$I_{CS}$ | 85<br>85                                         | 45<br>45  | 20<br>10 | 20<br>10          | 58, 61      |
| HLD                  | 2, 3, 4         | $I_{CU}$<br>$I_{CS}$ | 100<br>100                                       | 70<br>70  | 25<br>13 | 20<br>10          | 57, 59      |
| CHLD <sup>④</sup>    | 2, 3, 4         | $I_{CU}$<br>$I_{CS}$ | 100<br>100                                       | 70<br>70  | 25<br>13 | 20<br>10          | 61          |
| LDC                  | 2, 3, 4         | $I_{CU}$<br>$I_{CS}$ | 200<br>100                                       | 100<br>75 | 35<br>18 | 20<br>10          | 57, 60      |
| CLDC <sup>④</sup>    | 2, 3, 4         | $I_{CU}$<br>$I_{CS}$ | 200<br>100                                       | 100<br>75 | 35<br>18 | 20<br>10          | 62          |

① Utilization category A circuit breakers.

② L/R = 8 milliseconds minimum.

③ 2-pole circuit breaker or two poles of 3-pole circuit breaker. Incorporating Thermal-Magnetic trip unit only.

④ 100% rated breakers

## Series C® L-Frame

### L-Frame Digitrip Selection Guide

| Trip Unit Type                               | Digitrip RMS 310               | Digitrip OPTIM 550                     | Digitrip OPTIM 750   | Digitrip OPTIM 1050  |
|----------------------------------------------|--------------------------------|----------------------------------------|----------------------|----------------------|
| RMS Sensing                                  | Yes                            | Yes                                    | Yes                  | Yes                  |
| <b>Breaker Type</b>                          |                                |                                        |                      |                      |
| Frame                                        | L                              | L                                      | L                    | L                    |
| Ampere Range                                 | 300-600A                       | 200-600A                               | 200-600A             | 200-600A             |
| Interrupting Rating @ 480V                   | 35, 65, 100 (kA)               | 35, 65, 100 (kA)                       | 35, 65, 100 (kA)     | 35, 65, 100 (kA)     |
| <b>Protection</b>                            |                                |                                        |                      |                      |
| Ordering Options                             | LS, LSG                        | LSI, LSIG                              | LSI, LSI(A), LSIG    | LSI(A), LSIG         |
| Fixed Rated Plug ( $I_n$ )                   | Yes                            | Yes                                    | Yes                  | Yes                  |
| Overtemperature Trip                         | Yes                            | Yes                                    | Yes                  | Yes                  |
| <b>Long Delay Protection (L)</b>             |                                |                                        |                      |                      |
| Adjustable Rating Plug ( $I_n$ )             | Yes                            | Yes                                    | No                   | No                   |
| Long Delay Pickup                            | 0.5-1.0 ( $I_n$ ) <sup>①</sup> | 0.5-1.0 ( $I_n$ ) <sup>①</sup>         | 0.4-1.0 x ( $I_n$ )  | 0.4-1.0 x ( $I_n$ )  |
| Long Delay Time $I^2T$                       | 12 Seconds                     | 12 Seconds                             | 2-24 Seconds         | 2-24 Seconds         |
| Long Delay Time $I^4T$                       | No                             | No                                     | 1-5 Seconds          | 1-5 Seconds          |
| Long Delay Thermal Memory                    | Yes                            | Yes                                    | Yes                  | Yes                  |
| High Load Alarm                              | No                             | No                                     | 0.5-1.0 x $I_r$      | 0.5-1.0 x $I_r$      |
| <b>Short Delay Protection (S)</b>            |                                |                                        |                      |                      |
| Short Delay Pickup                           | 200-800% x ( $I_n$ )           | 200-800% x ( $I_n$ )                   | 150-800% x ( $I_r$ ) | 150-800% x ( $I_r$ ) |
| Short Delay Time $I^2T$                      | 100 ms                         | No                                     | 100-500 ms           | 100-500 ms           |
| Short Delay Time Flat                        | No                             | Inst-300 ms                            | 100-500 ms           | 100-500 ms           |
| Short Delay Time Zone Selective Interlocking | No                             | No                                     | No                   | Yes                  |
| <b>Instantaneous Protection (I)</b>          |                                |                                        |                      |                      |
| Instantaneous Pickup                         | No                             | 200-800% x ( $I_n$ )                   | 200-800% x ( $I_n$ ) | 200-800% x ( $I_n$ ) |
| Discriminator                                | No                             | No                                     | Yes                  | Yes                  |
| Instantaneous Override                       | Yes                            | Yes                                    | Yes                  | Yes                  |
| <b>Ground Fault Protection (G)</b>           |                                |                                        |                      |                      |
| Ground Fault Alarm                           | No                             | No                                     | 20-100% x ( $I_s$ )  | 20-100% x ( $I_s$ )  |
| Ground Fault Pickup                          | Varies by Frame                | Varies by Frame                        | 20-100% x ( $I_s$ )  | 20-100% x ( $I_s$ )  |
| Ground Fault Delay $I^2T$                    | No                             | No                                     | 100-500 ms           | 100-500 ms           |
| Ground Fault Delay Flat                      | Inst-500 ms                    | Inst-500 ms                            | 100-500 ms           | 100-500 ms           |
| Ground Fault Zone Selective Interlocking     | No                             | No                                     | No                   | Yes                  |
| Ground Fault Thermal Memory                  | Yes                            | Yes                                    | Yes                  | Yes                  |
| <b>System Diagnostics</b>                    |                                |                                        |                      |                      |
| Status LEDs                                  | Yes                            | Yes                                    | Yes                  | Yes                  |
| Cause of Trip LEDs                           | No                             | No                                     | Yes                  | Yes                  |
| Magnitude of Trip Information                | No                             | No                                     | Yes                  | Yes                  |
| Remote Signal Contact – Ground Alarm         | Yes                            | Yes                                    | No                   | Yes                  |
| Local Auxiliary and Bell Alarm Contact       | Optional                       | Optional                               | Optional             | Included             |
| <b>System Monitoring</b>                     |                                |                                        |                      |                      |
| Digital Display                              | No                             | No                                     | Yes <sup>②</sup>     | Yes <sup>②</sup>     |
| Current                                      | No                             | No                                     | Yes                  | Yes                  |
| Power and Energy                             | No                             | No                                     | No                   | Yes                  |
| Power Quality-Harmonics                      | No                             | No                                     | No                   | Yes                  |
| Power Factor                                 | No                             | No                                     | No                   | Yes                  |
| <b>Communications</b>                        |                                |                                        |                      |                      |
| Cutler-Hammer PowerNet                       | No                             | No                                     | No <sup>③</sup>      | Yes                  |
| <b>Testing</b>                               |                                |                                        |                      |                      |
| Testing Method                               | Test Set                       | OPTIMizer, BIM, Cutler-Hammer PowerNet |                      |                      |

① Adjust by rating plug.

② By OPTIMizer/BIM.

③ Cutler-Hammer PowerNet kit for field upgrade.

BIM = Breaker Interface Module  
(A) = GF Alarm $I_s$  = Sensor Rating $I_n$  = Rating Plug $I_r$  = Long Delay Pickup Setting

## Series C® L-Frame

## Types LD, HLD, and LDC Thermal-Magnetic Circuit Breakers with Interchangeable Trip Units

|                                         |                                                                         |            |                                                                         |            |                                                                                          |            |                                                                                                                                |                                                                   |
|-----------------------------------------|-------------------------------------------------------------------------|------------|-------------------------------------------------------------------------|------------|------------------------------------------------------------------------------------------|------------|--------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------|
| Maximum Continuous Ampere Rating @ 40°C | Standard Interrupting Capacity<br>600 Vac Rated<br>35 kAIC @ 480 Vac    |            | High Interrupting Capacity<br>600 Vac Rated<br>65 kAIC @ 480 Vac        |            | Ultra High Interrupting Capacity Current Limiting<br>600 Vac Rated<br>100 kAIC @ 480 Vac |            | Thermal Magnetic Trip Unit Only                                                                                                | Standard Terminals Only<br><br>See Page 63 for Optional Terminals |
|                                         | Factory Assembled Circuit Consisting of Frame, Trip Unit, and Terminals | Frame Only | Factory Assembled Circuit Consisting of Frame, Trip Unit, and Terminals | Frame Only | Factory Assembled Circuit Consisting of Frame, Trip Unit, and Terminals                  | Frame Only | For Use With: Standard or High or Ultra High Interrupting Frames<br><br>Magnetic Trip Range is 5-10 x Continuous Ampere Rating |                                                                   |
|                                         | Catalog Number                                                          |            |                                                                         |            |                                                                                          |            |                                                                                                                                |                                                                   |

## 2-Pole

|     |        |         |         |          |         |          |         |                        |
|-----|--------|---------|---------|----------|---------|----------|---------|------------------------|
| 300 | LD2300 | LD2600F | HLD2300 | HLD2600F | LDC2300 | LDC2600F | LT2300T | TA602LD <sup>①</sup>   |
| 350 | LD2350 |         | HLD2350 |          | LDC2350 |          | LT2350T | TA602LD <sup>①</sup>   |
| 400 | LD2400 |         | HLD2400 |          | LDC2400 |          | LT2400T | TA602LD <sup>①</sup>   |
| 450 | LD2450 |         | HLD2450 |          | LDC2450 |          | LT2450T | TA602LD <sup>①</sup>   |
| 500 | LD2500 |         | HLD2500 |          | LDC2500 |          | LT2500T | TA602LD <sup>①</sup>   |
| 600 | LD2600 |         | HLD2600 |          | LDC2600 |          | LT2600T | 2TA603LDK <sup>②</sup> |

## 3-Pole

|     |        |         |         |          |         |          |         |                        |
|-----|--------|---------|---------|----------|---------|----------|---------|------------------------|
| 300 | LD3300 | LD3600F | HLD3300 | HLD3600F | LDC3300 | LDC3600F | LT3300T | TA602LD <sup>①</sup>   |
| 350 | LD3350 |         | HLD3350 |          | LDC3350 |          | LT3350T | TA602LD <sup>①</sup>   |
| 400 | LD3400 |         | HLD3400 |          | LDC3400 |          | LT3400T | TA602LD <sup>①</sup>   |
| 450 | LD3450 |         | HLD3450 |          | LDC3450 |          | LT3450T | TA602LD <sup>①</sup>   |
| 500 | LD3500 |         | HLD3500 |          | LDC3500 |          | LT3500T | TA602LD <sup>①</sup>   |
| 600 | LD3600 |         | HLD3600 |          | LDC3600 |          | LT3600T | 3TA603LDK <sup>②</sup> |

4-Pole<sup>③</sup>

|     |        |         |         |          |         |          |         |                        |
|-----|--------|---------|---------|----------|---------|----------|---------|------------------------|
| 300 | LD4300 | LD4600F | HLD4300 | HLD4600F | LDC4300 | LDC4600F | LT4300T | TA602LD <sup>①</sup>   |
| 350 | LD4350 |         | HLD4350 |          | LDC4350 |          | LT4350T | TA602LD <sup>①</sup>   |
| 400 | LD4400 |         | HLD4400 |          | LDC4400 |          | LT4400T | TA602LD <sup>①</sup>   |
| 450 | LD4450 |         | HLD4450 |          | LDC4450 |          | LT4450T | TA602LD <sup>①</sup>   |
| 500 | LD4500 |         | HLD4500 |          | LDC4500 |          | LT4500T | TA602LD <sup>①</sup>   |
| 600 | LD4600 |         | HLD4600 |          | LDC4600 |          | LT4600T | 4TA603LDK <sup>②</sup> |

Instruction Leaflet/FRED Number 29C105 for Breaker; 29C607 for Thermal Magnetic Trip Unit

## Types LD, HLD, and LDC Electronic Circuit Breakers with Interchangeable Trip Units

Order as individual components: Breaker Frame, Trip Unit, Rating Plug, Terminals.

| Maximum Continuous Ampere Rating @ 40°C① | Circuit Breaker Frame Only                                     |                                                            |                                                                                    | Digitrip RMS 310 Trip Unit Only④                                                                                                                                                                                                                                                                                                                                                 |  |  | Digitrip RMS 310 Rating Plug Only |                   |                              | Standard Terminals Only            |
|------------------------------------------|----------------------------------------------------------------|------------------------------------------------------------|------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|-----------------------------------|-------------------|------------------------------|------------------------------------|
|                                          | Standard Interrupting Capacity 600 Vac Rated 35 kAIC @ 480 Vac | High Interrupting Capacity 600 Vac Rated 65 kAIC @ 480 Vac | Ultra High Interrupting Capacity Current Limiting 600 Vac Rated 100 kAIC @ 480 Vac | L – Adjustable Long Delay Pickup (By Adjustable Rating Plug)<br>S – Adjustable Short Delay Pickup with Fixed Short Delay Time (I²t Response) or Adjustable Short Delay Time (Flat Response)<br><br>I – Adjustable Instantaneous Pickup by Setting Short Delay Time to Instantaneous<br><br>G – Adjustable Ground Fault Pickup with Adjustable Ground Fault Delay (Flat Response) |  |  | Ampere Rating                     | Fixed Rating Plug | Adjustable Rating Plug       | See Page 63 for Optional Terminals |
|                                          |                                                                |                                                            |                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                  |  |  |                                   |                   | Ampere Rating Catalog Number |                                    |
|                                          | Catalog Number                                                 |                                                            |                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                  |  |  |                                   |                   |                              |                                    |

3-Pole<sup>③</sup>

|     |         |          |          |           |            |            |             |                                 |                                                          |                               |                                                                                                                        |
|-----|---------|----------|----------|-----------|------------|------------|-------------|---------------------------------|----------------------------------------------------------|-------------------------------|------------------------------------------------------------------------------------------------------------------------|
| 600 | LD3600F | HLD3600F | LDC3600F | LES3600LS | LES3600LSI | LES3600LSG | LES3600LSIG | 300<br>350<br>400<br>500<br>600 | 6LES300T<br>6LES350T<br>6LES400T<br>6LES500T<br>6LES600T | 300/400/500/600<br>A6LES600T1 | TA602LD <sup>①</sup><br>TA602LD <sup>①</sup><br>TA602LD <sup>①</sup><br>TA602LD <sup>①</sup><br>3TA603LDK <sup>②</sup> |
|-----|---------|----------|----------|-----------|------------|------------|-------------|---------------------------------|----------------------------------------------------------|-------------------------------|------------------------------------------------------------------------------------------------------------------------|

4-Pole<sup>③</sup>

|     |         |          |          |           |            |   |   |                                 |                                                          |                               |                                                                                                                        |
|-----|---------|----------|----------|-----------|------------|---|---|---------------------------------|----------------------------------------------------------|-------------------------------|------------------------------------------------------------------------------------------------------------------------|
| 600 | LD4600F | HLD4600F | LDC4600F | LES4600LS | LES4600LSI | – | – | 300<br>350<br>400<br>500<br>600 | 6LES300T<br>6LES350T<br>6LES400T<br>6LES500T<br>6LES600T | 300/400/500/600<br>A6LES600T1 | TA602LD <sup>④</sup><br>TA602LD <sup>④</sup><br>TA602LD <sup>④</sup><br>TA602LD <sup>④</sup><br>4TA603LDK <sup>②</sup> |
|-----|---------|----------|----------|-----------|------------|---|---|---------------------------------|----------------------------------------------------------|-------------------------------|------------------------------------------------------------------------------------------------------------------------|

Instruction Leaflet/FRED Number 29C105 for Breaker; 29C615 for LES Trip Unit

① Individually packed.

② Terminal kits contain one terminal for each pole and one terminal cover.

③ Neutral is in right pole.

④ For AC use only.

# Molded Case Circuit Breakers 125-600 Amperes

Cutler-Hammer

March 1999

## Series C® L-Frame

### 100% Rated Types CLD, CHLD, and CLDC Electronic Circuit Breakers with Interchangeable Trip Units

The NEC allows the breaker to be rated at 100% of its frame size in an assembly, provided that 90°C wire is applied at the 75°C ampacity. All 100% rated circuit breakers have electronic trip units. Order as individual components: Breaker Frame, Trip Unit, Rating Plug and Terminals.

| Maximum Continuous Ampere Rating @ 40°C① | Circuit Breaker Frame Only                                           |                                                                  |                                                                                             | Digitrip RMS 310 Trip Unit Only                                    |                                                                              |                                                                                            |                                                                                  | Digitrip RMS 310 Rating Plug Only |                   |                              | Standard Terminals Only            |
|------------------------------------------|----------------------------------------------------------------------|------------------------------------------------------------------|---------------------------------------------------------------------------------------------|--------------------------------------------------------------------|------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------|-----------------------------------|-------------------|------------------------------|------------------------------------|
|                                          | Standard Interrupting Capacity<br>600 Vac Rated<br>35 kAIC @ 480 Vac | High Interrupting Capacity<br>600 Vac Rated<br>65 kAIC @ 480 Vac | Ultra High Interrupting Capacity<br>Current Limiting<br>600 Vac Rated<br>100 kAIC @ 480 Vac | Standard                                                           | Options                                                                      |                                                                                            |                                                                                  | Ampere Rating                     | Fixed Rating Plug | Adjustable Rating Plug       | See Page 63 for Optional Terminals |
|                                          |                                                                      |                                                                  |                                                                                             | Adjustable Short Time Delay with I <sup>2</sup> t Short Delay Ramp | Independently Adjustable Short Time Pickup and Delay Ground Fault Protection | Adjustable Short Time Pickup with I <sup>2</sup> t Short Delay and Ground Fault Protection | Independently Adjustable Short Time Pickup and Delay and Ground Fault Protection |                                   |                   | Ampere Rating Catalog Number |                                    |
|                                          |                                                                      |                                                                  |                                                                                             |                                                                    |                                                                              |                                                                                            |                                                                                  |                                   |                   | Catalog Number               |                                    |

#### 3-Pole

|     |          |           |           |           |            |            |             |                                 |                                                          |                               |                                                                                                                        |
|-----|----------|-----------|-----------|-----------|------------|------------|-------------|---------------------------------|----------------------------------------------------------|-------------------------------|------------------------------------------------------------------------------------------------------------------------|
| 600 | CLD3600F | CHLD3600F | CLDC3600F | LES3600LS | LES3600LSI | LES3600LSG | LES3600LSIG | 300<br>350<br>400<br>500<br>600 | 6LES300T<br>6LES350T<br>6LES400T<br>6LES500T<br>6LES600T | 300/400/500/600<br>A6LES600T1 | TA602LD <sup>②</sup><br>TA602LD <sup>②</sup><br>TA602LD <sup>②</sup><br>TA602LD <sup>②</sup><br>3TA603LDK <sup>③</sup> |
|-----|----------|-----------|-----------|-----------|------------|------------|-------------|---------------------------------|----------------------------------------------------------|-------------------------------|------------------------------------------------------------------------------------------------------------------------|

Instruction Leaflet/FRED Number 29C105 for Breaker; 29C615 for LES Trip Unit

### Type LDB Thermal-Magnetic Circuit Breakers with Non-Interchangeable Trip Units

| Maximum Continuous Ampere Rating | 600 Vac Rated, 250 Vdc          |                                            |
|----------------------------------|---------------------------------|--------------------------------------------|
|                                  | Complete Circuit Breaker        |                                            |
|                                  | Without Line and Load Terminals | With Standard Line and Load Terminals Only |
|                                  | Catalog Number                  |                                            |

#### 2-Pole

|     |          |         |
|-----|----------|---------|
| 300 | LDB2300W | LDB2300 |
| 350 | LDB2350W | LDB2350 |
| 400 | LDB2400W | LDB2400 |
| 450 | LDB2450W | LDB2450 |
| 500 | LDB2500W | LDB2500 |
| 600 | LDB2600W | LDB2600 |

#### 3-Pole

|     |          |         |
|-----|----------|---------|
| 300 | LDB3300W | LDB3300 |
| 350 | LDB3350W | LDB3350 |
| 400 | LDB3400W | LDB3400 |
| 450 | LDB3450W | LDB3450 |
| 500 | LDB3500W | LDB3500 |
| 600 | LDB3600W | LDB3600 |

Instruction Leaflet/FRED Number 29C105 for Breaker

### Molded Case Switches

Molded case switches are used as compact switches in applications requiring high current switching capabilities. Molded case switches are constructed of circuit breaker components and are of the high instantaneous automatic type.<sup>④</sup> Molded case switches are listed in accordance with Underwriters Laboratories, Inc., Standard UL 1087.

| Maximum Continuous Ampere Rating @ 40°C | 600 Vac Maximum, 250 Vdc                             | Standard Terminals Only<br><br>See Page 63 for Optional Terminals |
|-----------------------------------------|------------------------------------------------------|-------------------------------------------------------------------|
|                                         | Circuit Breaker Only Without Line and Load Terminals |                                                                   |
|                                         | Catalog Number                                       |                                                                   |

#### 2-Pole

|     |          |           |
|-----|----------|-----------|
| 600 | LD2600WK | 2TA603LDK |
|-----|----------|-----------|

#### 3-Pole

|     |          |           |
|-----|----------|-----------|
| 600 | LD3600WK | 3TA603LDK |
|-----|----------|-----------|

#### 4-Pole

|     |          |           |
|-----|----------|-----------|
| 600 | LD4600WK | 4TA603LDK |
|-----|----------|-----------|

**Note:** Molded Case Switch may trip above 6000 amperes.

Instruction Leaflet/FRED Number 29C105 for Molded Case Switch

① Ampere rating is established by rating plug.

② Individually packed.

③ 3TA603LDK and 4TA603LDK terminal kits contain one terminal for each pole and one terminal cover.

## Series C® L-Frame

Digitrip OPTIM<sup>①</sup> Electronic Circuit Breaker with Interchangeable Rating Plug

Order as individual components: Breaker Frame (which includes Trip Unit), Rating Plug, Terminals.

|                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |      |      |           |      |            |      |                                 |                   |
|-----------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|------|-----------|------|------------|------|---------------------------------|-------------------|
| Maximum Continuous Ampere Rating @ 40°C | Circuit Breaker Frame Only                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |      |      |           |      |            |      | Digitrip OPTIM Rating Plug Only |                   |
|                                         | L – Adjustable Long Delay Pickup (I <sub>L</sub> ) with Adjustable Long Delay Time (I <sup>2</sup> t or I <sup>4</sup> t Response)②<br>S – Adjustable Short Delay Pickup with Adjustable Short Delay Time (I <sup>2</sup> t or Flat Response)<br>I – Adjustable Instantaneous Pickup<br>G – Adjustable Ground Fault Pickup with Adjustable Ground Fault Time (I <sup>2</sup> t or Flat Response)<br>A – Adjustable Ground Fault Alarm with Adjustable Ground Fault Time (I <sup>2</sup> t or Flat Response) |      |      |           |      |            |      | Ampere Rating                   | Fixed Rating Plug |
|                                         | OPTIM 550                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |      |      | OPTIM 750 |      | OPTIM 1050 |      |                                 |                   |
|                                         | LSI                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | LSIG | LSIA | LSIG      | LSIA | LSIG       | LSIA |                                 |                   |
|                                         | Catalog Number                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |      |      |           |      |            |      |                                 |                   |
|                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |      |      |           |      |            |      |                                 |                   |

## 3-Pole Standard Interrupting Capacity 600 Volt Ac Rated 35 kAIC @ 480 Vac

|     |            |            |            |            |            |             |             |                                        |                                                                                        |
|-----|------------|------------|------------|------------|------------|-------------|-------------|----------------------------------------|----------------------------------------------------------------------------------------|
| 125 | –          | –          | –          | LD3125T76W | LD3125T77W | LD3125T106W | LD3125T107W | 70<br>90<br>100<br>110<br>125          | ORPL125A070<br>ORPL125A090<br>ORPL125A100<br>ORPL125A110<br>ORPL125A125                |
| 250 | –          | –          | –          | LD3250T76W | LD3250T77W | LD3250T106W | LD3250T107W | 125<br>150<br>175<br>200<br>225<br>250 | ORPL025A125<br>ORPL025A150<br>ORPL025A175<br>ORPL025A200<br>ORPL025A225<br>ORPL025A250 |
| 400 | LD3400T52W | LD3400T56W | LD3400T57W | LD3400T76W | LD3400T77W | LD3400T106W | LD3400T107W | 200<br>225<br>250<br>300<br>350<br>400 | ORPL40A200<br>ORPL40A225<br>ORPL40A250<br>ORPL40A300<br>ORPL40A350<br>ORPL40A400       |
| 600 | LD3600T52W | LD3600T56W | LD3600T57W | LD3600T76W | LD3600T77W | LD3600T106W | LD3600T107W | 300<br>350<br>400<br>500<br>600        | ORPL60A300<br>ORPL60A350<br>ORPL60A400<br>ORPL60A500<br>ORPL60A600                     |

## 3-Pole High Interrupting Capacity 600 Volt Ac Rated 65 kAIC @ 480 Vac

|     |             |             |             |             |             |              |              |                                        |                                                                                        |
|-----|-------------|-------------|-------------|-------------|-------------|--------------|--------------|----------------------------------------|----------------------------------------------------------------------------------------|
| 125 | –           | –           | –           | HLD3125T76W | HLD3125T77W | HLD3125T106W | HLD3125T107W | 70<br>90<br>100<br>110<br>125          | ORPL125A070<br>ORPL125A090<br>ORPL125A100<br>ORPL125A110<br>ORPL125A125                |
| 250 | –           | –           | –           | HLD3250T76W | HLD3250T77W | HLD3250T106W | HLD3250T107W | 125<br>150<br>175<br>200<br>225<br>250 | ORPL025A125<br>ORPL025A150<br>ORPL025A175<br>ORPL025A200<br>ORPL025A225<br>ORPL025A250 |
| 400 | HLD3400T52W | HLD3400T56W | HLD3400T57W | HLD3400T76W | HLD3400T77W | HLD3400T106W | HLD3400T107W | 200<br>225<br>250<br>300<br>350<br>400 | ORPL40A200<br>ORPL40A225<br>ORPL40A250<br>ORPL40A300<br>ORPL40A350<br>ORPL40A400       |
| 600 | HLD3600T52W | HLD3600T56W | HLD3600T57W | HLD3600T76W | HLD3600T77W | HLD3600T106W | HLD3600T107W | 300<br>350<br>400<br>500<br>600        | ORPL60A300<br>ORPL60A350<br>ORPL60A400<br>ORPL60A500<br>ORPL60A600                     |

Instruction Leaflet/FRED Number 29C105 for Breaker; 29C891 for OPTIM Trip Unit

① One Form C auxiliary switch and one Form C bell alarm switch supplied with breaker as standard, on models 750 and 1050.

② Long delay  $I^4t$  response selection limits short delay time to flat response.

# Molded Case Circuit Breakers 125-600 Amperes

Cutler-Hammer

March 1999

## Series C® L-Frame

## Digitrip OPTIM<sup>①</sup> Electronic Circuit Breaker with Interchangeable Rating Plug

Order as individual components: Breaker Frame (which includes Trip Unit), Rating Plug, Terminals.

| Maximum Continuous Ampere Rating @ 40°C | Circuit Breaker Frame Only                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |  |      |           |  |            |  | Digitrip OPTIM Rating Plug Only |                   |
|-----------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|------|-----------|--|------------|--|---------------------------------|-------------------|
|                                         | L – Adjustable Long Delay Pickup (I <sub>L</sub> ) with Adjustable Long Delay Time (I <sup>2</sup> t or I <sup>4</sup> t Response)②<br>S – Adjustable Short Delay Pickup with Adjustable Short Delay Time (I <sup>2</sup> t or Flat Response)<br>I – Adjustable Instantaneous Pickup<br>G – Adjustable Ground Fault Pickup with Adjustable Ground Fault Time (I <sup>2</sup> t or Flat Response)<br>A – Adjustable Ground Fault Alarm with Adjustable Ground Fault Time (I <sup>2</sup> t or Flat Response) |  |      |           |  |            |  | Ampere Rating                   | Fixed Rating Plug |
|                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |  |      |           |  |            |  |                                 |                   |
|                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |  |      |           |  |            |  |                                 |                   |
|                                         | OPTIM 550                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |  |      | OPTIM 750 |  | OPTIM 1050 |  |                                 |                   |
|                                         | LSI                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |  | LSIG | LSIA      |  | LSIG       |  | LSIA                            |                   |
|                                         | Catalog Number                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |  |      |           |  |            |  |                                 |                   |

### 3-Pole Ultra High Interrupting Capacity Current Limiting 600 Volt Ac Rated 100 kAIC @ 480 Vac

|     |             |             |             |             |             |              |              |                                        |                                                                                        |
|-----|-------------|-------------|-------------|-------------|-------------|--------------|--------------|----------------------------------------|----------------------------------------------------------------------------------------|
| 125 | –           | –           | –           | LDC3125T76W | LDC3125T77W | LDC3125T106W | LDC3125T107W | 70<br>90<br>100<br>110<br>125          | ORPL125A070<br>ORPL125A090<br>ORPL125A100<br>ORPL125A110<br>ORPL125A125                |
| 250 | –           | –           | –           | LDC3250T76W | LDC3250T77W | LDC3250T106W | LDC3250T107W | 125<br>150<br>175<br>200<br>225<br>250 | ORPL025A125<br>ORPL025A150<br>ORPL025A175<br>ORPL025A200<br>ORPL025A225<br>ORPL025A250 |
| 400 | LDC3400T52W | LDC3400T56W | LDC3400T57W | LDC3400T76W | LDC3400T77W | LDC3400T106W | LDC3400T107W | 200<br>225<br>250<br>300<br>350<br>400 | ORPL40A200<br>ORPL40A225<br>ORPL40A250<br>ORPL40A300<br>ORPL40A350<br>ORPL40A400       |
| 600 | LDC3600T52W | LDC3600T56W | LDC3600T57W | LDC3600T76W | LDC3600T77W | LDC3600T106W | LDC3600T107W | 300<br>350<br>400<br>500<br>600        | ORPL60A300<br>ORPL60A350<br>ORPL60A400<br>ORPL60A500<br>ORPL60A600                     |

Instruction Leaflet/FRED Number 29C105 for Breaker; 29C891 for OPTIM Trip Unit

① One Form C auxiliary switch and one Form C bell alarm switch supplied with breaker as standard, on models 750 and 1050.

② Long delay  $I^4t$  response selection limits short delay time to flat response.

## Series C® L-Frame

100% Rated Digitrip OPTIM<sup>①</sup> Circuit Breakers with Interchangeable Rating Plug

Order as individual components: Breaker Frame (which includes Trip Unit), Rating Plug, Terminals.

| Maximum Continuous Ampere Rating @ 40°C | Circuit Breaker Frame Only                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |      |      |           |      |            |      | Digitrip OPTIM Rating Plug Only |                   |
|-----------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|------|-----------|------|------------|------|---------------------------------|-------------------|
|                                         | L – Adjustable Long Delay Pickup (I <sub>l</sub> ) with Adjustable Long Delay Time (I <sup>2</sup> t or I <sup>4</sup> t Response)②<br>S – Adjustable Short Delay Pickup with Adjustable Short Delay Time (I <sup>2</sup> t or Flat Response)<br>I – Adjustable Instantaneous Pickup<br>G – Adjustable Ground Fault Pickup with Adjustable Ground Fault Time (I <sup>2</sup> t or Flat Response)<br>A – Adjustable Ground Fault Alarm with Adjustable Ground Fault Time (I <sup>2</sup> t or Flat Response) |      |      |           |      |            |      | Ampere Rating                   | Fixed Rating Plug |
|                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |      |      |           |      |            |      |                                 |                   |
|                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |      |      |           |      |            |      |                                 |                   |
|                                         | OPTIM 550                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |      |      | OPTIM 750 |      | OPTIM 1050 |      |                                 |                   |
|                                         | LSI                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | LSIG | LSIA | LSIG      | LSIA | LSIG       | LSIA |                                 |                   |
| Catalog Number                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |      |      |           |      |            |      |                                 |                   |

## 3-Pole Standard Interrupting Capacity 600 Volt Ac Rated 35 kAIC @ 480 Vac

|     |             |             |             |             |             |              |              |                                        |                                                                                   |
|-----|-------------|-------------|-------------|-------------|-------------|--------------|--------------|----------------------------------------|-----------------------------------------------------------------------------------|
| 125 | –           | –           | –           | CLD3125T76W | CLD3125T77W | CLD3125T106W | CLD3125T107W | 70<br>90<br>100<br>110<br>125          | ORPL125A07<br>ORPL125A09<br>ORPL125A10<br>ORPL125A11<br>ORPL125A125               |
| 250 | –           | –           | –           | CLD3250T76W | CLD3250T77W | CLD3250T106W | CLD3250T107W | 125<br>150<br>175<br>200<br>225<br>250 | ORPL025A12<br>ORPL025A15<br>ORPL025A17<br>ORPL025A20<br>ORPL025A22<br>ORPL025A250 |
| 400 | CLD3400T52W | CLD3400T56W | CLD3400T57W | CLD3400T76W | CLD3400T77W | CLD3400T106W | CLD3400T107W | 200<br>225<br>250<br>300<br>350<br>400 | ORPL40A200<br>ORPL40A225<br>ORPL40A250<br>ORPL40A300<br>ORPL40A350<br>ORPL40A400  |
| 600 | CLD3600T52W | CLD3600T56W | CLD3600T57W | CLD3600T76W | CLD3600T77W | CLD3600T106W | CLD3600T107W | 300<br>350<br>400<br>500<br>600        | ORPL60A300<br>ORPL60A350<br>ORPL60A400<br>ORPL60A500<br>ORPL60A600                |

## 3-Pole High Interrupting Capacity 600 Volt Ac Rated 65 kAIC @ 480 Vac

|     |              |              |              |              |              |               |               |                                        |                                                                                        |
|-----|--------------|--------------|--------------|--------------|--------------|---------------|---------------|----------------------------------------|----------------------------------------------------------------------------------------|
| 125 | –            | –            | –            | CHLD3125T76W | CHLD3125T77W | CHLD3125T106W | CHLD3125T107W | 70<br>90<br>100<br>110<br>125          | ORPL125A070<br>ORPL125A090<br>ORPL125A100<br>ORPL125A110<br>ORPL125A125                |
| 250 | –            | –            | –            | CHLD3250T76W | CHLD3250T77W | CHLD3250T106W | CHLD3250T107W | 125<br>150<br>175<br>200<br>225<br>250 | ORPL025A125<br>ORPL025A150<br>ORPL025A175<br>ORPL025A200<br>ORPL025A225<br>ORPL025A250 |
| 400 | CHLD3400T52W | CHLD3400T56W | CHLD3400T57W | CHLD3400T76W | CHLD3400T77W | CHLD3400T106W | CHLD3400T107W | 200<br>225<br>250<br>300<br>350<br>400 | ORPL40A200<br>ORPL40A225<br>ORPL40A250<br>ORPL40A300<br>ORPL40A350<br>ORPL40A400       |
| 600 | CHLD3600T52W | CHLD3600T56W | CHLD3600T57W | CHLD3600T76W | CHLD3600T77W | CHLD3600T106W | CHLD3600T107W | 300<br>350<br>400<br>500<br>600        | ORPL60A300<br>ORPL60A350<br>ORPL60A400<br>ORPL60A500<br>ORPL60A600                     |

Instruction Leaflet/FRED Number 29C105 for Breaker; 29C891 for OPTIM Trip Unit

① One Form C auxiliary switch and one Form C bell alarm switch supplied with breaker as standard, on models 750 and 1050.

② Long delay  $I^4t$  response selection limits short delay time to flat response.



# Molded Case Circuit Breakers 125-600 Amperes

Cutler-Hammer

March 1999

## Series C® L-Frame

## 100% Rated Digitrip OPTIM<sup>①</sup> Electronic Circuit Breaker with Interchangeable Rating Plug

Order as individual components: Breaker Frame (which includes Trip Unit), Rating Plug, Terminals.

|                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |      |      |           |      |            |      |                                 |                   |
|-----------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|------|-----------|------|------------|------|---------------------------------|-------------------|
| Maximum Continuous Ampere Rating @ 40°C | Circuit Breaker Frame Only                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |      |      |           |      |            |      | Digitrip OPTIM Rating Plug Only |                   |
|                                         | L – Adjustable Long Delay Pickup (I <sub>L</sub> ) with Adjustable Long Delay Time (I <sup>2</sup> t or I <sup>4</sup> t Response)②<br>S – Adjustable Short Delay Pickup with Adjustable Short Delay Time (I <sup>2</sup> t or Flat Response)<br>I – Adjustable Instantaneous Pickup<br>G – Adjustable Ground Fault Pickup with Adjustable Ground Fault Time (I <sup>2</sup> t or Flat Response)<br>A – Adjustable Ground Fault Alarm with Adjustable Ground Fault Time (I <sup>2</sup> t or Flat Response) |      |      |           |      |            |      | Ampere Rating                   | Fixed Rating Plug |
|                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |      |      |           |      |            |      |                                 |                   |
|                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |      |      |           |      |            |      |                                 |                   |
|                                         | OPTIM 550                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |      |      | OPTIM 750 |      | OPTIM 1050 |      |                                 |                   |
|                                         | LSI                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | LSIG | LSIA | LSIG      | LSIA | LSIG       | LSIA |                                 |                   |
| Catalog Number                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |      |      |           |      |            |      |                                 |                   |

### 3-Pole Ultra High Interrupting Capacity Current Limiting 600 Volt Ac Rated 100 kAIC @ 480 Vac

|     |              |              |              |              |              |               |               |                                        |                                                                                        |
|-----|--------------|--------------|--------------|--------------|--------------|---------------|---------------|----------------------------------------|----------------------------------------------------------------------------------------|
| 125 | –            | –            | –            | CLDC3125T76W | CLDC3125T77W | CLDC3125T106W | CLDC3125T107W | 70<br>90<br>100<br>110<br>125          | ORPL125A070<br>ORPL125A090<br>ORPL125A100<br>ORPL125A110<br>ORPL125A125                |
| 250 | –            | –            | –            | CLDC3250T76W | CLDC3250T77W | CLDC3250T106W | CLDC3250T107W | 125<br>150<br>175<br>200<br>225<br>250 | ORPL025A125<br>ORPL025A150<br>ORPL025A175<br>ORPL025A200<br>ORPL025A225<br>ORPL025A250 |
| 400 | CLDC3400T52W | CLDC3400T56W | CLDC3400T57W | CLDC3400T76W | CLDC3400T77W | CLDC3400T106W | CLDC3400T107W | 200<br>225<br>250<br>300<br>350<br>400 | ORPL40A200<br>ORPL40A225<br>ORPL40A250<br>ORPL40A300<br>ORPL40A350<br>ORPL40A400       |
| 600 | CLDC3600T52W | CLDC3600T56W | CLDC3600T57W | CLDC3600T76W | CLDC3600T77W | CLDC3600T106W | CLDC3600T107W | 300<br>350<br>400<br>500<br>600        | ORPL60A300<br>ORPL60A350<br>ORPL60A400<br>ORPL60A500<br>ORPL60A600                     |

Instruction Leaflet/FRED Number 29C105 for Breaker; 29C891 for OPTIM Trip Unit

① One Form C auxiliary switch and one Form C bell alarm switch supplied with breaker as standard, on models 750 and 1050.

② Long delay  $I^4t$  response selection limits short delay time to flat response.



## Series C® L-Frame

## Catalog Numbering System

This information is presented only as an aid to understanding catalog numbers. It is not to be used to build catalog numbers for circuit breakers or trip units.

### Circuit Breaker/Frame Catalog Number

| Circuit Breaker/Frame Type | Number of Poles | Circuit Breaker/Frame Ampere Rating | Suffix                                     |
|----------------------------|-----------------|-------------------------------------|--------------------------------------------|
| LDB                        | 2: 2 Poles      | 300                                 | C: Copper Terminals                        |
| LD                         | 3: 3 Poles      | 350                                 | F: Frame Only                              |
| HLD                        | 4: 4 Poles      | 400                                 | K: High Magnetic Molded Case Switch        |
| LDC                        |                 | 450                                 | V: 50°C (Thermal-Magnetic Trip Units Only) |
| CLD                        |                 | 500                                 | W: Without Terminals                       |
| CHLD                       |                 | 600                                 | X: Load Side Terminals Only                |
| CLDC                       |                 |                                     | Y: Line Side Terminals Only                |

### Thermal-Magnetic Trip Unit Catalog Number

| Trip Unit Type       | Number of Poles | Trip Unit/Rating Plug Ampere Rating | Suffix                                                 |
|----------------------|-----------------|-------------------------------------|--------------------------------------------------------|
| LT: Thermal-Magnetic | 2: 2 Poles      | 300                                 | T: Trip Unit                                           |
|                      | 3: 3 Poles      | 350                                 | Thermal-Magnetic                                       |
|                      | 4: 4 Poles      | 400                                 | Fixed Thermal                                          |
|                      |                 | 450                                 | Adjustable Magnetic                                    |
|                      |                 | 500                                 | V: 50°C Calibration (Thermal-Magnetic Trip Units Only) |
|                      |                 | 600                                 |                                                        |

### OPTIM Circuit Breaker/Frame Catalog Number

| Circuit Breaker/Frame Type | Number of Poles | Circuit Breaker/Frame Ampere Rating        | Trip Model       | Trip Type | Suffix               |
|----------------------------|-----------------|--------------------------------------------|------------------|-----------|----------------------|
| LD                         | 3: 3 Poles      | 125                                        | T5 – Model 550   | 2 – LSI   | W: Without Terminals |
| HLD                        |                 | (Available on Model 750 and 1050 only)     | T7 – Model 750   | 6 – LSG   |                      |
| LDC                        |                 |                                            | T10 – Model 1050 | 7 – LSIA  |                      |
| CLD                        |                 | 250 (Available on Model 750 and 1050 only) |                  |           |                      |
| CHLD                       |                 | 400                                        |                  |           |                      |
| CLDC                       |                 | 600                                        |                  |           |                      |

### Digitrip RMS 310 Trip Unit Catalog Number

| Trip Unit Type  | Number of Poles | Trip Unit Ampere Rating | Suffix | Suffix                                        |
|-----------------|-----------------|-------------------------|--------|-----------------------------------------------|
| LES: Electronic | 3: 3 Poles      | 600                     | LS     | P: 100% Protected Neutral on 4-Pole Trip Unit |
|                 | 4: 4 Poles      |                         | LSI    |                                               |
|                 |                 |                         | LSG    |                                               |
|                 |                 |                         | LSIG   |                                               |

## Dimensions/Weights

### Dimensions, Inches (mm)

| Number of Poles | Width         | Height         | Depth          |
|-----------------|---------------|----------------|----------------|
| 2, 3            | 8.25<br>(210) | 10.75<br>(274) | 4.062<br>(103) |
| 4               | 11<br>(279)   | 10.75<br>(274) | 4.062<br>(103) |

### Approximate Shipping Weight, Lbs. (kg)

| Breaker Type | Complete Breaker |               |                | Frame Only    |               |               | Trip Unit    |              |              |
|--------------|------------------|---------------|----------------|---------------|---------------|---------------|--------------|--------------|--------------|
|              | Number of Poles  |               |                |               |               |               |              |              |              |
|              | 2                | 3             | 4              | 2             | 3             | 4             | 2            | 3            | 4            |
| LD, HLD, LDC | 18<br>(8.172)    | 20<br>(9.080) | 25<br>(11.340) | 14<br>(6.356) | 15<br>(6.810) | 20<br>(9.072) | 3<br>(1.361) | 4<br>(1.814) | 5<br>(2.268) |
| LDB          | 18<br>(8.172)    | 20<br>(9.080) | 25<br>(11.340) | –             | –             | –             | –            | –            | –            |

## Series C® L-Frame

## Allowable Accessory Combinations

Different combinations of accessories can be supplied, depending on the types of accessories and the number of poles in the circuit breaker.

|                                                              | Reference<br>Page |  | 2-Pole①, 3-Pole |        |       |  | 4-Pole |        |       |       |
|--------------------------------------------------------------|-------------------|--|-----------------|--------|-------|--|--------|--------|-------|-------|
|                                                              |                   |  | Left            | Center | Right |  | Left   | Center | Right | Neu.② |
| Internal Accessories (Only One Internal Accessory Per Pole)③ |                   |  |                 |        |       |  |        |        |       |       |
| Alarm Lockout (Make/Break)                                   | 140               |  | ■               |        | ■     |  | ■      |        | ■     |       |
| Alarm Lockout (2Make/2Break)                                 | 140               |  | ■               |        | ■     |  | ■      |        | ■     |       |
| Auxiliary Switch (1A, 1B)                                    | 143               |  | ■               |        | ■     |  | ■      |        | ■     |       |
| Auxiliary Switch (2A, 2B)                                    | 143               |  | ■               |        | ■     |  | ■      |        | ■     |       |
| Auxiliary Switch (3A, 3B)                                    | 143               |  | ■               |        | ■     |  | ■      |        | ■     |       |
| Auxiliary Switch (1A, 1B) and Alarm Switch Combination       | 146               |  | ■               |        | ■     |  | ■      |        | ■     |       |
| Auxiliary Switch (2A, 2B) and Alarm Switch Combination       | 146               |  | ■               |        | ■     |  | ■      |        | ■     |       |
| Shunt Trip – Standard④                                       | 149               |  | ■               |        | ■     |  | ■      |        | ■     |       |
| Shunt Trip – Low Energy④                                     | 152               |  | ■               |        | ■     |  | ■      |        | ■     |       |
| Undervoltage Release Mechanism④                              | 157               |  | ■               |        | ■     |  | ■      |        | ■     |       |
| Cutler-Hammer PowerNet Communications Kit (OPTIM 550)        | 160               |  |                 |        | ■     |  |        |        |       |       |

**External Accessories**

|                                                |     |  |   |   |   |  |   |   |   |  |
|------------------------------------------------|-----|--|---|---|---|--|---|---|---|--|
| End Cap Kit                                    | 161 |  |   | ● |   |  |   | ● |   |  |
| Control Wire Terminal Kit                      | 162 |  |   | ● |   |  |   | ● |   |  |
| Base Mounting Hardware                         | 163 |  |   | ● |   |  |   | ● |   |  |
| Terminal Shields                               | 165 |  |   | ● |   |  |   | ● |   |  |
| Interphase Barriers                            | 166 |  |   | ● |   |  |   | ● |   |  |
| Non-Padlockable Handle Block                   | 168 |  |   | ■ |   |  |   | ■ |   |  |
| Padlockable Handle Lock Hasp                   | 169 |  | □ |   | □ |  | □ |   | □ |  |
| Key Interlock Kit                              | 170 |  | □ |   | □ |  | □ |   | □ |  |
| Sliding Bar Interlock – Requires Two Breakers  | 171 |  |   | ● |   |  |   | ● |   |  |
| Walking Beam Interlock – Requires Two Breakers | 171 |  |   | ● |   |  |   | ● |   |  |
| Electrical (Motor) Operator                    | 173 |  |   | ● |   |  |   | ● |   |  |
| Plug-in Adapters                               | 174 |  |   | ● |   |  |   | ● |   |  |
| Rear Connecting Studs                          | 176 |  |   | ● |   |  |   | ● |   |  |
| Panelboard Connecting Straps                   | 177 |  |   | ● |   |  |   | ● |   |  |
| Handle Mechanisms                              | 178 |  |   | ● |   |  |   | ● |   |  |
| Door Hardware/Accessories                      | 182 |  |   | ● |   |  |   | ● |   |  |
| Handle Extension                               | 182 |  |   | ● |   |  |   | ● |   |  |
| Solid-State (Electronic) Portable Test Kit     | 184 |  |   | ● |   |  |   | ● |   |  |

**OPTIM System Components 3-Poles**

|                                 |     |  |  |  |  |  |  |  |  |  |
|---------------------------------|-----|--|--|--|--|--|--|--|--|--|
| Ground Fault Alarm Unit         | 184 |  |  |  |  |  |  |  |  |  |
| Potential Transformer Module    | 184 |  |  |  |  |  |  |  |  |  |
| Breaker Interface Module (BIM)  | 185 |  |  |  |  |  |  |  |  |  |
| Digitrip OPTIMizer              | 185 |  |  |  |  |  |  |  |  |  |
| Auxiliary Power Module          | 185 |  |  |  |  |  |  |  |  |  |
| Cutler-Hammer PowerNet Software | 185 |  |  |  |  |  |  |  |  |  |

**Modifications (Refer to Cutler-Hammer)**

|                                |     |  |  |   |  |  |  |   |  |  |
|--------------------------------|-----|--|--|---|--|--|--|---|--|--|
| Special Calibration            | 186 |  |  | ● |  |  |  | ● |  |  |
| Moisture Fungus Treatment      | 186 |  |  | ● |  |  |  | ● |  |  |
| Freeze-Tested Circuit Breakers | 186 |  |  | ● |  |  |  | ● |  |  |
| Marine Application             | 186 |  |  | ● |  |  |  | ● |  |  |

■ Applicable in indicated pole position

□ May be mounted on left or right pole – not both

● Accessory available/Modification available

① 2-pole breaker supplied in 3-pole frame. Current carrying parts omitted from center pole.

② Refer to Cutler-Hammer for appropriate neutral pole accessory combinations.

③ OPTIM models 750 and 1050 are factory sealed and do not have the right pole space available for accessories.

④ Shunt trip and UVR cannot be mounted in right poles on LES trip units.



## Series C® M-Frame



Typical Series C M-Frame Circuit Breaker

- All Series C M-frame circuit breakers are HACR rated.
- MDL-frame circuit breakers are available as individual components (Frame, Trip Unit, Terminals), or factory assembled complete breakers.
- M-frame circuit breakers with non-interchangeable trip units are suitable for reverse feed use.

## Interrupting Capacity Ratings

UL489/CSA Interrupting Capacity Ratings<sup>①</sup>

| Circuit Breaker Type | Number of Poles | Interrupting Capacity (Symmetrical Amperes) (kA) |     |     |                        | Page Number |
|----------------------|-----------------|--------------------------------------------------|-----|-----|------------------------|-------------|
|                      |                 | Volts Ac (50/60 Hz)                              |     |     | Volts Dc <sup>②③</sup> |             |
|                      |                 | 240                                              | 480 | 600 | 250                    |             |
| MDL                  | 2, 3            | 65                                               | 50  | 25  | 22                     | 69, 70      |
| CMDL                 | 2, 3            | 65                                               | 50  | 25  | 22                     | 70          |
| HMDL                 | 2, 3            | 100                                              | 65  | 35  | 25                     | 69, 70      |
| CHMDL                | 2, 3            | 100                                              | 65  | 35  | 25                     | 70          |

IEC 947-2 Interrupting Capacity Ratings<sup>①</sup>

| Circuit Breaker Type | Number of Poles | Interrupting Capacity – RMS Symmetrical Amperes (kA) $I_{CU} = I_{CS}$ |     |     |                        | Page Number |
|----------------------|-----------------|------------------------------------------------------------------------|-----|-----|------------------------|-------------|
|                      |                 | Volts Ac (50/60 Hz)                                                    |     |     | Volts Dc <sup>②③</sup> |             |
|                      |                 | 240                                                                    | 480 | 600 | 250                    |             |
| MDL                  | 2, 3            | 85                                                                     | 50  | 20  | 20                     | 69, 70      |
| CMDL                 | 2, 3            | 85                                                                     | 50  | 20  | 20                     | 70          |
| HMDL                 | 2, 3            | 100                                                                    | 65  | 25  | 20                     | 69, 70      |
| CHMDL                | 2, 3            | 100                                                                    | 65  | 25  | 20                     | 70          |

① Utilization category A circuit breakers.

② Two poles or two poles of 3-pole circuit breaker. Thermal-magnetic trip units only, MDL, HMDL breakers with electronic trip unit are not DC rated.

③ Time constant is 3 milliseconds minimum at 10 kA and 8 milliseconds at 22 kA.

## Series C® M-Frame

### MDL-Frame Digitrip Selection Guide

| Trip Unit Type                               |  | Digitrip RMS 310             |                              |
|----------------------------------------------|--|------------------------------|------------------------------|
| RMS Sensing                                  |  | Yes                          |                              |
| Breaker Type                                 |  |                              |                              |
| Frame                                        |  | MDL                          |                              |
| Ampere Range                                 |  | 400-800A                     |                              |
| Interrupting Rating @ 480V                   |  | 50, 65 (kA)                  |                              |
| Protection                                   |  |                              |                              |
| Ordering Options                             |  | LS, LSG                      | LSI, LSIG                    |
| Fixed Rated Plug (I <sub>n</sub> )           |  | Yes                          | Yes                          |
| Overtemperature Trip                         |  | Yes                          | Yes                          |
| Long Delay Protection (L)                    |  |                              |                              |
| Adjustable Rating Plug (I <sub>n</sub> )     |  | Yes                          | Yes                          |
| Long Delay Pickup                            |  | 0.5-1.0 (I <sub>n</sub> ) ①  | 0.5-1.0 (I <sub>n</sub> ) ①  |
| Long Delay Time I <sup>2</sup> T             |  | 12 Seconds                   | 12 Seconds                   |
| Long Delay Time I <sup>4</sup> T             |  | No                           | No                           |
| Long Delay Thermal Memory                    |  | Yes                          | Yes                          |
| High Load Alarm                              |  | No                           | No                           |
| Short Delay Protection (S)                   |  |                              |                              |
| Short Delay Pickup                           |  | 200-800% x (I <sub>n</sub> ) | 200-800% x (I <sub>n</sub> ) |
| Short Delay Time I <sup>2</sup> T            |  | 100 ms                       | No                           |
| Short Delay Time Flat                        |  | No                           | Inst-300 ms                  |
| Short Delay Time Zone Selective Interlocking |  | No                           | No                           |
| Instantaneous Protection (I)                 |  |                              |                              |
| Instantaneous Pickup                         |  | No                           | 200-800% x (I <sub>n</sub> ) |
| Discriminator                                |  | No                           | No                           |
| Instantaneous Override                       |  | Yes                          | Yes                          |
| Ground Fault Protection (G)                  |  |                              |                              |
| Ground Fault Alarm                           |  | No                           | No                           |
| Ground Fault Pickup                          |  | Varies by Frame              | Varies by Frame              |
| Ground Fault Delay I <sup>2</sup> T          |  | No                           | No                           |
| Ground Fault Delay Flat                      |  | Inst-500 ms                  | Inst-500 ms                  |
| Ground Fault Zone Selective Interlocking     |  | No                           | No                           |
| Ground Fault Thermal Memory                  |  | Yes                          | Yes                          |
| System Diagnostics                           |  |                              |                              |
| Status LEDs                                  |  | Yes                          | Yes                          |
| Cause of Trip LEDs                           |  | No                           | No                           |
| Magnitude of Trip Information                |  | No                           | No                           |
| Remote Signal Contacts – Ground Alarm        |  | Yes                          | Yes                          |
| System Monitoring                            |  |                              |                              |
| Digital Display                              |  | No                           | No                           |
| Current                                      |  | No                           | No                           |
| Power and Energy                             |  | No                           | No                           |
| Power Quality – Harmonics                    |  | No                           | No                           |
| Power Factor                                 |  | No                           | No                           |
| Communications                               |  |                              |                              |
| Cutler-Hammer PowerNet                       |  | No                           | No                           |
| Testing                                      |  |                              |                              |
| Testing Method                               |  | Test Set                     |                              |

① Adjust by rating plug.

 $I_n$  = Rating Plug

**Series C® M-Frame****Types MDL and HMDL Thermal-Magnetic Circuit Breakers with Interchangeable Trip Units**

|                                         |                                                                         |            |                                                                         |            |                                                                                                                                                                        |                                                                        |
|-----------------------------------------|-------------------------------------------------------------------------|------------|-------------------------------------------------------------------------|------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------|
| Maximum Continuous Ampere Rating @ 40°C | Standard Interrupting Capacity<br>600 Vac Rated<br>50 kAIC @ 480 Vac    |            | High Interrupting Capacity<br>600 Vac Rated<br>65 kAIC @ 480 Vac        |            | Thermal Magnetic Trip Unit Only                                                                                                                                        | Standard Terminals Only ①<br><br>See Page 72 for<br>Optional Terminals |
|                                         | Factory Assembled Circuit Consisting of Frame, Trip Unit, and Terminals | Frame Only | Factory Assembled Circuit Consisting of Frame, Trip Unit, and Terminals | Frame Only | For Use With: Standard or High or Ultra High Interrupting Frames<br><br>Magnetic Trip Range is 5-10 up through 600A;<br>4-8 on 700 and 800A x Continuous Ampere Rating |                                                                        |
|                                         | Catalog Number                                                          |            |                                                                         |            |                                                                                                                                                                        |                                                                        |

**2-Pole**

|     |         |          |          |           |         |          |
|-----|---------|----------|----------|-----------|---------|----------|
| 300 | MDL2300 | MDL2800F | HMDL2300 | HMDL2800F | MT2300T | TA700MA1 |
| 350 | MDL2350 |          | HMDL2350 |           | MT2350T | TA700MA1 |
| 400 | MDL2400 |          | HMDL2400 |           | MT2400T | TA700MA1 |
| 450 | MDL2450 |          | HMDL2450 |           | MT2450T | TA700MA1 |
| 500 | MDL2500 |          | HMDL2500 |           | MT2500T | TA700MA1 |
| 600 | MDL2600 |          | HMDL2600 |           | MT2600T | TA700MA1 |
| 700 | MDL2700 |          | HMDL2700 |           | MT2700T | TA700MA1 |
| 800 | MDL2800 |          | HMDL2800 |           | MT2800T | TA800MA2 |

**3-Pole**

|     |         |          |          |           |         |          |
|-----|---------|----------|----------|-----------|---------|----------|
| 300 | MDL3300 | MDL3800F | HMDL3300 | HMDL3800F | MT3300T | TA700MA1 |
| 350 | MDL3350 |          | HMDL3350 |           | MT3350T | TA700MA1 |
| 400 | MDL3400 |          | HMDL3400 |           | MT3400T | TA700MA1 |
| 450 | MDL3450 |          | HMDL3450 |           | MT3450T | TA700MA1 |
| 500 | MDL3500 |          | HMDL3500 |           | MT3500T | TA700MA1 |
| 600 | MDL3600 |          | HMDL3600 |           | MT3600T | TA700MA1 |
| 700 | MDL3700 |          | HMDL3700 |           | MT3700T | TA700MA1 |
| 800 | MDL3800 |          | HMDL3800 |           | MT3800T | TA800MA2 |

Instruction Leaflet/FRED Number 29C111 for Breaker

**Types MDLB and HMDLB Thermal-Magnetic Circuit Breakers with Non-Interchangeable Trip Units**

|                                               |                                                                               |                                                                               |                                                                        |
|-----------------------------------------------|-------------------------------------------------------------------------------|-------------------------------------------------------------------------------|------------------------------------------------------------------------|
| Maximum Continuous<br>Ampere Rating<br>@ 40°C | Standard Interrupting Capacity<br>600 Vac Rated<br>50 kAIC @ 480 Vac          | High Interrupting Capacity<br>600 Vac Rated<br>50 kAIC @ 480 Vac              | Standard Terminals Only ①<br><br>See Page 72 for<br>Optional Terminals |
|                                               | Factory Assembled Circuit<br>Consisting of Frame, Trip Unit,<br>and Terminals | Factory Assembled Circuit<br>Consisting of Frame, Trip Unit,<br>and Terminals |                                                                        |
|                                               | Catalog Number                                                                |                                                                               |                                                                        |

**2-Pole**

|     |          |           |          |
|-----|----------|-----------|----------|
| 300 | MDLB2300 | HMDLB2300 | TA700MA1 |
| 350 | MDLB2350 | HMDLB2350 | TA700MA1 |
| 400 | MDLB2400 | HMDLB2400 | TA700MA1 |
| 450 | MDLB2450 | HMDLB2450 | TA700MA1 |
| 500 | MDLB2500 | HMDLB2500 | TA700MA1 |
| 600 | MDLB2600 | HMDLB2600 | TA700MA1 |
| 700 | MDLB2700 | HMDLB2700 | TA700MA1 |
| 800 | MDLB2800 | HMDLB2800 | TA800MA2 |

**3-Pole**

|     |          |           |          |
|-----|----------|-----------|----------|
| 300 | MDLB3300 | HMDLB3300 | TA700MA1 |
| 350 | MDLB3350 | HMDLB3350 | TA700MA1 |
| 400 | MDLB3400 | HMDLB3400 | TA700MA1 |
| 450 | MDLB3450 | HMDLB3450 | TA700MA1 |
| 500 | MDLB3500 | HMDLB3500 | TA700MA1 |
| 600 | MDLB3600 | HMDLB3600 | TA700MA1 |
| 700 | MDLB3700 | HMDLB3700 | TA700MA1 |
| 800 | MDLB3800 | HMDLB3800 | TA800MA2 |

Instruction Leaflet/FRED Number 29C111 for Breaker

① Two terminals are required per pole.



# Molded Case Circuit Breakers 300-800 Amperes

Cutler-Hammer

March 1999

## Series C® M-Frame

### Types MDL and HMDL Electronic Circuit Breakers with Interchangeable Trip Units

Order as Individual Components: Breaker Frame, Trip Unit, Rating Plug, Terminals.

| Maximum Continuous Ampere Rating @ 40°C① | Circuit Breaker Frame Only                                                 |                                                                        | Digitrip RMS 310 Trip Unit Only②                                                                                                                                                                                                                                                                                                                                         |               | Digitrip RMS 310 Rating Plug Only |                              |  | Terminals |
|------------------------------------------|----------------------------------------------------------------------------|------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|-----------------------------------|------------------------------|--|-----------|
|                                          | Standard Interrupting Capacity<br>600 Vac<br>Rated<br>35 kAIC @<br>480 Vac | High Interrupting Capacity<br>600 Vac<br>Rated<br>65 kAIC @<br>480 Vac | L – Adjustable Long Delay Pickup (by Adjustable Rating Plug)<br>S – Adjustable Short Delay Pickup with Fixed Short Delay Time (I²t Response) or Adjustable Short Delay Time (Flat Response)<br>I – Adjustable Instantaneous Pickup by Setting Short Delay Time to Instantaneous<br>G – Adjustable Ground Fault Pickup with Adjustable Ground Fault Delay (Flat Response) | Ampere Rating | Fixed Rating Plug                 | Adjustable Rating Plugs      |  |           |
|                                          |                                                                            |                                                                        |                                                                                                                                                                                                                                                                                                                                                                          |               |                                   | Ampere Rating Catalog Number |  |           |
|                                          |                                                                            |                                                                        |                                                                                                                                                                                                                                                                                                                                                                          |               |                                   | Catalog Number               |  |           |

#### 3-Pole

|     |          |           |                                                      |                                 |                                                          |                              |                                                 |
|-----|----------|-----------|------------------------------------------------------|---------------------------------|----------------------------------------------------------|------------------------------|-------------------------------------------------|
| 800 | MDL3800F | HMDL3800F | MES3800LS<br>MES3800LSI<br>MES3800LSG<br>MES3800LSIG | 400<br>500<br>600<br>700<br>800 | 8MES400T<br>8MES500T<br>8MES600T<br>8MES700T<br>8MES800T | 400/500/600/800<br>A8MES800T | See Page 72 for Standard and Optional Terminals |
|-----|----------|-----------|------------------------------------------------------|---------------------------------|----------------------------------------------------------|------------------------------|-------------------------------------------------|

Instruction Leaflet/FRED Number 29C111 for Breaker; 29C615 for MES Trip Unit

### Types MDLB and HMDLB Electronic Circuit Breakers with Non-Interchangeable Trip Units

| Maximum Continuous Ampere Rating @ 40°C <sup>①</sup> | Factory Assembled Circuit Breaker Consisting of Frame and Trip Unit |     |     |      |
|------------------------------------------------------|---------------------------------------------------------------------|-----|-----|------|
|                                                      | LS                                                                  | LSI | LSG | LSIG |
|                                                      | Catalog Number                                                      |     |     |      |

#### 3-Pole Standard Interrupting Capacity 600 Vac Rated 50 kAIC @ 480 Vac

|     |              |              |              |              |
|-----|--------------|--------------|--------------|--------------|
| 800 | MDLB3800T33W | MDLB3800T32W | MDLB3800T35W | MDLB3800T36W |
|-----|--------------|--------------|--------------|--------------|

#### 3-Pole High Interrupting Capacity 600 Vac Rated 65 kAIC @ 480 Vac

|     |               |               |               |               |
|-----|---------------|---------------|---------------|---------------|
| 800 | HMDLB3800T33W | HMDLB3800T32W | HMDLB3800T35W | HMDLB3800T36W |
|-----|---------------|---------------|---------------|---------------|

Instruction Leaflet/FRED Number 29C111 for Breaker; 29C615 for MES Trip Unit

### 100% Rated Types CMDL and CHMDL Electronic Circuit Breakers with Non-Interchangeable Trip Units

The NEC allows the breaker to be rated at 100% of its frame size in an assembly, provided that 90°C wire is applied at the 75°C ampacity. All 100% rated circuit breakers have electronic trip units. Order as individual components: breaker frame, trip unit, rating plug and terminals.

| Maximum Continuous Ampere Rating @ 40°C① | Circuit Breaker Frame Only                       |                                              | Digitrip RMS 310 Trip Unit Only②                                  |                                                                              |                                                                                           |                                                                        | Digitrip RMS 310 Trip Unit Only |                   |                              | Terminals |
|------------------------------------------|--------------------------------------------------|----------------------------------------------|-------------------------------------------------------------------|------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------|------------------------------------------------------------------------|---------------------------------|-------------------|------------------------------|-----------|
|                                          | Standard Interrupting Capacity 50 kAIC @ 480 Vac | High Interrupting Capacity 50 kAIC @ 480 Vac | Standard                                                          | Options                                                                      |                                                                                           |                                                                        | Ampere Rating                   | Fixed Rating Plug | Adjustable Rating Plug       |           |
|                                          |                                                  |                                              | Adjustable Short Time Delay with 1 <sup>st</sup> Short Delay Ramp | Independently Adjustable Short Time Pickup and Delay Ground Fault Protection | Adjustable Short Time Pickup with 1 <sup>st</sup> Short Delay and Ground Fault Protection | Independently Adjustable Short Time Pickup and Ground Fault Protection |                                 |                   | Ampere Rating Catalog Number |           |
|                                          |                                                  |                                              | Catalog Number                                                    |                                                                              |                                                                                           |                                                                        |                                 |                   |                              |           |

#### 3-Pole

|     |           |            |           |            |            |             |                                 |                                                          |                              |                                                 |
|-----|-----------|------------|-----------|------------|------------|-------------|---------------------------------|----------------------------------------------------------|------------------------------|-------------------------------------------------|
| 800 | CMDL3800F | CHMDL3800F | MES3800LS | MES3800LSI | MES3800LSG | MES3800LSIG | 400<br>500<br>600<br>700<br>800 | 8MES400T<br>8MES500T<br>8MES600T<br>8MES700T<br>8MES800T | 400/500/600/800<br>A8MES800T | See Page 72 for Standard and Optional Terminals |
|-----|-----------|------------|-----------|------------|------------|-------------|---------------------------------|----------------------------------------------------------|------------------------------|-------------------------------------------------|

Instruction Leaflet/FRED Number 29C111 for Breaker; 29C615 for MES Trip Unit

① Ampere rating is established by rating plug.

② For Ac use only.

**Molded Case Switches**

Molded case switches are used as compact switches in applications requiring high current switching capabilities. Molded case switches are constructed of circuit breaker components and are of the high instantaneous automatic type. Molded case switches are listed in accordance with Underwriters Laboratories, Inc., Standard UL 1087.

|                                               |                                                         |
|-----------------------------------------------|---------------------------------------------------------|
| Maximum Continuous<br>Ampere Rating<br>@ 40°C | 600 Vac Maximum,<br>250 Vdc                             |
|                                               | Circuit Breaker Only without Line and<br>Load Terminals |
|                                               | Catalog Number                                          |

**2-Pole**

|     |           |
|-----|-----------|
| 800 | MDL2800WK |
|-----|-----------|

**3-Pole**

|     |           |
|-----|-----------|
| 800 | MDL3800WK |
|-----|-----------|

**Note:** Molded case switch may trip above  
6000 amperes.

Instruction Leaflet/FRED Number 29C111

Series C® M-Frame

Line and Load Terminals

M-Frame circuit breakers use Cu/Al terminals as standard. When optional copper or Cu/Al terminals are required, order by catalog number. Specify if factory installation is required.

Line and Load Terminals

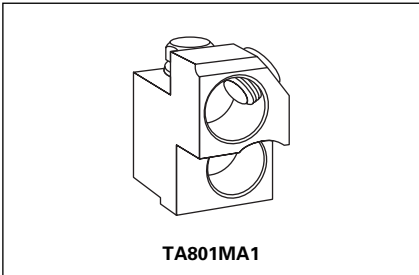
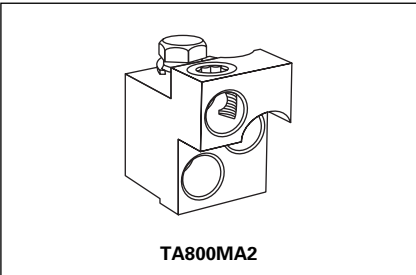
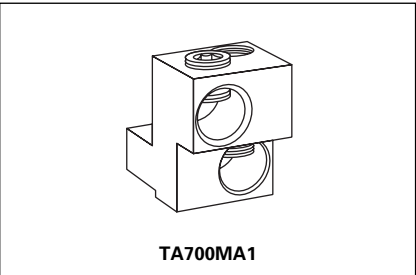
| Maximum Breaker Amperes | Terminal Body Material | Wire Type | AWG Wire Range/ No. Conductors | Terminal Catalog Number | Terminals with Control Wire Termination Catalog Number |
|-------------------------|------------------------|-----------|--------------------------------|-------------------------|--------------------------------------------------------|
|-------------------------|------------------------|-----------|--------------------------------|-------------------------|--------------------------------------------------------|

Standard Cu/Al Pressure Terminals

|     |          |       |                   |          |             |
|-----|----------|-------|-------------------|----------|-------------|
| 600 | Aluminum | Cu/Al | (2) #1-500 kcmil  | TA700MA1 | TA700MA1CWT |
| 800 | Aluminum | Cu/Al | (3) 3/0-400 kcmil | TA800MA2 | TA800MA2CWT |
| 800 | Aluminum | Cu/Al | (2) 500-750 kcmil | TA801MA  | TA801MACWT  |

Optional Copper and Cu/Al Pressure Type Terminals

|     |        |    |                   |         |   |
|-----|--------|----|-------------------|---------|---|
| 600 | Copper | Cu | (2) 2/0-500 kcmil | T600MA1 | — |
| 800 | Copper | Cu | (3) 3/0-300 kcmil | T800MA1 | — |



## Catalog Numbering System

This information is presented only as an aid to understanding catalog numbers. It is not to be used to build catalog numbers for circuit breakers or trip units.

### Circuit Breaker/Frame Catalog Number

| MDL 3 800 F                |                 |                                     |                                            |
|----------------------------|-----------------|-------------------------------------|--------------------------------------------|
| Circuit Breaker/Frame Type | Number of Poles | Circuit Breaker/Frame Ampere Rating | Suffix                                     |
| MDL                        | 2: 2 Poles      | 300①                                | F: Frame Only                              |
| HMDL                       | 3: 3 Poles      | 350①                                | K: High Magnetic Molded Case Switch        |
|                            |                 | 400                                 | V: 50°C (Thermal-Magnetic Trip Units Only) |
|                            |                 | 450                                 | W: Without Terminals                       |
|                            |                 | 500                                 | X: Load Side Terminals Only                |
|                            |                 | 600                                 | Y: Line Side Terminals Only                |
|                            |                 | 700                                 |                                            |
|                            |                 | 800                                 |                                            |

### Thermal-Magnetic Trip Unit Catalog Number

| MT 3 800 T     |                 |                                      |                                            |
|----------------|-----------------|--------------------------------------|--------------------------------------------|
| Trip Unit Type | Number of Poles | Trip Unit/ Rating Plug Ampere Rating | Suffix                                     |
| MT:            | 2: 2 Poles      | 300①                                 | T: Thermal-Magnetic                        |
| MES:           | 3: 3 Poles      | 350①                                 | V: 50°C (Thermal-Magnetic Trip Units Only) |
|                |                 | 400                                  | LS: Digitrip RMS 310                       |
|                |                 | 450                                  | LSI: Digitrip RMS 310                      |
|                |                 | 500                                  | LSG: Digitrip RMS 310                      |
|                |                 | 600                                  | LSIG: Digitrip RMS 310                     |
|                |                 | 700                                  |                                            |
|                |                 | 800                                  |                                            |

## Dimensions/Weights

### Dimensions, Inches (mm)

| Number of Poles | Width          | Height          | Depth          |
|-----------------|----------------|-----------------|----------------|
| 2, 3            | 8.250<br>(210) | 16.000<br>(406) | 4.062<br>(103) |

### Approximate Shipping Weight, Lbs. (kg)

| Breaker Type           | Complete Breaker |    | Frame Only |    | Trip Unit① |   |
|------------------------|------------------|----|------------|----|------------|---|
|                        | Number of Poles  |    |            |    |            |   |
|                        | 2                | 3  | 2          | 3  | 2          | 3 |
| MDL, HMDL (T/M T.U.)   | 26.5             | 29 | 24.5       | 26 | 2.5        | 3 |
| MDL, HMDL (Elec. T.U.) | —                | 30 | —          | 26 | —          | 4 |

① Thermal-Magnetic only.

## Series C® M-Frame

### Allowable Accessory Combinations

Different combinations of accessories can be supplied, depending on the types of accessories and the number of poles in the circuit breaker.

|                                                             | Reference Page | 2-Pole <sup>①</sup> |       |  | 3-Pole |        |       |  |
|-------------------------------------------------------------|----------------|---------------------|-------|--|--------|--------|-------|--|
|                                                             |                | Left                | Right |  | Left   | Center | Right |  |
| Internal Accessories (Only One Internal Accessory Per Pole) |                |                     |       |  |        |        |       |  |
| Alarm Lockout (Make/Break)                                  | 140            |                     | ■     |  | ■      |        | ■     |  |
| Alarm Lockout (2Make/2Break)                                | 140            |                     | ■     |  | ■      |        | ■     |  |
| Auxiliary Switch (1A, 1B)                                   | 143            |                     | ■     |  | ■      |        | ■     |  |
| Auxiliary Switch (2A, 2B)                                   | 143            |                     | ■     |  | ■      |        | ■     |  |
| Auxiliary Switch (3A, 3B)                                   | 143            |                     | ■     |  | ■      |        | ■     |  |
| Auxiliary Switch (1A, 1B) and Alarm Switch Combination      | 146            |                     | ■     |  | ■      |        | ■     |  |
| Auxiliary Switch (2A, 2B) and Alarm Switch Combination      | 146            |                     | ■     |  | ■      |        | ■     |  |
| Shunt Trip – Standard <sup>③</sup>                          | 149            |                     | ■     |  | ■      |        | ■     |  |
| Shunt Trip – Low Energy <sup>③</sup>                        | 152            |                     | ■     |  | ■      |        | ■     |  |
| Undervoltage Release Mechanism <sup>③</sup>                 | 157            |                     | ■     |  | ■      |        | ■     |  |

#### External Accessories

|                                                |     |   |  |  |   |   |   |  |
|------------------------------------------------|-----|---|--|--|---|---|---|--|
| Base Mounting Hardware                         | 163 |   |  |  |   | ● |   |  |
| Terminal Shields                               | 165 |   |  |  |   | ● |   |  |
| Interphase Barriers                            | 166 |   |  |  |   | ● |   |  |
| Non-Padlockable Handle Block                   | 168 |   |  |  |   | ■ |   |  |
| Padlockable Handle Lock Hasp                   | 169 | □ |  |  | □ |   | □ |  |
| Key Interlock Kit                              | 170 | □ |  |  | □ |   | □ |  |
| Sliding Bar Interlock – Requires Two Breakers  | 171 | ● |  |  |   | ● |   |  |
| Walking Beam Interlock – Requires Two Breakers | 171 | ● |  |  |   | ● |   |  |
| Electrical (Motor) Operator                    | 173 | ● |  |  |   | ● |   |  |
| Plug-in Adapters                               | 174 | ● |  |  |   | ● |   |  |
| Rear Connecting Studs                          | 176 | ● |  |  |   | ● |   |  |
| Panelboard Connecting Straps                   | 177 | ● |  |  |   | ● |   |  |
| Handle Mechanisms                              | 178 | ● |  |  |   | ● |   |  |
| Door Hardware/Accessories                      | 182 | ● |  |  |   | ● |   |  |
| Handle Extension                               | 182 |   |  |  |   | ● |   |  |
| Solid-State (Electronic) Portable Test Kit     | 184 | ● |  |  |   | ● |   |  |

#### Modifications (Refer to Cutler-Hammer)

|                                |     |   |  |  |  |   |  |  |
|--------------------------------|-----|---|--|--|--|---|--|--|
| Special Calibration            | 186 | ● |  |  |  | ● |  |  |
| Moisture Fungus Treatment      | 186 | ● |  |  |  | ● |  |  |
| Freeze-Tested Circuit Breakers | 186 | ● |  |  |  | ● |  |  |
| Marine Application             | 186 | ● |  |  |  | ● |  |  |

■ Applicable in indicated pole position

□ May be mounted on left or right pole – not both

● Accessory available/Modification available

① 2-pole breaker supplied in 3-pole frame. Current carrying parts omitted from center pole.

② Refer to Cutler-Hammer for appropriate neutral pole accessory combinations.

③ Shunt trip and UVR cannot be mounted in right poles on LES trip units.

## Series C® N-Frame



Typical Series C N-Frame Circuit Breaker

- All N-frame circuit breakers are suitable for reverse feed use.

## Interrupting Capacity Ratings

UL489 Interrupting Capacity Ratings<sup>①</sup>

| Circuit Breaker Type | Number of Poles | Interrupting Capacity (Symmetrical Amperes) (kA) |     |     |     |     | Page Number |
|----------------------|-----------------|--------------------------------------------------|-----|-----|-----|-----|-------------|
|                      |                 | Volts Ac (50/60 Hz)                              |     |     |     |     |             |
|                      |                 | 240                                              | 277 | 480 | 600 | 125 |             |
| ND                   | 2, 3, 4         | 65                                               | —   | 50  | 25  | —   | 77, 83      |
| CND②                 | 2, 3, 4         | 65                                               | —   | 50  | 25  | —   | 80, 84      |
| HND                  | 2, 3, 4         | 100                                              | —   | 65  | 35  | —   | 78, 83      |
| CHND②                | 2, 3, 4         | 100                                              | —   | 65  | 35  | —   | 81, 84      |
| NDC                  | 2, 3, 4         | 200                                              | —   | 100 | 50  | —   | 79, 83      |
| CNDC②                | 2, 3, 4         | 200                                              | —   | 100 | 50  | —   | 82, 84      |

IEC 947-2 Interrupting Capacity Ratings<sup>①</sup>

| Circuit Breaker Type                                  | Number of Poles | Interrupting Capacity (Symmetrical Amperes) (kA) |           |          | Page Number |
|-------------------------------------------------------|-----------------|--------------------------------------------------|-----------|----------|-------------|
|                                                       |                 | Volts Ac (50/60 Hz)                              |           |          |             |
|                                                       |                 | 240                                              | 415       | 690      |             |
| ND<br><div>I<sub>CU</sub><br/>I<sub>CS</sub></div>    | 2, 3, 4         | 85<br>85                                         | 50<br>50  | 20<br>10 | 77, 83      |
| CND②<br><div>I<sub>CU</sub><br/>I<sub>CS</sub></div>  | 2, 3, 4         | 85<br>85                                         | 50<br>50  | 20<br>10 | 80, 84      |
| HND<br><div>I<sub>CU</sub><br/>I<sub>CS</sub></div>   | 2, 3, 4         | 100<br>100                                       | 70<br>50  | 25<br>13 | 78, 83      |
| CHND②<br><div>I<sub>CU</sub><br/>I<sub>CS</sub></div> | 2, 3, 4         | 100<br>100                                       | 70<br>50  | 25<br>13 | 81, 84      |
| NDC<br><div>I<sub>CU</sub><br/>I<sub>CS</sub></div>   | 2, 3, 4         | 200<br>100                                       | 100<br>50 | 35<br>18 | 79, 83      |
| CNDC②<br><div>I<sub>CU</sub><br/>I<sub>CS</sub></div> | 2, 3, 4         | 200<br>100                                       | 100<br>50 | 35<br>18 | 82, 84      |

① Utilization Category A circuit breakers.

② 100% rated breakers.

## Series C® N-Frame

## N-Frame Digitrip Selection Guide

| Trip Unit Type                               | Digitrip RMS 310             |                              | Digitrip OPTIM 550                     | Digitrip OPTIM 750                     | Digitrip OPTIM 1050                    |
|----------------------------------------------|------------------------------|------------------------------|----------------------------------------|----------------------------------------|----------------------------------------|
| RMS Sensing                                  | Yes                          |                              | Yes                                    | Yes                                    | Yes                                    |
| Breaker Type                                 |                              |                              |                                        |                                        |                                        |
| Frame                                        | N                            |                              | N                                      | N                                      | N                                      |
| Ampere Range                                 | 400A-1200A                   |                              | 400A-1200A                             | 400A-1200A                             | 400A-1200A                             |
| Interrupting Rating @ 480V                   | 50, 65, 100 (kA)             |                              | 50, 65, 100 (kA)                       | 50, 65, 100 (kA)                       | 50, 65, 100 (kA)                       |
| Protection                                   |                              |                              |                                        |                                        |                                        |
| Ordering Options                             | LS, LSG                      | LSI, LSIG                    | LSI, LSIG, LSI(A)                      | LSI(A), LSIG                           | LSI(A), LISG                           |
| Fixed Rated Plug (I <sub>n</sub> )           | Yes                          | Yes                          | Yes                                    | Yes                                    | Yes                                    |
| Overtemperature Trip                         | Yes                          | Yes                          | Yes                                    | Yes                                    | Yes                                    |
| Long Delay Protection (L)                    |                              |                              |                                        |                                        |                                        |
| Adjustable Rating Plug (I <sub>n</sub> )     | Yes                          | Yes                          | No                                     | No                                     | No                                     |
| Long Delay Pickup                            | 0.5-1.0 (I <sub>n</sub> )①   | 0.5-1.0 (I <sub>n</sub> )①   | 0.4-1.0 x (I <sub>n</sub> )            | 0.4-1.0 x (I <sub>n</sub> )            | 0.4-1.0 x (I <sub>n</sub> )            |
| Long Delay Time I <sup>2</sup> T             | 12 Seconds                   | 12 Seconds                   | 2-24 Seconds                           | 2-24 Seconds                           | 2-24 Seconds                           |
| Long Delay Time I <sup>4</sup> T             | No                           | No                           | 1-5 Seconds                            | 1-5 Seconds                            | 1-5 Seconds                            |
| Long Delay Thermal Memory                    | Yes                          | Yes                          | Yes                                    | Yes                                    | Yes                                    |
| High Load Alarm                              | No                           | No                           | No                                     | 0.5-1.0 x I <sub>r</sub>               | 0.5-1.0 x I <sub>r</sub>               |
| Short Delay Protection (S)                   |                              |                              |                                        |                                        |                                        |
| Short Delay Pickup                           | 200-800% x (I <sub>n</sub> ) | 200-800% x (I <sub>n</sub> ) | 150-800% x (I <sub>r</sub> )           | 150-800% x (I <sub>r</sub> )           | 150-800% x (I <sub>r</sub> )           |
| Short Delay Time I <sup>2</sup> T            | 100 ms                       | No                           | 100-500 ms                             | 100-500 ms                             | 100-500 ms                             |
| Short Delay Time Flat                        | No                           | Inst-300 ms                  | 100-500 ms                             | 100-500 ms                             | 100-500 ms                             |
| Short Delay Time Zone Selective Interlocking | No                           | No                           | Yes                                    | Yes                                    | Yes                                    |
| Instantaneous Protection (I)                 |                              |                              |                                        |                                        |                                        |
| Instantaneous Pickup                         | No                           | 200-800% x (I <sub>n</sub> ) | 200-800% x (I <sub>n</sub> )           | 200-800% x (I <sub>n</sub> )           | 200-800% x (I <sub>n</sub> )           |
| Discriminator                                | No                           | No                           | Yes                                    | Yes                                    | Yes                                    |
| Instantaneous Override                       | Yes                          | Yes                          | Yes                                    | Yes                                    | Yes                                    |
| Ground Fault Protection (G)                  |                              |                              |                                        |                                        |                                        |
| Ground Fault Alarm                           | No                           | No                           | 20-100% x (I <sub>s</sub> )            | 20-100% x (I <sub>s</sub> )            | 20-100% x (I <sub>s</sub> )            |
| Ground Fault Pickup                          | Varies by Frame②             | Varies by Frame②             | 20-100% x (I <sub>s</sub> )            | 20-100% x (I <sub>s</sub> )            | 20-100% x (I <sub>s</sub> )            |
| Ground Fault Delay I <sup>2</sup> T          | No                           | No                           | 100-500 ms                             | 100-500 ms                             | 100-500 ms                             |
| Ground Fault Delay Flat                      | Inst-500 ms                  | Inst-500 ms                  | 100-500 ms                             | 100-500 ms                             | 100-500 ms                             |
| Ground Fault Zone Selective Interlocking     | No                           | No                           | No                                     | Yes                                    | Yes                                    |
| Ground Fault Thermal Memory                  | Yes                          | Yes                          | Yes                                    | Yes                                    | Yes                                    |
| System Diagnostics                           |                              |                              |                                        |                                        |                                        |
| Status LEDs                                  | Yes                          | Yes                          | Yes                                    | Yes                                    | Yes                                    |
| Cause of Trip LEDs                           | No                           | No                           | Yes                                    | Yes                                    | Yes                                    |
| Magnitude of Trip Information                | No                           | No                           | Yes                                    | Yes                                    | Yes                                    |
| Remote Signal Contact – Ground Alarm         | Yes                          | Yes                          | No                                     | Yes                                    | Yes                                    |
| Local Auxiliary and Bell Alarm Contact       | Optional                     | Optional                     | Optional                               | Included                               | Included                               |
| System Monitoring                            |                              |                              |                                        |                                        |                                        |
| Digital Display                              | No                           | No                           | Yes②                                   | Yes②                                   | Yes②                                   |
| Current                                      | No                           | No                           | Yes                                    | Yes                                    | Yes                                    |
| Power and Energy                             | No                           | No                           | No                                     | No                                     | Yes                                    |
| Power Quality-Harmonics                      | No                           | No                           | No                                     | No                                     | Yes                                    |
| Power Factor                                 | No                           | No                           | No                                     | No                                     | Yes                                    |
| Communications                               |                              |                              |                                        |                                        |                                        |
| Cutler-Hammer PowerNet                       | No                           | No                           | No③                                    | Yes                                    | Yes                                    |
| Testing                                      |                              |                              |                                        |                                        |                                        |
| Testing Method                               | Test Set                     |                              | OPTIMizer, BIM, Cutler-Hammer PowerNet | OPTIMizer, BIM, Cutler-Hammer PowerNet | OPTIMizer, BIM, Cutler-Hammer PowerNet |

① Adjust by rating plug.

② By OPTIMizer/BIM.

③ Cutler-Hammer PowerNet kit for field upgrade.

BIM = Breaker Interface Module

(A) = GF Alarm

 $I_s$  = Sensor Rating $I_n$  = Rating Plug $I_r$  = Long Delay Pickup Setting

## Series C® N-Frame

## Type ND Electronic Circuit Breakers with Non-Interchangeable Trip Units

Order as individual components: Breaker Frame, Rating Plug, Terminals

|                                         |                                                                       |                                                      |                                                                                            |                                                                                  |                                   |                    |                                             |                                       |
|-----------------------------------------|-----------------------------------------------------------------------|------------------------------------------------------|--------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------|-----------------------------------|--------------------|---------------------------------------------|---------------------------------------|
| Maximum Continuous Ampere Rating @ 40°C | Digitrip RMS 310 Circuit Breaker Frame Only                           |                                                      |                                                                                            |                                                                                  | Digitrip RMS 310 Rating Plug Only |                    |                                             | Standard Terminals Only①              |
|                                         | Standard Interrupting Capacity<br>600 Volt Ac Rated 50 kAIC @ 480 Vac |                                                      |                                                                                            |                                                                                  | Ampere Rating                     | Fixed Rating Plugs | Adjustable Rating Plug                      | See Page 85 for<br>Optional Terminals |
|                                         | Standard                                                              |                                                      | Options                                                                                    |                                                                                  |                                   |                    | Adjustable Ampere Ratings<br>Catalog Number |                                       |
|                                         | Adjustable Short Time Delay with I <sup>2</sup> t Short Delay Ramp    | Independently Adjustable Short Time Pickup and Delay | Adjustable Short Time Pickup with I <sup>2</sup> t Short Delay and Ground Fault Protection | Independently Adjustable Short Time Pickup and Delay and Ground Fault Protection |                                   |                    |                                             |                                       |
|                                         | Catalog Number                                                        |                                                      |                                                                                            |                                                                                  |                                   |                    |                                             |                                       |

## 2-Pole

|     |            |            |            |            |                                        |                                                                      |                                                              |                                                                       |
|-----|------------|------------|------------|------------|----------------------------------------|----------------------------------------------------------------------|--------------------------------------------------------------|-----------------------------------------------------------------------|
| 800 | ND2800T33W | ND2800T32W | ND2800T35W | ND2800T36W | 400<br>450<br>500<br>600<br>700<br>800 | 8NES400T<br>8NES450T<br>8NES500T<br>8NES600T<br>8NES700T<br>8NES800T | Adjustable Settings are:<br>400, 500, 600, 800<br>A8NES800T1 | TA700NB1<br>TA700NB1<br>TA700NB1<br>TA700NB1<br>TA700NB1<br>TA1000NB1 |
|-----|------------|------------|------------|------------|----------------------------------------|----------------------------------------------------------------------|--------------------------------------------------------------|-----------------------------------------------------------------------|

## 3-Pole

|     |            |            |            |            |                                        |                                                                      |                                                              |                                                                       |
|-----|------------|------------|------------|------------|----------------------------------------|----------------------------------------------------------------------|--------------------------------------------------------------|-----------------------------------------------------------------------|
| 800 | ND3800T33W | ND3800T32W | ND3800T35W | ND3800T36W | 400<br>450<br>500<br>600<br>700<br>800 | 8NES400T<br>8NES450T<br>8NES500T<br>8NES600T<br>8NES700T<br>8NES800T | Adjustable Settings are:<br>400, 500, 600, 800<br>A8NES800T1 | TA700NB1<br>TA700NB1<br>TA700NB1<br>TA700NB1<br>TA700NB1<br>TA1000NB1 |
|-----|------------|------------|------------|------------|----------------------------------------|----------------------------------------------------------------------|--------------------------------------------------------------|-----------------------------------------------------------------------|

4-Pole<sup>②</sup>

|     |            |            |   |   |                                        |                                                                      |                                                              |                                                                       |
|-----|------------|------------|---|---|----------------------------------------|----------------------------------------------------------------------|--------------------------------------------------------------|-----------------------------------------------------------------------|
| 800 | ND4800T33W | ND4800T32W | — | — | 400<br>450<br>500<br>600<br>700<br>800 | 8NES400T<br>8NES450T<br>8NES500T<br>8NES600T<br>8NES700T<br>8NES800T | Adjustable Settings are:<br>400, 500, 600, 800<br>A8NES800T1 | TA700NB1<br>TA700NB1<br>TA700NB1<br>TA700NB1<br>TA700NB1<br>TA1000NB1 |
|-----|------------|------------|---|---|----------------------------------------|----------------------------------------------------------------------|--------------------------------------------------------------|-----------------------------------------------------------------------|

## 2-Pole

|      |           |           |           |           |                                          |                                                                              |                                                                  |                                                                          |
|------|-----------|-----------|-----------|-----------|------------------------------------------|------------------------------------------------------------------------------|------------------------------------------------------------------|--------------------------------------------------------------------------|
| 1200 | ND212T33W | ND212T32W | ND212T35W | ND212T36W | 600<br>700<br>800<br>900<br>1000<br>1200 | 12NES600T<br>12NES700T<br>12NES800T<br>12NES900T<br>12NES1000T<br>12NES1200T | Adjustable Settings are:<br>600, 800, 1000, 1200<br>A12NES1200T1 | TA700NB1<br>TA700NB1<br>TA1000NB1<br>TA1000NB1<br>TA1000NB1<br>TA1200NB1 |
|------|-----------|-----------|-----------|-----------|------------------------------------------|------------------------------------------------------------------------------|------------------------------------------------------------------|--------------------------------------------------------------------------|

## 3-Pole

|      |           |           |           |           |                                          |                                                                              |                                                                  |                                                                          |
|------|-----------|-----------|-----------|-----------|------------------------------------------|------------------------------------------------------------------------------|------------------------------------------------------------------|--------------------------------------------------------------------------|
| 1200 | ND312T33W | ND312T32W | ND312T35W | ND312T36W | 600<br>700<br>800<br>900<br>1000<br>1200 | 12NES600T<br>12NES700T<br>12NES800T<br>12NES900T<br>12NES1000T<br>12NES1200T | Adjustable Settings are:<br>600, 800, 1000, 1200<br>A12NES1200T1 | TA700NB1<br>TA700NB1<br>TA1000NB1<br>TA1000NB1<br>TA1000NB1<br>TA1200NB1 |
|------|-----------|-----------|-----------|-----------|------------------------------------------|------------------------------------------------------------------------------|------------------------------------------------------------------|--------------------------------------------------------------------------|

4-Pole<sup>②</sup>

|      |           |           |   |   |                                          |                                                                              |                                                                  |                                                                          |
|------|-----------|-----------|---|---|------------------------------------------|------------------------------------------------------------------------------|------------------------------------------------------------------|--------------------------------------------------------------------------|
| 1200 | ND412T33W | ND412T32W | — | — | 600<br>700<br>800<br>900<br>1000<br>1200 | 12NES600T<br>12NES700T<br>12NES800T<br>12NES900T<br>12NES1000T<br>12NES1200T | Adjustable Settings are:<br>600, 800, 1000, 1200<br>A12NES1200T1 | TA700NB1<br>TA700NB1<br>TA1000NB1<br>TA1000NB1<br>TA1000NB1<br>TA1200NB1 |
|------|-----------|-----------|---|---|------------------------------------------|------------------------------------------------------------------------------|------------------------------------------------------------------|--------------------------------------------------------------------------|

Instruction Leaflet/FRED Number 29C106

① Two terminals are required per pole.

② Neutral is in right pole.



# Molded Case Circuit Breakers 400-1200 Amperes

Cutler-Hammer

March 1999

## Series C® N-Frame

## Type HND Electronic Circuit Breakers with Non-Interchangeable Trip Units

Order as individual components: Breaker Frame, Rating Plug, Terminals

|                                         |                                                                    |                                                      |                                                                                            |                                                                                  |                                   |                    |                                          |                                                                                |
|-----------------------------------------|--------------------------------------------------------------------|------------------------------------------------------|--------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------|-----------------------------------|--------------------|------------------------------------------|--------------------------------------------------------------------------------|
| Maximum Continuous Ampere Rating @ 40°C | Digitrip RMS 310 Circuit Breaker Frame Only                        |                                                      |                                                                                            |                                                                                  | Digitrip RMS 310 Rating Plug Only |                    |                                          | Standard Terminals Only <sup>①</sup><br><br>See Page 85 for Optional Terminals |
|                                         | High Interrupting Capacity<br>600 Volt Ac Rated 65 kAIC @ 480 Vac  |                                                      |                                                                                            |                                                                                  | Ampere Rating                     | Fixed Rating Plugs | Adjustable Rating Plug                   |                                                                                |
|                                         | Standard                                                           |                                                      | Options                                                                                    |                                                                                  |                                   |                    | Adjustable Ampere Ratings Catalog Number |                                                                                |
|                                         | Adjustable Short Time Delay with I <sup>2</sup> t Short Delay Ramp | Independently Adjustable Short Time Pickup and Delay | Adjustable Short Time Pickup with I <sup>2</sup> t Short Delay and Ground Fault Protection | Independently Adjustable Short Time Pickup and Delay and Ground Fault Protection |                                   |                    |                                          |                                                                                |
|                                         | Catalog Number                                                     |                                                      |                                                                                            |                                                                                  |                                   |                    |                                          |                                                                                |

## 2-Pole

|     |             |             |             |             |                                        |                                                                      |                                                              |                                                                       |
|-----|-------------|-------------|-------------|-------------|----------------------------------------|----------------------------------------------------------------------|--------------------------------------------------------------|-----------------------------------------------------------------------|
| 800 | HND2800T33W | HND2800T32W | HND2800T35W | HND2800T36W | 400<br>450<br>500<br>600<br>700<br>800 | 8NES400T<br>8NES450T<br>8NES500T<br>8NES600T<br>8NES700T<br>8NES800T | Adjustable Settings are:<br>400, 500, 600, 800<br>A8NES800T1 | TA700NB1<br>TA700NB1<br>TA700NB1<br>TA700NB1<br>TA700NB1<br>TA1000NB1 |
|-----|-------------|-------------|-------------|-------------|----------------------------------------|----------------------------------------------------------------------|--------------------------------------------------------------|-----------------------------------------------------------------------|

## 3-Pole

|     |             |             |             |             |                                        |                                                                      |                                                              |                                                                       |
|-----|-------------|-------------|-------------|-------------|----------------------------------------|----------------------------------------------------------------------|--------------------------------------------------------------|-----------------------------------------------------------------------|
| 800 | HND3800T33W | HND3800T32W | HND3800T35W | HND3800T36W | 400<br>450<br>500<br>600<br>700<br>800 | 8NES400T<br>8NES450T<br>8NES500T<br>8NES600T<br>8NES700T<br>8NES800T | Adjustable Settings are:<br>400, 500, 600, 800<br>A8NES800T1 | TA700NB1<br>TA700NB1<br>TA700NB1<br>TA700NB1<br>TA700NB1<br>TA1000NB1 |
|-----|-------------|-------------|-------------|-------------|----------------------------------------|----------------------------------------------------------------------|--------------------------------------------------------------|-----------------------------------------------------------------------|

4-Pole<sup>②</sup>

|     |             |             |   |   |                                        |                                                                      |                                                              |                                                                       |
|-----|-------------|-------------|---|---|----------------------------------------|----------------------------------------------------------------------|--------------------------------------------------------------|-----------------------------------------------------------------------|
| 800 | HND4800T33W | HND4800T32W | — | — | 400<br>450<br>500<br>600<br>700<br>800 | 8NES400T<br>8NES450T<br>8NES500T<br>8NES600T<br>8NES700T<br>8NES800T | Adjustable Settings are:<br>400, 500, 600, 800<br>A8NES800T1 | TA700NB1<br>TA700NB1<br>TA700NB1<br>TA700NB1<br>TA700NB1<br>TA1000NB1 |
|-----|-------------|-------------|---|---|----------------------------------------|----------------------------------------------------------------------|--------------------------------------------------------------|-----------------------------------------------------------------------|

## 2-Pole

|      |            |            |            |            |                                          |                                                                              |                                                                  |                                                                          |
|------|------------|------------|------------|------------|------------------------------------------|------------------------------------------------------------------------------|------------------------------------------------------------------|--------------------------------------------------------------------------|
| 1200 | HND212T33W | HND212T32W | HND212T35W | HND212T36W | 600<br>700<br>800<br>900<br>1000<br>1200 | 12NES600T<br>12NES700T<br>12NES800T<br>12NES900T<br>12NES1000T<br>12NES1200T | Adjustable Settings are:<br>600, 800, 1000, 1200<br>A12NES1200T1 | TA700NB1<br>TA700NB1<br>TA1000NB1<br>TA1000NB1<br>TA1000NB1<br>TA1200NB1 |
|------|------------|------------|------------|------------|------------------------------------------|------------------------------------------------------------------------------|------------------------------------------------------------------|--------------------------------------------------------------------------|

## 3-Pole

|      |            |            |            |            |                                          |                                                                              |                                                                  |                                                                          |
|------|------------|------------|------------|------------|------------------------------------------|------------------------------------------------------------------------------|------------------------------------------------------------------|--------------------------------------------------------------------------|
| 1200 | HND312T33W | HND312T32W | HND312T35W | HND312T36W | 600<br>700<br>800<br>900<br>1000<br>1200 | 12NES600T<br>12NES700T<br>12NES800T<br>12NES900T<br>12NES1000T<br>12NES1200T | Adjustable Settings are:<br>600, 800, 1000, 1200<br>A12NES1200T1 | TA700NB1<br>TA700NB1<br>TA1000NB1<br>TA1000NB1<br>TA1000NB1<br>TA1200NB1 |
|------|------------|------------|------------|------------|------------------------------------------|------------------------------------------------------------------------------|------------------------------------------------------------------|--------------------------------------------------------------------------|

4-Pole<sup>②</sup>

|      |            |            |   |   |                                          |                                                                              |                                                                  |                                                                          |
|------|------------|------------|---|---|------------------------------------------|------------------------------------------------------------------------------|------------------------------------------------------------------|--------------------------------------------------------------------------|
| 1200 | HND412T33W | HND412T32W | — | — | 600<br>700<br>800<br>900<br>1000<br>1200 | 12NES600T<br>12NES700T<br>12NES800T<br>12NES900T<br>12NES1000T<br>12NES1200T | Adjustable Settings are:<br>600, 800, 1000, 1200<br>A12NES1200T1 | TA700NB1<br>TA700NB1<br>TA1000NB1<br>TA1000NB1<br>TA1000NB1<br>TA1200NB1 |
|------|------------|------------|---|---|------------------------------------------|------------------------------------------------------------------------------|------------------------------------------------------------------|--------------------------------------------------------------------------|

Instruction Leaflet/FRED Number 29C106

① Two terminals are required per pole.

② Neutral is in right pole.

## Series C® N-Frame

## Type NDC Electronic Circuit Breakers with Non-Interchangeable Trip Units

Order as individual components: Breaker Frame, Rating Plug, Terminals

|                                         |                                                                          |                                                      |                                                                                            |                                                                                  |                                   |                    |                                          |                                       |
|-----------------------------------------|--------------------------------------------------------------------------|------------------------------------------------------|--------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------|-----------------------------------|--------------------|------------------------------------------|---------------------------------------|
| Maximum Continuous Ampere Rating @ 40°C | Digitrip RMS 310 Circuit Breaker Frame Only                              |                                                      |                                                                                            |                                                                                  | Digitrip RMS 310 Rating Plug Only |                    |                                          | Standard Terminals Only①              |
|                                         | Ultra High Interrupting Capacity<br>600 Volt Ac Rated 100 kAIC @ 480 Vac |                                                      |                                                                                            |                                                                                  | Ampere Rating                     | Fixed Rating Plugs | Adjustable Rating Plug                   | See Page 85 for<br>Optional Terminals |
|                                         | Standard                                                                 |                                                      | Options                                                                                    |                                                                                  |                                   |                    | Adjustable Ampere Ratings Catalog Number |                                       |
|                                         | Adjustable Short Time Delay with I <sup>2</sup> t Short Delay Ramp       | Independently Adjustable Short Time Pickup and Delay | Adjustable Short Time Pickup with I <sup>2</sup> t Short Delay and Ground Fault Protection | Independently Adjustable Short Time Pickup and Delay and Ground Fault Protection |                                   |                    |                                          |                                       |
|                                         | Catalog Number                                                           |                                                      |                                                                                            |                                                                                  |                                   |                    |                                          |                                       |

## 2-Pole

|     |             |             |             |             |                                        |                                                                      |                                                              |                                                                       |
|-----|-------------|-------------|-------------|-------------|----------------------------------------|----------------------------------------------------------------------|--------------------------------------------------------------|-----------------------------------------------------------------------|
| 800 | NDC2800T33W | NDC2800T32W | NDC2800T35W | NDC2800T36W | 400<br>450<br>500<br>600<br>700<br>800 | 8NES400T<br>8NES450T<br>8NES500T<br>8NES600T<br>8NES700T<br>8NES800T | Adjustable Settings are:<br>400, 500, 600, 800<br>A8NES800T1 | TA700NB1<br>TA700NB1<br>TA700NB1<br>TA700NB1<br>TA700NB1<br>TA1000NB1 |
|-----|-------------|-------------|-------------|-------------|----------------------------------------|----------------------------------------------------------------------|--------------------------------------------------------------|-----------------------------------------------------------------------|

## 3-Pole

|     |             |             |             |             |                                        |                                                                      |                                                              |                                                                       |
|-----|-------------|-------------|-------------|-------------|----------------------------------------|----------------------------------------------------------------------|--------------------------------------------------------------|-----------------------------------------------------------------------|
| 800 | NDC3800T33W | NDC3800T32W | NDC3800T35W | NDC3800T36W | 400<br>450<br>500<br>600<br>700<br>800 | 8NES400T<br>8NES450T<br>8NES500T<br>8NES600T<br>8NES700T<br>8NES800T | Adjustable Settings are:<br>400, 500, 600, 800<br>A8NES800T1 | TA700NB1<br>TA700NB1<br>TA700NB1<br>TA700NB1<br>TA700NB1<br>TA1000NB1 |
|-----|-------------|-------------|-------------|-------------|----------------------------------------|----------------------------------------------------------------------|--------------------------------------------------------------|-----------------------------------------------------------------------|

4-Pole<sup>②</sup>

|     |             |             |   |   |                                        |                                                                      |                                                              |                                                                       |
|-----|-------------|-------------|---|---|----------------------------------------|----------------------------------------------------------------------|--------------------------------------------------------------|-----------------------------------------------------------------------|
| 800 | NDC4800T33W | NDC4800T32W | — | — | 400<br>450<br>500<br>600<br>700<br>800 | 8NES400T<br>8NES450T<br>8NES500T<br>8NES600T<br>8NES700T<br>8NES800T | Adjustable Settings are:<br>400, 500, 600, 800<br>A8NES800T1 | TA700NB1<br>TA700NB1<br>TA700NB1<br>TA700NB1<br>TA700NB1<br>TA1000NB1 |
|-----|-------------|-------------|---|---|----------------------------------------|----------------------------------------------------------------------|--------------------------------------------------------------|-----------------------------------------------------------------------|

## 2-Pole

|      |            |            |            |            |                                          |                                                                              |                                                                  |                                                                          |
|------|------------|------------|------------|------------|------------------------------------------|------------------------------------------------------------------------------|------------------------------------------------------------------|--------------------------------------------------------------------------|
| 1200 | NDC212T33W | NDC212T32W | NDC212T35W | NDC212T36W | 600<br>700<br>800<br>900<br>1000<br>1200 | 12NES600T<br>12NES700T<br>12NES800T<br>12NES900T<br>12NES1000T<br>12NES1200T | Adjustable Settings are:<br>600, 800, 1000, 1200<br>A12NES1200T1 | TA700NB1<br>TA700NB1<br>TA1000NB1<br>TA1000NB1<br>TA1000NB1<br>TA1200NB1 |
|------|------------|------------|------------|------------|------------------------------------------|------------------------------------------------------------------------------|------------------------------------------------------------------|--------------------------------------------------------------------------|

## 3-Pole

|      |            |            |            |            |                                          |                                                                              |                                                                  |                                                                          |
|------|------------|------------|------------|------------|------------------------------------------|------------------------------------------------------------------------------|------------------------------------------------------------------|--------------------------------------------------------------------------|
| 1200 | NDC312T33W | NDC312T32W | NDC312T35W | NDC312T36W | 600<br>700<br>800<br>900<br>1000<br>1200 | 12NES600T<br>12NES700T<br>12NES800T<br>12NES900T<br>12NES1000T<br>12NES1200T | Adjustable Settings are:<br>600, 800, 1000, 1200<br>A12NES1200T1 | TA700NB1<br>TA700NB1<br>TA1000NB1<br>TA1000NB1<br>TA1000NB1<br>TA1200NB1 |
|------|------------|------------|------------|------------|------------------------------------------|------------------------------------------------------------------------------|------------------------------------------------------------------|--------------------------------------------------------------------------|

4-Pole<sup>②</sup>

|      |            |            |   |   |                                          |                                                                              |                                                                  |                                                                          |
|------|------------|------------|---|---|------------------------------------------|------------------------------------------------------------------------------|------------------------------------------------------------------|--------------------------------------------------------------------------|
| 1200 | NDC412T33W | NDC412T32W | — | — | 600<br>700<br>800<br>900<br>1000<br>1200 | 12NES600T<br>12NES700T<br>12NES800T<br>12NES900T<br>12NES1000T<br>12NES1200T | Adjustable Settings are:<br>600, 800, 1000, 1200<br>A12NES1200T1 | TA700NB1<br>TA700NB1<br>TA1000NB1<br>TA1000NB1<br>TA1000NB1<br>TA1200NB1 |
|------|------------|------------|---|---|------------------------------------------|------------------------------------------------------------------------------|------------------------------------------------------------------|--------------------------------------------------------------------------|

Instruction Leaflet/FRED Number 29C106

① Two terminals are required per pole.

② Neutral is in right pole.

# Molded Case Circuit Breakers 400-1200 Amperes

Cutler-Hammer

March 1999

## Series C® N-Frame

## 100% Rated Type CND Electronic Circuit Breakers with Non-Interchangeable Trip Units

The NEC allows the breaker to be rated at 100% of its frame size in an assembly, provided that 90°C wire is applied at the 75°C ampacity. Order as individual components: Breaker Frame, Rating Plug, Terminals

|                                         |                                                                       |                                                      |                                                                                            |                                                                                  |                                   |                    |                                          |                                                                                |
|-----------------------------------------|-----------------------------------------------------------------------|------------------------------------------------------|--------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------|-----------------------------------|--------------------|------------------------------------------|--------------------------------------------------------------------------------|
| Maximum Continuous Ampere Rating @ 40°C | Digitrip RMS 310 Circuit Breaker Frame Only                           |                                                      |                                                                                            |                                                                                  | Digitrip RMS 310 Rating Plug Only |                    |                                          | Standard Terminals Only <sup>①</sup><br><br>See Page 85 for Optional Terminals |
|                                         | Standard Interrupting Capacity<br>600 Volt Ac Rated 50 kAIC @ 480 Vac |                                                      |                                                                                            |                                                                                  | Ampere Rating                     | Fixed Rating Plugs | Adjustable Rating Plug                   |                                                                                |
|                                         | Standard                                                              |                                                      | Options                                                                                    |                                                                                  |                                   |                    | Adjustable Ampere Ratings Catalog Number |                                                                                |
|                                         | Adjustable Short Time Delay with I <sup>2</sup> t Short Delay Ramp    | Independently Adjustable Short Time Pickup and Delay | Adjustable Short Time Pickup with I <sup>2</sup> t Short Delay and Ground Fault Protection | Independently Adjustable Short Time Pickup and Delay and Ground Fault Protection |                                   |                    |                                          |                                                                                |
|                                         | Catalog Number                                                        |                                                      |                                                                                            |                                                                                  |                                   |                    |                                          |                                                                                |

## 2-Pole

|     |             |             |             |             |                                        |                                                                      |                                                              |                                                                       |
|-----|-------------|-------------|-------------|-------------|----------------------------------------|----------------------------------------------------------------------|--------------------------------------------------------------|-----------------------------------------------------------------------|
| 800 | CND2800T33W | CND2800T32W | CND2800T35W | CND2800T36W | 400<br>450<br>500<br>600<br>700<br>800 | 8NES400T<br>8NES450T<br>8NES500T<br>8NES600T<br>8NES700T<br>8NES800T | Adjustable Settings are:<br>400, 500, 600, 800<br>A8NES800T1 | TA700NB1<br>TA700NB1<br>TA700NB1<br>TA700NB1<br>TA700NB1<br>TA1000NB1 |
|-----|-------------|-------------|-------------|-------------|----------------------------------------|----------------------------------------------------------------------|--------------------------------------------------------------|-----------------------------------------------------------------------|

## 3-Pole

|     |             |             |             |             |                                        |                                                                      |                                                              |                                                                       |
|-----|-------------|-------------|-------------|-------------|----------------------------------------|----------------------------------------------------------------------|--------------------------------------------------------------|-----------------------------------------------------------------------|
| 800 | CND3800T33W | CND3800T32W | CND3800T35W | CND3800T36W | 400<br>450<br>500<br>600<br>700<br>800 | 8NES400T<br>8NES450T<br>8NES500T<br>8NES600T<br>8NES700T<br>8NES800T | Adjustable Settings are:<br>400, 500, 600, 800<br>A8NES800T1 | TA700NB1<br>TA700NB1<br>TA700NB1<br>TA700NB1<br>TA700NB1<br>TA1000NB1 |
|-----|-------------|-------------|-------------|-------------|----------------------------------------|----------------------------------------------------------------------|--------------------------------------------------------------|-----------------------------------------------------------------------|

4-Pole<sup>②</sup>

|     |             |             |   |   |                                        |                                                                      |                                                              |                                                                       |
|-----|-------------|-------------|---|---|----------------------------------------|----------------------------------------------------------------------|--------------------------------------------------------------|-----------------------------------------------------------------------|
| 800 | CND4800T33W | CND4800T32W | — | — | 400<br>450<br>500<br>600<br>700<br>800 | 8NES400T<br>8NES450T<br>8NES500T<br>8NES600T<br>8NES700T<br>8NES800T | Adjustable Settings are:<br>400, 500, 600, 800<br>A8NES800T1 | TA700NB1<br>TA700NB1<br>TA700NB1<br>TA700NB1<br>TA700NB1<br>TA1000NB1 |
|-----|-------------|-------------|---|---|----------------------------------------|----------------------------------------------------------------------|--------------------------------------------------------------|-----------------------------------------------------------------------|

## 2-Pole

|      |            |            |            |            |                                          |                                                                              |                                                                  |                                                                          |
|------|------------|------------|------------|------------|------------------------------------------|------------------------------------------------------------------------------|------------------------------------------------------------------|--------------------------------------------------------------------------|
| 1200 | CND212T33W | CND212T32W | CND212T35W | CND212T36W | 600<br>700<br>800<br>900<br>1000<br>1200 | 12NES600T<br>12NES700T<br>12NES800T<br>12NES900T<br>12NES1000T<br>12NES1200T | Adjustable Settings are:<br>600, 800, 1000, 1200<br>A12NES1200T1 | TA700NB1<br>TA700NB1<br>TA1000NB1<br>TA1000NB1<br>TA1000NB1<br>TA1200NB1 |
|------|------------|------------|------------|------------|------------------------------------------|------------------------------------------------------------------------------|------------------------------------------------------------------|--------------------------------------------------------------------------|

## 3-Pole

|      |            |            |            |            |                                          |                                                                              |                                                                  |                                                                          |
|------|------------|------------|------------|------------|------------------------------------------|------------------------------------------------------------------------------|------------------------------------------------------------------|--------------------------------------------------------------------------|
| 1200 | CND312T33W | CND312T32W | CND312T35W | CND312T36W | 600<br>700<br>800<br>900<br>1000<br>1200 | 12NES600T<br>12NES700T<br>12NES800T<br>12NES900T<br>12NES1000T<br>12NES1200T | Adjustable Settings are:<br>600, 800, 1000, 1200<br>A12NES1200T1 | TA700NB1<br>TA700NB1<br>TA1000NB1<br>TA1000NB1<br>TA1000NB1<br>TA1200NB1 |
|------|------------|------------|------------|------------|------------------------------------------|------------------------------------------------------------------------------|------------------------------------------------------------------|--------------------------------------------------------------------------|

4-Pole<sup>②</sup>

|      |            |            |   |   |                                          |                                                                              |                                                                  |                                                                          |
|------|------------|------------|---|---|------------------------------------------|------------------------------------------------------------------------------|------------------------------------------------------------------|--------------------------------------------------------------------------|
| 1200 | CND412T33W | CND412T32W | — | — | 600<br>700<br>800<br>900<br>1000<br>1200 | 12NES600T<br>12NES700T<br>12NES800T<br>12NES900T<br>12NES1000T<br>12NES1200T | Adjustable Settings are:<br>600, 800, 1000, 1200<br>A12NES1200T1 | TA700NB1<br>TA700NB1<br>TA1000NB1<br>TA1000NB1<br>TA1000NB1<br>TA1200NB1 |
|------|------------|------------|---|---|------------------------------------------|------------------------------------------------------------------------------|------------------------------------------------------------------|--------------------------------------------------------------------------|

Instruction Leaflet/FRED Number 29C106

① Two terminals are required per pole.

② Neutral is in right pole.

## Series C® N-Frame

## 100% Rated Type CHND Electronic Circuit Breakers with Non-Interchangeable Trip Units

The NEC allows the breaker to be rated at 100% of its frame size in an assembly, provided that 90°C wire is applied at the 75°C ampacity. Order as individual components: Breaker Frame, Rating Plug, Terminals

|                                         |                                                                    |                                                      |                                                                                            |                                                                                  |                                   |                    |                                             |                                       |
|-----------------------------------------|--------------------------------------------------------------------|------------------------------------------------------|--------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------|-----------------------------------|--------------------|---------------------------------------------|---------------------------------------|
| Maximum Continuous Ampere Rating @ 40°C | Digitrip RMS 310 Circuit Breaker Frame Only                        |                                                      |                                                                                            |                                                                                  | Digitrip RMS 310 Rating Plug Only |                    |                                             | Standard Terminals Only①              |
|                                         | High Interrupting Capacity<br>600 Volt Ac Rated 65 kAIC @ 480 Vac  |                                                      |                                                                                            |                                                                                  | Ampere Rating                     | Fixed Rating Plugs | Adjustable Rating Plug                      | See Page 85 for<br>Optional Terminals |
|                                         | Standard                                                           |                                                      | Options                                                                                    |                                                                                  |                                   |                    | Adjustable Ampere Ratings<br>Catalog Number |                                       |
|                                         | Adjustable Short Time Delay with I <sup>2</sup> t Short Delay Ramp | Independently Adjustable Short Time Pickup and Delay | Adjustable Short Time Pickup with I <sup>2</sup> t Short Delay and Ground Fault Protection | Independently Adjustable Short Time Pickup and Delay and Ground Fault Protection |                                   |                    |                                             |                                       |
|                                         | Catalog Number                                                     |                                                      |                                                                                            |                                                                                  |                                   |                    |                                             |                                       |

## 2-Pole

|     |              |              |              |              |                                        |                                                                      |                                                              |                                                                       |
|-----|--------------|--------------|--------------|--------------|----------------------------------------|----------------------------------------------------------------------|--------------------------------------------------------------|-----------------------------------------------------------------------|
| 800 | CHND2800T33W | CHND2800T32W | CHND2800T35W | CHND2800T36W | 400<br>450<br>500<br>600<br>700<br>800 | 8NES400T<br>8NES450T<br>8NES500T<br>8NES600T<br>8NES700T<br>8NES800T | Adjustable Settings are:<br>400, 500, 600, 800<br>A8NES800T1 | TA700NB1<br>TA700NB1<br>TA700NB1<br>TA700NB1<br>TA700NB1<br>TA1000NB1 |
|-----|--------------|--------------|--------------|--------------|----------------------------------------|----------------------------------------------------------------------|--------------------------------------------------------------|-----------------------------------------------------------------------|

## 3-Pole

|     |              |              |              |              |                                        |                                                                      |                                                              |                                                                       |
|-----|--------------|--------------|--------------|--------------|----------------------------------------|----------------------------------------------------------------------|--------------------------------------------------------------|-----------------------------------------------------------------------|
| 800 | CHND3800T33W | CHND3800T32W | CHND3800T35W | CHND3800T36W | 400<br>450<br>500<br>600<br>700<br>800 | 8NES400T<br>8NES450T<br>8NES500T<br>8NES600T<br>8NES700T<br>8NES800T | Adjustable Settings are:<br>400, 500, 600, 800<br>A8NES800T1 | TA700NB1<br>TA700NB1<br>TA700NB1<br>TA700NB1<br>TA700NB1<br>TA1000NB1 |
|-----|--------------|--------------|--------------|--------------|----------------------------------------|----------------------------------------------------------------------|--------------------------------------------------------------|-----------------------------------------------------------------------|

4-Pole<sup>②</sup>

|     |              |              |   |   |                                        |                                                                      |                                                              |                                                                       |
|-----|--------------|--------------|---|---|----------------------------------------|----------------------------------------------------------------------|--------------------------------------------------------------|-----------------------------------------------------------------------|
| 800 | CHND4800T33W | CHND4800T32W | — | — | 400<br>450<br>500<br>600<br>700<br>800 | 8NES400T<br>8NES450T<br>8NES500T<br>8NES600T<br>8NES700T<br>8NES800T | Adjustable Settings are:<br>400, 500, 600, 800<br>A8NES800T1 | TA700NB1<br>TA700NB1<br>TA700NB1<br>TA700NB1<br>TA700NB1<br>TA1000NB1 |
|-----|--------------|--------------|---|---|----------------------------------------|----------------------------------------------------------------------|--------------------------------------------------------------|-----------------------------------------------------------------------|

## 2-Pole

|      |             |             |             |             |                                          |                                                                              |                                                                  |                                                                          |
|------|-------------|-------------|-------------|-------------|------------------------------------------|------------------------------------------------------------------------------|------------------------------------------------------------------|--------------------------------------------------------------------------|
| 1200 | CHND212T33W | CHND212T32W | CHND212T35W | CHND212T36W | 600<br>700<br>800<br>900<br>1000<br>1200 | 12NES600T<br>12NES700T<br>12NES800T<br>12NES900T<br>12NES1000T<br>12NES1200T | Adjustable Settings are:<br>600, 800, 1000, 1200<br>A12NES1200T1 | TA700NB1<br>TA700NB1<br>TA1000NB1<br>TA1000NB1<br>TA1000NB1<br>TA1200NB1 |
|------|-------------|-------------|-------------|-------------|------------------------------------------|------------------------------------------------------------------------------|------------------------------------------------------------------|--------------------------------------------------------------------------|

## 3-Pole

|      |             |             |             |             |                                          |                                                                              |                                                                  |                                                                          |
|------|-------------|-------------|-------------|-------------|------------------------------------------|------------------------------------------------------------------------------|------------------------------------------------------------------|--------------------------------------------------------------------------|
| 1200 | CHND312T33W | CHND312T32W | CHND312T35W | CHND312T36W | 600<br>700<br>800<br>900<br>1000<br>1200 | 12NES600T<br>12NES700T<br>12NES800T<br>12NES900T<br>12NES1000T<br>12NES1200T | Adjustable Settings are:<br>600, 800, 1000, 1200<br>A12NES1200T1 | TA700NB1<br>TA700NB1<br>TA1000NB1<br>TA1000NB1<br>TA1000NB1<br>TA1200NB1 |
|------|-------------|-------------|-------------|-------------|------------------------------------------|------------------------------------------------------------------------------|------------------------------------------------------------------|--------------------------------------------------------------------------|

4-Pole<sup>②</sup>

|      |             |             |   |   |                                          |                                                                              |                                                                  |                                                                          |
|------|-------------|-------------|---|---|------------------------------------------|------------------------------------------------------------------------------|------------------------------------------------------------------|--------------------------------------------------------------------------|
| 1200 | CHND412T33W | CHND412T32W | — | — | 600<br>700<br>800<br>900<br>1000<br>1200 | 12NES600T<br>12NES700T<br>12NES800T<br>12NES900T<br>12NES1000T<br>12NES1200T | Adjustable Settings are:<br>600, 800, 1000, 1200<br>A12NES1200T1 | TA700NB1<br>TA700NB1<br>TA1000NB1<br>TA1000NB1<br>TA1000NB1<br>TA1200NB1 |
|------|-------------|-------------|---|---|------------------------------------------|------------------------------------------------------------------------------|------------------------------------------------------------------|--------------------------------------------------------------------------|

Instruction Leaflet/FRED Number 29C106

① Two terminals are required per pole.

② Neutral is in right pole.

# Molded Case Circuit Breakers 400-1200 Amperes

Cutler-Hammer

March 1999

## Series C® N-Frame

## 100% Rated Type CNDC Electronic Circuit Breakers with Non-Interchangeable Trip Units

The NEC allows the breaker to be rated at 100% of its frame size in an assembly, provided that 90°C wire is applied at the 75°C ampacity. Order as individual components: Breaker Frame, Rating Plug, Terminals

|                                         |                                                                          |                                                      |                                                                                            |                                                                                  |                                   |                    |                                          |                                                                    |
|-----------------------------------------|--------------------------------------------------------------------------|------------------------------------------------------|--------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------|-----------------------------------|--------------------|------------------------------------------|--------------------------------------------------------------------|
| Maximum Continuous Ampere Rating @ 40°C | Digitrip RMS 310 Circuit Breaker Frame Only                              |                                                      |                                                                                            |                                                                                  | Digitrip RMS 310 Rating Plug Only |                    |                                          | Standard Terminals Only①<br><br>See Page 85 for Optional Terminals |
|                                         | Ultra High Interrupting Capacity<br>600 Volt Ac Rated 100 kAIC @ 480 Vac |                                                      |                                                                                            |                                                                                  | Ampere Rating                     | Fixed Rating Plugs | Adjustable Rating Plug                   |                                                                    |
|                                         | Standard                                                                 |                                                      | Options                                                                                    |                                                                                  |                                   |                    | Adjustable Ampere Ratings Catalog Number |                                                                    |
|                                         | Adjustable Short Time Delay with I <sup>2</sup> t Short Delay Ramp       | Independently Adjustable Short Time Pickup and Delay | Adjustable Short Time Pickup with I <sup>2</sup> t Short Delay and Ground Fault Protection | Independently Adjustable Short Time Pickup and Delay and Ground Fault Protection |                                   |                    |                                          |                                                                    |
|                                         | Catalog Number                                                           |                                                      |                                                                                            |                                                                                  |                                   |                    |                                          |                                                                    |

## 2-Pole

|     |              |              |              |              |                                        |                                                                      |                                                              |                                                                       |
|-----|--------------|--------------|--------------|--------------|----------------------------------------|----------------------------------------------------------------------|--------------------------------------------------------------|-----------------------------------------------------------------------|
| 800 | CNDC2800T33W | CNDC2800T32W | CNDC2800T35W | CNDC2800T36W | 400<br>450<br>500<br>600<br>700<br>800 | 8NES400T<br>8NES450T<br>8NES500T<br>8NES600T<br>8NES700T<br>8NES800T | Adjustable Settings are:<br>400, 500, 600, 800<br>A8NES800T1 | TA700NB1<br>TA700NB1<br>TA700NB1<br>TA700NB1<br>TA700NB1<br>TA1000NB1 |
|-----|--------------|--------------|--------------|--------------|----------------------------------------|----------------------------------------------------------------------|--------------------------------------------------------------|-----------------------------------------------------------------------|

## 3-Pole

|     |              |              |              |              |                                        |                                                                      |                                                              |                                                                       |
|-----|--------------|--------------|--------------|--------------|----------------------------------------|----------------------------------------------------------------------|--------------------------------------------------------------|-----------------------------------------------------------------------|
| 800 | CNDC3800T33W | CNDC3800T32W | CNDC3800T35W | CNDC3800T36W | 400<br>450<br>500<br>600<br>700<br>800 | 8NES400T<br>8NES450T<br>8NES500T<br>8NES600T<br>8NES700T<br>8NES800T | Adjustable Settings are:<br>400, 500, 600, 800<br>A8NES800T1 | TA700NB1<br>TA700NB1<br>TA700NB1<br>TA700NB1<br>TA700NB1<br>TA1000NB1 |
|-----|--------------|--------------|--------------|--------------|----------------------------------------|----------------------------------------------------------------------|--------------------------------------------------------------|-----------------------------------------------------------------------|

4-Pole<sup>②</sup>

|     |              |              |   |   |                                        |                                                                      |                                                              |                                                                       |
|-----|--------------|--------------|---|---|----------------------------------------|----------------------------------------------------------------------|--------------------------------------------------------------|-----------------------------------------------------------------------|
| 800 | CNDC4800T33W | CNDC4800T32W | — | — | 400<br>450<br>500<br>600<br>700<br>800 | 8NES400T<br>8NES450T<br>8NES500T<br>8NES600T<br>8NES700T<br>8NES800T | Adjustable Settings are:<br>400, 500, 600, 800<br>A8NES800T1 | TA700NB1<br>TA700NB1<br>TA700NB1<br>TA700NB1<br>TA700NB1<br>TA1000NB1 |
|-----|--------------|--------------|---|---|----------------------------------------|----------------------------------------------------------------------|--------------------------------------------------------------|-----------------------------------------------------------------------|

## 2-Pole

|      |             |             |             |             |                                          |                                                                              |                                                                  |                                                                          |
|------|-------------|-------------|-------------|-------------|------------------------------------------|------------------------------------------------------------------------------|------------------------------------------------------------------|--------------------------------------------------------------------------|
| 1200 | CNDC212T33W | CNDC212T32W | CNDC212T35W | CNDC212T36W | 600<br>700<br>800<br>900<br>1000<br>1200 | 12NES600T<br>12NES700T<br>12NES800T<br>12NES900T<br>12NES1000T<br>12NES1200T | Adjustable Settings are:<br>600, 800, 1000, 1200<br>A12NES1200T1 | TA700NB1<br>TA700NB1<br>TA1000NB1<br>TA1000NB1<br>TA1000NB1<br>TA1200NB1 |
|------|-------------|-------------|-------------|-------------|------------------------------------------|------------------------------------------------------------------------------|------------------------------------------------------------------|--------------------------------------------------------------------------|

## 3-Pole

|      |             |             |             |             |                                          |                                                                              |                                                                  |                                                                          |
|------|-------------|-------------|-------------|-------------|------------------------------------------|------------------------------------------------------------------------------|------------------------------------------------------------------|--------------------------------------------------------------------------|
| 1200 | CNDC312T33W | CNDC312T32W | CNDC312T35W | CNDC312T36W | 600<br>700<br>800<br>900<br>1000<br>1200 | 12NES600T<br>12NES700T<br>12NES800T<br>12NES900T<br>12NES1000T<br>12NES1200T | Adjustable Settings are:<br>600, 800, 1000, 1200<br>A12NES1200T1 | TA700NB1<br>TA700NB1<br>TA1000NB1<br>TA1000NB1<br>TA1000NB1<br>TA1200NB1 |
|------|-------------|-------------|-------------|-------------|------------------------------------------|------------------------------------------------------------------------------|------------------------------------------------------------------|--------------------------------------------------------------------------|

4-Pole<sup>②</sup>

|      |             |             |   |   |                                          |                                                                              |                                                                  |                                                                          |
|------|-------------|-------------|---|---|------------------------------------------|------------------------------------------------------------------------------|------------------------------------------------------------------|--------------------------------------------------------------------------|
| 1200 | CNDC412T33W | CNDC412T32W | — | — | 600<br>700<br>800<br>900<br>1000<br>1200 | 12NES600T<br>12NES700T<br>12NES800T<br>12NES900T<br>12NES1000T<br>12NES1200T | Adjustable Settings are:<br>600, 800, 1000, 1200<br>A12NES1200T1 | TA700NB1<br>TA700NB1<br>TA1000NB1<br>TA1000NB1<br>TA1000NB1<br>TA1200NB1 |
|------|-------------|-------------|---|---|------------------------------------------|------------------------------------------------------------------------------|------------------------------------------------------------------|--------------------------------------------------------------------------|

Instruction Leaflet/FRED Number 29C106

① Two terminals are required per pole.

② Neutral is in right pole.

## Series C® N-Frame

Digitrip OPTIM<sup>①</sup> Electronic Circuit Breakers with Interchangeable Rating Plugs

Order as individual components: Breaker Frame (which includes Trip Unit), Rating Plug, Terminals.

| Maximum Continuous Ampere Rating @ 40°C | Circuit Breaker Frame Only                                                                                                                                                                                                                                                                                                                                                                                                                                        |           |           |           |           |            | Digitrip OPTIM Rating Plug Only |                   |            |
|-----------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|-----------|-----------|-----------|------------|---------------------------------|-------------------|------------|
|                                         | L – Adjustable Long Delay Pickup ( $I_L$ ) with Adjustable Long Delay Time ( $I^2t$ or $I^4t$ Response)②<br>S – Adjustable Short Delay Pickup with Adjustable Short Delay Time ( $I^2t$ or Flat Response)<br>I – Adjustable Instantaneous Pickup<br>G – Adjustable Ground Fault Pickup with Adjustable Ground Fault Time Delay ( $I^2t$ or Flat Response)<br>A – Adjustable Ground Fault Alarm with Adjustable Ground Fault Time Delay ( $I^2t$ or Flat Response) |           |           |           |           |            | Ampere Rating                   | Fixed Rating Plug |            |
|                                         | OPTIM 550                                                                                                                                                                                                                                                                                                                                                                                                                                                         | OPTIM 550 | OPTIM 550 | OPTIM 750 | OPTIM 750 | OPTIM 1050 |                                 |                   | OPTIM 1050 |
|                                         | LSI                                                                                                                                                                                                                                                                                                                                                                                                                                                               | LSIG      | LSIA      | LSIG      | LSIA      | LSIG       |                                 |                   | LSIA       |
|                                         | Catalog Number                                                                                                                                                                                                                                                                                                                                                                                                                                                    |           |           |           |           |            |                                 |                   |            |
|                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |           |           |           |           |            |                                 |                   |            |

## 3-Pole Standard Interrupting Capacity 600 Volt Ac Rated 50 kAIC @ 480 Vac

|      |            |            |            |            |            |             |             |                                               |                                                                                                |
|------|------------|------------|------------|------------|------------|-------------|-------------|-----------------------------------------------|------------------------------------------------------------------------------------------------|
| 800  | ND3800T52W | ND3800T56W | ND3800T57W | ND3800T76W | ND3800T77W | ND3800T106W | ND3800T107W | 400<br>450<br>500<br>550<br>600<br>700<br>800 | ORPN80A400<br>ORPN80A450<br>ORPN80A500<br>ORPN80A550<br>ORPN80A600<br>ORPN80A700<br>ORPN80A800 |
| 1200 | ND312T52W  | ND312T56W  | ND312T57W  | ND312T76W  | ND312T77W  | ND312T106W  | ND312T107W  | 600<br>700<br>800<br>1000<br>1200             | ORPN80A600<br>ORPN80A700<br>ORPN80A800<br>ORPN80A100<br>ORPN80A120                             |

## 3-Pole High Interrupting Capacity 600 Volt Ac Rated 65 kAIC @ 480 Vac

|      |             |             |             |             |             |              |              |                                               |                                                                                                |
|------|-------------|-------------|-------------|-------------|-------------|--------------|--------------|-----------------------------------------------|------------------------------------------------------------------------------------------------|
| 800  | HND3800T52W | HND3800T56W | HND3800T57W | HND3800T76W | HND3800T77W | HND3800T106W | HND3800T107W | 400<br>450<br>500<br>550<br>600<br>700<br>800 | ORPN80A400<br>ORPN80A450<br>ORPN80A500<br>ORPN80A550<br>ORPN80A600<br>ORPN80A700<br>ORPN80A800 |
| 1200 | HND312T52W  | HND312T56W  | HND312T57W  | HND312T76W  | HND312T77W  | HND312T106W  | HND312T107W  | 600<br>700<br>800<br>1000<br>1200             | ORPN80A600<br>ORPN80A700<br>ORPN80A800<br>ORPN80A100<br>ORPN80A120                             |

## 3-Pole Ultra High Interrupting Capacity 600 Volt Ac Rated 100 kAIC @ 480 Vac

|      |             |             |             |             |             |              |              |                                               |                                                                                                |
|------|-------------|-------------|-------------|-------------|-------------|--------------|--------------|-----------------------------------------------|------------------------------------------------------------------------------------------------|
| 800  | NDC3800T52W | NDC3800T56W | NDC3800T57W | NDC3800T76W | NDC3800T77W | NDC3800T106W | NDC3800T107W | 400<br>450<br>500<br>550<br>600<br>700<br>800 | ORPN80A400<br>ORPN80A450<br>ORPN80A500<br>ORPN80A550<br>ORPN80A600<br>ORPN80A700<br>ORPN80A800 |
| 1200 | NDC312T52W  | NDC312T56W  | NDC312T57W  | NDC312T76W  | NDC312T77W  | NDC312T106W  | NDC312T107W  | 600<br>700<br>800<br>1000<br>1200             | ORPN80A600<br>ORPN80A700<br>ORPN80A800<br>ORPN80A100<br>ORPN80A120                             |

Instruction Leaflet/FRED Number 29C106 for Breaker; 29C891 for OPTIM Trip

① 1 Form C auxiliary switch and 1 Form C bell (trip) alarm switch supplied with breaker as standard on models 750 and 1050.

② Long delay  $I^4t$  response selection limits short delay time to flat response.

# Molded Case Circuit Breakers 400-1200 Amperes

Cutler-Hammer

March 1999

## Series C® N-Frame

## 100% Rated Digitrip OPTIM<sup>①</sup> Circuit Breakers with Interchangeable Rating Plugs

Order as individual components: Breaker Frame (which includes Trip Unit), Rating Plug, Terminals.

|                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |           |           |           |           |            |                                 |                   |            |
|-----------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|-----------|-----------|-----------|------------|---------------------------------|-------------------|------------|
| Maximum Continuous Ampere Rating @ 40°C | Circuit Breaker Frame Only                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |           |           |           |           |            | Digitrip OPTIM Rating Plug Only |                   |            |
|                                         | L – Adjustable Long Delay Pickup (I <sub>L</sub> ) with Adjustable Long Delay Time (I <sup>2</sup> t or I <sup>4</sup> t Response)②<br>S – Adjustable Short Delay Pickup with Adjustable Short Delay Time (I <sup>2</sup> t or Flat Response)<br>I – Adjustable Instantaneous Pickup<br>G – Adjustable Ground Fault Pickup with Adjustable Ground Fault Time Delay (I <sup>2</sup> t or Flat Response)<br>A – Adjustable Ground Fault Alarm with Adjustable Ground Fault Time Delay (I <sup>2</sup> t or Flat Response) |           |           |           |           |            | Ampere Rating                   | Fixed Rating Plug |            |
|                                         | OPTIM 550                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | OPTIM 550 | OPTIM 550 | OPTIM 750 | OPTIM 750 | OPTIM 1050 |                                 |                   | OPTIM 1050 |
|                                         | LSI                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | LSIG      | LSIA      | LSIG      | LSIA      | LSIG       |                                 |                   | LSIA       |
|                                         | Catalog Number                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |           |           |           |           |            |                                 |                   |            |
|                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |           |           |           |           |            |                                 |                   |            |

### 3-Pole Standard Interrupting Capacity 600 Volt Ac Rated 50 kAIC @ 480 Vac

|      |             |             |             |             |             |              |              |                                               |                                                                                                |
|------|-------------|-------------|-------------|-------------|-------------|--------------|--------------|-----------------------------------------------|------------------------------------------------------------------------------------------------|
| 800  | CND3800T52W | CND3800T56W | CND3800T57W | CND3800T76W | CND3800T77W | CND3800T106W | CND3800T107W | 400<br>450<br>500<br>550<br>600<br>700<br>800 | ORPN80A400<br>ORPN80A450<br>ORPN80A500<br>ORPN80A550<br>ORPN80A600<br>ORPN80A700<br>ORPN80A800 |
| 1200 | CND312T52W  | CND312T56W  | CND312T57W  | CND312T76W  | CND312T77W  | CND312T106W  | CND312T107W  | 600<br>700<br>800<br>1000<br>1200             | ORPN80A600<br>ORPN80A700<br>ORPN80A800<br>ORPN80A100<br>ORPN80A120                             |

### 3-Pole High Interrupting Capacity 600 Volt Ac Rated 65 kAIC @ 480 Vac

|      |              |              |              |              |              |               |               |                                               |                                                                                                |
|------|--------------|--------------|--------------|--------------|--------------|---------------|---------------|-----------------------------------------------|------------------------------------------------------------------------------------------------|
| 800  | CHND3800T52W | CHND3800T56W | CHND3800T57W | CHND3800T76W | CHND3800T77W | CHND3800T106W | CHND3800T107W | 400<br>450<br>500<br>550<br>600<br>700<br>800 | ORPN80A400<br>ORPN80A450<br>ORPN80A500<br>ORPN80A550<br>ORPN80A600<br>ORPN80A700<br>ORPN80A800 |
| 1200 | CHND312T52W  | CHND312T56W  | CHND312T57W  | CHND312T76W  | CHND312T77W  | CHND312T106W  | CHND312T107W  | 600<br>700<br>800<br>1000<br>1200             | ORPN80A600<br>ORPN80A700<br>ORPN80A800<br>ORPN80A100<br>ORPN80A120                             |

### 3-Pole Ultra High Interrupting Capacity 600 Volt Ac Rated 100 kAIC @ 480 Vac

|      |              |              |              |              |              |               |               |                                               |                                                                                                |
|------|--------------|--------------|--------------|--------------|--------------|---------------|---------------|-----------------------------------------------|------------------------------------------------------------------------------------------------|
| 800  | CNDC3800T52W | CNDC3800T56W | CNDC3800T57W | CNDC3800T76W | CNDC3800T77W | CNDC3800T106W | CNDC3800T107W | 400<br>450<br>500<br>550<br>600<br>700<br>800 | ORPN80A400<br>ORPN80A450<br>ORPN80A500<br>ORPN80A550<br>ORPN80A600<br>ORPN80A700<br>ORPN80A800 |
| 1200 | CNDC312T52W  | CNDC312T56W  | CNDC312T57W  | CNDC312T76W  | CNDC312T77W  | CNDC312T106W  | CNDC312T107W  | 600<br>700<br>800<br>1000<br>1200             | ORPN80A600<br>ORPN80A700<br>ORPN80A800<br>ORPN80A100<br>ORPN80A120                             |

Instruction Leaflet/FRED Number 29C106 for Breaker; 29C891 for OPTIM Trip

① 1 Form C auxiliary switch and 1 Form C bell (trip) alarm switch supplied with breaker as standard on models 750 and 1050.

② Long delay  $I^4t$  response selection limits short delay time to flat response.

## Type ND Molded Case Switches

| Continuous<br>Ampere<br>Rating<br>@ 40°C | Catalog Number                                                      |          |                     |
|------------------------------------------|---------------------------------------------------------------------|----------|---------------------|
|                                          | 2-Pole                                                              | 3-Pole   | 4-Pole <sup>①</sup> |
|                                          | Complete with Standard Line and Load Terminals (shipped separately) |          |                     |
| 800                                      | Type ND – High Instantaneous (K)                                    |          |                     |
|                                          | –                                                                   | ND3800WK | ND4800WK            |
| 1200                                     | Type ND – High Instantaneous (K)                                    |          |                     |
|                                          | –                                                                   | ND312WK  | ND412WK             |

**Note:** Molded case switch may trip above 14,000 amperes.

For UL listed, series tested molded case switch application data, refer to Cutler-Hammer.

Instruction Leaflet/FRED Number 29C106

## Line and Load Terminals

## Ordering Information

N-frame circuit breakers use Cu/Al terminals as standard. When optional copper or Cu/Al terminals are required, order by catalog number. Specify if factory installation is required.

## Line and Load Terminals

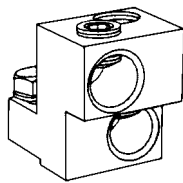
| Maximum Breaker Amperes | Terminal Body Material | Wire Type | AWG Wire Range/No. Conductors | Metric Wire Range mm <sup>2</sup> | Catalog Number |
|-------------------------|------------------------|-----------|-------------------------------|-----------------------------------|----------------|
|-------------------------|------------------------|-----------|-------------------------------|-----------------------------------|----------------|

## Standard Cu/Al Pressure Terminals

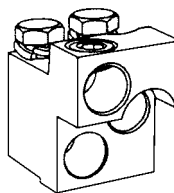
|      |          |       |                   |         |                        |
|------|----------|-------|-------------------|---------|------------------------|
| 700  | Aluminum | Cu/Al | (2) 1-500 kcmil   | 50-300  | TA700NB1               |
| 1000 | Aluminum | Cu/Al | (3) 3/0-400 kcmil | 95-185  | TA1000NB1 <sup>②</sup> |
| 1200 | Aluminum | Cu/Al | (4) 4/0-500 kcmil | 120-300 | TA1200NB1 <sup>②</sup> |
| 1200 | Aluminum | Cu/Al | (3) 500-750 kcmil | 300-400 | TA1201NB1 <sup>③</sup> |

## Optional Copper and Cu/Al Pressure Type Terminals

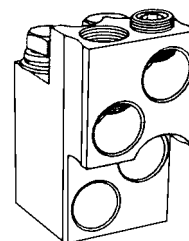
|      |        |    |                   |        |          |
|------|--------|----|-------------------|--------|----------|
| 700  | Copper | Cu | (2) 2/0-500 kcmil | 70-300 | T700NB1  |
| 1000 | Copper | Cu | (3) 3/0-500 kcmil | 95-300 | T1000NB1 |
| 1200 | Copper | Cu | (4) 3/0-400 kcmil | 95-185 | T1200NB3 |



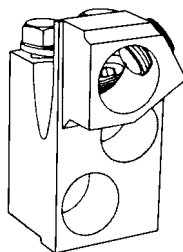
TA700NB1



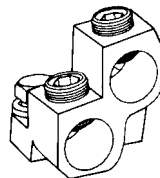
TA1000NB1



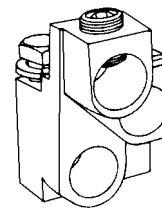
TA1200NB1



TA1201NB1



T700NB1



T1000NB1

- <sup>①</sup> Neutral is in right pole.  
<sup>②</sup> Terminal rating is A19 Cu.  
<sup>③</sup> Terminal rating is A17 Cu.



## Series C® N-Frame

## Catalog Numbering System

This information is presented only as an aid to understanding catalog numbers. It is not to be used to build catalog numbers for circuit breakers or trip units.

### Circuit Breaker/Frame Catalog Number

| Circuit Breaker/<br>Frame Type          | Number<br>of Poles                     | Circuit Breaker/<br>Frame Ampere<br>Rating | Trip Model                                                             | Trip Type                                            | Suffix                                                                                                                                                                                   |
|-----------------------------------------|----------------------------------------|--------------------------------------------|------------------------------------------------------------------------|------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ND<br>HND<br>NDC<br>CND<br>CHND<br>CNDC | 2: 2 Poles<br>3: 3 Poles<br>4: 4 Poles | 8: 800 Amperes<br>12: 1200 Amperes         | T3 – Model 310<br>T5 – Model 550<br>T7 – Model 750<br>T10 – Model 1050 | 2 – LSI<br>3 – LS<br>5 – LSG<br>6 – LSIG<br>7 – LSIA | E: 100% R.P. protected (4-Pole)<br>EH: 50% R.P. protected (4-Pole)<br>K: High Magnetic Molded<br>Case Switch<br>W: Without Terminals<br>X: Load Only Terminals<br>Y: Line Only Terminals |

## Dimensions/Weights

### Dimensions, Inches (mm)

| Number of Poles | Width           | Height      | Depth        |
|-----------------|-----------------|-------------|--------------|
| 2, 3            | 8.25<br>(210)   | 16<br>(407) | 5.5<br>(140) |
| 4               | 11.125<br>(283) | 16<br>(407) | 5.5<br>(140) |

### Approximate Shipping Weight, Lbs. (kg)

| Breaker Type | Complete Breaker |                |                |
|--------------|------------------|----------------|----------------|
|              | Number of Poles  |                |                |
|              | 2                | 3              | 4              |
| ND, HND, NDC | 37<br>(16.783)   | 45<br>(20.412) | 58<br>(26.308) |

## Allowable Accessory Combinations

Different combinations of accessories can be supplied, depending on the types of accessories and the number of poles in the circuit breaker.

|                                                              | Reference<br>Page |  | 3-Pole |        |       |  | 4-Pole |        |       |      |
|--------------------------------------------------------------|-------------------|--|--------|--------|-------|--|--------|--------|-------|------|
|                                                              |                   |  | Left   | Center | Right |  | Left   | Center | Right | Neu. |
| Internal Accessories (Only One Internal Accessory Per Pole)① |                   |  |        |        |       |  |        |        |       |      |
| Alarm Lockout (Make/Break)                                   | 141               |  | ■      |        | ■     |  | ■      |        | ■     |      |
| Alarm Lockout (2Make/2Break)                                 | 141               |  | ■      |        | ■     |  | ■      |        | ■     |      |
| Auxiliary Switch (1A, 1B)                                    | 144               |  | ■      |        | ■     |  | ■      |        | ■     |      |
| Auxiliary Switch (2A, 2B)                                    | 144               |  | ■      |        | ■     |  | ■      |        | ■     |      |
| Auxiliary Switch (3A, 3B)                                    | 144               |  | ■      |        | ■     |  | ■      |        | ■     |      |
| Auxiliary Switch (1A 1B) and Alarm Switch Combination        | 146               |  | ■      |        | ■     |  | ■      |        | ■     |      |
| Auxiliary Switch (2A 2B) and Alarm Switch Combination        | 146               |  | ■      |        | ■     |  | ■      |        | ■     |      |
| Shunt Trip – Standard                                        | 150               |  | ■      |        |       |  | ■      |        |       |      |
| Shunt Trip – Low Energy                                      | 152               |  | ■      |        |       |  | ■      |        |       |      |
| Undervoltage Release Mechanism                               | 158               |  | ■      |        |       |  | ■      |        |       |      |
| Cutler-Hammer PowerNet Communications Kit (OPTIM 550)        | 160               |  |        |        | ■     |  |        |        |       |      |
| External Accessories                                         |                   |  |        |        |       |  |        |        |       |      |
| Base Mounting Hardware                                       | 163               |  |        | ●      |       |  |        | ●      |       |      |
| Interphase Barriers                                          | 166               |  |        | ●      |       |  |        | ●      |       |      |
| Non-Padlockable Handle Block                                 | 168               |  |        | ■      |       |  |        | ■      |       |      |
| Padlockable Handle Lock Hasp                                 | 169               |  | □      |        | □     |  | □      |        | □     |      |
| Key Interlock Kit                                            | 170               |  | □      |        | □     |  | □      |        | □     |      |
| Sliding Bar Interlock – Requires Two Breakers                | 171               |  |        | ●      |       |  |        |        |       |      |
| Walking Beam Interlock – Requires Two Breakers               | 171               |  |        | ●      |       |  |        | ●      |       |      |
| Electrical (Motor) Operator                                  | 173               |  |        | ●      |       |  |        | ●      |       |      |
| Plug-in Adapters                                             | 174               |  |        | ●      |       |  |        | ●      |       |      |
| Rear Connecting Studs                                        | 176               |  |        | ●      |       |  |        | ●      |       |      |
| Panelboard Connecting Straps                                 | 177               |  |        | ●      |       |  |        | ●      |       |      |
| Handle Mechanisms                                            | 178               |  |        | ●      |       |  |        | ●      |       |      |
| Handle Extension                                             | 182               |  |        | ●      |       |  |        | ●      |       |      |
| Solid-State (Electronic) Portable Test Kit                   | 184               |  |        | ●      |       |  |        | ●      |       |      |
| OPTIM System Components 3-Poles                              |                   |  |        |        |       |  |        |        |       |      |
| Ground Fault Alarm Unit                                      | 184               |  |        |        |       |  |        |        |       |      |
| Potential Transformer Module                                 | 184               |  |        |        |       |  |        |        |       |      |
| Breaker Interface Module (BIM)                               | 185               |  |        |        |       |  |        |        |       |      |
| Digitrip OPTIMizer                                           | 185               |  |        |        |       |  |        |        |       |      |
| Auxiliary Power Module                                       | 185               |  |        |        |       |  |        |        |       |      |
| Cutler-Hammer PowerNet Software                              | 185               |  |        |        |       |  |        |        |       |      |
| Modifications (Refer to Cutler-Hammer)                       |                   |  |        |        |       |  |        |        |       |      |
| Special Calibration                                          | 186               |  |        | ●      |       |  |        | ●      |       |      |
| Moisture Fungus Treatment                                    | 186               |  |        | ●      |       |  |        | ●      |       |      |
| Freeze-Tested Circuit Breakers                               | 186               |  |        | ●      |       |  |        | ●      |       |      |
| Marine Application                                           | 186               |  |        | ●      |       |  |        | ●      |       |      |

■ Applicable in indicated pole position

□ May be mounted on left or right pole – not both

● Accessory available/Modification available

① OPTIM 750 and 1050 are factory sealed and do not have the right pole available for accessories.



## Series C® R-Frame



Typical Series C R-Frame Circuit Breaker

- R-frame circuit breakers are available as frame (which includes trip unit), rating plug and terminals.
- All R-frame circuit breakers are suitable for reverse feed use.

## Interrupting Capacity Ratings

## UL489/CSA Interrupting Capacity Ratings ①

| Circuit Breaker Type | Number of Poles | Interrupting Capacity (Symmetrical Amperes) (kA) |     |     |     | Circuit Breaker Type | Page Numbers     |     |     |     |     |       |
|----------------------|-----------------|--------------------------------------------------|-----|-----|-----|----------------------|------------------|-----|-----|-----|-----|-------|
|                      |                 | Volts Ac (50/60 Hz)                              |     |     |     |                      | Trip Unit Types② |     |     |     |     |       |
|                      |                 | 240                                              | 277 | 480 | 600 |                      | 310              | 510 | 610 | 810 | 910 | OPTIM |
| RD                   | 3, 4            | 125                                              | —   | 65  | 50  | RD                   | 91               | 94  | 96  | 98  | 100 | 102   |
| CRD ③                | 3, 4            | 125                                              | —   | 65  | 50  | CRD                  | 93               | 95  | 97  | 99  | 101 | 103   |
| RDC                  | 3, 4            | 200                                              | —   | 100 | 65  | RDC                  | 92               | 94  | 96  | 98  | 100 | 102   |
| CRDC ③               | 3, 4            | 200                                              | —   | 100 | 65  | CRDC                 | 93               | 95  | 97  | 99  | 101 | 103   |

## IEC 947-2 Interrupting Capacity Ratings ①

| Circuit Breaker Type                      | Number of Poles | Interrupting Capacity (Symmetrical Amperes) (kA) |           |          | Circuit Breaker Type | Page Numbers     |     |     |     |     |       |
|-------------------------------------------|-----------------|--------------------------------------------------|-----------|----------|----------------------|------------------|-----|-----|-----|-----|-------|
|                                           |                 | Volts Ac (50/60 Hz)                              |           |          |                      | Trip Unit Types② |     |     |     |     |       |
|                                           |                 | 240                                              | 415       | 690      |                      | 310              | 510 | 610 | 810 | 910 | OPTIM |
| RD<br>I <sub>CU</sub><br>I <sub>CS</sub>  | 3, 4            | 135<br>100                                       | 70<br>50  | 25<br>13 | RD                   | 91               | 94  | 96  | 98  | 100 | 102   |
| RDC<br>I <sub>CU</sub><br>I <sub>CS</sub> | 3, 4            | 200<br>100                                       | 100<br>50 | 35<br>18 | RDC                  | 92               | 94  | 96  | 98  | 100 | 102   |

① Utilization Category A circuit breakers.

② See page 90 for Trip Unit Selection Guide

③ 100% Rated breakers.

## Series C® R-Frame

### R-Frame Digitrip Selection Guide

| Trip Unit Type                               | Digitrip RMS 310                  | Digitrip RMS 510                  | Digitrip RMS 610            | Digitrip OPTIM 750                     | Digitrip RMS 810                  | Digitrip RMS 910                       | Digitrip OPTIM 1050                    |
|----------------------------------------------|-----------------------------------|-----------------------------------|-----------------------------|----------------------------------------|-----------------------------------|----------------------------------------|----------------------------------------|
| RMS Sensing                                  | Yes                               | Yes                               | Yes                         | Yes                                    | Yes                               | Yes                                    | Yes                                    |
| <b>Breaker Type</b>                          |                                   |                                   |                             |                                        |                                   |                                        |                                        |
| Frame                                        | R                                 | R                                 | R                           | R                                      | R                                 | R                                      | R                                      |
| Ampere Range                                 | 800A-2500A                        | 800A-2500A                        | 800A-2500A                  | 800A-2500A                             | 800A-2500A                        | 800A-2500A                             | 800A-2500A                             |
| Interrupting Rating @ 480V                   | 65, 100 (kA)                      | 65, 100 (kA)                      | 65, 100 (kA)                | 65, 100 (kA)                           | 65, 100 (kA)                      | 65, 100 (kA)                           | 65, 100 (kA)                           |
| <b>Protection</b>                            |                                   |                                   |                             |                                        |                                   |                                        |                                        |
| Ordering Options                             | LS, LSG                           | LSI, LSIG                         | LI, LS, LSI, LIG, LSG, LSIG | LI, LS, LSI, LIG, LSG, LSIG            | LSI(A), LSIG                      | LI, LS, LSI, LIG, LSG, LSIG            | LSI(A), LIG                            |
| Fixed Rated Plug ( $I_n$ )                   | Yes                               | Yes                               | Yes                         | Yes                                    | Yes                               | Yes                                    | Yes                                    |
| Overtemperature Trip                         | Yes                               | Yes                               | Yes                         | Yes                                    | Yes                               | Yes                                    | Yes                                    |
| <b>Long Delay Protection (L)</b>             |                                   |                                   |                             |                                        |                                   |                                        |                                        |
| Adjustable Rating Plug ( $I_n$ )             | Yes                               | Yes                               | No                          | No                                     | No                                | No                                     | No                                     |
| Long Delay Pickup                            | 0.5-1.0 ( $I_n$ ) <sup>①</sup>    | 0.5-1.0 ( $I_n$ ) <sup>①</sup>    | 0.5-1.0 x ( $I_n$ )         | 0.5-1.0 x ( $I_n$ )                    | 0.4-1.0 x ( $I_n$ )               | 0.5-1.0 x ( $I_n$ )                    | 0.5-1.0 x ( $I_n$ )                    |
| Long Delay Time I <sup>2</sup> T             | 12 Seconds                        | 12 Seconds                        | 2-24 Seconds                | 2-24 Seconds                           | 2-24 Seconds                      | 2-24 Seconds                           | 2-24 Seconds                           |
| Long Delay Time I <sup>4</sup> T             | No                                | No                                | No                          | No                                     | 1-5 Seconds                       | No                                     | 1-5 Seconds                            |
| Long Delay Thermal Memory                    | Yes                               | Yes                               | Yes                         | Yes                                    | Yes                               | Yes                                    | Yes                                    |
| High Load Alarm                              | No                                | No                                | No                          | 0.85 x $I_r$                           | 0.5-1.0 x $I_r$                   | 0.85 x $I_r$                           | 0.85 x $I_r$                           |
| <b>Short Delay Protection (S)</b>            |                                   |                                   |                             |                                        |                                   |                                        |                                        |
| Short Delay Pickup                           | 200-800% x ( $I_n$ ) <sup>②</sup> | 200-800% x ( $I_n$ ) <sup>②</sup> | 200-600% S1&S2 x ( $I_r$ )  | 200-600% S1&S2 x ( $I_r$ )             | 150-800% x ( $I_r$ ) <sup>③</sup> | 200-600% S1&S2 x ( $I_r$ )             | 200-600% S1&S2 x ( $I_r$ )             |
| Short Delay Time I <sup>2</sup> T            | 100 ms                            | No                                | 100-500 ms                  | 100-500 ms                             | 100-500 ms                        | 100-500 ms                             | 100-500 ms                             |
| Short Delay Time Flat                        | No                                | Inst-300 ms                       | 100-500 ms                  | 100-500 ms                             | 100-500 ms                        | 100-500 ms                             | 100-500 ms                             |
| Short Delay Time Zone Selective Interlocking | No                                | No                                | Yes                         | Yes                                    | Yes                               | Yes                                    | Yes                                    |
| <b>Instantaneous Protection (I)</b>          |                                   |                                   |                             |                                        |                                   |                                        |                                        |
| Instantaneous Pick Up                        | No                                | 200-800% x ( $I_n$ )              | 200-600% M1&M2 x ( $I_n$ )  | 200-600% M1&M2 x ( $I_n$ )             | 200-800% x ( $I_n$ ) <sup>③</sup> | 200-600% M1&M2 x ( $I_n$ )             | 200-600% M1&M2 x ( $I_n$ )             |
| Discriminator                                | No                                | No                                | Yes <sup>④</sup>            | Yes <sup>④</sup>                       | Yes                               | Yes <sup>④</sup>                       | Yes <sup>④</sup>                       |
| Instantaneous Override                       | Yes                               | Yes                               | Yes                         | Yes                                    | Yes                               | Yes                                    | Yes                                    |
| <b>Ground Fault Protection (G)</b>           |                                   |                                   |                             |                                        |                                   |                                        |                                        |
| Ground Fault Alarm <sup>⑤</sup>              | No                                | No                                | No                          | No                                     | 25-100% x ( $I_n$ )               | No                                     | No                                     |
| Ground Fault Pick Up <sup>⑤</sup>            | Varies by Frame                   | Varies by Frame                   | 25-100% x ( $I_s$ )         | 25-100% x ( $I_s$ )                    | 25-100% x ( $I_n$ )               | 25-100% x ( $I_s$ )                    | 25-100% x ( $I_s$ )                    |
| Ground Fault Delay I <sup>2</sup> T          | No                                | No                                | 100-500 ms                  | 100-500 ms                             | 100-500 ms                        | 100-500 ms                             | 100-500 ms                             |
| Ground Fault Delay Flat                      | Inst-500 ms                       | Inst-500 ms                       | 100-500 ms                  | 100-500 ms                             | 100-500 ms                        | 100-500 ms                             | 100-500 ms                             |
| Ground Fault Zone Selective Interlocking     | No                                | No                                | Yes                         | Yes                                    | Yes                               | Yes                                    | Yes                                    |
| Ground Fault Thermal Memory                  | Yes                               | Yes                               | Yes                         | Yes                                    | Yes                               | Yes                                    | Yes                                    |
| <b>System Diagnostics</b>                    |                                   |                                   |                             |                                        |                                   |                                        |                                        |
| Status LEDs                                  | Yes                               | Yes                               | Yes                         | Yes                                    | Yes                               | Yes                                    | Yes                                    |
| Cause of Trip LEDs                           | No                                | No                                | Yes                         | Yes                                    | Yes                               | Yes                                    | Yes                                    |
| Magnitude of Trip Information                | No                                | No                                | No                          | Yes                                    | Yes                               | Yes                                    | Yes                                    |
| Remote Signal Contacts                       | Yes                               | Yes                               | No                          | Yes                                    | Yes                               | Yes                                    | Yes                                    |
| <b>System Monitoring</b>                     |                                   |                                   |                             |                                        |                                   |                                        |                                        |
| Digital Display                              | No                                | No                                | No                          | Yes                                    | Yes <sup>⑥</sup>                  | Yes                                    | Yes                                    |
| Current                                      | No                                | No                                | No                          | Yes                                    | Yes                               | Yes                                    | Yes                                    |
| Voltage                                      | No                                | No                                | No                          | No                                     | No                                | No                                     | No                                     |
| Power and Energy                             | No                                | No                                | No                          | No                                     | No                                | Yes                                    | Yes                                    |
| Power Quality-Harmonics                      | No                                | No                                | No                          | No                                     | No                                | No                                     | Yes                                    |
| Power Factor                                 | No                                | No                                | No                          | No                                     | No                                | Yes (Over Cutler-Hammer PowerNet Only) | Yes                                    |
| <b>Communications</b>                        |                                   |                                   |                             |                                        |                                   |                                        |                                        |
| Cutler-Hammer PowerNet                       | No                                | No                                | No                          | No                                     | Yes                               | Yes                                    | Yes                                    |
| <b>Testing</b>                               |                                   |                                   |                             |                                        |                                   |                                        |                                        |
| Testing Method                               | Test Set                          | Integral                          | Integral                    | OPTIMizer, BIM, Cutler-Hammer PowerNet | Integral                          | Integral                               | OPTIMizer, BIM, Cutler-Hammer PowerNet |

① Adjust by rating plug.

② Except 2500 ampere frame is 200-600%.

③ Varies by frame.

④ LS/LSG only.

⑤ Not to exceed 1200 amperes.

⑥ By OPTIMizer/BIM.

BIM = Breaker Interface Module

(A) = GF Alarm

 $I_s$  = Sensor Rating $I_n$  = Rating Plug $I_r$  = Long Delay Pickup Setting x  $I_n$

## Series C® R-Frame

## Digitrip RMS 310 Electronic Circuit Breakers with Interchangeable Rating Plugs

Order as individual components: Breaker Frame (which includes Trip Unit) and Rating Plug.

| Maximum Continuous Ampere Rating @ 40°C | Circuit Breaker Frame Only                                                                                                                                                                                                                                                                                                                                                           |     |      |       | Digitrip RMS 310 Rating Plug Only |                   |                                          |
|-----------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|------|-------|-----------------------------------|-------------------|------------------------------------------|
|                                         | L – Adjustable Long Delay Pickup (By Adjustable Rating Plug)<br>S – Adjustable Short Delay Pickup with Fixed Short Delay Time (I <sup>2</sup> t Response) or Adjustable Short Delay Time (Flat Response)<br>I – Adjustable Instantaneous Pickup by Setting Short Delay Time to Instantaneous<br>G – Adjustable Ground Fault Pickup with Adjustable Ground Fault Time (Flat Response) |     |      |       | Ampere Rating                     | Fixed Rating Plug | Adjustable Rating Plug                   |
|                                         |                                                                                                                                                                                                                                                                                                                                                                                      |     |      |       |                                   |                   | Adjustable Ampere Ratings Catalog Number |
|                                         |                                                                                                                                                                                                                                                                                                                                                                                      |     |      |       |                                   |                   |                                          |
|                                         | LS                                                                                                                                                                                                                                                                                                                                                                                   | LSI | LSG③ | LSIG③ |                                   |                   |                                          |
|                                         | Catalog Number                                                                                                                                                                                                                                                                                                                                                                       |     |      |       |                                   |                   |                                          |

## 3-Pole Standard Interrupting Capacity 600 Volt Ac Rated 65 kAIC @ 480 Vac

|                   |           |           |           |           |                                                     |                                                                                   |                                                                  |
|-------------------|-----------|-----------|-----------|-----------|-----------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------|
| 1600 <sup>①</sup> | RD316T33W | RD316T32W | RD316T35W | RD316T36W | 800<br>1000<br>1200<br>1250<br>1400<br>1500<br>1600 | 16RES08T<br>16RES10T<br>16RES12T<br>16RES125T<br>16RES14T<br>16RES15T<br>16RES16T | Adjustable Settings are:<br>800, 1000, 1200, 1600<br>A16RES16T1  |
| 2000              | RD320T33W | RD320T32W | RD320T35W | RD320T36W | 1000<br>1200<br>1250<br>1400<br>1600<br>2000        | 20RES10T<br>20RES12T<br>20RES125T<br>20RES14T<br>20RES16T<br>20RES20T             | Adjustable Settings are:<br>1000, 1200, 1600, 2000<br>A20RES20T1 |
| 2500              | RD325T33W | RD325T32W | RD325T35W | RD325T36W | 1200<br>1250<br>1600<br>2000<br>2500                | 25RES12T<br>25RES125T<br>25RES16T<br>25RES20T<br>25RES25T                         | Adjustable Settings are:<br>1200, 1600, 2000, 2500<br>A25RES25T1 |

4-Pole<sup>②</sup> Standard Interrupting Capacity 600 Volt Ac Rated 65 kAIC @ 480 Vac

|                   |           |           |   |   |                                                     |                                                                                   |                                                                  |
|-------------------|-----------|-----------|---|---|-----------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------|
| 1600 <sup>①</sup> | RD416T33W | RD416T32W | – | – | 800<br>1000<br>1200<br>1250<br>1400<br>1500<br>1600 | 16RES08T<br>16RES10T<br>16RES12T<br>16RES125T<br>16RES14T<br>16RES15T<br>16RES16T | Adjustable Settings are:<br>800, 1000, 1200, 1600<br>A16RES16T1  |
| 2000              | RD420T33W | RD420T32W | – | – | 1000<br>1200<br>1250<br>1400<br>1600<br>2000        | 20RES10T<br>20RES12T<br>20RES125T<br>20RES14T<br>20RES16T<br>20RES20T             | Adjustable Settings are:<br>1000, 1200, 1600, 2000<br>A20RES20T1 |
| 2500              | RD425T33W | RD425T32W | – | – | 1200<br>1250<br>1600<br>2000<br>2500                | 25RES12T<br>25RES125T<br>25RES16T<br>25RES20T<br>25RES25T                         | Adjustable Settings are:<br>1200, 1600, 2000, 2500<br>A25RES25T1 |

Instruction Leaflet/FRED Number 29C107 for Breaker; Number 29C883 for Digitrip 310 Trip Unit

- ① For SCR application use 2000 ampere frame.  
 ② Unprotected right pole neutral. Add "P" to catalog number for 100% protected right pole neutral, i.e., "RD416T33PW".  
 ③ Add suffix "R" to breaker catalog number for ground fault remote indication compatibility.

# Molded Case Circuit Breakers 800-2500 Amperes

Cutler-Hammer

March 1999

## Series C® L-Frame

## Digitrip RMS 310 Electronic Circuit Breakers with Interchangeable Rating Plugs

Order as individual components: Breaker Frame (which includes Trip Unit) and Rating Plug.

| Maximum Continuous Ampere Rating @ 40°C | Circuit Breaker Frame Only                                                                                                                                                                                                                                                                                                                                                           |     |      |       | Digitrip RMS 310 Rating Plug Only |                   |                                          |
|-----------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|------|-------|-----------------------------------|-------------------|------------------------------------------|
|                                         | L – Adjustable Long Delay Pickup (By Adjustable Rating Plug)<br>S – Adjustable Short Delay Pickup with Fixed Short Delay Time (I <sup>2</sup> t Response) or Adjustable Short Delay Time (Flat Response)<br>I – Adjustable Instantaneous Pickup by Setting Short Delay Time to Instantaneous<br>G – Adjustable Ground Fault Pickup with Adjustable Ground Fault Time (Flat Response) |     |      |       | Ampere Rating                     | Fixed Rating Plug | Adjustable Rating Plug                   |
|                                         |                                                                                                                                                                                                                                                                                                                                                                                      |     |      |       |                                   |                   | Adjustable Ampere Ratings Catalog Number |
|                                         |                                                                                                                                                                                                                                                                                                                                                                                      |     |      |       |                                   |                   |                                          |
|                                         | LS                                                                                                                                                                                                                                                                                                                                                                                   | LSI | LSG③ | LSIG③ |                                   |                   |                                          |
| Catalog Number                          |                                                                                                                                                                                                                                                                                                                                                                                      |     |      |       |                                   |                   |                                          |

### 3-Pole High Interrupting Capacity 600 Volt Ac Rated 100 kAIC @ 480 Vac

|                   |            |            |            |            |                                                     |                                                                                   |                                                                  |
|-------------------|------------|------------|------------|------------|-----------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------|
| 1600 <sup>①</sup> | RDC316T33W | RDC316T32W | RDC316T35W | RDC316T36W | 800<br>1000<br>1200<br>1250<br>1400<br>1500<br>1600 | 16RES08T<br>16RES10T<br>16RES12T<br>16RES125T<br>16RES14T<br>16RES15T<br>16RES16T | Adjustable Settings are:<br>800, 1000, 1200, 1600<br>A16RES16T1  |
| 2000              | RDC320T33W | RDC320T32W | RDC320T35W | RDC320T36W | 1000<br>1200<br>1250<br>1400<br>1600<br>2000        | 20RES10T<br>20RES12T<br>20RES125T<br>20RES14T<br>20RES16T<br>20RES20T             | Adjustable Settings are:<br>1000, 1200, 1600, 2000<br>A20RES20T1 |
| 2500              | RDC325T33W | RDC325T32W | RDC325T35W | RDC325T36W | 1200<br>1250<br>1600<br>2000<br>2500                | 25RES12T<br>25RES125T<br>25RES16T<br>25RES20T<br>25RES25T                         | Adjustable Settings are:<br>1200, 1600, 2000, 2500<br>A25RES25T1 |

### 4-Pole<sup>②</sup> High Interrupting Capacity 600 Volt Ac Rated 100 kAIC @ 480 Vac

|                   |            |            |   |   |                                                     |                                                                                   |                                                                  |
|-------------------|------------|------------|---|---|-----------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------|
| 1600 <sup>①</sup> | RDC416T33W | RDC416T32W | – | – | 800<br>1000<br>1200<br>1250<br>1400<br>1500<br>1600 | 16RES08T<br>16RES10T<br>16RES12T<br>16RES125T<br>16RES14T<br>16RES15T<br>16RES16T | Adjustable Settings are:<br>800, 1000, 1200, 1600<br>A16RES16T1  |
| 2000              | RDC420T33W | RDC420T32W | – | – | 1000<br>1200<br>1250<br>1400<br>1600<br>2000        | 20RES10T<br>20RES12T<br>20RES125T<br>20RES14T<br>20RES16T<br>20RES20T             | Adjustable Settings are:<br>1000, 1200, 1600, 2000<br>A20RES20T1 |
| 2500              | RDC425T33W | RDC425T32W | – | – | 1200<br>1250<br>1600<br>2000<br>2500                | 25RES12T<br>25RES125T<br>25RES16T<br>25RES20T<br>25RES25T                         | Adjustable Settings are:<br>1200, 1600, 2000, 2500<br>A25RES25T1 |

Instruction Leaflet/FRED Number 29C107 for Breaker; Number 29C883 for Digitrip 310 Trip Unit

① For SCR application use 2000 ampere frame.

② Unprotected right pole neutral. Add "P" to catalog number for 100% protected right pole neutral, i.e., "RDC416T33PW".

③ Add suffix "R" to breaker catalog number for ground fault remote indication compatibility.

## Series C® R-Frame

100% Rated Digitrip RMS 310 Electronic Circuit Breakers<sup>①</sup>

The NEC allows the breaker to be rated at 100% of its frame size in an assembly, provided that 90°C wire is applied at 75°C ampacity. Order as individual components: Breaker Frame (which includes Trip Unit) and Rating Plug.

|                                         |                                                                                                                                                                                                                                                                                                                                                                                      |     |      |       |                                   |                   |                        |  |
|-----------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|------|-------|-----------------------------------|-------------------|------------------------|--|
| Maximum Continuous Ampere Rating @ 40°C | Circuit Breaker Frame Only                                                                                                                                                                                                                                                                                                                                                           |     |      |       | Digitrip RMS 310 Rating Plug Only |                   |                        |  |
|                                         | L – Adjustable Long Delay Pickup (By Adjustable Rating Plug)<br>S – Adjustable Short Delay Pickup with Fixed Short Delay Time (I <sup>2</sup> t Response) or Adjustable Short Delay Time (Flat Response)<br>I – Adjustable Instantaneous Pickup by Setting Short Delay Time to Instantaneous<br>G – Adjustable Ground Fault Pickup with Adjustable Ground Fault Time (Flat Response) |     |      |       | Ampere Rating                     | Fixed Rating Plug | Adjustable Rating Plug |  |
|                                         | Adjustable Ampere Ratings Catalog Number                                                                                                                                                                                                                                                                                                                                             |     |      |       |                                   |                   |                        |  |
|                                         |                                                                                                                                                                                                                                                                                                                                                                                      |     |      |       |                                   |                   |                        |  |
|                                         |                                                                                                                                                                                                                                                                                                                                                                                      |     |      |       |                                   |                   |                        |  |
| LS                                      |                                                                                                                                                                                                                                                                                                                                                                                      | LSI | LSG③ | LSIG③ |                                   |                   |                        |  |
| Catalog Number                          |                                                                                                                                                                                                                                                                                                                                                                                      |     |      |       |                                   |                   |                        |  |

## 3-Pole Standard Interrupting Capacity 600 Volt Ac Rated 65 kAIC @ 480 Vac

|                   |            |            |            |            |                                                     |                                                                                   |                                                                         |
|-------------------|------------|------------|------------|------------|-----------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------|
| 1600 <sup>②</sup> | CRD316T33W | CRD316T32W | CRD316T35W | CRD316T36W | 800<br>1000<br>1200<br>1250<br>1400<br>1500<br>1600 | 16RES08T<br>16RES10T<br>16RES12T<br>16RES125T<br>16RES14T<br>16RES15T<br>16RES16T | Adjustable Settings are:<br>800, 1000, 1200, 1600<br><b>A16RES16T1</b>  |
| 2000              | CRD320T33W | CRD320T32W | CRD320T35W | CRD320T36W | 1000<br>1200<br>1250<br>1400<br>1600<br>2000        | 20RES10T<br>20RES12T<br>20RES125T<br>20RES14T<br>20RES16T<br>20RES20T             | Adjustable Settings are:<br>1000, 1200, 1600, 2000<br><b>A20RES20T1</b> |

## 3-Pole High Interrupting Capacity 600 Volt Ac Rated 100 kAIC @ 480 Vac

|                    |             |             |             |             |                                                     |                                                                                   |                                                                         |
|--------------------|-------------|-------------|-------------|-------------|-----------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------|
| 1600 <sup>①②</sup> | CRDC316T33W | CRDC316T32W | CRDC316T35W | CRDC316T36W | 800<br>1000<br>1200<br>1250<br>1400<br>1500<br>1600 | 16RES08T<br>16RES10T<br>16RES12T<br>16RES125T<br>16RES14T<br>16RES15T<br>16RES16T | Adjustable Settings are:<br>800, 1000, 1200, 1600<br><b>A16RES16T1</b>  |
| 2000               | CRDC320T33W | CRDC320T32W | CRDC320T35W | CRDC320T36W | 1000<br>1200<br>1250<br>1400<br>1600<br>2000        | 20RES10T<br>20RES12T<br>20RES125T<br>20RES14T<br>20RES16T<br>20RES20T             | Adjustable Settings are:<br>1000, 1200, 1600, 2000<br><b>A20RES20T1</b> |

Instruction Leaflet/FRED Number 29C107 for Breaker; Number 29C883 for Digitrip 310 Trip Unit

- ① Includes B2016RDL rear connections.  
Refer to TD.29.02.T.E for dimensions.
- ② For SCR application use 2000 ampere frame.
- ③ Add suffix "R" to breaker catalog number for ground fault remote indication compatibility.



# Molded Case Circuit Breaker 800-2500 Amperes

Cutler-Hammer

March 1999

## Series C® R-Frame

## Digitrip RMS 510 Electronic Circuit Breakers with Interchangeable Rating Plugs

Order as individual components: Breaker Frame (which includes Trip Unit) and Rating Plug.

| Maximum Continuous Ampere Rating @ 40°C | Circuit Breaker Frame Only                                                                                                                                                                                                                                                                                                  |    |     |     |     |      | Digitrip Rating Plug Only |                |
|-----------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|-----|-----|-----|------|---------------------------|----------------|
|                                         | L – Adjustable Long Delay Pickup ( $I_L$ ) with Adjustable Long Delay Time<br>S – Adjustable Short Delay Pickup with Adjustable Short Delay Time ( $I^2t$ or Flat Response)<br>I – Adjustable Instantaneous Pickup<br>G – Adjustable Ground Fault Pickup with Adjustable Ground Fault Time Delay ( $I^2t$ or Flat Response) |    |     |     |     |      | Fixed Rating Plug         |                |
|                                         |                                                                                                                                                                                                                                                                                                                             |    |     |     |     |      | Rated Current ( $I_n$ )   | Catalog Number |
|                                         |                                                                                                                                                                                                                                                                                                                             |    |     |     |     |      |                           |                |
|                                         | LI                                                                                                                                                                                                                                                                                                                          | LS | LSI | LIG | LSG | LSIG |                           |                |
|                                         | Catalog Number                                                                                                                                                                                                                                                                                                              |    |     |     |     |      |                           |                |

### 3-Pole Standard Interrupting Capacity 600 Volt Ac Rated 65 kAIC @ 480 Vac

|      |           |           |           |           |           |           |                              |                                                      |
|------|-----------|-----------|-----------|-----------|-----------|-----------|------------------------------|------------------------------------------------------|
| 1600 | RD316T51W | RD316T53W | RD316T52W | RD316T54W | RD316T55W | RD316T56W | 800<br>1000<br>1200<br>1600  | RP6R16A080<br>RP6R16A100<br>RP6R16A120<br>RP6R16A160 |
| 2000 | RD320T51W | RD320T53W | RD320T52W | RD320T54W | RD320T55W | RD320T56W | 1000<br>1200<br>1600<br>2000 | RP6R20A100<br>RP6R20A120<br>RP6R20A160<br>RP6R20A200 |
| 2500 | RD325T51W | RD325T53W | RD325T52W | RD325T54W | RD325T55W | RD325T56W | 1600<br>2000<br>2500         | RP6R25A160<br>RP6R25A200<br>RP6R25A250               |

### 3-Pole High Interrupting Capacity 600 Volt Ac Rated 100 kAIC @ 480 Vac

|      |            |            |            |            |            |            |                              |                                                      |
|------|------------|------------|------------|------------|------------|------------|------------------------------|------------------------------------------------------|
| 1600 | RDC316T51W | RDC316T53W | RDC316T52W | RDC316T54W | RDC316T55W | RDC316T56W | 800<br>1000<br>1200<br>1600  | RP6R16A080<br>RP6R16A100<br>RP6R16A120<br>RP6R16A160 |
| 2000 | RDC320T51W | RDC320T53W | RDC320T52W | RDC320T54W | RDC320T55W | RDC320T56W | 1000<br>1200<br>1600<br>2000 | RP6R20A100<br>RP6R20A120<br>RP6R20A160<br>RP6R20A200 |
| 2500 | RDC325T51W | RDC325T53W | RDC325T52W | RDC325T54W | RDC325T55W | RDC325T56W | 1600<br>2000<br>2500         | RP6R25A160<br>RP6R25A200<br>RP6R25A250               |

Instruction Leaflet/FRED Number 29C107 for Breaker; Number 29C885 for Digitrip 510 Trip Unit

## Series C® R-Frame

## 100% Rated Digitrip RMS 510 Circuit Breakers

The NEC allows the breaker to be rated at 100% of its frame size in an assembly, provided that 90°C wire is applied at 75°C ampacity. Order as individual components: Breaker Frame (which includes Trip Unit) and Rating Plug.

|                                         |                                                                                                                                                                                                                                                                                                                                                       |    |     |     |     |      |                                 |                |
|-----------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|-----|-----|-----|------|---------------------------------|----------------|
| Maximum Continuous Ampere Rating @ 40°C | Circuit Breaker Frame Only                                                                                                                                                                                                                                                                                                                            |    |     |     |     |      | Digitrip Rating Plug Only       |                |
|                                         | L – Adjustable Long Delay Pickup (I <sub>L</sub> ) with Adjustable Long Delay Time<br>S – Adjustable Short Delay Pickup with Adjustable Short Delay Time (I <sup>2</sup> t or Flat Response)<br>I – Adjustable Instantaneous Pickup<br>G – Adjustable Ground Fault Pickup with Adjustable Ground Fault Time Delay (I <sup>2</sup> t or Flat Response) |    |     |     |     |      | Fixed Rating Plug               |                |
|                                         |                                                                                                                                                                                                                                                                                                                                                       |    |     |     |     |      | Rated Current (I <sub>n</sub> ) | Catalog Number |
|                                         |                                                                                                                                                                                                                                                                                                                                                       |    |     |     |     |      |                                 |                |
|                                         |                                                                                                                                                                                                                                                                                                                                                       |    |     |     |     |      |                                 |                |
|                                         | LI                                                                                                                                                                                                                                                                                                                                                    | LS | LSI | LIG | LSG | LSIG |                                 |                |
| Catalog Number                          |                                                                                                                                                                                                                                                                                                                                                       |    |     |     |     |      |                                 |                |

## 3-Pole Standard Interrupting Capacity 600 Volt Ac Rated 65 kAIC @ 480 Vac

|      |            |            |            |            |            |            |                              |                                                      |
|------|------------|------------|------------|------------|------------|------------|------------------------------|------------------------------------------------------|
| 1600 | CRD316T51W | CRD316T53W | CRD316T52W | CRD316T54W | CRD316T55W | CRD316T56W | 800<br>1000<br>1200<br>1600  | RP6R16A080<br>RP6R16A100<br>RP6R16A120<br>RP6R16A160 |
| 2000 | CRD320T51W | CRD320T53W | CRD320T52W | CRD320T54W | CRD320T55W | CRD320T56W | 1000<br>1200<br>1600<br>2000 | RP6R20A100<br>RP6R20A120<br>RP6R20A160<br>RP6R20A200 |

## 3-Pole High Interrupting Capacity 600 Volt Ac Rated 100 kAIC @ 480 Vac

|      |             |             |             |             |             |             |                              |                                                      |
|------|-------------|-------------|-------------|-------------|-------------|-------------|------------------------------|------------------------------------------------------|
| 1600 | CRDC316T51W | CRDC316T53W | CRDC316T52W | CRDC316T54W | CRDC316T55W | CRDC316T56W | 800<br>1000<br>1200<br>1600  | RP6R16A080<br>RP6R16A100<br>RP6R16A120<br>RP6R16A160 |
| 2000 | CRDC320T51W | CRDC320T53W | CRDC320T52W | CRDC320T54W | CRDC320T55W | CRDC320T56W | 1000<br>1200<br>1600<br>2000 | RP6R20A100<br>RP6R20A120<br>RP6R20A160<br>RP6R20A200 |

Instruction Leaflet/FRED Number 29C107 for Breaker; Number 29885 for Digitrip 510 Trip Unit

# Molded Case Circuit Breakers 800-2500 Amperes

Cutler-Hammer

March 1999

## Series C® R-Frame

## Digitrip RMS 610 Electronic Circuit Breakers with Interchangeable Rating Plugs

Order as individual components: Breaker Frame (which includes Trip Unit) and Rating Plug.

|                                         |                                                                                                                                                                                                                                                                                                                                                       |    |     |     |     |      |                                 |                |
|-----------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|-----|-----|-----|------|---------------------------------|----------------|
| Maximum Continuous Ampere Rating @ 40°C | Circuit Breaker Frame Only                                                                                                                                                                                                                                                                                                                            |    |     |     |     |      | Digitrip Rating Plug Only       |                |
|                                         | L – Adjustable Long Delay Pickup (I <sub>L</sub> ) with Adjustable Long Delay Time<br>S – Adjustable Short Delay Pickup with Adjustable Short Delay Time (I <sup>2</sup> t or Flat Response)<br>I – Adjustable Instantaneous Pickup<br>G – Adjustable Ground Fault Pickup with Adjustable Ground Fault Time Delay (I <sup>2</sup> t or Flat Response) |    |     |     |     |      | Fixed Rating Plug               |                |
|                                         |                                                                                                                                                                                                                                                                                                                                                       |    |     |     |     |      | Rated Current (I <sub>n</sub> ) | Catalog Number |
|                                         |                                                                                                                                                                                                                                                                                                                                                       |    |     |     |     |      |                                 |                |
|                                         |                                                                                                                                                                                                                                                                                                                                                       |    |     |     |     |      |                                 |                |
|                                         | LI                                                                                                                                                                                                                                                                                                                                                    | LS | LSI | LIG | LSG | LSIG |                                 |                |
| Catalog Number                          |                                                                                                                                                                                                                                                                                                                                                       |    |     |     |     |      |                                 |                |

### 3-Pole Standard Interrupting Capacity 600 Volt Ac Rated 65 kAIC @ 480 Vac

|      |           |           |           |           |           |           |                              |                                                      |
|------|-----------|-----------|-----------|-----------|-----------|-----------|------------------------------|------------------------------------------------------|
| 1600 | RD316T61W | RD316T63W | RD316T62W | RD316T64W | RD316T65W | RD316T66W | 800<br>1000<br>1200<br>1600  | RP6R16A080<br>RP6R16A100<br>RP6R16A120<br>RP6R16A160 |
| 2000 | RD320T61W | RD320T63W | RD320T62W | RD320T64W | RD320T65W | RD320T66W | 1000<br>1200<br>1600<br>2000 | RP6R20A100<br>RP6R20A120<br>RP6R20A160<br>RP6R20A200 |
| 2500 | RD325T61W | RD325T63W | RD325T62W | RD325T64W | RD325T65W | RD325T66W | 1600<br>2000<br>2500         | RP6R25A160<br>RP6R25A200<br>RP6R25A250               |

### 3-Pole High Interrupting Capacity 600 Volt Ac Rated 100 kAIC @ 480 Vac

|      |            |            |            |            |            |            |                              |                                                      |
|------|------------|------------|------------|------------|------------|------------|------------------------------|------------------------------------------------------|
| 1600 | RDC316T61W | RDC316T63W | RDC316T62W | RDC316T64W | RDC316T65W | RDC316T66W | 800<br>1000<br>1200<br>1600  | RP6R16A080<br>RP6R16A100<br>RP6R16A120<br>RP6R16A160 |
| 2000 | RDC320T61W | RDC320T63W | RDC320T62W | RDC320T64W | RDC320T65W | RDC320T66W | 1000<br>1200<br>1600<br>2000 | RP6R20A100<br>RP6R20A120<br>RP6R20A160<br>RP6R20A200 |
| 2500 | RDC325T61W | RDC325T63W | RDC325T62W | RDC325T64W | RDC325T65W | RDC325T66W | 1600<br>2000<br>2500         | RP6R25A160<br>RP6R25A200<br>RP6R25A250               |

Instruction Leaflet/FRED Number 29C107 for Breaker; Number 29886 for Digitrip 610 Trip Unit

## Series C® R-Frame

## 100% Rated Digitrip RMS 610 Circuit Breakers

The NEC allows the breaker to be rated at 100% of its frame size in an assembly, provided that 90°C wire is applied at 75°C ampacity. Order as individual components: Breaker Frame (which includes Trip Unit) and Rating Plug.

|                                         |                                                                                                                                                                                                                                                                                                                                                       |    |     |     |     |      |                                 |                |
|-----------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|-----|-----|-----|------|---------------------------------|----------------|
| Maximum Continuous Ampere Rating @ 40°C | Circuit Breaker Frame Only                                                                                                                                                                                                                                                                                                                            |    |     |     |     |      | Digitrip Rating Plug Only       |                |
|                                         | L – Adjustable Long Delay Pickup (I <sub>L</sub> ) with Adjustable Long Delay Time<br>S – Adjustable Short Delay Pickup with Adjustable Short Delay Time (I <sup>2</sup> t or Flat Response)<br>I – Adjustable Instantaneous Pickup<br>G – Adjustable Ground Fault Pickup with Adjustable Ground Fault Time Delay (I <sup>2</sup> t or Flat Response) |    |     |     |     |      | Fixed Rating Plug               |                |
|                                         |                                                                                                                                                                                                                                                                                                                                                       |    |     |     |     |      | Rated Current (I <sub>n</sub> ) | Catalog Number |
|                                         |                                                                                                                                                                                                                                                                                                                                                       |    |     |     |     |      |                                 |                |
|                                         |                                                                                                                                                                                                                                                                                                                                                       |    |     |     |     |      |                                 |                |
|                                         | LI                                                                                                                                                                                                                                                                                                                                                    | LS | LSI | LIG | LSG | LSIG |                                 |                |
| Catalog Number                          |                                                                                                                                                                                                                                                                                                                                                       |    |     |     |     |      |                                 |                |

## 3-Pole Standard Interrupting Capacity 600 Volt Ac Rated 65 kAIC @ 480 Vac

|      |            |            |            |            |            |            |                              |                                                      |
|------|------------|------------|------------|------------|------------|------------|------------------------------|------------------------------------------------------|
| 1600 | CRD316T61W | CRD316T63W | CRD316T62W | CRD316T64W | CRD316T65W | CRD316T66W | 800<br>1000<br>1200<br>1600  | RP6R16A080<br>RP6R16A100<br>RP6R16A120<br>RP6R16A160 |
| 2000 | CRD320T61W | CRD320T63W | CRD320T62W | CRD320T64W | CRD320T65W | CRD320T66W | 1000<br>1200<br>1600<br>2000 | RP6R20A100<br>RP6R20A120<br>RP6R20A160<br>RP6R20A200 |

## 3-Pole High Interrupting Capacity 600 Volt Ac Rated 100 kAIC @ 480 Vac

|      |             |             |             |             |             |             |                              |                                                      |
|------|-------------|-------------|-------------|-------------|-------------|-------------|------------------------------|------------------------------------------------------|
| 1600 | CRDC316T61W | CRDC316T63W | CRDC316T62W | CRDC316T64W | CRDC316T65W | CRDC316T66W | 800<br>1000<br>1200<br>1600  | RP6R16A080<br>RP6R16A100<br>RP6R16A120<br>RP6R16A160 |
| 2000 | CRDC320T61W | CRDC320T63W | CRDC320T62W | CRDC320T64W | CRDC320T65W | CRDC320T66W | 1000<br>1200<br>1600<br>2000 | RP6R20A100<br>RP6R20A120<br>RP6R20A160<br>RP6R20A200 |

Instruction Leaflet/FRED Number 29C107 for Breaker; Number 29886 for Digitrip 610 Trip Unit

# Molded Case Circuit Breakers

## 800-2500 Amperes

Cutler-Hammer

March 1999

## Series C® R-Frame

### Digitrip RMS 810 Electronic Circuit Breakers with Interchangeable Rating Plugs

Order as individual components: Breaker Frame (which includes Trip Unit) and Rating Plug.

| Maximum Continuous Ampere Rating @ 40°C | Circuit Breaker Frame Only                                                                                                                                                                                                                                                                                                  |    |     |     |     |      | Digitrip Rating Plug Only |                |
|-----------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|-----|-----|-----|------|---------------------------|----------------|
|                                         | L – Adjustable Long Delay Pickup ( $I_L$ ) with Adjustable Long Delay Time<br>S – Adjustable Short Delay Pickup with Adjustable Short Delay Time ( $I^2t$ or Flat Response)<br>I – Adjustable Instantaneous Pickup<br>G – Adjustable Ground Fault Pickup with Adjustable Ground Fault Time Delay ( $I^2t$ or Flat Response) |    |     |     |     |      | Fixed Rating Plug         |                |
|                                         |                                                                                                                                                                                                                                                                                                                             |    |     |     |     |      | Rated Current ( $I_n$ )   | Catalog Number |
|                                         |                                                                                                                                                                                                                                                                                                                             |    |     |     |     |      |                           |                |
|                                         | LI                                                                                                                                                                                                                                                                                                                          | LS | LSI | LIG | LSG | LSIG |                           |                |
|                                         | Catalog Number                                                                                                                                                                                                                                                                                                              |    |     |     |     |      |                           |                |

#### 3-Pole Standard Interrupting Capacity 600 Volt Ac Rated 65 kAIC @ 480 Vac

|      |           |           |           |           |           |           |                              |                                                      |
|------|-----------|-----------|-----------|-----------|-----------|-----------|------------------------------|------------------------------------------------------|
| 1600 | RD316T81W | RD316T83W | RD316T82W | RD316T84W | RD316T85W | RD316T86W | 800<br>1000<br>1200<br>1600  | RP6R16A080<br>RP6R16A100<br>RP6R16A120<br>RP6R16A160 |
| 2000 | RD320T81W | RD320T83W | RD320T82W | RD320T84W | RD320T85W | RD320T86W | 1000<br>1200<br>1600<br>2000 | RP6R20A100<br>RP6R20A120<br>RP6R20A160<br>RP6R20A200 |
| 2500 | RD325T81W | RD325T83W | RD325T82W | RD325T84W | RD325T85W | RD325T86W | 1600<br>2000<br>2500         | RP6R25A160<br>RP6R25A200<br>RP6R25A250               |

#### 3-Pole High Interrupting Capacity 600 Volt Ac Rated 100 kAIC @ 480 Vac

|      |            |            |            |            |            |            |                              |                                                      |
|------|------------|------------|------------|------------|------------|------------|------------------------------|------------------------------------------------------|
| 1600 | RDC316T81W | RDC316T83W | RDC316T82W | RDC316T84W | RDC316T85W | RDC316T86W | 800<br>1000<br>1200<br>1600  | RP6R16A080<br>RP6R16A100<br>RP6R16A120<br>RP6R16A160 |
| 2000 | RDC320T81W | RDC320T83W | RDC320T82W | RDC320T84W | RDC320T85W | RDC320T86W | 1000<br>1200<br>1600<br>2000 | RP6R20A100<br>RP6R20A120<br>RP6R20A160<br>RP6R20A200 |
| 2500 | RDC325T81W | RDC325T83W | RDC325T82W | RDC325T84W | RDC325T85W | RDC325T86W | 1600<br>2000<br>2500         | RP6R25A160<br>RP6R25A200<br>RP6R25A250               |

Instruction Leaflet/FRED Number 29C107 for Breaker; Number 29888 for Digitrip 810 Trip Unit

## Series C® R-Frame

## 100% Rated Digitrip RMS 810 Circuit Breakers

The NEC allows the breaker to be rated at 100% of its frame size in an assembly, provided that 90°C wire is applied at 75°C ampacity. Order as individual components: Breaker Frame (which includes Trip Unit) and Rating Plug.

|                                         |                                                                                                                                                                                                                                                                                                                                                       |    |     |     |     |      |                                 |                |
|-----------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|-----|-----|-----|------|---------------------------------|----------------|
| Maximum Continuous Ampere Rating @ 40°C | Circuit Breaker Frame Only                                                                                                                                                                                                                                                                                                                            |    |     |     |     |      | Digitrip Rating Plug Only       |                |
|                                         | L – Adjustable Long Delay Pickup (I <sub>L</sub> ) with Adjustable Long Delay Time<br>S – Adjustable Short Delay Pickup with Adjustable Short Delay Time (I <sup>2</sup> t or Flat Response)<br>I – Adjustable Instantaneous Pickup<br>G – Adjustable Ground Fault Pickup with Adjustable Ground Fault Time Delay (I <sup>2</sup> t or Flat Response) |    |     |     |     |      | Fixed Rating Plug               |                |
|                                         |                                                                                                                                                                                                                                                                                                                                                       |    |     |     |     |      | Rated Current (I <sub>n</sub> ) | Catalog Number |
|                                         |                                                                                                                                                                                                                                                                                                                                                       |    |     |     |     |      |                                 |                |
|                                         |                                                                                                                                                                                                                                                                                                                                                       |    |     |     |     |      |                                 |                |
|                                         | LI                                                                                                                                                                                                                                                                                                                                                    | LS | LSI | LIG | LSG | LSIG |                                 |                |
| Catalog Number                          |                                                                                                                                                                                                                                                                                                                                                       |    |     |     |     |      |                                 |                |

## 3-Pole Standard Interrupting Capacity 600 Volt Ac Rated 65 kAIC @ 480 Vac

|      |            |            |            |            |            |            |                              |                                                      |
|------|------------|------------|------------|------------|------------|------------|------------------------------|------------------------------------------------------|
| 1600 | CRD316T81W | CRD316T83W | CRD316T82W | CRD316T84W | CRD316T85W | CRD316T86W | 800<br>1000<br>1200<br>1600  | RP6R16A080<br>RP6R16A100<br>RP6R16A120<br>RP6R16A160 |
| 2000 | CRD320T81W | CRD320T83W | CRD320T82W | CRD320T84W | CRD320T85W | CRD320T86W | 1000<br>1200<br>1600<br>2000 | RP6R20A100<br>RP6R20A120<br>RP6R20A160<br>RP6R20A200 |

## 3-Pole High Interrupting Capacity 600 Volt Ac Rated 100 kAIC @ 480 Vac

|      |             |             |             |             |             |             |                              |                                                      |
|------|-------------|-------------|-------------|-------------|-------------|-------------|------------------------------|------------------------------------------------------|
| 1600 | CRDC316T81W | CRDC316T83W | CRDC316T82W | CRDC316T84W | CRDC316T85W | CRDC316T86W | 800<br>1000<br>1200<br>1600  | RP6R16A080<br>RP6R16A100<br>RP6R16A120<br>RP6R16A160 |
| 2000 | CRDC320T81W | CRDC320T83W | CRDC320T82W | CRDC320T84W | CRDC320T85W | CRDC320T86W | 1000<br>1200<br>1600<br>2000 | RP6R20A100<br>RP6R20A120<br>RP6R20A160<br>RP6R20A200 |

Instruction Leaflet/FRED Number 29C107 for Breaker; Number 29888 for Digitrip 810 Trip Unit

## Series C® R-Frame

### Digitrip RMS 910 Electronic Circuit Breakers with Interchangeable Rating Plugs

Order as individual components: Breaker Frame (which includes Trip Unit) and Rating Plug.

| Maximum Continuous Ampere Rating @ 40°C | Circuit Breaker Frame Only                                                                                                                                                                                                                                                                                                                            |    |     |     |     |      | Digitrip Rating Plug Only       |                |
|-----------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|-----|-----|-----|------|---------------------------------|----------------|
|                                         | L – Adjustable Long Delay Pickup (I <sub>L</sub> ) with Adjustable Long Delay Time<br>S – Adjustable Short Delay Pickup with Adjustable Short Delay Time (I <sup>2</sup> t or Flat Response)<br>I – Adjustable Instantaneous Pickup<br>G – Adjustable Ground Fault Pickup with Adjustable Ground Fault Time Delay (I <sup>2</sup> t or Flat Response) |    |     |     |     |      | Fixed Rating Plug               |                |
|                                         |                                                                                                                                                                                                                                                                                                                                                       |    |     |     |     |      | Rated Current (I <sub>n</sub> ) | Catalog Number |
|                                         |                                                                                                                                                                                                                                                                                                                                                       |    |     |     |     |      |                                 |                |
|                                         | LI                                                                                                                                                                                                                                                                                                                                                    | LS | LSI | LIG | LSG | LSIG |                                 |                |
| Catalog Number                          |                                                                                                                                                                                                                                                                                                                                                       |    |     |     |     |      |                                 |                |

#### 3-Pole Standard Interrupting Capacity 600 Volt Ac Rated 65 kAIC @ 480 Vac

|      |           |           |           |           |           |           |                              |                                                      |
|------|-----------|-----------|-----------|-----------|-----------|-----------|------------------------------|------------------------------------------------------|
| 1600 | RD316T91W | RD316T93W | RD316T92W | RD316T94W | RD316T95W | RD316T96W | 800<br>1000<br>1200<br>1600  | RP6R16A080<br>RP6R16A100<br>RP6R16A120<br>RP6R16A160 |
| 2000 | RD320T91W | RD320T93W | RD320T92W | RD320T94W | RD320T95W | RD320T96W | 1000<br>1200<br>1600<br>2000 | RP6R20A100<br>RP6R20A120<br>RP6R20A160<br>RP6R20A200 |
| 2500 | RD325T91W | RD325T93W | RD325T92W | RD325T94W | RD325T95W | RD325T96W | 1600<br>2000<br>2500         | RP6R25A160<br>RP6R25A200<br>RP6R25A250               |

#### 3-Pole High Interrupting Capacity 600 Volt Ac Rated 100 kAIC @ 480 Vac

|      |            |            |            |            |            |            |                              |                                                      |
|------|------------|------------|------------|------------|------------|------------|------------------------------|------------------------------------------------------|
| 1600 | RDC316T91W | RDC316T93W | RDC316T92W | RDC316T94W | RDC316T95W | RDC316T96W | 800<br>1000<br>1200<br>1600  | RP6R16A080<br>RP6R16A100<br>RP6R16A120<br>RP6R16A160 |
| 2000 | RDC320T91W | RDC320T93W | RDC320T92W | RDC320T94W | RDC320T95W | RDC320T96W | 1000<br>1200<br>1600<br>2000 | RP6R20A100<br>RP6R20A120<br>RP6R20A160<br>RP6R20A200 |
| 2500 | RDC325T91W | RDC325T93W | RDC325T92W | RDC325T94W | RDC325T95W | RDC325T96W | 1600<br>2000<br>2500         | RP6R25A160<br>RP6R25A200<br>RP6R25A250               |

Instruction Leaflet/FRED Number 29C107 for Breaker; Number 29889 for Digitrip 910 Trip Unit

## Series C® R-Frame

## 100% Rated Digitrip RMS 910 Circuit Breakers

The NEC allows the breaker to be rated at 100% of its frame size in an assembly, provided that 90°C wire is applied at 75°C ampacity. Order as individual components: Breaker Frame (which includes Trip Unit) and Rating Plug.

|                                         |                                                                                                                                                                                                                                                                                                                                                       |    |     |     |     |      |                                 |                |
|-----------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|-----|-----|-----|------|---------------------------------|----------------|
| Maximum Continuous Ampere Rating @ 40°C | Circuit Breaker Frame Only                                                                                                                                                                                                                                                                                                                            |    |     |     |     |      | Digitrip Rating Plug Only       |                |
|                                         | L – Adjustable Long Delay Pickup (I <sub>L</sub> ) with Adjustable Long Delay Time<br>S – Adjustable Short Delay Pickup with Adjustable Short Delay Time (I <sup>2</sup> t or Flat Response)<br>I – Adjustable Instantaneous Pickup<br>G – Adjustable Ground Fault Pickup with Adjustable Ground Fault Time Delay (I <sup>2</sup> t or Flat Response) |    |     |     |     |      | Fixed Rating Plug               |                |
|                                         |                                                                                                                                                                                                                                                                                                                                                       |    |     |     |     |      | Rated Current (I <sub>n</sub> ) | Catalog Number |
|                                         |                                                                                                                                                                                                                                                                                                                                                       |    |     |     |     |      |                                 |                |
|                                         |                                                                                                                                                                                                                                                                                                                                                       |    |     |     |     |      |                                 |                |
|                                         | LI                                                                                                                                                                                                                                                                                                                                                    | LS | LSI | LIG | LSG | LSIG |                                 |                |
| Catalog Number                          |                                                                                                                                                                                                                                                                                                                                                       |    |     |     |     |      |                                 |                |

## 3-Pole Standard Interrupting Capacity 600 Volt Ac Rated 65 kAIC @ 480 Vac

|      |            |            |            |            |            |            |                              |                                                      |
|------|------------|------------|------------|------------|------------|------------|------------------------------|------------------------------------------------------|
| 1600 | CRD316T91W | CRD316T93W | CRD316T92W | CRD316T94W | CRD316T95W | CRD316T96W | 800<br>1000<br>1200<br>1600  | RP6R16A080<br>RP6R16A100<br>RP6R16A120<br>RP6R16A160 |
| 2000 | CRD320T91W | CRD320T93W | CRD320T92W | CRD320T94W | CRD320T95W | CRD320T96W | 1000<br>1200<br>1600<br>2000 | RP6R20A100<br>RP6R20A120<br>RP6R20A160<br>RP6R20A200 |

## 3-Pole High Interrupting Capacity 600 Volt Ac Rated 100 kAIC @ 480 Vac

|      |             |             |             |             |             |             |                              |                                                      |
|------|-------------|-------------|-------------|-------------|-------------|-------------|------------------------------|------------------------------------------------------|
| 1600 | CRDC316T91W | CRDC316T93W | CRDC316T92W | CRDC316T94W | CRDC316T95W | CRDC316T96W | 800<br>1000<br>1200<br>1600  | RP6R16A080<br>RP6R16A100<br>RP6R16A120<br>RP6R16A160 |
| 2000 | CRDC320T91W | CRDC320T93W | CRDC320T92W | CRDC320T94W | CRDC320T95W | CRDC320T96W | 1000<br>1200<br>1600<br>2000 | RP6R20A100<br>RP6R20A120<br>RP6R20A160<br>RP6R20A200 |

Instruction Leaflet/FRED Number 29C107 for Breaker; Number 29889 for Digitrip 910 Trip Unit



# Molded Case Circuit Breakers 800-2500 Amperes

Cutler-Hammer

March 1999

## Series C® R-Frame

## Digitrip OPTIM Electronic Circuit Breakers with Interchangeable Rating Plugs

Order as individual components: Breaker Frame (which includes Trip Unit) and Rating Plug.

| Maximum Continuous Ampere Rating @ 40°C | Circuit Breaker Frame Only                                                                                                                                                                                                                                                                                                                                                                                                          |          |           |           | Digitrip OPTIM Rating Plug Only |                |
|-----------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|-----------|-----------|---------------------------------|----------------|
|                                         | L – Adjustable Long Delay Pickup ( $I_t$ ) with Adjustable Long Delay Time<br>S – Adjustable Short Delay Pickup with Adjustable Short Delay Time ( $I^2t$ or Flat Response)<br>I – Adjustable Instantaneous Pickup<br>G – Adjustable Ground Fault Pickup with Adjustable Ground Fault Time Delay ( $I^2t$ or Flat Response)<br>A – Adjustable Ground Fault Alarm with Adjustable Ground Fault Time Delay ( $I^2t$ or Flat Response) |          |           |           | Fixed Rating Plug               |                |
|                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                     |          |           |           | Ampere Rating                   | Catalog Number |
|                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                     |          |           |           |                                 |                |
|                                         | LSIA 750                                                                                                                                                                                                                                                                                                                                                                                                                            | LSIG 750 | LSIA 1050 | LSIG 1050 |                                 |                |
| Catalog Number                          |                                                                                                                                                                                                                                                                                                                                                                                                                                     |          |           |           |                                 |                |

### 3-Pole Standard Interrupting Capacity 600 Volt Ac Rated 65 kAIC @ 480 Vac

|      |           |           |            |            |                              |                                                      |
|------|-----------|-----------|------------|------------|------------------------------|------------------------------------------------------|
| 1600 | RD316T77W | RD316T76W | RD316T107W | RD316T106W | 800<br>1000<br>1200<br>1600  | ORPR16A080<br>ORPR16A100<br>ORPR16A120<br>ORPR16A160 |
| 2000 | RD320T77W | RD320T76W | RD320T107W | RD320T106W | 1000<br>1200<br>1600<br>2000 | ORPR20A100<br>ORPR20A120<br>ORPR20A160<br>ORPR20A200 |
| 2500 | RD325T77W | RD325T76W | RD325T107W | RD325T106W | 1600<br>2000<br>2500         | ORPR25A160<br>ORPR25A200<br>ORPR25A250               |

### 3-Pole High Interrupting Capacity 600 Volt Ac Rated 100 kAIC @ 480 Vac

|      |            |            |             |             |                              |                                                      |
|------|------------|------------|-------------|-------------|------------------------------|------------------------------------------------------|
| 1600 | RDC316T77W | RDC316T76W | RDC316T107W | RDC316T106W | 800<br>1000<br>1200<br>1600  | ORPR16A080<br>ORPR16A100<br>ORPR16A120<br>ORPR16A160 |
| 2000 | RDC320T77W | RDC320T76W | RDC320T107W | RDC320T106W | 1000<br>1200<br>1600<br>2000 | ORPR20A100<br>ORPR20A120<br>ORPR20A160<br>ORPR20A200 |
| 2500 | RDC325T77W | RDC325T76W | RDC325T107W | RDC325T106W | 1600<br>2000<br>2500         | ORPR25A160<br>ORPR25A200<br>ORPR25A250               |

Instruction Leaflet/FRED Number 29C107 for Breaker; Number 29C891 for OPTIM Trip Unit

## Series C® R-Frame

## 100% Rated 600 Volt AC Digitrip OPTIM Circuit Breakers with Interchangeable Rating Plugs

Order as individual components: Breaker Frame (which includes Trip Unit) and Rating Plug.

| Maximum Continuous Ampere Rating @ 40°C | Circuit Breaker Frame Only                                                                                                                                                                                                                                                                                                                                                                                                          |          |           |           | Digitrip OPTIM Rating Plug Only |                |
|-----------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|-----------|-----------|---------------------------------|----------------|
|                                         | L – Adjustable Long Delay Pickup ( $I_L$ ) with Adjustable Long Delay Time<br>S – Adjustable Short Delay Pickup with Adjustable Short Delay Time ( $I^2t$ or Flat Response)<br>I – Adjustable Instantaneous Pickup<br>G – Adjustable Ground Fault Pickup with Adjustable Ground Fault Time Delay ( $I^2t$ or Flat Response)<br>A – Adjustable Ground Fault Alarm with Adjustable Ground Fault Time Delay ( $I^2t$ or Flat Response) |          |           |           | Fixed Rating Plug               |                |
|                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                     |          |           |           | Ampere Rating                   | Catalog Number |
|                                         | LSIA 750                                                                                                                                                                                                                                                                                                                                                                                                                            | LSIG 750 | LSIA 1050 | LSIG 1050 |                                 |                |

## 3-Pole Standard Interrupting Capacity 600 Volt Ac Rated 65 kAIC @ 480 Vac

|      |            |            |             |             |                              |                                                      |
|------|------------|------------|-------------|-------------|------------------------------|------------------------------------------------------|
| 1600 | CRD316T77W | CRD316T76W | CRD316T107W | CRD316T106W | 800<br>1000<br>1200<br>1600  | ORPR16A080<br>ORPR16A100<br>ORPR16A120<br>ORPR16A160 |
| 2000 | CRD320T77W | CRD320T76W | CRD320T107W | CRD320T106W | 1000<br>1200<br>1600<br>2000 | ORPR20A100<br>ORPR20A120<br>ORPR20A160<br>ORPR20A200 |

## 3-Pole High Interrupting Capacity 600 Volt Ac Rated 100 kAIC @ 480 Vac

|      |             |             |              |              |                              |                                                      |
|------|-------------|-------------|--------------|--------------|------------------------------|------------------------------------------------------|
| 1600 | CRDC316T77W | CRDC316T76W | CRDC316T107W | CRDC316T106W | 800<br>1000<br>1200<br>1600  | ORPR16A080<br>ORPR16A100<br>ORPR16A120<br>ORPR16A160 |
| 2000 | CRDC320T77W | CRDC320T76W | CRDC320T107W | CRDC320T106W | 1000<br>1200<br>1600<br>2000 | ORPR20A100<br>ORPR20A120<br>ORPR20A160<br>ORPR20A200 |

Instruction Leaflet/FRED Number 29C107 for Breaker; Number 29C891 for OPTIM Trip Unit

## Series C® R-Frame

### Molded Case Switches

For UL listed, series tested molded case switch application data, refer to Cutler-Hammer.

| Continuous Ampere Rating @ 40°C | Complete without Terminals       |         |
|---------------------------------|----------------------------------|---------|
|                                 | 3-Pole                           | 4-Pole  |
|                                 | Catalog Number                   |         |
| 1600                            | Type RD – High Instantaneous (K) |         |
|                                 | RD316WK                          | RD416WK |
| 2000                            | Type RD – High Instantaneous (K) |         |
|                                 | RD320WK                          | RD420WK |
| 2500                            | Type RD – High Instantaneous (K) |         |
|                                 | —                                | —       |

**Note:** Molded case switch may trip above 17500 amperes.

Instruction Leaflet/FRED Number 29C106 for Molded Case Switch

### Line and Load Terminals

Line and load terminals provide wire connecting capabilities for specific ranges of continuous current ratings and wire types. All terminals comply with Underwriters Laboratories, Inc. Standards UL486A and UL486B and CSA C22.2 No. 65M. Unless otherwise specified, R-frame

circuit breaker line load terminals are shipped separately for field installation.

### Ordering Information

R-frame circuit breakers have Cu/Al terminals as standard and Cu only terminals as an option. Specify if factory installation is required.

### Line and Load Terminals

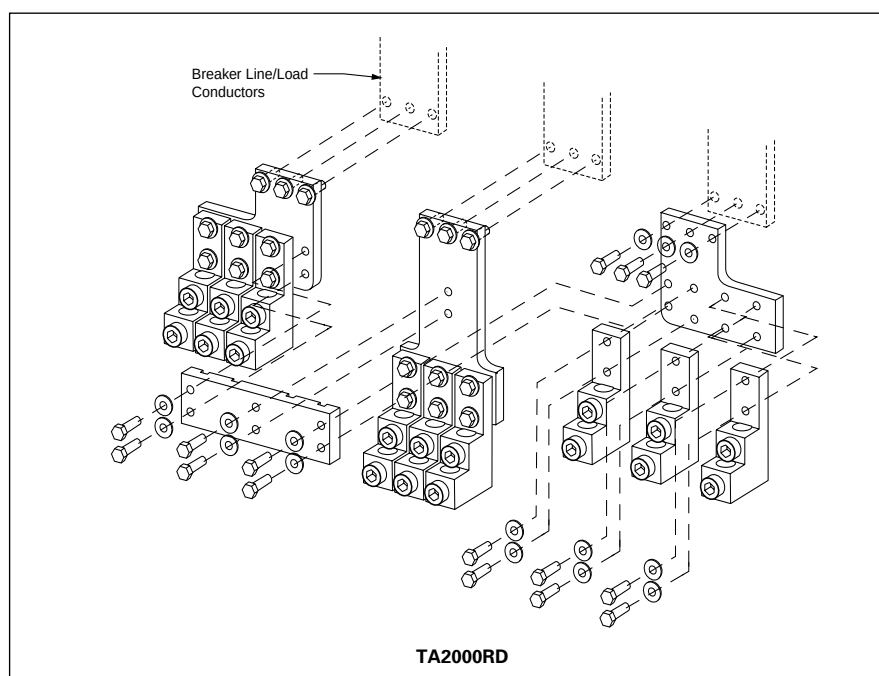
| Maximum Breaker Amperes | Terminal Body Material | Wire Type | Hardware | AWG/kcmil Wire Range/No. Conductors | Metric Wire Range mm <sup>2</sup> | Catalog Number        |
|-------------------------|------------------------|-----------|----------|-------------------------------------|-----------------------------------|-----------------------|
| 1600                    | Aluminum               | Cu/Al     | English  | 500-1000 (4)                        | 300-500                           | TA1600RD              |
| 1600                    | Copper                 | Cu        | English  | 1-600 (4)                           | 50-300                            | T1600RD               |
| 2000                    | Aluminum               | Cu/Al     | English  | 2-600 (6)                           | 35-300                            | TA2000RD <sup>①</sup> |

### Wire Terminals

|      |          |       |         |              |         |                       |
|------|----------|-------|---------|--------------|---------|-----------------------|
| 1600 | Aluminum | Cu/Al | English | 500-1000 (4) | 300-500 | TA1600RD              |
| 1600 | Copper   | Cu    | English | 1-600 (4)    | 50-300  | T1600RD               |
| 2000 | Aluminum | Cu/Al | English | 2-600 (6)    | 35-300  | TA2000RD <sup>①</sup> |

### Rear Connectors

|      |        |   |         |   |   |                       |
|------|--------|---|---------|---|---|-----------------------|
| 2000 | Copper | — | English | — | — | B2016RD               |
| 2000 | Copper | — | English | — | — | B2016RDL <sup>②</sup> |
| 2500 | Copper | — | English | — | — | B2500RD <sup>③</sup>  |



<sup>①</sup> Catalog number includes bus connection, terminals, and hardware for either line side or load side of 3-pole breaker.

<sup>②</sup> For use with 100% rated 1600A and 2000A frame. Do not order separately unless for replacement purposes. Is included in breaker carton when 100% rated device is ordered.

<sup>③</sup> For use with 2500-amp frame. Do not order separately unless for replacement purposes. Included in breaker carton when 2500A breaker is ordered.

## Catalog Numbering System

This information is presented only as an aid to understanding catalog numbers. It is not to be used to build catalog numbers for circuit breakers or trip units.

### Circuit Breaker/Frame Catalog Number

| Circuit Breaker/<br>Frame Type | Number of Poles | Circuit Breaker/<br>Frame Ampere Rating | Trip Type <sup>①</sup>         | Suffix                            |
|--------------------------------|-----------------|-----------------------------------------|--------------------------------|-----------------------------------|
| RD                             | 3: 3 Poles      | 16: 1600A                               | T32: Digitrip RMS 310 LSI      | W: Without Terminals              |
| RDC                            | 4: 4 Poles      | 20: 2000A                               | T53: Digitrip RMS 510 LS       | P: 100% Protected Neutral Pole    |
| CRD                            |                 | 25: 2500A                               | T65: Digitrip RMS 610 LSG      | R: Ground Fault Remote (310 Only) |
| CRDC                           |                 |                                         | T86: Digitrip RMS 810 LSIG     | K: Molded Case Switch             |
|                                |                 |                                         | T96: Digitrip RMS 910 LSIG     |                                   |
|                                |                 |                                         | T77: Digitrip OPTIM 750 LSIA   |                                   |
|                                |                 |                                         | T106: Digitrip OPTIM 1050 LSIG |                                   |

## Dimensions/Weights

### Dimensions, Inches (mm)

| Number of Poles | Width         | Height      | Depth         |
|-----------------|---------------|-------------|---------------|
| 3               | 15.5<br>(394) | 16<br>(406) | 9.75<br>(248) |
| 4               | 20<br>(508)   | 16<br>(406) | 9.75<br>(248) |

### Approximate Shipping Weight, Lbs. (kg)

| Breaker Type | Complete Breaker |   |
|--------------|------------------|---|
|              | Number of Poles  |   |
|              | 3                | 4 |

#### 1600A

|                    |                 |                 |
|--------------------|-----------------|-----------------|
| RD, CRD, RDC, CRDC | 102<br>(46.266) | 135<br>(61.235) |
|--------------------|-----------------|-----------------|

#### 2000A

|           |                 |                 |
|-----------|-----------------|-----------------|
| RD, RDC   | 102<br>(46.266) | 135<br>(61.235) |
| CRD, CRDC | 130<br>(58.967) | 175<br>(79.378) |

#### 2500A

|         |                 |                 |
|---------|-----------------|-----------------|
| RD, RDC | 135<br>(61.235) | 182<br>(82.553) |
|---------|-----------------|-----------------|

<sup>①</sup> For complete list of available trip types refer to pages 91 through 103.

## Series C® R-Frame

### Allowable Accessory Combinations

Different combinations of accessories can be supplied, depending on the types of accessories and the number of poles in the circuit breaker.

|                                | Reference Page | 3-Pole |        |       | 4-Pole |        |       |      |
|--------------------------------|----------------|--------|--------|-------|--------|--------|-------|------|
|                                |                | Left   | Center | Right | Left   | Center | Right | Neu. |
| Internal Accessories           |                |        |        |       |        |        |       |      |
| Alarm Lockout (Make/Break)     | 141            |        |        | ■     |        |        | ■     |      |
| Alarm Lockout (2Make/2Break)   | 141            |        |        | ■     |        |        | ■     |      |
| Auxiliary Switch (2A, 2B)      | 144            |        |        | ■     |        |        | ■     |      |
| Auxiliary Switch (4A, 4B)      | 144            |        |        | ■     |        |        | ■     |      |
| Shunt Trip – Standard          | 151            |        |        | ■     |        |        | ■     |      |
| Shunt Trip – Low Energy        | 152            |        |        | ■     |        |        | ■     |      |
| Undervoltage Release Mechanism | 159            |        |        | ■     |        |        | ■     |      |
| Accessory Terminal Block②      | 160            |        |        | ■     |        |        |       | ■    |

#### External Accessories

|                                                       |     |  |   |  |  |   |  |  |
|-------------------------------------------------------|-----|--|---|--|--|---|--|--|
| Base Mounting Hardware                                | 163 |  |   |  |  |   |  |  |
| Padlockable Handle Lock Hasp                          | 169 |  | ● |  |  | ● |  |  |
| Key Interlock Kit                                     | 170 |  | ■ |  |  | ■ |  |  |
| Walking Beam Interlock                                | 171 |  |   |  |  |   |  |  |
| Electrical (Motor) Operator                           | 173 |  | ■ |  |  | ■ |  |  |
| Drawout Cassette                                      | 164 |  | ● |  |  |   |  |  |
| Handle Mechanisms                                     | 178 |  | ■ |  |  | ■ |  |  |
| Handle Extension <sup>①</sup>                         | 182 |  | ■ |  |  | ■ |  |  |
| Solid-State (Electronic) Portable Test Kit (310 Only) | 184 |  | ● |  |  | ● |  |  |

#### OPTIM System Components

|                                 |     |  |   |  |  |  |  |  |
|---------------------------------|-----|--|---|--|--|--|--|--|
| Breaker Interface Module (BIM)  | 185 |  | ● |  |  |  |  |  |
| Digitrip OPTIMizer              | 185 |  | ● |  |  |  |  |  |
| Auxiliary Power Module          | 185 |  | ● |  |  |  |  |  |
| Cutler-Hammer PowerNet Software | 185 |  | ● |  |  |  |  |  |

#### Modifications (Refer to Cutler-Hammer)

|                                |     |  |   |  |  |  |   |  |
|--------------------------------|-----|--|---|--|--|--|---|--|
| Special Calibration            | 186 |  | ● |  |  |  | ● |  |
| Moisture Fungus Treatment      | 186 |  | ● |  |  |  | ● |  |
| Freeze-Tested Circuit Breakers | 186 |  | ● |  |  |  | ● |  |
| Marine Application             | 186 |  | ● |  |  |  | ● |  |

■ Applicable in indicated pole position

● Accessory available/Modification available

① Included with breaker.

② Mounts outside breaker.



Series C Motor Circuit Protectors

## General Information

Designated as the Cutler-Hammer Types GMCP, HMCP, the Series C instantaneous-only motor circuit protector (MCP) is available in ratings from 3A to 600A for motor starter sizes 0 through 6. The MCP is designed to comply with the applicable requirements of Underwriters Laboratories, Inc. Standard UL489, Canadian Standards Association Standard C22.2 No. 5, and International Electrotechnical Commission Recommendations IEC 157-1.

An innovative design of internal components allows higher MCP-starter combination interrupting ratings. The MCP is marked to permit proper electrical application within the assigned equipment ratings.

The MCP is a recognized component (UL File E7819) and complies with the applicable requirements of Underwriters Laboratories, Inc. Standard UL489. It is also designed to comply with the applicable requirements of Canadian Standards Association Standard C22.2 No. 5, International Electrotechnical Commission Recommendations IEC 157-1, and nameplates bear the CE marking.

## Catalog Numbering System

This information is presented only as an aid to understanding catalog numbers. It is not to be used to build catalog numbers for circuit breakers or trip units.

### Motor Circuit Protector Catalog Number

| HMCP 003 A0 C                 |                          |                                       |                                                |
|-------------------------------|--------------------------|---------------------------------------|------------------------------------------------|
| Motor Circuit Protective Type | Continuous Ampere Rating | Magnetic Trip Range/NEMA Starter Size | Suffix                                         |
| HMCP: 3 Poles                 | 003                      | A0: 9-30/0                            | C: Non-Aluminum Terminals                      |
| HM2P: 2 Poles <sup>①</sup>    | 007                      | C0: 21-70/0                           |                                                |
| HMCPs: 3 Poles                | 015                      | E0: 45-150/0                          | W: W/O Terminals                               |
|                               | 025                      | D0: 40-60/0                           | X: Load Terminals Only                         |
|                               | 030                      | H1: 90-300/1                          | Y: Line Terminals Only                         |
|                               | 050                      | G2: 80-120/2                          | S: Stainless Steel Terminals (150A Frame Only) |
|                               |                          | K2: 150-500/2                         | No Suffix: Standard Terminals on Line and Load |
|                               | 070                      | J2: 115-170/2                         |                                                |
|                               |                          | M2: 210-700/2                         |                                                |
|                               | 100                      | L3: 160-240/3                         |                                                |
|                               |                          | R3: 300-1000/3                        |                                                |
|                               | 150                      | T4: 450-1500/4                        |                                                |
|                               |                          | U4: 750-2500/4                        |                                                |
|                               | 250                      | A5: 350-700/5                         |                                                |
|                               |                          | C5: 450-900/5                         |                                                |
|                               | 400                      | D5: 500-1000/5                        |                                                |
|                               |                          | F5: 625-1250/5                        |                                                |
|                               |                          | G5: 750-1500/5                        |                                                |
|                               |                          | J5: 875-1750/5                        |                                                |
|                               |                          | K5: 1000-2000/5                       |                                                |
|                               |                          | L5: 1125-2250/5                       |                                                |
|                               |                          | W5: 1250-2500/5                       |                                                |
|                               |                          | N5: 1500-3000/5                       |                                                |
|                               |                          | R5: 1750-3500/5                       |                                                |
|                               |                          | X5: 2000-4000/5                       |                                                |
|                               | 600                      | L6: 1800-6000/6 Electronic)           |                                                |

| GMCP 003 A0 C                   |                          |                                       |                           |
|---------------------------------|--------------------------|---------------------------------------|---------------------------|
| Motor Circuit Protective Device | Continuous Ampere Rating | Magnetic Trip Range/NEMA Starter Size | Suffix                    |
| GMCP: 3 Poles                   | 003                      | A0: 15-30/0                           | C: Non-Aluminum Terminals |
|                                 | 007                      | C0: 35-70/0                           |                           |
|                                 | 015                      | E0: 75-150/0                          |                           |
|                                 | 030                      | H1: 150-300/1                         |                           |
|                                 | 050                      | K2: 250-500/2                         |                           |
|                                 | 060                      | J2: 300-600/2                         |                           |
|                                 | 063                      | M2: 320-630/2                         |                           |

① On J- and K-Frame HMCPs only.

### G-Frame

480 Vac Maximum, 250 Vdc Maximum

| MCP Catalog Number | NEMA Starter Size | Continuous Amperes | Cam Setting | Motor Full Load Center Amperes <sup>⑤</sup> | MCP Trip Setting |
|--------------------|-------------------|--------------------|-------------|---------------------------------------------|------------------|
| GMCP003A0C         | 0                 | 3                  | A           | 1.1 - 1.2                                   | 15               |
|                    |                   |                    | B           | 1.3 - 1.5                                   | 18               |
|                    |                   |                    | C           | 1.6 - 1.7                                   | 21               |
|                    |                   |                    | D           | 1.8 - 1.9                                   | 24               |
|                    |                   |                    | E           | 2.0 - 2.2                                   | 27               |
|                    |                   |                    | F           | 2.3 - 2.5                                   | 30               |
| GMCP007C0C         | 0                 | 7                  | A           | 2.6 - 3.1                                   | 35               |
|                    |                   |                    | B           | 3.2 - 3.6                                   | 42               |
|                    |                   |                    | C           | 3.7 - 3.9                                   | 49               |
|                    |                   |                    | D           | 4.3 - 4.7                                   | 56               |
|                    |                   |                    | E           | 4.8 - 5.2                                   | 63               |
|                    |                   |                    | F           | 5.3 - 5.7                                   | 70               |
| GMCP015E0C         | 0                 | 15                 | A           | 5.7 - 6.8                                   | 75               |
|                    |                   |                    | B           | 6.9 - 7.9                                   | 90               |
|                    |                   |                    | C           | 8.0 - 9.1                                   | 105              |
|                    |                   |                    | D           | 9.2 - 10.3                                  | 120              |
|                    |                   |                    | E           | 10.4 - 11.4                                 | 135              |
|                    |                   |                    | F           | 11.5 - 12.6                                 | 150              |
| GMCP030H1C         | 1                 | 30                 | A           | 11.5 - 13.7                                 | 150              |
|                    |                   |                    | B           | 13.8 - 16.0                                 | 180              |
|                    |                   |                    | C           | 16.1 - 18.3                                 | 210              |
|                    |                   |                    | D           | 18.4 - 20.6                                 | 240              |
|                    |                   |                    | E           | 20.7 - 22.9                                 | 270              |
|                    |                   |                    | F           | 23.0 - 25.2                                 | 300              |
| GMCP050K2C         | 2                 | 50                 | A           | 19.3 - 22.9                                 | 250              |
|                    |                   |                    | B           | 23.0 - 26.8                                 | 300              |
|                    |                   |                    | C           | 26.9 - 30.6                                 | 350              |
|                    |                   |                    | D           | 30.7 - 34.5                                 | 400              |
|                    |                   |                    | E           | 34.6 - 38.3                                 | 450              |
|                    |                   |                    | F           | 38.4 - 42.1                                 | 500              |
| GMCP060J2C         | 3                 | 60                 | A           | 23.1 - 27.5                                 | 300              |
|                    |                   |                    | B           | 27.7 - 32.2                                 | 360              |
|                    |                   |                    | C           | 32.3 - 36.7                                 | 420              |
|                    |                   |                    | D           | 36.9 - 41.4                                 | 480              |
|                    |                   |                    | E           | 41.5 - 46.0                                 | 540              |
|                    |                   |                    | F           | 46.2 - 50.5                                 | 600              |
| GMCP063M2C         | 3                 | 63                 | A           | 24.2 - 32.1                                 | 320              |
|                    |                   |                    | B           | 29.1 - 34.8                                 | 380              |
|                    |                   |                    | C           | 33.9 - 39.4                                 | 440              |
|                    |                   |                    | D           | 38.8 - 46.4                                 | 500              |
|                    |                   |                    | E           | 43.6 - 48.9                                 | 570              |
|                    |                   |                    | F           | 48.5 - 53.7                                 | 630              |

Instruction Leaflet/FRED Number 15579

### Modifications for GMCP

#### Internal Accessories

These modifications must be factory installed<sup>①</sup>.

| Type Accessory                                           | Electrical Ratings |           |         | Contact Arrangement | Style Number | Factory Suffix |
|----------------------------------------------------------|--------------------|-----------|---------|---------------------|--------------|----------------|
|                                                          | Volts              | Frequency | Amperes |                     |              |                |
| Shunt Trip <sup>③</sup>                                  | 120                | 50/60 Hz  | 1.1     |                     | 1373D62G18   | S5             |
| Shunt Trip <sup>③</sup>                                  | 240                | 50/60 Hz  | 2.1     |                     | 1373D62G19   | S6             |
| Auxiliary Switch <sup>④</sup>                            | 240                | 50/60 Hz  | 6.0     | 1a/1b               | 1288C74G03   | A3             |
| Auxiliary Switch <sup>④</sup>                            | 240                | 50/60 Hz  | 6.0     | 2a/2b               | 1288C73G03   | A6             |
| Alarm Switch <sup>④</sup>                                | 240                | 50/60 Hz  | 6.0     | Make/Break          | 1288C75G03   | B3             |
| Alarm Switch <sup>④</sup><br>Alarm Switch<br>Combination | 240                | 50/60 Hz  | 6.0     | 1a/1b<br>Make/Break | 1288C76G09   | B13            |

**Note:** No UVR available on GMCP.

Instruction Leaflet/FRED Number 15552 for Alarm Switch

Instruction Leaflet/FRED Number 15551 for Auxiliary Switch

Instruction Leaflet/FRED Number 15550 for Shunt Trip

#### External Mounted Accessories

| Description                   | Number Units in Package | Style Number |
|-------------------------------|-------------------------|--------------|
| Lock Dog (Non-Padlockable)    | 1                       | 1294C01H01   |
| Mounting Hardware             | 1                       | 624B375G23   |
| DIN Rail Adapter <sup>②</sup> | 10                      | 1225C79G02   |

Instruction Leaflet/FRED Number 29C191 (DIN Rail Adapter)

#### Vari-Depth Handle Mechanism<sup>⑥</sup>

| Description                          | Catalog Number |
|--------------------------------------|----------------|
| For Type 1 use                       | HRGMV11L       |
| For Type 3R, 4X, 12 use              | HRGMV14L       |
| Close Coupled Black with Gray Handle | HRGMC10        |
| Close Coupled Red with Yellow Handle | HRGMC30        |

① Only one accessory may be installed in GMCP.

② For use with standard 35 mm DIN rail such as, 35 x 7.5 or 15 mm per DIN EN50022.

③ LH only.

④ RH only.

⑤ Motor FLA ranges are typical. The corresponding trip setting is at 13 times the minimum FLA value shown. Where a 13 times setting is required for an intermediate FLA value, alternate cam settings and/or MCP ratings should be used.

⑥ For use with GMCP only.

## F-Frame

600 Vac Maximum, 250 Vdc Maximum

| MCP Catalog Number | NEMA Starter Size | Continuous Amperes | Cam Setting | Motor Full Load Center Amperes <sup>①</sup> | MCP Trip Setting <sup>②</sup> |
|--------------------|-------------------|--------------------|-------------|---------------------------------------------|-------------------------------|
| HMCP003A0C         | 0                 | 3                  | A           | .69 - .91                                   | 9                             |
|                    |                   |                    | B           | .92 - 1.0                                   | 12                            |
|                    |                   |                    | C           | 1.1 - 1.2                                   | 15                            |
|                    |                   |                    | D           | 1.3 - 1.5                                   | 18                            |
|                    |                   |                    | E           | 1.6 - 1.7                                   | 21                            |
|                    |                   |                    | F           | 1.8 - 1.9                                   | 24                            |
|                    |                   |                    | G           | 2.0 - 2.2                                   | 27                            |
|                    |                   |                    | H           | 2.3 - 2.5                                   | 30                            |
| HMCP007C0C         | 0                 | 7                  | A           | 1.5 - 2.0                                   | 21                            |
|                    |                   |                    | B           | 2.1 - 2.5                                   | 28                            |
|                    |                   |                    | C           | 2.6 - 3.1                                   | 35                            |
|                    |                   |                    | D           | 3.2 - 3.6                                   | 42                            |
|                    |                   |                    | E           | 3.7 - 3.9                                   | 49                            |
|                    |                   |                    | F           | 4.3 - 4.7                                   | 56                            |
|                    |                   |                    | G           | 4.8 - 5.2                                   | 63                            |
|                    |                   |                    | H           | 5.3 - 5.7                                   | 70                            |
| HMCP015E0C         | 0                 | 15                 | A           | 3.4 - 4.5                                   | 45                            |
|                    |                   |                    | B           | 4.6 - 5.6                                   | 60                            |
|                    |                   |                    | C           | 5.7 - 6.8                                   | 75                            |
|                    |                   |                    | D           | 6.9 - 7.9                                   | 90                            |
|                    |                   |                    | E           | 8.0 - 9.1                                   | 105                           |
|                    |                   |                    | F           | 9.2 - 10.3                                  | 120                           |
|                    |                   |                    | G           | 10.4 - 11.4                                 | 135                           |
|                    |                   |                    | H           | 11.5 - 12.6                                 | 150                           |
| HMCP030H1C         | 1                 | 30                 | A           | 6.9 - 9.1                                   | 90                            |
|                    |                   |                    | B           | 9.2 - 11.4                                  | 120                           |
|                    |                   |                    | C           | 11.5 - 13.7                                 | 150                           |
|                    |                   |                    | D           | 13.8 - 16.0                                 | 180                           |
|                    |                   |                    | E           | 16.1 - 18.3                                 | 210                           |
|                    |                   |                    | F           | 18.4 - 20.6                                 | 240                           |
|                    |                   |                    | G           | 20.7 - 22.9                                 | 270                           |
|                    |                   |                    | H           | 23.0 - 25.2                                 | 300                           |
| HMCP050K2C         | 2                 | 50                 | A           | 11.5 - 15.2                                 | 150                           |
|                    |                   |                    | B           | 15.3 - 19.1                                 | 200                           |
|                    |                   |                    | C           | 19.2 - 22.9                                 | 250                           |
|                    |                   |                    | D           | 23.0 - 26.8                                 | 300                           |
|                    |                   |                    | E           | 26.9 - 30.6                                 | 350                           |
|                    |                   |                    | F           | 30.7 - 34.5                                 | 400                           |
|                    |                   |                    | G           | 34.6 - 38.3                                 | 450                           |
|                    |                   |                    | H           | 38.4 - 42.1                                 | 500                           |
| HMCP070M2C         | 2                 | 70                 | A           | 16.1 - 21.4                                 | 210                           |
|                    |                   |                    | B           | 21.5 - 26.8                                 | 280                           |
|                    |                   |                    | C           | 26.9 - 32.2                                 | 350                           |
|                    |                   |                    | D           | 32.3 - 37.5                                 | 420                           |
|                    |                   |                    | E           | 37.6 - 42.9                                 | 490                           |
|                    |                   |                    | F           | 43.0 - 48.3                                 | 560                           |
|                    |                   |                    | G           | 48.4 - 53.7                                 | 630                           |
|                    |                   |                    | H           | 53.8 - 59.1                                 | 700                           |
| HMCP100R3C         | 3                 | 100                | A           | 23.0 - 30.6                                 | 300                           |
|                    |                   |                    | B           | 30.7 - 38.3                                 | 400                           |
|                    |                   |                    | C           | 38.4 - 46.0                                 | 500                           |
|                    |                   |                    | D           | 46.1 - 53.7                                 | 600                           |
|                    |                   |                    | E           | 53.8 - 61.4                                 | 700                           |
|                    |                   |                    | F           | 61.5 - 69.1                                 | 800                           |
|                    |                   |                    | G           | 69.2 - 76.8                                 | 900                           |
|                    |                   |                    | H           | 76.9 - 84.5                                 | 1000                          |

## F-Frame (Continued)

600 Vac Maximum, 250 Vdc Maximum

| MCP Catalog Number | NEMA Starter Size | Continuous Amperes | Cam Setting | Motor Full Load Center Amperes <sup>①</sup> | MCP Trip Setting <sup>②</sup> |
|--------------------|-------------------|--------------------|-------------|---------------------------------------------|-------------------------------|
| HMCP150T4C         | 4                 | 150                | A           | 34.6 - 46.0                                 | 450                           |
|                    |                   |                    | B           | 46.1 - 57.5                                 | 600                           |
|                    |                   |                    | C           | 57.6 - 69.1                                 | 750                           |
|                    |                   |                    | D           | 69.2 - 80.6                                 | 900                           |
|                    |                   |                    | E           | 80.7 - 92.2                                 | 1050                          |
|                    |                   |                    | F           | 92.3 - 103.7                                | 1200                          |
|                    |                   |                    | G           | 103.8 - 115.2                               | 1350                          |
|                    |                   |                    | H           | 115.3 - 126.7                               | 1500                          |
| HMCP150U4C         | 4                 | 150                | A           | 57.0 - 75.0                                 | 750                           |
|                    |                   |                    | B           | 76.0 - 95.0                                 | 1000                          |
|                    |                   |                    | C           | 96.0 - 114.0                                | 1250                          |
|                    |                   |                    | D           | 115.0 - 130.7                               | 1500                          |
|                    |                   |                    | E           | ③                                           | 1750                          |
|                    |                   |                    | F           | ③                                           | 2000                          |
|                    |                   |                    | G           | ③                                           | 2250                          |
|                    |                   |                    | H           | ③                                           | 2500                          |

Instruction Leaflet/FRED Number 29C401

## Special Low Magnetic Protection Application MCP

600 Vac Maximum, 250 Vdc Maximum

| MCP Catalog Number | NEMA Starter Size | Continuous Amperes | Cam Setting | Motor Full Load Center Amperes | MCP Trip Setting <sup>②</sup> |
|--------------------|-------------------|--------------------|-------------|--------------------------------|-------------------------------|
| HMCP025D0C         | —                 | 25A                | A           | —                              | 40                            |
|                    |                   |                    | B           | —                              | 43                            |
|                    |                   |                    | C           | —                              | 46                            |
|                    |                   |                    | D           | —                              | 49                            |
|                    |                   |                    | E           | —                              | 52                            |
|                    |                   |                    | F           | —                              | 55                            |
|                    |                   |                    | G           | —                              | 58                            |
|                    |                   |                    | H           | —                              | 60                            |
| HMCP050G2C         | —                 | 50A                | A           | —                              | 80                            |
|                    |                   |                    | B           | —                              | 87                            |
|                    |                   |                    | C           | —                              | 93                            |
|                    |                   |                    | D           | —                              | 98                            |
|                    |                   |                    | E           | —                              | 103                           |
|                    |                   |                    | F           | —                              | 109                           |
|                    |                   |                    | G           | —                              | 115                           |
|                    |                   |                    | H           | —                              | 120                           |
| HMCP070J2C         | —                 | 70A                | A           | —                              | 115                           |
|                    |                   |                    | B           | —                              | 122                           |
|                    |                   |                    | C           | —                              | 130                           |
|                    |                   |                    | D           | —                              | 139                           |
|                    |                   |                    | E           | —                              | 145                           |
|                    |                   |                    | F           | —                              | 153                           |
|                    |                   |                    | G           | —                              | 160                           |
|                    |                   |                    | H           | —                              | 170                           |
| HMCP100L3C         | —                 | 100A               | A           | —                              | 160                           |
|                    |                   |                    | B           | —                              | 174                           |
|                    |                   |                    | C           | —                              | 185                           |
|                    |                   |                    | D           | —                              | 196                           |
|                    |                   |                    | E           | —                              | 207                           |
|                    |                   |                    | F           | —                              | 218                           |
|                    |                   |                    | G           | —                              | 229                           |
|                    |                   |                    | H           | —                              | 240                           |

Instruction Leaflet/FRED Number 29C407

- ① Motor FLA ranges are typical. The corresponding trip setting is at 13 times the minimum FLA value shown. Where a 13 times setting is required for an intermediate FLA value, alternate cam settings and/or MCP ratings should be used.
- ② For Dc applications, actual trip levels are approximately 40% higher than values shown.
- ③ Settings above 130 amperes are for special applications. NEC Article 430-110(a) requires the ampere rating of the disconnecting means to be not less than 115% of the motor full load ampere rating.



## MCPs for Application with Motor Starters Equipped with Electronic Overload Relays

600 Vac Maximum, 250 Vdc Maximum

| MCP Catalog Number | NEMA Starter Size | Continuous Amperes | Cam Setting | Motor Full Load Center Amperes <sup>①</sup> | MCP Trip Setting <sup>②</sup> |
|--------------------|-------------------|--------------------|-------------|---------------------------------------------|-------------------------------|
| HMCPS003A0C        | 0                 | 3                  | A           | .69 - .91                                   | 9                             |
|                    |                   |                    | B           | .92 - 1.0                                   | 12                            |
|                    |                   |                    | C           | 1.1 - 1.2                                   | 15                            |
|                    |                   |                    | D           | 1.3 - 1.5                                   | 18                            |
|                    |                   |                    | E           | 1.6 - 1.7                                   | 21                            |
|                    |                   |                    | F           | 1.8 - 1.9                                   | 24                            |
|                    |                   |                    | G           | 2.0 - 2.2                                   | 27                            |
|                    |                   |                    | H           | 2.3 - 2.5                                   | 30                            |
| HMCPS007C0C        | 0                 | 7                  | A           | 1.5 - 2.0                                   | 21                            |
|                    |                   |                    | B           | 2.1 - 2.5                                   | 28                            |
|                    |                   |                    | C           | 2.6 - 3.1                                   | 35                            |
|                    |                   |                    | D           | 3.2 - 3.6                                   | 42                            |
|                    |                   |                    | E           | 3.7 - 3.9                                   | 49                            |
|                    |                   |                    | F           | 4.3 - 4.7                                   | 56                            |
|                    |                   |                    | G           | 4.8 - 5.2                                   | 63                            |
|                    |                   |                    | H           | 5.3 - 5.7                                   | 70                            |
| HMCPS015E0C        | 0                 | 15                 | A           | 3.4 - 4.5                                   | 45                            |
|                    |                   |                    | B           | 4.6 - 5.6                                   | 60                            |
|                    |                   |                    | C           | 5.7 - 6.8                                   | 75                            |
|                    |                   |                    | D           | 6.9 - 7.9                                   | 90                            |
|                    |                   |                    | E           | 8.0 - 9.1                                   | 105                           |
|                    |                   |                    | F           | 9.2 - 10.3                                  | 120                           |
|                    |                   |                    | G           | 10.4 - 11.4                                 | 135                           |
|                    |                   |                    | H           | 11.5 - 12.6                                 | 150                           |
| HMCPS030H1C        | 1                 | 30                 | A           | 6.9 - 9.1                                   | 90                            |
|                    |                   |                    | B           | 9.2 - 11.4                                  | 120                           |
|                    |                   |                    | C           | 11.5 - 13.7                                 | 150                           |
|                    |                   |                    | D           | 13.8 - 16.0                                 | 180                           |
|                    |                   |                    | E           | 16.1 - 18.3                                 | 210                           |
|                    |                   |                    | F           | 18.4 - 20.6                                 | 240                           |
|                    |                   |                    | G           | 20.7 - 22.9                                 | 270                           |
|                    |                   |                    | H           | 23.0 - 25.2                                 | 300                           |
| HMCPS050K2C        | 2                 | 50                 | A           | 11.5 - 15.2                                 | 150                           |
|                    |                   |                    | B           | 15.3 - 19.1                                 | 200                           |
|                    |                   |                    | C           | 19.2 - 22.9                                 | 250                           |
|                    |                   |                    | D           | 23.0 - 26.8                                 | 300                           |
|                    |                   |                    | E           | 26.9 - 30.6                                 | 350                           |
|                    |                   |                    | F           | 30.7 - 34.5                                 | 400                           |
|                    |                   |                    | G           | 34.6 - 38.3                                 | 450                           |
|                    |                   |                    | H           | 38.4 - 42.1                                 | 500                           |
| HMCPS100R3C        | 3                 | 100                | A           | 23.0 - 30.6                                 | 300                           |
|                    |                   |                    | B           | 30.7 - 38.3                                 | 400                           |
|                    |                   |                    | C           | 38.4 - 46.0                                 | 500                           |
|                    |                   |                    | D           | 46.1 - 53.7                                 | 600                           |
|                    |                   |                    | E           | 53.8 - 61.4                                 | 700                           |
|                    |                   |                    | F           | 61.5 - 69.1                                 | 800                           |
|                    |                   |                    | G           | 69.2 - 76.8                                 | 900                           |
|                    |                   |                    | H           | 76.9 - 84.5                                 | 1000                          |
| HMCPS150T4C        | 4                 | 150                | A           | 34.6 - 46.0                                 | 450                           |
|                    |                   |                    | B           | 46.1 - 57.5                                 | 600                           |
|                    |                   |                    | C           | 57.6 - 69.1                                 | 750                           |
|                    |                   |                    | D           | 69.2 - 80.6                                 | 900                           |
|                    |                   |                    | E           | 80.7 - 92.2                                 | 1050                          |
|                    |                   |                    | F           | 92.3 - 103.7                                | 1200                          |
|                    |                   |                    | G           | 103.8 - 115.2                               | 1350                          |
|                    |                   |                    | H           | 115.3 - 126.7                               | 1500                          |
| HMCPS150U4C        | 4                 | 150                | A           | 57.0 - 75.0                                 | 750                           |
|                    |                   |                    | B           | 76.0 - 95.0                                 | 1000                          |
|                    |                   |                    | C           | 96.0 - 114.0                                | 1250                          |
|                    |                   |                    | D           | 115.0 - 130.7                               | 1500                          |
|                    |                   |                    | E           | ③                                           | 1750                          |
|                    |                   |                    | F           | ③                                           | 2000                          |
|                    |                   |                    | G           | ③                                           | 2250                          |
|                    |                   |                    | H           | ③                                           | 2500                          |

Instruction Leaflet/FRED Number 29C401

## Type ELC Current Limiter Attachment (Size 0-4)



The type ELC current limiter attachment for the Series C MCP is designed to provide increased interrupting capacity. The combination may be used for the application up to 200,000A symmetrical at 600 Vac making the MCP suitable for use in network distribution systems or other applications where unusually high fault currents are available. The current limiter connects to the load end of the MCP and is provided with terminals suitable for copper or aluminum conductors. (See table).

Limiters are coordinated with the MCP so that normal fault currents are interrupted automatically by the MCP without any damage to the limiter. Only the rare very high fault is opened by the limiter. Faults that are interrupted by the limiter are interrupted by the limiter also magnetically trip the MCP, opening all three poles, preventing single-phase operation.

Each of the three poles of the type ELC limiter is equipped with an indicator that extends when a fault is interrupted by the limiter.

### Type ELC Current Limiter Terminal Wire Sizes<sup>④</sup>

| Type ELC Current Limiter Maximum Amperes | Standard Aluminum Terminals |                           | Nonstandard Terminals (Steel) |                           |
|------------------------------------------|-----------------------------|---------------------------|-------------------------------|---------------------------|
|                                          | Wire Range AWG              | Metric (mm <sup>2</sup> ) | Wire Range AWG                | Metric (mm <sup>2</sup> ) |
| 50                                       | #14-2                       | 2.5-35                    | #14-2 <sup>⑤</sup>            | 2.5-35                    |
| 100                                      | #1-4/0                      | 50-95                     | —                             | —                         |
| 150                                      | #1-4/0                      | 50-95                     | —                             | —                         |

### ELC Current Limiter Attachment

| MCP Rating (Amperes) | Catalog Number |
|----------------------|----------------|
| 3                    | ELC3003R       |
| 7                    | ELC3007R       |
| 15                   | ELC3015R       |
| 30                   | ELC3030R       |
| 50                   | ELC3050R       |
| 100                  | ELC3100R       |
| 150                  | ELC3150R       |

Instruction Leaflet/FRED Number 29C401

- ① Motor FLA ranges are typical. The corresponding trip setting is at 13 times the minimum FLA value shown. Where a 13 times setting is required for an intermediate FLA value, alternate cam settings and/or MCP ratings should be used.
- ② For Dc applications, actual trip levels are approximately 40% higher than values shown.
- ③ Settings above 130 amperes are for special applications. NEC Article 430-110(a) requires the ampere rating of the disconnecting means to be not less than 115% of the motor full load ampere rating.
- ④ Terminal wire connectors are UL listed for standard stranded wire sizes as defined in UL486A or UL486B.
- ⑤ Optional on special order for copper cable only.

## J-Frame

600 Vac Maximum, 250 Vdc Maximum

| MCP Catalog Number <sup>①</sup> | NEMA Starter Size | Continuous Amperes | Cam Setting | Motor Full Load Center Amperes <sup>②</sup> | MCP Trip Setting <sup>③</sup> |
|---------------------------------|-------------------|--------------------|-------------|---------------------------------------------|-------------------------------|
| HMCP250A5C                      | 4                 | 250                | A           | 27.0 - 30.7                                 | 350                           |
|                                 | 4                 |                    | B           | 30.8 - 33.8                                 | 400                           |
|                                 | 4                 |                    | C           | 33.9 - 36.9                                 | 440                           |
|                                 | 5                 |                    | D           | 37.0 - 40.3                                 | 480                           |
|                                 | 5                 |                    | E           | 40.4 - 43.8                                 | 525                           |
|                                 | 5                 |                    | F           | 43.9 - 46.9                                 | 570                           |
|                                 | 5                 |                    | G           | 47.0 - 50.7                                 | 610                           |
|                                 | 5                 |                    | H           | 50.8 - 53.8                                 | 660                           |
|                                 | 5                 |                    | I           | 53.9 - 57.2                                 | 700                           |
| HMCP250C5C                      | 5                 | 250                | A           | 34.7 - 38.8                                 | 450                           |
|                                 | 5                 |                    | B           | 38.9 - 43.4                                 | 505                           |
|                                 | 5                 |                    | C           | 43.5 - 47.6                                 | 565                           |
|                                 | 5                 |                    | D           | 47.7 - 52.2                                 | 620                           |
|                                 | 5                 |                    | E           | 52.3 - 56.5                                 | 680                           |
|                                 | 5                 |                    | F           | 56.6 - 60.7                                 | 735                           |
|                                 | 5                 |                    | G           | 60.8 - 64.9                                 | 790                           |
|                                 | 5                 |                    | H           | 65.0 - 69.2                                 | 845                           |
|                                 | 5                 |                    | I           | 69.3 - 73.5                                 | 900                           |
| HMCP250D5C                      | 5                 | 250                | A           | 38.5 - 43.4                                 | 500                           |
|                                 | 5                 |                    | B           | 43.5 - 48.0                                 | 565                           |
|                                 | 5                 |                    | C           | 48.1 - 53.0                                 | 625                           |
|                                 | 5                 |                    | D           | 53.1 - 57.6                                 | 690                           |
|                                 | 5                 |                    | E           | 57.7 - 62.3                                 | 750                           |
|                                 | 5                 |                    | F           | 62.4 - 67.3                                 | 810                           |
|                                 | 5                 |                    | G           | 67.4 - 71.9                                 | 875                           |
|                                 | 5                 |                    | H           | 72.0 - 76.9                                 | 935                           |
|                                 | 5                 |                    | I           | 77.0 - 81.6                                 | 1000                          |
| HMCP250F5C                      | 5                 | 250                | A           | 48.1 - 53.8                                 | 625                           |
|                                 | 5                 |                    | B           | 53.9 - 59.9                                 | 700                           |
|                                 | 5                 |                    | C           | 60.0 - 66.1                                 | 780                           |
|                                 | 5                 |                    | D           | 66.2 - 72.3                                 | 860                           |
|                                 | 5                 |                    | E           | 72.4 - 78.4                                 | 940                           |
|                                 | 5                 |                    | F           | 78.5 - 83.8                                 | 1020                          |
|                                 | 5                 |                    | G           | 83.9 - 89.9                                 | 1090                          |
|                                 | 5                 |                    | H           | 90.0 - 96.1                                 | 1170                          |
|                                 | 5                 |                    | I           | 96.2 - 102.0                                | 1250                          |
| HMCP250G5C                      | 5                 | 250                | A           | 57.7 - 64.6                                 | 750                           |
|                                 | 5                 |                    | B           | 64.7 - 71.9                                 | 840                           |
|                                 | 5                 |                    | C           | 72.0 - 79.2                                 | 935                           |
|                                 | 5                 |                    | D           | 79.3 - 86.5                                 | 1030                          |
|                                 | 5                 |                    | E           | 86.6 - 93.8                                 | 1125                          |
|                                 | 5                 |                    | F           | 93.9 - 101.1                                | 1220                          |
|                                 | 5                 |                    | G           | 101.2 - 108.4                               | 1315                          |
|                                 | 5                 |                    | H           | 108.5 - 115.3                               | 1410                          |
|                                 | 5                 |                    | I           | 115.4 - 122.4                               | 1500                          |

| MCP Catalog Number <sup>①</sup> | NEMA Starter Size | Continuous Amperes | Cam Setting | Motor Full Load Center Amperes <sup>②</sup> | MCP Trip Setting <sup>③</sup> |
|---------------------------------|-------------------|--------------------|-------------|---------------------------------------------|-------------------------------|
| HMCP250J5C                      | 5                 | 250                | A           | 67.4 - 75.3                                 | 875                           |
|                                 | 5                 |                    | B           | 75.4 - 83.8                                 | 980                           |
|                                 | 5                 |                    | C           | 83.9 - 92.3                                 | 1090                          |
|                                 | 5                 |                    | D           | 92.4 - 100.7                                | 1200                          |
|                                 | 5                 |                    | E           | 100.8 - 109.2                               | 1310                          |
|                                 | 5                 |                    | F           | 109.3 - 117.6                               | 1420                          |
|                                 | 5                 |                    | G           | 117.7 - 126.1                               | 1530                          |
|                                 | 5                 |                    | H           | 126.2 - 134.6                               | 1640                          |
|                                 | 5                 |                    | I           | 134.7 - 142.8                               | 1750                          |
| HMCP250K5C                      | 5                 | 250                | A           | 77.0 - 86.6                                 | 1000                          |
|                                 | 5                 |                    | B           | 86.6 - 96.1                                 | 1125                          |
|                                 | 5                 |                    | C           | 96.2 - 105.7                                | 1250                          |
|                                 | 5                 |                    | D           | 105.8 - 115.3                               | 1375                          |
|                                 | 5                 |                    | E           | 115.4 - 124.9                               | 1500                          |
|                                 | 5                 |                    | F           | 125.0 - 134.6                               | 1625                          |
|                                 | 5                 |                    | G           | 134.7 - 144.2                               | 1750                          |
|                                 | 5                 |                    | H           | 144.3 - 153.8                               | 1875                          |
|                                 | 5                 |                    | I           | 153.9 - 163.3                               | 2000                          |
| HMCP250L5C                      | 5                 | 250                | A           | 86.6 - 97.3                                 | 1125                          |
|                                 | 5                 |                    | B           | 97.4 - 108.4                                | 1265                          |
|                                 | 5                 |                    | C           | 108.5 - 118.8                               | 1410                          |
|                                 | 5                 |                    | D           | 118.9 - 129.9                               | 1545                          |
|                                 | 5                 |                    | E           | 130.0 - 140.7                               | 1690                          |
|                                 | 5                 |                    | F           | 140.8 - 151.5                               | 1830                          |
|                                 | 5                 |                    | G           | 151.6 - 162.3                               | 1970                          |
|                                 | 5                 |                    | H           | 162.4 - 173.0                               | 2110                          |
|                                 | 5                 |                    | I           | 173.1 - 183.6                               | 2250                          |
| HMCP250W5C                      | 5                 | 250                | A           | 96.2 - 108.0                                | 1250                          |
|                                 | 5                 |                    | B           | 108.1 - 119.9                               | 1405                          |
|                                 | 5                 |                    | C           | 120.0 - 132.3                               | 1560                          |
|                                 | 5                 |                    | D           | 132.4 - 144.2                               | 1720                          |
|                                 | 5                 |                    | E           | 144.3 - 156.1                               | 1875                          |
|                                 | 5                 |                    | F           | 156.2 - 168.0                               | 2030                          |
|                                 | 5                 |                    | G           | 168.1 - 179.9                               | 2185                          |
|                                 | 5                 |                    | H           | 180.0 - 192.3                               | 2340                          |
|                                 | 5                 |                    | I           | 192.4 - 204.0                               | 2500                          |

Instruction Leaflet/FRED Number 29C402

- ① Three-pole catalog numbers shown. Two-pole catalog numbers begin with "HM2P" in place of "HMCP."
- ② Motor FLA ranges are typical. The corresponding trip setting is at 13 times the minimum FLA value shown. Where a 13 times setting is required for an intermediate FLA value, alternate cam settings and/or MCP ratings should be used.
- ③ For Dc applications, actual trip levels are approximately 40% higher than values shown.

## K-Frame

600 Vac Maximum, 250 Vdc Maximum

| MCP Catalog Number <sup>①</sup> | NEMA Starter Size | Continuous Amperes | Cam Setting | Motor Full Load Center Amperes <sup>②</sup> | MCP Trip Setting <sup>③</sup> |
|---------------------------------|-------------------|--------------------|-------------|---------------------------------------------|-------------------------------|
| HMCP400D5C                      | 5                 | 400                | A           | 38.5 - 43.4                                 | 500                           |
|                                 | 5                 |                    | B           | 43.5 - 48.0                                 | 565                           |
|                                 | 5                 |                    | C           | 48.1 - 53.0                                 | 626                           |
|                                 | 5                 |                    | D           | 53.1 - 57.6                                 | 690                           |
|                                 | 5                 |                    | E           | 57.7 - 62.3                                 | 750                           |
|                                 | 5                 |                    | F           | 62.4 - 67.3                                 | 810                           |
|                                 | 5                 |                    | G           | 67.4 - 71.9                                 | 875                           |
|                                 | 5                 |                    | H           | 72.0 - 76.9                                 | 935                           |
|                                 | 5                 |                    | I           | 77.0 - 81.6                                 | 1000                          |
| HMCP400F5C                      | 5                 | 400                | A           | 48.1 - 53.8                                 | 625                           |
|                                 | 5                 |                    | B           | 53.9 - 59.9                                 | 700                           |
|                                 | 5                 |                    | C           | 60.0 - 66.1                                 | 780                           |
|                                 | 5                 |                    | D           | 66.2 - 72.3                                 | 860                           |
|                                 | 5                 |                    | E           | 72.4 - 78.4                                 | 940                           |
|                                 | 5                 |                    | F           | 78.5 - 83.8                                 | 1020                          |
|                                 | 5                 |                    | G           | 83.9 - 89.9                                 | 1090                          |
|                                 | 5                 |                    | H           | 90.0 - 96.1                                 | 1170                          |
|                                 | 5                 |                    | I           | 96.2 - 102.0                                | 1250                          |
| HMCP400G5C                      | 5                 | 400                | A           | 57.7 - 64.6                                 | 750                           |
|                                 | 5                 |                    | B           | 64.7 - 71.9                                 | 840                           |
|                                 | 5                 |                    | C           | 72.0 - 79.2                                 | 935                           |
|                                 | 5                 |                    | D           | 79.3 - 86.5                                 | 1030                          |
|                                 | 5                 |                    | E           | 86.6 - 93.8                                 | 1125                          |
|                                 | 5                 |                    | F           | 93.9 - 101.1                                | 1220                          |
|                                 | 5                 |                    | G           | 101.2 - 108.4                               | 1315                          |
|                                 | 5                 |                    | H           | 108.5 - 115.3                               | 1410                          |
|                                 | 5                 |                    | I           | 115.4 - 122.4                               | 1500                          |
| HMCP400J5C                      | 5                 | 400                | A           | 67.4 - 75.3                                 | 875                           |
|                                 | 5                 |                    | B           | 75.4 - 83.8                                 | 980                           |
|                                 | 5                 |                    | C           | 83.9 - 92.3                                 | 1090                          |
|                                 | 5                 |                    | D           | 92.4 - 100.7                                | 1200                          |
|                                 | 5                 |                    | E           | 100.8 - 109.2                               | 1310                          |
|                                 | 5                 |                    | F           | 109.3 - 117.6                               | 1420                          |
|                                 | 5                 |                    | G           | 117.7 - 126.1                               | 1530                          |
|                                 | 5                 |                    | H           | 126.2 - 134.6                               | 1640                          |
|                                 | 5                 |                    | I           | 134.7 - 142.8                               | 1750                          |
| HMCP400K5C                      | 5                 | 400                | A           | 77.0 - 86.5                                 | 1000                          |
|                                 | 5                 |                    | B           | 86.6 - 96.1                                 | 1125                          |
|                                 | 5                 |                    | C           | 96.2 - 105.7                                | 1250                          |
|                                 | 5                 |                    | D           | 105.8 - 115.3                               | 1375                          |
|                                 | 5                 |                    | E           | 115.4 - 124.9                               | 1500                          |
|                                 | 5                 |                    | F           | 125.0 - 134.6                               | 1625                          |
|                                 | 5                 |                    | G           | 134.7 - 144.2                               | 1750                          |
|                                 | 5                 |                    | H           | 144.3 - 153.8                               | 1875                          |
|                                 | 5                 |                    | I           | 153.9 - 163.3                               | 2000                          |

| MCP Catalog Number <sup>①</sup> | NEMA Starter Size | Continuous Amperes | Cam Setting | Motor Full Load Center Amperes <sup>②</sup> | MCP Trip Setting <sup>③</sup> |
|---------------------------------|-------------------|--------------------|-------------|---------------------------------------------|-------------------------------|
| HMCP400L5C                      | 5                 | 400                | A           | 86.6 - 97.3                                 | 1125                          |
|                                 | 5                 |                    | B           | 97.4 - 108.4                                | 1265                          |
|                                 | 5                 |                    | C           | 108.5 - 118.8                               | 1410                          |
|                                 | 5                 |                    | D           | 118.9 - 129.9                               | 1545                          |
|                                 | 5                 |                    | E           | 130.0 - 140.7                               | 1690                          |
|                                 | 5                 |                    | F           | 140.8 - 151.5                               | 1830                          |
|                                 | 5                 |                    | G           | 151.6 - 162.3                               | 1970                          |
|                                 | 5                 |                    | H           | 162.4 - 173.0                               | 2110                          |
|                                 | 5                 |                    | I           | 173.1 - 183.6                               | 2250                          |
| HMCP400W5C                      | 5                 | 400                | A           | 96.2 - 108.0                                | 1250                          |
|                                 | 5                 |                    | B           | 108.1 - 119.9                               | 1405                          |
|                                 | 5                 |                    | C           | 120.0 - 132.3                               | 1560                          |
|                                 | 5                 |                    | D           | 132.4 - 144.2                               | 1720                          |
|                                 | 5                 |                    | E           | 144.3 - 156.1                               | 1875                          |
|                                 | 5                 |                    | F           | 156.2 - 168.0                               | 2030                          |
|                                 | 5                 |                    | G           | 168.1 - 179.9                               | 2185                          |
|                                 | 5                 |                    | H           | 180.0 - 192.3                               | 2340                          |
|                                 | 5                 |                    | I           | 192.4 - 204.0                               | 2500                          |
| HMCP400N5C                      | 5                 | 400                | A           | 115.4 - 129.9                               | 1500                          |
|                                 | 5                 |                    | B           | 130.0 - 144.2                               | 1690                          |
|                                 | 5                 |                    | C           | 144.3 - 158.4                               | 1875                          |
|                                 | 5                 |                    | D           | 158.5 - 173.0                               | 2060                          |
|                                 | 5                 |                    | E           | 173.1 - 187.6                               | 2250                          |
|                                 | 5                 |                    | F           | 187.7 - 201.9                               | 2440                          |
|                                 | 5                 |                    | G           | 202.0 - 216.1                               | 2625                          |
|                                 | 5                 |                    | H           | 216.2 - 230.7                               | 2810                          |
|                                 | 5                 |                    | I           | 230.8 - 244.9                               | 3000                          |
| HMCP400R5C                      | 5                 | 400                | A           | 134.7 - 151.5                               | 1750                          |
|                                 | 5                 |                    | B           | 151.6 - 168.4                               | 1970                          |
|                                 | 5                 |                    | C           | 168.5 - 185.3                               | 2190                          |
|                                 | 5                 |                    | D           | 185.4 - 201.9                               | 2410                          |
|                                 | 5                 |                    | E           | 202.0 - 218.8                               | 2625                          |
|                                 | 5                 |                    | F           | 218.9 - 235.7                               | 2845                          |
|                                 | 5                 |                    | G           | 235.8 - 252.6                               | 3065                          |
|                                 | 5                 |                    | H           | 252.7 - 269.2                               | 3285                          |
|                                 | 5                 |                    | I           | 269.3 - 285.7                               | 3500                          |
| HMCP400X5C                      | 5                 | 400                | A           | 153.9 - 173.0                               | 2000                          |
|                                 | 5                 |                    | B           | 173.1 - 192.3                               | 2250                          |
|                                 | 5                 |                    | C           | 192.4 - 211.5                               | 2500                          |
|                                 | 5                 |                    | D           | 211.6 - 230.7                               | 2750                          |
|                                 | 5                 |                    | E           | 230.8 - 249.9                               | 3000                          |
|                                 | 5                 |                    | F           | 250.0 - 269.2                               | 3250                          |
|                                 | 5                 |                    | G           | 269.3 - 288.4                               | 3500                          |
|                                 | 5                 |                    | H           | 288.5 - 307.6                               | 3750                          |
|                                 | 5                 |                    | I           | 307.7 - 326.9                               | 4000                          |

Instruction Leaflet/FRED Number 29C403

## L-Frame<sup>④</sup>

600 Vac Maximum

| MCP Catalog Number | NEMA Starter Size | Continuous Amperes | Cam Setting | Motor Full Load Center Amperes <sup>②</sup> | MCP Trip Setting <sup>③</sup> |
|--------------------|-------------------|--------------------|-------------|---------------------------------------------|-------------------------------|
| HMCP600L6W         | 6                 | 600                | A           | 138.5 - 184.5                               | 1800                          |
|                    | 6                 |                    | B           | 184.6 - 230.7                               | 2400                          |
|                    | 6                 |                    | C           | 230.8 - 276.8                               | 3000                          |
|                    | 6                 |                    | D           | 276.9 - 323.0                               | 3600                          |
|                    | 6                 |                    | E           | 323.1 - 369.1                               | 4200                          |
|                    | 6                 |                    | F           | 369.2 - 415.3                               | 4800                          |
|                    | 6                 |                    | G           | 415.4 - 461.4                               | 5400                          |
|                    | 6                 |                    | H           | 461.5 - 507.7                               | 6000                          |

Instruction Leaflet/FRED Number 29C404

① Three-pole catalog numbers shown. Two-pole catalog numbers begin with "HM2P" in place of "HMCP."

② Motor FLA ranges are typical. The corresponding trip setting is at 13 times the minimum FLA value shown. Where a 13 times setting is required for an intermediate FLA value, alternate cam settings and/or MCP ratings should be used.

③ For Dc applications, actual trip levels are approximately 40% higher than values shown.

④ Equipped with electronic trip device.



*Typical Series C Earth  
Leakage Circuit Breaker*

## General Information

Series C Earth Leakage Breakers offer superior Class 1 ground fault protection and improved ground fault coordination capability.

Earth leakage ground fault protection differs from other types of systems in its level of sensitivity. The sensitivity of traditional devices is limited by the cumulative error of the residual current sensors and the placement of the phase and neutral conductors inside the current sensor.

Leakage breakers are zero sequence sensing devices. They are factory supplied with a single sensor and ground fault relay built-in. This technique allows for protection sensitivities down to the 30 milliampere level.

Leakage breakers are provided with a full complement of easy adjustments. The ground fault pickup setting is adjustable from 0.03 to 30 amperes in eight steps, and the ground fault time delay setting is adjustable from instantaneous to 2.0 seconds in six steps. When the pickup is set to 30 mA, the time delay setting defaults internally to instantaneous only. Increased selectivity provides for improved coordination with upstream and downstream ground fault devices as well as the flexibility to adjust for transient currents.

## Applications

### Three-Phase, Four-Wire Loads

For three-phase applications with line-to-neutral loads, select 4-pole earth leakage breakers and wire the neutral through the fourth (right) pole.

### Three-Phase, Three-Wire Loads

For applications with only three-phase, three-wire, line-to-line connected loads, select 3-pole earth leakage breakers.

### Single-Phase Loads

For single-phase, two-wire or three-wire applications, use a 3-pole earth leakage breaker and connect all conductors through the breaker.

## Accessories

### Optional Factory Installed Internal Accessories

Earth leakage breakers use the same internal accessories as standard F-, J- and K-Frame Series C Breakers. Internal accessories fit in the right-hand pole space and are available as factory modifications only.

### Optional External Accessories

Series C Earth Leakage Breakers use the same external accessories as the standard F-, J- and K-Frame circuit breakers.

### Selection Guide and Ordering Information

#### F-Frame Earth Leakage Ground Fault Breakers UL 489 and UL 1053 – Catalog Numbers

| Amperes <sup>③</sup> | 25 kA at 480 VAC |           | 65 kA at 480 VAC |            | 100 kA at 480 VAC |            |
|----------------------|------------------|-----------|------------------|------------|-------------------|------------|
|                      | 3-Pole           | 4-Pole    | 3-Pole           | 4-Pole     | 3-Pole            | 4-Pole     |
| 35                   | ELFD3035L        | ELFD4035L | ELHFD3035L       | ELHFD4035L | ELFDC3035L        | ELFDC4035L |
| 40                   | ELFD3040L        | ELFD4040L | ELHFD3040L       | ELHFD4040L | ELFDC3040L        | ELFDC4040L |
| 45                   | ELFD3045L        | ELFD4045L | ELHFD3045L       | ELHFD4045L | ELFDC3045L        | ELFDC4045L |
| 50                   | ELFD3050L        | ELFD4050L | ELHFD3050L       | ELHFD4050L | ELFDC3050L        | ELFDC4050L |
| 60                   | ELFD3060L        | ELFD4060L | ELHFD3060L       | ELHFD4060L | ELFDC3060L        | ELFDC4060L |
| 70                   | ELFD3070L        | ELFD4070L | ELHFD3070L       | ELHFD4070L | ELFDC3070L        | ELFDC4070L |
| 80                   | ELFD3080L        | ELFD4080L | ELHFD3080L       | ELHFD4080L | ELFDC3080L        | ELFDC4080L |
| 90                   | ELFD3090L        | ELFD4090L | ELHFD3090L       | ELHFD4090L | ELFDC3090L        | ELFDC4090L |
| 100                  | ELFD3100L        | ELFD4100L | ELHFD3100L       | ELHFD4100L | ELFDC3100L        | ELFDC4100L |
| 110                  | ELFD3110L        | ELFD4110L | ELHFD3110L       | ELHFD4110L | ELFDC3110L        | ELFDC4110L |
| 125                  | ELFD3125L        | ELFD4125L | ELHFD3125L       | ELHFD4125L | ELFDC3125L        | ELFDC4125L |
| 150                  | ELFD3150L        | ELFD4150L | ELHFD3150L       | ELHFD4150L | ELFDC3150L        | ELFDC4150L |

#### J-Frame Earth Leakage Ground Fault Breakers UL 489 and UL 1053 – Catalog Numbers

| Amperes | 35 kA at 480 VAC |          | 65 kA at 480 VAC |           | 100 kA at 480 VAC |           |
|---------|------------------|----------|------------------|-----------|-------------------|-----------|
|         | 3-Pole           | 4-Pole   | 3-Pole           | 4-Pole    | 3-Pole            | 4-Pole    |
| 100     | ELJD3100         | ELJD4100 | ELHJD3100        | ELHJD4100 | ELJDC3100         | ELJDC4100 |
| 125     | ELJD3125         | ELJD4125 | ELHJD3125        | ELHJD4125 | ELJDC3125         | ELJDC4125 |
| 150     | ELJD3150         | ELJD4150 | ELHJD3150        | ELHJD4150 | ELJDC3150         | ELJDC4150 |
| 175     | ELJD3175         | ELJD4175 | ELHJD3175        | ELHJD4175 | ELJDC3175         | ELJDC4175 |
| 200     | ELJD3200         | ELJD4200 | ELHJD3200        | ELHJD4200 | ELJDC3200         | ELJDC4200 |
| 225     | ELJD3225         | ELJD4225 | ELHJD3225        | ELHJD4225 | ELJDC3225         | ELJDC4225 |
| 250     | ELJD3250         | ELJD4250 | ELHJD3250        | ELHJD4250 | ELJDC3250         | ELJDC4250 |

#### K-Frame Earth Leakage Ground Fault Breakers UL 489 and UL 1053 – Catalog Numbers

| Amperes | 35 kA at 480 VAC |          | 65 kA at 480 VAC |           | 100 kA at 480 VAC |           |
|---------|------------------|----------|------------------|-----------|-------------------|-----------|
|         | 3-Pole           | 4-Pole   | 3-Pole           | 4-Pole    | 3-Pole            | 4-Pole    |
| 200     | ELKD3200         | ELKD4200 | ELHKD3200        | ELHKD4200 | ELKDC3200         | ELKDC4200 |
| 225     | ELKD3225         | ELKD4225 | ELHKD3225        | ELHKD4225 | ELKDC3225         | ELKDC4225 |
| 250     | ELKD3250         | ELKD4250 | ELHKD3250        | ELHKD4250 | ELKDC3250         | ELKDC4250 |
| 300     | ELKD3300         | ELKD4300 | ELHKD3300        | ELHKD4300 | ELKDC3300         | ELKDC4300 |
| 350     | ELKD3350         | ELKD4350 | ELHKD3350        | ELHKD4350 | ELKDC3350         | ELKDC4350 |
| 400     | ELKD3400         | ELKD4400 | ELHKD3400        | ELHKD4400 | ELKDC3400         | ELKDC4400 |

#### Standard Line and Load Terminals – Included with Breaker

| Frame   | Wire Type | (Number) Range of Conductors | Terminal Material |                 |
|---------|-----------|------------------------------|-------------------|-----------------|
| F-Frame | 35-100A   | Cu/Al                        | (1) #14-1/0       | Steel           |
| F-Frame | 110-150A  | Cu/Al                        | (1) #4-4/0        | Stainless Steel |
| J-Frame | 100-250A  | Cu/Al                        | (1) #4-250 kcmil  | Aluminum        |
| K-Frame | 200-350A  | Cu/Al                        | (1) 250-500 kcmil | Aluminum        |
| K-Frame | 400A      | Cu/Al                        | (2) 3/0-250 kcmil | Aluminum        |

#### Optional K-Frame Line and Load Terminals – Order Separately

| Wire Type | (Number) Range of Conductors | Terminal Material | Catalog Number       |
|-----------|------------------------------|-------------------|----------------------|
| Cu/Al     | (2) 250 kcmil                | Aluminum          | 3TA401K <sup>①</sup> |
| Cu/Al     | (1) 500 kcmil                | Aluminum          |                      |
| Cu/Al     | (2) 250 kcmil                | Aluminum          | 4TA401K <sup>②</sup> |
| Cu/Al     | (1) 500 kcmil                | Aluminum          |                      |
| Cu        | (1) 3-350 kcmil              | Copper            | T300K                |
| Cu        | (1) 3-350 kcmil              | Copper            | T300K                |
| Cu        | (1) 250-500 kcmil            | Copper            | T350K                |
| Cu        | (1) 250-500 kcmil            | Copper            | T350K                |
| Cu        | (1) 3/0-250 kcmil            | Copper            | 3T400K <sup>①</sup>  |
| Cu        | (1) 3/0-250 kcmil            | Copper            | 3T400K <sup>②</sup>  |

#### F-Frame HMCP with Earth Leakage Ground Fault

| Continuous Amperes | Catalog Number 3-Pole |
|--------------------|-----------------------|
| 3                  | ELHMCPO03A0C          |
| 7                  | ELHMCPO07C0C          |
| 15                 | ELHMCPO15E0C          |
| 25                 | ELHMCPO25X0C          |
| 30                 | ELHMCPO30H1C          |
| 50                 | ELHMCPO50K2C          |
| 70                 | ELHMCPO70M2C          |
| 100                | ELHMCPO100R3C         |
| 150                | ELHMCPO150T4C         |
| 150                | ELHMCPO150U4C         |
| 3                  | ELHMCPO03A0LC         |
| 7                  | ELHMCPO07C0LC         |
| 15                 | ELHMCPO15E0LC         |
| 25                 | ELHMCPO25D0C          |
| 30                 | ELHMCPO30H1LC         |
| 50                 | ELHMCPO50G2C          |
| 70                 | ELHMCPO70J2C          |
| 100                | ELHMCPO100L3C         |
| –                  | ELHMCPO24D0IC         |
| –                  | ELHMCPO50G2IC         |
| –                  | ELHMCPO70J2IC         |
| 100                | ELHMCPO100K3C         |

#### HMCPs for Application with Motor Starters Equipped with Electrical Overload Relays

|     |               |
|-----|---------------|
| 3   | ELHMCPS003A0C |
| 7   | ELHMCPS007C0C |
| 15  | ELHMCPS015E0C |
| 30  | ELHMCPS030H1C |
| 50  | ELHMCPS050K2C |
| 100 | ELHMCPS100R3C |
| 150 | ELHMCPS150T4C |
| 150 | ELHMCPS150U4C |

#### J-Frame HMCP with Earth Leakage Ground Fault

| Continuous Amperes | Catalog Number 3-Pole                                                                                                                        |
|--------------------|----------------------------------------------------------------------------------------------------------------------------------------------|
| 250                | ELHMCJP250A5<br>ELHMCJP250C5<br>ELHMCJP250D5<br>ELHMCJP250F5<br>ELHMCJP250G5<br>ELHMCJP250J5<br>ELHMCJP250K5<br>ELHMCJP250L5<br>ELHMCJP250V5 |
| 400                | ELHMCJP400D5<br>ELHMCJP400F5<br>ELHMCJP400G5<br>ELHMCJP400J5<br>ELHMCJP400K5                                                                 |

① Package of 3 terminals.

② Package of 4 terminals.

③ 15, 20, 25, and 30 ampere available.

## Type FCL Current Limit-R Thermal-Magnetic Circuit Breakers

15 to 100 Amperes, 480 Volts Ac  
Non-Interchangeable Trip, Line and  
Load Terminals Included



Type FCL Breaker

## Dimensions / Weights

## Dimensions, Inches

| Number of Poles | Width             | Height           | Depth            |
|-----------------|-------------------|------------------|------------------|
| 2-3             | 4.125<br>(104.78) | 8.75<br>(222.25) | 3.375<br>(85.73) |

## Approximate Shipping Weight, Lbs. (kg)

|        |              |
|--------|--------------|
| 2-Pole | 9<br>(4.082) |
| 3-Pole | 9<br>(4.082) |

## Listed with Underwriters Laboratories, Inc. except as noted.

Type FCL breakers are not defined in  
Federal Specification W-C-375-b.

## Interrupting Capacity Ratings

| Circuit Breaker Type | Volts Ac (50/60 Hz) | Interrupting Capacity (Symmetrical Amperes) (kA) |
|----------------------|---------------------|--------------------------------------------------|
| FCL                  | 240<br>480          | 200<br>150                                       |

On all 3-phase Delta, Grounded  
B phase applications, refer to  
Cutler-Hammer.

| Maximum Continuous<br>Ampere Rating<br>@ 40°C | 2-Pole <sup>①</sup> | 3-Pole   |
|-----------------------------------------------|---------------------|----------|
|                                               | Catalog Number      |          |
| 15                                            | FCL2015L            | FCL3015L |
| 20                                            | FCL2020L            | FCL3020L |
| 25                                            | FCL2025L            | FCL3025L |
| 30                                            | FCL2030L            | FCL3030L |
| 35                                            | FCL2035L            | FCL3035L |
| 40                                            | FCL2040L            | FCL3040L |
| 45                                            | FCL2045L            | FCL3045L |
| 50                                            | FCL2050L            | FCL3050L |
| 60                                            | FCL2060L            | FCL3060L |
| 70                                            | FCL2070L            | FCL3070L |
| 80                                            | FCL2080L            | FCL3080L |
| 90                                            | FCL2090L            | FCL3090L |
| 100                                           | FCL2100L            | FCL3100L |

## Line and Load Terminals

Breakers listed include line and load terminals. Terminals are Underwriters Laboratories, Inc. listed for wire sizes and types listed below. When used with aluminum cable, use joint compound. To order optional aluminum terminals, add suffix "Z" to breaker catalog number listed.

| Maximum Breaker Amperes                  | Wire Type | AWG Wire Range |
|------------------------------------------|-----------|----------------|
| <b>Standard Pressure Terminals</b>       |           |                |
| 100                                      | Al/Cu     | #14-1/0        |
| <b>Optional Al/Cu Pressure Terminals</b> |           |                |
| 50                                       | Al/Cu     | #14-#4         |
| 100                                      | Al/Cu     | #4-4/0         |

<sup>①</sup> 2-pole breakers are supplied in 3-pole frames  
with current carrying parts omitted from the  
center pole.



### Type LCL Current Limit-R Electronic Circuit Breakers

125 to 400 Amperes, 600 Volts Ac  
with Solid State Trip Units



Type LCL Breaker

### Dimensions / Weights

#### Dimensions, Inches

| Number of Poles | Width          | Height           | Depth              |
|-----------------|----------------|------------------|--------------------|
| 2-3             | 16<br>(406.40) | 8.25<br>(209.56) | 4.0625<br>(103.19) |

#### Approximate Shipping Weight, Lbs. (kg)

| Standard          |                |
|-------------------|----------------|
| 2-Pole            | 32<br>(14.515) |
| 3-Pole            | 32<br>(14.515) |
| With Ground Fault |                |
| 3-Pole            | 36<br>(16.329) |

### Listed with Underwriters Laboratories, Inc. except as noted.

Type LCL breakers are not defined in Federal Specification W-C-375-b.

#### Interrupting Capacity Ratings

| Circuit Breaker Type | Volts Ac (50/60 Hz) | Interrupting Capacity (Symmetrical Amperes) (kA) |
|----------------------|---------------------|--------------------------------------------------|
| LCL                  | 240<br>480<br>600   | 200<br>200<br>100                                |

On all 3-phase Delta, Grounded B phase applications, refer to Cutler-Hammer.

### Standard Breakers 600 Volts Ac, 50/60 Hz

Complete breaker requires frame, rating plug and terminals

| Frame Only         |                                                           |                                                 |                                                                                                   |
|--------------------|-----------------------------------------------------------|-------------------------------------------------|---------------------------------------------------------------------------------------------------|
| Poles <sup>①</sup> | Standard (Long Delay, Magnetic Trip and Current Limiting) | Magnetic Only <sup>②</sup> and Current Limiting | Long Delay, Magnetic Trip and Adjustable Short Delay Time (.08-.28 seconds), and Current Limiting |
| Catalog Number     |                                                           |                                                 |                                                                                                   |

#### Types LCL and LCLA 250 Ampere Frame (125-250 Amperes)

|   |          |           |           |
|---|----------|-----------|-----------|
| 2 | LCL2250F | LCL2250FM | LCLA2250F |
| 3 | LCL3250F | LCL3250FM | LCLA3250F |

#### Types LCL and LCLA 400 Ampere Frame (200-400 Amperes)

|   |          |           |           |
|---|----------|-----------|-----------|
| 2 | LCL2400F | LCL2400FM | LCLA2400F |
| 3 | LCL3400F | LCL3400FM | LCLA3400F |

Instruction Leaflet/FRED Number 15257

### Breakers with Built-in Ground Fault Protection

Complete breaker requires frame, rating plug and terminals – extra current transformer included for neutral.

| Frame Only         |                                                                               |                                                                                                                         |
|--------------------|-------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------|
| Poles <sup>①</sup> | Standard (Long Delay, Magnetic Trip, Current Limiting, and Ground Fault Trip) | Long Delay, Magnetic Trip and Adjustable Short Delay Time (.06-.22 seconds), and Ground Fault Trip and Current Limiting |
| Catalog Number     |                                                                               |                                                                                                                         |

#### Types LCLG and LCLGA 250 Ampere Frame (125-250 Amperes)

|   |           |            |
|---|-----------|------------|
| 3 | LCLG3250F | LCLGA3250F |
|---|-----------|------------|

#### Types LCLG and LCLGA 400 Ampere Frame (200-400 Amperes)

|   |           |            |
|---|-----------|------------|
| 3 | LCLG3400F | LCLGA3400F |
|---|-----------|------------|

Instruction Leaflet/FRED Number 15495

### Terminals<sup>③</sup> (Order Separately)

Two terminals are required per pole. Terminals are Underwriters Laboratories, Inc. listed for wire type and range listed below. When used with aluminum cable, use joint compound.

| Maximum Breaker Amperes | Wire Range, Type, Number of Cables | Terminal Catalog Number |
|-------------------------|------------------------------------|-------------------------|
|-------------------------|------------------------------------|-------------------------|

#### Standard Copper Pressure Terminals

|     |                                           |        |
|-----|-------------------------------------------|--------|
| 225 | 1#6-350 kcmil Cu                          | T225LA |
| 400 | 1#4-250 kcmil Cu, plus 1 3/0-600 kcmil Cu | T401LA |

#### Optional Al/Cu Pressure Terminals

|     |                                                 |          |
|-----|-------------------------------------------------|----------|
| 225 | 1#6-350 kcmil Cu, or 1#4-350 kcmil Al           | TA225LA1 |
| 400 | 1#4-250 kcmil Al/Cu, plus 1 3/0-600 kcmil Al/Cu | TA400LA1 |

### Rating Plug Selection Data

Rating plugs listed below are for both standard breakers and breakers with built-in ground fault protection.

#### Rating Plugs Only (For 2- or 3-Pole Frames)

| Continuous Ampere Rating | Magnetic Trip Setting, Amperes |      | Fixed Rating Plugs | Adjustable Rating Plugs <sup>④</sup> |
|--------------------------|--------------------------------|------|--------------------|--------------------------------------|
|                          | Low                            | High | Catalog Number     |                                      |

#### Types LCL and LCLA 250 Ampere Frames

|     |     |      |         |                       |
|-----|-----|------|---------|-----------------------|
| 125 | 375 | 1125 | 2LCL125 | —                     |
| 150 | 450 | 1350 | 2LCL150 | —                     |
| 175 | 525 | 1575 | 2LCL175 | A2LCL175 <sup>⑤</sup> |
| 200 | 600 | 1800 | 2LCL200 | A2LCL200              |
| 225 | 675 | 2025 | 2LCL225 | A2LCL225              |
| 250 | 750 | 2250 | 2LCL250 | A2LCL250 <sup>⑥</sup> |

#### Types LCL and LCLA 400 Ampere Frames

|     |     |      |         |                       |
|-----|-----|------|---------|-----------------------|
| 200 | 400 | 1600 | 4LCL200 | —                     |
| 225 | 450 | 1800 | 4LCL225 | —                     |
| 250 | 500 | 2000 | 4LCL250 | —                     |
| 275 | 550 | 2200 | 4LCL275 | —                     |
| 300 | 600 | 2400 | 4LCL300 | A4LCL300 <sup>⑤</sup> |
| 350 | 700 | 2800 | 4LCL350 | A4LCL350              |
| 400 | 800 | 3200 | 4LCL400 | A4LCL400 <sup>⑥</sup> |

① 2-pole breakers are supplied in 3-pole frames with current carrying parts omitted from the center pole.

② UL listed recognized component.

③ Terminals shipped separately from breaker.

④ Adjustable 70 to 100% except as noted.

⑤ Adjustable 75 to 100%.

⑥ Adjustable 50 to 100%.

## Type FB Tri-Pac Thermal-Magnetic Circuit Breakers

15 to 100 Amperes, 600 Volts Ac,  
250 Volts Dc, Replaceable Current  
Limiters



Type Tri-Pac FB Breaker

## Dimensions / Weights

## Dimensions, Inches

| Number of Poles | Width             | Height           | Depth          |
|-----------------|-------------------|------------------|----------------|
| 2-3             | 4.125<br>(104.78) | 8.75<br>(222.25) | 3.5<br>(88.90) |

## Approximate Shipping Weight, Lbs. (kg)

| Breaker    | Complete Breaker |        |
|------------|------------------|--------|
|            | 2-Pole           | 3-Pole |
| Tri-Pac FB | 10.5             | 11.5   |

Listed with Underwriters Labora-  
tories, Inc. except as noted.

Tri-Pac FB breakers meet the  
requirements for Class 16a, 16b, 17a  
and 26a circuit breakers as defined  
in Federal Specification W-C-375b.

## Interrupting Capacity Ratings

Underwriters Laboratories, Inc.  
Listed

600 Volts Ac Maximum: 200,000  
Amperes Symmetrical

## Based on NEMA Test Procedures

250 Volts Dc Maximum: 100,000  
Amperes.

On all 3-phase Delta, Ground B phase  
applications, refer to Cutler-Hammer.

① 2-pole breakers are supplied in 3-pole frames  
with current carrying parts omitted from the  
center pole.

| Maximum Continuous<br>Ampere Rating<br>@ 40°C | 2-Pole①                                    | 3-Pole   |
|-----------------------------------------------|--------------------------------------------|----------|
|                                               | Catalog Number (Current Limiters Included) |          |
| 15                                            | FB2015PL                                   | FB3015PL |
| 20                                            | FB2020PL                                   | FB3020PL |
| 30                                            | FB2030PL                                   | FB3030PL |
| 40                                            | FB2040PL                                   | FB3040PL |
| 50                                            | FB2050PL                                   | FB3050PL |
| 60                                            | FB2060PL                                   | FB3060PL |
| 70                                            | FB2070PL                                   | FB3070PL |
| 90                                            | FB2090PL                                   | FB3090PL |
| 100                                           | FB2100PL                                   | FB3100PL |

## Line and Load Terminals

Breakers listed include line and load terminals. Terminals are Underwriters Laboratories, Inc. listed for wire sizes and types listed below. When used with aluminum cable, use joint compound. To order optional aluminum terminals, add suffix "Z" to breaker catalog number listed.

| Maximum Breaker Amperes                  | Wire Type | AWG Wire Range |
|------------------------------------------|-----------|----------------|
| <b>Standard Pressure Terminals</b>       |           |                |
| 100                                      | Al/Cu     | #14-1/0        |
| <b>Optional Al/Cu Pressure Terminals</b> |           |                |
| 50                                       | Al/Cu     | #14-#4         |
| 100                                      | Al/Cu     | #4-4/0         |

## Replacement Current Limiters and Housing Assembly

## Current Limiters: One required per pole.

| Application                                                                                                                                                                                  | Catalog Number |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|
| Supplied as standard in Type FB Tri-Pac breakers rated 15-100 amperes. Replaces 200FBP03 formerly supplied on 15-40 ampere ratings, and 500FBP07 formerly supplied on 50-100 ampere ratings. | 100FBP06       |

Refer to CAT.71.01.T.E for complete application information.

## Current Limiter Housing Assembly Complete with Current Limiter

| Ampere Rating | Poles | Style Number |
|---------------|-------|--------------|
| 15-100        | 2     | 176C593G09   |
| 15-100        | 3     | 176C593G10   |



## Type LA Tri-Pac Thermal-Magnetic Circuit Breakers

70 to 400 Amperes, 600 Volts Ac,  
250 Volts Dc, 2-, 3-Pole, Inter-  
changeable Trip, Replaceable  
Current Limiters



Type Tri-Pac LA Breaker

## Dimensions / Weights

## Dimensions, Inches

| Number of Poles | Width            | Height         | Depth            |
|-----------------|------------------|----------------|------------------|
| 2-3             | 8.25<br>(209.56) | 16<br>(406.40) | 4.75<br>(113.54) |

## Approximate Shipping Weight, Lbs. (kg)

| Breaker    | Complete Breaker |        | Frame Only |        | Trip Unit |        |
|------------|------------------|--------|------------|--------|-----------|--------|
|            | 2-Pole           | 3-Pole | 2-Pole     | 3-Pole | 2-Pole    | 3-Pole |
| Tri-Pac LA | 29.75            | 34     | 23.5       | 25     | 2.25      | 3      |

## Listed with Underwriters Laboratories, Inc. except as noted.

Tri-Pac LA breakers meet the requirements for Class 16a, 16b, 17a and 26a circuit breakers as defined in Federal Specification W-C-375b.

## Interrupting Capacity Ratings

## Underwriters Laboratories, Inc. Listed

600 Volts Ac Maximum: 200,000  
Amperes Symmetrical

## Based on NEMA Test Procedures

250 Volts Dc Maximum: 100,000  
Amperes.

On all 3-phase Delta, Ground B phase  
applications, refer to Cutler-Hammer.

| Continu-<br>ous<br>Ampere<br>Rating<br>@40°C | Magnetic Trip Setting<br>Amperes <sup>④</sup> |      | Complete Breaker                                        | Shipped as Frame, Trip Units, Limiters and Terminals <sup>⑤</sup> |                |                                           |
|----------------------------------------------|-----------------------------------------------|------|---------------------------------------------------------|-------------------------------------------------------------------|----------------|-------------------------------------------|
|                                              | Low                                           | High | Includes Pressure Type<br>Copper Terminals <sup>⑤</sup> | Frame Only                                                        | Trip Unit Only | Current Limiter<br>1 Required per<br>Pole |
|                                              |                                               |      | Catalog Number                                          |                                                                   |                |                                           |

2 Poles, 600 Volts Ac, 250 Volts Dc<sup>⑥</sup>

|     |      |      |          |           |          |          |
|-----|------|------|----------|-----------|----------|----------|
| 70  | 350  | 700  | LA2070PR | LA2400PRF | LA2070PT | 200LAP08 |
| 90  | 450  | 900  | LA2090PR | LA2400PRF | LA2090PT | 200LAP08 |
| 100 | 500  | 1000 | LA2100PR | LA2400PRF | LA2100PT | 200LAP08 |
| 125 | 625  | 1250 | LA2125PR | LA2400PRF | LA2125PT | 200LAP08 |
| 150 | 750  | 1500 | LA2150PR | LA2400PRF | LA2150PT | 200LAP08 |
| 175 | 875  | 1750 | LA2175PR | LA2400PRF | LA2175PT | 200LAP08 |
| 200 | 1000 | 2000 | LA2200PR | LA2400PRF | LA2200PT | 200LAP08 |
| 225 | 1125 | 2250 | LA2225PR | LA2400PRF | LA2225PT | 400LAP10 |
| 250 | 1250 | 2500 | LA2250PR | LA2400PRF | LA2250PT | 400LAP10 |
| 300 | 1500 | 3000 | LA2300PR | LA2400PRF | LA2300PT | 400LAP10 |
| 350 | 1750 | 3500 | LA2350PR | LA2400PRF | LA2350PT | 400LAP10 |
| 400 | 2000 | 4000 | LA2400PR | LA2400PRF | LA2400PT | 400LAP10 |

## 3 Poles, 600 Volts Ac, 250 Volts Dc

|     |      |      |          |           |          |          |
|-----|------|------|----------|-----------|----------|----------|
| 70  | 350  | 700  | LA3070PR | LA3400PRF | LA3070PT | 200LAP08 |
| 90  | 450  | 900  | LA3090PR | LA3400PRF | LA3090PT | 200LAP08 |
| 100 | 500  | 1000 | LA3100PR | LA3400PRF | LA3100PT | 200LAP08 |
| 125 | 625  | 1250 | LA3125PR | LA3400PRF | LA3125PT | 200LAP08 |
| 150 | 750  | 1500 | LA3150PR | LA3400PRF | LA3150PT | 200LAP08 |
| 175 | 875  | 1750 | LA3175PR | LA3400PRF | LA3175PT | 200LAP08 |
| 200 | 1000 | 2000 | LA3200PR | LA3400PRF | LA3200PT | 200LAP08 |
| 225 | 1125 | 2250 | LA3225PR | LA3400PRF | LA3225PT | 400LAP10 |
| 250 | 1250 | 2500 | LA3250PR | LA3400PRF | LA3250PT | 400LAP10 |
| 300 | 1500 | 3000 | LA3300PR | LA3400PRF | LA3300PT | 400LAP10 |
| 350 | 1750 | 3500 | LA3350PR | LA3400PRF | LA3350PT | 400LAP10 |
| 400 | 2000 | 4000 | LA3400PR | LA3400PRF | LA3400PT | 400LAP10 |

Instruction Leaflet/FRED Number 14551 for Trip Unit and Fuse

## Current Limiters

Included with breaker, one required  
per pole.

| Application                                                                                                                                                                                                                                                                                                                                                                                     | Catalog<br>Number |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|
| Supplied as standard on ratings<br>through 200 amperes.                                                                                                                                                                                                                                                                                                                                         | 200LAP08          |
| Supplied as standard on 225 through<br>400 ampere ratings, optional on lower<br>ratings when a higher "cross-over<br>point" is desired. (Above two limiters<br>replace 800LAP12 formerly supplied<br>as standard on all ratings, 600LAP09<br>optional on all ratings through 300<br>amperes, 300LAP05 optional on rat-<br>ings through 150 amperes, and spe-<br>cial rating limiter 1000LAP14.) | 400LAP10          |
| Special rating where a higher "cross-<br>over point" is desired on 200 ampere<br>and higher ratings (Replaces limiter<br>1500LAP20)                                                                                                                                                                                                                                                             | 500LAP15<br>②③    |

- ① New limiters suitable for replacement in  
existing breakers by using plug-in conductor  
from old limiter (instructions included with  
limiter). Instruction Leaflet/FRED Number  
14824
- ② Not listed with Underwriters Laboratories, Inc.
- ③ Protection based on 100,000 ampere maxi-  
mum fault, 480 volts maximum.
- ④ Set on high side, adjustable to lower limits.

Terminals<sup>⑤</sup>

Two terminals are required per pole.  
Terminals are Underwriters Labora-  
tories, Inc. listed for wire size and  
type listed below. When used with  
aluminum conductors, use joint  
compound. To order optional alumi-  
num terminals, add suffix "Z" to  
complete breaker catalog number.

| Maximum<br>Breaker<br>Amperes | Wire Range, Type,<br>Number of Cables | Terminal<br>Catalog<br>Number |
|-------------------------------|---------------------------------------|-------------------------------|
|-------------------------------|---------------------------------------|-------------------------------|

## Standard Copper Pressure Terminals

|                  |                                               |         |
|------------------|-----------------------------------------------|---------|
| 225              | 1 #6-350 kcmil Cu                             | T225LA  |
| 225 <sup>⑦</sup> | 1 #6-250 kcmil Cu                             | T225LBF |
| 400              | 1 #4-250 kcmil Cu, plus<br>1 3/0-600 kcmil Cu | T401LA  |

## Optional Al/Cu Pressure Terminals

|     |                                                     |          |
|-----|-----------------------------------------------------|----------|
| 225 | 1 #6-350 kcmil Cu, or<br>1 #4-350 kcmil Cu/Al       | TA225LA1 |
| 400 | 1 #4-250 kcmil Al/Cu, plus<br>1 3/0-600 kcmil Al/Cu | TA400LA1 |

Instruction Leaflet/FRED Number 13732

- ⑤ Terminals shipped separately from breakers.
- ⑥ 2-pole breakers or trips are supplied in 3-pole  
frames with current carrying parts omitted  
from the center pole.
- ⑦ Optional terminal.

## Type NB Tri-Pac Thermal-Magnetic Circuit Breakers

300 to 800 Amperes, 600 Volts Ac,  
250 Volts Dc<sup>①</sup>, 2-, 3-Pole, Inter-  
changeable Trip, Replaceable  
Current Limiters



Type Tri-Pac NB Breaker

## Dimensions / Weights

## Dimensions, Inches

| Number of Poles | Width            | Height         | Depth           |
|-----------------|------------------|----------------|-----------------|
| 2-3             | 8.25<br>(209.56) | 22<br>(558.80) | 5.5<br>(139.70) |

## Approximate Shipping Weight, Lbs. (kg)

| Breaker    | Complete Breaker |        | Frame Only |        | Trip Unit |        |
|------------|------------------|--------|------------|--------|-----------|--------|
|            | 2-Pole           | 3-Pole | 2-Pole     | 3-Pole | 2-Pole    | 3-Pole |
| Tri-Pac NB | 62               | 75     | 58         | 65     | 3.5       | 4      |

## Listed with Underwriters Laboratories, Inc. except as noted.

Tri-Pac NB breakers meet the requirements for Class 16b, 17a and 26a circuit breakers as defined in Federal Specification W-C-375b.

| Continu-<br>ous<br>Ampere<br>Rating<br>@40°C | Magnetic Trip Setting<br>Amperes <sup>④</sup> |      | Complete Breaker                                        | Shipped as Frame, Trip Units, Limiters and Terminals |                |                                        |
|----------------------------------------------|-----------------------------------------------|------|---------------------------------------------------------|------------------------------------------------------|----------------|----------------------------------------|
|                                              | Low                                           | High | Includes Pressure Type<br>Copper Terminals <sup>⑤</sup> | Frame Only                                           | Trip Unit Only | Current Limiter<br>1 Required per Pole |
|                                              |                                               |      | Catalog Number                                          |                                                      |                |                                        |

2 Poles, 600 Volts Ac, 250 Volts Dc<sup>①③</sup>

|                  |      |      |         |          |          |         |
|------------------|------|------|---------|----------|----------|---------|
| 300              | 1500 | 3000 | NB2300P | NB2800PF | NB2300PT | 500NB12 |
| 350              | 1750 | 3500 | NB2350P | NB2800PF | NB2350PT | 500NB12 |
| 400 <sup>④</sup> | 2000 | 4000 | NB2400P | NB2800PF | NB2400PT | 500NB12 |
| 500 <sup>④</sup> | 2500 | 5000 | NB2500P | NB2800PF | NB2500PT | 500NB12 |
| 600 <sup>④</sup> | 3000 | 6000 | NB2600P | NB2800PF | NB2600PT | 800NB20 |
| 700 <sup>④</sup> | 3000 | 6000 | NB2700P | NB2800PF | NB2700PT | 800NB20 |
| 800 <sup>④</sup> | 3000 | 6000 | NB2800P | NB2800PF | NB2800PT | 800NB20 |

## 3 Poles, 600 Volts Ac Only

|                  |      |      |         |          |          |         |
|------------------|------|------|---------|----------|----------|---------|
| 300              | 1500 | 3000 | NB3300P | NB3800PF | NB3300PT | 500NB12 |
| 350              | 1750 | 3500 | NB3350P | NB3800PF | NB3350PT | 500NB12 |
| 400 <sup>④</sup> | 2000 | 4000 | NB3400P | NB3800PF | NB3400PT | 500NB12 |
| 500 <sup>④</sup> | 2500 | 5000 | NB3500P | NB3800PF | NB3500PT | 500NB12 |
| 600 <sup>④</sup> | 3000 | 6000 | NB3600P | NB3800PF | NB3600PT | 800NB20 |
| 700 <sup>④</sup> | 3000 | 6000 | NB3700P | NB3800PF | NB3700PT | 800NB20 |
| 800 <sup>④</sup> | 3000 | 6000 | NB3800P | NB3800PF | NB3800PT | 800NB20 |

Instruction Leaflet/FRED Number 13771 for Trip Unit and Fuse

## Interrupting Capacity Ratings

Underwriters Laboratories, Inc.  
Listed

600 Volts Ac Maximum: 200,000  
Amperes Symmetrical

## Based on NEMA Test Procedures

250 Volts Dc Maximum<sup>①</sup>: 100,000  
Amperes.

On all 3-phase Delta, Grounded  
B phase applications, refer to  
Cutler-Hammer.

## Current Limiters

Included with breaker, one required  
per pole.

| Application                                                                                                                                                 | Catalog Number |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|
| Supplied as standard on ratings through 500 amperes.                                                                                                        | 500NB12        |
| Supplied as standard on 600 through 800 ampere ratings, optional on lower ratings when a higher "cross-over point" is desired.                              | 800NB20        |
| Above two limiters replace 1000NB14 formerly supplied on ratings up to 600 amperes, 1500NB20 supplied on 700 amperes, and 2500NB25 supplied on 800 amperes. |                |

Terminals<sup>②</sup>

Two terminals are required per pole. Terminals are Underwriters Laboratories, Inc. listed for wire size and type listed below. When used with aluminum conductors, use joint compound. To order optional aluminum terminals, add suffix "Z" to complete breaker catalog number.

| Maximum<br>Ampere<br>Rating | Wire Range, Type,<br>Number of Cables | Terminal<br>Catalog<br>Number |
|-----------------------------|---------------------------------------|-------------------------------|
|-----------------------------|---------------------------------------|-------------------------------|

## Standard Copper Pressure Terminals

|     |                    |          |
|-----|--------------------|----------|
| 350 | 1 #1-600 kcmil Cu  | T350NB   |
| 700 | 2 2/0-500 kcmil Cu | T700NB1  |
| 800 | 3 3/0-500 kcmil Cu | T1000NB1 |

## Optional Al/Cu Pressure Terminals

|     |                       |           |
|-----|-----------------------|-----------|
| 700 | 2 #1-500 kcmil Al/Cu  | TA700NB1  |
| 800 | 3 3/0-400 kcmil Al/Cu | TA1000NB1 |
| 800 | 3 500-750 kcmil Al/Cu | TA1201NB1 |

① Dc rating applies to 350 amperes maximum thermal or to magnetic only breakers.

② Shipped separately from breaker

③ 2-pole breakers or trips are supplied in 3-pole frames with current carrying parts omitted from the center pole.

④ 60 Hz Ac only.

## Type PB Tri-Pac Thermal-Magnetic Circuit Breakers

600 to 1600 Amperes, 600 Volts Ac,  
60 Hertz Ac<sup>①</sup>, 250 Volts Dc<sup>②</sup>,  
2-, 3- Poles Interchangeable Trip,  
Replaceable Current Limiters



Type Tri-Pac PB Breaker

## Dimensions / Weights

## Dimensions, Inches

| Number of Poles | Width               | Height             | Depth              |
|-----------------|---------------------|--------------------|--------------------|
| 2-3             | 12.0625<br>(306.39) | 22.125<br>(561.98) | 9.0625<br>(230.19) |

## Approximate Shipping Weight, Lbs. (kg)

| Breaker    | Complete Breaker |        | Frame Only |        | Trip Unit |        |
|------------|------------------|--------|------------|--------|-----------|--------|
|            | 2-Pole           | 3-Pole | 2-Pole     | 3-Pole | 2-Pole    | 3-Pole |
| Tri-Pac PB | 148              | 179    | 106        | 120    | 18        | 23     |

## Listed with Underwriters Laboratories, Inc. except as noted.

Tri-Pac PB breakers meet the requirements for Class 17a and 26a circuit breakers as defined in Federal Specification W-C-375b.

## Interrupting Capacity Ratings

## Underwriters Laboratories, Inc. Listed

600 Volts Ac Maximum: 200,000  
Amperes Symmetrical

## Based on NEMA Test Procedures

250 Volts Dc<sup>②</sup>: 100,000 Amperes.

On all 3-phase Delta, Grounded  
B phase applications, refer to  
Cutler-Hammer.

| Continuous<br>Ampere<br>Rating<br>@40°C | Ac Magnetic Trip Setting (Set on High Side, Adjustable to Lower Limits) |      | Complete Breaker<br>Includes Rear<br>"T" Connectors <sup>⑤</sup> | Shipped as Frame, Trip Unit Current Limiters and Connectors |                             |                                        |
|-----------------------------------------|-------------------------------------------------------------------------|------|------------------------------------------------------------------|-------------------------------------------------------------|-----------------------------|----------------------------------------|
|                                         | Low                                                                     | High | Catalog Number                                                   | Frame Only                                                  | Trip Unit Only <sup>④</sup> | Current Limiter<br>1 Required per Pole |

2 Poles, 600 Volts Ac<sup>⑤</sup>

|      |      |      |           |            |            |            |
|------|------|------|-----------|------------|------------|------------|
| 600  | 1500 | 5000 | PB2600PR  | PB21600PRF | PB2600PRT  | 1000PBPR20 |
| 700  | 1500 | 5000 | PB2700PR  | PB21600PRF | PB2700PRT  | 1000PBPR20 |
| 800  | 1500 | 5000 | PB2800PR  | PB21600PRF | PB2800PRT  | 1000PBPR20 |
| 900  | 1500 | 5000 | PB2900PR  | PB21600PRF | PB2900PRT  | 1000PBPR20 |
| 1000 | 1500 | 5000 | PB21000PR | PB21600PRF | PB21000PRT | 1000PBPR20 |
| 1200 | 2000 | 6000 | PB21200PR | PB21600PRF | PB21200PRT | 1600PBPR30 |
| 1400 | 2500 | 7000 | PB21400PR | PB21600PRF | PB21400PRT | 1600PBPR30 |
| 1600 | 3000 | 8000 | PB21600PR | PB21600PRF | PB21600PRT | 1600PBPR30 |

## 3 Poles, 600 Volts Ac Only

|      |      |      |           |            |            |            |
|------|------|------|-----------|------------|------------|------------|
| 600  | 1500 | 5000 | PB3600PR  | PB31600PRF | PB3600PRT  | 1000PBPR20 |
| 700  | 1500 | 5000 | PB3700PR  | PB31600PRF | PB3700PRT  | 1000PBPR20 |
| 800  | 1500 | 5000 | PB3800PR  | PB31600PRF | PB3800PRT  | 1000PBPR20 |
| 900  | 1500 | 5000 | PB3900PR  | PB31600PRF | PB3900PRT  | 1000PBPR20 |
| 1000 | 1500 | 5000 | PB31000PR | PB31600PRF | PB31000PRT | 1000PBPR20 |
| 1200 | 2000 | 6000 | PB31200PR | PB31600PRF | PB31200PRT | 1600PBPR30 |
| 1400 | 2500 | 7000 | PB31400PR | PB31600PRF | PB31400PRT | 1600PBPR30 |
| 1600 | 3000 | 8000 | PB31600PR | PB31600PRF | PB31600PRT | 1600PBPR30 |

## Current Limiters

Included with breaker, one required  
per pole.

| Application                                                                                                                                                                                                                                                            | Catalog Number |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|
| Supplied as standard on ratings through 1000 amperes. (Replaces limiter 1500PBPR30 formerly supplied on 600 and 700 ampere ratings, and 3000 PBPR27 supplied on 800-1000 ampere ratings.)                                                                              | 1000PBPR20     |
| Supplied as standard on 1200 through 1600 ampere ratings. Optional on lower ratings where a higher "cross-over point" is desired. (Replaces limiter 4000PBPR30 formerly supplied on 1200 through 1400 ampere ratings, and 5000PBPR42 supplied on 1600 ampere ratings.) | 1600PBPR30     |

Bus Bar Connectors<sup>⑥</sup>"T" Connector for  
Cu/Al Bus

Two required per pole.  
For rear bus connection.  
Accepts up to four bus  
bolts. May be rotated 90°

| Catalog Number |
|----------------|
| BA2000B        |

Cable Connector  
(Optional)

For "T" connector.  
Accepts four 600 kcmil  
copper cables.

| Style Number |
|--------------|
| 505C706G04   |

Special Breakers<sup>⑥</sup>

## Magnetic Only Type Tri-Pacs:

Available on request.

- ① Higher frequency calibration not available. Minimum of 50 Hz calibration available on special order.  
② 250 volts Dc rating applies only to magnetic only breakers.  
③ Shipped separately from breaker.

- ④ Magnetic only trip units are available. Order by description.  
⑤ 2-pole breakers are supplied in 3-pole frames with current carrying parts omitted from center pole.  
⑥ Not listed with Underwriters Laboratories, Inc.

## Alarm Switch

For light or alarm indication when breaker trips. Does not function with manual operation. Automatically resets when breaker is relatched. Standard leads extend 18 inches outside of breaker. Longer leads may be specified. Not field mountable.

| Breaker Frame | Normal Pole Meeting | Contact Operation (Specific Type Desired) |
|---------------|---------------------|-------------------------------------------|
| FCL           | Center              | Make or Break                             |
| LA Tri-Pac    | Left                | Make or Break                             |
| NB Tri-Pac    | Left                | Make or Break                             |
| PB Tri-Pac    | Left                | Make or Break                             |
| LCL           | Left <sup>①</sup>   | Make or Break                             |

Alarm Switch Contact Rating (Non Inductive) LA Tri-Pac: 10 amperes, 120 volt Ac; 5A, 240 volt Ac.

## Auxiliary Switch<sup>②</sup>

For auxiliary control circuits. Miniature switches mount within breaker. Commonly used for remote indication of open or closed breaker and electrically interlocking component control circuits. "A" contacts are closed when breaker is closed. "B" contacts are open when breaker is closed. Standard leads extend 18 inches outside of breaker. Longer leads may be specified.



### Auxiliary Switch Attachment Kits for Field Mounting<sup>③④</sup>

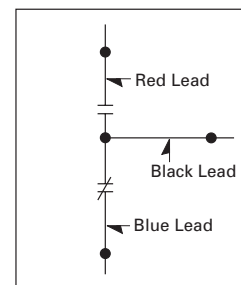
| Breaker Type | For Right-Hand Mounting |            | For Left-Hand Mounting |            | Maxmum Ac Voltage Rating <sup>⑤</sup> | Maximum Non-Inductive Amperes |
|--------------|-------------------------|------------|------------------------|------------|---------------------------------------|-------------------------------|
|              | 1A-1B                   | 2A-2B      | 1A-1B                  | 2A-2B      |                                       |                               |
|              | Style Number            |            |                        |            |                                       |                               |
| FCL          | 1369D79G03              | —          | 1369D79G03             | —          | 240                                   | 5                             |
| NB Tri-Pac   | 4980D16G05              | 4980D16G06 | 4980D16G12             | 4980D16G13 | 480                                   | 10                            |
| PB Tri-Pac   | 2602D32G14              | 2602D32G15 | 2602D32G11             | 2602D32G12 | 480                                   | 10                            |
| LCL          | —                       | —          | 1372D49G03             | 1372D49G06 | 480                                   | 6 (10@240)                    |

Instruction Leaflet/FRED Number 14535 NB Tri-Pac; 14534 PB Tri-Pac; 15279 LCL

### Factory Mounted Auxiliary Switches<sup>②</sup>

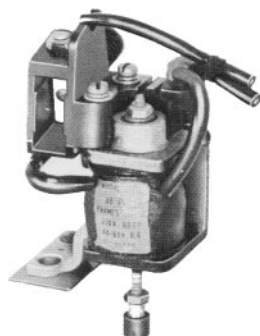
All of the above auxiliary switches can be specified for factory mounting at the same price as listed for the kit. These attachments have the leads out the side of the breaker and are UL listed when factory mounted unless other non UL listed modifications are used (except as noted).

Factory mounted switches only can be supplied for the following breakers: FB Tri-Pac<sup>®</sup>, LA Tri-Pac. Order by description.



- ① When alarm switch is used in conjunction with auxiliary switch, the auxiliary switch is rated 250 volts max., 5 amperes maximum.
- ② Left-hand mounting is standard unless otherwise specified.
- ③ All switches are multiples of 1A-1B with a common electrical connection (See diagram above).
- ④ Field mounting voids UL listing of breaker except on NB Tri-Pac and PB Tri-Pac breakers.
- ⑤ For Dc applications refer to factory.
- ⑥ Right-hand mounting only.

## Shunt Trip



For tripping breaker from a remote point. A solenoid device mounts within breaker case. Breaker trips when coil is energized.

Shunt trips should not be used as circuit interlocks using maintained contact pilot devices.

A cutoff switch breaks the circuit to the momentary rated coil when breaker opens. Available for control voltages up to 250 volts Dc or 600 volts Ac. Voltage and frequency must be specified. Standard leads extend 18 inches outside of breaker. Longer leads may be specified.

## Shunt Trip for Field Mounting<sup>①②③</sup>

| Voltage/Hz   | Breaker Type        |            |            |                    |            |            |
|--------------|---------------------|------------|------------|--------------------|------------|------------|
|              | Right-Hand Mounting |            |            | Left-Hand Mounting |            |            |
|              | FCL                 | NB Tri-Pac | PB Tri-Pac | FCL                | NB Tri-Pac | PB Tri-Pac |
| Style Number |                     |            |            |                    |            |            |
| 600/50-60 Hz | 1369D80G15          | 2606D58G15 | 2606D58G15 | 1369D80G01         | 2606D58G01 | 2606D58G01 |
| 480/50-60 Hz | 1369D80G16          | 2606D58G16 | 2606D58G16 | 1369D80G02         | 2606D58G02 | 2606D58G02 |
| 240/50-60 Hz | 1369D80G17          | 2606D58G17 | 2606D58G17 | 1369D80G03         | 2606D58G03 | 2606D58G03 |
| 208/50-60 Hz | 1369D80G18          | 2606D58G18 | 2606D58G18 | 1369D80G04         | 2606D58G04 | 2606D58G04 |
| 120/50-60 Hz | 1369D80G19          | 2606D58G19 | 2606D58G19 | 1369D80G05         | 2606D58G05 | 2606D58G05 |
| 60/50-60 Hz  | 1369D80G20          | 2606D58G20 | 2606D58G20 | 1369D80G06         | 2606D58G06 | 2606D58G06 |
| 48/50-60 Hz  | 1369D80G21          | 2606D58G21 | 2606D58G21 | 1369D80G07         | 2606D58G07 | 2606D58G07 |
| 24/50-60 Hz  | 1369D80G22          | 2606D58G22 | 2606D58G22 | 1369D80G08         | 2606D58G08 | 2606D58G08 |
| 250 Dc       | 1369D80G23          | 2606D58G23 | 2606D58G23 | 1369D80G09         | 2606D58G09 | 2606D58G09 |
| 125 Dc       | 1369D80G24          | 2606D58G24 | 2606D58G24 | 1369D80G10         | 2606D58G10 | 2606D58G10 |
| 60 Dc        | 1369D80G25          | 2606D58G25 | 2606D58G25 | 1369D80G11         | 2606D58G11 | 2606D58G11 |
| 48 Dc        | 1369D80G26          | 2606D58G26 | 2606D58G26 | 1369D80G12         | 2606D58G12 | 2606D58G12 |
| 24 Dc        | 1369D80G27          | 2606D58G27 | 2606D58G27 | 1369D80G13         | 2606D58G13 | 2606D58G13 |
| 12 Dc        | 1369D80G28          | 2606D58G28 | 2606D58G28 | 1369D80G14         | 2606D58G14 | 2606D58G14 |

Instruction Leaflet/FRED Numbers

15194

14919

14940

15194

14919

14940

Factory mounted shunt trips only can be supplied for FB Tri-Pac<sup>④⑤</sup> and LA Tri-Pac breakers. Order by description.

## Left-Hand Mounting Kits for Type LCL Current Limiting Breakers<sup>⑥</sup>

| Provision to trip flux transfer shunt trip from external 32 to 120 volt (Dc to 60 Hz) source. <sup>⑦⑧</sup> | Style Number |
|-------------------------------------------------------------------------------------------------------------|--------------|
|                                                                                                             | 1372D49G22   |
| Provision to trip flux transfer shunt trip from external 240 to 600 volt (50/60 Hz) source. <sup>⑧⑨</sup>   | Style Number |
|                                                                                                             | 1372D49G32   |

Instruction Leaflet/FRED Number 15279

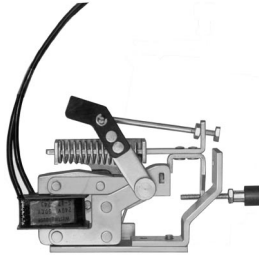
## Shunt Trip Coil Data for Type LCL Current Limiting Breakers

| Shunt Trip Voltage Rating | Coil Inrush |              |
|---------------------------|-------------|--------------|
|                           | Amperes     | Volt-Amperes |
| 120 Ac                    | .15         | 18           |

- ① 120 volt Ac ratings suitable for 55% pickup for ground fault applications.
- ② Not field mountable on non-automatic breakers (MCS).
- ③ Field mounting voids breakers' UL listing except on NB Tri-Pac and PB Tri-Pac.
- ④ Right-hand mounting only.
- ⑤ Not UL listed.
- ⑥ UL listing pending. Refer to Cutler-Hammer.
- ⑦ Rated 48 volts minimum for ground fault applications.
- ⑧ Also available factory mounted for 24 volt Dc. Order by description.
- ⑨ Not for ground fault.



## Standard Undervoltage Release<sup>①</sup>



For undervoltage protection. A solenoid device mounts within breaker case. Coil must be energized before closing breaker. Trips breaker when voltage drops below 40 to 60% of coil rating. Picks up and seals in at 80% of coil rating. For line voltages up to 250 volts Dc or 600 volts Ac. Externally mounted resistors are supplied for certain ratings. Standard leads extend 18 inches outside of breaker. Longer leads may be specified.

**Note:** U.V.R. attachments are not designed for, and should not be used as, circuit interlocks. For further information, refer to Cutler-Hammer.

### Factory Mounted Undervoltage Releases<sup>②</sup>

NB Tri-Pac and PB Tri-Pac undervoltage releases can be specified for factory mounting at the same price as the kit. These attachments have the leads out the side and are UL listed when factory mounted unless other non-UL listed modifications are used.

Factory mounted undervoltage releases only can be supplied for the following breakers: FB Tri-Pac<sup>③</sup>, LA Tri-Pac and FCL; LCL 120 Volts Ac only.<sup>④</sup> Order by description.

## Undervoltage Release Attachment Kits for Field Mounting<sup>⑤⑥</sup>

| Attachment Voltage, Hz | Breaker Type            |            |                        |            |
|------------------------|-------------------------|------------|------------------------|------------|
|                        | For Right-Hand Mounting |            | For Left-Hand Mounting |            |
|                        | NB Tri-Pac              | PB Tri-Pac | NB Tri-Pac             | PB Tri-Pac |
| Style Number           |                         |            |                        |            |
| 24 60                  | —                       | —          | —                      | —          |
| 48 60                  | —                       | 5674D29G16 | —                      | 5674D29G08 |
| 120 60                 | 373D632G01              | 5674D29G09 | 373D632G05             | 5674D29G01 |
| 208 60                 | 373D632G19              | 5674D29G10 | 373D632G20             | 5674D29G02 |
| 240 60                 | 373D632G02              | 5674D29G11 | 373D632G06             | 5674D29G03 |
| 480 60                 | 373D632G03              | 5674D29G13 | 373D632G07             | 5674D29G05 |
| 600 60                 | 373D632G04              | 5674D29G14 | 373D632G08             | 5674D29G06 |
| 12 Dc                  | 372D032G01              | 4976D85G01 | 372D032G06             | 4976D85G11 |
| 24 Dc                  | 372D032G02              | 4976D85G02 | 372D032G07             | 4976D85G12 |
| 48 Dc                  | 372D032G03              | 4976D85G03 | 372D032G08             | 4976D85G13 |
| 60 Dc                  | —                       | 4976D85G04 | —                      | 4976D85G14 |
| 125 Dc                 | 372D032G04              | 4976D85G07 | 372D032G09             | 4976D85G17 |
| 250 Dc                 | 372D032G05              | 4976D85G08 | 372D032G10             | 4976D85G18 |

Instruction Leaflet/FRED Number  
14961

13231

14961

13231

## Undervoltage Release Coil Data

| Voltage Rating, Hz | Breaker Type |                          |          |              |          |
|--------------------|--------------|--------------------------|----------|--------------|----------|
|                    | FB Tri-Pac   |                          |          | LCL          |          |
|                    | Coil Amperes | Series Resistance (Ohms) | Total VA | Coil Amperes | Total VA |
| 600 Ac             | 0.020        | 25,000                   | 12.0     | —            | —        |
| 480 Ac             | 0.016        | 25,000                   | 7.7      | —            | —        |
| 240 Ac             | 0.021        | 6,000                    | 5.1      | —            | —        |
| 208 Ac             | 0.019        | 6,000                    | 4.0      | —            | —        |
| 120 Ac             | 0.023        | —                        | 2.8      | .05          | 6        |
| 60 Ac              | 0.203        | 250                      | 12.2     | —            | —        |
| 48 Ac              | 0.245        | 150                      | 11.8     | —            | —        |
| 24 Ac              | 0.250        | 50                       | 6.0      | —            | —        |
| 250 Ac             | 0.026        | 5,000                    | 6.5      | —            | —        |
| 125 Ac             | 0.026        | —                        | 3.3      | —            | —        |
| 60 Ac              | 0.248        | 200                      | 14.9     | —            | —        |
| 48 Ac              | 0.260        | 150                      | 12.5     | —            | —        |
| 24 Ac              | 0.141        | —                        | 3.4      | —            | —        |
| 12 Ac              | 0.286        | —                        | 3.5      | —            | —        |

| Voltage Rating, Hz | Breaker Type           |                                   |          |              |                                   |          |
|--------------------|------------------------|-----------------------------------|----------|--------------|-----------------------------------|----------|
|                    | LA Tri-Pac, PB Tri-Pac |                                   |          | NB Tri-Pac   |                                   |          |
|                    | Coil Amperes           | External Series Resistance (Ohms) | Total VA | Coil Amperes | External Series Resistance (Ohms) | Total VA |
| 600 Ac             | 0.029                  | 20,000                            | 17.4     | 0.016        | 35,000                            | 9.6      |
| 480 Ac             | 0.014                  | —                                 | 6.8      | 0.013        | 30,000                            | 6.3      |
| 240 Ac             | 0.036                  | —                                 | 8.7      | 0.013        | —                                 | 3.2      |
| 208 Ac             | 0.036                  | —                                 | 7.5      | 0.018        | —                                 | 3.8      |
| 120 Ac             | 0.073                  | —                                 | 8.8      | 0.023        | —                                 | 2.8      |
| 48 Ac              | 0.152                  | —                                 | 7.3      | —            | —                                 | —        |
| 250 Dc             | 0.035                  | 5,000                             | 8.8      | 0.013        | 16,500                            | 3.3      |
| 125 Dc             | 0.039                  | 1,500                             | 4.9      | 0.013        | 6,500                             | 1.7      |
| 60 Dc              | 0.034                  | —                                 | 2.1      | —            | —                                 | —        |
| 48 Dc              | 0.040                  | —                                 | 2.0      | 0.012        | 600                               | 0.6      |
| 24 Dc              | 0.069                  | —                                 | 1.7      | 0.023        | —                                 | 0.6      |
| 12 Dc              | 0.136                  | —                                 | 1.7      | 0.048        | —                                 | 0.6      |

① Not UL listed.

② Right-hand mounting considered standard unless specified otherwise.

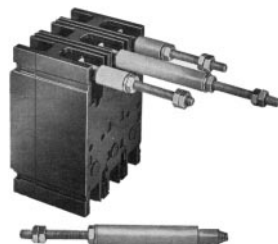
③ Right-hand mounting only.

④ UL listing pending.

⑤ Not field mountable on nonautomatic breakers (Molded case switches).

⑥ Field mounting voids UL listing of breaker except on NB Tri-Pac and PB Tri-Pac.

## Rear Connected Studs<sup>①</sup>



For complete stud assembly, order a stud and appropriate tube based on thickness of customer's mounting panel. A short stud must be assembled adjacent to a long stud to maintain clearances required by Underwriters Laboratories, Inc.<sup>②</sup> Two studs are required per pole.

## Panelboard Connecting Staps<sup>①</sup>

For connecting line end of breakers to panelboard bus.



| Ampere Rating | Connector Type | Style Number |
|---------------|----------------|--------------|
|---------------|----------------|--------------|

### Power Panelboards (Convertible)

#### Tri-Pac FB and FCL Breakers Bus Spacing 3½-inch

|                         |         |            |
|-------------------------|---------|------------|
| 50                      | Center  | 1253C72G01 |
| 50                      | Outside | 1253C72G02 |
| 100                     | Center  | 1253C73G03 |
| 100                     | Outside | 1253C73G04 |
| 150                     | Center  | 1253C73G01 |
| 150                     | Outside | 1253C73G02 |
| 3-Pole Mounting Bracket |         | 624B600H01 |
| 2-Pole Mounting Bracket |         | 624B600H02 |

#### LCL Breakers Bus Spacing 3½-inch

|                            |        |            |
|----------------------------|--------|------------|
| 400                        | Short  | 1275C85G01 |
| 400                        | Medium | 1275C85G02 |
| 400                        | Long   | 1275C85G03 |
| Mtg. Bracket Kit (1 Req'd) |        | 751B044G01 |

| Mounting Panel Thickness, Inches | Stud   |              | Tube <sup>③</sup> |              |
|----------------------------------|--------|--------------|-------------------|--------------|
|                                  | Length | Style Number | Length            | Style Number |

#### FCL and FB Tri-Pac Breakers

|         |       |            |    |            |
|---------|-------|------------|----|------------|
| 1       | Short | 451D874G01 | 1⅞ | 32B9446H20 |
|         | Long  | 451D874G02 | 3⅞ | 32B9446H24 |
| 1⅞ - 1⅝ | Short | 451D874G01 | 1⅞ | 32B9446H21 |
|         | Long  | 451D874G02 | 3⅞ | 32B9446H25 |
| ¾ - ⅝   | Short | 451D874G01 | 1⅞ | 32B9446H22 |
|         | Long  | 451D874G02 | 4⅞ | 32B9446H26 |
| ¼ - ⅝   | Short | 451D874G01 | 2  | 32B9446H23 |
|         | Long  | 451D874G02 | 4⅞ | 32B9446H27 |

| Stud Ampere Rating | Diameter, Inches and Thread | Extension Back of Breaker, Inches | Stud Style Number |
|--------------------|-----------------------------|-----------------------------------|-------------------|
|--------------------|-----------------------------|-----------------------------------|-------------------|

#### LCL, LA Tri-Pac Breakers

|                  |        |     |            |
|------------------|--------|-----|------------|
| 400 <sup>④</sup> | ¾ - 16 | 5⅞  | 05B7383G15 |
| 400 <sup>④</sup> | ¾ - 16 | 7⅞  | 05B7383G16 |
| 400 <sup>④</sup> | ¾ - 16 | 10⅞ | 05B7383G17 |

#### NB Tri-Pac Breakers

|     |         |     |            |
|-----|---------|-----|------------|
| 450 | 1⅞ - 12 | 5½  | 623B222G01 |
| 450 | 1⅞ - 12 | 8   | 623B222G02 |
| 450 | 1⅞ - 12 | 10½ | 623B222G03 |
| 800 | 1¼ - 12 | 5½  | 623B375G04 |
| 800 | 1¼ - 12 | 10½ | 623B375G03 |

## Plug-in Adapter Kits



For rear connected applications such as switchboards. Facilitates ease of installation and front removal of breaker. Includes conductor for mounting on breaker, plug-in mounting blocks with matching conductor, rear studs and mounting hardware. Order two mounting blocks style number when line and load are required; order one mounting block style number when either line or load is required.

| Description | Style Number |
|-------------|--------------|
|-------------|--------------|

#### FB Tri-Pac and FCL Breakers<sup>⑤</sup>

|                                |            |
|--------------------------------|------------|
| 1 Mounting Block, Line or Load |            |
| 2-Pole, 100 Ampere             | 507C036G05 |
| 2-Pole, 150 Ampere             | 507C036G06 |
| 3-Pole, 100 Ampere             | 507C036G03 |
| 3-Pole, 150 Ampere             | 507C036G04 |

Instruction Leaflet/FRED Number 13782

#### LCL Breakers

|                                  |            |
|----------------------------------|------------|
| 2 Mounting Blocks, Line and Load |            |
| 2-Pole                           | 313C644G25 |
| 3-Pole                           | 313C644G26 |
| 1 Mounting Block, Line and Load  |            |
| 2-Pole                           | 450D010G15 |
| 3-Pole                           | 450D010G16 |

Instruction Leaflet/FRED Number 15329

#### NB Tri-Pac Breakers<sup>①</sup>

|                                |            |
|--------------------------------|------------|
| 1 Mounting Block, Line or Load |            |
| NB Tri-Pac, 2 Poles            | 2614D53G03 |
| NB Tri-Pac, 3 Poles            | 2614D53G04 |

Instruction Leaflet/FRED Number 15073

#### Tri-Pac LA Breakers<sup>①</sup>

|                                  |            |
|----------------------------------|------------|
| 2 Mounting Blocks, Line and Load |            |
| 2-Pole                           | 313C644G41 |
| 3-Pole                           | 313C644G42 |
| 1 Mounting Block, Line Only      |            |
| 2-Pole                           | 450D010G17 |
| 3-Pole                           | 450D010G19 |
| 1 Mounting Block, Load Only      |            |
| 2-Pole                           | 450D010G18 |
| 3-Pole                           | 450D010G20 |

① Not Underwriters Laboratories, Inc. listed.

② 400 ampere LA studs of the same length have sufficient clearance; however, customer connections may make it necessary to use a short stud adjacent to a long stud.

③ Included at no charge when ordered with stud.

④ 150, 250, 300 and 400 ampere frames only.

⑤ These plug-in adapter kits are UL listed as recognized components.

**Mounting Block for  
NB Tri-Pac Breakers<sup>①</sup>**

| Ampere Rating     | Number of Poles | Style Number |
|-------------------|-----------------|--------------|
| <b>NB Tri-Pac</b> |                 |              |
| 800               | 2               | 4990D16G04   |
| 800               | 3               | 4990D16G03   |

**Extended Line Terminal  
Shields<sup>①</sup>**

For shielding line side terminal connections. One shield required per breaker. Order separately when needed. Sold only in lots of 10, including hardware.

| Breaker Frame   | Style Number |
|-----------------|--------------|
| FB Tri-Pac, FCL | 625B229G01   |
| LA Tri-Pac      | 314C420G05   |
| NB Tri-Pac      | 208B996G02   |

**Base Mounting Hardware**

Order separately when needed.

| Breaker Frame   | Style Number |
|-----------------|--------------|
| FB Tri-Pac, FCL | 21C6782G18   |
| LA Tri-Pac      | 1614613      |
| NB Tri-Pac      | 1091716      |
| PB Tri-Pac      | 624375G22    |

**Moisture-Fungus-Corrosion  
Treatment<sup>②</sup>**

Treatment can be provided to meet customer's specific atmospheric conditions. Moisture-fungus treating material used meets JAN-T-152; treatment meets MIL-V-173a. Requests and orders should specify government specifications or conditions to be met.

① Not Underwriters Laboratories, Inc. listed.  
Insulated base with front removeable bolted connection.

② Included with frame

**Handle Locks<sup>①</sup>****Non-Padlockable**

For prevention of unintentional operation of breaker. Fits over breaker handle and may be removed.

**Padlockable**

For prevention of unauthorized operation of breaker. Is non-removable once installed on breaker. Meets Underwriters Laboratories, Inc. and California Code requirements.

**Note:** All breakers are trip free and will trip with handle locks attached. Cannot be used when handle extension is used.

| Breaker Frame          | Style Number |
|------------------------|--------------|
| <b>Non-Padlockable</b> |              |
| FB Tri-Pac             | 29B2721H01   |
| LA Tri-Pac             | 1720101      |
| NB Tri-Pac             | 1720101      |

**Padlockable**

|            |            |
|------------|------------|
| FB Tri-Pac | 765A754G01 |
| LA Tri-Pac | 373B591G02 |

**Handle Extension**

| Breaker Frame           | Style Number |
|-------------------------|--------------|
| LA Tri-Pac              | 372B399G01   |
| NB Tri-Pac              | 1251C65G01   |
| PB Tri-Pac <sup>②</sup> | 315C882G01   |

③ Not UL listed.

④ Not available on drawout breakers.

⑤ Not available for FCL or LCL breakers.

⑥ Not available on motor operated breakers.

**Kirk Key Interlock<sup>⑤</sup>**

Availability: FB, LA, NB, PB Tri-Pacs.

Permits interlocking of two breakers or one breaker with other devices. Before breaker can be closed, key must be inserted and turned in breaker interlock. Breaker must be opened before key can be removed. It can then be inserted in interlock or other devices to permit their closure. Requests and orders should completely outline interlocking scheme, ultimate user and his address.

**Mechanical Interlocks<sup>②</sup>**

For mechanically interlocking a pair of breakers so that only one may be closed at one time, but both may be open simultaneously.

**Walking Beam Type<sup>②③④</sup>**

Mounts on panel (not included) at rear of breaker. Standard breaker spacing: LA Tri-Pac, NB Tri-Pac: 8-1/2 inches center to center; FB Tri-Pac: 4-3/8 inches center to center; PB Tri-Pac: 12-1/4 inches center to center. Order as a set of two special factory drilled breakers and one walking beam interlock. Specify breaker type, panel thickness and center-to-center dimension of breakers.

**Sliding Bar Type (Field Mountable)<sup>②⑤</sup>**

Mounts on panel (not included) fitting over front of breakers. Standard breaker spacing: LA Tri-Pac, NB Tri-Pac: 8-1/2 inches; FB Tri-Pac: 4-3/16 inches center to center.



## Motor Operators<sup>①</sup>

Motor operators provide complete remote control by means of a push-button or similar pilot device<sup>②</sup>. Positive switching action is accomplished by use of an operating arm engaging the breaker handle.

The unit is energized momentarily to actuate the lever arm moving it to either the "ON" or "OFF" position. The control is broken by an internal cutoff switch. Means for emergency manual operation is provided.

Motor operators are available with motors rated 120 volts Ac, 208 volts Ac, and 240 volts Ac.

The 480 volt operators utilize a 120 volt Ac motor in conjunction with a 480/240 to 120 volt dual voltage transformer. (On LA and larger operators, the transformer is supplied for separate mounting by the customer.)

**Note:** The motor operator is intended only for infrequent operation in line with Underwriters Laboratories, Inc. endurance standard for AB molded case breakers.



For FB Tri-Pac/FCL Breakers



For LA Tri-Pac Breakers



For NB Tri-Pac Breakers



For PB Tri-Pac Breakers

## Motor Operator Selection

| Type Breaker | Ac Voltage   |            |            |            | Dc Voltage |            |
|--------------|--------------|------------|------------|------------|------------|------------|
|              | 120          | 208        | 240        | 480        | 125        | 24         |
|              | Style Number |            |            |            |            |            |
| FCL          | 656D148G15   | 656D148G10 | 656D148G17 | 656D148G17 | —          | —          |
| LCL          | 5664D54G83   | 5664D54G86 | 5664D54G84 | 5664D54G85 | 5664D54G77 | 5664D54G88 |
| FB Tri-Pac   | 656D148G11   | 656D148G04 | 656D148G13 | 656D148G13 | —          | —          |
| LA Tri-Pac   | 2607D97G22   | 2607D97G25 | 2607D97G23 | 2607D97G24 | 2607D97G44 | —          |
| NB Tri-Pac   | 5664D54G65   | 5664D54G68 | 5664D54G66 | 5664D54G67 | 5664D54G82 | —          |
| PB Tri-Pac   | 5661D52G01   | 5661D52G04 | 5661D52G02 | 5661D52G03 | 5661D52G17 | —          |

Instruction Leaflet/FRED Number 13148 FCL; 15334 LCL; 13148 FB Tri-Pac; 15533 LA Tri-Pac; 15534 NB Tri-Pac; 14444 PB Tri-Pac

## Back Mounting Plates

| Type Breaker | 120, 208, 240, 480 Volts Ac |
|--------------|-----------------------------|
|              | Style Number                |
| FB-P/FCL     | 1282C01G01                  |

## Motor Data

| Type Breaker | Motor       |      | Inrush Current, Ampere (Peak) |           |           | Continuous Current (RMS) |           |           | Operating Time, Open or Close |
|--------------|-------------|------|-------------------------------|-----------|-----------|--------------------------|-----------|-----------|-------------------------------|
|              | Type        | Hp.  | 120 Volts                     | 208 Volts | 240 Volts | 120 Volts                | 208 Volts | 240 Volts |                               |
| FB Tri-Pac   | Split Phase | 1/75 | 10                            | 4         | 5         | 2.3                      | 1.17      | 1.65      | 1.5 Seconds                   |
| LA Tri-Pac   | Reversing   | —    | 8                             | 5         | 4         | —                        | —         | —         | 12 Cycles                     |
| NB Tri-Pac   | Reversing   | —    | 11                            | 7         | 6         | —                        | —         | —         | 12 Cycles                     |
| PB Tri-Pac   | Reversing   | —    | 20                            | 12        | 11        | —                        | —         | —         | 10 Cycles                     |

<sup>①</sup> Ac voltage rated operators are UL listed as recognized components.

<sup>②</sup> The pilot device must be maintained contact type for FB Tri-Pac, FCL, mechanisms; momentary contact type for all others.

## Drawout Frame



These drawout frames are for use with standard 3-pole Cutler-Hammer molded case circuit breakers. They consist of two separate parts; stationary mounting frame and movable carrier frame. Slide rails are drawer-type, and a screw mechanism is used to engage or withdraw the movable carrier frame.

The drawout frames have three positions: connected, test and disconnected. The frames do not include a safety tripping interlock, or secondary contacts. These are optional items and may be ordered at additional cost.

Breakers mounted in the drawout frames can be equipped with standard breaker accessories including shunt trip, undervoltage release, auxiliary switch, alarm switch and motor operator.

### Selection Data

| Breaker Type <sup>①</sup> | Stationary Mounting Frame Style Number | Movable Carrier Frame Style Number |
|---------------------------|----------------------------------------|------------------------------------|
| NB Tri-Pac                | 2603D85G09                             | 2608D34G12                         |

### Standard Installation

Order one stationary mounting frame and one movable carrier frame.

Order breakers without terminals or rear connectors.

Order any attachments desired (shunt trip, undervoltage release, etc.)

Order secondary contacts as required:

- A shunt trip, undervoltage release or alarm switch requires two contacts;
- A 1A-1B auxiliary switch requires three contacts;
- A motor operator requires a maximum of four contacts;
- Others as required.

### Secondary Contacts

These are used to disconnect auxiliary circuits when attachments such as shunt trip or motor operator are used. Available in multiples of four contacts with a maximum of 32 contacts for the NB Tri-Pac. They must be factory mounted. Order by description as similar to stationary or moving frame and specify number of contacts required.

### Racking Crank

A special crank to engage or withdraw the moving portion of the drawout. A standard 1/2 inch hex socket with extension can be used for this purpose.

| Style Number | 765A767G01 |
|--------------|------------|
|--------------|------------|

### Cell Switches Mounted on Drawout Frames, All Ratings

Up to four switches can be provided. Order by description.

Each switch provides NO and NC contact that transfers before reaching the test position when being withdrawn, and after the test position when being racked in.

<sup>①</sup> Drawout for FB and LA Tri-Pac, FCL, and LCL Circuit Breakers are not available. PB Tri-Pac movable is available factory-installed only. Order by description.



## General Information

Engine generator molded case circuit breakers are designed specifically for application on diesel engine powered standby generators where high interrupting circuit breakers are not required. The JG through NG breakers are equipped with a special trip unit, that includes standard thermal (overload) protection and special low magnetic pickup range (FG includes a fixed thermal/magnetic pickup). The standard thermal trip unit provides overload protection for conductors per the National Electric Code. The low magnetic pickup range is approximately two to five times the continuous rating and provides closer low level short circuit protection when applied on generators that have very low short circuit capacity. This combination allows the user to customize the breaker to the generator output.

## Catalog Numbering System

This information is presented only as an aid to understanding catalog numbers. It is not to be used to build catalog numbers for circuit breakers.

FG breakers include both line and load side terminals.

JG, KG, LG, and NG breakers with "W" catalog number suffix do not include any terminals.

JG, KG, LG, and NG breakers without "W" catalog number suffix include both line and load terminals.

Contact Cutler-Hammer for additional ratings and internal/external accessories.

## Interrupting Capacity Ratings

### UL 489 Interrupting Capacity Ratings

Interrupting Capacity (Symmetrical Amperes)

Volts Ac (50/60 Hz)

240 18,000

480 14,000

600 10,000

### IEC 947-2 Interrupting Capacity Ratings

Interrupting Capacity (Symmetrical Amperes)

Volts Ac (50/60 Hz)

220, 240 18,000/9,000

380, 415 14,000/7,000

660, 690 10,000/5,000

## Standards

Engine generator molded case circuit breakers are designed to conform with the following standards:

- Underwriters Laboratories, Inc., Standard UL 489, Molded Case Circuit Breakers and Circuit Breaker Enclosures File E7819
- Canadian Standards Association Standard C22.2 No. 5, Service Entrance and Branch Circuit Breakers
- International Electrotechnical Commission Recommendations IEC 947-2, Circuit Breakers

Conformance with these standards satisfies most local and international codes, assuming user acceptability and simplified application.

|    |   | FG    | 3               | 100          | W                    |
|----|---|-------|-----------------|--------------|----------------------|
|    |   | Frame | Number of Poles | Trip Amperes | Suffix               |
| FG | 3 |       |                 | 15           | W: Without Terminals |
|    |   |       |                 | 20           |                      |
|    |   |       |                 | 25           |                      |
|    |   |       |                 | 30           |                      |
|    |   |       |                 | 35           |                      |
|    |   |       |                 | 40           |                      |
|    |   |       |                 | 45           |                      |
|    |   |       |                 | 50           |                      |
|    |   |       |                 | 60           |                      |
|    |   |       |                 | 70           |                      |
|    |   |       |                 | 80           |                      |
|    |   |       |                 | 90           |                      |
|    |   |       |                 | 100          |                      |
|    |   |       |                 | 125          |                      |
|    |   |       |                 | 150          |                      |
| JG |   |       |                 | 175          |                      |
|    |   |       |                 | 200          |                      |
|    |   |       |                 | 225          |                      |
|    |   |       |                 | 250          |                      |
| KG |   |       |                 | 300          |                      |
|    |   |       |                 | 350          |                      |
|    |   |       |                 | 400          |                      |
| LG |   |       |                 | 450          |                      |
|    |   |       |                 | 500          |                      |
|    |   |       |                 | 600          |                      |
| NG |   |       |                 | 700          |                      |
|    |   |       |                 | 800          |                      |
|    |   |       |                 | 900          |                      |
|    |   |       |                 | 1000         |                      |
|    |   |       |                 | 1200         |                      |

# Molded Case Circuit Breakers Engine Generator Circuit Breakers

Cutler-Hammer

March 1999

## Circuit Breakers

The following table lists FG through NG engine generator breakers with the maximum generator kVA and kW rating. Engine generator breakers

are applied at 115% of the generator full load current rating. The maximum kW rating is based on three-phase generators at 80% power factor.

| Magnetic Pickup Range | Maximum Generator Rating 60 Hz |                 |                  |                 |                  |                 | Engine Generator Breaker Catalog Number                  |
|-----------------------|--------------------------------|-----------------|------------------|-----------------|------------------|-----------------|----------------------------------------------------------|
|                       | 240 Vac                        |                 | 480 Vac          |                 | 600 Vac          |                 |                                                          |
|                       | kVA <sup>①</sup>               | kW <sup>②</sup> | kVA <sup>①</sup> | kW <sup>②</sup> | kVA <sup>①</sup> | kW <sup>②</sup> |                                                          |
| Fixed                 | 5                              | 4               | 11               | 9               | 14               | 11              | FG3015                                                   |
| Fixed                 | 7                              | 6               | 14               | 12              | 18               | 14              | FG3020                                                   |
| Fixed                 | 9                              | 7               | 18               | 14              | 23               | 18              | FG3025                                                   |
| Fixed                 | 11                             | 9               | 22               | 17              | 27               | 22              | FG3030                                                   |
| Fixed                 | 13                             | 10              | 25               | 20              | 32               | 25              | FG3035                                                   |
| Fixed                 | 14                             | 12              | 29               | 23              | 36               | 29              | FG3040                                                   |
| Fixed                 | 16                             | 13              | 32               | 26              | 41               | 32              | FG3045                                                   |
| Fixed                 | 18                             | 14              | 36               | 29              | 45               | 36              | FG3050                                                   |
| Fixed                 | 22                             | 17              | 43               | 35              | 54               | 43              | FG3060                                                   |
| Fixed                 | 25                             | 20              | 51               | 40              | 63               | 51              | FG3070                                                   |
| Fixed                 | 29                             | 23              | 58               | 46              | 72               | 58              | FG3080                                                   |
| Fixed                 | 32                             | 26              | 65               | 52              | 81               | 65              | FG3090                                                   |
| Fixed                 | 36                             | 29              | 72               | 58              | 90               | 72              | FG3100                                                   |
| Fixed                 | 40                             | 32              | 79               | 64              | 99               | 79              | FG3110                                                   |
| Fixed                 | 45                             | 36              | 90               | 72              | 113              | 90              | FG3125                                                   |
| Fixed                 | 54                             | 43              | 108              | 87              | 135              | 108             | FG3150                                                   |
| Fixed                 | 63                             | 51              | 126              | 101             | 158              | 126             | FG3175                                                   |
| Fixed                 | 72                             | 58              | 144              | 116             | 181              | 144             | FG3200                                                   |
| Fixed                 | 81                             | 65              | 162              | 130             | 203              | 162             | FG3225                                                   |
| 350-700               | 63                             | 51              | 126              | 101             | 158              | 126             | JG3175W <sup>③</sup>                                     |
| 350-700               | 72                             | 58              | 144              | 116             | 181              | 144             | JG3175<br>JG3200W <sup>③</sup><br>JG3200                 |
| 350-700               | 81                             | 65              | 162              | 130             | 203              | 162             | JG3225W <sup>③</sup>                                     |
| 350-700               | 90                             | 72              | 181              | 144             | 226              | 181             | JG3225<br>JG3250W <sup>③</sup><br>JG3250                 |
| 500-1000              | 108                            | 87              | 217              | 173             | 271              | 217             | KG3300W <sup>③</sup>                                     |
| 500-1000              | 126                            | 101             | 253              | 202             | 316              | 253             | KG3300<br>KG3350W <sup>③</sup><br>KG3350                 |
| 1000-2000             | 144                            | 116             | 289              | 231             | 361              | 289             | KG3400W <sup>③</sup>                                     |
| 600-2500              | 162                            | 130             | 325              | 260             | 406              | 325             | KG3400<br>LG3450<br>LG3450W <sup>③</sup>                 |
| 600-2500              | 181                            | 144             | 361              | 289             | 451              | 361             | LG3500                                                   |
| 600-2500              | 217                            | 173             | 433              | 347             | 542              | 433             | LG3500W <sup>③</sup><br>LG3600<br>LG3600W <sup>③</sup>   |
| 800-2500              | 253                            | 202             | 505              | 404             | 632              | 505             | NG3700                                                   |
| 800-2500              | 289                            | 231             | 578              | 462             | 722              | 578             | NG3700W <sup>③</sup><br>NG3800<br>NG3800W <sup>③</sup>   |
| 1600-5000             | 325                            | 260             | 650              | 520             | 812              | 650             | NG3900                                                   |
| 1600-5000             | 361                            | 289             | 722              | 578             | 903              | 722             | NG3900W <sup>③</sup><br>NG31000<br>NG31000W <sup>③</sup> |
| 1600-5000             | 433                            | 347             | 867              | 693             | 1083             | 867             | NG31200<br>NG31200W <sup>③</sup>                         |

① Breaker continuous current is based on 115% of the generator full load ampere rating.

② Based on three-phase generators at 80% power factor.

③ Without terminals.

Enclosures

Enclosure Description

Type 1 General Purpose

- Surface or Flush Mounting
- 15-1200 Ampere Range
- 600 Volts Ac, 500 Volts Dc

Type 1 enclosed breakers are designed for use in commercial buildings, apartment buildings and other areas where a general purpose enclosure is applicable. The breaker is front operable and is capable of being padlocked in either the On or Off position. Ratings through 1200 amperes are listed with Underwriters Laboratories, Inc. as approved for service entrance application. Both surface and flush mounted enclosures are available.

Type 3R Rainproof  
Surface Mounting

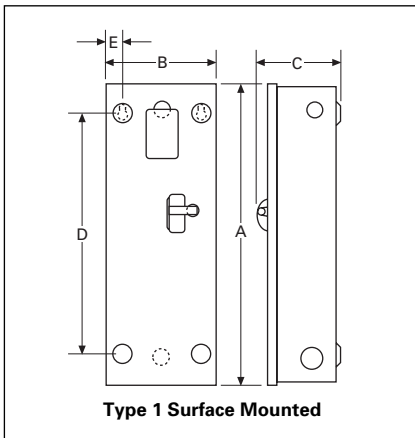
- Interchangeable Hubs (Through 400 Amperes)
- 15-1200 Ampere Range
- 600 Volts Ac, 500 Volts Dc

This general purpose outdoor service center employs a circuit breaker inside a weatherproof sheet steel breaker enclosure to serve as a main disconnect and protective device for feeder circuits. Ratings through 1200 amperes are listed by Underwriters Laboratories, Inc. as suitable for service entrance application.

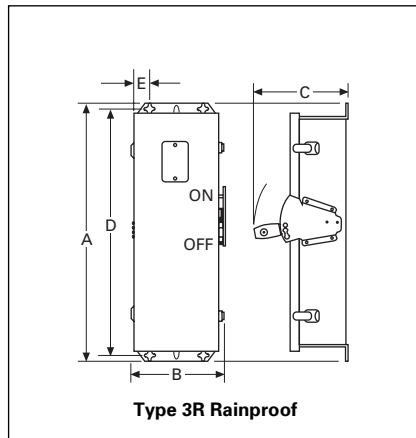
Type 12 Dustproof  
Surface Mounting

- No Knockouts or Other Openings
- 15-1200 Ampere Range
- 600 Volts Ac, 500 Volts Dc

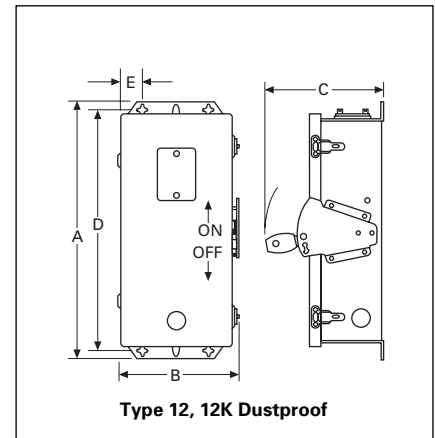
The Type 12 enclosure is designed in line with specifications for special industry application where unusually severe conditions involving oil, coolant, dust and other foreign materials exist in the operating atmosphere. The handle padlocks in the Off position and the cover is interlocked with the handle mechanism to prevent opening the cover with the circuit breaker in the On position. Ratings through 1200 amperes are listed by Underwriters Laboratories, Inc. as suitable for service entrance application.



Type 1 Surface Mounted



Type 3R Rainproof



Type 12, 12K Dustproof

Enclosure Selection Data

| Breaker<br>Frame<br>(Amperes) | Enclosure<br>Type Class | Dimensions |      |        |     |        |     |        |      |        |    | App.<br>Wt.<br>Lbs. | Conduit Sizes,<br>Inches              | Catalog<br>Number |
|-------------------------------|-------------------------|------------|------|--------|-----|--------|-----|--------|------|--------|----|---------------------|---------------------------------------|-------------------|
|                               |                         | A          |      | B      |     | C      |     | D      |      | E      |    |                     |                                       |                   |
|                               |                         | Inches     | mm   | Inches | mm  | Inches | mm  | Inches | mm   | Inches | mm |                     |                                       |                   |
| FG<br>15-225                  | Type 1                  | 23.25      | 591  | 8.41   | 214 | 6.28   | 160 | 18.75  | 476  | 1.20   | 31 | 15                  | .25, .50, .75, 1, 1.25, 1.50, 2, 2.50 | SFDN225           |
|                               | Type 3R                 | 25.66      | 652  | 8.84   | 225 | 9.31   | 237 | 24.28  | 617  | 1.70   | 43 | 19                  | .25, .50, .75, 1, 1.25, 1.50, 2, 2.50 | RFDN225           |
|                               | Type 12                 | 25.66      | 652  | 8.84   | 226 | 9.31   | 238 | 24.28  | 618  | 1.70   | 43 | 18                  |                                       | JFDN225           |
| JG<br>175-250                 | Type 1                  | 34.70      | 881  | 10.92  | 227 | 7.20   | 183 | 30.00  | 762  | 1.88   | 48 | 31                  | .25, .50, 2, 2.50, 3                  | SJDN250           |
|                               | Type 3R                 | 37.50      | 891  | 11.56  | 294 | 10.22  | 260 | 35.77  | 909  | 1.94   | 49 | 40                  | .25, .50, 2, 2.50, 3                  | RJDN250           |
|                               | Type 12                 | 37.53      | 953  | 11.56  | 294 | 10.22  | 260 | 35.77  | 909  | 1.94   | 49 | 37                  |                                       | JJDN250           |
| KG<br>300-400                 | Type 1                  | 38.81      | 986  | 11.06  | 281 | 10.94  | 278 | 34.00  | 869  | 2.28   | 58 | 53                  | .25, .50, .75, 1.50, 2, 2.50, 3, 3.50 | SKDN400           |
|                               | Type 3R                 | 41.69      | 997  | 11.75  | 298 | 14.06  | 357 | 39.90  | 1014 | 1.97   | 50 | 60                  | .25, .50, .75, 2.50, 3, 3.50          | RKDN400           |
|                               | Type 12                 | 41.69      | 997  | 11.75  | 298 | 14.06  | 357 | 39.90  | 1015 | 1.97   | 50 | 53                  |                                       | JKDN400           |
| LG<br>450-600                 | Type 1                  | 45.88      | 1165 | 14.31  | 364 | 12.38  | 314 | 46.56  | 1183 | 1.91   | 48 | 81                  | .25, .50, .75, 3, 3.50, 4             | SJDN600           |
|                               | Type 3R                 | 48.31      | 1227 | 14.91  | 379 | 15.50  | 394 | 46.56  | 1183 | 1.92   | 49 | 84                  | .25, .50, .75, 3, 3.50, 4             | RLDN600           |
|                               | Type 12                 | 48.31      | 1227 | 14.91  | 379 | 15.50  | 394 | 46.56  | 1183 | 1.92   | 49 | 81                  |                                       | JLDN600           |
| NG<br>700-1200                | Type 1                  | 61.22      | 1555 | 21.44  | 545 | 15.41  | 391 | 61.84  | 1571 | 1.97   | 50 | 178                 |                                       | SNDN1200          |
|                               | Type 3R                 | 63.59      | 1615 | 22.00  | 559 | 17.63  | 448 | 61.84  | 1571 | 1.97   | 50 | 175                 |                                       | RNDN1200          |
|                               | Type 12                 | 63.59      | 1615 | 22.00  | 559 | 17.63  | 448 | 61.84  | 1571 | 1.97   | 50 | 170                 |                                       | JNDN1200          |

## Accessories

### Standard Terminals

| Breaker Frame | Maximum Ampere Rating | AWG Wire Range    | Metric Wire Range mm <sup>2</sup> | Catalog Number        |
|---------------|-----------------------|-------------------|-----------------------------------|-----------------------|
| FG            | 100                   | #14-1/0           | 2.5 -50                           | 3T100FB <sup>①</sup>  |
| FG            | 150                   | #4-4/0            | 25 -95                            | 3TA225FD <sup>①</sup> |
| JG            | 250                   | #4-350 kcmil      | 25 -185                           | TA250KB               |
| KG            | 350                   | 250-500 kcmil     | 120 -240                          | TA350K                |
| KG            | 400                   | 3/0-250 kcmil (2) | 95 -120                           | 3TA400K <sup>①</sup>  |
| LG            | 600                   | 250-500 kcmil (2) | 120 -240                          | TA600LA               |
| NG            | 700                   | 1-500 kcmil (2)   | 50 -300                           | TA700NB1              |
| NG            | 1000                  | 3/0-400 kcmil (3) | 95 -185                           | TA1000NB1             |
| NG            | 1200                  | 4/0-500 kcmil (4) | 120 -300                          | TA1200NB1             |

### Neutral Kits, Insulated and Groundable

| Maximum Enclosure Rating (Amperes) | Main Lug Number Size Cu/Al                      | Ground Lug Size Cu/Al | Catalog Number |
|------------------------------------|-------------------------------------------------|-----------------------|----------------|
| 100                                | (1) 14-1/0                                      | (1) 14-1/0            | INK100         |
| 250                                | (1) 6-350 kcmil                                 | (1) 4-300 kcmil       | INK250         |
| 400                                | (1) 4-750 kcmil or<br>(2) 1/0-250 kcmil         | (1) 4-300 kcmil       | INK400         |
| 600                                | (2) 250-500 kcmil                               | (1) 4-300 kcmil       | INK600         |
| 1200                               | (3) 1/0 to 750 kcmil or<br>(4) 1/0 to 750 kcmil | (1) #6-250 kcmil      | INK1200        |

### Internal Accessories

| Breaker Frame | Auxiliary Switch     |                      | Shunt Trip |                |
|---------------|----------------------|----------------------|------------|----------------|
|               | 1A-1B Catalog Number | 2A-2B Catalog Number | Rating     | Catalog Number |
| FG            | A1X1PK               | A2X1PK               | 12-24 Vdc  | SNT1LP03K      |
| JG            | A1X2PK               | A2X2PK               | 12-24 Vdc  | SNT2P04K       |
| KG            | A1X3PK               | A2X3PK               | 12-24 Vdc  | SNT3P05K       |
| LG            | A1X4PK               | A2X4PK               | 12-24 Vdc  | SNT4LP03K      |
| NG            | A1X5RPK              | A2X5RPK              | 12-24 Vdc  | SNT5LP03K      |

<sup>①</sup> Package of 3 terminals.

## General Information

UL listed dc molded case circuit breakers for use in general dc circuits and ungrounded battery supply circuits of UPS systems providing continuous, reliable ac power to computer controlled applications such as financial transactions and telecommunications.

For standard interrupting capacity 250 dc molded case circuit breakers. Refer to Index, Page 1, for appropriate Series C frame size.

The Series C dc breakers listed below use the same internal and external accessories as the standard Series C breaker. NBDC and PBDC use same internal and external accessories as standard NB and PB breakers.

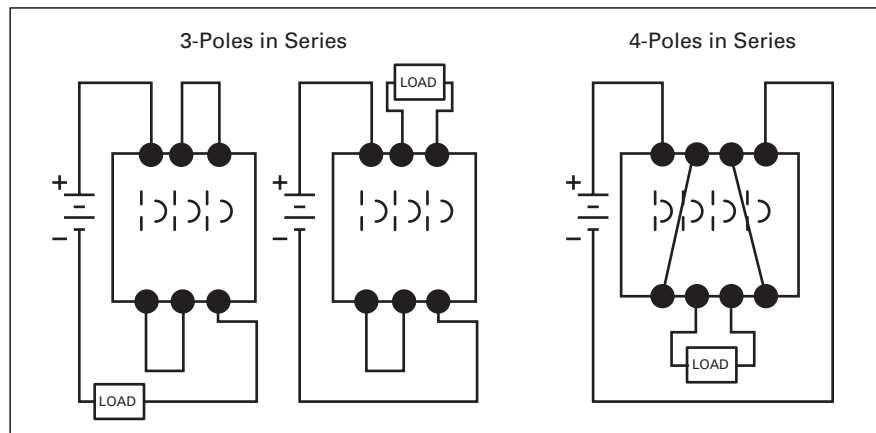
Molded case circuit breakers for transportation application requiring 750 Vdc are available 15 through 2500 ampere 20 kA interrupting capacity at 750 Vdc. Breakers require 4 poles in series for 750 Vdc application. However, 750V is not a UL rating. For 750 Vdc application refer to Cutler-Hammer for ordering information. Dimensions are the same as the standard thermal-magnetic equivalent.

## Interrupting Capacity Ratings

### UL489 Interrupting Capacity Ratings

| Circuit Breaker Type | Interrupting Capacity (Symmetrical kA) |                  |                  |                  |
|----------------------|----------------------------------------|------------------|------------------|------------------|
|                      | Volts DC <sup>①</sup>                  |                  |                  |                  |
|                      | 125 <sup>②</sup>                       | 250 <sup>③</sup> | 600 <sup>④</sup> | 750 <sup>⑤</sup> |
| HFDDC                | 42                                     | 42               | 35               | 20               |
| HJDDC                | 42                                     | 42               | 35               | 20               |
| HKDDC                | 42                                     | 42               | 35               | 20               |
| HLDDC                | 42                                     | 42               | 35               | 20               |
| HMDLDC               | 42                                     | 42               | 35               | 20               |
| NBDC                 | 50                                     | 50               | 50               | 20               |
| PBDC                 | 75                                     | 75               | 75               | 20               |

### Series Connection Diagrams for DC Application<sup>⑥</sup>



① Dc ratings apply to substantially non-inductive circuits. 8 millisecond time constant.

② 1-pole in series.

③ 2-poles in series.

④ 3-poles in series.

⑤ 4-poles in series. Not a UL listed voltage rating.

⑥ Use rated cable per NEC Connect to terminals as per breaker nameplate.



# Molded Case Circuit Breakers

## Series C<sup>®</sup> Circuit Breakers for DC Applications

Cutler-Hammer

March 1999

### Type HFDDC DC Circuit Breakers

| Maximum<br>Continuous<br>Ampere Rating<br>@ 40°C          | Complete Circuit Breaker with Line and Load Terminals |            |            |
|-----------------------------------------------------------|-------------------------------------------------------|------------|------------|
|                                                           | 1-Pole                                                | 2-Pole     | 3-Pole     |
|                                                           | Catalog Number                                        |            |            |
| 1, 2, 3-Pole High Interrupting Capacity 35 kAIC @ 600 Vac |                                                       |            |            |
| 15                                                        | HFDDC1015L                                            | HFDDC2015L | HFDDC3015L |
| 20                                                        | HFDDC1020L                                            | HFDDC2020L | HFDDC3020L |
| 25                                                        | HFDDC1025L                                            | HFDDC2025L | HFDDC3025L |
| 30                                                        | HFDDC1030L                                            | HFDDC2030L | HFDDC3030L |
| 35                                                        | HFDDC1035L                                            | HFDDC2035L | HFDDC3035L |
| 40                                                        | HFDDC1040L                                            | HFDDC2040L | HFDDC3040L |
| 45                                                        | HFDDC1045L                                            | HFDDC2045L | HFDDC3045L |
| 50                                                        | HFDDC1050L                                            | HFDDC2050L | HFDDC3050L |
| 60                                                        | HFDDC1060L                                            | HFDDC2060L | HFDDC3060L |
| 70                                                        | HFDDC1070L                                            | HFDDC2070L | HFDDC3070L |
| 80                                                        | HFDDC1080L                                            | HFDDC2080L | HFDDC3080L |
| 90                                                        | HFDDC1090L                                            | HFDDC2090L | HFDDC3090L |
| 100                                                       | HFDDC1100L                                            | HFDDC2100L | HFDDC3100L |
| 110                                                       | HFDDC1110L                                            | HFDDC2110L | HFDDC3110L |
| 125                                                       | HFDDC1125L                                            | HFDDC2125L | HFDDC3125L |
| 150                                                       | HFDDC1150L                                            | HFDDC2150L | HFDDC3150L |
| 175                                                       | —                                                     | —          | HFDDC3175L |
| 200                                                       | —                                                     | —          | HFDDC3200L |
| 225                                                       | —                                                     | —          | HFDDC3225L |

Instruction Leaflet/FRED Number 29C700

### Type HJDDC DC Circuit Breakers

| Maximum Continuous Ampere Rating @ 40°C             | Circuit Breaker Frame Only① | Thermal Magnetic Trip Unit | Standard Terminals |
|-----------------------------------------------------|-----------------------------|----------------------------|--------------------|
|                                                     | Catalog Number              |                            |                    |
| 3-Pole High Interrupting Capacity 35 kAIC @ 600 Vac |                             |                            |                    |
| 70                                                  | HJDDC3250F                  | JT3070T                    | TA250KB            |
| 90                                                  |                             | JT3090T                    | TA250KB            |
| 100                                                 |                             | JT3100T                    | TA250KB            |
| 125                                                 |                             | JT3125T                    | TA250KB            |
| 150                                                 |                             | JT3150T                    | TA250KB            |
| 175                                                 | HJDDC3250F                  | JT3175T                    | TA250KB            |
| 200                                                 |                             | JT3200T                    | TA250KB            |
| 225                                                 |                             | JT3225T                    | TA250KB            |
| 250                                                 |                             | JT3250T                    | TA250KB            |
| 100                                                 |                             | HKDDC3400F                 | KT3100T            |
| 125                                                 | KT3125T                     |                            | TA300K             |
| 150                                                 | KT3150T                     |                            | TA300K             |
| 175                                                 | KT3175T                     |                            | TA300K             |
| 200                                                 | KT3200T                     |                            | TA300K             |
| 225                                                 | KT3225T                     |                            | TA300K             |

Instruction Leaflet/FRED Number 29C701

### Type HKDDC DC Circuit Breakers

| Maximum Continuous<br>Ampere Rating<br>@ 40°C       | Circuit Breaker<br>Frame Only① | Thermal Magnetic<br>Trip Unit            | Standard<br>Terminals                                          |                                                                  |
|-----------------------------------------------------|--------------------------------|------------------------------------------|----------------------------------------------------------------|------------------------------------------------------------------|
|                                                     | Catalog Number                 |                                          |                                                                |                                                                  |
| 3-Pole High Interrupting Capacity 35 kAIC @ 600 Vac |                                |                                          |                                                                |                                                                  |
| 250<br>300<br>350<br>400                            | HKDDC3400F                     | KT3250T<br>KT3300T<br>KT3350T<br>KT3400T | TA350K<br>TA350K<br>TA350K<br>3TA400K                          |                                                                  |
| 300<br>350<br>400<br>450<br>500<br>600              |                                | HLDDC3600F                               | LT3300T<br>LT3350T<br>LT3400T<br>LT3450T<br>LT3500T<br>LT3600T | TA602LD<br>TA602LD<br>TA602LD<br>TA602LD<br>TA602LD<br>3TA603LDK |

Instruction Leaflet/FRED Number 29C702

### Type HMDL DC Circuit Breakers

| Maximum Continuous Ampere Rating @ 40°C             | Circuit Breaker Frame Only① | Thermal Magnetic Trip Unit |
|-----------------------------------------------------|-----------------------------|----------------------------|
|                                                     | Catalog Number              |                            |
| 3-Pole High Interrupting Capacity 35 kAIC @ 600 Vac |                             |                            |
| 300                                                 | HMDL3800F                   | MT3300T                    |
| 350                                                 |                             | MT3350T                    |
| 400                                                 |                             | MT3400T                    |
| 450                                                 |                             | MT3450T                    |
| 500                                                 |                             | MT3500T                    |
| 600                                                 |                             | MT3600T                    |
| 700                                                 |                             | MT3700T                    |
| 800                                                 |                             | MT3800T                    |

### Type NBDC DC Circuit Breakers

| Maximum Continuous Ampere Rating @ 40°C             | Complete Circuit Breaker Factory Assembled Without Terminals① | Includes Magnetic Only Trip Unit Calibrated @ 135% | Standard Terminals |
|-----------------------------------------------------|---------------------------------------------------------------|----------------------------------------------------|--------------------|
|                                                     | Catalog Number                                                |                                                    |                    |
| 3-Pole High Interrupting Capacity 50 kAIC @ 600 Vac |                                                               |                                                    |                    |
| 700                                                 | NBDC3700MW                                                    | Included                                           | TA1000NB1          |
| 800                                                 | NBDC3800MW                                                    | Included                                           | TA1000NB1          |
| 900                                                 | NBDC3900MW                                                    | Included                                           | TA1000NB1          |
| 1000                                                | NBDC31000MW                                                   | Included                                           | TA1000NB1          |
| 1200                                                | NBDC31200MW                                                   | Included                                           | TA1200NB1          |

### Type PBDC DC Circuit Breakers

|                                                     |                                                               |                                                    |                     |
|-----------------------------------------------------|---------------------------------------------------------------|----------------------------------------------------|---------------------|
| Maximum Continuous Ampere Rating @ 40°C             | Complete Circuit Breaker Factory Assembled Without Terminals① | Includes Magnetic Only Trip Unit Calibrated @ 135% | Standard② Terminals |
|                                                     | Catalog Number                                                |                                                    |                     |
| 3-Pole High Interrupting Capacity 75 kAIC @ 600 Vac |                                                               |                                                    |                     |
| 1600                                                | PBDC31600W                                                    | Included                                           | BA2000PB            |
| 2000                                                | PBDC32000W                                                    | Included                                           | BA2000PB            |
| 2500                                                | PBDC32500W                                                    | Included                                           | BA2500PB            |

Instruction Leaflet/FRED Number 15560

<sup>①</sup> Complete circuit breaker includes frame, trip unit, and terminals.

## Type GFM

## Type GFM



Type GFM Ground Fault Protection Device

## Description

Cutler-Hammer Type GFM devices are Class 1 Ground Fault Sensing and Relaying devices designed to comply with the requirements outlined in Underwriters Laboratories, Inc. Standards for Safety entitled: Ground Fault Sensing and Relaying Equipment, UL1053.

Type GFM devices, when properly installed on a grounded electrical distribution system, will sense phase to ground fault currents and cause a disconnect to open and clear the fault instantaneously at predetermined current values. These devices have a maximum voltage rating of 600V, 50/60 Hertz and may be applied in accordance with Article 230-95 of the National Electrical Code.

Type GFM Ground Fault Protective Devices are self-contained combination sensing and relaying devices designed primarily for application on motor circuits and fixed loads where low-level Ground Fault Equipment Protection is required.

GFM devices are available in two basic types with each type having two physical sizes. The two basic types differ in the type of output circuit provided. The first type,

designated either GFM2 or GFM4, employs an internal relay having S.P.D.T. contacts that will operate a remote shunt trip device where control power is available.

The second type, designated either GFM2A or GFM4A, is completely solid state with an output SCR circuit designed to operate a remote, low-energy, flux transfer shunt trip mounted in a molded case breaker. No supplementary control power for the shunt trip is required.

## Size Selection

The proper size selection is a function of the conductor size of the equipment being protected. Types GFM2/GFM2A have approximately a two-inch window opening. Types GFM4/GFM4A have approximately a four-inch window opening.

## Rating Selection

The basic Ground Fault Current Pickup rating of either type GFM device is 5 amperes, i.e., each unit when properly installed will initiate a trip signal to a remote shunt trip with the presence of a 5 ampere Ground Fault Current within established tolerance limits. Separate optional rating plugs are available to alter the pickup rating to a maximum of 100 amperes.

## Control Power

Internal control power is not required to operate Type GFM Ground Fault Protective devices. All internal control power required is derived from the Ground Fault current through the internal current sensor.

External control power is required to operate the remote shunt trips used in conjunction with Type GFM2 and GFM4 devices.

External control power is not required with Type GFM2A and GFM4A devices to operate the special remote, low-energy, flux transfer shunt trips used in molded case circuit breakers.

## Trip Indication/Reset

A combination visual indicator and reset button is provided on the top of Type GFM2 and GFM4 devices to indicate the initiation of a tripping action to clear a Ground Fault. The operation of the internal relay will cause the white button to visibly raise.

To reset the device, the Indicator/Reset button must be depressed. Failure to reset the device will not allow the associated disconnect device to be reclosed.

No Indicator/Reset button is provided on Types GFM2A or GFM4A since an internal SCR is used in the output circuit. These devices reset automatically when the disconnect opens to clear the Ground Fault.

## Application

Type GFM devices may be installed in Zero Sequence or Ground Return Sensing methods, Proper Ground Fault Protection schemes are dependent upon proper system installation and grounding methods.

## Mounting

Each Type GFM device contains a Ground Fault Sensor which is a special current transformer. These are insulated devices which can be mounted directly to enclosure surfaces. Four tubular rivets secure the sensor housing. These four (0.200 dia.) mounting holes can be used to mount the GFM device in either a vertical or horizontal mounting position.

Optional mounting brackets as shown on the next page are available. These brackets may be mounted on either the bottom or side depending upon the installation requirements.

Regardless of the mounting method used, the top of the device with the visual indicator/ reset button and nameplate instructions should be maintained in a visual position after installation. GFM devices should be installed so that all conductors passing through the conductor window are physically centered.

## Type GFM

## Ordering Information

Order by catalog number or style number:

1 Basic GFM Unit

1 Rating plug if required

1 Mounting bracket if required

1 Circuit breaker with standard shunt trip factory installed (as required), or optionally when possible, a circuit breaker and field mountable shunt trip as separate items.

## Rating Plug Installation

To install an optional rating plug to obtain other than the minimum 5 ampere rating, remove the terminal cover held in position by a single screw and retention groove. With the cover removed, insert the rating plug in the position indicated. The rating plug is held captive in position with the addition of the terminal cover after the wiring is completed. With the terminal cover in position, the ampere rating of the rating plug remains visible.

## Output Circuitry

Contact ratings for Type GFM2 and GFM4 are 10 amperes continuous, 240 volts Ac maximum. Types GFM2A and GFM4A are intended to be used only with remote flux transfer shunt trips.

## Selection Data

### GFM Basic Units

| Output Type | Approximate Window Opening, Inches | Basic Ampere Rating (Plug Omitted) | Operating Time @ 10 x Ampere Rating | Catalog Number |
|-------------|------------------------------------|------------------------------------|-------------------------------------|----------------|
|-------------|------------------------------------|------------------------------------|-------------------------------------|----------------|

#### Unit for Use with Standard Shunt Trip

|       |   |   |              |      |
|-------|---|---|--------------|------|
| Relay | 2 | 5 | 0.03 Seconds | GFM2 |
| Relay | 4 | 5 | 0.03 Seconds | GFM4 |

#### Unit for Use with Flux Transfer Shunt Trips

|     |   |   |              |       |
|-----|---|---|--------------|-------|
| SCR | 2 | 5 | 0.03 Seconds | GFM2A |
| SCR | 4 | 5 | 0.03 Seconds | GFM4A |

Instruction Leaflet/FRED Number 14945

### GFM Optional Rating Plugs

| Ampere Rating | Catalog Number |
|---------------|----------------|
| 10            | GFMP10         |
| 25            | GFMP25         |
| 50            | GFMP50         |
| 50            | GFMP75         |
| 100           | GFMP100        |

## Optional Mounting Brackets

Includes two (2) brackets and mounting hardware



| GFM Type | Bracket Kit Style Number |
|----------|--------------------------|
| GFM2/2A  | 750B295G01               |
| GFM4/4A  | 750B295G02               |

## Type GFR

## Type GFR

## Description

The GFR ground fault relays, current sensors, test panels and accessory devices are UL listed by Underwriters Laboratories, Inc. in accordance with their standard for Ground Fault Sensing and Relaying Equipment, UL 1053, under File E48381.①

A Type GFR ground fault protection system, when properly installed on a grounded electrical system, will sense phase-to-ground fault currents. When the level of fault current is in excess of the pre-selected current pickup and time delay settings, the GFR relay will initiate a trip action of a disconnect device, which will open the faulted circuit and clear the fault.

The GFR devices are UL Class I devices designed to protect electrical equipment against extensive damage from arcing ground faults.

A basic Type GFR ground fault protection system consists of a ground fault relay②, a ground fault current sensor and a disconnect device equipped with a shunt trip device. This disconnect device can be a molded case circuit breaker, a power circuit breaker, a bolted pressure switch or other fusible disconnect device, suitable for application with UL Class I Ground Fault Sensing and Relaying equipment.

Additional optional equipment can be added to the protection system to meet the requirements of the specifying engineer, including:

- Ground Fault Test Panel
- Ground Fault Warning Indicator Relay
- Ground Fault Indicating Ammeter

GFR relays are available with zone selective interlocking circuitry to interlock several relays within the same system. This allows the relay which detects a ground fault to

instantly clear the fault by tripping the disconnect device. The relay simultaneously sends a signal to relay units "upstream" from the fault to time delay or to block their operation completely. Current sensors in various designs provide a range of "window" sizes to accommodate standard bus and cable arrangements.

Shunt trip attachments may be ordered for field mounting in Cutler-Hammer molded case circuit breakers, or may be ordered factory installed in the breaker.

## Electrical Ratings

## GFR Relay

Ground Fault Detection Ranges:  
1 to 12, 5 to 60 or 100 to 1200 Amperes

## Output contacts:

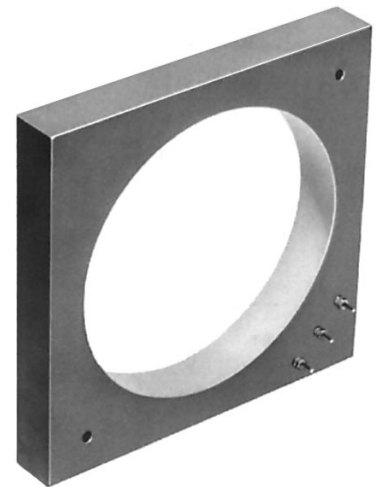
|                     |             |
|---------------------|-------------|
| 240 Volt, 50/60 Hz: | 3.0 Amperes |
| 120 Volt, 50/60 Hz: | 6.0 Amperes |
| 28 Volt Dc:         | 3.0 Amperes |
| 125 Volt Dc:        | .5 Amperes  |

## Control power requirements:

120 Volt, 50/60 Hz: .125 Amperes, or  
125 Volt Dc (optional)



GFR Relay



Typical Current Sensor

## Sensor:

600 Volts, 50/60 Hz maximum system voltage

① Suitable for either surface or semi-flush mounting.

② These devices are also listed with CSA under their file number 43357.

# Molded Case Circuit Breakers Add-on Ground Fault Protection

Cutler-Hammer

March 1999

## Type GFR

### Ordering Information

Each installation requires:

1. One relay unit (select trip ampere as required)
2. One current sensor (select configuration required)
3. One circuit breaker or disconnect device with shunt trip, or a shunt trip attachment for mounting in existing breaker.
4. Test panel. (Optional)

### GFR Relay

| GFR Relay Types | Catalog Numbers <sup>①</sup> |      |         |
|-----------------|------------------------------|------|---------|
|                 | Ground Fault Pickup Amperes  |      |         |
|                 | 1-12                         | 5-60 | 100-200 |

#### For 120 Volt 50/60 Hz Control

|                                            |         |         |           |
|--------------------------------------------|---------|---------|-----------|
| Electrical Reset with Zone Interlocking    | GRF12EI | GFR60EI | GFR1200EI |
| Electrical Reset without Zone Interlocking | GRF12E  | GFR60E  | GFR1200E  |
| Mechanical Reset with Zone Interlocking    | GRF12MI | GFR60MI | GFR1200MI |
| Mechanical Reset without Zone Interlocking | GRF12MI | GFR60MI | GFR1200MI |

#### For 120 Volt Dc Control

|                                            |          |          |            |
|--------------------------------------------|----------|----------|------------|
| Electrical Reset with Zone Interlocking    | GRF12EID | GFR60EID | GFR1200EID |
| Electrical Reset without Zone Interlocking | GRF12ED  | GFR60ED  | GFR1200ED  |
| Mechanical Reset with Zone Interlocking    | GRF12MID | GFR60MID | GFR1200MID |
| Mechanical Reset without Zone Interlocking | GRF12MID | GFR60MID | GFR1200MID |

### Current Sensor

| Window Size | Style Number |
|-------------|--------------|
|-------------|--------------|

#### Used with Relays Rated 1-12 Amperes

|               |            |
|---------------|------------|
| 5.50 In. I.D. | 1283C45G01 |
|---------------|------------|

#### Used with Relays Rated 5-60 Amperes

|                         |            |
|-------------------------|------------|
| 2.50 In. I.D.           | 179C768G01 |
| 5.50 In. I.D.           | 1256C13G01 |
| 8.25 In. I.D.           | 179C767G01 |
| 7.81 x 11.00 In. Rect.② | 1257C88G04 |
| 3.31 x 24.94 In. Rect.② | 1257C92G03 |

#### Used with Relays Rated 100-1200 Amperes

|                          |            |
|--------------------------|------------|
| 2.50 In. I.D.            | 179C768G02 |
| 5.50 In. I.D.            | 1256C13G02 |
| 8.25 In. I.D.            | 179C767G02 |
| 7.81 x 11.00 In. Rect.②  | 1257C88G03 |
| 9.94 x 16.94 In. Rect.②  | 1257C90G02 |
| 9.94 x 23.94 In. Rect.②  | 1257C91G02 |
| 15.94 x 19.94 In. Rect.② | 1257C89G02 |
| 3.31 x 24.94 In. Rect.②  | 1257C92G04 |
| 6.75 x 29.64 In. Rect.②  | 1255C39G03 |

Instruction Leaflet/FRED Number 15321

- ① Suitable for either surface or semi-flush mounting.
- ② One end removable for installation.
- ③ When a mechanically reset relay is used with a test panel, both the relay and test panel must be reset following either a simulated ground fault test or actual ground fault.
- ④ Not UL listed.

### Accessories

#### Test Panel (120 Volts Ac)③

Used to test the ground fault system, to give an indication the relay has tripped the breaker, and to reset the relay after tripping④. These functions may be separately mounted pilot devices.

#### Optional Test Panel

| Control       | Test          | Catalog Number |
|---------------|---------------|----------------|
| 120V 50/60 Hz | 120V 50/60 Hz | GFRTP          |
| 125V Dc       | 120V 50/60 Hz | GFRTPD         |

### Ground Fault Warning Indicator

This is an accessory item for use with GFR Relays with interlocking circuitry. At approximately 30-50% of the Relay pickup setting, the indicator switches separate 120 volt Ac control power to a lamp or relay, (not included) to give an indication of a ground fault. The indicator is rated 110/120 volts Ac 50/60 Hz for a maximum indicator load of .5 amperes.

| Ground Fault Warning Indicator | Style Number |
|--------------------------------|--------------|
| Manual Reset                   | 1234C67G01   |
| Self-Resetting                 | 1234C67G02   |

### Indicating Ammeter④

The optional indicating ammeter. It connects to the sensor terminals, through a momentary contact pushbutton, and will indicate (in amperes) any ground fault current flowing through the sensor. Kit includes the ammeter and pushbutton.

| GFR System Used with | Kit Style Number |
|----------------------|------------------|
| 1-12 Ampere          | 752B820G01       |
| 5-60 Ampere          | 752B820G02       |
| 100-1200 Ampere      | 752B820G03       |

### Shunt Trip Attachments

Use 120 volt Ac shunt trips.

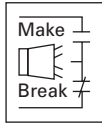
### Face Plate

Recommended when these relays are semi-flush mounted, to close the door cutout opening.

| Description | Style Number |
|-------------|--------------|
| Face Plate  | 752B410G01   |

## Alarm Switch

## Alarm Switch



## General Information

For remote indication of automatic trip operation. Does not function with manual switching; however, it will operate when either a shunt trip or undervoltage release is operated.

A “make” contact closes and a “break” contact opens when the alarm/lockout switch operates. The switch automatically resets when the circuit breaker is reset.

## Ordering Information

## G-Frame

Alarm Switch (RH only)<sup>①</sup>

| Electrical Rating |           |         | Contact Arrangement | Style Number <sup>②③④</sup> | Factory Suffix |
|-------------------|-----------|---------|---------------------|-----------------------------|----------------|
| Volts             | Frequency | Amperes |                     |                             |                |

## Alarm Switch

|     |          |   |                 |            |    |
|-----|----------|---|-----------------|------------|----|
| 240 | 50/60 Hz | 6 | 1 Make/ 1 Break | 1288C75G03 | B3 |
|-----|----------|---|-----------------|------------|----|

## Alarm Switch Auxiliary Switches Combination

|     |          |   |                           |            |     |
|-----|----------|---|---------------------------|------------|-----|
| 240 | 50/60 Hz | 6 | 1 Make/ 1 Break and 1a/1b | 1288C76G09 | B13 |
|-----|----------|---|---------------------------|------------|-----|

Instruction Leaflet/FRED Number 15552

## F-Frame

Electrical Rating Data<sup>⑤⑥</sup>

| Maximum Voltage | Frequency | Maximum Current Amperes | Dielectric Withstand Voltage |
|-----------------|-----------|-------------------------|------------------------------|
|-----------------|-----------|-------------------------|------------------------------|

## Multi-Pole Circuit Breakers

|     |          |                   |      |
|-----|----------|-------------------|------|
| 600 | 50/60 Hz | 6                 | 2500 |
| 125 | Dc       | 0.50 <sup>⑦</sup> | 2200 |
| 250 | Dc       | 0.25 <sup>⑦</sup> | 2200 |

## Single-Pole Circuit Breakers

|         |          |                |      |
|---------|----------|----------------|------|
| 125/250 | 50/60 Hz | 6 <sup>⑦</sup> | 2000 |
| 28      | Dc       | 3 <sup>⑦</sup> | 2000 |
| 28      | Dc       | 5 <sup>⑧</sup> | 2000 |

Alarm Switch<sup>①</sup>

| Number of Contacts<br>(Make and Break) | Mounting Location<br>(Pole) | Factory Mounted              |                   |               |                | Field Mounted                        |                    |
|----------------------------------------|-----------------------------|------------------------------|-------------------|---------------|----------------|--------------------------------------|--------------------|
|                                        |                             | Connection Type and Location |                   |               |                | Field Installation Kits <sup>⑨</sup> |                    |
|                                        |                             | 18-Inch Pigtail Leads        |                   |               | Terminal Block | Pigtail Leads                        | Terminal Block     |
|                                        |                             | Same Side                    | Rear <sup>⑩</sup> | Opposite Side |                |                                      |                    |
|                                        |                             |                              |                   |               | Suffix Number  |                                      |                    |
| 1                                      | Left <sup>⑪</sup><br>Right  | B01<br>B05                   | B02<br>B06        | B03<br>B07    | B04<br>B08     | A1L1LPK<br>A1L1RPK                   | A1L1LTK<br>A1L1RTK |
| 2                                      | Left <sup>⑪</sup><br>Right  | B09<br>B12                   | B10<br>B13        | —<br>—        | B11<br>B14     | A2L1LPK<br>A2L1RPK                   | A2L1LTK<br>A2L1RTK |
| 1 (Make Only)                          | Single Pole                 | B15 <sup>⑫</sup>             | —                 | —             | —              | —                                    | —                  |

Instruction Leaflet/FRED Number 29C180

① F-Frame circuit breakers are factory sealed. Underwriters Laboratories, Inc., requires that internal accessories be installed at the factory. Internal accessories are UL listed for factory installation under E7819. Where local codes and standards permit and UL listing is not required, internal accessories can be field installed. Accessory installation should be done before the circuit breaker is mounted and connected.

② Includes 24-inch external pigtail leads, 18 AWG (16-010).

③ A maximum of two internal accessories may be mounted in a three-pole circuit breaker.

④ Suitable for mounting in right pole only of 2- or 3-pole breaker.

⑤ Endurance: 6000 electrical operations plus 4000 mechanical operations.

⑥ Endurance: 6000 electrical operations plus 2000 mechanical operations.

⑦ Non-inductive load.

⑧ Inductive (L/R = 0.026).

⑨ Not listed with Underwriters Laboratories, Inc., for field installation.

⑩ Standard pigtail lead exit location.

⑪ Standard mounting location.

⑫ Factory installation only. Leads exit load end of circuit breaker.



## Alarm Switch

## J-Frame

Electrical Rating Data<sup>①②</sup>

| Maximum Voltage   | Frequency            | Maximum Current Amperes                     | Dielectric Withstand Voltage |
|-------------------|----------------------|---------------------------------------------|------------------------------|
| 600<br>125<br>250 | 50/60 Hz<br>Dc<br>Dc | 6<br>0.50 <sup>③</sup><br>0.25 <sup>③</sup> | 2500                         |

## Alarm Switch

| Number of Contacts (Make and Break) | Mounting Location (Pole)   | Factory Mounted              |                   |               |                | Field Mounted                        |                                 |
|-------------------------------------|----------------------------|------------------------------|-------------------|---------------|----------------|--------------------------------------|---------------------------------|
|                                     |                            | Connection Type and Location |                   |               |                | Field Installation Kits <sup>④</sup> |                                 |
|                                     |                            | 18-Inch Pigtail Leads        |                   |               | Terminal Block | Pigtail Leads                        | Terminal Block                  |
|                                     |                            | Same Side                    | Rear <sup>⑤</sup> | Opposite Side | Same Side      |                                      |                                 |
|                                     |                            | Suffix Number                |                   |               |                | Catalog Number                       |                                 |
| 1                                   | Left <sup>⑥</sup><br>Right | B01<br>B05                   | B02<br>B06        | B03<br>B07    | B04<br>B08     | A1L2LPK<br>A1L2RPK                   | A1L2LTK<br>A1L2RTK <sup>⑦</sup> |

Instruction Leaflet/FRED Number 29C181

## K-Frame

Electrical Rating Data<sup>②⑧</sup>

| Maximum Voltage   | Frequency            | Maximum Current Amperes                     | Dielectric Withstand Voltage |
|-------------------|----------------------|---------------------------------------------|------------------------------|
| 600<br>125<br>250 | 50/60 Hz<br>Dc<br>Dc | 6<br>0.50 <sup>③</sup><br>0.25 <sup>③</sup> | 2500                         |

## Alarm Switch

| Number of Sets of Contacts (1M and 1B) | Mounting Location (Pole)   | Factory Mounted              |                   |               |                | Field Mounted                        |                    |
|----------------------------------------|----------------------------|------------------------------|-------------------|---------------|----------------|--------------------------------------|--------------------|
|                                        |                            | Connection Type and Location |                   |               |                | Field Installation Kits <sup>④</sup> |                    |
|                                        |                            | 18-Inch Pigtail Leads        |                   |               | Terminal Block | Pigtail Leads                        | Terminal Block     |
|                                        |                            | Same Side                    | Rear <sup>⑤</sup> | Opposite Side | Same Side      |                                      |                    |
|                                        |                            | Suffix Number                |                   |               |                | Catalog Number                       |                    |
| 1                                      | Left <sup>⑥</sup><br>Right | B01<br>B05                   | B02<br>B06        | B03<br>B07    | B04<br>B08     | A1L3LPK<br>A1L3RPK                   | A1L3LTK<br>A1L3RTK |
| 2                                      | Left <sup>⑥</sup><br>Right | B09<br>B12                   | B10<br>B13        | —<br>—        | B11<br>B14     | A2L3LPK<br>A2L3RPK                   | A2L3LTK<br>A2L3RTK |

Instruction Leaflet/FRED Number 29C182

## L- and M-Frames

Electrical Rating Data<sup>②⑧</sup>

| Maximum Voltage   | Frequency            | Maximum Current Amperes                     | Dielectric Withstand Voltage |
|-------------------|----------------------|---------------------------------------------|------------------------------|
| 600<br>125<br>250 | 50/60 Hz<br>Dc<br>Dc | 6<br>0.50 <sup>③</sup><br>0.25 <sup>③</sup> | 2500                         |

## Alarm Switch

| Number of Sets of Contacts (1M and 1B) | Mounting Location (Pole)   | Factory Mounted              |                   |               |                | Field Mounted                        |                    |
|----------------------------------------|----------------------------|------------------------------|-------------------|---------------|----------------|--------------------------------------|--------------------|
|                                        |                            | Connection Type and Location |                   |               |                | Field Installation Kits <sup>④</sup> |                    |
|                                        |                            | 18-Inch Pigtail Leads        |                   |               | Terminal Block | Pigtail Leads                        | Terminal Block     |
|                                        |                            | Same Side                    | Rear <sup>⑤</sup> | Opposite Side | Same Side      |                                      |                    |
|                                        |                            | Suffix Number                |                   |               |                | Catalog Number                       |                    |
| 1                                      | Left <sup>⑥</sup><br>Right | B01<br>B05                   | B02<br>B06        | B03<br>B07    | B04<br>B08     | A1L4LPK<br>A1L4RPK                   | A1L4LTK<br>A1L4RTK |
| 2                                      | Left <sup>⑥</sup><br>Right | B09<br>B12                   | B10<br>B13        | —<br>—        | B11<br>B14     | A2L4LPK<br>A2L4RPK                   | A2L4LTK<br>A2L4RTK |

Instruction Leaflet/FRED Number 29C183

- ① Endurance: 6000 electrical operations plus 2000 mechanical operations.  
 ② Pigtail wire size: No. 18 AWG (0.82 mm<sup>2</sup>).  
 ③ Non-inductive load.  
 ④ Listed with Underwriters Laboratories, Inc., for field installation on interchangeable trip unit breakers under E64983.  
 ⑤ Standard mounting location.  
 ⑥ Standard mounting location – leads exit rear of breaker.  
 ⑦ Not for use on 4-pole circuit breakers.  
 ⑧ Endurance – 5,000 electrical operations plus 1000 mechanical operations.

## Alarm Switch

## N-Frame

Electrical Rating Data<sup>①</sup>

| Maximum Voltage   | Frequency            | Maximum Current Amperes                     | Dielectric Withstand Voltage |
|-------------------|----------------------|---------------------------------------------|------------------------------|
| 600<br>125<br>250 | 50/60 Hz<br>Dc<br>Dc | 6<br>0.50 <sup>②</sup><br>0.25 <sup>②</sup> | 2500                         |

## Alarm Switch

| Number of Sets of Contacts (Make and Break) | Mounting Location (Pole)   | Factory Mounted              |                   |               |                | Field Mounted                        |                    |
|---------------------------------------------|----------------------------|------------------------------|-------------------|---------------|----------------|--------------------------------------|--------------------|
|                                             |                            | Connection Type and Location |                   |               |                | Field Installation Kits <sup>③</sup> |                    |
|                                             |                            | 18-Inch Pigtail Leads        |                   |               | Terminal Block | Pigtail Leads                        | Terminal Block     |
|                                             |                            | Same Side                    | Rear <sup>④</sup> | Opposite Side | Same Side      |                                      |                    |
|                                             |                            | Suffix Number                |                   |               |                | Catalog Number                       |                    |
| 1                                           | Left<br>Right <sup>④</sup> | B01<br>B05                   | B02<br>B06        | B03<br>B07    | B04<br>B08     | A1L5LPK<br>A1L5RPK                   | A1L5LTK<br>A1L5RTK |
| 2                                           | Left<br>Right <sup>④</sup> | B09<br>B12                   | B10<br>B13        | —<br>—        | B11<br>B14     | A2L5LPK<br>A2L5RPK                   | A2L5LTK<br>A2L5RTK |

Instruction Leaflet/FRED Number 29C184

## R-Frame

Electrical Rating Data<sup>⑤⑥</sup>

| Maximum Voltage   | Frequency            | Maximum Current Amperes                     |
|-------------------|----------------------|---------------------------------------------|
| 600<br>125<br>250 | 50/60 Hz<br>Dc<br>Dc | 6<br>0.50 <sup>②</sup><br>0.25 <sup>②</sup> |

## Alarm Switch (RH only)

| Number of Contacts (Make and Break) | Factory Mounted              | Field Mounted                        |
|-------------------------------------|------------------------------|--------------------------------------|
|                                     | Connection Type and Location | Field Installation Kits <sup>③</sup> |
|                                     | 18-Inch Pigtail Leads        | Pigtail Leads                        |
|                                     | Suffix Number <sup>⑦</sup>   | Catalog Number <sup>⑦</sup>          |
| 1                                   | B05                          | A1L6RPK                              |
| 2                                   | B12                          | A2L6RPK                              |

Instruction Leaflet/FRED Number 29C185

① Endurance – 3000 electrical operations plus 1000 mechanical operations.

② Non-inductive load.

③ Listed with Underwriters Laboratories, Inc. for field installation under E64983.

④ Standard mounting location – leads exit rear of breaker.

⑤ Endurance: 500 electrical operations plus 2500 mechanical operations.

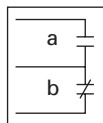
⑥ Pigtail wire size: No. 18 AWG (0.82 mm<sup>2</sup>). Leads are red, black and blue.

⑦ A maximum of three ASL plug-in modules may be installed in a circuit breaker.



## Auxiliary Switch

## Auxiliary Switch



## General Information

The auxiliary switch provides circuit breaker contact status information by monitoring the position of the molded cross bar which contains the moving contact arms. The auxiliary switch is used for remote indication and interlock system verification,

and consists of one or two SPDT switches housed in a plug-in module. Each SPDT switch has one "a" and one "b" contact. When the circuit breaker contacts are open, the "a" contact is open and the "b" contact is closed.

## Ordering Information

## G-Frame

## Auxiliary (RH only)

| Electrical Ratings |           |         | Contact Arrangement | Style Number <sup>①②③</sup> | Factory Suffix |
|--------------------|-----------|---------|---------------------|-----------------------------|----------------|
| Volts              | Frequency | Amperes |                     |                             |                |
| 240                | 50/60 Hz  | 6       | 1a/1b               | 1288C74G03                  | A3             |
| 240                | 50/60 Hz  | 6       | 2a/2b               | 1288C73G03                  | A6             |

Instruction Leaflet/FRED Number 15551

## F-Frame

Electrical Rating Data<sup>④⑤</sup>

| Maximum Voltage  | Frequency | Maximum Current Amperes | Dielectric Withstand Voltage |
|------------------|-----------|-------------------------|------------------------------|
| 125 <sup>⑥</sup> | 50/60 Hz  | 1                       | 2500                         |
| 600              | 50/60 Hz  | 6                       | 2500                         |
| 125              | Dc        | 0.50 <sup>⑦</sup>       | 2200                         |
| 250              | Dc        | 0.25 <sup>⑦</sup>       | 2200                         |

## Auxiliary Switch

| Number of<br>Contacts<br>a and b | Mounting<br>Location<br>(Pole)   | Factory Mounted              |                            |                            |                      | Field Mounted                            |                               |
|----------------------------------|----------------------------------|------------------------------|----------------------------|----------------------------|----------------------|------------------------------------------|-------------------------------|
|                                  |                                  | Connection Type and Location |                            |                            |                      | Field Installation Kits®                 |                               |
|                                  |                                  | 18-Inch Pigtail Leads        |                            |                            | Terminal<br>Block    | Pigtail<br>Leads                         | Terminal<br>Block             |
|                                  |                                  | Same<br>Side                 | Rear®                      | Opposite<br>Side           | Same<br>Side         |                                          |                               |
|                                  |                                  | Suffix Number                |                            |                            |                      | Catalog Number                           |                               |
| 1                                | Left⑤<br><br>Right or<br>Neutral | A01<br>A15⑩<br>A05<br>A18⑩   | A02<br>A16⑩<br>A06<br>A19⑩ | A03<br>A17⑩<br>A07<br>A20⑩ | A04<br>—<br>A08<br>— | A1X1PK<br>E1X1PK<br>A1X1PK<br>—          | A1X1LTK<br>—<br>A1X1RTK®      |
| 2                                | Left⑤<br><br>Right or<br>Neutral | A09<br>A21⑩<br>A12<br>A23⑩   | A10<br>A22⑩<br>A13<br>A24⑩ | —<br>—<br>—<br>—           | A11<br>—<br>A14<br>— | A2X1LPK<br>E2X1LPK<br>A2X1RPK<br>E2X1RPK | A2X1LTK<br>—<br>A2X1RTK®<br>— |

Instruction Leaflet/FRED Number 29C120

## J-Frame

Electrical Rating Data<sup>④⑤</sup>

| Maximum Voltage | Frequency | Maximum Current Amperes | Dielectric Withstand Voltage |
|-----------------|-----------|-------------------------|------------------------------|
| 600             | 50/60 Hz  | 6                       | 2500                         |
| 125             | Dc        | 0.50 <sup>⑦</sup>       |                              |
| 250             | Dc        | 0.25 <sup>⑦</sup>       |                              |

## Auxiliary Switch

| Number of Sets of Contacts (1a and 1b) | Mounting Location (Pole) | Factory Mounted              |            |               |                | Field Mounted            |                     |
|----------------------------------------|--------------------------|------------------------------|------------|---------------|----------------|--------------------------|---------------------|
|                                        |                          | Connection Type and Location |            |               |                | Field Installation Kits⑩ |                     |
|                                        |                          | 18-Inch Pigtail Leads        |            |               | Terminal Block | Pigtail Leads            | Terminal Block      |
|                                        |                          | Same Side                    | Rear⑪      | Opposite Side | Same Side      |                          |                     |
|                                        |                          | Suffix Number                |            |               |                | Catalog Number           |                     |
| 1                                      | Left Right⑫              | A01<br>A05                   | A02<br>A06 | A03<br>A07    | A04<br>A08     | A1X2PK<br>A1X2PK         | A1X2LTK<br>A1X2RTK⑬ |
| 2                                      | Left Right⑫              | A09<br>A12                   | A10<br>A13 | —<br>—        | A11<br>A14     | A2X2PK<br>A2X2PK         | A2X2LTK<br>A2X2RTK⑬ |

Instruction Leaflet/FRED Number 29C121

① Includes 24-inch external pigtail leads, #18 AWG (16-.010).

② A maximum of two internal accessories may be mounted in a three-pole circuit breaker.

③ Suitable for mounting in right pole only of 2- or 3-pole breaker.

④ Endurance: 6000 electrical operations plus 4000 mechanical operations.

⑤ Pigtail wire size: No. 18 AWG (0.82 mm<sup>2</sup>).

⑥ For use in electronic circuit of 100 micro-amperes and 15 Vdc minimum.

⑦ Non-inductive load.

⑧ Not listed with Underwriters Laboratories, Inc., for field installation.

⑨ Standard pigtail lead exit location.

⑩ 125-volt (Max.), 50/60 Hz switch for use in electronic circuit of 100 micro-amp and 15 Vdc minimum.

⑪ Listed with Underwriters Laboratories, Inc. for field installation or interchangeable trip unit breakers under E64983.

⑫ Standard mounting location – leads exit rear of breaker.

⑬ Not for use on 4-pole circuit breakers.

## Auxiliary Switch

## K-Frame

Electrical Rating Data<sup>①②</sup>

| Maximum Voltage   | Frequency            | Maximum Current Amperes                     | Dielectric Withstand Voltage |
|-------------------|----------------------|---------------------------------------------|------------------------------|
| 600<br>125<br>250 | 50/60 Hz<br>Dc<br>Dc | 6<br>0.50 <sup>③</sup><br>0.25 <sup>③</sup> | 2500                         |

## Auxiliary Switch

| Number of Sets of Contacts (1M and 1B) | Mounting Location (Pole)   | Factory Mounted              |                   |               |                | Field Mounted                        |                                 |
|----------------------------------------|----------------------------|------------------------------|-------------------|---------------|----------------|--------------------------------------|---------------------------------|
|                                        |                            | Connection Type and Location |                   |               |                | Field Installation Kits <sup>④</sup> |                                 |
|                                        |                            | 18-Inch Pigtail Leads        |                   |               | Terminal Block | Pigtail Leads                        | Terminal Block                  |
|                                        |                            | Same Side                    | Rear <sup>⑤</sup> | Opposite Side | Same Side      |                                      |                                 |
|                                        |                            | Suffix Number                |                   |               |                | Catalog Number                       |                                 |
| 1                                      | Left<br>Right <sup>⑤</sup> | A01<br>A05                   | A02<br>A06        | A03<br>A07    | A04<br>A08     | A1X3PK<br>A1X3PK                     | A1X3LTK<br>A1X3RTK <sup>⑥</sup> |
| 2                                      | Left<br>Right <sup>⑤</sup> | A09<br>A12                   | A10<br>A13        | —<br>—        | A11<br>A14     | A2X3PK<br>A2X3PK                     | A2X3LTK<br>A2X3RTK <sup>⑥</sup> |
| 3                                      | Left<br>Right              | A18<br>A17                   | —<br>—            | —<br>—        | A15<br>A16     | A3X3LPK<br>A3X3RPK                   | A3X3LTK<br>A3X3RTK <sup>⑥</sup> |

Instruction Leaflet/FRED Number 29C122

## L- and M-Frames

Electrical Rating Data<sup>②</sup>

| Maximum Voltage   | Frequency            | Maximum Current Amperes                     | Dielectric Withstand Voltage |
|-------------------|----------------------|---------------------------------------------|------------------------------|
| 600<br>125<br>250 | 50/60 Hz<br>Dc<br>Dc | 6<br>0.50 <sup>③</sup><br>0.25 <sup>③</sup> | 2500                         |

## Auxiliary Switch

| Number of Sets of Contacts (1a and 1b) | Mounting Location (Pole)   | Factory Mounted              |                   |               |                | Field Mounted                        |                                 |
|----------------------------------------|----------------------------|------------------------------|-------------------|---------------|----------------|--------------------------------------|---------------------------------|
|                                        |                            | Connection Type and Location |                   |               |                | Field Installation Kits <sup>④</sup> |                                 |
|                                        |                            | 18-Inch Pigtail Leads        |                   |               | Terminal Block | Pigtail Leads                        | Terminal Block                  |
|                                        |                            | Same Side                    | Rear <sup>⑤</sup> | Opposite Side | Same Side      |                                      |                                 |
|                                        |                            | Suffix Number                |                   |               |                | Catalog Number                       |                                 |
| 1                                      | Left<br>Right <sup>⑤</sup> | A01<br>A05                   | A02<br>A06        | A03<br>A07    | A04<br>A08     | A1X4PK<br>A1X4PK                     | A1X4LTK<br>A1X4RTK <sup>⑥</sup> |
| 2                                      | Left<br>Right <sup>⑤</sup> | A09<br>A12                   | A10<br>A13        | —<br>—        | A11<br>A14     | A2X4PK<br>A2X4PK                     | A2X4LTK<br>A2X4RTK <sup>⑥</sup> |
| 3                                      | Left<br>Right <sup>⑤</sup> | A18<br>A17                   | —<br>—            | —<br>—        | A15<br>A16     | A3X4PK<br>A3X4PK                     | A3X4LTK<br>A3X4RTK <sup>⑥</sup> |

Instruction Leaflet/FRED Number 29C123

① Endurance – 5000 electrical operations plus 1000 mechanical operations.

② Pigtail wire size – No. 18 AWG (0.82 mm<sup>2</sup>).

③ Non-inductive load.

④ Listed with Underwriters Laboratories, Inc. for field installation under E64983.

⑤ Standard mounting location – leads exit rear of breaker.

⑥ Not for use on 4-pole circuit breaker.

## Auxiliary Switch

## N-Frame

Electrical Rating Data<sup>①②</sup>

| Maximum Voltage | Frequency | Maximum Current Amperes | Dielectric Withstand Voltage |
|-----------------|-----------|-------------------------|------------------------------|
| 600             | 50/60 Hz  | 6                       | 2500                         |
| 125             | Dc        | 0.50 <sup>③</sup>       |                              |
| 250             | Dc        | 0.25 <sup>③</sup>       |                              |

## Auxiliary Switch

| Number of Sets of Contacts (1A and 1B) | Mounting Location (Pole) | Factory Mounted              |            |               |                | Field Mounted            |                     |
|----------------------------------------|--------------------------|------------------------------|------------|---------------|----------------|--------------------------|---------------------|
|                                        |                          | Connection Type and Location |            |               |                | Field Installation Kits④ |                     |
|                                        |                          | 18-Inch Pigtail Leads        |            |               | Terminal Block | Pigtail Leads            | Terminal Block      |
|                                        |                          | Same Side                    | Rear⑤      | Opposite Side | Same Side      |                          |                     |
|                                        |                          | Suffix Number                |            |               |                | Catalog Number           |                     |
| 1                                      | Left<br>Right⑤           | A01<br>A05                   | A02<br>A06 | A03<br>A07    | A04<br>A08     | A1X5LPK<br>A1X5RPK       | A1X5LTK<br>A1X5RTK⑥ |
| 2                                      | Left<br>Right⑤           | A09<br>A12                   | A10<br>A13 | —<br>—        | A11<br>A14     | A2X5LPK<br>A2X5RPK       | A2X5LTK<br>A2X5RTK⑥ |
| 3                                      | Left<br>Right⑤           | A18<br>A17                   | —<br>—     | —<br>—        | A15<br>A16     | A3X5LPK<br>A3X5RPK       | A3X5LTK<br>A3X5RTK⑥ |

Instruction Leaflet/FRED Number 29C124

## R-Frame

Electrical Rating Data<sup>⑦⑧</sup>

| Maximum Voltage | Frequency | Maximum Current Amperes |
|-----------------|-----------|-------------------------|
| 600             | 50/60 Hz  | 6                       |
| 125             | Dc        | 0.50 <sup>③</sup>       |
| 250             | Dc        | 0.25 <sup>③</sup>       |

## Auxiliary Switch (RH only)

| Number of Contacts (Make and Break) | Factory Mounted              | Field Mounted                        |
|-------------------------------------|------------------------------|--------------------------------------|
|                                     | Connection Type and Location | Field Installation Kits <sup>④</sup> |
|                                     | 18-Inch Pigtail Leads        | Pigtail Leads                        |
|                                     | Suffix Number <sup>⑨</sup>   | Catalog Number <sup>⑨</sup>          |
| 2                                   | A12                          | A2X6RPK                              |
| 4                                   | A19                          | A4X6RPK                              |

Instruction Leaflet/FRED Number 29C125

① Endurance – 3000 electrical operations plus 1000 mechanical operations.

② Pigtail wire size – No. 18 AWG (0.82 mm<sup>2</sup>).

③ Non-inductive load.

④ Listed with Underwriters Laboratories, Inc. for field installation under E64983.

⑤ Standard mounting location – leads exit rear of breaker.

⑥ Not for use on 4-pole circuit breaker.

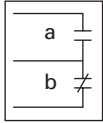
⑦ Endurance: 500 electrical operations plus 2500 mechanical operations.

⑧ Pigtail wire size: No. 18 AWG (0.82 mm<sup>2</sup>). Leads are red, black and blue.

⑨ A maximum of two auxiliary switches (any combination of 2a/2b or 4a/4b plug-in modules may be installed in a circuit breaker.

## Auxiliary Switch and Alarm Switch Combination

## Auxiliary Switch and Alarm Switch Combination



## General Information

Each catalog number listed in the following table includes one auxiliary switch and one alarm switch. In an auxiliary switch ASL switch

combination, the auxiliary switch is always mounted on the side of the plug-in module next to the center pole of the circuit breaker.

## Ordering Information

## F-Frame

Electrical Rating Data<sup>①②</sup>

| Maximum Voltage | Frequency | Maximum Current Amperes | Dielectric Withstand Voltage |
|-----------------|-----------|-------------------------|------------------------------|
| 125             | 50/60 Hz  | 1                       | 2500                         |
| 600             | 50/60 Hz  | 6                       | 2500                         |
| 125             | Dc        | 0.50 <sup>③</sup>       | 2200                         |
| 250             | Dc        | 0.25 <sup>③</sup>       | 2200                         |

## Auxiliary Switch and Alarm Switch Combination

| Mounting Location (Pole) | Factory Mounted              |            |                | Field Mounted            |                     |
|--------------------------|------------------------------|------------|----------------|--------------------------|---------------------|
|                          | Connection Type and Location |            |                | Field Installation Kits④ |                     |
|                          | 18-Inch Pigtail Leads        |            | Terminal Block | Pigtail Leads            | Terminal Block      |
|                          | Same Side                    | Rear⑤      | Same Side      |                          |                     |
|                          | Suffix Number                |            |                | Catalog Number           |                     |
| Left⑤<br>Right           | C01<br>C04                   | C02<br>C05 | C03<br>C06     | AAL1LPK<br>AAL1RPK       | AAL1LTK<br>AAL1RTK⑥ |

Instruction Leaflet/FRED Number 29C180

## J-Frame

Electrical Rating Data<sup>⑦②</sup>

| Maximum Voltage | Frequency | Maximum Current Amperes | Dielectric Withstand Voltage |
|-----------------|-----------|-------------------------|------------------------------|
| 600             | 50/60 Hz  | 6                       | 2500                         |
| 125             | Dc        | 0.50 <sup>③</sup>       |                              |
| 250             | Dc        | 0.25 <sup>③</sup>       |                              |

## Auxiliary Switch and Alarm Switch Combination

| Number of Sets of Contacts (1a and 1b and 1M and 1B) | Mounting Location (Pole) | Factory Mounted              |            |               |                | Field Mounted            |                     |
|------------------------------------------------------|--------------------------|------------------------------|------------|---------------|----------------|--------------------------|---------------------|
|                                                      |                          | Connection Type and Location |            |               |                | Field Installation Kits® |                     |
|                                                      |                          | 18-Inch Pigtail Leads        |            |               | Terminal Block | Pigtail Leads            | Terminal Block      |
|                                                      |                          | Same Side                    | Rear®      | Opposite Side |                |                          |                     |
|                                                      |                          | Suffix Number                |            |               |                |                          |                     |
| 1                                                    | Left<br>Right®           | C01<br>C04                   | C02<br>C05 | —<br>—        | C03<br>C06     | AAL2LPK<br>AAL2RPK       | AAL2LTK<br>AAL2RTK® |

Instruction Leaflet/FRED Number 29C181

## K-Frame

Electrical Rating Data<sup>⑩②</sup>

| Maximum Voltage | Frequency | Maximum Current Amperes | Dielectric Withstand Voltage |
|-----------------|-----------|-------------------------|------------------------------|
| 600             | 50/60 Hz  | 6                       | 2500                         |
| 125             | Dc        | 0.50 <sup>③</sup>       |                              |
| 250             | Dc        | 0.25 <sup>③</sup>       |                              |

## Auxiliary Switch and Alarm Switch Combination

| Number of Sets of Contacts (1a and 1b and 1M and 1B) | Mounting Location (Pole) | Factory Mounted              |            |               |                | Field Mounted            |                    |
|------------------------------------------------------|--------------------------|------------------------------|------------|---------------|----------------|--------------------------|--------------------|
|                                                      |                          | Connection Type and Location |            |               |                | Field Installation Kits® |                    |
|                                                      |                          | 18-Inch Pigtail Leads        |            |               | Terminal Block | Pigtail Leads            | Terminal Block     |
|                                                      |                          | Same Side                    | Rear®      | Opposite Side | Same Side      |                          |                    |
|                                                      |                          | Suffix Number                |            |               |                | Catalog Number           |                    |
| 1                                                    | Left<br>Right®           | C01<br>C04                   | C02<br>C05 | —<br>—        | C03<br>C06     | AAL3LPK<br>AAL3RPK       | AAL3LTK<br>AAL3RTK |

Instruction Leaflet/FRED Number 29C182

① Endurance: 6000 electrical operations plus 4000 mechanical operations.

② Pigtail wire size: No. 18 AWG (0.82 mm<sup>2</sup>).

③ Non-inductive load.

④ Not listed with Underwriters Laboratories, Inc., for field installation.

⑤ Standard mounting location.

⑥ Not for use on 4-pole circuit breakers.

⑦ Endurance – 6000 electrical operations plus 2000 mechanical operations.

⑧ Listed with Underwriters Laboratories, Inc. for field installation or interchangeable trip unit breakers under E64983.

⑨ Standard mounting location – leads exit rear of breaker.

⑩ Endurance – 5000 electrical operations plus 1000 mechanical operations.

## Auxiliary Switch and Alarm Switch Combination

### L- and M-Frames

#### Electrical Rating Data<sup>①②</sup>

| Maximum Voltage   | Frequency            | Maximum Current Amperes                     | Dielectric Withstand Voltage |
|-------------------|----------------------|---------------------------------------------|------------------------------|
| 600<br>125<br>250 | 50/60 Hz<br>Dc<br>Dc | 6<br>0.50 <sup>③</sup><br>0.25 <sup>③</sup> | 2500                         |

#### Auxiliary Switch and Alarm Switch Combination

| Number of Sets of Contacts | Mounting Location (Pole) | Factory Mounted              |            |               |                |                      | Field Mounted            |  |
|----------------------------|--------------------------|------------------------------|------------|---------------|----------------|----------------------|--------------------------|--|
|                            |                          | Connection Type and Location |            |               |                |                      | Field Installation Kits④ |  |
|                            |                          | 18-Inch Pigtail Leads        |            |               | Terminal Block | Pigtail Leads        | Terminal Block           |  |
|                            |                          | Same Side                    | Rear⑤      | Opposite Side | Same Side      |                      |                          |  |
|                            |                          | Suffix Number                |            |               |                |                      | Catalog Number           |  |
| 1A, 1B and 1 Make/ 1 Break | Left Right⑤              | C01<br>C04                   | C02<br>C05 | —<br>—        | C03<br>C06     | AA114LPK<br>AA114RPK | AA114LTK<br>AA114RTK⑥    |  |
| 2A, 2B and 1 Make/ 1 Break | Left Right⑤              | C07<br>C10                   | C08<br>C11 | —<br>—        | C12<br>C13     | AA214LPK<br>AA214RPK | AA214LTK<br>AA214RTK⑥    |  |
| 3A, 3B and 1 Make/ 1 Break | Left Right⑤              | C14<br>C15                   | —<br>—     | —<br>—        | —<br>—         | AA314LPK<br>AA314RPK | —<br>—                   |  |

Instruction Leaflet/FRED Number 29C183

### N-Frame

#### Electrical Rating Data<sup>⑦②</sup>

| Maximum Voltage   | Frequency            | Maximum Current Amperes                     | Dielectric Withstand Voltage |
|-------------------|----------------------|---------------------------------------------|------------------------------|
| 600<br>125<br>250 | 50/60 Hz<br>Dc<br>Dc | 6<br>0.50 <sup>③</sup><br>0.25 <sup>③</sup> | 2500                         |

#### Auxiliary Switch and Alarm Switch Combination

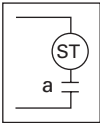
| Number of Sets of Contacts | Mounting Location (Pole) | Factory Mounted              |            |               |                | Field Mounted            |                       |
|----------------------------|--------------------------|------------------------------|------------|---------------|----------------|--------------------------|-----------------------|
|                            |                          | Connection Type and Location |            |               |                | Field Installation Kits④ |                       |
|                            |                          | 18-Inch Pigtail Leads        |            |               | Terminal Block | Pigtail Leads            | Terminal Block        |
|                            |                          | Same Side                    | Rear⑤      | Opposite Side | Same Side      |                          |                       |
|                            |                          | Suffix Number                |            |               |                | Catalog Number           |                       |
| 1A, 1B and 1 Make/ 1 Break | Left Right⑤              | C01<br>C04                   | C02<br>C05 | —<br>—        | C03<br>C06     | AA115LPK<br>AA115RPK     | AA115LTK<br>AA115RTK⑥ |
| 2A, 2B and 1 Make/ 1 Break | Left Right⑤              | C07<br>C10                   | C08<br>C11 | —<br>—        | C12<br>C13     | AA215LPK<br>AA215RPK     | AA215LTK<br>AA215RTK⑥ |

Instruction Leaflet/FRED Number 29C184

- ① Endurance – 5000 electrical operations plus 1000 mechanical operations.  
 ② Pigtail wire size – No. 18 AWG (0.82 mm<sup>2</sup>).  
 ③ Non-inductive load.  
 ④ Listed with Underwriters Laboratories, Inc. for field installation under E64983.  
 ⑤ Standard mounting location – leads exit rear of breaker.  
 ⑥ Not for use on 4-pole circuit breaker.  
 ⑦ Endurance – 3000 electrical operations plus 1000 mechanical operations.

Shunt Trip

Shunt Trip



General Information

The shunt trip provides remote controlled tripping of the circuit breaker. The shunt trip consists of an intermittent rated solenoid with a tripping plunger and a cutoff switch assembled to a plug-in module.

When required for ground fault protection applications, certain Ac rated shunt trips, as noted in the Electrical Rating Table, are suitable for operation at 55 percent of rated voltage.

Ordering Information

Select shunt trip catalog number for the voltage within the indicated voltage range. Shunt trip coils are designed to be applied at specific Ac or Dc voltages within the voltage range shown. Electrical ratings are also shown on applicable circuit breaker accessory nameplates.

G-Frame

Shunt Trip (LH 3-Pole only)

| Electrical Ratings |           |         | Catalog Number | Suffix Number |
|--------------------|-----------|---------|----------------|---------------|
| Volts              | Frequency | Amperes |                |               |
| 120                | 50/60 Hz  | 1.1     | 1373D62G01     | S1            |
| 240                | 50/60 Hz  | 2.1     | 1373D62G02     | S2            |
| 12                 | Dc        | 2.8     | 1373D62G15     | S3            |
| 24                 | Dc        | 5.7     | 1373D62G16     | S4            |
| 24                 | 60 Hz     | —       | 1373D62G20     | S7            |

Instruction Leaflet/FRED Number 15550

**Note:** G-Frame circuit breakers are factory sealed. Underwriters Laboratories, Inc., requires that internal accessories be installed at the factory. Internal accessories are UL listed for factory installation under E7819.

Where local codes and standards permit and UL listing is not required, internal accessories can be field installed. Accessory installation should be done before the circuit breaker is mounted and connected.

### Shunt Trip

## F-Frame

### Electrical Rating Data<sup>①②③</sup>

| 50/60 Hz       |                           |     | Dc             |                           |     |
|----------------|---------------------------|-----|----------------|---------------------------|-----|
| Supply Voltage | Minimum Operating Voltage | VA  | Supply Voltage | Minimum Operating Voltage | VA  |
| 12             | 6.75                      | 75  | 12             | 9                         | 100 |
| 24             |                           | 300 | 24             |                           | 400 |
| 48             |                           | 92  | 48             |                           | 100 |
| 60             |                           | 140 | 60             |                           | 160 |
| 110            | 36                        | 480 |                | 36                        |     |
| 120            |                           | 570 |                |                           |     |
| 127            |                           | 640 |                |                           |     |
| 208            |                           | 180 | 110            |                           | 55  |
| 220            | 156                       | 200 | 120            | 77                        | 66  |
| 240            |                           | 240 | 125            |                           | 71  |
| 380            |                           | 610 | 127            |                           | 72  |
|                |                           |     |                |                           |     |
| 415            | 300                       | 130 | 220            | —                         | 110 |
| 440            |                           | 330 | 250            |                           | 140 |
| 480            |                           | 380 | —              |                           | —   |
| 525            |                           | 450 | —              |                           | —   |
| 550            |                           | 530 | —              |                           | —   |
| 600            |                           | 590 | —              |                           | —   |
|                |                           | —   | —              |                           | —   |
|                |                           | —   | —              |                           | —   |

### Shunt Trip

| Voltage Rating<br>(Ac Frequency = 50/60 Hz) | Factory Mounted                    |                   |               |                | Field Mounted                        |                |
|---------------------------------------------|------------------------------------|-------------------|---------------|----------------|--------------------------------------|----------------|
|                                             | Connection Type and Location       |                   |               |                | Field Installation Kits <sup>④</sup> |                |
|                                             | 18-Inch Pigtail Leads <sup>⑤</sup> |                   |               | Terminal Block | Pigtail Leads                        | Terminal Block |
|                                             | Same Side                          | Rear <sup>⑥</sup> | Opposite Side | Same Side      |                                      |                |
|                                             | Suffix Number                      |                   |               |                | Catalog Number                       |                |

### Left-Pole Mounting Ac/Dc Ratings

|                                      |     |     |     |     |           |           |
|--------------------------------------|-----|-----|-----|-----|-----------|-----------|
| 12-24 Vac or Vdc                     | S01 | S02 | S03 | S04 | SNT1LP03K | SNT1LT03K |
| 48-127 Vac or 48-60 Vdc <sup>⑦</sup> | S05 | S06 | S07 | S08 | SNT1LP08K | SNT1LT08K |
| 208-380 Vac or 110-127 Vdc           | S09 | S10 | S11 | S12 | SNT1LP12K | SNT1LT12K |
| 415-600 Vac or 220-250 Vdc           | S13 | S14 | S15 | S16 | SNT1LP18K | SNT1LT18K |

### Right- or Neutral-Pole Mounting Ac/Dc Ratings<sup>⑧</sup>

|                                      |     |     |     |     |           |                        |
|--------------------------------------|-----|-----|-----|-----|-----------|------------------------|
| 12-24 Vac or Vdc                     | S17 | S18 | S19 | S20 | SNT1RP03K | SNT1RT03K <sup>⑨</sup> |
| 48-127 Vac or 48-60 Vdc <sup>⑦</sup> | S21 | S22 | S23 | S24 | SNT1RP08K | SNT1RT08K <sup>⑨</sup> |
| 208-380 Vac or 110-127 Vdc           | S25 | S26 | S27 | S28 | SNT1RP12K | SNT1RT12K <sup>⑨</sup> |
| 415-600 Vac or 220-250 Vdc           | S29 | S30 | S31 | S32 | SNT1RP18K | SNT1RT18K <sup>⑨</sup> |

Instruction Leaflet/FRED Number 29C140

**Note:** F-Frame circuit breakers are factory sealed. Underwriters Laboratories, Inc., requires that internal accessories be installed at the factory.

Internal accessories are UL listed for factory installation under E7819.

Where local codes and standards permit and UL listing is not required, internal accessories can be field installed. Accessory installation should be done before the circuit breaker is mounted and connected.

## J-Frame

### Electrical Rating Data<sup>①②⑩</sup>

| 50/60 Hz         |                           |      | Dc             |                           |      |
|------------------|---------------------------|------|----------------|---------------------------|------|
| Supply Voltage   | Minimum Operating Voltage | VA   | Supply Voltage | Minimum Operating Voltage | VA   |
| 12               | 9                         | 31   | 12             | 8.4                       | 50   |
| 24               |                           | 173  | 24             |                           | 247  |
| 48               | 36                        | 686  | 48             | 33.6                      | 1094 |
| 60               |                           | 1014 | 60             |                           | 1698 |
| 110 <sup>⑪</sup> | 60.5                      | 66   | 110            | 77                        | 112  |
| 120 <sup>⑪</sup> |                           | 84   | 120            |                           | 138  |
| 127 <sup>⑪</sup> |                           | 102  | 125            |                           | 150  |
| 208 <sup>⑪</sup> |                           | 354  | —              |                           | —    |
| 220 <sup>⑪</sup> |                           | 396  | —              |                           | —    |
| 240 <sup>⑪</sup> |                           | 432  | —              |                           | —    |
| 380              | 285                       | 180  | 110            | 154                       | 40   |
| 400              |                           | 200  | 120            |                           | 58   |
| 415              |                           | 240  | 125            |                           | —    |
| 440              |                           | 610  | 127            |                           | —    |
| 480              | 360                       | 34   | —              | —                         | —    |
| 525              |                           | 42   | —              |                           | —    |
| 550              |                           | 50   | —              |                           | —    |
| 600              |                           | 60   | —              |                           | —    |

### Shunt Trip

| Voltage Rating<br>(Ac Frequency = 50/60 Hz) | Factory Mounted              |                   |               |                | Field Mounted                        |                |
|---------------------------------------------|------------------------------|-------------------|---------------|----------------|--------------------------------------|----------------|
|                                             | Connection Type and Location |                   |               |                | Field Installation Kits <sup>⑫</sup> |                |
|                                             | 18-Inch Pigtail Leads        |                   |               | Terminal Block | Pigtail Leads                        | Terminal Block |
|                                             | Same Side                    | Rear <sup>⑬</sup> | Opposite Side |                |                                      |                |
|                                             | Suffix Number                |                   |               |                | Catalog Number                       |                |

### Left-Pole Mounting Ac/Dc Ratings<sup>⑭</sup>

|                                         |     |     |     |     |          |          |
|-----------------------------------------|-----|-----|-----|-----|----------|----------|
| 12-24 Vac or Vdc                        | S41 | S42 | S43 | S44 | SNT2P04K | SNT2T04K |
| 48-60 Vac or Vdc                        | S49 | S50 | S51 | S52 | SNT2P06K | SNT2T06K |
| 110-240 Vac or 110-125 Vdc <sup>⑮</sup> | S09 | S10 | S11 | S12 | SNT2P11K | SNT2T11K |
| 380-440 Vac or 220-250 Vdc              | S33 | S34 | S35 | S36 | SNT2P14K | SNT2T14K |
| 480-600 Vac                             | S17 | S18 | S19 | S20 | SNT2P18K | SNT2T18K |

### Right-Pole Mounting Ac/Dc Ratings

|                                         |     |     |     |     |          |                       |
|-----------------------------------------|-----|-----|-----|-----|----------|-----------------------|
| 12-24 Vac or Vdc                        | S45 | S46 | S47 | S48 | SNT2P04K | SNT2T04K <sup>⑨</sup> |
| 48-60 Vac or Vdc                        | S53 | S54 | S55 | S56 | SNT2P06K | SNT2T06K <sup>⑨</sup> |
| 110-240 Vac or 110-125 Vdc <sup>⑮</sup> | S29 | S30 | S31 | S32 | SNT2P11K | SNT2T11K <sup>⑨</sup> |
| 380-440 Vac or 220-250 Vdc              | S33 | S34 | S35 | S36 | SNT2P14K | SNT2T14K <sup>⑨</sup> |
| 480-600 Vac                             | S37 | S38 | S39 | S40 | SNT2P18K | SNT2T18K <sup>⑨</sup> |

Instruction Leaflet/FRED Number 29C142

- ① Average unlatching time: 6 milliseconds.
- ② Average circuit breaker contact total opening time: 18 milliseconds.
- ③ Endurance: 6000 electrical operations plus 4000 mechanical operations.
- ④ Not listed with Underwriters Laboratories, Inc., for field installation.
- ⑤ Pigtail wire size: No. 18 AWG (0.82 mm<sup>2</sup>).
- ⑥ Standard pigtail lead exit location.

- ⑦ 120 Vac marked suitable for ground fault protection devices.
- ⑧ Standard mounting location.
- ⑨ Not for use on 4-pole circuit breakers.
- ⑩ Endurance – 6000 electrical operations plus 2000 mechanical operations.
- ⑪ Supply voltages suitable for use with Class 1 GFP devices. Marking label included with accessory kits.

- ⑫ Listed with Underwriters Laboratories, Inc. for field installation under E64983.
- ⑬ Standard mounting location – leads exit rear of breaker.
- ⑭ Suitable for use with Class 1 ground fault sensing element.

## Shunt Trip

## K-Frame

Electrical Rating Data<sup>①②③</sup>

| 50/60 Hz         |                           |      | Dc             |                           |      |
|------------------|---------------------------|------|----------------|---------------------------|------|
| Supply Voltage   | Minimum Operating Voltage | VA   | Supply Voltage | Minimum Operating Voltage | VA   |
| 12               | 9                         | 45   | 12             | 8.4                       | 35   |
| 24               |                           | 200  | 24             |                           | 170  |
| 48               |                           | 830  | 48             |                           | 710  |
| 60               |                           | 1280 | 60             |                           | 1105 |
| 110 <sup>④</sup> | 60                        | 100  | 110            | 77                        | 110  |
| 120 <sup>④</sup> |                           | 120  | 120            |                           | 130  |
| 127 <sup>④</sup> |                           | 140  | 125            |                           | 140  |
| 208 <sup>④</sup> |                           | 420  | —              |                           | —    |
| 220 <sup>④</sup> | 285                       | 470  | —              | 154                       | —    |
| 240 <sup>④</sup> |                           | 550  | —              |                           | —    |
| 380              |                           | 95   | 220            |                           | 41   |
| 400              |                           | 108  | 250            |                           | 54   |
| 415              | 360                       | 120  | —              | —                         | —    |
| 440              |                           | 136  | —              |                           | —    |
| 480              |                           | 40   | —              |                           | —    |
| 525              |                           | 50   | —              |                           | —    |
| 550              | 70                        | 50   | —              | —                         | —    |
| 600              |                           | 70   | —              |                           | —    |

## Shunt Trip

| Voltage Rating<br>(Ac Frequency = 50/60 Hz) | Factory Mounted              |                   |               |                | Field Mounted                        |                |
|---------------------------------------------|------------------------------|-------------------|---------------|----------------|--------------------------------------|----------------|
|                                             | Connection Type and Location |                   |               |                | Field Installation Kits <sup>⑤</sup> |                |
|                                             | 18-Inch Pigtail Leads        |                   |               | Terminal Block | Pigtail Leads                        | Terminal Block |
|                                             | Same Side                    | Rear <sup>⑥</sup> | Opposite Side | Same Side      |                                      |                |
|                                             | Suffix Number                |                   |               |                | Catalog Number                       |                |

Left-Pole Mounting Ac/Dc Ratings<sup>⑤</sup>

|                                         |     |     |     |     |           |          |
|-----------------------------------------|-----|-----|-----|-----|-----------|----------|
| 12-24 Vac or Vdc                        | S41 | S42 | S43 | S44 | SNT3P04K  | SNT3T04K |
| 48-60 Vac or Vdc                        | S49 | S50 | S51 | S52 | SNT3P06K  | SNT3T06K |
| 110-240 Vac or 110-125 Vdc <sup>⑦</sup> | S09 | S10 | S11 | S12 | SNT3LP11K | SNT3T11K |
| 380-440 Vac or 220-250 Vdc              | S13 | S14 | S15 | S16 | SNT3P14K  | SNT3T14K |
| 480-600 Vac                             | S17 | S18 | S19 | S20 | SNT3P18K  | SNT3T18K |

Right-Pole Mounting Ac/Dc Ratings<sup>⑧</sup>

|                                         |     |     |     |     |          |                       |
|-----------------------------------------|-----|-----|-----|-----|----------|-----------------------|
| 12-24 Vac or Vdc                        | S45 | S46 | S47 | S48 | SNT3P04K | SNT3T04K <sup>⑨</sup> |
| 110-240 Vac or 110-125 Vdc <sup>⑦</sup> | S29 | S30 | S31 | S32 | SNT3P11K | SNT3T11K <sup>⑨</sup> |
| 380-440 Vac or 220-250 Vdc              | S33 | S34 | S35 | S36 | SNT3P14K | SNT3T14K <sup>⑨</sup> |
| 480-600 Vac                             | S37 | S38 | S39 | S40 | SNT3P18K | SNT3T18K <sup>⑨</sup> |

Instruction Leaflet/FRED Number 29C144

## L- and M-Frames

Electrical Rating Data<sup>①②③</sup>

| 50/60 Hz         |                           |      | Dc             |                           |      |
|------------------|---------------------------|------|----------------|---------------------------|------|
| Supply Voltage   | Minimum Operating Voltage | VA   | Supply Voltage | Minimum Operating Voltage | VA   |
| 12               | 9                         | 45   | 12             | 9                         | 35   |
| 24               |                           | 200  | 24             |                           | 170  |
| 48               | 34                        | 830  | 48             | 34                        | 710  |
| 60               |                           | 1280 | 60             |                           | 1105 |
| 110 <sup>④</sup> | 60                        | 100  | 110            | 77                        | 110  |
| 120 <sup>④</sup> |                           | 120  | 120            |                           | 130  |
| 127 <sup>④</sup> |                           | 140  | 125            |                           | 140  |
| 208 <sup>④</sup> |                           | 420  | —              |                           | —    |
| 220 <sup>④</sup> | 266                       | 470  | —              | 154                       | —    |
| 240 <sup>④</sup> |                           | 550  | —              |                           | —    |
| 380              |                           | 95   | 220            |                           | 41   |
| 400              |                           | 108  | 250            |                           | 54   |
| 415              | 336                       | 120  | —              | —                         | —    |
| 440              |                           | 136  | —              |                           | —    |
| 480              |                           | 40   | —              |                           | —    |
| 525              |                           | 50   | —              |                           | —    |
| 550              | 70                        | 50   | —              | —                         | —    |
| 600              |                           | 70   | —              |                           | —    |

## Shunt Trip

| Voltage Rating<br>(Ac Frequency = 50/60 Hz) | Factory Mounted              |                   |               |                | Field Mounted                        |                |
|---------------------------------------------|------------------------------|-------------------|---------------|----------------|--------------------------------------|----------------|
|                                             | Connection Type and Location |                   |               |                | Field Installation Kits <sup>⑤</sup> |                |
|                                             | 18-Inch Pigtail Leads        |                   |               | Terminal Block | Pigtail Leads                        | Terminal Block |
|                                             | Same Side                    | Rear <sup>⑥</sup> | Opposite Side | Same Side      |                                      |                |
|                                             | Suffix Number                |                   |               |                | Catalog Number                       |                |

Left-Pole Mounting Ac/Dc Ratings<sup>⑤</sup>

|                            |     |     |     |     |           |           |
|----------------------------|-----|-----|-----|-----|-----------|-----------|
| 12-24 Vac or Vdc           | S01 | S02 | S03 | S04 | SNT4LP03K | SNT4LT03K |
| 48-60 Vac                  | S05 | S06 | S07 | S08 | SNT4LP05K | SNT4LT05K |
| 48-60 Vdc                  | S85 | S86 | S87 | —   | SNT4LP23K | SNT4LT23K |
| 110-240 Vac                | S09 | S10 | S11 | S12 | SNT4LP11K | SNT4LT11K |
| 110-125 Vdc                | S41 | S42 | S43 | S44 | SNT4LP26K | SNT4LT26K |
| 380-440 Vac or 220-250 Vdc | S13 | S14 | S15 | S16 | SNT4LP14K | SNT4LT14K |
| 480-600 Vac                | S17 | S18 | S19 | S20 | SNT4LP18K | SNT4LT18K |

Right-Pole Mounting Ac/Dc Ratings<sup>⑧</sup>

|                            |     |     |     |     |           |           |
|----------------------------|-----|-----|-----|-----|-----------|-----------|
| 12-24 Vac or Vdc           | S21 | S22 | S23 | S24 | SNT4RP03K | SNT4RT03K |
| 48-60 Vac                  | S25 | S26 | S27 | S28 | SNT4RP05K | SNT4RT05K |
| 48-60 Vdc                  | S88 | S89 | S90 | —   | SNT4RP23K | SNT4RT23K |
| 110-240 Vac                | S29 | S30 | S31 | S32 | SNT4RP11K | SNT4RT11K |
| 110-125 Vdc                | S45 | S46 | S47 | S48 | SNT4RP26K | SNT4RT26K |
| 380-440 Vac or 220-250 Vdc | S33 | S34 | S35 | S36 | SNT4RP14K | SNT4RT14K |
| 480-600 Vac                | S37 | S38 | S39 | S40 | SNT4RP18K | SNT4RT18K |

Instruction Leaflet/FRED Number 29C146

- ① Approximate unlatching time – 6 milliseconds.  
 ② Approximate total circuit breaker contact opening time – 18 milliseconds.  
 ③ Endurance – 5,000 electrical operations plus 1,000 mechanical operations.  
 ④ Supply voltages suitable for use with Class 1 GFP devices. Marking label included with accessory kits.  
 ⑤ Listed with Underwriters Laboratories, Inc., for field installation under E64983.

- ⑥ Standard mounting location – leads exit rear of breaker.  
 ⑦ Suitable for use with Class 1 ground fault sensing element.  
 ⑧ For use with KT (thermal-magnetic) trip units only.  
 ⑨ Not for use on 4-pole circuit breaker.  
 ⑩ For use with LT (thermal-magnetic) 3-pole trip units only.



## Shunt Trip

## N-Frame

Electrical Rating Data<sup>①②③</sup>

| 50/60 Hz         |                           |      | Dc             |                           |      |
|------------------|---------------------------|------|----------------|---------------------------|------|
| Supply Voltage   | Minimum Operating Voltage | VA   | Supply Voltage | Minimum Operating Voltage | VA   |
| 24               | 16.8                      | 200  | 24             | 16.8                      | 170  |
| 48               | 33.6                      | 830  | 48             | 33.6                      | 710  |
| 60               |                           | 1280 | 60             |                           | 1150 |
| 110 <sup>④</sup> | 60                        | 100  | 110            | 77                        | 110  |
| 120 <sup>④</sup> |                           | 120  | 120            |                           | 130  |
| 127 <sup>④</sup> |                           | 140  | 125            |                           | 140  |
| 208 <sup>④</sup> |                           | 420  | —              | —                         | —    |
| 220 <sup>④</sup> |                           | 470  | —              | —                         | —    |
| 240 <sup>④</sup> |                           | 550  | —              | —                         | —    |
| 380              | 266                       | 95   | 220            | 154                       | 41   |
| 400              |                           | 108  | 250            | —                         | 54   |
| 415              |                           | 120  | —              | —                         | —    |
| 440              |                           | 136  | —              | —                         | —    |
| 480              | 336                       | 40   | —              | —                         | —    |
| 525              |                           | 50   | —              | —                         | —    |
| 550              |                           | 50   | —              | —                         | —    |
| 600              |                           | 70   | —              | —                         | —    |

## Ordering Information

## Shunt Trip

| Voltage Rating<br>(Ac Frequency = 50/60 Hz) | Factory Mounted              |                   |               |                | Field Mounted                        |                |
|---------------------------------------------|------------------------------|-------------------|---------------|----------------|--------------------------------------|----------------|
|                                             | Connection Type and Location |                   |               |                | Field Installation Kits <sup>⑤</sup> |                |
|                                             | 18-Inch Pigtail Leads        |                   |               | Terminal Block | Pigtail Leads                        | Terminal Block |
|                                             | Same Side                    | Rear <sup>⑥</sup> | Opposite Side | Same Side      |                                      |                |
|                                             | Suffix Number                |                   |               |                | Catalog Number                       |                |

Left-Pole Mounting Ac/Dc Ratings<sup>⑥</sup>

|                            |     |     |     |     |           |           |
|----------------------------|-----|-----|-----|-----|-----------|-----------|
| 24 Vac or Vdc              | S01 | S02 | S03 | S04 | SNT5LP03K | SNT5LT03K |
| 48-60 Vac                  | S05 | S06 | S07 | S08 | SNT5LP05K | SNT5LT05K |
| 110-240 Vac <sup>④</sup>   | S09 | S10 | S11 | S12 | SNT5LP11K | SNT5LT11K |
| 110-125 Vdc                | S41 | S42 | S43 | S44 | SNT5LP26K | SNT5LT26K |
| 380-440 Vac or 220-250 Vdc | S13 | S14 | S15 | S16 | SNT5LP14K | SNT5LT14K |
| 480-600 Vac                | S17 | S18 | S19 | S20 | SNT5LP18K | SNT5LT18K |
| 48-60 Vdc                  | S21 | S22 | S23 | S24 | SNT5LP23K | SNT5LT23K |

Instruction Leaflet/FRED Number 29C148

① Approximate unlatching time – 6 milliseconds.

② Approximate total circuit breaker contact opening time – 18 milliseconds.

③ Endurance – 3000 electrical operations plus 1000 mechanical operations.

④ Supply voltages suitable for use with Class 1 GFP devices. Marking label included with accessory kits.

⑤ Listed with Underwriters Laboratories, Inc. for field installation under E64983.

⑥ Standard mounting location – leads exit rear of breaker.

## Shunt Trip

## R-Frame

## Electrical Rating Data

| Suffix Number       | Application Ratings |                | Electrical Operating Ratings <sup>①②③④⑤⑥</sup> |                               |                                        |                                |                                        |                                           |                                             |
|---------------------|---------------------|----------------|------------------------------------------------|-------------------------------|----------------------------------------|--------------------------------|----------------------------------------|-------------------------------------------|---------------------------------------------|
|                     | Voltage (V)         | Frequency (Hz) | Supply Voltage (V)                             | Minimum Operating Voltage (V) | I <sub>p</sub> (A)                     | I <sub>rms</sub> at 0.250s (A) | I <sub>rms</sub> at 0.033s (A)         | VA                                        | One Minute Dielectric Withstand Voltage (V) |
| 03/03K              | 24                  | 50/60          | 24                                             | 16.8                          | 71.1                                   | —                              | 50.3                                   | 1210                                      | 1050                                        |
|                     | 24                  | Dc             | 24                                             | 16.8                          | —                                      | 36.1                           | —                                      | 870                                       | 1050                                        |
| 05/05K              | 48-60               | 50/60          | 48<br>60                                       | 34.0                          | 13.1<br>17.2                           | —                              | 9.2<br>12.2                            | 450<br>740                                | 1120                                        |
| 11/11K <sup>⑦</sup> | 110-240             | 50/60          | 110<br>120<br>127<br>208<br>220<br>240         | 60.5                          | 4.2<br>4.5<br>4.6<br>7.9<br>8.5<br>8.7 | —                              | 3.0<br>3.2<br>3.3<br>5.6<br>6.0<br>6.1 | 330<br>390<br>430<br>1170<br>1370<br>1470 | 1480                                        |
| 14/14K              | 380-440             | 50/60          | 380<br>415<br>440                              | 266.0                         | 4.5<br>5.0<br>5.3                      | —                              | 3.2<br>3.6<br>3.7                      | 1220<br>1500<br>1640                      | 1880                                        |
|                     | 220-250             | Dc             | 220<br>250                                     | 154.0                         | —                                      | 2.4<br>2.7                     | —                                      | 530<br>680                                | 1500                                        |
| 18/18K              | 480-600             | 50/60          | 480<br>525<br>550<br>600                       | 336.0                         | 0.6<br>0.7<br>0.7<br>0.8               | —                              | 0.4<br>0.5<br>0.5<br>0.6               | 200<br>270<br>280<br>360                  | 2200                                        |
| 23/23K              | 48-60               | Dc             | 48<br>60                                       | 34.0                          | —                                      | 9.8<br>11.6                    | —                                      | 470<br>700                                | 1120                                        |
| 26/26K              | 110-125             | Dc             | 110<br>120<br>125                              | 77.0                          | —                                      | 3.3<br>3.6<br>3.8              | —                                      | 370<br>440<br>480                         | 1250                                        |

## Shunt Trip (RH only)

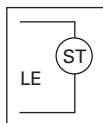
| Voltage Rating<br>(Ac Frequency = 50/60 Hz) | Factory Mounted                    | Field Mounted                        |
|---------------------------------------------|------------------------------------|--------------------------------------|
|                                             | Connection Type and Location       | Field Installation Kits <sup>⑧</sup> |
|                                             | 18-Inch Pigtail Leads <sup>⑨</sup> | Pigtail Leads                        |
|                                             | Suffix Number <sup>⑨</sup>         | Catalog Number <sup>⑨</sup>          |
| 24 Vac or Vdc                               | S21                                | SNT6P03K                             |
| 48-60 Vac                                   | S25                                | SNT6P05K                             |
| 110-240 Vac                                 | S29                                | SNT6P11K                             |
| 380-440 Vac or 220-250 Vdc                  | S33                                | SNT6P14K                             |
| 480-600 Vac                                 | S37                                | SNT6P18K                             |
| 48-60 Vdc                                   | S88                                | SNT6P23K                             |
| 110-125 Vdc                                 | S45                                | SNT6P26K                             |

Instruction Leaflet/FRED Number 29C150

- ① Approximate unlatching time of 6 milliseconds.  
 ② Average circuit breaker contact total opening time approximately 62 milliseconds, at rated voltage.  
 ③ Endurance – 500 electrical operations and 2500 mechanical operations.  
 ④ Shunt trip can be operated up to a maximum of six times per minute.  
 ⑤ Maximum operating voltage – 110% of maximum voltage range rating.  
 ⑥ Pigtail wire size – No. 18 AWG (0.82 mm<sup>2</sup>). Leads are yellow and white.  
 ⑦ Suitable for use with Class 1 GFP devices; marking label supplied with accessory kit.  
 ⑧ Listed with Underwriters Laboratories, Inc. for field installation under E64983.  
 ⑨ A maximum of two shunt trip plug-in modules may be installed in a circuit breaker.

## Low Energy Shunt Trip

## Low Energy Shunt Trip



## General Information

Low energy shunt trip devices are designed to operate from low energy output signals from dedicated current sensors typically applied in ground fault protection schemes. However, with a proper control voltage source, they may be applied in place of conventional trip devices for special applications. Flux paths surrounding permanent magnets used in the shunt trip assembly hold a charged spring poised in readiness to operate the circuit breaker trip mechanism. When a 100

microfarad capacitor charged to 28 Vdc is discharged through the shunt trip coil, the resultant flux opposes the permanent magnet flux field, which releases the stored energy in the spring to trip the circuit breaker. As the circuit breaker resets, the shunt trip reset arm is actuated by the circuit breaker handle, resetting the shunt trip. The plug-in module is mounted in retaining slots in the top of the trip unit. Coil is intermittent-rated only. Cutoff provisions required in control circuit.

## Ordering Information

Select shunt trip catalog number for the voltage within the indicated voltage range. Shunt trip coils are designed to be applied at specific Ac or Dc voltages within the voltage range shown. Electrical ratings are also shown on applicable circuit breaker accessory nameplates.

## F-, J-, K-, L-, M-, N-, and R-Frames

Low Energy Shunt Trip<sup>①</sup>

| Mounting Positions | Factory Mounted              |                   |               |                | Field Mounted                        |                |
|--------------------|------------------------------|-------------------|---------------|----------------|--------------------------------------|----------------|
|                    | Connection Type and Location |                   |               |                | Field Installation Kits <sup>②</sup> |                |
|                    | 18-Inch Pigtail Leads        |                   |               | Terminal Block | Pigtail Leads                        | Terminal Block |
|                    | Same Side                    | Rear <sup>③</sup> | Opposite Side | Same Side      |                                      |                |
|                    | Suffix Numbers               |                   |               |                | Catalog Numbers                      |                |

## F-Frame

|                         |            |            |            |            |                |                |
|-------------------------|------------|------------|------------|------------|----------------|----------------|
| Left Pole               | <b>N01</b> | <b>N02</b> | <b>N03</b> | <b>N04</b> | <b>LST1LPK</b> | <b>LST1LTK</b> |
| Right Pole <sup>③</sup> | <b>N05</b> | <b>N06</b> | <b>N07</b> | <b>N08</b> | <b>LST1RPK</b> | <b>LST1RTK</b> |

Instruction Leaflet/FRED Number 29C141

## J-Frame

|                        |            |            |            |   |                |   |
|------------------------|------------|------------|------------|---|----------------|---|
| Left Pole <sup>③</sup> | <b>N01</b> | <b>N02</b> | <b>N03</b> | — | <b>LST2LPK</b> | — |
| Right Pole             | <b>N05</b> | <b>N06</b> | <b>N07</b> | — | <b>LST2RPK</b> | — |

Instruction Leaflet/FRED Number 29C143

## K-Frame

|                         |            |            |            |   |                |   |
|-------------------------|------------|------------|------------|---|----------------|---|
| Left Pole <sup>③</sup>  | <b>N01</b> | <b>N02</b> | <b>N03</b> | — | <b>LST3LPK</b> | — |
| Right Pole <sup>④</sup> | <b>N05</b> | <b>N06</b> | <b>N07</b> | — | <b>LST3RPK</b> | — |

Instruction Leaflet/FRED Number 29C145

## L- and M-Frames

|                         |            |            |            |   |                |   |
|-------------------------|------------|------------|------------|---|----------------|---|
| Left Pole <sup>③</sup>  | <b>N01</b> | <b>N02</b> | <b>N03</b> | — | <b>LST4LPK</b> | — |
| Right Pole <sup>④</sup> | <b>N05</b> | <b>N06</b> | <b>N07</b> | — | <b>LST4RPK</b> | — |

Instruction Leaflet/FRED Number 29C147

## N-Frame

|                        |            |            |            |   |                |   |
|------------------------|------------|------------|------------|---|----------------|---|
| Left Pole <sup>③</sup> | <b>N01</b> | <b>N02</b> | <b>N03</b> | — | <b>LST5LPK</b> | — |
|------------------------|------------|------------|------------|---|----------------|---|

Instruction Leaflet/FRED Number 29C149

## R-Frame

|            |            |   |   |   |                |   |
|------------|------------|---|---|---|----------------|---|
| Right Pole | <b>N01</b> | — | — | — | <b>LST6RPK</b> | — |
|------------|------------|---|---|---|----------------|---|

Instruction Leaflet/FRED Number 29C151

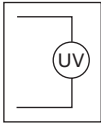
① Cutoff provisions required in control circuit.

② Listed with Underwriters Laboratories, Inc. for field installation under E64983.

③ Standard mounting location – leads exit rear of breaker.

④ For use with thermal-magnetic trip units only.

## Undervoltage Release Mechanism

Undervoltage Release  
Mechanism

## General Information

The undervoltage release mechanism monitors a voltage (typically a line voltage) and trips the circuit breaker when the voltage falls to between 70 and 35 percent of the solenoid coil rating.

The undervoltage release mechanism consists of a continuous rated solenoid with a plunger and tripping lever mounted in a plug-in module. The tab on the tripping lever resets the undervoltage release mechanism

when normal voltage has been restored and the circuit breaker handle is moved to the reset (or OFF) position. With less than pickup voltage applied to the undervoltage release mechanism, the circuit breaker contacts will not touch when a closing operation is attempted.

**Note:** Undervoltage release mechanism accessories are not designed for, and should not be used as, circuit interlocks.

## Ordering Information

Select handle reset undervoltage release mechanism catalog number for the voltage within the indicated voltage range. Undervoltage release mechanism coils are designed to be applied at specific Ac or Dc voltages within the voltage range shown. Electrical ratings are shown on applicable circuit breaker accessory nameplates.

## G-Frame

## Undervoltage Release Mechanism (LH 3-Pole only)

| Electrical Ratings |           |         | Style Numbers ①②③ | Factory Suffix |
|--------------------|-----------|---------|-------------------|----------------|
| Volts              | Frequency | Amperes |                   |                |
| 120                | 50/60 Hz  | 0.05    | 1373D62G03        | T1             |
| 24                 | 50/60 Hz  | 0.22    | 1373D62G04        | T2             |
| 48                 | 50/60 Hz  | 0.11    | 1373D62G05        | T3             |
| 60                 | 50/60 Hz  | 0.10    | 1373D62G06        | T4             |
| 110                | 50 Hz     | 0.049   | 1373D62G07        | T5             |
| 208                | 60 Hz     | 0.026   | 1373D62G08        | T6             |
| 220                | 50 Hz     | 0.025   | 1373D62G09        | T7             |
| 240                | 50/60 Hz  | 0.024   | 1373D62G10        | T8             |
| 380                | 50 Hz     | 0.015   | 1373D62G11        | T9             |
| 415                | 50 Hz     | 0.013   | 1373D62G12        | T10            |
| 440                | 50 Hz     | 0.012   | 1373D62G13        | T11            |
| 480                | 60 Hz     | 0.01    | 1373D62G14        | T12            |

Instruction Leaflet/FRED Number 15553

**Note:** G-frame circuit breakers are factory sealed. Underwriters Laboratories, Inc., requires that internal accessories be installed at the factory.

Internal accessories are UL listed for factory installation under E7819.

Where local codes and standards permit and UL listing is not required, internal accessories can be field installed. Accessory installation should be done before the circuit breaker is mounted and connected.

① Includes 24 inch external pigtail leads, #18 AWG (16-.010).

② A maximum of two internal accessories may be mounted in a three-pole circuit breaker.

③ Suitable for mounting in left pole only of 3-pole breaker.

## Undervoltage Release Mechanism

### F-Frame

**Note:** F-frame circuit breakers are factory sealed. Underwriters Laboratories, Inc., requires that internal accessories be installed at the factory.

Internal accessories are UL listed for factory installation under E7819.

Where local codes and standards permit and UL listing is not required, internal accessories can be field installed. Accessory installation should be done before the circuit breaker is mounted and connected.

### Electrical Rating Data<sup>①</sup>

| 50/60 Hz       |                 |       |                |                          | Dc             |                 |       |                |                   |
|----------------|-----------------|-------|----------------|--------------------------|----------------|-----------------|-------|----------------|-------------------|
| Supply Voltage | Dropout Voltage |       | Pickup Voltage | VA                       | Supply Voltage | Dropout Voltage |       | Pickup Voltage | VA                |
|                | Min.            | Max.  | Max.           |                          |                | Min.            | Max.  | Max.           |                   |
| 12             | 4.2             | 6.3   | 7.6            | 1.3<br>2.5               | 12             | 4.2             | 8.4   | 10.2           | 2.8               |
| 24             | 8.4             | 16.8  | 20.4           | 1.4                      | 24             | 8.4             | 16.8  | 20.4           | 1.6               |
| 48             | 21.0            | 33.6  | 40.8           | 1.2<br>1.9               | 48             | 21.0            | 33.6  | 40.8           | 1.3<br>2.0        |
| 60             |                 |       |                |                          | 60             |                 |       |                |                   |
| 110            | 44.5            | 77.0  | 93.5           | 1.3<br>1.5<br>1.7        | 110            | 44.5            | 77.0  | 93.5           | 1.5<br>1.7<br>1.9 |
| 120            |                 |       |                |                          | 120            |                 |       |                |                   |
| 127            |                 |       |                |                          | 125            |                 |       |                |                   |
| 208            | 84.0            | 145.6 | 176.8          | 2.2<br>2.4<br>2.9        | 220            | 87.5            | 154.0 | 187.0          | 2.6<br>3.4<br>—   |
| 220            |                 |       |                |                          | 250            | —               | —     | —              | —                 |
| 240            |                 |       |                |                          | —              | —               | —     | —              | —                 |
| 380            | 168.0           | 266.0 | 323.0          | 2.9<br>3.5<br>3.9<br>4.6 | —              | —               | —     | —              | —                 |
| 415            |                 |       |                |                          | —              | —               | —     | —              | —                 |
| 440            |                 |       |                |                          | —              | —               | —     | —              | —                 |
| 480            |                 |       |                |                          | —              | —               | —     | —              | —                 |
| 525            | 210.0           | 367.0 | 446.0          | 4.3<br>4.8<br>5.8        | —              | —               | —     | —              | —                 |
| 550            |                 |       |                |                          | —              | —               | —     | —              | —                 |
| 600            |                 |       |                |                          | —              | —               | —     | —              | —                 |

### Undervoltage Release Mechanism

| Voltage Rating<br>(Ac Freq = 50/60 Hz) | Factory Mounted (For F-Frame Breaker and F-Frame HMCP) |                   |               |                | Field Mounted (F-Frame Breaker)      |  | Field Mounted (F-Frame Breaker HMCP) |               |                |
|----------------------------------------|--------------------------------------------------------|-------------------|---------------|----------------|--------------------------------------|--|--------------------------------------|---------------|----------------|
|                                        | Connection Type and Location                           |                   |               |                | Field Installation Kits <sup>②</sup> |  |                                      |               |                |
|                                        | 18-inch Pigtail Leads                                  |                   |               | Terminal Block | Pigtail Leads                        |  | Terminal Block                       | Pigtail Leads | Terminal Block |
|                                        | Same Side                                              | Rear <sup>③</sup> | Opposite Side | Same Side      |                                      |  |                                      |               |                |
|                                        | Suffix Numbers                                         |                   |               |                | Catalog Numbers                      |  |                                      |               |                |

#### Left-Pole Mounting Ac Ratings

|             |     |     |     |      |           |           |            |            |
|-------------|-----|-----|-----|------|-----------|-----------|------------|------------|
| 12 Vac      | U01 | U02 | U03 | U04  | UVH1LP02K | UVH1LT02K | MUVH1LP02K | MUVH1LT02K |
| 24 Vac      | U05 | U06 | U07 | U08  | UVH1LP03K | UVH1LT03K | MUVH1LP03K | MUVH1LT03K |
| 48 Vac      | U37 | U38 | U39 | U40  | UVH1LP22K | UVH1LT22K | MUVH1LP22K | MUVH1LT22K |
| 60 Vac      | U97 | U98 | U99 | U100 | UVH1LP24K | UVH1LT24K | MUVH1LP24K | MUVH1LT24K |
| 110-127 Vac | U13 | U14 | U15 | U16  | UVH1LP08K | UVH1LT08K | MUVH1LP08K | MUVH1LT08K |
| 208-240 Vac | U17 | U18 | U19 | U20  | UVH1LP11K | UVH1LT11K | MUVH1LP11K | MUVH1LT11K |
| 380-480 Vac | U21 | U22 | U23 | U24  | UVH1LP15K | UVH1LT15K | MUVH1LP15K | MUVH1LT15K |
| 525-600 Vac | U25 | U26 | U27 | U28  | UVH1LP18K | UVH1LT18K | MUVH1LP18K | MUVH1LT18K |

#### Right-Pole Mounting Ac Ratings<sup>④⑤</sup>

|             |      |      |      |      |           |           |            |            |
|-------------|------|------|------|------|-----------|-----------|------------|------------|
| 12 Vac      | U49  | U50  | U51  | U52  | UVH1RP02K | UVH1RT02K | MUVH1RP02K | MUVH1RT02K |
| 24 Vac      | U53  | U54  | U55  | U56  | UVH1RP03K | UVH1RT03K | MUVH1RP03K | MUVH1RT03K |
| 48 Vac      | U85  | U86  | U87  | U88  | UVH1RP22K | UVH1RT22K | MUVH1RP22K | MUVH1RT22K |
| 60 Vac      | U101 | U102 | U103 | U104 | UVH1RP24K | UVH1RT24K | MUVH1RP24K | MUVH1RT24K |
| 110-127 Vac | U61  | U62  | U63  | U64  | UVH1RP08K | UVH1RT08K | MUVH1RP08K | MUVH1RT08K |
| 208-240 Vac | U65  | U66  | U67  | U68  | UVH1RP11K | UVH1RT11K | MUVH1RP11K | MUVH1RT11K |
| 380-480 Vac | U69  | U70  | U71  | U72  | UVH1RP15K | UVH1RT15K | MUVH1RP15K | MUVH1RT15K |
| 525-600 Vac | U73  | U74  | U75  | U76  | UVH1RP18K | UVH1RT18K | MUVH1RP18K | MUVH1RT18K |

#### Left-Pole Mounting Dc Ratings

|             |     |     |     |      |           |           |            |            |
|-------------|-----|-----|-----|------|-----------|-----------|------------|------------|
| 12 Vdc      | U29 | U30 | U31 | U32  | UVH1LP20K | UVH1LT20K | MUVH1LP20K | MUVH1LT20K |
| 24 Vdc      | U33 | U34 | U35 | U36  | UVH1LP21K | UVH1LT21K | MUVH1LP21K | MUVH1LT21K |
| 48 Vdc      | U37 | U38 | U39 | U40  | UVH1LP22K | UVH1LT22K | MUVH1LP22K | MUVH1LT22K |
| 60 Vdc      | U97 | U98 | U99 | U100 | UVH1LP24K | UVH1LT24K | MUVH1LP24K | MUVH1LT24K |
| 110-127 Vdc | U41 | U42 | U43 | U44  | UVH1LP26K | UVH1LT26K | MUVH1LP26K | MUVH1LT26K |
| 220-250 Vdc | U45 | U46 | U47 | U48  | UVH1LP28K | UVH1LT28K | MUVH1LP28K | MUVH1LT28K |

#### Right-Pole Mounting Dc Ratings<sup>④⑤</sup>

|             |      |      |      |      |           |           |            |            |
|-------------|------|------|------|------|-----------|-----------|------------|------------|
| 12 Vdc      | U77  | U78  | U79  | U80  | UVH1RP20K | UVH1RT20K | MUVH1RP20K | MUVH1RT20K |
| 24 Vdc      | U81  | U82  | U83  | U84  | UVH1RP21K | UVH1RT21K | MUVH1RP21K | MUVH1RT21K |
| 48 Vdc      | U85  | U86  | U87  | U88  | UVH1RP22K | UVH1RT22K | MUVH1RP22K | MUVH1RT22K |
| 60 Vdc      | U101 | U102 | U103 | U104 | UVH1RP22K | UVH1RT22K | MUVH1RP22K | MUVH1RT22K |
| 110-127 Vdc | U89  | U90  | U91  | U92  | UVH1RP26K | UVH1RT26K | MUVH1RP26K | MUVH1RT26K |
| 220-250 Vdc | U93  | U94  | U95  | U96  | UVH1RP28K | UVH1RT28K | MUVH1RP28K | MUVH1RT28K |

Instruction Leaflet/FRED Number 29C160 and 29C179 (HMCP)

① Endurance: 6000 electrical operations plus 4000 mechanical operations.

② Not listed with Underwriters Laboratories, Inc., for field installation.

③ Standard pigtail lead exit location.

④ Standard mounting location.

⑤ Not for use on right pole of 4-pole circuit breaker.

## Undervoltage Release Mechanism

## J-Frame

## Electrical Rating Data ①②

| 50/60 Hz       |                 |       |                |     | Dc             |                 |       |                |     |
|----------------|-----------------|-------|----------------|-----|----------------|-----------------|-------|----------------|-----|
| Supply Voltage | Dropout Voltage |       | Pickup Voltage | VA  | Supply Voltage | Dropout Voltage |       | Pickup Voltage | VA  |
|                | Min.            | Max.  | Max.           |     |                | Min.            | Max.  | Max.           |     |
| 12             | 4.2             | 8.4   | 10.2           | 1.9 | 12             | 4.2             | 8.4   | 10.2           | 1.6 |
| 24             | 8.4             | 16.8  | 20.4           | 3.9 | 24             | 8.4             | 16.8  | 20.4           | 3.1 |
| 48             | 21.0            | 33.6  | 40.8           | 2.5 | 48             | 21.0            | 33.6  | 40.8           | 2.0 |
| 60             |                 |       |                | 3.8 | 60             |                 |       |                | 3.1 |
| 110            | 44.5            | 77.0  | 93.5           | 1.8 | 110            | 44.5            | 77.0  | 93.5           | 1.6 |
| 120            |                 |       |                | 2.1 | 120            |                 |       |                | 1.9 |
| 127            |                 |       |                | 2.4 | 125            |                 |       |                | 2.2 |
| 208            | 85.0            | 145.6 | 176.8          | 2.7 | 220            | 87.5            | 154.0 | 187.0          | 3.1 |
| 220            |                 |       |                | 3.1 | 250            |                 |       |                | 4.0 |
| 240            |                 |       |                | 3.8 | —              |                 |       |                | —   |
| 380            | 168.0           | 266.0 | 323.0          | 3.4 | —              | —               | —     | —              | —   |
| 415            |                 |       |                | 4.0 | —              | —               | —     | —              | —   |
| 440            |                 |       |                | 4.6 | —              | —               | —     | —              | —   |
| 480            |                 |       |                | 5.4 | —              | —               | —     | —              | —   |

## Undervoltage Release Mechanism

| Voltage Rating<br>(Ac Freq =<br>50/60 Hz) | Factory Mounted              |                   |               |                             | Field Mounted                        |                             |
|-------------------------------------------|------------------------------|-------------------|---------------|-----------------------------|--------------------------------------|-----------------------------|
|                                           | Connection Type and Location |                   |               |                             | Field Installation Kits <sup>③</sup> |                             |
|                                           | 18-inch Pigtail Leads        |                   |               | Terminal Block <sup>②</sup> | Pigtail Leads                        | Terminal Block <sup>④</sup> |
|                                           | Same Side                    | Rear <sup>③</sup> | Opposite Side | Same Side                   |                                      |                             |
|                                           | Suffix Numbers               |                   |               |                             | Catalog Numbers                      |                             |

## Left-Pole Mounting Ac Ratings⑤

|             |     |     |     |     |           |           |
|-------------|-----|-----|-----|-----|-----------|-----------|
| 12 Vac      | U05 | U06 | U07 | U08 | UVH2LP02K | UVH2LT02K |
| 24 Vac      | U09 | U10 | U11 | U12 | UVH2LP03K | UVH2LT03K |
| 48-60 Vac   | U13 | U14 | U15 | U16 | UVH2LP05K | UVH2LT05K |
| 110-127 Vac | U17 | U18 | U19 | U20 | UVH2LP08K | UVH2LT08K |
| 208-240 Vac | U21 | U22 | U23 | U24 | UVH2LP11K | UVH2LT11K |
| 380-480 Vac | U25 | U26 | U27 | U28 | UVH2LP15K | UVH2LT15K |

## Right-Pole Mounting Ac Ratings④

|             |     |     |     |     |           |           |
|-------------|-----|-----|-----|-----|-----------|-----------|
| 12 Vac      | U37 | U38 | U39 | U40 | UVH2RP02K | UVH2RT02K |
| 24 Vac      | U41 | U42 | U43 | U44 | UVH2RP03K | UVH2RT03K |
| 48-60 Vac   | U45 | U46 | U47 | U48 | UVH2RP05K | UVH2RT05K |
| 110-127 Vac | U49 | U50 | U51 | U52 | UVH2RP08K | UVH2RT08K |
| 208-240 Vac | U53 | U54 | U55 | U56 | UVH2RP11K | UVH2RT11K |
| 380-480 Vac | U57 | U58 | U59 | U60 | UVH2RP15K | UVH2RT15K |

## Left-Pole Mounting Dc Ratings⑤

|             |     |     |     |     |           |           |
|-------------|-----|-----|-----|-----|-----------|-----------|
| 12 Vdc      | T01 | T02 | T03 | T04 | UVH2LP20K | UVH2LT20K |
| 24 Vdc      | T05 | T06 | T07 | T08 | UVH2LP21K | UVH2LT21K |
| 48-60 Vdc   | T09 | T10 | T11 | T12 | UVH2LP23K | UVH2LT23K |
| 110-127 Vdc | T13 | T14 | T15 | T16 | UVH2LP26K | UVH2LT26K |
| 220-250 Vdc | T17 | T18 | T19 | T20 | UVH2LP28K | UVH2LT28K |

## Right-Pole Mounting Dc Ratings④

|             |     |     |     |     |           |           |
|-------------|-----|-----|-----|-----|-----------|-----------|
| 12 Vdc      | T21 | T22 | T23 | T24 | UVH2RP20K | UVH2RT20K |
| 24 Vdc      | T25 | T26 | T27 | T28 | UVH2RP21K | UVH2RT21K |
| 48-60 Vdc   | T29 | T30 | T31 | T32 | UVH2RP23K | UVH2RT23K |
| 110-127 Vdc | T33 | T34 | T35 | T36 | UVH2RP26K | UVH2RT26K |
| 220-250 Vdc | T37 | T38 | T39 | T40 | UVH2RP28K | UVH2RT28K |

Instruction Leaflet/FRED Number 29C163

- ① Endurance: 6000 electrical operations plus 2000 mechanical operations.
- ② For electrical rating data for manual, automatic and electrical reset undervoltage release mechanisms, refer to Cutler-Hammer.
- ③ Listed with Underwriters Laboratories, Inc. for field installation under E64983.
- ④ Not for use on right pole of 4-pole circuit breakers.
- ⑤ Standard mounting location – leads exit rear of breaker.

**Undervoltage Release Mechanism**
**K-Frame**
**Electrical Rating Data ①**

| 50/60 Hz                 |                 |       |                |                          | Dc                |                  |                  |                  |                   |
|--------------------------|-----------------|-------|----------------|--------------------------|-------------------|------------------|------------------|------------------|-------------------|
| Supply Voltage           | Dropout Voltage |       | Pickup Voltage | VA                       | Supply Voltage    | Dropout Voltage  |                  | Pickup Voltage   | VA                |
|                          | Min.            | Max.  | Max.           |                          |                   | Min.             | Max.             | Max.             |                   |
| 12                       | 4.2             | 8.4   | 10.2           | 1.9                      | 12                | 4.2              | 8.4              | 10.2             | 1.6               |
| 24                       | 8.4             | 16.8  | 20.4           | 3.9                      | 24                | 8.4              | 16.8             | 20.4             | 3.1               |
| 48<br>60                 | 21.0            | 33.6  | 40.8           | 2.5<br>3.8               | 48<br>60          | 21.0             | 33.6             | 40.8             | 2.0<br>3.1        |
| 110<br>120<br>127        | 44.5            | 77.0  | 93.5           | 1.8<br>2.1<br>2.4        | 110<br>120<br>125 | 44.5             | 77.0             | 93.5             | 1.6<br>1.9<br>2.2 |
| 208<br>220<br>240        | 85.0            | 145.6 | 176.8          | 2.7<br>3.1<br>3.8        | 220<br>250<br>—   | 87.5             | 154.0            | 187.0            | 3.1<br>4.0<br>—   |
| 380<br>415<br>440<br>480 | 168.0           | 266.0 | 323.0          | 3.4<br>4.0<br>4.6<br>5.4 | —<br>—<br>—<br>—  | —<br>—<br>—<br>— | —<br>—<br>—<br>— | —<br>—<br>—<br>— | —<br>—<br>—<br>—  |

**Undervoltage Release Mechanism**

| Voltage Rating<br>(Ac Freq =<br>50/60 Hz) | Factory Mounted              |       |               |                | Field Mounted            |                |
|-------------------------------------------|------------------------------|-------|---------------|----------------|--------------------------|----------------|
|                                           | Connection Type and Location |       |               |                | Field Installation Kits② |                |
|                                           | 18-inch Pigtail Leads        |       |               | Terminal Block | Pigtail Leads            | Terminal Block |
|                                           | Same Side                    | Rear③ | Opposite Side | Same Side      |                          |                |
|                                           | Suffix Numbers               |       |               |                | Catalog Numbers          |                |

**Left-Pole Mounting Ac Ratings③**

|             |     |     |     |     |           |           |
|-------------|-----|-----|-----|-----|-----------|-----------|
| 12 Vac      | U05 | U06 | U07 | U08 | UVH3LP02K | UVH3LT02K |
| 24 Vac      | U09 | U10 | U11 | U12 | UVH3LP03K | UVH3LT03K |
| 48-60 Vac   | U13 | U14 | U15 | U16 | UVH3LP05K | UVH3LT05K |
| 110-127 Vac | U17 | U18 | U19 | U20 | UVH3LP08K | UVH3LT08K |
| 208-240 Vac | U21 | U22 | U23 | U24 | UVH3LP11K | UVH3LT11K |
| 380-480 Vac | U25 | U26 | U27 | U28 | UVH3LP15K | UVH3LT15K |

**Right-Pole Mounting Ac Ratings④⑤**

|             |     |     |     |     |           |           |
|-------------|-----|-----|-----|-----|-----------|-----------|
| 12 Vac      | U37 | U38 | U39 | U40 | UVH3RP02K | UVH3RT02K |
| 24 Vac      | U41 | U42 | U43 | U44 | UVH3RP03K | UVH3RT03K |
| 48-60 Vac   | U45 | U46 | U47 | U48 | UVH3RP05K | UVH3RT05K |
| 110-127 Vac | U49 | U50 | U51 | U52 | UVH3RP08K | UVH3RT08K |
| 208-240 Vac | U53 | U54 | U55 | U56 | UVH3RP11K | UVH3RT11K |
| 380-480 Vac | U57 | U58 | U59 | U60 | UVH3RP15K | UVH3RT15K |

**Left-Pole Mounting Dc Ratings③**

|             |     |     |     |     |           |           |
|-------------|-----|-----|-----|-----|-----------|-----------|
| 12 Vdc      | T01 | T02 | T03 | T04 | UVH3LP20K | UVH3LT20K |
| 24 Vdc      | T05 | T06 | T07 | T08 | UVH3LP21K | UVH3LT21K |
| 48-60 Vdc   | T09 | T10 | T11 | T12 | UVH3LP23K | UVH3LT23K |
| 110-127 Vdc | T13 | T14 | T15 | T16 | UVH3LP26K | UVH3LT26K |
| 220-250 Vdc | T17 | T18 | T19 | T20 | UVH3LP28K | UVH3LT28K |

**Right-Pole Mounting Dc Ratings④⑤**

|             |     |     |     |     |           |           |
|-------------|-----|-----|-----|-----|-----------|-----------|
| 12 Vdc      | T21 | T22 | T23 | T24 | UVH3RP20K | UVH3RT20K |
| 24 Vdc      | T25 | T26 | T27 | T28 | UVH3RP21K | UVH3RT21K |
| 48-60 Vdc   | T29 | T30 | T31 | T32 | UVH3RP23K | UVH3RT23K |
| 110-127 Vdc | T33 | T34 | T35 | T36 | UVH3RP26K | UVH3RT26K |
| 220-250 Vdc | T37 | T38 | T39 | T40 | UVH3RP28K | UVH3RT28K |

Instruction Leaflet/FRED Number 29C166

- ① Endurance: 5,000 electrical operations plus 1,000 mechanical operations
- ② Listed with Underwriters Laboratories, Inc., for field installation under E64983.
- ③ Standard mounting location — leads exit rear of breaker.
- ④ For use with KT (thermal-magnetic) trip units only.
- ⑤ Not for use on right pole of 4-pole circuit breaker.

## Undervoltage Release Mechanism

## L- and M-Frames

## Electrical Rating Data ①

| 50/60 Hz                 |                 |       |                |                          | Dc                |                  |                  |                  |                   |
|--------------------------|-----------------|-------|----------------|--------------------------|-------------------|------------------|------------------|------------------|-------------------|
| Supply Voltage           | Dropout Voltage |       | Pickup Voltage | VA                       | Supply Voltage    | Dropout Voltage  |                  | Pickup Voltage   | VA                |
|                          | Min.            | Max.  | Max.           |                          |                   | Min.             | Max.             | Max.             |                   |
| 12                       | 4.2             | 8.4   | 10.2           | 1.9                      | 12                | 4.2              | 8.4              | 10.2             | 1.6               |
| 24                       | 8.4             | 16.8  | 20.4           | 3.9                      | 24                | 8.4              | 16.8             | 20.4             | 3.1               |
| 48<br>60                 | 21.0            | 33.6  | 40.8           | 2.5<br>3.8               | 48<br>60          | 21.0             | 33.6             | 40.8             | 2.0<br>3.1        |
| 110<br>120<br>127        | 44.5            | 77.0  | 93.5           | 1.8<br>2.1<br>2.4        | 110<br>120<br>125 | 44.5             | 77.0             | 93.5             | 1.6<br>1.9<br>2.2 |
| 208<br>220<br>240        | 85.0            | 145.6 | 176.8          | 2.7<br>3.1<br>3.8        | 220<br>250<br>—   | 87.5             | 154.0            | 187.0            | 3.1<br>4.0<br>—   |
| 380<br>415<br>440<br>480 | 168.0           | 266.0 | 323.0          | 3.4<br>4.0<br>4.6<br>5.4 | —<br>—<br>—<br>—  | —<br>—<br>—<br>— | —<br>—<br>—<br>— | —<br>—<br>—<br>— | —<br>—<br>—<br>—  |

## Undervoltage Release Mechanism

| Voltage Rating<br>(Ac Freq =<br>50/60 Hz) | Factory Mounted              |                   |               |                | Field Mounted                        |                |
|-------------------------------------------|------------------------------|-------------------|---------------|----------------|--------------------------------------|----------------|
|                                           | Connection Type and Location |                   |               |                | Field Installation Kits <sup>②</sup> |                |
|                                           | 18-inch Pigtail Leads        |                   |               | Terminal Block | Pigtail Leads                        | Terminal Block |
|                                           | Same Side                    | Rear <sup>③</sup> | Opposite Side | Same Side      |                                      |                |
|                                           | Suffix Numbers               |                   |               |                | Catalog Numbers                      |                |

Left-Pole Mounting Ac Ratings<sup>③</sup>

|             |     |     |     |     |           |           |
|-------------|-----|-----|-----|-----|-----------|-----------|
| 12 Vac      | U05 | U06 | U07 | U08 | UVH4LP02K | UVH4LT02K |
| 24 Vac      | U09 | U10 | U11 | U12 | UVH4LP03K | UVH4LT03K |
| 48-60 Vac   | U13 | U14 | U15 | U16 | UVH4LP05K | UVH4LT05K |
| 110-127 Vac | U17 | U18 | U19 | U20 | UVH4LP08K | UVH4LT08K |
| 208-240 Vac | U21 | U22 | U23 | U24 | UVH4LP11K | UVH4LT11K |
| 380-480 Vac | U25 | U26 | U27 | U28 | UVH4LP15K | UVH4LT15K |

Right-Pole Mounting Ac Ratings<sup>④⑤</sup>

|             |     |     |     |     |           |           |
|-------------|-----|-----|-----|-----|-----------|-----------|
| 12 Vac      | U37 | U38 | U39 | U40 | UVH4RP02K | UVH4RT02K |
| 24 Vac      | U41 | U42 | U43 | U44 | UVH4RP03K | UVH4RT03K |
| 48-60 Vac   | U45 | U46 | U47 | U48 | UVH4RP05K | UVH4RT05K |
| 110-127 Vac | U49 | U50 | U51 | U52 | UVH4RP08K | UVH4RT08K |
| 208-240 Vac | U53 | U54 | U55 | U56 | UVH4RP11K | UVH4RT11K |
| 380-480 Vac | U57 | U58 | U59 | U60 | UVH4RP15K | UVH4RT15K |

Left-Pole Mounting Dc Ratings<sup>③</sup>

|             |     |     |     |     |           |           |
|-------------|-----|-----|-----|-----|-----------|-----------|
| 12 Vdc      | T01 | T02 | T03 | T04 | UVH4LP20K | UVH4LT20K |
| 24 Vdc      | T05 | T06 | T07 | T08 | UVH4LP21K | UVH4LT21K |
| 48-60 Vdc   | T09 | T10 | T11 | T12 | UVH4LP23K | UVH4LT23K |
| 110-127 Vdc | T13 | T14 | T15 | T16 | UVH4LP26K | UVH4LT26K |
| 220-250 Vdc | T17 | T18 | T19 | T20 | UVH4LP28K | UVH4LT28K |

Right-Pole Mounting Dc Ratings<sup>④⑤</sup>

|             |     |     |     |     |           |           |
|-------------|-----|-----|-----|-----|-----------|-----------|
| 12 Vdc      | T21 | T22 | T23 | T24 | UVH4RP20K | UVH4RT20K |
| 24 Vdc      | T25 | T26 | T27 | T28 | UVH4RP21K | UVH4RT21K |
| 48-60 Vdc   | T29 | T30 | T31 | T32 | UVH4RP23K | UVH4RT23K |
| 110-127 Vdc | T33 | T34 | T35 | T36 | UVH4RP26K | UVH4RT26K |
| 220-250 Vdc | T37 | T38 | T39 | T40 | UVH4RP28K | UVH4RT28K |

Instruction Leaflet/FRED Number 29C170

- ① Endurance: 5000 electrical operations plus 1000 mechanical operations
- ② Listed with Underwriters Laboratories, Inc. for field installation under E64983.
- ③ Standard mounting location — leads exit rear of breaker.
- ④ For use with LT (thermal-magnetic) trip units only.
- ⑤ Not for use on right pole of 4-pole circuit breaker.



**Undervoltage Release Mechanism**
**N-Frame**
**Electrical Rating Data ①**

| 50/60 Hz                 |                 |       |                |                          | Dc                |                  |                  |                  |                   |
|--------------------------|-----------------|-------|----------------|--------------------------|-------------------|------------------|------------------|------------------|-------------------|
| Supply Voltage           | Dropout Voltage |       | Pickup Voltage | VA                       | Supply Voltage    | Dropout Voltage  |                  | Pickup Voltage   | VA                |
|                          | Min.            | Max.  | Max.           |                          |                   | Min.             | Max.             | Max.             |                   |
| 12                       | 4.2             | 8.4   | 10.2           | 1.9                      | 12                | 4.2              | 8.4              | 10.2             | 1.6               |
| 24                       | 8.4             | 16.8  | 20.4           | 3.9                      | 24                | 8.4              | 16.8             | 20.4             | 3.1               |
| 48<br>60                 | 21.0            | 33.6  | 40.8           | 2.5<br>3.8               | 48<br>60          | 21.0             | 33.6             | 40.8             | 2.0<br>3.1        |
| 110<br>120<br>127        | 44.5            | 77.0  | 93.5           | 1.8<br>2.1<br>2.4        | 110<br>120<br>125 | 44.5             | 77.0             | 93.5             | 1.6<br>1.9<br>2.2 |
| 208<br>220<br>240        | 84.0            | 145.6 | 176.8          | 2.7<br>3.1<br>3.8        | 220<br>250        | 87.5<br>—        | 154.0<br>—       | 187.0<br>—       | 3.1<br>4.0        |
| 380<br>415<br>480<br>500 | 175.0           | 266.0 | 323.0          | 3.4<br>4.0<br>4.6<br>5.4 | —<br>—<br>—<br>—  | —<br>—<br>—<br>— | —<br>—<br>—<br>— | —<br>—<br>—<br>— | —<br>—<br>—<br>—  |

**Undervoltage Release Mechanism**

| Voltage Rating<br>(Ac Freq =<br>50/60 Hz) | Factory Mounted              |       |               |                | Field Mounted            |                |
|-------------------------------------------|------------------------------|-------|---------------|----------------|--------------------------|----------------|
|                                           | Connection Type and Location |       |               |                | Field Installation Kits② |                |
|                                           | 18-inch Pigtail Leads        |       |               | Terminal Block | Pigtail Leads            | Terminal Block |
|                                           | Same Side                    | Rear③ | Opposite Side | Same Side      |                          |                |
|                                           | Suffix Numbers               |       |               |                | Catalog Numbers          |                |

**Left-Pole Mounting Ac Ratings③**

|             |     |     |      |     |           |           |
|-------------|-----|-----|------|-----|-----------|-----------|
| 12 Vac      | U05 | U06 | U07  | U08 | UVH5LP02K | UVH5LT02K |
| 24 Vac      | U09 | U10 | U11  | U12 | UVH5LP03K | UVH5LT03K |
| 48-60 Vac   | U13 | U14 | U153 | U16 | UVH5LP05K | UVH5LT05K |
| 110-127 Vac | U17 | U18 | U19  | U20 | UVH5LP08K | UVH5LT08K |
| 208-240 Vac | U21 | U22 | U23  | U24 | UVH5LP11K | UVH5LT11K |
| 380-480 Vac | U25 | U26 | U27  | U28 | UVH5LP29K | UVH5LT29K |

**Left-Pole Mounting Dc Ratings③**

|             |     |     |     |     |           |           |
|-------------|-----|-----|-----|-----|-----------|-----------|
| 12 Vdc      | T01 | T02 | T03 | T04 | UVH5LP20K | UVH5LT20K |
| 24 Vdc      | T05 | T06 | T07 | T08 | UVH5LP21K | UVH5LT21K |
| 48-60 Vdc   | T09 | T10 | T11 | T12 | UVH5LP23K | UVH5LT23K |
| 110-127 Vdc | T13 | T14 | T15 | T16 | UVH5LP26K | UVH5LT26K |
| 220-250 Vdc | T17 | T18 | T19 | T20 | UVH5LP28K | UVH5LT28K |

Instruction Leaflet/FRED Number 29C174

① Endurance: 3000 electrical operations plus 1000 mechanical operations.

③ Listed with Underwriters Laboratories, Inc. for field installation under E64983.

③ Standard mounting location – leads exit rear of breaker.

## Undervoltage Release Mechanism

## R-Frame

Ac Undervoltage Release Mechanism (Handle Reset) Ratings<sup>①②</sup>

| Catalog Suffix | Application Ratings<br>Voltage (V) | Electrical Operating Ratings    |              |                  |                         | Approximate Operating Time (ms)  |                    |                                                |                                         |                                   |
|----------------|------------------------------------|---------------------------------|--------------|------------------|-------------------------|----------------------------------|--------------------|------------------------------------------------|-----------------------------------------|-----------------------------------|
|                |                                    | Supply Voltage (V)              | Dropout Min. | Voltage (V) Max. | Pickup Voltage (V) Max. | VA                               | Min.③ UVR Response | Initiation④ Circuit Breaker Contact Separation | Maximum Circuit Breaker Contact Opening | Dielectric⑤ Withstand Voltage (V) |
| 02/02K         | 12                                 | 12                              | 4.2          | 8.4              | 10.2                    | 2.3                              | 5                  | 46                                             | 77                                      | 1024                              |
| 03/03K         | 24                                 | 24                              | 8.4          | 16.8             | 20.4                    | 3.1                              | 5                  | 46                                             | 77                                      | 1048                              |
| 05/05K         | 48-60                              | 48<br>60                        | 21.0         | 33.5             | 40.8                    | 3.4<br>6.0                       | 5                  | 46                                             | 77                                      | 1120                              |
| 08/08K         | 110-127                            | 110<br>120<br>127               | 44.5         | 77.0             | 93.5                    | 3.3<br>3.6<br>3.8                | 5                  | 46                                             | 77                                      | 1254                              |
| 11/11K         | 208-240                            | 208<br>220<br>240               | 84.0         | 145.6            | 176.8                   | 4.2<br>6.6<br>7.2                | 5                  | 46                                             | 77                                      | 1480                              |
| 29/29K         | 380-500                            | 380<br>415<br>440<br>480<br>500 | 168.0        | 266.0            | 323.0                   | 3.8<br>8.3<br>8.8<br>9.6<br>10.0 | 5                  | 46                                             | 77                                      | 2000                              |

Dc Undervoltage Release Mechanism (Handle Reset) Ratings<sup>①②</sup>

| Catalog Suffix | Application Ratings<br>Voltage (V) | Electrical Operating Ratings |              |                  |                         | Approximate Operating Time (ms) |                    |                                                |                                         |                                   |
|----------------|------------------------------------|------------------------------|--------------|------------------|-------------------------|---------------------------------|--------------------|------------------------------------------------|-----------------------------------------|-----------------------------------|
|                |                                    | Supply Voltage (V)           | Dropout Min. | Voltage (V) Max. | Pickup Voltage (V) Max. | VA                              | Min.③ UVR Response | Initiation④ Circuit Breaker Contact Separation | Maximum Circuit Breaker Contact Opening | Dielectric⑤ Withstand Voltage (V) |
| 20/20K         | 12                                 | 12                           | 4.2          | 8.4              | 10.2                    | 3.4                             | 5                  | 46                                             | 77                                      | 1024                              |
| 21/21K         | 24                                 | 24                           | 8.4          | 16.8             | 20.4                    | 4.3                             | 5                  | 46                                             | 77                                      | 1048                              |
| 23/23K         | 48-60                              | 48<br>60                     | 21.0         | 33.5             | 40.8                    | 4.8<br>7.2                      | 5                  | 46                                             | 77                                      | 1120                              |
| 26/26K         | 110-127                            | 110<br>120<br>125            | 43.8         | 77.0             | 93.5                    | 3.3<br>3.6<br>3.8               | 5                  | 46                                             | 77                                      | 1250                              |
| 28/28K         | 220-250                            | 220<br>250                   | 87.5         | 154.0            | 187.0                   | 6.6<br>7.5                      | 5                  | 46                                             | 77                                      | 1500                              |

## Undervoltage Release Mechanism (RH only)

| Voltage Rating<br>(Ac Freq = 50/60 Hz) | Factory Mounted              |  | Field Mounted                        |  |
|----------------------------------------|------------------------------|--|--------------------------------------|--|
|                                        | Connection Type and Location |  | Field Installation Kits <sup>①</sup> |  |
|                                        | 18-inch Pigtail Leads        |  | Pigtail Leads                        |  |
|                                        | Suffix Numbers <sup>②</sup>  |  | Catalog Numbers <sup>②</sup>         |  |
| 12 Vac                                 | U37                          |  | UVH6RP02K                            |  |
| 24 Vac                                 | U41                          |  | UVH6RP03K                            |  |
| 48-60 Vac                              | U45                          |  | UVH6RP05K                            |  |
| 110-127 Vac                            | U49                          |  | UVH6RP08K                            |  |
| 208-240 Vac                            | U53                          |  | UVH6RP11K                            |  |
| 380-500 Vac                            | U57                          |  | UVH6RP29K                            |  |
| 12 Vdc                                 | T21                          |  | UVH6RP20K                            |  |
| 24 Vdc                                 | T25                          |  | UVH6RP21K                            |  |
| 48-60 Vdc                              | T29                          |  | UVH6RP23K                            |  |
| 110-125 Vdc                            | T33                          |  | UVH6RP26K                            |  |
| 220-250 Vdc                            | T37                          |  | UVH6RP28K                            |  |

① Endurance – 500 electrical operations plus 2500 mechanical operations.

② Pigtail wire size – No. 18 AWG (0.82 mm<sup>2</sup>). Leads are orange and brown.

③ UVR will override a momentary voltage dip up to the response time shown.

④ Unlatching occurs 1 millisecond before circuit breaker contacts begin to separate.

⑤ For 1 minute.

Instruction Leaflet/FRED Number 29C178

**Accessory Terminal Block/Cutler-Hammer PowerNet Communications Kit (OPTIM 550 only)**
**Accessory Terminal Block  
(R-Frame)**

(For Fixed Mounted Configuration)


**General Information**

Internal accessory wiring leads are normally supplied with pigtail leads (No. 18 AWG) that exit from the right side of the circuit breaker. Where specified, fixed mounted accessory terminal blocks are available. A maximum of one 24-point terminal block can be installed on the right side of the circuit breaker for the internal accessories.

For convenience in determining the appropriate number of terminal block points required, refer to table at right.

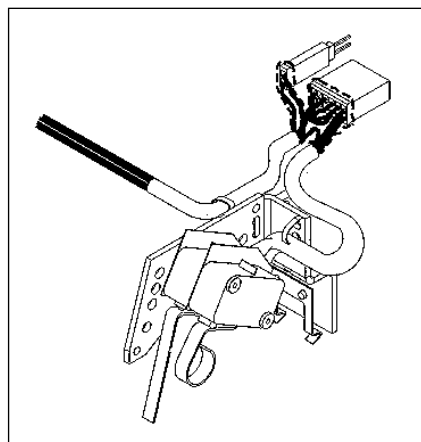
**Number of Control Wires For Each Internally Mounted Accessories**

| Type of Accessory                 | Number of Contacts Per Single Accessory | Required Number of Wires |
|-----------------------------------|-----------------------------------------|--------------------------|
| Auxiliary Switch                  | 2a/2b<br>4a/4b                          | 6<br>12                  |
| Alarm (Signal)/<br>Lockout Switch | 1m/1b<br>2m/2b                          | 6<br>12                  |
| Shunt Trip                        | N/A                                     | 2                        |
| Low Energy Shunt                  | N/A                                     | 2                        |
| Undervoltage Release Mechanism    | N/A                                     | 2                        |

**Ordering Information<sup>①</sup>**

| Factory Installed | Field Mounted  |
|-------------------|----------------|
| Suffix Number     | Catalog Number |
| <b>Q01</b>        | <b>TBRDK</b>   |

Instruction Leaflet/FRED Number 29C312

**Cutler-Hammer PowerNet Communications Kit (OPTIM 550 only) K-, L-, and N-Frames**

**General Information**

The Cutler-Hammer PowerNet Communications Kit can be ordered to add Cutler-Hammer PowerNet communications to an existing OPTIM 550 breaker in the field. An 18-inch wiring pigtail is routed to the rear of the breaker: two wires for Cutler-Hammer PowerNet and two wires for 24V Dc (45 mA load). It is recommended that the power supply be an "isolated high quality" unit.

**Ordering Information**
**Cutler-Hammer PowerNet  
Communications Kit**

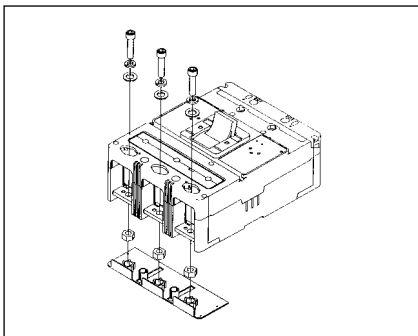
| Circuit Breaker                                    | Catalog Numbers                                    |
|----------------------------------------------------|----------------------------------------------------|
| <b>K-Frame</b><br><b>L-Frame</b><br><b>N-Frame</b> | <b>ICK550K</b><br><b>ICK550L</b><br><b>ICK550N</b> |

 Instruction Leaflet/FRED Number 29C506,  
29C897, 29C898

<sup>①</sup> One 24-point accessory terminal block provided with circuit breaker when ordered factory installed or shipped from warehouse as separate item when ordered for field installation. See Digitrip RMS master connection diagram (IL 29C714).

## Termination Hardware – Ring Type

## Endcap Kit



The endcap kit slides onto the line or load conductor of the circuit breaker and acts as a threaded adapter for the conductor to accept a ring terminal or other bolt-on connector. The endcap kit is available with English and metric thread sizes. Screws and washers are supplied by customer. (Field installation only.) Listed per UL File E7819.

## Ordering Information

| Thread Type | Thread Size | Catalog Number                         |
|-------------|-------------|----------------------------------------|
|             |             | Package of 12<br>(Priced Individually) |

## F-Frame

|                    |              |                               |
|--------------------|--------------|-------------------------------|
| Imperial<br>Metric | 10-32<br>M-5 | <b>KPEK1</b><br><b>KPEK1M</b> |
|--------------------|--------------|-------------------------------|

## J-Frame

|                    |              |                               |
|--------------------|--------------|-------------------------------|
| Imperial<br>Metric | 10-32<br>M-5 | <b>KPEK2</b><br><b>KPEK2M</b> |
|--------------------|--------------|-------------------------------|

## K-Frame

|                    |              |                               |
|--------------------|--------------|-------------------------------|
| Imperial<br>Metric | 10-32<br>M-5 | <b>KPEK3</b><br><b>KPEK3M</b> |
|--------------------|--------------|-------------------------------|

## L-Frame

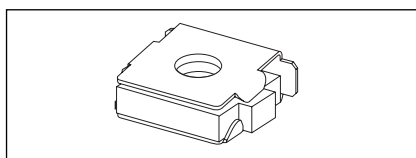
|                    |              |                               |
|--------------------|--------------|-------------------------------|
| Imperial<br>Metric | 10-32<br>M-5 | <b>KPEK4</b><br><b>KPEK4M</b> |
|--------------------|--------------|-------------------------------|

## Keeper Nut

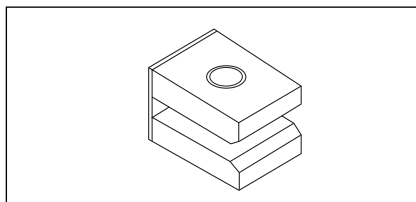
The keeper nut slides onto the line or load conductor of the circuit breaker and acts as a threaded adapter for the conductor to accept a ring terminal or other bolt-on connector. The keeper nut is available with English and metric thread sizes. Screws and washers are supplied by customer. (Field installation only.) Listed per UL File E7819.

## Ordering Information

## F-Frame



| Thread Type        | Thread Size  | Catalog Number                         |
|--------------------|--------------|----------------------------------------|
|                    |              | Package of 12<br>(Priced Individually) |
| Imperial<br>Metric | 10-32<br>M-5 | <b>KPR1A</b><br><b>KPR1AM</b>          |



## K-Frame

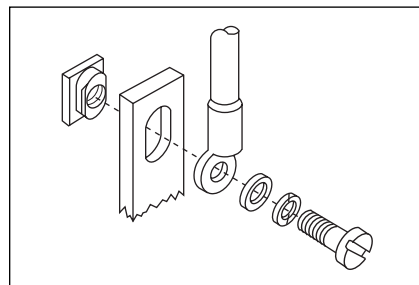
| Thread Type | Thread Size | Line/<br>Load End | Catalog Number                 |
|-------------|-------------|-------------------|--------------------------------|
|             |             |                   | Package of 3                   |
| Imperial    | .375-16     | Line<br>Load      | <b>KPR3A</b><br><b>KPR3B</b>   |
| Metric      | M-8         | Line<br>Load      | <b>KPR3AM</b><br><b>KPR3BM</b> |

## L-, M-, N-Frames

Not required. Terminals are threaded.

## Plug Nut

## J-Frame



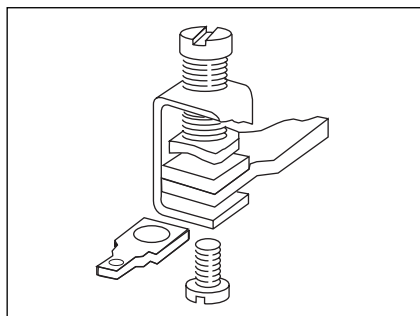
The plug nut is used in applications where screw-connected ring-type terminals are preferred to connect cables to circuit breaker conductors. The plug nut is press-fit into the opening in the circuit breaker terminal conductor. Screws and washers are supplied by customer.

## Ordering Information

| Thread Type        | Thread Size    | Catalog Number              |
|--------------------|----------------|-----------------------------|
|                    |                | Package of 6                |
| Imperial<br>Metric | .250-20<br>M-6 | <b>PLN2</b><br><b>PLN2M</b> |

## Control Wire Terminal Kit

### F-Frame



The control wire terminal kit provides a means to tap off control power from a main disconnect using the provided male end of a quick disconnect.

For use with steel or stainless steel<sup>①</sup> terminals only.

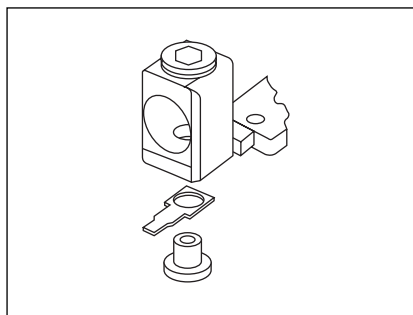
### Ordering Information

Package of 12 control wire terminal tangs. Terminals must be ordered separately. Priced individually.

| Catalog Number |
|----------------|
| <b>FCWTK</b>   |

### J- and K-Frames

Not for use with T250KB terminals.



### Ordering Information

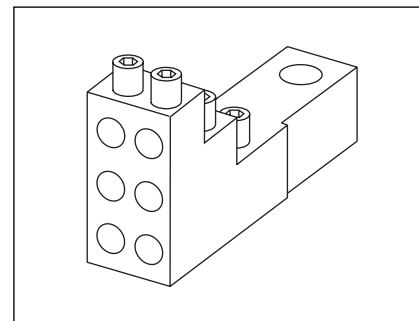
Package of 12 control wire terminal tangs. Terminals must be ordered separately. Priced individually.

| Catalog Number |
|----------------|
| <b>KCWTK</b>   |

### L-Frame

| AWG Wire Range/Number Conductors | Metric Wire Range mm <sup>2</sup> | Catalog Number                               |
|----------------------------------|-----------------------------------|----------------------------------------------|
| Al/Cu<br>(2) 250 – 350 kcmil     | 120-150                           | <b>TA602LDCW</b> <sup>②</sup>                |
| Cu<br>(2) 3/0 – 350 kcmil        | 120-150                           | <b>T602LDCW</b> <sup>②</sup>                 |
| Al/Cu<br>(2) 400 – 500 kcmil     | 185-240                           | <b>2TA603LDCW</b> <sup>①</sup><br>2-Pole Kit |
| Al/Cu<br>(2) 400 – 500 kcmil     | 185-240                           | <b>3TA603LDCW</b> <sup>①</sup><br>3-Pole Kit |
| Al/Cu<br>(2) 400 – 500 kcmil     | 185-240                           | <b>4TA603LDCW</b> <sup>①</sup><br>4-Pole Kit |

## Multi-Wire Connectors



Field-installed multi-wire connectors for the load side (OFF) end terminals. They are used to distribute the load from the circuit breaker to multiple devices without the use of separate distribution terminal blocks.

Multi-wire lug kits include mounting hardware, insulators and tin-plated aluminum connectors to replace three mechanical load lugs. UL listed for copper only as used on the load side (OFF) end.

### Ordering Information

Package of 3.

| Maximum Amperes | Wires Per Terminal | Wire Size Range AWG Cu | Kit Catalog Number |
|-----------------|--------------------|------------------------|--------------------|
|-----------------|--------------------|------------------------|--------------------|

#### F-Frame

|     |   |       |                  |
|-----|---|-------|------------------|
| 225 | 3 | #14-2 | <b>3TA150F3K</b> |
| 225 | 6 | #14-6 | <b>3TA150F6K</b> |

#### J-Frame

|     |   |       |                  |
|-----|---|-------|------------------|
| 225 | 3 | #14-2 | <b>3TA250J3K</b> |
| 225 | 6 | #14-6 | <b>3TA250J6K</b> |

#### K-Frame

|     |   |         |                  |
|-----|---|---------|------------------|
| 400 | 3 | #12-2/0 | <b>3TA400K3K</b> |
| 400 | 6 | #14-2/0 | <b>3TA400K6K</b> |

<sup>①</sup> Terminal kits contain one terminal for each pole and one terminal cover.

<sup>②</sup> Individually packed.

## Base Mounting Hardware

## Base Mounting Hardware

## Ordering Information

Hardware for surface mounting of circuit breakers is supplied only on request. Hardware consists of mounting screws and lockwashers. Order hardware for circuit breaker pole configurations as required.

| Screw Length | Style Number |
|--------------|--------------|
|--------------|--------------|

## G-Frame

|                 |            |
|-----------------|------------|
| 2.625 (66.7 mm) | 624B375G23 |
| 3.000 (76.2 mm) | 8703C80G05 |

## Imperial Thread

| Number of Poles | Description                                                         | Type of Mounting                                                | Style / Catalog Number   | Number of Poles | Description                                                     | Type of Mounting                                                | Style / Catalog Number   |
|-----------------|---------------------------------------------------------------------|-----------------------------------------------------------------|--------------------------|-----------------|-----------------------------------------------------------------|-----------------------------------------------------------------|--------------------------|
| <b>F-Frame</b>  |                                                                     |                                                                 |                          |                 |                                                                 |                                                                 |                          |
| 1               | .164-32 x 3.188 inch Pan-Head Steel Screws, Lockwashers, and Clamps | Individual Group (one set of hardware for two circuit breakers) | 624B375G01<br>624B375G02 | 1               | M4 - 0.7 x 80 mm Pan-Head Steel Screws, Lockwashers, and Clamps | Individual Group (one set of hardware for two circuit breakers) | 4218B80G09<br>4218B80G10 |
| 2               | .164-32 x 1.5 inch Pan-Head Steel Screws and Lockwashers            | Individual                                                      | 4218B80G01               | 2               | M4 - 0.7 x 38 mm Pan-Head Steel Screws and Lockwashers          | Individual                                                      | 4218B80G11               |
| 3, 4            | .164-32 x 1.5 inch Pan-Head Steel Screws and Lockwashers            | Individual                                                      | BMH1                     | 3, 4            | M4 - 0.7 x 38 mm Pan-Head Steel Screws and Lockwashers          | Individual                                                      | BMH1M                    |

## J-Frame

|         |                                                            |            |      |         |                                                       |            |       |
|---------|------------------------------------------------------------|------------|------|---------|-------------------------------------------------------|------------|-------|
| 2, 3, 4 | 0.250-20 x 2.75 inch Pan-Head Steel Screws and Lockwashers | Individual | BMH2 | 2, 3, 4 | M6 - 0.7 x 70mm Pan-Head Steel Screws and Lockwashers | Individual | BMH2M |
|---------|------------------------------------------------------------|------------|------|---------|-------------------------------------------------------|------------|-------|

## K-Frame

|         |                                                           |            |      |         |                                                       |            |       |
|---------|-----------------------------------------------------------|------------|------|---------|-------------------------------------------------------|------------|-------|
| 2, 3, 4 | 0.250-20 x 1.5 inch Pan-Head Steel Screws and Lockwashers | Individual | BMH3 | 2, 3, 4 | M6 - 0.7 x 38mm Pan-Head Steel Screws and Lockwashers | Individual | BMH3M |
|---------|-----------------------------------------------------------|------------|------|---------|-------------------------------------------------------|------------|-------|

## L-Frame

|         |                                                                                 |            |      |      |   |            |       |
|---------|---------------------------------------------------------------------------------|------------|------|------|---|------------|-------|
| 2, 3, 4 | 0.250-20 x 1.5 inch Filister-Head Steel Screws and Lockwashers and Flat Washers | Individual | BMH4 | 2, 3 | — | Individual | BMH4M |
|---------|---------------------------------------------------------------------------------|------------|------|------|---|------------|-------|

## M-Frame

|      |                                                                                   |            |      |      |   |            |       |
|------|-----------------------------------------------------------------------------------|------------|------|------|---|------------|-------|
| 2, 3 | 0.3125-18 x 1.25 inch Filister-Head Steel Screws and Lockwashers and Flat Washers | Individual | BMH5 | 2, 3 | — | Individual | BMH5M |
|------|-----------------------------------------------------------------------------------|------------|------|------|---|------------|-------|

## N-Frame

|         |                                                             |  |      |      |   |            |       |
|---------|-------------------------------------------------------------|--|------|------|---|------------|-------|
| 2, 3, 4 | 0.3125-18 x 1.25 inch Pan-Head Steel Screws and Lockwashers |  | BMH5 | 2, 3 | — | Individual | BMH5M |
|---------|-------------------------------------------------------------|--|------|------|---|------------|-------|

## R-Frame

|                      |  |  |  |  |  |  |  |
|----------------------|--|--|--|--|--|--|--|
| Supplied by customer |  |  |  |  |  |  |  |
|----------------------|--|--|--|--|--|--|--|

## Drawout Cassette

## Drawout Cassette



The drawout cassette is currently for use with the standard 3-pole 65 kA/480 Vac, 1600A and 2000A RD circuit breakers only. It consists of two separate components: the movable mechanism which is factory mounted to the circuit breaker frame (shown in figure) and the stationary mechanism which is housed in the cassette and shipped separately.

The drawout mechanism has four positions.

- Connected – The breaker is fully connected to the primary stabs and secondary contacts.
- Test – The breaker is not connected to the primary stab but is connected to the secondary contacts.
- Disconnected – Both the primary stabs and the secondary contacts are disconnected.
- Withdraw – The breaker can be removed from the cassette.

## Ordering Information

## RD Drawout Cassette

65 kA/480 Vac version

| Description          | Catalog Number                                                             |
|----------------------|----------------------------------------------------------------------------|
| Movable Mechanism    | <b>RD20DOM</b>                                                             |
| Stationary Mechanism | <b>RD20DOS</b><br>(without shutters)<br><b>RD20DOSS</b><br>(with shutters) |

Instruction Leaflet/FRED Number 32697

**Note:** Movable mechanism must be ordered with RD or RDC circuit breaker and is shipped mounted to circuit breaker frame. Stationary mechanism is ordered separately.

All internal accessories must be factory installed for use with drawout.

## RD Drawout Cassette

100 kA/480 Vac version

| Description          | Catalog Number                                                             |
|----------------------|----------------------------------------------------------------------------|
| Movable Mechanism    | <b>RD20DOM</b>                                                             |
| Stationary Mechanism | <b>RD20DOS</b><br>(without shutters)<br><b>RD20DOSS</b><br>(with shutters) |

Instruction Leaflet/FRED Number 32697

## Terminal Shields

Terminal shields provide protection against accidental contact with live line side terminations. Terminal shields are fabricated from high dielectric insulating material and fasten over the front terminal access openings. Small openings in the shields provide limited access to the terminals for tightening connectors. (Field installation only.)

## Ordering Information

### G-Frame

#### Terminal Shield

| Number Units in Package | Style Number |
|-------------------------|--------------|
| 10                      | GTSK3        |

### J-Frame



| Number of Poles | Location | Style Number (Package of 10) |
|-----------------|----------|------------------------------|
| 2, 3<br>4       | Line End | 1266C07G01<br>6631C01G01     |
| 2, 3<br>4       | Load End | 6641C16G01<br>6641C16G02     |

### L-Frame



| Style Number (Package of 1) |
|-----------------------------|
| 314CA420G01                 |

### F-Frame



| Number of Poles | Location | Style Number                                   |                                                                          |
|-----------------|----------|------------------------------------------------|--------------------------------------------------------------------------|
|                 |          | Standard (Package of 10) (Priced Individually) | Special - For use when electrical operator is mounted on circuit breaker |
| 1               | Line     | 625B229G06                                     | —                                                                        |
| 2               |          | 625B229G07                                     | —                                                                        |
| 3               |          | 625B229G08                                     | 4210B95G01                                                               |
| 4               |          | 625B229G09                                     | 4210B95G02                                                               |

### K-Frame



| Number of Poles | Location | Catalog Number (Package of 10) |
|-----------------|----------|--------------------------------|
| 2, 3            | Line     | TS33LN                         |
| 4               | Line     | TS34LN                         |
| 3               | Load     | TS33LD                         |

### M-Frame



| Style Number (Package of 1) |
|-----------------------------|
| 4203B20G01                  |



## Termination Hardware

## Terminal End Covers

### F-Frame



The terminal end covers are designed for use in motor control center applications where, because of confined spaces, line side conductors are normally custom fitted. The molded end covers are made of high dielectric glass-polyester and slide over the line ends of the circuit breaker. Close fitting conductor openings are molded into the end covers. The end cover and circuit breaker case fit together to form terminal compartments that isolate discharged ionizing gases during circuit breaker tripping. Terminal end covers are available with two conductor opening diameters, 0.25 and 0.41 inch, and are listed per UL File E7819. (Field installation only.)

### Ordering Information

The terminal end cover is available for 3-pole circuit breakers only. Two conductor opening sizes are available. Specify quantity (one per circuit breaker) when ordering.

| Conductor Opening Diameter (Inches) | Catalog Number |
|-------------------------------------|----------------|
| 0.25 (6.35 mm)                      | TEC1           |
| 0.41 (10.41 mm)                     | TEC2           |

## Interphase Barriers

The interphase barriers provide additional electrical clearance between circuit breaker poles for special termination applications. The barriers are high dielectric insulating plates that are installed in the molded slots between the terminals. (Field installation only.) Two per package.



| Frame | Catalog Number |
|-------|----------------|
| F     | IPB1           |
| J     | IPB2           |
| K     | IPB3           |
| L     | IPB4           |
| M     | IPB4           |
| N     | IPB5           |

Base Mounting Adapters

Base Mounting Plate<sup>①</sup>  
G-Frame GD/GC/GHC



Ordering Information

| Number Units in Package | Style Number |
|-------------------------|--------------|
| 1                       | 207B513G01   |

DIN Rail Adapter<sup>②③</sup>  
G-Frame GD/GC/GHC

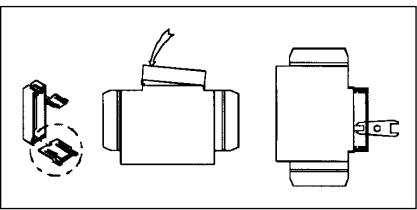


Ordering Information

| Number Units in Package | Style Number            |
|-------------------------|-------------------------|
| 10                      | 1225C79G01              |
| 10                      | 1225C79G02 <sup>④</sup> |

Instruction Leaflet/FRED Number 29C091

Key Operated Attachment  
G-Frame GD/GC/GHC



Ordering Information

| Number Units in Package | Style Number |
|-------------------------|--------------|
| 10                      | GK0A         |

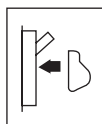
Instruction Leaflet/FRED Number 29C090

<sup>①</sup> Suitable for mounting (6) single-pole circuit breakers.  
<sup>②</sup> For use with standard 35 mm DIN Rail such as, 35 x 7.5 or 35 x 15 mm per DIN EN50022.  
<sup>③</sup> Adapter mounting screws included are for use with 2- and 3-pole circuit breakers. Adapters for 1-pole circuit breakers clip into the base molding.  
<sup>④</sup> For use on 3-pole breakers only.

**Handle Locking and Blocking Devices**
**Lock Dog (non-padlockable)  
G-Frame GD/GC/GHC/GB/  
GHB/GMCP**

**Ordering Information**

| Number Units in Package | Style Number |
|-------------------------|--------------|
| 1                       | 1294C01H01   |

**Non-Padlockable  
Handle Block**


The nonlockable handle block secures the circuit breaker handle in either the ON or OFF position. (Trip-free operation allows the circuit breaker to trip when the handle block holds the circuit breaker handle in the ON position.) The device is positioned over the circuit breaker handle and secured by a setscrew to deter accidental operation of the circuit breaker handle. Listed per UL File E7819. (Field installation only.)

**Ordering Information**

| Frame   | Catalog Number |
|---------|----------------|
| F       | LKD1           |
| J, K    | LKD3           |
| L, M, N | LKD4           |

**Padlockable Handle  
G-Frame GD/GC/GHC/GB/GHB**

**Ordering Information**

| Number Units in Package | Style Number |
|-------------------------|--------------|
| 10                      | 1223C77G03   |

(Accepts .285 Lock Shank)

**Padlockable Handle Block**


The device is positioned in the cover opening to prevent handle movement. Will accommodate one 5/16 padlock.

**Ordering Information**

| Frame | Catalog Number |
|-------|----------------|
| J, K  | PHB3           |

**Snap-On Padlockable  
Handle Lock Hasp**


The snap-on padlockable handle lock allows the handle to be locked in the OFF or ON position. (Trip-free operation allows the circuit breaker to trip when the handle lock holds the circuit breaker handle in the ON position.) This device was designed for use on the 1-pole circuit breaker, but may be used on 1-, 2-, 3-, and 4-pole styles. The handle lock snaps onto the escutcheon area of the handle with an optional retaining screw for added secureness. The handle lock will accommodate one padlock with a 1/4-inch (6 mm) shackle. Listed per UL File E7819. (Field installation only.)

**Ordering Information**

| Frame | Catalog Number |
|-------|----------------|
| F     | PHB1           |

## Handle Locking and Blocking Devices

## Padlockable Handle Lock Hasp



The padlockable handle lock hasp allows the handle to be locked in the ON or OFF position. (Trip-free operation allows the circuit breaker to trip when the handle lock holds the circuit breaker handle in the ON position.) The hasp mounts on the circuit breaker cover within the trimline. The cover is predrilled on both sides of the operating handle so that the hasp can be mounted on either side of the handle. The hasp will accommodate up to three padlocks with 1/4-inch (6 mm) shackles. Listed per UL File E7819. (Field installation only.)

The padlockable handle lock can be mounted on either side of the operating handle. One per circuit breaker. (Field installation only.)

## Ordering Information

| Description | Catalog Number |
|-------------|----------------|
|-------------|----------------|

## F-Frame

|                         |      |
|-------------------------|------|
| 1-pole breakers         | PHL1 |
| 2-, 3-, 4-pole breakers | PLK1 |

Instruction Leaflet/FRED Number 29C230

## J, K-Frames

|                         |                       |
|-------------------------|-----------------------|
| 2-, 3-, 4-pole breakers | PLK3                  |
| For Left Side Mounting  | PLK3LOFF <sup>①</sup> |
| For Right Side Mounting | PLK3ROFF <sup>①</sup> |

Instruction Leaflet/FRED Number 29C232

## L-Frame

| Side Mounted                    |                       |
|---------------------------------|-----------------------|
| Lock On or Off                  | HLK4                  |
| Lock Off Only (Left-Hand Mount) | HLK4LOFF <sup>①</sup> |

Instruction Leaflet/FRED Number 29C234

| Top Mounted    |                       |
|----------------|-----------------------|
| Lock On or Off | HLK4S                 |
| Lock Off Only  | HLK4SOFF <sup>①</sup> |

Instruction Leaflet/FRED Number 29C234C

## M-Frame

|                                 |                       |
|---------------------------------|-----------------------|
| Lock On or Off                  | HLK4                  |
| Lock Off Only (Left-Hand Mount) | HLK4LOFF <sup>①</sup> |

Instruction Leaflet/FRED Number 29C234

| Vertical Mounting |          |
|-------------------|----------|
| Lock On/Off       | HLK45    |
| Lock Off Only     | HLK45OFF |

Instruction Leaflet/FRED Number 29C234C

## N-Frame

|              |      |
|--------------|------|
| Side Mounted | PLK5 |
|--------------|------|

Instruction Leaflet/FRED Number 29C234

|                        |                       |
|------------------------|-----------------------|
| Top Mounted (On/Off)   | PLK5S                 |
| Top Mounted (Off Only) | PLK5SOFF <sup>①</sup> |

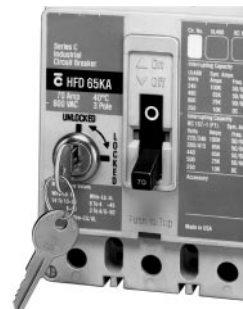
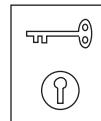
Instruction Leaflet/FRED Number 29C234C

## R-Frame

|               |                      |
|---------------|----------------------|
| Lock On/Off   | HLK6                 |
| Lock Off Only | HLK6OFF <sup>①</sup> |

Instruction Leaflet/FRED Number 29C240

## Cylinder Lock



The cylinder lock internally blocks the trip bar in the tripped position to prevent the circuit breaker from being switched to ON. The cylinder lock is factory installed in the circuit breaker cover. Other internally mounted accessories cannot be installed in the same pole as the cylinder lock. (Factory installation only.)

The cylinder lock is factory installed in the left pole only of the circuit breaker cover. Internal accessories cannot be installed in the same pole as the cylinder lock.

## Ordering Information

| Frames  | Catalog Number       |
|---------|----------------------|
| F, J, K | Order by description |

<sup>①</sup> For padlockable handle lock hasp to padlock handle in OFF position only order either catalog number.

**Mechanical Interlocking Devices**
**Key Interlock Kit**
**(Lock Not Included)**


The key interlock is used to externally lock the circuit breaker handle in the OFF position. When the key interlock is locked, an extended deadbolt blocks movement of the circuit breaker handle. Uniquely coded keys are removable only with the deadbolt extended. Each coded key controls a group of circuit breakers for a given specific customer installation.

The key interlock assembly is Underwriters Laboratories, Inc., listed for field installation under UL file E7819 and consists of a mounting kit and a purchaser supplied deadbolt lock. The mounting kit comprises a mounting plate, which is secured to the circuit breaker cover in either the left- or right-pole position, key interlock mounting screws, and a wire seal. Specific mounting kits are required for individual key interlock types.

**Ordering Information**

Key interlock mounting kits are for field installation only. Select mounting kit catalog numbers to match type of lock used. Key interlocks are supplied by customer.

| Lock Manufacturer | Lock Type | Bolt Projection in Withdrawn Position | Kit Catalog Number |
|-------------------|-----------|---------------------------------------|--------------------|
|-------------------|-----------|---------------------------------------|--------------------|

**F-Frame**

|                 |          |          |             |
|-----------------|----------|----------|-------------|
| Superior        | B-4003-1 | 3/8 inch | <b>KYK1</b> |
| Kirk            | F        | 3/8 inch |             |
| Square D        | SF       | None     |             |
| Federal Pioneer | VF       | 3/8 inch |             |
| Castell         | K or QK  | 3/8 inch | <b>CTK1</b> |

Instruction Leaflet/FRED Number 29C231

**J-, K-Frames**

|                 |          |          |             |
|-----------------|----------|----------|-------------|
| Superior        | B-4003-1 | 3/8 inch | <b>KYK3</b> |
| Kirk            | F        | 3/8 inch |             |
| Square D        | SF       | None     |             |
| Federal Pioneer | VF       | 3/8 inch |             |
| Castell         | K or QK  | 3/8 inch |             |

Instruction Leaflet/FRED Number 29C233

**L-, M-, N-Frames**

|                 |          |          |             |
|-----------------|----------|----------|-------------|
| Superior        | B-4003-1 | 3/8 inch | <b>KYK4</b> |
| Kirk            | F        | 3/8 inch |             |
| Square D        | SF       | None     |             |
| Federal Pioneer | VF       | 3/8 inch |             |
| Castell         | K or QK  | 3/8 inch | <b>CTK4</b> |

Instruction Leaflet/FRED Number 29C235

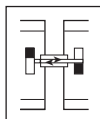
**R-Frame**

|                 |          |        |             |
|-----------------|----------|--------|-------------|
| Superior        | B-4003-1 | 1 inch | <b>KYK6</b> |
| Kirk            | F        | 1 inch |             |
| Square D        | SF       | 1 inch |             |
| Federal Pioneer | VF       | 1 inch |             |
| Castell         | K or QK  | 1 inch | <b>CTK6</b> |

Instruction Leaflet/FRED Number 29C240

## Mechanical Interlocking Devices

## Sliding Bar Interlock



The sliding bar interlock provides mechanical interlocking between two adjacent 3-pole circuit breakers. It is installed on the enclosure cover between the circuit breakers. When the sliding bar interlock handle is moved from one side to the other, a bar extends to alternately block movement of the circuit breaker handles and prevents both circuit breakers from being switched to ON at the same time. Sliding bar interlocks are not UL listed. (Field installation only.)

## Ordering Information

The sliding bar interlock is available for mounting between two adjacent 3-pole circuit breakers with circuit breakers centerline spacing as indicated in table and enclosure front panel thickness of 1/8 or 3/16 inch. (For field installation only.)

| Frame | Centerline Spacing (inches) | Catalog Number | Instruction Leaflet/FRED Number |
|-------|-----------------------------|----------------|---------------------------------|
| F     | 4-3/16                      | SBK1           | 29C310                          |
| J     | 4-3/8                       | SBK2           | 29C310                          |
| K     | 5-3/4                       | SBK3           | 29C310                          |
| L, M  | 8-1/2                       | SBK4           | 29C311                          |
| N     | 8-1/2                       | SBK5           | 46A8396                         |



## Walking Beam Interlock

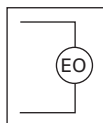
The walking beam interlock provides mechanical interlocking between two adjacent circuit breakers of the same pole configuration. The walking beam interlock mounts on a bracket behind and between the circuit breakers. A plunger on each end of the beam is inserted through an access hole in the back plate and base of each circuit breaker. The walking beam interlock prevents both circuit breakers from being switched ON at the same time. If a walking beam interlock is installed, the wiring troughs in the back of the circuit breaker case are blocked by the plungers and cannot be used for cross wiring. Factory modified circuit breakers are required for this application. UL File E3816.

## Ordering Information

The walking beam interlock is available for mounting between two adjacent circuit breakers spaced 1/4-inch apart and having the same pole configuration. The two circuit breakers must be factory modified to accept the walking beam interlock assembly (suitable for use with either 2-, 3-, or 4-pole circuit breakers). With properly modified circuit breakers, the walking beam interlock is suitable for field installation. Order circuit breakers specifying modification for walking beam and select walking beam interlock from table on this page. Circuit breakers and walking beam interlock are boxed and shipped separately.

| Frame | Catalog Number | Instruction Leaflet/FRED Number |
|-------|----------------|---------------------------------|
| F     | WBL1           | 29C300                          |
| K     | WBL3           | 29C301                          |
| L, M  | WBL4           | 29C302                          |
| N     | WBL5           | 29C303                          |
| R     | WBL6           | 29C304                          |

## Electrical Operator

Electrical Operator<sup>①</sup>

The electrical (solenoid) operator is a single solenoid mechanism that enables local and remote circuit breaker ON, OFF, and reset switching. The electrical operator is mounted on the circuit breaker cover within the trimline of the circuit breaker. The electrical operator uses a unique bistable latch that allows the device to operate using one solenoid. The accessory provides high-speed switching with a maximum operating time of 5 cycles (80 ms) making it suitable for generator synchronizing applications.

Means are provided for remote electrical operation and for local manual operation. A special slide includes provisions for padlocking the circuit breaker handle in the OFF position. The slide will accept three padlock shackles with a maximum diameter of 1/4-inch (6 mm) each. An interlock electrically disconnects the solenoid when the electrical operator cover is removed. The above table provides electrical rating data for the electrical (solenoid) operator.

The electrical (solenoid) operator is Underwriters Laboratories, Inc., listed as a circuit breaker accessory under UL File E64983.

## Ordering Information

## F-Frame

Electrical Rating Data<sup>②</sup>

| Voltage                              | Frequency      | Inrush Current Amperes | Maximum Operating Time | Fuse <sup>③</sup> Amperes |
|--------------------------------------|----------------|------------------------|------------------------|---------------------------|
| 120 <sup>④</sup><br>240 <sup>④</sup> | 50/60 Hz<br>Ac | 10<br>5                | 5 cycles<br>(80 ms)    | 3<br>2                    |
| 120 <sup>⑤</sup><br>240 <sup>⑤</sup> | Dc<br>Dc       | 14<br>8                | 5 cycles<br>(80 ms)    | 3-5<br>2-3                |

Instruction Leaflet/FRED Number 29C200 (AC); 29C210 (DC)

## Electrical Operator

| Voltage        | Frequency | Terminal Block         | 18-Inch Pigtail Lead   |
|----------------|-----------|------------------------|------------------------|
| Catalog Number |           |                        |                        |
| 120<br>240     | Ac        | EOP1T07<br>EOP1T11     | EOP1P07<br>EOP1P11     |
| 120<br>240     | Dc        | EOP1T07DC<br>EOP1T11DC | EOP1P07DC<br>EOP1P11DC |

## J-Frame

Electrical Rating Data<sup>⑤⑥⑦⑧</sup>

| Voltage (V) <sup>③</sup> | Inrush Current (A) | Fuse (A) |
|--------------------------|--------------------|----------|
| 120<br>240               | 24<br>12           | 6<br>4   |

Instruction Leaflet/FRED Number 29C202 (AC); 29C211 (DC)

## Electrical Operator

| Operating Voltage | Frequency      | Terminal Block         |
|-------------------|----------------|------------------------|
| Catalog Number    |                |                        |
| 120<br>240        | 50/60 Hz<br>Ac | EOP2T07<br>EOP2T11     |
| 120<br>240        | Dc             | EOP2T07DC<br>EOP2T11DC |

## K-Frame

Electrical Rating Data<sup>⑤⑥⑦⑧</sup>

| Voltage (V) <sup>③</sup> | Inrush Current (A) | Fuse (A) |
|--------------------------|--------------------|----------|
| 120<br>240               | 24<br>12           | 6<br>4   |

Instruction Leaflet/FRED Number 29C202 (AC); 29C211 (DC)

## Electrical Operator

| Operating Voltage | Frequency      | Terminal Block         |
|-------------------|----------------|------------------------|
| Catalog Number    |                |                        |
| 120<br>240        | 50/60 Hz<br>Ac | EOP3T07<br>EOP3T11     |
| 120<br>240        | Dc             | EOP3T07DC<br>EOP3T11DC |

① The electrical operator design is endurance tested for 10,000 electrical operations.

② Use current-limiting type fuse where required.

③ Tolerance: +10%, -15% of nominal voltage.

④ Tolerance: ±10% of nominal voltage.

⑤ Underwriters laboratories listed under UL file E64983.

⑥ The electrical operator design has been endurance tested for 6,000 electrical operations.

⑦ Frequency: 50/60 Hz.

⑧ Maximum operating time: 5 cycles (80 ms).



## Electrical Operator

The motor operator allows the circuit's breaker to be opened, closed, or reset remotely. It also has a lock-off capability and provisions for manual operation.

The motor operator contains a reversible motor connected to a ball screw. The ball screw drives the circuit breaker handle. Limit switches and relays are used to control the motor.

The motor operator is UL listed as a recognized component suitable for field installation on all type L-frame circuit breakers and molded case switches under UL File E64124.

From the point of energization of the closing mechanism at 85% voltage, the closing time is 30 cycles  $\pm$  10%.

## Ordering Information

## L- and M-Frames

## Electrical Rating Data ①②③④

| Voltage (V)⑤         | Inrush Current (A) |
|----------------------|--------------------|
| 120 Ac<br>208<br>240 | 8<br>5<br>4        |
| 125 Dc<br>24         | 9<br>27            |

Instruction Leaflet/FRED Number 29C203

## Electrical Operator

| Operating Voltage        | Frequency | Terminal Block                                |
|--------------------------|-----------|-----------------------------------------------|
|                          |           | Catalog Number                                |
| 120<br>208<br>240<br>480 | 50/60 Hz  | EOPM4T07<br>EOPM4T11<br>EOPM4T11A<br>EOPM4T15 |
| 125<br>24                | Dc        | EOPM4T26<br>EOPM4T21                          |

## N-Frame

## Electrical Rating Data ①③⑥⑦

| Voltage (V)⑤             | Frequency | Inrush Current (A) | Fuse (A) |
|--------------------------|-----------|--------------------|----------|
| 120<br>208<br>240<br>480 | 50/60 Hz  | 25<br>21<br>19     | 6<br>4   |
| 48<br>125                | Dc        | 80<br>13           |          |

Instruction Leaflet/FRED Number 29C204

## Electrical Operator

| Operating Voltage        | Frequency | Pigtail Leads                            |
|--------------------------|-----------|------------------------------------------|
|                          |           | Catalog Number                           |
| 120<br>208<br>240<br>480 | 50/60 Hz  | EOP5T07<br>EOP5T09<br>EOP5T11<br>EOP5T15 |
| 48<br>125                | Dc        | EOP5T22<br>EOP5T26                       |

## R-Frame

Available Motor Operator Ratings  
and Operating Conditions ⑧⑨⑩⑪

| Rating Voltage (V)⑫ | Frequency                  | Motor Inrush Current (A) |
|---------------------|----------------------------|--------------------------|
| 120<br>240<br>48    | 50/60 Hz<br>50/60 Hz<br>Dc | 40<br>27<br>53           |

Instruction Leaflet/FRED Number 29C205

## Electrical Operator

| Operating Voltage | Frequency                  | Factory Installed Terminal Block |
|-------------------|----------------------------|----------------------------------|
|                   |                            | Catalog Number                   |
| 120<br>240<br>48  | 50/60 Hz<br>50/60 Hz<br>Dc | EOP6T08K<br>EOP6T11K<br>EOP6T21K |

- ① Underwriters Laboratories Inc. listed under UL File E64983.
- ② The electrical operator design has been endurance tested for 6,000 electrical operations.
- ③ Frequency: 50/60 Hz.
- ④ Maximum operating time: 5 cycles (80 ms).
- ⑤ Tolerance: +10%, -15% of nominal voltage.
- ⑥ The electrical operator design has been endurance tested for 2,500 electrical operations.
- ⑦ Maximum operating time: 12 cycles max. Operator is an intermittent duty device. The safe duty cycle (OFF to ON to OFF) should not exceed one per minute.

- ⑧ Operator is an intermittent duty service. The safe duty cycle (OFF to ON to OFF) should not exceed one per minute.
- ⑨ Electric Operating time at rated voltage; (a) To turn breaker ON – 1/2 second max. (b) To turn breaker OFF – 1/2 second max.
- ⑩ Motor operating temperature; Class "A" temperature limits apply.
- ⑪ A minimum 1 kVA power source is recommended for motor operation.
- ⑫ Applied voltage should be no less than 85% or no more than 110% of rated.



## Plug-in Adapters

### Plug-in Adapters



Plug-in adapters simplify installation and front removal of circuit breakers. Individual line and load plug-in adapters are available for rear connection applications on 2-, 3-, and 4-pole circuit breakers. Common mounting plates for line- and load-end adapters are available.

### Ordering Information

#### F-Frame

| Continuous Current Rating (Amperes) | 2-Pole       | 3-Pole     | 4-Pole     |
|-------------------------------------|--------------|------------|------------|
|                                     | Style Number |            |            |
| 100                                 | 507C036G13   | 507C036G15 | 179C968G03 |
| 150-225                             | 507C036G14   | 507C036G16 | 179C968G04 |
| Mounting Plate                      | 176C511H01   | 507C047H01 | ①          |

Instruction Leaflet/FRED Number 13782

#### K-Frame

| Continuous Current Rating (Amperes) | Catalog Number |        |        |
|-------------------------------------|----------------|--------|--------|
|                                     | 2-Pole         | 3-pole | 4-Pole |
| 400                                 | PAD32          | PAD33  | PAD34  |
| Mounting Plate                      | ②              | PMP33  | PMP34  |

Instruction Leaflet/FRED Number 15378

#### L-Frame

| Continuous Current Rating (Amperes) | Catalog Number |            |
|-------------------------------------|----------------|------------|
|                                     | 2-Pole         | 3-pole     |
| 600                                 | 506C059G03     | 506C059G04 |
| Mounting Plate                      | 504C824H01     | 504C824H01 |

Instruction Leaflet/FRED Number 29C314

#### J-Frame

| Continuous Current Rating (Amperes) | Terminal End                      | 2-Pole                                 | 3-Pole                                 | 4-Pole                        |
|-------------------------------------|-----------------------------------|----------------------------------------|----------------------------------------|-------------------------------|
|                                     |                                   | Style/Catalog Number                   |                                        |                               |
| 250                                 | Line<br>Load<br>1 Line and 1 Load | 1260C86G05<br>1260C86G07<br>506C144G27 | 1260C86G06<br>1260C86G08<br>506C144G28 | 1231C67G01<br>1231C67G02<br>— |
| Mounting Plate                      | —                                 | ②                                      | PMP23                                  | —                             |

Instruction Leaflet/FRED Number 149321

#### M-Frame

| Continuous Current Rating (Amperes) | Catalog Number |            |
|-------------------------------------|----------------|------------|
|                                     | 2-Pole         | 3-Pole     |
| 800                                 | 2614D53G05     | 2614D53G06 |
| Mounting Plate                      | 1290C73H01     |            |

Instruction Leaflet/FRED Number 15073

#### N-Frame

| Continuous Current Rating (Amperes) | Style Number |            |
|-------------------------------------|--------------|------------|
|                                     | 2-Pole       | 3-pole     |
| 1200                                | 2614D53G03   | 2614D53G04 |
| Mounting Plate                      | 1290C73H01   |            |

Instruction Leaflet/FRED Number 13782

① Refer to Cutler-Hammer for availability.

② Use 3-pole mounting plate for 2-pole circuit breaker.

## Rear Connecting Studs

## Rear Connecting Studs

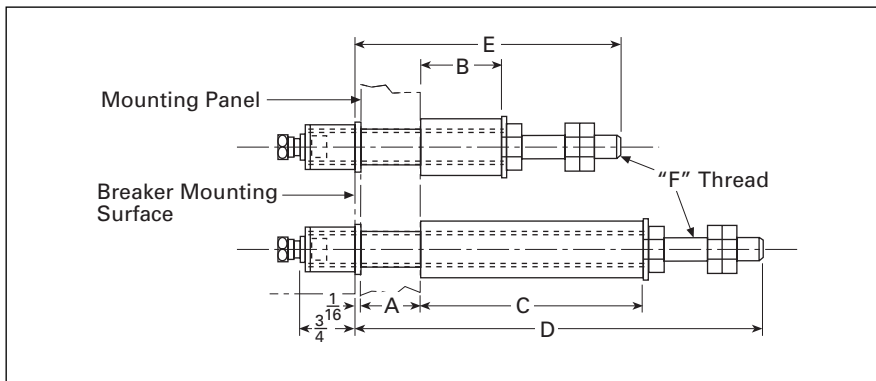


Rear connecting studs are available in several sizes to accommodate specific fixed-mounted circuit breaker applications.

Each rear connecting stud assembly consists of one stud and one tube. To maintain proper clearances between poles, select alternate long and short stud assemblies for circuit breakers with more than one pole. One assembly is required for line-end and one for load-end of each pole. Tubes must be ordered separately. Connecting studs are available only with English thread sizes.

## Ordering Information

## F-Frame



| Stud<br>Ampere<br>Rating | Stud Style<br>Number | Panel Thickness<br>(Inches) | Tube Length<br>(Inches) |   | Tube<br>Style<br>Number | Dimensions<br>(Inches) |   |   |
|--------------------------|----------------------|-----------------------------|-------------------------|---|-------------------------|------------------------|---|---|
|                          |                      | A                           | B                       | C |                         | D                      | E | F |

## For 15A to 100A Circuit Breakers

|            |            |                 |         |        |            |       |       |            |
|------------|------------|-----------------|---------|--------|------------|-------|-------|------------|
| 100A Short | 451D874G01 | 1               | 11/16   | —      | 32B9446H20 | —     | 3-5/8 | 15/16 - 18 |
| 100A Short | 451D874G01 | 1-1/16 to 15/16 | 13/8    | —      | 32B9446H21 | —     | —     |            |
| 100A Short | 451D874G01 | 3/8 to 5/8      | 1-11/16 | —      | 32B9446H22 | —     | —     |            |
| 100A Short | 451D874G01 | 1/4 to 5/16     | 2       | —      | 32B9446H23 | —     | —     |            |
| 100A Long  | 451D874G02 | 1               | —       | 3-7/16 | 32B9446H24 | 6-1/8 | —     |            |
| 100A Long  | 451D874G02 | 1-1/16 to 15/16 | —       | 3-3/4  | 32B9446H25 | —     | —     |            |
| 100A Long  | 451D874G02 | 3/8 to 5/8      | —       | 4-1/16 | 32B9446H26 | —     | —     |            |
| 100A Long  | 451D874G02 | 1/4 to 5/16     | —       | 4-3/8  | 32B9446H27 | —     | —     |            |

## For 110A to 150A Circuit Breakers

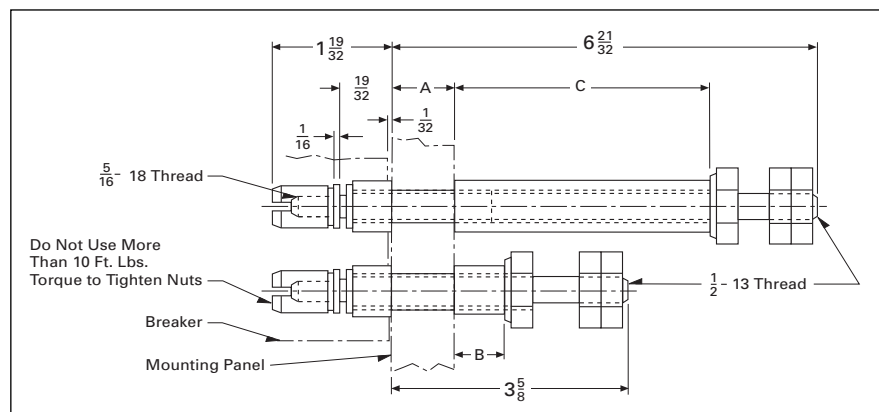
|            |            |                |         |        |            |       |       |           |
|------------|------------|----------------|---------|--------|------------|-------|-------|-----------|
| 150A Short | 374D883G01 | 1              | 11/16   | —      | 374D883H06 | —     | 4-1/4 | 1/16 - 14 |
| 150A Short | 374D883G01 | 11/16 to 15/16 | 13/8    | —      | 374D883H07 | —     | —     |           |
| 150A Short | 374D883G01 | 3/8 to 5/8     | 1-11/16 | —      | 374D883H08 | —     | —     |           |
| 150A Short | 374D883G01 | 1/4 to 5/16    | 2       | —      | 374D883H09 | —     | —     |           |
| 150A Long  | 374D883G02 | 1              | —       | 3-7/16 | 374D883H10 | 7-1/2 | —     |           |
| 150A Long  | 374D883G02 | 11/16 to 15/16 | —       | 3-3/4  | 374D883H11 | —     | —     |           |
| 150A Long  | 374D883G02 | 3/8 to 5/8     | —       | 4-1/16 | 374D883H12 | —     | —     |           |
| 150A Long  | 374D883G02 | 1/4 to 5/16    | —       | 4-3/8  | 374D883H13 | —     | —     |           |

## Rear Connecting Studs

### Rear Connecting Studs

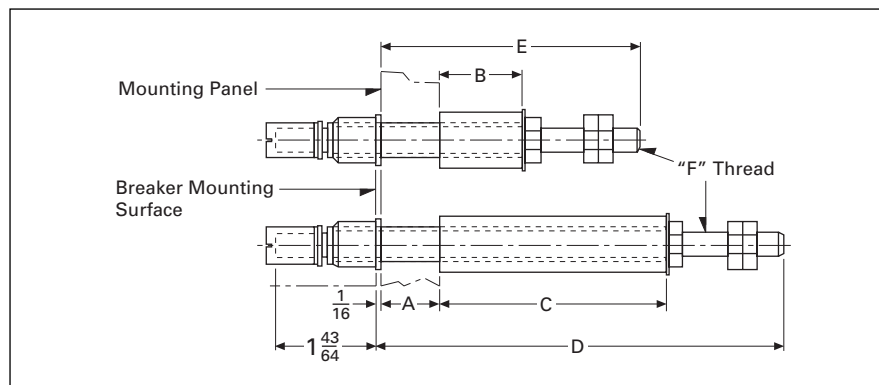
#### Ordering Information

##### J-Frame



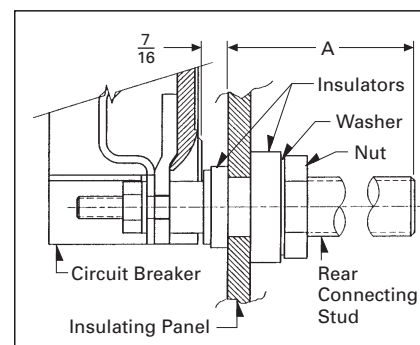
| Stud<br>Ampere<br>Rating | Stud Style Number | Panel<br>Thickness<br>(Inches) | Tube Length<br>(Inches) |      | Tube Style Number |
|--------------------------|-------------------|--------------------------------|-------------------------|------|-------------------|
|                          |                   | A                              | B                       | C    |                   |
| 250A Short               | 5010D23G01        | 3/4 – 1                        | 27/32                   | —    | 456D983H05        |
| 250A Short               | 5010D23G01        | 1/2 – 3/4                      | 1-3/32                  | —    | 456D983H06        |
| 250A Short               | 5010D23G01        | 1/4 – 1/2                      | 1-1/32                  | —    | 456D983H07        |
| 250A Long                | 5010D23G02        | 3/4 – 1                        | —                       | 37/8 | 5010D23H05        |
| 250A Long                | 5010D23G02        | 1/2 – 3/4                      | —                       | 41/8 | 5010D23H06        |
| 250A Long                | 5010D23G02        | 1/4 – 1/2                      | —                       | 43/8 | 5010D23H07        |

##### K-Frame



| Stud Length | Stud Style Number | Panel Thickness (Inches) | Tube Length (Inches) |         |   | Standard Tube Style Number | Dimensions (Inches) |         |          |
|-------------|-------------------|--------------------------|----------------------|---------|---|----------------------------|---------------------|---------|----------|
|             |                   | A                        | B                    | C       | D |                            | E                   | F       |          |
| 400A Short  | 6642C14G02        | 3/4 to 1                 | 27/32                | —       | — | 313C909H17                 | —                   | 3-21/32 | 3/4 - 16 |
| 400A Short  | 6642C14G04        | 1/2 to 3/4               | 1-3/32               | —       | — | 313C909H18                 | —                   | —       | —        |
| 400A Short  | 6642C14G06        | 1/4 to 1/2               | 1-11/32              | —       | — | 313C909H19                 | —                   | —       | —        |
| 400A Long   | 6642C14G03        | 3/4 to 1                 | —                    | 3-25/32 | — | 313C909H20                 | —                   | —       | —        |
| 400A Long   | 6642C14G05        | 1/2 to 3/4               | —                    | 4-1/32  | — | 313C909H21                 | 6-37/64             | —       | —        |
| 400A Long   | 6642C14G07        | 1/4 to 1/2               | —                    | 4-9/32  | — | 313C909H22                 | —                   | —       | —        |

##### L-Frame



| Stud Length (A) | Stud Style Number |
|-----------------|-------------------|
| 5-15/32         | 314C960G07        |
| 7-31/32         | 314C960G08        |
| 10-15/32        | 314C960G09        |

##### M-Frame①

| Stud Ampere Rating | Diameter, Inches and Thread | Extension Back of Breaker, Inches | Stud Style Numbers |
|--------------------|-----------------------------|-----------------------------------|--------------------|
| 225                | 1/2-13                      | 3-21/32                           | 314C960G01         |
| 400                | 3/4-16                      | 5-29/32                           | 314C960G04         |
| 400                | 3/4-16                      | 8-13/32                           | 314C960G05         |
| 400                | 3/4-16                      | 10-29/32                          | 314C960G06         |
| 600                | 1-12                        | 5-29/32                           | 314C960G07         |
| 600                | 1-12                        | 8-13/32                           | 314C960G08         |
| 600                | 1-12                        | 10-29/32                          | 314C960G09         |
| 800                | 1-1/8-12                    | 5-29/32                           | 314C960G10         |
| 800                | 1-1/8-12                    | 8-13/32                           | 314C960G11         |
| 800                | 1-1/8-12                    | 10-29/32                          | 314C960G12         |

##### N-Frame①

| Stud Ampere Rating | Diameter, Inches and Thread | Extension Back of Breaker, Inches | Stud Style Numbers |
|--------------------|-----------------------------|-----------------------------------|--------------------|
| 800                | 1-1/8-12                    | 5-1/2                             | 623B222G01         |
| 800                | 1-1/8-12                    | 8                                 | 623B222G02         |
| 800                | 1-1/8-12                    | 10-1/2                            | 623B222G03         |
| 1200               | 1-1/4-12                    | 5-1/2                             | 373B375G04         |
| 1200               | 1-1/4-12                    | 10-1/2                            | 373B375G03         |

① Not UL listed.

## Panelboard Connecting Straps

## Panelboard Connecting Straps



Panelboard connecting straps are used to connect the circuit breaker terminals to the panelboard bus. The panelboard connecting straps are available with various ratings for outside and center poles. (Field installation only.)

## Ordering Information

Panelboard connecting straps are available to meet the needs of most standard panelboard applications. Style numbers for mounting brackets for CDP panelboard installations are also included.

Refer to panelboard manufacturer for compatibility.

## F-Frame

## Panelboard Connecting Straps

| Bus Spacing (Inches) | Continuous Current Rating (Amperes) | Pole Connector Type |         |
|----------------------|-------------------------------------|---------------------|---------|
|                      |                                     | Center              | Outside |
|                      |                                     | Style Number        |         |

## 5-3/4-Inch Deep Box, 600 Vac Maximum

|       |     |            |            |
|-------|-----|------------|------------|
| 2-3/4 | 50  | 673B142G02 | 673B142G09 |
| 2-3/4 | 100 | 673B142G02 | 673B142G10 |
| 2-3/4 | 150 | 673B142G04 | 673B142G03 |
| 3-1/2 | 50  | 1253C72G01 | 1253C72G03 |
| 3-1/2 | 100 | 1253C73G03 | 1253C73G06 |
| 3-1/2 | 150 | 1253C73G01 | 1253C73G05 |

## Mounting Bracket

| Number of Poles | Style Number |
|-----------------|--------------|
| 2               | 624B600H02   |
| 3               | 624B600H01   |

## J-Frame

## Panelboard Connecting Straps

| Bus Spacing (Inches) | Continuous Current Rating (Amperes) | Pole Connector Type |            |
|----------------------|-------------------------------------|---------------------|------------|
|                      |                                     | Center              | Outside    |
|                      |                                     | Style Number        |            |
| 3-1/2                | 250                                 | 2600D26G01          | 2600D26G02 |

## Mounting Bracket

| Number of Poles | Style Number |
|-----------------|--------------|
| 2, 3            | 1576707      |

## K-Frame

## Panelboard Connecting Straps

| Bus Spacing (Inches) | Continuous Current Rating (Amperes) | Pole Connector Type |            |
|----------------------|-------------------------------------|---------------------|------------|
|                      |                                     | Center              | Outside    |
|                      |                                     | Style Number        |            |
| 3-1/2                | 400                                 | 4212B78G02          | 4212B77G01 |

## Mounting Bracket

| Number of Poles | Style Number |
|-----------------|--------------|
| 2, 3            | 208B264H01   |

## L-Frame

## Panelboard Connecting Straps

| Continuous Current Rating (Amperes) | Pole Connector Type |            |
|-------------------------------------|---------------------|------------|
|                                     | Center              | Outside    |
| Style Number                        |                     |            |
| 600                                 | 624B609G01          | 506C052G01 |

## Mounting Bracket

| Number of Poles | Style Number |
|-----------------|--------------|
| 2, 3            | 208B297H01   |

## M-Frame

## Panelboard Connecting Straps

| Bus Spacing (Inches) | Continuous Current Rating (Amperes) | Connector Type    | Pole Connector Type                    |
|----------------------|-------------------------------------|-------------------|----------------------------------------|
|                      |                                     |                   | Style Number                           |
| 3-1/2                | 800                                 | Short Medium Long | 314C996G01<br>314C996G02<br>314C996G03 |

## Mounting Bracket

| Style Number |
|--------------|
| 315C270H01   |

## N-Frame

## Panelboard Connecting Straps

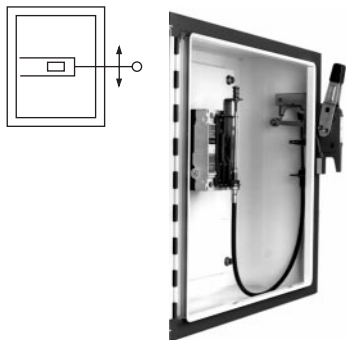
| Bus Spacing (Inches) | Continuous Current Rating (Amperes) | Connector Type    | Pole Connector Type                    |
|----------------------|-------------------------------------|-------------------|----------------------------------------|
|                      |                                     |                   | Style Number                           |
| 3-1/2                | 1200                                | Short Medium Long | 505C606G04<br>505C606G05<br>505C606G06 |

## Mounting Bracket (Four (4) Required)

| Style Number |
|--------------|
| 315C270H01   |

## Handle Mechanisms

### Flange Mounted Flex Shaft™



The Flex Shaft type handle mechanism is an extra heavy-duty handle mechanism designed for mounting in flange-type enclosures. An operating handle, flexible shaft, and mechanism are required for standard application.

The handle can be locked in the RESET position with up to three padlocks. The handle is suitable for Types 1, 3R, 4<sup>①</sup>, 4X<sup>①</sup>, and 12 fabricated enclosures. The handle fits the industry standard cutout.

Eight lengths of shafts are available for use with the wide range of depths of various enclosures (3 feet through 10 feet). These choices enable this mechanism to be mounted in various depth, width, and height enclosures.

**Note:** when selecting the length of shaft, ensure minimum bending radius of 4 inches is maintained to operate properly.

The standard method of shipment includes the mechanism preset at the factory; however, minor field adjustments may be required.

For this publication, the term Circuit Breaker shall also include the molded case switch and Series C motor circuit protector (HMCP).

UL File E64893.

### Ordering Information

Catalog Number includes complete assembly consisting of C371 handle, flexible shaft, operating mechanism, and door interlock hardware to fit industry standard flange cutout.

| Length of Flex Shaft<br>(in feet) | Catalog<br>Number |
|-----------------------------------|-------------------|
|-----------------------------------|-------------------|

#### F-Frame<sup>②</sup>

|    |        |
|----|--------|
| 3  | F1S03C |
| 4  | F1S04C |
| 5  | F1S05C |
| 6  | F1S06C |
| 7  | F1S07C |
| 8  | F1S08C |
| 9  | F1S09C |
| 10 | F1S10C |

Instruction Leaflet/FRED Number 15609

#### J-Frame<sup>②</sup>

|    |        |
|----|--------|
| 3  | F2S03C |
| 4  | F2S04C |
| 5  | F2S05C |
| 6  | F2S06C |
| 7  | F2S07C |
| 8  | F2S08C |
| 9  | F2S09C |
| 10 | F2S10C |

Instruction Leaflet/FRED Number 15605

#### K-Frame<sup>②</sup>

|    |        |
|----|--------|
| 3  | F3S03C |
| 4  | F3S04C |
| 5  | F3S05C |
| 6  | F3S06C |
| 7  | F3S07C |
| 8  | F3S08C |
| 9  | F3S09C |
| 10 | F3S10C |

Instruction Leaflet/FRED Number 15604

#### L- and M-Frames

|    |       |
|----|-------|
| 4  | F4S04 |
| 5  | F4S05 |
| 6  | F4S06 |
| 10 | F4S10 |

Instruction Leaflet/FRED Number 15606

#### N-Frame

|    |       |
|----|-------|
| 4  | F5S04 |
| 5  | F5S05 |
| 6  | F5S06 |
| 10 | F5S10 |

Instruction Leaflet/FRED Number 15606

#### R-Frame

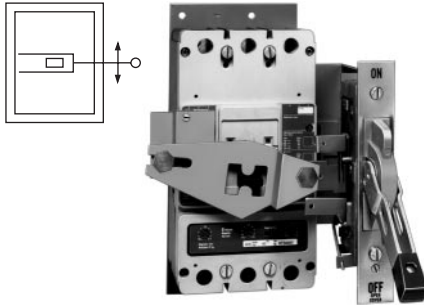
|   |       |
|---|-------|
| 4 | F6S04 |
| 5 | F6S05 |
| 6 | F6S06 |

Instruction Leaflet/FRED Number 15606

① Type 4/4X handle mechanisms are available. Add suffix X to complete catalog number.

② Add suffix I to complete catalog number for IEC handle. Add suffix L to complete catalog number for 6-inch handle.

## Handle Mechanisms

Flange Mounted  
Type SM Safety

The SM safety handle mechanism provides a means of externally operating a circuit breaker mounted in an enclosure and is designed to reduce the possibility of circuit breaker tampering. The handle mechanism is especially suited for use in automotive and machine tool industries through its conformance to Type 12 and J. I. C. requirements. A specially modified handle mechanism for Type 4 enclosure application is also available order by description. The handle mechanism will accept up to three padlock shackles, each with a maximum diameter of 3/8 inch (9.52mm). UL File E64893.

## Ordering Information

| Description                         | Catalog Number                |
|-------------------------------------|-------------------------------|
| <b>F-Frame</b>                      |                               |
| Right-Hand Mounting Enclosure Cover | Hinged on Left <b>SM150R</b>  |
| Left-Hand Mounting Enclosure Cover  | Hinged on Right <b>SM150L</b> |

Instruction Leaflet/FRED Number 14439

**J-Frame**

|                                     |                                |
|-------------------------------------|--------------------------------|
| Right-Hand Mounting Enclosure Cover | Hinged on Left <b>SM250JR</b>  |
| Left-Hand Mounting Enclosure Cover  | Hinged on Right <b>SM250JL</b> |

Instruction Leaflet/FRED Number 29C274

**K-Frame**

|                                     |                                |
|-------------------------------------|--------------------------------|
| Right-Hand Mounting Enclosure Cover | Hinged on Left <b>SM400KR</b>  |
| Left-Hand Mounting Enclosure Cover  | Hinged on Right <b>SM400KL</b> |

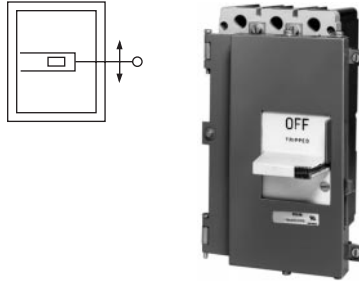
Instruction Leaflet/FRED Number 29C274

**L- and M-Frames**

|                 |               |
|-----------------|---------------|
| Hinged on Left  | <b>SM600R</b> |
| Hinged on Right | <b>SM600L</b> |

Instruction Leaflet/FRED Number 29C284

① Width spacer kits cannot be used with short rod at minimum enclosure depth.

Through-the-Door  
Type MC Motor Control

The MC motor control handle mechanism is a linear-operating, fixed-depth mechanism designed for through-the-door mounting in standardized and shallow depth enclosures. The handle mechanism provides positive operation and direct disconnect status indication. It is interlocked with the enclosure door so that the door can be opened only when the handle is set to OFF. (A defeater, supplied with the handle mechanism, can be used to bypass the interlock for maintenance and inspection.) The handle mechanism will accept up to three padlock shackles, each with a maximum diameter of 3/8 inch (7.92 mm). UL File E56845.

## Ordering Information

| Description                            | Catalog Number   |
|----------------------------------------|------------------|
| <b>F-Frame</b>                         |                  |
| For use with Type 1 Enclosure Catalog  | <b>SMCU150FD</b> |
| For use with Type 12 Enclosure Catalog | <b>CMCU150FD</b> |

Instruction Leaflet/FRED Number 14572

**J-Frame**

|                                        |                  |
|----------------------------------------|------------------|
| For use with Type 1 Enclosure Catalog  | <b>SMCU250JD</b> |
| For use with Type 12 Enclosure Catalog | <b>CMCU250JD</b> |

Instruction Leaflet/FRED Number 29C273

**K-Frame**

|                                        |                  |
|----------------------------------------|------------------|
| For use with Type 1 Enclosure Catalog  | <b>SMCU400KD</b> |
| For use with Type 12 Enclosure Catalog | <b>CMCU400KD</b> |

Instruction Leaflet/FRED Number 29C273

**M-Frames**

|                                        |                  |
|----------------------------------------|------------------|
| For use with Type 1 Enclosure Catalog  | <b>SMCU600LD</b> |
| For use with Type 12 Enclosure Catalog | <b>CMCU600LD</b> |

Instruction Leaflet/FRED Number 29C283

**Handle Mechanisms**
**Through-the-Door Rotary**


These compact rotary handle mechanisms are especially designed for use with the GD/GC/GHC circuit protection devices. The Close-Coupled version is designed for mounting in a shallow enclosure, while the Vari-Depth is suitable for deep enclosures.

Both G-frame handle mechanisms are suitable for use on Type 1 enclosures. In addition, the Vari-Depth handle mechanism is offered for use with Types 3R, 12, and 4X enclosures.

The new handles are a compact, plastic, general purpose design which is easy to install. These mechanisms are commonly used where high volume, standardized enclosures are being fabricated.

The Close-Coupled design is available with or without a shroud. The handle is offered in two colors; black or yellow. An escutcheon ring and interlock clip are provided as standard. This standard design includes a lock-off feature.

The Vari-Depth design includes an operating mechanism, shaft, and external handle. The handle is available in two colors; black or yellow. An external lock-off is included in the handle design. The shaft may be cut to size to fit the enclosure.

UL and CSA listed.

**Ordering Information**

| Breaker Frame | Enclosure Type | Handle Color | Shaft Length | Shroud Included | Catalog Number |
|---------------|----------------|--------------|--------------|-----------------|----------------|
|---------------|----------------|--------------|--------------|-----------------|----------------|

**G-Frame Vari-Depth Design**

(Catalog Number includes complete assembly consisting of handle, shaft, and operating mechanism.)

|           |               |        |           |   |                 |
|-----------|---------------|--------|-----------|---|-----------------|
| GD/GC/GHC | Type 1        | Black  | 14 inches | — | <b>HRGCV11L</b> |
| GD/GC/GHC | Type 1        | Yellow |           |   | <b>HRGCV31L</b> |
| GD/GC/GHC | Type 3R/12/4X | Black  |           |   | <b>HRGCV14L</b> |
| GD/GC/GHC | Type 3R/12/4X | Yellow |           |   | <b>HRGCV34L</b> |

**G-Frame Close-Coupled Design**

(Catalog Number includes complete assembly consisting of operating handle and door interlock.)

|           |        |        |   |     |                |
|-----------|--------|--------|---|-----|----------------|
| GD/GC/GHC | Type 1 | Black  | — | No  | <b>HRGCC10</b> |
| GD/GC/GHC | Type 1 | Black  |   | Yes | <b>HRGCC1S</b> |
| GD/GC/GHC | Type 1 | Yellow |   | No  | <b>HRGCC30</b> |
| GD/GC/GHC | Type 1 | Yellow |   | Yes | <b>HRGCC3S</b> |

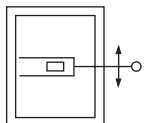
Instruction Leaflet/FRED Number 15567 (Close Coupled);

Instruction Leaflet/FRED Number 15569 (Variable Depth)



## Handle Mechanisms

## Through-the-Door Rotary



The general purpose rotary handle mechanisms are suitable for use with Types 1, 3R, (4, 4X), and 12 fabricated enclosures. They are designed for use with Series C F-frame circuit breakers, molded case switches, and motor circuit protectors (HMCP).

Required for a standard application are the operating handle, shaft, and mechanism.

The operating handle has been designed to meet NFPA 79 requirements. It may be mounted in either the horizontal or the vertical direction. The handle was ergonomically designed with extra clearance for a "gloved hand" to operate. It may be padlocked in the OFF position utilizing 3 padlocks.

The standard label on the operating handle indicates ON/Tripped/OFF/Reset. UL File E64893

To meet the various enclosure depths, four variable depth shafts are offered (6-inch, 12-inch, 16-inch, and 24-inch). Each shaft includes a support brace to ensure proper alignment. In addition, the 16-inch and 24-inch extra long shafts include an adjustable support bracket.

The standard mechanism located on the breaker does include means for internally locking the breaker in the "OFF" position with up to three padlocks each with a maximum diameter of .312-inch.

## Ordering Information

| Shaft Length<br>(Inches) | Complete Catalog Number <sup>①</sup> | Separate Style Number        |                                |                    | Catalog Number         |                        |
|--------------------------|--------------------------------------|------------------------------|--------------------------------|--------------------|------------------------|------------------------|
|                          |                                      | Standard Handle <sup>③</sup> | Breaker Mechanism <sup>④</sup> | Shaft <sup>⑤</sup> | IEC IP65 <sup>⑤⑥</sup> | IEC IP66 <sup>⑤⑥</sup> |

## F-Frame

|    |        |            |            |            |         |          |
|----|--------|------------|------------|------------|---------|----------|
| 6  | HM1R06 | 6648C22G01 | 6648C23G11 | 4217B37G04 | WHM1R06 | WHM1R06X |
| 12 | HM1R12 | 6648C22G01 | 6648C23G11 | 4217B37G01 | WHM1R12 | WHM1R12X |
| 16 | HM1R16 | 6648C22G01 | 6648C23G11 | 4217B37G02 | WHM1R16 | WHM1R16X |
| 24 | HM1R24 | 6648C22G01 | 6648C23G11 | 4217B37G03 | WHM1R24 | WHM1R24X |

Instruction Leaflet/FRED Number 15594

## J-Frame

|    |        |            |            |            |         |          |
|----|--------|------------|------------|------------|---------|----------|
| 6  | HM2R06 | 6648C22G01 | 6648C23G02 | 4217B37G04 | WHM2R06 | WHM2R06X |
| 12 | HM2R12 | 6648C22G01 | 6648C23G02 | 4217B37G01 | WHM2R12 | WHM2R12X |
| 16 | HM2R16 | 6648C22G01 | 6648C23G02 | 4217B37G02 | WHM2R16 | WHM2R16X |
| 24 | HM2R24 | 6648C22G01 | 6648C23G02 | 4217B37G03 | WHM2R24 | WHM2R24X |

Instruction Leaflet/FRED Number 15599

## K-Frame

|    |        |            |            |            |         |          |
|----|--------|------------|------------|------------|---------|----------|
| 6  | HM3R06 | 6648C22G01 | 6648C23G13 | 4217B37G04 | WHM3R06 | WHM3R06X |
| 12 | HM3R12 | 6648C22G01 | 6648C23G13 | 4217B37G01 | WHM3R12 | WHM3R12X |
| 16 | HM3R16 | 6648C22G01 | 6648C23G13 | 4217B37G02 | WHM3R16 | WHM3R16X |
| 24 | HM3R24 | 6648C22G01 | 6648C23G13 | 4217B37G03 | WHM3R24 | WHM3R24X |

Instruction Leaflet/FRED Number 15600

## L- and M-Frames

|    |        |            |            |            |         |          |
|----|--------|------------|------------|------------|---------|----------|
| 6  | HM4R06 | 6648C22G11 | 6648C23G07 | 4217B37G04 | WHM4R06 | WHM4R06X |
| 12 | HM4R12 | 6648C22G11 | 6648C23G07 | 4217B37G01 | WHM4R12 | WHM4R12X |
| 16 | HM4R16 | 6648C22G11 | 6648C23G07 | 4217B37G02 | WHM4R16 | WHM4R16X |
| 24 | HM4R24 | 6648C22G11 | 6648C23G07 | 4217B37G03 | WHM4R24 | WHM4R24X |

Instruction Leaflet/FRED Number 15601

## N-Frame

|    |        |            |            |            |         |          |
|----|--------|------------|------------|------------|---------|----------|
| 6  | HM5R06 | 6648C22G11 | 6648C23G07 | 4217B37G04 | WHM5R06 | WHM5R06X |
| 12 | HM5R12 | 6648C22G11 | 6648C23G07 | 4217B37G01 | WHM5R12 | WHM5R12X |
| 16 | HM5R16 | 6648C22G11 | 6648C23G07 | 4217B37G02 | WHM5R16 | WHM5R16X |
| 24 | HM5R24 | 6648C22G11 | 6648C23G07 | 4217B37G03 | WHM5R24 | WHM5R24X |

Instruction Leaflet/FRED Number 15602

Type 4/4X handles are similar to standard handles except they include an internal neoprene gasket. Type 4/4X handle style number is 6648C22G03. Due to gasketing effect between the handle and the housing, the handle may not indicate a tripped position.

## Accessories

As an option, an auxiliary switch is offered so that the control panel builder may electrically indicate the status of the breaker. This accessory would be mounted on the mechanism and comes with 24-inch pigtail leads.

|              |            |
|--------------|------------|
| Style Number | 5108A61G01 |
|--------------|------------|

**Refer to CD-ROM, SA.74A.01.T.E, for replacement type Vari-depth and AMT handle mechanisms.**

- ① Complete catalog number includes the standard handle, mechanism, shaft, and support brace/bracket.
- ② Handle is designed suitable for Types 1, 3R, and 12 enclosures. Use style number 6648C22G03 for Type 4/4X handle or add X suffix to complete catalog number.
- ③ The standard handle label indicates ON/Tripped/OFF/Reset.
- ③ Breaker mechanism includes a shaft support bracket and its parts.
- ④ Longer shafts (16-inch and 24-inch) include an adjustable support extension.
- ⑤ IEC Handle Mechanism supplied with Metric thread mounting hardware.
- ⑥ Complete Catalog Number includes a handle, mechanism and shaft.



## Handle Mechanisms

### Door Hardware

#### F-, J-, K-, L- and M-Frames

Door Hardware listed in this section may be used with Types SM and AMT handle mechanisms.

Three choices of door hardware and an auxiliary handle are offered to provide the best latching scheme for individual needs. The door hardware is designed with a provision for padlocking, and a coin-proof slot that requires the use of a tool to open the door.

Select desired hardware below. Additional latches can be ordered from accessories section if desired.

| Hardware Item                                                                       | Description and Catalog Number                                                                                                                                                                                 |
|-------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|   | With sliding latches for smaller panels up to approx. 30-inch high.<br><br>Catalog Number<br>Right Hand: <b>DH1R</b><br>Left Hand: <b>DH1L</b><br><br>Instruction Leaflet/FRED Number 13327(L); 13326(R)       |
|  | With 2-roller latches for intermediate panels up to approx. 40-inch high.<br><br>Catalog Number<br>Right Hand: <b>DH2R</b><br>Left Hand: <b>DH2L</b><br><br>Instruction Leaflet/FRED Number 13325(L); 13324(R) |
|  | With 3-roller latches for larger panels, approx. 40-inch and higher.<br><br>Catalog Number<br>Right Hand: <b>DH3R</b><br>Left Hand: <b>DH3L</b><br><br>Instruction Leaflet/FRED Number 13323(L); 13322(R)      |
|  | Auxiliary handle for larger panels.<br><br>Catalog Number<br>Right Hand: <b>DH4R</b><br>Left Hand: <b>DH4L</b>                                                                                                 |

**Note:** Right-hand enclosure cover hinged on left, left-hand enclosure cover hinged on right.

#### Accessories

##### Dress Nameplates:

Required to meet automotive specifications. Mounts from inside enclosure and covers operating mechanism mounting bolts; makes mechanism non-removable when enclosure door is closed.



| Description     | Style Number      |
|-----------------|-------------------|
| Dress Nameplate | <b>373D260G05</b> |

**Electrical Interlock Kit:** Provides 1 N.C. and 1 N.O. contacts (SPDT switch) for use with auxiliary circuits. Mounts to end of mechanism housing as shown.



| Description              | Style Number      |
|--------------------------|-------------------|
| Electrical Interlock Kit | <b>622B747G01</b> |

**Auxiliary Latch Kits:** Provide an additional latch for use with applications where two point latching may not be adequate.



*Sliding Latch*



*Rolling Latch*

| Description                                    | Style Number      |
|------------------------------------------------|-------------------|
| <b>For Door Hardware Using Sliding Latches</b> |                   |
| Right- or Left-Hand Mounting                   | <b>622B747G01</b> |
| <b>For Door Hardware Using Rolling Latches</b> |                   |
| Right-Hand Mounting                            | <b>370D801G04</b> |
| Left-Hand Mounting                             | <b>370D802G04</b> |

#### Door Operated Interlock Defeater Kit for Type SM Mechanisms

Required when door hardware is not used, operates as door closes. Additional method of securing door such as screw latch, also required (supplied by box manufacturer).

| Description                          | Style Number      |
|--------------------------------------|-------------------|
| Door Operated Interlock Defeater Kit | <b>623B214G02</b> |

#### Remote Mounting Kit (J-Frame)

Enables the operating mechanism to be mounted remotely on a vertical centerline from the circuit breaker or disconnect switch.

| Description         | Style Number      |
|---------------------|-------------------|
| Remote Mounting Kit | <b>505C367G01</b> |

### Handle Extension



Handle extension is not included with J-, K-, L-, and M-Frame breakers. It must be purchased separately.

| Frame       | Catalog Number |
|-------------|----------------|
| <b>J, K</b> | <b>HEX3</b>    |
| <b>L, M</b> | <b>HEX4</b>    |

Handle extension is included with breaker with N- and R-Frame breakers.

| Frame    | Catalog Number |
|----------|----------------|
| <b>N</b> | <b>HEX5</b>    |
| <b>R</b> | <b>HEX6</b>    |

Type LFD



The LFD current limiter is an accessory that bolts to the load end of a standard FDB or FD thermal-magnetic circuit breaker, providing 200,000A interrupting capacity at up to 600 Vac. LFD current limiters for thermal-magnetic circuit breakers are listed with Underwriters Laboratories, Inc., under File E47239.

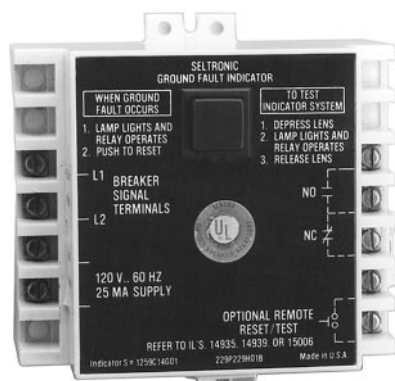
Ordering Information

| Circuit Breaker Rating Amperes① | Catalog Number |
|---------------------------------|----------------|
| 15-70                           | LFD3070R       |
| 80-160                          | LFD3150R       |

Instruction Leaflet/FRED Number 29C407

① Underwriters Laboratories Inc. listed under UL File E64983.

## Ground Fault Alarm Unit



The Ground Fault Alarm Unit is a remotely mounted device with a combination indicating light/test button that will light when the breaker trips or alarms on ground fault. The Ground Fault Alarm Unit requires a separate 120 Vac power source to power the light and the internal relay which has 1 N.O. and 1 N.C. contacts for remote indication. The Ground Fault Alarm Unit can be panel mounted for ordering with an optional face mounting bracket. For use on Digitrip 310 only. K- through N-frame.

### Ordering Information

| Catalog Number                            |
|-------------------------------------------|
| <b>GFAU</b> – Ground Fault Alarm Unit     |
| Style Number                              |
| <b>1264C67G01</b> – Face Mounting Bracket |

Instruction Leaflet/FRED Number 29C614 Diagram

## IQ Energy Sentinel



The IQ Energy Sentinel is a highly accurate, microprocessor-based, breaker-mounted device designed to

monitor power and energy readings. It represents an alternative to watt meters, watt-hour meters, and watt demand meters. Key advantages include savings in space, lower installation costs, and remote monitoring capability.

The IQ Energy Sentinel mounts on the load side of a Series C F-frame (150 ampere) circuit breaker. It can be applied on three-phase, four-wire systems, or single-phase, three-wire systems with voltage connected through phases A and C.

Instruction Leaflet/FRED Number 17437

For more information see Descriptive Bulletin 8178.

## Potential Transformer Module



The Potential Transformer Module is required for Series C, Digitrip OPTIM 1050, to provide a voltage input to allow the trip unit to monitor power and energy as well as power factor. The Potential Transformer Module is a 6 VA transformer with a primary voltage input of up to 600V line to line. Three 0.1 ampere fuses are provided on the primary of the transformer and can be used for isolation purposes during dielectric testing. The device is normally panel mounted and can feed up to 16 OPTIM trip units.

### Ordering Information

| Description                  | Catalog Number |
|------------------------------|----------------|
| Potential Transformer Module | <b>DOPTMLN</b> |

Instruction Leaflet/FRED Number 29C894 Diagram

## Solid-State (Electronic) Portable Test Kit

The solid-state (electronic) portable test kit provides verification of performance of all ratings of Digitrip 310 electronic trip units installed in Series C circuit breakers while in service under varying load and/or phase imbalance. The test kit operates on 120-volt, 50/60 Hz power; it includes complete instructions and test times for testing long time, short time/instantaneous operation and optional ground fault operation of the circuit breaker.

### Ordering Information

| Description                                | Catalog Number |
|--------------------------------------------|----------------|
| Solid-State (Electronic) Portable Test Kit | <b>STK2</b>    |

① Model 550 OPTIMs require the Cutler-Hammer PowerNet field upgrade kit.

## OPTIM System Components

Breaker Interface Module  
(BIM)

The Breaker Interface Module (BIM) is a panel mounted user interface device that is mounted on the front of an electrical assembly or at a remote location. The BIM is used to access, configure, test and display information for OPTIM trip units and other devices. The BIM consists of four display windows, eight function buttons, 18 LEDs, and a graphical time/current curve to provide breaker status, operational information, protection status and energy monitoring. A 24 Vdc power supply is required to provide power to the BIM. This is supplied by the switchboard builder to Cutler-Hammer specifications. The BIM is a member of the Cutler-Hammer PowerNet family of communicating devices that connects OPTIM trip units, Digitrip RMS 810/910 trip units and energy sentinels as a subnetwork system. The BIM can also be connected to a main network via a PONI module to Cutler-Hammer PowerNet software.

## Ordering Information

Catalog Number

BIM

Instruction Leaflet/FRED Number 29C893

## Digitrip OPTIMizer



The Digitrip OPTIMizer is a handheld programmer that is used to access, configure, test and display information from OPTIM trip units. The OPTIMizer plugs into the front of an OPTIM trip unit via an eight-pin telephone jack and is powered by a nine-volt battery or the auxiliary power module. In addition, a three-pin INCOM network connection is also provided to program other OPTIM devices on the system. An Auxiliary Power Module connection provides a trip test when control power is not present at the breaker. The OPTIMizer is supplied as a standard package to include the programmer, the eight-pin connection cord, battery and carrying case. The Auxiliary Power Module is optional.

## Ordering Information

Catalog Number

OPTIMizer – Standard Package

Instruction Leaflet/FRED Number 29C892

## Auxiliary Power Module



The Auxiliary Power Module is a power supply requiring 120 Vac input at 50 or 60 Hz that provides a 32 Vdc output<sup>①</sup>. The Auxiliary Power Module provides control power for testing an OPTIM trip unit when other means of control power is not available or for continuous OPTIMizer operation versus temporary with a battery. The Auxiliary Power Module connects into the top of the Digitrip OPTIMizer via a keyed receptacle. The main application for the Auxiliary Power Module would be for the testing of a stand-alone non-communicating OPTIM breaker that ordinarily would not have control power.

## Ordering Information

Catalog Number

PRTAAPM

Cutler-Hammer PowerNet  
Software

Series C Digitrip OPTIM trip units can communicate back to a central Personal Computer by installing Cutler-Hammer PowerNet software<sup>②</sup>. In addition other software packages are available to allow the user to configure the trip units as well as monitor system performance.

Instruction Leaflet/FRED Number 29C890

① The OPTIMizer can work off of 32 Vdc control power, although 24 Vdc is the standard on OPTIM breakers.

② Model 550 OPTIMIS require the Cutler-Hammer PowerNet field upgrade kit.

## Note: 24 Vdc Power Supply

A 24 Vdc power supply is required for all Digitrip OPTIM trip units that are required to communicate either on the main Cutler-Hammer PowerNet network or as a subnetwork to a BIM. The breaker's load is 45 mA of current. Typically one power supply is required per switchboard and can provide control power to a BIM and the OPTIM trip units. The 24 Vdc power supply should be an "isolated high quality" power supply with a "CE" label, and is normally provided by the switchboard manufacturer to Cutler-Hammer recommendations.

## Special Calibration<sup>①</sup>

Special non-UL-listed calibrations are available for certain ambient temperatures other than 40°C and for frequencies other than 50/60 Hz or Dc. Reduced interrupting ratings will apply for 400 Hz applications. Maximum thermal calibration is limited to 135A at 400 Hz.

Suffix H01 400 Hz.

See Application Data 29-160 for information regarding special conditions.

## 50°C Calibration<sup>①</sup>

Add suffix "V" to catalog number for complete breaker, listed above, when ordering listed ampere ratings for breakers to be used in 50°C ambients.

## Moisture-Fungus Treatment

All Series C circuit breaker cases are molded from glass-polyester which does not support the growth of fungus. Any parts which are susceptible to the growth of fungus will require special treatment.

Suffix J01 Fungus Treated

## Freeze-Tested Circuit Breakers

The circuit breakers may be ordered with freeze testing. This option uses special lubrication and mechanical operation is verified at -40°C.

Suffix F01 Freeze Tested.

## Marine Applications

F-Frame circuit breakers can be supplied to meet the following marine specifications:

U.S. Coast Guard CFR 46 ABS –  
American Bureau of Shipping  
IEEE 45

These specifications generally require molded case circuit breakers to be supplied with 50°C ambient calibration, special nameplating, and plug-in adapter kits. When plug-in adapter kits are used, no terminals need be supplied.

Series C circuit breakers can also be supplied to meet UL489 Supplement SA (Marine Use) and UL489 Supplement SB (Naval Use).

UL489 Supplement SA applies to vessels over 65 feet in length. Requirements include 40°C ambient calibration, special labeling, and no use of aluminum conductors or terminals.

Suffix H08 "Marine."

UL489 Supplement SB requires 50°C ambient calibration, vibration testings, special nameplating and no use of aluminum conductors or terminals.

Suffix H09 "Naval."

<sup>①</sup> Not listed with Underwriters Laboratories, Inc.

<sup>②</sup> For use with standard 35 mm DIN rail such as, 35 x 7.5 or 15 mm per DIN EN50022.



## **NEMA 1 General Purpose**



**Surface or Flush Mounting  
15-1200 Ampere Range  
600 Volts Ac, 500 Volts Dc**

NEMA 1 enclosed breakers are designed for indoor use in commercial buildings, apartment buildings and other areas where a general purpose enclosure is applicable. The breaker is front operable and is capable of being padlocked in the Off position. (Padlocking not available on enclosures for Quicklag® breakers.) Ratings through 1200 amperes are listed with Underwriters Laboratories, Inc. as suitable for service entrance application. Both surface and flush mounted enclosures are available. UL File Number E7819. CSA File Number LR84319.

## **NEMA 3R Rainproof Surface Mounting**



**Interchangeable Hubs (through  
400 amperes) 15-1200 Ampere Range  
600 Volts Ac, 500 Volts Dc**

This general purpose outdoor service center employs a circuit breaker inside a weatherproof sheet steel enclosure to serve as a main disconnect and protective device for feeder circuits. The operating handle can be padlocked in the Off position, and is interlocked to prevent the door from opening when the breaker is On. Ratings through 1200 amperes are listed by Underwriters Laboratories, Inc. as suitable for service entrance application. UL File Number E7819. CSA File Number LR84319.

## **NEMA 4/4X, 5 Water and Dustproof**



**Stainless Steel – Type 304  
Surface Mounting  
15-1200 Ampere Range  
600 Volts Ac, 500 Volts Dc**

This enclosure meets NEMA 4/4X and 5 requirements for water and dustproof applications and has no knockouts or other openings. It is particularly well suited for use in dairies, borax mines, breweries, paper mills and other process industries. The operating handle can be padlocked in the Off position, and is interlocked to prevent the door from opening when the breaker is On. Ratings through 1200 amperes are Underwriters Laboratories, Inc. listed as suitable for service entrance application. UL File Number E7819. CSA File Number LR84319.

## **NEMA 12 Dustproof Surface Mounting**



**No Knockouts or Other Openings  
15-1200 Ampere Range  
600 Volts Ac, 500 Volts Dc**

The Type 12 enclosure is designed in line with specifications for special industry application where unusually

severe conditions involving oil, coolant, dust and other foreign materials exist in the operating atmosphere. The handle padlocks in the Off position and the cover is interlocked with the handle mechanism to prevent opening the cover with the circuit breaker in the On position. Ratings through 1200 amperes are listed by Underwriters Laboratories, Inc. as suitable for service entrance application. A NEMA 12 semi-dust-tight design which includes knockouts is available. These units are rated 15-400 amperes, 600 volts Ac, 500 volts Dc. UL File Number E7819. CSA File Number LR84319.

## **NEMA 7, 9 Hazardous Location**

**Cast Aluminum, Explosionproof  
Surface Mounting  
15-800 Ampere Range  
600 Volts Ac, 250 Volts Dc**

Hazardous location, Class I, Groups B (except XFDN050), C, D; Class II, Groups E, F, G. This special service cast aluminum enclosure is supplied with a wide, machined flanged cover to prevent igniting outside atmospheres by arcing from inside the enclosure. Front operable, the handle padlocks in the Off position. Enclosures rated 600 amperes and above have lift-off hinges for ease of assembly. UL and cUL File Number E71279.

Enclosure Only Catalog Numbers Selection Guide<sup>①</sup>

| Breaker Frame                                                | Breaker<br>Ampere Range | Enclosure                                                    |                                                                |
|--------------------------------------------------------------|-------------------------|--------------------------------------------------------------|----------------------------------------------------------------|
|                                                              |                         | NEMA Class                                                   | Catalog Number                                                 |
| Series C® Breakers                                           |                         |                                                              |                                                                |
| GC, GHC, GD<br>2- and 3-Pole only<br>GHCGFEP®<br>1-Pole Only | 15-100                  | 1 Surface<br>3R<br>12<br>12K<br>4/4X, 5 St. Steel            | SGDN100®<br>RGDN100<br>JGDN100<br>DGDN100<br>WGDN100           |
| EHD, FD, FDB,<br>HFD, FDC                                    | 15-100                  | 1 Surface<br>1 Flush<br>3R<br>12<br>12K<br>4/4X, 5 St. Steel | SFDN100<br>FFDN100<br>RFDN100<br>JFDN100<br>DFDN100<br>WFDN100 |
| EHD, FD, FDB<br>HFD, FDC                                     | 15-50<br>60-225④        | 7/9 Cast Aluminum<br>7/9 Cast Aluminum                       | XFDN050<br>XFDN225                                             |
| FD, FDB, HFD, FDC,<br>ED, EDH, EDC                           | 125-225                 | 1 Surface<br>1 Flush<br>3R<br>12<br>12K<br>4/4X, 5 St. Steel | SFDN225<br>FFDN225<br>RFDN225<br>JFDN225<br>DFDN225<br>WFDN225 |
| JD, JDB, HJD, JDC                                            | 125-250                 | 1 Surface<br>1 Flush<br>3R<br>12<br>12K<br>4/4X, 5 St. Steel | SJDN250<br>FJDN250<br>RJDN250<br>JJDN250<br>DJDN250<br>WJDN250 |
| JD, JDB, HJD, JDC                                            | 125-250                 | 7/9 Cast Aluminum                                            | XJDN250                                                        |
| KD, KDB, HKD, KDC, DK                                        | 125-400                 | 1 Surface<br>1 Flush<br>3R<br>12<br>12K<br>4/4X, 5 St. Steel | SKDN400<br>FKDN400<br>RKDN400<br>JKDN400<br>DKDN400<br>WKDN400 |
| KD, KDB, HKD, KDC, DK                                        | 125-400                 | 7/9 Cast Aluminum                                            | XKDN400                                                        |
| LD, LDB, HLD, LDC                                            | 300-600                 | 1 Surface<br>3R<br>12<br>4/4X, 5 St. Steel                   | SLDN600<br>RLDN600<br>JLDN600<br>WLDN600                       |
| LD, LDB, HLD, LDC<br>MD, MDS                                 | 300-600<br>400-800      | 7/9 Cast Aluminum                                            | XMCN800                                                        |
| MD, MDS, ND, NDC,<br>HND                                     | 400-1200                | 1 Surface<br>3R<br>12<br>4/4X, 5 St. Steel                   | SNDN1200<br>RNDN1200<br>JNDN1200<br>WNDN1200                   |
| ND, HND, NDC                                                 |                         | 7/9 Cast Aluminum                                            | XNDN1200                                                       |

Earth Leakage Breakers<sup>⑤</sup>

|                                        |        |                                                 |                                                                                                              |
|----------------------------------------|--------|-------------------------------------------------|--------------------------------------------------------------------------------------------------------------|
| ELFD, ELHFD and ELFDC<br>(3-Pole Only) | 15-100 | 1 Surface<br>1 Flush<br>3R<br>12<br>12K<br>4/4X | <b>SFD100E</b><br><b>FFD100E</b><br><b>RFDN100E</b><br><b>JFDN100E</b><br><b>DFDN100E</b><br><b>WFDN100E</b> |
|----------------------------------------|--------|-------------------------------------------------|--------------------------------------------------------------------------------------------------------------|

## Current Limit-R Breakers

|                  |         |                                            |                                                                          |
|------------------|---------|--------------------------------------------|--------------------------------------------------------------------------|
| FCL              | 15-100  | 3R<br>12<br>12K<br>4/4X, 5 St. Steel       | <b>RFDN150</b><br><b>JFDN150</b><br><b>DFDN150</b><br><b>WFDN150</b>     |
| LCL <sup>⑥</sup> | 125-400 | 1 Surface<br>3R<br>12<br>4/4X, 5 St. Steel | <b>SNDN1200</b><br><b>RNDN1200</b><br><b>JNDN1200</b><br><b>WNDN1200</b> |

## TRI-PAC® Breakers

|                   |         |                                      |                                                                          |
|-------------------|---------|--------------------------------------|--------------------------------------------------------------------------|
| FB-P              | 15-100  | 3R<br>12<br>12K<br>4/4X, 5 St. Steel | <b>RFDN150</b><br><b>JFDN150</b><br><b>DFDN150</b><br><b>WFDN150</b>     |
| LA-P <sup>⑦</sup> | 70-400  | 1 Surface<br>3R<br>12<br>4/4X        | <b>SNDN1200</b><br><b>RNDN1200</b><br><b>JNDN1200</b><br><b>WNDN1200</b> |
| NB-P              | 500-800 | 12<br>4/4X, 5 St. Steel              | <b>JNDPN800</b><br><b>WNDPN800</b>                                       |

Neutral Kits, Insulated and Groundable<sup>⑧</sup>

| Maximum Enclosure Rating (Amperes) | Main Lug Size Cu/Al                             | Ground Lug Size Cu/Al | Catalog Number |
|------------------------------------|-------------------------------------------------|-----------------------|----------------|
| 100                                | (1) 14-1/0                                      | (1) 14-1/0            | <b>INK100</b>  |
| 250                                | (1) 6-350 kcmil                                 | (1) 4-300 kcmil       | <b>INK250</b>  |
| 400                                | (1) 4-750 kcmil or<br>(2) 1/0-250 kcmil         | (1) 4-300 kcmil       | <b>INK400</b>  |
| 600                                | (2) 250-500 kcmil                               | (1) 4-300 kcmil       | <b>INK600</b>  |
| 1200                               | (3) 1/0 to 750 kcmil or<br>(4) 1/0 to 750 kcmil | (1) #6-250 kcmil      | <b>INK1200</b> |

## Raintight Hubs

|  | Hub Diameter in Inches     |                                 | Catalog Number                                                                         |
|------------------------------------------------------------------------------------|----------------------------|---------------------------------|----------------------------------------------------------------------------------------|
|                                                                                    | <b>Small Hubs</b>          |                                 |                                                                                        |
|                                                                                    | For use with RGDN and RFDN | 3/4<br>1<br>1-1/4<br>1-1/2<br>2 | <b>DS075H1</b><br><b>DS100H1</b><br><b>DS125H1</b><br><b>DS150H1</b><br><b>DS200H1</b> |
|                                                                                    | <b>Large Hubs</b>          |                                 |                                                                                        |
| For use with RJDN. (RKDN has two cutouts)                                          |                            | 2<br>2-1/2<br>3                 | <b>R1H200</b><br><b>R1H250</b><br><b>R1H300</b>                                        |
| Required if using Type DS hubs on RJDN and RKDN enclosures.                        |                            |                                 | <b>R1HA</b>                                                                            |

All rainproof enclosures 30A through 400A are shipped with plate over cutout. Hubs are not supplied with screws on 30A through 400A enclosures. Use screws from plate.

Breather and Drain, Hazardous Enclosures<sup>⑤</sup>

| Description                                                                                                                                                                                                                              | Compliance                                                                                                                | Conduit Opening | Catalog Number |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------|-----------------|----------------|
| A Universal Breather/ Drain Fitting is installed in the top of an enclosure to provide ventilation to minimize condensation and in the bottom to allow drainage of accumulated condensation while maintaining explosion proof integrity. | Type BD:<br>NEMA 7 – Class I, Groups C, D; Class I, Zone 1, Group IIB<br>NEMA 9 – Class II, Groups F, G                   | 1/2             | <b>XPBD2</b>   |
|                                                                                                                                                                                                                                          | Type DBB:<br>NEMA 7 – Class I, Groups B, C, D; Class I, Zone 1, Group IIB + Hydrogen<br>NEMA 9 – Class II, Groups E, F, G | 1/2             | <b>XPDBB50</b> |

- ① Enclosures only shown above; if an assembled enclosed circuit breaker is required refer to Cutler-Hammer Satellite.
- ② Suitable for use with one-pole breaker base mounting plate kit. OCCBP required.
- ③ Enclosure must have date stamp later than 4-15-98.
- ④ Maximum wire size: 4/0.
- ⑤ Availability to be announced.
- ⑥ LCL requires additional adapter plate 1223C06G01.
- ⑦ LA-P requires additional adapter plate S/N 1223C06G02.
- ⑧ If ground fault protection is required, contact regional satellite.

## Dimensions and Shipping Weights

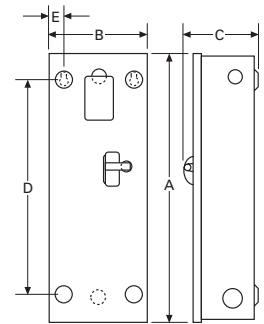
*Not to be used for construction purposes unless approved.*

Inches and Millimeters.

## NEMA 1 Surface Mounted

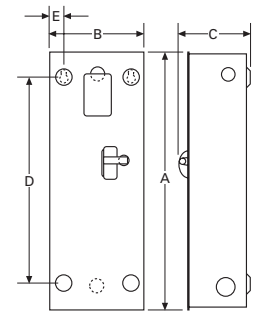
| Catalog Number | App. Wt. Lbs. | Max. Amperes | Dimensions        |      |                   |     |                   |     |                   |      |                  |    | Conduit Sizes, Inches        |  |
|----------------|---------------|--------------|-------------------|------|-------------------|-----|-------------------|-----|-------------------|------|------------------|----|------------------------------|--|
|                |               |              | A                 |      | B                 |     | C                 |     | D                 |      | E                |    |                              |  |
|                |               |              | Inches            | mm   | Inches            | mm  | Inches            | mm  | Inches            | mm   | Inches           | mm |                              |  |
| SGDN100        | 12            | 100          | 17½               | 444  | 8⅝ <sub>32</sub>  | 214 | 6⅝ <sub>32</sub>  | 160 | 13⅝ <sub>32</sub> | 331  | 1⅞ <sub>64</sub> | 31 | ¼, ½, ¾, 1, 1¼, 1½, 2, 2½    |  |
| SFDN100        | 12            | 100          | 17½               | 444  | 8⅝ <sub>32</sub>  | 214 | 6⅝ <sub>32</sub>  | 160 | 13⅝ <sub>32</sub> | 331  | 1⅞ <sub>64</sub> | 31 | ¼, ½, ¾, 1, 1¼, 1½, 2, 2½    |  |
| SFDN150        | 15            | 150          | 23¼               | 591  | 8⅝ <sub>32</sub>  | 214 | 6⅝ <sub>32</sub>  | 160 | 18¾               | 476  | 1⅞ <sub>64</sub> | 31 | ¼, ½, ¾, 1, 1¼, 1½, 2, 2½    |  |
| SFDN225        | 15            | 225          | 23¼               | 591  | 8⅝ <sub>32</sub>  | 214 | 6⅝ <sub>32</sub>  | 160 | 18¾               | 476  | 1⅞ <sub>64</sub> | 31 | ¼, ½, ¾, 1, 1¼, 1½, 2, 2½    |  |
| SJDN250        | 31            | 250          | 34⅞ <sub>64</sub> | 881  | 10⅞ <sub>64</sub> | 227 | 7⅞ <sub>64</sub>  | 183 | 30                | 762  | 1⅞               | 48 | ¼, ½, 2, 2½, 3               |  |
| SKDN400        | 53            | 400          | 38⅜ <sub>16</sub> | 986  | 11⅜ <sub>16</sub> | 281 | 10⅞ <sub>16</sub> | 278 | 34                | 869  | 2⅝ <sub>32</sub> | 58 | ¼, ½, ¾, 1, 1½, 2, 2½, 3, 3½ |  |
| SLDN600        | 81            | 600          | 45⅞               | 1165 | 14⅞ <sub>16</sub> | 364 | 12⅝               | 314 | 46⅞ <sub>16</sub> | 1183 | 1⅞ <sub>32</sub> | 48 | ¼, ½, ¾, 3, 3½, 4            |  |
| SNDN1200       | 178           | 1200         | 61⅜ <sub>32</sub> | 1555 | 21⅜ <sub>16</sub> | 545 | 15⅞ <sub>32</sub> | 391 | 61⅜ <sub>32</sub> | 1571 | 1⅞ <sub>32</sub> | 50 |                              |  |

Technical drawing of a terminal block assembly. The drawing shows a side view of the block with various dimensions labeled: A is the height of the block, B is the width of the block, C is the distance between the center of the terminal block and the center of the mounting hole, D is the distance between the center of the terminal block and the center of the mounting hole, and E is the distance between the center of the terminal block and the center of the mounting hole.



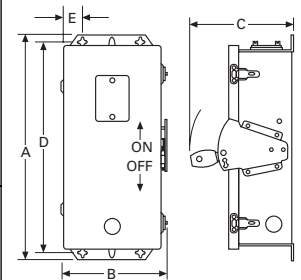
## NEMA 1 Flush Mounted

|                |    |     |                   |      |                   |     |                   |     |                   |     |                  |    |                              |
|----------------|----|-----|-------------------|------|-------------------|-----|-------------------|-----|-------------------|-----|------------------|----|------------------------------|
| <b>FFDN100</b> | 12 | 100 | 18⅜ <sub>16</sub> | 478  | 9⅝ <sub>32</sub>  | 247 | 6⅝ <sub>32</sub>  | 160 | 13⅜ <sub>32</sub> | 331 | 1⅝ <sub>64</sub> | 47 | ¼, ½, ¾, 1, 1¼, 1½, 2, 2½    |
| <b>FFDN150</b> | 15 | 150 | 24⅞ <sub>16</sub> | 624  | 9⅝ <sub>32</sub>  | 247 | 6⅝ <sub>32</sub>  | 160 | 18¾               | 476 | 1⅝ <sub>64</sub> | 47 | ¼, ½, ¾, 1, 1¼, 1½, 2, 2½    |
| <b>FFDN225</b> | 15 | 225 | 24⅞ <sub>16</sub> | 624  | 9⅝ <sub>32</sub>  | 247 | 6⅝ <sub>32</sub>  | 160 | 18¾               | 476 | 1⅝ <sub>64</sub> | 47 | ¼, ½, ¾, 1, 1¼, 1½, 2, 2½    |
| <b>FJDN250</b> | 32 | 250 | 36⅞ <sub>64</sub> | 915  | 12⅞ <sub>64</sub> | 311 | 7⅞ <sub>64</sub>  | 183 | 30                | 762 | 1⅞               | 48 | ¼, ½, 2, 2½, 3               |
| <b>FKDN400</b> | 53 | 400 | 40⅞               | 1019 | 12⅞               | 314 | 10⅞ <sub>16</sub> | 278 | 34                | 869 | 2⅞ <sub>16</sub> | 75 | ¼, ½, ¾, 1, 1½, 2, 2½, 3, 3½ |



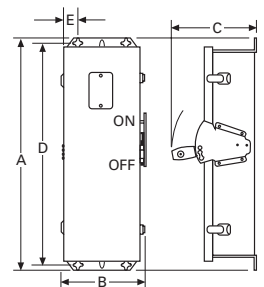
## NEMA 12, 12K Dustproof

|                 |     |      |                   |      |                   |     |                   |     |                   |      |                  |     |                              |
|-----------------|-----|------|-------------------|------|-------------------|-----|-------------------|-----|-------------------|------|------------------|-----|------------------------------|
| <b>JGDN100</b>  | 14  | 100  | 19⅝ <sub>32</sub> | 506  | 8⅞ <sub>32</sub>  | 225 | 9⅞ <sub>16</sub>  | 237 | 18⅞ <sub>32</sub> | 471  | 1⅝ <sub>64</sub> | 43  |                              |
| <b>JFDN100</b>  | 14  | 100  | 19⅝ <sub>32</sub> | 506  | 8⅞ <sub>32</sub>  | 225 | 9⅞ <sub>16</sub>  | 237 | 18⅞ <sub>32</sub> | 471  | 1⅝ <sub>64</sub> | 43  |                              |
| <b>JFDN150</b>  | 18  | 150  | 25⅞ <sub>32</sub> | 652  | 8⅞ <sub>32</sub>  | 225 | 9⅞ <sub>16</sub>  | 237 | 24⅞ <sub>32</sub> | 617  | 1⅝ <sub>64</sub> | 43  |                              |
| <b>JFDN225</b>  | 18  | 225  | 25⅞ <sub>32</sub> | 652  | 8⅞ <sub>32</sub>  | 225 | 9⅞ <sub>16</sub>  | 237 | 24⅞ <sub>32</sub> | 617  | 1⅝ <sub>64</sub> | 43  |                              |
| <b>JJDN250</b>  | 37  | 250  | 37⅞ <sub>32</sub> | 953  | 11⅞ <sub>16</sub> | 294 | 10⅞ <sub>32</sub> | 260 | 35⅞ <sub>64</sub> | 909  | 1⅞ <sub>16</sub> | 49  |                              |
| <b>JKDN400</b>  | 58  | 400  | 41⅞ <sub>16</sub> | 1059 | 11¾               | 298 | 14⅞ <sub>16</sub> | 357 | 39⅞ <sub>16</sub> | 1014 | 1⅜ <sub>32</sub> | 150 |                              |
| <b>JLDN600</b>  | 81  | 600  | 48⅞ <sub>16</sub> | 1227 | 14⅞ <sub>32</sub> | 379 | 15⅞               | 394 | 46⅞ <sub>16</sub> | 1183 | 1⅞ <sub>64</sub> | 49  |                              |
| <b>JNDPN800</b> | 110 | 800  | 63⅞ <sub>32</sub> | 1545 | 22                | 559 | 17⅞               | 448 | —                 | —    | —                | —   |                              |
| <b>JNDN1200</b> | 170 | 1200 | 63⅞ <sub>32</sub> | 1545 | 22                | 559 | 17⅞               | 448 | 61⅞ <sub>32</sub> | 1571 | 1⅜ <sub>32</sub> | 50  |                              |
| <b>DGDN100</b>  | 16  | 100  | 19⅝ <sub>32</sub> | 506  | 8⅞ <sub>32</sub>  | 225 | 9⅞ <sub>16</sub>  | 237 | —                 | —    | —                | —   | ¼, ½, ¾, 1, 1¼, 1½, 2, 2½    |
| <b>DFDN100</b>  | 16  | 100  | 19⅝ <sub>32</sub> | 506  | 8⅞ <sub>32</sub>  | 225 | 9⅞ <sub>16</sub>  | 237 | —                 | —    | —                | —   | ¼, ½, ¾, 1, 1¼, 1½, 2, 2½    |
| <b>DFDN150</b>  | 19  | 150  | 25⅞ <sub>32</sub> | 652  | 8⅞ <sub>32</sub>  | 225 | 9⅞ <sub>16</sub>  | 237 | —                 | —    | —                | —   | ¼, ½, ¾, 1, 1¼, 1½, 2, 2½    |
| <b>DFDN225</b>  | 19  | 225  | 25⅞ <sub>32</sub> | 652  | 8⅞ <sub>32</sub>  | 225 | 9⅞ <sub>16</sub>  | 237 | —                 | —    | —                | —   | ¼, ½, ¾, 1, 1¼, 1½, 2, 2½    |
| <b>DJDN250</b>  | 36  | 250  | 37⅞ <sub>32</sub> | 953  | 11⅞ <sub>16</sub> | 294 | 10⅞ <sub>32</sub> | 260 | —                 | —    | —                | —   | ¼, ½, 2, 2½, 3               |
| <b>DKDN400</b>  | 53  | 400  | 41⅞ <sub>16</sub> | 1059 | 11¾               | 298 | 14⅞ <sub>16</sub> | 357 | —                 | —    | —                | —   | ¼, ½, ¾, 1, 1½, 2, 2½, 3, 3½ |



## NEMA 3R Rainproof

|                 |     |      |                   |      |                   |     |                   |     |                   |      |                  |    |                       |
|-----------------|-----|------|-------------------|------|-------------------|-----|-------------------|-----|-------------------|------|------------------|----|-----------------------|
| <b>RGDN100</b>  | 14  | 100  | 19⅝ <sub>32</sub> | 458  | 8⅞ <sub>32</sub>  | 225 | 9⅞ <sub>16</sub>  | 237 | 18⅞ <sub>32</sub> | 471  | 1⅝ <sub>64</sub> | 43 | ¼, ½, ¾, 1, 1¼, 2, 2½ |
| <b>RFDN100</b>  | 14  | 100  | 19⅝ <sub>32</sub> | 458  | 8⅞ <sub>32</sub>  | 225 | 9⅞ <sub>16</sub>  | 237 | 18⅞ <sub>32</sub> | 471  | 1⅝ <sub>64</sub> | 43 | ¼, ½, ¾, 1, 1¼, 2, 2½ |
| <b>RFDN150</b>  | 19  | 150  | 25⅞ <sub>32</sub> | 603  | 8⅞ <sub>32</sub>  | 225 | 9⅞ <sub>16</sub>  | 237 | 24⅞ <sub>32</sub> | 617  | 1⅝ <sub>64</sub> | 43 | ¼, ½, ¾, 1, 1¼, 2, 2½ |
| <b>RFDN225</b>  | 19  | 225  | 25⅞ <sub>32</sub> | 603  | 8⅞ <sub>32</sub>  | 225 | 9⅞ <sub>16</sub>  | 237 | 24⅞ <sub>32</sub> | 617  | 1⅝ <sub>64</sub> | 43 | ¼, ½, ¾, 1, 1¼, 2, 2½ |
| <b>RJDN250</b>  | 40  | 250  | 37⅞ <sub>32</sub> | 891  | 11⅞ <sub>16</sub> | 294 | 10⅞ <sub>32</sub> | 260 | 35⅞ <sub>64</sub> | 909  | 1⅞ <sub>16</sub> | 49 | ¼, ½, 2, 2½, 3        |
| <b>RKDN400</b>  | 60  | 400  | 41⅞ <sub>16</sub> | 997  | 11¾               | 298 | 14⅞ <sub>16</sub> | 357 | 39⅞ <sub>16</sub> | 1014 | 1⅜ <sub>32</sub> | 50 | ¼, ½, ¾, 2½, 3, 3½    |
| <b>RLDN600</b>  | 84  | 600  | 48⅞ <sub>16</sub> | 1227 | 14⅞ <sub>32</sub> | 379 | 15⅞               | 394 | 46⅞ <sub>16</sub> | 1183 | 1⅞ <sub>64</sub> | 49 | ¼, ½, ¾, 3, 3½, 4     |
| <b>RNDN1200</b> | 175 | 1200 | 63⅞ <sub>32</sub> | 1615 | 22                | 559 | 17⅞               | 448 | 61⅞ <sub>32</sub> | 1571 | 1⅜ <sub>32</sub> | 50 |                       |



(Continued)



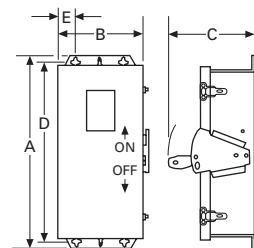
## Dimensions and Shipping Weights

Not to be used for construction purposes unless approved.

Inches and Millimeters.

### NEMA 4/4X, 5 Stainless Steel

| Catalog Number | App. Wt. Lbs. | Max. Amperes | Dimensions                      |      |                                 |     |                                 |     |                                 |      |                                 |    |
|----------------|---------------|--------------|---------------------------------|------|---------------------------------|-----|---------------------------------|-----|---------------------------------|------|---------------------------------|----|
|                |               |              | A                               |      | B                               |     | C                               |     | D                               |      | E                               |    |
|                |               |              | Inches                          | mm   | Inches                          | mm  | Inches                          | mm  | Inches                          | mm   | Inches                          | mm |
| WGDN100        | 16            | 100          | 19 <sup>3</sup> / <sub>32</sub> | 506  | 8 <sup>7</sup> / <sub>32</sub>  | 225 | 9 <sup>1</sup> / <sub>16</sub>  | 237 | 18 <sup>1</sup> / <sub>32</sub> | 471  | 1 <sup>45</sup> / <sub>64</sub> | 43 |
| WFDN100        | 16            | 100          | 19 <sup>3</sup> / <sub>32</sub> | 506  | 8 <sup>7</sup> / <sub>32</sub>  | 225 | 9 <sup>1</sup> / <sub>16</sub>  | 237 | 18 <sup>1</sup> / <sub>32</sub> | 471  | 1 <sup>45</sup> / <sub>64</sub> | 43 |
| WFDN150        | 20            | 150          | 25 <sup>2</sup> / <sub>32</sub> | 652  | 8 <sup>7</sup> / <sub>32</sub>  | 225 | 9 <sup>1</sup> / <sub>16</sub>  | 237 | 24 <sup>3</sup> / <sub>32</sub> | 617  | 1 <sup>45</sup> / <sub>64</sub> | 43 |
| WFDN225        | 20            | 225          | 25 <sup>2</sup> / <sub>32</sub> | 652  | 8 <sup>7</sup> / <sub>32</sub>  | 225 | 9 <sup>1</sup> / <sub>16</sub>  | 237 | 24 <sup>3</sup> / <sub>32</sub> | 617  | 1 <sup>45</sup> / <sub>64</sub> | 43 |
| WJDN250        | 39            | 250          | 37 <sup>1</sup> / <sub>2</sub>  | 953  | 11 <sup>7</sup> / <sub>16</sub> | 294 | 10 <sup>3</sup> / <sub>32</sub> | 260 | 35 <sup>4</sup> / <sub>64</sub> | 909  | 1 <sup>5</sup> / <sub>16</sub>  | 49 |
| WKDN400        | 60            | 400          | 41 <sup>1</sup> / <sub>16</sub> | 1059 | 11 <sup>3</sup> / <sub>4</sub>  | 298 | 14 <sup>1</sup> / <sub>16</sub> | 357 | 39 <sup>1</sup> / <sub>16</sub> | 1014 | 1 <sup>3</sup> / <sub>32</sub>  | 50 |
| WLDN600        | 88            | 600          | 48 <sup>3</sup> / <sub>16</sub> | 1227 | 14 <sup>2</sup> / <sub>32</sub> | 379 | 15 <sup>1</sup> / <sub>2</sub>  | 394 | 46 <sup>9</sup> / <sub>16</sub> | 1183 | 1 <sup>5</sup> / <sub>64</sub>  | 49 |
| WNDN1200       | 185           | 1200         | 63 <sup>1</sup> / <sub>32</sub> | 1545 | 22                              | 559 | 17 <sup>7</sup> / <sub>8</sub>  | 448 | 61 <sup>2</sup> / <sub>32</sub> | 1571 | 1 <sup>3</sup> / <sub>32</sub>  | 50 |



### NEMA 4/4X, 5 Stainless Steel

| Catalog Number | Breaker Size (Amperes) | Overall Enclosure              |                                |                                |                                | Enclosure Mounting             |    |     | Conduit                       |                               | Hinged Cover                  | Standard Conduit              |             | Weight (lbs.) | Dia. No. |
|----------------|------------------------|--------------------------------|--------------------------------|--------------------------------|--------------------------------|--------------------------------|----|-----|-------------------------------|-------------------------------|-------------------------------|-------------------------------|-------------|---------------|----------|
|                |                        | A                              | B                              | C                              | D                              | E                              | F  | G   | H                             | I                             |                               | Size                          | Location    |               |          |
| XFDN050        | 50                     | 15                             | 10 <sup>3</sup> / <sub>8</sub> | 8 <sup>3</sup> / <sub>4</sub>  | 5 <sup>3</sup> / <sub>16</sub> | 9                              | 12 | 1/2 | 1 <sup>3</sup> / <sub>4</sub> | 3 <sup>3</sup> / <sub>4</sub> | 2 <sup>5</sup> / <sub>8</sub> | 1 <sup>1</sup> / <sub>4</sub> | 2 & 7       | 34            | 1        |
| XFDN225        | 100/225                | 25 <sup>1</sup> / <sub>2</sub> | 12 <sup>1</sup> / <sub>2</sub> | 10 <sup>3</sup> / <sub>8</sub> | 7 <sup>3</sup> / <sub>8</sub>  | 10 <sup>1</sup> / <sub>2</sub> | 20 | 1/2 | 2                             | 3 <sup>3</sup> / <sub>4</sub> | 4 <sup>3</sup> / <sub>4</sub> | 2                             | 2 & 7       | 70            | 1        |
| XJDN250        | 250                    | 38 <sup>1</sup> / <sub>2</sub> | 13                             | 11 <sup>1</sup> / <sub>4</sub> | 8 <sup>3</sup> / <sub>4</sub>  | 11 <sup>1</sup> / <sub>2</sub> | 28 | 1/2 | 2 <sup>1</sup> / <sub>8</sub> | 3 <sup>1</sup> / <sub>2</sub> | 5 <sup>1</sup> / <sub>2</sub> | 2 <sup>1</sup> / <sub>2</sub> | 2 & 7       | 120           | 1        |
| XKDN400        | 400                    | 44 <sup>3</sup> / <sub>4</sub> | 18                             | 12 <sup>3</sup> / <sub>4</sub> | 9 <sup>3</sup> / <sub>4</sub>  | 10                             | 45 | 1/2 | 3                             | 4                             | 5 <sup>1</sup> / <sub>2</sub> | 3                             | 1, 3 & 6, 8 | 180           | 2        |
| XMCN800        | 600/800                | 50 <sup>3</sup> / <sub>4</sub> | 20 <sup>3</sup> / <sub>4</sub> | 15                             | 12 <sup>1</sup> / <sub>2</sub> | 22                             | 40 | 1/2 | 4                             | 5                             | 6                             | 4                             | 1, 3 & 6, 8 | 460           | 3        |
| XNDN1200       | 1200①                  | 65                             | 25                             | 15 <sup>1</sup> / <sub>4</sub> | 12 <sup>3</sup> / <sub>4</sub> | 23 <sup>1</sup> / <sub>2</sub> | 50 | 1/2 | 6 <sup>1</sup> / <sub>2</sub> | 4 <sup>3</sup> / <sub>4</sub> | 7                             | 4                             | 1, 3 & 6, 8 | 600           | 3        |

CONDUIT POSITION NO.

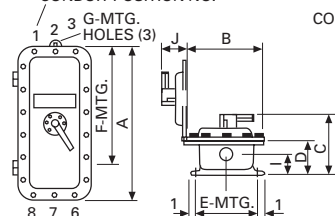


Diagram 1

#### Conduit Openings

Refer to outline dimensions for size and location of standard conduit openings. In addition, 1/2-inch openings are drilled and tapped for breather and drain. Unless ordered with breather and drain, these openings are plugged. Refer to Cutler-Hammer for list price of breather and drain.

CONDUIT POSITION NO.

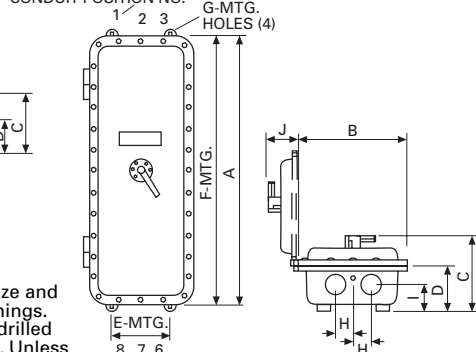


Diagram 2

CONDUIT POSITION NO.

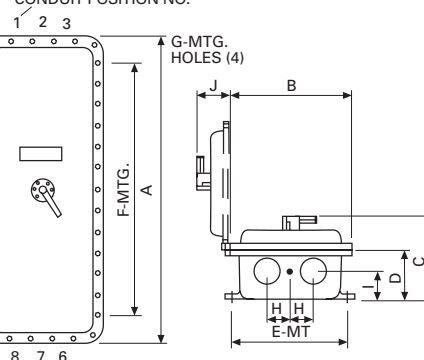
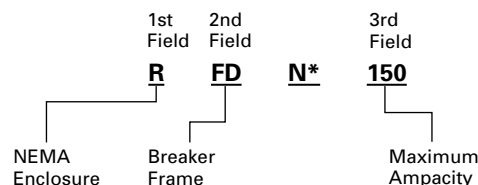


Diagram 3

## Circuit Breaker Enclosure Interpretation Data

| 1st Field<br>Enclosure Type |           |   | 2nd Field<br>Breaker Family | 3rd Field<br>Maximum Ampacity |
|-----------------------------|-----------|---|-----------------------------|-------------------------------|
| NEMA 1                      | Flush     | F | G-Frame                     | 50                            |
|                             | Surface   | S | F-Frame                     | 100                           |
| NEMA 3R                     |           | R | J-Frame                     | 150                           |
| NEMA 12                     |           | J | K-Frame                     | 225                           |
| NEMA 12K                    |           | D | L-Frame                     | 250                           |
| NEMA 4, 4X, 5               | Stainless | W | M-Frame                     | 400                           |
| NEMA 7/9                    | Cast Al.  | X | N-Frame                     | 600                           |
|                             |           |   |                             | 1200                          |



\* "N" in this position indicates enclosure complies with 1981 NEC gutter space requirement.

① Power cables must enter and leave from opposite ends (through feed).

## Standards

Series C<sup>®</sup> molded case circuit breakers are designed to conform with the following standards:

- Underwriters Laboratories, Inc., Standard UL 489, Molded Case Circuit Breakers and Circuit Breaker Enclosures
- National Electrical Manufacturers Association Standards Publication No. AB1-1993, Molded Case Circuit Breakers
- Australian Standard AS 2184, Molded Case Circuit Breakers
- British Standards Institution Standard BS 4752: Part 1, Switchgear and Control Gear Part 1: Circuit Breakers
- Canadian Standards Association Standard C22.2 No. 5, Service Entrance and Branch Circuit Breakers
- International Electrotechnical Commission Recommendations IEC 157-1, Circuit Breakers
- Japanese T-Mark Standard Molded Case Circuit Breakers
- South African Bureau of Standards, Standard SABS 156, Standard Specification for Molded Case Circuit Breakers
- Swiss Electro-Technical Association Standard SEV 157-1, Safety Regulations for Circuit Breakers
- Union Technique de l'Electricite Standard NF C 63-120, Low Voltage Switchgear and Control Gear Circuit Breaker Requirements
- Verband Deutscher Elektrotechniker (Association of German Electrical Engineers) Standard VDE 0660, Low Voltage Switchgear and Control Gear, Circuit Breakers

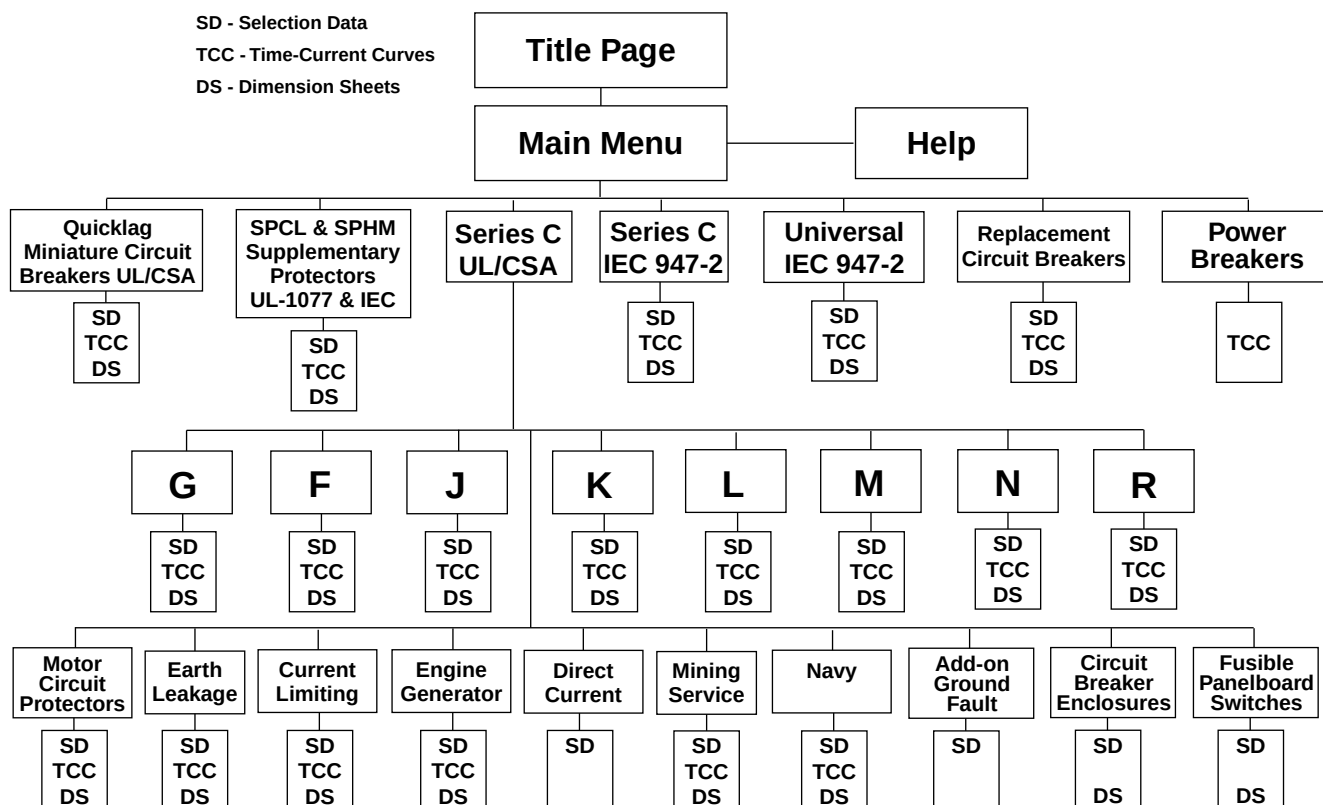
Conformance with these standards satisfies most local and international codes, assuming user acceptability and simplified application.

Series C molded case circuit breakers equal or exceed Federal Specification Classification W-C-375b requirements for the particular class associated with the circuit breaker frame being considered.

## Further Information

Circuit Breaker  
CD-ROM SA.74A.01.T.E

## Navigation Chart of CD-ROM



## System Requirements

- Processor: 486 or faster (Pentium® or Pentium Pro recommended)
- Operating System: Microsoft Windows 95, Windows 98, Windows NT 3.5, or Windows NT 4.0
- Memory: 8 MB of available RAM (16 MB recommended)
- Available Hard Disk Storage Space: 12 MB
- Devices: a CD-ROM drive and a mouse
- Monitor: minimum 640 x 480 resolution and 8-bit color (256 colors)

## Installation Instructions

- This is an autorun CD. Just insert this disk in the CD-ROM drive and wait for it to launch.

CD-ROM Installation Help Line: U.S.: 1-800-270-5134  
Outside of the United States: Contact your local Cutler-Hammer sales office.

If the CD is not included in this Product Guide, contact Cutler-Hammer Fulfillment Center at 1-800-957-7050 and ask for SA.74A.01.T.E.

### Miniature Circuit Breakers

#### Selection Guide ..... 2

#### QUICKLAG® Industrial Circuit Breakers

Circuit Breakers, Plug-on Types HQP, QPHW, QHPX, QHPW ..... 5

Ground Fault Circuit Breakers, Plug-on Types QPGF, QPHGF ..... 6

Ground Fault Equipment Protectors, Plug-on Types QPGFEP, QPHGFEP ..... 6

Circuit Breakers, Bolt-on Types BA, QBHW, HBAX, HBAW ..... 7

Ground Fault Circuit Breakers, Bolt-on Types QBGF, QBHGF ..... 8

Ground Fault Equipment Protectors, Bolt-on Types QBGFEP, QBHGFEP ..... 8

Circuit Breakers, Cable-in/Cable-out  
1-Inch per Pole Types QC, QCHW, QHCX, QHCW ... 9

1/2-Inch per Pole Types QCR, QCF, QCRH, QCFH ... 10

Ground Fault Circuit Breakers, Cable-in/Cable-out  
Types QCGF, QCHGF ..... 13

Ground Fault Equipment Protectors, Cable-in/  
Cable-out Types QPGFEP, QCHGFEP ..... 13

Solenoid-operated, Remote-controlled Types GHBS, GBHS ..... 14

International Rated Circuit Breakers ..... 16

Special Application Breakers ..... 17

Accessories ..... 18

Factory Modifications, Factory Installed Terminals ... 19

#### Supplementary Protectors

Type SPCL Current Limiting ..... 20

Type SPHM Hydraulic Magnetic ..... 23

#### Circuit Breaker Electronic Catalog

Navigation Chart of Attached CD-ROM ..... 192



- Product Guide
- Selection Data
- Time Current Curves
- Dimensions

Website: [www.cutlerhammer.eaton.com](http://www.cutlerhammer.eaton.com)

### Molded Case Circuit Breakers

#### Selection Guide ..... 3

#### Series C Circuit Breakers

G-Frame ..... 25

F-Frame ..... 31

J-Frame ..... 37

K-Frame ..... 43

L-Frame ..... 55

M-Frame ..... 67

N-Frame ..... 75

R-Frame ..... 89

#### Specific Application Circuit Breakers

Motor Circuit Protectors ..... 107

Earth Leakage ..... 113

Current Limiting

Non-fused ..... 115

Fused ..... 117

Engine Generator ..... 129

Direct Current ..... 133

Mining Service ..... See CD-ROM SA.74A.01.T.E

Navy ..... See CD-ROM SA.74A.01.T.E

Add-on Ground Fault Protection ..... 135

#### Internal Accessories

Alarm Switch ..... 139

Auxiliary Switch ..... 142

Auxiliary and Alarm Switch Combination ..... 145

Shunt Trip ..... 147

Low Energy Shunt Trip ..... 152

Undervoltage Release Mechanism ..... 153

Terminal Block ..... 160

Communication Kits ..... 160

#### External Accessories

Termination Hardware ..... 161

Mounting Hardware ..... 163

Locking Devices ..... 168

Interlocking Devices ..... 170

Electric Operators ..... 172

Plug-in Adapters ..... 174

Rear Connecting Studs ..... 175

Panelboard Connecting Straps ..... 177

Handle Mechanisms ..... 178

Circuit Breaker Enclosures ..... 187

Standards ..... 191

| Circuit Breaker Type | Circuit Breaker Type Code | Cont. Ampere Rating At 40°C | Number of Poles | Volts |    | Federal Spec. W-C-375b | Interrupting Ratings rms Symmetrical Amperes |         |     |       |      |    | Page Number |
|----------------------|---------------------------|-----------------------------|-----------------|-------|----|------------------------|----------------------------------------------|---------|-----|-------|------|----|-------------|
|                      |                           |                             |                 | Ac    | Dc |                        | Ac Ratings Volts                             |         |     | Dc②   |      |    |             |
|                      |                           |                             |                 |       |    |                        | 120                                          | 120/240 | 240 | 24-48 | 62.5 | 80 |             |

## Quicklag Industrial Circuit Breakers①

### Plug-in, Bolt-on, Cable-in/Cable-out

|         |         |        |         |         |              |               |        |        |        |       |       |       |    |
|---------|---------|--------|---------|---------|--------------|---------------|--------|--------|--------|-------|-------|-------|----|
| HQP     | P       | 10-70  | 1       | 120/240 | 24, 48, 62.5 | 10a, 11a, 12a | —      | 10,000 | —      | 5,000 | ③     | —     | 5  |
| HQP     | P       | 10-125 | 2       | 120/240 | 24, 48, 80   | 10a, 12a      | —      | 10,000 | —      | 5,000 | 5,000 | 5,000 | 5  |
| HQP     | P       | 10-100 | 2, 3    | 240     | —            | 10b, 11b, 12b | —      | —      | 10,000 | —     | —     | —     | 5  |
| QPHW    | P       | 15-70  | 1       | 120/240 | 24, 48, 62.5 | 14a           | —      | 22,000 | —      | 5,000 | ③     | —     | 5  |
| QPHW    | P       | 15-125 | 2       | 120/240 | 24, 48, 80   | 14a           | —      | 22,000 | —      | 5,000 | 5,000 | 5,000 | 5  |
| QPHW    | P       | 15-100 | 2, 3    | 240     | —            | 14b           | —      | —      | 22,000 | —     | —     | —     | 5  |
| QHPX    | P       | 15-70  | 1       | 120/240 | 24, 48, 62.5 | —             | —      | 42,000 | —      | 5,000 | ③     | —     | 5  |
| QHPX    | P       | 15-100 | 2       | 120/240 | 24, 48, 80   | —             | —      | 42,000 | —      | 5,000 | 5,000 | 5,000 | 5  |
| QHPX    | P       | 15-100 | 3       | 240     | —            | —             | —      | —      | 42,000 | —     | —     | —     | 5  |
| QHPW    | P       | 15-30  | 1       | 120/240 | 24, 48, 62.5 | 15a           | —      | 65,000 | —      | 5,000 | ③     | —     | 5  |
| QHPW    | P       | 15-30  | 2       | 120/240 | 24, 48, 80   | 15a           | —      | 65,000 | —      | 5,000 | 5,000 | 5,000 | 5  |
| QHPW    | P       | 15-20  | 3       | 240     | —            | 15b           | —      | —      | 65,000 | —     | —     | —     | 5  |
| QPGF    | P, GF   | 15-40  | 1       | 120     | —            | 10a, 11a, 12a | 10,000 | —      | —      | —     | —     | —     | 6  |
| QPGF    | P, GF   | 15-50  | 2       | 120/240 | —            | 10a, 11a, 12a | —      | 10,000 | —      | —     | —     | —     | 6  |
| QPHGF   | P, GF   | 15-30  | 1       | 120     | —            | 10a, 11a, 12a | 22,000 | —      | —      | —     | —     | —     | 6  |
| QPHGF   | P, GF   | 15-50  | 2       | 120/240 | —            | 10a, 11a, 12a | —      | 22,000 | —      | —     | —     | —     | 6  |
| QPGFEP  | P, GFEP | 15-40  | 1       | 120     | —            | —             | 10,000 | —      | —      | —     | —     | —     | 6  |
| QPGFEP  | P, GFEP | 15-50  | 2       | 120/240 | —            | —             | —      | 10,000 | —      | —     | —     | —     | 6  |
| QPHGFEP | P, GFEP | 15-30  | 1       | 120     | —            | —             | 22,000 | —      | —      | —     | —     | —     | 6  |
| QPHGFEP | P, GFEP | 15-30  | 2       | 120/240 | —            | —             | 22,000 | 22,000 | —      | —     | —     | —     | 6  |
| BAB     | B       | 10-70  | 1       | 120/240 | 24, 48, 62.5 | 10a, 11a, 12a | —      | 10,000 | —      | 5,000 | ③     | —     | 7  |
| BAB     | B       | 10-125 | 2       | 120/240 | 24, 48, 80   | 10a, 12a      | —      | 10,000 | —      | 5,000 | 5,000 | 5,000 | 7  |
| BAB     | B       | 10-100 | 2, 3    | 240     | —            | 10b, 11b, 12b | —      | —      | 10,000 | —     | —     | —     | 7  |
| QBHW    | B       | 15-70  | 1       | 120/240 | 24, 48, 62.5 | 14a           | —      | 22,000 | —      | 5,000 | ③     | —     | 7  |
| QBHW    | B       | 15-125 | 2       | 120/240 | 24, 48, 80   | 14a           | —      | 22,000 | —      | 5,000 | 5,000 | 5,000 | 7  |
| QBHW    | B       | 15-100 | 2, 3    | 240     | —            | 14b           | —      | —      | 22,000 | —     | —     | —     | 7  |
| HBAX    | B       | 15-70  | 1       | 120/240 | 24, 48, 62.5 | —             | —      | 42,000 | —      | 5,000 | ③     | —     | 7  |
| HBAX    | B       | 15-100 | 2       | 120/240 | 24, 48, 80   | —             | —      | 42,000 | —      | 5,000 | 5,000 | 5,000 | 7  |
| HBAX    | B       | 15-100 | 3       | 240     | —            | —             | —      | —      | 42,000 | —     | —     | —     | 7  |
| HBAW    | B       | 15-30  | 1       | 120/240 | 24, 48, 62.5 | 15a           | —      | 65,000 | —      | 5,000 | ③     | —     | 7  |
| HBAW    | B       | 15-30  | 2       | 120/240 | 24, 48, 80   | 15a           | —      | 65,000 | —      | 5,000 | 5,000 | 5,000 | 7  |
| HBAW    | B       | 15-20  | 3       | 240     | —            | 15b           | —      | —      | 65,000 | —     | —     | —     | 7  |
| QBGf    | B, GF   | 15-40  | 1       | 120     | —            | 10a, 11a, 12a | 10,000 | —      | —      | —     | —     | —     | 8  |
| QBGf    | B, GF   | 15-50  | 2       | 120/240 | —            | 10a, 11a, 12a | —      | 10,000 | —      | —     | —     | —     | 8  |
| QBHGf   | B, GF   | 15-30  | 1       | 120     | —            | 10a, 11a, 12a | 22,000 | —      | —      | —     | —     | —     | 8  |
| QBHGf   | B, GF   | 15-30  | 2       | 120/240 | —            | 10a, 11a, 12a | —      | 22,000 | —      | —     | —     | —     | 8  |
| QBGfEP  | B, GFEP | 15-40  | 1       | 120     | —            | —             | 10,000 | —      | —      | —     | —     | —     | 8  |
| QBGfEP  | B, GFEP | 15-50  | 2       | 120/240 | —            | —             | —      | 10,000 | —      | —     | —     | —     | 8  |
| QBHGfEP | B, GFEP | 15-30  | 1       | 120     | —            | —             | 22,000 | —      | —      | —     | —     | —     | 8  |
| QBHGfEP | B, GFEP | 15-30  | 2       | 120/240 | —            | —             | 22,000 | 22,000 | —      | —     | —     | —     | 8  |
| QC      | C       | 10-70  | 1       | 120/240 | 24, 48, 62.5 | 10a, 11a, 12a | —      | 10,000 | —      | 5,000 | ③     | —     | 9  |
| QC      | C       | 10-100 | 2       | 120/240 | 24, 48, 80   | 10a, 12a      | —      | 10,000 | —      | 5,000 | 5,000 | 5,000 | 9  |
| QC      | C       | 10-100 | 2, 3, 4 | 240     | —            | 10b, 11b, 12b | —      | —      | 10,000 | —     | —     | —     | 9  |
| QCF     | C       | 10-60  | 1, 2    | 120/240 | 24, 48, 62.5 | —             | 10,000 | 10,000 | —      | 3,000 | ③     | —     | 10 |
| QCF     | C       | 15-20  | 1, 2    | 120/240 | 24, 48, 62.5 | —             | 22,000 | —      | —      | 3,000 | 3,000 | —     | 10 |
| QCF     | C       | 15-30  | 2, 3    | 240     | 24, 48, 62.5 | —             | —      | 10,000 | —      | 3,000 | 3,000 | —     | 10 |
| QCR     | C       | 10-60  | 1, 2    | 120/240 | 24, 48, 62.5 | —             | 10,000 | 10,000 | —      | 3,000 | 2,000 | —     | 10 |
| QCR     | C       | 15-20  | 1, 2    | 120/240 | 24, 48, 62.5 | —             | 22,000 | —      | —      | 3,000 | 3,000 | —     | 10 |
| QCR     | C       | 15-30  | 2, 3    | 240     | 24, 48, 62.5 | —             | —      | 10,000 | —      | 3,000 | 3,000 | —     | 10 |
| QCHW    | C       | 15-70  | 1       | 120/240 | 24, 48, 62.5 | 14a           | —      | 22,000 | —      | 5,000 | ③     | —     | 9  |
| QCHW    | C       | 15-100 | 2       | 120/240 | 24, 48, 80   | 14a           | —      | 22,000 | —      | 5,000 | 5,000 | 5,000 | 9  |
| QCHW    | C       | 15-100 | 2, 3    | 240     | —            | 14b           | —      | —      | 22,000 | —     | —     | —     | 9  |
| QHCX    | C       | 15-70  | 1       | 120/240 | 24, 48, 62.5 | —             | —      | 42,000 | —      | 5,000 | ③     | —     | 9  |
| QHCX    | C       | 15-100 | 2       | 120/240 | 24, 48, 80   | —             | —      | 42,000 | —      | 5,000 | 5,000 | 5,000 | 9  |
| QHCX    | C       | 15-100 | 3       | 240     | —            | —             | —      | —      | 42,000 | —     | —     | —     | 9  |
| QHCW    | C       | 15-30  | 1       | 120/240 | 24, 48, 62.5 | 15a           | —      | 65,000 | —      | 5,000 | ③     | —     | 9  |
| QHCW    | C       | 15-30  | 2       | 120/240 | 24, 48, 80   | 15a           | —      | 65,000 | —      | 5,000 | 5,000 | 5,000 | 9  |
| QHCW    | C       | 15-20  | 3       | 240     | —            | 15b           | —      | —      | 65,000 | —     | —     | —     | 9  |
| QCGF    | C, GF   | 15-40  | 1       | 120     | —            | —             | 10,000 | —      | —      | —     | —     | —     | 13 |
| QCGF    | C, GF   | 15-50  | 2       | 120/240 | —            | —             | —      | 10,000 | —      | —     | —     | —     | 13 |
| QCHGF   | C, GF   | 15-30  | 1       | 120     | —            | —             | 22,000 | —      | —      | —     | —     | —     | 13 |
| QCHGF   | C, GF   | 15-30  | 2       | 120/240 | —            | —             | —      | 22,000 | —      | —     | —     | —     | 13 |
| QCGFEP  | C, GFEP | 15-40  | 1       | 120     | —            | —             | 10,000 | —      | —      | —     | —     | —     | 13 |
| QCGFEP  | C, GFEP | 15-50  | 2       | 120/240 | —            | —             | —      | 10,000 | —      | —     | —     | —     | 13 |
| QCHGFEP | C, GFEP | 15-30  | 1       | 120     | —            | —             | 22,000 | —      | —      | —     | —     | —     | 13 |
| QCHGFEP | C, GFEP | 15-30  | 2       | 120/240 | —            | —             | —      | 22,000 | —      | —     | —     | —     | 13 |

Circuit Breaker Type Codes: P Plug-in; B Bolt-on; C Cable-in/Cable-out; GF Ground Fault, 5 ma; GFEP Ground Fault, 30 ma.

For Types SPCL and SPHM Supplementary Protectors, see pages 20 and 23.

For Types GHBS and GBHS Solenoid-operated, Remote-controlled Circuit Breakers, see page 14.

① QUICKLAG circuit breakers are suitable for application in relative humidity 0-95% non-condensating.

② Two-pole dc interrupting ratings based on 2 poles connected in series.

③ 62.5 Vac interrupting rating is 3800 AIC 10-50 amperes and 2500 AIC 55-100 amperes continuous.

| Circuit Breaker Type | Cont. Amp Rating At 40°C | No. Poles | Volts |    | Type of Trip① | Federal Spec. W-C-375b | UL Listed Interrupting Ratings rms Symmetrical Amperes |         |     |     |     |     |     |     |         | Page Number |
|----------------------|--------------------------|-----------|-------|----|---------------|------------------------|--------------------------------------------------------|---------|-----|-----|-----|-----|-----|-----|---------|-------------|
|                      |                          |           | Ac    | Dc |               |                        | Ac Ratings Volts                                       |         |     |     |     |     | Dc② |     |         |             |
|                      |                          |           |       |    |               |                        | 120                                                    | 120/240 | 240 | 277 | 480 | 600 | 125 | 250 | 125/250 |             |

**Series C<sup>®</sup> Industrial Circuit Breakers****G-Frame**

|     |        |      |         |         |        |                         |        |   |        |        |        |   |        |   |        |    |
|-----|--------|------|---------|---------|--------|-------------------------|--------|---|--------|--------|--------|---|--------|---|--------|----|
| GB  | 15-100 | 1    | 120     | 125     | N.I.T. | 11a                     | 65,000 | — | —      | —      | —      | — | 14,000 | — | —      | 27 |
| GB  | 15-100 | 2, 3 | 240     | 125/250 |        | 10b, 11b, 12b, 14b, 15b | —      | — | 65,000 | —      | —      | — | —      | — | 14,000 | 27 |
| GHB | 15-100 | 1    | 120     | 125     | N.I.T. | 11a                     | 65,000 | — | —      | —      | —      | — | 14,000 | — | —      | 27 |
| GHB | 15-100 | 2, 3 | 240     | 125/250 |        | 10b, 11b, 12b, 14b, 15b | —      | — | 65,000 | —      | —      | — | —      | — | 14,000 | 27 |
| GHB | 15-100 | 1    | 277     | 125     |        | 12c, 13a                | —      | — | —      | 14,000 | —      | — | 14,000 | — | —      | 27 |
| GHB | 15-100 | 2, 3 | 277/480 | 125/250 |        | 13b                     | —      | — | —      | 14,000 | 14,000 | — | —      | — | 14,000 | 27 |

|     |        |      |         |         |        |                         |        |   |        |        |        |   |        |   |        |    |
|-----|--------|------|---------|---------|--------|-------------------------|--------|---|--------|--------|--------|---|--------|---|--------|----|
| GC  | 15-100 | 1    | 120     | 125     | N.I.T. | 11a                     | 65,000 | — | —      | —      | —      | — | 14,000 | — | —      | 28 |
| GC  | 15-100 | 2, 3 | 240     | 125/250 |        | 10b, 11b, 12b, 14b, 15b | —      | — | 65,000 | —      | —      | — | —      | — | 14,000 | 28 |
| GHC | 15-100 | 1    | 120     | 125     | N.I.T. | 12c, 13a                | 65,000 | — | —      | —      | —      | — | 14,000 | — | —      | 28 |
| GHC | 15-100 | 2, 3 | 240     | 125/250 |        | 13b                     | —      | — | 65,000 | —      | —      | — | —      | — | 14,000 | 28 |
| GHC | 15-100 | 1    | 277     | 125     |        | 12c, 13a                | —      | — | —      | 14,000 | —      | — | 14,000 | — | —      | 28 |
| GHC | 15-100 | 2, 3 | 277/480 | 125/250 |        | 13b                     | —      | — | —      | 14,000 | 14,000 | — | —      | — | 14,000 | 28 |

**F-Frame**

|     |         |      |     |     |        |     |   |   |         |        |         |        |        |        |   |    |
|-----|---------|------|-----|-----|--------|-----|---|---|---------|--------|---------|--------|--------|--------|---|----|
| GD  | 15-100  | 3    | 480 | 250 | N.I.T. | 13b | — | — | 65,000  | —      | 22,000  | —      | —      | 10,000 | — | 26 |
| ED  | 100-255 | 2, 3 | 240 | 125 | N.I.T. | 12b | — | — | 65,000  | —      | —       | —      | 10,000 | —      | — | 32 |
| EDH | 100-255 | 2, 3 | 240 | 125 |        | 14b | — | — | 100,000 | —      | —       | —      | 10,000 | —      | — | 32 |
| EDC | 100-255 | 2, 3 | 240 | 125 |        | 1   | — | — | 200,000 | —      | —       | —      | 10,000 | —      | — | 32 |
| EHD | 15-100  | 1    | 277 | 125 | N.I.T. | 13a | — | — | —       | 14,000 | —       | —      | 10,000 | —      | — | 32 |
| EHD | 15-100  | 2, 3 | 480 | 250 |        | 13b | — | — | 18,000  | —      | 14,000  | —      | —      | 10,000 | — | 32 |
| FDB | 15-150  | 2, 3 | 600 | 250 | N.I.T. | 18a | — | — | 18,000  | —      | 14,000  | 14,000 | —      | 10,000 | — | 32 |
| FDB | 15-150  | 4    | 600 | 250 |        | ③   | — | — | 18,000  | —      | 14,000  | 14,000 | —      | 10,000 | — | 32 |
| FD  | 15-150  | 1    | 277 | 125 | N.I.T. | 13a | — | — | —       | 25,000 | —       | —      | 10,000 | —      | — | 32 |
| FD  | 15-150  | 2, 3 | 600 | 250 |        | 22a | — | — | 65,000  | —      | 25,000  | 18,000 | —      | 10,000 | — | 32 |
| FD  | 15-150  | 4    | 600 | 250 |        | ③   | — | — | 65,000  | —      | 25,000  | 18,000 | —      | 10,000 | — | 32 |
| HFD | 15-150  | 1    | 277 | 125 | N.I.T. | 13a | — | — | —       | 65,000 | —       | —      | 10,000 | —      | — | 33 |
| HFD | 15-150  | 2, 3 | 600 | 250 |        | 22a | — | — | 100,000 | —      | 65,000  | 25,000 | —      | 20,000 | — | 33 |
| HFD | 15-150  | 4    | 600 | 250 |        | ③   | — | — | 100,000 | —      | 65,000  | 25,000 | —      | 20,000 | — | 33 |
| FDC | 15-150  | 2, 3 | 600 | 250 | N.I.T. | 24a | — | — | 200,000 | —      | 100,000 | 35,000 | —      | 20,000 | — | 33 |
| FDC | 15-150  | 4    | 600 | 250 |        | ③   | — | — | 200,000 | —      | 100,000 | 35,000 | —      | 20,000 | — | 33 |

**J-Frame**

|     |        |         |     |     |        |     |   |   |         |   |         |        |   |        |   |    |
|-----|--------|---------|-----|-----|--------|-----|---|---|---------|---|---------|--------|---|--------|---|----|
| JDB | 70-250 | 2, 3    | 600 | 250 | N.I.T. | 22a | — | — | 65,000  | — | 25,000  | 18,000 | — | 10,000 | — | 39 |
| JD  | 70-250 | 2, 3, 4 | 600 | 250 |        | 22a | — | — | 65,000  | — | 25,000  | 18,000 | — | 10,000 | — | 38 |
| HJD | 70-250 | 2, 3, 4 | 600 | 250 | I.T.   | 22a | — | — | 100,000 | — | 65,000  | 25,000 | — | 22,000 | — | 38 |
| JDC | 70-250 | 2, 3, 4 | 600 | 250 | I.T.   | 22a | — | — | 200,000 | — | 100,000 | 35,000 | — | 22,000 | — | 38 |

**K-Frame**

|      |         |         |     |     |        |     |   |   |         |   |         |        |   |        |   |            |
|------|---------|---------|-----|-----|--------|-----|---|---|---------|---|---------|--------|---|--------|---|------------|
| DK   | 250-400 | 2, 3    | 240 | 250 | N.I.T. | 14b | — | — | 65,000  | — | —       | —      | — | 10,000 | — | 47         |
| KDB  | 100-400 | 2, 3    | 600 | 250 | N.I.T. | 23a | — | — | 65,000  | — | 35,000  | 25,000 | — | 10,000 | — | 47         |
| KD   | 100-400 | 2, 3, 4 | 600 | 250 | I.T.   | 23a | — | — | 65,000  | — | 35,000  | 25,000 | — | 10,000 | — | 45, 46, 49 |
| CKD  | 100-400 | 2, 3, 4 | 600 | 250 | I.T.   | 23a | — | — | 65,000  | — | 35,000  | 25,000 | — | 10,000 | — | 48, 50     |
| HKD  | 100-400 | 2, 3, 4 | 600 | 250 | I.T.   | 23a | — | — | 100,000 | — | 65,000  | 35,000 | — | 22,000 | — | 45, 46, 49 |
| CHKD | 100-400 | 2, 3, 4 | 600 | 250 | I.T.   | 23a | — | — | 100,000 | — | 65,000  | 35,000 | — | 22,000 | — | 48, 50     |
| KDC  | 100-400 | 2, 3, 4 | 600 | 250 | I.T.   | 23a | — | — | 200,000 | — | 100,000 | 50,000 | — | 22,000 | — | 45, 46, 49 |

**L-Frame**

|      |         |         |     |     |        |     |   |   |         |   |         |        |   |        |   |        |
|------|---------|---------|-----|-----|--------|-----|---|---|---------|---|---------|--------|---|--------|---|--------|
| LDB  | 300-600 | 2, 3    | 600 | 250 | N.I.T. | 23a | — | — | 65,000  | — | 35,000  | 25,000 | — | 22,000 | — | 58     |
| LD   | 300-600 | 2, 3, 4 | 600 | 250 | I.T.   | 23a | — | — | 65,000  | — | 35,000  | 25,000 | — | 22,000 | — | 57, 59 |
| CLD  | 300-600 | 2, 3, 4 | 600 | 250 | I.T.   | 23a | — | — | 65,000  | — | 35,000  | 25,000 | — | 22,000 | — | 58, 61 |
| HL   | 300-600 | 2, 3, 4 | 600 | 250 | I.T.   | 23a | — | — | 100,000 | — | 65,000  | 35,000 | — | 25,000 | — | 57, 59 |
| CHLD | 300-600 | 2, 3, 4 | 600 | 250 | I.T.   | 23a | — | — | 100,000 | — | 65,000  | 35,000 | — | 25,000 | — | 61     |
| LDC  | 300-600 | 2, 3, 4 | 600 | 250 | I.T.   | 23a | — | — | 200,000 | — | 100,000 | 50,000 | — | 25,000 | — | 57, 60 |
| CLDC | 300-600 | 2, 3, 4 | 600 | 250 | I.T.   | 23a | — | — | 200,000 | — | 100,000 | 50,000 | — | 25,000 | — | 62     |

① N.I.T. is non-interchangeable trip unit and I.T. is interchangeable trip unit.

② Two-pole circuit breaker, or two poles of three-pole circuit breaker at 250 Vdc.

③ Not defined in W-C-375b.

## Selection Guide, Continued

| Circuit Breaker Type | Cont. Amp Rating At 40°C | No. Poles | Volts |    | Type of Trip① | Federal Spec. W-C-375b | UL Listed Interrupting Ratings rms Symmetrical Amperes |         |     |     |     |     |     |     |         | Page Number |
|----------------------|--------------------------|-----------|-------|----|---------------|------------------------|--------------------------------------------------------|---------|-----|-----|-----|-----|-----|-----|---------|-------------|
|                      |                          |           | Ac    | Dc |               |                        | Ac Ratings Volts                                       |         |     |     |     |     | Dc② |     |         |             |
|                      |                          |           |       |    |               |                        | 120                                                    | 120/240 | 240 | 277 | 480 | 600 | 125 | 250 | 125/250 |             |

### Series C<sup>®</sup> Industrial Circuit Breakers

#### M-Frame

|       |         |      |     |     |      |     |   |   |         |   |        |        |   |        |   |        |
|-------|---------|------|-----|-----|------|-----|---|---|---------|---|--------|--------|---|--------|---|--------|
| MDL   | 300-800 | 2, 3 | 600 | 250 | I.T. | 23a | — | — | 65,000  | — | 50,000 | 25,000 | — | 22,000 | — | 69, 70 |
| CMDL  | 300-800 | 2, 3 | 600 | 250 | I.T. | 23a | — | — | 65,000  | — | 50,000 | 25,000 | — | 22,000 | — | 70     |
| HMDL  | 300-800 | 2, 3 | 600 | 250 | I.T. | 23a | — | — | 100,000 | — | 65,000 | 35,000 | — | 25,000 | — | 69, 70 |
| CHMDL | 300-800 | 2, 3 | 600 | 250 | I.T. | 23a | — | — | 100,000 | — | 65,000 | 35,000 | — | 25,000 | — | 70     |

#### N-Frame

|      |          |      |     |   |        |     |   |   |         |   |         |        |   |   |   |        |
|------|----------|------|-----|---|--------|-----|---|---|---------|---|---------|--------|---|---|---|--------|
| ND   | 600-1200 | 3, 4 | 600 | — | N.I.T. | 23A | — | — | 65,000  | — | 50,000  | 25,000 | — | — | — | 77, 83 |
| CND  | 600-1200 | 3, 4 | 600 | — | N.I.T. | 23A | — | — | 65,000  | — | 50,000  | 25,000 | — | — | — | 80, 84 |
| HND  | 600-1200 | 3, 4 | 600 | — | N.I.T. | 23A | — | — | 100,000 | — | 65,000  | 35,000 | — | — | — | 78, 83 |
| CHND | 600-1200 | 3, 4 | 600 | — | N.I.T. | 23A | — | — | 100,000 | — | 65,000  | 35,000 | — | — | — | 81, 84 |
| NDC  | 600-1200 | 3, 4 | 600 | — | N.I.T. | 23A | — | — | 200,000 | — | 100,000 | 50,000 | — | — | — | 79, 83 |
| CNDC | 600-1200 | 3, 4 | 600 | — | N.I.T. | 23A | — | — | 200,000 | — | 100,000 | 50,000 | — | — | — | 82, 84 |

#### R-Frame

|           |           |      |     |   |        |     |   |   |         |   |         |        |   |   |   |    |
|-----------|-----------|------|-----|---|--------|-----|---|---|---------|---|---------|--------|---|---|---|----|
| RD 1600   | 800-1600  | 3, 4 | 600 | — | N.I.T. | 24a | — | — | 125,000 | — | 65,000  | 50,000 | — | — | — | 91 |
| CRD 1600  | 800-1600  | 3, 4 | 600 | — | N.I.T. | 24a | — | — | 125,000 | — | 65,000  | 50,000 | — | — | — | 93 |
| RD 2000   | 1000-2000 | 3, 4 | 600 | — | N.I.T. | 24a | — | — | 125,000 | — | 65,000  | 50,000 | — | — | — | 91 |
| RD 2500   | 1000-2500 | 3, 4 | 600 | — | N.I.T. | 24a | — | — | 200,000 | — | 65,000  | 50,000 | — | — | — | 91 |
| CRD 2000  | 1000-2000 | 3, 4 | 600 | — | N.I.T. | 24a | — | — | 125,000 | — | 65,000  | 50,000 | — | — | — | 93 |
| RDC 1600  | 800-1600  | 3, 4 | 600 | — | N.I.T. | 25a | — | — | 200,000 | — | 100,000 | 65,000 | — | — | — | 92 |
| CRDC 1600 | 800-1600  | 3, 4 | 600 | — | N.I.T. | 25a | — | — | 200,000 | — | 100,000 | 65,000 | — | — | — | 93 |
| RDC 2000  | 1000-2000 | 3, 4 | 600 | — | N.I.T. | 25a | — | — | 200,000 | — | 100,000 | 65,000 | — | — | — | 92 |
| RDC 2500  | 1000-2500 | 3, 4 | 600 | — | N.I.T. | 25a | — | — | 200,000 | — | 100,000 | 65,000 | — | — | — | 92 |
| CRDC 2000 | 1000-2000 | 3, 4 | 600 | — | N.I.T. | 25a | — | — | 200,000 | — | 100,000 | 65,000 | — | — | — | 93 |

### Series C<sup>®</sup> HMCP Motor Circuit Protectors

107

#### Current Limit R Current Limiting Circuit Breakers – Non-Fused Type

|     |         |      |     |   |        |   |   |   |         |   |         |         |   |   |   |     |
|-----|---------|------|-----|---|--------|---|---|---|---------|---|---------|---------|---|---|---|-----|
| FCL | 15-100  | 2, 3 | 480 | — | N.I.T. | — | — | — | 200,000 | — | 150,000 | —       | — | — | — | 115 |
| LCL | 125-400 | 2, 3 | 600 | — | N.I.T. | — | — | — | 200,000 | — | 200,000 | 100,000 | — | — | — | 116 |

#### Tri-Pac Current Limiting Circuit Breakers – Fused Type

|    |          |      |     |     |        |                    |   |   |         |   |         |         |   |   |         |     |
|----|----------|------|-----|-----|--------|--------------------|---|---|---------|---|---------|---------|---|---|---------|-----|
| FB | 15-100   | 2, 3 | 600 | 250 | N.I.T. | 16a, 16b, 17a, 26a | — | — | 200,000 | — | 200,000 | 200,000 | — | — | 100,000 | 117 |
| LA | 70-400   | 2, 3 | 600 | 250 | I.T.   | 16a, 16b, 17a, 26a | — | — | 200,000 | — | 200,000 | 200,000 | — | — | 100,000 | 118 |
| NB | 300-800  | 2, 3 | 600 | 250 | I.T.   | 16b, 17a, 26a      | — | — | 200,000 | — | 200,000 | 200,000 | — | — | 100,000 | 119 |
| PB | 600-1600 | 2, 3 | 600 | 250 | I.T.   | 17a, 26a           | — | — | 200,000 | — | 200,000 | 200,000 | — | — | 100,000 | 120 |

① N.I.T. is non-interchangeable trip unit and I.T. is interchangeable trip unit.

② Two-pole circuit breaker, or two poles of three-pole circuit breaker at 250 Vdc.

## QUICKLAG Industrial Circuit Breakers Plug-on

### Description

#### Built and Listed to UL 489

#### QUICKLAG Circuit Breakers Plug-on Type

Type HQP: 10-150 Amperes,  
10,000 AIC

Type QPHW: 15-125 Amperes,  
22,000 AIC

Type QHPX: 15-100 Amperes,  
42,000 AIC

Type QHPW: 15-30 Amperes,  
65,000 AIC



QUICKLAG Type HQP 1-Pole



QUICKLAG Type HQP 2-Pole



QUICKLAG Type HQP 3-Pole

### Breaker Catalog Numbers

| Continuous Ampere Rating at 40°C | Catalog Number       |                      |         |                      |
|----------------------------------|----------------------|----------------------|---------|----------------------|
|                                  | 1-Pole <sup>①②</sup> | 2-Pole <sup>①②</sup> |         | 3-Pole <sup>①②</sup> |
|                                  | 120/240 Vac          | 120/240 Vac          | 240 Vac | 240 Vac              |

#### QUICKLAG Type: HQP 10,000 Ampere I.C. Thermal-Magnetic Breakers

|     |                       |         |          |          |
|-----|-----------------------|---------|----------|----------|
| 10  | HQP1010               | HQP2010 | HQP2010H | HQP3010H |
| 15  | HQP1015 <sup>③④</sup> | HQP2015 | HQP2015H | HQP3015H |
| 20  | HQP1020 <sup>③④</sup> | HQP2020 | HQP2020H | HQP3020H |
| 25  | HQP1025               | HQP2025 | HQP2025H | HQP3025H |
| 30  | HQP1030               | HQP2030 | HQP2030H | HQP3030H |
| 35  | HQP1035               | HQP2035 | HQP2035H | HQP3035H |
| 40  | HQP1040               | HQP2040 | HQP2040H | HQP3040H |
| 45  | HQP1045               | HQP2045 | HQP2045H | HQP3045H |
| 50  | HQP1050               | HQP2050 | HQP2050H | HQP3050H |
| 55  | HQP1055               | HQP2055 | HQP2055H | HQP3055H |
| 60  | HQP1060               | HQP2060 | HQP2060H | HQP3060H |
| 70  | HQP1070               | HQP2070 | HQP2070H | HQP3070H |
| 80  | —                     | HQP2080 | HQP2080H | HQP3080H |
| 90  | —                     | HQP2090 | HQP2090H | HQP3090H |
| 100 | HQP1100               | HQP2100 | HQP2100H | HQP3100H |
| 110 | —                     | HQP2110 | —        | —        |
| 125 | —                     | HQP2125 | —        | —        |
| 150 | —                     | HQP2150 | —        | —        |

#### QUICKLAG Type: QPHW 22,000 Ampere I.C. Thermal-Magnetic Breakers

|     |                       |          |           |           |
|-----|-----------------------|----------|-----------|-----------|
| 15  | QPHW1015 <sup>③</sup> | QPHW2015 | QPHW2015H | QPHW3015H |
| 20  | QPHW1020 <sup>③</sup> | QPHW2020 | QPHW2020H | QPHW3020H |
| 25  | QPHW1025              | QPHW2025 | QPHW2025H | QPHW3025H |
| 30  | QPHW1030              | QPHW2030 | QPHW2030H | QPHW3030H |
| 35  | QPHW1035              | QPHW2035 | QPHW2035H | QPHW3035H |
| 40  | QPHW1040              | QPHW2040 | QPHW2040H | QPHW3040H |
| 45  | QPHW1045              | QPHW2045 | QPHW2045H | QPHW3045H |
| 50  | QPHW1050              | QPHW2050 | QPHW2050H | QPHW3050H |
| 55  | QPHW1055              | QPHW2055 | QPHW2055H | QPHW3055H |
| 60  | QPHW1060              | QPHW2060 | QPHW2060H | QPHW3060H |
| 70  | QPHW1070              | QPHW2070 | QPHW2070H | QPHW3070H |
| 80  | —                     | QPHW2080 | QPHW2080H | QPHW3080H |
| 90  | —                     | QPHW2090 | QPHW2090H | QPHW3090H |
| 100 | —                     | QPHW2100 | QPHW2100H | QPHW3100H |
| 110 | —                     | QPHW2110 | —         | —         |
| 125 | —                     | QPHW2125 | —         | —         |

#### QUICKLAG Type: QHPX 42,000 Ampere I.C. Thermal-Magnetic Breakers

|     |                       |          |   |           |
|-----|-----------------------|----------|---|-----------|
| 15  | QHPX1015 <sup>③</sup> | QHPX2015 | — | QHPX3015H |
| 20  | QHPX1020 <sup>③</sup> | QHPX2020 | — | QHPX3020H |
| 25  | QHPX1025              | QHPX2025 | — | QHPX3025H |
| 30  | QHPX1030              | QHPX2030 | — | QHPX3030H |
| 35  | QHPX1035              | QHPX2035 | — | QHPX3035H |
| 40  | QHPX1040              | QHPX2040 | — | QHPX3040H |
| 45  | QHPX1045              | QHPX2045 | — | QHPX3045H |
| 50  | QHPX1050              | QHPX2050 | — | QHPX3050H |
| 55  | QHPX1055              | QHPX2055 | — | QHPX3055H |
| 60  | QHPX1060              | QHPX2060 | — | QHPX3060H |
| 70  | QHPX1070              | QHPX2070 | — | QHPX3070H |
| 80  | —                     | QHPX2080 | — | QHPX3080H |
| 90  | —                     | QHPX2090 | — | QHPX3090H |
| 100 | —                     | QHPX2100 | — | QHPX3100H |

#### QUICKLAG Type: QHPW 65,000 Ampere I.C. Thermal-Magnetic Breakers

|    |                       |          |   |           |
|----|-----------------------|----------|---|-----------|
| 15 | QHPW1015 <sup>③</sup> | QHPW2015 | — | QHPW3015H |
| 20 | QHPW1020 <sup>③</sup> | QHPW2020 | — | QHPW3020H |
| 25 | QHPW1025              | QHPW2025 | — | —         |
| 30 | QHPW1030              | QHPW2030 | — | —         |

### Shipping Data

| Poles | Carton Quantity | Approximate Weight Lbs. (Kgs) | Dimensions Inches (mm)                            |
|-------|-----------------|-------------------------------|---------------------------------------------------|
| 1     | 24              | 9.000 (4.09)                  | 12.500 (317.50) x 7.500 (190.50) x 5.000 (127.00) |
| 2     | 12              | 9.000 (4.09)                  | 12.500 (317.50) x 7.500 (190.50) x 5.000 (127.00) |
| 3     | 8               | 9.000 (4.09)                  | 12.500 (317.50) x 7.500 (190.50) x 5.000 (127.00) |

- ① All products UL and CSA listed.
- ② All products 15-100A are HACR rated.
- ③ Switching duty rated for 120 Vac fluorescent light applications.
- ④ For special low-magnetic breaker order HQP1015L1 or HQP1020L1



# Miniature Circuit Breakers QUICKLAG® Industrial Circuit Breakers

Cutler-Hammer

March 1999

## QUICKLAG Industrial Ground Fault Circuit Breakers and Equipment Protectors Plug-on

### Description

#### Plug-on Type

Built and Listed to UL 489

#### QUICKLAG Ground Fault Circuit Breakers, Class A GFCI

Built and Tested to UL 943

#### 5mA Trip Sensitivity

Type QPGF: 15-50 Amperes,  
10,000 AIC

Type QPHGF: 15-30 Amperes,  
22,000 AIC

#### QUICKLAG Ground Fault Equipment Protectors

Built and Listed to UL 1053

#### 30mA Trip Sensitivity

Type QPGFEP: 15-50 Amperes,  
10,000 AIC

Type QPHGFEP: 15-30 Amperes,  
22,000 AIC



QUICKLAG Type QPGF 1-Pole  
Ground Fault Circuit Breaker



QUICKLAG Type QPGF 2-Pole  
Ground Fault Circuit Breaker

### Shipping Data

Shipped individually or in carton quantities.

| Poles | Carton Quantity | Approximate Weight Lbs. (Kgs) | Dimensions Inches (mm)                            |
|-------|-----------------|-------------------------------|---------------------------------------------------|
| 1     | 20              | 11.000 (4.99)                 | 12.500 (317.50) x 6.500 (165.10) x 5.000 (127.00) |
| 2     | 5               | 5.000 (2.29)                  | 15.500 (393.70) x 6.000 (152.40) x 4.500 (114.30) |

### Breaker Catalog Numbers

| Continuous Ampere Rating at 40°C | Catalog Number |             |
|----------------------------------|----------------|-------------|
|                                  | 1-Pole         | 2-Pole      |
|                                  | 120 Vac        | 120/240 Vac |

#### Ground Fault Circuit Breakers – 5mA Sensitivity

QUICKLAG Type: QPGF 10,000 Ampere I.C. Thermal-Magnetic Breakers

|    |          |          |
|----|----------|----------|
| 15 | QPGF1015 | QPGF2015 |
| 20 | QPGF1020 | QPGF2020 |
| 25 | QPGF1025 | QPGF2025 |
| 30 | QPGF1030 | QPGF2030 |
| 40 | QPGF1040 | QPGF2040 |
| 50 | —        | QPGF2050 |

#### QUICKLAG Type: QPHGF 22,000 Ampere I.C. Thermal-Magnetic Breakers

|    |           |           |
|----|-----------|-----------|
| 15 | QPHGF1015 | QPHGF2015 |
| 20 | QPHGF1020 | QPHGF2020 |
| 25 | QPHGF1025 | QPHGF2025 |
| 30 | QPHGF1030 | QPHGF2030 |

#### Ground Fault Equipment Protectors – 30mA Sensitivity

QUICKLAG Type: QPGFEP 10,000 Ampere I.C. Thermal-Magnetic Breakers

|    |            |            |
|----|------------|------------|
| 15 | QPGFEP1015 | QPGFEP2015 |
| 20 | QPGFEP1020 | QPGFEP2020 |
| 25 | QPGFEP1025 | QPGFEP2025 |
| 30 | QPGFEP1030 | QPGFEP2030 |
| 40 | QPGFEP1040 | QPGFEP2040 |
| 50 | —          | QPGFEP2050 |

#### QUICKLAG Type: QPHGFEP 22,000 Ampere I.C. Thermal-Magnetic Breakers

|    |             |             |
|----|-------------|-------------|
| 15 | QPHGFEP1015 | QPHGFEP2015 |
| 20 | QPHGFEP1020 | QPHGFEP2020 |
| 25 | QPHGFEP1025 | QPHGFEP2025 |
| 30 | QPHGFEP1030 | QPHGFEP2030 |

#### Special Application Ground Fault Circuit Protectors – 5mA Sensitivity

QUICKLAG Type: QPGF 10,000 Ampere I.C. with Bell Alarm (W1) or Auxiliary Switch (W2)

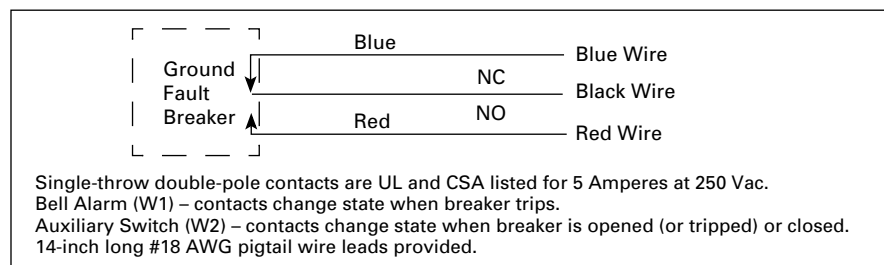
|    |            |            |
|----|------------|------------|
| 15 | QPGF1015W1 | QPGF2015W1 |
| 20 | QPGF1020W1 | QPGF2020W1 |
| 25 | QPGF1025W1 | QPGF2025W1 |
| 30 | QPGF1030W1 | QPGF2030W1 |
| 40 | —          | QPGF2040W1 |
| 50 | —          | QPGF2050W1 |
| 15 | QPGF1015W2 | —          |
| 20 | QPGF1020W2 | —          |
| 25 | QPGF1025W2 | —          |
| 30 | QPGF1030W2 | —          |

#### Special Application Ground Fault Circuit Protectors – 30mA Sensitivity

QUICKLAG Type: QPGFEP 10,000 Ampere I.C. with Bell Alarm (W1) or Auxiliary Switch (W2)

|    |              |              |
|----|--------------|--------------|
| 15 | QPGFEP1015W1 | QPGFEP2015W1 |
| 20 | QPGFEP1020W1 | QPGFEP2020W1 |
| 25 | QPGFEP1025W1 | QPGFEP2025W1 |
| 30 | QPGFEP1030W1 | QPGFEP2030W1 |
| 40 | —            | QPGFEP2040W1 |
| 50 | —            | QPGFEP2050W1 |
| 15 | QPGFEP1015W2 | —            |
| 20 | QPGFEP1020W2 | —            |
| 25 | QPGFEP1025W2 | —            |
| 30 | QPGFEP1030W2 | —            |

### Bell Alarm and Auxiliary Contact Schematic



## QUICKLAG Industrial Circuit Breakers Bolt-on

### Description

#### Built and Listed to UL 489

#### QUICKLAG Circuit Breakers Bolt-on Type

Type BA: 10-125 Amperes,  
10,000 AIC

Type QBHW: 15-125 Amperes,  
22,000 AIC

Type HBAX: 15-100 Amperes,  
42,000 AIC

Type HBAW: 15-30 Amperes,  
65,000 AIC



QUICKLAG Type BA 1-Pole



QUICKLAG Type BA 2-Pole



QUICKLAG Type BA 3-Pole

### Breaker Catalog Numbers

| Continuous<br>Ampere<br>Rating at<br>40°C | Catalog Number       |  |                      |         |
|-------------------------------------------|----------------------|--|----------------------|---------|
|                                           | 1-Pole <sup>①②</sup> |  | 2-Pole <sup>①②</sup> |         |
|                                           | 120/240 Vac          |  | 120/240 Vac          | 240 Vac |

## QUICKLAG Type: BA 10,000 Ampere I.C. Thermal-Magnetic Breakers

|     |                       |         |          |          |
|-----|-----------------------|---------|----------|----------|
| 10  | BAB1010               | BAB2010 | BAB2010H | BAB3010H |
| 15  | BAB1015 <sup>③④</sup> | BAB2015 | BAB2015H | BAB3015H |
| 20  | BAB1020 <sup>③④</sup> | BAB2020 | BAB2020H | BAB3020H |
| 25  | BAB1025               | BAB2025 | BAB2025H | BAB3025H |
| 30  | BAB1030               | BAB2030 | BAB2030H | BAB3030H |
| 35  | BAB1035               | BAB2035 | BAB2035H | BAB3035H |
| 40  | BAB1040               | BAB2040 | BAB2040H | BAB3040H |
| 45  | BAB1045               | BAB2045 | BAB2045H | BAB3045H |
| 50  | BAB1050               | BAB2050 | BAB2050H | BAB3050H |
| 55  | BAB1055               | BAB2055 | BAB2055H | BAB3055H |
| 60  | BAB1060               | BAB2060 | BAB2060H | BAB3060H |
| 70  | BAB1070               | BAB2070 | BAB2070H | BAB3070H |
| 80  | —                     | BAB2080 | BAB2080H | BAB3080H |
| 90  | —                     | BAB2090 | BAB2090H | BAB3090H |
| 100 | BAB1100               | BAB2100 | BAB2100H | BAB3100H |
| 110 | —                     | BAB2110 | —        | —        |
| 125 | —                     | BAB2125 | —        | —        |

## QUICKLAG Type: QBHW 22,000 Ampere I.C. Thermal-Magnetic Breakers

|     |                       |          |           |           |
|-----|-----------------------|----------|-----------|-----------|
| 15  | QBHW1015 <sup>③</sup> | QBHW2015 | QBHW2015H | QBHW3015H |
| 20  | QBHW1020 <sup>③</sup> | QBHW2020 | QBHW2020H | QBHW3020H |
| 25  | QBHW1025              | QBHW2025 | QBHW2025H | QBHW3025H |
| 30  | QBHW1030              | QBHW2030 | QBHW2030H | QBHW3030H |
| 35  | QBHW1035              | QBHW2035 | QBHW2035H | QBHW3035H |
| 40  | QBHW1040              | QBHW2040 | QBHW2040H | QBHW3040H |
| 45  | QBHW1045              | QBHW2045 | QBHW2045H | QBHW3045H |
| 50  | QBHW1050              | QBHW2050 | QBHW2050H | QBHW3050H |
| 55  | QBHW1055              | QBHW2055 | QBHW2055H | QBHW3055H |
| 60  | QBHW1060              | QBHW2060 | QBHW2060H | QBHW3060H |
| 70  | QBHW1070              | QBHW2070 | QBHW2070H | QBHW3070H |
| 80  | —                     | QBHW2080 | QBHW2080H | QBHW3080H |
| 90  | —                     | QBHW2090 | QBHW2090H | QBHW3090H |
| 100 | —                     | QBHW2100 | QBHW2100H | QBHW3100H |
| 110 | —                     | QBHW2110 | —         | —         |
| 125 | —                     | QBHW2125 | —         | —         |

## QUICKLAG Type: HBAX 42,000 Ampere I.C. Thermal-Magnetic Breakers

|     |                       |          |   |           |
|-----|-----------------------|----------|---|-----------|
| 15  | HBAX1015 <sup>③</sup> | HBAX2015 | — | HBAX3015H |
| 20  | HBAX1020 <sup>③</sup> | HBAX2020 | — | HBAX3020H |
| 25  | HBAX1025              | HBAX2025 | — | HBAX3025H |
| 30  | HBAX1030              | HBAX2030 | — | HBAX3030H |
| 35  | HBAX1035              | HBAX2035 | — | HBAX3035H |
| 40  | HBAX1040              | HBAX2040 | — | HBAX3040H |
| 45  | HBAX1045              | HBAX2045 | — | HBAX3045H |
| 50  | HBAX1050              | HBAX2050 | — | HBAX3050H |
| 55  | HBAX1055              | HBAX2055 | — | HBAX3055H |
| 60  | HBAX1060              | HBAX2060 | — | HBAX3060H |
| 70  | HBAX1070              | HBAX2070 | — | HBAX3070H |
| 80  | —                     | HBAX2080 | — | HBAX3080H |
| 90  | —                     | HBAX2090 | — | HBAX3090H |
| 100 | —                     | HBAX2100 | — | HBAX3100H |

## QUICKLAG Type: HBAW 65,000 Ampere I.C. Thermal-Magnetic Breakers

|    |                       |          |   |           |
|----|-----------------------|----------|---|-----------|
| 15 | HBAW1015 <sup>③</sup> | HBAW2015 | — | HBAW3015H |
| 20 | HBAW1020 <sup>③</sup> | HBAW2020 | — | HBAW3020H |
| 25 | HBAW1025              | HBAW2025 | — | —         |
| 30 | HBAW1030              | HBAW2030 | — | —         |

### Shipping Data

| Poles | Carton<br>Quantity | Approximate<br>Weight Lbs. (Kgs) | Dimensions Inches (mm)                            |
|-------|--------------------|----------------------------------|---------------------------------------------------|
| 1     | 24                 | 9.000 (4.09)                     | 12.500 (317.50) x 7.500 (190.50) x 5.000 (127.00) |
| 2     | 18                 | 9.000 (4.09)                     | 12.500 (317.50) x 7.500 (190.50) x 5.000 (127.00) |
| 3     | 8                  | 9.000 (4.09)                     | 12.500 (317.50) x 7.500 (190.50) x 5.000 (127.00) |

- ① All products UL and CSA listed.  
 ② All products 15-100A are HACR rated.  
 ③ Switching duty rated for 120 Vac  
 fluorescent light applications.  
 ④ For special low-magnetic breaker order  
 BAB1015L1 or BAB1020L1.

# Miniature Circuit Breakers QUICKLAG® Industrial Circuit Breakers

Cutler-Hammer

March 1999

## QUICKLAG Industrial Ground Fault Circuit Protectors Bolt-on

### Description

#### Bolt-on Type

Built and Listed to UL 489

#### QUICKLAG Ground Fault Circuit Breakers, Class A GFCI

Built and Tested to UL 943

5mA Trip Sensitivity

Type QBGF: 15-50 Amperes,  
10,000 AIC

Type QBHGF: 15-30 Amperes,  
22,000 AIC

#### QUICKLAG Ground Fault Equipment Protectors

Built and Tested to UL 1053

30mA Trip Sensitivity

Type QBGFEP: 15-50 Amperes,  
10,000 AIC

Type QBHGFEP: 15-30 Amperes,  
22,000 AIC



QUICKLAG Type QBGF 1-Pole  
Ground Fault Circuit Breaker



QUICKLAG Type QBGF 2-Pole  
Ground Fault Circuit Breaker

### Breaker Catalog Numbers

| Continuous<br>Ampere<br>Rating at<br>40°C | Catalog Number |             |
|-------------------------------------------|----------------|-------------|
|                                           | 1-Pole         | 2-Pole      |
|                                           | 120 Vac        | 120/240 Vac |

#### Ground Fault Circuit Breakers – 5mA Sensitivity

QUICKLAG Type: QBGF 10,000 Ampere I.C. Thermal-Magnetic Breakers

|    |          |          |
|----|----------|----------|
| 15 | QBGF1015 | QBGF2015 |
| 20 | QBGF1020 | QBGF2020 |
| 25 | QBGF1025 | QBGF2025 |
| 30 | QBGF1030 | QBGF2030 |
| 40 | QBGF1040 | QBGF2040 |
| 50 | —        | QBGF2050 |

#### QUICKLAG Type: QBHGF 22,000 Ampere I.C. Thermal-Magnetic Breakers

|    |           |           |
|----|-----------|-----------|
| 15 | QBHGF1015 | QBHGF2015 |
| 20 | QBHGF1020 | QBHGF2020 |
| 25 | QBHGF1025 | QBHGF2025 |
| 30 | QBHGF1030 | QBHGF2030 |

#### Ground Fault Equipment Protectors – 30mA Sensitivity

QUICKLAG Type: QBGFEP 10,000 Ampere I.C. Thermal-Magnetic Breakers

|    |            |            |
|----|------------|------------|
| 15 | QBGFEP1015 | QBGFEP2015 |
| 20 | QBGFEP1020 | QBGFEP2020 |
| 25 | QBGFEP1025 | QBGFEP2025 |
| 30 | QBGFEP1030 | QBGFEP2030 |
| 40 | QBGFEP1040 | QBGFEP2040 |
| 50 | —          | QBGFEP2050 |

#### QUICKLAG Type: QBHGFEP 22,000 Ampere I.C. Thermal-Magnetic Breakers

|    |             |             |
|----|-------------|-------------|
| 15 | QBHGFEP1015 | QBHGFEP2015 |
| 20 | QBHGFEP1020 | QBHGFEP2020 |
| 25 | QBHGFEP1025 | QBHGFEP2025 |
| 30 | QBHGFEP1030 | QBHGFEP2030 |

#### Special Application Ground Fault Circuit Protectors – 5mA Sensitivity

QUICKLAG Type: QBGF 10,000 Ampere I.C. with Bell Alarm (W1) or Auxiliary Switch (W2)

|    |            |            |
|----|------------|------------|
| 15 | QBGF1015W1 | QBGF2015W1 |
| 20 | QBGF1020W1 | QBGF2020W1 |
| 25 | QBGF1025W1 | QBGF2025W1 |
| 30 | QBGF1030W1 | QBGF2030W1 |
| 40 | —          | QBGF2040W1 |
| 50 | —          | QBGF2050W1 |
| 15 | QBGF1015W2 | —          |
| 20 | QBGF1020W2 | —          |
| 25 | QBGF1025W2 | —          |
| 30 | QBGF1030W2 | —          |

#### Special Application Ground Fault Circuit Protectors – 30mA Sensitivity

QUICKLAG Type: QBGFEP 10,000 Ampere I.C. with Bell Alarm (W1) or Auxiliary Switch (W2)

|    |              |              |
|----|--------------|--------------|
| 15 | QBGFEP1015W1 | QBGFEP2015W1 |
| 20 | QBGFEP1020W1 | QBGFEP2020W1 |
| 25 | QBGFEP1025W1 | QBGFEP2025W1 |
| 30 | QBGFEP1030W1 | QBGFEP2030W1 |
| 40 | —            | QBGFEP2040W1 |
| 50 | —            | QBGFEP2050W1 |
| 15 | QBGFEP1015W2 | —            |
| 20 | QBGFEP1020W2 | —            |
| 25 | QBGFEP1025W2 | —            |
| 30 | QBGFEP1030W2 | —            |

### Shipping Data

| Poles | Carton<br>Quantity | Approximate<br>Weight Lbs.<br>(Kgs) | Dimensions<br>Inches (mm)                               |
|-------|--------------------|-------------------------------------|---------------------------------------------------------|
| 1     | 20                 | 11.000 (4.99)                       | 12.500 (317.50)<br>x 6.500 (165.10)<br>x 5.000 (127.00) |
| 2     | 5                  | 5.000 (2.29)                        | 15.500 (393.70)<br>x 6.000 (152.40)<br>x 4.500 (114.30) |

### Bell Alarm and Auxiliary Contact Schematic



Single-throw double-pole contacts are UL and CSA listed for 5 Amperes at 250 Vac.

Bell Alarm (W1) – contacts change state when breaker trips.

Auxiliary Switch (W2) – contacts change state when breaker is opened (or tripped) or closed.  
14-inch long #18 AWG pigtail wire leads provided.

QUICKLAG Industrial Circuit Breakers Cable-in/Cable-out (1 inch per pole)

### Description

#### Built and Listed to UL 489

#### QUICKLAG Circuit Breakers Cable-in/Cable-out Type

Type QC: 10-100 Amperes,  
10,000 AIC

Type QCHW: 15-100 Amperes,  
22,000 AIC

Type QHCX: 15-100 Amperes,  
42,000 AIC

Type QHCW: 15-30 Amperes,  
65,000 AIC



QUICKLAG Type QC 1-Pole



QUICKLAG Type QC 3-Pole



QUICKLAG Type QC 4-Pole

### Breaker Catalog Numbers

| Continuous<br>Ampere<br>Rating at<br>40°C | Catalog Number       |                      |         |                      |                      |
|-------------------------------------------|----------------------|----------------------|---------|----------------------|----------------------|
|                                           | 1-Pole <sup>①②</sup> | 2-Pole <sup>①②</sup> |         | 3-Pole <sup>①②</sup> | 4-Pole <sup>①②</sup> |
|                                           | 120/240 Vac          | 120/240 Vac          | 240 Vac | 240 Vac              | 240 Vac              |

#### QUICKLAG Type: QC 10,000 Ampere I.C. Thermal-Magnetic Breakers

|     |                      |        |         |         |         |
|-----|----------------------|--------|---------|---------|---------|
| 10  | QC1010               | QC2010 | QC2010H | QC3010H | QC4010H |
| 15  | QC1015 <sup>③④</sup> | QC2015 | QC2015H | QC3015H | QC4015H |
| 20  | QC1020 <sup>③④</sup> | QC2020 | QC2020H | QC3020H | QC4020H |
| 25  | QC1025               | QC2025 | QC2025H | QC3025H | QC4025H |
| 30  | QC1030               | QC2030 | QC2030H | QC3030H | QC4030H |
| 35  | QC1035               | QC2035 | QC2035H | QC3035H | QC4035H |
| 40  | QC1040               | QC2040 | QC2040H | QC3040H | QC4040H |
| 45  | QC1045               | QC2045 | QC2045H | QC3045H | QC4045H |
| 50  | QC1050               | QC2050 | QC2050H | QC3050H | QC4050H |
| 55  | QC1055               | QC2055 | QC2055H | QC3055H | QC4055H |
| 60  | QC1060               | QC2060 | QC2060H | QC3060H | QC4060H |
| 70  | QC1070               | QC2070 | QC2070H | QC3070H | QC4070H |
| 80  | —                    | QC2080 | QC2080H | QC3080H | QC4080H |
| 90  | —                    | QC2090 | QC2090H | QC3090H | QC4090H |
| 100 | QC1100               | QC2100 | QC2100H | QC3100H | QC4100H |

#### QUICKLAG Type: QCHW 22,000 Ampere I.C. Thermal-Magnetic Breakers

|     |                       |          |           |           |           |
|-----|-----------------------|----------|-----------|-----------|-----------|
| 15  | QCHW1015 <sup>③</sup> | QCHW2015 | QCHW2015H | QCHW3015H | QCHW4015H |
| 20  | QCHW1020 <sup>③</sup> | QCHW2020 | QCHW2020H | QCHW3020H | QCHW4020H |
| 25  | QCHW1025              | QCHW2025 | QCHW2025H | QCHW3025H | QCHW4025H |
| 30  | QCHW1030              | QCHW2030 | QCHW2030H | QCHW3030H | QCHW4030H |
| 35  | QCHW1035              | QCHW2035 | QCHW2035H | QCHW3035H | QCHW4035H |
| 40  | QCHW1040              | QCHW2040 | QCHW2040H | QCHW3040H | QCHW4040H |
| 45  | QCHW1045              | QCHW2045 | QCHW2045H | QCHW3045H | QCHW4045H |
| 50  | QCHW1050              | QCHW2050 | QCHW2050H | QCHW3050H | QCHW4050H |
| 55  | QCHW1055              | QCHW2055 | QCHW2055H | QCHW3055H | QCHW4055H |
| 60  | QCHW1060              | QCHW2060 | QCHW2060H | QCHW3060H | QCHW4060H |
| 70  | QCHW1070              | QCHW2070 | QCHW2070H | QCHW3070H | QCHW4070H |
| 80  | —                     | QCHW2080 | QCHW2080H | QCHW3080H | QCHW4080H |
| 90  | —                     | QCHW2090 | QCHW2090H | QCHW3090H | QCHW4090H |
| 100 | —                     | QCHW2100 | QCHW2100H | QCHW3100H | QCHW4100H |

#### QUICKLAG Type: QHCX 42,000 Ampere I.C. Thermal-Magnetic Breakers

|     |                       |          |   |           |   |
|-----|-----------------------|----------|---|-----------|---|
| 15  | QHCX1015 <sup>③</sup> | QHCX2015 | — | QHCX3015H | — |
| 20  | QHCX1020 <sup>③</sup> | QHCX2020 | — | QHCX3020H | — |
| 25  | QHCX1025              | QHCX2025 | — | QHCX3025H | — |
| 30  | QHCX1030              | QHCX2030 | — | QHCX3030H | — |
| 35  | QHCX1035              | QHCX2035 | — | QHCX3035H | — |
| 40  | QHCX1040              | QHCX2040 | — | QHCX3040H | — |
| 45  | QHCX1045              | QHCX2045 | — | QHCX3045H | — |
| 50  | QHCX1050              | QHCX2050 | — | QHCX3050H | — |
| 55  | QHCX1055              | QHCX2055 | — | QHCX3055H | — |
| 60  | QHCX1060              | QHCX2060 | — | QHCX3060H | — |
| 70  | QHCX1070              | QHCX2070 | — | QHCX3070H | — |
| 80  | —                     | QHCX2080 | — | QHCX3080H | — |
| 90  | —                     | QHCX2090 | — | QHCX3090H | — |
| 100 | —                     | QHCX2100 | — | QHCX3100H | — |

#### QUICKLAG Type: QHCW 65,000 Ampere I.C. Thermal-Magnetic Breakers

|    |                       |          |   |           |   |
|----|-----------------------|----------|---|-----------|---|
| 15 | QHCW1015 <sup>③</sup> | QHCW2015 | — | QHCW3015H | — |
| 20 | QHCW1020 <sup>③</sup> | QHCW2020 | — | QHCW3020H | — |
| 25 | QHCW1025              | QHCW2025 | — | —         | — |
| 30 | QHCW1030              | QHCW2030 | — | —         | — |

### Shipping Data

| Poles | Carton<br>Quantity | Approximate<br>Weight Lbs. (Kgs) | Dimensions Inches (mm)                            |
|-------|--------------------|----------------------------------|---------------------------------------------------|
| 1     | 24                 | 9.000 (4.09)                     | 12.500 (317.50) x 7.500 (190.50) x 5.000 (127.00) |
| 2     | 18                 | 9.000 (4.09)                     | 12.500 (317.50) x 7.500 (190.50) x 5.000 (127.00) |
| 3     | 8                  | 9.000 (4.09)                     | 12.500 (317.50) x 7.500 (190.50) x 5.000 (127.00) |

① All products UL and CSA listed.

② All products 10-100A are HACR rated.

③ Switching duty rated for 120 Vac  
fluorescent light applications only.

④ For special low-magnetic breaker order  
QC1015L1 or QC1020L1.

## QUICKLAG Industrial Circuit Breakers Cable-in/Cable-out (1/2 inch per pole)

### Description

#### Built and Listed to UL 489

Type QCR and QCF Circuit Breakers are UL listed Circuit Breakers that are suitable for use as branch circuit protectors.

### Applications

QCR and QCF Circuit Breakers are only 1/2-inch wide per pole and are excellent for general purpose industrial applications where space savings is required.

### Product Features and Ratings

- 1/2-inch wide per pole
- Cable-in/Cable-out
- Black cases with black handles
- Three position handle: ON, Tripped (center), OFF
- Thermal-Magnetic Protection
- UL File E7819
- CSA File LR48907
- One, two and three pole
- 10 kAIC at 120/240 Vac, 10-60 Amperes
- 22 kAIC at 120/240 Vac, 15-20 Amperes
- 10 kAIC at 240 Vac, 10-30 Amperes
- 3 kAIC at 62.5 Vdc (1 Pole)
- 3 kAIC at 130 Vdc (2 Poles in Series)
- Normal Operating Environment:  
0-40°C  
5-95% Humidity  
(Non-Condensing)

### Additional Ratings

In addition to the ratings shown for the 1/2-inch wide QCR and QCF, the complete QC breaker line includes:

- 1-4 Poles
- 5-100 Amperes
- 10 through 65 kAIC
- 120/240 and 240 Vac
- 1-inch per pole



1-Pole 2-Pole  
QCR (Rear-Mounted Breakers)



1-Pole 2-Pole  
QCF (Front-Mounted Breakers)



3-Pole  
QCR (Rear-Mounted Breakers)



3-Pole  
QCF (Front-Mounted Breakers)

Type QCR have as a standard feature provisions for 35mm DIN-Rail rear mounting with a spring-loaded release. Optional clips for individual mounting are available as a separate accessory.

Type QCF have two threaded steel inserts to facilitate front mounting with #6-32 steel screws. The clamp type terminals accessible from the rear of the breaker so that cables can be accessed without removal of the breaker from the front cover.



QCR 1-Pole Breaker with QCRMTGFT Clips (Qty. 2) Individually Mounted



QCF Breaker Front Panel Mounted

## QUICKLAG Industrial Circuit Breakers Cable-in/Cable-out (1/2 inch per pole)

Breaker Catalog Numbers<sup>①②③④</sup>

| Continuous<br>Ampere<br>Rating at<br>40°C             | QCR Breaker 10 kAIC Interruption Ratings <sup>⑤</sup> |                                 |                            |                            | QCF Breaker 10 kAIC Interruption Ratings <sup>⑤</sup> |                          |                            |                            |
|-------------------------------------------------------|-------------------------------------------------------|---------------------------------|----------------------------|----------------------------|-------------------------------------------------------|--------------------------|----------------------------|----------------------------|
|                                                       | 120/240 Vac                                           | 120/240 Vac                     | 240 Vac <sup>⑥</sup>       |                            | 120/240 Vac                                           | 120/240 Vac              | 240 Vac <sup>⑥</sup>       |                            |
|                                                       | 1-Pole                                                | 2-Pole                          | 2-Pole                     | 3-Pole                     | 1-Pole                                                | 2-Pole                   | 2-Pole                     | 3-Pole                     |
| QCR Breaker 10 kAIC Interruption Ratings <sup>⑤</sup> |                                                       |                                 |                            |                            | QCF Breaker 10 kAIC Interruption Ratings <sup>⑤</sup> |                          |                            |                            |
| 10                                                    | QCR1010<br>QCR1010T<br>—                              | QCR2010<br>QCR2010T<br>QCR2010P | —<br>—<br>—                | —<br>—<br>—                | QCF1010<br>QCF1010T<br>—                              | QCF2010<br>QCF2010T<br>— | —<br>—<br>—                | —<br>—<br>—                |
| 15                                                    | QCR1015 <sup>⑦</sup><br>QCR1015T <sup>⑦</sup><br>—    | QCR2015<br>QCR2015T<br>QCR2015P | QCR2015H<br>QCR2015HT<br>— | QCR3015H<br>QCR3015HT<br>— | QCF1015 <sup>②</sup><br>QCF1015T <sup>②</sup><br>—    | QCF2015<br>QCF2015T<br>— | QCF2015H<br>QCF2015HT<br>— | QCF3015H<br>QCF3015HT<br>— |
| 20                                                    | QCR1020 <sup>⑦</sup><br>QCR1020T <sup>⑦</sup><br>—    | QCR2020<br>QCR2020T<br>QCR2020P | QCR2020H<br>QCR2020HT<br>— | QCR3020H<br>QCR3020HT<br>— | QCF1020 <sup>②</sup><br>QCF1020T <sup>②</sup><br>—    | QCF2020<br>QCF2020T<br>— | QCF2020H<br>QCF2020HT<br>— | QCF3020H<br>QCF3020HT<br>— |
| 25                                                    | QCR1025<br>QCR1025T<br>—                              | QCR2025<br>QCR2025T<br>QCR2025P | QCR2025H<br>QCR2025HT<br>— | QCR3025H<br>QCR3025HT<br>— | QCF1025<br>QCF1025T<br>—                              | QCF2025<br>QCF2025T<br>— | QCF2025H<br>QCF2025HT<br>— | QCF3025H<br>QCF3025HT<br>— |
| 30                                                    | QCR1030<br>QCR1030T<br>—                              | QCR2030<br>QCR2030T<br>QCR2030P | QCR2030H<br>QCR2030HT<br>— | QCR3030H<br>QCR3030HT<br>— | QCF1030<br>QCF1030T<br>—                              | QCF2030<br>QCF2030T<br>— | QCF2030H<br>QCF2030HT<br>— | QCF3030H<br>QCF3030HT<br>— |
| 35                                                    | QCR1035<br>—                                          | QCR2035<br>QCR2035P             | —<br>—                     | —<br>—                     | QCF1035<br>—                                          | QCF2035<br>—             | —<br>—                     | —<br>—                     |
| 40                                                    | QCR1040<br>—                                          | QCR2040<br>QCR2040P             | —<br>—                     | —<br>—                     | QCF1040<br>—                                          | QCF2040<br>—             | —<br>—                     | —<br>—                     |
| 45                                                    | QCR1045<br>—                                          | QCR2045<br>QCR2045P             | —<br>—                     | —<br>—                     | QCF1045<br>—                                          | QCF2045<br>—             | —<br>—                     | —<br>—                     |
| 50                                                    | QCR1050<br>—                                          | QCR2050<br>QCR2050P             | —<br>—                     | —<br>—                     | QCF1050<br>—                                          | QCF2050<br>—             | —<br>—                     | —<br>—                     |
| 55                                                    | QCR1055<br>—                                          | QCR2055<br>QCR2055P             | —<br>—                     | —<br>—                     | QCF1055<br>—                                          | QCF2055<br>—             | —<br>—                     | —<br>—                     |
| 60 <sup>⑧</sup>                                       | QCR1060<br>—                                          | QCR2060<br>QCR2060P             | —<br>—                     | —<br>—                     | QCF1060<br>—                                          | QCF2060<br>—             | —<br>—                     | —<br>—                     |
| QCR Breaker 22 kAIC Interruption Ratings              |                                                       |                                 |                            |                            | QCF Breaker 22 kAIC Interruption Ratings              |                          |                            |                            |
| 15                                                    | QCRH1015 <sup>⑦</sup><br>QCRH1015T <sup>⑦</sup>       | QCRH2015<br>QCRH2015T           | —<br>—                     | —<br>—                     | QCFH1015 <sup>⑦</sup><br>QCFH1015T <sup>⑦</sup>       | QCFH2015<br>QCFH2015T    | —<br>—                     | —<br>—                     |
| 20                                                    | QCRH1020 <sup>⑦</sup><br>QCRH1020T <sup>⑦</sup>       | QCRH2020<br>QCRH2020T           | —<br>—                     | —<br>—                     | QCFH1020 <sup>⑦</sup><br>QCFH1020T <sup>⑦</sup>       | QCFH2020<br>QCFH2020T    | —<br>—                     | —<br>—                     |

## Available QCR and QCF Breaker Accessories

| Catalog Number | Description                                                                                                                                               |
|----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|
| QCRMTGFT       | Steel mounting clip mounts QCR breaker if individual mounting is required. Quantity two required for 1- and 2-pole and four required for 3-pole breakers. |
| QCRFPL1P       | Removable padlock device for single-pole QCR or QCF breaker.                                                                                              |
| QCRFPLMP       | Removable padlock device for multi-pole QCR or QCF breaker.                                                                                               |
| QCRFLOFF       | Padlock bracket assembly for QCR or QCF single or multi-pole breakers (off only).                                                                         |

① Standard breaker terminals are box type lugs.

② Breakers with "T" Catalog Number Suffix are suitable for line and load side ring terminal connection (#10-32 plus/minus terminal screw provided).

③ Breakers with "P" Catalog Number Suffix are suitable for terminating 2 #10 AWG Quick-Connect Type Terminals per phase on breaker load side.

④ Breakers with Shunt Trip Attachment (extra pole required on breaker right-hand side) are available. Contact Cutler-Hammer.

⑤ All ratings 15 to 60 amperes are HACR rated.

⑥ Breakers with "H" Catalog Suffix have 240 Vac construction.

⑦ All 15 and 20 ampere single-pole breakers are SWD (Switching Duty) rated for fluorescent lighting applications.

⑧ 60/75°C Cu/Al wire on all ratings except 60 amperes which requires Cu only conductor.



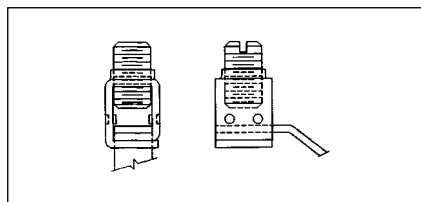
QUICKLAG Industrial Circuit Breakers Cable-in/Cable-out (1/2 inch per pole)

## QCR and QCF Breaker Factory Installed Terminals



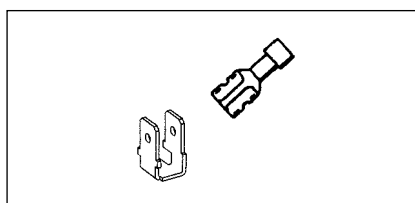
### QCR and QCF Standard Box Terminals

Factory installed line and load side breaker terminal to accommodate #14 AWG to #4 AWG wire.



### QCR Quick-Connect Terminals

Factory installed two-prong quick-connect terminal on breaker load side suitable for terminating two #10 AWG wire with insulated slip-on terminals as shown. Line side terminal is the standard type.

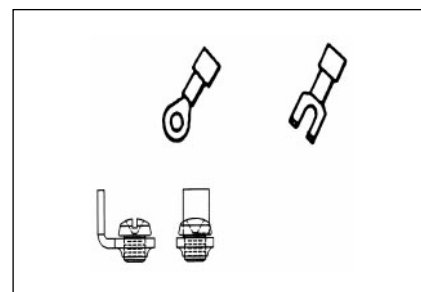


Catalog Suffix "P"



### QCR and QCF Ring or Spade Lug Terminals

(10 to 30 ampere ratings only): Factory installed line and load side terminals each equipped with a #10-32 screw suitable for terminating one #10 AWG wire with insulated ring or spade type terminal as shown.



Catalog Suffix "T"

### Description

#### Cable-in/Cable-out Type Built and Listed to UL 489

#### QUICKLAG Ground Fault Circuit Breakers, Class A GFCI Built and Tested to UL 943 5mA Trip Sensitivity

Type QCGF: 15-50 Amperes,  
10,000 AIC

Type QCHGF: 15-30 Amperes,  
22,000 AIC

#### QUICKLAG Ground Fault Equipment Protectors Built and Tested to UL 1053 30mA Trip Sensitivity

Type QCGFEP: 15-50 Amperes,  
10,000 AIC

Type QCHGFEP: 15-30 Amperes,  
22,000 AIC



*QUICKLAG Type QCGF 1-Pole  
Ground Fault Circuit Breaker*



*QUICKLAG Type QCGF 2-Pole  
Ground Fault Circuit Breaker*

### Shipping Data

| Poles | Carton Quantity | Approximate Weight Lbs. (Kgs) | Dimensions Inches (mm)                            |
|-------|-----------------|-------------------------------|---------------------------------------------------|
| 1     | 20              | 11.000 (4.99)                 | 12.500 (317.50) x 6.500 (165.10) x 5.000 (127.00) |
| 2     | 5               | 5.000 (2.29)                  | 15.500 (393.70) x 6.000 (152.40) x 4.500 (114.30) |

### Breaker Catalog Numbers

| Continuous Ampere Rating at 40°C | Catalog Number      |                     |
|----------------------------------|---------------------|---------------------|
|                                  | 1-Pole <sup>①</sup> | 2-Pole <sup>①</sup> |
|                                  | 120 Vac             | 120/240 Vac         |

#### Ground Fault Circuit Breakers – 5mA Sensitivity QUICKLAG Type: QCGF 10,000 Ampere I.C. Thermal-Magnetic Breakers

|    |          |          |
|----|----------|----------|
| 15 | QCGF1015 | QCGF2015 |
| 20 | QCGF1020 | QCGF2020 |
| 25 | QCGF1025 | QCGF2025 |
| 30 | QCGF1030 | QCGF2030 |
| 40 | QCGF1040 | QCGF2040 |
| 50 | —        | QCGF2050 |

#### QUICKLAG Type: QCHGF 22,000 Ampere I.C. Thermal-Magnetic Breakers

|    |           |           |
|----|-----------|-----------|
| 15 | QCHGF1015 | QCHGF2015 |
| 20 | QCHGF1020 | QCHGF2020 |
| 25 | QCHGF1025 | QCHGF2025 |
| 30 | QCHGF1030 | QCHGF2030 |

#### Ground Fault Equipment Protectors – 30mA Sensitivity QUICKLAG Type: QCGFEP 10,000 Ampere I.C. Thermal-Magnetic Breakers

|    |            |            |
|----|------------|------------|
| 15 | QCGFEP1015 | QCGFEP2015 |
| 20 | QCGFEP1020 | QCGFEP2020 |
| 25 | QCGFEP1025 | QCGFEP2025 |
| 30 | QCGFEP1030 | QCGFEP2030 |
| 40 | QCGFEP1040 | QCGFEP2040 |
| 50 | —          | QCGFEP2050 |

#### QUICKLAG Type: QCHGFEP 22,000 Ampere I.C. Thermal-Magnetic Breakers

|    |             |             |
|----|-------------|-------------|
| 15 | QCHGFEP1015 | QCHGFEP2015 |
| 20 | QCHGFEP1020 | QCHGFEP2020 |
| 25 | QCHGFEP1025 | QCHGFEP2025 |
| 30 | QCHGFEP1030 | QCHGFEP2030 |

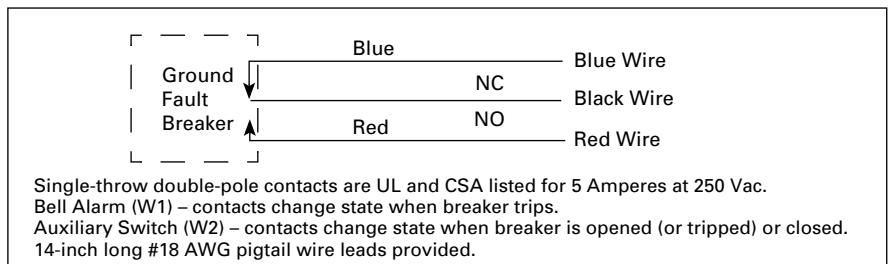
#### Special Application Ground Fault Circuit Protector – 5mA Sensitivity QUICKLAG Type: QCGF 10,000 Ampere I.C. with Bell Alarm (W1) or Auxiliary Switch (W2)

|    |            |            |
|----|------------|------------|
| 15 | QCGF1015W1 | QCGF2015W1 |
| 20 | QCGF1020W1 | QCGF2020W1 |
| 25 | QCGF1025W1 | QCGF2025W1 |
| 30 | QCGF1030W1 | QCGF2030W1 |
| 40 | —          | QCGF2040W1 |
| 50 | —          | QCGF2050W1 |
| 15 | QCGF1015W2 | —          |
| 20 | QCGF1020W2 | —          |
| 25 | QCGF1025W2 | —          |
| 30 | QCGF1030W2 | —          |

#### Special Application Ground Fault Equipment Protectors – 30mA Sensitivity QUICKLAG Type: QCGFEP 10,000 Ampere I.C. with Bell Alarm (W1) or Auxiliary Switch (W2)

|    |              |              |
|----|--------------|--------------|
| 15 | QCGFEP1015W1 | QCGFEP2015W1 |
| 20 | QCGFEP1020W1 | QCGFEP2020W1 |
| 25 | QCGFEP1025W1 | QCGFEP2025W1 |
| 30 | QCGFEP1030W1 | QCGFEP2030W1 |
| 40 | —            | QCGFEP2040W1 |
| 50 | —            | QCGFEP2050W1 |
| 15 | QCGFEP1015W2 | —            |
| 20 | QCGFEP1020W2 | —            |
| 25 | QCGFEP1025W2 | —            |
| 30 | QCGFEP1030W2 | —            |

### Bell Alarm and Auxiliary Contact Schematic



① All products UL and CSA listed.



## Types GHBS and GBHS Solenoid-Operated, Remote-Controlled

### Description

GHBS and GBHS circuit breakers are bolt-on branch circuit breakers designed for use in panelboards and are ideally suited for lighting control applications. In addition to providing conventional branch circuit protection, they include a unique solenoid-operated mechanism that provides for efficient breaker pulse-on and pulse-off operation when used with a suitable controller like the Cutler-Hammer Pow-R-Command lighting control system.

### Product Features

- Bolt-on Line-Side Terminal
- Cable Connected Load-Side Terminal
- 3-Prong Control Terminal (Common, Solenoid, Auxiliary Switch)
- Bi-Metal Assembly for Thermal Overload Protection
- Fast Acting Short Circuit Protection
- Arc-Runner and Arc-Chute Assembly for Fast Acting Arc Extinction
- Three Position Handle: OFF, TRIP (Center), ON
- Handle in "ON" Position Enables Remote Control
- Handle in "OFF" Position Disables Remote Control
- Handle Permits Manual Switching When Control Power is Lost
- Mechanical Trip Indicator Window (Red-ON, Green-OFF/TRIPPED)
- 15 and 20 Ampere Breakers SWD (Switching Duty) Rated
- HID Ratings for HID (High Intensity Discharge) Lighting
- Auxiliary Switch for Control Circuit Feedback



1-Pole



2-Pole

### GHBS UL 489 Interrupting Ratings

| Circuit Breaker Type <sup>①</sup> | Number of Poles | Interrupting Capacity (Symmetrical Amperes) |                     |        |         |
|-----------------------------------|-----------------|---------------------------------------------|---------------------|--------|---------|
|                                   |                 | Rating Amperes <sup>②</sup>                 | Volts Ac (50/60 Hz) |        |         |
|                                   |                 |                                             | 120                 | 240    | 277/480 |
| GHBS1015D                         | 1               | 15                                          | 65,000              | —      | 14,000  |
| GHBS1020D                         | 1               | 20                                          | 65,000              | —      | 14,000  |
| GHBS1030D                         | 1               | 30                                          | 65,000              | —      | 14,000  |
| GHBS2015D                         | 2               | 15                                          | —                   | 65,000 | 14,000  |
| GHBS2020D                         | 2               | 20                                          | —                   | 65,000 | 14,000  |
| GHBS2030D                         | 2               | 30                                          | —                   | 65,000 | 14,000  |

Instruction Leaflet/FRED Number 15546

### GBHS CSA 22.2 Interrupting Ratings

| Circuit Breaker Type | Number of Poles | Interrupting Capacity (Symmetrical Amperes) |                     |
|----------------------|-----------------|---------------------------------------------|---------------------|
|                      |                 | Rating Amperes <sup>②</sup>                 | Volts Ac (50/60 Hz) |
|                      |                 |                                             | 347/600             |
| GBHS1015D            | 1               | 15                                          | 10,000              |
| GBHS1020D            | 1               | 20                                          | 10,000              |
| GBHS2015D            | 2               | 15                                          | 10,000              |
| GBHS2020D            | 2               | 20                                          | 10,000              |



15-20 Amperes



30 Amperes

### Terminal Type

For load-side. Terminals are UL listed as suitable for wire type and size given below.

| Circuit Breaker Amperes | Terminal Type | Screw Head Type | Wire Type | AWG Wire Range |
|-------------------------|---------------|-----------------|-----------|----------------|
| 15-20                   | Clamp         | Slotted         | Cu/Al     | #14-#10        |
| 30                      | Box           | Slotted         | Cu/Al     | #14-#2         |

### Dimensions Per Pole, Inches (mm)

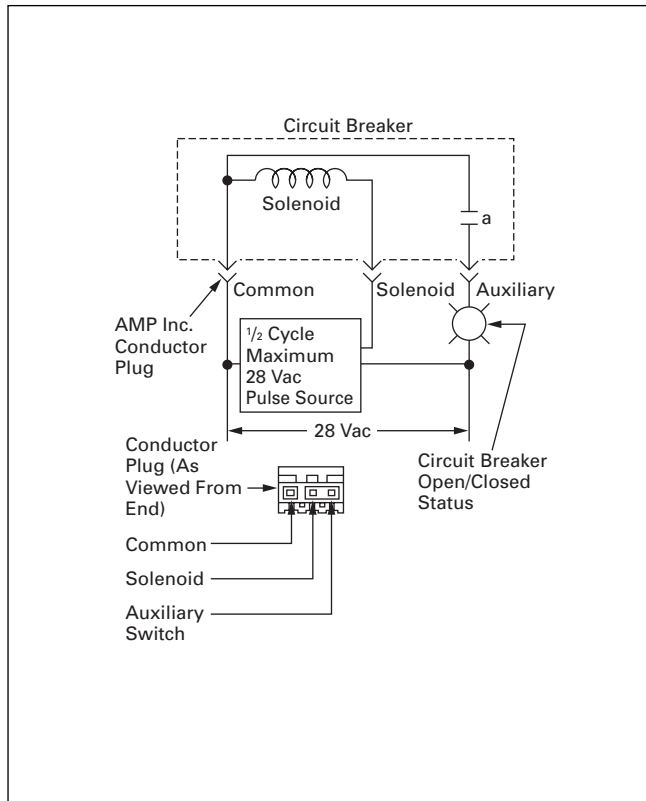
| Width            | Height            | Depth            |
|------------------|-------------------|------------------|
| 1.000<br>(25.40) | 4.125<br>(104.78) | 2.810<br>(71.37) |

Dimensions in parentheses in millimeters.

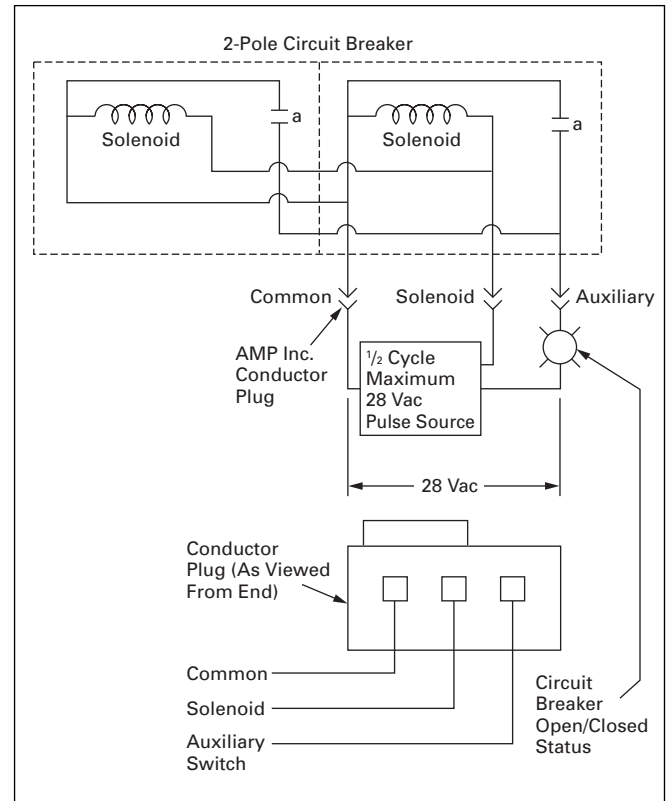
① All UL listed circuit breakers are HID (High Intensity Discharge) rated.

② Continuous current rating at 40°C.

### Wiring Diagrams



Typical Single-Pole Circuit Breaker Schematic Diagram and Conductor Plug Wiring Connections



Circuit Breaker Schematic Diagram and Conductor Plug Wiring Connections for 2-Pole

### Remote Control Operation

The remote-control capability of the breaker is "armed" when the breaker handle is manually switched to the "ON" position. Once armed, the breaker can be pulsed "ON" and "OFF" by a controller device which provides an ac pulse of specified magnitude and duration to the solenoid operated mechanism. Control connections to the breaker are provided through a male conductor plug (supplied by others) which

snaps into the female connector provided with the breaker.

A normally open (a) auxiliary contact provides for breaker "ON"/"OFF" status indication to the remote controller and/or indicating lamp.

The remote-control capability of the breaker is "disarmed" when the breaker handle is in the "OFF" or "TRIPPED" position. In the event the breaker automatically trips, the breaker must be reset manually.

### Breaker Solenoid and Operating Data

- Ambient Temperature: 0-40° C
- Nominal Pulse Magnitude: 28 volts ac RMS
- Tolerance: +10% to -15% of Nominal Voltage
- Pulse Duration: 1/2 cycle (8-10 ms)
- Minimum Recommended Pulse Current at Nominal Voltage:
  - 1-Pole: 4.9 Amperes Peak, 3.5 Amperes RMS
  - 2-Pole: 7.84 Amperes Peak, 5.6 Amperes RMS
- Breaker Operating Time: 20-40 ms
- Maximum Breaker Cycling: 6 Operations per Minute
- Humidity: 0-95% non-Condensing

# Miniature Circuit Breakers QUICKLAG® Industrial Circuit Breakers

Cutler-Hammer

March 1999

QUICKLAG International Rated Industrial Circuit Breakers Plug-on, Bolt-on and Cable-in/Cable-out

## Description

### QUICKLAG International Circuit Breakers

Plug-on Type HQP: 10-100 Amperes

Bolt-on Type BA: 10-100 Amperes

Cable-in/Cable-out Type QC:

10-100 Amperes

Built and Test Certified to BS3871,  
Pt. 1 50/60 Hz, 40°C

### Interrupting Ratings

|                                   | Suffix E   | Suffix HE  |
|-----------------------------------|------------|------------|
| NEMA<br>120/240 Vac               | 10,000 AIC | 10,000 AIC |
| BS3871<br>220/380,<br>240/415 Vac | 3,000 AIC  | 6,000 AIC  |

### QUICKLAG International Ground Fault Circuit Breakers

Plug-on Type GFXB: 10-40 Amperes

Bolt-on Type GFXBB: 10-40 Amperes

Cable-in/Cable-out Type GFXBC:

10-40 Amperes

Built and Test Certified to

BS3871, Pt. 1

BS3871, Section 31-C

BS4293

50/60 Hz, 40°C

30 mA Sensitivity

### Interrupting Rating

|                                |           |
|--------------------------------|-----------|
| BS3871<br>220/380, 240/415 Vac | 3,000 AIC |
|--------------------------------|-----------|

### Shipping Data

| Miniature<br>Circuit<br>Breaker    | No.<br>of<br>Poles | Std.<br>Carton<br>Qty. | Approx.<br>Carton<br>Weight<br>Lbs.<br>(Kgs) | Approx.<br>Standard<br>Carton<br>Dimensions<br>Inches (mm) |
|------------------------------------|--------------------|------------------------|----------------------------------------------|------------------------------------------------------------|
| QUICKLAG<br>Types B,<br>P, C – All | 1                  | 24                     | 9.000<br>(4.09)                              | 12.500 (317.50)<br>x 6.500 (165.10)<br>x 5.000 (127.00)    |
| QUICKLAG<br>Types B,<br>P, C – All | 2                  | 12                     | 9.000<br>(4.09)                              | 12.500 (317.50)<br>x 7.500 (190.50)<br>x 5.000 (127.00)    |
| QUICKLAG<br>Types B,<br>P, C – All | 3                  | 8                      | 9.000<br>(4.09)                              | 12.500 (317.50)<br>x 7.500 (190.50)<br>x 5.000 (127.00)    |

### QUICKLAG Ground Fault

|                           |   |    |                  |                                                         |
|---------------------------|---|----|------------------|---------------------------------------------------------|
| Type P –<br>All           | 1 | 20 | 11.000<br>(4.99) | 12.500 (317.50)<br>x 6.500 (165.10)<br>x 5.000 (127.00) |
| Types B<br>and<br>C – All | 1 | 20 | 11.000<br>(4.99) | 12.500 (317.50)<br>x 7.000 (177.80)<br>x 5.500 (139.70) |
| Types P<br>and<br>B – All | 2 | 5  | 5.000<br>(2.27)  | 12.500 (317.50)<br>6.000 (152.40)<br>4.500 (114.30)     |

## Breaker Catalog Numbers

| Continuous<br>Ampere<br>Rating at<br>40°C | Catalog Number |             |             |                                             |
|-------------------------------------------|----------------|-------------|-------------|---------------------------------------------|
|                                           | 1-Pole         | 2-Pole      | 3-Pole      | Ground Fault<br>1-Pole 30 mA<br>Sensitivity |
|                                           | 240/415 Vac    | 240/415 Vac | 240/415 Vac | 240/415 Vac                                 |

### 3,000 Amperes I.C. (M3) Plug-on Thermal-Magnetic Circuit Breakers

|     |          |          |          |           |
|-----|----------|----------|----------|-----------|
| 10  | HQP1010E | HQP2010E | HQP3010E | GFXB110B2 |
| 15  | HQP1015E | HQP2015E | HQP3015E | GFXB115B2 |
| 16  | —        | —        | —        | GFXB116B2 |
| 20  | HQP1020E | HQP2020E | HQP3020E | GFXB120B2 |
| 25  | HQP1025E | HQP2025E | HQP3025E | GFXB125B2 |
| 30  | HQP1030E | HQP2030E | HQP3030E | GFXB130B2 |
| 32  | —        | —        | —        | GFXB132B2 |
| 40  | HQP1040E | HQP2040E | HQP3040E | GFXB140B2 |
| 50  | HQP1050E | HQP2050E | HQP3050E | —         |
| 60  | HQP1060E | HQP2060E | HQP3060E | —         |
| 70  | HQP1070E | HQP2070E | HQP3070E | —         |
| 90  | —        | HQP2090E | HQP3090E | —         |
| 100 | —        | HQP2100E | HQP3100E | —         |

### 6,000 Ampere I.C. (M6) Plug-on Thermal-Magnetic Circuit Breakers

|     |           |           |           |   |
|-----|-----------|-----------|-----------|---|
| 15  | HQP1015HE | HQP2015HE | HQP3015HE | — |
| 20  | HQP1020HE | HQP2020HE | HQP3020HE | — |
| 25  | HQP1025HE | HQP2025HE | HQP3025HE | — |
| 30  | HQP1030HE | HQP2030HE | HQP3030HE | — |
| 40  | HQP1040HE | HQP2040HE | HQP3040HE | — |
| 50  | HQP1050HE | HQP2050HE | HQP3050HE | — |
| 60  | HQP1060HE | HQP2060HE | HQP3060HE | — |
| 70  | HQP1070HE | HQP2070HE | HQP3070HE | — |
| 90  | —         | HQP2090HE | HQP3090HE | — |
| 100 | —         | HQP2100HE | HQP3100HE | — |

### 3,000 Ampere I.C. (M3) Bolt-on Thermal-Magnetic Circuit Breakers

|     |          |          |          |            |
|-----|----------|----------|----------|------------|
| 10  | BAB1010E | BAB2010E | BAB3010E | GFXBB110B2 |
| 15  | BAB1015E | BAB2015E | BAB3015E | GFXBB115B2 |
| 16  | —        | —        | —        | GFXBB116B2 |
| 20  | BAB1020E | BAB2020E | BAB3020E | GFXBB120B2 |
| 25  | BAB1025E | BAB2025E | BAB3025E | GFXBB125B2 |
| 30  | BAB1030E | BAB2030E | BAB3030E | GFXBB130B2 |
| 32  | —        | —        | —        | GFXBB132B2 |
| 40  | BAB1040E | BAB2040E | BAB3040E | GFXBB140B2 |
| 50  | BAB1050E | BAB2050E | BAB3050E | —          |
| 60  | BAB1060E | BAB2060E | BAB3060E | —          |
| 70  | BAB1070E | BAB2070E | BAB3070E | —          |
| 90  | —        | BAB2090E | BAB3090E | —          |
| 100 | —        | BAB2100E | BAB3100E | —          |

### 6,000 Ampere I.C. (M6) Bolt-on Thermal-Magnetic Circuit Breakers

|     |           |           |           |   |
|-----|-----------|-----------|-----------|---|
| 15  | BAB1015HE | BAB2015HE | BAB3015HE | — |
| 20  | BAB1020HE | BAB2020HE | BAB3020HE | — |
| 25  | BAB1025HE | BAB2025HE | BAB3025HE | — |
| 30  | BAB1030HE | BAB2030HE | BAB3030HE | — |
| 40  | BAB1040HE | BAB2040HE | BAB3040HE | — |
| 50  | BAB1050HE | BAB2050HE | BAB3050HE | — |
| 60  | BAB1060HE | BAB2060HE | BAB3060HE | — |
| 70  | BAB1070HE | BAB2070HE | BAB3070HE | — |
| 90  | —         | BAB2090HE | BAB3090HE | — |
| 100 | —         | BAB2100HE | BAB3100HE | — |

### 3,000 Ampere I.C. (M3) Cable-in/Cable-out Thermal-Magnetic Circuit Breakers

|     |         |         |         |            |
|-----|---------|---------|---------|------------|
| 10  | QC1010E | QC2010E | QC3010E | GFXBC110B2 |
| 15  | QC1015E | QC2015E | QC3015E | GFXBC115B2 |
| 16  | —       | —       | —       | GFXBC116B2 |
| 20  | QC1020E | QC2020E | QC3020E | GFXBC120B2 |
| 25  | QC1025E | QC2025E | QC3025E | GFXBC125B2 |
| 30  | QC1030E | QC2030E | QC3030E | GFXBC130B2 |
| 32  | —       | —       | —       | GFXBC132B2 |
| 40  | QC1040E | QC2040E | QC3040E | GFXBC140B2 |
| 50  | QC1050E | QC2050E | QC3050E | —          |
| 60  | QC1060E | QC2060E | QC3060E | —          |
| 70  | QC1070E | QC2070E | QC3070E | —          |
| 90  | —       | QC2090E | QC3090E | —          |
| 100 | —       | QC2100E | QC3100E | —          |

### 6,000 Ampere I.C. (M6) Cable-in/Cable-out Thermal-Magnetic Circuit Breakers

|     |          |          |          |   |
|-----|----------|----------|----------|---|
| 15  | QC1015HE | QC2015HE | QC3015HE | — |
| 20  | QC1020HE | QC2020HE | QC3020HE | — |
| 25  | QC1025HE | QC2025HE | QC3025HE | — |
| 30  | QC1030HE | QC2030HE | QC3030HE | — |
| 40  | QC1040HE | QC2040HE | QC3040HE | — |
| 50  | QC1050HE | QC2050HE | QC3050HE | — |
| 60  | QC1060HE | QC2060HE | QC3060HE | — |
| 70  | QC1070HE | QC2070HE | QC3070HE | — |
| 90  | —        | QC2090HE | QC3090HE | — |
| 100 | —        | QC2100HE | QC3100HE | — |

## QUICKLAG Industrial Circuit Breakers Special Application Breakers

### Description

#### QUICKLAG Switching Neutral Circuit Breakers

Plug-on Type HQP: 10-30 Amperes, 1 and 2 Poles, 10,000 AIC  
 Bolt-on Type BA: 10-30 Amperes, 1 and 2 Poles, 10,000 AIC  
 Cable-in Type QC: 10-30 Amperes, 1 and 2 Poles, 10,000 AIC

Switching Neutral QUICKLAG Breakers available in one- and two-pole configurations, plus neutral pole for applications in accordance with NEC 514-5, 240-22, and 380-2. A one-pole device takes two pole spaces, and a two-pole device takes three pole spaces.



QUICKLAG Type P  
Switching Neutral

#### QUICKLAG HID (High Intensity Discharge) Breakers

Plug-on Type HQP: 15-60 Amperes, 1 and 2 Poles, 10,000 AIC  
 Bolt-on Type BA: 15-60 Amperes, 1 and 2 Poles, 10,000 AIC  
 Cable-in Type QC: 15-60 Amperes, 1 and 2 Poles, 10,000 AIC

Breakers designed specifically for use with high intensity discharge (HID) lighting applications. (UL listed as standard lighting breakers.)

#### Molded Case Switches

#### Non-Automatic QUICKLAG Molded Case Switch

Plug-on Type HQP: 50, 60, 100 Amperes, 1, 2 and 3 Poles  
 Bolt-on Type BA: 50, 60, 100 Amperes, 1, 2 and 3 Poles  
 Cable-in Type QC: 50, 60, 100 Amperes, 1, 2 and 3 Poles

#### Breaker Catalog Numbers

| Continuous<br>Ampere<br>Rating 40°C | Catalog Number      |                     |                     |         |
|-------------------------------------|---------------------|---------------------|---------------------|---------|
|                                     | 1-Pole <sup>①</sup> | 2-Pole <sup>①</sup> | 3-Pole <sup>①</sup> |         |
|                                     | 120/240 Vac         | 120/240 Vac         | 240 Vac             | 240 Vac |

#### QUICKLAG Type: HQP Switching Neutral Thermal-Magnetic Breakers

|    |          |          |   |   |
|----|----------|----------|---|---|
| 10 | HQP2010B | HQP3010B | — | — |
| 15 | HQP2015B | HQP3015B | — | — |
| 20 | HQP2020B | HQP3020B | — | — |
| 25 | HQP2025B | HQP3025B | — | — |
| 30 | HQP2030B | HQP3030B | — | — |

#### QUICKLAG Type: BA Switching Neutral Thermal-Magnetic Breakers

|    |          |          |   |   |
|----|----------|----------|---|---|
| 10 | BAB2010C | BAB3010C | — | — |
| 15 | BAB2015C | BAB3015C | — | — |
| 20 | BAB2020C | BAB3020C | — | — |
| 25 | BAB2025C | BAB3025C | — | — |
| 30 | BAB2030C | BAB3030C | — | — |

#### QUICKLAG Type: QC Switching Neutral Thermal-Magnetic Breakers

|    |         |         |   |   |
|----|---------|---------|---|---|
| 10 | QC2010B | QC3010B | — | — |
| 15 | QC2015B | QC3015B | — | — |
| 20 | QC2020B | QC3020B | — | — |
| 25 | QC2025B | QC3025B | — | — |
| 30 | QC2030B | QC3030B | — | — |

#### QUICKLAG Type: HQP HID (High Intensity Discharge) Thermal-Magnetic Breakers

|    |          |          |   |   |
|----|----------|----------|---|---|
| 15 | HQP1015D | HQP2015D | — | — |
| 20 | HQP1020D | HQP2020D | — | — |
| 25 | HQP1025D | HQP2025D | — | — |
| 30 | HQP1030D | HQP2030D | — | — |
| 35 | HQP1035D | HQP2035D | — | — |
| 40 | HQP1040D | HQP2040D | — | — |
| 50 | HQP1050D | HQP2050D | — | — |
| 60 | HQP1060D | HQP2060D | — | — |

#### QUICKLAG Type: BA HID (High Intensity Discharge) Thermal-Magnetic Breakers

|    |          |          |   |   |
|----|----------|----------|---|---|
| 15 | BAB1015D | BAB2015D | — | — |
| 20 | BAB1020D | BAB2020D | — | — |
| 25 | BAB1025D | BAB2025D | — | — |
| 30 | BAB1030D | BAB2030D | — | — |
| 35 | BAB1035D | BAB2035D | — | — |
| 40 | BAB1040D | BAB2040D | — | — |
| 50 | BAB1050D | BAB2050D | — | — |
| 60 | BAB1060D | BAB2060D | — | — |

#### QUICKLAG Type: QC HID (High Intensity Discharge) Thermal-Magnetic Breakers

|    |         |         |   |   |
|----|---------|---------|---|---|
| 15 | QC1015D | QC2015D | — | — |
| 20 | QC1020D | QC2020D | — | — |
| 25 | QC1025D | QC2025D | — | — |
| 30 | QC1030D | QC2030D | — | — |
| 35 | QC1035D | QC2035D | — | — |
| 40 | QC1040D | QC2040D | — | — |
| 50 | QC1050D | QC2050D | — | — |
| 60 | QC1060D | QC2060D | — | — |

#### QUICKLAG Type: HQP Non-Auto Molded Case Switches

|     |          |   |          |          |
|-----|----------|---|----------|----------|
| 50  | HQP1050N | — | HQP2050N | HQP3050N |
| 60  | HQP1060N | — | HQP2060N | HQP3060N |
| 100 | HQP1100N | — | HQP2100N | HQP3100N |

#### QUICKLAG Type: BA Non-Auto Molded Case Switches

|     |          |   |          |          |
|-----|----------|---|----------|----------|
| 50  | BAB1050N | — | BAB2050N | BAB3050N |
| 60  | BAB1060N | — | BAB2060N | BAB3060N |
| 100 | BAB1100N | — | BAB2100N | BAB3100N |

#### QUICKLAG Type: QC Non-Auto Molded Case Switches

|     |         |   |         |         |
|-----|---------|---|---------|---------|
| 50  | QC1050N | — | QC2050N | QC3050N |
| 60  | QC1060N | — | QC2060N | QC3060N |
| 100 | QC1100N | — | QC2100N | QC3100N |

#### Shipping Data

| Miniature Circuit Breaker          | No. of Poles | Standard Carton Quantity | Approximate Carton Weight Lbs. (Kgs) | Approximate Standard Carton Dimensions Inches (mm) |
|------------------------------------|--------------|--------------------------|--------------------------------------|----------------------------------------------------|
| QUICKLAG Types B, P, C – All       | 1            | 24                       | 9.000 (4.09)                         | 12.500 (317.50) x 7.500 (190.50) x 5.000 (127.00)  |
| QUICKLAG Types B, P, C – All       | 2            | 12                       | 9.000 (4.09)                         | 12.500 (317.50) x 7.500 (190.50) x 5.000 (127.00)  |
| QUICKLAG Types B, P, C – All       | 3            | 8                        | 9.000 (4.09)                         | 12.500 (317.50) x 7.500 (190.50) x 5.000 (127.00)  |
| QUICKLAG Ground Fault Type P – All | 1            | 20                       | 11.000 (4.99)                        | 12.500 (317.50) x 6.500 (165.10) x 5.000 (127.00)  |
| Types B and C – All                | 1            | 20                       | 11.000 (4.99)                        | 12.500 (317.50) x 7.000 (177.80) x 5.500 (139.70)  |
| Types P and B – All                | 2            | 5                        | 5.000 (2.27)                         | 12.500 (317.50) x 6.000 (152.40) x 4.500 (114.30)  |

① All products UL and CSA listed.

## QUICKLAG Industrial Circuit Breakers Accessories

| Accessory Type <sup>①</sup>      | Catalog Number | Description                                                          | Order in Multiples of |
|----------------------------------|----------------|----------------------------------------------------------------------|-----------------------|
| Handle Locks:<br>Non-padlockable | QL1NPL         | QUICKLAG Type P, B, C – 1 Pole                                       | 10                    |
|                                  | QL23NPL        | QUICKLAG Type P, B, C – 2, 3 Poles                                   | 10                    |
| Handle Locks:<br>Padlockable     | QL1PL          | QUICKLAG Type P, B, C – 1 Pole                                       | 10                    |
|                                  | QLPB123PL      | QUICKLAG Type P, B – 1, 2, 3 Poles                                   | 10                    |
|                                  | QC123PL        | QUICKLAG Type C – 1, 2, 3 Poles                                      | 10                    |
|                                  | QLGF12PL       | Ground Fault Padlock Device Type P, B – 1, 2 Poles                   | 10                    |
| Handle Tie                       | QL1HT          | QUICKLAG Handle Tie - 1 Pole                                         | 100                   |
| Mounting Hardware                | QCFCCLIP       | QUICKLAG Type C Face Mounting Clip                                   | 24                    |
|                                  | QC1FP          | QUICKLAG Type C Face Mounting Plate – 1 Pole                         | 10                    |
|                                  | QC2FP          | QUICKLAG Type C Face Mounting Plate – 2 Poles                        | 10                    |
|                                  | QC3FP          | QUICKLAG Type C Face Mounting Plate – 3 Poles                        | 10                    |
|                                  | QC1FPLOFF      | QUICKLAG Type C Face Mounting Plate and Lock-off (Off Only) – 1 Pole | 10                    |
|                                  | QC2FPLOFF      | QUICKLAG Type C Face Mounting Plate and Lock-off (Off Only) – 2 Pole | 10                    |
|                                  | QC3FPLOFF      | QUICKLAG Type C Face Mounting Plate and Lock-off (Off Only) – 3 Pole | 10                    |
|                                  | QCBCLIP        | QUICKLAG Type C Base Mounting Clamp                                  | 100                   |
|                                  | QC6BP          | QUICKLAG Base Mounting Plate – 6 Poles Total                         | 10                    |
|                                  | QC4CONB        | QUICKLAG Type C Single Point Connector                               | 10                    |
|                                  | QCDINADAPT     | QUICKLAG Type C DIN Rail Adapter                                     | 6                     |
| Dummy Breakers                   | HQP1000        | QUICKLAG Type P                                                      | 1                     |
|                                  | BAB1000        | QUICKLAG Type B                                                      | 1                     |
|                                  | QC1000         | QUICKLAG Type C                                                      | 1                     |
|                                  | QC30SAMPLE     | QUICKLAG Type C Clear Choice Breaker                                 | 4                     |



QL1NPL



QL23NPL



QL1PL



QLPB123PL



QC123PL



QL1HT



QCFCCLIP



QC1FP



QC2FP



QC3FP



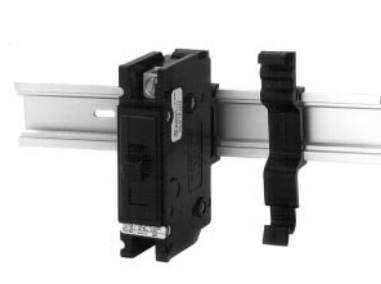
QCBCLIP



QC6BP



QC4CONB



QCDINADAPT

① See pages 7 and 8 for QCR and QCF accessories.



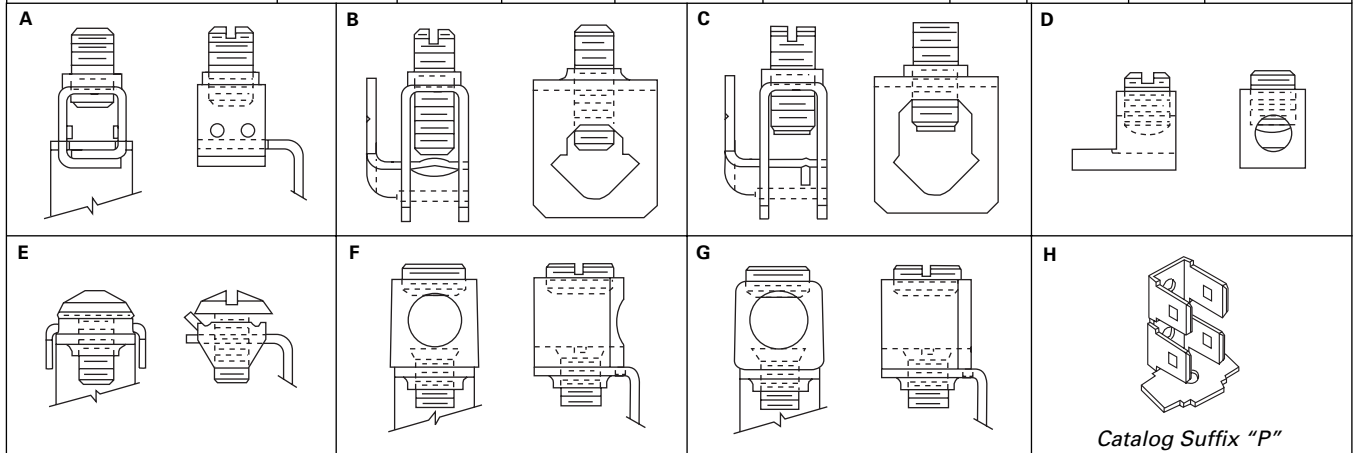
## QUICKLAG Industrial Circuit Breakers Modifications/Terminals

Factory Modifications<sup>①</sup>

| Type of Modification                                                                                                                         | Breaker Types                                          | Catalog Suffix |
|----------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------|----------------|
| Shunt Trip (Requires 1 extra pole space on right side)<br>120, 208, 240 Vac<br>12, 24, 48 Vac/dc<br>Draws 2.6A at 120V<br>Draws 11A at 24Vdc | QUICKLAG Types P, B and C<br>QUICKLAG Types P, B and C | S<br>S1        |
| Special Calibration (50°C)                                                                                                                   | QUICKLAG Types P, B and C                              | V              |
| Shock Testing                                                                                                                                | QUICKLAG Types P, B and C                              | L              |
| Freeze Testing                                                                                                                               | QUICKLAG Types P, B and C                              | Y              |
| Moisture-Fungus Treatment                                                                                                                    | QUICKLAG Types P, B, C and Ground Fault                | F              |

## Factory Installed Breaker Terminals

| Breaker Type                                             | Continuous<br>Ampere<br>Rating    | Standard Line Terminal                                |                         |               | Standard Load Terminal                |                         |                             | Optional Terminals<br>(20% List Price Adder) |                                  |
|----------------------------------------------------------|-----------------------------------|-------------------------------------------------------|-------------------------|---------------|---------------------------------------|-------------------------|-----------------------------|----------------------------------------------|----------------------------------|
|                                                          |                                   | Term<br>Type                                          | Wire<br>Type            | Wire<br>Range | Term<br>Type                          | Wire<br>Type            | Wire<br>Range               | Line                                         | Load                             |
| QUICKLAG Type P<br>HQP, QPHW,<br>QHPX, QHPW              | 10 to 30<br>35 to 50<br>55 to 125 | Plug-on female clips which mate<br>with the bus stabs |                         |               | A<br>B<br>C                           | Cu/Al<br>Cu/Al<br>Cu/Al | #14-#4<br>#14-#4<br>#8-1/0  | N/A                                          | C<br>C<br>—                      |
| QUICKLAG Ground Fault<br>QPGF, QPHGF,<br>QPGFEP, QPHGFEP | 10 to 30<br>40                    | Plug-on female clips which mate<br>with the bus stabs |                         |               | A – 1-pole<br>D – 2-pole<br>D         | Cu/Al<br>Cu/Al<br>Cu    | #14-#4<br>#14-#8<br>#14-#8  | N/A                                          | C<br>C<br>—                      |
| QUICKLAG Type B<br>BAB, QBHW,<br>HBAX, HBAW              | 10 to 30<br>35 to 50<br>55 to 125 | Extended tangs which bolt<br>directly to the bus      |                         |               | A – 1- and 2- pole<br>B – 3-pole<br>C | Cu/Al<br>Cu/Al<br>Cu/Al | #14-#4<br>#14-#4<br>#8-1/0  | N/A                                          | C<br>C<br>—                      |
| QUICKLAG Ground Fault<br>QBGF, QBHGF,<br>QBGFEP, QBHGFEP | 10 to 30<br>40                    | Extended tangs which bolt<br>directly to the bus      |                         |               | A – 1-pole<br>D – 2-pole<br>D         | Cu/Al<br>Cu/Al<br>Cu    | #14-#4<br>#14-#8<br>#14-#8  | N/A                                          | N/A                              |
| QUICKLAG Type C<br>QC, QCHW,<br>QHCX, QHCW               | 10 to 20<br>25 to 60<br>70 to 100 | E<br>F<br>G                                           | Cu/Al<br>Cu/Al<br>Cu/Al | #14-#10       | E<br>B<br>C                           | Cu/Al<br>Cu/Al<br>Cu/Al | #14-#10<br>#14-#4<br>#8-1/0 | F, G<br>E, G<br>E                            | F, G, H<br>E, F, G, H<br>E, G, H |
| QUICKLAG<br>QCR, QCF                                     | 10-55<br>60                       | A<br>A                                                | Cu/Al<br>Cu             | -#14<br>-#4   | A<br>A                                | Cu/Al<br>Cu             | #14<br>-#4                  | N/A                                          | N/A                              |
| QUICKLAG Ground Fault<br>QCGF, QCHGF,<br>QCGFEP, QCHGFEP | 10 to 20<br>25 to 50              | E<br>F                                                | Cu/Al<br>Cu/Al          | #14-#10       | A<br>A                                | Cu/Al<br>Cu/Al          | #14-#4<br>#14-#4            | F, G<br>E, G                                 | N/A                              |



## Spare Terminal Hardware Screws (Lugs not Included)

| Catalog Number | Order in Multiples of | Terminal Type | Description                                    |
|----------------|-----------------------|---------------|------------------------------------------------|
| QLD TSA        | 10                    | A             | QUICKLAG Terminal Screw                        |
| QLD TSB        | 10                    | B             | QUICKLAG Terminal Screw                        |
| QLD TSC        | 10                    | C             | QUICKLAG Terminal Screw                        |
| QLB HTSE       | 10                    | E             | QUICKLAG Binding Head Terminal Screw and Clamp |
| QLN TSFG       | 10                    | F and G       | QUICKLAG Terminal Screw                        |

① Contact Cutler-Hammer for factory modifications available for QCR and QCF breakers.

# Miniature Circuit Breakers SPCL Supplementary Protectors

Cutler-Hammer

March 1999

## Supplementary Protectors Current Limiting Type Cable-in/Cable-out DIN Rail



### Description

#### UL 1077 Supplementary Protectors

Type SPCL Supplementary Protectors are IEC circuit breakers that are recognized by UL under UL 1077. They are intended for use as over-current protection within an appliance or electrical equipment where branch circuit protection (for example a UL listed Molded Case Circuit Breaker) has already been provided or is not required.

#### Equipment and Control Circuit Protection

These protectors are ideal for replacing fuses in control circuits. Applications include protecting motor control circuits, small control circuit transformers, relays, contactor coils, power supplies, PLC I/O points, appliances, and electronic equipment.

### Product Features

The Type SPCL Supplementary Protectors are provided in light gray cases with charcoal gray handles.

**DIN-Rail Mounting:** A quick snap-on clip design allows easy installation on 35mm DIN Rail.

**Current-Limiting Design:** Fast short circuit interruption reduces let-through energy, reducing damage to the circuit.

#### Thermal-Magnetic Overcurrent

**Protection:** Types B and C overcurrent curves provide maximum reliability and accuracy. Type B protection is normally used for low inrush applications. Type C protection is used for general purpose industrial applications that require higher inrush tolerance.

**Center Trip Position:** The breaker handle has a unique center trip "Reset" position that indicates an overcurrent trip. "Off" (O) and "On" (I) handle positions are visually indicated by red and green flags.

### SPCL Specifications

| Standards and Approvals         | Number of Poles                                                                                                            | Electrical Ratings           |              |         |                              |
|---------------------------------|----------------------------------------------------------------------------------------------------------------------------|------------------------------|--------------|---------|------------------------------|
|                                 |                                                                                                                            | Continuous Current (Amperes) | Vac 50/60 Hz | Vdc     | Ampere Interrupting Capacity |
| UL 1077<br>File No. E162396     | 1                                                                                                                          | 0.5-63                       | 120          | 12-65   | 10 kA                        |
|                                 | 2                                                                                                                          | 0.5-63                       | 240          | 12-130① | 10 kA                        |
|                                 | 3-4                                                                                                                        | 0.5-63                       | 240          |         | 10 kA                        |
| CSA 22.2<br>File No. LR105580-1 | 1                                                                                                                          | 0.5-63                       | 277          |         | 6 kA                         |
|                                 | 2-4                                                                                                                        | 0.5-63                       | 480          |         | 5 kA                         |
| EN60898<br>VDE0660              | 1-4                                                                                                                        | 0.5-63                       | 240/415      |         | 10 kA                        |
| Overcurrent Curves              | Overcurrent Curve Type B (3-5X) and Type C (5-10X) per VDE 0641, Part 11.                                                  |                              |              |         |                              |
| Degree of Protection            | IP20.                                                                                                                      |                              |              |         |                              |
| Connecting Terminals            | Suitable for Single-Core, Standard, and Flexible Conductors from #14 to #6 AWG (Cu). Recommended Torque is 27 Inch-Pounds. |                              |              |         |                              |

### SPCL Supplementary Protector Catalog Numbers

| Continuous Ampere Rating | Catalog Number |        |        |        |
|--------------------------|----------------|--------|--------|--------|
|                          | 1-Pole         | 2-Pole | 3-Pole | 4-Pole |

#### C Curve

|     |           |           |           |           |
|-----|-----------|-----------|-----------|-----------|
| 0.5 | SPCL1C00⑤ | SPCL2C00⑤ | SPCL3C00⑤ | SPCL4C00⑥ |
| 1   | SPCL1C01⑤ | SPCL2C01⑤ | SPCL3C01⑤ | SPCL4C01⑥ |
| 2   | SPCL1C02⑤ | SPCL2C02⑤ | SPCL3C02⑤ | SPCL4C02⑥ |
| 3   | SPCL1C03⑤ | SPCL2C03⑤ | —         | —         |
| 4   | SPCL1C04⑤ | SPCL2C04⑤ | SPCL3C04⑤ | SPCL4C04⑥ |
| 5   | SPCL1C05⑤ | SPCL2C05⑤ | —         | —         |
| 6   | SPCL1C06⑤ | SPCL2C06⑤ | SPCL3C06⑤ | SPCL4C06⑥ |
| 7   | SPCL1C07⑤ | SPCL2C07⑤ | —         | —         |
| 8   | SPCL1C08⑤ | SPCL2C08⑤ | —         | —         |
| 10  | SPCL1C10⑤ | SPCL2C10⑤ | SPCL3C10⑤ | SPCL4C10⑥ |
| 13  | SPCL1C13⑤ | —         | —         | —         |
| 16  | SPCL1C16⑤ | SPCL2C16⑤ | SPCL3C16⑤ | SPCL4C16⑥ |
| 20  | SPCL1C20⑤ | SPCL2C20⑤ | SPCL3C20⑤ | SPCL4C20⑥ |
| 25  | SPCL1C25⑤ | SPCL2C25⑤ | SPCL3C25⑤ | SPCL4C25⑥ |
| 32  | SPCL1C32⑤ | SPCL2C32⑤ | SPCL3C32⑤ | SPCL4C32⑥ |
| 40  | SPCL1C40⑤ | SPCL2C40⑤ | SPCL3C40⑤ | SPCL4C40⑥ |
| 50  | SPCL1C50⑤ | SPCL2C50⑤ | SPCL3C50⑤ | SPCL4C50⑥ |
| 63  | SPCL1C63⑤ | SPCL2C63⑤ | SPCL3C63⑤ | SPCL4C63⑥ |

#### B Curve

|    |           |           |           |           |
|----|-----------|-----------|-----------|-----------|
| 6  | SPCL1B06⑤ | SPCL2B06⑥ | SPCL3B06⑥ | SPCL4B06⑥ |
| 10 | SPCL1B10⑤ | SPCL2B10⑥ | SPCL3B10⑥ | SPCL4B10⑥ |
| 13 | SPCL1B13⑤ | —         | —         | —         |
| 16 | SPCL1B16⑤ | SPCL2B16⑥ | SPCL3B16⑥ | SPCL4B16⑥ |
| 20 | SPCL1B20⑤ | SPCL2B20⑥ | SPCL3B20⑥ | SPCL4B20⑥ |
| 25 | SPCL1B25⑤ | SPCL2B25⑥ | SPCL3B25⑥ | SPCL4B25⑥ |
| 32 | SPCL1B32⑤ | SPCL2B32⑥ | SPCL3B32⑥ | SPCL4B32⑥ |
| 40 | SPCL1B40⑤ | SPCL2B40⑥ | SPCL3B40⑥ | SPCL4B40⑥ |
| 50 | SPCL1B50⑤ | SPCL2B50⑥ | SPCL3B50⑥ | SPCL4B50⑥ |
| 63 | SPCL1B63⑤ | SPCL2B63⑥ | SPCL3B63⑥ | SPCL4B63⑥ |

### Shipping Data

|              | Packed in Cartons of: | Carton Dimensions Inches (mm)                    | Approximate Weight Lbs. (Kgs) |
|--------------|-----------------------|--------------------------------------------------|-------------------------------|
| 1-Pole Units | 12                    | 9.000 (228.60) x 4.000 (101.60) x 4.000 (101.60) | 10.000 (4.54)                 |
| 2-Pole Units | 6                     | 9.000 (228.60) x 4.000 (101.60) x 4.000 (101.60) | 10.000 (4.54)                 |
| 3-Pole Units | 4                     | 9.000 (228.60) x 4.000 (101.60) x 4.000 (101.60) | 10.000 (4.54)                 |
| 4-Pole Units | 3                     | 9.000 (228.60) x 4.000 (101.60) x 4.000 (101.60) | 10.000 (4.54)                 |

- ① 130 Vdc rating based on 2 poles connected in series.
- ⑤ Normally stocked.
- ⑥ Special order, contact Cutler-Hammer. Minimum quantities apply.

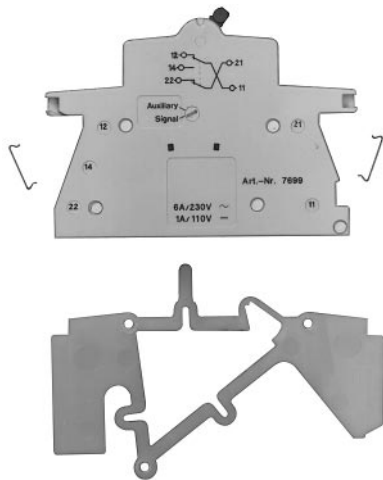
### CE Mark

SPCL protectors carry the CE mark in accordance with Low Voltage Directive (LVD) (73/23/EEC)

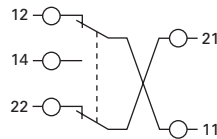
## SPCL Accessories

### Auxiliary/Signal Switch Kit

Catalog Number SPCLUAUX is a field mountable switch kit that attaches to the left side of a SPCL Protector. It is field selectable to auxiliary or signal (bell alarm) configuration. The switch is UL and CSA approved for general purpose ratings of 6 ampere at 240 Vac or 1 ampere at 125 Vdc. Contacts are provided as indicated on the wiring diagram. Screw-type terminals are provided to accommodate up to #16 AWG wire. Recommended torque is approximately 13 inch-pounds.



Wiring Diagram



### Contact Charts

| Contacts | Auxiliary Switch Mode |                  |
|----------|-----------------------|------------------|
|          | Protector Open        | Protector Closed |
| 11 to 12 | X                     | 0                |
| 11 to 14 | 0                     | X                |
| 21 to 22 | X                     | 0                |

| Contacts | Signal Switch Mode |                  |                   |
|----------|--------------------|------------------|-------------------|
|          | Protector Open     | Protector Closed | Protector Tripped |
| 11 to 12 | 0                  | 0                | X                 |
| 11 to 14 | X                  | X                | 0                 |
| 21 to 22 | 0                  | 0                | X                 |

### Technical Data

|                             |                                       |
|-----------------------------|---------------------------------------|
| Rated Voltage:              | 230 Vac/110 Vdc                       |
| Rated Current:              | 6A Ac/1A Dc                           |
| Conductor Cross Section:    | To 1.5 mm <sup>2</sup><br>(No 16 AWG) |
| Tightening Torque:          | 1 Nm<br>(13 inch-pounds)              |
| Product:                    | Catalog Number                        |
| Universal Auxiliary Switch: | <b>SPCLUAUX</b>                       |

Figure 1

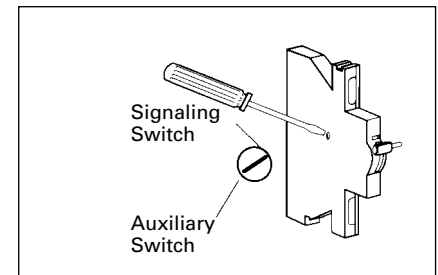


Figure 2

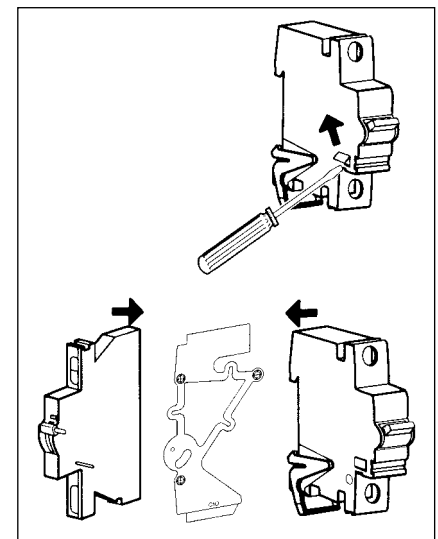
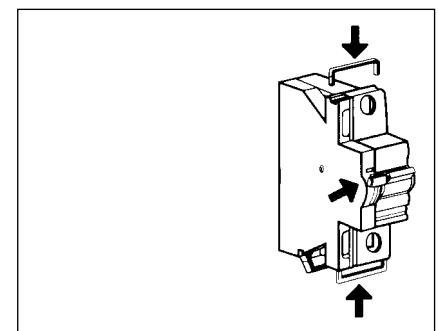


Figure 3





## Supplementary Protectors Current Limiting Type Cable-in/Cable-out DIN Rail

### SPCL Accessories

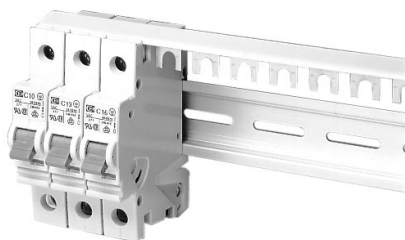
#### Lock-off Devices



#### Lock-off Devices

| Catalog Number    | Description                                                                                                 |
|-------------------|-------------------------------------------------------------------------------------------------------------|
| <b>SPCLPLDEV</b>  | Padlockable device, mounts on protector and includes provisions to accept catalog number SPCLOCKKEY Padlock |
| <b>SPCLOCKKEY</b> | Padlock with 3 keys                                                                                         |

#### Bus Bar Systems



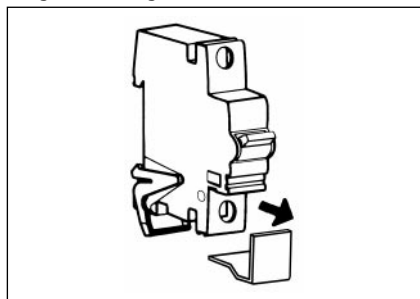
#### Bus Bar Systems

| Catalog Number     | Description                                                                             |
|--------------------|-----------------------------------------------------------------------------------------|
| <b>SPCLIPB10MM</b> | Single-phase 240 Vac VDE approved Bus Bar, 1 meter in length, 10mm <sup>2</sup> density |
| <b>SPCL1PB16MM</b> | Single-phase 240 Vac VDE approved Bus Bar, 1 meter in length, 16mm <sup>2</sup> density |

#### Maximum Bus Bar Current<sup>①</sup>

| Conductor Density | End Connect | Center Connect |
|-------------------|-------------|----------------|
| 10 sq. mm         | 50 Amperes  | 100 Amperes    |
| 16 sq. mm         | 65 Amperes  | 130 Amperes    |

#### Finger Proofing Shield



#### Finger Proofing Shield

| Catalog Number  | Description                                                                                                                                                          |
|-----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>SPCL2000</b> | Clip-on finger proofing shield to enhance finger protection on SPCL protectors. Plastic finger proofing shield clips into upper or lower terminal poles as required. |

<sup>①</sup> Per VDE 0606.

## Description

**UL 1077 Supplementary Protectors**  
Type SPHM Supplementary Protectors are IEC circuit breakers that are recognized by UL under UL 1077. They are intended for use as over-current protection within an appliance or electrical equipment where branch circuit protection (for example a UL listed Molded Case Circuit Breaker) has already been provided or is not required.

### Equipment and Control Circuit Applications

These protectors are ideal for protecting motor control circuits, CPTs, relays, contactor coils, power supplies, PLC I/O points, lighting circuits, appliances, electronic equipment, and replacing fuses.

## Product Features

The Type SPHM Supplementary Protectors are provided in light gray cases with charcoal gray handles. Handles are marked with "O" for "Off" and "I" for "On".

**DIN Rail Mounting:** Easy installation on 35mm DIN Rail. A spring loaded clip is provided for quick release from the DIN Rail mounting.

### Heat-Induced Nuisance Tripping Eliminated:

The protector is designed to "hold in" at 100% of continuous rated current regardless of ambient temperatures from -40 to +85°C.

**Immediate Reset After Trip:** The protector can be reset (closed) immediately after an overcurrent trip without a "cooling off" period.

**Precise Overcurrent Calibration:** The protector can be precisely calibrated to a wide variety of current ranges from 0.1 to 50 amperes continuous. For special ratings not shown, contact Cutler-Hammer.

**Flexible Time-Characteristic Curves:** Long, Medium, and Short Delay Curves are available. Long Delay are for special extended inrush, Medium

## Catalog Numbering System

| SPHM                                             |        |              | 3     | H            | M      | 0030           | Auxiliary Switch |                  |
|--------------------------------------------------|--------|--------------|-------|--------------|--------|----------------|------------------|------------------|
| Type                                             |        |              | Poles |              | Inrush |                | Current Rating   |                  |
| Supplementary Protector<br>Hydraulic<br>Magnetic | Code   | Poles        |       |              |        |                | Code             | Current          |
|                                                  | 1      | 1-Pole       |       |              |        |                | A①               | Normally Open②   |
|                                                  | 2      | 2-Pole       |       |              |        |                | B①               | Normally Closed② |
|                                                  | 3      | 3-Pole       |       |              |        |                |                  |                  |
| 4                                                | 4-Pole |              |       |              |        |                |                  |                  |
|                                                  |        |              | Delay |              |        | Current Rating |                  |                  |
| Code                                             | Delay  | Voltage      | Code  | Delay        | Curve  | Code           | Current③         |                  |
| H                                                | 8X     | 50/60 Hz     | M     | Medium Short | 23     | 00R1           | 0.10 Ampere      |                  |
| R                                                | 18X    | 50/60 Hz     | L     | Long         | 10     | 0R25           | 0.25 Ampere      |                  |
|                                                  |        |              | M     | Medium       | 20     | 0R50           | 0.50 Ampere      |                  |
|                                                  |        |              | S     | Short        | 30     | 0R75           | 0.75 Ampere      |                  |
| Y④                                               | 25X    | 50/60 Hz     | L     | Long         | 251    | 0001           | 1 Ampere         |                  |
|                                                  |        |              | M     | Medium       | 252    | 02R5           | 2.5 Ampere       |                  |
|                                                  |        |              | S     | Short        | 253    | 0005           | 5 Ampere         |                  |
| J                                                | 8X     | Dc           | M     | Medium       | 2      | 07R5           | 7.5 Ampere       |                  |
|                                                  |        |              | S     | Short        | 3      | 0010           | 10 Ampere        |                  |
| S                                                | 18X    | Dc           | L     | Long         | 10     | 0015           | 15 Ampere        |                  |
|                                                  |        |              | M     | Medium       | 20     | 0020           | 20 Ampere        |                  |
|                                                  |        |              | S     | Short        | 30     | 0025           | 25 Ampere        |                  |
| Z④                                               | 25X    | Dc           | L     | Long         | 251    | 0030           | 30 Ampere        |                  |
|                                                  |        |              | M     | Medium       | 252    | 0035③          | 35 Ampere        |                  |
|                                                  |        |              | S     | Short        | 253    | 0040③          | 40 Ampere        |                  |
| S                                                | Switch | Dc, 50/60 Hz | W     | Switch       | —      | 0050③          | 50 Ampere        |                  |

## General Specifications and Electrical Ratings

| Standards and Approvals | Continuous Current Rating | Vac 50/60 Hz | Vdc | Interruption Cap Capacity RMS Symmetrical |
|-------------------------|---------------------------|--------------|-----|-------------------------------------------|
| UL 1077                 | 0.1 to 30 Amperes         | 277/480      |     | 3 kA                                      |
|                         | 0.1 to 50 Amperes         | 250          |     | 5 kA                                      |
| CSA 22.2                | 0.1 to 50 Amperes         |              | 80  | 5 kA                                      |
| VDE 0660                | 0.1 to 50 Amperes         | 230/400      |     | 1.5 kA                                    |
| IEC-380                 | 0.1 to 50 Amperes         |              | 80  | 2 kA                                      |

for general purpose, and Short Delay for sensitive electronic applications.

**1/2 Cycle High-Inrush Tolerance:** The protector can be provided with tolerance to various levels of 1/2 cycle current spikes. General purpose tolerance is 8X the continuous current rating. Tolerance to 18X and 25X are also available.

**Environmental, Vibration, and Shock Resistance:** Mil-Spec qualification for fungus resistance, humidity, salt-spray resistance, and shock vibration resistance.

**Integral Auxiliary Switch (Optional):** One auxiliary switch contact (a or b) can be factory installed per protector pole. A separate pole for the contact is not required.

**Standards:** UL Recognized under UL 1077, CSA Certified to CSA 22.2. Meets the requirements of IEC-380, IEC-435, IEC-601, VDE 0660, VDE 601, VDE 0730, VDE 0750, VDE 0804, VDE 0806

**Inrush Tolerance:** 8X (Standard), 18X, or 25X

**Overcurrent Curves:** Long Delay, Medium Delay, or Short Delay

**Operating Temperature:** -40 to +85°C

**Wire Range:** Breaker Terminals: 14-6 AWG Copper, 35-inch-lbs torque  
Auxiliary Switch Terminals: 16 AWG Copper, 3.5-inch-lbs torque

**Auxiliary Switch:** 10 Amperes at 250 Vac

**Degree of Protection:** IP-20

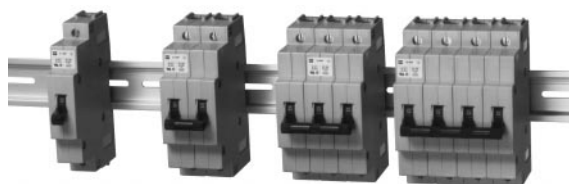
- ① One A or B contact maximum per pole. Contacts will be arranged left to right (e.g.,) BAB suffix on 3-pole breaker.  
② Contact position when breaker in open condition. Contacts rated 10 amperes at 250 Vac.  
③ UL recognized to 250 Vac, 5 kA above 30 amperes.  
④ Maximum of 40 amperes available at 25X inrush.

# Miniature Circuit Breakers SPHM Supplementary Protectors

Cutler-Hammer

March 1999

## Supplementary Protectors Hydraulic Magnetic Type Cable-in/Cable-out DIN Rail



1-Pole

2-Pole

3-Pole

4-Pole

### SPHM Catalog Numbers

| Continuous<br>Current<br>Rating<br>(Amperes) | Catalog Number                                      |                                              |                                              |                                              |
|----------------------------------------------|-----------------------------------------------------|----------------------------------------------|----------------------------------------------|----------------------------------------------|
|                                              | 8X (Standard Inrush Tolerance) Medium Delay Curve 2 |                                              |                                              |                                              |
|                                              | 1-Pole 277 Vac                                      | 2-Pole 277/480 Vac                           | 3-Pole 277/480 Vac                           | 4-Pole 277/480 Vac                           |
| 0.1                                          | SPHM1HM00R1Ⓢ                                        | SPHM2HM00R1Ⓢ                                 | SPHM3HM00R1Ⓢ                                 | SPHM4HM00R1Ⓢ                                 |
| 0.25                                         | SPHM1HM0R25Ⓢ                                        | SPHM2HM0R25Ⓢ                                 | SPHM3HM0R25Ⓢ                                 | SPHM4HM0R25Ⓢ                                 |
| 0.50                                         | SPHM1HM0R50Ⓢ                                        | SPHM2HM0R50Ⓢ                                 | SPHM3HM0R50Ⓢ                                 | SPHM4HM0R50Ⓢ                                 |
| 0.75                                         | SPHM1HM0R75Ⓢ                                        | SPHM2HM0R75Ⓢ                                 | SPHM3HM0R75Ⓢ                                 | SPHM4HM0R75Ⓢ                                 |
| 1                                            | SPHM1HM0001Ⓢ                                        | SPHM2HM0001Ⓢ                                 | SPHM3HM0001Ⓢ                                 | SPHM4HM0001Ⓢ                                 |
| 2.5                                          | SPHM1HM02R5Ⓢ                                        | SPHM2HM02R5Ⓢ                                 | SPHM3HM02R5Ⓢ                                 | SPHM4HM02R5Ⓢ                                 |
| 5.0                                          | SPHM1HM0005Ⓢ                                        | SPHM2HM0005Ⓢ                                 | SPHM3HM0005Ⓢ                                 | SPHM4HM0005Ⓢ                                 |
| 7.5                                          | SPHM1HM07R5Ⓢ                                        | SPHM2HM07R5Ⓢ                                 | SPHM3HM07R5Ⓢ                                 | SPHM4HM07R5Ⓢ                                 |
| 10                                           | SPHM1HM0010Ⓢ                                        | SPHM2HM0010Ⓢ                                 | SPHM3HM0010Ⓢ                                 | SPHM4HM0010Ⓢ                                 |
| 15                                           | SPHM1HM0015Ⓢ                                        | SPHM2HM0015Ⓢ                                 | SPHM3HM0015Ⓢ                                 | SPHM4HM0015Ⓢ                                 |
| 20                                           | SPHM1HM0020Ⓢ                                        | SPHM2HM0020Ⓢ                                 | SPHM3HM0020Ⓢ                                 | SPHM4HM0020Ⓢ                                 |
| 25                                           | SPHM1HM0025Ⓢ                                        | SPHM2HM0025Ⓢ                                 | SPHM3HM0025Ⓢ                                 | SPHM4HM0025Ⓢ                                 |
| 30                                           | SPHM1HM0030Ⓢ                                        | SPHM2HM0030Ⓢ                                 | SPHM3HM0030Ⓢ                                 | SPHM4HM0030Ⓢ                                 |
| Continuous<br>Current Rating<br>(Amperes)    | 8X (Standard Inrush Tolerance) Medium Delay Curve 2 |                                              |                                              |                                              |
|                                              | 1-Pole 250 Vac                                      | 2-Pole 250 Vac                               | 3-Pole 250 Vac                               | 4-Pole 250 Vac                               |
|                                              | 35<br>40<br>50                                      | SPHM1HM0035Ⓢ<br>SPHM1HM0040Ⓢ<br>SPHM1HM0050Ⓢ | SPHM2HM0035Ⓢ<br>SPHM2HM0040Ⓢ<br>SPHM2HM0050Ⓢ | SPHM3HM0035Ⓢ<br>SPHM3HM0040Ⓢ<br>SPHM3HM0050Ⓢ |
| Continuous<br>Current Rating<br>(Amperes)    | 18X (High Inrush Tolerance) Medium Delay Curve 20   |                                              |                                              |                                              |
|                                              | 1-Pole 277 Vac                                      | 2-Pole 277/480 Vac                           | 3-Pole 277/480 Vac                           | 4-Pole 277/480 Vac                           |
|                                              | 0.1<br>0.25<br>0.50                                 | SPHM1RM00R1Ⓢ<br>SPHM1RM0R25Ⓢ<br>SPHM1RM0R50Ⓢ | SPHM2RM00R1Ⓢ<br>SPHM2RM0R25Ⓢ<br>SPHM2RM0R50Ⓢ | SPHM3RM00R1Ⓢ<br>SPHM3RM0R25Ⓢ<br>SPHM3RM0R50Ⓢ |
| 0.75                                         | SPHM1RM0R75Ⓢ                                        | SPHM2RM0R75Ⓢ                                 | SPHM3RM0R75Ⓢ                                 | SPHM4RM0R75Ⓢ                                 |
| 1                                            | SPHM1RM0001Ⓢ                                        | SPHM2RM0001Ⓢ                                 | SPHM3RM0001Ⓢ                                 | SPHM4RM0001Ⓢ                                 |
| 2.5                                          | SPHM1RM02R5Ⓢ                                        | SPHM2RM02R5Ⓢ                                 | SPHM3RM02R5Ⓢ                                 | SPHM4RM02R5Ⓢ                                 |
| 5                                            | SPHM1RM0005Ⓢ                                        | SPHM2RM0005Ⓢ                                 | SPHM3RM0005Ⓢ                                 | SPHM4RM0005Ⓢ                                 |
| 7.5                                          | SPHM1RM07R5Ⓢ                                        | SPHM2RM07R5Ⓢ                                 | SPHM3RM07R5Ⓢ                                 | SPHM4RM07R5Ⓢ                                 |
| 10                                           | SPHM1RM0010Ⓢ                                        | SPHM2RM0010Ⓢ                                 | SPHM3RM0010Ⓢ                                 | SPHM4RM0010Ⓢ                                 |
| 15                                           | SPHM1RM0015Ⓢ                                        | SPHM2RM0015Ⓢ                                 | SPHM3RM0015Ⓢ                                 | SPHM4RM0015Ⓢ                                 |
| 20                                           | SPHM1RM0020Ⓢ                                        | SPHM2RM0020Ⓢ                                 | SPHM3RM0020Ⓢ                                 | SPHM4RM0020Ⓢ                                 |
| 25                                           | SPHM1RM0025Ⓢ                                        | SPHM2RM0025Ⓢ                                 | SPHM3RM0025Ⓢ                                 | SPHM4RM0025Ⓢ                                 |
| 30                                           | SPHM1RM0030Ⓢ                                        | SPHM2RM0030Ⓢ                                 | SPHM3RM0030Ⓢ                                 | SPHM4RM0030Ⓢ                                 |
| Continuous<br>Current Rating<br>(Amperes)    | 18X (High Inrush Tolerance) Medium Delay Curve 20   |                                              |                                              |                                              |
|                                              | 1-Pole 250 Vac                                      | 2-Pole 250 Vac                               | 3-Pole 250 Vac                               | 4-Pole 250 Vac                               |
|                                              | 35<br>40<br>50                                      | SPHM1RM0035Ⓢ<br>SPHM1RM0040Ⓢ<br>SPHM1RM0050Ⓢ | SPHM2RM0035Ⓢ<br>SPHM2RM0040Ⓢ<br>SPHM2RM0050Ⓢ | SPHM3RM0035Ⓢ<br>SPHM3RM0040Ⓢ<br>SPHM3RM0050Ⓢ |

### Shipping Data

|              | Shipped in<br>Cartons of: | Carton Dimensions Inches (mm)                     | Approx. Weight<br>Lbs. (Kgs) |
|--------------|---------------------------|---------------------------------------------------|------------------------------|
| 1-Pole Units | 12                        | 10.500 (266.70) x 4.125 (104.78) x 4.500 (114.30) | 15.000 (6.81)                |
| 2-Pole Units | 6                         | 10.500 (266.70) x 4.125 (104.78) x 4.500 (114.30) | 15.000 (6.81)                |
| 3-Pole Units | 4                         | 10.500 (266.70) x 4.125 (104.78) x 4.500 (114.30) | 15.000 (6.81)                |
| 4-Pole Units | 3                         | 10.500 (266.70) x 4.125 (104.78) x 4.500 (114.30) | 15.000 (6.81)                |

Ⓢ Normally stocked.

Ⓢ Special order, contact Cutler-Hammer.  
Minimum quantities apply. Contact  
Cutler-Hammer for price and availability  
for 400 Hz, Dc, Auxiliary Switch, and other  
catalog number combinations not shown.

## Series C® G-Frame

- All two- and three-pole circuit breakers are of the common trip type. On all 3-phase Delta (240V) Grounded B phase applications, refer to Cutler-Hammer.
- Single-pole circuit breakers, 15 and 20 amperes. Switching duty rated (SWD) for fluorescent lighting applications.
- All G-frame circuit breakers are suitable for reverse feed use.
- HACR rated.

## Interrupting Capacity Ratings

## UL489 Interrupting Capacity Ratings

| Circuit Breaker Type | Number of Poles | Interrupting Capacity (Symmetrical Amperes) (kA) |     |     |     |          |       | Page Number |
|----------------------|-----------------|--------------------------------------------------|-----|-----|-----|----------|-------|-------------|
|                      |                 | Volts Ac (50/60 Hz)                              |     |     |     | Volts Dc |       |             |
|                      |                 | 120                                              | 240 | 277 | 480 | 125      | 250①② |             |
| GD                   | 3               | —                                                | 65  | —   | 22  | —        | 10    | 26          |

| Circuit Breaker Type | Number of Poles | Interrupting Capacity (Symmetrical Amperes) (kA) |     |     |          |                 |         | Page Number |
|----------------------|-----------------|--------------------------------------------------|-----|-----|----------|-----------------|---------|-------------|
|                      |                 | Volts Ac (50/60 Hz)                              |     |     |          | Volts Dc        |         |             |
|                      |                 | 120                                              | 240 | 277 | 480Y/277 | 125             | 125/250 |             |
| GB                   | 1               | 65                                               | —   | —   | —        | 14 <sup>③</sup> | —       | 27          |
|                      | 2, 3            | —                                                | 65  | —   | —        | —               | 14      | 27          |
| GHB                  | 1               | 65                                               | —   | 14  | —        | 14 <sup>③</sup> | —       | 27          |
|                      | 2, 3            | —                                                | 65  | —   | 14       | —               | 14      | 27          |
| GC                   | 1               | 65                                               | —   | —   | —        | 14 <sup>③</sup> | —       | 28          |
|                      | 2, 3            | —                                                | 65  | —   | —        | —               | 14      | 28          |
| GHC                  | 1               | 65                                               | —   | 14  | —        | 14 <sup>③</sup> | —       | 28          |
|                      | 2, 3            | —                                                | 65  | —   | 14       | —               | 14      | 28          |

## Catalog Numbering System

This information is presented only as an aid to understanding catalog numbers. It is not to be used to build catalog numbers for circuit breakers or trip units.

## Circuit Breaker/Frame Catalog Number

|                      |                 |              |          |            |                     |
|----------------------|-----------------|--------------|----------|------------|---------------------|
|                      |                 | <b>GD</b>    | <b>3</b> | <b>100</b> |                     |
| Circuit Breaker Type | Number of Poles | Trip Amperes |          | Suffix     |                     |
| GD                   | 1: 1 Pole       | 15           |          | K:         | Molded Case Switch  |
| GB                   | 2: 2 Pole       | 20           |          | D:         | Ring Type Terminals |
| GHB                  | 3: 3 Pole       | 24           |          | C:         | Steel Collars       |
| GC                   |                 | 30           |          | V:         | 50°C                |
| GHC                  |                 | 35           |          | J01:       | Fungus Proofed      |
|                      |                 | 40           |          | R01:       | Shock Tested        |
|                      |                 | 45           |          | F01:       | Freeze Tested       |
|                      |                 | 50           |          |            |                     |
|                      |                 | 60           |          |            |                     |
|                      |                 | 70           |          |            |                     |
|                      |                 | 80           |          |            |                     |
|                      |                 | 90           |          |            |                     |
|                      |                 | 100          |          |            |                     |

## Terminal Types

For line and load-side. Terminals are UL listed as suitable for wire type and size given below.

| Circuit Breaker Amperes | Terminal Type Material   | Screw Head Type | Wire Type | AWG Wire Range | Metric Wire <sup>④</sup> Range (mm <sup>2</sup> ) |
|-------------------------|--------------------------|-----------------|-----------|----------------|---------------------------------------------------|
| <b>Standard</b>         |                          |                 |           |                |                                                   |
| 15-20                   | Clamp (Plated Steel)     | Slotted         | Cu/Al     | #14-10         | 2.5-4                                             |
| 25-100                  | Pressure (Aluminum Body) | Slotted         | Cu/Al     | #10-1/0        | 4-50                                              |
| <b>Optional</b>         |                          |                 |           |                |                                                   |
| 15-50                   | Pressure (Steel Body)    | Slotted         | Cu        | —              | —                                                 |

① Two poles of 3-pole circuit breaker.  
 ② Time constant is 8 milliseconds minimum.  
 ③ 15 through 70A breakers only.  
 ④ Not UL listed sizes.

# Molded Case Circuit Breakers 15-100 Amperes

Cutler-Hammer

March 1999

## Series C® G-Frame



Typical Series C G-Frame Circuit Breaker

## Type GD Thermal-Magnetic Circuit Breakers with Non-Interchangeable Trip-Units

|                                         |                                                   |                                               |
|-----------------------------------------|---------------------------------------------------|-----------------------------------------------|
| Maximum Continuous Ampere Rating @ 40°C | 480 Vac Maximum, 250 Vdc①                         | Catalog Number (Includes binding head screws) |
|                                         | 22 kAIC @ 480 Vac                                 |                                               |
|                                         | Catalog Number (Includes Line and Load Terminals) |                                               |

### 3-Pole

|     |        |         |
|-----|--------|---------|
| 15  | GD3015 | GD3015D |
| 20  | GD3020 | GD3020D |
| 25  | GD3025 | GD3025D |
| 30  | GD3030 | GD3030D |
| 35  | GD3035 | GD3035D |
| 40  | GD3040 | GD3040D |
| 45  | GD3045 | GD3045D |
| 50  | GD3050 | GD3050D |
| 60  | GD3060 | GD3060D |
| 70  | GD3070 | GD3070D |
| 80  | GD3080 | GD3080D |
| 90  | GD3090 | GD3090D |
| 100 | GD3100 | GD3100D |

Instruction Leaflet/FRED Number 29C102

## Molded Case Switches

|                                         |                                                   |
|-----------------------------------------|---------------------------------------------------|
| Maximum Continuous Ampere Rating @ 40°C | 480 Vac Maximum, 250 Vdc                          |
|                                         | Catalog Number (Includes Line and Load Terminals) |

### 3-Pole

|     |         |
|-----|---------|
| 60  | GD3060K |
| 100 | GD3100K |

Instruction Leaflet/FRED Number 29C102

## Series C® G-Frame

## Types GB and GHB Bolt-On Panelboard Circuit Breakers



Typical GB

These breakers meet the requirements of Federal Specification W-C-375b as follows:

Types GB, GHB, 120 and 240 Volts:

1 Pole: Class 11a.

2, 3 Poles: Classes 10b, 11b, 12b, 14b, 15b

Type GHB, 277 and 480Y/277 Volts:

1 Pole: Classes 12c, 13a

2, 3 Poles: Class 13b

## Type GB Thermal-Magnetic Circuit Breakers with Non-Interchangeable Trip Units

| Continuous<br>Ampere Rating<br>@ 40°C | 120 Vac Maximum,<br>125 Vdc Maximum <sup>①</sup> | 240 Vac Maximum,<br>125/250 Vdc Maximum | 240 Vac Maximum,<br>125/250 Vdc Maximum <sup>②</sup> |
|---------------------------------------|--------------------------------------------------|-----------------------------------------|------------------------------------------------------|
|                                       | 1-Pole                                           | 2-Pole                                  | 3-Pole                                               |
| Catalog Number                        |                                                  |                                         |                                                      |
| 15                                    | GB1015 <sup>③</sup>                              | GB2015 <sup>③</sup>                     | GB3015 <sup>③</sup>                                  |
| 20                                    | GB1020 <sup>③</sup>                              | GB2020 <sup>③</sup>                     | GB3020 <sup>③</sup>                                  |
| 25                                    | GB1025                                           | GB2025                                  | GB3025                                               |
| 30                                    | GB1030                                           | GB2030                                  | GB3030                                               |
| 35                                    | GB1035                                           | GB2035                                  | GB3035                                               |
| 40                                    | GB1040                                           | GB2040                                  | GB3040                                               |
| 45                                    | GB1045                                           | GB2045                                  | GB3045                                               |
| 50                                    | GB1050                                           | GB2050                                  | GB3050                                               |
| 60                                    | GB1060                                           | GB2060                                  | GB3060                                               |
| 70                                    | GB1070                                           | GB2070                                  | GB3070                                               |
| 80                                    | GB1080                                           | GB2080                                  | GB3080                                               |
| 90                                    | GB1090                                           | GB2090                                  | GB3090                                               |
| 100                                   | GB1100                                           | GB2100                                  | GB3100                                               |

Type GHB Thermal-Magnetic Circuit Breakers with Non-Interchangeable Trip Units<sup>④</sup>

| Continuous<br>Ampere Rating<br>@ 40°C | 277/480 Vac Maximum,<br>125 Vdc Maximum <sup>①</sup> | 277/480 Vac Maximum,<br>125/250 Vdc Maximum | 277/480 Vac Maximum,<br>125/250 Vdc Maximum <sup>②</sup> |
|---------------------------------------|------------------------------------------------------|---------------------------------------------|----------------------------------------------------------|
|                                       | 1-Pole                                               | 2-Pole                                      | 3-Pole                                                   |
| Catalog Number                        |                                                      |                                             |                                                          |
| 15                                    | GHB1015 <sup>③</sup>                                 | GHB2015 <sup>③</sup>                        | GHB3015 <sup>③</sup>                                     |
| 20                                    | GHB1020 <sup>③</sup>                                 | GHB2020 <sup>③</sup>                        | GHB3020 <sup>③</sup>                                     |
| 25                                    | GHB1025                                              | GHB2025                                     | GHB3025                                                  |
| 30                                    | GHB1030                                              | GHB2030                                     | GHB3030                                                  |
| 35                                    | GHB1035                                              | GHB2035                                     | GHB3035                                                  |
| 40                                    | GHB1040                                              | GHB2040                                     | GHB3040                                                  |
| 45                                    | GHB1045                                              | GHB2045                                     | GHB3045                                                  |
| 50                                    | GHB1050                                              | GHB2050                                     | GHB3050                                                  |
| 60                                    | GHB1060                                              | GHB2060                                     | GHB3060                                                  |
| 70                                    | GHB1070                                              | GHB2070                                     | GHB3070                                                  |
| 80                                    | GHB1080                                              | GHB2080                                     | GHB3080                                                  |
| 90                                    | GHB1090                                              | GHB2090                                     | GHB3090                                                  |
| 100                                   | GHB1100                                              | GHB2100                                     | GHB3100                                                  |

Instruction Leaflet/FRED Number 15547

## Type GHBGFEP Bolt-on Panelboard 30mA Industrial Ground Fault Circuit Protectors

15-60 Amperes, 277 Volt, 50/60 Hz

Single Phase  
(Requires 2 Poles)

These circuit breakers meet the requirements of UL489 and UL1053.

Operational voltage 240V to 305V.

## Interrupting Capacity Ratings

| Circuit<br>Breaker<br>Type | Number<br>of Poles | Interrupting Capacity<br>(Symmetrical Amperes) |
|----------------------------|--------------------|------------------------------------------------|
|                            |                    | 277 Volts Ac (50/60 Hz)                        |
| GHBGFEP                    | 2                  | 14,000                                         |

Type GHBGFEP Bolt-on Panelboard 30mA  
Industrial Ground Fault Circuit Protectors  
with Non-Interchangeable Trip Units

| Continuous<br>Ampere<br>Rating<br>@ 40°C | One Phase (Requires 2 Poles)<br>277V, 30mA |
|------------------------------------------|--------------------------------------------|
|                                          | Catalog Number                             |
| 15                                       | GHBGFEP1015                                |
| 20                                       | GHBGFEP1020                                |
| 30                                       | GHBGFEP1030                                |
| 40                                       | GHBGFEP1040                                |
| 50                                       | GHBGFEP1050                                |
| 60                                       | GHBGFEP1060                                |

Instruction Leaflet/FRED Number 29C193

- ① 15 through 70 ampere circuit breakers only.
- ② Use (2) outside poles.
- ③ Uses .190-32 screw type clamp terminals.
- ④ 480Y/277V, circuit breakers (Type GHB) not suitable for 3-phase Delta (480V).

# Molded Case Circuit Breakers 15-100 Amperes

Cutler-Hammer

March 1999

## Series C® G-Frame

### Types GC and GHC Circuit Breakers

15-100 Amperes, 120, 240, 277,  
480Y/277V, 50/60 Hz, 125, 125/250  
Vdc, 1, 2, and 3 Poles



Typical GC

These breakers meet the requirements of Federal Specification W-C-37b as follows:

Types GC, 120 and 240 Volts:

- 1 Pole: Class 11a
- 2, 3 Poles: Classes 10b, 11b, 12b, 14b, 15b

Type GHC, 277 and 480Y/277 Volts:

- 1 Pole: Classes 12c, 13a
- 2, 3 Poles: Class 13b

### Type GC Thermal-Magnetic Circuit Breakers with Non-Interchangeable Trip Units

| Continuous<br>Ampere Rating<br>@ 40°C | 240 Vac Maximum,<br>125 Vdc Maximum <sup>①</sup> | 240 Vac Maximum,<br>125/250 Vdc Maximum | 240 Vac Maximum,<br>125/250 Vdc Maximum <sup>②</sup> |
|---------------------------------------|--------------------------------------------------|-----------------------------------------|------------------------------------------------------|
|                                       | 1-Pole                                           | 2-Pole                                  | 3-Pole                                               |
| Catalog Number                        |                                                  |                                         |                                                      |
| 15                                    | GC1015 <sup>③</sup>                              | GC2015 <sup>③</sup>                     | GC3015 <sup>③</sup>                                  |
| 20                                    | GC1020 <sup>③</sup>                              | GC2020 <sup>③</sup>                     | GC3020 <sup>③</sup>                                  |
| 25                                    | GC1025                                           | GC2025                                  | GC3025                                               |
| 30                                    | GC1030                                           | GC2030                                  | GC3030                                               |
| 35                                    | GC1035                                           | GC2035                                  | GC3035                                               |
| 40                                    | GC1040                                           | GC2040                                  | GC3040                                               |
| 45                                    | GC1045                                           | GC2045                                  | GC3045                                               |
| 50                                    | GC1050                                           | GC2050                                  | GC3050                                               |
| 60                                    | GC1060                                           | GC2060                                  | GC3060                                               |
| 70                                    | GC1070                                           | GC2070                                  | GC3070                                               |
| 80                                    | GC1080                                           | GC2080                                  | GC3080                                               |
| 90                                    | GC1090                                           | GC2090                                  | GC3090                                               |
| 100                                   | GC1100                                           | GC2100                                  | GC3100                                               |

### Type GHC Thermal-Magnetic Circuit Breakers with Non-Interchangeable Trip Units

| Continuous<br>Ampere Rating<br>@ 40°C | 277 Vac Maximum,<br>125 Vdc Maximum <sup>①</sup> | 480Y/277 Vac Maximum,<br>125/250 Vdc Maximum | 480Y/277 Vac Maximum,<br>125/250 Vdc Maximum <sup>②</sup> |
|---------------------------------------|--------------------------------------------------|----------------------------------------------|-----------------------------------------------------------|
|                                       | 1-Pole                                           | 2-Pole                                       | 3-Pole                                                    |
| Catalog Number                        |                                                  |                                              |                                                           |
| 15                                    | GHC1015 <sup>③</sup>                             | GHC2015 <sup>③</sup>                         | GHC3015 <sup>③</sup>                                      |
| 20                                    | GHC1020 <sup>③</sup>                             | GHC2020 <sup>③</sup>                         | GHC3020 <sup>③</sup>                                      |
| 25                                    | GHC1025                                          | GHC2025                                      | GHC3025                                                   |
| 30                                    | GHC1030                                          | GHC2030                                      | GHC3030                                                   |
| 35                                    | GHC1035                                          | GHC2035                                      | GHC3035                                                   |
| 40                                    | GHC1040                                          | GHC2040                                      | GHC3040                                                   |
| 45                                    | GHC1045                                          | GHC2045                                      | GHC3045                                                   |
| 50                                    | GHC1050                                          | GHC2050                                      | GHC3050                                                   |
| 60                                    | GHC1060                                          | GHC2060                                      | GHC3060                                                   |
| 70                                    | GHC1070                                          | GHC2070                                      | GHC3070                                                   |
| 80                                    | GHC1080                                          | GHC2080                                      | GHC3080                                                   |
| 90                                    | GHC1090                                          | GHC2090                                      | GHC3090                                                   |
| 100                                   | GHC1100                                          | GHC2100                                      | GHC3100                                                   |

Instruction Leaflet/FRED Number 15548

### Type GHCGFEP Cable In/Cable Out 30mA Industrial Ground Fault Circuit Protectors

15-60 Amperes, 277 Volt, 50/60 Hz



Single Phase  
Requires 2 Poles

These circuit breakers meet the requirements of UL489 and UL1053.

Operational voltage 240V to 305V.

#### Interrupting Capacity Ratings

| Circuit<br>Breaker<br>Type | Number<br>of Poles | Interrupting Capacity<br>(Symmetrical Amperes) |
|----------------------------|--------------------|------------------------------------------------|
|                            |                    | 277 Volts Ac (50/60 Hz)                        |
| GHCGFEP                    | 2                  | 14,000                                         |

### Type GHBGFEP Bolt-on Panelboard 30mA Industrial Ground Fault Circuit Protectors with Non-Interchangeable Trip Units

| Continuous<br>Ampere<br>Rating<br>@ 40°C | One Phase (Requires 2 Poles)<br>277V, 30mA |
|------------------------------------------|--------------------------------------------|
|                                          | Catalog Number                             |
| 15                                       | GHBGFEP1015                                |
| 20                                       | GHBGFEP1020                                |
| 30                                       | GHBGFEP1030                                |
| 40                                       | GHBGFEP1040                                |
| 50                                       | GHBGFEP1050                                |
| 60                                       | GHBGFEP1060                                |

Instruction Leaflet/FRED Number 29C193

① 15 through 70 ampere circuit breakers only.

② Use (2) outside poles.

③ Uses .190-32 screw type clamp terminals.



**Special Purpose Breakers**

These are Types GC and GHC circuit breakers with binding head screw-type terminals on line and load side. These circuit breakers with screw-type terminals (.190-32) will be

marked "Special purpose breaker not for general use." To order this special breaker, use the catalog number below.

**Type GC Thermal-Magnetic Circuit Breakers with Non-Interchangeable Trip Units**

| Continuous<br>Ampere Rating<br>@ 40°C | 120 Vac Maximum,<br>125 Vdc Maximum | 240 Vac Maximum,<br>125/250 Vdc Maximum | 240 Vac Maximum,<br>125/250 Vdc Maximum <sup>①</sup> |
|---------------------------------------|-------------------------------------|-----------------------------------------|------------------------------------------------------|
|                                       | 1-Pole                              | 2-Pole                                  | 3-Pole                                               |
|                                       | Catalog Number                      |                                         |                                                      |
| 25                                    | GC1025D                             | GC2025D                                 | GC3025D                                              |
| 30                                    | GC1030D                             | GC2030D                                 | GC3030D                                              |
| 35                                    | GC1035D                             | GC2035D                                 | GC3035D                                              |
| 40                                    | GC1040D                             | GC2040D                                 | GC3040D                                              |
| 45                                    | GC1045D                             | GC2045D                                 | GC3045D                                              |
| 50                                    | GC1050D                             | GC2050D                                 | GC3050D                                              |
| 55                                    | GC1055D                             | GC2055D                                 | GC3055D                                              |
| 60                                    | GC1060D                             | GC2060D                                 | GC3060D                                              |

**Type GHC Thermal-Magnetic Circuit Breakers with Non-Interchangeable Trip Units**

| Continuous<br>Ampere Rating<br>@ 40°C | 277 Vac Maximum,<br>125 Vdc Maximum | 480Y/277 Vac Maximum,<br>125/250 Vdc Maximum | 480Y/277 Vac Maximum,<br>125/250 Vdc Maximum <sup>①</sup> |
|---------------------------------------|-------------------------------------|----------------------------------------------|-----------------------------------------------------------|
|                                       | 1-Pole                              | 2-Pole                                       | 3-Pole                                                    |
|                                       | Catalog Number                      |                                              |                                                           |
| 25                                    | GHC1025D                            | GHC2025D                                     | GHC3025D                                                  |
| 30                                    | GHC1030D                            | GHC2030D                                     | GHC3030D                                                  |
| 35                                    | GHC1035D                            | GHC2035D                                     | GHC3035D                                                  |
| 40                                    | GHC1040D                            | GHC2040D                                     | GHC3040D                                                  |
| 45                                    | GHC1045D                            | GHC2045D                                     | GHC3045D                                                  |
| 50                                    | GHC1050D                            | GHC2050D                                     | GHC3050D                                                  |
| 55                                    | GHC1055D                            | GHC2055D                                     | GHC3055D                                                  |
| 60                                    | GHC1060D                            | GHC2060D                                     | GHC3060D                                                  |

Instruction Leaflet/FRED Number 15548

<sup>①</sup> Use (2) outside poles.



## Series C® G-Frame

## Dimensions/Weights

### Dimensions, Inches (mm)

| Number of Poles | Width          | Height           | Depth           |
|-----------------|----------------|------------------|-----------------|
| 1               | 1.0<br>(25.33) | 4.88<br>(123.95) | 2.81<br>(71.41) |
| 2               | 2.0<br>(50.78) | 4.88<br>(123.95) | 2.81<br>(71.41) |
| 3               | 3.0<br>(76)    | 4.88<br>(123.95) | 2.81<br>(71.41) |

### Approximate Shipping Weight, Lbs. (kg)

| Breaker Type | Number of Poles |               |                 |
|--------------|-----------------|---------------|-----------------|
|              | 1               | 2             | 3               |
| GD           | 1.0<br>(.454)   | 1.5<br>(.680) | 2.25<br>(1.021) |
| GHGFEF       | —               | 1.2<br>(.545) | —               |
| GHGFEF       | —               | 1.1<br>(.499) | —               |
| GB/GHC       | Carton Quantity |               |                 |
|              | 24              | 12            | 8               |
|              | 16<br>(7.264)   | 16<br>(7.264) | 16<br>(7.264)   |
| GC/GHC       | Carton Quantity |               |                 |
|              | 24              | 12            | 8               |
|              | 18<br>(8.172)   | 18<br>(8.172) | 18<br>(8.172)   |

## Accessories

### Internal

|                                         |     |
|-----------------------------------------|-----|
| Alarm Switch .....                      | 139 |
| Auxiliary Switch .....                  | 142 |
| Shunt Trip .....                        | 147 |
| Undervoltage Release<br>Mechanism ..... | 153 |

### External

|                                  |     |
|----------------------------------|-----|
| Base Mounting Hardware .....     | 163 |
| Base Mounting Plate .....        | 167 |
| DIN Rail Adapter .....           | 167 |
| Key Operated Attachment .....    | 167 |
| Lock Dog (non-padlockable) ..... | 168 |
| Padlockable Handle .....         | 168 |
| Handle Mechanisms .....          | 180 |

## Series C® F-Frame



Typical Series C F-Frame Breaker

- All Series C F-frame circuit breakers are HACR rated.
- All circuit breakers 10 through 50 amperes are suitable for HID (high intensity discharge) use.
- All F-frame circuit breakers are suitable for reverse feed use.

## Interrupting Capacity Ratings

## UL489 Interrupting Capacity Ratings

| Circuit Breaker Type | Number of Poles | Interrupting Capacity (Symmetrical Amperes) (kA) |     |     |     |           |       | Page Number        |
|----------------------|-----------------|--------------------------------------------------|-----|-----|-----|-----------|-------|--------------------|
|                      |                 | Volts Ac (50/60 Hz)                              |     |     |     | Volts Dc① |       |                    |
|                      |                 | 240                                              | 277 | 480 | 600 | 125       | 250②③ |                    |
| ED                   | 2, 3            | 65                                               | —   | —   | —   | 10        | —     | <a href="#">32</a> |
| EDH                  | 2, 3            | 100                                              | —   | —   | —   | 10        | —     | <a href="#">32</a> |
| EDC                  | 2, 3            | 200                                              | —   | —   | —   | 10        | —     | <a href="#">32</a> |
| EHD                  | 1               | —                                                | 14  | —   | —   | 10        | —     | <a href="#">32</a> |
|                      | 2, 3            | 18                                               | —   | 14  | —   | —         | 10    | <a href="#">32</a> |
| FDB                  | 2, 3, 4         | 18                                               | —   | 14  | 14  | —         | 10    | <a href="#">32</a> |
| FD                   | 1               | —                                                | 25  | —   | —   | 10        | —     | <a href="#">32</a> |
|                      | 2, 3, 4         | 65                                               | —   | 25  | 18  | —         | 10    | <a href="#">32</a> |
| HFD                  | 1               | —                                                | 65  | —   | —   | 10        | —     | <a href="#">33</a> |
|                      | 2, 3, 4         | 100                                              | —   | 65  | 25  | —         | 22    | <a href="#">33</a> |
| FDC                  | 2, 3, 4         | 200                                              | —   | 100 | 35  | —         | 22    | <a href="#">33</a> |

## IEC 157-1 (P1) Interrupting Capacity Ratings (P1)

| Circuit Breaker Type | Number of Poles | Interrupting Capacity (Symmetrical Amperes) (kA) |          |     |     |           |       | Page Number        |
|----------------------|-----------------|--------------------------------------------------|----------|-----|-----|-----------|-------|--------------------|
|                      |                 | Volts Ac (50/60 Hz)                              |          |     |     | Volts Dc① |       |                    |
|                      |                 | 220, 240                                         | 380, 415 | 440 | 500 | 125       | 250②③ |                    |
| ED                   | 2, 3            | 65                                               | —        | —   | —   | 10        | —     | <a href="#">32</a> |
| EDH                  | 2, 3            | 100                                              | —        | —   | —   | 10        | —     | <a href="#">32</a> |
| EDC                  | 2, 3            | 200                                              | —        | —   | —   | 10        | —     | <a href="#">32</a> |
| FDB                  | 2, 3, 4         | 18                                               | 14       | 14  | 14  | —         | 10    | <a href="#">32</a> |
| FD                   | 1               | 25                                               | —        | —   | —   | 10        | —     | <a href="#">32</a> |
|                      | 2, 3, 4         | 65                                               | 35       | 35  | 18  | —         | 10    | <a href="#">32</a> |
| HFD                  | 1               | 65                                               | —        | —   | —   | 10        | —     | <a href="#">33</a> |
|                      | 2, 3, 4         | 100                                              | 65       | 65  | 25  | —         | 22    | <a href="#">33</a> |
| FDC                  | 2, 3, 4         | 200                                              | 100      | 100 | 35  | —         | 22    | <a href="#">33</a> |

① Dc ratings apply to substantially non-inductive circuits.

② 2-pole circuit breaker, or two poles of 3-pole circuit breaker.

③ Time constant is 3 milliseconds minimum at 10 kA and 8 milliseconds minimum at 22 kA.

# Molded Case Circuit Breakers 10-225 Amperes

Cutler-Hammer

March 1999

## Series C® F-Frame

## Types ED, EDH, and EDC Thermal-Magnetic Circuit Breakers with Non-Interchangeable Trip Units Suitable for Reverse Feed

| Maximum Continuous Ampere Rating @ 40°C | 240 Vac Maximum, 125 Vdc                             |        |                    |         |                           |         |
|-----------------------------------------|------------------------------------------------------|--------|--------------------|---------|---------------------------|---------|
|                                         | 65 kAIC @ 240 Vac                                    |        | 100 kAIC @ 240 Vac |         | 200 kAIC @ 240 Vac        |         |
|                                         | Type ED                                              |        | Type EDH           |         | Type EDC Current Limiting |         |
|                                         | 2-Pole                                               | 3-Pole | 2-Pole             | 3-Pole  | 2-Pole                    | 3-Pole  |
|                                         | Catalog Number (Includes Terminals on Load End Only) |        |                    |         |                           |         |
| 100                                     | ED2100                                               | ED3100 | EDH2100            | EDH3100 | EDC2100                   | EDC3100 |
| 125                                     | ED2125                                               | ED3125 | EDH2125            | EDH3125 | EDC2125                   | EDC3125 |
| 150                                     | ED2150                                               | ED3150 | EDH2150            | EDH3150 | EDC2150                   | EDC3150 |
| 175                                     | ED2175                                               | ED3175 | EDH2175            | EDH3175 | EDC2175                   | EDC3175 |
| 200                                     | ED2200                                               | ED3200 | EDH2200            | EDH3200 | EDC2200                   | EDC3200 |
| 225                                     | ED2225                                               | ED3225 | EDH2225            | EDH3225 | EDC2225                   | EDC3225 |

Instruction Leaflet/FRED Number 29C101

## Type EHD Thermal-Magnetic Circuit Breakers with Non-Interchangeable Trip Units

|                                         |                                                      |                          |         |
|-----------------------------------------|------------------------------------------------------|--------------------------|---------|
| Maximum Continuous Ampere Rating @ 40°C | 277 Vac Maximum, 125 Vdc                             | 480 Vac Maximum, 250 Vdc |         |
|                                         | 14 kAIC @ 277 Vac                                    | 14 kAIC @ 480 Vac        |         |
|                                         | Type EHD                                             |                          |         |
|                                         | 1-Pole                                               | 2-Pole                   | 3-Pole  |
|                                         | Catalog Number (Includes Terminals on Load End Only) |                          |         |
| 10①                                     | EHD1010                                              | EHD2010                  | EHD3010 |
| 15                                      | EHD1015②                                             | EHD2015                  | EHD3015 |
| 20                                      | EHD1020②                                             | EHD2020                  | EHD3020 |
| 25                                      | EHD1025                                              | EHD2025                  | EHD3025 |
| 30                                      | EHD1030                                              | EHD2030                  | EHD3030 |
| 35                                      | EHD1035                                              | EHD2035                  | EHD3035 |
| 40                                      | EHD1040                                              | EHD2040                  | EHD3040 |
| 45                                      | EHD1045                                              | EHD2045                  | EHD3045 |
| 50                                      | EHD1050                                              | EHD2050                  | EHD3050 |
| 60                                      | EHD1060                                              | EHD2060                  | EHD3060 |
| 70                                      | EHD1070                                              | EHD2070                  | EHD3070 |
| 80                                      | EHD1080                                              | EHD2080                  | EHD3080 |
| 90                                      | EHD1090                                              | EHD2090                  | EHD3090 |
| 100                                     | EHD1100                                              | EHD2100                  | EHD3100 |

Instruction Leaflet/FRED Number 29C101

## Type FD Thermal-Magnetic Circuit Breakers with Non-Interchangeable Trip Units

| Maximum Continuous<br>Ampere<br>Rating<br>@ 40°C | 600 Vac Maximum, 250 Vdc                             |         |         | 277 Vac Maximum, 125 Vdc |  | 600 Vac Maximum, 250 Vdc |        |        |  |
|--------------------------------------------------|------------------------------------------------------|---------|---------|--------------------------|--|--------------------------|--------|--------|--|
|                                                  | 14 kAIC @ 600 Vac                                    |         |         | 25 kAIC @ 277 Vac        |  | 25 kAIC @ 480 Vac        |        |        |  |
|                                                  | Type FDB                                             |         |         | Type FD                  |  |                          |        |        |  |
|                                                  | 2-Pole                                               | 3-Pole  | 4-Pole  | 1-Pole                   |  | 2-Pole                   | 3-Pole | 4-Pole |  |
|                                                  | Catalog Number (Includes Terminals on Load End Only) |         |         |                          |  |                          |        |        |  |
| 10①                                              | FDB2010                                              | FDB3010 | FDB4010 | FD1010                   |  | —                        | —      | —      |  |
| 15                                               | FDB2015                                              | FDB3015 | FDB4015 | FD1015②                  |  | FD2015                   | FD3015 | FD4015 |  |
| 20                                               | FDB2020                                              | FDB3020 | FDB4020 | FD1020②                  |  | FD2020                   | FD3020 | FD4020 |  |
| 25                                               | FDB2025                                              | FDB3025 | FDB4025 | FD1025                   |  | FD2025                   | FD3025 | FD4025 |  |
| 30                                               | FDB2030                                              | FDB3030 | FDB4030 | FD1030                   |  | FD2030                   | FD3030 | FD4030 |  |
| 35                                               | FDB2035                                              | FDB3035 | FDB4035 | FD1035                   |  | FD2035                   | FD3035 | FD4035 |  |
| 40                                               | FDB2040                                              | FDB3040 | FDB4040 | FD1040                   |  | FD2040                   | FD3040 | FD4040 |  |
| 45                                               | FDB2045                                              | FDB3045 | FDB4045 | FD1045                   |  | FD2045                   | FD3045 | FD4045 |  |
| 50                                               | FDB2050                                              | FDB3050 | FDB4050 | FD1050                   |  | FD2050                   | FD3050 | FD4050 |  |
| 60                                               | FDB2060                                              | FDB3060 | FDB4060 | FD1060                   |  | FD2060                   | FD3060 | FD4060 |  |
| 70                                               | FDB2070                                              | FDB3070 | FDB4070 | FD1070                   |  | FD2070                   | FD3070 | FD4070 |  |
| 80                                               | FDB2080                                              | FDB3080 | FDB4080 | FD1080                   |  | FD2080                   | FD3080 | FD4080 |  |
| 90                                               | FDB2090                                              | FDB3090 | FDB4090 | FD1090                   |  | FD2090                   | FD3090 | FD4090 |  |
| 100                                              | FDB2100                                              | FDB3100 | FDB4100 | FD1100                   |  | FD2100                   | FD3100 | FD4100 |  |
| 110                                              | FDB2110                                              | FDB3110 | FDB4110 | FD1110                   |  | FD2110                   | FD3110 | FD4110 |  |
| 125                                              | FDB2125                                              | FDB3125 | FDB4125 | FD1125                   |  | FD2125                   | FD3125 | FD4125 |  |
| 150                                              | FDB2150                                              | FDB3150 | FDB4150 | FD1150                   |  | FD2150                   | FD3150 | FD4150 |  |
| 175                                              | —                                                    | —       | —       | —                        |  | FD2175                   | FD3175 | FD4175 |  |
| 200                                              | —                                                    | —       | —       | —                        |  | FD2200                   | FD3200 | FD4200 |  |
| 225                                              | —                                                    | —       | —       | —                        |  | FD2225                   | FD3225 | FD4225 |  |

Instruction Leaflet/FRED Number 29C101

① Not UL listed. 5 kAIC interrupting rating.

② UL listed for SWD applications, see NEC Article 240-83 (d).

## Series C® F-Frame

## Types HFD and FDC Thermal-Magnetic Circuit Breakers with Non-Interchangeable Trip Units

| Maximum Continuous Ampere Rating @ 40°C | 600 Vac Maximum, 250 Vdc                             |         | 277 Vac Maximum, 125 Vdc |         |         |         | 600 Vac Maximum, 250 Vdc  |        |  |
|-----------------------------------------|------------------------------------------------------|---------|--------------------------|---------|---------|---------|---------------------------|--------|--|
|                                         | 65 kAIC @ 277 Vac                                    |         | 65 kAIC @ 480 Vac        |         |         |         | 100 kAIC @ 480 Vac        |        |  |
|                                         | Type HFD                                             |         |                          |         |         |         | Type FDC Current Limiting |        |  |
|                                         | 1-Pole                                               |         | 2-Pole                   | 3-Pole  | 4-Pole  | 2-Pole  | 3-Pole                    | 4-Pole |  |
|                                         | Catalog Number (Includes Terminals on Load End Only) |         |                          |         |         |         |                           |        |  |
| 15                                      | HFD1015                                              | HFD2015 | HFD3015                  | HFD4015 | FDC2015 | FDC3015 | FDC4015                   |        |  |
| 20                                      | HFD1020                                              | HFD2020 | HFD3020                  | HFD4020 | FDC2020 | FDC3020 | FDC4020                   |        |  |
| 25                                      | HFD1025                                              | HFD2025 | HFD3025                  | HFD4025 | FDC2025 | FDC3025 | FDC4025                   |        |  |
| 30                                      | HFD1030                                              | HFD2030 | HFD3030                  | HFD4030 | FDC2030 | FDC3030 | FDC4030                   |        |  |
| 35                                      | HFD1035                                              | HFD2035 | HFD3035                  | HFD4035 | FDC2035 | FDC3035 | FDC4035                   |        |  |
| 40                                      | HFD1040                                              | HFD2040 | HFD3040                  | HFD4040 | FDC2040 | FDC3040 | FDC4040                   |        |  |
| 45                                      | HFD1045                                              | HFD2045 | HFD3045                  | HFD4045 | FDC2045 | FDC3045 | FDC4045                   |        |  |
| 50                                      | HFD1050                                              | HFD2050 | HFD3050                  | HFD4050 | FDC2050 | FDC3050 | FDC4050                   |        |  |
| 60                                      | HFD1060                                              | HFD2060 | HFD3060                  | HFD4060 | FDC2060 | FDC3060 | FDC4060                   |        |  |
| 70                                      | HFD1070                                              | HFD2070 | HFD3070                  | HFD4070 | FDC2070 | FDC3070 | FDC4070                   |        |  |
| 80                                      | HFD1080                                              | HFD2080 | HFD3080                  | HFD4080 | FDC2080 | FDC3080 | FDC4080                   |        |  |
| 90                                      | HFD1090                                              | HFD2090 | HFD3090                  | HFD4090 | FDC2090 | FDC3090 | FDC4090                   |        |  |
| 100                                     | HFD1100                                              | HFD2100 | HFD3100                  | HFD4100 | FDC2100 | FDC3100 | FDC4100                   |        |  |
| 110                                     | HFD1110                                              | HFD2110 | HFD3110                  | HFD4110 | FDC2110 | FDC3110 | FDC4110                   |        |  |
| 125                                     | HFD1125                                              | HFD2125 | HFD3125                  | HFD4125 | FDC2125 | FDC3125 | FDC4125                   |        |  |
| 150                                     | HFD1150                                              | HFD2150 | HFD3150                  | HFD4150 | FDC2150 | FDC3150 | FDC4150                   |        |  |
| 175                                     | —                                                    | HFD2175 | HFD3175                  | HFD4175 | FDC2175 | FDC3175 | FDC4175                   |        |  |
| 200                                     | —                                                    | HFD2200 | HFD3200                  | HFD4200 | FDC2200 | FDC3200 | FDC4200                   |        |  |
| 225                                     | —                                                    | HFD2225 | HFD3225                  | HFD4225 | FDC2225 | FDC3225 | FDC4225                   |        |  |

Instruction Leaflet/FRED Number 29C101

## Molded Case Switches

Molded case switches are used as compact switches in applications requiring high current switching capabilities. Molded case switches are constructed of circuit breaker components and are of the high instantaneous automatic type. Molded case switches are listed in accordance with Underwriters Laboratories, Inc., Standard UL 1087.

| Maximum Continuous Ampere Rating @ 40°C | 480 Vac Maximum, 250 Vdc                               | 600 Vac Maximum, 250 Vdc                               |
|-----------------------------------------|--------------------------------------------------------|--------------------------------------------------------|
|                                         | Complete Circuit Breaker with Load Side Terminals Only | Complete Circuit Breaker with Load Side Terminals Only |
|                                         | Catalog Number                                         |                                                        |

## 2-Pole

|     |          |         |
|-----|----------|---------|
| 100 | EHD2100K | FD2100K |
| 150 | —        | FD2150K |
| 225 | —        | FD2225K |

## 3-Pole

|     |          |         |
|-----|----------|---------|
| 100 | EHD3100K | FD3100K |
| 150 | —        | FD3150K |
| 225 | —        | FD3225K |

## 4-Pole

|     |   |         |
|-----|---|---------|
| 100 | — | FD4100K |
| 150 | — | FD4150K |
| 225 | — | FD4225K |

**Note:** Molded Case Switches may open above 1800 amperes.

Instruction Leaflet/FRED Number 29C101

## Series C® F-Frame

### Line and Load Terminals

Line and load terminals provide wire connecting capabilities for specific ranges of continuous current ratings and wire types. Except as noted, terminals comply with Underwriters Laboratories, Inc., Standards UL486A and UL486B. Unless otherwise specified, F-frame circuit breakers

are factory equipped with load terminals only.

### Ordering Information

F-frame circuit breakers and molded case switches have load terminals only as standard equipment. When standard line-end terminals (same as

standard load-end terminals) are required, add suffix L to the circuit breaker catalog number. When non-standard or optional line and/or load terminals are required, order by style number. Specify if factory installation is required.

### Line and Load Terminals

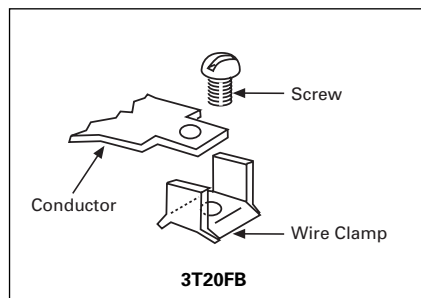
| Maximum Breaker Amperes | Terminal Body Material | Wire Type | AWG Wire Range | Metric Wire Range mm <sup>2</sup> | Package of 3 Terminals<br>Catalog Number |
|-------------------------|------------------------|-----------|----------------|-----------------------------------|------------------------------------------|
|-------------------------|------------------------|-----------|----------------|-----------------------------------|------------------------------------------|

#### Standard Pressure Type Terminals

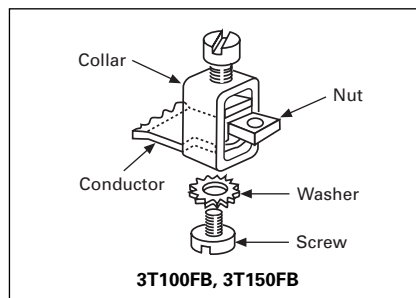
|          |          |       |         |        |                     |
|----------|----------|-------|---------|--------|---------------------|
| 20 (EHD) | Steel    | Cu/Al | #14-#10 | 2.5-4  | 3T20FB <sup>①</sup> |
| 100      | Steel    | Cu/Al | #14-1/0 | 2.5-50 | 3T100FB             |
| 225      | Aluminum | Cu/Al | #14-4/0 | 25-95  | 3TA225FD            |

#### Optional Pressure Terminals

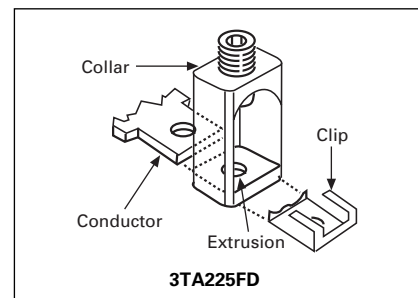
|     |                 |       |              |        |                        |
|-----|-----------------|-------|--------------|--------|------------------------|
| 50  | Aluminum        | Cu/Al | #14-#4       | 2.5-16 | 3TA50FB <sup>①</sup>   |
| 100 | Aluminum        | Cu/Al | #14-1/0      | 2.5-50 | 3TA100FD               |
| 200 | Stainless Steel | Cu    | #4-4/0       | 25-95  | 3T150FB                |
| 225 | Aluminum        | Cu/Al | #6-300 kcmil | 16-150 | 3TA225FDK <sup>②</sup> |



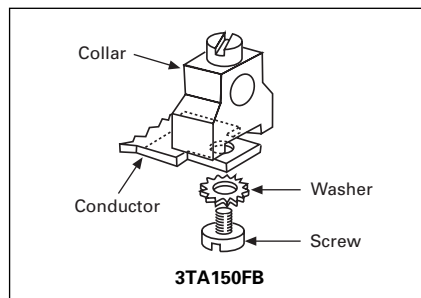
Assemble wire clamp to bottom of conductor as shown.



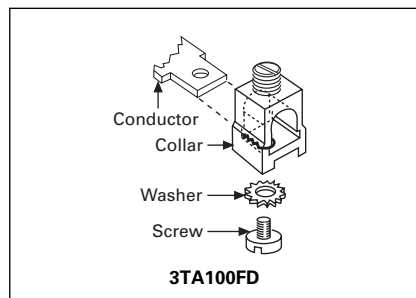
Insert collar enclosing conductor as shown. Locate nut on top of conductor and tighten securely with screw and washer. Caution: Collar must surround conductor.



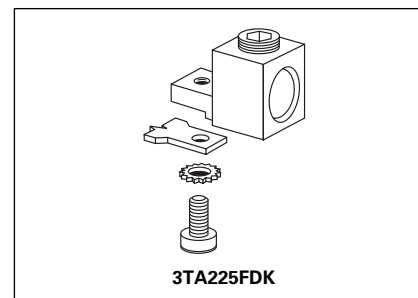
Insert collar enclosing conductor and center on extrusion on collar. Install clip with legs on top of conductor and snap end around bottom of collar.



Assemble collar on top of conductor as shown. Tighten securely with screw and washer.



Collar slides onto conductor and is held in position by a screw and lockwasher.



Assemble collar on top of conductor as shown. Tighten securely with screw and washer. Terminal shield must be used with this collar.

<sup>①</sup> Not for use with ED, EDH, EDC breakers.

<sup>②</sup> Includes terminal shield kit. Adds approximately 3 inches to breaker height. Available for use on 3-pole breaker only.

## Catalog Numbering System

This information is presented only as an aid to understanding catalog numbers. It is not to be used to build catalog numbers for circuit breakers or trip units.

### Circuit Breaker Catalog Number

| FDC 3 100 L          |                 |                                         |                                              |
|----------------------|-----------------|-----------------------------------------|----------------------------------------------|
| Circuit Breaker Type | Number of Poles | Trip Amperes                            | Suffix                                       |
| EHD                  | 1: 1 Pole       | 10                                      | E: 100% Protected (4-Pole only) Neutral Pole |
| FDB                  | 2: 2 Poles      | 15                                      | EH: 50% Protected (4-Pole only)              |
| FD                   | 3: 3 Poles      | 20                                      | K: High Magnetic Molded Case Switch          |
| HFD                  | 4: 4 Poles      | 25                                      | L: Line and Load Terminals                   |
| FDC                  |                 | 30                                      | S: Stainless Steel Terminals                 |
|                      |                 | 35                                      | V: 50°C Calibration                          |
|                      |                 | 40                                      | W: Without Terminals                         |
|                      |                 | 45                                      | Y: Line Terminals Only                       |
|                      |                 | 50                                      | Z: Aluminum Terminals (≤ 100 Amperes)        |
|                      |                 | 60                                      |                                              |
|                      |                 | 70                                      |                                              |
|                      |                 | 80                                      |                                              |
|                      |                 | 90                                      |                                              |
|                      |                 | 100                                     |                                              |
|                      |                 | 110                                     |                                              |
|                      |                 | 125                                     |                                              |
|                      |                 | 150                                     |                                              |
|                      |                 | 175 (FD, HFD, FDC, 2-, 3-, 4-Pole Only) |                                              |
|                      |                 | 200 (FD, HFD, FDC, 2-, 3-, 4-Pole Only) |                                              |
|                      |                 | 225 (FD, HFD, FDC, 2-, 3-, 4-Pole Only) |                                              |

| EDC 3 200 L          |                 |              |                                     |
|----------------------|-----------------|--------------|-------------------------------------|
| Circuit Breaker Type | Number of Poles | Trip Amperes | Suffix                              |
| ED                   | 2: 2 Poles      | 100          | L: Line and Load Terminals          |
| EDH                  | 3: 3 Poles      | 125          | W: Without Terminals                |
| EDC                  |                 | 150          | Y: Line Terminals Only              |
|                      |                 | 175          | Z: Aluminum Terminals (100 Amperes) |
|                      |                 | 200          |                                     |
|                      |                 | 225          |                                     |

## Dimensions/Weights

### Dimensions, Inches (mm)

| Number of Poles | Width          | Height     | Depth         |
|-----------------|----------------|------------|---------------|
| 1               | 1.375<br>(35)  | 6<br>(152) | 3.375<br>(86) |
| 2               | 2.75<br>(70)   | 6<br>(152) | 3.375<br>(86) |
| 3               | 4.125<br>(105) | 6<br>(152) | 3.375<br>(86) |
| 4               | 5.5<br>(140)   | 6<br>(152) | 3.375<br>(86) |

### Approximate Shipping Weight, Lbs. (kg)

| Breaker Type           | Number of Poles |              |                |              |
|------------------------|-----------------|--------------|----------------|--------------|
|                        | 1               | 2            | 3              | 4            |
| ED, EDH, EDC           | —               | 3<br>(1.361) | 4.5<br>(2.041) | —            |
| EHD, FDB, FD, HFD, FDC | 2<br>(.907)     | 3<br>(1.361) | 4.5<br>(2.041) | 6<br>(2.721) |

## Series C® F-Frame

### Allowable Accessory Combinations

Different combinations of accessories can be supplied, depending on the types of accessories and the number of poles in the circuit breaker.

|  | Reference Page | 1-Pole | 2-Pole |       | 3-Pole |        |       | 4-Pole |        |       |      |
|--|----------------|--------|--------|-------|--------|--------|-------|--------|--------|-------|------|
|  |                | Center | Left   | Right | Left   | Center | Right | Left   | Center | Right | Neu. |

#### Internal Accessories

|                                               |     |   |  |   |  |   |  |   |  |   |   |
|-----------------------------------------------|-----|---|--|---|--|---|--|---|--|---|---|
| Alarm Lockout Switch (Make Only)              | 139 | ■ |  |   |  |   |  |   |  |   |   |
| Alarm Lockout (Make/Break)                    | 139 |   |  | ■ |  | □ |  | □ |  | ■ |   |
| Alarm Lockout (2Make/2Break)                  | 139 |   |  | ■ |  | □ |  | □ |  | ■ |   |
| Auxiliary Switch (1A, 1B)                     | 142 |   |  | ■ |  | ■ |  | ■ |  | ■ | ■ |
| Auxiliary Switch (2A, 2B)                     | 142 |   |  | ■ |  | ■ |  | ■ |  | ■ | ■ |
| Auxiliary Switch and Alarm Switch Combination | 145 |   |  | ■ |  | □ |  | □ |  | ■ |   |
| Shunt Trip – Standard                         | 148 |   |  | ■ |  | ■ |  | ■ |  | ■ | ■ |
| Shunt Trip – Low Energy                       | 152 |   |  | ■ |  | ■ |  | ■ |  | ■ |   |
| Undervoltage Release Mechanism                | 154 |   |  | ■ |  | ■ |  | ■ |  | ■ |   |

#### External Accessories

|                                                |     |   |   |   |  |   |  |   |   |   |   |
|------------------------------------------------|-----|---|---|---|--|---|--|---|---|---|---|
| End Cap Kit                                    | 161 |   |   | ● |  | ● |  |   |   | ● |   |
| Keeper Nut                                     | 161 | ● |   | ● |  | ● |  |   |   | ● |   |
| Control Wire Terminal Kit                      | 162 | ● |   | ● |  | ● |  |   |   | ● |   |
| Multiwire Connectors                           | 162 | ● |   | ● |  | ● |  |   |   | ● |   |
| Base Mounting Hardware                         | 163 | ● |   | ● |  | ● |  |   |   | ● |   |
| Terminal Shields                               | 165 | ● |   | ● |  | ● |  |   |   | ● |   |
| Terminal End Covers                            | 166 |   |   |   |  | ● |  |   |   |   |   |
| Interphase Barriers                            | 166 |   |   | ● |  | ● |  |   |   | ● |   |
| Non-Padlockable Handle Block                   | 168 | ■ | ■ |   |  | ■ |  |   | ■ |   |   |
| Snap-on Padlockable Handle Lock Hasp           | 168 | ■ | ■ |   |  | ■ |  |   | ■ |   |   |
| Padlockable Handle Lock Hasp                   | 169 |   |   | ■ |  | □ |  | □ |   | □ | □ |
| Cylinder Lock                                  | 169 |   |   |   |  | ■ |  |   |   |   |   |
| Key Interlock Kit                              | 170 |   |   | ■ |  | □ |  | □ |   | □ | □ |
| Sliding Bar Interlock – Requires Two Breakers  | 171 |   |   |   |  | ● |  |   |   |   |   |
| Walking Beam Interlock – Requires Two Breakers | 171 |   |   |   |  | ● |  |   |   | ● |   |
| Electrical (Solenoid) Operator                 | 172 |   |   |   |  | ● |  |   |   | ● |   |
| Plug-in Adapters                               | 174 |   |   | ● |  | ● |  |   |   | ● |   |
| Rear Connecting Studs                          | 175 | ● |   | ● |  | ● |  |   |   | ● |   |
| Panelboard Connecting Straps                   | 177 | ● |   | ● |  | ● |  |   |   | ● |   |
| Handle Mechanisms                              | 178 |   |   |   |  | ● |  |   |   |   |   |
| Door Hardware/Accessories                      | 182 |   |   |   |  | ● |  |   |   | ● |   |
| LFD Current Limiter                            | 183 |   |   |   |  | ● |  |   |   |   |   |
| IQ Energy Sentinel                             | 184 |   |   | ● |  | ● |  |   |   |   |   |

#### Modifications (Refer to Cutler-Hammer)

|                                |     |   |  |   |  |   |  |  |  |   |  |
|--------------------------------|-----|---|--|---|--|---|--|--|--|---|--|
| Special Calibration            | 186 | ● |  | ● |  | ● |  |  |  | ● |  |
| Moisture Fungus Treatment      | 186 | ● |  | ● |  | ● |  |  |  | ● |  |
| Freeze-Tested Circuit Breakers | 186 | ● |  | ● |  | ● |  |  |  | ● |  |
| Marine Application             | 186 | ● |  | ● |  | ● |  |  |  | ● |  |

■ Applicable in indicated pole position

□ May be mounted on left or right pole – not both

● Accessory available/Modification available

## Series C® J-Frame



Typical Series C J-Frame Circuit Breaker

- All Series C J-frame Circuit Breakers are HACR rated.
- J-frame circuit breakers are available as individual components (Frame, Trip Unit, Terminals), or factory assembled complete breakers.
- J-frame circuit breakers with non-interchangeable trip units are suitable for reverse feed use.

## Interrupting Capacity Ratings

## UL489 Interrupting Capacity Ratings

| Circuit Breaker Type | Number of Poles | Interrupting Capacity (Symmetrical Amperes) (kA) |     |     |     |                   |                  | Page Number |
|----------------------|-----------------|--------------------------------------------------|-----|-----|-----|-------------------|------------------|-------------|
|                      |                 | Volts Ac (50/60 Hz)                              |     |     |     | Volts Dc          |                  |             |
|                      |                 | 240                                              | 480 | 600 | 125 | 250 <sup>①②</sup> | 500 <sup>③</sup> |             |
| JDB                  | 2, 3            | 65                                               | 35  | 18  | —   | 10                | —                | 39          |
| JD                   | 2, 3, 4         | 65                                               | 35  | 18  | —   | 10                | —                | 38          |
| HJD                  | 2, 3, 4         | 100                                              | 65  | 25  | —   | 22                | —                | 38          |
| JDC                  | 2, 3, 4         | 200                                              | 100 | 35  | —   | 22                | —                | 38          |

## IEC 157-1 (P1) Interrupting Capacity Ratings

| Circuit Breaker Type | Number of Poles | Interrupting Capacity (Symmetrical Amperes) (kA) |     |     |     |     |                   | Page Number |
|----------------------|-----------------|--------------------------------------------------|-----|-----|-----|-----|-------------------|-------------|
|                      |                 | Volts Ac (50/60 Hz)                              |     |     |     |     | Volts Dc          |             |
|                      |                 | 240                                              | 380 | 415 | 600 | 125 | 250 <sup>①②</sup> |             |
| JD                   | 2, 3, 4         | 65                                               | 35  | 35  | —   | —   | 10                | 38          |
| HJD                  | 2, 3, 4         | 100                                              | 65  | 65  | —   | —   | 22                | 38          |
| JDC                  | 2, 3, 4         | 200                                              | 100 | 100 | —   | —   | 22                | 38          |

- ① 2-pole circuit breaker or two outside poles of 3-pole circuit breaker.
- ② Time constant is 3 milliseconds minimum at 10 kA and 8 milliseconds minimum at 22 kA.
- ③ 8 milliseconds time constant.



# Molded Case Circuit Breakers 70-250 Amperes

Cutler-Hammer

March 1999

## Series C® J-Frame

## Types JD, HJD, and JDC Thermal-Magnetic Circuit Breakers with Interchangeable Trip Units

|                                         |                                                                         |            |                                                                         |            |                                                                                          |            |                                                                  |                                                                   |
|-----------------------------------------|-------------------------------------------------------------------------|------------|-------------------------------------------------------------------------|------------|------------------------------------------------------------------------------------------|------------|------------------------------------------------------------------|-------------------------------------------------------------------|
| Maximum Continuous Ampere Rating @ 40°C | Standard Interrupting Capacity<br>600 Vac Rated<br>25 kAIC @ 480 Vac    |            | High Interrupting Capacity<br>600 Vac Rated<br>65 kAIC @ 480 Vac        |            | Ultra High Interrupting Capacity Current Limiting<br>600 Vac Rated<br>100 kAIC @ 480 Vac |            | Thermal Magnetic Trip Unit Only                                  | Standard Terminals Only<br><br>See Page 40 for Optional Terminals |
|                                         | Factory Assembled Circuit Consisting of Frame, Trip Unit, and Terminals | Frame Only | Factory Assembled Circuit Consisting of Frame, Trip Unit, and Terminals | Frame Only | Factory Assembled Circuit Consisting of Frame, Trip Unit, and Terminals                  | Frame Only | For Use With: Standard or High or Ultra High Interrupting Frames |                                                                   |
|                                         | Catalog Number                                                          |            |                                                                         |            |                                                                                          |            |                                                                  |                                                                   |

## 2-Pole

|     |        |         |         |          |         |          |         |                      |
|-----|--------|---------|---------|----------|---------|----------|---------|----------------------|
| 70  | JD2070 | JD2250F | HJD2070 | HJD2250F | JDC2070 | JDC2250F | JT2070T | TA250KB <sup>①</sup> |
| 90  | JD2090 |         | HJD2090 |          | JDC2090 |          | JT2090T |                      |
| 100 | JD2100 |         | HJD2100 |          | JDC2100 |          | JT2100T |                      |
| 125 | JD2125 |         | HJD2125 |          | JDC2125 |          | JT2125T |                      |
| 150 | JD2150 |         | HJD2150 |          | JDC2150 |          | JT2150T |                      |
| 175 | JD2175 |         | HJD2175 |          | JDC2175 |          | JT2175T |                      |
| 200 | JD2200 |         | HJD2200 |          | JDC2200 |          | JT2200T |                      |
| 225 | JD2225 |         | HJD2225 |          | JDC2225 |          | JT2225T |                      |
| 250 | JD2250 |         | HJD2250 |          | JDC2250 |          | JT2250T |                      |

## 3-Pole

|     |        |         |         |          |         |          |         |                      |
|-----|--------|---------|---------|----------|---------|----------|---------|----------------------|
| 70  | JD3070 | JD3250F | HJD3070 | HJD3250F | JDC3070 | JDC3250F | JT3070T | TA250KB <sup>①</sup> |
| 90  | JD3090 |         | HJD3090 |          | JDC3090 |          | JT3090T |                      |
| 100 | JD3100 |         | HJD3100 |          | JDC3100 |          | JT3100T |                      |
| 125 | JD3125 |         | HJD3125 |          | JDC3125 |          | JT3125T |                      |
| 150 | JD3150 |         | HJD3150 |          | JDC3150 |          | JT3150T |                      |
| 175 | JD3175 |         | HJD3175 |          | JDC3175 |          | JT3175T |                      |
| 200 | JD3200 |         | HJD3200 |          | JDC3200 |          | JT3200T |                      |
| 225 | JD3225 |         | HJD3225 |          | JDC3225 |          | JT3225T |                      |
| 250 | JD3250 |         | HJD3250 |          | JDC3250 |          | JT3250T |                      |

4-Pole<sup>②③</sup>

|     |        |         |         |          |         |          |         |                      |
|-----|--------|---------|---------|----------|---------|----------|---------|----------------------|
| 70  | JD4070 | JD4250F | HJD4070 | HJD4250F | JDC4070 | JDC4250F | JT4070T | TA250KB <sup>①</sup> |
| 90  | JD4090 |         | HJD4090 |          | JDC4090 |          | JT4090T |                      |
| 100 | JD4100 |         | HJD4100 |          | JDC4100 |          | JT4100T |                      |
| 125 | JD4125 |         | HJD4125 |          | JDC4125 |          | JT4125T |                      |
| 150 | JD4150 |         | HJD4150 |          | JDC4150 |          | JT4150T |                      |
| 175 | JD4175 |         | HJD4175 |          | JDC4175 |          | JT4175T |                      |
| 200 | JD4200 |         | HJD4200 |          | JDC4200 |          | JT4200T |                      |
| 225 | JD4225 |         | HJD4225 |          | JDC4225 |          | JT4225T |                      |
| 250 | JD4250 |         | HJD4250 |          | JDC4250 |          | JT4250T |                      |

Instruction Leaflet/FRED Number 29C103 for Breaker; 29C600 for Thermal Magnetic Trip Unit

① Individually packed.

② Fully rated neutral pole with no protection.

③ Neutral is in right pole.

**Type JDB Thermal-Magnetic Circuit Breakers with  
Non-Interchangeable Thermal-Magnetic Trip Units**

|                                                  |                                    |                                               |
|--------------------------------------------------|------------------------------------|-----------------------------------------------|
| Maximum<br>Continuous<br>Ampere Rating<br>@ 40°C | 600 Vac Rated, 250 Vdc             |                                               |
|                                                  | Complete Circuit Breaker           |                                               |
|                                                  | Without Line and<br>Load Terminals | With Standard Line and Load<br>Terminals Only |
|                                                  | Catalog Number                     |                                               |

**2-Pole**

|     |          |         |
|-----|----------|---------|
| 70  | JDB2070W | JDB2070 |
| 90  | JDB2090W | JDB2090 |
| 100 | JDB2100W | JDB2100 |
| 125 | JDB2125W | JDB2125 |
| 150 | JDB2150W | JDB2150 |
| 175 | JDB2175W | JDB2175 |
| 200 | JDB2200W | JDB2200 |
| 225 | JDB2225W | JDB2225 |
| 250 | JDB2250W | JDB2250 |

**3-Pole**

|     |          |         |
|-----|----------|---------|
| 70  | JDB3070W | JDB3070 |
| 90  | JDB3090W | JDB3090 |
| 100 | JDB3100W | JDB3100 |
| 125 | JDB3125W | JDB3125 |
| 150 | JDB3150W | JDB3150 |
| 175 | JDB3175W | JDB3175 |
| 200 | JDB3200W | JDB3200 |
| 225 | JDB3225W | JDB3225 |
| 250 | JDB3250W | JDB3250 |

Instruction Leaflet/FRED Number 29C103 for Breaker

**Molded Case Switches**

Molded case switches are used as compact switches in applications requiring high current switching capabilities. Molded case switches are constructed of circuit breaker components and are of the high instantaneous automatic type. Molded case switches are listed in accordance with Underwriters Laboratories, Inc., Standard UL 1087.

|                                         |                                                               |                               |                                    |
|-----------------------------------------|---------------------------------------------------------------|-------------------------------|------------------------------------|
| Maximum Continuous Ampere Rating @ 40°C | 600 Vac Maximum, 250 Vdc                                      |                               | Standard Terminals Only            |
|                                         | Complete Circuit Breaker Only Without Line and Load Terminals |                               |                                    |
|                                         |                                                               | Suitable for Reverse Feed Use | See page 40 for Optional Terminals |
|                                         | Catalog Number                                                |                               |                                    |

**2-Pole**

|     |          |           |          |
|-----|----------|-----------|----------|
| 250 | JD2250WK | JDB2250WK | TA250KB① |
|-----|----------|-----------|----------|

**3-Pole**

|     |          |           |          |
|-----|----------|-----------|----------|
| 250 | JD3250WK | JDB3250WK | TA250KB① |
|-----|----------|-----------|----------|

**Note:** Molded case switches may open above 2500 amperes.

Instruction Leaflet/FRED Number 29C103

① Individually packed.

## Series C® J-Frame

### Line and Load Terminals

Line and load terminals provide wire connecting capabilities for specific ranges of continuous current ratings and wire types. All terminals comply with Underwriters Laboratories, Inc., Standards UL486A and UL486B and CSA Standard C22.2 No. 65, or Electrical Bulletin 1165. Unless otherwise specified, J-frame circuit breaker line and load terminals are shipped separately for field installation.

The bottom of the standard TA250KB terminal contains a recess which is positioned over the J-frame circuit breaker terminal conductor.

### Ordering Information

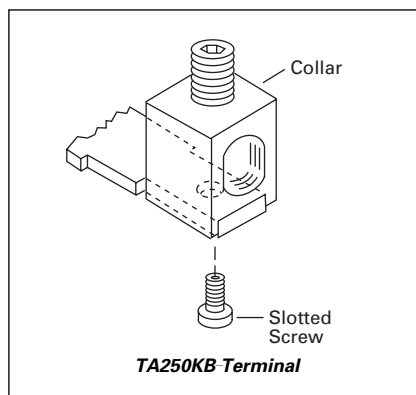
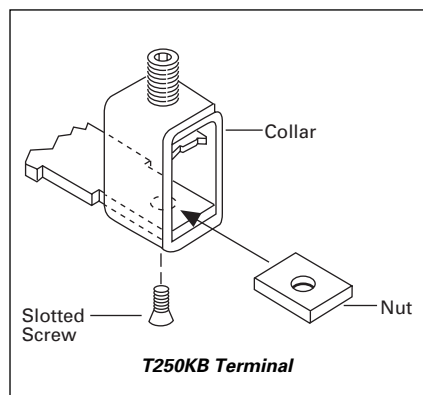
J-frame circuit breakers use Cu/Al terminals as standard. When optional copper-only terminals are required, order by catalog number. Specify if factory installation is required.

### Line and Load Terminals

| Maximum Breaker Amperes | Terminal Body Material | Wire Type | AWG Wire Range/<br>No. Conductors | Metric Wire Range mm <sup>2</sup> | Catalog Numbers |
|-------------------------|------------------------|-----------|-----------------------------------|-----------------------------------|-----------------|
|-------------------------|------------------------|-----------|-----------------------------------|-----------------------------------|-----------------|

#### Standard Cu/Al Pressure Terminals

|     |                 |       |              |        |                |
|-----|-----------------|-------|--------------|--------|----------------|
| 250 | Aluminum        | Cu/Al | #4-350 kcmil | 25-185 | <b>TA250KB</b> |
| 250 | Stainless Steel | Cu    | #4-350 kcmil | 25-185 | <b>T250KB</b>  |



## Catalog Numbering System

This information is presented only as an aid to understanding catalog numbers. It is not to be used to build catalog numbers for circuit breakers or trip units.

### Circuit Breaker/Frame Catalog Number

| Circuit Breaker/<br>Frame<br>Type | Number<br>of Poles | Circuit Breaker/<br>Frame<br>Ampere<br>Rating | Suffix                                 |
|-----------------------------------|--------------------|-----------------------------------------------|----------------------------------------|
| JDB                               | 2: 2 Poles         | 70                                            | C: Non-Aluminum<br>Terminals           |
| JD                                | 3: 3 Poles         | 90                                            | F: Frame Only                          |
| HJD                               | 4: 4 Poles         | 100                                           | K: High Magnetic Molded<br>Case Switch |
| JDC                               |                    | 125                                           | V: 50°C Calibration                    |
|                                   |                    | 150                                           | W: Without Terminals                   |
|                                   |                    | 175                                           | X: Load Side<br>Terminals Only         |
|                                   |                    | 200                                           | Y: Line Side<br>Terminals Only         |
|                                   |                    | 225                                           |                                        |
|                                   |                    | 250                                           |                                        |

### Trip Unit Catalog Number

| Trip Unit<br>Type        | Number<br>of Poles | Trip Unit/<br>Rating<br>Plug<br>Ampere<br>Rating | Suffix                                                       |
|--------------------------|--------------------|--------------------------------------------------|--------------------------------------------------------------|
| JT: Thermal-<br>Magnetic | 2                  | 70                                               | T: Trip Unit                                                 |
|                          | 3                  | 90                                               | Thermal-Magnetic                                             |
|                          | 4                  | 100                                              | Fixed Thermal                                                |
|                          |                    | 125                                              | Adj. Magnetic                                                |
|                          |                    | 150                                              | V: 50°C Calibration<br>(Thermal-Magnetic<br>Trip Units Only) |
|                          |                    | 175                                              |                                                              |
|                          |                    | 200                                              |                                                              |
|                          |                    | 225                                              |                                                              |
|                          |                    | 250                                              |                                                              |

## Dimensions/Weights

### Dimensions, Inches (mm)

| Number of Poles | Width          | Height      | Depth          |
|-----------------|----------------|-------------|----------------|
| 2, 3            | 4.125<br>(105) | 10<br>(255) | 4.063<br>(103) |
| 4               | 5.5<br>(140)   | 10<br>(254) | 4.063<br>(103) |

### Approximate Shipping Weight, Lbs. (kg)

| Breaker Type | Complete Breaker |                 |                  | Frame Only    |               |                 | Trip Unit①  |             |                 |  |
|--------------|------------------|-----------------|------------------|---------------|---------------|-----------------|-------------|-------------|-----------------|--|
|              | Number of Poles  |                 |                  |               |               |                 |             |             |                 |  |
|              | 2                | 3               | 4                | 2             | 3             | 4               | 2           | 3           | 4               |  |
| JDB          | 11.25<br>(5.103) | 12.5<br>(5.670) | —                | —             | —             | —               | —           | —           | —               |  |
| JD           | 11.25<br>(5.103) | 12.5<br>(5.670) | 13.25<br>(6.010) | 9<br>(4.082)  | 10<br>(4.536) | 10.5<br>(4.763) | 2<br>(.907) | 2<br>(.907) | 2.25<br>(1.021) |  |
| HJD          | 11.25<br>(5.103) | 12.5<br>(5.670) | 13.25<br>(6.010) | 9<br>(4.082)  | 10<br>(4.536) | 10.5<br>(4.763) | 2<br>(.907) | 2<br>(.907) | 2.25<br>(1.021) |  |
| JDC          | 12.25<br>(5.103) | 13.5<br>(6.124) | 14.25<br>(6.470) | 10<br>(4.536) | 11<br>(4.990) | 11.5<br>(5.217) | 2<br>(.907) | 2<br>(.907) | 2.25<br>(1.021) |  |

## Series C® J-Frame

## Series C® J-Frame Allowable Accessory Combinations

Different combinations of accessories can be supplied, depending on the types of accessories and the number of poles in the circuit breaker.

|                                                             | Reference<br>Page |  | 2-, 3-Pole |        |       |  | 4-Pole |        |       |      |
|-------------------------------------------------------------|-------------------|--|------------|--------|-------|--|--------|--------|-------|------|
|                                                             |                   |  | Left       | Center | Right |  | Left   | Center | Right | Neu. |
| Internal Accessories (Only One Internal Accessory Per Pole) |                   |  |            |        |       |  |        |        |       |      |
| Alarm Lockout (Make/Break)                                  | 140               |  | □          |        | □     |  | □      |        | □     |      |
| Auxiliary Switch (1A, 1B)                                   | 142               |  | ■          |        | ■     |  | ■      |        | ■     |      |
| Auxiliary Switch (2A, 2B)                                   | 142               |  | ■          |        | ■     |  | ■      |        | ■     |      |
| Auxiliary Switch and Alarm Switch Combination               | 145               |  | □          |        | □     |  | □      |        | □     |      |
| Shunt Trip – Standard                                       | 148               |  | ■          |        | ■     |  | ■      |        | ■     |      |
| Shunt Trip – Low Energy                                     | 152               |  | ■          |        | ■     |  | ■      |        | ■     |      |
| Undervoltage Release Mechanism                              | 155               |  | ■          |        | ■     |  | ■      |        | ■     |      |
| External Accessories                                        |                   |  |            |        |       |  |        |        |       |      |
| End Cap Kit                                                 | 161               |  |            | ●      |       |  |        | ●      |       |      |
| Plug Nut                                                    | 161               |  |            | ●      |       |  |        | ●      |       |      |
| Control Wire Terminal Kit                                   | 162               |  |            | ●      |       |  |        | ●      |       |      |
| Multiwire Connectors                                        | 162               |  |            | ●      |       |  |        | ●      |       |      |
| Base Mounting Hardware                                      | 163               |  |            | ●      |       |  |        | ●      |       |      |
| Terminal Shields                                            | 165               |  |            | ●      |       |  |        | ●      |       |      |
| Interphase Barriers                                         | 166               |  |            | ●      |       |  |        | ●      |       |      |
| Non-Padlockable Handle Block                                | 168               |  |            | ■      |       |  |        | ■      |       |      |
| Padlockable Handle Block                                    | 168               |  |            | ■      |       |  |        | ■      |       |      |
| Padlockable Handle Lock Hasp                                | 169               |  | □          |        | □     |  | □      |        | □     |      |
| Cylinder Lock                                               | 169               |  | □          |        | □     |  |        |        |       |      |
| Key Interlock Kit                                           | 170               |  | □          |        | □     |  | □      |        | □     |      |
| Sliding Bar Interlock – Requires Two Breakers               | 171               |  |            | ●      |       |  |        |        |       |      |
| Electrical (Solenoid) Operator                              | 172               |  |            | ●      |       |  |        | ●      |       |      |
| Plug-in Adapters                                            | 174               |  |            | ●      |       |  |        | ●      |       |      |
| Rear Connecting Studs                                       | 176               |  |            | ●      |       |  |        | ●      |       |      |
| Panelboard Connecting Straps                                | 177               |  |            | ●      |       |  |        | ●      |       |      |
| Handle Mechanisms                                           | 178               |  |            | ●      |       |  |        | ●      |       |      |
| Door Hardware/Accessories                                   | 182               |  |            | ●      |       |  |        | ●      |       |      |
| Handle Extension                                            | 182               |  |            | ●      |       |  |        | ●      |       |      |
| IQ Energy Sentinel                                          | 184               |  |            | ●      |       |  |        |        |       |      |
| Modifications (Refer to Cutler-Hammer)                      |                   |  |            |        |       |  |        |        |       |      |
| Special Calibration                                         | 186               |  |            | ●      |       |  |        | ●      |       |      |
| Moisture Fungus Treatment                                   | 186               |  |            | ●      |       |  |        | ●      |       |      |
| Freeze-Tested Circuit Breakers                              | 186               |  |            | ●      |       |  |        | ●      |       |      |
| Marine/Naval Application                                    | 186               |  |            | ●      |       |  |        | ●      |       |      |

■ Applicable in indicated pole position

□ May be mounted on left or right pole – not both

● Accessory available/Modification available

## Series C® K-Frame



Typical Series C K-Frame Circuit Breaker

- All Series C K-frame Circuit Breakers are HACR rated.
- K-frame circuit breakers are available as individual components (Frame, Trip Unit, Terminals), or factory assembled complete breakers. OPTIM circuit breakers are available as factory assembled only.
- K-frame circuit breakers with non-interchangeable trip units are suitable for reverse feed use.

## Interrupting Capacity Ratings

## NEMA/UL489/CSA Interrupting Capacity Ratings

| Circuit Breaker Type | Number of Poles | Interrupting Capacity (Symmetrical Amperes) (kA) |     |     |     |                   | Page Number |
|----------------------|-----------------|--------------------------------------------------|-----|-----|-----|-------------------|-------------|
|                      |                 | Volts Ac (50/60Hz)                               |     |     |     | Volts Dc          |             |
|                      |                 | 240                                              | 277 | 480 | 600 | 250 <sup>②③</sup> |             |
| DK                   | 2, 3            | 65                                               | —   | —   | —   | 10                | 47          |
| KDB                  | 2, 3, 4         | 65                                               | —   | 35  | 25  | 10                | 47          |
| KD                   | 2, 3, 4         | 65                                               | —   | 35  | 25  | 10                | 45, 46, 49  |
| HKD                  | 2, 3, 4         | 100                                              | —   | 65  | 35  | 22                | 45, 46, 49  |
| KDC                  | 2, 3, 4         | 200                                              | —   | 100 | 50  | 22                | 45, 46, 49  |
| CKD                  | 3               | 65                                               | —   | 35  | 25  | 10                | 48, 50      |
| CHKD                 | 3               | 100                                              | —   | 65  | 35  | 22                | 48, 50      |

## IEC 157-1 (P1) Interrupting Capacity Ratings

| Circuit Breaker Type | Number of Poles | Interrupting Capacity (Symmetrical Amperes) (kA) |     |     |     |     |          | Page Number |
|----------------------|-----------------|--------------------------------------------------|-----|-----|-----|-----|----------|-------------|
|                      |                 | Volts Ac (50/60Hz)                               |     |     |     |     | Volts Dc |             |
|                      |                 | 240                                              | 380 | 415 | 440 | 500 | 600      |             |
| DK                   | 2, 3            | 65                                               | —   | —   | —   | —   | —        | 10          |
| KDB                  | 2, 3, 4         | 65                                               | 40  | 40  | —   | —   | —        | 10          |
| KD                   | 2, 3, 4         | 65                                               | 40  | 40  | —   | —   | —        | 10          |
| HKD                  | 2, 3, 4         | 100                                              | 65  | 65  | —   | —   | —        | 22          |
| KDC                  | 2, 3, 4         | 200                                              | 100 | 100 | —   | —   | —        | 22          |

- ① Weights shown are for thermal magnetic trip units. 3-pole electronic trip units weigh 2.5 lbs. (1.134 kg).
- ② 2-pole circuit breaker or two outside poles of 3-pole circuit breaker.
- ③ Time constant is 3 milliseconds minimum at 10 kA and 8 milliseconds minimum at 22 kA.

## Series C® K-Frame

## K-Frame Digitrip Selection Guide

| Trip Unit Type                               | Digitrip RMS 310             |                              | Digitrip OPTIM 550                     |
|----------------------------------------------|------------------------------|------------------------------|----------------------------------------|
| RMS Sensing                                  | Yes                          |                              | Yes                                    |
| Breaker Type                                 |                              |                              |                                        |
| Frame                                        | K                            |                              | K                                      |
| Ampere Range                                 | 70-400A                      |                              | 70-400A                                |
| Interrupting Rating at 480V                  | 35, 65, 100 (kA)             |                              | 35, 65, 100 (kA)                       |
| Protection                                   |                              |                              |                                        |
| Ordering Options                             | LS, LSG                      | LSI, LSIG                    | LSI, LSI(A), LSIG                      |
| Fixed Rated Plug (I <sub>n</sub> )           | Yes                          | Yes                          | Yes                                    |
| Overtemperature Trip                         | Yes                          | Yes                          | Yes                                    |
| Long Delay Protection (L)                    |                              |                              |                                        |
| Adjustable Rating Plug (I <sub>n</sub> )     | Yes                          | Yes                          | No                                     |
| Long Delay Pickup                            | 0.5-1.0 (I <sub>n</sub> )①   | 0.5-1.0 (I <sub>n</sub> )①   | 0.4-1.0 x (I <sub>n</sub> )            |
| Long Delay Time I <sup>2</sup> T             | 12 Seconds                   | 12 Seconds                   | 2-24 Seconds                           |
| Long Delay Time I <sup>4</sup> T             | No                           | No                           | 1-5 Seconds                            |
| Long Delay Thermal Memory                    | Yes                          | Yes                          | Yes                                    |
| High Load Alarm                              | No                           | No                           | 0.5-1.0 x I <sub>r</sub>               |
| Short Delay Protection (S)                   |                              |                              |                                        |
| Short Delay Pickup                           | 200-800% x (I <sub>n</sub> ) | 200-800% x (I <sub>n</sub> ) | 150-800% x (I <sub>r</sub> )           |
| Short Delay Time I <sup>2</sup> T            | 100 ms                       | No                           | 100-500 ms                             |
| Short Delay Time Flat                        | No                           | Inst-300 ms                  | 100-500 ms                             |
| Short Delay Time Zone Selective Interlocking | No                           | No                           | No                                     |
| Instantaneous Protection (I)                 |                              |                              |                                        |
| Instantaneous Pickup                         | No                           | 200-800% x (I <sub>n</sub> ) | 200-800% x (I <sub>n</sub> )           |
| Discriminator                                | No                           | No                           | Yes                                    |
| Instantaneous Override                       | Yes                          | Yes                          | Yes                                    |
| Ground Fault Protection (G)                  |                              |                              |                                        |
| Ground Fault Alarm                           | No                           | No                           | 20-100% x (I <sub>s</sub> )            |
| Ground Fault Pickup                          | Varies by Frame              | Varies by Frame              | 20-100% x (I <sub>s</sub> )            |
| Ground Fault Delay I <sup>2</sup> T          | No                           | No                           | 100-500 ms                             |
| Ground Fault Delay Flat                      | Inst-500 ms                  | Inst-500 ms                  | 100-500 ms                             |
| Ground Fault Zone Selective Interlocking     | No                           | No                           | No                                     |
| Ground Fault Thermal Memory                  | Yes                          | Yes                          | Yes                                    |
| System Diagnostics                           |                              |                              |                                        |
| Status LEDs                                  | Yes                          | Yes                          | Yes                                    |
| Cause of Trip LEDs                           | No                           | No                           | Yes                                    |
| Magnitude of Trip Information                | No                           | No                           | Yes                                    |
| Remote Signal Contact – Ground Alarm         | Yes                          | Yes                          | No                                     |
| Local Auxiliary and Bell Alarm Contact       | Optional                     | Optional                     | Optional                               |
| System Monitoring                            |                              |                              |                                        |
| Digital Display                              | No                           | No                           | Yes②                                   |
| Current                                      | No                           | No                           | Yes                                    |
| Power and Energy                             | No                           | No                           | No                                     |
| Power Quality-Harmonics                      | No                           | No                           | No                                     |
| Power Factor                                 | No                           | No                           | No                                     |
| Communications                               |                              |                              |                                        |
| Cutler-Hammer PowerNet                       | No                           | No                           | No③                                    |
| Testing                                      |                              |                              |                                        |
| Testing Method                               | Test Set                     |                              | OPTIMizer, BIM, Cutler-Hammer PowerNet |

① Adjust by rating plug.

② By OPTIMizer/BIM.

③ Cutler-Hammer PowerNet kit for field upgrade.

BIM = Breaker Interface Module

(A) = GF Alarm

 $I_s$  = Sensor Rating $I_n$  = Rating Plug $I_r$  = Long Delay Pickup Setting

## Series C® K-Frame

## Types KD, HKD, and KDC Thermal-Magnetic Circuit Breakers with Interchangeable Trip Units

|                                         |                                                                         |            |                                                                         |            |                                                                                          |            |                                                                  |                                                                   |
|-----------------------------------------|-------------------------------------------------------------------------|------------|-------------------------------------------------------------------------|------------|------------------------------------------------------------------------------------------|------------|------------------------------------------------------------------|-------------------------------------------------------------------|
| Maximum Continuous Ampere Rating @ 40°C | Standard Interrupting Capacity<br>600 Vac Rated<br>35 kAIC @ 480 Vac    |            | High Interrupting Capacity<br>600 Vac Rated<br>65 kAIC @ 480 Vac        |            | Ultra High Interrupting Capacity Current Limiting<br>600 Vac Rated<br>100 kAIC @ 480 Vac |            | Thermal Magnetic Trip Unit Only                                  | Standard Terminals Only<br><br>See Page 51 for Optional Terminals |
|                                         | Factory Assembled Circuit Consisting of Frame, Trip Unit, and Terminals | Frame Only | Factory Assembled Circuit Consisting of Frame, Trip Unit, and Terminals | Frame Only | Factory Assembled Circuit Consisting of Frame, Trip Unit, and Terminals                  | Frame Only | For Use With: Standard or High or Ultra High Interrupting Frames |                                                                   |
|                                         | Catalog Number                                                          |            |                                                                         |            |                                                                                          |            |                                                                  |                                                                   |

## 2-Pole

|     |        |         |         |          |         |          |         |          |
|-----|--------|---------|---------|----------|---------|----------|---------|----------|
| 100 | KD2100 | KD2400F | HKD2100 | HKD2400F | KDC2100 | KDC2400F | KT2100T | TA300K①  |
| 125 | KD2125 |         | HKD2125 |          | KDC2125 |          | KT2125T | TA300K①  |
| 150 | KD2150 |         | HKD2150 |          | KDC2150 |          | KT2150T | TA300K①  |
| 175 | KD2175 |         | HKD2175 |          | KDC2175 |          | KT2175T | TA300K①  |
| 200 | KD2200 |         | HKD2200 |          | KDC2200 |          | KT2200T | TA300K①  |
| 225 | KD2225 |         | HKD2225 |          | KDC2225 |          | KT2225T | TA300K①  |
| 250 | KD2250 |         | HKD2250 |          | KDC2250 |          | KT2250T | TA350K①  |
| 300 | KD2300 |         | HKD2300 |          | KDC2300 |          | KT2300T | TA350K①  |
| 350 | KD2350 |         | HKD2350 |          | KDC2350 |          | KT2350T | TA350K①  |
| 400 | KD2400 |         | HKD2400 |          | KDC2400 |          | KT2400T | 2TA400K② |

## 3-Pole

|     |        |         |         |          |         |          |         |          |
|-----|--------|---------|---------|----------|---------|----------|---------|----------|
| 100 | KD3100 | KD3400F | HKD3100 | HKD3400F | KDC3100 | KDC3400F | KT3100T | TA300K①  |
| 125 | KD3125 |         | HKD3125 |          | KDC3125 |          | KT3125T | TA300K①  |
| 150 | KD3150 |         | HKD3150 |          | KDC3150 |          | KT3150T | TA300K①  |
| 175 | KD3175 |         | HKD3175 |          | KDC3175 |          | KT3175T | TA300K①  |
| 200 | KD3200 |         | HKD3200 |          | KDC3200 |          | KT3200T | TA300K①  |
| 225 | KD3225 |         | HKD3225 |          | KDC3225 |          | KT3225T | TA300K①  |
| 250 | KD3250 |         | HKD3250 |          | KDC3250 |          | KT3250T | TA350K①  |
| 300 | KD3300 |         | HKD3300 |          | KDC3300 |          | KT3300T | TA350K①  |
| 350 | KD3350 |         | HKD3350 |          | KDC3350 |          | KT3350T | TA350K①  |
| 400 | KD3400 |         | HKD3400 |          | KDC3400 |          | KT3400T | 3TA400K② |

## 4-Pole

|     |        |         |         |          |         |          |         |          |
|-----|--------|---------|---------|----------|---------|----------|---------|----------|
| 100 | KD4100 | KD4400F | HKD4100 | HKD4400F | KDC4100 | KDC4400F | KT3100T | TA300K①  |
| 125 | KD4125 |         | HKD4125 |          | KDC4125 |          | KT3125T | TA300K①  |
| 150 | KD4150 |         | HKD4150 |          | KDC4150 |          | KT3150T | TA300K①  |
| 175 | KD4175 |         | HKD4175 |          | KDC4175 |          | KT3175T | TA300K①  |
| 200 | KD4200 |         | HKD4200 |          | KDC4200 |          | KT3200T | TA300K①  |
| 225 | KD4225 |         | HKD4225 |          | KDC4225 |          | KT3225T | TA300K①  |
| 250 | KD4250 |         | HKD4250 |          | KDC4250 |          | KT3250T | TA350K①  |
| 300 | KD4300 |         | HKD4300 |          | KDC4300 |          | KT3300T | TA350K①  |
| 350 | KD4350 |         | HKD4350 |          | KDC4350 |          | KT3350T | TA350K①  |
| 400 | KD4400 |         | HKD4400 |          | KDC4400 |          | KT3400T | 4TA400K② |

Instruction Leaflet/FRED Number 29C104 for Breaker; 29C603 for Thermal Magnetic Trip Unit

① Individually packed.

② 2TA400K, 3TA400K, and 4TA400K terminal kits contain one terminal for each pole and one terminal cover.



# Molded Case Circuit Breakers 70-400 Amperes

Cutler-Hammer

March 1999

## Series C® K-Frame

## Types KD, HKD, and KDC Electronic Circuit Breakers with Interchangeable Trip Units

Order as individual components: Breaker Frame, Trip Unit, Rating Plug, Terminals.

| Maximum Continuous Ampere Rating @ 40°C① | Circuit Breaker Frame Only                                     |                                                            |                                                                                    | Digitrip RMS 310 Trip Unit Only②                      |                                                      |                                                                               |                                                                                  | Digitrip 310 Rating Plug Only |                   |                              | Standard Terminals Only            |
|------------------------------------------|----------------------------------------------------------------|------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------|------------------------------------------------------|-------------------------------------------------------------------------------|----------------------------------------------------------------------------------|-------------------------------|-------------------|------------------------------|------------------------------------|
|                                          | Standard Interrupting Capacity 600 Vac Rated 35 kAIC @ 480 Vac | High Interrupting Capacity 600 Vac Rated 65 kAIC @ 480 Vac | Ultra High Interrupting Capacity Current Limiting 600 Vac Rated 100 kAIC @ 480 Vac | Standard                                              | Options                                              |                                                                               |                                                                                  | Ampere Rating                 | Fixed Rating Plug | Adjustable Rating Plugs      | See Page 51 for Optional Terminals |
|                                          |                                                                |                                                            |                                                                                    | Adjustable Short Time Delay with I²t Short Delay Ramp | Independently Adjustable Short Time Pickup and Delay | Adjustable Short Time Pickup with I²t Short Delay and Ground Fault Protection | Independently Adjustable Short Time Pickup and Delay and Ground Fault Protection |                               |                   | Ampere Rating Catalog Number |                                    |
|                                          |                                                                |                                                            |                                                                                    |                                                       |                                                      |                                                                               |                                                                                  |                               |                   | Catalog Number               |                                    |

3-Pole<sup>③</sup>

|     |         |          |          |           |            |            |             |                                                            |                                                                                                          |                               |                                                                                                                                         |
|-----|---------|----------|----------|-----------|------------|------------|-------------|------------------------------------------------------------|----------------------------------------------------------------------------------------------------------|-------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------|
| 125 | KD3400F | HKD3400F | KDC3400F | KES3125LS | KES3125LSI | KES3125LSG | KES3125LSIG | 70<br>90<br>100<br>110<br>125                              | 1KES070T<br>1KES090T<br>1KES100T<br>1KES110T<br>1KES125T                                                 | 70/90/100/125<br>A1KES125T1   | TA300K <sup>④</sup>                                                                                                                     |
| 250 | KD3400F | HKD3400F | KDC3400F | KES3250LS | KES3250LSI | KES3250LSG | KES3250LSIG | 70<br>100<br>125<br>150<br>160<br>175<br>200<br>225<br>250 | 2KES070T<br>2KES100T<br>2KES125T<br>2KES150T<br>2KES160T<br>2KES175T<br>2KES200T<br>2KES225T<br>2KES250T | 125/150/200/250<br>A2KES250T1 | TA300K <sup>④</sup>                                                                                                                     |
| 400 | KD3400F | HKD3400F | KDC3400F | KES3400LS | KES3400LSI | KES3400LSG | KES3400LSIG | 200<br>225<br>250<br>300<br>350<br>400                     | 4KES200T<br>4KES225T<br>4KES250T<br>4KES300T<br>4KES350T<br>4KES400T                                     | 200/250/300/400<br>A4KES400T1 | TA300K <sup>④</sup><br>TA300K <sup>④</sup><br>TA300K <sup>④</sup><br>TA300K <sup>④</sup><br>TA350K <sup>④</sup><br>3TA400K <sup>④</sup> |

4-Pole<sup>⑥⑦</sup>

|     |         |          |          |           |            |   |   |                                                            |                                                                                                          |                               |                                                                                                                                         |
|-----|---------|----------|----------|-----------|------------|---|---|------------------------------------------------------------|----------------------------------------------------------------------------------------------------------|-------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------|
| 125 | KD4400F | HKD4400F | KDC4400F | KES4125LS | KES4125LSI | — | — | 70<br>90<br>100<br>110<br>125                              | 1KES070T<br>1KES090T<br>1KES100T<br>1KES110T<br>1KES125T                                                 | 70/90/100/125<br>A1KES125T1   | TA300K <sup>④</sup>                                                                                                                     |
| 250 | KD4400F | HKD4400F | KDC4400F | KES4250LS | KES4250LSI | — | — | 70<br>100<br>125<br>150<br>160<br>175<br>200<br>225<br>250 | 2KES070T<br>2KES100T<br>2KES125T<br>2KES150T<br>2KES160T<br>2KES175T<br>2KES200T<br>2KES225T<br>2KES250T | 125/150/200/250<br>A2KES250T1 | TA300K <sup>④</sup>                                                                                                                     |
| 400 | KD4400F | HKD4400F | KDC4400F | KES4400LS | KES4400LSI | — | — | 200<br>225<br>250<br>300<br>350<br>400                     | 4KES200T<br>4KES225T<br>4KES250T<br>4KES300T<br>4KES350T<br>4KES400T                                     | 200/250/300/400<br>A4KES400T1 | TA300K <sup>④</sup><br>TA300K <sup>④</sup><br>TA300K <sup>④</sup><br>TA300K <sup>④</sup><br>TA350K <sup>④</sup><br>3TA400K <sup>④</sup> |

Instruction Leaflet/FRED Number 29C104 for Breaker; 29C614 for Electronic Trip Unit

- ① Ampere rating is established by rating plug.  
 ② For Ac use only.  
 ③ 3-pole KES Trip Units are for use in 3-pole frames only.  
 ④ Individually packed.

- ⑤ 3TA400K and 4TA400K terminal kits contain one terminal for each pole and one terminal cover.  
 ⑥ Trip unit includes protected neutral pole. Use corresponding 3-pole trip unit if protected neutral pole is not required.

- ⑦ Fully rated neutral pole protection is standard. For 50% rated protection on neutral pole, add suffix E to 4-pole trip unit catalog number.

## Series C® K-Frame

## Types DK and KDB Thermal-Magnetic Circuit Breakers with Non-Interchangeable Trip Units

| Maximum Continuous Ampere Rating @ 40°C | 240 Vac Rated, 250 Vdc          |                          |                                            |
|-----------------------------------------|---------------------------------|--------------------------|--------------------------------------------|
|                                         | Complete Circuit Breaker        |                          |                                            |
|                                         | Without Line and Load Terminals | With Line Terminals Only | With Standard Line and Load Terminals Only |
|                                         | Catalog Number                  |                          |                                            |

## 2-Pole

|     |         |         |        |
|-----|---------|---------|--------|
| 100 | —       | —       | —      |
| 125 | —       | —       | —      |
| 150 | —       | —       | —      |
| 175 | —       | —       | —      |
| 200 | —       | —       | —      |
| 225 | —       | —       | —      |
| 250 | DK2250W | DK2250Y | DK2250 |
| 300 | DK2300W | DK2300Y | DK2300 |
| 350 | DK2350W | DK2350Y | DK2350 |
| 400 | DK2400W | DK2400Y | DK2400 |

## 3-Pole

|     |         |         |        |
|-----|---------|---------|--------|
| 100 | —       | —       | —      |
| 125 | —       | —       | —      |
| 150 | —       | —       | —      |
| 175 | —       | —       | —      |
| 200 | —       | —       | —      |
| 225 | —       | —       | —      |
| 250 | DK3250W | DK3250Y | DK3250 |
| 300 | DK3300W | DK3300Y | DK3300 |
| 350 | DK3350W | DK3350Y | DK3350 |
| 400 | DK3400W | DK3400Y | DK3400 |

| Maximum Continuous Ampere Rating @ 40°C | 600 Vac Rated, 250 Vdc          |                                       |
|-----------------------------------------|---------------------------------|---------------------------------------|
|                                         | Complete Circuit Breaker        |                                       |
|                                         | Without Line and Load Terminals | With Standard Line and Load Terminals |
|                                         | Catalog Number                  |                                       |

## 2-Pole

|     |          |         |
|-----|----------|---------|
| 100 | KDB2100W | KDB2100 |
| 125 | KDB2125W | KDB2125 |
| 150 | KDB2150W | KDB2150 |
| 175 | KDB2175W | KDB2175 |
| 200 | KDB2200W | KDB2200 |
| 225 | KDB2225W | KDB2225 |
| 250 | KDB2250W | KDB2250 |
| 300 | KDB2300W | KDB2300 |
| 350 | KDB2350W | KDB2350 |
| 400 | KDB2400W | KDB2400 |

## 3-Pole

|     |          |         |
|-----|----------|---------|
| 100 | KDB3100W | KDB3100 |
| 125 | KDB3125W | KDB3125 |
| 150 | KDB3150W | KDB3150 |
| 175 | KDB3175W | KDB3175 |
| 200 | KDB3200W | KDB3200 |
| 225 | KDB3225W | KDB3225 |
| 250 | KDB3250W | KDB3250 |
| 300 | KDB3300W | KDB3300 |
| 350 | KDB3350W | KDB3350 |
| 400 | KDB3400W | KDB3400 |

Instruction Leaflet/FRED Number 29C104

## Molded Case Switches

Molded case switches are used as compact switches in applications requiring high current switching capabilities. Molded case switches are constructed of circuit breaker components and are of the high instantaneous automatic type. Molded case switches are listed in accordance with Underwriters Laboratories, Inc., Standard UL 1087.

| Maximum Continuous Ampere Rating @ 40°C | 240 Vac Maximum, 250 Vdc                                       | 600 Vac Maximum, 250 Vdc                                       | 600 Vac Maximum, 250 Vdc                                                                      |
|-----------------------------------------|----------------------------------------------------------------|----------------------------------------------------------------|-----------------------------------------------------------------------------------------------|
|                                         | Complete Circuit Breaker with Standard Line and Load Terminals | Complete Circuit Breaker with Standard Line and Load Terminals | Complete Circuit Breaker with Standard Line and Load Terminals. Suitable for Reverse Feed Use |
|                                         | Catalog Number                                                 |                                                                |                                                                                               |

## 2-Pole

|     |         |         |          |
|-----|---------|---------|----------|
| 400 | DK2400K | KD2400K | KDB2400K |
|-----|---------|---------|----------|

## 3-Pole

|     |         |         |          |
|-----|---------|---------|----------|
| 400 | DK3400K | KD3400K | KDB3400K |
|-----|---------|---------|----------|

## 4-Pole

|     |   |         |   |
|-----|---|---------|---|
| 400 | — | KD4400K | — |
|-----|---|---------|---|

**Note:** Molded case switches may open above 4000 amperes.

Instruction Leaflet/FRED Number 29C104

# Molded Case Circuit Breakers 70-400 Amperes

Cutler-Hammer

March 1999

## Series C® K-Frame

## 100% Rated Types CKD and CHKD Electronic Circuit Breakers

The NEC allows the breaker to be rated at 100% of its frame size in an assembly, provided that 90°C wire is applied at the 75°C ampacity. All 100% rated circuit breakers have electronic trip units.

| Maximum Continuous Ampere Rating @ 40°C | Circuit Breaker Frame Only                              |                                                     | Digitrip RMS 310 Trip Unit Only                                    |                                                      |                                                                                            |                                                                                  | Digitrip 310 Rating Plug Only |                   |                              | Standard Terminals Only                            |
|-----------------------------------------|---------------------------------------------------------|-----------------------------------------------------|--------------------------------------------------------------------|------------------------------------------------------|--------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------|-------------------------------|-------------------|------------------------------|----------------------------------------------------|
|                                         | Standard Interrupting Capacity<br><br>35 kAIC @ 480 Vac | High Interrupting Capacity<br><br>65 kAIC @ 480 Vac | Standard                                                           | Options                                              |                                                                                            |                                                                                  | Ampere Rating                 | Fixed Rating Plug | Adjustable Rating Plug       | <a href="#">See Page 51 for Optional Terminals</a> |
|                                         |                                                         |                                                     | Adjustable Short Time Delay with I <sup>2</sup> t Short Delay Ramp | Independently Adjustable Short Time Pickup and Delay | Adjustable Short Time Pickup with I <sup>2</sup> t Short Delay and Ground Fault Protection | Independently Adjustable Short Time Pickup and Delay and Ground Fault Protection |                               |                   | Ampere Rating Catalog Number |                                                    |
|                                         |                                                         |                                                     |                                                                    |                                                      |                                                                                            |                                                                                  |                               |                   | Catalog Number               |                                                    |

## 3-Pole

|     |          |           |           |            |            |             |                                                            |                                                                                                          |                               |                                                                 |
|-----|----------|-----------|-----------|------------|------------|-------------|------------------------------------------------------------|----------------------------------------------------------------------------------------------------------|-------------------------------|-----------------------------------------------------------------|
| 125 | CKD3400F | CHKD3400F | KES3125LS | KES3125LSI | KES3125LSG | KES3125LSIG | 70<br>90<br>100<br>110<br>125                              | 1KES070T<br>1KES090T<br>1KES100T<br>1KES110T<br>1KES125T                                                 | 70/90/100/125<br>A1KES125T1   | TA300K④                                                         |
| 250 | CKD3400F | CHKD3400F | KES3250LS | KES3250LSI | KES3250LSG | KES3250LSIG | 70<br>100<br>125<br>150<br>160<br>175<br>200<br>225<br>250 | 2KES070T<br>2KES100T<br>2KES125T<br>2KES150T<br>2KES160T<br>2KES175T<br>2KES200T<br>2KES225T<br>2KES250T | 125/150/200/250<br>A2KES250T1 | TA300K④                                                         |
| 400 | CKD3400F | CHKD3400F | KES3400LS | KES3400LSI | KES3400LSG | KES3400LSIG | 200<br>225<br>250<br>300<br>350<br>400                     | 4KES200T<br>4KES225T<br>4KES250T<br>4KES300T<br>4KES350T<br>4KES400T                                     | 200/250/300/400<br>A4KES400T1 | TA300K④<br>TA300K④<br>TA300K④<br>TA300K④<br>TA350K④<br>3TA400K④ |

Instruction Leaflet/FRED Number 29C104 for Breaker; 29C614 for KES Trip Unit

① Individually packed.

② TA400K, T400K and TA401K terminal kits contain one terminal for each pole and one terminal cover.

## Digitrip OPTIM 550 Electronic Circuit Breakers with Interchangeable Rating Plug

Order as individual components: Breaker Frame (which includes Trip Unit), Rating Plug, Terminals.

| Maximum<br>Continuous<br>Ampere<br>Rating<br>@ 40°C | Circuit Breaker Frame Only                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |      |      | Digitrip OPTIM Rating Plug Only |                   |
|-----------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|------|---------------------------------|-------------------|
|                                                     | L – Adjustable Long Delay Pickup (I <sub>L</sub> ) with Adjustable Long Delay Time (I <sup>2</sup> t or I <sup>4</sup> t Response)①<br>S – Adjustable Short Delay Pickup with Adjustable Short Delay Time (I <sup>2</sup> t or Flat Response)<br>I – Adjustable Instantaneous Pickup<br>G – Adjustable Ground Fault Pickup with Adjustable Ground Fault Time (I <sup>2</sup> t or Flat Response)<br>A – Adjustable Ground Fault Alarm with Adjustable Ground Fault Time (I <sup>2</sup> t or Flat Response) |      |      | Ampere Rating                   | Fixed Rating Plug |
|                                                     | OPTIM 550                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |      |      |                                 |                   |
|                                                     | LSI                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | LSIG | LSIA |                                 |                   |
|                                                     | Catalog Number                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |      |      |                                 |                   |

## 3-Pole Standard Interrupting Capacity 600 Volt Ac Rated 35 kAIC @ 480 Vac

|     |            |            |            |                                        |                                                                                        |
|-----|------------|------------|------------|----------------------------------------|----------------------------------------------------------------------------------------|
| 125 | KD3125T52W | KD3125T56W | KD3125T57W | 70<br>90<br>100<br>110<br>125          | ORPK125A070<br>ORPK125A090<br>ORPK125A100<br>ORPK125A110<br>ORPK125A125                |
| 250 | KD3250T52W | KD3250T56W | KD3250T57W | 125<br>150<br>175<br>200<br>225<br>250 | ORPK025A125<br>ORPK025A150<br>ORPK025A175<br>ORPK025A200<br>ORPK025A225<br>ORPK025A250 |
| 400 | KD3400T52W | KD3400T56W | KD3400T57W | 200<br>225<br>250<br>300<br>350<br>400 | ORPK40A200<br>ORPK40A225<br>ORPK40A250<br>ORPK40A300<br>ORPK40A350<br>ORPK40A400       |

## 3-Pole High Interrupting Capacity 600 Volt Ac Rated 65 kAIC @ 480 Vac

|     |             |             |             |                                        |                                                                                        |
|-----|-------------|-------------|-------------|----------------------------------------|----------------------------------------------------------------------------------------|
| 125 | HKD3125T52W | HKD3125T56W | HKD3125T57W | 70<br>90<br>100<br>110<br>125          | ORPK125A070<br>ORPK125A090<br>ORPK125A100<br>ORPK125A110<br>ORPK125A125                |
| 250 | HKD3250T52W | HKD3250T56W | HKD3250T57W | 125<br>150<br>175<br>200<br>225<br>250 | ORPK025A125<br>ORPK025A150<br>ORPK025A175<br>ORPK025A200<br>ORPK025A225<br>ORPK025A250 |
| 400 | HKD3400T52W | HKD3400T56W | HKD3400T57W | 200<br>225<br>250<br>300<br>350<br>400 | ORPK40A200<br>ORPK40A225<br>ORPK40A250<br>ORPK40A300<br>ORPK40A350<br>ORPK40A400       |

## 3-Pole Ultra High Interrupting Capacity Current Limiting 600 Volt Ac Rated 100 kAIC @ 480 Vac

|     |             |             |             |                                        |                                                                                        |
|-----|-------------|-------------|-------------|----------------------------------------|----------------------------------------------------------------------------------------|
| 125 | KDC3125T52W | KDC3125T56W | KDC3125T57W | 70<br>90<br>100<br>110<br>125          | ORPK125A070<br>ORPK125A090<br>ORPK125A100<br>ORPK125A110<br>ORPK125A125                |
| 250 | KDC3250T52W | KDC3250T56W | KDC3250T57W | 125<br>150<br>175<br>200<br>225<br>250 | ORPK025A125<br>ORPK025A150<br>ORPK025A175<br>ORPK025A200<br>ORPK025A225<br>ORPK025A250 |
| 400 | KDC3400T52W | KDC3400T56W | KDC3400T57W | 200<br>225<br>250<br>300<br>350<br>400 | ORPK40A200<br>ORPK40A225<br>ORPK40A250<br>ORPK40A300<br>ORPK40A350<br>ORPK40A400       |

Instruction Leaflet/FRED Number 29C104

① Long delay  $I^4t$  response selection limits short delay time to flat response.

# Molded Case Circuit Breakers 70-400 Amperes

Cutler-Hammer

March 1999

## Series C® K-Frame

## 100% Rated Digitrip OPTIM 550 Electronic Circuit Breakers with Interchangeable Rating Plug

Order as individual components: Breaker Frame (which includes Trip Unit), Rating Plug, Terminals.

| Maximum Continuous Ampere Rating @ 40°C | Circuit Breaker Frame Only                                                                                                                                                                                                                                                                                                                                                                                                                            |      |      | Digitrip OPTIM Rating Plug Only |                   |
|-----------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|------|---------------------------------|-------------------|
|                                         | L – Adjustable Long Delay Pickup ( $I_L$ ) with Adjustable Long Delay Time ( $I^2t$ or $I^4t$ Response)①<br>S – Adjustable Short Delay Pickup with Adjustable Short Delay Time ( $I^2t$ or Flat Response)<br>I – Adjustable Instantaneous Pickup<br>G – Adjustable Ground Fault Pickup with Adjustable Ground Fault Time ( $I^2t$ or Flat Response)<br>A – Adjustable Ground Fault Alarm with Adjustable Ground Fault Time ( $I^2t$ or Flat Response) |      |      | Ampere Rating                   | Fixed Rating Plug |
|                                         | OPTIM 550                                                                                                                                                                                                                                                                                                                                                                                                                                             |      |      |                                 |                   |
|                                         | LSI                                                                                                                                                                                                                                                                                                                                                                                                                                                   | LSIG | LSIA |                                 |                   |
| Catalog Number                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                       |      |      |                                 |                   |

### 3-Pole Standard Interrupting Capacity 600 Volt Ac Rated 35 kAIC @ 480 Vac

|     |             |             |             |                                        |                                                                                        |
|-----|-------------|-------------|-------------|----------------------------------------|----------------------------------------------------------------------------------------|
| 125 | CKD3125T52W | CKD3125T56W | CKD3125T57W | 70<br>90<br>100<br>110<br>125          | ORPK125A070<br>ORPK125A090<br>ORPK125A100<br>ORPK125A110<br>ORPK125A125                |
| 250 | CKD3250T52W | CKD3250T56W | CKD3250T57W | 125<br>150<br>175<br>200<br>225<br>250 | ORPK025A125<br>ORPK025A150<br>ORPK025A175<br>ORPK025A200<br>ORPK025A225<br>ORPK025A250 |
| 400 | CKD3400T52W | CKD3400T56W | CKD3400T57W | 200<br>225<br>250<br>300<br>350<br>400 | ORPK40A200<br>ORPK40A225<br>ORPK40A250<br>ORPK40A300<br>ORPK40A350<br>ORPK40A400       |

### 3-Pole High Interrupting Capacity 600 Volt AC Rated 65 kAIC @ 480 Vac

|     |              |              |              |                                        |                                                                                        |
|-----|--------------|--------------|--------------|----------------------------------------|----------------------------------------------------------------------------------------|
| 125 | CHKD3125T52W | CHKD3125T56W | CHKD3125T57W | 70<br>90<br>100<br>110<br>125          | ORPK125A070<br>ORPK125A090<br>ORPK125A100<br>ORPK125A110<br>ORPK125A125                |
| 250 | CHKD3250T52W | CHKD3250T56W | CHKD3250T57W | 125<br>150<br>175<br>200<br>225<br>250 | ORPK025A125<br>ORPK025A150<br>ORPK025A175<br>ORPK025A200<br>ORPK025A225<br>ORPK025A250 |
| 400 | CHKD3400T52W | CHKD3400T56W | CHKD3400T57W | 200<br>225<br>250<br>300<br>350<br>400 | ORPK40A200<br>ORPK40A225<br>ORPK40A250<br>ORPK40A300<br>ORPK40A350<br>ORPK40A400       |

Instruction Leaflet/FRED Number 29C104

① Long delay  $I^4t$  response selection limits short delay time to flat response.

## Series C® K-Frame

## Line and Load Terminals

Line and load terminals provide wire connecting capabilities for specific ranges of continuous current ratings and wire types. All terminals comply with Underwriters Laboratories, Inc., Standards UL486A and UL486B

and CSA Standard C22.2 No. 65, or Electrical Bulletin 1165. Unless otherwise specified, K-frame circuit breaker line and load terminals are shipped separately for field installation.

## Ordering Information

K-frame circuit breakers use Cu/Al terminals as standard. When optional copper or Cu/Al terminals are required, order by catalog number. Specify if factory installation is required.

## Line and Load Terminals

| Maximum Breaker Amperes                  | Terminal Body Material | Wire Type | AWG Wire Range/<br>No. Conductors | Metric Wire<br>Range mm <sup>2</sup> | Terminal<br>Catalog Number | Figure | Terminals with Control Wire<br>Termination Catalog Number | Figure |
|------------------------------------------|------------------------|-----------|-----------------------------------|--------------------------------------|----------------------------|--------|-----------------------------------------------------------|--------|
| <b>Standard Cu/Al Pressure Terminals</b> |                        |           |                                   |                                      |                            |        |                                                           |        |
| 225                                      | Aluminum               | Cu/Al     | 3-350/(1)                         | 35-185                               | TA300K <sup>①</sup>        | 4      | —                                                         | —      |
| 350                                      | Aluminum               | Cu/Al     | 250-500/(1)                       | 120-240                              | TA350K <sup>①</sup>        | 3      | —                                                         | —      |
| 400                                      | Aluminum               | Cu/Al     | 3/0-250/(2)                       | 95-120                               | 2TA400K <sup>④</sup>       | 2      | 2TA400KCW <sup>④</sup>                                    | 5      |
|                                          |                        |           |                                   |                                      | 3TA400K <sup>⑤</sup>       | 2      | 3TA400KCW <sup>⑤</sup>                                    | 5      |
|                                          |                        |           |                                   |                                      | 4TA400K <sup>⑥</sup>       | 2      | 4TA400KCW <sup>⑥</sup>                                    | 5      |

## Optional Copper and Cu/Al Pressure Type Terminals

|     |          |       |                                  |                  |                      |   |                        |   |
|-----|----------|-------|----------------------------------|------------------|----------------------|---|------------------------|---|
| 225 | Copper   | Cu    | 3-350/(1)                        | 35-185           | T300K <sup>①</sup>   | 4 | —                      | — |
| 350 | Copper   | Cu    | 250-500/(1)                      | 120-240          | T350K <sup>①</sup>   | 3 | —                      | — |
| 400 | Copper   | Cu    | 3/0-250/(2)                      | 95-120           | 2T400K <sup>④</sup>  | 2 | 2T400KCW <sup>④</sup>  | 5 |
|     |          |       |                                  |                  | 3T400K <sup>⑤</sup>  | 2 | 3T400KCW <sup>⑤</sup>  | 5 |
|     |          |       |                                  |                  | 4T400K <sup>⑥</sup>  | 2 | 4T400KCW <sup>⑥</sup>  | 5 |
| 400 | Aluminum | Cu/Al | 2/0-250/(2)<br>or<br>2/0-500/(1) | 70-120<br>70-240 | 2TA401K <sup>④</sup> | 1 | 2TA401KCW <sup>④</sup> | 5 |
|     |          |       |                                  |                  | 3TA401K <sup>⑤</sup> | 1 | 3TA401KCW <sup>⑤</sup> | 5 |
|     |          |       |                                  |                  | 4TA401K <sup>⑥</sup> | 1 | 4TA401KCW <sup>⑥</sup> | 5 |
| 400 | Aluminum | Cu/Al | 500-750/(1)                      | 300-400          | TA402K               | 6 | —                      | — |

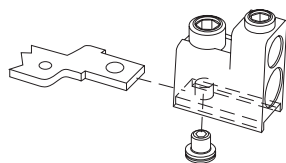


Figure 1. TA401K

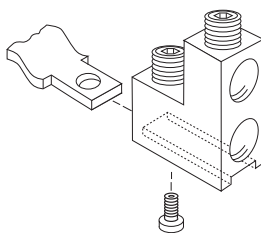


Figure 2. TA400K, T400K

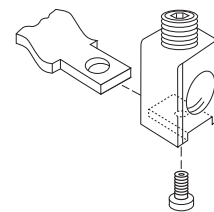


Figure 3. TA350K, T350K

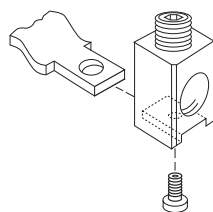


Figure 4. TA300K, T300K

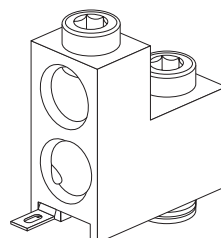


Figure 5. T400KCW, TA400KCW, TA401KCW

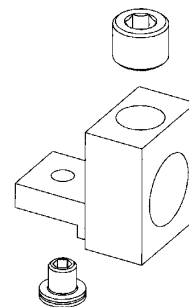


Figure 6. TA402K

See page 53 for other termination accessories.

- ① Individually packed.
- ② Terminal kits contain one terminal for each pole and one terminal cover.
- ③ Terminal kits contain one terminal for each pole and three interphase barriers.

- ④ 2-Pole Kit.
- ⑤ 3-Pole Kit.
- ⑥ 4-Pole Kit.

## Series C® K-Frame

## Catalog Numbering System

This information is presented only as an aid to understanding catalog numbers. It is not to be used to build catalog numbers for circuit breakers or trip units.

### Circuit Breaker/Frame Catalog Number

| Circuit Breaker/Frame Type | Number of Poles | Circuit Breaker/Frame Ampere Rating | Suffix                                                          |
|----------------------------|-----------------|-------------------------------------|-----------------------------------------------------------------|
| DK                         | 2: 2 Poles      | 100                                 | C: Copper Terminals                                             |
| DKB                        | 3: 3 Poles      | 125                                 | E: 50% Protected                                                |
| KD                         | 4: 4 Poles      | 150                                 | Neutral Pole (4-Pole Electronic Trip Circuit Breaker Only)      |
| HKD                        |                 | 175                                 | F: Frame Only                                                   |
| KDC                        |                 | 200                                 | K: High Magnetic Molded Case Switch                             |
| CKD                        |                 | 225                                 | W: Without Terminals                                            |
| CHKD                       |                 | 250                                 | X: Load Side Terminals Only                                     |
|                            |                 | 300                                 | Y: Line Side Terminals Only                                     |
|                            |                 | 350                                 | No Suffix Number Indicates Standard Load and Lineside Terminals |
|                            |                 | 400                                 |                                                                 |

### OPTIM Circuit Breaker/Frame Catalog Number

| Circuit Breaker/Frame Type | Number of Poles | Circuit Breaker/Frame Ampere Rating | Trip Model | Trip Type | Suffix               |
|----------------------------|-----------------|-------------------------------------|------------|-----------|----------------------|
| KD                         | 3: 3 Poles      | 125                                 | T5 – Model | 2 – LSI   | W: Without Terminals |
| HKD                        |                 | 250                                 |            | 6 – LSI   |                      |
| KDC                        |                 | 400                                 | 550        | 7 – LSI   |                      |
| CKD                        |                 |                                     |            |           |                      |
| CHKD                       |                 |                                     |            |           |                      |

### Trip Unit Catalog Number

| Trip Unit Type       | Number of Poles | Trip Unit/ Rating Plug Ampere Rating | Suffix                                                                           |
|----------------------|-----------------|--------------------------------------|----------------------------------------------------------------------------------|
| KT: Thermal-Magnetic | 2: 2 Poles      | 70①                                  | LS: Electronic Trip Unit                                                         |
|                      | 3: 3 Poles      | 90①                                  | Adjustable Short Time Delay with I <sup>2</sup> t                                |
| KES: Electronic      | 4: 4 Poles      | 100                                  | Short Delay Ramp                                                                 |
|                      |                 | 125                                  | LSI: Electronic Trip Unit                                                        |
|                      |                 | 150                                  | Independently Adjustable Short Time Pickup and Delay                             |
|                      |                 | 175                                  | LSG: Electronic Trip Unit                                                        |
|                      |                 | 200                                  | Adjustable Short Time Pickup with I <sup>2</sup> t                               |
|                      |                 | 225                                  | Short Delay and Ground Fault Protection                                          |
|                      |                 | 250                                  | LSIG: Electronic Trip Unit                                                       |
|                      |                 | 300                                  | Independently Adjustable Short Time Pickup and Delay and Ground Fault Protection |
|                      |                 | 350                                  | V: 50°C Calibration (Thermal-Magnetic Trip Units Only)                           |
|                      |                 | 400                                  | E: 50% Protected Neutral Pole (4-Pole Electronic Trip Unit Only)                 |
|                      |                 |                                      | T: Terminals Only                                                                |
|                      |                 |                                      | Trip Unit Only                                                                   |

## Dimensions/Weights

### Dimensions, Inches (mm)

| Number of Poles | Width          | Height          | Depth          |
|-----------------|----------------|-----------------|----------------|
| 2, 3            | 5.5<br>(140)   | 10.125<br>(257) | 4.063<br>(103) |
| 4               | 7.219<br>(183) | 10.125<br>(257) | 4.063<br>(103) |

### Approximate Shipping Weight, Lbs. (kg)

| Breaker Type | Complete Breaker |                 | Frame Only     |                | Trip Unit①    |               |
|--------------|------------------|-----------------|----------------|----------------|---------------|---------------|
|              | Number of Poles  |                 |                |                |               |               |
|              | 2                | 3               | 2              | 3              | 2             | 3             |
| DK           | 10<br>(4.536)    | 11.5<br>(5.216) | –              | –              | –             | –             |
| KDB          | 10<br>(4.536)    | 11.5<br>(5.216) | –              | –              | –             | –             |
| KD           | 10<br>(4.536)    | 11.5<br>(5.216) | 7.5<br>(3.402) | 8.5<br>(3.856) | 1.5<br>(.680) | 1.5<br>(.680) |
| HKD          | 10<br>(4.536)    | 11.5<br>(5.216) | 7.5<br>(3.402) | 8.5<br>(3.856) | 1.5<br>(.680) | 1.5<br>(.680) |
| KDC          | 10<br>(4.536)    | 11.5<br>(5.216) | 7.5<br>(3.402) | 8.5<br>(3.856) | 1.5<br>(.680) | 1.5<br>(.680) |

① Ampere rating available with electronic trip unit only.

## Allowable Accessory Combinations

Different combinations of accessories can be supplied, depending on the types of accessories and the number of poles in the circuit breaker.

|                                                             | Reference<br>Page | 2-Pole <sup>①</sup> |       |  | 3-Pole |        |       |  | 4-Pole |        |       |      |
|-------------------------------------------------------------|-------------------|---------------------|-------|--|--------|--------|-------|--|--------|--------|-------|------|
|                                                             |                   | Left                | Right |  | Left   | Center | Right |  | Left   | Center | Right | Neu. |
| Internal Accessories (Only One Internal Accessory Per Pole) |                   |                     |       |  |        |        |       |  |        |        |       |      |
| Alarm Lockout (Make/Break)                                  | 140               |                     | ■     |  | □      |        | □     |  | ■      |        |       |      |
| Alarm Lockout (2Make/2Break)                                | 140               |                     |       |  | □      |        | □     |  | ■      |        |       |      |
| Auxiliary Switch (1A, 1B)                                   | 143               |                     | ■     |  | ■      |        | ■     |  | ■      |        | ■     |      |
| Auxiliary Switch (2A, 2B)                                   | 143               |                     |       |  | ■      |        | ■     |  | ■      |        | ■     |      |
| Auxiliary Switch (3A, 3B)                                   | 143               |                     |       |  | ■      |        | ■     |  | ■      |        | ■     |      |
| Auxiliary Switch and Alarm Switch Combination               | 145               |                     |       |  | □      |        | □     |  | □      |        | □     |      |
| Shunt Trip – Standard                                       | 149               |                     | ■     |  | ■      |        | ■     |  | ■      |        | ■     |      |
| Shunt Trip – Low Energy                                     | 152               |                     |       |  | ■      |        | ■     |  | ■      |        |       |      |
| Undervoltage Release Mechanism                              | 156               |                     | ■     |  | ■      |        | ■     |  | ■      |        |       |      |
| Cutler-Hammer PowerNet Communications Kit (OPTIM 550)       | 160               |                     |       |  |        |        | ■     |  |        |        |       |      |

### External Accessories

|                                                |     |   |   |  |   |   |   |  |   |   |   |  |
|------------------------------------------------|-----|---|---|--|---|---|---|--|---|---|---|--|
| End Cap Kit                                    | 161 |   | ● |  |   | ● |   |  |   |   | ● |  |
| Keeper Nut                                     | 161 |   | ● |  |   | ● |   |  |   |   | ● |  |
| Control Wire Terminal Kit                      | 162 |   | ● |  |   | ● |   |  |   |   | ● |  |
| Multiwire Connectors                           | 162 |   | ● |  |   | ● |   |  |   |   | ● |  |
| Base Mounting Hardware                         | 163 |   | ● |  |   | ● |   |  |   |   | ● |  |
| Terminal Shields                               | 165 |   | ● |  |   | ● |   |  |   |   | ● |  |
| Interphase Barriers                            | 166 |   | ● |  |   | ● |   |  |   |   | ● |  |
| Non-Padlockable Handle Block                   | 168 | ■ |   |  |   | ■ |   |  |   | ■ |   |  |
| Padlockable Handle Block                       | 168 |   |   |  |   | ■ |   |  |   |   |   |  |
| Padlockable Handle Lock Hasp                   | 169 |   | ■ |  | □ |   | □ |  | □ |   | □ |  |
| Cylinder Lock                                  | 169 | □ | □ |  | □ |   | □ |  |   |   |   |  |
| Key Interlock Kit                              | 170 | ■ | □ |  | □ |   | □ |  | □ |   | □ |  |
| Sliding Bar Interlock – Requires Two Breakers  | 171 |   |   |  |   | ● |   |  |   |   |   |  |
| Walking Beam Interlock – Requires Two Breakers | 171 |   |   |  |   | ● |   |  |   |   | ● |  |
| Electrical (Solenoid) Operator                 | 172 |   |   |  |   | ● |   |  |   |   | ● |  |
| Plug-in Adapters                               | 174 |   | ● |  |   | ● |   |  |   |   | ● |  |
| Rear Connecting Studs                          | 176 |   | ● |  |   | ● |   |  |   |   | ● |  |
| Panelboard Connecting Straps                   | 177 |   | ● |  |   | ● |   |  |   |   | ● |  |
| Handle Mechanisms                              | 178 |   | ● |  |   | ● |   |  |   |   | ● |  |
| Door Hardware/Accessories                      | 182 |   | ● |  |   | ● |   |  |   |   | ● |  |
| Handle Extension                               | 182 |   | ● |  |   | ● |   |  |   |   | ● |  |
| IQ Energy Sentinel                             | 184 |   |   |  |   | ● |   |  |   |   | ● |  |
| Solid-State (Electronic) Portable Test Kit     | 184 |   | ● |  |   | ● |   |  |   |   | ● |  |

### OPTIM System Components 3-Poles

|                                 |     |  |  |  |  |  |  |  |  |  |  |  |
|---------------------------------|-----|--|--|--|--|--|--|--|--|--|--|--|
| Breaker Interface Module (BIM)  | 185 |  |  |  |  |  |  |  |  |  |  |  |
| Digitrip OPTIMizer              | 185 |  |  |  |  |  |  |  |  |  |  |  |
| Auxiliary Power Module          | 185 |  |  |  |  |  |  |  |  |  |  |  |
| Cutler-Hammer PowerNet Software | 185 |  |  |  |  |  |  |  |  |  |  |  |

### Modifications (Refer to Cutler-Hammer)

|                                |     |  |   |  |  |   |  |  |  |  |   |  |
|--------------------------------|-----|--|---|--|--|---|--|--|--|--|---|--|
| Special Calibration            | 186 |  | ● |  |  | ● |  |  |  |  | ● |  |
| Moisture Fungus Treatment      | 186 |  | ● |  |  | ● |  |  |  |  | ● |  |
| Freeze-Tested Circuit Breakers | 186 |  | ● |  |  | ● |  |  |  |  | ● |  |
| Marine Application             | 186 |  | ● |  |  | ● |  |  |  |  | ● |  |

■ Applicable in indicated pole position

□ May be mounted on left or right pole – not both

● Accessory available/Modification available

① 2-pole breaker supplied in 3-pole frame.  
Current carrying parts omitted from center pole.





## Series C® L-Frame



Typical Series C L-Frame Circuit Breaker

- All Series C L-frame circuit breakers are HACR rated.
- L-frame circuit breakers are available as individual components (Frame, Trip Unit, Terminals), or factory assembled complete breakers. OPTIM circuit breakers are available as factory assembled only.
- L-frame circuit breakers with non-interchangeable trip units are suitable for reverse feed use.

## Interrupting Capacity Ratings

UL489 Interrupting Capacity Ratings<sup>①</sup>

| Circuit Breaker Type | Number of Poles | Interrupting Capacity (RMS Symmetrical Amperes) (kA) |     |     |     |     |                   |     | Page Number |
|----------------------|-----------------|------------------------------------------------------|-----|-----|-----|-----|-------------------|-----|-------------|
|                      |                 | Volts Ac (50/60 Hz)                                  |     |     |     |     | Volts Dc          |     |             |
|                      |                 | 240                                                  | 277 | 480 | 600 | 125 | 250 <sup>②③</sup> | 500 |             |
| LDB                  | 2, 3            | 65                                                   | —   | 35  | 25  | —   | 22                | —   | 58          |
| LD                   | 2, 3, 4         | 65                                                   | —   | 35  | 25  | —   | 22                | —   | 57, 59      |
| CLD                  | 2, 3, 4         | 65                                                   | —   | 35  | 25  | —   | 22                | —   | 58, 61      |
| HLD                  | 2, 3, 4         | 100                                                  | —   | 65  | 35  | —   | 25                | —   | 57, 59      |
| CHLD <sup>④</sup>    | 2, 3, 4         | 100                                                  | —   | 65  | 35  | —   | 25                | —   | 61          |
| LDC                  | 2, 3, 4         | 200                                                  | —   | 100 | 50  | —   | 30                | —   | 57, 60      |
| CLDC <sup>④</sup>    | 2, 3, 4         | 200                                                  | —   | 100 | 50  | —   | 30                | —   | 62          |

IEC 947-2 Interrupting Capacity Ratings<sup>①</sup>

| Circuit Breaker Type | Number of Poles |                      | Interrupting Capacity (Symmetrical Amperes) (kA) |           |          |                   | Page Number |
|----------------------|-----------------|----------------------|--------------------------------------------------|-----------|----------|-------------------|-------------|
|                      |                 |                      | Volts Ac (50/60 Hz)                              |           |          | Volts Dc          |             |
|                      |                 |                      | 240                                              | 415       | 690      | 250 <sup>②③</sup> |             |
| LDB                  | 2, 3            | $I_{CU}$<br>$I_{CS}$ | 85<br>85                                         | 45<br>45  | 20<br>10 | 20<br>10          | 58          |
| LD                   | 2, 3, 4         | $I_{CU}$<br>$I_{CS}$ | 85<br>85                                         | 45<br>45  | 20<br>10 | 20<br>10          | 57, 59      |
| CLD <sup>④</sup>     | 2, 3, 4         | $I_{CU}$<br>$I_{CS}$ | 85<br>85                                         | 45<br>45  | 20<br>10 | 20<br>10          | 58, 61      |
| HLD                  | 2, 3, 4         | $I_{CU}$<br>$I_{CS}$ | 100<br>100                                       | 70<br>70  | 25<br>13 | 20<br>10          | 57, 59      |
| CHLD <sup>④</sup>    | 2, 3, 4         | $I_{CU}$<br>$I_{CS}$ | 100<br>100                                       | 70<br>70  | 25<br>13 | 20<br>10          | 61          |
| LDC                  | 2, 3, 4         | $I_{CU}$<br>$I_{CS}$ | 200<br>100                                       | 100<br>75 | 35<br>18 | 20<br>10          | 57, 60      |
| CLDC <sup>④</sup>    | 2, 3, 4         | $I_{CU}$<br>$I_{CS}$ | 200<br>100                                       | 100<br>75 | 35<br>18 | 20<br>10          | 62          |

① Utilization category A circuit breakers.

② L/R = 8 milliseconds minimum.

③ 2-pole circuit breaker or two poles of 3-pole circuit breaker. Incorporating Thermal-Magnetic trip unit only.

④ 100% rated breakers

## Series C® L-Frame

### L-Frame Digitrip Selection Guide

| Trip Unit Type                               | Digitrip RMS 310               | Digitrip OPTIM 550             | Digitrip OPTIM 750                     | Digitrip OPTIM 1050  |
|----------------------------------------------|--------------------------------|--------------------------------|----------------------------------------|----------------------|
| RMS Sensing                                  | Yes                            | Yes                            | Yes                                    | Yes                  |
| <b>Breaker Type</b>                          |                                |                                |                                        |                      |
| Frame                                        | L                              | L                              | L                                      | L                    |
| Ampere Range                                 | 300-600A                       | 200-600A                       | 200-600A                               | 200-600A             |
| Interrupting Rating @ 480V                   | 35, 65, 100 (kA)               | 35, 65, 100 (kA)               | 35, 65, 100 (kA)                       | 35, 65, 100 (kA)     |
| <b>Protection</b>                            |                                |                                |                                        |                      |
| Ordering Options                             | LS, LSG                        | LSI, LSIG                      | LSI, LSI(A), LSIG                      | LSI(A), LSIG         |
| Fixed Rated Plug ( $I_n$ )                   | Yes                            | Yes                            | Yes                                    | Yes                  |
| Overtemperature Trip                         | Yes                            | Yes                            | Yes                                    | Yes                  |
| <b>Long Delay Protection (L)</b>             |                                |                                |                                        |                      |
| Adjustable Rating Plug ( $I_n$ )             | Yes                            | Yes                            | No                                     | No                   |
| Long Delay Pickup                            | 0.5-1.0 ( $I_n$ ) <sup>①</sup> | 0.5-1.0 ( $I_n$ ) <sup>①</sup> | 0.4-1.0 x ( $I_n$ )                    | 0.4-1.0 x ( $I_n$ )  |
| Long Delay Time $I^2T$                       | 12 Seconds                     | 12 Seconds                     | 2-24 Seconds                           | 2-24 Seconds         |
| Long Delay Time $I^4T$                       | No                             | No                             | 1-5 Seconds                            | 1-5 Seconds          |
| Long Delay Thermal Memory                    | Yes                            | Yes                            | Yes                                    | Yes                  |
| High Load Alarm                              | No                             | No                             | 0.5-1.0 x $I_r$                        | 0.5-1.0 x $I_r$      |
| <b>Short Delay Protection (S)</b>            |                                |                                |                                        |                      |
| Short Delay Pickup                           | 200-800% x ( $I_n$ )           | 200-800% x ( $I_n$ )           | 150-800% x ( $I_r$ )                   | 150-800% x ( $I_r$ ) |
| Short Delay Time $I^2T$                      | 100 ms                         | No                             | 100-500 ms                             | 100-500 ms           |
| Short Delay Time Flat                        | No                             | Inst-300 ms                    | 100-500 ms                             | 100-500 ms           |
| Short Delay Time Zone Selective Interlocking | No                             | No                             | No                                     | Yes                  |
| <b>Instantaneous Protection (I)</b>          |                                |                                |                                        |                      |
| Instantaneous Pickup                         | No                             | 200-800% x ( $I_n$ )           | 200-800% x ( $I_n$ )                   | 200-800% x ( $I_n$ ) |
| Discriminator                                | No                             | No                             | Yes                                    | Yes                  |
| Instantaneous Override                       | Yes                            | Yes                            | Yes                                    | Yes                  |
| <b>Ground Fault Protection (G)</b>           |                                |                                |                                        |                      |
| Ground Fault Alarm                           | No                             | No                             | 20-100% x ( $I_s$ )                    | 20-100% x ( $I_s$ )  |
| Ground Fault Pickup                          | Varies by Frame                | Varies by Frame                | 20-100% x ( $I_s$ )                    | 20-100% x ( $I_s$ )  |
| Ground Fault Delay $I^2T$                    | No                             | No                             | 100-500 ms                             | 100-500 ms           |
| Ground Fault Delay Flat                      | Inst-500 ms                    | Inst-500 ms                    | 100-500 ms                             | 100-500 ms           |
| Ground Fault Zone Selective Interlocking     | No                             | No                             | No                                     | Yes                  |
| Ground Fault Thermal Memory                  | Yes                            | Yes                            | Yes                                    | Yes                  |
| <b>System Diagnostics</b>                    |                                |                                |                                        |                      |
| Status LEDs                                  | Yes                            | Yes                            | Yes                                    | Yes                  |
| Cause of Trip LEDs                           | No                             | No                             | Yes                                    | Yes                  |
| Magnitude of Trip Information                | No                             | No                             | Yes                                    | Yes                  |
| Remote Signal Contact – Ground Alarm         | Yes                            | Yes                            | No                                     | Yes                  |
| Local Auxiliary and Bell Alarm Contact       | Optional                       | Optional                       | Optional                               | Included             |
| <b>System Monitoring</b>                     |                                |                                |                                        |                      |
| Digital Display                              | No                             | No                             | Yes <sup>②</sup>                       | Yes <sup>②</sup>     |
| Current                                      | No                             | No                             | Yes                                    | Yes                  |
| Power and Energy                             | No                             | No                             | No                                     | Yes                  |
| Power Quality-Harmonics                      | No                             | No                             | No                                     | Yes                  |
| Power Factor                                 | No                             | No                             | No                                     | Yes                  |
| <b>Communications</b>                        |                                |                                |                                        |                      |
| Cutler-Hammer PowerNet                       | No                             | No                             | No <sup>③</sup>                        | Yes                  |
| <b>Testing</b>                               |                                |                                |                                        |                      |
| Testing Method                               | Test Set                       |                                | OPTIMizer, BIM, Cutler-Hammer PowerNet |                      |

① Adjust by rating plug.

② By OPTIMizer/BIM.

③ Cutler-Hammer PowerNet kit for field upgrade.

BIM = Breaker Interface Module

(A) = GF Alarm

 $I_s$  = Sensor Rating $I_n$  = Rating Plug $I_r$  = Long Delay Pickup Setting

## Series C® L-Frame

## Types LD, HLD, and LDC Thermal-Magnetic Circuit Breakers with Interchangeable Trip Units

|                                         |                                                                         |            |                                                                         |            |                                                                                          |            |                                                                                                                                |                                                                   |
|-----------------------------------------|-------------------------------------------------------------------------|------------|-------------------------------------------------------------------------|------------|------------------------------------------------------------------------------------------|------------|--------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------|
| Maximum Continuous Ampere Rating @ 40°C | Standard Interrupting Capacity<br>600 Vac Rated<br>35 kAIC @ 480 Vac    |            | High Interrupting Capacity<br>600 Vac Rated<br>65 kAIC @ 480 Vac        |            | Ultra High Interrupting Capacity Current Limiting<br>600 Vac Rated<br>100 kAIC @ 480 Vac |            | Thermal Magnetic Trip Unit Only                                                                                                | Standard Terminals Only<br><br>See Page 63 for Optional Terminals |
|                                         | Factory Assembled Circuit Consisting of Frame, Trip Unit, and Terminals | Frame Only | Factory Assembled Circuit Consisting of Frame, Trip Unit, and Terminals | Frame Only | Factory Assembled Circuit Consisting of Frame, Trip Unit, and Terminals                  | Frame Only | For Use With: Standard or High or Ultra High Interrupting Frames<br><br>Magnetic Trip Range is 5-10 x Continuous Ampere Rating |                                                                   |
|                                         | Catalog Number                                                          |            |                                                                         |            |                                                                                          |            |                                                                                                                                |                                                                   |

## 2-Pole

|     |        |         |         |          |         |          |         |                        |
|-----|--------|---------|---------|----------|---------|----------|---------|------------------------|
| 300 | LD2300 | LD2600F | HLD2300 | HLD2600F | LDC2300 | LDC2600F | LT2300T | TA602LD <sup>①</sup>   |
| 350 | LD2350 |         | HLD2350 |          | LDC2350 |          | LT2350T | TA602LD <sup>①</sup>   |
| 400 | LD2400 |         | HLD2400 |          | LDC2400 |          | LT2400T | TA602LD <sup>①</sup>   |
| 450 | LD2450 |         | HLD2450 |          | LDC2450 |          | LT2450T | TA602LD <sup>①</sup>   |
| 500 | LD2500 |         | HLD2500 |          | LDC2500 |          | LT2500T | TA602LD <sup>①</sup>   |
| 600 | LD2600 |         | HLD2600 |          | LDC2600 |          | LT2600T | 2TA603LDK <sup>②</sup> |

## 3-Pole

|     |        |         |         |          |         |          |         |                        |
|-----|--------|---------|---------|----------|---------|----------|---------|------------------------|
| 300 | LD3300 | LD3600F | HLD3300 | HLD3600F | LDC3300 | LDC3600F | LT3300T | TA602LD <sup>①</sup>   |
| 350 | LD3350 |         | HLD3350 |          | LDC3350 |          | LT3350T | TA602LD <sup>①</sup>   |
| 400 | LD3400 |         | HLD3400 |          | LDC3400 |          | LT3400T | TA602LD <sup>①</sup>   |
| 450 | LD3450 |         | HLD3450 |          | LDC3450 |          | LT3450T | TA602LD <sup>①</sup>   |
| 500 | LD3500 |         | HLD3500 |          | LDC3500 |          | LT3500T | TA602LD <sup>①</sup>   |
| 600 | LD3600 |         | HLD3600 |          | LDC3600 |          | LT3600T | 3TA603LDK <sup>②</sup> |

4-Pole<sup>③</sup>

|     |        |         |         |          |         |          |         |                        |
|-----|--------|---------|---------|----------|---------|----------|---------|------------------------|
| 300 | LD4300 | LD4600F | HLD4300 | HLD4600F | LDC4300 | LDC4600F | LT4300T | TA602LD <sup>①</sup>   |
| 350 | LD4350 |         | HLD4350 |          | LDC4350 |          | LT4350T | TA602LD <sup>①</sup>   |
| 400 | LD4400 |         | HLD4400 |          | LDC4400 |          | LT4400T | TA602LD <sup>①</sup>   |
| 450 | LD4450 |         | HLD4450 |          | LDC4450 |          | LT4450T | TA602LD <sup>①</sup>   |
| 500 | LD4500 |         | HLD4500 |          | LDC4500 |          | LT4500T | TA602LD <sup>①</sup>   |
| 600 | LD4600 |         | HLD4600 |          | LDC4600 |          | LT4600T | 4TA603LDK <sup>②</sup> |

Instruction Leaflet/FRED Number 29C105 for Breaker; 29C607 for Thermal Magnetic Trip Unit

## Types LD, HLD, and LDC Electronic Circuit Breakers with Interchangeable Trip Units

Order as individual components: Breaker Frame, Trip Unit, Rating Plug, Terminals.

| Maximum Continuous Ampere Rating @ 40°C① | Circuit Breaker Frame Only                                     |                                                            |                                                                                    | Digitrip RMS 310 Trip Unit Only④                                                                                                                                                                                                                                                                                                                                                 |  |  | Digitrip RMS 310 Rating Plug Only |                   |                              | Standard Terminals Only            |
|------------------------------------------|----------------------------------------------------------------|------------------------------------------------------------|------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|-----------------------------------|-------------------|------------------------------|------------------------------------|
|                                          | Standard Interrupting Capacity 600 Vac Rated 35 kAIC @ 480 Vac | High Interrupting Capacity 600 Vac Rated 65 kAIC @ 480 Vac | Ultra High Interrupting Capacity Current Limiting 600 Vac Rated 100 kAIC @ 480 Vac | L – Adjustable Long Delay Pickup (By Adjustable Rating Plug)<br>S – Adjustable Short Delay Pickup with Fixed Short Delay Time (I²t Response) or Adjustable Short Delay Time (Flat Response)<br><br>I – Adjustable Instantaneous Pickup by Setting Short Delay Time to Instantaneous<br><br>G – Adjustable Ground Fault Pickup with Adjustable Ground Fault Delay (Flat Response) |  |  | Ampere Rating                     | Fixed Rating Plug | Adjustable Rating Plug       | See Page 63 for Optional Terminals |
|                                          |                                                                |                                                            |                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                  |  |  |                                   |                   | Ampere Rating Catalog Number |                                    |
|                                          | Catalog Number                                                 |                                                            |                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                  |  |  |                                   |                   |                              |                                    |

3-Pole<sup>③</sup>

|     |         |          |          |           |            |            |             |                                 |                                                          |                               |                                                                                                                        |
|-----|---------|----------|----------|-----------|------------|------------|-------------|---------------------------------|----------------------------------------------------------|-------------------------------|------------------------------------------------------------------------------------------------------------------------|
| 600 | LD3600F | HLD3600F | LDC3600F | LES3600LS | LES3600LSI | LES3600LSG | LES3600LSIG | 300<br>350<br>400<br>500<br>600 | 6LES300T<br>6LES350T<br>6LES400T<br>6LES500T<br>6LES600T | 300/400/500/600<br>A6LES600T1 | TA602LD <sup>①</sup><br>TA602LD <sup>①</sup><br>TA602LD <sup>①</sup><br>TA602LD <sup>①</sup><br>3TA603LDK <sup>②</sup> |
|-----|---------|----------|----------|-----------|------------|------------|-------------|---------------------------------|----------------------------------------------------------|-------------------------------|------------------------------------------------------------------------------------------------------------------------|

4-Pole<sup>③</sup>

|     |         |          |          |           |            |   |   |                                 |                                                          |                               |                                                                                                                        |
|-----|---------|----------|----------|-----------|------------|---|---|---------------------------------|----------------------------------------------------------|-------------------------------|------------------------------------------------------------------------------------------------------------------------|
| 600 | LD4600F | HLD4600F | LDC4600F | LES4600LS | LES4600LSI | – | – | 300<br>350<br>400<br>500<br>600 | 6LES300T<br>6LES350T<br>6LES400T<br>6LES500T<br>6LES600T | 300/400/500/600<br>A6LES600T1 | TA602LD <sup>④</sup><br>TA602LD <sup>④</sup><br>TA602LD <sup>④</sup><br>TA602LD <sup>④</sup><br>4TA603LDK <sup>②</sup> |
|-----|---------|----------|----------|-----------|------------|---|---|---------------------------------|----------------------------------------------------------|-------------------------------|------------------------------------------------------------------------------------------------------------------------|

Instruction Leaflet/FRED Number 29C105 for Breaker; 29C615 for LES Trip Unit

① Individually packed.

② Terminal kits contain one terminal for each pole and one terminal cover.

③ Neutral is in right pole.

④ For AC use only.

# Molded Case Circuit Breakers 125-600 Amperes

Cutler-Hammer

March 1999

## Series C® L-Frame

### 100% Rated Types CLD, CHLD, and CLDC Electronic Circuit Breakers with Interchangeable Trip Units

The NEC allows the breaker to be rated at 100% of its frame size in an assembly, provided that 90°C wire is applied at the 75°C ampacity. All 100% rated circuit breakers have electronic trip units. Order as individual components: Breaker Frame, Trip Unit, Rating Plug and Terminals.

| Maximum Continuous Ampere Rating @ 40°C① | Circuit Breaker Frame Only                                           |                                                                  |                                                                                             | Digitrip RMS 310 Trip Unit Only                                    |                                                                              |                                                                                            |                                                                                  | Digitrip RMS 310 Rating Plug Only |                   |                              | Standard Terminals Only            |
|------------------------------------------|----------------------------------------------------------------------|------------------------------------------------------------------|---------------------------------------------------------------------------------------------|--------------------------------------------------------------------|------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------|-----------------------------------|-------------------|------------------------------|------------------------------------|
|                                          | Standard Interrupting Capacity<br>600 Vac Rated<br>35 kAIC @ 480 Vac | High Interrupting Capacity<br>600 Vac Rated<br>65 kAIC @ 480 Vac | Ultra High Interrupting Capacity<br>Current Limiting<br>600 Vac Rated<br>100 kAIC @ 480 Vac | Standard                                                           | Options                                                                      |                                                                                            |                                                                                  | Ampere Rating                     | Fixed Rating Plug | Adjustable Rating Plug       | See Page 63 for Optional Terminals |
|                                          |                                                                      |                                                                  |                                                                                             | Adjustable Short Time Delay with I <sup>2</sup> t Short Delay Ramp | Independently Adjustable Short Time Pickup and Delay Ground Fault Protection | Adjustable Short Time Pickup with I <sup>2</sup> t Short Delay and Ground Fault Protection | Independently Adjustable Short Time Pickup and Delay and Ground Fault Protection |                                   |                   | Ampere Rating Catalog Number |                                    |
|                                          |                                                                      |                                                                  |                                                                                             |                                                                    |                                                                              |                                                                                            |                                                                                  |                                   |                   |                              |                                    |
| Catalog Number                           |                                                                      |                                                                  |                                                                                             |                                                                    |                                                                              |                                                                                            |                                                                                  |                                   |                   |                              |                                    |

#### 3-Pole

|     |          |           |           |           |            |            |             |                                 |                                                          |                               |                                                                                                                        |
|-----|----------|-----------|-----------|-----------|------------|------------|-------------|---------------------------------|----------------------------------------------------------|-------------------------------|------------------------------------------------------------------------------------------------------------------------|
| 600 | CLD3600F | CHLD3600F | CLDC3600F | LES3600LS | LES3600LSI | LES3600LSG | LES3600LSIG | 300<br>350<br>400<br>500<br>600 | 6LES300T<br>6LES350T<br>6LES400T<br>6LES500T<br>6LES600T | 300/400/500/600<br>A6LES600T1 | TA602LD <sup>②</sup><br>TA602LD <sup>②</sup><br>TA602LD <sup>②</sup><br>TA602LD <sup>②</sup><br>3TA603LDK <sup>③</sup> |
|-----|----------|-----------|-----------|-----------|------------|------------|-------------|---------------------------------|----------------------------------------------------------|-------------------------------|------------------------------------------------------------------------------------------------------------------------|

Instruction Leaflet/FRED Number 29C105 for Breaker; 29C615 for LES Trip Unit

### Type LDB Thermal-Magnetic Circuit Breakers with Non-Interchangeable Trip Units

| Maximum Continuous Ampere Rating | 600 Vac Rated, 250 Vdc          |                                            |
|----------------------------------|---------------------------------|--------------------------------------------|
|                                  | Complete Circuit Breaker        |                                            |
|                                  | Without Line and Load Terminals | With Standard Line and Load Terminals Only |
|                                  | Catalog Number                  |                                            |

#### 2-Pole

|     |          |         |
|-----|----------|---------|
| 300 | LDB2300W | LDB2300 |
| 350 | LDB2350W | LDB2350 |
| 400 | LDB2400W | LDB2400 |
| 450 | LDB2450W | LDB2450 |
| 500 | LDB2500W | LDB2500 |
| 600 | LDB2600W | LDB2600 |

#### 3-Pole

|     |          |         |
|-----|----------|---------|
| 300 | LDB3300W | LDB3300 |
| 350 | LDB3350W | LDB3350 |
| 400 | LDB3400W | LDB3400 |
| 450 | LDB3450W | LDB3450 |
| 500 | LDB3500W | LDB3500 |
| 600 | LDB3600W | LDB3600 |

Instruction Leaflet/FRED Number 29C105 for Breaker

### Molded Case Switches

Molded case switches are used as compact switches in applications requiring high current switching capabilities. Molded case switches are constructed of circuit breaker components and are of the high instantaneous automatic type.<sup>④</sup> Molded case switches are listed in accordance with Underwriters Laboratories, Inc., Standard UL 1087.

| Maximum Continuous Ampere Rating @ 40°C | 600 Vac Maximum, 250 Vdc                             | Standard Terminals Only<br><br>See Page 63 for Optional Terminals |
|-----------------------------------------|------------------------------------------------------|-------------------------------------------------------------------|
|                                         | Circuit Breaker Only Without Line and Load Terminals |                                                                   |
|                                         | Catalog Number                                       |                                                                   |

#### 2-Pole

|     |          |           |
|-----|----------|-----------|
| 600 | LD2600WK | 2TA603LDK |
|-----|----------|-----------|

#### 3-Pole

|     |          |           |
|-----|----------|-----------|
| 600 | LD3600WK | 3TA603LDK |
|-----|----------|-----------|

#### 4-Pole

|     |          |           |
|-----|----------|-----------|
| 600 | LD4600WK | 4TA603LDK |
|-----|----------|-----------|

**Note:** Molded Case Switch may trip above 6000 amperes.

Instruction Leaflet/FRED Number 29C105 for Molded Case Switch

① Ampere rating is established by rating plug.

② Individually packed.

③ 3TA603LDK and 4TA603LDK terminal kits contain one terminal for each pole and one terminal cover.

## Series C® L-Frame

Digitrip OPTIM<sup>①</sup> Electronic Circuit Breaker with Interchangeable Rating Plug

Order as individual components: Breaker Frame (which includes Trip Unit), Rating Plug, Terminals.

|                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |      |      |           |      |            |      |                                 |                   |
|-----------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|------|-----------|------|------------|------|---------------------------------|-------------------|
| Maximum Continuous Ampere Rating @ 40°C | Circuit Breaker Frame Only                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |      |      |           |      |            |      | Digitrip OPTIM Rating Plug Only |                   |
|                                         | L – Adjustable Long Delay Pickup (I <sub>L</sub> ) with Adjustable Long Delay Time (I <sup>2</sup> t or I <sup>4</sup> t Response)②<br>S – Adjustable Short Delay Pickup with Adjustable Short Delay Time (I <sup>2</sup> t or Flat Response)<br>I – Adjustable Instantaneous Pickup<br>G – Adjustable Ground Fault Pickup with Adjustable Ground Fault Time (I <sup>2</sup> t or Flat Response)<br>A – Adjustable Ground Fault Alarm with Adjustable Ground Fault Time (I <sup>2</sup> t or Flat Response) |      |      |           |      |            |      | Ampere Rating                   | Fixed Rating Plug |
|                                         | OPTIM 550                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |      |      | OPTIM 750 |      | OPTIM 1050 |      |                                 |                   |
|                                         | LSI                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | LSIG | LSIA | LSIG      | LSIA | LSIG       | LSIA |                                 |                   |
|                                         | Catalog Number                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |      |      |           |      |            |      |                                 |                   |

## 3-Pole Standard Interrupting Capacity 600 Volt Ac Rated 35 kAIC @ 480 Vac

|     |            |            |            |            |            |             |             |                                        |                                                                                        |
|-----|------------|------------|------------|------------|------------|-------------|-------------|----------------------------------------|----------------------------------------------------------------------------------------|
| 125 | –          | –          | –          | LD3125T76W | LD3125T77W | LD3125T106W | LD3125T107W | 70<br>90<br>100<br>110<br>125          | ORPL125A070<br>ORPL125A090<br>ORPL125A100<br>ORPL125A110<br>ORPL125A125                |
| 250 | –          | –          | –          | LD3250T76W | LD3250T77W | LD3250T106W | LD3250T107W | 125<br>150<br>175<br>200<br>225<br>250 | ORPL025A125<br>ORPL025A150<br>ORPL025A175<br>ORPL025A200<br>ORPL025A225<br>ORPL025A250 |
| 400 | LD3400T52W | LD3400T56W | LD3400T57W | LD3400T76W | LD3400T77W | LD3400T106W | LD3400T107W | 200<br>225<br>250<br>300<br>350<br>400 | ORPL40A200<br>ORPL40A225<br>ORPL40A250<br>ORPL40A300<br>ORPL40A350<br>ORPL40A400       |
| 600 | LD3600T52W | LD3600T56W | LD3600T57W | LD3600T76W | LD3600T77W | LD3600T106W | LD3600T107W | 300<br>350<br>400<br>500<br>600        | ORPL60A300<br>ORPL60A350<br>ORPL60A400<br>ORPL60A500<br>ORPL60A600                     |

## 3-Pole High Interrupting Capacity 600 Volt Ac Rated 65 kAIC @ 480 Vac

|     |             |             |             |             |             |              |              |                                        |                                                                                        |
|-----|-------------|-------------|-------------|-------------|-------------|--------------|--------------|----------------------------------------|----------------------------------------------------------------------------------------|
| 125 | –           | –           | –           | HLD3125T76W | HLD3125T77W | HLD3125T106W | HLD3125T107W | 70<br>90<br>100<br>110<br>125          | ORPL125A070<br>ORPL125A090<br>ORPL125A100<br>ORPL125A110<br>ORPL125A125                |
| 250 | –           | –           | –           | HLD3250T76W | HLD3250T77W | HLD3250T106W | HLD3250T107W | 125<br>150<br>175<br>200<br>225<br>250 | ORPL025A125<br>ORPL025A150<br>ORPL025A175<br>ORPL025A200<br>ORPL025A225<br>ORPL025A250 |
| 400 | HLD3400T52W | HLD3400T56W | HLD3400T57W | HLD3400T76W | HLD3400T77W | HLD3400T106W | HLD3400T107W | 200<br>225<br>250<br>300<br>350<br>400 | ORPL40A200<br>ORPL40A225<br>ORPL40A250<br>ORPL40A300<br>ORPL40A350<br>ORPL40A400       |
| 600 | HLD3600T52W | HLD3600T56W | HLD3600T57W | HLD3600T76W | HLD3600T77W | HLD3600T106W | HLD3600T107W | 300<br>350<br>400<br>500<br>600        | ORPL60A300<br>ORPL60A350<br>ORPL60A400<br>ORPL60A500<br>ORPL60A600                     |

Instruction Leaflet/FRED Number 29C105 for Breaker; 29C891 for OPTIM Trip Unit

① One Form C auxiliary switch and one Form C bell alarm switch supplied with breaker as standard, on models 750 and 1050.

② Long delay  $I^4t$  response selection limits short delay time to flat response.

# Molded Case Circuit Breakers 125-600 Amperes

Cutler-Hammer

March 1999

## Series C® L-Frame

## Digitrip OPTIM<sup>①</sup> Electronic Circuit Breaker with Interchangeable Rating Plug

Order as individual components: Breaker Frame (which includes Trip Unit), Rating Plug, Terminals.

| Maximum Continuous Ampere Rating @ 40°C | Circuit Breaker Frame Only                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |      |      |           |      |            |      | Digitrip OPTIM Rating Plug Only |                   |
|-----------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|------|-----------|------|------------|------|---------------------------------|-------------------|
|                                         | L – Adjustable Long Delay Pickup (I <sub>L</sub> ) with Adjustable Long Delay Time (I <sup>2</sup> t or I <sup>4</sup> t Response)②<br>S – Adjustable Short Delay Pickup with Adjustable Short Delay Time (I <sup>2</sup> t or Flat Response)<br>I – Adjustable Instantaneous Pickup<br>G – Adjustable Ground Fault Pickup with Adjustable Ground Fault Time (I <sup>2</sup> t or Flat Response)<br>A – Adjustable Ground Fault Alarm with Adjustable Ground Fault Time (I <sup>2</sup> t or Flat Response) |      |      |           |      |            |      | Ampere Rating                   | Fixed Rating Plug |
|                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |      |      |           |      |            |      |                                 |                   |
|                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |      |      |           |      |            |      |                                 |                   |
|                                         | OPTIM 550                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |      |      | OPTIM 750 |      | OPTIM 1050 |      |                                 |                   |
|                                         | LSI                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | LSIG | LSIA | LSIG      | LSIA | LSIG       | LSIA |                                 |                   |
|                                         | Catalog Number                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |      |      |           |      |            |      |                                 |                   |

### 3-Pole Ultra High Interrupting Capacity Current Limiting 600 Volt Ac Rated 100 kAIC @ 480 Vac

|     |             |             |             |             |             |              |              |                                        |                                                                                        |
|-----|-------------|-------------|-------------|-------------|-------------|--------------|--------------|----------------------------------------|----------------------------------------------------------------------------------------|
| 125 | –           | –           | –           | LDC3125T76W | LDC3125T77W | LDC3125T106W | LDC3125T107W | 70<br>90<br>100<br>110<br>125          | ORPL125A070<br>ORPL125A090<br>ORPL125A100<br>ORPL125A110<br>ORPL125A125                |
| 250 | –           | –           | –           | LDC3250T76W | LDC3250T77W | LDC3250T106W | LDC3250T107W | 125<br>150<br>175<br>200<br>225<br>250 | ORPL025A125<br>ORPL025A150<br>ORPL025A175<br>ORPL025A200<br>ORPL025A225<br>ORPL025A250 |
| 400 | LDC3400T52W | LDC3400T56W | LDC3400T57W | LDC3400T76W | LDC3400T77W | LDC3400T106W | LDC3400T107W | 200<br>225<br>250<br>300<br>350<br>400 | ORPL40A200<br>ORPL40A225<br>ORPL40A250<br>ORPL40A300<br>ORPL40A350<br>ORPL40A400       |
| 600 | LDC3600T52W | LDC3600T56W | LDC3600T57W | LDC3600T76W | LDC3600T77W | LDC3600T106W | LDC3600T107W | 300<br>350<br>400<br>500<br>600        | ORPL60A300<br>ORPL60A350<br>ORPL60A400<br>ORPL60A500<br>ORPL60A600                     |

Instruction Leaflet/FRED Number 29C105 for Breaker; 29C891 for OPTIM Trip Unit

① One Form C auxiliary switch and one Form C bell alarm switch supplied with breaker as standard, on models 750 and 1050.

② Long delay  $I^4t$  response selection limits short delay time to flat response.

## Series C® L-Frame

100% Rated Digitrip OPTIM<sup>①</sup> Circuit Breakers with Interchangeable Rating Plug

Order as individual components: Breaker Frame (which includes Trip Unit), Rating Plug, Terminals.

| Maximum Continuous<br>Ampere<br>Rating<br>@ 40°C | Circuit Breaker Frame Only                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |      |      |           |      |            |  | Digitrip OPTIM<br>Rating Plug Only |                      |
|--------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|------|-----------|------|------------|--|------------------------------------|----------------------|
|                                                  | L – Adjustable Long Delay Pickup (I <sub>L</sub> ) with Adjustable Long Delay Time (I <sup>2</sup> t or I <sup>4</sup> t Response)②<br>S – Adjustable Short Delay Pickup with Adjustable Short Delay Time (I <sup>2</sup> t or Flat Response)<br>I – Adjustable Instantaneous Pickup<br>G – Adjustable Ground Fault Pickup with Adjustable Ground Fault Time (I <sup>2</sup> t or Flat Response)<br>A – Adjustable Ground Fault Alarm with Adjustable Ground Fault Time (I <sup>2</sup> t or Flat Response) |      |      |           |      |            |  | Ampere<br>Rating                   | Fixed Rating<br>Plug |
|                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |      |      |           |      |            |  |                                    |                      |
|                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |      |      |           |      |            |  |                                    |                      |
|                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |      |      |           |      |            |  |                                    |                      |
|                                                  | OPTIM 550                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |      |      | OPTIM 750 |      | OPTIM 1050 |  |                                    |                      |
| LSI                                              | LSIG                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | LSIA | LSIG | LSIA      | LSIG | LSIA       |  |                                    |                      |
| Catalog Number                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |      |      |           |      |            |  |                                    |                      |

## 3-Pole Standard Interrupting Capacity 600 Volt Ac Rated 35 kAIC @ 480 Vac

|     |             |             |             |             |             |              |              |                                        |                                                                                   |
|-----|-------------|-------------|-------------|-------------|-------------|--------------|--------------|----------------------------------------|-----------------------------------------------------------------------------------|
| 125 | —           | —           | —           | CLD3125T76W | CLD3125T77W | CLD3125T106W | CLD3125T107W | 70<br>90<br>100<br>110<br>125          | ORPL125A07<br>ORPL125A09<br>ORPL125A10<br>ORPL125A11<br>ORPL125A125               |
| 250 | —           | —           | —           | CLD3250T76W | CLD3250T77W | CLD3250T106W | CLD3250T107W | 125<br>150<br>175<br>200<br>225<br>250 | ORPL025A12<br>ORPL025A15<br>ORPL025A17<br>ORPL025A20<br>ORPL025A22<br>ORPL025A250 |
| 400 | CLD3400T52W | CLD3400T56W | CLD3400T57W | CLD3400T76W | CLD3400T77W | CLD3400T106W | CLD3400T107W | 200<br>225<br>250<br>300<br>350<br>400 | ORPL40A200<br>ORPL40A225<br>ORPL40A250<br>ORPL40A300<br>ORPL40A350<br>ORPL40A400  |
| 600 | CLD3600T52W | CLD3600T56W | CLD3600T57W | CLD3600T76W | CLD3600T77W | CLD3600T106W | CLD3600T107W | 300<br>350<br>400<br>500<br>600        | ORPL60A300<br>ORPL60A350<br>ORPL60A400<br>ORPL60A500<br>ORPL60A600                |

## 3-Pole High Interrupting Capacity 600 Volt Ac Rated 65 kAIC @ 480 Vac

|     |              |              |              |              |              |               |               |                                        |                                                                                        |
|-----|--------------|--------------|--------------|--------------|--------------|---------------|---------------|----------------------------------------|----------------------------------------------------------------------------------------|
| 125 | —            | —            | —            | CHLD3125T76W | CHLD3125T77W | CHLD3125T106W | CHLD3125T107W | 70<br>90<br>100<br>110<br>125          | ORPL125A070<br>ORPL125A090<br>ORPL125A100<br>ORPL125A110<br>ORPL125A125                |
| 250 | —            | —            | —            | CHLD3250T76W | CHLD3250T77W | CHLD3250T106W | CHLD3250T107W | 125<br>150<br>175<br>200<br>225<br>250 | ORPL025A125<br>ORPL025A150<br>ORPL025A175<br>ORPL025A200<br>ORPL025A225<br>ORPL025A250 |
| 400 | CHLD3400T52W | CHLD3400T56W | CHLD3400T57W | CHLD3400T76W | CHLD3400T77W | CHLD3400T106W | CHLD3400T107W | 200<br>225<br>250<br>300<br>350<br>400 | ORPL40A200<br>ORPL40A225<br>ORPL40A250<br>ORPL40A300<br>ORPL40A350<br>ORPL40A400       |
| 600 | CHLD3600T52W | CHLD3600T56W | CHLD3600T57W | CHLD3600T76W | CHLD3600T77W | CHLD3600T106W | CHLD3600T107W | 300<br>350<br>400<br>500<br>600        | ORPL60A300<br>ORPL60A350<br>ORPL60A400<br>ORPL60A500<br>ORPL60A600                     |

Instruction Leaflet/FRED Number 29C105 for Breaker; 29C891 for OPTIM Trip Unit

① One Form C auxiliary switch and one Form C bell alarm switch supplied with breaker as standard, on models 750 and 1050.

② Long delay  $I^4t$  response selection limits short delay time to flat response.



# Molded Case Circuit Breakers 125-600 Amperes

Cutler-Hammer

March 1999

## Series C® L-Frame

## 100% Rated Digitrip OPTIM<sup>①</sup> Electronic Circuit Breaker with Interchangeable Rating Plug

Order as individual components: Breaker Frame (which includes Trip Unit), Rating Plug, Terminals.

|                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |      |      |           |      |            |      |                                 |                   |
|-----------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|------|-----------|------|------------|------|---------------------------------|-------------------|
| Maximum Continuous Ampere Rating @ 40°C | Circuit Breaker Frame Only                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |      |      |           |      |            |      | Digitrip OPTIM Rating Plug Only |                   |
|                                         | L – Adjustable Long Delay Pickup (I <sub>L</sub> ) with Adjustable Long Delay Time (I <sup>2</sup> t or I <sup>4</sup> t Response)②<br>S – Adjustable Short Delay Pickup with Adjustable Short Delay Time (I <sup>2</sup> t or Flat Response)<br>I – Adjustable Instantaneous Pickup<br>G – Adjustable Ground Fault Pickup with Adjustable Ground Fault Time (I <sup>2</sup> t or Flat Response)<br>A – Adjustable Ground Fault Alarm with Adjustable Ground Fault Time (I <sup>2</sup> t or Flat Response) |      |      |           |      |            |      | Ampere Rating                   | Fixed Rating Plug |
|                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |      |      |           |      |            |      |                                 |                   |
|                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |      |      |           |      |            |      |                                 |                   |
|                                         | OPTIM 550                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |      |      | OPTIM 750 |      | OPTIM 1050 |      |                                 |                   |
|                                         | LSI                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | LSIG | LSIA | LSIG      | LSIA | LSIG       | LSIA |                                 |                   |
| Catalog Number                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |      |      |           |      |            |      |                                 |                   |

### 3-Pole Ultra High Interrupting Capacity Current Limiting 600 Volt Ac Rated 100 kAIC @ 480 Vac

|     |              |              |              |              |              |               |               |                                        |                                                                                        |
|-----|--------------|--------------|--------------|--------------|--------------|---------------|---------------|----------------------------------------|----------------------------------------------------------------------------------------|
| 125 | –            | –            | –            | CLDC3125T76W | CLDC3125T77W | CLDC3125T106W | CLDC3125T107W | 70<br>90<br>100<br>110<br>125          | ORPL125A070<br>ORPL125A090<br>ORPL125A100<br>ORPL125A110<br>ORPL125A125                |
| 250 | –            | –            | –            | CLDC3250T76W | CLDC3250T77W | CLDC3250T106W | CLDC3250T107W | 125<br>150<br>175<br>200<br>225<br>250 | ORPL025A125<br>ORPL025A150<br>ORPL025A175<br>ORPL025A200<br>ORPL025A225<br>ORPL025A250 |
| 400 | CLDC3400T52W | CLDC3400T56W | CLDC3400T57W | CLDC3400T76W | CLDC3400T77W | CLDC3400T106W | CLDC3400T107W | 200<br>225<br>250<br>300<br>350<br>400 | ORPL40A200<br>ORPL40A225<br>ORPL40A250<br>ORPL40A300<br>ORPL40A350<br>ORPL40A400       |
| 600 | CLDC3600T52W | CLDC3600T56W | CLDC3600T57W | CLDC3600T76W | CLDC3600T77W | CLDC3600T106W | CLDC3600T107W | 300<br>350<br>400<br>500<br>600        | ORPL60A300<br>ORPL60A350<br>ORPL60A400<br>ORPL60A500<br>ORPL60A600                     |

Instruction Leaflet/FRED Number 29C105 for Breaker; 29C891 for OPTIM Trip Unit

① One Form C auxiliary switch and one Form C bell alarm switch supplied with breaker as standard, on models 750 and 1050.

② Long delay  $I^4t$  response selection limits short delay time to flat response.

## Series C® L-Frame

## Line and Load Terminals

Line and load terminals provide wire connecting capabilities for specific ranges of continuous current ratings and wire types. All terminals comply with Underwriters Laboratories, Inc., Standards UL486A and UL486B and CSA Standard C22.2 No. 65M. Unless otherwise specified, L-frame circuit breaker line and load terminals are shipped separately for field installation.

The wire connecting terminal is secured with two pan-head, slotted screws and lock washers which can be checked for the correct torque loading or retightened from the front of the circuit breaker before installation of the conductors. (Applies to all styles.) The circuit breaker line/load terminal conductors are positioned in the conducting holes in the wire connecting terminal

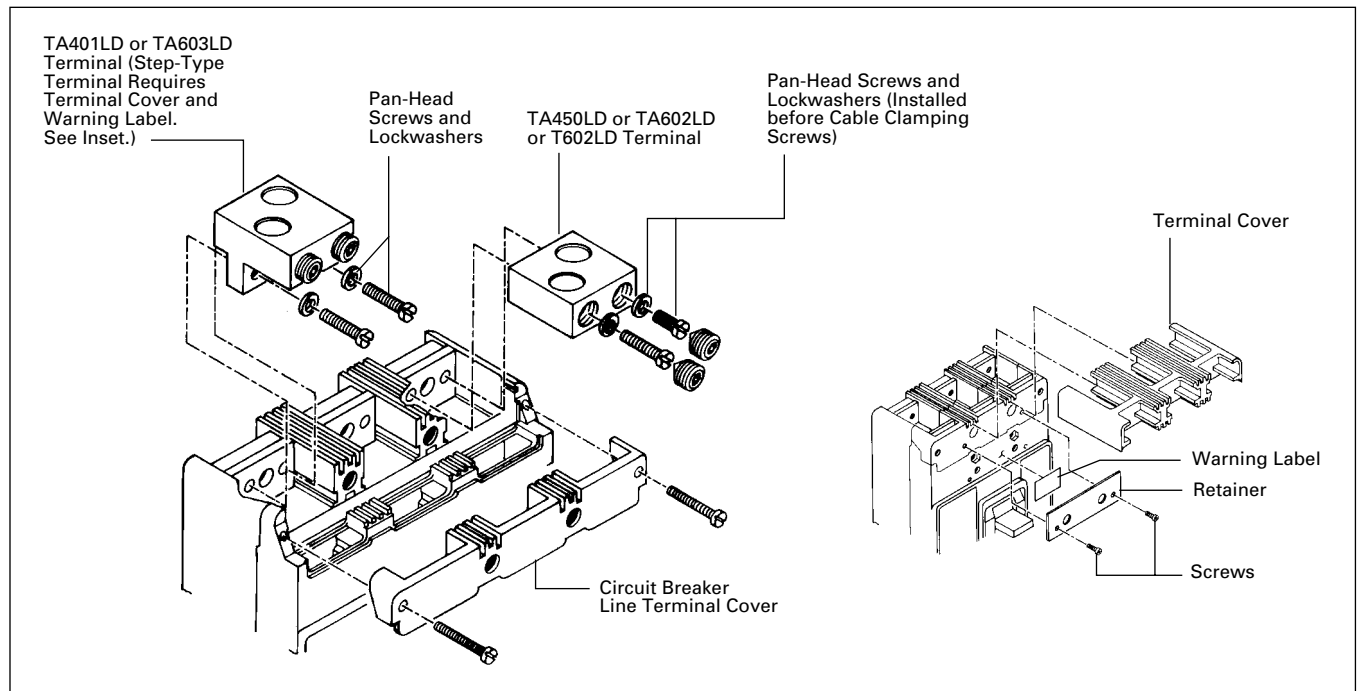
and are secured with recessed socket screws which are tightened to the correct torque loading from the front of the circuit breaker.

## Ordering Information

L-frame circuit breakers use Cu/Al terminals as standard. When optional copper terminals are required, order by catalog number. Specify if factory installation is required.

## Line and Load Terminals

| Maximum Breaker Amperes                                  | Terminal Body Material | Wire Type | AWG Wire Range/ Number of Conductors | Metric Wire Range mm <sup>2</sup> | Terminal Catalog Number                                                    | Terminals with Control Wire Termination Catalog Numbers |
|----------------------------------------------------------|------------------------|-----------|--------------------------------------|-----------------------------------|----------------------------------------------------------------------------|---------------------------------------------------------|
| <b>Standard Cu/Al Pressure Terminals</b>                 |                        |           |                                      |                                   |                                                                            |                                                         |
| 400                                                      | Aluminum               | Cu/Al     | 4/0-600 (1)                          | 120-300                           | 2TA401LDK- 2-Pole Kit①<br>3TA401LDK- 3-Pole Kit①<br>4TA401LDK- 4-Pole Kit① | —                                                       |
| 450                                                      | Aluminum               | Cu/Al     | 4-4/0 (2)                            | 25-95                             | TA450LD ②                                                                  | —                                                       |
| 500                                                      | Aluminum               | Cu/Al     | 3/0-350 (2)                          | 95-150                            | TA602LD ②                                                                  | TA602LDCW                                               |
| 600                                                      | Aluminum               | Cu/Al     | 400-500 (2)                          | 185-240                           | 2TA603LDK- 2-Pole Kit①<br>3TA603LDK- 3-Pole Kit①<br>4TA603LDK- 4-Pole Kit① | 2TA602LDKW<br>3TA602LDKW<br>4TA602LDKW                  |
| <b>Optional Copper and Cu/Al Pressure Type Terminals</b> |                        |           |                                      |                                   |                                                                            |                                                         |
| 600                                                      | Copper                 | Cu        | 250-500 (2)                          | 120-250                           | T602LD ②                                                                   | —                                                       |



① Terminal kits contain one terminal for each pole and one terminal cover.

② Individually packed.

## Series C® L-Frame

## Catalog Numbering System

This information is presented only as an aid to understanding catalog numbers. It is not to be used to build catalog numbers for circuit breakers or trip units.

### Circuit Breaker/Frame Catalog Number

| Circuit Breaker/Frame Type | Number of Poles | Circuit Breaker/Frame Ampere Rating | Suffix                                     |
|----------------------------|-----------------|-------------------------------------|--------------------------------------------|
| LDB                        | 2: 2 Poles      | 300                                 | C: Copper Terminals                        |
| LD                         | 3: 3 Poles      | 350                                 | F: Frame Only                              |
| HLD                        | 4: 4 Poles      | 400                                 | K: High Magnetic Molded Case Switch        |
| LDC                        |                 | 450                                 | V: 50°C (Thermal-Magnetic Trip Units Only) |
| CLD                        |                 | 500                                 | W: Without Terminals                       |
| CHLD                       |                 | 600                                 | X: Load Side Terminals Only                |
| CLDC                       |                 |                                     | Y: Line Side Terminals Only                |

### Thermal-Magnetic Trip Unit Catalog Number

| Trip Unit Type       | Number of Poles | Trip Unit/Rating Plug Ampere Rating | Suffix                                                 |
|----------------------|-----------------|-------------------------------------|--------------------------------------------------------|
| LT: Thermal-Magnetic | 2: 2 Poles      | 300                                 | T: Trip Unit                                           |
|                      | 3: 3 Poles      | 350                                 | Thermal-Magnetic                                       |
|                      | 4: 4 Poles      | 400                                 | Fixed Thermal                                          |
|                      |                 | 450                                 | Adjustable Magnetic                                    |
|                      |                 | 500                                 | V: 50°C Calibration (Thermal-Magnetic Trip Units Only) |
|                      |                 | 600                                 |                                                        |

### OPTIM Circuit Breaker/Frame Catalog Number

| Circuit Breaker/Frame Type | Number of Poles | Circuit Breaker/Frame Ampere Rating        | Trip Model       | Trip Type | Suffix               |
|----------------------------|-----------------|--------------------------------------------|------------------|-----------|----------------------|
| LD                         | 3: 3 Poles      | 125                                        | T5 – Model 550   | 2 – LSI   | W: Without Terminals |
| HLD                        |                 | (Available on Model 750 and 1050 only)     | T7 – Model 750   | 6 – LSG   |                      |
| LDC                        |                 |                                            | T10 – Model 1050 | 7 – LSIA  |                      |
| CLD                        |                 | 250 (Available on Model 750 and 1050 only) |                  |           |                      |
| CHLD                       |                 | 400                                        |                  |           |                      |
| CLDC                       |                 | 600                                        |                  |           |                      |

### Digitrip RMS 310 Trip Unit Catalog Number

| Trip Unit Type  | Number of Poles | Trip Unit Ampere Rating | Suffix | Suffix                                        |
|-----------------|-----------------|-------------------------|--------|-----------------------------------------------|
| LES: Electronic | 3: 3 Poles      | 600                     | LS     | P: 100% Protected Neutral on 4-Pole Trip Unit |
|                 | 4: 4 Poles      |                         | LSI    |                                               |
|                 |                 |                         | LSG    |                                               |
|                 |                 |                         | LSIG   |                                               |

## Dimensions/Weights

### Dimensions, Inches (mm)

| Number of Poles | Width         | Height         | Depth          |
|-----------------|---------------|----------------|----------------|
| 2, 3            | 8.25<br>(210) | 10.75<br>(274) | 4.062<br>(103) |
| 4               | 11<br>(279)   | 10.75<br>(274) | 4.062<br>(103) |

### Approximate Shipping Weight, Lbs. (kg)

| Breaker Type | Complete Breaker |               |                | Frame Only    |               |               | Trip Unit    |              |              |
|--------------|------------------|---------------|----------------|---------------|---------------|---------------|--------------|--------------|--------------|
|              | Number of Poles  |               |                |               |               |               |              |              |              |
|              | 2                | 3             | 4              | 2             | 3             | 4             | 2            | 3            | 4            |
| LD, HLD, LDC | 18<br>(8.172)    | 20<br>(9.080) | 25<br>(11.340) | 14<br>(6.356) | 15<br>(6.810) | 20<br>(9.072) | 3<br>(1.361) | 4<br>(1.814) | 5<br>(2.268) |
| LDB          | 18<br>(8.172)    | 20<br>(9.080) | 25<br>(11.340) | –             | –             | –             | –            | –            | –            |

## Series C® L-Frame

## Allowable Accessory Combinations

Different combinations of accessories can be supplied, depending on the types of accessories and the number of poles in the circuit breaker.

|                                                              | Reference<br>Page |  | 2-Pole①, 3-Pole |        |       |  | 4-Pole |        |       |       |
|--------------------------------------------------------------|-------------------|--|-----------------|--------|-------|--|--------|--------|-------|-------|
|                                                              |                   |  | Left            | Center | Right |  | Left   | Center | Right | Neu.② |
| Internal Accessories (Only One Internal Accessory Per Pole)③ |                   |  |                 |        |       |  |        |        |       |       |
| Alarm Lockout (Make/Break)                                   | 140               |  | ■               |        | ■     |  | ■      |        | ■     |       |
| Alarm Lockout (2Make/2Break)                                 | 140               |  | ■               |        | ■     |  | ■      |        | ■     |       |
| Auxiliary Switch (1A, 1B)                                    | 143               |  | ■               |        | ■     |  | ■      |        | ■     |       |
| Auxiliary Switch (2A, 2B)                                    | 143               |  | ■               |        | ■     |  | ■      |        | ■     |       |
| Auxiliary Switch (3A, 3B)                                    | 143               |  | ■               |        | ■     |  | ■      |        | ■     |       |
| Auxiliary Switch (1A, 1B) and Alarm Switch Combination       | 146               |  | ■               |        | ■     |  | ■      |        | ■     |       |
| Auxiliary Switch (2A, 2B) and Alarm Switch Combination       | 146               |  | ■               |        | ■     |  | ■      |        | ■     |       |
| Shunt Trip – Standard④                                       | 149               |  | ■               |        | ■     |  | ■      |        | ■     |       |
| Shunt Trip – Low Energy④                                     | 152               |  | ■               |        | ■     |  | ■      |        | ■     |       |
| Undervoltage Release Mechanism④                              | 157               |  | ■               |        | ■     |  | ■      |        | ■     |       |
| Cutler-Hammer PowerNet Communications Kit (OPTIM 550)        | 160               |  |                 |        | ■     |  |        |        |       |       |

**External Accessories**

|                                                |     |  |   |   |   |  |   |   |   |  |
|------------------------------------------------|-----|--|---|---|---|--|---|---|---|--|
| End Cap Kit                                    | 161 |  |   | ● |   |  |   | ● |   |  |
| Control Wire Terminal Kit                      | 162 |  |   | ● |   |  |   | ● |   |  |
| Base Mounting Hardware                         | 163 |  |   | ● |   |  |   | ● |   |  |
| Terminal Shields                               | 165 |  |   | ● |   |  |   | ● |   |  |
| Interphase Barriers                            | 166 |  |   | ● |   |  |   | ● |   |  |
| Non-Padlockable Handle Block                   | 168 |  |   | ■ |   |  |   | ■ |   |  |
| Padlockable Handle Lock Hasp                   | 169 |  | □ |   | □ |  | □ |   | □ |  |
| Key Interlock Kit                              | 170 |  | □ |   | □ |  | □ |   | □ |  |
| Sliding Bar Interlock – Requires Two Breakers  | 171 |  |   | ● |   |  |   | ● |   |  |
| Walking Beam Interlock – Requires Two Breakers | 171 |  |   | ● |   |  |   | ● |   |  |
| Electrical (Motor) Operator                    | 173 |  |   | ● |   |  |   | ● |   |  |
| Plug-in Adapters                               | 174 |  |   | ● |   |  |   | ● |   |  |
| Rear Connecting Studs                          | 176 |  |   | ● |   |  |   | ● |   |  |
| Panelboard Connecting Straps                   | 177 |  |   | ● |   |  |   | ● |   |  |
| Handle Mechanisms                              | 178 |  |   | ● |   |  |   | ● |   |  |
| Door Hardware/Accessories                      | 182 |  |   | ● |   |  |   | ● |   |  |
| Handle Extension                               | 182 |  |   | ● |   |  |   | ● |   |  |
| Solid-State (Electronic) Portable Test Kit     | 184 |  |   | ● |   |  |   | ● |   |  |

**OPTIM System Components 3-Poles**

|                                 |     |  |  |  |  |  |  |  |  |  |
|---------------------------------|-----|--|--|--|--|--|--|--|--|--|
| Ground Fault Alarm Unit         | 184 |  |  |  |  |  |  |  |  |  |
| Potential Transformer Module    | 184 |  |  |  |  |  |  |  |  |  |
| Breaker Interface Module (BIM)  | 185 |  |  |  |  |  |  |  |  |  |
| Digitrip OPTIMizer              | 185 |  |  |  |  |  |  |  |  |  |
| Auxiliary Power Module          | 185 |  |  |  |  |  |  |  |  |  |
| Cutler-Hammer PowerNet Software | 185 |  |  |  |  |  |  |  |  |  |

**Modifications (Refer to Cutler-Hammer)**

|                                |     |  |  |   |  |  |  |   |  |  |
|--------------------------------|-----|--|--|---|--|--|--|---|--|--|
| Special Calibration            | 186 |  |  | ● |  |  |  | ● |  |  |
| Moisture Fungus Treatment      | 186 |  |  | ● |  |  |  | ● |  |  |
| Freeze-Tested Circuit Breakers | 186 |  |  | ● |  |  |  | ● |  |  |
| Marine Application             | 186 |  |  | ● |  |  |  | ● |  |  |

■ Applicable in indicated pole position

□ May be mounted on left or right pole – not both

● Accessory available/Modification available

① 2-pole breaker supplied in 3-pole frame. Current carrying parts omitted from center pole.

② Refer to Cutler-Hammer for appropriate neutral pole accessory combinations.

③ OPTIM models 750 and 1050 are factory sealed and do not have the right pole space available for accessories.

④ Shunt trip and UVR cannot be mounted in right poles on LES trip units.



## Series C® M-Frame



Typical Series C M-Frame Circuit Breaker

- All Series C M-frame circuit breakers are HACR rated.
- MDL-frame circuit breakers are available as individual components (Frame, Trip Unit, Terminals), or factory assembled complete breakers.
- M-frame circuit breakers with non-interchangeable trip units are suitable for reverse feed use.

## Interrupting Capacity Ratings

UL489/CSA Interrupting Capacity Ratings<sup>①</sup>

| Circuit Breaker Type | Number of Poles | Interrupting Capacity (Symmetrical Amperes) (kA) |     |     |                        | Page Number |
|----------------------|-----------------|--------------------------------------------------|-----|-----|------------------------|-------------|
|                      |                 | Volts Ac (50/60 Hz)                              |     |     | Volts Dc <sup>②③</sup> |             |
|                      |                 | 240                                              | 480 | 600 | 250                    |             |
| MDL                  | 2, 3            | 65                                               | 50  | 25  | 22                     | 69, 70      |
| CMDL                 | 2, 3            | 65                                               | 50  | 25  | 22                     | 70          |
| HMDL                 | 2, 3            | 100                                              | 65  | 35  | 25                     | 69, 70      |
| CHMDL                | 2, 3            | 100                                              | 65  | 35  | 25                     | 70          |

IEC 947-2 Interrupting Capacity Ratings<sup>①</sup>

| Circuit Breaker Type | Number of Poles | Interrupting Capacity – RMS Symmetrical Amperes (kA) $I_{CU} = I_{CS}$ |     |     |                        | Page Number |
|----------------------|-----------------|------------------------------------------------------------------------|-----|-----|------------------------|-------------|
|                      |                 | Volts Ac (50/60 Hz)                                                    |     |     | Volts Dc <sup>②③</sup> |             |
|                      |                 | 240                                                                    | 480 | 600 | 250                    |             |
| MDL                  | 2, 3            | 85                                                                     | 50  | 20  | 20                     | 69, 70      |
| CMDL                 | 2, 3            | 85                                                                     | 50  | 20  | 20                     | 70          |
| HMDL                 | 2, 3            | 100                                                                    | 65  | 25  | 20                     | 69, 70      |
| CHMDL                | 2, 3            | 100                                                                    | 65  | 25  | 20                     | 70          |

① Utilization category A circuit breakers.

② Two poles or two poles of 3-pole circuit breaker. Thermal-magnetic trip units only, MDL, HMDL breakers with electronic trip unit are not DC rated.

③ Time constant is 3 milliseconds minimum at 10 kA and 8 milliseconds at 22 kA.

## Series C® M-Frame

### MDL-Frame Digitrip Selection Guide

| Trip Unit Type                               |  | Digitrip RMS 310             |                              |
|----------------------------------------------|--|------------------------------|------------------------------|
| RMS Sensing                                  |  | Yes                          |                              |
| Breaker Type                                 |  |                              |                              |
| Frame                                        |  | MDL                          |                              |
| Ampere Range                                 |  | 400-800A                     |                              |
| Interrupting Rating @ 480V                   |  | 50, 65 (kA)                  |                              |
| Protection                                   |  |                              |                              |
| Ordering Options                             |  | LS, LSG                      | LSI, LSIG                    |
| Fixed Rated Plug (I <sub>n</sub> )           |  | Yes                          | Yes                          |
| Overtemperature Trip                         |  | Yes                          | Yes                          |
| Long Delay Protection (L)                    |  |                              |                              |
| Adjustable Rating Plug (I <sub>n</sub> )     |  | Yes                          | Yes                          |
| Long Delay Pickup                            |  | 0.5-1.0 (I <sub>n</sub> ) ①  | 0.5-1.0 (I <sub>n</sub> ) ①  |
| Long Delay Time I <sup>2</sup> T             |  | 12 Seconds                   | 12 Seconds                   |
| Long Delay Time I <sup>4</sup> T             |  | No                           | No                           |
| Long Delay Thermal Memory                    |  | Yes                          | Yes                          |
| High Load Alarm                              |  | No                           | No                           |
| Short Delay Protection (S)                   |  |                              |                              |
| Short Delay Pickup                           |  | 200-800% x (I <sub>n</sub> ) | 200-800% x (I <sub>n</sub> ) |
| Short Delay Time I <sup>2</sup> T            |  | 100 ms                       | No                           |
| Short Delay Time Flat                        |  | No                           | Inst-300 ms                  |
| Short Delay Time Zone Selective Interlocking |  | No                           | No                           |
| Instantaneous Protection (I)                 |  |                              |                              |
| Instantaneous Pickup                         |  | No                           | 200-800% x (I <sub>n</sub> ) |
| Discriminator                                |  | No                           | No                           |
| Instantaneous Override                       |  | Yes                          | Yes                          |
| Ground Fault Protection (G)                  |  |                              |                              |
| Ground Fault Alarm                           |  | No                           | No                           |
| Ground Fault Pickup                          |  | Varies by Frame              | Varies by Frame              |
| Ground Fault Delay I <sup>2</sup> T          |  | No                           | No                           |
| Ground Fault Delay Flat                      |  | Inst-500 ms                  | Inst-500 ms                  |
| Ground Fault Zone Selective Interlocking     |  | No                           | No                           |
| Ground Fault Thermal Memory                  |  | Yes                          | Yes                          |
| System Diagnostics                           |  |                              |                              |
| Status LEDs                                  |  | Yes                          | Yes                          |
| Cause of Trip LEDs                           |  | No                           | No                           |
| Magnitude of Trip Information                |  | No                           | No                           |
| Remote Signal Contacts – Ground Alarm        |  | Yes                          | Yes                          |
| System Monitoring                            |  |                              |                              |
| Digital Display                              |  | No                           | No                           |
| Current                                      |  | No                           | No                           |
| Power and Energy                             |  | No                           | No                           |
| Power Quality – Harmonics                    |  | No                           | No                           |
| Power Factor                                 |  | No                           | No                           |
| Communications                               |  |                              |                              |
| Cutler-Hammer PowerNet                       |  | No                           | No                           |
| Testing                                      |  |                              |                              |
| Testing Method                               |  | Test Set                     |                              |

① Adjust by rating plug.

 $I_n$  = Rating Plug

## Series C® M-Frame

## Types MDL and HMDL Thermal-Magnetic Circuit Breakers with Interchangeable Trip Units

|                                         |                                                                         |            |                                                                         |            |                                                                                                                                                                        |                                                                        |
|-----------------------------------------|-------------------------------------------------------------------------|------------|-------------------------------------------------------------------------|------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------|
| Maximum Continuous Ampere Rating @ 40°C | Standard Interrupting Capacity<br>600 Vac Rated<br>50 kAIC @ 480 Vac    |            | High Interrupting Capacity<br>600 Vac Rated<br>65 kAIC @ 480 Vac        |            | Thermal Magnetic Trip Unit Only                                                                                                                                        | Standard Terminals Only ①<br><br>See Page 72 for<br>Optional Terminals |
|                                         | Factory Assembled Circuit Consisting of Frame, Trip Unit, and Terminals | Frame Only | Factory Assembled Circuit Consisting of Frame, Trip Unit, and Terminals | Frame Only | For Use With: Standard or High or Ultra High Interrupting Frames<br><br>Magnetic Trip Range is 5-10 up through 600A;<br>4-8 on 700 and 800A x Continuous Ampere Rating |                                                                        |
|                                         | Catalog Number                                                          |            |                                                                         |            |                                                                                                                                                                        |                                                                        |

## 2-Pole

|     |         |          |          |           |         |          |
|-----|---------|----------|----------|-----------|---------|----------|
| 300 | MDL2300 | MDL2800F | HMDL2300 | HMDL2800F | MT2300T | TA700MA1 |
| 350 | MDL2350 |          | HMDL2350 |           | MT2350T | TA700MA1 |
| 400 | MDL2400 |          | HMDL2400 |           | MT2400T | TA700MA1 |
| 450 | MDL2450 |          | HMDL2450 |           | MT2450T | TA700MA1 |
| 500 | MDL2500 |          | HMDL2500 |           | MT2500T | TA700MA1 |
| 600 | MDL2600 |          | HMDL2600 |           | MT2600T | TA700MA1 |
| 700 | MDL2700 |          | HMDL2700 |           | MT2700T | TA700MA1 |
| 800 | MDL2800 |          | HMDL2800 |           | MT2800T | TA800MA2 |

## 3-Pole

|     |         |          |          |           |         |          |
|-----|---------|----------|----------|-----------|---------|----------|
| 300 | MDL3300 | MDL3800F | HMDL3300 | HMDL3800F | MT3300T | TA700MA1 |
| 350 | MDL3350 |          | HMDL3350 |           | MT3350T | TA700MA1 |
| 400 | MDL3400 |          | HMDL3400 |           | MT3400T | TA700MA1 |
| 450 | MDL3450 |          | HMDL3450 |           | MT3450T | TA700MA1 |
| 500 | MDL3500 |          | HMDL3500 |           | MT3500T | TA700MA1 |
| 600 | MDL3600 |          | HMDL3600 |           | MT3600T | TA700MA1 |
| 700 | MDL3700 |          | HMDL3700 |           | MT3700T | TA700MA1 |
| 800 | MDL3800 |          | HMDL3800 |           | MT3800T | TA800MA2 |

Instruction Leaflet/FRED Number 29C111 for Breaker

## Types MDLB and HMDLB Thermal-Magnetic Circuit Breakers with Non-Interchangeable Trip Units

|                                               |                                                                               |                                                                               |                                                                        |
|-----------------------------------------------|-------------------------------------------------------------------------------|-------------------------------------------------------------------------------|------------------------------------------------------------------------|
| Maximum Continuous<br>Ampere Rating<br>@ 40°C | Standard Interrupting Capacity<br>600 Vac Rated<br>50 kAIC @ 480 Vac          | High Interrupting Capacity<br>600 Vac Rated<br>50 kAIC @ 480 Vac              | Standard Terminals Only ①<br><br>See Page 72 for<br>Optional Terminals |
|                                               | Factory Assembled Circuit<br>Consisting of Frame, Trip Unit,<br>and Terminals | Factory Assembled Circuit<br>Consisting of Frame, Trip Unit,<br>and Terminals |                                                                        |
|                                               | Catalog Number                                                                |                                                                               |                                                                        |

## 2-Pole

|     |          |           |          |
|-----|----------|-----------|----------|
| 300 | MDLB2300 | HMDLB2300 | TA700MA1 |
| 350 | MDLB2350 | HMDLB2350 | TA700MA1 |
| 400 | MDLB2400 | HMDLB2400 | TA700MA1 |
| 450 | MDLB2450 | HMDLB2450 | TA700MA1 |
| 500 | MDLB2500 | HMDLB2500 | TA700MA1 |
| 600 | MDLB2600 | HMDLB2600 | TA700MA1 |
| 700 | MDLB2700 | HMDLB2700 | TA700MA1 |
| 800 | MDLB2800 | HMDLB2800 | TA800MA2 |

## 3-Pole

|     |          |           |          |
|-----|----------|-----------|----------|
| 300 | MDLB3300 | HMDLB3300 | TA700MA1 |
| 350 | MDLB3350 | HMDLB3350 | TA700MA1 |
| 400 | MDLB3400 | HMDLB3400 | TA700MA1 |
| 450 | MDLB3450 | HMDLB3450 | TA700MA1 |
| 500 | MDLB3500 | HMDLB3500 | TA700MA1 |
| 600 | MDLB3600 | HMDLB3600 | TA700MA1 |
| 700 | MDLB3700 | HMDLB3700 | TA700MA1 |
| 800 | MDLB3800 | HMDLB3800 | TA800MA2 |

Instruction Leaflet/FRED Number 29C111 for Breaker

① Two terminals are required per pole.



# Molded Case Circuit Breakers 300-800 Amperes

Cutler-Hammer

March 1999

## Series C® M-Frame

### Types MDL and HMDL Electronic Circuit Breakers with Interchangeable Trip Units

Order as Individual Components: Breaker Frame, Trip Unit, Rating Plug, Terminals.

| Maximum Continuous Ampere Rating @ 40°C① | Circuit Breaker Frame Only                                                 |                                                                        | Digitrip RMS 310 Trip Unit Only②                                                                                                                                                                                                                                                                                                                                         |               | Digitrip RMS 310 Rating Plug Only |                              |  | Terminals |
|------------------------------------------|----------------------------------------------------------------------------|------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|-----------------------------------|------------------------------|--|-----------|
|                                          | Standard Interrupting Capacity<br>600 Vac<br>Rated<br>35 kAIC @<br>480 Vac | High Interrupting Capacity<br>600 Vac<br>Rated<br>65 kAIC @<br>480 Vac | L – Adjustable Long Delay Pickup (by Adjustable Rating Plug)<br>S – Adjustable Short Delay Pickup with Fixed Short Delay Time (I²t Response) or Adjustable Short Delay Time (Flat Response)<br>I – Adjustable Instantaneous Pickup by Setting Short Delay Time to Instantaneous<br>G – Adjustable Ground Fault Pickup with Adjustable Ground Fault Delay (Flat Response) | Ampere Rating | Fixed Rating Plug                 | Adjustable Rating Plugs      |  |           |
|                                          |                                                                            |                                                                        |                                                                                                                                                                                                                                                                                                                                                                          |               |                                   | Ampere Rating Catalog Number |  |           |
|                                          |                                                                            |                                                                        |                                                                                                                                                                                                                                                                                                                                                                          |               |                                   | Catalog Number               |  |           |

#### 3-Pole

|     |          |           |                                                      |                                 |                                                          |                              |                                                 |
|-----|----------|-----------|------------------------------------------------------|---------------------------------|----------------------------------------------------------|------------------------------|-------------------------------------------------|
| 800 | MDL3800F | HMDL3800F | MES3800LS<br>MES3800LSI<br>MES3800LSG<br>MES3800LSIG | 400<br>500<br>600<br>700<br>800 | 8MES400T<br>8MES500T<br>8MES600T<br>8MES700T<br>8MES800T | 400/500/600/800<br>A8MES800T | See Page 72 for Standard and Optional Terminals |
|-----|----------|-----------|------------------------------------------------------|---------------------------------|----------------------------------------------------------|------------------------------|-------------------------------------------------|

Instruction Leaflet/FRED Number 29C111 for Breaker; 29C615 for MES Trip Unit

### Types MDLB and HMDLB Electronic Circuit Breakers with Non-Interchangeable Trip Units

| Maximum Continuous Ampere Rating @ 40°C <sup>①</sup> | Factory Assembled Circuit Breaker Consisting of Frame and Trip Unit |     |     |      |
|------------------------------------------------------|---------------------------------------------------------------------|-----|-----|------|
|                                                      | LS                                                                  | LSI | LSG | LSIG |
|                                                      | Catalog Number                                                      |     |     |      |

#### 3-Pole Standard Interrupting Capacity 600 Vac Rated 50 kAIC @ 480 Vac

|     |              |              |              |              |
|-----|--------------|--------------|--------------|--------------|
| 800 | MDLB3800T33W | MDLB3800T32W | MDLB3800T35W | MDLB3800T36W |
|-----|--------------|--------------|--------------|--------------|

#### 3-Pole High Interrupting Capacity 600 Vac Rated 65 kAIC @ 480 Vac

|     |               |               |               |               |
|-----|---------------|---------------|---------------|---------------|
| 800 | HMDLB3800T33W | HMDLB3800T32W | HMDLB3800T35W | HMDLB3800T36W |
|-----|---------------|---------------|---------------|---------------|

Instruction Leaflet/FRED Number 29C111 for Breaker; 29C615 for MES Trip Unit

### 100% Rated Types CMDL and CHMDL Electronic Circuit Breakers with Non-Interchangeable Trip Units

The NEC allows the breaker to be rated at 100% of its frame size in an assembly, provided that 90°C wire is applied at the 75°C ampacity. All 100% rated circuit breakers have electronic trip units. Order as individual components: breaker frame, trip unit, rating plug and terminals.

| Maximum Continuous Ampere Rating @ 40°C① | Circuit Breaker Frame Only                       |                                              | Digitrip RMS 310 Trip Unit Only②                                  |                                                                              |                                                                                           |                                                                        | Digitrip RMS 310 Trip Unit Only |                   |                              | Terminals |
|------------------------------------------|--------------------------------------------------|----------------------------------------------|-------------------------------------------------------------------|------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------|------------------------------------------------------------------------|---------------------------------|-------------------|------------------------------|-----------|
|                                          | Standard Interrupting Capacity 50 kAIC @ 480 Vac | High Interrupting Capacity 50 kAIC @ 480 Vac | Standard                                                          | Options                                                                      |                                                                                           |                                                                        | Ampere Rating                   | Fixed Rating Plug | Adjustable Rating Plug       |           |
|                                          |                                                  |                                              | Adjustable Short Time Delay with 1 <sup>st</sup> Short Delay Ramp | Independently Adjustable Short Time Pickup and Delay Ground Fault Protection | Adjustable Short Time Pickup with 1 <sup>st</sup> Short Delay and Ground Fault Protection | Independently Adjustable Short Time Pickup and Ground Fault Protection |                                 |                   | Ampere Rating Catalog Number |           |
|                                          |                                                  |                                              | Catalog Number                                                    |                                                                              |                                                                                           |                                                                        |                                 |                   |                              |           |

#### 3-Pole

|     |           |            |           |            |            |             |                                 |                                                          |                              |                                                 |
|-----|-----------|------------|-----------|------------|------------|-------------|---------------------------------|----------------------------------------------------------|------------------------------|-------------------------------------------------|
| 800 | CMDL3800F | CHMDL3800F | MES3800LS | MES3800LSI | MES3800LSG | MES3800LSIG | 400<br>500<br>600<br>700<br>800 | 8MES400T<br>8MES500T<br>8MES600T<br>8MES700T<br>8MES800T | 400/500/600/800<br>A8MES800T | See Page 72 for Standard and Optional Terminals |
|-----|-----------|------------|-----------|------------|------------|-------------|---------------------------------|----------------------------------------------------------|------------------------------|-------------------------------------------------|

Instruction Leaflet/FRED Number 29C111 for Breaker; 29C615 for MES Trip Unit

① Ampere rating is established by rating plug.

② For Ac use only.

**Molded Case Switches**

Molded case switches are used as compact switches in applications requiring high current switching capabilities. Molded case switches are constructed of circuit breaker components and are of the high instantaneous automatic type. Molded case switches are listed in accordance with Underwriters Laboratories, Inc., Standard UL 1087.

|                                               |                                                         |
|-----------------------------------------------|---------------------------------------------------------|
| Maximum Continuous<br>Ampere Rating<br>@ 40°C | 600 Vac Maximum,<br>250 Vdc                             |
|                                               | Circuit Breaker Only without Line and<br>Load Terminals |
|                                               | Catalog Number                                          |

**2-Pole**

|     |           |
|-----|-----------|
| 800 | MDL2800WK |
|-----|-----------|

**3-Pole**

|     |           |
|-----|-----------|
| 800 | MDL3800WK |
|-----|-----------|

**Note:** Molded case switch may trip above  
6000 amperes.

Instruction Leaflet/FRED Number 29C111

Series C® M-Frame

Line and Load Terminals

M-Frame circuit breakers use Cu/Al terminals as standard. When optional copper or Cu/Al terminals are required, order by catalog number. Specify if factory installation is required.

Line and Load Terminals

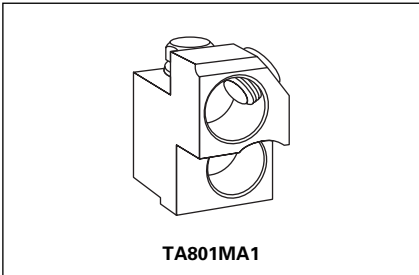
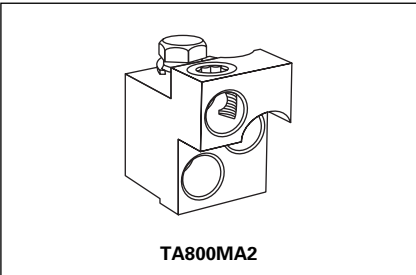
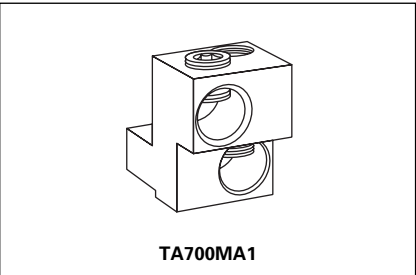
| Maximum Breaker Amperes | Terminal Body Material | Wire Type | AWG Wire Range/ No. Conductors | Terminal Catalog Number | Terminals with Control Wire Termination Catalog Number |
|-------------------------|------------------------|-----------|--------------------------------|-------------------------|--------------------------------------------------------|
|-------------------------|------------------------|-----------|--------------------------------|-------------------------|--------------------------------------------------------|

Standard Cu/Al Pressure Terminals

|     |          |       |                   |          |             |
|-----|----------|-------|-------------------|----------|-------------|
| 600 | Aluminum | Cu/Al | (2) #1-500 kcmil  | TA700MA1 | TA700MA1CWT |
| 800 | Aluminum | Cu/Al | (3) 3/0-400 kcmil | TA800MA2 | TA800MA2CWT |
| 800 | Aluminum | Cu/Al | (2) 500-750 kcmil | TA801MA  | TA801MACWT  |

Optional Copper and Cu/Al Pressure Type Terminals

|     |        |    |                   |         |   |
|-----|--------|----|-------------------|---------|---|
| 600 | Copper | Cu | (2) 2/0-500 kcmil | T600MA1 | — |
| 800 | Copper | Cu | (3) 3/0-300 kcmil | T800MA1 | — |



## Catalog Numbering System

This information is presented only as an aid to understanding catalog numbers. It is not to be used to build catalog numbers for circuit breakers or trip units.

### Circuit Breaker/Frame Catalog Number

| MDL 3 800 F                |                 |                                     |                                            |
|----------------------------|-----------------|-------------------------------------|--------------------------------------------|
| Circuit Breaker/Frame Type | Number of Poles | Circuit Breaker/Frame Ampere Rating | Suffix                                     |
| MDL                        | 2: 2 Poles      | 300 <sup>①</sup>                    | F: Frame Only                              |
| HMDL                       | 3: 3 Poles      | 350 <sup>①</sup>                    | K: High Magnetic Molded Case Switch        |
|                            |                 | 400                                 | V: 50°C (Thermal-Magnetic Trip Units Only) |
|                            |                 | 450                                 | W: Without Terminals                       |
|                            |                 | 500                                 | X: Load Side Terminals Only                |
|                            |                 | 600                                 | Y: Line Side Terminals Only                |
|                            |                 | 700                                 |                                            |
|                            |                 | 800                                 |                                            |

### Thermal-Magnetic Trip Unit Catalog Number

| MT 3 800 T     |                 |                                      |                                            |
|----------------|-----------------|--------------------------------------|--------------------------------------------|
| Trip Unit Type | Number of Poles | Trip Unit/ Rating Plug Ampere Rating | Suffix                                     |
| MT:            | 2: 2 Poles      | 300 <sup>①</sup>                     | T: Thermal-Magnetic                        |
| MES:           | 3: 3 Poles      | 350 <sup>①</sup>                     | V: 50°C (Thermal-Magnetic Trip Units Only) |
|                |                 | 400                                  | LS: Digitrip RMS 310                       |
|                |                 | 450                                  | LSI: Digitrip RMS 310                      |
|                |                 | 500                                  | LSG: Digitrip RMS 310                      |
|                |                 | 600                                  | LSIG: Digitrip RMS 310                     |
|                |                 | 700                                  |                                            |
|                |                 | 800                                  |                                            |

## Dimensions/Weights

### Dimensions, Inches (mm)

| Number of Poles | Width          | Height          | Depth          |
|-----------------|----------------|-----------------|----------------|
| 2, 3            | 8.250<br>(210) | 16.000<br>(406) | 4.062<br>(103) |

### Approximate Shipping Weight, Lbs. (kg)

| Breaker Type           | Complete Breaker |    | Frame Only |    | Trip Unit① |   |
|------------------------|------------------|----|------------|----|------------|---|
|                        | Number of Poles  |    |            |    |            |   |
|                        | 2                | 3  | 2          | 3  | 2          | 3 |
| MDL, HMDL (T/M T.U.)   | 26.5             | 29 | 24.5       | 26 | 2.5        | 3 |
| MDL, HMDL (Elec. T.U.) | —                | 30 | —          | 26 | —          | 4 |

<sup>①</sup> Thermal-Magnetic only.

## Series C® M-Frame

### Allowable Accessory Combinations

Different combinations of accessories can be supplied, depending on the types of accessories and the number of poles in the circuit breaker.

|                                                             | Reference Page | 2-Pole <sup>①</sup> |       |  | 3-Pole |        |       |  |
|-------------------------------------------------------------|----------------|---------------------|-------|--|--------|--------|-------|--|
|                                                             |                | Left                | Right |  | Left   | Center | Right |  |
| Internal Accessories (Only One Internal Accessory Per Pole) |                |                     |       |  |        |        |       |  |
| Alarm Lockout (Make/Break)                                  | 140            |                     | ■     |  | ■      |        | ■     |  |
| Alarm Lockout (2Make/2Break)                                | 140            |                     | ■     |  | ■      |        | ■     |  |
| Auxiliary Switch (1A, 1B)                                   | 143            |                     | ■     |  | ■      |        | ■     |  |
| Auxiliary Switch (2A, 2B)                                   | 143            |                     | ■     |  | ■      |        | ■     |  |
| Auxiliary Switch (3A, 3B)                                   | 143            |                     | ■     |  | ■      |        | ■     |  |
| Auxiliary Switch (1A, 1B) and Alarm Switch Combination      | 146            |                     | ■     |  | ■      |        | ■     |  |
| Auxiliary Switch (2A, 2B) and Alarm Switch Combination      | 146            |                     | ■     |  | ■      |        | ■     |  |
| Shunt Trip – Standard <sup>③</sup>                          | 149            |                     | ■     |  | ■      |        | ■     |  |
| Shunt Trip – Low Energy <sup>③</sup>                        | 152            |                     | ■     |  | ■      |        | ■     |  |
| Undervoltage Release Mechanism <sup>③</sup>                 | 157            |                     | ■     |  | ■      |        | ■     |  |

#### External Accessories

|                                                |     |   |  |  |   |   |   |  |
|------------------------------------------------|-----|---|--|--|---|---|---|--|
| Base Mounting Hardware                         | 163 |   |  |  |   | ● |   |  |
| Terminal Shields                               | 165 |   |  |  |   | ● |   |  |
| Interphase Barriers                            | 166 |   |  |  |   | ● |   |  |
| Non-Padlockable Handle Block                   | 168 |   |  |  |   | ■ |   |  |
| Padlockable Handle Lock Hasp                   | 169 | □ |  |  | □ |   | □ |  |
| Key Interlock Kit                              | 170 | □ |  |  | □ |   | □ |  |
| Sliding Bar Interlock – Requires Two Breakers  | 171 | ● |  |  |   | ● |   |  |
| Walking Beam Interlock – Requires Two Breakers | 171 | ● |  |  |   | ● |   |  |
| Electrical (Motor) Operator                    | 173 | ● |  |  |   | ● |   |  |
| Plug-in Adapters                               | 174 | ● |  |  |   | ● |   |  |
| Rear Connecting Studs                          | 176 | ● |  |  |   | ● |   |  |
| Panelboard Connecting Straps                   | 177 | ● |  |  |   | ● |   |  |
| Handle Mechanisms                              | 178 | ● |  |  |   | ● |   |  |
| Door Hardware/Accessories                      | 182 | ● |  |  |   | ● |   |  |
| Handle Extension                               | 182 |   |  |  |   | ● |   |  |
| Solid-State (Electronic) Portable Test Kit     | 184 | ● |  |  |   | ● |   |  |

#### Modifications (Refer to Cutler-Hammer)

|                                |     |   |  |  |  |   |  |  |
|--------------------------------|-----|---|--|--|--|---|--|--|
| Special Calibration            | 186 | ● |  |  |  | ● |  |  |
| Moisture Fungus Treatment      | 186 | ● |  |  |  | ● |  |  |
| Freeze-Tested Circuit Breakers | 186 | ● |  |  |  | ● |  |  |
| Marine Application             | 186 | ● |  |  |  | ● |  |  |

■ Applicable in indicated pole position

□ May be mounted on left or right pole – not both

● Accessory available/Modification available

① 2-pole breaker supplied in 3-pole frame. Current carrying parts omitted from center pole.

② Refer to Cutler-Hammer for appropriate neutral pole accessory combinations.

③ Shunt trip and UVR cannot be mounted in right poles on LES trip units.

## Series C® N-Frame



Typical Series C N-Frame Circuit Breaker

- All N-frame circuit breakers are suitable for reverse feed use.

## Interrupting Capacity Ratings

UL489 Interrupting Capacity Ratings<sup>①</sup>

| Circuit Breaker Type | Number of Poles | Interrupting Capacity (Symmetrical Amperes) (kA) |     |     |     |     | Page Number |
|----------------------|-----------------|--------------------------------------------------|-----|-----|-----|-----|-------------|
|                      |                 | Volts Ac (50/60 Hz)                              |     |     |     |     |             |
|                      |                 | 240                                              | 277 | 480 | 600 | 125 |             |
| ND                   | 2, 3, 4         | 65                                               | —   | 50  | 25  | —   | 77, 83      |
| CND②                 | 2, 3, 4         | 65                                               | —   | 50  | 25  | —   | 80, 84      |
| HND                  | 2, 3, 4         | 100                                              | —   | 65  | 35  | —   | 78, 83      |
| CHND②                | 2, 3, 4         | 100                                              | —   | 65  | 35  | —   | 81, 84      |
| NDC                  | 2, 3, 4         | 200                                              | —   | 100 | 50  | —   | 79, 83      |
| CNDC②                | 2, 3, 4         | 200                                              | —   | 100 | 50  | —   | 82, 84      |

IEC 947-2 Interrupting Capacity Ratings<sup>①</sup>

| Circuit Breaker Type                                  | Number of Poles | Interrupting Capacity (Symmetrical Amperes) (kA) |           |          | Page Number |
|-------------------------------------------------------|-----------------|--------------------------------------------------|-----------|----------|-------------|
|                                                       |                 | Volts Ac (50/60 Hz)                              |           |          |             |
|                                                       |                 | 240                                              | 415       | 690      |             |
| ND<br><div>I<sub>CU</sub><br/>I<sub>CS</sub></div>    | 2, 3, 4         | 85<br>85                                         | 50<br>50  | 20<br>10 | 77, 83      |
| CND②<br><div>I<sub>CU</sub><br/>I<sub>CS</sub></div>  | 2, 3, 4         | 85<br>85                                         | 50<br>50  | 20<br>10 | 80, 84      |
| HND<br><div>I<sub>CU</sub><br/>I<sub>CS</sub></div>   | 2, 3, 4         | 100<br>100                                       | 70<br>50  | 25<br>13 | 78, 83      |
| CHND②<br><div>I<sub>CU</sub><br/>I<sub>CS</sub></div> | 2, 3, 4         | 100<br>100                                       | 70<br>50  | 25<br>13 | 81, 84      |
| NDC<br><div>I<sub>CU</sub><br/>I<sub>CS</sub></div>   | 2, 3, 4         | 200<br>100                                       | 100<br>50 | 35<br>18 | 79, 83      |
| CNDC②<br><div>I<sub>CU</sub><br/>I<sub>CS</sub></div> | 2, 3, 4         | 200<br>100                                       | 100<br>50 | 35<br>18 | 82, 84      |

① Utilization Category A circuit breakers.

② 100% rated breakers.

## Series C® N-Frame

### N-Frame Digitrip Selection Guide

| Trip Unit Type                               | Digitrip RMS 310             |                              | Digitrip OPTIM 550                     | Digitrip OPTIM 750                     | Digitrip OPTIM 1050                    |
|----------------------------------------------|------------------------------|------------------------------|----------------------------------------|----------------------------------------|----------------------------------------|
| RMS Sensing                                  | Yes                          |                              | Yes                                    | Yes                                    | Yes                                    |
| Breaker Type                                 |                              |                              |                                        |                                        |                                        |
| Frame                                        | N                            |                              | N                                      | N                                      | N                                      |
| Ampere Range                                 | 400A-1200A                   |                              | 400A-1200A                             | 400A-1200A                             | 400A-1200A                             |
| Interrupting Rating @ 480V                   | 50, 65, 100 (kA)             |                              | 50, 65, 100 (kA)                       | 50, 65, 100 (kA)                       | 50, 65, 100 (kA)                       |
| Protection                                   |                              |                              |                                        |                                        |                                        |
| Ordering Options                             | LS, LSG                      | LSI, LSIG                    | LSI, LSIG, LSI(A)                      | LSI(A), LSIG                           | LSI(A), LISG                           |
| Fixed Rated Plug (I <sub>n</sub> )           | Yes                          | Yes                          | Yes                                    | Yes                                    | Yes                                    |
| Overtemperature Trip                         | Yes                          | Yes                          | Yes                                    | Yes                                    | Yes                                    |
| Long Delay Protection (L)                    |                              |                              |                                        |                                        |                                        |
| Adjustable Rating Plug (I <sub>n</sub> )     | Yes                          | Yes                          | No                                     | No                                     | No                                     |
| Long Delay Pickup                            | 0.5-1.0 (I <sub>n</sub> )①   | 0.5-1.0 (I <sub>n</sub> )①   | 0.4-1.0 x (I <sub>n</sub> )            | 0.4-1.0 x (I <sub>n</sub> )            | 0.4-1.0 x (I <sub>n</sub> )            |
| Long Delay Time I <sup>2</sup> T             | 12 Seconds                   | 12 Seconds                   | 2-24 Seconds                           | 2-24 Seconds                           | 2-24 Seconds                           |
| Long Delay Time I <sup>4</sup> T             | No                           | No                           | 1-5 Seconds                            | 1-5 Seconds                            | 1-5 Seconds                            |
| Long Delay Thermal Memory                    | Yes                          | Yes                          | Yes                                    | Yes                                    | Yes                                    |
| High Load Alarm                              | No                           | No                           | No                                     | 0.5-1.0 x I <sub>r</sub>               | 0.5-1.0 x I <sub>r</sub>               |
| Short Delay Protection (S)                   |                              |                              |                                        |                                        |                                        |
| Short Delay Pickup                           | 200-800% x (I <sub>n</sub> ) | 200-800% x (I <sub>n</sub> ) | 150-800% x (I <sub>r</sub> )           | 150-800% x (I <sub>r</sub> )           | 150-800% x (I <sub>r</sub> )           |
| Short Delay Time I <sup>2</sup> T            | 100 ms                       | No                           | 100-500 ms                             | 100-500 ms                             | 100-500 ms                             |
| Short Delay Time Flat                        | No                           | Inst-300 ms                  | 100-500 ms                             | 100-500 ms                             | 100-500 ms                             |
| Short Delay Time Zone Selective Interlocking | No                           | No                           | Yes                                    | Yes                                    | Yes                                    |
| Instantaneous Protection (I)                 |                              |                              |                                        |                                        |                                        |
| Instantaneous Pickup                         | No                           | 200-800% x (I <sub>n</sub> ) | 200-800% x (I <sub>n</sub> )           | 200-800% x (I <sub>n</sub> )           | 200-800% x (I <sub>n</sub> )           |
| Discriminator                                | No                           | No                           | Yes                                    | Yes                                    | Yes                                    |
| Instantaneous Override                       | Yes                          | Yes                          | Yes                                    | Yes                                    | Yes                                    |
| Ground Fault Protection (G)                  |                              |                              |                                        |                                        |                                        |
| Ground Fault Alarm                           | No                           | No                           | 20-100% x (I <sub>s</sub> )            | 20-100% x (I <sub>s</sub> )            | 20-100% x (I <sub>s</sub> )            |
| Ground Fault Pickup                          | Varies by Frame②             | Varies by Frame②             | 20-100% x (I <sub>s</sub> )            | 20-100% x (I <sub>s</sub> )            | 20-100% x (I <sub>s</sub> )            |
| Ground Fault Delay I <sup>2</sup> T          | No                           | No                           | 100-500 ms                             | 100-500 ms                             | 100-500 ms                             |
| Ground Fault Delay Flat                      | Inst-500 ms                  | Inst-500 ms                  | 100-500 ms                             | 100-500 ms                             | 100-500 ms                             |
| Ground Fault Zone Selective Interlocking     | No                           | No                           | No                                     | Yes                                    | Yes                                    |
| Ground Fault Thermal Memory                  | Yes                          | Yes                          | Yes                                    | Yes                                    | Yes                                    |
| System Diagnostics                           |                              |                              |                                        |                                        |                                        |
| Status LEDs                                  | Yes                          | Yes                          | Yes                                    | Yes                                    | Yes                                    |
| Cause of Trip LEDs                           | No                           | No                           | Yes                                    | Yes                                    | Yes                                    |
| Magnitude of Trip Information                | No                           | No                           | Yes                                    | Yes                                    | Yes                                    |
| Remote Signal Contact – Ground Alarm         | Yes                          | Yes                          | No                                     | Yes                                    | Yes                                    |
| Local Auxiliary and Bell Alarm Contact       | Optional                     | Optional                     | Optional                               | Included                               | Included                               |
| System Monitoring                            |                              |                              |                                        |                                        |                                        |
| Digital Display                              | No                           | No                           | Yes②                                   | Yes②                                   | Yes②                                   |
| Current                                      | No                           | No                           | Yes                                    | Yes                                    | Yes                                    |
| Power and Energy                             | No                           | No                           | No                                     | No                                     | Yes                                    |
| Power Quality-Harmonics                      | No                           | No                           | No                                     | No                                     | Yes                                    |
| Power Factor                                 | No                           | No                           | No                                     | No                                     | Yes                                    |
| Communications                               |                              |                              |                                        |                                        |                                        |
| Cutler-Hammer PowerNet                       | No                           | No                           | No③                                    | Yes                                    | Yes                                    |
| Testing                                      |                              |                              |                                        |                                        |                                        |
| Testing Method                               | Test Set                     |                              | OPTIMizer, BIM, Cutler-Hammer PowerNet | OPTIMizer, BIM, Cutler-Hammer PowerNet | OPTIMizer, BIM, Cutler-Hammer PowerNet |

① Adjust by rating plug.

② By OPTIMizer/BIM.

③ Cutler-Hammer PowerNet kit for field upgrade.

BIM = Breaker Interface Module

(A) = GF Alarm

 $I_s$  = Sensor Rating $I_n$  = Rating Plug $I_r$  = Long Delay Pickup Setting

## Series C® N-Frame

## Type ND Electronic Circuit Breakers with Non-Interchangeable Trip Units

Order as individual components: Breaker Frame, Rating Plug, Terminals

|                                         |                                                                       |                                                      |                                                                               |                                                                                  |                                   |                    |                                          |                                    |
|-----------------------------------------|-----------------------------------------------------------------------|------------------------------------------------------|-------------------------------------------------------------------------------|----------------------------------------------------------------------------------|-----------------------------------|--------------------|------------------------------------------|------------------------------------|
| Maximum Continuous Ampere Rating @ 40°C | Digitrip RMS 310 Circuit Breaker Frame Only                           |                                                      |                                                                               |                                                                                  | Digitrip RMS 310 Rating Plug Only |                    |                                          | Standard Terminals Only①           |
|                                         | Standard Interrupting Capacity<br>600 Volt Ac Rated 50 kAIC @ 480 Vac |                                                      |                                                                               |                                                                                  | Ampere Rating                     | Fixed Rating Plugs | Adjustable Rating Plug                   | See Page 85 for Optional Terminals |
|                                         | Standard                                                              |                                                      | Options                                                                       |                                                                                  |                                   |                    | Adjustable Ampere Ratings Catalog Number |                                    |
|                                         | Adjustable Short Time Delay with I²t Short Delay Ramp                 | Independently Adjustable Short Time Pickup and Delay | Adjustable Short Time Pickup with I²t Short Delay and Ground Fault Protection | Independently Adjustable Short Time Pickup and Delay and Ground Fault Protection |                                   |                    |                                          |                                    |
|                                         | Catalog Number                                                        |                                                      |                                                                               |                                                                                  |                                   |                    |                                          |                                    |

## 2-Pole

|     |            |            |            |            |                                        |                                                                      |                                                              |                                                                       |
|-----|------------|------------|------------|------------|----------------------------------------|----------------------------------------------------------------------|--------------------------------------------------------------|-----------------------------------------------------------------------|
| 800 | ND2800T33W | ND2800T32W | ND2800T35W | ND2800T36W | 400<br>450<br>500<br>600<br>700<br>800 | 8NES400T<br>8NES450T<br>8NES500T<br>8NES600T<br>8NES700T<br>8NES800T | Adjustable Settings are:<br>400, 500, 600, 800<br>A8NES800T1 | TA700NB1<br>TA700NB1<br>TA700NB1<br>TA700NB1<br>TA700NB1<br>TA1000NB1 |
|-----|------------|------------|------------|------------|----------------------------------------|----------------------------------------------------------------------|--------------------------------------------------------------|-----------------------------------------------------------------------|

## 3-Pole

|     |            |            |            |            |                                        |                                                                      |                                                              |                                                                       |
|-----|------------|------------|------------|------------|----------------------------------------|----------------------------------------------------------------------|--------------------------------------------------------------|-----------------------------------------------------------------------|
| 800 | ND3800T33W | ND3800T32W | ND3800T35W | ND3800T36W | 400<br>450<br>500<br>600<br>700<br>800 | 8NES400T<br>8NES450T<br>8NES500T<br>8NES600T<br>8NES700T<br>8NES800T | Adjustable Settings are:<br>400, 500, 600, 800<br>A8NES800T1 | TA700NB1<br>TA700NB1<br>TA700NB1<br>TA700NB1<br>TA700NB1<br>TA1000NB1 |
|-----|------------|------------|------------|------------|----------------------------------------|----------------------------------------------------------------------|--------------------------------------------------------------|-----------------------------------------------------------------------|

4-Pole<sup>②</sup>

|     |            |            |   |   |                                        |                                                                      |                                                              |                                                                       |
|-----|------------|------------|---|---|----------------------------------------|----------------------------------------------------------------------|--------------------------------------------------------------|-----------------------------------------------------------------------|
| 800 | ND4800T33W | ND4800T32W | — | — | 400<br>450<br>500<br>600<br>700<br>800 | 8NES400T<br>8NES450T<br>8NES500T<br>8NES600T<br>8NES700T<br>8NES800T | Adjustable Settings are:<br>400, 500, 600, 800<br>A8NES800T1 | TA700NB1<br>TA700NB1<br>TA700NB1<br>TA700NB1<br>TA700NB1<br>TA1000NB1 |
|-----|------------|------------|---|---|----------------------------------------|----------------------------------------------------------------------|--------------------------------------------------------------|-----------------------------------------------------------------------|

## 2-Pole

|      |           |           |           |           |                                          |                                                                              |                                                                  |                                                                          |
|------|-----------|-----------|-----------|-----------|------------------------------------------|------------------------------------------------------------------------------|------------------------------------------------------------------|--------------------------------------------------------------------------|
| 1200 | ND212T33W | ND212T32W | ND212T35W | ND212T36W | 600<br>700<br>800<br>900<br>1000<br>1200 | 12NES600T<br>12NES700T<br>12NES800T<br>12NES900T<br>12NES1000T<br>12NES1200T | Adjustable Settings are:<br>600, 800, 1000, 1200<br>A12NES1200T1 | TA700NB1<br>TA700NB1<br>TA1000NB1<br>TA1000NB1<br>TA1000NB1<br>TA1200NB1 |
|------|-----------|-----------|-----------|-----------|------------------------------------------|------------------------------------------------------------------------------|------------------------------------------------------------------|--------------------------------------------------------------------------|

## 3-Pole

|      |           |           |           |           |                                          |                                                                              |                                                                  |                                                                          |
|------|-----------|-----------|-----------|-----------|------------------------------------------|------------------------------------------------------------------------------|------------------------------------------------------------------|--------------------------------------------------------------------------|
| 1200 | ND312T33W | ND312T32W | ND312T35W | ND312T36W | 600<br>700<br>800<br>900<br>1000<br>1200 | 12NES600T<br>12NES700T<br>12NES800T<br>12NES900T<br>12NES1000T<br>12NES1200T | Adjustable Settings are:<br>600, 800, 1000, 1200<br>A12NES1200T1 | TA700NB1<br>TA700NB1<br>TA1000NB1<br>TA1000NB1<br>TA1000NB1<br>TA1200NB1 |
|------|-----------|-----------|-----------|-----------|------------------------------------------|------------------------------------------------------------------------------|------------------------------------------------------------------|--------------------------------------------------------------------------|

4-Pole<sup>②</sup>

|      |           |           |   |   |                                          |                                                                              |                                                                  |                                                                          |
|------|-----------|-----------|---|---|------------------------------------------|------------------------------------------------------------------------------|------------------------------------------------------------------|--------------------------------------------------------------------------|
| 1200 | ND412T33W | ND412T32W | — | — | 600<br>700<br>800<br>900<br>1000<br>1200 | 12NES600T<br>12NES700T<br>12NES800T<br>12NES900T<br>12NES1000T<br>12NES1200T | Adjustable Settings are:<br>600, 800, 1000, 1200<br>A12NES1200T1 | TA700NB1<br>TA700NB1<br>TA1000NB1<br>TA1000NB1<br>TA1000NB1<br>TA1200NB1 |
|------|-----------|-----------|---|---|------------------------------------------|------------------------------------------------------------------------------|------------------------------------------------------------------|--------------------------------------------------------------------------|

Instruction Leaflet/FRED Number 29C106

① Two terminals are required per pole.

② Neutral is in right pole.



# Molded Case Circuit Breakers 400-1200 Amperes

Cutler-Hammer

March 1999

## Series C® N-Frame

## Type HND Electronic Circuit Breakers with Non-Interchangeable Trip Units

Order as individual components: Breaker Frame, Rating Plug, Terminals

|                                         |                                                                    |                                                      |                                                                                            |                                                                                  |                                   |                    |                                          |                                                                                |
|-----------------------------------------|--------------------------------------------------------------------|------------------------------------------------------|--------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------|-----------------------------------|--------------------|------------------------------------------|--------------------------------------------------------------------------------|
| Maximum Continuous Ampere Rating @ 40°C | Digitrip RMS 310 Circuit Breaker Frame Only                        |                                                      |                                                                                            |                                                                                  | Digitrip RMS 310 Rating Plug Only |                    |                                          | Standard Terminals Only <sup>①</sup><br><br>See Page 85 for Optional Terminals |
|                                         | High Interrupting Capacity<br>600 Volt Ac Rated 65 kAIC @ 480 Vac  |                                                      |                                                                                            |                                                                                  | Ampere Rating                     | Fixed Rating Plugs | Adjustable Rating Plug                   |                                                                                |
|                                         | Standard                                                           |                                                      | Options                                                                                    |                                                                                  |                                   |                    | Adjustable Ampere Ratings Catalog Number |                                                                                |
|                                         | Adjustable Short Time Delay with I <sup>2</sup> t Short Delay Ramp | Independently Adjustable Short Time Pickup and Delay | Adjustable Short Time Pickup with I <sup>2</sup> t Short Delay and Ground Fault Protection | Independently Adjustable Short Time Pickup and Delay and Ground Fault Protection |                                   |                    |                                          |                                                                                |
|                                         | Catalog Number                                                     |                                                      |                                                                                            |                                                                                  |                                   |                    |                                          |                                                                                |

## 2-Pole

|     |             |             |             |             |                                        |                                                                      |                                                              |                                                                       |
|-----|-------------|-------------|-------------|-------------|----------------------------------------|----------------------------------------------------------------------|--------------------------------------------------------------|-----------------------------------------------------------------------|
| 800 | HND2800T33W | HND2800T32W | HND2800T35W | HND2800T36W | 400<br>450<br>500<br>600<br>700<br>800 | 8NES400T<br>8NES450T<br>8NES500T<br>8NES600T<br>8NES700T<br>8NES800T | Adjustable Settings are:<br>400, 500, 600, 800<br>A8NES800T1 | TA700NB1<br>TA700NB1<br>TA700NB1<br>TA700NB1<br>TA700NB1<br>TA1000NB1 |
|-----|-------------|-------------|-------------|-------------|----------------------------------------|----------------------------------------------------------------------|--------------------------------------------------------------|-----------------------------------------------------------------------|

## 3-Pole

|     |             |             |             |             |                                        |                                                                      |                                                              |                                                                       |
|-----|-------------|-------------|-------------|-------------|----------------------------------------|----------------------------------------------------------------------|--------------------------------------------------------------|-----------------------------------------------------------------------|
| 800 | HND3800T33W | HND3800T32W | HND3800T35W | HND3800T36W | 400<br>450<br>500<br>600<br>700<br>800 | 8NES400T<br>8NES450T<br>8NES500T<br>8NES600T<br>8NES700T<br>8NES800T | Adjustable Settings are:<br>400, 500, 600, 800<br>A8NES800T1 | TA700NB1<br>TA700NB1<br>TA700NB1<br>TA700NB1<br>TA700NB1<br>TA1000NB1 |
|-----|-------------|-------------|-------------|-------------|----------------------------------------|----------------------------------------------------------------------|--------------------------------------------------------------|-----------------------------------------------------------------------|

4-Pole<sup>②</sup>

|     |             |             |   |   |                                        |                                                                      |                                                              |                                                                       |
|-----|-------------|-------------|---|---|----------------------------------------|----------------------------------------------------------------------|--------------------------------------------------------------|-----------------------------------------------------------------------|
| 800 | HND4800T33W | HND4800T32W | — | — | 400<br>450<br>500<br>600<br>700<br>800 | 8NES400T<br>8NES450T<br>8NES500T<br>8NES600T<br>8NES700T<br>8NES800T | Adjustable Settings are:<br>400, 500, 600, 800<br>A8NES800T1 | TA700NB1<br>TA700NB1<br>TA700NB1<br>TA700NB1<br>TA700NB1<br>TA1000NB1 |
|-----|-------------|-------------|---|---|----------------------------------------|----------------------------------------------------------------------|--------------------------------------------------------------|-----------------------------------------------------------------------|

## 2-Pole

|      |            |            |            |            |                                          |                                                                              |                                                                  |                                                                          |
|------|------------|------------|------------|------------|------------------------------------------|------------------------------------------------------------------------------|------------------------------------------------------------------|--------------------------------------------------------------------------|
| 1200 | HND212T33W | HND212T32W | HND212T35W | HND212T36W | 600<br>700<br>800<br>900<br>1000<br>1200 | 12NES600T<br>12NES700T<br>12NES800T<br>12NES900T<br>12NES1000T<br>12NES1200T | Adjustable Settings are:<br>600, 800, 1000, 1200<br>A12NES1200T1 | TA700NB1<br>TA700NB1<br>TA1000NB1<br>TA1000NB1<br>TA1000NB1<br>TA1200NB1 |
|------|------------|------------|------------|------------|------------------------------------------|------------------------------------------------------------------------------|------------------------------------------------------------------|--------------------------------------------------------------------------|

## 3-Pole

|      |            |            |            |            |                                          |                                                                              |                                                                  |                                                                          |
|------|------------|------------|------------|------------|------------------------------------------|------------------------------------------------------------------------------|------------------------------------------------------------------|--------------------------------------------------------------------------|
| 1200 | HND312T33W | HND312T32W | HND312T35W | HND312T36W | 600<br>700<br>800<br>900<br>1000<br>1200 | 12NES600T<br>12NES700T<br>12NES800T<br>12NES900T<br>12NES1000T<br>12NES1200T | Adjustable Settings are:<br>600, 800, 1000, 1200<br>A12NES1200T1 | TA700NB1<br>TA700NB1<br>TA1000NB1<br>TA1000NB1<br>TA1000NB1<br>TA1200NB1 |
|------|------------|------------|------------|------------|------------------------------------------|------------------------------------------------------------------------------|------------------------------------------------------------------|--------------------------------------------------------------------------|

4-Pole<sup>②</sup>

|      |            |            |   |   |                                          |                                                                              |                                                                  |                                                                          |
|------|------------|------------|---|---|------------------------------------------|------------------------------------------------------------------------------|------------------------------------------------------------------|--------------------------------------------------------------------------|
| 1200 | HND412T33W | HND412T32W | — | — | 600<br>700<br>800<br>900<br>1000<br>1200 | 12NES600T<br>12NES700T<br>12NES800T<br>12NES900T<br>12NES1000T<br>12NES1200T | Adjustable Settings are:<br>600, 800, 1000, 1200<br>A12NES1200T1 | TA700NB1<br>TA700NB1<br>TA1000NB1<br>TA1000NB1<br>TA1000NB1<br>TA1200NB1 |
|------|------------|------------|---|---|------------------------------------------|------------------------------------------------------------------------------|------------------------------------------------------------------|--------------------------------------------------------------------------|

Instruction Leaflet/FRED Number 29C106

① Two terminals are required per pole.

② Neutral is in right pole.

## Series C® N-Frame

## Type NDC Electronic Circuit Breakers with Non-Interchangeable Trip Units

Order as individual components: Breaker Frame, Rating Plug, Terminals

|                                         |                                                                          |                                                      |                                                                                            |                                                                                  |                                   |                    |                                          |                                       |
|-----------------------------------------|--------------------------------------------------------------------------|------------------------------------------------------|--------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------|-----------------------------------|--------------------|------------------------------------------|---------------------------------------|
| Maximum Continuous Ampere Rating @ 40°C | Digitrip RMS 310 Circuit Breaker Frame Only                              |                                                      |                                                                                            |                                                                                  | Digitrip RMS 310 Rating Plug Only |                    |                                          | Standard Terminals Only①              |
|                                         | Ultra High Interrupting Capacity<br>600 Volt Ac Rated 100 kAIC @ 480 Vac |                                                      |                                                                                            |                                                                                  | Ampere Rating                     | Fixed Rating Plugs | Adjustable Rating Plug                   | See Page 85 for<br>Optional Terminals |
|                                         | Standard                                                                 |                                                      | Options                                                                                    |                                                                                  |                                   |                    | Adjustable Ampere Ratings Catalog Number |                                       |
|                                         | Adjustable Short Time Delay with I <sup>2</sup> t Short Delay Ramp       | Independently Adjustable Short Time Pickup and Delay | Adjustable Short Time Pickup with I <sup>2</sup> t Short Delay and Ground Fault Protection | Independently Adjustable Short Time Pickup and Delay and Ground Fault Protection |                                   |                    |                                          |                                       |
|                                         | Catalog Number                                                           |                                                      |                                                                                            |                                                                                  |                                   |                    |                                          |                                       |

## 2-Pole

|     |             |             |             |             |                                        |                                                                      |                                                              |                                                                       |
|-----|-------------|-------------|-------------|-------------|----------------------------------------|----------------------------------------------------------------------|--------------------------------------------------------------|-----------------------------------------------------------------------|
| 800 | NDC2800T33W | NDC2800T32W | NDC2800T35W | NDC2800T36W | 400<br>450<br>500<br>600<br>700<br>800 | 8NES400T<br>8NES450T<br>8NES500T<br>8NES600T<br>8NES700T<br>8NES800T | Adjustable Settings are:<br>400, 500, 600, 800<br>A8NES800T1 | TA700NB1<br>TA700NB1<br>TA700NB1<br>TA700NB1<br>TA700NB1<br>TA1000NB1 |
|-----|-------------|-------------|-------------|-------------|----------------------------------------|----------------------------------------------------------------------|--------------------------------------------------------------|-----------------------------------------------------------------------|

## 3-Pole

|     |             |             |             |             |                                        |                                                                      |                                                              |                                                                       |
|-----|-------------|-------------|-------------|-------------|----------------------------------------|----------------------------------------------------------------------|--------------------------------------------------------------|-----------------------------------------------------------------------|
| 800 | NDC3800T33W | NDC3800T32W | NDC3800T35W | NDC3800T36W | 400<br>450<br>500<br>600<br>700<br>800 | 8NES400T<br>8NES450T<br>8NES500T<br>8NES600T<br>8NES700T<br>8NES800T | Adjustable Settings are:<br>400, 500, 600, 800<br>A8NES800T1 | TA700NB1<br>TA700NB1<br>TA700NB1<br>TA700NB1<br>TA700NB1<br>TA1000NB1 |
|-----|-------------|-------------|-------------|-------------|----------------------------------------|----------------------------------------------------------------------|--------------------------------------------------------------|-----------------------------------------------------------------------|

4-Pole<sup>②</sup>

|     |             |             |   |   |                                        |                                                                      |                                                              |                                                                       |
|-----|-------------|-------------|---|---|----------------------------------------|----------------------------------------------------------------------|--------------------------------------------------------------|-----------------------------------------------------------------------|
| 800 | NDC4800T33W | NDC4800T32W | — | — | 400<br>450<br>500<br>600<br>700<br>800 | 8NES400T<br>8NES450T<br>8NES500T<br>8NES600T<br>8NES700T<br>8NES800T | Adjustable Settings are:<br>400, 500, 600, 800<br>A8NES800T1 | TA700NB1<br>TA700NB1<br>TA700NB1<br>TA700NB1<br>TA700NB1<br>TA1000NB1 |
|-----|-------------|-------------|---|---|----------------------------------------|----------------------------------------------------------------------|--------------------------------------------------------------|-----------------------------------------------------------------------|

## 2-Pole

|      |            |            |            |            |                                          |                                                                              |                                                                  |                                                                          |
|------|------------|------------|------------|------------|------------------------------------------|------------------------------------------------------------------------------|------------------------------------------------------------------|--------------------------------------------------------------------------|
| 1200 | NDC212T33W | NDC212T32W | NDC212T35W | NDC212T36W | 600<br>700<br>800<br>900<br>1000<br>1200 | 12NES600T<br>12NES700T<br>12NES800T<br>12NES900T<br>12NES1000T<br>12NES1200T | Adjustable Settings are:<br>600, 800, 1000, 1200<br>A12NES1200T1 | TA700NB1<br>TA700NB1<br>TA1000NB1<br>TA1000NB1<br>TA1000NB1<br>TA1200NB1 |
|------|------------|------------|------------|------------|------------------------------------------|------------------------------------------------------------------------------|------------------------------------------------------------------|--------------------------------------------------------------------------|

## 3-Pole

|      |            |            |            |            |                                          |                                                                              |                                                                  |                                                                          |
|------|------------|------------|------------|------------|------------------------------------------|------------------------------------------------------------------------------|------------------------------------------------------------------|--------------------------------------------------------------------------|
| 1200 | NDC312T33W | NDC312T32W | NDC312T35W | NDC312T36W | 600<br>700<br>800<br>900<br>1000<br>1200 | 12NES600T<br>12NES700T<br>12NES800T<br>12NES900T<br>12NES1000T<br>12NES1200T | Adjustable Settings are:<br>600, 800, 1000, 1200<br>A12NES1200T1 | TA700NB1<br>TA700NB1<br>TA1000NB1<br>TA1000NB1<br>TA1000NB1<br>TA1200NB1 |
|------|------------|------------|------------|------------|------------------------------------------|------------------------------------------------------------------------------|------------------------------------------------------------------|--------------------------------------------------------------------------|

4-Pole<sup>②</sup>

|      |            |            |   |   |                                          |                                                                              |                                                                  |                                                                          |
|------|------------|------------|---|---|------------------------------------------|------------------------------------------------------------------------------|------------------------------------------------------------------|--------------------------------------------------------------------------|
| 1200 | NDC412T33W | NDC412T32W | — | — | 600<br>700<br>800<br>900<br>1000<br>1200 | 12NES600T<br>12NES700T<br>12NES800T<br>12NES900T<br>12NES1000T<br>12NES1200T | Adjustable Settings are:<br>600, 800, 1000, 1200<br>A12NES1200T1 | TA700NB1<br>TA700NB1<br>TA1000NB1<br>TA1000NB1<br>TA1000NB1<br>TA1200NB1 |
|------|------------|------------|---|---|------------------------------------------|------------------------------------------------------------------------------|------------------------------------------------------------------|--------------------------------------------------------------------------|

Instruction Leaflet/FRED Number 29C106

① Two terminals are required per pole.

② Neutral is in right pole.

# Molded Case Circuit Breakers 400-1200 Amperes

Cutler-Hammer

March 1999

## Series C® N-Frame

## 100% Rated Type CND Electronic Circuit Breakers with Non-Interchangeable Trip Units

The NEC allows the breaker to be rated at 100% of its frame size in an assembly, provided that 90°C wire is applied at the 75°C ampacity. Order as individual components: Breaker Frame, Rating Plug, Terminals

|                                         |                                                                       |                                                      |                                                                               |                                                                                  |                                   |                    |                                          |                                                                    |
|-----------------------------------------|-----------------------------------------------------------------------|------------------------------------------------------|-------------------------------------------------------------------------------|----------------------------------------------------------------------------------|-----------------------------------|--------------------|------------------------------------------|--------------------------------------------------------------------|
| Maximum Continuous Ampere Rating @ 40°C | Digitrip RMS 310 Circuit Breaker Frame Only                           |                                                      |                                                                               |                                                                                  | Digitrip RMS 310 Rating Plug Only |                    |                                          | Standard Terminals Only①<br><br>See Page 85 for Optional Terminals |
|                                         | Standard Interrupting Capacity<br>600 Volt Ac Rated 50 kAIC @ 480 Vac |                                                      |                                                                               |                                                                                  | Ampere Rating                     | Fixed Rating Plugs | Adjustable Rating Plug                   |                                                                    |
|                                         | Standard                                                              |                                                      | Options                                                                       |                                                                                  |                                   |                    | Adjustable Ampere Ratings Catalog Number |                                                                    |
|                                         | Adjustable Short Time Delay with I²t Short Delay Ramp                 | Independently Adjustable Short Time Pickup and Delay | Adjustable Short Time Pickup with I²t Short Delay and Ground Fault Protection | Independently Adjustable Short Time Pickup and Delay and Ground Fault Protection |                                   |                    |                                          |                                                                    |
|                                         | Catalog Number                                                        |                                                      |                                                                               |                                                                                  |                                   |                    |                                          |                                                                    |

## 2-Pole

|     |             |             |             |             |                                        |                                                                      |                                                              |                                                                       |
|-----|-------------|-------------|-------------|-------------|----------------------------------------|----------------------------------------------------------------------|--------------------------------------------------------------|-----------------------------------------------------------------------|
| 800 | CND2800T33W | CND2800T32W | CND2800T35W | CND2800T36W | 400<br>450<br>500<br>600<br>700<br>800 | 8NES400T<br>8NES450T<br>8NES500T<br>8NES600T<br>8NES700T<br>8NES800T | Adjustable Settings are:<br>400, 500, 600, 800<br>A8NES800T1 | TA700NB1<br>TA700NB1<br>TA700NB1<br>TA700NB1<br>TA700NB1<br>TA1000NB1 |
|-----|-------------|-------------|-------------|-------------|----------------------------------------|----------------------------------------------------------------------|--------------------------------------------------------------|-----------------------------------------------------------------------|

## 3-Pole

|     |             |             |             |             |                                        |                                                                      |                                                              |                                                                       |
|-----|-------------|-------------|-------------|-------------|----------------------------------------|----------------------------------------------------------------------|--------------------------------------------------------------|-----------------------------------------------------------------------|
| 800 | CND3800T33W | CND3800T32W | CND3800T35W | CND3800T36W | 400<br>450<br>500<br>600<br>700<br>800 | 8NES400T<br>8NES450T<br>8NES500T<br>8NES600T<br>8NES700T<br>8NES800T | Adjustable Settings are:<br>400, 500, 600, 800<br>A8NES800T1 | TA700NB1<br>TA700NB1<br>TA700NB1<br>TA700NB1<br>TA700NB1<br>TA1000NB1 |
|-----|-------------|-------------|-------------|-------------|----------------------------------------|----------------------------------------------------------------------|--------------------------------------------------------------|-----------------------------------------------------------------------|

4-Pole<sup>②</sup>

|     |             |             |   |   |                                        |                                                                      |                                                              |                                                                       |
|-----|-------------|-------------|---|---|----------------------------------------|----------------------------------------------------------------------|--------------------------------------------------------------|-----------------------------------------------------------------------|
| 800 | CND4800T33W | CND4800T32W | — | — | 400<br>450<br>500<br>600<br>700<br>800 | 8NES400T<br>8NES450T<br>8NES500T<br>8NES600T<br>8NES700T<br>8NES800T | Adjustable Settings are:<br>400, 500, 600, 800<br>A8NES800T1 | TA700NB1<br>TA700NB1<br>TA700NB1<br>TA700NB1<br>TA700NB1<br>TA1000NB1 |
|-----|-------------|-------------|---|---|----------------------------------------|----------------------------------------------------------------------|--------------------------------------------------------------|-----------------------------------------------------------------------|

## 2-Pole

|      |            |            |            |            |                                          |                                                                              |                                                                  |                                                                          |
|------|------------|------------|------------|------------|------------------------------------------|------------------------------------------------------------------------------|------------------------------------------------------------------|--------------------------------------------------------------------------|
| 1200 | CND212T33W | CND212T32W | CND212T35W | CND212T36W | 600<br>700<br>800<br>900<br>1000<br>1200 | 12NES600T<br>12NES700T<br>12NES800T<br>12NES900T<br>12NES1000T<br>12NES1200T | Adjustable Settings are:<br>600, 800, 1000, 1200<br>A12NES1200T1 | TA700NB1<br>TA700NB1<br>TA1000NB1<br>TA1000NB1<br>TA1000NB1<br>TA1200NB1 |
|------|------------|------------|------------|------------|------------------------------------------|------------------------------------------------------------------------------|------------------------------------------------------------------|--------------------------------------------------------------------------|

## 3-Pole

|      |            |            |            |            |                                          |                                                                              |                                                                  |                                                                          |
|------|------------|------------|------------|------------|------------------------------------------|------------------------------------------------------------------------------|------------------------------------------------------------------|--------------------------------------------------------------------------|
| 1200 | CND312T33W | CND312T32W | CND312T35W | CND312T36W | 600<br>700<br>800<br>900<br>1000<br>1200 | 12NES600T<br>12NES700T<br>12NES800T<br>12NES900T<br>12NES1000T<br>12NES1200T | Adjustable Settings are:<br>600, 800, 1000, 1200<br>A12NES1200T1 | TA700NB1<br>TA700NB1<br>TA1000NB1<br>TA1000NB1<br>TA1000NB1<br>TA1200NB1 |
|------|------------|------------|------------|------------|------------------------------------------|------------------------------------------------------------------------------|------------------------------------------------------------------|--------------------------------------------------------------------------|

4-Pole<sup>②</sup>

|      |            |            |   |   |                                          |                                                                              |                                                                  |                                                                          |
|------|------------|------------|---|---|------------------------------------------|------------------------------------------------------------------------------|------------------------------------------------------------------|--------------------------------------------------------------------------|
| 1200 | CND412T33W | CND412T32W | — | — | 600<br>700<br>800<br>900<br>1000<br>1200 | 12NES600T<br>12NES700T<br>12NES800T<br>12NES900T<br>12NES1000T<br>12NES1200T | Adjustable Settings are:<br>600, 800, 1000, 1200<br>A12NES1200T1 | TA700NB1<br>TA700NB1<br>TA1000NB1<br>TA1000NB1<br>TA1000NB1<br>TA1200NB1 |
|------|------------|------------|---|---|------------------------------------------|------------------------------------------------------------------------------|------------------------------------------------------------------|--------------------------------------------------------------------------|

Instruction Leaflet/FRED Number 29C106

① Two terminals are required per pole.

② Neutral is in right pole.

## Series C® N-Frame

## 100% Rated Type CHND Electronic Circuit Breakers with Non-Interchangeable Trip Units

The NEC allows the breaker to be rated at 100% of its frame size in an assembly, provided that 90°C wire is applied at the 75°C ampacity. Order as individual components: Breaker Frame, Rating Plug, Terminals

|                                         |                                                                    |                                                      |                                                                                            |                                                                                  |                                   |                    |                                             |                                       |
|-----------------------------------------|--------------------------------------------------------------------|------------------------------------------------------|--------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------|-----------------------------------|--------------------|---------------------------------------------|---------------------------------------|
| Maximum Continuous Ampere Rating @ 40°C | Digitrip RMS 310 Circuit Breaker Frame Only                        |                                                      |                                                                                            |                                                                                  | Digitrip RMS 310 Rating Plug Only |                    |                                             | Standard Terminals Only①              |
|                                         | High Interrupting Capacity<br>600 Volt Ac Rated 65 kAIC @ 480 Vac  |                                                      |                                                                                            |                                                                                  | Ampere Rating                     | Fixed Rating Plugs | Adjustable Rating Plug                      | See Page 85 for<br>Optional Terminals |
|                                         | Standard                                                           |                                                      | Options                                                                                    |                                                                                  |                                   |                    | Adjustable Ampere Ratings<br>Catalog Number |                                       |
|                                         | Adjustable Short Time Delay with I <sup>2</sup> t Short Delay Ramp | Independently Adjustable Short Time Pickup and Delay | Adjustable Short Time Pickup with I <sup>2</sup> t Short Delay and Ground Fault Protection | Independently Adjustable Short Time Pickup and Delay and Ground Fault Protection |                                   |                    |                                             |                                       |
|                                         | Catalog Number                                                     |                                                      |                                                                                            |                                                                                  |                                   |                    |                                             |                                       |

## 2-Pole

|     |              |              |              |              |                                        |                                                                      |                                                              |                                                                       |
|-----|--------------|--------------|--------------|--------------|----------------------------------------|----------------------------------------------------------------------|--------------------------------------------------------------|-----------------------------------------------------------------------|
| 800 | CHND2800T33W | CHND2800T32W | CHND2800T35W | CHND2800T36W | 400<br>450<br>500<br>600<br>700<br>800 | 8NES400T<br>8NES450T<br>8NES500T<br>8NES600T<br>8NES700T<br>8NES800T | Adjustable Settings are:<br>400, 500, 600, 800<br>A8NES800T1 | TA700NB1<br>TA700NB1<br>TA700NB1<br>TA700NB1<br>TA700NB1<br>TA1000NB1 |
|-----|--------------|--------------|--------------|--------------|----------------------------------------|----------------------------------------------------------------------|--------------------------------------------------------------|-----------------------------------------------------------------------|

## 3-Pole

|     |              |              |              |              |                                        |                                                                      |                                                              |                                                                       |
|-----|--------------|--------------|--------------|--------------|----------------------------------------|----------------------------------------------------------------------|--------------------------------------------------------------|-----------------------------------------------------------------------|
| 800 | CHND3800T33W | CHND3800T32W | CHND3800T35W | CHND3800T36W | 400<br>450<br>500<br>600<br>700<br>800 | 8NES400T<br>8NES450T<br>8NES500T<br>8NES600T<br>8NES700T<br>8NES800T | Adjustable Settings are:<br>400, 500, 600, 800<br>A8NES800T1 | TA700NB1<br>TA700NB1<br>TA700NB1<br>TA700NB1<br>TA700NB1<br>TA1000NB1 |
|-----|--------------|--------------|--------------|--------------|----------------------------------------|----------------------------------------------------------------------|--------------------------------------------------------------|-----------------------------------------------------------------------|

4-Pole<sup>②</sup>

|     |              |              |   |   |                                        |                                                                      |                                                              |                                                                       |
|-----|--------------|--------------|---|---|----------------------------------------|----------------------------------------------------------------------|--------------------------------------------------------------|-----------------------------------------------------------------------|
| 800 | CHND4800T33W | CHND4800T32W | — | — | 400<br>450<br>500<br>600<br>700<br>800 | 8NES400T<br>8NES450T<br>8NES500T<br>8NES600T<br>8NES700T<br>8NES800T | Adjustable Settings are:<br>400, 500, 600, 800<br>A8NES800T1 | TA700NB1<br>TA700NB1<br>TA700NB1<br>TA700NB1<br>TA700NB1<br>TA1000NB1 |
|-----|--------------|--------------|---|---|----------------------------------------|----------------------------------------------------------------------|--------------------------------------------------------------|-----------------------------------------------------------------------|

## 2-Pole

|      |             |             |             |             |                                          |                                                                              |                                                                  |                                                                          |
|------|-------------|-------------|-------------|-------------|------------------------------------------|------------------------------------------------------------------------------|------------------------------------------------------------------|--------------------------------------------------------------------------|
| 1200 | CHND212T33W | CHND212T32W | CHND212T35W | CHND212T36W | 600<br>700<br>800<br>900<br>1000<br>1200 | 12NES600T<br>12NES700T<br>12NES800T<br>12NES900T<br>12NES1000T<br>12NES1200T | Adjustable Settings are:<br>600, 800, 1000, 1200<br>A12NES1200T1 | TA700NB1<br>TA700NB1<br>TA1000NB1<br>TA1000NB1<br>TA1000NB1<br>TA1200NB1 |
|------|-------------|-------------|-------------|-------------|------------------------------------------|------------------------------------------------------------------------------|------------------------------------------------------------------|--------------------------------------------------------------------------|

## 3-Pole

|      |             |             |             |             |                                          |                                                                              |                                                                  |                                                                          |
|------|-------------|-------------|-------------|-------------|------------------------------------------|------------------------------------------------------------------------------|------------------------------------------------------------------|--------------------------------------------------------------------------|
| 1200 | CHND312T33W | CHND312T32W | CHND312T35W | CHND312T36W | 600<br>700<br>800<br>900<br>1000<br>1200 | 12NES600T<br>12NES700T<br>12NES800T<br>12NES900T<br>12NES1000T<br>12NES1200T | Adjustable Settings are:<br>600, 800, 1000, 1200<br>A12NES1200T1 | TA700NB1<br>TA700NB1<br>TA1000NB1<br>TA1000NB1<br>TA1000NB1<br>TA1200NB1 |
|------|-------------|-------------|-------------|-------------|------------------------------------------|------------------------------------------------------------------------------|------------------------------------------------------------------|--------------------------------------------------------------------------|

4-Pole<sup>②</sup>

|      |             |             |   |   |                                          |                                                                              |                                                                  |                                                                          |
|------|-------------|-------------|---|---|------------------------------------------|------------------------------------------------------------------------------|------------------------------------------------------------------|--------------------------------------------------------------------------|
| 1200 | CHND412T33W | CHND412T32W | — | — | 600<br>700<br>800<br>900<br>1000<br>1200 | 12NES600T<br>12NES700T<br>12NES800T<br>12NES900T<br>12NES1000T<br>12NES1200T | Adjustable Settings are:<br>600, 800, 1000, 1200<br>A12NES1200T1 | TA700NB1<br>TA700NB1<br>TA1000NB1<br>TA1000NB1<br>TA1000NB1<br>TA1200NB1 |
|------|-------------|-------------|---|---|------------------------------------------|------------------------------------------------------------------------------|------------------------------------------------------------------|--------------------------------------------------------------------------|

Instruction Leaflet/FRED Number 29C106

① Two terminals are required per pole.

② Neutral is in right pole.

# Molded Case Circuit Breakers 400-1200 Amperes

Cutler-Hammer

March 1999

## Series C® N-Frame

## 100% Rated Type CNDC Electronic Circuit Breakers with Non-Interchangeable Trip Units

The NEC allows the breaker to be rated at 100% of its frame size in an assembly, provided that 90°C wire is applied at the 75°C ampacity. Order as individual components: Breaker Frame, Rating Plug, Terminals

|                                                  |                                                                          |                                                               |                                                                                          |                                                                                              |                                   |                          |                                             |                                       |
|--------------------------------------------------|--------------------------------------------------------------------------|---------------------------------------------------------------|------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------|-----------------------------------|--------------------------|---------------------------------------------|---------------------------------------|
| Maximum Continuous<br>Ampere<br>Rating<br>@ 40°C | Digitrip RMS 310 Circuit Breaker Frame Only                              |                                                               |                                                                                          |                                                                                              | Digitrip RMS 310 Rating Plug Only |                          |                                             | Standard Terminals Only①              |
|                                                  | Ultra High Interrupting Capacity<br>600 Volt Ac Rated 100 kAIC @ 480 Vac |                                                               |                                                                                          |                                                                                              | Ampere<br>Rating                  | Fixed<br>Rating<br>Plugs | Adjustable Rating Plug                      | See Page 85 for<br>Optional Terminals |
|                                                  | Standard                                                                 |                                                               | Options                                                                                  |                                                                                              |                                   |                          | Adjustable Ampere Ratings<br>Catalog Number |                                       |
|                                                  | Adjustable Short<br>Time Delay with<br>1½ Short Delay<br>Ramp            | Independently<br>Adjustable Short<br>Time Pickup and<br>Delay | Adjustable Short<br>Time Pickup with<br>1½ Short Delay<br>and Ground Fault<br>Protection | Independently<br>Adjustable Short<br>Time Pickup and<br>Delay and Ground<br>Fault Protection |                                   |                          |                                             |                                       |
|                                                  | Catalog Number                                                           |                                                               |                                                                                          |                                                                                              |                                   |                          |                                             |                                       |

## 2-Pole

|     |              |              |              |              |                                        |                                                                      |                                                              |                                                                       |
|-----|--------------|--------------|--------------|--------------|----------------------------------------|----------------------------------------------------------------------|--------------------------------------------------------------|-----------------------------------------------------------------------|
| 800 | CNDC2800T33W | CNDC2800T32W | CNDC2800T35W | CNDC2800T36W | 400<br>450<br>500<br>600<br>700<br>800 | 8NES400T<br>8NES450T<br>8NES500T<br>8NES600T<br>8NES700T<br>8NES800T | Adjustable Settings are:<br>400, 500, 600, 800<br>A8NES800T1 | TA700NB1<br>TA700NB1<br>TA700NB1<br>TA700NB1<br>TA700NB1<br>TA1000NB1 |
|-----|--------------|--------------|--------------|--------------|----------------------------------------|----------------------------------------------------------------------|--------------------------------------------------------------|-----------------------------------------------------------------------|

## 3-Pole

|     |              |              |              |              |                                        |                                                                      |                                                              |                                                                       |
|-----|--------------|--------------|--------------|--------------|----------------------------------------|----------------------------------------------------------------------|--------------------------------------------------------------|-----------------------------------------------------------------------|
| 800 | CNDC3800T33W | CNDC3800T32W | CNDC3800T35W | CNDC3800T36W | 400<br>450<br>500<br>600<br>700<br>800 | 8NES400T<br>8NES450T<br>8NES500T<br>8NES600T<br>8NES700T<br>8NES800T | Adjustable Settings are:<br>400, 500, 600, 800<br>A8NES800T1 | TA700NB1<br>TA700NB1<br>TA700NB1<br>TA700NB1<br>TA700NB1<br>TA1000NB1 |
|-----|--------------|--------------|--------------|--------------|----------------------------------------|----------------------------------------------------------------------|--------------------------------------------------------------|-----------------------------------------------------------------------|

4-Pole<sup>②</sup>

|     |              |              |   |   |                                        |                                                                      |                                                              |                                                                       |
|-----|--------------|--------------|---|---|----------------------------------------|----------------------------------------------------------------------|--------------------------------------------------------------|-----------------------------------------------------------------------|
| 800 | CNDC4800T33W | CNDC4800T32W | — | — | 400<br>450<br>500<br>600<br>700<br>800 | 8NES400T<br>8NES450T<br>8NES500T<br>8NES600T<br>8NES700T<br>8NES800T | Adjustable Settings are:<br>400, 500, 600, 800<br>A8NES800T1 | TA700NB1<br>TA700NB1<br>TA700NB1<br>TA700NB1<br>TA700NB1<br>TA1000NB1 |
|-----|--------------|--------------|---|---|----------------------------------------|----------------------------------------------------------------------|--------------------------------------------------------------|-----------------------------------------------------------------------|

## 2-Pole

|      |             |             |             |             |                                          |                                                                              |                                                                  |                                                                          |
|------|-------------|-------------|-------------|-------------|------------------------------------------|------------------------------------------------------------------------------|------------------------------------------------------------------|--------------------------------------------------------------------------|
| 1200 | CNDC212T33W | CNDC212T32W | CNDC212T35W | CNDC212T36W | 600<br>700<br>800<br>900<br>1000<br>1200 | 12NES600T<br>12NES700T<br>12NES800T<br>12NES900T<br>12NES1000T<br>12NES1200T | Adjustable Settings are:<br>600, 800, 1000, 1200<br>A12NES1200T1 | TA700NB1<br>TA700NB1<br>TA1000NB1<br>TA1000NB1<br>TA1000NB1<br>TA1200NB1 |
|------|-------------|-------------|-------------|-------------|------------------------------------------|------------------------------------------------------------------------------|------------------------------------------------------------------|--------------------------------------------------------------------------|

## 3-Pole

|      |             |             |             |             |                                          |                                                                              |                                                                  |                                                                          |
|------|-------------|-------------|-------------|-------------|------------------------------------------|------------------------------------------------------------------------------|------------------------------------------------------------------|--------------------------------------------------------------------------|
| 1200 | CNDC312T33W | CNDC312T32W | CNDC312T35W | CNDC312T36W | 600<br>700<br>800<br>900<br>1000<br>1200 | 12NES600T<br>12NES700T<br>12NES800T<br>12NES900T<br>12NES1000T<br>12NES1200T | Adjustable Settings are:<br>600, 800, 1000, 1200<br>A12NES1200T1 | TA700NB1<br>TA700NB1<br>TA1000NB1<br>TA1000NB1<br>TA1000NB1<br>TA1200NB1 |
|------|-------------|-------------|-------------|-------------|------------------------------------------|------------------------------------------------------------------------------|------------------------------------------------------------------|--------------------------------------------------------------------------|

4-Pole<sup>②</sup>

|      |             |             |   |   |                                          |                                                                              |                                                                  |                                                                          |
|------|-------------|-------------|---|---|------------------------------------------|------------------------------------------------------------------------------|------------------------------------------------------------------|--------------------------------------------------------------------------|
| 1200 | CNDC412T33W | CNDC412T32W | — | — | 600<br>700<br>800<br>900<br>1000<br>1200 | 12NES600T<br>12NES700T<br>12NES800T<br>12NES900T<br>12NES1000T<br>12NES1200T | Adjustable Settings are:<br>600, 800, 1000, 1200<br>A12NES1200T1 | TA700NB1<br>TA700NB1<br>TA1000NB1<br>TA1000NB1<br>TA1000NB1<br>TA1200NB1 |
|------|-------------|-------------|---|---|------------------------------------------|------------------------------------------------------------------------------|------------------------------------------------------------------|--------------------------------------------------------------------------|

Instruction Leaflet/FRED Number 29C106

① Two terminals are required per pole.

② Neutral is in right pole.

## Series C® N-Frame

Digitrip OPTIM<sup>①</sup> Electronic Circuit Breakers with Interchangeable Rating Plugs

Order as individual components: Breaker Frame (which includes Trip Unit), Rating Plug, Terminals.

| Maximum Continuous Ampere Rating @ 40°C | Circuit Breaker Frame Only                                                                                                                                                                                                                                                                                                                                                                                                                                                    |           |           |           |           |            | Digitrip OPTIM Rating Plug Only |                   |            |
|-----------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|-----------|-----------|-----------|------------|---------------------------------|-------------------|------------|
|                                         | L – Adjustable Long Delay Pickup ( $I_L$ ) with Adjustable Long Delay Time ( $I^2t$ or $I^4t$ Response) <sup>②</sup><br>S – Adjustable Short Delay Pickup with Adjustable Short Delay Time ( $I^2t$ or Flat Response)<br>I – Adjustable Instantaneous Pickup<br>G – Adjustable Ground Fault Pickup with Adjustable Ground Fault Time Delay ( $I^2t$ or Flat Response)<br>A – Adjustable Ground Fault Alarm with Adjustable Ground Fault Time Delay ( $I^2t$ or Flat Response) |           |           |           |           |            | Ampere Rating                   | Fixed Rating Plug |            |
|                                         | OPTIM 550                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | OPTIM 550 | OPTIM 550 | OPTIM 750 | OPTIM 750 | OPTIM 1050 |                                 |                   | OPTIM 1050 |
|                                         | LSI                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | LSIG      | LSIA      | LSIG      | LSIA      | LSIG       |                                 |                   | LSIA       |
|                                         | Catalog Number                                                                                                                                                                                                                                                                                                                                                                                                                                                                |           |           |           |           |            |                                 |                   |            |
|                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |           |           |           |           |            |                                 |                   |            |

## 3-Pole Standard Interrupting Capacity 600 Volt Ac Rated 50 kAIC @ 480 Vac

|      |            |            |            |            |            |             |             |                                               |                                                                                                |
|------|------------|------------|------------|------------|------------|-------------|-------------|-----------------------------------------------|------------------------------------------------------------------------------------------------|
| 800  | ND3800T52W | ND3800T56W | ND3800T57W | ND3800T76W | ND3800T77W | ND3800T106W | ND3800T107W | 400<br>450<br>500<br>550<br>600<br>700<br>800 | ORPN80A400<br>ORPN80A450<br>ORPN80A500<br>ORPN80A550<br>ORPN80A600<br>ORPN80A700<br>ORPN80A800 |
| 1200 | ND312T52W  | ND312T56W  | ND312T57W  | ND312T76W  | ND312T77W  | ND312T106W  | ND312T107W  | 600<br>700<br>800<br>1000<br>1200             | ORPN80A600<br>ORPN80A700<br>ORPN80A800<br>ORPN80A100<br>ORPN80A120                             |

## 3-Pole High Interrupting Capacity 600 Volt Ac Rated 65 kAIC @ 480 Vac

|      |             |             |             |             |             |              |              |                                               |                                                                                                |
|------|-------------|-------------|-------------|-------------|-------------|--------------|--------------|-----------------------------------------------|------------------------------------------------------------------------------------------------|
| 800  | HND3800T52W | HND3800T56W | HND3800T57W | HND3800T76W | HND3800T77W | HND3800T106W | HND3800T107W | 400<br>450<br>500<br>550<br>600<br>700<br>800 | ORPN80A400<br>ORPN80A450<br>ORPN80A500<br>ORPN80A550<br>ORPN80A600<br>ORPN80A700<br>ORPN80A800 |
| 1200 | HND312T52W  | HND312T56W  | HND312T57W  | HND312T76W  | HND312T77W  | HND312T106W  | HND312T107W  | 600<br>700<br>800<br>1000<br>1200             | ORPN80A600<br>ORPN80A700<br>ORPN80A800<br>ORPN80A100<br>ORPN80A120                             |

## 3-Pole Ultra High Interrupting Capacity 600 Volt Ac Rated 100 kAIC @ 480 Vac

|      |             |             |             |             |             |              |              |                                               |                                                                                                |
|------|-------------|-------------|-------------|-------------|-------------|--------------|--------------|-----------------------------------------------|------------------------------------------------------------------------------------------------|
| 800  | NDC3800T52W | NDC3800T56W | NDC3800T57W | NDC3800T76W | NDC3800T77W | NDC3800T106W | NDC3800T107W | 400<br>450<br>500<br>550<br>600<br>700<br>800 | ORPN80A400<br>ORPN80A450<br>ORPN80A500<br>ORPN80A550<br>ORPN80A600<br>ORPN80A700<br>ORPN80A800 |
| 1200 | NDC312T52W  | NDC312T56W  | NDC312T57W  | NDC312T76W  | NDC312T77W  | NDC312T106W  | NDC312T107W  | 600<br>700<br>800<br>1000<br>1200             | ORPN80A600<br>ORPN80A700<br>ORPN80A800<br>ORPN80A100<br>ORPN80A120                             |

Instruction Leaflet/FRED Number 29C106 for Breaker; 29C891 for OPTIM Trip

① 1 Form C auxiliary switch and 1 Form C bell (trip) alarm switch supplied with breaker as standard on models 750 and 1050.

② Long delay  $I^4t$  response selection limits short delay time to flat response.

# Molded Case Circuit Breakers 400-1200 Amperes

Cutler-Hammer

March 1999

## Series C® N-Frame

## 100% Rated Digitrip OPTIM<sup>①</sup> Circuit Breakers with Interchangeable Rating Plugs

Order as individual components: Breaker Frame (which includes Trip Unit), Rating Plug, Terminals.

|                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |           |           |           |           |            |                                 |                   |            |
|-----------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|-----------|-----------|-----------|------------|---------------------------------|-------------------|------------|
| Maximum Continuous Ampere Rating @ 40°C | Circuit Breaker Frame Only                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |           |           |           |           |            | Digitrip OPTIM Rating Plug Only |                   |            |
|                                         | L – Adjustable Long Delay Pickup (I <sub>L</sub> ) with Adjustable Long Delay Time (I <sup>2</sup> t or I <sup>4</sup> t Response)②<br>S – Adjustable Short Delay Pickup with Adjustable Short Delay Time (I <sup>2</sup> t or Flat Response)<br>I – Adjustable Instantaneous Pickup<br>G – Adjustable Ground Fault Pickup with Adjustable Ground Fault Time Delay (I <sup>2</sup> t or Flat Response)<br>A – Adjustable Ground Fault Alarm with Adjustable Ground Fault Time Delay (I <sup>2</sup> t or Flat Response) |           |           |           |           |            | Ampere Rating                   | Fixed Rating Plug |            |
|                                         | OPTIM 550                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | OPTIM 550 | OPTIM 550 | OPTIM 750 | OPTIM 750 | OPTIM 1050 |                                 |                   | OPTIM 1050 |
|                                         | LSI                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | LSIG      | LSIA      | LSIG      | LSIA      | LSIG       |                                 |                   | LSIA       |
|                                         | Catalog Number                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |           |           |           |           |            |                                 |                   |            |
|                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |           |           |           |           |            |                                 |                   |            |

## 3-Pole Standard Interrupting Capacity 600 Volt Ac Rated 50 kAIC @ 480 Vac

|      |             |             |             |             |             |              |              |                                               |                                                                                                |
|------|-------------|-------------|-------------|-------------|-------------|--------------|--------------|-----------------------------------------------|------------------------------------------------------------------------------------------------|
| 800  | CND3800T52W | CND3800T56W | CND3800T57W | CND3800T76W | CND3800T77W | CND3800T106W | CND3800T107W | 400<br>450<br>500<br>550<br>600<br>700<br>800 | ORPN80A400<br>ORPN80A450<br>ORPN80A500<br>ORPN80A550<br>ORPN80A600<br>ORPN80A700<br>ORPN80A800 |
| 1200 | CND312T52W  | CND312T56W  | CND312T57W  | CND312T76W  | CND312T77W  | CND312T106W  | CND312T107W  | 600<br>700<br>800<br>1000<br>1200             | ORPN80A600<br>ORPN80A700<br>ORPN80A800<br>ORPN80A100<br>ORPN80A120                             |

## 3-Pole High Interrupting Capacity 600 Volt Ac Rated 65 kAIC @ 480 Vac

|      |              |              |              |              |              |               |               |                                               |                                                                                                |
|------|--------------|--------------|--------------|--------------|--------------|---------------|---------------|-----------------------------------------------|------------------------------------------------------------------------------------------------|
| 800  | CHND3800T52W | CHND3800T56W | CHND3800T57W | CHND3800T76W | CHND3800T77W | CHND3800T106W | CHND3800T107W | 400<br>450<br>500<br>550<br>600<br>700<br>800 | ORPN80A400<br>ORPN80A450<br>ORPN80A500<br>ORPN80A550<br>ORPN80A600<br>ORPN80A700<br>ORPN80A800 |
| 1200 | CHND312T52W  | CHND312T56W  | CHND312T57W  | CHND312T76W  | CHND312T77W  | CHND312T106W  | CHND312T107W  | 600<br>700<br>800<br>1000<br>1200             | ORPN80A600<br>ORPN80A700<br>ORPN80A800<br>ORPN80A100<br>ORPN80A120                             |

## 3-Pole Ultra High Interrupting Capacity 600 Volt Ac Rated 100 kAIC @ 480 Vac

|      |              |              |              |              |              |               |               |                                               |                                                                                                |
|------|--------------|--------------|--------------|--------------|--------------|---------------|---------------|-----------------------------------------------|------------------------------------------------------------------------------------------------|
| 800  | CNDC3800T52W | CNDC3800T56W | CNDC3800T57W | CNDC3800T76W | CNDC3800T77W | CNDC3800T106W | CNDC3800T107W | 400<br>450<br>500<br>550<br>600<br>700<br>800 | ORPN80A400<br>ORPN80A450<br>ORPN80A500<br>ORPN80A550<br>ORPN80A600<br>ORPN80A700<br>ORPN80A800 |
| 1200 | CNDC312T52W  | CNDC312T56W  | CNDC312T57W  | CNDC312T76W  | CNDC312T77W  | CNDC312T106W  | CNDC312T107W  | 600<br>700<br>800<br>1000<br>1200             | ORPN80A600<br>ORPN80A700<br>ORPN80A800<br>ORPN80A100<br>ORPN80A120                             |

Instruction Leaflet/FRED Number 29C106 for Breaker; 29C891 for OPTIM Trip

① 1 Form C auxiliary switch and 1 Form C bell (trip) alarm switch supplied with breaker as standard on models 750 and 1050.

② Long delay  $I^4t$  response selection limits short delay time to flat response.

## Type ND Molded Case Switches

| Continuous<br>Ampere<br>Rating<br>@ 40°C | Catalog Number                                                      |          |                     |
|------------------------------------------|---------------------------------------------------------------------|----------|---------------------|
|                                          | 2-Pole                                                              | 3-Pole   | 4-Pole <sup>①</sup> |
|                                          | Complete with Standard Line and Load Terminals (shipped separately) |          |                     |
| 800                                      | Type ND – High Instantaneous (K)                                    |          |                     |
|                                          | –                                                                   | ND3800WK | ND4800WK            |
| 1200                                     | Type ND – High Instantaneous (K)                                    |          |                     |
|                                          | –                                                                   | ND312WK  | ND412WK             |

**Note:** Molded case switch may trip above 14,000 amperes.

For UL listed, series tested molded case switch application data, refer to Cutler-Hammer.

Instruction Leaflet/FRED Number 29C106

## Line and Load Terminals

## Ordering Information

N-frame circuit breakers use Cu/Al terminals as standard. When optional copper or Cu/Al terminals are required, order by catalog number. Specify if factory installation is required.

## Line and Load Terminals

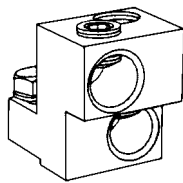
| Maximum Breaker Amperes | Terminal Body Material | Wire Type | AWG Wire Range/No. Conductors | Metric Wire Range mm <sup>2</sup> | Catalog Number |
|-------------------------|------------------------|-----------|-------------------------------|-----------------------------------|----------------|
|-------------------------|------------------------|-----------|-------------------------------|-----------------------------------|----------------|

## Standard Cu/Al Pressure Terminals

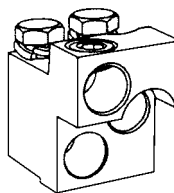
|      |          |       |                   |         |                        |
|------|----------|-------|-------------------|---------|------------------------|
| 700  | Aluminum | Cu/Al | (2) 1-500 kcmil   | 50-300  | TA700NB1               |
| 1000 | Aluminum | Cu/Al | (3) 3/0-400 kcmil | 95-185  | TA1000NB1 <sup>②</sup> |
| 1200 | Aluminum | Cu/Al | (4) 4/0-500 kcmil | 120-300 | TA1200NB1 <sup>②</sup> |
| 1200 | Aluminum | Cu/Al | (3) 500-750 kcmil | 300-400 | TA1201NB1 <sup>③</sup> |

## Optional Copper and Cu/Al Pressure Type Terminals

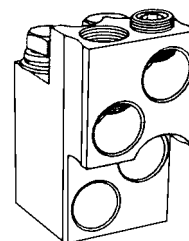
|      |        |    |                   |        |          |
|------|--------|----|-------------------|--------|----------|
| 700  | Copper | Cu | (2) 2/0-500 kcmil | 70-300 | T700NB1  |
| 1000 | Copper | Cu | (3) 3/0-500 kcmil | 95-300 | T1000NB1 |
| 1200 | Copper | Cu | (4) 3/0-400 kcmil | 95-185 | T1200NB3 |



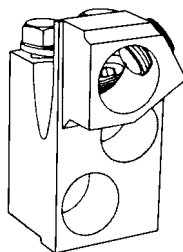
TA700NB1



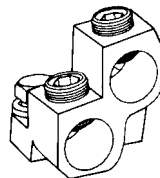
TA1000NB1



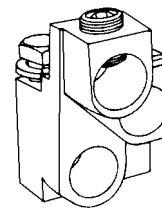
TA1200NB1



TA1201NB1



T700NB1



T1000NB1

① Neutral is in right pole.

② Terminal rating is A19 Cu.

③ Terminal rating is A17 Cu.



## Series C® N-Frame

## Catalog Numbering System

This information is presented only as an aid to understanding catalog numbers. It is not to be used to build catalog numbers for circuit breakers or trip units.

### Circuit Breaker/Frame Catalog Number

| Circuit Breaker/<br>Frame Type          | Number<br>of Poles                     | Circuit Breaker/<br>Frame Ampere<br>Rating | Trip Model                                                             | Trip Type                                            | Suffix                                                                                                                                                                                   |
|-----------------------------------------|----------------------------------------|--------------------------------------------|------------------------------------------------------------------------|------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ND<br>HND<br>NDC<br>CND<br>CHND<br>CNDC | 2: 2 Poles<br>3: 3 Poles<br>4: 4 Poles | 8: 800 Amperes<br>12: 1200 Amperes         | T3 – Model 310<br>T5 – Model 550<br>T7 – Model 750<br>T10 – Model 1050 | 2 – LSI<br>3 – LS<br>5 – LSG<br>6 – LSIG<br>7 – LSIA | E: 100% R.P. protected (4-Pole)<br>EH: 50% R.P. protected (4-Pole)<br>K: High Magnetic Molded<br>Case Switch<br>W: Without Terminals<br>X: Load Only Terminals<br>Y: Line Only Terminals |

## Dimensions/Weights

### Dimensions, Inches (mm)

| Number of Poles | Width           | Height      | Depth        |
|-----------------|-----------------|-------------|--------------|
| 2, 3            | 8.25<br>(210)   | 16<br>(407) | 5.5<br>(140) |
| 4               | 11.125<br>(283) | 16<br>(407) | 5.5<br>(140) |

### Approximate Shipping Weight, Lbs. (kg)

| Breaker Type | Complete Breaker |                |                |
|--------------|------------------|----------------|----------------|
|              | Number of Poles  |                |                |
|              | 2                | 3              | 4              |
| ND, HND, NDC | 37<br>(16.783)   | 45<br>(20.412) | 58<br>(26.308) |

## Allowable Accessory Combinations

Different combinations of accessories can be supplied, depending on the types of accessories and the number of poles in the circuit breaker.

|                                                              | Reference<br>Page |  | 3-Pole |        |       |  | 4-Pole |        |       |      |
|--------------------------------------------------------------|-------------------|--|--------|--------|-------|--|--------|--------|-------|------|
|                                                              |                   |  | Left   | Center | Right |  | Left   | Center | Right | Neu. |
| Internal Accessories (Only One Internal Accessory Per Pole)① |                   |  |        |        |       |  |        |        |       |      |
| Alarm Lockout (Make/Break)                                   | 141               |  | ■      |        | ■     |  | ■      |        | ■     |      |
| Alarm Lockout (2Make/2Break)                                 | 141               |  | ■      |        | ■     |  | ■      |        | ■     |      |
| Auxiliary Switch (1A, 1B)                                    | 144               |  | ■      |        | ■     |  | ■      |        | ■     |      |
| Auxiliary Switch (2A, 2B)                                    | 144               |  | ■      |        | ■     |  | ■      |        | ■     |      |
| Auxiliary Switch (3A, 3B)                                    | 144               |  | ■      |        | ■     |  | ■      |        | ■     |      |
| Auxiliary Switch (1A 1B) and Alarm Switch Combination        | 146               |  | ■      |        | ■     |  | ■      |        | ■     |      |
| Auxiliary Switch (2A 2B) and Alarm Switch Combination        | 146               |  | ■      |        | ■     |  | ■      |        | ■     |      |
| Shunt Trip – Standard                                        | 150               |  | ■      |        |       |  | ■      |        |       |      |
| Shunt Trip – Low Energy                                      | 152               |  | ■      |        |       |  | ■      |        |       |      |
| Undervoltage Release Mechanism                               | 158               |  | ■      |        |       |  | ■      |        |       |      |
| Cutler-Hammer PowerNet Communications Kit (OPTIM 550)        | 160               |  |        |        | ■     |  |        |        |       |      |
| External Accessories                                         |                   |  |        |        |       |  |        |        |       |      |
| Base Mounting Hardware                                       | 163               |  |        | ●      |       |  |        | ●      |       |      |
| Interphase Barriers                                          | 166               |  |        | ●      |       |  |        | ●      |       |      |
| Non-Padlockable Handle Block                                 | 168               |  |        | ■      |       |  |        | ■      |       |      |
| Padlockable Handle Lock Hasp                                 | 169               |  | □      |        | □     |  | □      |        | □     |      |
| Key Interlock Kit                                            | 170               |  | □      |        | □     |  | □      |        | □     |      |
| Sliding Bar Interlock – Requires Two Breakers                | 171               |  |        | ●      |       |  |        |        |       |      |
| Walking Beam Interlock – Requires Two Breakers               | 171               |  |        | ●      |       |  |        | ●      |       |      |
| Electrical (Motor) Operator                                  | 173               |  |        | ●      |       |  |        | ●      |       |      |
| Plug-in Adapters                                             | 174               |  |        | ●      |       |  |        | ●      |       |      |
| Rear Connecting Studs                                        | 176               |  |        | ●      |       |  |        | ●      |       |      |
| Panelboard Connecting Straps                                 | 177               |  |        | ●      |       |  |        | ●      |       |      |
| Handle Mechanisms                                            | 178               |  |        | ●      |       |  |        | ●      |       |      |
| Handle Extension                                             | 182               |  |        | ●      |       |  |        | ●      |       |      |
| Solid-State (Electronic) Portable Test Kit                   | 184               |  |        | ●      |       |  |        | ●      |       |      |
| OPTIM System Components 3-Poles                              |                   |  |        |        |       |  |        |        |       |      |
| Ground Fault Alarm Unit                                      | 184               |  |        |        |       |  |        |        |       |      |
| Potential Transformer Module                                 | 184               |  |        |        |       |  |        |        |       |      |
| Breaker Interface Module (BIM)                               | 185               |  |        |        |       |  |        |        |       |      |
| Digitrip OPTIMizer                                           | 185               |  |        |        |       |  |        |        |       |      |
| Auxiliary Power Module                                       | 185               |  |        |        |       |  |        |        |       |      |
| Cutler-Hammer PowerNet Software                              | 185               |  |        |        |       |  |        |        |       |      |
| Modifications (Refer to Cutler-Hammer)                       |                   |  |        |        |       |  |        |        |       |      |
| Special Calibration                                          | 186               |  |        | ●      |       |  |        | ●      |       |      |
| Moisture Fungus Treatment                                    | 186               |  |        | ●      |       |  |        | ●      |       |      |
| Freeze-Tested Circuit Breakers                               | 186               |  |        | ●      |       |  |        | ●      |       |      |
| Marine Application                                           | 186               |  |        | ●      |       |  |        | ●      |       |      |

■ Applicable in indicated pole position

□ May be mounted on left or right pole – not both

● Accessory available/Modification available

① OPTIM 750 and 1050 are factory sealed and do not have the right pole available for accessories.





Typical Series C R-Frame Circuit Breaker

- R-frame circuit breakers are available as frame (which includes trip unit), rating plug and terminals.
- All R-frame circuit breakers are suitable for reverse feed use.

## Interrupting Capacity Ratings

### UL489/CSA Interrupting Capacity Ratings ①

| Circuit Breaker Type | Number of Poles | Interrupting Capacity (Symmetrical Amperes) (kA) |     |     |     | Circuit Breaker Type | Page Numbers                 |     |     |     |     |       |
|----------------------|-----------------|--------------------------------------------------|-----|-----|-----|----------------------|------------------------------|-----|-----|-----|-----|-------|
|                      |                 | Volts Ac (50/60 Hz)                              |     |     |     |                      | Trip Unit Types <sup>②</sup> |     |     |     |     |       |
|                      |                 | 240                                              | 277 | 480 | 600 |                      | 310                          | 510 | 610 | 810 | 910 | OPTIM |
| RD                   | 3, 4            | 125                                              | —   | 65  | 50  | RD                   | 91                           | 94  | 96  | 98  | 100 | 102   |
| CRD <sup>③</sup>     | 3, 4            | 125                                              | —   | 65  | 50  | CRD                  | 93                           | 95  | 97  | 99  | 101 | 103   |
| RDC                  | 3, 4            | 200                                              | —   | 100 | 65  | RDC                  | 92                           | 94  | 96  | 98  | 100 | 102   |
| CRDC <sup>③</sup>    | 3, 4            | 200                                              | —   | 100 | 65  | CRDC                 | 93                           | 95  | 97  | 99  | 101 | 103   |

### IEC 947-2 Interrupting Capacity Ratings ①

| Circuit Breaker Type                      | Number of Poles | Interrupting Capacity (Symmetrical Amperes) (kA) |           |          | Circuit Breaker Type | Page Numbers     |     |     |     |     |       |
|-------------------------------------------|-----------------|--------------------------------------------------|-----------|----------|----------------------|------------------|-----|-----|-----|-----|-------|
|                                           |                 | Volts Ac (50/60 Hz)                              |           |          |                      | Trip Unit Types② |     |     |     |     |       |
|                                           |                 | 240                                              | 415       | 690      |                      | 310              | 510 | 610 | 810 | 910 | OPTIM |
| RD<br>I <sub>CU</sub><br>I <sub>CS</sub>  | 3, 4            | 135<br>100                                       | 70<br>50  | 25<br>13 | RD                   | 91               | 94  | 96  | 98  | 100 | 102   |
| RDC<br>I <sub>CU</sub><br>I <sub>CS</sub> | 3, 4            | 200<br>100                                       | 100<br>50 | 35<br>18 | RDC                  | 92               | 94  | 96  | 98  | 100 | 102   |

① Utilization Category A circuit breakers.

② See page 90 for Trip Unit Selection Guide

③ 100% Rated breakers.

## Series C® R-Frame

### R-Frame Digitrip Selection Guide

| Trip Unit Type                               | Digitrip RMS 310                  | Digitrip RMS 510                  | Digitrip RMS 610            | Digitrip OPTIM 750                     | Digitrip RMS 810                  | Digitrip RMS 910                       | Digitrip OPTIM 1050                    |
|----------------------------------------------|-----------------------------------|-----------------------------------|-----------------------------|----------------------------------------|-----------------------------------|----------------------------------------|----------------------------------------|
| RMS Sensing                                  | Yes                               | Yes                               | Yes                         | Yes                                    | Yes                               | Yes                                    | Yes                                    |
| <b>Breaker Type</b>                          |                                   |                                   |                             |                                        |                                   |                                        |                                        |
| Frame                                        | R                                 | R                                 | R                           | R                                      | R                                 | R                                      | R                                      |
| Ampere Range                                 | 800A-2500A                        | 800A-2500A                        | 800A-2500A                  | 800A-2500A                             | 800A-2500A                        | 800A-2500A                             | 800A-2500A                             |
| Interrupting Rating @ 480V                   | 65, 100 (kA)                      | 65, 100 (kA)                      | 65, 100 (kA)                | 65, 100 (kA)                           | 65, 100 (kA)                      | 65, 100 (kA)                           | 65, 100 (kA)                           |
| <b>Protection</b>                            |                                   |                                   |                             |                                        |                                   |                                        |                                        |
| Ordering Options                             | LS, LSG                           | LSI, LSIG                         | LI, LS, LSI, LIG, LSG, LSIG | LI, LS, LSI, LIG, LSG, LSIG            | LSI(A), LSIG                      | LI, LS, LSI, LIG, LSG, LSIG            | LSI(A), LIG                            |
| Fixed Rated Plug ( $I_n$ )                   | Yes                               | Yes                               | Yes                         | Yes                                    | Yes                               | Yes                                    | Yes                                    |
| Overtemperature Trip                         | Yes                               | Yes                               | Yes                         | Yes                                    | Yes                               | Yes                                    | Yes                                    |
| <b>Long Delay Protection (L)</b>             |                                   |                                   |                             |                                        |                                   |                                        |                                        |
| Adjustable Rating Plug ( $I_n$ )             | Yes                               | Yes                               | No                          | No                                     | No                                | No                                     | No                                     |
| Long Delay Pickup                            | 0.5-1.0 ( $I_n$ ) <sup>①</sup>    | 0.5-1.0 ( $I_n$ ) <sup>①</sup>    | 0.5-1.0 x ( $I_n$ )         | 0.5-1.0 x ( $I_n$ )                    | 0.4-1.0 x ( $I_n$ )               | 0.5-1.0 x ( $I_n$ )                    | 0.5-1.0 x ( $I_n$ )                    |
| Long Delay Time I <sup>2</sup> T             | 12 Seconds                        | 12 Seconds                        | 2-24 Seconds                | 2-24 Seconds                           | 2-24 Seconds                      | 2-24 Seconds                           | 2-24 Seconds                           |
| Long Delay Time I <sup>4</sup> T             | No                                | No                                | No                          | No                                     | 1-5 Seconds                       | No                                     | 1-5 Seconds                            |
| Long Delay Thermal Memory                    | Yes                               | Yes                               | Yes                         | Yes                                    | Yes                               | Yes                                    | Yes                                    |
| High Load Alarm                              | No                                | No                                | No                          | 0.85 x $I_r$                           | 0.5-1.0 x $I_r$                   | 0.85 x $I_r$                           | 0.85 x $I_r$                           |
| <b>Short Delay Protection (S)</b>            |                                   |                                   |                             |                                        |                                   |                                        |                                        |
| Short Delay Pickup                           | 200-800% x ( $I_n$ ) <sup>②</sup> | 200-800% x ( $I_n$ ) <sup>②</sup> | 200-600% S1&S2 x ( $I_r$ )  | 200-600% S1&S2 x ( $I_r$ )             | 150-800% x ( $I_r$ ) <sup>③</sup> | 200-600% S1&S2 x ( $I_r$ )             | 200-600% S1&S2 x ( $I_r$ )             |
| Short Delay Time I <sup>2</sup> T            | 100 ms                            | No                                | 100-500 ms                  | 100-500 ms                             | 100-500 ms                        | 100-500 ms                             | 100-500 ms                             |
| Short Delay Time Flat                        | No                                | Inst-300 ms                       | 100-500 ms                  | 100-500 ms                             | 100-500 ms                        | 100-500 ms                             | 100-500 ms                             |
| Short Delay Time Zone Selective Interlocking | No                                | No                                | Yes                         | Yes                                    | Yes                               | Yes                                    | Yes                                    |
| <b>Instantaneous Protection (I)</b>          |                                   |                                   |                             |                                        |                                   |                                        |                                        |
| Instantaneous Pick Up                        | No                                | 200-800% x ( $I_n$ )              | 200-600% M1&M2 x ( $I_n$ )  | 200-600% M1&M2 x ( $I_n$ )             | 200-800% x ( $I_n$ ) <sup>③</sup> | 200-600% M1&M2 x ( $I_n$ )             | 200-600% M1&M2 x ( $I_n$ )             |
| Discriminator                                | No                                | No                                | Yes <sup>④</sup>            | Yes <sup>④</sup>                       | Yes                               | Yes <sup>④</sup>                       | Yes <sup>④</sup>                       |
| Instantaneous Override                       | Yes                               | Yes                               | Yes                         | Yes                                    | Yes                               | Yes                                    | Yes                                    |
| <b>Ground Fault Protection (G)</b>           |                                   |                                   |                             |                                        |                                   |                                        |                                        |
| Ground Fault Alarm <sup>⑤</sup>              | No                                | No                                | No                          | No                                     | 25-100% x ( $I_n$ )               | No                                     | No                                     |
| Ground Fault Pick Up <sup>⑤</sup>            | Varies by Frame                   | Varies by Frame                   | 25-100% x ( $I_s$ )         | 25-100% x ( $I_s$ )                    | 25-100% x ( $I_n$ )               | 25-100% x ( $I_s$ )                    | 25-100% x ( $I_s$ )                    |
| Ground Fault Delay I <sup>2</sup> T          | No                                | No                                | 100-500 ms                  | 100-500 ms                             | 100-500 ms                        | 100-500 ms                             | 100-500 ms                             |
| Ground Fault Delay Flat                      | Inst-500 ms                       | Inst-500 ms                       | 100-500 ms                  | 100-500 ms                             | 100-500 ms                        | 100-500 ms                             | 100-500 ms                             |
| Ground Fault Zone Selective Interlocking     | No                                | No                                | Yes                         | Yes                                    | Yes                               | Yes                                    | Yes                                    |
| Ground Fault Thermal Memory                  | Yes                               | Yes                               | Yes                         | Yes                                    | Yes                               | Yes                                    | Yes                                    |
| <b>System Diagnostics</b>                    |                                   |                                   |                             |                                        |                                   |                                        |                                        |
| Status LEDs                                  | Yes                               | Yes                               | Yes                         | Yes                                    | Yes                               | Yes                                    | Yes                                    |
| Cause of Trip LEDs                           | No                                | No                                | Yes                         | Yes                                    | Yes                               | Yes                                    | Yes                                    |
| Magnitude of Trip Information                | No                                | No                                | No                          | Yes                                    | Yes                               | Yes                                    | Yes                                    |
| Remote Signal Contacts                       | Yes                               | Yes                               | No                          | Yes                                    | Yes                               | Yes                                    | Yes                                    |
| <b>System Monitoring</b>                     |                                   |                                   |                             |                                        |                                   |                                        |                                        |
| Digital Display                              | No                                | No                                | No                          | Yes                                    | Yes <sup>⑥</sup>                  | Yes                                    | Yes                                    |
| Current                                      | No                                | No                                | No                          | Yes                                    | Yes                               | Yes                                    | Yes                                    |
| Voltage                                      | No                                | No                                | No                          | No                                     | No                                | No                                     | No                                     |
| Power and Energy                             | No                                | No                                | No                          | No                                     | No                                | Yes                                    | Yes                                    |
| Power Quality-Harmonics                      | No                                | No                                | No                          | No                                     | No                                | No                                     | Yes                                    |
| Power Factor                                 | No                                | No                                | No                          | No                                     | No                                | Yes (Over Cutler-Hammer PowerNet Only) | Yes                                    |
| <b>Communications</b>                        |                                   |                                   |                             |                                        |                                   |                                        |                                        |
| Cutler-Hammer PowerNet                       | No                                | No                                | No                          | No                                     | Yes                               | Yes                                    | Yes                                    |
| <b>Testing</b>                               |                                   |                                   |                             |                                        |                                   |                                        |                                        |
| Testing Method                               | Test Set                          | Integral                          | Integral                    | OPTIMizer, BIM, Cutler-Hammer PowerNet | Integral                          | Integral                               | OPTIMizer, BIM, Cutler-Hammer PowerNet |

① Adjust by rating plug.

② Except 2500 ampere frame is 200-600%.

③ Varies by frame.

④ LS/LSG only.

⑤ Not to exceed 1200 amperes.

⑥ By OPTIMizer/BIM.

BIM = Breaker Interface Module

(A) = GF Alarm

 $I_s$  = Sensor Rating $I_n$  = Rating Plug $I_r$  = Long Delay Pickup Setting x  $I_n$

## Series C® R-Frame

## Digitrip RMS 310 Electronic Circuit Breakers with Interchangeable Rating Plugs

Order as individual components: Breaker Frame (which includes Trip Unit) and Rating Plug.

| Maximum Continuous Ampere Rating @ 40°C | Circuit Breaker Frame Only                                                                                                                                                                                                                                                                                                                                                           |     |      |       | Digitrip RMS 310 Rating Plug Only |                   |                                          |
|-----------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|------|-------|-----------------------------------|-------------------|------------------------------------------|
|                                         | L – Adjustable Long Delay Pickup (By Adjustable Rating Plug)<br>S – Adjustable Short Delay Pickup with Fixed Short Delay Time (I <sup>2</sup> t Response) or Adjustable Short Delay Time (Flat Response)<br>I – Adjustable Instantaneous Pickup by Setting Short Delay Time to Instantaneous<br>G – Adjustable Ground Fault Pickup with Adjustable Ground Fault Time (Flat Response) |     |      |       | Ampere Rating                     | Fixed Rating Plug | Adjustable Rating Plug                   |
|                                         |                                                                                                                                                                                                                                                                                                                                                                                      |     |      |       |                                   |                   | Adjustable Ampere Ratings Catalog Number |
|                                         |                                                                                                                                                                                                                                                                                                                                                                                      |     |      |       |                                   |                   |                                          |
|                                         | LS                                                                                                                                                                                                                                                                                                                                                                                   | LSI | LSG③ | LSIG③ |                                   |                   |                                          |
|                                         | Catalog Number                                                                                                                                                                                                                                                                                                                                                                       |     |      |       |                                   |                   |                                          |

## 3-Pole Standard Interrupting Capacity 600 Volt Ac Rated 65 kAIC @ 480 Vac

|                   |           |           |           |           |                                                     |                                                                                   |                                                                  |
|-------------------|-----------|-----------|-----------|-----------|-----------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------|
| 1600 <sup>①</sup> | RD316T33W | RD316T32W | RD316T35W | RD316T36W | 800<br>1000<br>1200<br>1250<br>1400<br>1500<br>1600 | 16RES08T<br>16RES10T<br>16RES12T<br>16RES125T<br>16RES14T<br>16RES15T<br>16RES16T | Adjustable Settings are:<br>800, 1000, 1200, 1600<br>A16RES16T1  |
| 2000              | RD320T33W | RD320T32W | RD320T35W | RD320T36W | 1000<br>1200<br>1250<br>1400<br>1600<br>2000        | 20RES10T<br>20RES12T<br>20RES125T<br>20RES14T<br>20RES16T<br>20RES20T             | Adjustable Settings are:<br>1000, 1200, 1600, 2000<br>A20RES20T1 |
| 2500              | RD325T33W | RD325T32W | RD325T35W | RD325T36W | 1200<br>1250<br>1600<br>2000<br>2500                | 25RES12T<br>25RES125T<br>25RES16T<br>25RES20T<br>25RES25T                         | Adjustable Settings are:<br>1200, 1600, 2000, 2500<br>A25RES25T1 |

4-Pole<sup>②</sup> Standard Interrupting Capacity 600 Volt Ac Rated 65 kAIC @ 480 Vac

|                   |           |           |   |   |                                                     |                                                                                   |                                                                  |
|-------------------|-----------|-----------|---|---|-----------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------|
| 1600 <sup>①</sup> | RD416T33W | RD416T32W | – | – | 800<br>1000<br>1200<br>1250<br>1400<br>1500<br>1600 | 16RES08T<br>16RES10T<br>16RES12T<br>16RES125T<br>16RES14T<br>16RES15T<br>16RES16T | Adjustable Settings are:<br>800, 1000, 1200, 1600<br>A16RES16T1  |
| 2000              | RD420T33W | RD420T32W | – | – | 1000<br>1200<br>1250<br>1400<br>1600<br>2000        | 20RES10T<br>20RES12T<br>20RES125T<br>20RES14T<br>20RES16T<br>20RES20T             | Adjustable Settings are:<br>1000, 1200, 1600, 2000<br>A20RES20T1 |
| 2500              | RD425T33W | RD425T32W | – | – | 1200<br>1250<br>1600<br>2000<br>2500                | 25RES12T<br>25RES125T<br>25RES16T<br>25RES20T<br>25RES25T                         | Adjustable Settings are:<br>1200, 1600, 2000, 2500<br>A25RES25T1 |

Instruction Leaflet/FRED Number 29C107 for Breaker; Number 29C883 for Digitrip 310 Trip Unit

- ① For SCR application use 2000 ampere frame.  
 ② Unprotected right pole neutral. Add "P" to catalog number for 100% protected right pole neutral, i.e., "RD416T33PW".  
 ③ Add suffix "R" to breaker catalog number for ground fault remote indication compatibility.

# Molded Case Circuit Breakers 800-2500 Amperes

Cutler-Hammer

March 1999

## Series C® L-Frame

## Digitrip RMS 310 Electronic Circuit Breakers with Interchangeable Rating Plugs

Order as individual components: Breaker Frame (which includes Trip Unit) and Rating Plug.

| Maximum Continuous Ampere Rating @ 40°C | Circuit Breaker Frame Only                                                                                                                                                                                                                                                                                                                                                           |     |      |       | Digitrip RMS 310 Rating Plug Only |                   |                                          |
|-----------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|------|-------|-----------------------------------|-------------------|------------------------------------------|
|                                         | L – Adjustable Long Delay Pickup (By Adjustable Rating Plug)<br>S – Adjustable Short Delay Pickup with Fixed Short Delay Time (I <sup>2</sup> t Response) or Adjustable Short Delay Time (Flat Response)<br>I – Adjustable Instantaneous Pickup by Setting Short Delay Time to Instantaneous<br>G – Adjustable Ground Fault Pickup with Adjustable Ground Fault Time (Flat Response) |     |      |       | Ampere Rating                     | Fixed Rating Plug | Adjustable Rating Plug                   |
|                                         |                                                                                                                                                                                                                                                                                                                                                                                      |     |      |       |                                   |                   | Adjustable Ampere Ratings Catalog Number |
|                                         |                                                                                                                                                                                                                                                                                                                                                                                      |     |      |       |                                   |                   |                                          |
|                                         | LS                                                                                                                                                                                                                                                                                                                                                                                   | LSI | LSG③ | LSIG③ |                                   |                   |                                          |
| Catalog Number                          |                                                                                                                                                                                                                                                                                                                                                                                      |     |      |       |                                   |                   |                                          |

### 3-Pole High Interrupting Capacity 600 Volt Ac Rated 100 kAIC @ 480 Vac

|                   |            |            |            |            |                                                     |                                                                                   |                                                                  |
|-------------------|------------|------------|------------|------------|-----------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------|
| 1600 <sup>①</sup> | RDC316T33W | RDC316T32W | RDC316T35W | RDC316T36W | 800<br>1000<br>1200<br>1250<br>1400<br>1500<br>1600 | 16RES08T<br>16RES10T<br>16RES12T<br>16RES125T<br>16RES14T<br>16RES15T<br>16RES16T | Adjustable Settings are:<br>800, 1000, 1200, 1600<br>A16RES16T1  |
| 2000              | RDC320T33W | RDC320T32W | RDC320T35W | RDC320T36W | 1000<br>1200<br>1250<br>1400<br>1600<br>2000        | 20RES10T<br>20RES12T<br>20RES125T<br>20RES14T<br>20RES16T<br>20RES20T             | Adjustable Settings are:<br>1000, 1200, 1600, 2000<br>A20RES20T1 |
| 2500              | RDC325T33W | RDC325T32W | RDC325T35W | RDC325T36W | 1200<br>1250<br>1600<br>2000<br>2500                | 25RES12T<br>25RES125T<br>25RES16T<br>25RES20T<br>25RES25T                         | Adjustable Settings are:<br>1200, 1600, 2000, 2500<br>A25RES25T1 |

### 4-Pole<sup>②</sup> High Interrupting Capacity 600 Volt Ac Rated 100 kAIC @ 480 Vac

|                   |            |            |   |   |                                                     |                                                                                   |                                                                  |
|-------------------|------------|------------|---|---|-----------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------|
| 1600 <sup>①</sup> | RDC416T33W | RDC416T32W | – | – | 800<br>1000<br>1200<br>1250<br>1400<br>1500<br>1600 | 16RES08T<br>16RES10T<br>16RES12T<br>16RES125T<br>16RES14T<br>16RES15T<br>16RES16T | Adjustable Settings are:<br>800, 1000, 1200, 1600<br>A16RES16T1  |
| 2000              | RDC420T33W | RDC420T32W | – | – | 1000<br>1200<br>1250<br>1400<br>1600<br>2000        | 20RES10T<br>20RES12T<br>20RES125T<br>20RES14T<br>20RES16T<br>20RES20T             | Adjustable Settings are:<br>1000, 1200, 1600, 2000<br>A20RES20T1 |
| 2500              | RDC425T33W | RDC425T32W | – | – | 1200<br>1250<br>1600<br>2000<br>2500                | 25RES12T<br>25RES125T<br>25RES16T<br>25RES20T<br>25RES25T                         | Adjustable Settings are:<br>1200, 1600, 2000, 2500<br>A25RES25T1 |

Instruction Leaflet/FRED Number 29C107 for Breaker; Number 29C883 for Digitrip 310 Trip Unit

① For SCR application use 2000 ampere frame.

② Unprotected right pole neutral. Add "P" to catalog number for 100% protected right pole neutral, i.e., "RDC416T33PW".

③ Add suffix "R" to breaker catalog number for ground fault remote indication compatibility.

## Series C® R-Frame

100% Rated Digitrip RMS 310 Electronic Circuit Breakers<sup>①</sup>

The NEC allows the breaker to be rated at 100% of its frame size in an assembly, provided that 90°C wire is applied at 75°C ampacity. Order as individual components: Breaker Frame (which includes Trip Unit) and Rating Plug.

|                                         |                                                                                                                                                                                                                                                                                                                                                                                      |     |      |       |                                   |                   |                                          |
|-----------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|------|-------|-----------------------------------|-------------------|------------------------------------------|
| Maximum Continuous Ampere Rating @ 40°C | Circuit Breaker Frame Only                                                                                                                                                                                                                                                                                                                                                           |     |      |       | Digitrip RMS 310 Rating Plug Only |                   |                                          |
|                                         | L – Adjustable Long Delay Pickup (By Adjustable Rating Plug)<br>S – Adjustable Short Delay Pickup with Fixed Short Delay Time (I <sup>2</sup> t Response) or Adjustable Short Delay Time (Flat Response)<br>I – Adjustable Instantaneous Pickup by Setting Short Delay Time to Instantaneous<br>G – Adjustable Ground Fault Pickup with Adjustable Ground Fault Time (Flat Response) |     |      |       | Ampere Rating                     | Fixed Rating Plug | Adjustable Rating Plug                   |
|                                         |                                                                                                                                                                                                                                                                                                                                                                                      |     |      |       |                                   |                   | Adjustable Ampere Ratings Catalog Number |
|                                         |                                                                                                                                                                                                                                                                                                                                                                                      |     |      |       |                                   |                   |                                          |
|                                         |                                                                                                                                                                                                                                                                                                                                                                                      |     |      |       |                                   |                   |                                          |
| LS                                      |                                                                                                                                                                                                                                                                                                                                                                                      | LSI | LSG③ | LSIG③ |                                   |                   |                                          |
| Catalog Number                          |                                                                                                                                                                                                                                                                                                                                                                                      |     |      |       |                                   |                   |                                          |

## 3-Pole Standard Interrupting Capacity 600 Volt Ac Rated 65 kAIC @ 480 Vac

|                   |            |            |            |            |                                                     |                                                                                   |                                                                         |
|-------------------|------------|------------|------------|------------|-----------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------|
| 1600 <sup>②</sup> | CRD316T33W | CRD316T32W | CRD316T35W | CRD316T36W | 800<br>1000<br>1200<br>1250<br>1400<br>1500<br>1600 | 16RES08T<br>16RES10T<br>16RES12T<br>16RES125T<br>16RES14T<br>16RES15T<br>16RES16T | Adjustable Settings are:<br>800, 1000, 1200, 1600<br><b>A16RES16T1</b>  |
| 2000              | CRD320T33W | CRD320T32W | CRD320T35W | CRD320T36W | 1000<br>1200<br>1250<br>1400<br>1600<br>2000        | 20RES10T<br>20RES12T<br>20RES125T<br>20RES14T<br>20RES16T<br>20RES20T             | Adjustable Settings are:<br>1000, 1200, 1600, 2000<br><b>A20RES20T1</b> |

## 3-Pole High Interrupting Capacity 600 Volt Ac Rated 100 kAIC @ 480 Vac

|                    |             |             |             |             |                                                     |                                                                                   |                                                                         |
|--------------------|-------------|-------------|-------------|-------------|-----------------------------------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------|
| 1600 <sup>①②</sup> | CRDC316T33W | CRDC316T32W | CRDC316T35W | CRDC316T36W | 800<br>1000<br>1200<br>1250<br>1400<br>1500<br>1600 | 16RES08T<br>16RES10T<br>16RES12T<br>16RES125T<br>16RES14T<br>16RES15T<br>16RES16T | Adjustable Settings are:<br>800, 1000, 1200, 1600<br><b>A16RES16T1</b>  |
| 2000               | CRDC320T33W | CRDC320T32W | CRDC320T35W | CRDC320T36W | 1000<br>1200<br>1250<br>1400<br>1600<br>2000        | 20RES10T<br>20RES12T<br>20RES125T<br>20RES14T<br>20RES16T<br>20RES20T             | Adjustable Settings are:<br>1000, 1200, 1600, 2000<br><b>A20RES20T1</b> |

Instruction Leaflet/FRED Number 29C107 for Breaker; Number 29C883 for Digitrip 310 Trip Unit

- <sup>①</sup> Includes B2016RDL rear connections.  
Refer to TD.29.02.T.E for dimensions.
- <sup>②</sup> For SCR application use 2000 ampere frame.
- <sup>③</sup> Add suffix "R" to breaker catalog number for ground fault remote indication compatibility.



# Molded Case Circuit Breaker 800-2500 Amperes

Cutler-Hammer

March 1999

## Series C® R-Frame

## Digitrip RMS 510 Electronic Circuit Breakers with Interchangeable Rating Plugs

Order as individual components: Breaker Frame (which includes Trip Unit) and Rating Plug.

| Maximum Continuous Ampere Rating @ 40°C | Circuit Breaker Frame Only                                                                                                                                                                                                                                                                                                                            |    |     |     |     |      | Digitrip Rating Plug Only       |                |
|-----------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|-----|-----|-----|------|---------------------------------|----------------|
|                                         | L – Adjustable Long Delay Pickup (I <sub>L</sub> ) with Adjustable Long Delay Time<br>S – Adjustable Short Delay Pickup with Adjustable Short Delay Time (I <sup>2</sup> t or Flat Response)<br>I – Adjustable Instantaneous Pickup<br>G – Adjustable Ground Fault Pickup with Adjustable Ground Fault Time Delay (I <sup>2</sup> t or Flat Response) |    |     |     |     |      | Fixed Rating Plug               |                |
|                                         |                                                                                                                                                                                                                                                                                                                                                       |    |     |     |     |      | Rated Current (I <sub>n</sub> ) | Catalog Number |
|                                         |                                                                                                                                                                                                                                                                                                                                                       |    |     |     |     |      |                                 |                |
|                                         |                                                                                                                                                                                                                                                                                                                                                       |    |     |     |     |      |                                 |                |
|                                         | LI                                                                                                                                                                                                                                                                                                                                                    | LS | LSI | LIG | LSG | LSIG |                                 |                |
| Catalog Number                          |                                                                                                                                                                                                                                                                                                                                                       |    |     |     |     |      |                                 |                |

### 3-Pole Standard Interrupting Capacity 600 Volt Ac Rated 65 kAIC @ 480 Vac

|      |           |           |           |           |           |           |                              |                                                      |
|------|-----------|-----------|-----------|-----------|-----------|-----------|------------------------------|------------------------------------------------------|
| 1600 | RD316T51W | RD316T53W | RD316T52W | RD316T54W | RD316T55W | RD316T56W | 800<br>1000<br>1200<br>1600  | RP6R16A080<br>RP6R16A100<br>RP6R16A120<br>RP6R16A160 |
| 2000 | RD320T51W | RD320T53W | RD320T52W | RD320T54W | RD320T55W | RD320T56W | 1000<br>1200<br>1600<br>2000 | RP6R20A100<br>RP6R20A120<br>RP6R20A160<br>RP6R20A200 |
| 2500 | RD325T51W | RD325T53W | RD325T52W | RD325T54W | RD325T55W | RD325T56W | 1600<br>2000<br>2500         | RP6R25A160<br>RP6R25A200<br>RP6R25A250               |

### 3-Pole High Interrupting Capacity 600 Volt Ac Rated 100 kAIC @ 480 Vac

|      |            |            |            |            |            |            |                              |                                                      |
|------|------------|------------|------------|------------|------------|------------|------------------------------|------------------------------------------------------|
| 1600 | RDC316T51W | RDC316T53W | RDC316T52W | RDC316T54W | RDC316T55W | RDC316T56W | 800<br>1000<br>1200<br>1600  | RP6R16A080<br>RP6R16A100<br>RP6R16A120<br>RP6R16A160 |
| 2000 | RDC320T51W | RDC320T53W | RDC320T52W | RDC320T54W | RDC320T55W | RDC320T56W | 1000<br>1200<br>1600<br>2000 | RP6R20A100<br>RP6R20A120<br>RP6R20A160<br>RP6R20A200 |
| 2500 | RDC325T51W | RDC325T53W | RDC325T52W | RDC325T54W | RDC325T55W | RDC325T56W | 1600<br>2000<br>2500         | RP6R25A160<br>RP6R25A200<br>RP6R25A250               |

Instruction Leaflet/FRED Number 29C107 for Breaker; Number 29C885 for Digitrip 510 Trip Unit

## Series C® R-Frame

## 100% Rated Digitrip RMS 510 Circuit Breakers

The NEC allows the breaker to be rated at 100% of its frame size in an assembly, provided that 90°C wire is applied at 75°C ampacity. Order as individual components: Breaker Frame (which includes Trip Unit) and Rating Plug.

| Maximum Continuous Ampere Rating @ 40°C | Circuit Breaker Frame Only                                                                                                                                                                                                                                                                                                  |    |     |     |     |      | Digitrip Rating Plug Only |                |
|-----------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|-----|-----|-----|------|---------------------------|----------------|
|                                         | L – Adjustable Long Delay Pickup ( $I_L$ ) with Adjustable Long Delay Time<br>S – Adjustable Short Delay Pickup with Adjustable Short Delay Time ( $I^2t$ or Flat Response)<br>I – Adjustable Instantaneous Pickup<br>G – Adjustable Ground Fault Pickup with Adjustable Ground Fault Time Delay ( $I^2t$ or Flat Response) |    |     |     |     |      | Fixed Rating Plug         |                |
|                                         |                                                                                                                                                                                                                                                                                                                             |    |     |     |     |      | Rated Current ( $I_n$ )   | Catalog Number |
|                                         |                                                                                                                                                                                                                                                                                                                             |    |     |     |     |      |                           |                |
|                                         | LI                                                                                                                                                                                                                                                                                                                          | LS | LSI | LIG | LSG | LSIG |                           |                |
|                                         | Catalog Number                                                                                                                                                                                                                                                                                                              |    |     |     |     |      |                           |                |

## 3-Pole Standard Interrupting Capacity 600 Volt Ac Rated 65 kAIC @ 480 Vac

|      |            |            |            |            |            |            |                              |                                                      |
|------|------------|------------|------------|------------|------------|------------|------------------------------|------------------------------------------------------|
| 1600 | CRD316T51W | CRD316T53W | CRD316T52W | CRD316T54W | CRD316T55W | CRD316T56W | 800<br>1000<br>1200<br>1600  | RP6R16A080<br>RP6R16A100<br>RP6R16A120<br>RP6R16A160 |
| 2000 | CRD320T51W | CRD320T53W | CRD320T52W | CRD320T54W | CRD320T55W | CRD320T56W | 1000<br>1200<br>1600<br>2000 | RP6R20A100<br>RP6R20A120<br>RP6R20A160<br>RP6R20A200 |

## 3-Pole High Interrupting Capacity 600 Volt Ac Rated 100 kAIC @ 480 Vac

|      |             |             |             |             |             |             |                              |                                                      |
|------|-------------|-------------|-------------|-------------|-------------|-------------|------------------------------|------------------------------------------------------|
| 1600 | CRDC316T51W | CRDC316T53W | CRDC316T52W | CRDC316T54W | CRDC316T55W | CRDC316T56W | 800<br>1000<br>1200<br>1600  | RP6R16A080<br>RP6R16A100<br>RP6R16A120<br>RP6R16A160 |
| 2000 | CRDC320T51W | CRDC320T53W | CRDC320T52W | CRDC320T54W | CRDC320T55W | CRDC320T56W | 1000<br>1200<br>1600<br>2000 | RP6R20A100<br>RP6R20A120<br>RP6R20A160<br>RP6R20A200 |

Instruction Leaflet/FRED Number 29C107 for Breaker; Number 29885 for Digitrip 510 Trip Unit

# Molded Case Circuit Breakers 800-2500 Amperes

Cutler-Hammer

March 1999

## Series C® R-Frame

## Digitrip RMS 610 Electronic Circuit Breakers with Interchangeable Rating Plugs

Order as individual components: Breaker Frame (which includes Trip Unit) and Rating Plug.

| Maximum Continuous Ampere Rating @ 40°C | Circuit Breaker Frame Only                                                                                                                                                                                                                                                                                                                            |    |     |     |     |      | Digitrip Rating Plug Only       |                |
|-----------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|-----|-----|-----|------|---------------------------------|----------------|
|                                         | L – Adjustable Long Delay Pickup (I <sub>L</sub> ) with Adjustable Long Delay Time<br>S – Adjustable Short Delay Pickup with Adjustable Short Delay Time (I <sup>2</sup> t or Flat Response)<br>I – Adjustable Instantaneous Pickup<br>G – Adjustable Ground Fault Pickup with Adjustable Ground Fault Time Delay (I <sup>2</sup> t or Flat Response) |    |     |     |     |      | Fixed Rating Plug               |                |
|                                         |                                                                                                                                                                                                                                                                                                                                                       |    |     |     |     |      | Rated Current (I <sub>n</sub> ) | Catalog Number |
|                                         |                                                                                                                                                                                                                                                                                                                                                       |    |     |     |     |      |                                 |                |
|                                         |                                                                                                                                                                                                                                                                                                                                                       |    |     |     |     |      |                                 |                |
|                                         | LI                                                                                                                                                                                                                                                                                                                                                    | LS | LSI | LIG | LSG | LSIG |                                 |                |
| Catalog Number                          |                                                                                                                                                                                                                                                                                                                                                       |    |     |     |     |      |                                 |                |

### 3-Pole Standard Interrupting Capacity 600 Volt Ac Rated 65 kAIC @ 480 Vac

|      |           |           |           |           |           |           |                              |                                                      |
|------|-----------|-----------|-----------|-----------|-----------|-----------|------------------------------|------------------------------------------------------|
| 1600 | RD316T61W | RD316T63W | RD316T62W | RD316T64W | RD316T65W | RD316T66W | 800<br>1000<br>1200<br>1600  | RP6R16A080<br>RP6R16A100<br>RP6R16A120<br>RP6R16A160 |
| 2000 | RD320T61W | RD320T63W | RD320T62W | RD320T64W | RD320T65W | RD320T66W | 1000<br>1200<br>1600<br>2000 | RP6R20A100<br>RP6R20A120<br>RP6R20A160<br>RP6R20A200 |
| 2500 | RD325T61W | RD325T63W | RD325T62W | RD325T64W | RD325T65W | RD325T66W | 1600<br>2000<br>2500         | RP6R25A160<br>RP6R25A200<br>RP6R25A250               |

### 3-Pole High Interrupting Capacity 600 Volt Ac Rated 100 kAIC @ 480 Vac

|      |            |            |            |            |            |            |                              |                                                      |
|------|------------|------------|------------|------------|------------|------------|------------------------------|------------------------------------------------------|
| 1600 | RDC316T61W | RDC316T63W | RDC316T62W | RDC316T64W | RDC316T65W | RDC316T66W | 800<br>1000<br>1200<br>1600  | RP6R16A080<br>RP6R16A100<br>RP6R16A120<br>RP6R16A160 |
| 2000 | RDC320T61W | RDC320T63W | RDC320T62W | RDC320T64W | RDC320T65W | RDC320T66W | 1000<br>1200<br>1600<br>2000 | RP6R20A100<br>RP6R20A120<br>RP6R20A160<br>RP6R20A200 |
| 2500 | RDC325T61W | RDC325T63W | RDC325T62W | RDC325T64W | RDC325T65W | RDC325T66W | 1600<br>2000<br>2500         | RP6R25A160<br>RP6R25A200<br>RP6R25A250               |

Instruction Leaflet/FRED Number 29C107 for Breaker; Number 29886 for Digitrip 610 Trip Unit

## Series C® R-Frame

## 100% Rated Digitrip RMS 610 Circuit Breakers

The NEC allows the breaker to be rated at 100% of its frame size in an assembly, provided that 90°C wire is applied at 75°C ampacity. Order as individual components: Breaker Frame (which includes Trip Unit) and Rating Plug.

|                                         |                                                                                                                                                                                                                                                                                                                                                       |    |     |     |     |      |                                 |                |
|-----------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|-----|-----|-----|------|---------------------------------|----------------|
| Maximum Continuous Ampere Rating @ 40°C | Circuit Breaker Frame Only                                                                                                                                                                                                                                                                                                                            |    |     |     |     |      | Digitrip Rating Plug Only       |                |
|                                         | L – Adjustable Long Delay Pickup (I <sub>L</sub> ) with Adjustable Long Delay Time<br>S – Adjustable Short Delay Pickup with Adjustable Short Delay Time (I <sup>2</sup> t or Flat Response)<br>I – Adjustable Instantaneous Pickup<br>G – Adjustable Ground Fault Pickup with Adjustable Ground Fault Time Delay (I <sup>2</sup> t or Flat Response) |    |     |     |     |      | Fixed Rating Plug               |                |
|                                         |                                                                                                                                                                                                                                                                                                                                                       |    |     |     |     |      | Rated Current (I <sub>n</sub> ) | Catalog Number |
|                                         |                                                                                                                                                                                                                                                                                                                                                       |    |     |     |     |      |                                 |                |
|                                         |                                                                                                                                                                                                                                                                                                                                                       |    |     |     |     |      |                                 |                |
|                                         | LI                                                                                                                                                                                                                                                                                                                                                    | LS | LSI | LIG | LSG | LSIG |                                 |                |
| Catalog Number                          |                                                                                                                                                                                                                                                                                                                                                       |    |     |     |     |      |                                 |                |

## 3-Pole Standard Interrupting Capacity 600 Volt Ac Rated 65 kAIC @ 480 Vac

|      |            |            |            |            |            |            |                              |                                                      |
|------|------------|------------|------------|------------|------------|------------|------------------------------|------------------------------------------------------|
| 1600 | CRD316T61W | CRD316T63W | CRD316T62W | CRD316T64W | CRD316T65W | CRD316T66W | 800<br>1000<br>1200<br>1600  | RP6R16A080<br>RP6R16A100<br>RP6R16A120<br>RP6R16A160 |
| 2000 | CRD320T61W | CRD320T63W | CRD320T62W | CRD320T64W | CRD320T65W | CRD320T66W | 1000<br>1200<br>1600<br>2000 | RP6R20A100<br>RP6R20A120<br>RP6R20A160<br>RP6R20A200 |

## 3-Pole High Interrupting Capacity 600 Volt Ac Rated 100 kAIC @ 480 Vac

|      |             |             |             |             |             |             |                              |                                                      |
|------|-------------|-------------|-------------|-------------|-------------|-------------|------------------------------|------------------------------------------------------|
| 1600 | CRDC316T61W | CRDC316T63W | CRDC316T62W | CRDC316T64W | CRDC316T65W | CRDC316T66W | 800<br>1000<br>1200<br>1600  | RP6R16A080<br>RP6R16A100<br>RP6R16A120<br>RP6R16A160 |
| 2000 | CRDC320T61W | CRDC320T63W | CRDC320T62W | CRDC320T64W | CRDC320T65W | CRDC320T66W | 1000<br>1200<br>1600<br>2000 | RP6R20A100<br>RP6R20A120<br>RP6R20A160<br>RP6R20A200 |

Instruction Leaflet/FRED Number 29C107 for Breaker; Number 29886 for Digitrip 610 Trip Unit

# Molded Case Circuit Breakers

## 800-2500 Amperes

Cutler-Hammer

March 1999

## Series C® R-Frame

### Digitrip RMS 810 Electronic Circuit Breakers with Interchangeable Rating Plugs

Order as individual components: Breaker Frame (which includes Trip Unit) and Rating Plug.

| Maximum Continuous Ampere Rating @ 40°C | Circuit Breaker Frame Only                                                                                                                                                                                                                                                                                                  |    |     |     |     |      | Digitrip Rating Plug Only |                |
|-----------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|-----|-----|-----|------|---------------------------|----------------|
|                                         | L – Adjustable Long Delay Pickup ( $I_L$ ) with Adjustable Long Delay Time<br>S – Adjustable Short Delay Pickup with Adjustable Short Delay Time ( $I^2t$ or Flat Response)<br>I – Adjustable Instantaneous Pickup<br>G – Adjustable Ground Fault Pickup with Adjustable Ground Fault Time Delay ( $I^2t$ or Flat Response) |    |     |     |     |      | Fixed Rating Plug         |                |
|                                         |                                                                                                                                                                                                                                                                                                                             |    |     |     |     |      | Rated Current ( $I_n$ )   | Catalog Number |
|                                         |                                                                                                                                                                                                                                                                                                                             |    |     |     |     |      |                           |                |
|                                         | LI                                                                                                                                                                                                                                                                                                                          | LS | LSI | LIG | LSG | LSIG |                           |                |
|                                         | Catalog Number                                                                                                                                                                                                                                                                                                              |    |     |     |     |      |                           |                |

#### 3-Pole Standard Interrupting Capacity 600 Volt Ac Rated 65 kAIC @ 480 Vac

|      |           |           |           |           |           |           |                              |                                                      |
|------|-----------|-----------|-----------|-----------|-----------|-----------|------------------------------|------------------------------------------------------|
| 1600 | RD316T81W | RD316T83W | RD316T82W | RD316T84W | RD316T85W | RD316T86W | 800<br>1000<br>1200<br>1600  | RP6R16A080<br>RP6R16A100<br>RP6R16A120<br>RP6R16A160 |
| 2000 | RD320T81W | RD320T83W | RD320T82W | RD320T84W | RD320T85W | RD320T86W | 1000<br>1200<br>1600<br>2000 | RP6R20A100<br>RP6R20A120<br>RP6R20A160<br>RP6R20A200 |
| 2500 | RD325T81W | RD325T83W | RD325T82W | RD325T84W | RD325T85W | RD325T86W | 1600<br>2000<br>2500         | RP6R25A160<br>RP6R25A200<br>RP6R25A250               |

#### 3-Pole High Interrupting Capacity 600 Volt Ac Rated 100 kAIC @ 480 Vac

|      |            |            |            |            |            |            |                              |                                                      |
|------|------------|------------|------------|------------|------------|------------|------------------------------|------------------------------------------------------|
| 1600 | RDC316T81W | RDC316T83W | RDC316T82W | RDC316T84W | RDC316T85W | RDC316T86W | 800<br>1000<br>1200<br>1600  | RP6R16A080<br>RP6R16A100<br>RP6R16A120<br>RP6R16A160 |
| 2000 | RDC320T81W | RDC320T83W | RDC320T82W | RDC320T84W | RDC320T85W | RDC320T86W | 1000<br>1200<br>1600<br>2000 | RP6R20A100<br>RP6R20A120<br>RP6R20A160<br>RP6R20A200 |
| 2500 | RDC325T81W | RDC325T83W | RDC325T82W | RDC325T84W | RDC325T85W | RDC325T86W | 1600<br>2000<br>2500         | RP6R25A160<br>RP6R25A200<br>RP6R25A250               |

Instruction Leaflet/FRED Number 29C107 for Breaker; Number 29888 for Digitrip 810 Trip Unit

## Series C® R-Frame

## 100% Rated Digitrip RMS 810 Circuit Breakers

The NEC allows the breaker to be rated at 100% of its frame size in an assembly, provided that 90°C wire is applied at 75°C ampacity. Order as individual components: Breaker Frame (which includes Trip Unit) and Rating Plug.

|                                         |                                                                                                                                                                                                                                                                                                                                                       |    |     |     |     |      |                                 |                |
|-----------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|-----|-----|-----|------|---------------------------------|----------------|
| Maximum Continuous Ampere Rating @ 40°C | Circuit Breaker Frame Only                                                                                                                                                                                                                                                                                                                            |    |     |     |     |      | Digitrip Rating Plug Only       |                |
|                                         | L – Adjustable Long Delay Pickup (I <sub>L</sub> ) with Adjustable Long Delay Time<br>S – Adjustable Short Delay Pickup with Adjustable Short Delay Time (I <sup>2</sup> t or Flat Response)<br>I – Adjustable Instantaneous Pickup<br>G – Adjustable Ground Fault Pickup with Adjustable Ground Fault Time Delay (I <sup>2</sup> t or Flat Response) |    |     |     |     |      | Fixed Rating Plug               |                |
|                                         |                                                                                                                                                                                                                                                                                                                                                       |    |     |     |     |      | Rated Current (I <sub>n</sub> ) | Catalog Number |
|                                         |                                                                                                                                                                                                                                                                                                                                                       |    |     |     |     |      |                                 |                |
|                                         |                                                                                                                                                                                                                                                                                                                                                       |    |     |     |     |      |                                 |                |
|                                         | LI                                                                                                                                                                                                                                                                                                                                                    | LS | LSI | LIG | LSG | LSIG |                                 |                |
| Catalog Number                          |                                                                                                                                                                                                                                                                                                                                                       |    |     |     |     |      |                                 |                |

## 3-Pole Standard Interrupting Capacity 600 Volt Ac Rated 65 kAIC @ 480 Vac

|      |            |            |            |            |            |            |                              |                                                      |
|------|------------|------------|------------|------------|------------|------------|------------------------------|------------------------------------------------------|
| 1600 | CRD316T81W | CRD316T83W | CRD316T82W | CRD316T84W | CRD316T85W | CRD316T86W | 800<br>1000<br>1200<br>1600  | RP6R16A080<br>RP6R16A100<br>RP6R16A120<br>RP6R16A160 |
| 2000 | CRD320T81W | CRD320T83W | CRD320T82W | CRD320T84W | CRD320T85W | CRD320T86W | 1000<br>1200<br>1600<br>2000 | RP6R20A100<br>RP6R20A120<br>RP6R20A160<br>RP6R20A200 |

## 3-Pole High Interrupting Capacity 600 Volt Ac Rated 100 kAIC @ 480 Vac

|      |             |             |             |             |             |             |                              |                                                      |
|------|-------------|-------------|-------------|-------------|-------------|-------------|------------------------------|------------------------------------------------------|
| 1600 | CRDC316T81W | CRDC316T83W | CRDC316T82W | CRDC316T84W | CRDC316T85W | CRDC316T86W | 800<br>1000<br>1200<br>1600  | RP6R16A080<br>RP6R16A100<br>RP6R16A120<br>RP6R16A160 |
| 2000 | CRDC320T81W | CRDC320T83W | CRDC320T82W | CRDC320T84W | CRDC320T85W | CRDC320T86W | 1000<br>1200<br>1600<br>2000 | RP6R20A100<br>RP6R20A120<br>RP6R20A160<br>RP6R20A200 |

Instruction Leaflet/FRED Number 29C107 for Breaker; Number 29888 for Digitrip 810 Trip Unit

## Series C® R-Frame

### Digitrip RMS 910 Electronic Circuit Breakers with Interchangeable Rating Plugs

Order as individual components: Breaker Frame (which includes Trip Unit) and Rating Plug.

| Maximum Continuous Ampere Rating @ 40°C | Circuit Breaker Frame Only                                                                                                                                                                                                                                                                                                  |    |     |     |     |      | Digitrip Rating Plug Only |                |
|-----------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|-----|-----|-----|------|---------------------------|----------------|
|                                         | L – Adjustable Long Delay Pickup ( $I_L$ ) with Adjustable Long Delay Time<br>S – Adjustable Short Delay Pickup with Adjustable Short Delay Time ( $I^2t$ or Flat Response)<br>I – Adjustable Instantaneous Pickup<br>G – Adjustable Ground Fault Pickup with Adjustable Ground Fault Time Delay ( $I^2t$ or Flat Response) |    |     |     |     |      | Fixed Rating Plug         |                |
|                                         |                                                                                                                                                                                                                                                                                                                             |    |     |     |     |      | Rated Current ( $I_n$ )   | Catalog Number |
|                                         |                                                                                                                                                                                                                                                                                                                             |    |     |     |     |      |                           |                |
|                                         | LI                                                                                                                                                                                                                                                                                                                          | LS | LSI | LIG | LSG | LSIG |                           |                |
|                                         | Catalog Number                                                                                                                                                                                                                                                                                                              |    |     |     |     |      |                           |                |

#### 3-Pole Standard Interrupting Capacity 600 Volt Ac Rated 65 kAIC @ 480 Vac

|      |           |           |           |           |           |           |                              |                                                      |
|------|-----------|-----------|-----------|-----------|-----------|-----------|------------------------------|------------------------------------------------------|
| 1600 | RD316T91W | RD316T93W | RD316T92W | RD316T94W | RD316T95W | RD316T96W | 800<br>1000<br>1200<br>1600  | RP6R16A080<br>RP6R16A100<br>RP6R16A120<br>RP6R16A160 |
| 2000 | RD320T91W | RD320T93W | RD320T92W | RD320T94W | RD320T95W | RD320T96W | 1000<br>1200<br>1600<br>2000 | RP6R20A100<br>RP6R20A120<br>RP6R20A160<br>RP6R20A200 |
| 2500 | RD325T91W | RD325T93W | RD325T92W | RD325T94W | RD325T95W | RD325T96W | 1600<br>2000<br>2500         | RP6R25A160<br>RP6R25A200<br>RP6R25A250               |

#### 3-Pole High Interrupting Capacity 600 Volt Ac Rated 100 kAIC @ 480 Vac

|      |            |            |            |            |            |            |                              |                                                      |
|------|------------|------------|------------|------------|------------|------------|------------------------------|------------------------------------------------------|
| 1600 | RDC316T91W | RDC316T93W | RDC316T92W | RDC316T94W | RDC316T95W | RDC316T96W | 800<br>1000<br>1200<br>1600  | RP6R16A080<br>RP6R16A100<br>RP6R16A120<br>RP6R16A160 |
| 2000 | RDC320T91W | RDC320T93W | RDC320T92W | RDC320T94W | RDC320T95W | RDC320T96W | 1000<br>1200<br>1600<br>2000 | RP6R20A100<br>RP6R20A120<br>RP6R20A160<br>RP6R20A200 |
| 2500 | RDC325T91W | RDC325T93W | RDC325T92W | RDC325T94W | RDC325T95W | RDC325T96W | 1600<br>2000<br>2500         | RP6R25A160<br>RP6R25A200<br>RP6R25A250               |

Instruction Leaflet/FRED Number 29C107 for Breaker; Number 29889 for Digitrip 910 Trip Unit

## Series C® R-Frame

## 100% Rated Digitrip RMS 910 Circuit Breakers

The NEC allows the breaker to be rated at 100% of its frame size in an assembly, provided that 90°C wire is applied at 75°C ampacity. Order as individual components: Breaker Frame (which includes Trip Unit) and Rating Plug.

|                                         |                                                                                                                                                                                                                                                                                                                                                       |    |     |     |     |      |                                 |                |
|-----------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|-----|-----|-----|------|---------------------------------|----------------|
| Maximum Continuous Ampere Rating @ 40°C | Circuit Breaker Frame Only                                                                                                                                                                                                                                                                                                                            |    |     |     |     |      | Digitrip Rating Plug Only       |                |
|                                         | L – Adjustable Long Delay Pickup (I <sub>L</sub> ) with Adjustable Long Delay Time<br>S – Adjustable Short Delay Pickup with Adjustable Short Delay Time (I <sup>2</sup> t or Flat Response)<br>I – Adjustable Instantaneous Pickup<br>G – Adjustable Ground Fault Pickup with Adjustable Ground Fault Time Delay (I <sup>2</sup> t or Flat Response) |    |     |     |     |      | Fixed Rating Plug               |                |
|                                         |                                                                                                                                                                                                                                                                                                                                                       |    |     |     |     |      | Rated Current (I <sub>n</sub> ) | Catalog Number |
|                                         |                                                                                                                                                                                                                                                                                                                                                       |    |     |     |     |      |                                 |                |
|                                         |                                                                                                                                                                                                                                                                                                                                                       |    |     |     |     |      |                                 |                |
|                                         | LI                                                                                                                                                                                                                                                                                                                                                    | LS | LSI | LIG | LSG | LSIG |                                 |                |
| Catalog Number                          |                                                                                                                                                                                                                                                                                                                                                       |    |     |     |     |      |                                 |                |

## 3-Pole Standard Interrupting Capacity 600 Volt Ac Rated 65 kAIC @ 480 Vac

|      |            |            |            |            |            |            |                              |                                                      |
|------|------------|------------|------------|------------|------------|------------|------------------------------|------------------------------------------------------|
| 1600 | CRD316T91W | CRD316T93W | CRD316T92W | CRD316T94W | CRD316T95W | CRD316T96W | 800<br>1000<br>1200<br>1600  | RP6R16A080<br>RP6R16A100<br>RP6R16A120<br>RP6R16A160 |
| 2000 | CRD320T91W | CRD320T93W | CRD320T92W | CRD320T94W | CRD320T95W | CRD320T96W | 1000<br>1200<br>1600<br>2000 | RP6R20A100<br>RP6R20A120<br>RP6R20A160<br>RP6R20A200 |

## 3-Pole High Interrupting Capacity 600 Volt Ac Rated 100 kAIC @ 480 Vac

|      |             |             |             |             |             |             |                              |                                                      |
|------|-------------|-------------|-------------|-------------|-------------|-------------|------------------------------|------------------------------------------------------|
| 1600 | CRDC316T91W | CRDC316T93W | CRDC316T92W | CRDC316T94W | CRDC316T95W | CRDC316T96W | 800<br>1000<br>1200<br>1600  | RP6R16A080<br>RP6R16A100<br>RP6R16A120<br>RP6R16A160 |
| 2000 | CRDC320T91W | CRDC320T93W | CRDC320T92W | CRDC320T94W | CRDC320T95W | CRDC320T96W | 1000<br>1200<br>1600<br>2000 | RP6R20A100<br>RP6R20A120<br>RP6R20A160<br>RP6R20A200 |

Instruction Leaflet/FRED Number 29C107 for Breaker; Number 29889 for Digitrip 910 Trip Unit



# Molded Case Circuit Breakers 800-2500 Amperes

Cutler-Hammer

March 1999

## Series C® R-Frame

## Digitrip OPTIM Electronic Circuit Breakers with Interchangeable Rating Plugs

Order as individual components: Breaker Frame (which includes Trip Unit) and Rating Plug.

| Maximum Continuous Ampere Rating @ 40°C | Circuit Breaker Frame Only                                                                                                                                                                                                                                                                                                                                                                                                                                             |          |           |           | Digitrip OPTIM Rating Plug Only |                |
|-----------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|-----------|-----------|---------------------------------|----------------|
|                                         | L – Adjustable Long Delay Pickup (I <sub>L</sub> ) with Adjustable Long Delay Time<br>S – Adjustable Short Delay Pickup with Adjustable Short Delay Time (I <sup>2</sup> t or Flat Response)<br>I – Adjustable Instantaneous Pickup<br>G – Adjustable Ground Fault Pickup with Adjustable Ground Fault Time Delay (I <sup>2</sup> t or Flat Response)<br>A – Adjustable Ground Fault Alarm with Adjustable Ground Fault Time Delay (I <sup>2</sup> t or Flat Response) |          |           |           | Fixed Rating Plug               |                |
|                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |          |           |           | Ampere Rating                   | Catalog Number |
|                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |          |           |           |                                 |                |
|                                         | LSIA 750                                                                                                                                                                                                                                                                                                                                                                                                                                                               | LSIG 750 | LSIA 1050 | LSIG 1050 |                                 |                |
| Catalog Number                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |          |           |           |                                 |                |

### 3-Pole Standard Interrupting Capacity 600 Volt Ac Rated 65 kAIC @ 480 Vac

|      |           |           |            |            |                              |                                                      |
|------|-----------|-----------|------------|------------|------------------------------|------------------------------------------------------|
| 1600 | RD316T77W | RD316T76W | RD316T107W | RD316T106W | 800<br>1000<br>1200<br>1600  | ORPR16A080<br>ORPR16A100<br>ORPR16A120<br>ORPR16A160 |
| 2000 | RD320T77W | RD320T76W | RD320T107W | RD320T106W | 1000<br>1200<br>1600<br>2000 | ORPR20A100<br>ORPR20A120<br>ORPR20A160<br>ORPR20A200 |
| 2500 | RD325T77W | RD325T76W | RD325T107W | RD325T106W | 1600<br>2000<br>2500         | ORPR25A160<br>ORPR25A200<br>ORPR25A250               |

### 3-Pole High Interrupting Capacity 600 Volt Ac Rated 100 kAIC @ 480 Vac

|      |            |            |             |             |                              |                                                      |
|------|------------|------------|-------------|-------------|------------------------------|------------------------------------------------------|
| 1600 | RDC316T77W | RDC316T76W | RDC316T107W | RDC316T106W | 800<br>1000<br>1200<br>1600  | ORPR16A080<br>ORPR16A100<br>ORPR16A120<br>ORPR16A160 |
| 2000 | RDC320T77W | RDC320T76W | RDC320T107W | RDC320T106W | 1000<br>1200<br>1600<br>2000 | ORPR20A100<br>ORPR20A120<br>ORPR20A160<br>ORPR20A200 |
| 2500 | RDC325T77W | RDC325T76W | RDC325T107W | RDC325T106W | 1600<br>2000<br>2500         | ORPR25A160<br>ORPR25A200<br>ORPR25A250               |

Instruction Leaflet/FRED Number 29C107 for Breaker; Number 29C891 for OPTIM Trip Unit

## Series C® R-Frame

## 100% Rated 600 Volt AC Digitrip OPTIM Circuit Breakers with Interchangeable Rating Plugs

Order as individual components: Breaker Frame (which includes Trip Unit) and Rating Plug.

| Maximum Continuous Ampere Rating @ 40°C | Circuit Breaker Frame Only                                                                                                                                                                                                                                                                                                                                                                                                          |          |           |           | Digitrip OPTIM Rating Plug Only |                |
|-----------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|-----------|-----------|---------------------------------|----------------|
|                                         | L – Adjustable Long Delay Pickup ( $I_L$ ) with Adjustable Long Delay Time<br>S – Adjustable Short Delay Pickup with Adjustable Short Delay Time ( $I^2t$ or Flat Response)<br>I – Adjustable Instantaneous Pickup<br>G – Adjustable Ground Fault Pickup with Adjustable Ground Fault Time Delay ( $I^2t$ or Flat Response)<br>A – Adjustable Ground Fault Alarm with Adjustable Ground Fault Time Delay ( $I^2t$ or Flat Response) |          |           |           | Fixed Rating Plug               |                |
|                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                     |          |           |           | Ampere Rating                   | Catalog Number |
|                                         | LSIA 750                                                                                                                                                                                                                                                                                                                                                                                                                            | LSIG 750 | LSIA 1050 | LSIG 1050 |                                 |                |

## 3-Pole Standard Interrupting Capacity 600 Volt Ac Rated 65 kAIC @ 480 Vac

|      |            |            |             |             |                              |                                                      |
|------|------------|------------|-------------|-------------|------------------------------|------------------------------------------------------|
| 1600 | CRD316T77W | CRD316T76W | CRD316T107W | CRD316T106W | 800<br>1000<br>1200<br>1600  | ORPR16A080<br>ORPR16A100<br>ORPR16A120<br>ORPR16A160 |
| 2000 | CRD320T77W | CRD320T76W | CRD320T107W | CRD320T106W | 1000<br>1200<br>1600<br>2000 | ORPR20A100<br>ORPR20A120<br>ORPR20A160<br>ORPR20A200 |

## 3-Pole High Interrupting Capacity 600 Volt Ac Rated 100 kAIC @ 480 Vac

|      |             |             |              |              |                              |                                                      |
|------|-------------|-------------|--------------|--------------|------------------------------|------------------------------------------------------|
| 1600 | CRDC316T77W | CRDC316T76W | CRDC316T107W | CRDC316T106W | 800<br>1000<br>1200<br>1600  | ORPR16A080<br>ORPR16A100<br>ORPR16A120<br>ORPR16A160 |
| 2000 | CRDC320T77W | CRDC320T76W | CRDC320T107W | CRDC320T106W | 1000<br>1200<br>1600<br>2000 | ORPR20A100<br>ORPR20A120<br>ORPR20A160<br>ORPR20A200 |

Instruction Leaflet/FRED Number 29C107 for Breaker; Number 29C891 for OPTIM Trip Unit

## Series C® R-Frame

### Molded Case Switches

For UL listed, series tested molded case switch application data, refer to Cutler-Hammer.

| Continuous Ampere Rating @ 40°C | Complete without Terminals       |         |
|---------------------------------|----------------------------------|---------|
|                                 | 3-Pole                           | 4-Pole  |
|                                 | Catalog Number                   |         |
| 1600                            | Type RD – High Instantaneous (K) |         |
|                                 | RD316WK                          | RD416WK |
| 2000                            | Type RD – High Instantaneous (K) |         |
|                                 | RD320WK                          | RD420WK |
| 2500                            | Type RD – High Instantaneous (K) |         |
|                                 | —                                | —       |

**Note:** Molded case switch may trip above 17500 amperes.

Instruction Leaflet/FRED Number 29C106 for Molded Case Switch

### Line and Load Terminals

Line and load terminals provide wire connecting capabilities for specific ranges of continuous current ratings and wire types. All terminals comply with Underwriters Laboratories, Inc. Standards UL486A and UL486B and CSA C22.2 No. 65M. Unless otherwise specified, R-frame

circuit breaker line load terminals are shipped separately for field installation.

### Ordering Information

R-frame circuit breakers have Cu/Al terminals as standard and Cu only terminals as an option. Specify if factory installation is required.

### Line and Load Terminals

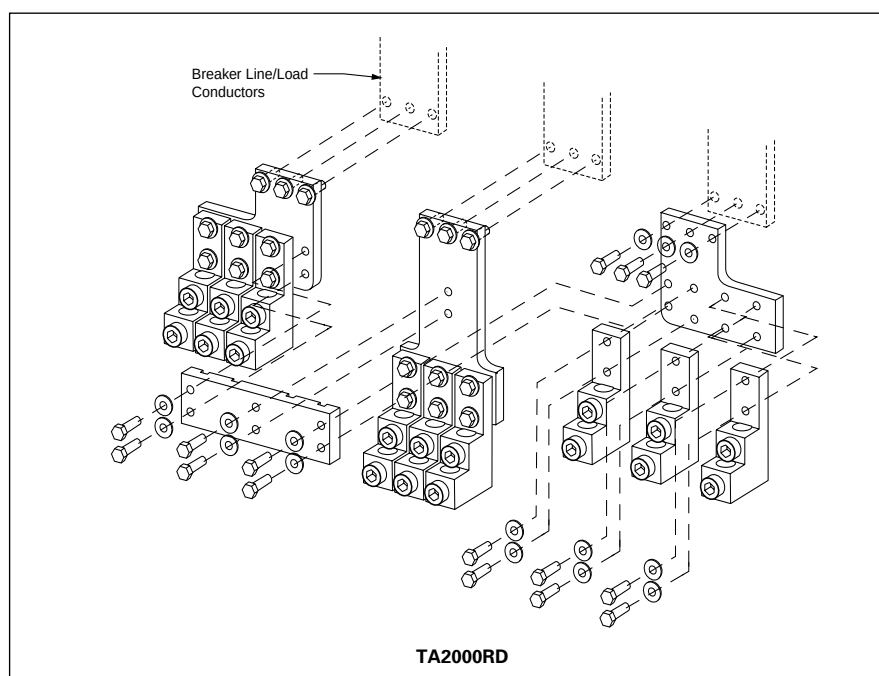
| Maximum Breaker Amperes | Terminal Body Material | Wire Type | Hardware | AWG/kcmil Wire Range/No. Conductors | Metric Wire Range mm <sup>2</sup> | Catalog Number        |
|-------------------------|------------------------|-----------|----------|-------------------------------------|-----------------------------------|-----------------------|
| 1600                    | Aluminum               | Cu/Al     | English  | 500-1000 (4)                        | 300-500                           | TA1600RD              |
| 1600                    | Copper                 | Cu        | English  | 1-600 (4)                           | 50-300                            | T1600RD               |
| 2000                    | Aluminum               | Cu/Al     | English  | 2-600 (6)                           | 35-300                            | TA2000RD <sup>①</sup> |

### Wire Terminals

|      |          |       |         |              |         |                       |
|------|----------|-------|---------|--------------|---------|-----------------------|
| 1600 | Aluminum | Cu/Al | English | 500-1000 (4) | 300-500 | TA1600RD              |
| 1600 | Copper   | Cu    | English | 1-600 (4)    | 50-300  | T1600RD               |
| 2000 | Aluminum | Cu/Al | English | 2-600 (6)    | 35-300  | TA2000RD <sup>①</sup> |

### Rear Connectors

|      |        |   |         |   |   |                       |
|------|--------|---|---------|---|---|-----------------------|
| 2000 | Copper | — | English | — | — | B2016RD               |
| 2000 | Copper | — | English | — | — | B2016RDL <sup>②</sup> |
| 2500 | Copper | — | English | — | — | B2500RD <sup>③</sup>  |



<sup>①</sup> Catalog number includes bus connection, terminals, and hardware for either line side or load side of 3-pole breaker.

<sup>②</sup> For use with 100% rated 1600A and 2000A frame. Do not order separately unless for replacement purposes. Is included in breaker carton when 100% rated device is ordered.

<sup>③</sup> For use with 2500-amp frame. Do not order separately unless for replacement purposes. Included in breaker carton when 2500A breaker is ordered.

## Catalog Numbering System

This information is presented only as an aid to understanding catalog numbers. It is not to be used to build catalog numbers for circuit breakers or trip units.

### Circuit Breaker/Frame Catalog Number

| Circuit Breaker/<br>Frame Type | Number of Poles | Circuit Breaker/<br>Frame Ampere Rating | Trip Type <sup>①</sup>         | Suffix                            |
|--------------------------------|-----------------|-----------------------------------------|--------------------------------|-----------------------------------|
| RD                             | 3: 3 Poles      | 16: 1600A                               | T32: Digitrip RMS 310 LSI      | W: Without Terminals              |
| RDC                            | 4: 4 Poles      | 20: 2000A                               | T53: Digitrip RMS 510 LS       | P: 100% Protected Neutral Pole    |
| CRD                            |                 | 25: 2500A                               | T65: Digitrip RMS 610 LSG      | R: Ground Fault Remote (310 Only) |
| CRDC                           |                 |                                         | T86: Digitrip RMS 810 LSIG     | K: Molded Case Switch             |
|                                |                 |                                         | T96: Digitrip RMS 910 LSIG     |                                   |
|                                |                 |                                         | T77: Digitrip OPTIM 750 LSIA   |                                   |
|                                |                 |                                         | T106: Digitrip OPTIM 1050 LSIG |                                   |

## Dimensions/Weights

### Dimensions, Inches (mm)

| Number of Poles | Width         | Height      | Depth         |
|-----------------|---------------|-------------|---------------|
| 3               | 15.5<br>(394) | 16<br>(406) | 9.75<br>(248) |
| 4               | 20<br>(508)   | 16<br>(406) | 9.75<br>(248) |

### Approximate Shipping Weight, Lbs. (kg)

| Breaker Type | Complete Breaker |   |
|--------------|------------------|---|
|              | Number of Poles  |   |
|              | 3                | 4 |

#### 1600A

|                    |                 |                 |
|--------------------|-----------------|-----------------|
| RD, CRD, RDC, CRDC | 102<br>(46.266) | 135<br>(61.235) |
|--------------------|-----------------|-----------------|

#### 2000A

|           |                 |                 |
|-----------|-----------------|-----------------|
| RD, RDC   | 102<br>(46.266) | 135<br>(61.235) |
| CRD, CRDC | 130<br>(58.967) | 175<br>(79.378) |

#### 2500A

|         |                 |                 |
|---------|-----------------|-----------------|
| RD, RDC | 135<br>(61.235) | 182<br>(82.553) |
|---------|-----------------|-----------------|

<sup>①</sup> For complete list of available trip types refer to pages 91 through 103.

## Series C® R-Frame

### Allowable Accessory Combinations

Different combinations of accessories can be supplied, depending on the types of accessories and the number of poles in the circuit breaker.

|                                | Reference Page | 3-Pole |        |       | 4-Pole |        |       |      |
|--------------------------------|----------------|--------|--------|-------|--------|--------|-------|------|
|                                |                | Left   | Center | Right | Left   | Center | Right | Neu. |
| Internal Accessories           |                |        |        |       |        |        |       |      |
| Alarm Lockout (Make/Break)     | 141            |        |        | ■     |        |        | ■     |      |
| Alarm Lockout (2Make/2Break)   | 141            |        |        | ■     |        |        | ■     |      |
| Auxiliary Switch (2A, 2B)      | 144            |        |        | ■     |        |        | ■     |      |
| Auxiliary Switch (4A, 4B)      | 144            |        |        | ■     |        |        | ■     |      |
| Shunt Trip – Standard          | 151            |        |        | ■     |        |        | ■     |      |
| Shunt Trip – Low Energy        | 152            |        |        | ■     |        |        | ■     |      |
| Undervoltage Release Mechanism | 159            |        |        | ■     |        |        | ■     |      |
| Accessory Terminal Block②      | 160            |        |        | ■     |        |        |       | ■    |

#### External Accessories

|                                                       |     |  |   |  |  |   |  |  |
|-------------------------------------------------------|-----|--|---|--|--|---|--|--|
| Base Mounting Hardware                                | 163 |  |   |  |  |   |  |  |
| Padlockable Handle Lock Hasp                          | 169 |  | ● |  |  | ● |  |  |
| Key Interlock Kit                                     | 170 |  | ■ |  |  | ■ |  |  |
| Walking Beam Interlock                                | 171 |  |   |  |  |   |  |  |
| Electrical (Motor) Operator                           | 173 |  | ■ |  |  | ■ |  |  |
| Drawout Cassette                                      | 164 |  | ● |  |  |   |  |  |
| Handle Mechanisms                                     | 178 |  | ■ |  |  | ■ |  |  |
| Handle Extension <sup>①</sup>                         | 182 |  | ■ |  |  | ■ |  |  |
| Solid-State (Electronic) Portable Test Kit (310 Only) | 184 |  | ● |  |  | ● |  |  |

#### OPTIM System Components

|                                 |     |  |   |  |  |  |  |  |
|---------------------------------|-----|--|---|--|--|--|--|--|
| Breaker Interface Module (BIM)  | 185 |  | ● |  |  |  |  |  |
| Digitrip OPTIMizer              | 185 |  | ● |  |  |  |  |  |
| Auxiliary Power Module          | 185 |  | ● |  |  |  |  |  |
| Cutler-Hammer PowerNet Software | 185 |  | ● |  |  |  |  |  |

#### Modifications (Refer to Cutler-Hammer)

|                                |     |  |   |  |  |  |   |  |
|--------------------------------|-----|--|---|--|--|--|---|--|
| Special Calibration            | 186 |  | ● |  |  |  | ● |  |
| Moisture Fungus Treatment      | 186 |  | ● |  |  |  | ● |  |
| Freeze-Tested Circuit Breakers | 186 |  | ● |  |  |  | ● |  |
| Marine Application             | 186 |  | ● |  |  |  | ● |  |

■ Applicable in indicated pole position

● Accessory available/Modification available

<sup>①</sup> Included with breaker.

<sup>②</sup> Mounts outside breaker.



Series C Motor Circuit Protectors

## General Information

Designated as the Cutler-Hammer Types GMCP, HMCP, the Series C instantaneous-only motor circuit protector (MCP) is available in ratings from 3A to 600A for motor starter sizes 0 through 6. The MCP is designed to comply with the applicable requirements of Underwriters Laboratories, Inc. Standard UL489, Canadian Standards Association Standard C22.2 No. 5, and International Electrotechnical Commission Recommendations IEC 157-1.

An innovative design of internal components allows higher MCP-starter combination interrupting ratings. The MCP is marked to permit proper electrical application within the assigned equipment ratings.

The MCP is a recognized component (UL File E7819) and complies with the applicable requirements of Underwriters Laboratories, Inc. Standard UL489. It is also designed to comply with the applicable requirements of Canadian Standards Association Standard C22.2 No. 5, International Electrotechnical Commission Recommendations IEC 157-1, and nameplates bear the CE marking.

## Catalog Numbering System

This information is presented only as an aid to understanding catalog numbers. It is not to be used to build catalog numbers for circuit breakers or trip units.

### Motor Circuit Protector Catalog Number

| HMCP                          | 003                      | A0                                    | C                                              |
|-------------------------------|--------------------------|---------------------------------------|------------------------------------------------|
| Motor Circuit Protective Type | Continuous Ampere Rating | Magnetic Trip Range/NEMA Starter Size | Suffix                                         |
| HMCP: 3 Poles                 | 003                      | A0: 9-30/0                            | C: Non-Aluminum                                |
| HM2P: 2 Poles <sup>①</sup>    | 007                      | C0: 21-70/0                           | Terminals                                      |
| HMCPs: 3 Poles                | 015                      | E0: 45-150/0                          | W: W/O Terminals                               |
|                               | 025                      | D0: 40-60/0                           | X: Load Terminals Only                         |
|                               | 030                      | H1: 90-300/1                          | Y: Line Terminals Only                         |
|                               | 050                      | G2: 80-120/2                          | S: Stainless Steel Terminals (150A Frame Only) |
|                               |                          | K2: 150-500/2                         | No Suffix: Standard                            |
|                               | 070                      | J2: 115-170/2                         | Terminals on Line                              |
|                               |                          | M2: 210-700/2                         | and Load                                       |
|                               | 100                      | L3: 160-240/3                         |                                                |
|                               |                          | R3: 300-1000/3                        |                                                |
|                               | 150                      | T4: 450-1500/4                        |                                                |
|                               |                          | U4: 750-2500/4                        |                                                |
|                               | 250                      | A5: 350-700/5                         |                                                |
|                               |                          | C5: 450-900/5                         |                                                |
|                               | 400                      | D5: 500-1000/5                        |                                                |
|                               |                          | F5: 625-1250/5                        |                                                |
|                               |                          | G5: 750-1500/5                        |                                                |
|                               |                          | J5: 875-1750/5                        |                                                |
|                               |                          | K5: 1000-2000/5                       |                                                |
|                               |                          | L5: 1125-2250/5                       |                                                |
|                               |                          | W5: 1250-2500/5                       |                                                |
|                               |                          | N5: 1500-3000/5                       |                                                |
|                               |                          | R5: 1750-3500/5                       |                                                |
|                               |                          | X5: 2000-4000/5                       |                                                |
|                               | 600                      | L6: 1800-6000/6 Electronic)           |                                                |

| GMCP                            | 003                      | A0                                    | C               |
|---------------------------------|--------------------------|---------------------------------------|-----------------|
| Motor Circuit Protective Device | Continuous Ampere Rating | Magnetic Trip Range/NEMA Starter Size | Suffix          |
| GMCP: 3 Poles                   | 003                      | A0: 15-30/0                           | C: Non-Aluminum |
|                                 | 007                      | C0: 35-70/0                           | Terminals       |
|                                 | 015                      | E0: 75-150/0                          |                 |
|                                 | 030                      | H1: 150-300/1                         |                 |
|                                 | 050                      | K2: 250-500/2                         |                 |
|                                 | 060                      | J2: 300-600/2                         |                 |
|                                 | 063                      | M2: 320-630/2                         |                 |

① On J- and K-Frame HMCPs only.

### G-Frame

480 Vac Maximum, 250 Vdc Maximum

| MCP Catalog Number | NEMA Starter Size | Continuous Amperes | Cam Setting | Motor Full Load Center Amperes <sup>⑤</sup> | MCP Trip Setting |
|--------------------|-------------------|--------------------|-------------|---------------------------------------------|------------------|
| GMCP003A0C         | 0                 | 3                  | A           | 1.1 - 1.2                                   | 15               |
|                    |                   |                    | B           | 1.3 - 1.5                                   | 18               |
|                    |                   |                    | C           | 1.6 - 1.7                                   | 21               |
|                    |                   |                    | D           | 1.8 - 1.9                                   | 24               |
|                    |                   |                    | E           | 2.0 - 2.2                                   | 27               |
|                    |                   |                    | F           | 2.3 - 2.5                                   | 30               |
| GMCP007C0C         | 0                 | 7                  | A           | 2.6 - 3.1                                   | 35               |
|                    |                   |                    | B           | 3.2 - 3.6                                   | 42               |
|                    |                   |                    | C           | 3.7 - 3.9                                   | 49               |
|                    |                   |                    | D           | 4.3 - 4.7                                   | 56               |
|                    |                   |                    | E           | 4.8 - 5.2                                   | 63               |
|                    |                   |                    | F           | 5.3 - 5.7                                   | 70               |
| GMCP015E0C         | 0                 | 15                 | A           | 5.7 - 6.8                                   | 75               |
|                    |                   |                    | B           | 6.9 - 7.9                                   | 90               |
|                    |                   |                    | C           | 8.0 - 9.1                                   | 105              |
|                    |                   |                    | D           | 9.2 - 10.3                                  | 120              |
|                    |                   |                    | E           | 10.4 - 11.4                                 | 135              |
|                    |                   |                    | F           | 11.5 - 12.6                                 | 150              |
| GMCP030H1C         | 1                 | 30                 | A           | 11.5 - 13.7                                 | 150              |
|                    |                   |                    | B           | 13.8 - 16.0                                 | 180              |
|                    |                   |                    | C           | 16.1 - 18.3                                 | 210              |
|                    |                   |                    | D           | 18.4 - 20.6                                 | 240              |
|                    |                   |                    | E           | 20.7 - 22.9                                 | 270              |
|                    |                   |                    | F           | 23.0 - 25.2                                 | 300              |
| GMCP050K2C         | 2                 | 50                 | A           | 19.3 - 22.9                                 | 250              |
|                    |                   |                    | B           | 23.0 - 26.8                                 | 300              |
|                    |                   |                    | C           | 26.9 - 30.6                                 | 350              |
|                    |                   |                    | D           | 30.7 - 34.5                                 | 400              |
|                    |                   |                    | E           | 34.6 - 38.3                                 | 450              |
|                    |                   |                    | F           | 38.4 - 42.1                                 | 500              |
| GMCP060J2C         | 3                 | 60                 | A           | 23.1 - 27.5                                 | 300              |
|                    |                   |                    | B           | 27.7 - 32.2                                 | 360              |
|                    |                   |                    | C           | 32.3 - 36.7                                 | 420              |
|                    |                   |                    | D           | 36.9 - 41.4                                 | 480              |
|                    |                   |                    | E           | 41.5 - 46.0                                 | 540              |
|                    |                   |                    | F           | 46.2 - 50.5                                 | 600              |
| GMCP063M2C         | 3                 | 63                 | A           | 24.2 - 32.1                                 | 320              |
|                    |                   |                    | B           | 29.1 - 34.8                                 | 380              |
|                    |                   |                    | C           | 33.9 - 39.4                                 | 440              |
|                    |                   |                    | D           | 38.8 - 46.4                                 | 500              |
|                    |                   |                    | E           | 43.6 - 48.9                                 | 570              |
|                    |                   |                    | F           | 48.5 - 53.7                                 | 630              |

Instruction Leaflet/FRED Number 15579

### Modifications for GMCP

#### Internal Accessories

These modifications must be factory installed<sup>①</sup>.

| Type Accessory                                           | Electrical Ratings |           |         | Contact Arrangement | Style Number | Factory Suffix |
|----------------------------------------------------------|--------------------|-----------|---------|---------------------|--------------|----------------|
|                                                          | Volts              | Frequency | Amperes |                     |              |                |
| Shunt Trip <sup>③</sup>                                  | 120                | 50/60 Hz  | 1.1     |                     | 1373D62G18   | S5             |
| Shunt Trip <sup>③</sup>                                  | 240                | 50/60 Hz  | 2.1     |                     | 1373D62G19   | S6             |
| Auxiliary Switch <sup>④</sup>                            | 240                | 50/60 Hz  | 6.0     | 1a/1b               | 1288C74G03   | A3             |
| Auxiliary Switch <sup>④</sup>                            | 240                | 50/60 Hz  | 6.0     | 2a/2b               | 1288C73G03   | A6             |
| Alarm Switch <sup>④</sup>                                | 240                | 50/60 Hz  | 6.0     | Make/Break          | 1288C75G03   | B3             |
| Alarm Switch <sup>④</sup><br>Alarm Switch<br>Combination | 240                | 50/60 Hz  | 6.0     | 1a/1b<br>Make/Break | 1288C76G09   | B13            |

**Note:** No UVR available on GMCP.

Instruction Leaflet/FRED Number 15552 for Alarm Switch

Instruction Leaflet/FRED Number 15551 for Auxiliary Switch

Instruction Leaflet/FRED Number 15550 for Shunt Trip

#### External Mounted Accessories

| Description                   | Number Units in Package | Style Number |
|-------------------------------|-------------------------|--------------|
| Lock Dog (Non-Padlockable)    | 1                       | 1294C01H01   |
| Mounting Hardware             | 1                       | 624B375G23   |
| DIN Rail Adapter <sup>②</sup> | 10                      | 1225C79G02   |

Instruction Leaflet/FRED Number 29C191 (DIN Rail Adapter)

#### Vari-Depth Handle Mechanism<sup>⑥</sup>

| Description                          | Catalog Number |
|--------------------------------------|----------------|
| For Type 1 use                       | HRGMV11L       |
| For Type 3R, 4X, 12 use              | HRGMV14L       |
| Close Coupled Black with Gray Handle | HRGMC10        |
| Close Coupled Red with Yellow Handle | HRGMC30        |

① Only one accessory may be installed in GMCP.

② For use with standard 35 mm DIN rail such as, 35 x 7.5 or 15 mm per DIN EN50022.

③ LH only.

④ RH only.

⑤ Motor FLA ranges are typical. The corresponding trip setting is at 13 times the minimum FLA value shown. Where a 13 times setting is required for an intermediate FLA value, alternate cam settings and/or MCP ratings should be used.

⑥ For use with GMCP only.

## F-Frame

600 Vac Maximum, 250 Vdc Maximum

| MCP Catalog Number | NEMA Starter Size | Continuous Amperes | Cam Setting | Motor Full Load Center Amperes <sup>①</sup> | MCP Trip Setting <sup>②</sup> |
|--------------------|-------------------|--------------------|-------------|---------------------------------------------|-------------------------------|
| HMCP003A0C         | 0                 | 3                  | A           | .69 - .91                                   | 9                             |
|                    |                   |                    | B           | .92 - 1.0                                   | 12                            |
|                    |                   |                    | C           | 1.1 - 1.2                                   | 15                            |
|                    |                   |                    | D           | 1.3 - 1.5                                   | 18                            |
|                    |                   |                    | E           | 1.6 - 1.7                                   | 21                            |
|                    |                   |                    | F           | 1.8 - 1.9                                   | 24                            |
|                    |                   |                    | G           | 2.0 - 2.2                                   | 27                            |
|                    |                   |                    | H           | 2.3 - 2.5                                   | 30                            |
| HMCP007C0C         | 0                 | 7                  | A           | 1.5 - 2.0                                   | 21                            |
|                    |                   |                    | B           | 2.1 - 2.5                                   | 28                            |
|                    |                   |                    | C           | 2.6 - 3.1                                   | 35                            |
|                    |                   |                    | D           | 3.2 - 3.6                                   | 42                            |
|                    |                   |                    | E           | 3.7 - 3.9                                   | 49                            |
|                    |                   |                    | F           | 4.3 - 4.7                                   | 56                            |
|                    |                   |                    | G           | 4.8 - 5.2                                   | 63                            |
|                    |                   |                    | H           | 5.3 - 5.7                                   | 70                            |
| HMCP015E0C         | 0                 | 15                 | A           | 3.4 - 4.5                                   | 45                            |
|                    |                   |                    | B           | 4.6 - 5.6                                   | 60                            |
|                    |                   |                    | C           | 5.7 - 6.8                                   | 75                            |
|                    |                   |                    | D           | 6.9 - 7.9                                   | 90                            |
|                    |                   |                    | E           | 8.0 - 9.1                                   | 105                           |
|                    |                   |                    | F           | 9.2 - 10.3                                  | 120                           |
|                    |                   |                    | G           | 10.4 - 11.4                                 | 135                           |
|                    |                   |                    | H           | 11.5 - 12.6                                 | 150                           |
| HMCP030H1C         | 1                 | 30                 | A           | 6.9 - 9.1                                   | 90                            |
|                    |                   |                    | B           | 9.2 - 11.4                                  | 120                           |
|                    |                   |                    | C           | 11.5 - 13.7                                 | 150                           |
|                    |                   |                    | D           | 13.8 - 16.0                                 | 180                           |
|                    |                   |                    | E           | 16.1 - 18.3                                 | 210                           |
|                    |                   |                    | F           | 18.4 - 20.6                                 | 240                           |
|                    |                   |                    | G           | 20.7 - 22.9                                 | 270                           |
|                    |                   |                    | H           | 23.0 - 25.2                                 | 300                           |
| HMCP050K2C         | 2                 | 50                 | A           | 11.5 - 15.2                                 | 150                           |
|                    |                   |                    | B           | 15.3 - 19.1                                 | 200                           |
|                    |                   |                    | C           | 19.2 - 22.9                                 | 250                           |
|                    |                   |                    | D           | 23.0 - 26.8                                 | 300                           |
|                    |                   |                    | E           | 26.9 - 30.6                                 | 350                           |
|                    |                   |                    | F           | 30.7 - 34.5                                 | 400                           |
|                    |                   |                    | G           | 34.6 - 38.3                                 | 450                           |
|                    |                   |                    | H           | 38.4 - 42.1                                 | 500                           |
| HMCP070M2C         | 2                 | 70                 | A           | 16.1 - 21.4                                 | 210                           |
|                    |                   |                    | B           | 21.5 - 26.8                                 | 280                           |
|                    |                   |                    | C           | 26.9 - 32.2                                 | 350                           |
|                    |                   |                    | D           | 32.3 - 37.5                                 | 420                           |
|                    |                   |                    | E           | 37.6 - 42.9                                 | 490                           |
|                    |                   |                    | F           | 43.0 - 48.3                                 | 560                           |
|                    |                   |                    | G           | 48.4 - 53.7                                 | 630                           |
|                    |                   |                    | H           | 53.8 - 59.1                                 | 700                           |
| HMCP100R3C         | 3                 | 100                | A           | 23.0 - 30.6                                 | 300                           |
|                    |                   |                    | B           | 30.7 - 38.3                                 | 400                           |
|                    |                   |                    | C           | 38.4 - 46.0                                 | 500                           |
|                    |                   |                    | D           | 46.1 - 53.7                                 | 600                           |
|                    |                   |                    | E           | 53.8 - 61.4                                 | 700                           |
|                    |                   |                    | F           | 61.5 - 69.1                                 | 800                           |
|                    |                   |                    | G           | 69.2 - 76.8                                 | 900                           |
|                    |                   |                    | H           | 76.9 - 84.5                                 | 1000                          |

## F-Frame (Continued)

600 Vac Maximum, 250 Vdc Maximum

| MCP Catalog Number | NEMA Starter Size | Continuous Amperes | Cam Setting | Motor Full Load Center Amperes <sup>①</sup> | MCP Trip Setting <sup>②</sup> |
|--------------------|-------------------|--------------------|-------------|---------------------------------------------|-------------------------------|
| HMCP150T4C         | 4                 | 150                | A           | 34.6 - 46.0                                 | 450                           |
|                    |                   |                    | B           | 46.1 - 57.5                                 | 600                           |
|                    |                   |                    | C           | 57.6 - 69.1                                 | 750                           |
|                    |                   |                    | D           | 69.2 - 80.6                                 | 900                           |
|                    |                   |                    | E           | 80.7 - 92.2                                 | 1050                          |
|                    |                   |                    | F           | 92.3 - 103.7                                | 1200                          |
|                    |                   |                    | G           | 103.8 - 115.2                               | 1350                          |
|                    |                   |                    | H           | 115.3 - 126.7                               | 1500                          |
| HMCP150U4C         | 4                 | 150                | A           | 57.0 - 75.0                                 | 750                           |
|                    |                   |                    | B           | 76.0 - 95.0                                 | 1000                          |
|                    |                   |                    | C           | 96.0 - 114.0                                | 1250                          |
|                    |                   |                    | D           | 115.0 - 130.7                               | 1500                          |
|                    |                   |                    | E           | ③                                           | 1750                          |
|                    |                   |                    | F           | ③                                           | 2000                          |
|                    |                   |                    | G           | ③                                           | 2250                          |
|                    |                   |                    | H           | ③                                           | 2500                          |

Instruction Leaflet/FRED Number 29C401

## Special Low Magnetic Protection Application MCP

600 Vac Maximum, 250 Vdc Maximum

| MCP Catalog Number | NEMA Starter Size | Continuous Amperes | Cam Setting | Motor Full Load Center Amperes | MCP Trip Setting <sup>②</sup> |
|--------------------|-------------------|--------------------|-------------|--------------------------------|-------------------------------|
| HMCP025D0C         | —                 | 25A                | A           | —                              | 40                            |
|                    |                   |                    | B           | —                              | 43                            |
|                    |                   |                    | C           | —                              | 46                            |
|                    |                   |                    | D           | —                              | 49                            |
|                    |                   |                    | E           | —                              | 52                            |
|                    |                   |                    | F           | —                              | 55                            |
|                    |                   |                    | G           | —                              | 58                            |
|                    |                   |                    | H           | —                              | 60                            |
| HMCP050G2C         | —                 | 50A                | A           | —                              | 80                            |
|                    |                   |                    | B           | —                              | 87                            |
|                    |                   |                    | C           | —                              | 93                            |
|                    |                   |                    | D           | —                              | 98                            |
|                    |                   |                    | E           | —                              | 103                           |
|                    |                   |                    | F           | —                              | 109                           |
|                    |                   |                    | G           | —                              | 115                           |
|                    |                   |                    | H           | —                              | 120                           |
| HMCP070J2C         | —                 | 70A                | A           | —                              | 115                           |
|                    |                   |                    | B           | —                              | 122                           |
|                    |                   |                    | C           | —                              | 130                           |
|                    |                   |                    | D           | —                              | 139                           |
|                    |                   |                    | E           | —                              | 145                           |
|                    |                   |                    | F           | —                              | 153                           |
|                    |                   |                    | G           | —                              | 160                           |
|                    |                   |                    | H           | —                              | 170                           |
| HMCP100L3C         | —                 | 100A               | A           | —                              | 160                           |
|                    |                   |                    | B           | —                              | 174                           |
|                    |                   |                    | C           | —                              | 185                           |
|                    |                   |                    | D           | —                              | 196                           |
|                    |                   |                    | E           | —                              | 207                           |
|                    |                   |                    | F           | —                              | 218                           |
|                    |                   |                    | G           | —                              | 229                           |
|                    |                   |                    | H           | —                              | 240                           |

Instruction Leaflet/FRED Number 29C407

- ① Motor FLA ranges are typical. The corresponding trip setting is at 13 times the minimum FLA value shown. Where a 13 times setting is required for an intermediate FLA value, alternate cam settings and/or MCP ratings should be used.
- ② For Dc applications, actual trip levels are approximately 40% higher than values shown.
- ③ Settings above 130 amperes are for special applications. NEC Article 430-110(a) requires the ampere rating of the disconnecting means to be not less than 115% of the motor full load ampere rating.



### MCPs for Application with Motor Starters Equipped with Electronic Overload Relays

600 Vac Maximum, 250 Vdc Maximum

| MCP Catalog Number | NEMA Starter Size | Continuous Amperes | Cam Setting | Motor Full Load Center Amperes <sup>①</sup> | MCP Trip Setting <sup>②</sup> |
|--------------------|-------------------|--------------------|-------------|---------------------------------------------|-------------------------------|
| HMCPS003A0C        | 0                 | 3                  | A           | .69 - .91                                   | 9                             |
|                    |                   |                    | B           | .92 - 1.0                                   | 12                            |
|                    |                   |                    | C           | 1.1 - 1.2                                   | 15                            |
|                    |                   |                    | D           | 1.3 - 1.5                                   | 18                            |
|                    |                   |                    | E           | 1.6 - 1.7                                   | 21                            |
|                    |                   |                    | F           | 1.8 - 1.9                                   | 24                            |
|                    |                   |                    | G           | 2.0 - 2.2                                   | 27                            |
|                    |                   |                    | H           | 2.3 - 2.5                                   | 30                            |
| HMCPS007C0C        | 0                 | 7                  | A           | 1.5 - 2.0                                   | 21                            |
|                    |                   |                    | B           | 2.1 - 2.5                                   | 28                            |
|                    |                   |                    | C           | 2.6 - 3.1                                   | 35                            |
|                    |                   |                    | D           | 3.2 - 3.6                                   | 42                            |
|                    |                   |                    | E           | 3.7 - 3.9                                   | 49                            |
|                    |                   |                    | F           | 4.3 - 4.7                                   | 56                            |
|                    |                   |                    | G           | 4.8 - 5.2                                   | 63                            |
|                    |                   |                    | H           | 5.3 - 5.7                                   | 70                            |
| HMCPS015E0C        | 0                 | 15                 | A           | 3.4 - 4.5                                   | 45                            |
|                    |                   |                    | B           | 4.6 - 5.6                                   | 60                            |
|                    |                   |                    | C           | 5.7 - 6.8                                   | 75                            |
|                    |                   |                    | D           | 6.9 - 7.9                                   | 90                            |
|                    |                   |                    | E           | 8.0 - 9.1                                   | 105                           |
|                    |                   |                    | F           | 9.2 - 10.3                                  | 120                           |
|                    |                   |                    | G           | 10.4 - 11.4                                 | 135                           |
|                    |                   |                    | H           | 11.5 - 12.6                                 | 150                           |
| HMCPS030H1C        | 1                 | 30                 | A           | 6.9 - 9.1                                   | 90                            |
|                    |                   |                    | B           | 9.2 - 11.4                                  | 120                           |
|                    |                   |                    | C           | 11.5 - 13.7                                 | 150                           |
|                    |                   |                    | D           | 13.8 - 16.0                                 | 180                           |
|                    |                   |                    | E           | 16.1 - 18.3                                 | 210                           |
|                    |                   |                    | F           | 18.4 - 20.6                                 | 240                           |
|                    |                   |                    | G           | 20.7 - 22.9                                 | 270                           |
|                    |                   |                    | H           | 23.0 - 25.2                                 | 300                           |
| HMCPS050K2C        | 2                 | 50                 | A           | 11.5 - 15.2                                 | 150                           |
|                    |                   |                    | B           | 15.3 - 19.1                                 | 200                           |
|                    |                   |                    | C           | 19.2 - 22.9                                 | 250                           |
|                    |                   |                    | D           | 23.0 - 26.8                                 | 300                           |
|                    |                   |                    | E           | 26.9 - 30.6                                 | 350                           |
|                    |                   |                    | F           | 30.7 - 34.5                                 | 400                           |
|                    |                   |                    | G           | 34.6 - 38.3                                 | 450                           |
|                    |                   |                    | H           | 38.4 - 42.1                                 | 500                           |
| HMCPS100R3C        | 3                 | 100                | A           | 23.0 - 30.6                                 | 300                           |
|                    |                   |                    | B           | 30.7 - 38.3                                 | 400                           |
|                    |                   |                    | C           | 38.4 - 46.0                                 | 500                           |
|                    |                   |                    | D           | 46.1 - 53.7                                 | 600                           |
|                    |                   |                    | E           | 53.8 - 61.4                                 | 700                           |
|                    |                   |                    | F           | 61.5 - 69.1                                 | 800                           |
|                    |                   |                    | G           | 69.2 - 76.8                                 | 900                           |
|                    |                   |                    | H           | 76.9 - 84.5                                 | 1000                          |
| HMCPS150T4C        | 4                 | 150                | A           | 34.6 - 46.0                                 | 450                           |
|                    |                   |                    | B           | 46.1 - 57.5                                 | 600                           |
|                    |                   |                    | C           | 57.6 - 69.1                                 | 750                           |
|                    |                   |                    | D           | 69.2 - 80.6                                 | 900                           |
|                    |                   |                    | E           | 80.7 - 92.2                                 | 1050                          |
|                    |                   |                    | F           | 92.3 - 103.7                                | 1200                          |
|                    |                   |                    | G           | 103.8 - 115.2                               | 1350                          |
|                    |                   |                    | H           | 115.3 - 126.7                               | 1500                          |
| HMCPS150U4C        | 4                 | 150                | A           | 57.0 - 75.0                                 | 750                           |
|                    |                   |                    | B           | 76.0 - 95.0                                 | 1000                          |
|                    |                   |                    | C           | 96.0 - 114.0                                | 1250                          |
|                    |                   |                    | D           | 115.0 - 130.7                               | 1500                          |
|                    |                   |                    | E           | ③                                           | 1750                          |
|                    |                   |                    | F           | ③                                           | 2000                          |
|                    |                   |                    | G           | ③                                           | 2250                          |
|                    |                   |                    | H           | ③                                           | 2500                          |

Instruction Leaflet/FRED Number 29C401

### Type ELC Current Limiter Attachment (Size 0-4)



The type ELC current limiter attachment for the Series C MCP is designed to provide increased interrupting capacity. The combination may be used for the application up to 200,000A symmetrical at 600 Vac making the MCP suitable for use in network distribution systems or other applications where unusually high fault currents are available. The current limiter connects to the load end of the MCP and is provided with terminals suitable for copper or aluminum conductors. (See table).

Limiters are coordinated with the MCP so that normal fault currents are interrupted automatically by the MCP without any damage to the limiter. Only the rare very high fault is opened by the limiter. Faults that are interrupted by the limiter are interrupted by the limiter also magnetically trip the MCP, opening all three poles, preventing single-phase operation.

Each of the three poles of the type ELC limiter is equipped with an indicator that extends when a fault is interrupted by the limiter.

#### Type ELC Current Limiter Terminal Wire Sizes<sup>④</sup>

| Type ELC Current Limiter Maximum Amperes | Standard Aluminum Terminals |                           | Nonstandard Terminals (Steel) |                           |
|------------------------------------------|-----------------------------|---------------------------|-------------------------------|---------------------------|
|                                          | Wire Range AWG              | Metric (mm <sup>2</sup> ) | Wire Range AWG                | Metric (mm <sup>2</sup> ) |
| 50                                       | #14-2                       | 2.5-35                    | #14-2 <sup>⑤</sup>            | 2.5-35                    |
| 100                                      | #1-4/0                      | 50-95                     | —                             | —                         |
| 150                                      | #1-4/0                      | 50-95                     | —                             | —                         |

#### ELC Current Limiter Attachment

| MCP Rating (Amperes) | Catalog Number |
|----------------------|----------------|
| 3                    | ELC3003R       |
| 7                    | ELC3007R       |
| 15                   | ELC3015R       |
| 30                   | ELC3030R       |
| 50                   | ELC3050R       |
| 100                  | ELC3100R       |
| 150                  | ELC3150R       |

Instruction Leaflet/FRED Number 29C401

- ① Motor FLA ranges are typical. The corresponding trip setting is at 13 times the minimum FLA value shown. Where a 13 times setting is required for an intermediate FLA value, alternate cam settings and/or MCP ratings should be used.
- ② For Dc applications, actual trip levels are approximately 40% higher than values shown.
- ③ Settings above 130 amperes are for special applications. NEC Article 430-110(a) requires the ampere rating of the disconnecting means to be not less than 115% of the motor full load ampere rating.
- ④ Terminal wire connectors are UL listed for standard stranded wire sizes as defined in UL486A or UL486B.
- ⑤ Optional on special order for copper cable only.

## J-Frame

600 Vac Maximum, 250 Vdc Maximum

| MCP Catalog Number <sup>①</sup> | NEMA Starter Size | Continuous Amperes | Cam Setting | Motor Full Load Center Amperes <sup>②</sup> | MCP Trip Setting <sup>③</sup> |
|---------------------------------|-------------------|--------------------|-------------|---------------------------------------------|-------------------------------|
| HMCP250A5C                      | 4                 | 250                | A           | 27.0 - 30.7                                 | 350                           |
|                                 | 4                 |                    | B           | 30.8 - 33.8                                 | 400                           |
|                                 | 4                 |                    | C           | 33.9 - 36.9                                 | 440                           |
|                                 | 5                 |                    | D           | 37.0 - 40.3                                 | 480                           |
|                                 | 5                 |                    | E           | 40.4 - 43.8                                 | 525                           |
|                                 | 5                 |                    | F           | 43.9 - 46.9                                 | 570                           |
|                                 | 5                 |                    | G           | 47.0 - 50.7                                 | 610                           |
|                                 | 5                 |                    | H           | 50.8 - 53.8                                 | 660                           |
|                                 | 5                 |                    | I           | 53.9 - 57.2                                 | 700                           |
| HMCP250C5C                      | 5                 | 250                | A           | 34.7 - 38.8                                 | 450                           |
|                                 | 5                 |                    | B           | 38.9 - 43.4                                 | 505                           |
|                                 | 5                 |                    | C           | 43.5 - 47.6                                 | 565                           |
|                                 | 5                 |                    | D           | 47.7 - 52.2                                 | 620                           |
|                                 | 5                 |                    | E           | 52.3 - 56.5                                 | 680                           |
|                                 | 5                 |                    | F           | 56.6 - 60.7                                 | 735                           |
|                                 | 5                 |                    | G           | 60.8 - 64.9                                 | 790                           |
|                                 | 5                 |                    | H           | 65.0 - 69.2                                 | 845                           |
|                                 | 5                 |                    | I           | 69.3 - 73.5                                 | 900                           |
| HMCP250D5C                      | 5                 | 250                | A           | 38.5 - 43.4                                 | 500                           |
|                                 | 5                 |                    | B           | 43.5 - 48.0                                 | 565                           |
|                                 | 5                 |                    | C           | 48.1 - 53.0                                 | 625                           |
|                                 | 5                 |                    | D           | 53.1 - 57.6                                 | 690                           |
|                                 | 5                 |                    | E           | 57.7 - 62.3                                 | 750                           |
|                                 | 5                 |                    | F           | 62.4 - 67.3                                 | 810                           |
|                                 | 5                 |                    | G           | 67.4 - 71.9                                 | 875                           |
|                                 | 5                 |                    | H           | 72.0 - 76.9                                 | 935                           |
|                                 | 5                 |                    | I           | 77.0 - 81.6                                 | 1000                          |
| HMCP250F5C                      | 5                 | 250                | A           | 48.1 - 53.8                                 | 625                           |
|                                 | 5                 |                    | B           | 53.9 - 59.9                                 | 700                           |
|                                 | 5                 |                    | C           | 60.0 - 66.1                                 | 780                           |
|                                 | 5                 |                    | D           | 66.2 - 72.3                                 | 860                           |
|                                 | 5                 |                    | E           | 72.4 - 78.4                                 | 940                           |
|                                 | 5                 |                    | F           | 78.5 - 83.8                                 | 1020                          |
|                                 | 5                 |                    | G           | 83.9 - 89.9                                 | 1090                          |
|                                 | 5                 |                    | H           | 90.0 - 96.1                                 | 1170                          |
|                                 | 5                 |                    | I           | 96.2 - 102.0                                | 1250                          |
| HMCP250G5C                      | 5                 | 250                | A           | 57.7 - 64.6                                 | 750                           |
|                                 | 5                 |                    | B           | 64.7 - 71.9                                 | 840                           |
|                                 | 5                 |                    | C           | 72.0 - 79.2                                 | 935                           |
|                                 | 5                 |                    | D           | 79.3 - 86.5                                 | 1030                          |
|                                 | 5                 |                    | E           | 86.6 - 93.8                                 | 1125                          |
|                                 | 5                 |                    | F           | 93.9 - 101.1                                | 1220                          |
|                                 | 5                 |                    | G           | 101.2 - 108.4                               | 1315                          |
|                                 | 5                 |                    | H           | 108.5 - 115.3                               | 1410                          |
|                                 | 5                 |                    | I           | 115.4 - 122.4                               | 1500                          |

| MCP Catalog Number <sup>①</sup> | NEMA Starter Size | Continuous Amperes | Cam Setting | Motor Full Load Center Amperes <sup>②</sup> | MCP Trip Setting <sup>③</sup> |
|---------------------------------|-------------------|--------------------|-------------|---------------------------------------------|-------------------------------|
| HMCP250J5C                      | 5                 | 250                | A           | 67.4 - 75.3                                 | 875                           |
|                                 | 5                 |                    | B           | 75.4 - 83.8                                 | 980                           |
|                                 | 5                 |                    | C           | 83.9 - 92.3                                 | 1090                          |
|                                 | 5                 |                    | D           | 92.4 - 100.7                                | 1200                          |
|                                 | 5                 |                    | E           | 100.8 - 109.2                               | 1310                          |
|                                 | 5                 |                    | F           | 109.3 - 117.6                               | 1420                          |
|                                 | 5                 |                    | G           | 117.7 - 126.1                               | 1530                          |
|                                 | 5                 |                    | H           | 126.2 - 134.6                               | 1640                          |
|                                 | 5                 |                    | I           | 134.7 - 142.8                               | 1750                          |
| HMCP250K5C                      | 5                 | 250                | A           | 77.0 - 86.6                                 | 1000                          |
|                                 | 5                 |                    | B           | 86.6 - 96.1                                 | 1125                          |
|                                 | 5                 |                    | C           | 96.2 - 105.7                                | 1250                          |
|                                 | 5                 |                    | D           | 105.8 - 115.3                               | 1375                          |
|                                 | 5                 |                    | E           | 115.4 - 124.9                               | 1500                          |
|                                 | 5                 |                    | F           | 125.0 - 134.6                               | 1625                          |
|                                 | 5                 |                    | G           | 134.7 - 144.2                               | 1750                          |
|                                 | 5                 |                    | H           | 144.3 - 153.8                               | 1875                          |
|                                 | 5                 |                    | I           | 153.9 - 163.3                               | 2000                          |
| HMCP250L5C                      | 5                 | 250                | A           | 86.6 - 97.3                                 | 1125                          |
|                                 | 5                 |                    | B           | 97.4 - 108.4                                | 1265                          |
|                                 | 5                 |                    | C           | 108.5 - 118.8                               | 1410                          |
|                                 | 5                 |                    | D           | 118.9 - 129.9                               | 1545                          |
|                                 | 5                 |                    | E           | 130.0 - 140.7                               | 1690                          |
|                                 | 5                 |                    | F           | 140.8 - 151.5                               | 1830                          |
|                                 | 5                 |                    | G           | 151.6 - 162.3                               | 1970                          |
|                                 | 5                 |                    | H           | 162.4 - 173.0                               | 2110                          |
|                                 | 5                 |                    | I           | 173.1 - 183.6                               | 2250                          |
| HMCP250W5C                      | 5                 | 250                | A           | 96.2 - 108.0                                | 1250                          |
|                                 | 5                 |                    | B           | 108.1 - 119.9                               | 1405                          |
|                                 | 5                 |                    | C           | 120.0 - 132.3                               | 1560                          |
|                                 | 5                 |                    | D           | 132.4 - 144.2                               | 1720                          |
|                                 | 5                 |                    | E           | 144.3 - 156.1                               | 1875                          |
|                                 | 5                 |                    | F           | 156.2 - 168.0                               | 2030                          |
|                                 | 5                 |                    | G           | 168.1 - 179.9                               | 2185                          |
|                                 | 5                 |                    | H           | 180.0 - 192.3                               | 2340                          |
|                                 | 5                 |                    | I           | 192.4 - 204.0                               | 2500                          |

Instruction Leaflet/FRED Number 29C402

- ① Three-pole catalog numbers shown. Two-pole catalog numbers begin with "HM2P" in place of "HMCP."
- ② Motor FLA ranges are typical. The corresponding trip setting is at 13 times the minimum FLA value shown. Where a 13 times setting is required for an intermediate FLA value, alternate cam settings and/or MCP ratings should be used.
- ③ For Dc applications, actual trip levels are approximately 40% higher than values shown.

## K-Frame

600 Vac Maximum, 250 Vdc Maximum

| MCP Catalog Number <sup>①</sup> | NEMA Starter Size | Continuous Amperes | Cam Setting | Motor Full Load Center Amperes <sup>②</sup> | MCP Trip Setting <sup>③</sup> |
|---------------------------------|-------------------|--------------------|-------------|---------------------------------------------|-------------------------------|
| HMCP400D5C                      | 5                 | 400                | A           | 38.5 - 43.4                                 | 500                           |
|                                 | 5                 |                    | B           | 43.5 - 48.0                                 | 565                           |
|                                 | 5                 |                    | C           | 48.1 - 53.0                                 | 626                           |
|                                 | 5                 |                    | D           | 53.1 - 57.6                                 | 690                           |
|                                 | 5                 |                    | E           | 57.7 - 62.3                                 | 750                           |
|                                 | 5                 |                    | F           | 62.4 - 67.3                                 | 810                           |
|                                 | 5                 |                    | G           | 67.4 - 71.9                                 | 875                           |
|                                 | 5                 |                    | H           | 72.0 - 76.9                                 | 935                           |
|                                 | 5                 |                    | I           | 77.0 - 81.6                                 | 1000                          |
| HMCP400F5C                      | 5                 | 400                | A           | 48.1 - 53.8                                 | 625                           |
|                                 | 5                 |                    | B           | 53.9 - 59.9                                 | 700                           |
|                                 | 5                 |                    | C           | 60.0 - 66.1                                 | 780                           |
|                                 | 5                 |                    | D           | 66.2 - 72.3                                 | 860                           |
|                                 | 5                 |                    | E           | 72.4 - 78.4                                 | 940                           |
|                                 | 5                 |                    | F           | 78.5 - 83.8                                 | 1020                          |
|                                 | 5                 |                    | G           | 83.9 - 89.9                                 | 1090                          |
|                                 | 5                 |                    | H           | 90.0 - 96.1                                 | 1170                          |
|                                 | 5                 |                    | I           | 96.2 - 102.0                                | 1250                          |
| HMCP400G5C                      | 5                 | 400                | A           | 57.7 - 64.6                                 | 750                           |
|                                 | 5                 |                    | B           | 64.7 - 71.9                                 | 840                           |
|                                 | 5                 |                    | C           | 72.0 - 79.2                                 | 935                           |
|                                 | 5                 |                    | D           | 79.3 - 86.5                                 | 1030                          |
|                                 | 5                 |                    | E           | 86.6 - 93.8                                 | 1125                          |
|                                 | 5                 |                    | F           | 93.9 - 101.1                                | 1220                          |
|                                 | 5                 |                    | G           | 101.2 - 108.4                               | 1315                          |
|                                 | 5                 |                    | H           | 108.5 - 115.3                               | 1410                          |
|                                 | 5                 |                    | I           | 115.4 - 122.4                               | 1500                          |
| HMCP400J5C                      | 5                 | 400                | A           | 67.4 - 75.3                                 | 875                           |
|                                 | 5                 |                    | B           | 75.4 - 83.8                                 | 980                           |
|                                 | 5                 |                    | C           | 83.9 - 92.3                                 | 1090                          |
|                                 | 5                 |                    | D           | 92.4 - 100.7                                | 1200                          |
|                                 | 5                 |                    | E           | 100.8 - 109.2                               | 1310                          |
|                                 | 5                 |                    | F           | 109.3 - 117.6                               | 1420                          |
|                                 | 5                 |                    | G           | 117.7 - 126.1                               | 1530                          |
|                                 | 5                 |                    | H           | 126.2 - 134.6                               | 1640                          |
|                                 | 5                 |                    | I           | 134.7 - 142.8                               | 1750                          |
| HMCP400K5C                      | 5                 | 400                | A           | 77.0 - 86.5                                 | 1000                          |
|                                 | 5                 |                    | B           | 86.6 - 96.1                                 | 1125                          |
|                                 | 5                 |                    | C           | 96.2 - 105.7                                | 1250                          |
|                                 | 5                 |                    | D           | 105.8 - 115.3                               | 1375                          |
|                                 | 5                 |                    | E           | 115.4 - 124.9                               | 1500                          |
|                                 | 5                 |                    | F           | 125.0 - 134.6                               | 1625                          |
|                                 | 5                 |                    | G           | 134.7 - 144.2                               | 1750                          |
|                                 | 5                 |                    | H           | 144.3 - 153.8                               | 1875                          |
|                                 | 5                 |                    | I           | 153.9 - 163.3                               | 2000                          |

| MCP Catalog Number <sup>①</sup> | NEMA Starter Size | Continuous Amperes | Cam Setting | Motor Full Load Center Amperes <sup>②</sup> | MCP Trip Setting <sup>③</sup> |
|---------------------------------|-------------------|--------------------|-------------|---------------------------------------------|-------------------------------|
| HMCP400L5C                      | 5                 | 400                | A           | 86.6 - 97.3                                 | 1125                          |
|                                 | 5                 |                    | B           | 97.4 - 108.4                                | 1265                          |
|                                 | 5                 |                    | C           | 108.5 - 118.8                               | 1410                          |
|                                 | 5                 |                    | D           | 118.9 - 129.9                               | 1545                          |
|                                 | 5                 |                    | E           | 130.0 - 140.7                               | 1690                          |
|                                 | 5                 |                    | F           | 140.8 - 151.5                               | 1830                          |
|                                 | 5                 |                    | G           | 151.6 - 162.3                               | 1970                          |
|                                 | 5                 |                    | H           | 162.4 - 173.0                               | 2110                          |
|                                 | 5                 |                    | I           | 173.1 - 183.6                               | 2250                          |
| HMCP400W5C                      | 5                 | 400                | A           | 96.2 - 108.0                                | 1250                          |
|                                 | 5                 |                    | B           | 108.1 - 119.9                               | 1405                          |
|                                 | 5                 |                    | C           | 120.0 - 132.3                               | 1560                          |
|                                 | 5                 |                    | D           | 132.4 - 144.2                               | 1720                          |
|                                 | 5                 |                    | E           | 144.3 - 156.1                               | 1875                          |
|                                 | 5                 |                    | F           | 156.2 - 168.0                               | 2030                          |
|                                 | 5                 |                    | G           | 168.1 - 179.9                               | 2185                          |
|                                 | 5                 |                    | H           | 180.0 - 192.3                               | 2340                          |
|                                 | 5                 |                    | I           | 192.4 - 204.0                               | 2500                          |
| HMCP400N5C                      | 5                 | 400                | A           | 115.4 - 129.9                               | 1500                          |
|                                 | 5                 |                    | B           | 130.0 - 144.2                               | 1690                          |
|                                 | 5                 |                    | C           | 144.3 - 158.4                               | 1875                          |
|                                 | 5                 |                    | D           | 158.5 - 173.0                               | 2060                          |
|                                 | 5                 |                    | E           | 173.1 - 187.6                               | 2250                          |
|                                 | 5                 |                    | F           | 187.7 - 201.9                               | 2440                          |
|                                 | 5                 |                    | G           | 202.0 - 216.1                               | 2625                          |
|                                 | 5                 |                    | H           | 216.2 - 230.7                               | 2810                          |
|                                 | 5                 |                    | I           | 230.8 - 244.9                               | 3000                          |
| HMCP400R5C                      | 5                 | 400                | A           | 134.7 - 151.5                               | 1750                          |
|                                 | 5                 |                    | B           | 151.6 - 168.4                               | 1970                          |
|                                 | 5                 |                    | C           | 168.5 - 185.3                               | 2190                          |
|                                 | 5                 |                    | D           | 185.4 - 201.9                               | 2410                          |
|                                 | 5                 |                    | E           | 202.0 - 218.8                               | 2625                          |
|                                 | 5                 |                    | F           | 218.9 - 235.7                               | 2845                          |
|                                 | 5                 |                    | G           | 235.8 - 252.6                               | 3065                          |
|                                 | 5                 |                    | H           | 252.7 - 269.2                               | 3285                          |
|                                 | 5                 |                    | I           | 269.3 - 285.7                               | 3500                          |
| HMCP400X5C                      | 5                 | 400                | A           | 153.9 - 173.0                               | 2000                          |
|                                 | 5                 |                    | B           | 173.1 - 192.3                               | 2250                          |
|                                 | 5                 |                    | C           | 192.4 - 211.5                               | 2500                          |
|                                 | 5                 |                    | D           | 211.6 - 230.7                               | 2750                          |
|                                 | 5                 |                    | E           | 230.8 - 249.9                               | 3000                          |
|                                 | 5                 |                    | F           | 250.0 - 269.2                               | 3250                          |
|                                 | 5                 |                    | G           | 269.3 - 288.4                               | 3500                          |
|                                 | 5                 |                    | H           | 288.5 - 307.6                               | 3750                          |
|                                 | 5                 |                    | I           | 307.7 - 326.9                               | 4000                          |

Instruction Leaflet/FRED Number 29C403

## L-Frame<sup>④</sup>

600 Vac Maximum

| MCP Catalog Number | NEMA Starter Size | Continuous Amperes | Cam Setting | Motor Full Load Center Amperes <sup>②</sup> | MCP Trip Setting <sup>③</sup> |
|--------------------|-------------------|--------------------|-------------|---------------------------------------------|-------------------------------|
| HMCP600L6W         | 6                 | 600                | A           | 138.5 - 184.5                               | 1800                          |
|                    | 6                 |                    | B           | 184.6 - 230.7                               | 2400                          |
|                    | 6                 |                    | C           | 230.8 - 276.8                               | 3000                          |
|                    | 6                 |                    | D           | 276.9 - 323.0                               | 3600                          |
|                    | 6                 |                    | E           | 323.1 - 369.1                               | 4200                          |
|                    | 6                 |                    | F           | 369.2 - 415.3                               | 4800                          |
|                    | 6                 |                    | G           | 415.4 - 461.4                               | 5400                          |
|                    | 6                 |                    | H           | 461.5 - 507.7                               | 6000                          |

Instruction Leaflet/FRED Number 29C404

① Three-pole catalog numbers shown. Two-pole catalog numbers begin with "HM2P" in place of "HMCP."

② Motor FLA ranges are typical. The corresponding trip setting is at 13 times the minimum FLA value shown. Where a 13 times setting is required for an intermediate FLA value, alternate cam settings and/or MCP ratings should be used.

③ For Dc applications, actual trip levels are approximately 40% higher than values shown.

④ Equipped with electronic trip device.



*Typical Series C Earth  
Leakage Circuit Breaker*

## General Information

Series C Earth Leakage Breakers offer superior Class 1 ground fault protection and improved ground fault coordination capability.

Earth leakage ground fault protection differs from other types of systems in its level of sensitivity. The sensitivity of traditional devices is limited by the cumulative error of the residual current sensors and the placement of the phase and neutral conductors inside the current sensor.

Leakage breakers are zero sequence sensing devices. They are factory supplied with a single sensor and ground fault relay built-in. This technique allows for protection sensitivities down to the 30 milliampere level.

Leakage breakers are provided with a full complement of easy adjustments. The ground fault pickup setting is adjustable from 0.03 to 30 amperes in eight steps, and the ground fault time delay setting is adjustable from instantaneous to 2.0 seconds in six steps. When the pickup is set to 30 mA, the time delay setting defaults internally to instantaneous only. Increased selectivity provides for improved coordination with upstream and downstream ground fault devices as well as the flexibility to adjust for transient currents.

## Applications

### Three-Phase, Four-Wire Loads

For three-phase applications with line-to-neutral loads, select 4-pole earth leakage breakers and wire the neutral through the fourth (right) pole.

### Three-Phase, Three-Wire Loads

For applications with only three-phase, three-wire, line-to-line connected loads, select 3-pole earth leakage breakers.

### Single-Phase Loads

For single-phase, two-wire or three-wire applications, use a 3-pole earth leakage breaker and connect all conductors through the breaker.

## Accessories

### Optional Factory Installed Internal Accessories

Earth leakage breakers use the same internal accessories as standard F-, J- and K-Frame Series C Breakers. Internal accessories fit in the right-hand pole space and are available as factory modifications only.

### Optional External Accessories

Series C Earth Leakage Breakers use the same external accessories as the standard F-, J- and K-Frame circuit breakers.

### Selection Guide and Ordering Information

#### F-Frame Earth Leakage Ground Fault Breakers UL 489 and UL 1053 – Catalog Numbers

| Amperes <sup>③</sup> | 25 kA at 480 VAC |           | 65 kA at 480 VAC |            | 100 kA at 480 VAC |            |
|----------------------|------------------|-----------|------------------|------------|-------------------|------------|
|                      | 3-Pole           | 4-Pole    | 3-Pole           | 4-Pole     | 3-Pole            | 4-Pole     |
| 35                   | ELFD3035L        | ELFD4035L | ELHFD3035L       | ELHFD4035L | ELFDC3035L        | ELFDC4035L |
| 40                   | ELFD3040L        | ELFD4040L | ELHFD3040L       | ELHFD4040L | ELFDC3040L        | ELFDC4040L |
| 45                   | ELFD3045L        | ELFD4045L | ELHFD3045L       | ELHFD4045L | ELFDC3045L        | ELFDC4045L |
| 50                   | ELFD3050L        | ELFD4050L | ELHFD3050L       | ELHFD4050L | ELFDC3050L        | ELFDC4050L |
| 60                   | ELFD3060L        | ELFD4060L | ELHFD3060L       | ELHFD4060L | ELFDC3060L        | ELFDC4060L |
| 70                   | ELFD3070L        | ELFD4070L | ELHFD3070L       | ELHFD4070L | ELFDC3070L        | ELFDC4070L |
| 80                   | ELFD3080L        | ELFD4080L | ELHFD3080L       | ELHFD4080L | ELFDC3080L        | ELFDC4080L |
| 90                   | ELFD3090L        | ELFD4090L | ELHFD3090L       | ELHFD4090L | ELFDC3090L        | ELFDC4090L |
| 100                  | ELFD3100L        | ELFD4100L | ELHFD3100L       | ELHFD4100L | ELFDC3100L        | ELFDC4100L |
| 110                  | ELFD3110L        | ELFD4110L | ELHFD3110L       | ELHFD4110L | ELFDC3110L        | ELFDC4110L |
| 125                  | ELFD3125L        | ELFD4125L | ELHFD3125L       | ELHFD4125L | ELFDC3125L        | ELFDC4125L |
| 150                  | ELFD3150L        | ELFD4150L | ELHFD3150L       | ELHFD4150L | ELFDC3150L        | ELFDC4150L |

#### J-Frame Earth Leakage Ground Fault Breakers UL 489 and UL 1053 – Catalog Numbers

| Amperes | 35 kA at 480 VAC |          | 65 kA at 480 VAC |           | 100 kA at 480 VAC |           |
|---------|------------------|----------|------------------|-----------|-------------------|-----------|
|         | 3-Pole           | 4-Pole   | 3-Pole           | 4-Pole    | 3-Pole            | 4-Pole    |
| 100     | ELJD3100         | ELJD4100 | ELHJD3100        | ELHJD4100 | ELJDC3100         | ELJDC4100 |
| 125     | ELJD3125         | ELJD4125 | ELHJD3125        | ELHJD4125 | ELJDC3125         | ELJDC4125 |
| 150     | ELJD3150         | ELJD4150 | ELHJD3150        | ELHJD4150 | ELJDC3150         | ELJDC4150 |
| 175     | ELJD3175         | ELJD4175 | ELHJD3175        | ELHJD4175 | ELJDC3175         | ELJDC4175 |
| 200     | ELJD3200         | ELJD4200 | ELHJD3200        | ELHJD4200 | ELJDC3200         | ELJDC4200 |
| 225     | ELJD3225         | ELJD4225 | ELHJD3225        | ELHJD4225 | ELJDC3225         | ELJDC4225 |
| 250     | ELJD3250         | ELJD4250 | ELHJD3250        | ELHJD4250 | ELJDC3250         | ELJDC4250 |

#### K-Frame Earth Leakage Ground Fault Breakers UL 489 and UL 1053 – Catalog Numbers

| Amperes | 35 kA at 480 VAC |          | 65 kA at 480 VAC |           | 100 kA at 480 VAC |           |
|---------|------------------|----------|------------------|-----------|-------------------|-----------|
|         | 3-Pole           | 4-Pole   | 3-Pole           | 4-Pole    | 3-Pole            | 4-Pole    |
| 200     | ELKD3200         | ELKD4200 | ELHKD3200        | ELHKD4200 | ELKDC3200         | ELKDC4200 |
| 225     | ELKD3225         | ELKD4225 | ELHKD3225        | ELHKD4225 | ELKDC3225         | ELKDC4225 |
| 250     | ELKD3250         | ELKD4250 | ELHKD3250        | ELHKD4250 | ELKDC3250         | ELKDC4250 |
| 300     | ELKD3300         | ELKD4300 | ELHKD3300        | ELHKD4300 | ELKDC3300         | ELKDC4300 |
| 350     | ELKD3350         | ELKD4350 | ELHKD3350        | ELHKD4350 | ELKDC3350         | ELKDC4350 |
| 400     | ELKD3400         | ELKD4400 | ELHKD3400        | ELHKD4400 | ELKDC3400         | ELKDC4400 |

#### Standard Line and Load Terminals – Included with Breaker

| Frame   | Wire Type | (Number) Range of Conductors | Terminal Material |                 |
|---------|-----------|------------------------------|-------------------|-----------------|
| F-Frame | 35-100A   | Cu/Al                        | (1) #14-1/0       | Steel           |
| F-Frame | 110-150A  | Cu/Al                        | (1) #4-4/0        | Stainless Steel |
| J-Frame | 100-250A  | Cu/Al                        | (1) #4-250 kcmil  | Aluminum        |
| K-Frame | 200-350A  | Cu/Al                        | (1) 250-500 kcmil | Aluminum        |
| K-Frame | 400A      | Cu/Al                        | (2) 3/0-250 kcmil | Aluminum        |

#### Optional K-Frame Line and Load Terminals – Order Separately

| Wire Type | (Number) Range of Conductors | Terminal Material | Catalog Number       |
|-----------|------------------------------|-------------------|----------------------|
| Cu/Al     | (2) 250 kcmil                | Aluminum          | 3TA401K <sup>①</sup> |
| Cu/Al     | (1) 500 kcmil                | Aluminum          |                      |
| Cu/Al     | (2) 250 kcmil                | Aluminum          | 4TA401K <sup>②</sup> |
| Cu/Al     | (1) 500 kcmil                | Aluminum          |                      |
| Cu        | (1) 3-350 kcmil              | Copper            | T300K                |
| Cu        | (1) 3-350 kcmil              | Copper            | T300K                |
| Cu        | (1) 250-500 kcmil            | Copper            | T350K                |
| Cu        | (1) 250-500 kcmil            | Copper            | T350K                |
| Cu        | (1) 3/0-250 kcmil            | Copper            | 3T400K <sup>①</sup>  |
| Cu        | (1) 3/0-250 kcmil            | Copper            | 3T400K <sup>②</sup>  |

#### F-Frame HMCP with Earth Leakage Ground Fault

| Continuous Amperes | Catalog Number 3-Pole |
|--------------------|-----------------------|
| 3                  | ELHMCPO03A0C          |
| 7                  | ELHMCPO07C0C          |
| 15                 | ELHMCPO15E0C          |
| 25                 | ELHMCPO25X0C          |
| 30                 | ELHMCPO30H1C          |
| 50                 | ELHMCPO50K2C          |
| 70                 | ELHMCPO70M2C          |
| 100                | ELHMCPO100R3C         |
| 150                | ELHMCPO150T4C         |
| 150                | ELHMCPO150U4C         |
| 3                  | ELHMCPO03A0LC         |
| 7                  | ELHMCPO07C0LC         |
| 15                 | ELHMCPO15E0LC         |
| 25                 | ELHMCPO25D0C          |
| 30                 | ELHMCPO30H1LC         |
| 50                 | ELHMCPO50G2C          |
| 70                 | ELHMCPO70J2C          |
| 100                | ELHMCPO100L3C         |
| –                  | ELHMCPO24D0IC         |
| –                  | ELHMCPO50G2IC         |
| –                  | ELHMCPO70J2IC         |
| 100                | ELHMCPO100K3C         |

#### HMCPs for Application with Motor Starters Equipped with Electrical Overload Relays

|     |               |
|-----|---------------|
| 3   | ELHMCPS003A0C |
| 7   | ELHMCPS007C0C |
| 15  | ELHMCPS015E0C |
| 30  | ELHMCPS030H1C |
| 50  | ELHMCPS050K2C |
| 100 | ELHMCPS100R3C |
| 150 | ELHMCPS150T4C |
| 150 | ELHMCPS150U4C |

#### J-Frame HMCP with Earth Leakage Ground Fault

| Continuous Amperes | Catalog Number 3-Pole                                                                                                                        |
|--------------------|----------------------------------------------------------------------------------------------------------------------------------------------|
| 250                | ELHMCJP250A5<br>ELHMCJP250C5<br>ELHMCJP250D5<br>ELHMCJP250F5<br>ELHMCJP250G5<br>ELHMCJP250J5<br>ELHMCJP250K5<br>ELHMCJP250L5<br>ELHMCJP250V5 |
| 400                | ELHMCJP400D5<br>ELHMCJP400F5<br>ELHMCJP400G5<br>ELHMCJP400J5<br>ELHMCJP400K5                                                                 |

① Package of 3 terminals.

② Package of 4 terminals.

③ 15, 20, 25, and 30 ampere available.

## Type FCL Current Limit-R Thermal-Magnetic Circuit Breakers

15 to 100 Amperes, 480 Volts Ac  
Non-Interchangeable Trip, Line and  
Load Terminals Included



Type FCL Breaker

## Dimensions / Weights

## Dimensions, Inches

| Number of Poles | Width             | Height           | Depth            |
|-----------------|-------------------|------------------|------------------|
| 2-3             | 4.125<br>(104.78) | 8.75<br>(222.25) | 3.375<br>(85.73) |

## Approximate Shipping Weight, Lbs. (kg)

|        |              |
|--------|--------------|
| 2-Pole | 9<br>(4.082) |
| 3-Pole | 9<br>(4.082) |

## Listed with Underwriters Laboratories, Inc. except as noted.

Type FCL breakers are not defined in  
Federal Specification W-C-375-b.

## Interrupting Capacity Ratings

| Circuit Breaker Type | Volts Ac (50/60 Hz) | Interrupting Capacity (Symmetrical Amperes) (kA) |
|----------------------|---------------------|--------------------------------------------------|
| FCL                  | 240<br>480          | 200<br>150                                       |

On all 3-phase Delta, Grounded  
B phase applications, refer to  
Cutler-Hammer.

| Maximum Continuous<br>Ampere Rating<br>@ 40°C | 2-Pole <sup>①</sup> | 3-Pole   |
|-----------------------------------------------|---------------------|----------|
|                                               | Catalog Number      |          |
| 15                                            | FCL2015L            | FCL3015L |
| 20                                            | FCL2020L            | FCL3020L |
| 25                                            | FCL2025L            | FCL3025L |
| 30                                            | FCL2030L            | FCL3030L |
| 35                                            | FCL2035L            | FCL3035L |
| 40                                            | FCL2040L            | FCL3040L |
| 45                                            | FCL2045L            | FCL3045L |
| 50                                            | FCL2050L            | FCL3050L |
| 60                                            | FCL2060L            | FCL3060L |
| 70                                            | FCL2070L            | FCL3070L |
| 80                                            | FCL2080L            | FCL3080L |
| 90                                            | FCL2090L            | FCL3090L |
| 100                                           | FCL2100L            | FCL3100L |

## Line and Load Terminals

Breakers listed include line and load terminals. Terminals are Underwriters Laboratories, Inc. listed for wire sizes and types listed below. When used with aluminum cable, use joint compound. To order optional aluminum terminals, add suffix "Z" to breaker catalog number listed.

| Maximum Breaker Amperes                  | Wire Type | AWG Wire Range |
|------------------------------------------|-----------|----------------|
| <b>Standard Pressure Terminals</b>       |           |                |
| 100                                      | Al/Cu     | #14-1/0        |
| <b>Optional Al/Cu Pressure Terminals</b> |           |                |
| 50                                       | Al/Cu     | #14-#4         |
| 100                                      | Al/Cu     | #4-4/0         |

<sup>①</sup> 2-pole breakers are supplied in 3-pole frames  
with current carrying parts omitted from the  
center pole.



### Type LCL Current Limit-R Electronic Circuit Breakers

125 to 400 Amperes, 600 Volts Ac  
with Solid State Trip Units



Type LCL Breaker

### Dimensions / Weights

#### Dimensions, Inches

| Number of Poles | Width          | Height           | Depth              |
|-----------------|----------------|------------------|--------------------|
| 2-3             | 16<br>(406.40) | 8.25<br>(209.56) | 4.0625<br>(103.19) |

#### Approximate Shipping Weight, Lbs. (kg)

| Standard          |                |
|-------------------|----------------|
| 2-Pole            | 32<br>(14.515) |
| 3-Pole            | 32<br>(14.515) |
| With Ground Fault |                |
| 3-Pole            | 36<br>(16.329) |

**Listed with Underwriters Laboratories, Inc. except as noted.**  
Type LCL breakers are not defined in Federal Specification W-C-375-b.

#### Interrupting Capacity Ratings

| Circuit Breaker Type | Volts Ac (50/60 Hz) | Interrupting Capacity (Symmetrical Amperes) (kA) |
|----------------------|---------------------|--------------------------------------------------|
| LCL                  | 240<br>480<br>600   | 200<br>200<br>100                                |

On all 3-phase Delta, Grounded B phase applications, refer to Cutler-Hammer.

### Standard Breakers 600 Volts Ac, 50/60 Hz

Complete breaker requires frame, rating plug and terminals

| Frame Only         |                                                           |                                                 |                                                                                                   |
|--------------------|-----------------------------------------------------------|-------------------------------------------------|---------------------------------------------------------------------------------------------------|
| Poles <sup>①</sup> | Standard (Long Delay, Magnetic Trip and Current Limiting) | Magnetic Only <sup>②</sup> and Current Limiting | Long Delay, Magnetic Trip and Adjustable Short Delay Time (.08-.28 seconds), and Current Limiting |
| Catalog Number     |                                                           |                                                 |                                                                                                   |

#### Types LCL and LCLA 250 Ampere Frame (125-250 Amperes)

|   |          |           |           |
|---|----------|-----------|-----------|
| 2 | LCL2250F | LCL2250FM | LCLA2250F |
| 3 | LCL3250F | LCL3250FM | LCLA3250F |

#### Types LCL and LCLA 400 Ampere Frame (200-400 Amperes)

|   |          |           |           |
|---|----------|-----------|-----------|
| 2 | LCL2400F | LCL2400FM | LCLA2400F |
| 3 | LCL3400F | LCL3400FM | LCLA3400F |

Instruction Leaflet/FRED Number 15257

### Breakers with Built-in Ground Fault Protection

Complete breaker requires frame, rating plug and terminals – extra current transformer included for neutral.

| Frame Only         |                                                                               |                                                                                                                         |
|--------------------|-------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------|
| Poles <sup>①</sup> | Standard (Long Delay, Magnetic Trip, Current Limiting, and Ground Fault Trip) | Long Delay, Magnetic Trip and Adjustable Short Delay Time (.06-.22 seconds), and Ground Fault Trip and Current Limiting |
| Catalog Number     |                                                                               |                                                                                                                         |

#### Types LCLG and LCLGA 250 Ampere Frame (125-250 Amperes)

|   |           |            |
|---|-----------|------------|
| 3 | LCLG3250F | LCLGA3250F |
|---|-----------|------------|

#### Types LCLG and LCLGA 400 Ampere Frame (200-400 Amperes)

|   |           |            |
|---|-----------|------------|
| 3 | LCLG3400F | LCLGA3400F |
|---|-----------|------------|

Instruction Leaflet/FRED Number 15495

### Terminals<sup>③</sup> (Order Separately)

Two terminals are required per pole. Terminals are Underwriters Laboratories, Inc. listed for wire type and range listed below. When used with aluminum cable, use joint compound.

| Maximum Breaker Amperes | Wire Range, Type, Number of Cables | Terminal Catalog Number |
|-------------------------|------------------------------------|-------------------------|
|-------------------------|------------------------------------|-------------------------|

#### Standard Copper Pressure Terminals

|     |                                           |        |
|-----|-------------------------------------------|--------|
| 225 | 1#6-350 kcmil Cu                          | T225LA |
| 400 | 1#4-250 kcmil Cu, plus 1 3/0-600 kcmil Cu | T401LA |

#### Optional Al/Cu Pressure Terminals

|     |                                                 |          |
|-----|-------------------------------------------------|----------|
| 225 | 1#6-350 kcmil Cu, or 1#4-350 kcmil Al           | TA225LA1 |
| 400 | 1#4-250 kcmil Al/Cu, plus 1 3/0-600 kcmil Al/Cu | TA400LA1 |

### Rating Plug Selection Data

Rating plugs listed below are for both standard breakers and breakers with built-in ground fault protection.

#### Rating Plugs Only (For 2- or 3-Pole Frames)

| Continuous Ampere Rating | Magnetic Trip Setting, Amperes |      | Fixed Rating Plugs | Adjustable Rating Plugs <sup>④</sup> |
|--------------------------|--------------------------------|------|--------------------|--------------------------------------|
|                          | Low                            | High | Catalog Number     |                                      |

#### Types LCL and LCLA 250 Ampere Frames

|     |     |      |         |                       |
|-----|-----|------|---------|-----------------------|
| 125 | 375 | 1125 | 2LCL125 | —                     |
| 150 | 450 | 1350 | 2LCL150 | —                     |
| 175 | 525 | 1575 | 2LCL175 | A2LCL175 <sup>⑤</sup> |
| 200 | 600 | 1800 | 2LCL200 | A2LCL200              |
| 225 | 675 | 2025 | 2LCL225 | A2LCL225              |
| 250 | 750 | 2250 | 2LCL250 | A2LCL250 <sup>⑥</sup> |

#### Types LCL and LCLA 400 Ampere Frames

|     |     |      |         |                       |
|-----|-----|------|---------|-----------------------|
| 200 | 400 | 1600 | 4LCL200 | —                     |
| 225 | 450 | 1800 | 4LCL225 | —                     |
| 250 | 500 | 2000 | 4LCL250 | —                     |
| 275 | 550 | 2200 | 4LCL275 | —                     |
| 300 | 600 | 2400 | 4LCL300 | A4LCL300 <sup>⑤</sup> |
| 350 | 700 | 2800 | 4LCL350 | A4LCL350              |
| 400 | 800 | 3200 | 4LCL400 | A4LCL400 <sup>⑥</sup> |

① 2-pole breakers are supplied in 3-pole frames with current carrying parts omitted from the center pole.

② UL listed recognized component.

③ Terminals shipped separately from breaker.

④ Adjustable 70 to 100% except as noted.

⑤ Adjustable 75 to 100%.

⑥ Adjustable 50 to 100%.

## Type FB Tri-Pac Thermal-Magnetic Circuit Breakers

15 to 100 Amperes, 600 Volts Ac,  
250 Volts Dc, Replaceable Current  
Limiters



Type Tri-Pac FB Breaker

## Dimensions / Weights

## Dimensions, Inches

| Number of Poles | Width             | Height           | Depth          |
|-----------------|-------------------|------------------|----------------|
| 2-3             | 4.125<br>(104.78) | 8.75<br>(222.25) | 3.5<br>(88.90) |

## Approximate Shipping Weight, Lbs. (kg)

| Breaker    | Complete Breaker |        |
|------------|------------------|--------|
|            | 2-Pole           | 3-Pole |
| Tri-Pac FB | 10.5             | 11.5   |

Listed with Underwriters Labora-  
tories, Inc. except as noted.

Tri-Pac FB breakers meet the  
requirements for Class 16a, 16b, 17a  
and 26a circuit breakers as defined  
in Federal Specification W-C-375b.

## Interrupting Capacity Ratings

Underwriters Laboratories, Inc.  
Listed

600 Volts Ac Maximum: 200,000  
Amperes Symmetrical

## Based on NEMA Test Procedures

250 Volts Dc Maximum: 100,000  
Amperes.

On all 3-phase Delta, Ground B phase  
applications, refer to Cutler-Hammer.

① 2-pole breakers are supplied in 3-pole frames  
with current carrying parts omitted from the  
center pole.

| Maximum Continuous<br>Ampere Rating<br>@ 40°C | 2-Pole①                                    | 3-Pole   |
|-----------------------------------------------|--------------------------------------------|----------|
|                                               | Catalog Number (Current Limiters Included) |          |
| 15                                            | FB2015PL                                   | FB3015PL |
| 20                                            | FB2020PL                                   | FB3020PL |
| 30                                            | FB2030PL                                   | FB3030PL |
| 40                                            | FB2040PL                                   | FB3040PL |
| 50                                            | FB2050PL                                   | FB3050PL |
| 60                                            | FB2060PL                                   | FB3060PL |
| 70                                            | FB2070PL                                   | FB3070PL |
| 90                                            | FB2090PL                                   | FB3090PL |
| 100                                           | FB2100PL                                   | FB3100PL |

## Line and Load Terminals

Breakers listed include line and load terminals. Terminals are Underwriters Laboratories, Inc. listed for wire sizes and types listed below. When used with aluminum cable, use joint compound. To order optional aluminum terminals, add suffix "Z" to breaker catalog number listed.

| Maximum Breaker Amperes                  | Wire Type | AWG Wire Range |
|------------------------------------------|-----------|----------------|
| <b>Standard Pressure Terminals</b>       |           |                |
| 100                                      | Al/Cu     | #14-1/0        |
| <b>Optional Al/Cu Pressure Terminals</b> |           |                |
| 50                                       | Al/Cu     | #14-#4         |
| 100                                      | Al/Cu     | #4-4/0         |

## Replacement Current Limiters and Housing Assembly

## Current Limiters: One required per pole.

| Application                                                                                                                                                                                  | Catalog Number |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|
| Supplied as standard in Type FB Tri-Pac breakers rated 15-100 amperes. Replaces 200FBP03 formerly supplied on 15-40 ampere ratings, and 500FBP07 formerly supplied on 50-100 ampere ratings. | 100FBP06       |

Refer to CAT.71.01.T.E for complete application information.

## Current Limiter Housing Assembly Complete with Current Limiter

| Ampere Rating | Poles | Style Number |
|---------------|-------|--------------|
| 15-100        | 2     | 176C593G09   |
| 15-100        | 3     | 176C593G10   |



## Type LA Tri-Pac Thermal-Magnetic Circuit Breakers

70 to 400 Amperes, 600 Volts Ac,  
250 Volts Dc, 2-, 3-Pole, Inter-  
changeable Trip, Replaceable  
Current Limiters



Type Tri-Pac LA Breaker

## Dimensions / Weights

## Dimensions, Inches

| Number of Poles | Width            | Height         | Depth            |
|-----------------|------------------|----------------|------------------|
| 2-3             | 8.25<br>(209.56) | 16<br>(406.40) | 4.75<br>(113.54) |

## Approximate Shipping Weight, Lbs. (kg)

| Breaker    | Complete Breaker |        | Frame Only |        | Trip Unit |        |
|------------|------------------|--------|------------|--------|-----------|--------|
|            | 2-Pole           | 3-Pole | 2-Pole     | 3-Pole | 2-Pole    | 3-Pole |
| Tri-Pac LA | 29.75            | 34     | 23.5       | 25     | 2.25      | 3      |

## Listed with Underwriters Laboratories, Inc. except as noted.

Tri-Pac LA breakers meet the requirements for Class 16a, 16b, 17a and 26a circuit breakers as defined in Federal Specification W-C-375b.

## Interrupting Capacity Ratings

## Underwriters Laboratories, Inc. Listed

600 Volts Ac Maximum: 200,000  
Amperes Symmetrical

## Based on NEMA Test Procedures

250 Volts Dc Maximum: 100,000  
Amperes.

On all 3-phase Delta, Ground B phase  
applications, refer to Cutler-Hammer.

| Continu-<br>ous<br>Ampere<br>Rating<br>@40°C | Magnetic Trip Setting<br>Amperes <sup>④</sup> |      | Complete Breaker                                        | Shipped as Frame, Trip Units, Limiters and Terminals <sup>⑤</sup> |                |                                           |
|----------------------------------------------|-----------------------------------------------|------|---------------------------------------------------------|-------------------------------------------------------------------|----------------|-------------------------------------------|
|                                              | Low                                           | High | Includes Pressure Type<br>Copper Terminals <sup>⑤</sup> | Frame Only                                                        | Trip Unit Only | Current Limiter<br>1 Required per<br>Pole |
|                                              |                                               |      | Catalog Number                                          |                                                                   |                |                                           |

2 Poles, 600 Volts Ac, 250 Volts Dc<sup>⑥</sup>

|     |      |      |          |           |          |          |
|-----|------|------|----------|-----------|----------|----------|
| 70  | 350  | 700  | LA2070PR | LA2400PRF | LA2070PT | 200LAP08 |
| 90  | 450  | 900  | LA2090PR | LA2400PRF | LA2090PT | 200LAP08 |
| 100 | 500  | 1000 | LA2100PR | LA2400PRF | LA2100PT | 200LAP08 |
| 125 | 625  | 1250 | LA2125PR | LA2400PRF | LA2125PT | 200LAP08 |
| 150 | 750  | 1500 | LA2150PR | LA2400PRF | LA2150PT | 200LAP08 |
| 175 | 875  | 1750 | LA2175PR | LA2400PRF | LA2175PT | 200LAP08 |
| 200 | 1000 | 2000 | LA2200PR | LA2400PRF | LA2200PT | 200LAP08 |
| 225 | 1125 | 2250 | LA2225PR | LA2400PRF | LA2225PT | 400LAP10 |
| 250 | 1250 | 2500 | LA2250PR | LA2400PRF | LA2250PT | 400LAP10 |
| 300 | 1500 | 3000 | LA2300PR | LA2400PRF | LA2300PT | 400LAP10 |
| 350 | 1750 | 3500 | LA2350PR | LA2400PRF | LA2350PT | 400LAP10 |
| 400 | 2000 | 4000 | LA2400PR | LA2400PRF | LA2400PT | 400LAP10 |

## 3 Poles, 600 Volts Ac, 250 Volts Dc

|     |      |      |          |           |          |          |
|-----|------|------|----------|-----------|----------|----------|
| 70  | 350  | 700  | LA3070PR | LA3400PRF | LA3070PT | 200LAP08 |
| 90  | 450  | 900  | LA3090PR | LA3400PRF | LA3090PT | 200LAP08 |
| 100 | 500  | 1000 | LA3100PR | LA3400PRF | LA3100PT | 200LAP08 |
| 125 | 625  | 1250 | LA3125PR | LA3400PRF | LA3125PT | 200LAP08 |
| 150 | 750  | 1500 | LA3150PR | LA3400PRF | LA3150PT | 200LAP08 |
| 175 | 875  | 1750 | LA3175PR | LA3400PRF | LA3175PT | 200LAP08 |
| 200 | 1000 | 2000 | LA3200PR | LA3400PRF | LA3200PT | 200LAP08 |
| 225 | 1125 | 2250 | LA3225PR | LA3400PRF | LA3225PT | 400LAP10 |
| 250 | 1250 | 2500 | LA3250PR | LA3400PRF | LA3250PT | 400LAP10 |
| 300 | 1500 | 3000 | LA3300PR | LA3400PRF | LA3300PT | 400LAP10 |
| 350 | 1750 | 3500 | LA3350PR | LA3400PRF | LA3350PT | 400LAP10 |
| 400 | 2000 | 4000 | LA3400PR | LA3400PRF | LA3400PT | 400LAP10 |

Instruction Leaflet/FRED Number 14551 for Trip Unit and Fuse

## Current Limiters

Included with breaker, one required  
per pole.

| Application                                                                                                                                                                                                                                                                                                                                                      | Catalog Number |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|
| Supplied as standard on ratings through 200 amperes.                                                                                                                                                                                                                                                                                                             | 200LAP08       |
| Supplied as standard on 225 through 400 ampere ratings, optional on lower ratings when a higher "cross-over point" is desired. (Above two limiters replace 800LAP12 formerly supplied as standard on all ratings, 600LAP09 optional on all ratings through 300 amperes, 300LAP05 optional on ratings through 150 amperes, and special rating limiter 1000LAP14.) | 400LAP10       |
| Special rating where a higher "cross-over point" is desired on 200 ampere and higher ratings (Replaces limiter 1500LAP20)                                                                                                                                                                                                                                        | 500LAP15<br>②③ |

- ① New limiters suitable for replacement in existing breakers by using plug-in conductor from old limiter (instructions included with limiter). Instruction Leaflet/FRED Number 14824
- ② Not listed with Underwriters Laboratories, Inc.
- ③ Protection based on 100,000 ampere maximum fault, 480 volts maximum.
- ④ Set on high side, adjustable to lower limits.

Terminals<sup>⑤</sup>

Two terminals are required per pole. Terminals are Underwriters Laboratories, Inc. listed for wire size and type listed below. When used with aluminum conductors, use joint compound. To order optional aluminum terminals, add suffix "Z" to complete breaker catalog number.

| Maximum Breaker Amperes | Wire Range, Type, Number of Cables | Terminal Catalog Number |
|-------------------------|------------------------------------|-------------------------|
|-------------------------|------------------------------------|-------------------------|

## Standard Copper Pressure Terminals

|                  |                                               |         |
|------------------|-----------------------------------------------|---------|
| 225              | 1 #6-350 kcmil Cu                             | T225LA  |
| 225 <sup>⑦</sup> | 1 #6-250 kcmil Cu                             | T225LBF |
| 400              | 1 #4-250 kcmil Cu, plus<br>1 3/0-600 kcmil Cu | T401LA  |

## Optional Al/Cu Pressure Terminals

|     |                                                     |          |
|-----|-----------------------------------------------------|----------|
| 225 | 1 #6-350 kcmil Cu, or<br>1 #4-350 kcmil Cu/Al       | TA225LA1 |
| 400 | 1 #4-250 kcmil Al/Cu, plus<br>1 3/0-600 kcmil Al/Cu | TA400LA1 |

Instruction Leaflet/FRED Number 13732

- ⑤ Terminals shipped separately from breakers.
- ⑥ 2-pole breakers or trips are supplied in 3-pole frames with current carrying parts omitted from the center pole.
- ⑦ Optional terminal.

## Type NB Tri-Pac Thermal-Magnetic Circuit Breakers

300 to 800 Amperes, 600 Volts Ac,  
250 Volts Dc<sup>①</sup>, 2-, 3-Pole, Inter-  
changeable Trip, Replaceable  
Current Limiters



Type Tri-Pac NB Breaker

## Dimensions / Weights

## Dimensions, Inches

| Number of Poles | Width            | Height         | Depth           |
|-----------------|------------------|----------------|-----------------|
| 2-3             | 8.25<br>(209.56) | 22<br>(558.80) | 5.5<br>(139.70) |

## Approximate Shipping Weight, Lbs. (kg)

| Breaker    | Complete Breaker |        | Frame Only |        | Trip Unit |        |
|------------|------------------|--------|------------|--------|-----------|--------|
|            | 2-Pole           | 3-Pole | 2-Pole     | 3-Pole | 2-Pole    | 3-Pole |
| Tri-Pac NB | 62               | 75     | 58         | 65     | 3.5       | 4      |

## Listed with Underwriters Laboratories, Inc. except as noted.

Tri-Pac NB breakers meet the requirements for Class 16b, 17a and 26a circuit breakers as defined in Federal Specification W-C-375b.

| Continu-<br>ous<br>Ampere<br>Rating<br>@40°C | Magnetic Trip Setting<br>Amperes <sup>④</sup> |      | Complete Breaker                                        | Shipped as Frame, Trip Units, Limiters and Terminals |                |                                        |
|----------------------------------------------|-----------------------------------------------|------|---------------------------------------------------------|------------------------------------------------------|----------------|----------------------------------------|
|                                              | Low                                           | High | Includes Pressure Type<br>Copper Terminals <sup>⑤</sup> | Frame Only                                           | Trip Unit Only | Current Limiter<br>1 Required per Pole |
|                                              |                                               |      | Catalog Number                                          |                                                      |                |                                        |

2 Poles, 600 Volts Ac, 250 Volts Dc<sup>①③</sup>

|                  |      |      |         |          |          |         |
|------------------|------|------|---------|----------|----------|---------|
| 300              | 1500 | 3000 | NB2300P | NB2800PF | NB2300PT | 500NB12 |
| 350              | 1750 | 3500 | NB2350P | NB2800PF | NB2350PT | 500NB12 |
| 400 <sup>④</sup> | 2000 | 4000 | NB2400P | NB2800PF | NB2400PT | 500NB12 |
| 500 <sup>④</sup> | 2500 | 5000 | NB2500P | NB2800PF | NB2500PT | 500NB12 |
| 600 <sup>④</sup> | 3000 | 6000 | NB2600P | NB2800PF | NB2600PT | 800NB20 |
| 700 <sup>④</sup> | 3000 | 6000 | NB2700P | NB2800PF | NB2700PT | 800NB20 |
| 800 <sup>④</sup> | 3000 | 6000 | NB2800P | NB2800PF | NB2800PT | 800NB20 |

## 3 Poles, 600 Volts Ac Only

|                  |      |      |         |          |          |         |
|------------------|------|------|---------|----------|----------|---------|
| 300              | 1500 | 3000 | NB3300P | NB3800PF | NB3300PT | 500NB12 |
| 350              | 1750 | 3500 | NB3350P | NB3800PF | NB3350PT | 500NB12 |
| 400 <sup>④</sup> | 2000 | 4000 | NB3400P | NB3800PF | NB3400PT | 500NB12 |
| 500 <sup>④</sup> | 2500 | 5000 | NB3500P | NB3800PF | NB3500PT | 500NB12 |
| 600 <sup>④</sup> | 3000 | 6000 | NB3600P | NB3800PF | NB3600PT | 800NB20 |
| 700 <sup>④</sup> | 3000 | 6000 | NB3700P | NB3800PF | NB3700PT | 800NB20 |
| 800 <sup>④</sup> | 3000 | 6000 | NB3800P | NB3800PF | NB3800PT | 800NB20 |

Instruction Leaflet/FRED Number 13771 for Trip Unit and Fuse

## Interrupting Capacity Ratings

Underwriters Laboratories, Inc.  
Listed

600 Volts Ac Maximum: 200,000  
Amperes Symmetrical

## Based on NEMA Test Procedures

250 Volts Dc Maximum<sup>①</sup>: 100,000  
Amperes.

On all 3-phase Delta, Grounded  
B phase applications, refer to  
Cutler-Hammer.

## Current Limiters

Included with breaker, one required  
per pole.

| Application                                                                                                                                                 | Catalog Number |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|
| Supplied as standard on ratings through 500 amperes.                                                                                                        | 500NB12        |
| Supplied as standard on 600 through 800 ampere ratings, optional on lower ratings when a higher "cross-over point" is desired.                              | 800NB20        |
| Above two limiters replace 1000NB14 formerly supplied on ratings up to 600 amperes, 1500NB20 supplied on 700 amperes, and 2500NB25 supplied on 800 amperes. |                |

Terminals<sup>②</sup>

Two terminals are required per pole. Terminals are Underwriters Laboratories, Inc. listed for wire size and type listed below. When used with aluminum conductors, use joint compound. To order optional aluminum terminals, add suffix "Z" to complete breaker catalog number.

| Maximum<br>Ampere<br>Rating | Wire Range, Type,<br>Number of Cables | Terminal<br>Catalog<br>Number |
|-----------------------------|---------------------------------------|-------------------------------|
|-----------------------------|---------------------------------------|-------------------------------|

## Standard Copper Pressure Terminals

|     |                    |          |
|-----|--------------------|----------|
| 350 | 1 #1-600 kcmil Cu  | T350NB   |
| 700 | 2 2/0-500 kcmil Cu | T700NB1  |
| 800 | 3 3/0-500 kcmil Cu | T1000NB1 |

## Optional Al/Cu Pressure Terminals

|     |                       |           |
|-----|-----------------------|-----------|
| 700 | 2 #1-500 kcmil Al/Cu  | TA700NB1  |
| 800 | 3 3/0-400 kcmil Al/Cu | TA1000NB1 |
| 800 | 3 500-750 kcmil Al/Cu | TA1201NB1 |

① Dc rating applies to 350 amperes maximum thermal or to magnetic only breakers.

② Shipped separately from breaker

③ 2-pole breakers or trips are supplied in 3-pole frames with current carrying parts omitted from the center pole.

④ 60 Hz Ac only.

## Type PB Tri-Pac Thermal-Magnetic Circuit Breakers

600 to 1600 Amperes, 600 Volts Ac,  
60 Hertz Ac<sup>①</sup>, 250 Volts Dc<sup>②</sup>,  
2-, 3- Poles Interchangeable Trip,  
Replaceable Current Limiters



Type Tri-Pac PB Breaker

## Dimensions / Weights

## Dimensions, Inches

| Number of Poles | Width               | Height             | Depth              |
|-----------------|---------------------|--------------------|--------------------|
| 2-3             | 12.0625<br>(306.39) | 22.125<br>(561.98) | 9.0625<br>(230.19) |

## Approximate Shipping Weight, Lbs. (kg)

| Breaker    | Complete Breaker |        | Frame Only |        | Trip Unit |        |
|------------|------------------|--------|------------|--------|-----------|--------|
|            | 2-Pole           | 3-Pole | 2-Pole     | 3-Pole | 2-Pole    | 3-Pole |
| Tri-Pac PB | 148              | 179    | 106        | 120    | 18        | 23     |

## Listed with Underwriters Laboratories, Inc. except as noted.

Tri-Pac PB breakers meet the requirements for Class 17a and 26a circuit breakers as defined in Federal Specification W-C-375b.

## Interrupting Capacity Ratings

## Underwriters Laboratories, Inc. Listed

600 Volts Ac Maximum: 200,000  
Amperes Symmetrical

## Based on NEMA Test Procedures

250 Volts Dc<sup>②</sup>: 100,000 Amperes.

On all 3-phase Delta, Grounded  
B phase applications, refer to  
Cutler-Hammer.

| Continuous<br>Ampere<br>Rating<br>@40°C | Ac Magnetic Trip Set-<br>ting (Set on High Side,<br>Adjustable to Lower<br>Limits) |      | Complete Breaker<br>Includes Rear<br>"T" Connectors <sup>⑤</sup> | Shipped as Frame, Trip Unit Current Limiters and Connectors |                             |                                        |
|-----------------------------------------|------------------------------------------------------------------------------------|------|------------------------------------------------------------------|-------------------------------------------------------------|-----------------------------|----------------------------------------|
|                                         | Low                                                                                | High | Catalog Number                                                   | Frame Only                                                  | Trip Unit Only <sup>④</sup> | Current Limiter<br>1 Required per Pole |

2 Poles, 600 Volts Ac<sup>⑤</sup>

|      |      |      |           |            |            |            |
|------|------|------|-----------|------------|------------|------------|
| 600  | 1500 | 5000 | PB2600PR  | PB21600PRF | PB2600PRT  | 1000PBPR20 |
| 700  | 1500 | 5000 | PB2700PR  | PB21600PRF | PB2700PRT  | 1000PBPR20 |
| 800  | 1500 | 5000 | PB2800PR  | PB21600PRF | PB2800PRT  | 1000PBPR20 |
| 900  | 1500 | 5000 | PB2900PR  | PB21600PRF | PB2900PRT  | 1000PBPR20 |
| 1000 | 1500 | 5000 | PB21000PR | PB21600PRF | PB21000PRT | 1000PBPR20 |
| 1200 | 2000 | 6000 | PB21200PR | PB21600PRF | PB21200PRT | 1600PBPR30 |
| 1400 | 2500 | 7000 | PB21400PR | PB21600PRF | PB21400PRT | 1600PBPR30 |
| 1600 | 3000 | 8000 | PB21600PR | PB21600PRF | PB21600PRT | 1600PBPR30 |

## 3 Poles, 600 Volts Ac Only

|      |      |      |           |            |            |            |
|------|------|------|-----------|------------|------------|------------|
| 600  | 1500 | 5000 | PB3600PR  | PB31600PRF | PB3600PRT  | 1000PBPR20 |
| 700  | 1500 | 5000 | PB3700PR  | PB31600PRF | PB3700PRT  | 1000PBPR20 |
| 800  | 1500 | 5000 | PB3800PR  | PB31600PRF | PB3800PRT  | 1000PBPR20 |
| 900  | 1500 | 5000 | PB3900PR  | PB31600PRF | PB3900PRT  | 1000PBPR20 |
| 1000 | 1500 | 5000 | PB31000PR | PB31600PRF | PB31000PRT | 1000PBPR20 |
| 1200 | 2000 | 6000 | PB31200PR | PB31600PRF | PB31200PRT | 1600PBPR30 |
| 1400 | 2500 | 7000 | PB31400PR | PB31600PRF | PB31400PRT | 1600PBPR30 |
| 1600 | 3000 | 8000 | PB31600PR | PB31600PRF | PB31600PRT | 1600PBPR30 |

## Current Limiters

Included with breaker, one required  
per pole.

| Application                                                                                                                                                                                                                                                            | Catalog Number |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|
| Supplied as standard on ratings through 1000 amperes. (Replaces limiter 1500PBPR30 formerly supplied on 600 and 700 ampere ratings, and 3000 PBPR27 supplied on 800-1000 ampere ratings.)                                                                              | 1000PBPR20     |
| Supplied as standard on 1200 through 1600 ampere ratings. Optional on lower ratings where a higher "cross-over point" is desired. (Replaces limiter 4000PBPR30 formerly supplied on 1200 through 1400 ampere ratings, and 5000PBPR42 supplied on 1600 ampere ratings.) | 1600PBPR30     |

Bus Bar Connectors<sup>⑥</sup>"T" Connector for  
Cu/Al Bus

Two required per pole.  
For rear bus connection.  
Accepts up to four bus  
bolts. May be rotated 90°

| Catalog Number |
|----------------|
| BA2000B        |

Cable Connector  
(Optional)

For "T" connector.  
Accepts four 600 kcmil  
copper cables.

| Style Number |
|--------------|
| 505C706G04   |

Special Breakers<sup>⑥</sup>

## Magnetic Only Type Tri-Pacs:

Available on request.

- ① Higher frequency calibration not available. Minimum of 50 Hz calibration available on special order.  
② 250 volts Dc rating applies only to magnetic only breakers.  
③ Shipped separately from breaker.

- ④ Magnetic only trip units are available. Order by description.  
⑤ 2-pole breakers are supplied in 3-pole frames with current carrying parts omitted from center pole.  
⑥ Not listed with Underwriters Laboratories, Inc.

## Alarm Switch

For light or alarm indication when breaker trips. Does not function with manual operation. Automatically resets when breaker is relatched. Standard leads extend 18 inches outside of breaker. Longer leads may be specified. Not field mountable.

| Breaker Frame | Normal Pole Meeting | Contact Operation (Specific Type Desired) |
|---------------|---------------------|-------------------------------------------|
| FCL           | Center              | Make or Break                             |
| LA Tri-Pac    | Left                | Make or Break                             |
| NB Tri-Pac    | Left                | Make or Break                             |
| PB Tri-Pac    | Left                | Make or Break                             |
| LCL           | Left <sup>①</sup>   | Make or Break                             |

Alarm Switch Contact Rating (Non Inductive) LA Tri-Pac: 10 amperes, 120 volt Ac; 5A, 240 volt Ac.

## Auxiliary Switch<sup>②</sup>

For auxiliary control circuits. Miniature switches mount within breaker. Commonly used for remote indication of open or closed breaker and electrically interlocking component control circuits. "A" contacts are closed when breaker is closed. "B" contacts are open when breaker is closed. Standard leads extend 18 inches outside of breaker. Longer leads may be specified.



### Auxiliary Switch Attachment Kits for Field Mounting<sup>③④</sup>

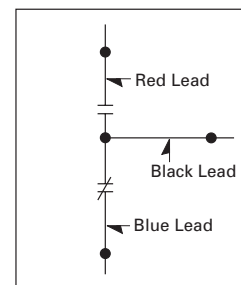
| Breaker Type | For Right-Hand Mounting |            | For Left-Hand Mounting |            | Maxmum<br>Ac Voltage<br>Rating <sup>⑤</sup> | Maximum<br>Non-Inductive<br>Amperes |
|--------------|-------------------------|------------|------------------------|------------|---------------------------------------------|-------------------------------------|
|              | 1A-1B                   | 2A-2B      | 1A-1B                  | 2A-2B      |                                             |                                     |
|              | Style Number            |            |                        |            |                                             |                                     |
| FCL          | 1369D79G03              | —          | 1369D79G03             | —          | 240                                         | 5                                   |
| NB Tri-Pac   | 4980D16G05              | 4980D16G06 | 4980D16G12             | 4980D16G13 | 480                                         | 10                                  |
| PB Tri-Pac   | 2602D32G14              | 2602D32G15 | 2602D32G11             | 2602D32G12 | 480                                         | 10                                  |
| LCL          | —                       | —          | 1372D49G03             | 1372D49G06 | 480                                         | 6 (10@240)                          |

Instruction Leaflet/FRED Number 14535 NB Tri-Pac; 14534 PB Tri-Pac; 15279 LCL

### Factory Mounted Auxiliary Switches<sup>②</sup>

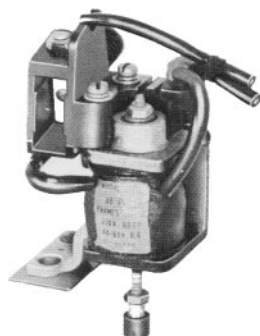
All of the above auxiliary switches can be specified for factory mounting at the same price as listed for the kit. These attachments have the leads out the side of the breaker and are UL listed when factory mounted unless other non UL listed modifications are used (except as noted).

Factory mounted switches only can be supplied for the following breakers: FB Tri-Pac<sup>®</sup>, LA Tri-Pac. Order by description.



- ① When alarm switch is used in conjunction with auxiliary switch, the auxiliary switch is rated 250 volts max., 5 amperes maximum.
- ② Left-hand mounting is standard unless otherwise specified.
- ③ All switches are multiples of 1A-1B with a common electrical connection (See diagram above).
- ④ Field mounting voids UL listing of breaker except on NB Tri-Pac and PB Tri-Pac breakers.
- ⑤ For Dc applications refer to factory.
- ⑥ Right-hand mounting only.

## Shunt Trip



For tripping breaker from a remote point. A solenoid device mounts within breaker case. Breaker trips when coil is energized.

Shunt trips should not be used as circuit interlocks using maintained contact pilot devices.

A cutoff switch breaks the circuit to the momentary rated coil when breaker opens. Available for control voltages up to 250 volts Dc or 600 volts Ac. Voltage and frequency must be specified. Standard leads extend 18 inches outside of breaker. Longer leads may be specified.

## Shunt Trip for Field Mounting<sup>①②③</sup>

| Voltage/Hz   | Breaker Type        |            |            |                    |            |            |
|--------------|---------------------|------------|------------|--------------------|------------|------------|
|              | Right-Hand Mounting |            |            | Left-Hand Mounting |            |            |
|              | FCL                 | NB Tri-Pac | PB Tri-Pac | FCL                | NB Tri-Pac | PB Tri-Pac |
| Style Number |                     |            |            |                    |            |            |
| 600/50-60 Hz | 1369D80G15          | 2606D58G15 | 2606D58G15 | 1369D80G01         | 2606D58G01 | 2606D58G01 |
| 480/50-60 Hz | 1369D80G16          | 2606D58G16 | 2606D58G16 | 1369D80G02         | 2606D58G02 | 2606D58G02 |
| 240/50-60 Hz | 1369D80G17          | 2606D58G17 | 2606D58G17 | 1369D80G03         | 2606D58G03 | 2606D58G03 |
| 208/50-60 Hz | 1369D80G18          | 2606D58G18 | 2606D58G18 | 1369D80G04         | 2606D58G04 | 2606D58G04 |
| 120/50-60 Hz | 1369D80G19          | 2606D58G19 | 2606D58G19 | 1369D80G05         | 2606D58G05 | 2606D58G05 |
| 60/50-60 Hz  | 1369D80G20          | 2606D58G20 | 2606D58G20 | 1369D80G06         | 2606D58G06 | 2606D58G06 |
| 48/50-60 Hz  | 1369D80G21          | 2606D58G21 | 2606D58G21 | 1369D80G07         | 2606D58G07 | 2606D58G07 |
| 24/50-60 Hz  | 1369D80G22          | 2606D58G22 | 2606D58G22 | 1369D80G08         | 2606D58G08 | 2606D58G08 |
| 250 Dc       | 1369D80G23          | 2606D58G23 | 2606D58G23 | 1369D80G09         | 2606D58G09 | 2606D58G09 |
| 125 Dc       | 1369D80G24          | 2606D58G24 | 2606D58G24 | 1369D80G10         | 2606D58G10 | 2606D58G10 |
| 60 Dc        | 1369D80G25          | 2606D58G25 | 2606D58G25 | 1369D80G11         | 2606D58G11 | 2606D58G11 |
| 48 Dc        | 1369D80G26          | 2606D58G26 | 2606D58G26 | 1369D80G12         | 2606D58G12 | 2606D58G12 |
| 24 Dc        | 1369D80G27          | 2606D58G27 | 2606D58G27 | 1369D80G13         | 2606D58G13 | 2606D58G13 |
| 12 Dc        | 1369D80G28          | 2606D58G28 | 2606D58G28 | 1369D80G14         | 2606D58G14 | 2606D58G14 |

Instruction Leaflet/FRED Numbers

15194

14919

14940

15194

14919

14940

Factory mounted shunt trips only can be supplied for FB Tri-Pac<sup>④⑤</sup> and LA Tri-Pac breakers. Order by description.

## Left-Hand Mounting Kits for Type LCL Current Limiting Breakers<sup>⑥</sup>

| Provision to trip flux transfer shunt trip from external 32 to 120 volt (Dc to 60 Hz) source. <sup>⑦⑧</sup> | Style Number |
|-------------------------------------------------------------------------------------------------------------|--------------|
|                                                                                                             | 1372D49G22   |
| Provision to trip flux transfer shunt trip from external 240 to 600 volt (50/60 Hz) source. <sup>⑧⑨</sup>   | Style Number |
|                                                                                                             | 1372D49G32   |

Instruction Leaflet/FRED Number 15279

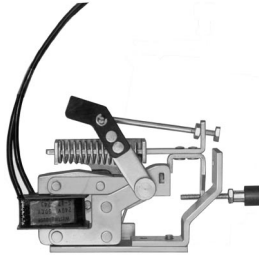
## Shunt Trip Coil Data for Type LCL Current Limiting Breakers

| Shunt Trip Voltage Rating | Coil Inrush |              |
|---------------------------|-------------|--------------|
|                           | Amperes     | Volt-Amperes |
| 120 Ac                    | .15         | 18           |

- ① 120 volt Ac ratings suitable for 55% pickup for ground fault applications.
- ② Not field mountable on non-automatic breakers (MCS).
- ③ Field mounting voids breakers' UL listing except on NB Tri-Pac and PB Tri-Pac.
- ④ Right-hand mounting only.
- ⑤ Not UL listed.
- ⑥ UL listing pending. Refer to Cutler-Hammer.
- ⑦ Rated 48 volts minimum for ground fault applications.
- ⑧ Also available factory mounted for 24 volt Dc. Order by description.
- ⑨ Not for ground fault.



## Standard Undervoltage Release<sup>①</sup>



For undervoltage protection. A solenoid device mounts within breaker case. Coil must be energized before closing breaker. Trips breaker when voltage drops below 40 to 60% of coil rating. Picks up and seals in at 80% of coil rating. For line voltages up to 250 volts Dc or 600 volts Ac. Externally mounted resistors are supplied for certain ratings. Standard leads extend 18 inches outside of breaker. Longer leads may be specified.

**Note:** U.V.R. attachments are not designed for, and should not be used as, circuit interlocks. For further information, refer to Cutler-Hammer.

### Factory Mounted Undervoltage Releases<sup>②</sup>

NB Tri-Pac and PB Tri-Pac undervoltage releases can be specified for factory mounting at the same price as the kit. These attachments have the leads out the side and are UL listed when factory mounted unless other non-UL listed modifications are used.

Factory mounted undervoltage releases only can be supplied for the following breakers: FB Tri-Pac<sup>③</sup>, LA Tri-Pac and FCL; LCL 120 Volts Ac only.<sup>④</sup> Order by description.

## Undervoltage Release Attachment Kits for Field Mounting<sup>⑤⑥</sup>

| Attachment Voltage, Hz | Breaker Type            |            |                        |            |
|------------------------|-------------------------|------------|------------------------|------------|
|                        | For Right-Hand Mounting |            | For Left-Hand Mounting |            |
|                        | NB Tri-Pac              | PB Tri-Pac | NB Tri-Pac             | PB Tri-Pac |
| Style Number           |                         |            |                        |            |
| 24 60                  | —                       | —          | —                      | —          |
| 48 60                  | —                       | 5674D29G16 | —                      | 5674D29G08 |
| 120 60                 | 373D632G01              | 5674D29G09 | 373D632G05             | 5674D29G01 |
| 208 60                 | 373D632G19              | 5674D29G10 | 373D632G20             | 5674D29G02 |
| 240 60                 | 373D632G02              | 5674D29G11 | 373D632G06             | 5674D29G03 |
| 480 60                 | 373D632G03              | 5674D29G13 | 373D632G07             | 5674D29G05 |
| 600 60                 | 373D632G04              | 5674D29G14 | 373D632G08             | 5674D29G06 |
| 12 Dc                  | 372D032G01              | 4976D85G01 | 372D032G06             | 4976D85G11 |
| 24 Dc                  | 372D032G02              | 4976D85G02 | 372D032G07             | 4976D85G12 |
| 48 Dc                  | 372D032G03              | 4976D85G03 | 372D032G08             | 4976D85G13 |
| 60 Dc                  | —                       | 4976D85G04 | —                      | 4976D85G14 |
| 125 Dc                 | 372D032G04              | 4976D85G07 | 372D032G09             | 4976D85G17 |
| 250 Dc                 | 372D032G05              | 4976D85G08 | 372D032G10             | 4976D85G18 |

Instruction Leaflet/FRED Number  
14961

13231

14961

13231

## Undervoltage Release Coil Data

| Voltage Rating, Hz | Breaker Type |                          |          |              |          |
|--------------------|--------------|--------------------------|----------|--------------|----------|
|                    | FB Tri-Pac   |                          |          | LCL          |          |
|                    | Coil Amperes | Series Resistance (Ohms) | Total VA | Coil Amperes | Total VA |
| 600 Ac             | 0.020        | 25,000                   | 12.0     | —            | —        |
| 480 Ac             | 0.016        | 25,000                   | 7.7      | —            | —        |
| 240 Ac             | 0.021        | 6,000                    | 5.1      | —            | —        |
| 208 Ac             | 0.019        | 6,000                    | 4.0      | —            | —        |
| 120 Ac             | 0.023        | —                        | 2.8      | .05          | 6        |
| 60 Ac              | 0.203        | 250                      | 12.2     | —            | —        |
| 48 Ac              | 0.245        | 150                      | 11.8     | —            | —        |
| 24 Ac              | 0.250        | 50                       | 6.0      | —            | —        |
| 250 Ac             | 0.026        | 5,000                    | 6.5      | —            | —        |
| 125 Ac             | 0.026        | —                        | 3.3      | —            | —        |
| 60 Ac              | 0.248        | 200                      | 14.9     | —            | —        |
| 48 Ac              | 0.260        | 150                      | 12.5     | —            | —        |
| 24 Ac              | 0.141        | —                        | 3.4      | —            | —        |
| 12 Ac              | 0.286        | —                        | 3.5      | —            | —        |

| Voltage Rating, Hz | Breaker Type           |                                   |          |              |                                   |          |
|--------------------|------------------------|-----------------------------------|----------|--------------|-----------------------------------|----------|
|                    | LA Tri-Pac, PB Tri-Pac |                                   |          | NB Tri-Pac   |                                   |          |
|                    | Coil Amperes           | External Series Resistance (Ohms) | Total VA | Coil Amperes | External Series Resistance (Ohms) | Total VA |
| 600 Ac             | 0.029                  | 20,000                            | 17.4     | 0.016        | 35,000                            | 9.6      |
| 480 Ac             | 0.014                  | —                                 | 6.8      | 0.013        | 30,000                            | 6.3      |
| 240 Ac             | 0.036                  | —                                 | 8.7      | 0.013        | —                                 | 3.2      |
| 208 Ac             | 0.036                  | —                                 | 7.5      | 0.018        | —                                 | 3.8      |
| 120 Ac             | 0.073                  | —                                 | 8.8      | 0.023        | —                                 | 2.8      |
| 48 Ac              | 0.152                  | —                                 | 7.3      | —            | —                                 | —        |
| 250 Dc             | 0.035                  | 5,000                             | 8.8      | 0.013        | 16,500                            | 3.3      |
| 125 Dc             | 0.039                  | 1,500                             | 4.9      | 0.013        | 6,500                             | 1.7      |
| 60 Dc              | 0.034                  | —                                 | 2.1      | —            | —                                 | —        |
| 48 Dc              | 0.040                  | —                                 | 2.0      | 0.012        | 600                               | 0.6      |
| 24 Dc              | 0.069                  | —                                 | 1.7      | 0.023        | —                                 | 0.6      |
| 12 Dc              | 0.136                  | —                                 | 1.7      | 0.048        | —                                 | 0.6      |

① Not UL listed.

② Right-hand mounting considered standard unless specified otherwise.

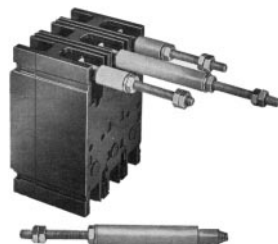
③ Right-hand mounting only.

④ UL listing pending.

⑤ Not field mountable on nonautomatic breakers (Molded case switches).

⑥ Field mounting voids UL listing of breaker except on NB Tri-Pac and PB Tri-Pac.

## Rear Connected Studs<sup>①</sup>



For complete stud assembly, order a stud and appropriate tube based on thickness of customer's mounting panel. A short stud must be assembled adjacent to a long stud to maintain clearances required by Underwriters Laboratories, Inc.<sup>②</sup> Two studs are required per pole.

## Panelboard Connecting Staps<sup>①</sup>

For connecting line end of breakers to panelboard bus.



| Ampere Rating | Connector Type | Style Number |
|---------------|----------------|--------------|
|---------------|----------------|--------------|

### Power Panelboards (Convertible)

#### Tri-Pac FB and FCL Breakers Bus Spacing 3½-inch

|                         |         |            |
|-------------------------|---------|------------|
| 50                      | Center  | 1253C72G01 |
| 50                      | Outside | 1253C72G02 |
| 100                     | Center  | 1253C73G03 |
| 100                     | Outside | 1253C73G04 |
| 150                     | Center  | 1253C73G01 |
| 150                     | Outside | 1253C73G02 |
| 3-Pole Mounting Bracket |         | 624B600H01 |
| 2-Pole Mounting Bracket |         | 624B600H02 |

#### LCL Breakers Bus Spacing 3½-inch

|                            |        |            |
|----------------------------|--------|------------|
| 400                        | Short  | 1275C85G01 |
| 400                        | Medium | 1275C85G02 |
| 400                        | Long   | 1275C85G03 |
| Mtg. Bracket Kit (1 Req'd) |        | 751B044G01 |

| Mounting Panel Thickness, Inches | Stud   |              | Tube <sup>③</sup> |              |
|----------------------------------|--------|--------------|-------------------|--------------|
|                                  | Length | Style Number | Length            | Style Number |

#### FCL and FB Tri-Pac Breakers

|         |       |            |    |            |
|---------|-------|------------|----|------------|
| 1       | Short | 451D874G01 | 1⅞ | 32B9446H20 |
|         | Long  | 451D874G02 | 3⅞ | 32B9446H24 |
| 1⅞ - 1⅝ | Short | 451D874G01 | 1⅞ | 32B9446H21 |
|         | Long  | 451D874G02 | 3⅞ | 32B9446H25 |
| ¾ - ⅝   | Short | 451D874G01 | 1⅞ | 32B9446H22 |
|         | Long  | 451D874G02 | 4⅞ | 32B9446H26 |
| ¼ - ⅜   | Short | 451D874G01 | 2  | 32B9446H23 |
|         | Long  | 451D874G02 | 4⅞ | 32B9446H27 |

| Stud Ampere Rating | Diameter, Inches and Thread | Extension Back of Breaker, Inches | Stud Style Number |
|--------------------|-----------------------------|-----------------------------------|-------------------|
|--------------------|-----------------------------|-----------------------------------|-------------------|

#### LCL, LA Tri-Pac Breakers

|                  |        |     |            |
|------------------|--------|-----|------------|
| 400 <sup>④</sup> | ¾ - 16 | 5⅞  | 05B7383G15 |
| 400 <sup>④</sup> | ¾ - 16 | 7⅞  | 05B7383G16 |
| 400 <sup>④</sup> | ¾ - 16 | 10⅞ | 05B7383G17 |

#### NB Tri-Pac Breakers

|     |         |     |            |
|-----|---------|-----|------------|
| 450 | 1⅞ - 12 | 5½  | 623B222G01 |
| 450 | 1⅞ - 12 | 8   | 623B222G02 |
| 450 | 1⅞ - 12 | 10½ | 623B222G03 |
| 800 | 1⅞ - 12 | 5½  | 623B375G04 |
| 800 | 1⅞ - 12 | 10½ | 623B375G03 |

## Plug-in Adapter Kits



For rear connected applications such as switchboards. Facilitates ease of installation and front removal of breaker. Includes conductor for mounting on breaker, plug-in mounting blocks with matching conductor, rear studs and mounting hardware. Order two mounting blocks style number when line and load are required; order one mounting block style number when either line or load is required.

| Description | Style Number |
|-------------|--------------|
|-------------|--------------|

#### FB Tri-Pac and FCL Breakers<sup>⑤</sup>

|                                |            |
|--------------------------------|------------|
| 1 Mounting Block, Line or Load |            |
| 2-Pole, 100 Ampere             | 507C036G05 |
| 2-Pole, 150 Ampere             | 507C036G06 |
| 3-Pole, 100 Ampere             | 507C036G03 |
| 3-Pole, 150 Ampere             | 507C036G04 |

Instruction Leaflet/FRED Number 13782

#### LCL Breakers

|                                  |            |
|----------------------------------|------------|
| 2 Mounting Blocks, Line and Load |            |
| 2-Pole                           | 313C644G25 |
| 3-Pole                           | 313C644G26 |
| 1 Mounting Block, Line and Load  |            |
| 2-Pole                           | 450D010G15 |
| 3-Pole                           | 450D010G16 |

Instruction Leaflet/FRED Number 15329

#### NB Tri-Pac Breakers<sup>①</sup>

|                                |            |
|--------------------------------|------------|
| 1 Mounting Block, Line or Load |            |
| NB Tri-Pac, 2 Poles            | 2614D53G03 |
| NB Tri-Pac, 3 Poles            | 2614D53G04 |

Instruction Leaflet/FRED Number 15073

#### Tri-Pac LA Breakers<sup>①</sup>

|                                  |            |
|----------------------------------|------------|
| 2 Mounting Blocks, Line and Load |            |
| 2-Pole                           | 313C644G41 |
| 3-Pole                           | 313C644G42 |
| 1 Mounting Block, Line Only      |            |
| 2-Pole                           | 450D010G17 |
| 3-Pole                           | 450D010G19 |
| 1 Mounting Block, Load Only      |            |
| 2-Pole                           | 450D010G18 |
| 3-Pole                           | 450D010G20 |

① Not Underwriters Laboratories, Inc. listed.

② 400 ampere LA studs of the same length have sufficient clearance; however, customer connections may make it necessary to use a short stud adjacent to a long stud.

③ Included at no charge when ordered with stud.

④ 150, 250, 300 and 400 ampere frames only.

⑤ These plug-in adapter kits are UL listed as recognized components.

**Mounting Block for  
NB Tri-Pac Breakers<sup>①</sup>**

| Ampere Rating     | Number of Poles | Style Number |
|-------------------|-----------------|--------------|
| <b>NB Tri-Pac</b> |                 |              |
| 800               | 2               | 4990D16G04   |
| 800               | 3               | 4990D16G03   |

**Extended Line Terminal  
Shields<sup>①</sup>**

For shielding line side terminal connections. One shield required per breaker. Order separately when needed. Sold only in lots of 10, including hardware.

| Breaker Frame   | Style Number |
|-----------------|--------------|
| FB Tri-Pac, FCL | 625B229G01   |
| LA Tri-Pac      | 314C420G05   |
| NB Tri-Pac      | 208B996G02   |

**Base Mounting Hardware**

Order separately when needed.

| Breaker Frame   | Style Number |
|-----------------|--------------|
| FB Tri-Pac, FCL | 21C6782G18   |
| LA Tri-Pac      | 1614613      |
| NB Tri-Pac      | 1091716      |
| PB Tri-Pac      | 624375G22    |

**Moisture-Fungus-Corrosion  
Treatment<sup>②</sup>**

Treatment can be provided to meet customer's specific atmospheric conditions. Moisture-fungus treating material used meets JAN-T-152; treatment meets MIL-V-173a. Requests and orders should specify government specifications or conditions to be met.

① Not Underwriters Laboratories, Inc. listed.  
Insulated base with front removeable bolted connection.  
② Included with frame

**Handle Locks<sup>①</sup>****Non-Padlockable**

For prevention of unintentional operation of breaker. Fits over breaker handle and may be removed.

**Padlockable**

For prevention of unauthorized operation of breaker. Is non-removable once installed on breaker. Meets Underwriters Laboratories, Inc. and California Code requirements.

**Note:** All breakers are trip free and will trip with handle locks attached. Cannot be used when handle extension is used.

| Breaker Frame          | Style Number |
|------------------------|--------------|
| <b>Non-Padlockable</b> |              |
| FB Tri-Pac             | 29B2721H01   |
| LA Tri-Pac             | 1720101      |
| NB Tri-Pac             | 1720101      |

**Padlockable**

|            |            |
|------------|------------|
| FB Tri-Pac | 765A754G01 |
| LA Tri-Pac | 373B591G02 |

**Handle Extension**

| Breaker Frame           | Style Number |
|-------------------------|--------------|
| LA Tri-Pac              | 372B399G01   |
| NB Tri-Pac              | 1251C65G01   |
| PB Tri-Pac <sup>②</sup> | 315C882G01   |

③ Not UL listed.  
④ Not available on drawout breakers.  
⑤ Not available for FCL or LCL breakers.  
⑥ Not available on motor operated breakers.

**Kirk Key Interlock<sup>⑤</sup>**

Availability: FB, LA, NB, PB Tri-Pacs.

Permits interlocking of two breakers or one breaker with other devices. Before breaker can be closed, key must be inserted and turned in breaker interlock. Breaker must be opened before key can be removed. It can then be inserted in interlock or other devices to permit their closure. Requests and orders should completely outline interlocking scheme, ultimate user and his address.

**Mechanical Interlocks<sup>②</sup>**

For mechanically interlocking a pair of breakers so that only one may be closed at one time, but both may be open simultaneously.

**Walking Beam Type<sup>②③④</sup>**

Mounts on panel (not included) at rear of breaker. Standard breaker spacing: LA Tri-Pac, NB Tri-Pac: 8-1/2 inches center to center; FB Tri-Pac: 4-3/8 inches center to center; PB Tri-Pac: 12-1/4 inches center to center. Order as a set of two special factory drilled breakers and one walking beam interlock. Specify breaker type, panel thickness and center-to-center dimension of breakers.

**Sliding Bar Type (Field Mountable)<sup>②⑤</sup>**

Mounts on panel (not included) fitting over front of breakers. Standard breaker spacing: LA Tri-Pac, NB Tri-Pac: 8-1/2 inches; FB Tri-Pac: 4-3/16 inches center to center.



## Motor Operators<sup>①</sup>

Motor operators provide complete remote control by means of a push-button or similar pilot device<sup>②</sup>. Positive switching action is accomplished by use of an operating arm engaging the breaker handle.

The unit is energized momentarily to actuate the lever arm moving it to either the "ON" or "OFF" position. The control is broken by an internal cutoff switch. Means for emergency manual operation is provided.

Motor operators are available with motors rated 120 volts Ac, 208 volts Ac, and 240 volts Ac.

The 480 volt operators utilize a 120 volt Ac motor in conjunction with a 480/240 to 120 volt dual voltage transformer. (On LA and larger operators, the transformer is supplied for separate mounting by the customer.)

**Note:** The motor operator is intended only for infrequent operation in line with Underwriters Laboratories, Inc. endurance standard for AB molded case breakers.



For FB Tri-Pac/FCL Breakers



For LA Tri-Pac Breakers



For NB Tri-Pac Breakers



For PB Tri-Pac Breakers

## Motor Operator Selection

| Type Breaker | Ac Voltage   |            |            |            | Dc Voltage |            |
|--------------|--------------|------------|------------|------------|------------|------------|
|              | 120          | 208        | 240        | 480        | 125        | 24         |
|              | Style Number |            |            |            |            |            |
| FCL          | 656D148G15   | 656D148G10 | 656D148G17 | 656D148G17 | —          | —          |
| LCL          | 5664D54G83   | 5664D54G86 | 5664D54G84 | 5664D54G85 | 5664D54G77 | 5664D54G88 |
| FB Tri-Pac   | 656D148G11   | 656D148G04 | 656D148G13 | 656D148G13 | —          | —          |
| LA Tri-Pac   | 2607D97G22   | 2607D97G25 | 2607D97G23 | 2607D97G24 | 2607D97G44 | —          |
| NB Tri-Pac   | 5664D54G65   | 5664D54G68 | 5664D54G66 | 5664D54G67 | 5664D54G82 | —          |
| PB Tri-Pac   | 5661D52G01   | 5661D52G04 | 5661D52G02 | 5661D52G03 | 5661D52G17 | —          |

Instruction Leaflet/FRED Number 13148 FCL; 15334 LCL; 13148 FB Tri-Pac; 15533 LA Tri-Pac; 15534 NB Tri-Pac; 14444 PB Tri-Pac

## Back Mounting Plates

| Type Breaker | 120, 208, 240, 480 Volts Ac |
|--------------|-----------------------------|
|              | Style Number                |
| FB-P/FCL     | 1282C01G01                  |

## Motor Data

| Type Breaker | Motor       |      | Inrush Current, Ampere (Peak) |           |           | Continuous Current (RMS) |           |           | Operating Time, Open or Close |
|--------------|-------------|------|-------------------------------|-----------|-----------|--------------------------|-----------|-----------|-------------------------------|
|              | Type        | Hp.  | 120 Volts                     | 208 Volts | 240 Volts | 120 Volts                | 208 Volts | 240 Volts |                               |
| FB Tri-Pac   | Split Phase | 1/75 | 10                            | 4         | 5         | 2.3                      | 1.17      | 1.65      | 1.5 Seconds                   |
| LA Tri-Pac   | Reversing   | —    | 8                             | 5         | 4         | —                        | —         | —         | 12 Cycles                     |
| NB Tri-Pac   | Reversing   | —    | 11                            | 7         | 6         | —                        | —         | —         | 12 Cycles                     |
| PB Tri-Pac   | Reversing   | —    | 20                            | 12        | 11        | —                        | —         | —         | 10 Cycles                     |

① Ac voltage rated operators are UL listed as recognized components.

② The pilot device must be maintained contact type for FB Tri-Pac, FCL, mechanisms; momentary contact type for all others.

## Drawout Frame



These drawout frames are for use with standard 3-pole Cutler-Hammer molded case circuit breakers. They consist of two separate parts; stationary mounting frame and movable carrier frame. Slide rails are drawer-type, and a screw mechanism is used to engage or withdraw the movable carrier frame.

The drawout frames have three positions: connected, test and disconnected. The frames do not include a safety tripping interlock, or secondary contacts. These are optional items and may be ordered at additional cost.

Breakers mounted in the drawout frames can be equipped with standard breaker accessories including shunt trip, undervoltage release, auxiliary switch, alarm switch and motor operator.

### Secondary Contacts

These are used to disconnect auxiliary circuits when attachments such as shunt trip or motor operator are used. Available in multiples of four contacts with a maximum of 32 contacts for the NB Tri-Pac. They must be factory mounted. Order by description as similar to stationary or moving frame and specify number of contacts required.

### Selection Data

| Breaker Type <sup>①</sup> | Stationary Mounting Frame Style Number | Movable Carrier Frame Style Number |
|---------------------------|----------------------------------------|------------------------------------|
| NB Tri-Pac                | 2603D85G09                             | 2608D34G12                         |

### Standard Installation

Order one stationary mounting frame and one movable carrier frame.

Order breakers without terminals or rear connectors.

Order any attachments desired (shunt trip, undervoltage release, etc.)

Order secondary contacts as required:

- A shunt trip, undervoltage release or alarm switch requires two contacts;
- A 1A-1B auxiliary switch requires three contacts;
- A motor operator requires a maximum of four contacts;
- Others as required.

### Racking Crank

A special crank to engage or withdraw the moving portion of the drawout. A standard 1/2 inch hex socket with extension can be used for this purpose.

| Style Number | 765A767G01 |
|--------------|------------|
|--------------|------------|

### Cell Switches Mounted on Drawout Frames, All Ratings

Up to four switches can be provided. Order by description.

Each switch provides NO and NC contact that transfers before reaching the test position when being withdrawn, and after the test position when being racked in.

<sup>①</sup> Drawout for FB and LA Tri-Pac, FCL, and LCL Circuit Breakers are not available. PB Tri-Pac movable is available factory-installed only. Order by description.



## General Information

Engine generator molded case circuit breakers are designed specifically for application on diesel engine powered standby generators where high interrupting circuit breakers are not required. The JG through NG breakers are equipped with a special trip unit, that includes standard thermal (overload) protection and special low magnetic pickup range (FG includes a fixed thermal/magnetic pickup). The standard thermal trip unit provides overload protection for conductors per the National Electric Code. The low magnetic pickup range is approximately two to five times the continuous rating and provides closer low level short circuit protection when applied on generators that have very low short circuit capacity. This combination allows the user to customize the breaker to the generator output.

## Catalog Numbering System

This information is presented only as an aid to understanding catalog numbers. It is not to be used to build catalog numbers for circuit breakers.

FG breakers include both line and load side terminals.

JG, KG, LG, and NG breakers with "W" catalog number suffix do not include any terminals.

JG, KG, LG, and NG breakers without "W" catalog number suffix include both line and load terminals.

Contact Cutler-Hammer for additional ratings and internal/external accessories.

## Interrupting Capacity Ratings

### UL 489 Interrupting Capacity Ratings

Interrupting Capacity (Symmetrical Amperes)

Volts Ac (50/60 Hz)

240 18,000

480 14,000

600 10,000

### IEC 947-2 Interrupting Capacity Ratings

Interrupting Capacity (Symmetrical Amperes)

Volts Ac (50/60 Hz)

220, 240 18,000/9,000

380, 415 14,000/7,000

660, 690 10,000/5,000

## Standards

Engine generator molded case circuit breakers are designed to conform with the following standards:

- Underwriters Laboratories, Inc., Standard UL 489, Molded Case Circuit Breakers and Circuit Breaker Enclosures File E7819
- Canadian Standards Association Standard C22.2 No. 5, Service Entrance and Branch Circuit Breakers
- International Electrotechnical Commission Recommendations IEC 947-2, Circuit Breakers

Conformance with these standards satisfies most local and international codes, assuming user acceptability and simplified application.

|    |   | FG    | 3               | 100          | W                    |
|----|---|-------|-----------------|--------------|----------------------|
|    |   | Frame | Number of Poles | Trip Amperes | Suffix               |
| FG | 3 |       |                 | 15           | W: Without Terminals |
|    |   |       |                 | 20           |                      |
|    |   |       |                 | 25           |                      |
|    |   |       |                 | 30           |                      |
|    |   |       |                 | 35           |                      |
|    |   |       |                 | 40           |                      |
|    |   |       |                 | 45           |                      |
|    |   |       |                 | 50           |                      |
|    |   |       |                 | 60           |                      |
|    |   |       |                 | 70           |                      |
|    |   |       |                 | 80           |                      |
|    |   |       |                 | 90           |                      |
|    |   |       |                 | 100          |                      |
|    |   |       |                 | 125          |                      |
|    |   |       |                 | 150          |                      |
| JG |   |       |                 | 175          |                      |
|    |   |       |                 | 200          |                      |
|    |   |       |                 | 225          |                      |
|    |   |       |                 | 250          |                      |
| KG |   |       |                 | 300          |                      |
|    |   |       |                 | 350          |                      |
|    |   |       |                 | 400          |                      |
| LG |   |       |                 | 450          |                      |
|    |   |       |                 | 500          |                      |
|    |   |       |                 | 600          |                      |
| NG |   |       |                 | 700          |                      |
|    |   |       |                 | 800          |                      |
|    |   |       |                 | 900          |                      |
|    |   |       |                 | 1000         |                      |
|    |   |       |                 | 1200         |                      |

# Molded Case Circuit Breakers Engine Generator Circuit Breakers

Cutler-Hammer

March 1999

## Circuit Breakers

The following table lists FG through NG engine generator breakers with the maximum generator kVA and kW rating. Engine generator breakers

are applied at 115% of the generator full load current rating. The maximum kW rating is based on three-phase generators at 80% power factor.

| Magnetic Pickup Range | Maximum Generator Rating 60 Hz |                 |                  |                 |                  |                 | Engine Generator Breaker Catalog Number                  |
|-----------------------|--------------------------------|-----------------|------------------|-----------------|------------------|-----------------|----------------------------------------------------------|
|                       | 240 Vac                        |                 | 480 Vac          |                 | 600 Vac          |                 |                                                          |
|                       | kVA <sup>①</sup>               | kW <sup>②</sup> | kVA <sup>①</sup> | kW <sup>②</sup> | kVA <sup>①</sup> | kW <sup>②</sup> |                                                          |
| Fixed                 | 5                              | 4               | 11               | 9               | 14               | 11              | FG3015                                                   |
| Fixed                 | 7                              | 6               | 14               | 12              | 18               | 14              | FG3020                                                   |
| Fixed                 | 9                              | 7               | 18               | 14              | 23               | 18              | FG3025                                                   |
| Fixed                 | 11                             | 9               | 22               | 17              | 27               | 22              | FG3030                                                   |
| Fixed                 | 13                             | 10              | 25               | 20              | 32               | 25              | FG3035                                                   |
| Fixed                 | 14                             | 12              | 29               | 23              | 36               | 29              | FG3040                                                   |
| Fixed                 | 16                             | 13              | 32               | 26              | 41               | 32              | FG3045                                                   |
| Fixed                 | 18                             | 14              | 36               | 29              | 45               | 36              | FG3050                                                   |
| Fixed                 | 22                             | 17              | 43               | 35              | 54               | 43              | FG3060                                                   |
| Fixed                 | 25                             | 20              | 51               | 40              | 63               | 51              | FG3070                                                   |
| Fixed                 | 29                             | 23              | 58               | 46              | 72               | 58              | FG3080                                                   |
| Fixed                 | 32                             | 26              | 65               | 52              | 81               | 65              | FG3090                                                   |
| Fixed                 | 36                             | 29              | 72               | 58              | 90               | 72              | FG3100                                                   |
| Fixed                 | 40                             | 32              | 79               | 64              | 99               | 79              | FG3110                                                   |
| Fixed                 | 45                             | 36              | 90               | 72              | 113              | 90              | FG3125                                                   |
| Fixed                 | 54                             | 43              | 108              | 87              | 135              | 108             | FG3150                                                   |
| Fixed                 | 63                             | 51              | 126              | 101             | 158              | 126             | FG3175                                                   |
| Fixed                 | 72                             | 58              | 144              | 116             | 181              | 144             | FG3200                                                   |
| Fixed                 | 81                             | 65              | 162              | 130             | 203              | 162             | FG3225                                                   |
| 350-700               | 63                             | 51              | 126              | 101             | 158              | 126             | JG3175W <sup>③</sup>                                     |
| 350-700               | 72                             | 58              | 144              | 116             | 181              | 144             | JG3175<br>JG3200W <sup>③</sup><br>JG3200                 |
| 350-700               | 81                             | 65              | 162              | 130             | 203              | 162             | JG3225W <sup>③</sup>                                     |
| 350-700               | 90                             | 72              | 181              | 144             | 226              | 181             | JG3225<br>JG3250W <sup>③</sup><br>JG3250                 |
| 500-1000              | 108                            | 87              | 217              | 173             | 271              | 217             | KG3300W <sup>③</sup>                                     |
| 500-1000              | 126                            | 101             | 253              | 202             | 316              | 253             | KG3300<br>KG3350W <sup>③</sup><br>KG3350                 |
| 1000-2000             | 144                            | 116             | 289              | 231             | 361              | 289             | KG3400W <sup>③</sup>                                     |
| 600-2500              | 162                            | 130             | 325              | 260             | 406              | 325             | KG3400<br>LG3450<br>LG3450W <sup>③</sup>                 |
| 600-2500              | 181                            | 144             | 361              | 289             | 451              | 361             | LG3500                                                   |
| 600-2500              | 217                            | 173             | 433              | 347             | 542              | 433             | LG3500W <sup>③</sup><br>LG3600<br>LG3600W <sup>③</sup>   |
| 800-2500              | 253                            | 202             | 505              | 404             | 632              | 505             | NG3700                                                   |
| 800-2500              | 289                            | 231             | 578              | 462             | 722              | 578             | NG3700W <sup>③</sup><br>NG3800<br>NG3800W <sup>③</sup>   |
| 1600-5000             | 325                            | 260             | 650              | 520             | 812              | 650             | NG3900                                                   |
| 1600-5000             | 361                            | 289             | 722              | 578             | 903              | 722             | NG3900W <sup>③</sup><br>NG31000<br>NG31000W <sup>③</sup> |
| 1600-5000             | 433                            | 347             | 867              | 693             | 1083             | 867             | NG31200<br>NG31200W <sup>③</sup>                         |

① Breaker continuous current is based on 115% of the generator full load ampere rating.

② Based on three-phase generators at 80% power factor.

③ Without terminals.

Enclosures

## Enclosure Description

### Type 1 General Purpose

- Surface or Flush Mounting
- 15-1200 Ampere Range
- 600 Volts Ac, 500 Volts Dc

Type 1 enclosed breakers are designed for use in commercial buildings, apartment buildings and other areas where a general purpose enclosure is applicable. The breaker is front operable and is capable of being padlocked in either the On or Off position. Ratings through 1200 amperes are listed with Underwriters Laboratories, Inc. as approved for service entrance application. Both surface and flush mounted enclosures are available.

### Type 3R Rainproof Surface Mounting

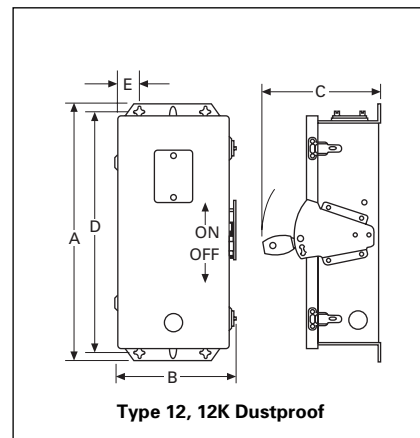
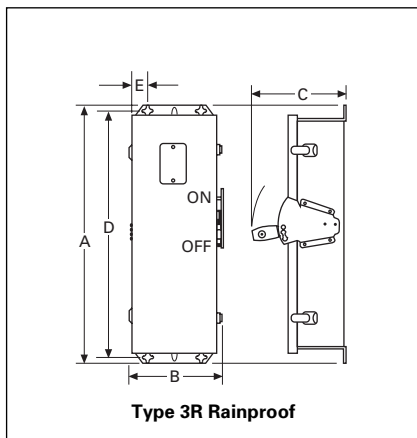
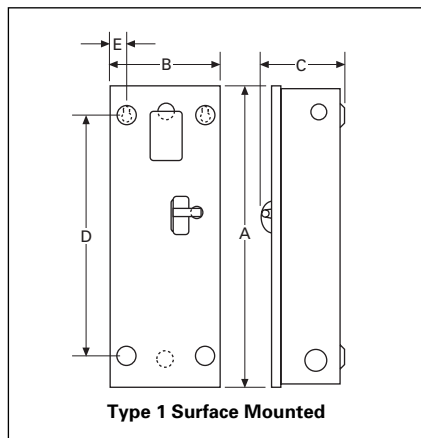
- Interchangeable Hubs (Through 400 Amperes)
- 15-1200 Ampere Range
- 600 Volts Ac, 500 Volts Dc

This general purpose outdoor service center employs a circuit breaker inside a weatherproof sheet steel breaker enclosure to serve as a main disconnect and protective device for feeder circuits. Ratings through 1200 amperes are listed by Underwriters Laboratories, Inc. as suitable for service entrance application.

### Type 12 Dustproof Surface Mounting

- No Knockouts or Other Openings
- 15-1200 Ampere Range
- 600 Volts Ac, 500 Volts Dc

The Type 12 enclosure is designed in line with specifications for special industry application where unusually severe conditions involving oil, coolant, dust and other foreign materials exist in the operating atmosphere. The handle padlocks in the Off position and the cover is interlocked with the handle mechanism to prevent opening the cover with the circuit breaker in the On position. Ratings through 1200 amperes are listed by Underwriters Laboratories, Inc. as suitable for service entrance application.



## Enclosure Selection Data

| Breaker Frame<br>(Amperes) | Enclosure<br>Type Class | Dimensions |      |        |     |        |     |        |      |        |    | App.<br>Wt.<br>Lbs. | Conduit Sizes,<br>Inches                                                       | Catalog<br>Number                |
|----------------------------|-------------------------|------------|------|--------|-----|--------|-----|--------|------|--------|----|---------------------|--------------------------------------------------------------------------------|----------------------------------|
|                            |                         | A          |      | B      |     | C      |     | D      |      | E      |    |                     |                                                                                |                                  |
|                            |                         | Inches     | mm   | Inches | mm  | Inches | mm  | Inches | mm   | Inches | mm |                     |                                                                                |                                  |
| FG<br>15-225               | Type 1                  | 23.25      | 591  | 8.41   | 214 | 6.28   | 160 | 18.75  | 476  | 1.20   | 31 | 15                  | .25, .50, .75, 1, 1.25, 1.50, 2, 2.50<br>.25, .50, .75, 1, 1.25, 1.50, 2, 2.50 | SFDN225<br>RFDN225<br>JFDN225    |
|                            | Type 3R                 | 25.66      | 652  | 8.84   | 225 | 9.31   | 237 | 24.28  | 617  | 1.70   | 43 | 19                  |                                                                                |                                  |
|                            | Type 12                 | 25.66      | 652  | 8.84   | 226 | 9.31   | 238 | 24.28  | 618  | 1.70   | 43 | 18                  |                                                                                |                                  |
| JG<br>175-250              | Type 1                  | 34.70      | 881  | 10.92  | 227 | 7.20   | 183 | 30.00  | 762  | 1.88   | 48 | 31                  | .25, .50, 2, 2.50, 3<br>.25, .50, 2, 2.50, 3                                   | SJDN250<br>RJDN250<br>JJDN250    |
|                            | Type 3R                 | 37.50      | 891  | 11.56  | 294 | 10.22  | 260 | 35.77  | 909  | 1.94   | 49 | 40                  |                                                                                |                                  |
|                            | Type 12                 | 37.53      | 953  | 11.56  | 294 | 10.22  | 260 | 35.77  | 909  | 1.94   | 49 | 37                  |                                                                                |                                  |
| KG<br>300-400              | Type 1                  | 38.81      | 986  | 11.06  | 281 | 10.94  | 278 | 34.00  | 869  | 2.28   | 58 | 53                  | .25, .50, .75, 1.50, 2, 2.50, 3, 3.50<br>.25, .50, .75, 2.50, 3, 3.50          | SKDN400<br>RKDN400<br>JKDN400    |
|                            | Type 3R                 | 41.69      | 997  | 11.75  | 298 | 14.06  | 357 | 39.90  | 1014 | 1.97   | 50 | 60                  |                                                                                |                                  |
|                            | Type 12                 | 41.69      | 997  | 11.75  | 298 | 14.06  | 357 | 39.90  | 1015 | 1.97   | 50 | 53                  |                                                                                |                                  |
| LG<br>450-600              | Type 1                  | 45.88      | 1165 | 14.31  | 364 | 12.38  | 314 | 46.56  | 1183 | 1.91   | 48 | 81                  | .25, .50, .75, 3, 3.50, 4<br>.25, .50, .75, 3, 3.50, 4                         | SJDN600<br>RLDN600<br>JLDN600    |
|                            | Type 3R                 | 48.31      | 1227 | 14.91  | 379 | 15.50  | 394 | 46.56  | 1183 | 1.92   | 49 | 84                  |                                                                                |                                  |
|                            | Type 12                 | 48.31      | 1227 | 14.91  | 379 | 15.50  | 394 | 46.56  | 1183 | 1.92   | 49 | 81                  |                                                                                |                                  |
| NG<br>700-1200             | Type 1                  | 61.22      | 1555 | 21.44  | 545 | 15.41  | 391 | 61.84  | 1571 | 1.97   | 50 | 178                 |                                                                                | SNDN1200<br>RNDN1200<br>JNDN1200 |
|                            | Type 3R                 | 63.59      | 1615 | 22.00  | 559 | 17.63  | 448 | 61.84  | 1571 | 1.97   | 50 | 175                 |                                                                                |                                  |
|                            | Type 12                 | 63.59      | 1615 | 22.00  | 559 | 17.63  | 448 | 61.84  | 1571 | 1.97   | 50 | 170                 |                                                                                |                                  |

## Accessories

### Standard Terminals

| Breaker Frame | Maximum Ampere Rating | AWG Wire Range    | Metric Wire Range mm <sup>2</sup> | Catalog Number        |
|---------------|-----------------------|-------------------|-----------------------------------|-----------------------|
| FG            | 100                   | #14-1/0           | 2.5 -50                           | 3T100FB <sup>①</sup>  |
| FG            | 150                   | #4-4/0            | 25 -95                            | 3TA225FD <sup>①</sup> |
| JG            | 250                   | #4-350 kcmil      | 25 -185                           | TA250KB               |
| KG            | 350                   | 250-500 kcmil     | 120 -240                          | TA350K                |
| KG            | 400                   | 3/0-250 kcmil (2) | 95 -120                           | 3TA400K <sup>①</sup>  |
| LG            | 600                   | 250-500 kcmil (2) | 120 -240                          | TA600LA               |
| NG            | 700                   | 1-500 kcmil (2)   | 50 -300                           | TA700NB1              |
| NG            | 1000                  | 3/0-400 kcmil (3) | 95 -185                           | TA1000NB1             |
| NG            | 1200                  | 4/0-500 kcmil (4) | 120 -300                          | TA1200NB1             |

### Neutral Kits, Insulated and Groundable

| Maximum Enclosure Rating (Amperes) | Main Lug Number Size Cu/Al                      | Ground Lug Size Cu/Al | Catalog Number |
|------------------------------------|-------------------------------------------------|-----------------------|----------------|
| 100                                | (1) 14-1/0                                      | (1) 14-1/0            | INK100         |
| 250                                | (1) 6-350 kcmil                                 | (1) 4-300 kcmil       | INK250         |
| 400                                | (1) 4-750 kcmil or<br>(2) 1/0-250 kcmil         | (1) 4-300 kcmil       | INK400         |
| 600                                | (2) 250-500 kcmil                               | (1) 4-300 kcmil       | INK600         |
| 1200                               | (3) 1/0 to 750 kcmil or<br>(4) 1/0 to 750 kcmil | (1) #6-250 kcmil      | INK1200        |

### Internal Accessories

| Breaker Frame | Auxiliary Switch     |                      | Shunt Trip |                |
|---------------|----------------------|----------------------|------------|----------------|
|               | 1A-1B Catalog Number | 2A-2B Catalog Number | Rating     | Catalog Number |
| FG            | A1X1PK               | A2X1PK               | 12-24 Vdc  | SNT1LP03K      |
| JG            | A1X2PK               | A2X2PK               | 12-24 Vdc  | SNT2P04K       |
| KG            | A1X3PK               | A2X3PK               | 12-24 Vdc  | SNT3P05K       |
| LG            | A1X4PK               | A2X4PK               | 12-24 Vdc  | SNT4LP03K      |
| NG            | A1X5RPK              | A2X5RPK              | 12-24 Vdc  | SNT5LP03K      |

<sup>①</sup> Package of 3 terminals.

## General Information

UL listed dc molded case circuit breakers for use in general dc circuits and ungrounded battery supply circuits of UPS systems providing continuous, reliable ac power to computer controlled applications such as financial transactions and telecommunications.

For standard interrupting capacity 250 dc molded case circuit breakers. Refer to Index, Page 1, for appropriate Series C frame size.

The Series C dc breakers listed below use the same internal and external accessories as the standard Series C breaker. NBDC and PBDC use same internal and external accessories as standard NB and PB breakers.

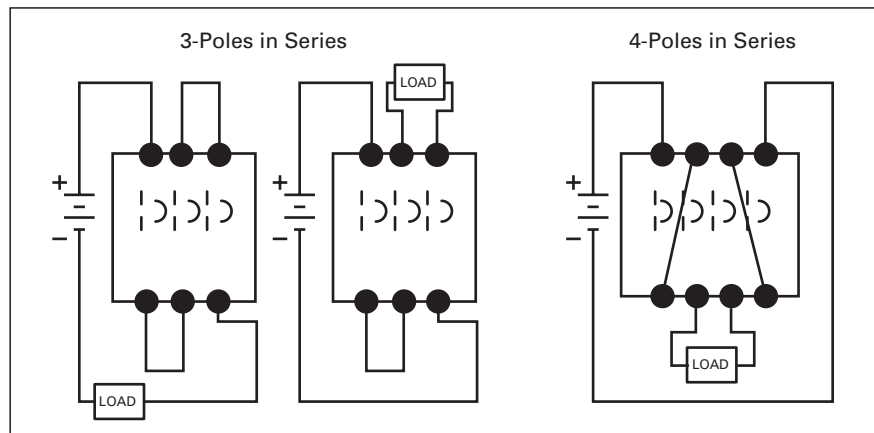
Molded case circuit breakers for transportation application requiring 750 Vdc are available 15 through 2500 ampere 20 kA interrupting capacity at 750 Vdc. Breakers require 4 poles in series for 750 Vdc application. However, 750V is not a UL rating. For 750 Vdc application refer to Cutler-Hammer for ordering information. Dimensions are the same as the standard thermal-magnetic equivalent.

## Interrupting Capacity Ratings

### UL489 Interrupting Capacity Ratings

| Circuit Breaker Type | Interrupting Capacity (Symmetrical kA) |                  |                  |                  |
|----------------------|----------------------------------------|------------------|------------------|------------------|
|                      | Volts DC <sup>①</sup>                  |                  |                  |                  |
|                      | 125 <sup>②</sup>                       | 250 <sup>③</sup> | 600 <sup>④</sup> | 750 <sup>⑤</sup> |
| HFDDC                | 42                                     | 42               | 35               | 20               |
| HJDDC                | 42                                     | 42               | 35               | 20               |
| HKDDC                | 42                                     | 42               | 35               | 20               |
| HLDDC                | 42                                     | 42               | 35               | 20               |
| HMDLDC               | 42                                     | 42               | 35               | 20               |
| NBDC                 | 50                                     | 50               | 50               | 20               |
| PBDC                 | 75                                     | 75               | 75               | 20               |

### Series Connection Diagrams for DC Application<sup>⑥</sup>



① Dc ratings apply to substantially non-inductive circuits. 8 millisecond time constant.

② 1-pole in series.

③ 2-poles in series.

④ 3-poles in series.

⑤ 4-poles in series. Not a UL listed voltage rating.

⑥ Use rated cable per NEC Connect to terminals as per breaker nameplate.



# Molded Case Circuit Breakers

## Series C® Circuit Breakers for DC Applications

Cutler-Hammer

March 1999

### Type HFDDC DC Circuit Breakers

| Maximum<br>Continuous<br>Ampere Rating<br>@ 40°C          | Complete Circuit Breaker with Line and Load Terminals |            |            |
|-----------------------------------------------------------|-------------------------------------------------------|------------|------------|
|                                                           | 1-Pole                                                | 2-Pole     | 3-Pole     |
|                                                           | Catalog Number                                        |            |            |
| 1, 2, 3-Pole High Interrupting Capacity 35 kAIC @ 600 Vac |                                                       |            |            |
| 15                                                        | HFDDC1015L                                            | HFDDC2015L | HFDDC3015L |
| 20                                                        | HFDDC1020L                                            | HFDDC2020L | HFDDC3020L |
| 25                                                        | HFDDC1025L                                            | HFDDC2025L | HFDDC3025L |
| 30                                                        | HFDDC1030L                                            | HFDDC2030L | HFDDC3030L |
| 35                                                        | HFDDC1035L                                            | HFDDC2035L | HFDDC3035L |
| 40                                                        | HFDDC1040L                                            | HFDDC2040L | HFDDC3040L |
| 45                                                        | HFDDC1045L                                            | HFDDC2045L | HFDDC3045L |
| 50                                                        | HFDDC1050L                                            | HFDDC2050L | HFDDC3050L |
| 60                                                        | HFDDC1060L                                            | HFDDC2060L | HFDDC3060L |
| 70                                                        | HFDDC1070L                                            | HFDDC2070L | HFDDC3070L |
| 80                                                        | HFDDC1080L                                            | HFDDC2080L | HFDDC3080L |
| 90                                                        | HFDDC1090L                                            | HFDDC2090L | HFDDC3090L |
| 100                                                       | HFDDC1100L                                            | HFDDC2100L | HFDDC3100L |
| 110                                                       | HFDDC1110L                                            | HFDDC2110L | HFDDC3110L |
| 125                                                       | HFDDC1125L                                            | HFDDC2125L | HFDDC3125L |
| 150                                                       | HFDDC1150L                                            | HFDDC2150L | HFDDC3150L |
| 175                                                       | —                                                     | —          | HFDDC3175L |
| 200                                                       | —                                                     | —          | HFDDC3200L |
| 225                                                       | —                                                     | —          | HFDDC3225L |

Instruction Leaflet/FRED Number 29C700

### Type HJDDC DC Circuit Breakers

| Maximum Continuous Ampere Rating @ 40°C             | Circuit Breaker Frame Only① | Thermal Magnetic Trip Unit | Standard Terminals |
|-----------------------------------------------------|-----------------------------|----------------------------|--------------------|
|                                                     | Catalog Number              |                            |                    |
| 3-Pole High Interrupting Capacity 35 kAIC @ 600 Vac |                             |                            |                    |
| 70                                                  | HJDDC3250F                  | JT3070T                    | TA250KB            |
| 90                                                  |                             | JT3090T                    | TA250KB            |
| 100                                                 |                             | JT3100T                    | TA250KB            |
| 125                                                 |                             | JT3125T                    | TA250KB            |
| 150                                                 |                             | JT3150T                    | TA250KB            |
| 175                                                 | HJDDC3250F                  | JT3175T                    | TA250KB            |
| 200                                                 |                             | JT3200T                    | TA250KB            |
| 225                                                 |                             | JT3225T                    | TA250KB            |
| 250                                                 |                             | JT3250T                    | TA250KB            |
| 100                                                 |                             | HKDDC3400F                 | KT3100T            |
| 125                                                 | KT3125T                     |                            | TA300K             |
| 150                                                 | KT3150T                     |                            | TA300K             |
| 175                                                 | KT3175T                     |                            | TA300K             |
| 200                                                 | KT3200T                     |                            | TA300K             |
| 225                                                 | KT3225T                     |                            | TA300K             |

Instruction Leaflet/FRED Number 29C701

### Type HKDDC DC Circuit Breakers

| Maximum Continuous<br>Ampere Rating<br>@ 40°C       | Circuit Breaker<br>Frame Only① | Thermal Magnetic<br>Trip Unit            | Standard<br>Terminals                                          |                                                                  |
|-----------------------------------------------------|--------------------------------|------------------------------------------|----------------------------------------------------------------|------------------------------------------------------------------|
|                                                     | Catalog Number                 |                                          |                                                                |                                                                  |
| 3-Pole High Interrupting Capacity 35 kAIC @ 600 Vac |                                |                                          |                                                                |                                                                  |
| 250<br>300<br>350<br>400                            | HKDDC3400F                     | KT3250T<br>KT3300T<br>KT3350T<br>KT3400T | TA350K<br>TA350K<br>TA350K<br>3TA400K                          |                                                                  |
| 300<br>350<br>400<br>450<br>500<br>600              |                                | HLDDC3600F                               | LT3300T<br>LT3350T<br>LT3400T<br>LT3450T<br>LT3500T<br>LT3600T | TA602LD<br>TA602LD<br>TA602LD<br>TA602LD<br>TA602LD<br>3TA603LDK |

Instruction Leaflet/FRED Number 29C702

### Type HMDL DC Circuit Breakers

| Maximum Continuous Ampere Rating @ 40°C             | Circuit Breaker Frame Only① | Thermal Magnetic Trip Unit |
|-----------------------------------------------------|-----------------------------|----------------------------|
|                                                     | Catalog Number              |                            |
| 3-Pole High Interrupting Capacity 35 kAIC @ 600 Vac |                             |                            |
| 300                                                 | HMDL3800F                   | MT3300T                    |
| 350                                                 |                             | MT3350T                    |
| 400                                                 |                             | MT3400T                    |
| 450                                                 |                             | MT3450T                    |
| 500                                                 |                             | MT3500T                    |
| 600                                                 |                             | MT3600T                    |
| 700                                                 |                             | MT3700T                    |
| 800                                                 |                             | MT3800T                    |

### Type NBDC DC Circuit Breakers

| Maximum Continuous Ampere Rating @ 40°C             | Complete Circuit Breaker Factory Assembled Without Terminals① | Includes Magnetic Only Trip Unit Calibrated @ 135% | Standard Terminals |
|-----------------------------------------------------|---------------------------------------------------------------|----------------------------------------------------|--------------------|
|                                                     | Catalog Number                                                |                                                    |                    |
| 3-Pole High Interrupting Capacity 50 kAIC @ 600 Vac |                                                               |                                                    |                    |
| 700                                                 | NBDC3700MW                                                    | Included                                           | TA1000NB1          |
| 800                                                 | NBDC3800MW                                                    | Included                                           | TA1000NB1          |
| 900                                                 | NBDC3900MW                                                    | Included                                           | TA1000NB1          |
| 1000                                                | NBDC31000MW                                                   | Included                                           | TA1000NB1          |
| 1200                                                | NBDC31200MW                                                   | Included                                           | TA1200NB1          |

### Type PBDC DC Circuit Breakers

|                                                     |                                                               |                                                    |                     |
|-----------------------------------------------------|---------------------------------------------------------------|----------------------------------------------------|---------------------|
| Maximum Continuous Ampere Rating @ 40°C             | Complete Circuit Breaker Factory Assembled Without Terminals① | Includes Magnetic Only Trip Unit Calibrated @ 135% | Standard② Terminals |
|                                                     | Catalog Number                                                |                                                    |                     |
| 3-Pole High Interrupting Capacity 75 kAIC @ 600 Vac |                                                               |                                                    |                     |
| 1600                                                | PBDC31600W                                                    | Included                                           | BA2000PB            |
| 2000                                                | PBDC32000W                                                    | Included                                           | BA2000PB            |
| 2500                                                | PBDC32500W                                                    | Included                                           | BA2500PB            |

Instruction Leaflet/FRED Number 15560

<sup>①</sup> Complete circuit breaker includes frame, trip unit, and terminals.

## Type GFM

## Type GFM



Type GFM Ground Fault Protection Device

## Description

Cutler-Hammer Type GFM devices are Class 1 Ground Fault Sensing and Relaying devices designed to comply with the requirements outlined in Underwriters Laboratories, Inc. Standards for Safety entitled: Ground Fault Sensing and Relaying Equipment, UL1053.

Type GFM devices, when properly installed on a grounded electrical distribution system, will sense phase to ground fault currents and cause a disconnect to open and clear the fault instantaneously at predetermined current values. These devices have a maximum voltage rating of 600V, 50/60 Hertz and may be applied in accordance with Article 230-95 of the National Electrical Code.

Type GFM Ground Fault Protective Devices are self-contained combination sensing and relaying devices designed primarily for application on motor circuits and fixed loads where low-level Ground Fault Equipment Protection is required.

GFM devices are available in two basic types with each type having two physical sizes. The two basic types differ in the type of output circuit provided. The first type,

designated either GFM2 or GFM4, employs an internal relay having S.P.D.T. contacts that will operate a remote shunt trip device where control power is available.

The second type, designated either GFM2A or GFM4A, is completely solid state with an output SCR circuit designed to operate a remote, low-energy, flux transfer shunt trip mounted in a molded case breaker. No supplementary control power for the shunt trip is required.

## Size Selection

The proper size selection is a function of the conductor size of the equipment being protected. Types GFM2/GFM2A have approximately a two-inch window opening. Types GFM4/GFM4A have approximately a four-inch window opening.

## Rating Selection

The basic Ground Fault Current Pickup rating of either type GFM device is 5 amperes, i.e., each unit when properly installed will initiate a trip signal to a remote shunt trip with the presence of a 5 ampere Ground Fault Current within established tolerance limits. Separate optional rating plugs are available to alter the pickup rating to a maximum of 100 amperes.

## Control Power

Internal control power is not required to operate Type GFM Ground Fault Protective devices. All internal control power required is derived from the Ground Fault current through the internal current sensor.

External control power is required to operate the remote shunt trips used in conjunction with Type GFM2 and GFM4 devices.

External control power is not required with Type GFM2A and GFM4A devices to operate the special remote, low-energy, flux transfer shunt trips used in molded case circuit breakers.

## Trip Indication/Reset

A combination visual indicator and reset button is provided on the top of Type GFM2 and GFM4 devices to indicate the initiation of a tripping action to clear a Ground Fault. The operation of the internal relay will cause the white button to visibly raise.

To reset the device, the Indicator/Reset button must be depressed. Failure to reset the device will not allow the associated disconnect device to be reclosed.

No Indicator/Reset button is provided on Types GFM2A or GFM4A since an internal SCR is used in the output circuit. These devices reset automatically when the disconnect opens to clear the Ground Fault.

## Application

Type GFM devices may be installed in Zero Sequence or Ground Return Sensing methods, Proper Ground Fault Protection schemes are dependent upon proper system installation and grounding methods.

## Mounting

Each Type GFM device contains a Ground Fault Sensor which is a special current transformer. These are insulated devices which can be mounted directly to enclosure surfaces. Four tubular rivets secure the sensor housing. These four (0.200 dia.) mounting holes can be used to mount the GFM device in either a vertical or horizontal mounting position.

Optional mounting brackets as shown on the next page are available. These brackets may be mounted on either the bottom or side depending upon the installation requirements.

Regardless of the mounting method used, the top of the device with the visual indicator/ reset button and nameplate instructions should be maintained in a visual position after installation. GFM devices should be installed so that all conductors passing through the conductor window are physically centered.

## Type GFM

### Ordering Information

Order by catalog number or style number:

1 Basic GFM Unit

1 Rating plug if required

1 Mounting bracket if required

1 Circuit breaker with standard shunt trip factory installed (as required), or optionally when possible, a circuit breaker and field mountable shunt trip as separate items.

### Rating Plug Installation

To install an optional rating plug to obtain other than the minimum 5 ampere rating, remove the terminal cover held in position by a single screw and retention groove. With the cover removed, insert the rating plug in the position indicated. The rating plug is held captive in position with the addition of the terminal cover after the wiring is completed. With the terminal cover in position, the ampere rating of the rating plug remains visible.

### Output Circuitry

Contact ratings for Type GFM2 and GFM4 are 10 amperes continuous, 240 volts Ac maximum. Types GFM2A and GFM4A are intended to be used only with remote flux transfer shunt trips.

### Selection Data

#### GFM Basic Units

| Output Type | Approximate Window Opening, Inches | Basic Ampere Rating (Plug Omitted) | Operating Time @ 10 x Ampere Rating | Catalog Number |
|-------------|------------------------------------|------------------------------------|-------------------------------------|----------------|
|-------------|------------------------------------|------------------------------------|-------------------------------------|----------------|

#### Unit for Use with Standard Shunt Trip

|       |   |   |              |      |
|-------|---|---|--------------|------|
| Relay | 2 | 5 | 0.03 Seconds | GFM2 |
| Relay | 4 | 5 | 0.03 Seconds | GFM4 |

#### Unit for Use with Flux Transfer Shunt Trips

|     |   |   |              |       |
|-----|---|---|--------------|-------|
| SCR | 2 | 5 | 0.03 Seconds | GFM2A |
| SCR | 4 | 5 | 0.03 Seconds | GFM4A |

Instruction Leaflet/FRED Number 14945

#### GFM Optional Rating Plugs

| Ampere Rating | Catalog Number |
|---------------|----------------|
| 10            | GFMP10         |
| 25            | GFMP25         |
| 50            | GFMP50         |
| 50            | GFMP75         |
| 100           | GFMP100        |

### Optional Mounting Brackets

Includes two (2) brackets and mounting hardware



| GFM Type | Bracket Kit Style Number |
|----------|--------------------------|
| GFM2/2A  | 750B295G01               |
| GFM4/4A  | 750B295G02               |

## Type GFR

## Type GFR

## Description

The GFR ground fault relays, current sensors, test panels and accessory devices are UL listed by Underwriters Laboratories, Inc. in accordance with their standard for Ground Fault Sensing and Relaying Equipment, UL 1053, under File E48381.<sup>①</sup>

A Type GFR ground fault protection system, when properly installed on a grounded electrical system, will sense phase-to-ground fault currents. When the level of fault current is in excess of the pre-selected current pickup and time delay settings, the GFR relay will initiate a trip action of a disconnect device, which will open the faulted circuit and clear the fault.

The GFR devices are UL Class I devices designed to protect electrical equipment against extensive damage from arcing ground faults.

A basic Type GFR ground fault protection system consists of a ground fault relay<sup>②</sup>, a ground fault current sensor and a disconnect device equipped with a shunt trip device. This disconnect device can be a molded case circuit breaker, a power circuit breaker, a bolted pressure switch or other fusible disconnect device, suitable for application with UL Class I Ground Fault Sensing and Relaying equipment.

Additional optional equipment can be added to the protection system to meet the requirements of the specifying engineer, including:

- Ground Fault Test Panel
- Ground Fault Warning Indicator Relay
- Ground Fault Indicating Ammeter

GFR relays are available with zone selective interlocking circuitry to interlock several relays within the same system. This allows the relay which detects a ground fault to

instantly clear the fault by tripping the disconnect device. The relay simultaneously sends a signal to relay units "upstream" from the fault to time delay or to block their operation completely. Current sensors in various designs provide a range of "window" sizes to accommodate standard bus and cable arrangements.

Shunt trip attachments may be ordered for field mounting in Cutler-Hammer molded case circuit breakers, or may be ordered factory installed in the breaker.

## Electrical Ratings

## GFR Relay

Ground Fault Detection Ranges:  
1 to 12, 5 to 60 or 100 to 1200 Amperes

## Output contacts:

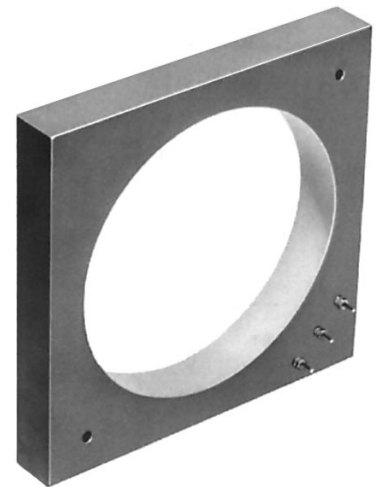
|                     |             |
|---------------------|-------------|
| 240 Volt, 50/60 Hz: | 3.0 Amperes |
| 120 Volt, 50/60 Hz: | 6.0 Amperes |
| 28 Volt Dc:         | 3.0 Amperes |
| 125 Volt Dc:        | .5 Amperes  |

## Control power requirements:

120 Volt, 50/60 Hz: .125 Amperes, or  
125 Volt Dc (optional)



GFR Relay



Typical Current Sensor

## Sensor:

600 Volts, 50/60 Hz maximum system voltage

<sup>①</sup> Suitable for either surface or semi-flush mounting.

<sup>②</sup> These devices are also listed with CSA under their file number 43357.

# Molded Case Circuit Breakers Add-on Ground Fault Protection

Cutler-Hammer

March 1999

## Type GFR

### Ordering Information

Each installation requires:

1. One relay unit (select trip ampere as required)
2. One current sensor (select configuration required)
3. One circuit breaker or disconnect device with shunt trip, or a shunt trip attachment for mounting in existing breaker.
4. Test panel. (Optional)

### GFR Relay

| GFR Relay Types | Catalog Numbers <sup>①</sup> |      |         |
|-----------------|------------------------------|------|---------|
|                 | Ground Fault Pickup Amperes  |      |         |
|                 | 1-12                         | 5-60 | 100-200 |

#### For 120 Volt 50/60 Hz Control

|                                            |         |         |           |
|--------------------------------------------|---------|---------|-----------|
| Electrical Reset with Zone Interlocking    | GRF12EI | GFR60EI | GFR1200EI |
| Electrical Reset without Zone Interlocking | GRF12E  | GFR60E  | GFR1200E  |
| Mechanical Reset with Zone Interlocking    | GRF12MI | GFR60MI | GFR1200MI |
| Mechanical Reset without Zone Interlocking | GRF12MI | GFR60MI | GFR1200MI |

#### For 120 Volt Dc Control

|                                            |          |          |            |
|--------------------------------------------|----------|----------|------------|
| Electrical Reset with Zone Interlocking    | GRF12EID | GFR60EID | GFR1200EID |
| Electrical Reset without Zone Interlocking | GRF12ED  | GFR60ED  | GFR1200ED  |
| Mechanical Reset with Zone Interlocking    | GRF12MID | GFR60MID | GFR1200MID |
| Mechanical Reset without Zone Interlocking | GRF12MID | GFR60MID | GFR1200MID |

### Current Sensor

| Window Size | Style Number |
|-------------|--------------|
|-------------|--------------|

#### Used with Relays Rated 1-12 Amperes

|               |            |
|---------------|------------|
| 5.50 In. I.D. | 1283C45G01 |
|---------------|------------|

#### Used with Relays Rated 5-60 Amperes

|                         |            |
|-------------------------|------------|
| 2.50 In. I.D.           | 179C768G01 |
| 5.50 In. I.D.           | 1256C13G01 |
| 8.25 In. I.D.           | 179C767G01 |
| 7.81 x 11.00 In. Rect.② | 1257C88G04 |
| 3.31 x 24.94 In. Rect.② | 1257C92G03 |

#### Used with Relays Rated 100-1200 Amperes

|                          |            |
|--------------------------|------------|
| 2.50 In. I.D.            | 179C768G02 |
| 5.50 In. I.D.            | 1256C13G02 |
| 8.25 In. I.D.            | 179C767G02 |
| 7.81 x 11.00 In. Rect.②  | 1257C88G03 |
| 9.94 x 16.94 In. Rect.②  | 1257C90G02 |
| 9.94 x 23.94 In. Rect.②  | 1257C91G02 |
| 15.94 x 19.94 In. Rect.② | 1257C89G02 |
| 3.31 x 24.94 In. Rect.②  | 1257C92G04 |
| 6.75 x 29.64 In. Rect.②  | 1255C39G03 |

Instruction Leaflet/FRED Number 15321

- ① Suitable for either surface or semi-flush mounting.
- ② One end removable for installation.
- ③ When a mechanically reset relay is used with a test panel, both the relay and test panel must be reset following either a simulated ground fault test or actual ground fault.
- ④ Not UL listed.

### Accessories

#### Test Panel (120 Volts Ac)③

Used to test the ground fault system, to give an indication the relay has tripped the breaker, and to reset the relay after tripping④. These functions may be separately mounted pilot devices.

#### Optional Test Panel

| Control       | Test          | Catalog Number |
|---------------|---------------|----------------|
| 120V 50/60 Hz | 120V 50/60 Hz | GFRTP          |
| 125V Dc       | 120V 50/60 Hz | GFRTPD         |

### Ground Fault Warning Indicator

This is an accessory item for use with GFR Relays with interlocking circuitry. At approximately 30-50% of the Relay pickup setting, the indicator switches separate 120 volt Ac control power to a lamp or relay, (not included) to give an indication of a ground fault. The indicator is rated 110/120 volts Ac 50/60 Hz for a maximum indicator load of .5 amperes.

| Ground Fault Warning Indicator | Style Number |
|--------------------------------|--------------|
| Manual Reset                   | 1234C67G01   |
| Self-Resetting                 | 1234C67G02   |

### Indicating Ammeter④

The optional indicating ammeter. It connects to the sensor terminals, through a momentary contact pushbutton, and will indicate (in amperes) any ground fault current flowing through the sensor. Kit includes the ammeter and pushbutton.

| GFR System Used with | Kit Style Number |
|----------------------|------------------|
| 1-12 Ampere          | 752B820G01       |
| 5-60 Ampere          | 752B820G02       |
| 100-1200 Ampere      | 752B820G03       |

### Shunt Trip Attachments

Use 120 volt Ac shunt trips.

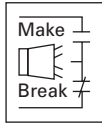
### Face Plate

Recommended when these relays are semi-flush mounted, to close the door cutout opening.

| Description | Style Number |
|-------------|--------------|
| Face Plate  | 752B410G01   |

## Alarm Switch

## Alarm Switch



## General Information

For remote indication of automatic trip operation. Does not function with manual switching; however, it will operate when either a shunt trip or undervoltage release is operated.

A “make” contact closes and a “break” contact opens when the alarm/lockout switch operates. The switch automatically resets when the circuit breaker is reset.

## Ordering Information

## G-Frame

Alarm Switch (RH only)<sup>①</sup>

| Electrical Rating |           |         | Contact Arrangement | Style Number <sup>②③④</sup> | Factory Suffix |
|-------------------|-----------|---------|---------------------|-----------------------------|----------------|
| Volts             | Frequency | Amperes |                     |                             |                |

## Alarm Switch

|     |          |   |                 |            |    |
|-----|----------|---|-----------------|------------|----|
| 240 | 50/60 Hz | 6 | 1 Make/ 1 Break | 1288C75G03 | B3 |
|-----|----------|---|-----------------|------------|----|

## Alarm Switch Auxiliary Switches Combination

|     |          |   |                           |            |     |
|-----|----------|---|---------------------------|------------|-----|
| 240 | 50/60 Hz | 6 | 1 Make/ 1 Break and 1a/1b | 1288C76G09 | B13 |
|-----|----------|---|---------------------------|------------|-----|

Instruction Leaflet/FRED Number 15552

## F-Frame

Electrical Rating Data<sup>⑤⑥</sup>

| Maximum Voltage | Frequency | Maximum Current Amperes | Dielectric Withstand Voltage |
|-----------------|-----------|-------------------------|------------------------------|
|-----------------|-----------|-------------------------|------------------------------|

## Multi-Pole Circuit Breakers

|     |          |                   |      |
|-----|----------|-------------------|------|
| 600 | 50/60 Hz | 6                 | 2500 |
| 125 | Dc       | 0.50 <sup>⑦</sup> | 2200 |
| 250 | Dc       | 0.25 <sup>⑦</sup> | 2200 |

## Single-Pole Circuit Breakers

|         |          |                |      |
|---------|----------|----------------|------|
| 125/250 | 50/60 Hz | 6 <sup>⑦</sup> | 2000 |
| 28      | Dc       | 3 <sup>⑦</sup> | 2000 |
| 28      | Dc       | 5 <sup>⑧</sup> | 2000 |

Alarm Switch<sup>①</sup>

| Number of Contacts<br>(Make and Break) | Mounting Location<br>(Pole) | Factory Mounted              |                   |               |                | Field Mounted                        |                    |
|----------------------------------------|-----------------------------|------------------------------|-------------------|---------------|----------------|--------------------------------------|--------------------|
|                                        |                             | Connection Type and Location |                   |               |                | Field Installation Kits <sup>⑨</sup> |                    |
|                                        |                             | 18-Inch Pigtail Leads        |                   |               | Terminal Block | Pigtail Leads                        | Terminal Block     |
|                                        |                             | Same Side                    | Rear <sup>⑩</sup> | Opposite Side |                |                                      |                    |
|                                        |                             |                              |                   |               | Suffix Number  |                                      |                    |
| 1                                      | Left <sup>⑪</sup><br>Right  | B01<br>B05                   | B02<br>B06        | B03<br>B07    | B04<br>B08     | A1L1LPK<br>A1L1RPK                   | A1L1LTK<br>A1L1RTK |
| 2                                      | Left <sup>⑪</sup><br>Right  | B09<br>B12                   | B10<br>B13        | —<br>—        | B11<br>B14     | A2L1LPK<br>A2L1RPK                   | A2L1LTK<br>A2L1RTK |
| 1 (Make Only)                          | Single Pole                 | B15 <sup>⑫</sup>             | —                 | —             | —              | —                                    | —                  |

Instruction Leaflet/FRED Number 29C180

① F-Frame circuit breakers are factory sealed. Underwriters Laboratories, Inc., requires that internal accessories be installed at the factory. Internal accessories are UL listed for factory installation under E7819. Where local codes and standards permit and UL listing is not required, internal accessories can be field installed. Accessory installation should be done before the circuit breaker is mounted and connected.

② Includes 24-inch external pigtail leads, 18 AWG (16-.010).

③ A maximum of two internal accessories may be mounted in a three-pole circuit breaker.

④ Suitable for mounting in right pole only of 2- or 3-pole breaker.

⑤ Endurance: 6000 electrical operations plus 4000 mechanical operations.

⑥ Endurance: 6000 electrical operations plus 2000 mechanical operations.

⑦ Non-inductive load.

⑧ Inductive (L/R = 0.026).

⑨ Not listed with Underwriters Laboratories, Inc., for field installation.

⑩ Standard pigtail lead exit location.

⑪ Standard mounting location.

⑫ Factory installation only. Leads exit load end of circuit breaker.



## Alarm Switch

## J-Frame

Electrical Rating Data<sup>①②</sup>

| Maximum Voltage   | Frequency            | Maximum Current Amperes                     | Dielectric Withstand Voltage |
|-------------------|----------------------|---------------------------------------------|------------------------------|
| 600<br>125<br>250 | 50/60 Hz<br>Dc<br>Dc | 6<br>0.50 <sup>③</sup><br>0.25 <sup>③</sup> | 2500                         |

## Alarm Switch

| Number of Contacts (Make and Break) | Mounting Location (Pole)   | Factory Mounted              |                   |               |                | Field Mounted                        |                                 |
|-------------------------------------|----------------------------|------------------------------|-------------------|---------------|----------------|--------------------------------------|---------------------------------|
|                                     |                            | Connection Type and Location |                   |               |                | Field Installation Kits <sup>④</sup> |                                 |
|                                     |                            | 18-Inch Pigtail Leads        |                   |               | Terminal Block | Pigtail Leads                        | Terminal Block                  |
|                                     |                            | Same Side                    | Rear <sup>⑤</sup> | Opposite Side | Same Side      |                                      |                                 |
|                                     |                            | Suffix Number                |                   |               |                | Catalog Number                       |                                 |
| 1                                   | Left <sup>⑥</sup><br>Right | B01<br>B05                   | B02<br>B06        | B03<br>B07    | B04<br>B08     | A1L2LPK<br>A1L2RPK                   | A1L2LTK<br>A1L2RTK <sup>⑦</sup> |

Instruction Leaflet/FRED Number 29C181

## K-Frame

Electrical Rating Data<sup>②⑧</sup>

| Maximum Voltage   | Frequency            | Maximum Current Amperes                     | Dielectric Withstand Voltage |
|-------------------|----------------------|---------------------------------------------|------------------------------|
| 600<br>125<br>250 | 50/60 Hz<br>Dc<br>Dc | 6<br>0.50 <sup>③</sup><br>0.25 <sup>③</sup> | 2500                         |

## Alarm Switch

| Number of Sets of Contacts (1M and 1B) | Mounting Location (Pole) | Factory Mounted              |            |               |                | Field Mounted            |                    |
|----------------------------------------|--------------------------|------------------------------|------------|---------------|----------------|--------------------------|--------------------|
|                                        |                          | Connection Type and Location |            |               |                | Field Installation Kits④ |                    |
|                                        |                          | 18-Inch Pigtail Leads        |            |               | Terminal Block | Pigtail Leads            | Terminal Block     |
|                                        |                          | Same Side                    | Rear⑤      | Opposite Side | Same Side      |                          |                    |
|                                        |                          | Suffix Number                |            |               |                | Catalog Number           |                    |
| 1                                      | Left⑥<br>Right           | B01<br>B05                   | B02<br>B06 | B03<br>B07    | B04<br>B08     | A1L3LPK<br>A1L3RPK       | A1L3LTK<br>A1L3RTK |
| 2                                      | Left⑥<br>Right           | B09<br>B12                   | B10<br>B13 | —<br>—        | B11<br>B14     | A2L3LPK<br>A2L3RPK       | A2L3LTK<br>A2L3RTK |

Instruction Leaflet/FRED Number 29C182

## L- and M-Frames

Electrical Rating Data<sup>②⑧</sup>

| Maximum Voltage   | Frequency            | Maximum Current Amperes                     | Dielectric Withstand Voltage |
|-------------------|----------------------|---------------------------------------------|------------------------------|
| 600<br>125<br>250 | 50/60 Hz<br>Dc<br>Dc | 6<br>0.50 <sup>③</sup><br>0.25 <sup>③</sup> | 2500                         |

## Alarm Switch

| Number of Sets of Contacts (1M and 1B) | Mounting Location (Pole)   | Factory Mounted              |                   |               |                | Field Mounted                        |                    |
|----------------------------------------|----------------------------|------------------------------|-------------------|---------------|----------------|--------------------------------------|--------------------|
|                                        |                            | Connection Type and Location |                   |               |                | Field Installation Kits <sup>④</sup> |                    |
|                                        |                            | 18-Inch Pigtail Leads        |                   |               | Terminal Block | Pigtail Leads                        | Terminal Block     |
|                                        |                            | Same Side                    | Rear <sup>⑤</sup> | Opposite Side | Same Side      |                                      |                    |
|                                        |                            | Suffix Number                |                   |               |                | Catalog Number                       |                    |
| 1                                      | Left <sup>⑥</sup><br>Right | B01<br>B05                   | B02<br>B06        | B03<br>B07    | B04<br>B08     | A1L4LPK<br>A1L4RPK                   | A1L4LTK<br>A1L4RTK |
| 2                                      | Left <sup>⑥</sup><br>Right | B09<br>B12                   | B10<br>B13        | —<br>—        | B11<br>B14     | A2L4LPK<br>A2L4RPK                   | A2L4LTK<br>A2L4RTK |

Instruction Leaflet/FRED Number 29C183

- ① Endurance: 6000 electrical operations plus 2000 mechanical operations.
- ② Pigtail wire size: No. 18 AWG (0.82 mm<sup>2</sup>).
- ③ Non-inductive load.
- ④ Listed with Underwriters Laboratories, Inc., for field installation on interchangeable trip unit breakers under E64983.
- ⑤ Standard mounting location.
- ⑥ Standard mounting location – leads exit rear of breaker.
- ⑦ Not for use on 4-pole circuit breakers.
- ⑧ Endurance – 5,000 electrical operations plus 1000 mechanical operations.

## Alarm Switch

## N-Frame

Electrical Rating Data<sup>①</sup>

| Maximum Voltage   | Frequency            | Maximum Current Amperes                     | Dielectric Withstand Voltage |
|-------------------|----------------------|---------------------------------------------|------------------------------|
| 600<br>125<br>250 | 50/60 Hz<br>Dc<br>Dc | 6<br>0.50 <sup>②</sup><br>0.25 <sup>②</sup> | 2500                         |

## Alarm Switch

| Number of Sets of Contacts (Make and Break) | Mounting Location (Pole) | Factory Mounted              |            |               |                | Field Mounted            |                    |
|---------------------------------------------|--------------------------|------------------------------|------------|---------------|----------------|--------------------------|--------------------|
|                                             |                          | Connection Type and Location |            |               |                | Field Installation Kits③ |                    |
|                                             |                          | 18-Inch Pigtail Leads        |            |               | Terminal Block | Pigtail Leads            | Terminal Block     |
|                                             |                          | Same Side                    | Rear④      | Opposite Side | Same Side      |                          |                    |
|                                             |                          | Suffix Number                |            |               |                | Catalog Number           |                    |
| 1                                           | Left<br>Right④           | B01<br>B05                   | B02<br>B06 | B03<br>B07    | B04<br>B08     | A1L5LPK<br>A1L5RPK       | A1L5LTK<br>A1L5RTK |
| 2                                           | Left<br>Right④           | B09<br>B12                   | B10<br>B13 | —<br>—        | B11<br>B14     | A2L5LPK<br>A2L5RPK       | A2L5LTK<br>A2L5RTK |

Instruction Leaflet/FRED Number 29C184

## R-Frame

Electrical Rating Data<sup>⑤⑥</sup>

| Maximum Voltage   | Frequency            | Maximum Current Amperes                     |
|-------------------|----------------------|---------------------------------------------|
| 600<br>125<br>250 | 50/60 Hz<br>Dc<br>Dc | 6<br>0.50 <sup>②</sup><br>0.25 <sup>②</sup> |

## Alarm Switch (RH only)

| Number of Contacts (Make and Break) | Factory Mounted              | Field Mounted                        |
|-------------------------------------|------------------------------|--------------------------------------|
|                                     | Connection Type and Location | Field Installation Kits <sup>③</sup> |
|                                     | 18-Inch Pigtail Leads        | Pigtail Leads                        |
|                                     | Suffix Number <sup>⑦</sup>   | Catalog Number <sup>⑦</sup>          |
| 1                                   | B05                          | A1L6RPK                              |
| 2                                   | B12                          | A2L6RPK                              |

Instruction Leaflet/FRED Number 29C185

① Endurance – 3000 electrical operations plus 1000 mechanical operations.

② Non-inductive load.

③ Listed with Underwriters Laboratories, Inc. for field installation under E64983.

④ Standard mounting location – leads exit rear of breaker.

⑤ Endurance: 500 electrical operations plus 2500 mechanical operations.

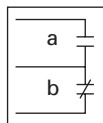
⑥ Pigtail wire size: No. 18 AWG (0.82 mm<sup>2</sup>). Leads are red, black and blue.

⑦ A maximum of three ASL plug-in modules may be installed in a circuit breaker.



## Auxiliary Switch

### Auxiliary Switch



### General Information

The auxiliary switch provides circuit breaker contact status information by monitoring the position of the molded cross bar which contains the moving contact arms. The auxiliary switch is used for remote indication and interlock system verification,

and consists of one or two SPDT switches housed in a plug-in module. Each SPDT switch has one "a" and one "b" contact. When the circuit breaker contacts are open, the "a" contact is open and the "b" contact is closed.

## Ordering Information

### G-Frame

#### Auxiliary (RH only)

| Electrical Ratings |           |         | Contact Arrangement | Style Number <sup>①②③</sup> | Factory Suffix |
|--------------------|-----------|---------|---------------------|-----------------------------|----------------|
| Volts              | Frequency | Amperes |                     |                             |                |
| 240                | 50/60 Hz  | 6       | 1a/1b               | 1288C74G03                  | A3             |
| 240                | 50/60 Hz  | 6       | 2a/2b               | 1288C73G03                  | A6             |

Instruction Leaflet/FRED Number 15551

### F-Frame

#### Electrical Rating Data<sup>④⑤</sup>

| Maximum Voltage  | Frequency | Maximum Current Amperes | Dielectric Withstand Voltage |
|------------------|-----------|-------------------------|------------------------------|
| 125 <sup>⑥</sup> | 50/60 Hz  | 1                       | 2500                         |
| 600              | 50/60 Hz  | 6                       | 2500                         |
| 125              | Dc        | 0.50 <sup>⑦</sup>       | 2200                         |
| 250              | Dc        | 0.25 <sup>⑦</sup>       | 2200                         |

#### Auxiliary Switch

| Number of<br>Contacts<br>a and b | Mounting<br>Location<br>(Pole)   | Factory Mounted              |                            |                            |                      | Field Mounted                            |                               |
|----------------------------------|----------------------------------|------------------------------|----------------------------|----------------------------|----------------------|------------------------------------------|-------------------------------|
|                                  |                                  | Connection Type and Location |                            |                            |                      | Field Installation Kits®                 |                               |
|                                  |                                  | 18-Inch Pigtail Leads        |                            |                            | Terminal<br>Block    | Pigtail<br>Leads                         | Terminal<br>Block             |
|                                  |                                  | Same<br>Side                 | Rear®                      | Opposite<br>Side           | Same<br>Side         |                                          |                               |
|                                  |                                  | Suffix Number                |                            |                            |                      | Catalog Number                           |                               |
| 1                                | Left⑤<br><br>Right or<br>Neutral | A01<br>A15⑩<br>A05<br>A18⑩   | A02<br>A16⑩<br>A06<br>A19⑩ | A03<br>A17⑩<br>A07<br>A20⑩ | A04<br>—<br>A08<br>— | A1X1PK<br>E1X1PK<br>A1X1PK<br>—          | A1X1LTK<br>—<br>A1X1RTK®      |
| 2                                | Left⑤<br><br>Right or<br>Neutral | A09<br>A21⑩<br>A12<br>A23⑩   | A10<br>A22⑩<br>A13<br>A24⑩ | —<br>—<br>—<br>—           | A11<br>—<br>A14<br>— | A2X1LPK<br>E2X1LPK<br>A2X1RPK<br>E2X1RPK | A2X1LTK<br>—<br>A2X1RTK®<br>— |

Instruction Leaflet/FRED Number 29C120

### J-Frame

#### Electrical Rating Data<sup>④⑤</sup>

| Maximum Voltage | Frequency | Maximum Current Amperes | Dielectric Withstand Voltage |
|-----------------|-----------|-------------------------|------------------------------|
| 600             | 50/60 Hz  | 6                       | 2500                         |
| 125             | Dc        | 0.50 <sup>⑦</sup>       |                              |
| 250             | Dc        | 0.25 <sup>⑦</sup>       |                              |

#### Auxiliary Switch

| Number of Sets of Contacts (1a and 1b) | Mounting Location (Pole) | Factory Mounted              |            |               |                | Field Mounted            |                     |
|----------------------------------------|--------------------------|------------------------------|------------|---------------|----------------|--------------------------|---------------------|
|                                        |                          | Connection Type and Location |            |               |                | Field Installation Kits⑩ |                     |
|                                        |                          | 18-Inch Pigtail Leads        |            |               | Terminal Block | Pigtail Leads            | Terminal Block      |
|                                        |                          | Same Side                    | Rear⑪      | Opposite Side | Same Side      |                          |                     |
|                                        |                          | Suffix Number                |            |               |                | Catalog Number           |                     |
| 1                                      | Left Right⑫              | A01<br>A05                   | A02<br>A06 | A03<br>A07    | A04<br>A08     | A1X2PK<br>A1X2PK         | A1X2LTK<br>A1X2RTK⑬ |
| 2                                      | Left Right⑫              | A09<br>A12                   | A10<br>A13 | —<br>—        | A11<br>A14     | A2X2PK<br>A2X2PK         | A2X2LTK<br>A2X2RTK⑬ |

Instruction Leaflet/FRED Number 29C121

① Includes 24-inch external pigtail leads, #18 AWG (16-.010).

② A maximum of two internal accessories may be mounted in a three-pole circuit breaker.

③ Suitable for mounting in right pole only of 2- or 3-pole breaker.

④ Endurance: 6000 electrical operations plus 4000 mechanical operations.

⑤ Pigtail wire size: No. 18 AWG (0.82 mm<sup>2</sup>).

⑥ For use in electronic circuit of 100 micro-amperes and 15 Vdc minimum.

⑦ Non-inductive load.

⑧ Not listed with Underwriters Laboratories, Inc., for field installation.

⑨ Standard pigtail lead exit location.

⑩ 125-volt (Max.), 50/60 Hz switch for use in electronic circuit of 100 micro-amp and 15 Vdc minimum.

⑪ Listed with Underwriters Laboratories, Inc. for field installation or interchangeable trip unit breakers under E64983.

⑫ Standard mounting location – leads exit rear of breaker.

⑬ Not for use on 4-pole circuit breakers.

## Auxiliary Switch

## K-Frame

Electrical Rating Data<sup>①②</sup>

| Maximum Voltage   | Frequency            | Maximum Current Amperes                     | Dielectric Withstand Voltage |
|-------------------|----------------------|---------------------------------------------|------------------------------|
| 600<br>125<br>250 | 50/60 Hz<br>Dc<br>Dc | 6<br>0.50 <sup>③</sup><br>0.25 <sup>③</sup> | 2500                         |

## Auxiliary Switch

| Number of Sets of Contacts (1M and 1B) | Mounting Location (Pole)   | Factory Mounted              |                   |               |                | Field Mounted                        |                                 |
|----------------------------------------|----------------------------|------------------------------|-------------------|---------------|----------------|--------------------------------------|---------------------------------|
|                                        |                            | Connection Type and Location |                   |               |                | Field Installation Kits <sup>④</sup> |                                 |
|                                        |                            | 18-Inch Pigtail Leads        |                   |               | Terminal Block | Pigtail Leads                        | Terminal Block                  |
|                                        |                            | Same Side                    | Rear <sup>⑤</sup> | Opposite Side | Same Side      |                                      |                                 |
|                                        |                            | Suffix Number                |                   |               |                | Catalog Number                       |                                 |
| 1                                      | Left<br>Right <sup>⑤</sup> | A01<br>A05                   | A02<br>A06        | A03<br>A07    | A04<br>A08     | A1X3PK<br>A1X3PK                     | A1X3LTK<br>A1X3RTK <sup>⑥</sup> |
| 2                                      | Left<br>Right <sup>⑤</sup> | A09<br>A12                   | A10<br>A13        | —<br>—        | A11<br>A14     | A2X3PK<br>A2X3PK                     | A2X3LTK<br>A2X3RTK <sup>⑥</sup> |
| 3                                      | Left<br>Right              | A18<br>A17                   | —<br>—            | —<br>—        | A15<br>A16     | A3X3LPK<br>A3X3RPK                   | A3X3LTK<br>A3X3RTK <sup>⑥</sup> |

Instruction Leaflet/FRED Number 29C122

## L- and M-Frames

Electrical Rating Data<sup>②</sup>

| Maximum Voltage   | Frequency            | Maximum Current Amperes                     | Dielectric Withstand Voltage |
|-------------------|----------------------|---------------------------------------------|------------------------------|
| 600<br>125<br>250 | 50/60 Hz<br>Dc<br>Dc | 6<br>0.50 <sup>③</sup><br>0.25 <sup>③</sup> | 2500                         |

## Auxiliary Switch

| Number of Sets of Contacts (1a and 1b) | Mounting Location (Pole)   | Factory Mounted              |                   |               |                | Field Mounted                        |                                 |
|----------------------------------------|----------------------------|------------------------------|-------------------|---------------|----------------|--------------------------------------|---------------------------------|
|                                        |                            | Connection Type and Location |                   |               |                | Field Installation Kits <sup>④</sup> |                                 |
|                                        |                            | 18-Inch Pigtail Leads        |                   |               | Terminal Block | Pigtail Leads                        | Terminal Block                  |
|                                        |                            | Same Side                    | Rear <sup>⑤</sup> | Opposite Side | Same Side      |                                      |                                 |
|                                        |                            | Suffix Number                |                   |               |                | Catalog Number                       |                                 |
| 1                                      | Left<br>Right <sup>⑤</sup> | A01<br>A05                   | A02<br>A06        | A03<br>A07    | A04<br>A08     | A1X4PK<br>A1X4PK                     | A1X4LTK<br>A1X4RTK <sup>⑥</sup> |
| 2                                      | Left<br>Right <sup>⑤</sup> | A09<br>A12                   | A10<br>A13        | —<br>—        | A11<br>A14     | A2X4PK<br>A2X4PK                     | A2X4LTK<br>A2X4RTK <sup>⑥</sup> |
| 3                                      | Left<br>Right <sup>⑤</sup> | A18<br>A17                   | —<br>—            | —<br>—        | A15<br>A16     | A3X4PK<br>A3X4PK                     | A3X4LTK<br>A3X4RTK <sup>⑥</sup> |

Instruction Leaflet/FRED Number 29C123

① Endurance – 5000 electrical operations plus 1000 mechanical operations.

② Pigtail wire size – No. 18 AWG (0.82 mm<sup>2</sup>).

③ Non-inductive load.

④ Listed with Underwriters Laboratories, Inc. for field installation under E64983.

⑤ Standard mounting location – leads exit rear of breaker.

⑥ Not for use on 4-pole circuit breaker.

## Auxiliary Switch

### N-Frame

#### Electrical Rating Data<sup>①②</sup>

| Maximum Voltage   | Frequency            | Maximum Current Amperes                     | Dielectric Withstand Voltage |
|-------------------|----------------------|---------------------------------------------|------------------------------|
| 600<br>125<br>250 | 50/60 Hz<br>Dc<br>Dc | 6<br>0.50 <sup>③</sup><br>0.25 <sup>③</sup> | 2500                         |

#### Auxiliary Switch

| Number of Sets of Contacts (1A and 1B) | Mounting Location (Pole) | Factory Mounted              |            |               |                | Field Mounted            |                     |
|----------------------------------------|--------------------------|------------------------------|------------|---------------|----------------|--------------------------|---------------------|
|                                        |                          | Connection Type and Location |            |               |                | Field Installation Kits④ |                     |
|                                        |                          | 18-Inch Pigtail Leads        |            |               | Terminal Block | Pigtail Leads            | Terminal Block      |
|                                        |                          | Same Side                    | Rear⑤      | Opposite Side | Same Side      |                          |                     |
|                                        |                          | Suffix Number                |            |               |                | Catalog Number           |                     |
| 1                                      | Left<br>Right⑤           | A01<br>A05                   | A02<br>A06 | A03<br>A07    | A04<br>A08     | A1X5LPK<br>A1X5RPK       | A1X5LTK<br>A1X5RTK⑥ |
| 2                                      | Left<br>Right⑤           | A09<br>A12                   | A10<br>A13 | —<br>—        | A11<br>A14     | A2X5LPK<br>A2X5RPK       | A2X5LTK<br>A2X5RTK⑥ |
| 3                                      | Left<br>Right⑤           | A18<br>A17                   | —<br>—     | —<br>—        | A15<br>A16     | A3X5LPK<br>A3X5RPK       | A3X5LTK<br>A3X5RTK⑥ |

Instruction Leaflet/FRED Number 29C124

### R-Frame

#### Electrical Rating Data<sup>⑦⑧</sup>

| Maximum Voltage   | Frequency            | Maximum Current Amperes                     |
|-------------------|----------------------|---------------------------------------------|
| 600<br>125<br>250 | 50/60 Hz<br>Dc<br>Dc | 6<br>0.50 <sup>③</sup><br>0.25 <sup>③</sup> |

#### Auxiliary Switch (RH only)

| Number of Contacts (Make and Break) | Factory Mounted              | Field Mounted                        |
|-------------------------------------|------------------------------|--------------------------------------|
|                                     | Connection Type and Location | Field Installation Kits <sup>④</sup> |
|                                     | 18-Inch Pigtail Leads        | Pigtail Leads                        |
|                                     | Suffix Number <sup>⑨</sup>   | Catalog Number <sup>⑨</sup>          |
| 2                                   | A12                          | A2X6RPK                              |
| 4                                   | A19                          | A4X6RPK                              |

Instruction Leaflet/FRED Number 29C125

① Endurance – 3000 electrical operations plus 1000 mechanical operations.

② Pigtail wire size – No. 18 AWG (0.82 mm<sup>2</sup>).

③ Non-inductive load.

④ Listed with Underwriters Laboratories, Inc. for field installation under E64983.

⑤ Standard mounting location – leads exit rear of breaker.

⑥ Not for use on 4-pole circuit breaker.

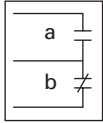
⑦ Endurance: 500 electrical operations plus 2500 mechanical operations.

⑧ Pigtail wire size: No. 18 AWG (0.82 mm<sup>2</sup>). Leads are red, black and blue.

⑨ A maximum of two auxiliary switches (any combination of 2a/2b or 4a/4b plug-in modules may be installed in a circuit breaker.

## Auxiliary Switch and Alarm Switch Combination

## Auxiliary Switch and Alarm Switch Combination



## General Information

Each catalog number listed in the following table includes one auxiliary switch and one alarm switch. In an auxiliary switch ASL switch

combination, the auxiliary switch is always mounted on the side of the plug-in module next to the center pole of the circuit breaker.

## Ordering Information

## F-Frame

Electrical Rating Data<sup>①②</sup>

| Maximum Voltage | Frequency | Maximum Current Amperes | Dielectric Withstand Voltage |
|-----------------|-----------|-------------------------|------------------------------|
| 125             | 50/60 Hz  | 1                       | 2500                         |
| 600             | 50/60 Hz  | 6                       | 2500                         |
| 125             | Dc        | 0.50 <sup>③</sup>       | 2200                         |
| 250             | Dc        | 0.25 <sup>③</sup>       | 2200                         |

## Auxiliary Switch and Alarm Switch Combination

| Mounting Location (Pole) | Factory Mounted              |            |                | Field Mounted            |                     |
|--------------------------|------------------------------|------------|----------------|--------------------------|---------------------|
|                          | Connection Type and Location |            |                | Field Installation Kits④ |                     |
|                          | 18-Inch Pigtail Leads        |            | Terminal Block | Pigtail Leads            | Terminal Block      |
|                          | Same Side                    | Rear⑤      | Same Side      |                          |                     |
|                          | Suffix Number                |            |                | Catalog Number           |                     |
| Left⑤<br>Right           | C01<br>C04                   | C02<br>C05 | C03<br>C06     | AAL1LPK<br>AAL1RPK       | AAL1LTK<br>AAL1RTK⑥ |

Instruction Leaflet/FRED Number 29C180

## J-Frame

Electrical Rating Data<sup>⑦②</sup>

| Maximum Voltage | Frequency | Maximum Current Amperes | Dielectric Withstand Voltage |
|-----------------|-----------|-------------------------|------------------------------|
| 600             | 50/60 Hz  | 6                       | 2500                         |
| 125             | Dc        | 0.50 <sup>③</sup>       |                              |
| 250             | Dc        | 0.25 <sup>③</sup>       |                              |

## Auxiliary Switch and Alarm Switch Combination

| Number of Sets of Contacts (1a and 1b and 1M and 1B) | Mounting Location (Pole) | Factory Mounted              |            |               |                | Field Mounted            |                     |
|------------------------------------------------------|--------------------------|------------------------------|------------|---------------|----------------|--------------------------|---------------------|
|                                                      |                          | Connection Type and Location |            |               |                | Field Installation Kits® |                     |
|                                                      |                          | 18-Inch Pigtail Leads        |            |               | Terminal Block | Pigtail Leads            | Terminal Block      |
|                                                      |                          | Same Side                    | Rear®      | Opposite Side |                |                          |                     |
|                                                      |                          | Suffix Number                |            |               |                |                          |                     |
| 1                                                    | Left<br>Right®           | C01<br>C04                   | C02<br>C05 | —<br>—        | C03<br>C06     | AAL2LPK<br>AAL2RPK       | AAL2LTK<br>AAL2RTK® |

Instruction Leaflet/FRED Number 29C181

## K-Frame

Electrical Rating Data<sup>⑩②</sup>

| Maximum Voltage | Frequency | Maximum Current Amperes | Dielectric Withstand Voltage |
|-----------------|-----------|-------------------------|------------------------------|
| 600             | 50/60 Hz  | 6                       | 2500                         |
| 125             | Dc        | 0.50 <sup>③</sup>       |                              |
| 250             | Dc        | 0.25 <sup>③</sup>       |                              |

## Auxiliary Switch and Alarm Switch Combination

| Number of Sets of Contacts (1a and 1b and 1M and 1B) | Mounting Location (Pole) | Factory Mounted              |            |               |                | Field Mounted            |                    |
|------------------------------------------------------|--------------------------|------------------------------|------------|---------------|----------------|--------------------------|--------------------|
|                                                      |                          | Connection Type and Location |            |               |                | Field Installation Kits® |                    |
|                                                      |                          | 18-Inch Pigtail Leads        |            |               | Terminal Block | Pigtail Leads            | Terminal Block     |
|                                                      |                          | Same Side                    | Rear®      | Opposite Side |                |                          |                    |
|                                                      |                          | Suffix Number                |            |               |                |                          |                    |
| 1                                                    | Left<br>Right®           | C01<br>C04                   | C02<br>C05 | —<br>—        | C03<br>C06     | AAL3LPK<br>AAL3RPK       | AAL3LTK<br>AAL3RTK |

Instruction Leaflet/FRED Number 29C182

① Endurance: 6000 electrical operations plus 4000 mechanical operations.

② Pigtail wire size: No. 18 AWG (0.82 mm<sup>2</sup>).

③ Non-inductive load.

④ Not listed with Underwriters Laboratories, Inc., for field installation.

⑤ Standard mounting location.

⑥ Not for use on 4-pole circuit breakers.

⑦ Endurance – 6000 electrical operations plus 2000 mechanical operations.

⑧ Listed with Underwriters Laboratories, Inc. for field installation or interchangeable trip unit breakers under E64983.

⑨ Standard mounting location – leads exit rear of breaker.

⑩ Endurance – 5000 electrical operations plus 1000 mechanical operations.

## Auxiliary Switch and Alarm Switch Combination

### L- and M-Frames

#### Electrical Rating Data<sup>①②</sup>

| Maximum Voltage   | Frequency            | Maximum Current Amperes                     | Dielectric Withstand Voltage |
|-------------------|----------------------|---------------------------------------------|------------------------------|
| 600<br>125<br>250 | 50/60 Hz<br>Dc<br>Dc | 6<br>0.50 <sup>③</sup><br>0.25 <sup>③</sup> | 2500                         |

#### Auxiliary Switch and Alarm Switch Combination

| Number of Sets of Contacts | Mounting Location (Pole) | Factory Mounted              |            |               |                | Field Mounted            |                       |
|----------------------------|--------------------------|------------------------------|------------|---------------|----------------|--------------------------|-----------------------|
|                            |                          | Connection Type and Location |            |               |                | Field Installation Kits④ |                       |
|                            |                          | 18-Inch Pigtail Leads        |            |               | Terminal Block | Pigtail Leads            | Terminal Block        |
|                            |                          | Same Side                    | Rear⑤      | Opposite Side | Same Side      |                          |                       |
|                            |                          | Suffix Number                |            |               |                | Catalog Number           |                       |
| 1A, 1B and 1 Make/ 1 Break | Left Right⑤              | C01<br>C04                   | C02<br>C05 | —<br>—        | C03<br>C06     | AA114LPK<br>AA114RPK     | AA114LTK<br>AA114RTK⑥ |
| 2A, 2B and 1 Make/ 1 Break | Left Right⑤              | C07<br>C10                   | C08<br>C11 | —<br>—        | C12<br>C13     | AA214LPK<br>AA214RPK     | AA214LTK<br>AA214RTK⑥ |
| 3A, 3B and 1 Make/ 1 Break | Left Right⑤              | C14<br>C15                   | —<br>—     | —<br>—        | —<br>—         | AA314LPK<br>AA314RPK     | —<br>—                |

Instruction Leaflet/FRED Number 29C183

### N-Frame

#### Electrical Rating Data<sup>⑦②</sup>

| Maximum Voltage   | Frequency            | Maximum Current Amperes                     | Dielectric Withstand Voltage |
|-------------------|----------------------|---------------------------------------------|------------------------------|
| 600<br>125<br>250 | 50/60 Hz<br>Dc<br>Dc | 6<br>0.50 <sup>③</sup><br>0.25 <sup>③</sup> | 2500                         |

#### Auxiliary Switch and Alarm Switch Combination

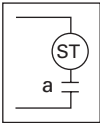
| Number of Sets of Contacts | Mounting Location (Pole) | Factory Mounted              |                   |               |                | Field Mounted                        |                                   |
|----------------------------|--------------------------|------------------------------|-------------------|---------------|----------------|--------------------------------------|-----------------------------------|
|                            |                          | Connection Type and Location |                   |               |                | Field Installation Kits <sup>④</sup> |                                   |
|                            |                          | 18-Inch Pigtail Leads        |                   |               | Terminal Block | Pigtail Leads                        | Terminal Block                    |
|                            |                          | Same Side                    | Rear <sup>⑤</sup> | Opposite Side | Same Side      |                                      |                                   |
|                            |                          | Suffix Number                |                   |               |                | Catalog Number                       |                                   |
| 1A, 1B and 1 Make/ 1 Break | Left Right <sup>⑤</sup>  | C01<br>C04                   | C02<br>C05        | —<br>—        | C03<br>C06     | AA115LPK<br>AA115RPK                 | AA115LTK<br>AA115RTK <sup>⑥</sup> |
| 2A, 2B and 1 Make/ 1 Break | Left Right <sup>⑤</sup>  | C07<br>C10                   | C08<br>C11        | —<br>—        | C12<br>C13     | AA215LPK<br>AA215RPK                 | AA215LTK<br>AA215RTK <sup>⑥</sup> |

Instruction Leaflet/FRED Number 29C184

- ① Endurance – 5000 electrical operations plus 1000 mechanical operations.  
 ② Pigtail wire size – No. 18 AWG (0.82 mm<sup>2</sup>).  
 ③ Non-inductive load.  
 ④ Listed with Underwriters Laboratories, Inc. for field installation under E64983.  
 ⑤ Standard mounting location – leads exit rear of breaker.  
 ⑥ Not for use on 4-pole circuit breaker.  
 ⑦ Endurance – 3000 electrical operations plus 1000 mechanical operations.

Shunt Trip

Shunt Trip



General Information

The shunt trip provides remote controlled tripping of the circuit breaker. The shunt trip consists of an intermittent rated solenoid with a tripping plunger and a cutoff switch assembled to a plug-in module.

When required for ground fault protection applications, certain Ac rated shunt trips, as noted in the Electrical Rating Table, are suitable for operation at 55 percent of rated voltage.

Ordering Information

Select shunt trip catalog number for the voltage within the indicated voltage range. Shunt trip coils are designed to be applied at specific Ac or Dc voltages within the voltage range shown. Electrical ratings are also shown on applicable circuit breaker accessory nameplates.

G-Frame

Shunt Trip (LH 3-Pole only)

| Electrical Ratings |           |         | Catalog Number | Suffix Number |
|--------------------|-----------|---------|----------------|---------------|
| Volts              | Frequency | Amperes |                |               |
| 120                | 50/60 Hz  | 1.1     | 1373D62G01     | S1            |
| 240                | 50/60 Hz  | 2.1     | 1373D62G02     | S2            |
| 12                 | Dc        | 2.8     | 1373D62G15     | S3            |
| 24                 | Dc        | 5.7     | 1373D62G16     | S4            |
| 24                 | 60 Hz     | —       | 1373D62G20     | S7            |

Instruction Leaflet/FRED Number 15550

**Note:** G-Frame circuit breakers are factory sealed. Underwriters Laboratories, Inc., requires that internal accessories be installed at the factory. Internal accessories are UL listed for factory installation under E7819.

Where local codes and standards permit and UL listing is not required, internal accessories can be field installed. Accessory installation should be done before the circuit breaker is mounted and connected.

### Shunt Trip

## F-Frame

### Electrical Rating Data<sup>①②③</sup>

| 50/60 Hz       |                           |     | Dc             |                           |     |
|----------------|---------------------------|-----|----------------|---------------------------|-----|
| Supply Voltage | Minimum Operating Voltage | VA  | Supply Voltage | Minimum Operating Voltage | VA  |
| 12             | 6.75                      | 75  | 12             | 9                         | 100 |
| 24             |                           | 300 | 24             |                           | 400 |
| 48             |                           | 92  | 48             |                           | 100 |
| 60             |                           | 140 | 60             |                           | 160 |
| 110            | 36                        | 480 |                | 36                        |     |
| 120            |                           | 570 |                |                           |     |
| 127            |                           | 640 |                |                           |     |
| 208            |                           | 180 | 110            |                           | 55  |
| 220            | 156                       | 200 | 120            | 77                        | 66  |
| 240            |                           | 240 | 125            |                           | 71  |
| 380            |                           | 610 | 127            |                           | 72  |
|                |                           |     |                |                           |     |
| 415            | 300                       | 130 | 220            | —                         | 110 |
| 440            |                           | 330 | 250            |                           | 140 |
| 480            |                           | 380 | —              |                           | —   |
| 525            |                           | 450 | —              |                           | —   |
| 550            |                           | 530 | —              |                           | —   |
| 600            |                           | 590 | —              |                           | —   |
|                |                           | —   | —              |                           | —   |
|                |                           | —   | —              |                           | —   |

### Shunt Trip

| Voltage Rating<br>(Ac Frequency = 50/60 Hz) | Factory Mounted                    |                   |               |                | Field Mounted                        |                |
|---------------------------------------------|------------------------------------|-------------------|---------------|----------------|--------------------------------------|----------------|
|                                             | Connection Type and Location       |                   |               |                | Field Installation Kits <sup>④</sup> |                |
|                                             | 18-Inch Pigtail Leads <sup>⑤</sup> |                   |               | Terminal Block | Pigtail Leads                        | Terminal Block |
|                                             | Same Side                          | Rear <sup>⑥</sup> | Opposite Side | Same Side      |                                      |                |
|                                             | Suffix Number                      |                   |               |                | Catalog Number                       |                |

#### Left-Pole Mounting Ac/Dc Ratings

|                                      |     |     |     |     |           |           |
|--------------------------------------|-----|-----|-----|-----|-----------|-----------|
| 12-24 Vac or Vdc                     | S01 | S02 | S03 | S04 | SNT1LP03K | SNT1LT03K |
| 48-127 Vac or 48-60 Vdc <sup>⑦</sup> | S05 | S06 | S07 | S08 | SNT1LP08K | SNT1LT08K |
| 208-380 Vac or 110-127 Vdc           | S09 | S10 | S11 | S12 | SNT1LP12K | SNT1LT12K |
| 415-600 Vac or 220-250 Vdc           | S13 | S14 | S15 | S16 | SNT1LP18K | SNT1LT18K |

#### Right- or Neutral-Pole Mounting Ac/Dc Ratings<sup>⑧</sup>

|                                      |     |     |     |     |           |                        |
|--------------------------------------|-----|-----|-----|-----|-----------|------------------------|
| 12-24 Vac or Vdc                     | S17 | S18 | S19 | S20 | SNT1RP03K | SNT1RT03K <sup>⑨</sup> |
| 48-127 Vac or 48-60 Vdc <sup>⑦</sup> | S21 | S22 | S23 | S24 | SNT1RP08K | SNT1RT08K <sup>⑨</sup> |
| 208-380 Vac or 110-127 Vdc           | S25 | S26 | S27 | S28 | SNT1RP12K | SNT1RT12K <sup>⑨</sup> |
| 415-600 Vac or 220-250 Vdc           | S29 | S30 | S31 | S32 | SNT1RP18K | SNT1RT18K <sup>⑨</sup> |

Instruction Leaflet/FRED Number 29C140

**Note:** F-Frame circuit breakers are factory sealed. Underwriters Laboratories, Inc., requires that internal accessories be installed at the factory.

Internal accessories are UL listed for factory installation under E7819.

Where local codes and standards permit and UL listing is not required, internal accessories can be field installed. Accessory installation should be done before the circuit breaker is mounted and connected.

## J-Frame

### Electrical Rating Data<sup>①②⑩</sup>

| 50/60 Hz         |                           |      | Dc             |                           |      |
|------------------|---------------------------|------|----------------|---------------------------|------|
| Supply Voltage   | Minimum Operating Voltage | VA   | Supply Voltage | Minimum Operating Voltage | VA   |
| 12               | 9                         | 31   | 12             | 8.4                       | 50   |
| 24               |                           | 173  | 24             |                           | 247  |
| 48               | 36                        | 686  | 48             | 33.6                      | 1094 |
| 60               |                           | 1014 | 60             |                           | 1698 |
| 110 <sup>⑪</sup> | 60.5                      | 66   | 110            | 77                        | 112  |
| 120 <sup>⑪</sup> |                           | 84   | 120            |                           | 138  |
| 127 <sup>⑪</sup> |                           | 102  | 125            |                           | 150  |
| 208 <sup>⑪</sup> |                           | 354  | —              |                           | —    |
| 220 <sup>⑪</sup> |                           | 396  | —              |                           | —    |
| 240 <sup>⑪</sup> |                           | 432  | —              |                           | —    |
| 380              | 285                       | 180  | 110            | 154                       | 40   |
| 400              |                           | 200  | 120            |                           | 58   |
| 415              |                           | 240  | 125            |                           | —    |
| 440              |                           | 610  | 127            |                           | —    |
| 480              | 360                       | 34   | —              | —                         | —    |
| 525              |                           | 42   | —              |                           | —    |
| 550              |                           | 50   | —              |                           | —    |
| 600              |                           | 60   | —              |                           | —    |

### Shunt Trip

| Voltage Rating<br>(Ac Frequency = 50/60 Hz) | Factory Mounted              |                   |               |                | Field Mounted                        |                |
|---------------------------------------------|------------------------------|-------------------|---------------|----------------|--------------------------------------|----------------|
|                                             | Connection Type and Location |                   |               |                | Field Installation Kits <sup>⑫</sup> |                |
|                                             | 18-Inch Pigtail Leads        |                   |               | Terminal Block | Pigtail Leads                        | Terminal Block |
|                                             | Same Side                    | Rear <sup>⑬</sup> | Opposite Side |                |                                      |                |
|                                             | Suffix Number                |                   |               |                |                                      |                |

#### Left-Pole Mounting Ac/Dc Ratings<sup>⑭</sup>

|                                         |     |     |     |     |          |          |
|-----------------------------------------|-----|-----|-----|-----|----------|----------|
| 12-24 Vac or Vdc                        | S41 | S42 | S43 | S44 | SNT2P04K | SNT2T04K |
| 48-60 Vac or Vdc                        | S49 | S50 | S51 | S52 | SNT2P06K | SNT2T06K |
| 110-240 Vac or 110-125 Vdc <sup>⑭</sup> | S09 | S10 | S11 | S12 | SNT2P11K | SNT2T11K |
| 380-440 Vac or 220-250 Vdc              | S33 | S34 | S35 | S36 | SNT2P14K | SNT2T14K |
| 480-600 Vac                             | S17 | S18 | S19 | S20 | SNT2P18K | SNT2T18K |

#### Right-Pole Mounting Ac/Dc Ratings

|                                         |     |     |     |     |          |                       |
|-----------------------------------------|-----|-----|-----|-----|----------|-----------------------|
| 12-24 Vac or Vdc                        | S45 | S46 | S47 | S48 | SNT2P04K | SNT2T04K <sup>⑨</sup> |
| 48-60 Vac or Vdc                        | S53 | S54 | S55 | S56 | SNT2P06K | SNT2T06K <sup>⑨</sup> |
| 110-240 Vac or 110-125 Vdc <sup>⑭</sup> | S29 | S30 | S31 | S32 | SNT2P11K | SNT2T11K <sup>⑨</sup> |
| 380-440 Vac or 220-250 Vdc              | S33 | S34 | S35 | S36 | SNT2P14K | SNT2T14K <sup>⑨</sup> |
| 480-600 Vac                             | S37 | S38 | S39 | S40 | SNT2P18K | SNT2T18K <sup>⑨</sup> |

Instruction Leaflet/FRED Number 29C142

- ① Average unlatching time: 6 milliseconds.
- ② Average circuit breaker contact total opening time: 18 milliseconds.
- ③ Endurance: 6000 electrical operations plus 4000 mechanical operations.
- ④ Not listed with Underwriters Laboratories, Inc., for field installation.
- ⑤ Pigtail wire size: No. 18 AWG (0.82 mm<sup>2</sup>).
- ⑥ Standard pigtail lead exit location.

- ⑦ 120 Vac marked suitable for ground fault protection devices.
- ⑧ Standard mounting location.
- ⑨ Not for use on 4-pole circuit breakers.
- ⑩ Endurance – 6000 electrical operations plus 2000 mechanical operations.
- ⑪ Supply voltages suitable for use with Class 1 GFP devices. Marking label included with accessory kits.

- ⑫ Listed with Underwriters Laboratories, Inc. for field installation under E64983.
- ⑬ Standard mounting location – leads exit rear of breaker.
- ⑭ Suitable for use with Class 1 ground fault sensing element.

## Shunt Trip

## K-Frame

Electrical Rating Data<sup>①②③</sup>

| 50/60 Hz         |                           |      | Dc             |                           |      |
|------------------|---------------------------|------|----------------|---------------------------|------|
| Supply Voltage   | Minimum Operating Voltage | VA   | Supply Voltage | Minimum Operating Voltage | VA   |
| 12               | 9                         | 45   | 12             | 8.4                       | 35   |
| 24               |                           | 200  | 24             |                           | 170  |
| 48               |                           | 830  | 48             |                           | 710  |
| 60               |                           | 1280 | 60             |                           | 1105 |
| 110 <sup>④</sup> | 60                        | 100  | 110            | 77                        | 110  |
| 120 <sup>④</sup> |                           | 120  | 120            |                           | 130  |
| 127 <sup>④</sup> |                           | 140  | 125            |                           | 140  |
| 208 <sup>④</sup> |                           | 420  | —              |                           | —    |
| 220 <sup>④</sup> | 285                       | 470  | —              | 154                       | —    |
| 240 <sup>④</sup> |                           | 550  | —              |                           | —    |
| 380              |                           | 95   | 220            |                           | 41   |
| 400              |                           | 108  | 250            |                           | 54   |
| 415              | 360                       | 120  | —              | —                         | —    |
| 440              |                           | 136  | —              |                           | —    |
| 480              |                           | 40   | —              |                           | —    |
| 525              |                           | 50   | —              |                           | —    |
| 550              | 70                        | 50   | —              | —                         | —    |
| 600              |                           | 70   | —              |                           | —    |

## Shunt Trip

| Voltage Rating<br>(Ac Frequency = 50/60 Hz) | Factory Mounted              |                   |               |                | Field Mounted                        |                |
|---------------------------------------------|------------------------------|-------------------|---------------|----------------|--------------------------------------|----------------|
|                                             | Connection Type and Location |                   |               |                | Field Installation Kits <sup>⑤</sup> |                |
|                                             | 18-Inch Pigtail Leads        |                   |               | Terminal Block | Pigtail Leads                        | Terminal Block |
|                                             | Same Side                    | Rear <sup>⑥</sup> | Opposite Side | Same Side      |                                      |                |
|                                             | Suffix Number                |                   |               |                | Catalog Number                       |                |

Left-Pole Mounting Ac/Dc Ratings<sup>⑤</sup>

|                                         |     |     |     |     |           |          |
|-----------------------------------------|-----|-----|-----|-----|-----------|----------|
| 12-24 Vac or Vdc                        | S41 | S42 | S43 | S44 | SNT3P04K  | SNT3T04K |
| 48-60 Vac or Vdc                        | S49 | S50 | S51 | S52 | SNT3P06K  | SNT3T06K |
| 110-240 Vac or 110-125 Vdc <sup>⑦</sup> | S09 | S10 | S11 | S12 | SNT3LP11K | SNT3T11K |
| 380-440 Vac or 220-250 Vdc              | S13 | S14 | S15 | S16 | SNT3P14K  | SNT3T14K |
| 480-600 Vac                             | S17 | S18 | S19 | S20 | SNT3P18K  | SNT3T18K |

Right-Pole Mounting Ac/Dc Ratings<sup>⑧</sup>

|                                         |     |     |     |     |          |                       |
|-----------------------------------------|-----|-----|-----|-----|----------|-----------------------|
| 12-24 Vac or Vdc                        | S45 | S46 | S47 | S48 | SNT3P04K | SNT3T04K <sup>⑨</sup> |
| 110-240 Vac or 110-125 Vdc <sup>⑦</sup> | S29 | S30 | S31 | S32 | SNT3P11K | SNT3T11K <sup>⑨</sup> |
| 380-440 Vac or 220-250 Vdc              | S33 | S34 | S35 | S36 | SNT3P14K | SNT3T14K <sup>⑨</sup> |
| 480-600 Vac                             | S37 | S38 | S39 | S40 | SNT3P18K | SNT3T18K <sup>⑨</sup> |

Instruction Leaflet/FRED Number 29C144

## L- and M-Frames

Electrical Rating Data<sup>①②③</sup>

| 50/60 Hz         |                           |      | Dc             |                           |      |
|------------------|---------------------------|------|----------------|---------------------------|------|
| Supply Voltage   | Minimum Operating Voltage | VA   | Supply Voltage | Minimum Operating Voltage | VA   |
| 12               | 9                         | 45   | 12             | 9                         | 35   |
| 24               |                           | 200  | 24             |                           | 170  |
| 48               | 34                        | 830  | 48             | 34                        | 710  |
| 60               |                           | 1280 | 60             |                           | 1105 |
| 110 <sup>④</sup> | 60                        | 100  | 110            | 77                        | 110  |
| 120 <sup>④</sup> |                           | 120  | 120            |                           | 130  |
| 127 <sup>④</sup> |                           | 140  | 125            |                           | 140  |
| 208 <sup>④</sup> |                           | 420  | —              |                           | —    |
| 220 <sup>④</sup> | 266                       | 470  | —              | 154                       | —    |
| 240 <sup>④</sup> |                           | 550  | —              |                           | —    |
| 380              |                           | 95   | 220            |                           | 41   |
| 400              |                           | 108  | 250            |                           | 54   |
| 415              | 336                       | 120  | —              | —                         | —    |
| 440              |                           | 136  | —              |                           | —    |
| 480              |                           | 40   | —              |                           | —    |
| 525              |                           | 50   | —              |                           | —    |
| 550              | 70                        | 50   | —              | —                         | —    |
| 600              |                           | 70   | —              |                           | —    |

## Shunt Trip

| Voltage Rating<br>(Ac Frequency = 50/60 Hz) | Factory Mounted              |                   |               |                | Field Mounted                        |                |
|---------------------------------------------|------------------------------|-------------------|---------------|----------------|--------------------------------------|----------------|
|                                             | Connection Type and Location |                   |               |                | Field Installation Kits <sup>⑤</sup> |                |
|                                             | 18-Inch Pigtail Leads        |                   |               | Terminal Block | Pigtail Leads                        | Terminal Block |
|                                             | Same Side                    | Rear <sup>⑥</sup> | Opposite Side | Same Side      |                                      |                |
|                                             | Suffix Number                |                   |               |                | Catalog Number                       |                |

Left-Pole Mounting Ac/Dc Ratings<sup>⑤</sup>

|                            |     |     |     |     |           |           |
|----------------------------|-----|-----|-----|-----|-----------|-----------|
| 12-24 Vac or Vdc           | S01 | S02 | S03 | S04 | SNT4LP03K | SNT4LT03K |
| 48-60 Vac                  | S05 | S06 | S07 | S08 | SNT4LP05K | SNT4LT05K |
| 48-60 Vdc                  | S85 | S86 | S87 | —   | SNT4LP23K | SNT4LT23K |
| 110-240 Vac                | S09 | S10 | S11 | S12 | SNT4LP11K | SNT4LT11K |
| 110-125 Vdc                | S41 | S42 | S43 | S44 | SNT4LP26K | SNT4LT26K |
| 380-440 Vac or 220-250 Vdc | S13 | S14 | S15 | S16 | SNT4LP14K | SNT4LT14K |
| 480-600 Vac                | S17 | S18 | S19 | S20 | SNT4LP18K | SNT4LT18K |

Right-Pole Mounting Ac/Dc Ratings<sup>⑧</sup>

|                            |     |     |     |     |           |           |
|----------------------------|-----|-----|-----|-----|-----------|-----------|
| 12-24 Vac or Vdc           | S21 | S22 | S23 | S24 | SNT4RP03K | SNT4RT03K |
| 48-60 Vac                  | S25 | S26 | S27 | S28 | SNT4RP05K | SNT4RT05K |
| 48-60 Vdc                  | S88 | S89 | S90 | —   | SNT4RP23K | SNT4RT23K |
| 110-240 Vac                | S29 | S30 | S31 | S32 | SNT4RP11K | SNT4RT11K |
| 110-125 Vdc                | S45 | S46 | S47 | S48 | SNT4RP26K | SNT4RT26K |
| 380-440 Vac or 220-250 Vdc | S33 | S34 | S35 | S36 | SNT4RP14K | SNT4RT14K |
| 480-600 Vac                | S37 | S38 | S39 | S40 | SNT4RP18K | SNT4RT18K |

Instruction Leaflet/FRED Number 29C146

- ① Approximate unlatching time – 6 milliseconds.  
 ② Approximate total circuit breaker contact opening time – 18 milliseconds.  
 ③ Endurance – 5,000 electrical operations plus 1,000 mechanical operations.  
 ④ Supply voltages suitable for use with Class 1 GFP devices. Marking label included with accessory kits.  
 ⑤ Listed with Underwriters Laboratories, Inc., for field installation under E64983.

- ⑥ Standard mounting location – leads exit rear of breaker.  
 ⑦ Suitable for use with Class 1 ground fault sensing element.  
 ⑧ For use with KT (thermal-magnetic) trip units only.  
 ⑨ Not for use on 4-pole circuit breaker.  
 ⑩ For use with LT (thermal-magnetic) 3-pole trip units only.



## Shunt Trip

## N-Frame

Electrical Rating Data<sup>①②③</sup>

| 50/60 Hz         |                           |      | Dc             |                           |      |
|------------------|---------------------------|------|----------------|---------------------------|------|
| Supply Voltage   | Minimum Operating Voltage | VA   | Supply Voltage | Minimum Operating Voltage | VA   |
| 24               | 16.8                      | 200  | 24             | 16.8                      | 170  |
| 48               | 33.6                      | 830  | 48             | 33.6                      | 710  |
| 60               |                           | 1280 | 60             |                           | 1150 |
| 110 <sup>④</sup> | 60                        | 100  | 110            | 77                        | 110  |
| 120 <sup>④</sup> |                           | 120  | 120            |                           | 130  |
| 127 <sup>④</sup> |                           | 140  | 125            |                           | 140  |
| 208 <sup>④</sup> |                           | 420  | —              | —                         | —    |
| 220 <sup>④</sup> |                           | 470  | —              | —                         | —    |
| 240 <sup>④</sup> |                           | 550  | —              | —                         | —    |
| 380              | 266                       | 95   | 220            | 154                       | 41   |
| 400              |                           | 108  | 250            | —                         | 54   |
| 415              |                           | 120  | —              | —                         | —    |
| 440              |                           | 136  | —              | —                         | —    |
| 480              | 336                       | 40   | —              | —                         | —    |
| 525              |                           | 50   | —              | —                         | —    |
| 550              |                           | 50   | —              | —                         | —    |
| 600              |                           | 70   | —              | —                         | —    |

## Ordering Information

## Shunt Trip

| Voltage Rating<br>(Ac Frequency = 50/60 Hz) | Factory Mounted              |                   |               |                | Field Mounted                        |                |
|---------------------------------------------|------------------------------|-------------------|---------------|----------------|--------------------------------------|----------------|
|                                             | Connection Type and Location |                   |               |                | Field Installation Kits <sup>⑤</sup> |                |
|                                             | 18-Inch Pigtail Leads        |                   |               | Terminal Block | Pigtail Leads                        | Terminal Block |
|                                             | Same Side                    | Rear <sup>⑥</sup> | Opposite Side | Same Side      |                                      |                |
|                                             | Suffix Number                |                   |               |                | Catalog Number                       |                |

Left-Pole Mounting Ac/Dc Ratings<sup>⑥</sup>

|                            |     |     |     |     |           |           |
|----------------------------|-----|-----|-----|-----|-----------|-----------|
| 24 Vac or Vdc              | S01 | S02 | S03 | S04 | SNT5LP03K | SNT5LT03K |
| 48-60 Vac                  | S05 | S06 | S07 | S08 | SNT5LP05K | SNT5LT05K |
| 110-240 Vac <sup>④</sup>   | S09 | S10 | S11 | S12 | SNT5LP11K | SNT5LT11K |
| 110-125 Vdc                | S41 | S42 | S43 | S44 | SNT5LP26K | SNT5LT26K |
| 380-440 Vac or 220-250 Vdc | S13 | S14 | S15 | S16 | SNT5LP14K | SNT5LT14K |
| 480-600 Vac                | S17 | S18 | S19 | S20 | SNT5LP18K | SNT5LT18K |
| 48-60 Vdc                  | S21 | S22 | S23 | S24 | SNT5LP23K | SNT5LT23K |

Instruction Leaflet/FRED Number 29C148

① Approximate unlatching time – 6 milliseconds.

② Approximate total circuit breaker contact opening time – 18 milliseconds.

③ Endurance – 3000 electrical operations plus 1000 mechanical operations.

④ Supply voltages suitable for use with Class 1 GFP devices. Marking label included with accessory kits.

⑤ Listed with Underwriters Laboratories, Inc. for field installation under E64983.

⑥ Standard mounting location – leads exit rear of breaker.

## Shunt Trip

## R-Frame

## Electrical Rating Data

| Suffix Number       | Application Ratings |                | Electrical Operating Ratings <sup>①②③④⑤⑥</sup> |                               |                                        |                                |                                        |                                           |                                             |
|---------------------|---------------------|----------------|------------------------------------------------|-------------------------------|----------------------------------------|--------------------------------|----------------------------------------|-------------------------------------------|---------------------------------------------|
|                     | Voltage (V)         | Frequency (Hz) | Supply Voltage (V)                             | Minimum Operating Voltage (V) | I <sub>p</sub> (A)                     | I <sub>rms</sub> at 0.250s (A) | I <sub>rms</sub> at 0.033s (A)         | VA                                        | One Minute Dielectric Withstand Voltage (V) |
| 03/03K              | 24                  | 50/60          | 24                                             | 16.8                          | 71.1                                   | —                              | 50.3                                   | 1210                                      | 1050                                        |
|                     | 24                  | Dc             | 24                                             | 16.8                          | —                                      | 36.1                           | —                                      | 870                                       | 1050                                        |
| 05/05K              | 48-60               | 50/60          | 48<br>60                                       | 34.0                          | 13.1<br>17.2                           | —                              | 9.2<br>12.2                            | 450<br>740                                | 1120                                        |
| 11/11K <sup>⑦</sup> | 110-240             | 50/60          | 110<br>120<br>127<br>208<br>220<br>240         | 60.5                          | 4.2<br>4.5<br>4.6<br>7.9<br>8.5<br>8.7 | —                              | 3.0<br>3.2<br>3.3<br>5.6<br>6.0<br>6.1 | 330<br>390<br>430<br>1170<br>1370<br>1470 | 1480                                        |
| 14/14K              | 380-440             | 50/60          | 380<br>415<br>440                              | 266.0                         | 4.5<br>5.0<br>5.3                      | —                              | 3.2<br>3.6<br>3.7                      | 1220<br>1500<br>1640                      | 1880                                        |
|                     | 220-250             | Dc             | 220<br>250                                     | 154.0                         | —                                      | 2.4<br>2.7                     | —                                      | 530<br>680                                | 1500                                        |
| 18/18K              | 480-600             | 50/60          | 480<br>525<br>550<br>600                       | 336.0                         | 0.6<br>0.7<br>0.7<br>0.8               | —                              | 0.4<br>0.5<br>0.5<br>0.6               | 200<br>270<br>280<br>360                  | 2200                                        |
| 23/23K              | 48-60               | Dc             | 48<br>60                                       | 34.0                          | —                                      | 9.8<br>11.6                    | —                                      | 470<br>700                                | 1120                                        |
| 26/26K              | 110-125             | Dc             | 110<br>120<br>125                              | 77.0                          | —                                      | 3.3<br>3.6<br>3.8              | —                                      | 370<br>440<br>480                         | 1250                                        |

## Shunt Trip (RH only)

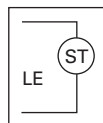
| Voltage Rating<br>(Ac Frequency = 50/60 Hz) | Factory Mounted                    | Field Mounted                        |
|---------------------------------------------|------------------------------------|--------------------------------------|
|                                             | Connection Type and Location       | Field Installation Kits <sup>⑧</sup> |
|                                             | 18-Inch Pigtail Leads <sup>⑨</sup> | Pigtail Leads                        |
|                                             | Suffix Number <sup>⑨</sup>         | Catalog Number <sup>⑨</sup>          |
| 24 Vac or Vdc                               | S21                                | SNT6P03K                             |
| 48-60 Vac                                   | S25                                | SNT6P05K                             |
| 110-240 Vac                                 | S29                                | SNT6P11K                             |
| 380-440 Vac or 220-250 Vdc                  | S33                                | SNT6P14K                             |
| 480-600 Vac                                 | S37                                | SNT6P18K                             |
| 48-60 Vdc                                   | S88                                | SNT6P23K                             |
| 110-125 Vdc                                 | S45                                | SNT6P26K                             |

Instruction Leaflet/FRED Number 29C150

- ① Approximate unlatching time of 6 milliseconds.  
 ② Average circuit breaker contact total opening time approximately 62 milliseconds, at rated voltage.  
 ③ Endurance – 500 electrical operations and 2500 mechanical operations.  
 ④ Shunt trip can be operated up to a maximum of six times per minute.  
 ⑤ Maximum operating voltage – 110% of maximum voltage range rating.  
 ⑥ Pigtail wire size – No. 18 AWG (0.82 mm<sup>2</sup>). Leads are yellow and white.  
 ⑦ Suitable for use with Class 1 GFP devices; marking label supplied with accessory kit.  
 ⑧ Listed with Underwriters Laboratories, Inc. for field installation under E64983.  
 ⑨ A maximum of two shunt trip plug-in modules may be installed in a circuit breaker.

## Low Energy Shunt Trip

## Low Energy Shunt Trip



## General Information

Low energy shunt trip devices are designed to operate from low energy output signals from dedicated current sensors typically applied in ground fault protection schemes. However, with a proper control voltage source, they may be applied in place of conventional trip devices for special applications. Flux paths surrounding permanent magnets used in the shunt trip assembly hold a charged spring poised in readiness to operate the circuit breaker trip mechanism. When a 100

microfarad capacitor charged to 28 Vdc is discharged through the shunt trip coil, the resultant flux opposes the permanent magnet flux field, which releases the stored energy in the spring to trip the circuit breaker. As the circuit breaker resets, the shunt trip reset arm is actuated by the circuit breaker handle, resetting the shunt trip. The plug-in module is mounted in retaining slots in the top of the trip unit. Coil is intermittent-rated only. Cutoff provisions required in control circuit.

## Ordering Information

Select shunt trip catalog number for the voltage within the indicated voltage range. Shunt trip coils are designed to be applied at specific Ac or Dc voltages within the voltage range shown. Electrical ratings are also shown on applicable circuit breaker accessory nameplates.

## F-, J-, K-, L-, M-, N-, and R-Frames

Low Energy Shunt Trip<sup>①</sup>

| Mounting Positions | Factory Mounted              |                   |               |                | Field Mounted                        |                |
|--------------------|------------------------------|-------------------|---------------|----------------|--------------------------------------|----------------|
|                    | Connection Type and Location |                   |               |                | Field Installation Kits <sup>②</sup> |                |
|                    | 18-Inch Pigtail Leads        |                   |               | Terminal Block | Pigtail Leads                        | Terminal Block |
|                    | Same Side                    | Rear <sup>③</sup> | Opposite Side | Same Side      |                                      |                |
|                    | Suffix Numbers               |                   |               |                | Catalog Numbers                      |                |

## F-Frame

|                         |     |     |     |     |         |         |
|-------------------------|-----|-----|-----|-----|---------|---------|
| Left Pole               | N01 | N02 | N03 | N04 | LST1LPK | LST1LTK |
| Right Pole <sup>③</sup> | N05 | N06 | N07 | N08 | LST1RPK | LST1RTK |

Instruction Leaflet/FRED Number 29C141

## J-Frame

|                        |     |     |     |   |         |   |
|------------------------|-----|-----|-----|---|---------|---|
| Left Pole <sup>③</sup> | N01 | N02 | N03 | — | LST2LPK | — |
| Right Pole             | N05 | N06 | N07 | — | LST2RPK | — |

Instruction Leaflet/FRED Number 29C143

## K-Frame

|                         |     |     |     |   |         |   |
|-------------------------|-----|-----|-----|---|---------|---|
| Left Pole <sup>③</sup>  | N01 | N02 | N03 | — | LST3LPK | — |
| Right Pole <sup>④</sup> | N05 | N06 | N07 | — | LST3RPK | — |

Instruction Leaflet/FRED Number 29C145

## L- and M-Frames

|                         |     |     |     |   |         |   |
|-------------------------|-----|-----|-----|---|---------|---|
| Left Pole <sup>③</sup>  | N01 | N02 | N03 | — | LST4LPK | — |
| Right Pole <sup>④</sup> | N05 | N06 | N07 | — | LST4RPK | — |

Instruction Leaflet/FRED Number 29C147

## N-Frame

|                        |     |     |     |   |         |   |
|------------------------|-----|-----|-----|---|---------|---|
| Left Pole <sup>③</sup> | N01 | N02 | N03 | — | LST5LPK | — |
|------------------------|-----|-----|-----|---|---------|---|

Instruction Leaflet/FRED Number 29C149

## R-Frame

|            |     |   |   |   |         |   |
|------------|-----|---|---|---|---------|---|
| Right Pole | N01 | — | — | — | LST6RPK | — |
|------------|-----|---|---|---|---------|---|

Instruction Leaflet/FRED Number 29C151

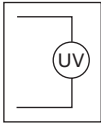
① Cutoff provisions required in control circuit.

② Listed with Underwriters Laboratories, Inc. for field installation under E64983.

③ Standard mounting location – leads exit rear of breaker.

④ For use with thermal-magnetic trip units only.

## Undervoltage Release Mechanism

Undervoltage Release  
Mechanism

## General Information

The undervoltage release mechanism monitors a voltage (typically a line voltage) and trips the circuit breaker when the voltage falls to between 70 and 35 percent of the solenoid coil rating.

The undervoltage release mechanism consists of a continuous rated solenoid with a plunger and tripping lever mounted in a plug-in module. The tab on the tripping lever resets the undervoltage release mechanism

when normal voltage has been restored and the circuit breaker handle is moved to the reset (or OFF) position. With less than pickup voltage applied to the undervoltage release mechanism, the circuit breaker contacts will not touch when a closing operation is attempted.

**Note:** Undervoltage release mechanism accessories are not designed for, and should not be used as, circuit interlocks.

## Ordering Information

Select handle reset undervoltage release mechanism catalog number for the voltage within the indicated voltage range. Undervoltage release mechanism coils are designed to be applied at specific Ac or Dc voltages within the voltage range shown. Electrical ratings are shown on applicable circuit breaker accessory nameplates.

## G-Frame

## Undervoltage Release Mechanism (LH 3-Pole only)

| Electrical Ratings |           |         | Style Numbers ①②③ | Factory Suffix |
|--------------------|-----------|---------|-------------------|----------------|
| Volts              | Frequency | Amperes |                   |                |
| 120                | 50/60 Hz  | 0.05    | 1373D62G03        | T1             |
| 24                 | 50/60 Hz  | 0.22    | 1373D62G04        | T2             |
| 48                 | 50/60 Hz  | 0.11    | 1373D62G05        | T3             |
| 60                 | 50/60 Hz  | 0.10    | 1373D62G06        | T4             |
| 110                | 50 Hz     | 0.049   | 1373D62G07        | T5             |
| 208                | 60 Hz     | 0.026   | 1373D62G08        | T6             |
| 220                | 50 Hz     | 0.025   | 1373D62G09        | T7             |
| 240                | 50/60 Hz  | 0.024   | 1373D62G10        | T8             |
| 380                | 50 Hz     | 0.015   | 1373D62G11        | T9             |
| 415                | 50 Hz     | 0.013   | 1373D62G12        | T10            |
| 440                | 50 Hz     | 0.012   | 1373D62G13        | T11            |
| 480                | 60 Hz     | 0.01    | 1373D62G14        | T12            |

Instruction Leaflet/FRED Number 15553

**Note:** G-frame circuit breakers are factory sealed. Underwriters Laboratories, Inc., requires that internal accessories be installed at the factory.

Internal accessories are UL listed for factory installation under E7819.

Where local codes and standards permit and UL listing is not required, internal accessories can be field installed. Accessory installation should be done before the circuit breaker is mounted and connected.

① Includes 24 inch external pigtail leads, #18 AWG (16-.010).

② A maximum of two internal accessories may be mounted in a three-pole circuit breaker.

③ Suitable for mounting in left pole only of 3-pole breaker.

## Undervoltage Release Mechanism

### F-Frame

**Note:** F-frame circuit breakers are factory sealed. Underwriters Laboratories, Inc., requires that internal accessories be installed at the factory.

Internal accessories are UL listed for factory installation under E7819.

Where local codes and standards permit and UL listing is not required, internal accessories can be field installed. Accessory installation should be done before the circuit breaker is mounted and connected.

### Electrical Rating Data<sup>①</sup>

| 50/60 Hz                 |                 |       |                |                          | Dc                |                  |                  |                  |                   |
|--------------------------|-----------------|-------|----------------|--------------------------|-------------------|------------------|------------------|------------------|-------------------|
| Supply Voltage           | Dropout Voltage |       | Pickup Voltage | VA                       | Supply Voltage    | Dropout Voltage  |                  | Pickup Voltage   | VA                |
|                          | Min.            | Max.  | Max.           |                          |                   | Min.             | Max.             | Max.             |                   |
| 12                       | 4.2             | 6.3   | 7.6            | 1.3<br>2.5               | 12                | 4.2              | 8.4              | 10.2             | 2.8               |
| 24                       | 8.4             | 16.8  | 20.4           | 1.4                      | 24                | 8.4              | 16.8             | 20.4             | 1.6               |
| 48<br>60                 | 21.0            | 33.6  | 40.8           | 1.2<br>1.9               | 48<br>60          | 21.0             | 33.6             | 40.8             | 1.3<br>2.0        |
| 110<br>120<br>127        | 44.5            | 77.0  | 93.5           | 1.3<br>1.5<br>1.7        | 110<br>120<br>125 | 44.5             | 77.0             | 93.5             | 1.5<br>1.7<br>1.9 |
| 208<br>220<br>240        | 84.0            | 145.6 | 176.8          | 2.2<br>2.4<br>2.9        | 220<br>250<br>—   | 87.5<br>—<br>—   | 154.0<br>—<br>—  | 187.0<br>—<br>—  | 2.6<br>3.4<br>—   |
| 380<br>415<br>440<br>480 | 168.0           | 266.0 | 323.0          | 2.9<br>3.5<br>3.9<br>4.6 | —<br>—<br>—<br>—  | —<br>—<br>—<br>— | —<br>—<br>—<br>— | —<br>—<br>—<br>— | —<br>—<br>—<br>—  |
| 525<br>550<br>600        | 210.0           | 367.0 | 446.0          | 4.3<br>4.8<br>5.8        | —<br>—<br>—       | —<br>—<br>—      | —<br>—<br>—      | —<br>—<br>—      | —<br>—<br>—       |

### Undervoltage Release Mechanism

| Voltage Rating<br>(Ac Freq = 50/60 Hz) | Factory Mounted (For F-Frame Breaker and F-Frame HMCP) |                   |               |                | Field Mounted (F-Frame Breaker)      |  | Field Mounted (F-Frame Breaker HMCP) |               |                |
|----------------------------------------|--------------------------------------------------------|-------------------|---------------|----------------|--------------------------------------|--|--------------------------------------|---------------|----------------|
|                                        | Connection Type and Location                           |                   |               |                | Field Installation Kits <sup>②</sup> |  |                                      |               |                |
|                                        | 18-inch Pigtail Leads                                  |                   |               | Terminal Block | Pigtail Leads                        |  | Terminal Block                       | Pigtail Leads | Terminal Block |
|                                        | Same Side                                              | Rear <sup>③</sup> | Opposite Side | Same Side      |                                      |  |                                      |               |                |
|                                        | Suffix Numbers                                         |                   |               |                | Catalog Numbers                      |  |                                      |               |                |

#### Left-Pole Mounting Ac Ratings

|             |     |     |     |      |           |           |            |            |
|-------------|-----|-----|-----|------|-----------|-----------|------------|------------|
| 12 Vac      | U01 | U02 | U03 | U04  | UVH1LP02K | UVH1LT02K | MUVH1LP02K | MUVH1LT02K |
| 24 Vac      | U05 | U06 | U07 | U08  | UVH1LP03K | UVH1LT03K | MUVH1LP03K | MUVH1LT03K |
| 48 Vac      | U37 | U38 | U39 | U40  | UVH1LP22K | UVH1LT22K | MUVH1LP22K | MUVH1LT22K |
| 60 Vac      | U97 | U98 | U99 | U100 | UVH1LP24K | UVH1LT24K | MUVH1LP24K | MUVH1LT24K |
| 110-127 Vac | U13 | U14 | U15 | U16  | UVH1LP08K | UVH1LT08K | MUVH1LP08K | MUVH1LT08K |
| 208-240 Vac | U17 | U18 | U19 | U20  | UVH1LP11K | UVH1LT11K | MUVH1LP11K | MUVH1LT11K |
| 380-480 Vac | U21 | U22 | U23 | U24  | UVH1LP15K | UVH1LT15K | MUVH1LP15K | MUVH1LT15K |
| 525-600 Vac | U25 | U26 | U27 | U28  | UVH1LP18K | UVH1LT18K | MUVH1LP18K | MUVH1LT18K |

#### Right-Pole Mounting Ac Ratings<sup>④⑤</sup>

|             |      |      |      |      |           |           |            |            |
|-------------|------|------|------|------|-----------|-----------|------------|------------|
| 12 Vac      | U49  | U50  | U51  | U52  | UVH1RP02K | UVH1RT02K | MUVH1RP02K | MUVH1RT02K |
| 24 Vac      | U53  | U54  | U55  | U56  | UVH1RP03K | UVH1RT03K | MUVH1RP03K | MUVH1RT03K |
| 48 Vac      | U85  | U86  | U87  | U88  | UVH1RP22K | UVH1RT22K | MUVH1RP22K | MUVH1RT22K |
| 60 Vac      | U101 | U102 | U103 | U104 | UVH1RP24K | UVH1RT24K | MUVH1RP24K | MUVH1RT24K |
| 110-127 Vac | U61  | U62  | U63  | U64  | UVH1RP08K | UVH1RT08K | MUVH1RP08K | MUVH1RT08K |
| 208-240 Vac | U65  | U66  | U67  | U68  | UVH1RP11K | UVH1RT11K | MUVH1RP11K | MUVH1RT11K |
| 380-480 Vac | U69  | U70  | U71  | U72  | UVH1RP15K | UVH1RT15K | MUVH1RP15K | MUVH1RT15K |
| 525-600 Vac | U73  | U74  | U75  | U76  | UVH1RP18K | UVH1RT18K | MUVH1RP18K | MUVH1RT18K |

#### Left-Pole Mounting Dc Ratings

|             |     |     |     |      |           |           |            |            |
|-------------|-----|-----|-----|------|-----------|-----------|------------|------------|
| 12 Vdc      | U29 | U30 | U31 | U32  | UVH1LP20K | UVH1LT20K | MUVH1LP20K | MUVH1LT20K |
| 24 Vdc      | U33 | U34 | U35 | U36  | UVH1LP21K | UVH1LT21K | MUVH1LP21K | MUVH1LT21K |
| 48 Vdc      | U37 | U38 | U39 | U40  | UVH1LP22K | UVH1LT22K | MUVH1LP22K | MUVH1LT22K |
| 60 Vdc      | U97 | U98 | U99 | U100 | UVH1LP24K | UVH1LT24K | MUVH1LP24K | MUVH1LT24K |
| 110-127 Vdc | U41 | U42 | U43 | U44  | UVH1LP26K | UVH1LT26K | MUVH1LP26K | MUVH1LT26K |
| 220-250 Vdc | U45 | U46 | U47 | U48  | UVH1LP28K | UVH1LT28K | MUVH1LP28K | MUVH1LT28K |

#### Right-Pole Mounting Dc Ratings<sup>④⑤</sup>

|             |      |      |      |      |           |           |            |            |
|-------------|------|------|------|------|-----------|-----------|------------|------------|
| 12 Vdc      | U77  | U78  | U79  | U80  | UVH1RP20K | UVH1RT20K | MUVH1RP20K | MUVH1RT20K |
| 24 Vdc      | U81  | U82  | U83  | U84  | UVH1RP21K | UVH1RT21K | MUVH1RP21K | MUVH1RT21K |
| 48 Vdc      | U85  | U86  | U87  | U88  | UVH1RP22K | UVH1RT22K | MUVH1RP22K | MUVH1RT22K |
| 60 Vdc      | U101 | U102 | U103 | U104 | UVH1RP22K | UVH1RT22K | MUVH1RP22K | MUVH1RT22K |
| 110-127 Vdc | U89  | U90  | U91  | U92  | UVH1RP26K | UVH1RT26K | MUVH1RP26K | MUVH1RT26K |
| 220-250 Vdc | U93  | U94  | U95  | U96  | UVH1RP28K | UVH1RT28K | MUVH1RP28K | MUVH1RT28K |

Instruction Leaflet/FRED Number 29C160 and 29C179 (HMCP)

① Endurance: 6000 electrical operations plus 4000 mechanical operations.

② Not listed with Underwriters Laboratories, Inc., for field installation.

③ Standard pigtail lead exit location.

④ Standard mounting location.

⑤ Not for use on right pole of 4-pole circuit breaker.

## Undervoltage Release Mechanism

## J-Frame

## Electrical Rating Data ①②

| 50/60 Hz       |                 |       |                |     | Dc             |                 |       |                |     |
|----------------|-----------------|-------|----------------|-----|----------------|-----------------|-------|----------------|-----|
| Supply Voltage | Dropout Voltage |       | Pickup Voltage | VA  | Supply Voltage | Dropout Voltage |       | Pickup Voltage | VA  |
|                | Min.            | Max.  | Max.           |     |                | Min.            | Max.  | Max.           |     |
| 12             | 4.2             | 8.4   | 10.2           | 1.9 | 12             | 4.2             | 8.4   | 10.2           | 1.6 |
| 24             | 8.4             | 16.8  | 20.4           | 3.9 | 24             | 8.4             | 16.8  | 20.4           | 3.1 |
| 48             | 21.0            | 33.6  | 40.8           | 2.5 | 48             | 21.0            | 33.6  | 40.8           | 2.0 |
| 60             |                 |       |                | 3.8 | 60             |                 |       |                | 3.1 |
| 110            | 44.5            | 77.0  | 93.5           | 1.8 | 110            | 44.5            | 77.0  | 93.5           | 1.6 |
| 120            |                 |       |                | 2.1 | 120            |                 |       |                | 1.9 |
| 127            |                 |       |                | 2.4 | 125            |                 |       |                | 2.2 |
| 208            | 85.0            | 145.6 | 176.8          | 2.7 | 220            | 87.5            | 154.0 | 187.0          | 3.1 |
| 220            |                 |       |                | 3.1 | 250            |                 |       |                | 4.0 |
| 240            |                 |       |                | 3.8 | —              | —               | —     | —              | —   |
| 380            | 168.0           | 266.0 | 323.0          | 3.4 | —              | —               | —     | —              | —   |
| 415            |                 |       |                | 4.0 | —              | —               | —     | —              | —   |
| 440            |                 |       |                | 4.6 | —              | —               | —     | —              | —   |
| 480            |                 |       |                | 5.4 | —              | —               | —     | —              | —   |

## Undervoltage Release Mechanism

| Voltage Rating<br>(Ac Freq =<br>50/60 Hz) | Factory Mounted              |                   |               |                             | Field Mounted                        |                             |
|-------------------------------------------|------------------------------|-------------------|---------------|-----------------------------|--------------------------------------|-----------------------------|
|                                           | Connection Type and Location |                   |               |                             | Field Installation Kits <sup>③</sup> |                             |
|                                           | 18-inch Pigtail Leads        |                   |               | Terminal Block <sup>②</sup> | Pigtail Leads                        | Terminal Block <sup>④</sup> |
|                                           | Same Side                    | Rear <sup>③</sup> | Opposite Side | Same Side                   |                                      |                             |
|                                           | Suffix Numbers               |                   |               |                             | Catalog Numbers                      |                             |

## Left-Pole Mounting Ac Ratings⑤

|             |     |     |     |     |           |           |
|-------------|-----|-----|-----|-----|-----------|-----------|
| 12 Vac      | U05 | U06 | U07 | U08 | UVH2LP02K | UVH2LT02K |
| 24 Vac      | U09 | U10 | U11 | U12 | UVH2LP03K | UVH2LT03K |
| 48-60 Vac   | U13 | U14 | U15 | U16 | UVH2LP05K | UVH2LT05K |
| 110-127 Vac | U17 | U18 | U19 | U20 | UVH2LP08K | UVH2LT08K |
| 208-240 Vac | U21 | U22 | U23 | U24 | UVH2LP11K | UVH2LT11K |
| 380-480 Vac | U25 | U26 | U27 | U28 | UVH2LP15K | UVH2LT15K |

## Right-Pole Mounting Ac Ratings④

|             |     |     |     |     |           |           |
|-------------|-----|-----|-----|-----|-----------|-----------|
| 12 Vac      | U37 | U38 | U39 | U40 | UVH2RP02K | UVH2RT02K |
| 24 Vac      | U41 | U42 | U43 | U44 | UVH2RP03K | UVH2RT03K |
| 48-60 Vac   | U45 | U46 | U47 | U48 | UVH2RP05K | UVH2RT05K |
| 110-127 Vac | U49 | U50 | U51 | U52 | UVH2RP08K | UVH2RT08K |
| 208-240 Vac | U53 | U54 | U55 | U56 | UVH2RP11K | UVH2RT11K |
| 380-480 Vac | U57 | U58 | U59 | U60 | UVH2RP15K | UVH2RT15K |

## Left-Pole Mounting Dc Ratings⑤

|             |     |     |     |     |           |           |
|-------------|-----|-----|-----|-----|-----------|-----------|
| 12 Vdc      | T01 | T02 | T03 | T04 | UVH2LP20K | UVH2LT20K |
| 24 Vdc      | T05 | T06 | T07 | T08 | UVH2LP21K | UVH2LT21K |
| 48-60 Vdc   | T09 | T10 | T11 | T12 | UVH2LP23K | UVH2LT23K |
| 110-127 Vdc | T13 | T14 | T15 | T16 | UVH2LP26K | UVH2LT26K |
| 220-250 Vdc | T17 | T18 | T19 | T20 | UVH2LP28K | UVH2LT28K |

## Right-Pole Mounting Dc Ratings④

|             |     |     |     |     |           |           |
|-------------|-----|-----|-----|-----|-----------|-----------|
| 12 Vdc      | T21 | T22 | T23 | T24 | UVH2RP20K | UVH2RT20K |
| 24 Vdc      | T25 | T26 | T27 | T28 | UVH2RP21K | UVH2RT21K |
| 48-60 Vdc   | T29 | T30 | T31 | T32 | UVH2RP23K | UVH2RT23K |
| 110-127 Vdc | T33 | T34 | T35 | T36 | UVH2RP26K | UVH2RT26K |
| 220-250 Vdc | T37 | T38 | T39 | T40 | UVH2RP28K | UVH2RT28K |

Instruction Leaflet/FRED Number 29C163

- ① Endurance: 6000 electrical operations plus 2000 mechanical operations.
- ② For electrical rating data for manual, automatic and electrical reset undervoltage release mechanisms, refer to Cutler-Hammer.
- ③ Listed with Underwriters Laboratories, Inc. for field installation under E64983.
- ④ Not for use on right pole of 4-pole circuit breakers.
- ⑤ Standard mounting location – leads exit rear of breaker.

**Undervoltage Release Mechanism**
**K-Frame**
**Electrical Rating Data ①**

| 50/60 Hz       |                 |       |                |     | Dc             |                 |       |                |     |
|----------------|-----------------|-------|----------------|-----|----------------|-----------------|-------|----------------|-----|
| Supply Voltage | Dropout Voltage |       | Pickup Voltage | VA  | Supply Voltage | Dropout Voltage |       | Pickup Voltage | VA  |
|                | Min.            | Max.  | Max.           |     |                | Min.            | Max.  | Max.           |     |
| 12             | 4.2             | 8.4   | 10.2           | 1.9 | 12             | 4.2             | 8.4   | 10.2           | 1.6 |
| 24             | 8.4             | 16.8  | 20.4           | 3.9 | 24             | 8.4             | 16.8  | 20.4           | 3.1 |
| 48             | 21.0            | 33.6  | 40.8           | 2.5 | 48             | 21.0            | 33.6  | 40.8           | 2.0 |
| 60             |                 |       |                | 3.8 | 60             |                 |       |                | 3.1 |
| 110            | 44.5            | 77.0  | 93.5           | 1.8 | 110            |                 |       |                | 1.6 |
| 120            |                 |       |                | 2.1 | 120            | 44.5            | 77.0  | 93.5           | 1.9 |
| 127            |                 |       |                | 2.4 | 125            |                 |       |                | 2.2 |
| 208            | 85.0            | 145.6 | 176.8          | 2.7 | 220            | 87.5            | 154.0 | 187.0          | 3.1 |
| 220            |                 |       |                | 3.1 | 250            |                 |       |                | 4.0 |
| 240            |                 |       |                | 3.8 | —              | —               | —     | —              | —   |
| 380            | 168.0           | 266.0 | 323.0          | 3.4 | —              | —               | —     | —              | —   |
| 415            |                 |       |                | 4.0 | —              | —               | —     | —              | —   |
| 440            |                 |       |                | 4.6 | —              | —               | —     | —              | —   |
| 480            |                 |       |                | 5.4 | —              | —               | —     | —              | —   |

**Undervoltage Release Mechanism**

| Voltage Rating<br>(Ac Freq =<br>50/60 Hz) | Factory Mounted              |       |               |                | Field Mounted            |                |
|-------------------------------------------|------------------------------|-------|---------------|----------------|--------------------------|----------------|
|                                           | Connection Type and Location |       |               |                | Field Installation Kits② |                |
|                                           | 18-inch Pigtail Leads        |       |               | Terminal Block | Pigtail Leads            | Terminal Block |
|                                           | Same Side                    | Rear③ | Opposite Side | Same Side      |                          |                |
|                                           | Suffix Numbers               |       |               |                | Catalog Numbers          |                |

**Left-Pole Mounting Ac Ratings③**

|             |     |     |     |     |           |           |
|-------------|-----|-----|-----|-----|-----------|-----------|
| 12 Vac      | U05 | U06 | U07 | U08 | UVH3LP02K | UVH3LT02K |
| 24 Vac      | U09 | U10 | U11 | U12 | UVH3LP03K | UVH3LT03K |
| 48-60 Vac   | U13 | U14 | U15 | U16 | UVH3LP05K | UVH3LT05K |
| 110-127 Vac | U17 | U18 | U19 | U20 | UVH3LP08K | UVH3LT08K |
| 208-240 Vac | U21 | U22 | U23 | U24 | UVH3LP11K | UVH3LT11K |
| 380-480 Vac | U25 | U26 | U27 | U28 | UVH3LP15K | UVH3LT15K |

**Right-Pole Mounting Ac Ratings④⑤**

|             |     |     |     |     |           |           |
|-------------|-----|-----|-----|-----|-----------|-----------|
| 12 Vac      | U37 | U38 | U39 | U40 | UVH3RP02K | UVH3RT02K |
| 24 Vac      | U41 | U42 | U43 | U44 | UVH3RP03K | UVH3RT03K |
| 48-60 Vac   | U45 | U46 | U47 | U48 | UVH3RP05K | UVH3RT05K |
| 110-127 Vac | U49 | U50 | U51 | U52 | UVH3RP08K | UVH3RT08K |
| 208-240 Vac | U53 | U54 | U55 | U56 | UVH3RP11K | UVH3RT11K |
| 380-480 Vac | U57 | U58 | U59 | U60 | UVH3RP15K | UVH3RT15K |

**Left-Pole Mounting Dc Ratings③**

|             |     |     |     |     |           |           |
|-------------|-----|-----|-----|-----|-----------|-----------|
| 12 Vdc      | T01 | T02 | T03 | T04 | UVH3LP20K | UVH3LT20K |
| 24 Vdc      | T05 | T06 | T07 | T08 | UVH3LP21K | UVH3LT21K |
| 48-60 Vdc   | T09 | T10 | T11 | T12 | UVH3LP23K | UVH3LT23K |
| 110-127 Vdc | T13 | T14 | T15 | T16 | UVH3LP26K | UVH3LT26K |
| 220-250 Vdc | T17 | T18 | T19 | T20 | UVH3LP28K | UVH3LT28K |

**Right-Pole Mounting Dc Ratings④⑤**

|             |     |     |     |     |           |           |
|-------------|-----|-----|-----|-----|-----------|-----------|
| 12 Vdc      | T21 | T22 | T23 | T24 | UVH3RP20K | UVH3RT20K |
| 24 Vdc      | T25 | T26 | T27 | T28 | UVH3RP21K | UVH3RT21K |
| 48-60 Vdc   | T29 | T30 | T31 | T32 | UVH3RP23K | UVH3RT23K |
| 110-127 Vdc | T33 | T34 | T35 | T36 | UVH3RP26K | UVH3RT26K |
| 220-250 Vdc | T37 | T38 | T39 | T40 | UVH3RP28K | UVH3RT28K |

Instruction Leaflet/FRED Number 29C166

① Endurance: 5,000 electrical operations plus 1,000 mechanical operations

② Listed with Underwriters Laboratories, Inc., for field installation under E64983.

③ Standard mounting location — leads exit rear of breaker.

④ For use with KT (thermal-magnetic) trip units only.

⑤ Not for use on right pole of 4-pole circuit breaker.

## Undervoltage Release Mechanism

## L- and M-Frames

## Electrical Rating Data ①

| 50/60 Hz                 |                 |       |                |                          | Dc                |                  |                  |                  |                   |
|--------------------------|-----------------|-------|----------------|--------------------------|-------------------|------------------|------------------|------------------|-------------------|
| Supply Voltage           | Dropout Voltage |       | Pickup Voltage | VA                       | Supply Voltage    | Dropout Voltage  |                  | Pickup Voltage   | VA                |
|                          | Min.            | Max.  | Max.           |                          |                   | Min.             | Max.             | Max.             |                   |
| 12                       | 4.2             | 8.4   | 10.2           | 1.9                      | 12                | 4.2              | 8.4              | 10.2             | 1.6               |
| 24                       | 8.4             | 16.8  | 20.4           | 3.9                      | 24                | 8.4              | 16.8             | 20.4             | 3.1               |
| 48<br>60                 | 21.0            | 33.6  | 40.8           | 2.5<br>3.8               | 48<br>60          | 21.0             | 33.6             | 40.8             | 2.0<br>3.1        |
| 110<br>120<br>127        | 44.5            | 77.0  | 93.5           | 1.8<br>2.1<br>2.4        | 110<br>120<br>125 | 44.5             | 77.0             | 93.5             | 1.6<br>1.9<br>2.2 |
| 208<br>220<br>240        | 85.0            | 145.6 | 176.8          | 2.7<br>3.1<br>3.8        | 220<br>250<br>—   | 87.5             | 154.0            | 187.0            | 3.1<br>4.0<br>—   |
| 380<br>415<br>440<br>480 | 168.0           | 266.0 | 323.0          | 3.4<br>4.0<br>4.6<br>5.4 | —<br>—<br>—<br>—  | —<br>—<br>—<br>— | —<br>—<br>—<br>— | —<br>—<br>—<br>— | —<br>—<br>—<br>—  |

## Undervoltage Release Mechanism

| Voltage Rating<br>(Ac Freq =<br>50/60 Hz) | Factory Mounted              |                   |               |                | Field Mounted                        |                |
|-------------------------------------------|------------------------------|-------------------|---------------|----------------|--------------------------------------|----------------|
|                                           | Connection Type and Location |                   |               |                | Field Installation Kits <sup>②</sup> |                |
|                                           | 18-inch Pigtail Leads        |                   |               | Terminal Block | Pigtail Leads                        | Terminal Block |
|                                           | Same Side                    | Rear <sup>③</sup> | Opposite Side | Same Side      |                                      |                |
|                                           | Suffix Numbers               |                   |               |                | Catalog Numbers                      |                |

Left-Pole Mounting Ac Ratings<sup>③</sup>

|             |     |     |     |     |           |           |
|-------------|-----|-----|-----|-----|-----------|-----------|
| 12 Vac      | U05 | U06 | U07 | U08 | UVH4LP02K | UVH4LT02K |
| 24 Vac      | U09 | U10 | U11 | U12 | UVH4LP03K | UVH4LT03K |
| 48-60 Vac   | U13 | U14 | U15 | U16 | UVH4LP05K | UVH4LT05K |
| 110-127 Vac | U17 | U18 | U19 | U20 | UVH4LP08K | UVH4LT08K |
| 208-240 Vac | U21 | U22 | U23 | U24 | UVH4LP11K | UVH4LT11K |
| 380-480 Vac | U25 | U26 | U27 | U28 | UVH4LP15K | UVH4LT15K |

Right-Pole Mounting Ac Ratings<sup>④⑤</sup>

|             |     |     |     |     |           |           |
|-------------|-----|-----|-----|-----|-----------|-----------|
| 12 Vac      | U37 | U38 | U39 | U40 | UVH4RP02K | UVH4RT02K |
| 24 Vac      | U41 | U42 | U43 | U44 | UVH4RP03K | UVH4RT03K |
| 48-60 Vac   | U45 | U46 | U47 | U48 | UVH4RP05K | UVH4RT05K |
| 110-127 Vac | U49 | U50 | U51 | U52 | UVH4RP08K | UVH4RT08K |
| 208-240 Vac | U53 | U54 | U55 | U56 | UVH4RP11K | UVH4RT11K |
| 380-480 Vac | U57 | U58 | U59 | U60 | UVH4RP15K | UVH4RT15K |

Left-Pole Mounting Dc Ratings<sup>③</sup>

|             |     |     |     |     |           |           |
|-------------|-----|-----|-----|-----|-----------|-----------|
| 12 Vdc      | T01 | T02 | T03 | T04 | UVH4LP20K | UVH4LT20K |
| 24 Vdc      | T05 | T06 | T07 | T08 | UVH4LP21K | UVH4LT21K |
| 48-60 Vdc   | T09 | T10 | T11 | T12 | UVH4LP23K | UVH4LT23K |
| 110-127 Vdc | T13 | T14 | T15 | T16 | UVH4LP26K | UVH4LT26K |
| 220-250 Vdc | T17 | T18 | T19 | T20 | UVH4LP28K | UVH4LT28K |

Right-Pole Mounting Dc Ratings<sup>④⑤</sup>

|             |     |     |     |     |           |           |
|-------------|-----|-----|-----|-----|-----------|-----------|
| 12 Vdc      | T21 | T22 | T23 | T24 | UVH4RP20K | UVH4RT20K |
| 24 Vdc      | T25 | T26 | T27 | T28 | UVH4RP21K | UVH4RT21K |
| 48-60 Vdc   | T29 | T30 | T31 | T32 | UVH4RP23K | UVH4RT23K |
| 110-127 Vdc | T33 | T34 | T35 | T36 | UVH4RP26K | UVH4RT26K |
| 220-250 Vdc | T37 | T38 | T39 | T40 | UVH4RP28K | UVH4RT28K |

Instruction Leaflet/FRED Number 29C170

- ① Endurance: 5000 electrical operations plus 1000 mechanical operations
- ② Listed with Underwriters Laboratories, Inc. for field installation under E64983.
- ③ Standard mounting location — leads exit rear of breaker.
- ④ For use with LT (thermal-magnetic) trip units only.
- ⑤ Not for use on right pole of 4-pole circuit breaker.



**Undervoltage Release Mechanism**
**N-Frame**
**Electrical Rating Data ①**

| 50/60 Hz                 |                 |       |                |                          | Dc                |                  |                  |                  |                   |
|--------------------------|-----------------|-------|----------------|--------------------------|-------------------|------------------|------------------|------------------|-------------------|
| Supply Voltage           | Dropout Voltage |       | Pickup Voltage | VA                       | Supply Voltage    | Dropout Voltage  |                  | Pickup Voltage   | VA                |
|                          | Min.            | Max.  | Max.           |                          |                   | Min.             | Max.             | Max.             |                   |
| 12                       | 4.2             | 8.4   | 10.2           | 1.9                      | 12                | 4.2              | 8.4              | 10.2             | 1.6               |
| 24                       | 8.4             | 16.8  | 20.4           | 3.9                      | 24                | 8.4              | 16.8             | 20.4             | 3.1               |
| 48<br>60                 | 21.0            | 33.6  | 40.8           | 2.5<br>3.8               | 48<br>60          | 21.0             | 33.6             | 40.8             | 2.0<br>3.1        |
| 110<br>120<br>127        | 44.5            | 77.0  | 93.5           | 1.8<br>2.1<br>2.4        | 110<br>120<br>125 | 44.5             | 77.0             | 93.5             | 1.6<br>1.9<br>2.2 |
| 208<br>220<br>240        | 84.0            | 145.6 | 176.8          | 2.7<br>3.1<br>3.8        | 220<br>250        | 87.5<br>—        | 154.0<br>—       | 187.0<br>—       | 3.1<br>4.0        |
| 380<br>415<br>480<br>500 | 175.0           | 266.0 | 323.0          | 3.4<br>4.0<br>4.6<br>5.4 | —<br>—<br>—<br>—  | —<br>—<br>—<br>— | —<br>—<br>—<br>— | —<br>—<br>—<br>— | —<br>—<br>—<br>—  |

**Undervoltage Release Mechanism**

| Voltage Rating<br>(Ac Freq =<br>50/60 Hz) | Factory Mounted              |       |               |                | Field Mounted            |                |
|-------------------------------------------|------------------------------|-------|---------------|----------------|--------------------------|----------------|
|                                           | Connection Type and Location |       |               |                | Field Installation Kits② |                |
|                                           | 18-inch Pigtail Leads        |       |               | Terminal Block | Pigtail Leads            | Terminal Block |
|                                           | Same Side                    | Rear③ | Opposite Side | Same Side      |                          |                |
|                                           | Suffix Numbers               |       |               |                | Catalog Numbers          |                |

**Left-Pole Mounting Ac Ratings③**

|             |     |     |      |     |           |           |
|-------------|-----|-----|------|-----|-----------|-----------|
| 12 Vac      | U05 | U06 | U07  | U08 | UVH5LP02K | UVH5LT02K |
| 24 Vac      | U09 | U10 | U11  | U12 | UVH5LP03K | UVH5LT03K |
| 48-60 Vac   | U13 | U14 | U153 | U16 | UVH5LP05K | UVH5LT05K |
| 110-127 Vac | U17 | U18 | U19  | U20 | UVH5LP08K | UVH5LT08K |
| 208-240 Vac | U21 | U22 | U23  | U24 | UVH5LP11K | UVH5LT11K |
| 380-480 Vac | U25 | U26 | U27  | U28 | UVH5LP29K | UVH5LT29K |

**Left-Pole Mounting Dc Ratings③**

|             |     |     |     |     |           |           |
|-------------|-----|-----|-----|-----|-----------|-----------|
| 12 Vdc      | T01 | T02 | T03 | T04 | UVH5LP20K | UVH5LT20K |
| 24 Vdc      | T05 | T06 | T07 | T08 | UVH5LP21K | UVH5LT21K |
| 48-60 Vdc   | T09 | T10 | T11 | T12 | UVH5LP23K | UVH5LT23K |
| 110-127 Vdc | T13 | T14 | T15 | T16 | UVH5LP26K | UVH5LT26K |
| 220-250 Vdc | T17 | T18 | T19 | T20 | UVH5LP28K | UVH5LT28K |

Instruction Leaflet/FRED Number 29C174

① Endurance: 3000 electrical operations plus 1000 mechanical operations.

③ Listed with Underwriters Laboratories, Inc. for field installation under E64983.

③ Standard mounting location – leads exit rear of breaker.

## Undervoltage Release Mechanism

## R-Frame

Ac Undervoltage Release Mechanism (Handle Reset) Ratings<sup>①②</sup>

| Catalog Suffix | Application Ratings<br>Voltage (V) | Electrical Operating Ratings    |              |                  |                         | Approximate Operating Time (ms)  |                    |                                                |                                         |                                   |
|----------------|------------------------------------|---------------------------------|--------------|------------------|-------------------------|----------------------------------|--------------------|------------------------------------------------|-----------------------------------------|-----------------------------------|
|                |                                    | Supply Voltage (V)              | Dropout Min. | Voltage (V) Max. | Pickup Voltage (V) Max. | VA                               | Min.③ UVR Response | Initiation④ Circuit Breaker Contact Separation | Maximum Circuit Breaker Contact Opening | Dielectric⑤ Withstand Voltage (V) |
| 02/02K         | 12                                 | 12                              | 4.2          | 8.4              | 10.2                    | 2.3                              | 5                  | 46                                             | 77                                      | 1024                              |
| 03/03K         | 24                                 | 24                              | 8.4          | 16.8             | 20.4                    | 3.1                              | 5                  | 46                                             | 77                                      | 1048                              |
| 05/05K         | 48-60                              | 48<br>60                        | 21.0         | 33.5             | 40.8                    | 3.4<br>6.0                       | 5                  | 46                                             | 77                                      | 1120                              |
| 08/08K         | 110-127                            | 110<br>120<br>127               | 44.5         | 77.0             | 93.5                    | 3.3<br>3.6<br>3.8                | 5                  | 46                                             | 77                                      | 1254                              |
| 11/11K         | 208-240                            | 208<br>220<br>240               | 84.0         | 145.6            | 176.8                   | 4.2<br>6.6<br>7.2                | 5                  | 46                                             | 77                                      | 1480                              |
| 29/29K         | 380-500                            | 380<br>415<br>440<br>480<br>500 | 168.0        | 266.0            | 323.0                   | 3.8<br>8.3<br>8.8<br>9.6<br>10.0 | 5                  | 46                                             | 77                                      | 2000                              |

Dc Undervoltage Release Mechanism (Handle Reset) Ratings<sup>①②</sup>

| Catalog Suffix | Application Ratings<br>Voltage (V) | Electrical Operating Ratings |              |                  |                         | Approximate Operating Time (ms) |                    |                                                |                                         |                                   |
|----------------|------------------------------------|------------------------------|--------------|------------------|-------------------------|---------------------------------|--------------------|------------------------------------------------|-----------------------------------------|-----------------------------------|
|                |                                    | Supply Voltage (V)           | Dropout Min. | Voltage (V) Max. | Pickup Voltage (V) Max. | VA                              | Min.③ UVR Response | Initiation④ Circuit Breaker Contact Separation | Maximum Circuit Breaker Contact Opening | Dielectric⑤ Withstand Voltage (V) |
| 20/20K         | 12                                 | 12                           | 4.2          | 8.4              | 10.2                    | 3.4                             | 5                  | 46                                             | 77                                      | 1024                              |
| 21/21K         | 24                                 | 24                           | 8.4          | 16.8             | 20.4                    | 4.3                             | 5                  | 46                                             | 77                                      | 1048                              |
| 23/23K         | 48-60                              | 48<br>60                     | 21.0         | 33.5             | 40.8                    | 4.8<br>7.2                      | 5                  | 46                                             | 77                                      | 1120                              |
| 26/26K         | 110-127                            | 110<br>120<br>125            | 43.8         | 77.0             | 93.5                    | 3.3<br>3.6<br>3.8               | 5                  | 46                                             | 77                                      | 1250                              |
| 28/28K         | 220-250                            | 220<br>250                   | 87.5         | 154.0            | 187.0                   | 6.6<br>7.5                      | 5                  | 46                                             | 77                                      | 1500                              |

## Undervoltage Release Mechanism (RH only)

| Voltage Rating<br>(Ac Freq = 50/60 Hz) | Factory Mounted              |  | Field Mounted                        |  |
|----------------------------------------|------------------------------|--|--------------------------------------|--|
|                                        | Connection Type and Location |  | Field Installation Kits <sup>①</sup> |  |
|                                        | 18-inch Pigtail Leads        |  | Pigtail Leads                        |  |
|                                        | Suffix Numbers <sup>②</sup>  |  | Catalog Numbers <sup>②</sup>         |  |
| 12 Vac                                 | U37                          |  | UVH6RP02K                            |  |
| 24 Vac                                 | U41                          |  | UVH6RP03K                            |  |
| 48-60 Vac                              | U45                          |  | UVH6RP05K                            |  |
| 110-127 Vac                            | U49                          |  | UVH6RP08K                            |  |
| 208-240 Vac                            | U53                          |  | UVH6RP11K                            |  |
| 380-500 Vac                            | U57                          |  | UVH6RP29K                            |  |
| 12 Vdc                                 | T21                          |  | UVH6RP20K                            |  |
| 24 Vdc                                 | T25                          |  | UVH6RP21K                            |  |
| 48-60 Vdc                              | T29                          |  | UVH6RP23K                            |  |
| 110-125 Vdc                            | T33                          |  | UVH6RP26K                            |  |
| 220-250 Vdc                            | T37                          |  | UVH6RP28K                            |  |

① Endurance – 500 electrical operations plus 2500 mechanical operations.

② Pigtail wire size – No. 18 AWG (0.82 mm<sup>2</sup>). Leads are orange and brown.

③ UVR will override a momentary voltage dip up to the response time shown.

④ Unlatching occurs 1 millisecond before circuit breaker contacts begin to separate.

⑤ For 1 minute.

Instruction Leaflet/FRED Number 29C178

**Accessory Terminal Block/Cutler-Hammer PowerNet Communications Kit (OPTIM 550 only)**
**Accessory Terminal Block  
(R-Frame)**

(For Fixed Mounted Configuration)


**General Information**

Internal accessory wiring leads are normally supplied with pigtail leads (No. 18 AWG) that exit from the right side of the circuit breaker. Where specified, fixed mounted accessory terminal blocks are available. A maximum of one 24-point terminal block can be installed on the right side of the circuit breaker for the internal accessories.

For convenience in determining the appropriate number of terminal block points required, refer to table at right.

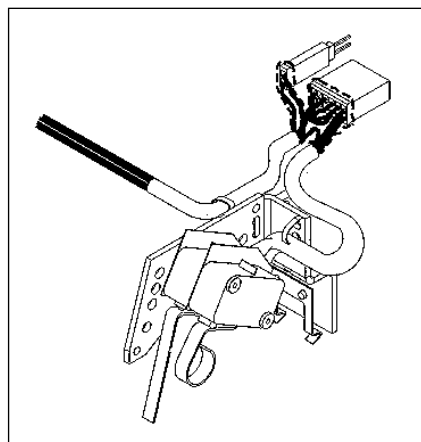
**Number of Control Wires For Each Internally Mounted Accessories**

| Type of Accessory                 | Number of Contacts Per Single Accessory | Required Number of Wires |
|-----------------------------------|-----------------------------------------|--------------------------|
| Auxiliary Switch                  | 2a/2b<br>4a/4b                          | 6<br>12                  |
| Alarm (Signal)/<br>Lockout Switch | 1m/1b<br>2m/2b                          | 6<br>12                  |
| Shunt Trip                        | N/A                                     | 2                        |
| Low Energy Shunt                  | N/A                                     | 2                        |
| Undervoltage Release Mechanism    | N/A                                     | 2                        |

**Ordering Information<sup>①</sup>**

| Factory Installed | Field Mounted  |
|-------------------|----------------|
| Suffix Number     | Catalog Number |
| <b>Q01</b>        | <b>TBRDK</b>   |

Instruction Leaflet/FRED Number 29C312

**Cutler-Hammer PowerNet Communications Kit (OPTIM 550 only) K-, L-, and N-Frames**

**General Information**

The Cutler-Hammer PowerNet Communications Kit can be ordered to add Cutler-Hammer PowerNet communications to an existing OPTIM 550 breaker in the field. An 18-inch wiring pigtail is routed to the rear of the breaker: two wires for Cutler-Hammer PowerNet and two wires for 24V Dc (45 mA load). It is recommended that the power supply be an "isolated high quality" unit.

**Ordering Information**
**Cutler-Hammer PowerNet  
Communications Kit**

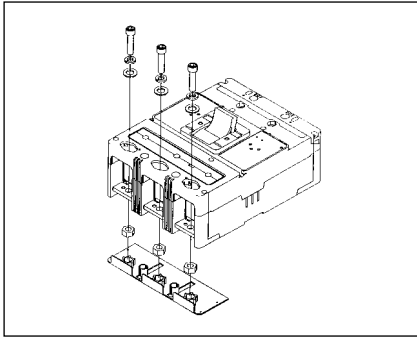
| Circuit Breaker                                    | Catalog Numbers                                    |
|----------------------------------------------------|----------------------------------------------------|
| <b>K-Frame</b><br><b>L-Frame</b><br><b>N-Frame</b> | <b>ICK550K</b><br><b>ICK550L</b><br><b>ICK550N</b> |

 Instruction Leaflet/FRED Number 29C506,  
29C897, 29C898

<sup>①</sup> One 24-point accessory terminal block provided with circuit breaker when ordered factory installed or shipped from warehouse as separate item when ordered for field installation. See Digitrip RMS master connection diagram (IL 29C714).

## Termination Hardware – Ring Type

## Endcap Kit



The endcap kit slides onto the line or load conductor of the circuit breaker and acts as a threaded adapter for the conductor to accept a ring terminal or other bolt-on connector. The endcap kit is available with English and metric thread sizes. Screws and washers are supplied by customer. (Field installation only.) Listed per UL File E7819.

## Ordering Information

| Thread Type | Thread Size | Catalog Number                         |
|-------------|-------------|----------------------------------------|
|             |             | Package of 12<br>(Priced Individually) |

## F-Frame

|          |       |        |
|----------|-------|--------|
| Imperial | 10-32 | KPEK1  |
| Metric   | M-5   | KPEK1M |

## J-Frame

|          |       |        |
|----------|-------|--------|
| Imperial | 10-32 | KPEK2  |
| Metric   | M-5   | KPEK2M |

## K-Frame

|          |       |        |
|----------|-------|--------|
| Imperial | 10-32 | KPEK3  |
| Metric   | M-5   | KPEK3M |

## L-Frame

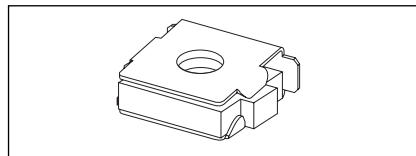
|          |       |        |
|----------|-------|--------|
| Imperial | 10-32 | KPEK4  |
| Metric   | M-5   | KPEK4M |

## Keeper Nut

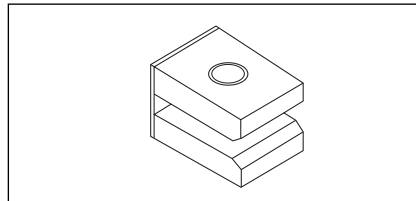
The keeper nut slides onto the line or load conductor of the circuit breaker and acts as a threaded adapter for the conductor to accept a ring terminal or other bolt-on connector. The keeper nut is available with English and metric thread sizes. Screws and washers are supplied by customer. (Field installation only.) Listed per UL File E7819.

## Ordering Information

## F-Frame



| Thread Type | Thread Size | Catalog Number                         |
|-------------|-------------|----------------------------------------|
|             |             | Package of 12<br>(Priced Individually) |
| Imperial    | 10-32       | KPR1A                                  |
| Metric      | M-5         | KPR1AM                                 |



## K-Frame

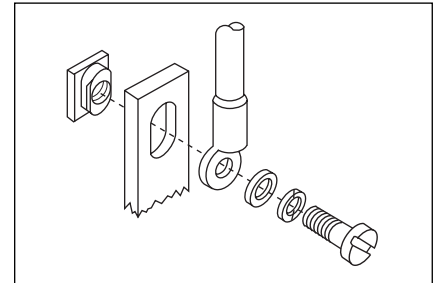
| Thread Type | Thread Size | Line/Load End | Catalog Number   |
|-------------|-------------|---------------|------------------|
|             |             |               | Package of 3     |
| Imperial    | .375-16     | Line Load     | KPR3A<br>KPR3B   |
| Metric      | M-8         | Line Load     | KPR3AM<br>KPR3BM |

## L-, M-, N-Frames

Not required. Terminals are threaded.

## Plug Nut

## J-Frame



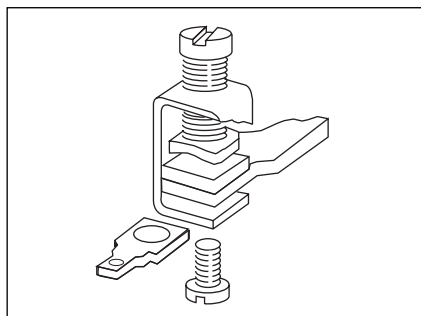
The plug nut is used in applications where screw-connected ring-type terminals are preferred to connect cables to circuit breaker conductors. The plug nut is press-fit into the opening in the circuit breaker terminal conductor. Screws and washers are supplied by customer.

## Ordering Information

| Thread Type | Thread Size | Catalog Number |
|-------------|-------------|----------------|
|             |             | Package of 6   |
| Imperial    | .250-20     | PLN2           |
| Metric      | M-6         | PLN2M          |

## Control Wire Terminal Kit

### F-Frame



The control wire terminal kit provides a means to tap off control power from a main disconnect using the provided male end of a quick disconnect.

For use with steel or stainless steel<sup>①</sup> terminals only.

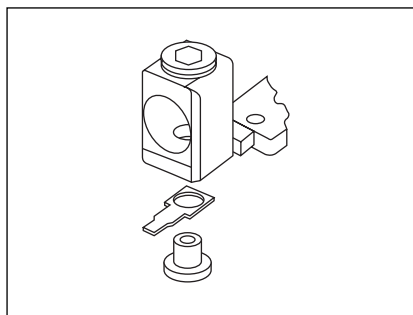
### Ordering Information

Package of 12 control wire terminal tangs. Terminals must be ordered separately. Priced individually.

| Catalog Number |
|----------------|
| FCWTK          |

### J- and K-Frames

Not for use with T250KB terminals.



### Ordering Information

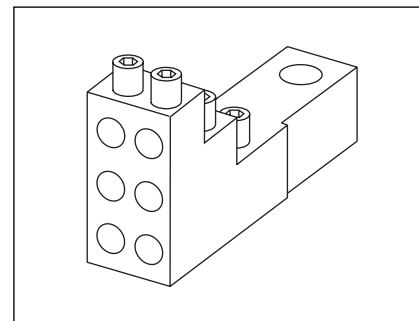
Package of 12 control wire terminal tangs. Terminals must be ordered separately. Priced individually.

| Catalog Number |
|----------------|
| KCWTK          |

### L-Frame

| AWG Wire Range/Number Conductors | Metric Wire Range mm² | Catalog Number                        |
|----------------------------------|-----------------------|---------------------------------------|
| Al/Cu<br>(2) 250 – 350 kcmil     | 120-150               | TA602LDCW <sup>②</sup>                |
| Cu<br>(2) 3/0 – 350 kcmil        | 120-150               | T602LDCW <sup>②</sup>                 |
| Al/Cu<br>(2) 400 – 500 kcmil     | 185-240               | 2TA603LDCW <sup>①</sup><br>2-Pole Kit |
| Al/Cu<br>(2) 400 – 500 kcmil     | 185-240               | 3TA603LDCW <sup>①</sup><br>3-Pole Kit |
| Al/Cu<br>(2) 400 – 500 kcmil     | 185-240               | 4TA603LDCW <sup>①</sup><br>4-Pole Kit |

## Multi-Wire Connectors



Field-installed multi-wire connectors for the load side (OFF) end terminals. They are used to distribute the load from the circuit breaker to multiple devices without the use of separate distribution terminal blocks.

Multi-wire lug kits include mounting hardware, insulators and tin-plated aluminum connectors to replace three mechanical load lugs. UL listed for copper only as used on the load side (OFF) end.

### Ordering Information

Package of 3.

| Maximum Amperes | Wires Per Terminal | Wire Size Range AWG Cu | Kit Catalog Number |
|-----------------|--------------------|------------------------|--------------------|
|-----------------|--------------------|------------------------|--------------------|

#### F-Frame

|     |   |       |           |
|-----|---|-------|-----------|
| 225 | 3 | #14-2 | 3TA150F3K |
| 225 | 6 | #14-6 | 3TA150F6K |

#### J-Frame

|     |   |       |           |
|-----|---|-------|-----------|
| 225 | 3 | #14-2 | 3TA250J3K |
| 225 | 6 | #14-6 | 3TA250J6K |

#### K-Frame

|     |   |         |           |
|-----|---|---------|-----------|
| 400 | 3 | #12-2/0 | 3TA400K3K |
| 400 | 6 | #14-2/0 | 3TA400K6K |

<sup>①</sup> Terminal kits contain one terminal for each pole and one terminal cover.

<sup>②</sup> Individually packed.

## Base Mounting Hardware

## Base Mounting Hardware

## Ordering Information

Hardware for surface mounting of circuit breakers is supplied only on request. Hardware consists of mounting screws and lockwashers. Order hardware for circuit breaker pole configurations as required.

| Screw Length | Style Number |
|--------------|--------------|
|--------------|--------------|

## G-Frame

|                 |            |
|-----------------|------------|
| 2.625 (66.7 mm) | 624B375G23 |
| 3.000 (76.2 mm) | 8703C80G05 |

## Imperial Thread

| Number of Poles | Description                                                         | Type of Mounting                                                | Style / Catalog Number   | Number of Poles | Description                                                     | Type of Mounting                                                | Style / Catalog Number   |
|-----------------|---------------------------------------------------------------------|-----------------------------------------------------------------|--------------------------|-----------------|-----------------------------------------------------------------|-----------------------------------------------------------------|--------------------------|
| <b>F-Frame</b>  |                                                                     |                                                                 |                          |                 |                                                                 |                                                                 |                          |
| 1               | .164-32 x 3.188 inch Pan-Head Steel Screws, Lockwashers, and Clamps | Individual Group (one set of hardware for two circuit breakers) | 624B375G01<br>624B375G02 | 1               | M4 - 0.7 x 80 mm Pan-Head Steel Screws, Lockwashers, and Clamps | Individual Group (one set of hardware for two circuit breakers) | 4218B80G09<br>4218B80G10 |
| 2               | .164-32 x 1.5 inch Pan-Head Steel Screws and Lockwashers            | Individual                                                      | 4218B80G01               | 2               | M4 - 0.7 x 38 mm Pan-Head Steel Screws and Lockwashers          | Individual                                                      | 4218B80G11               |
| 3, 4            | .164-32 x 1.5 inch Pan-Head Steel Screws and Lockwashers            | Individual                                                      | BMH1                     | 3, 4            | M4 - 0.7 x 38 mm Pan-Head Steel Screws and Lockwashers          | Individual                                                      | BMH1M                    |

## J-Frame

|         |                                                            |            |      |         |                                                       |            |       |
|---------|------------------------------------------------------------|------------|------|---------|-------------------------------------------------------|------------|-------|
| 2, 3, 4 | 0.250-20 x 2.75 inch Pan-Head Steel Screws and Lockwashers | Individual | BMH2 | 2, 3, 4 | M6 - 0.7 x 70mm Pan-Head Steel Screws and Lockwashers | Individual | BMH2M |
|---------|------------------------------------------------------------|------------|------|---------|-------------------------------------------------------|------------|-------|

## K-Frame

|         |                                                           |            |      |         |                                                       |            |       |
|---------|-----------------------------------------------------------|------------|------|---------|-------------------------------------------------------|------------|-------|
| 2, 3, 4 | 0.250-20 x 1.5 inch Pan-Head Steel Screws and Lockwashers | Individual | BMH3 | 2, 3, 4 | M6 - 0.7 x 38mm Pan-Head Steel Screws and Lockwashers | Individual | BMH3M |
|---------|-----------------------------------------------------------|------------|------|---------|-------------------------------------------------------|------------|-------|

## L-Frame

|         |                                                                                 |            |      |      |   |            |       |
|---------|---------------------------------------------------------------------------------|------------|------|------|---|------------|-------|
| 2, 3, 4 | 0.250-20 x 1.5 inch Filister-Head Steel Screws and Lockwashers and Flat Washers | Individual | BMH4 | 2, 3 | — | Individual | BMH4M |
|---------|---------------------------------------------------------------------------------|------------|------|------|---|------------|-------|

## M-Frame

|      |                                                                                   |            |      |      |   |            |       |
|------|-----------------------------------------------------------------------------------|------------|------|------|---|------------|-------|
| 2, 3 | 0.3125-18 x 1.25 inch Filister-Head Steel Screws and Lockwashers and Flat Washers | Individual | BMH5 | 2, 3 | — | Individual | BMH5M |
|------|-----------------------------------------------------------------------------------|------------|------|------|---|------------|-------|

## N-Frame

|         |                                                             |  |      |      |   |            |       |
|---------|-------------------------------------------------------------|--|------|------|---|------------|-------|
| 2, 3, 4 | 0.3125-18 x 1.25 inch Pan-Head Steel Screws and Lockwashers |  | BMH5 | 2, 3 | — | Individual | BMH5M |
|---------|-------------------------------------------------------------|--|------|------|---|------------|-------|

## R-Frame

|                      |  |  |  |  |  |  |  |
|----------------------|--|--|--|--|--|--|--|
| Supplied by customer |  |  |  |  |  |  |  |
|----------------------|--|--|--|--|--|--|--|

## Drawout Cassette

## Drawout Cassette



The drawout cassette is currently for use with the standard 3-pole 65 kA/480 Vac, 1600A and 2000A RD circuit breakers only. It consists of two separate components: the movable mechanism which is factory mounted to the circuit breaker frame (shown in figure) and the stationary mechanism which is housed in the cassette and shipped separately.

The drawout mechanism has four positions.

- Connected – The breaker is fully connected to the primary stabs and secondary contacts.
- Test – The breaker is not connected to the primary stab but is connected to the secondary contacts.
- Disconnected – Both the primary stabs and the secondary contacts are disconnected.
- Withdraw – The breaker can be removed from the cassette.

## Ordering Information

## RD Drawout Cassette

65 kA/480 Vac version

| Description          | Catalog Number                                                             |
|----------------------|----------------------------------------------------------------------------|
| Movable Mechanism    | <b>RD20DOM</b>                                                             |
| Stationary Mechanism | <b>RD20DOS</b><br>(without shutters)<br><b>RD20DOSS</b><br>(with shutters) |

Instruction Leaflet/FRED Number 32697

**Note:** Movable mechanism must be ordered with RD or RDC circuit breaker and is shipped mounted to circuit breaker frame. Stationary mechanism is ordered separately.

All internal accessories must be factory installed for use with drawout.

## RD Drawout Cassette

100 kA/480 Vac version

| Description          | Catalog Number                                                             |
|----------------------|----------------------------------------------------------------------------|
| Movable Mechanism    | <b>RD20DOM</b>                                                             |
| Stationary Mechanism | <b>RD20DOS</b><br>(without shutters)<br><b>RD20DOSS</b><br>(with shutters) |

Instruction Leaflet/FRED Number 32697

## Terminal Shields

Terminal shields provide protection against accidental contact with live line side terminations. Terminal shields are fabricated from high dielectric insulating material and fasten over the front terminal access openings. Small openings in the shields provide limited access to the terminals for tightening connectors. (Field installation only.)

## Ordering Information

### G-Frame

#### Terminal Shield

| Number Units in Package | Style Number |
|-------------------------|--------------|
| 10                      | GTSK3        |

### J-Frame



| Number of Poles | Location | Style Number<br>(Package of 10) |
|-----------------|----------|---------------------------------|
| 2, 3<br>4       | Line End | 1266C07G01<br>6631C01G01        |
| 2, 3<br>4       | Load End | 6641C16G01<br>6641C16G02        |

### L-Frame



| Style Number (Package of 1) |
|-----------------------------|
| 314CA420G01                 |

### F-Frame



| Number of Poles | Location | Style Number                                         |                                                                                            |
|-----------------|----------|------------------------------------------------------|--------------------------------------------------------------------------------------------|
|                 |          | Standard<br>(Package of 10)<br>(Priced Individually) | Special - For<br>use when<br>electrical<br>operator is<br>mounted on<br>circuit<br>breaker |
| 1               | Line     | 625B229G06                                           | —                                                                                          |
| 2               |          | 625B229G07                                           | —                                                                                          |
| 3               |          | 625B229G08                                           | 4210B95G01                                                                                 |
| 4               |          | 625B229G09                                           | 4210B95G02                                                                                 |

### K-Frame



| Number of Poles | Location | Catalog Number<br>(Package of 10) |
|-----------------|----------|-----------------------------------|
| 2, 3            | Line     | TS33LN                            |
| 4               | Line     | TS34LN                            |
| 3               | Load     | TS33LD                            |

### M-Frame



| Style Number (Package of 1) |
|-----------------------------|
| 4203B20G01                  |



## Termination Hardware

## Terminal End Covers

### F-Frame



The terminal end covers are designed for use in motor control center applications where, because of confined spaces, line side conductors are normally custom fitted. The molded end covers are made of high dielectric glass-polyester and slide over the line ends of the circuit breaker. Close fitting conductor openings are molded into the end covers. The end cover and circuit breaker case fit together to form terminal compartments that isolate discharged ionizing gases during circuit breaker tripping. Terminal end covers are available with two conductor opening diameters, 0.25 and 0.41 inch, and are listed per UL File E7819. (Field installation only.)

### Ordering Information

The terminal end cover is available for 3-pole circuit breakers only. Two conductor opening sizes are available. Specify quantity (one per circuit breaker) when ordering.

| Conductor Opening Diameter (Inches) | Catalog Number |
|-------------------------------------|----------------|
| 0.25 (6.35 mm)                      | TEC1           |
| 0.41 (10.41 mm)                     | TEC2           |

## Interphase Barriers

The interphase barriers provide additional electrical clearance between circuit breaker poles for special termination applications. The barriers are high dielectric insulating plates that are installed in the molded slots between the terminals. (Field installation only.) Two per package.



| Frame | Catalog Number |
|-------|----------------|
| F     | IPB1           |
| J     | IPB2           |
| K     | IPB3           |
| L     | IPB4           |
| M     | IPB4           |
| N     | IPB5           |

Base Mounting Adapters

Base Mounting Plate<sup>①</sup>  
G-Frame GD/GC/GHC



Ordering Information

| Number Units in Package | Style Number |
|-------------------------|--------------|
| 1                       | 207B513G01   |

DIN Rail Adapter<sup>②③</sup>  
G-Frame GD/GC/GHC

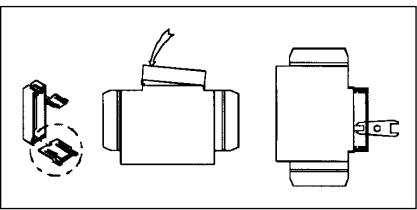


Ordering Information

| Number Units in Package | Style Number            |
|-------------------------|-------------------------|
| 10                      | 1225C79G01              |
| 10                      | 1225C79G02 <sup>④</sup> |

Instruction Leaflet/FRED Number 29C091

Key Operated Attachment  
G-Frame GD/GC/GHC



Ordering Information

| Number Units in Package | Style Number |
|-------------------------|--------------|
| 10                      | GK0A         |

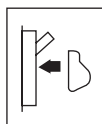
Instruction Leaflet/FRED Number 29C090

① Suitable for mounting (6) single-pole circuit breakers.  
② For use with standard 35 mm DIN Rail such as, 35 x 7.5 or 35 x 15 mm per DIN EN50022.  
③ Adapter mounting screws included are for use with 2- and 3-pole circuit breakers. Adapters for 1-pole circuit breakers clip into the base molding.  
④ For use on 3-pole breakers only.

**Handle Locking and Blocking Devices**
**Lock Dog (non-padlockable)  
G-Frame GD/GC/GHC/GB/  
GHB/GMCP**

**Ordering Information**

| Number Units in Package | Style Number |
|-------------------------|--------------|
| 1                       | 1294C01H01   |

**Non-Padlockable  
Handle Block**


The nonlockable handle block secures the circuit breaker handle in either the ON or OFF position. (Trip-free operation allows the circuit breaker to trip when the handle block holds the circuit breaker handle in the ON position.) The device is positioned over the circuit breaker handle and secured by a setscrew to deter accidental operation of the circuit breaker handle. Listed per UL File E7819. (Field installation only.)

**Ordering Information**

| Frame   | Catalog Number |
|---------|----------------|
| F       | LKD1           |
| J, K    | LKD3           |
| L, M, N | LKD4           |

**Padlockable Handle  
G-Frame GD/GC/GHC/GB/GHB**

**Ordering Information**

| Number Units in Package | Style Number |
|-------------------------|--------------|
| 10                      | 1223C77G03   |

(Accepts .285 Lock Shank)

**Padlockable Handle Block**


The device is positioned in the cover opening to prevent handle movement. Will accommodate one 5/16 padlock.

**Ordering Information**

| Frame | Catalog Number |
|-------|----------------|
| J, K  | PHB3           |

**Snap-On Padlockable  
Handle Lock Hasp**


The snap-on padlockable handle lock allows the handle to be locked in the OFF or ON position. (Trip-free operation allows the circuit breaker to trip when the handle lock holds the circuit breaker handle in the ON position.) This device was designed for use on the 1-pole circuit breaker, but may be used on 1-, 2-, 3-, and 4-pole styles. The handle lock snaps onto the escutcheon area of the handle with an optional retaining screw for added secureness. The handle lock will accommodate one padlock with a 1/4-inch (6 mm) shackle. Listed per UL File E7819. (Field installation only.)

**Ordering Information**

| Frame | Catalog Number |
|-------|----------------|
| F     | PHB1           |

## Handle Locking and Blocking Devices

## Padlockable Handle Lock Hasp



The padlockable handle lock hasp allows the handle to be locked in the ON or OFF position. (Trip-free operation allows the circuit breaker to trip when the handle lock holds the circuit breaker handle in the ON position.) The hasp mounts on the circuit breaker cover within the trimline. The cover is predrilled on both sides of the operating handle so that the hasp can be mounted on either side of the handle. The hasp will accommodate up to three padlocks with 1/4-inch (6 mm) shackles. Listed per UL File E7819. (Field installation only.)

The padlockable handle lock can be mounted on either side of the operating handle. One per circuit breaker. (Field installation only.)

## Ordering Information

| Description | Catalog Number |
|-------------|----------------|
|-------------|----------------|

## F-Frame

|                         |      |
|-------------------------|------|
| 1-pole breakers         | PHL1 |
| 2-, 3-, 4-pole breakers | PLK1 |

Instruction Leaflet/FRED Number 29C230

## J, K-Frames

|                         |                       |
|-------------------------|-----------------------|
| 2-, 3-, 4-pole breakers | PLK3                  |
| For Left Side Mounting  | PLK3LOFF <sup>①</sup> |
| For Right Side Mounting | PLK3ROFF <sup>①</sup> |

Instruction Leaflet/FRED Number 29C232

## L-Frame

| Side Mounted                    |                       |
|---------------------------------|-----------------------|
| Lock On or Off                  | HLK4                  |
| Lock Off Only (Left-Hand Mount) | HLK4LOFF <sup>①</sup> |

Instruction Leaflet/FRED Number 29C234

| Top Mounted    |                       |
|----------------|-----------------------|
| Lock On or Off | HLK4S                 |
| Lock Off Only  | HLK4SOFF <sup>①</sup> |

Instruction Leaflet/FRED Number 29C234C

## M-Frame

|                                 |                       |
|---------------------------------|-----------------------|
| Lock On or Off                  | HLK4                  |
| Lock Off Only (Left-Hand Mount) | HLK4LOFF <sup>①</sup> |

Instruction Leaflet/FRED Number 29C234

| Vertical Mounting |          |
|-------------------|----------|
| Lock On/Off       | HLK45    |
| Lock Off Only     | HLK45OFF |

Instruction Leaflet/FRED Number 29C234C

## N-Frame

|              |      |
|--------------|------|
| Side Mounted | PLK5 |
|--------------|------|

Instruction Leaflet/FRED Number 29C234

|                        |                       |
|------------------------|-----------------------|
| Top Mounted (On/Off)   | PLK5S                 |
| Top Mounted (Off Only) | PLK5SOFF <sup>①</sup> |

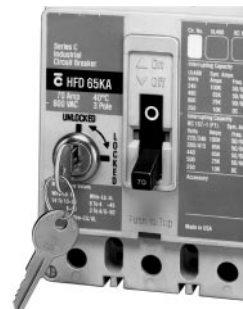
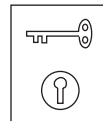
Instruction Leaflet/FRED Number 29C234C

## R-Frame

|               |                      |
|---------------|----------------------|
| Lock On/Off   | HLK6                 |
| Lock Off Only | HLK6OFF <sup>①</sup> |

Instruction Leaflet/FRED Number 29C240

## Cylinder Lock



The cylinder lock internally blocks the trip bar in the tripped position to prevent the circuit breaker from being switched to ON. The cylinder lock is factory installed in the circuit breaker cover. Other internally mounted accessories cannot be installed in the same pole as the cylinder lock. (Factory installation only.)

The cylinder lock is factory installed in the left pole only of the circuit breaker cover. Internal accessories cannot be installed in the same pole as the cylinder lock.

## Ordering Information

| Frames  | Catalog Number       |
|---------|----------------------|
| F, J, K | Order by description |

<sup>①</sup> For padlockable handle lock hasp to padlock handle in OFF position only order either catalog number.

**Mechanical Interlocking Devices**
**Key Interlock Kit**
**(Lock Not Included)**


The key interlock is used to externally lock the circuit breaker handle in the OFF position. When the key interlock is locked, an extended deadbolt blocks movement of the circuit breaker handle. Uniquely coded keys are removable only with the deadbolt extended. Each coded key controls a group of circuit breakers for a given specific customer installation.

The key interlock assembly is Underwriters Laboratories, Inc., listed for field installation under UL file E7819 and consists of a mounting kit and a purchaser supplied deadbolt lock. The mounting kit comprises a mounting plate, which is secured to the circuit breaker cover in either the left- or right-pole position, key interlock mounting screws, and a wire seal. Specific mounting kits are required for individual key interlock types.

**Ordering Information**

Key interlock mounting kits are for field installation only. Select mounting kit catalog numbers to match type of lock used. Key interlocks are supplied by customer.

| Lock Manufacturer | Lock Type | Bolt Projection in Withdrawn Position | Kit Catalog Number |
|-------------------|-----------|---------------------------------------|--------------------|
|-------------------|-----------|---------------------------------------|--------------------|

**F-Frame**

|                 |          |          |             |
|-----------------|----------|----------|-------------|
| Superior        | B-4003-1 | 3/8 inch | <b>KYK1</b> |
| Kirk            | F        | 3/8 inch |             |
| Square D        | SF       | None     |             |
| Federal Pioneer | VF       | 3/8 inch |             |
| Castell         | K or QK  | 3/8 inch | <b>CTK1</b> |

Instruction Leaflet/FRED Number 29C231

**J-, K-Frames**

|                 |          |          |             |
|-----------------|----------|----------|-------------|
| Superior        | B-4003-1 | 3/8 inch | <b>KYK3</b> |
| Kirk            | F        | 3/8 inch |             |
| Square D        | SF       | None     |             |
| Federal Pioneer | VF       | 3/8 inch |             |
| Castell         | K or QK  | 3/8 inch |             |

Instruction Leaflet/FRED Number 29C233

**L-, M-, N-Frames**

|                 |          |          |             |
|-----------------|----------|----------|-------------|
| Superior        | B-4003-1 | 3/8 inch | <b>KYK4</b> |
| Kirk            | F        | 3/8 inch |             |
| Square D        | SF       | None     |             |
| Federal Pioneer | VF       | 3/8 inch |             |
| Castell         | K or QK  | 3/8 inch | <b>CTK4</b> |

Instruction Leaflet/FRED Number 29C235

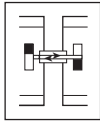
**R-Frame**

|                 |          |        |             |
|-----------------|----------|--------|-------------|
| Superior        | B-4003-1 | 1 inch | <b>KYK6</b> |
| Kirk            | F        | 1 inch |             |
| Square D        | SF       | 1 inch |             |
| Federal Pioneer | VF       | 1 inch |             |
| Castell         | K or QK  | 1 inch | <b>CTK6</b> |

Instruction Leaflet/FRED Number 29C240

## Mechanical Interlocking Devices

## Sliding Bar Interlock



The sliding bar interlock provides mechanical interlocking between two adjacent 3-pole circuit breakers. It is installed on the enclosure cover between the circuit breakers. When the sliding bar interlock handle is moved from one side to the other, a bar extends to alternately block movement of the circuit breaker handles and prevents both circuit breakers from being switched to ON at the same time. Sliding bar interlocks are not UL listed. (Field installation only.)

## Ordering Information

The sliding bar interlock is available for mounting between two adjacent 3-pole circuit breakers with circuit breakers centerline spacing as indicated in table and enclosure front panel thickness of 1/8 or 3/16 inch. (For field installation only.)

| Frame | Centerline Spacing (inches) | Catalog Number | Instruction Leaflet/FRED Number |
|-------|-----------------------------|----------------|---------------------------------|
| F     | 4-3/16                      | SBK1           | 29C310                          |
| J     | 4-3/8                       | SBK2           | 29C310                          |
| K     | 5-3/4                       | SBK3           | 29C310                          |
| L, M  | 8-1/2                       | SBK4           | 29C311                          |
| N     | 8-1/2                       | SBK5           | 46A8396                         |



## Walking Beam Interlock

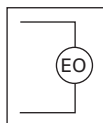
The walking beam interlock provides mechanical interlocking between two adjacent circuit breakers of the same pole configuration. The walking beam interlock mounts on a bracket behind and between the circuit breakers. A plunger on each end of the beam is inserted through an access hole in the back plate and base of each circuit breaker. The walking beam interlock prevents both circuit breakers from being switched ON at the same time. If a walking beam interlock is installed, the wiring troughs in the back of the circuit breaker case are blocked by the plungers and cannot be used for cross wiring. Factory modified circuit breakers are required for this application. UL File E3816.

## Ordering Information

The walking beam interlock is available for mounting between two adjacent circuit breakers spaced 1/4-inch apart and having the same pole configuration. The two circuit breakers must be factory modified to accept the walking beam interlock assembly (suitable for use with either 2-, 3-, or 4-pole circuit breakers). With properly modified circuit breakers, the walking beam interlock is suitable for field installation. Order circuit breakers specifying modification for walking beam and select walking beam interlock from table on this page. Circuit breakers and walking beam interlock are boxed and shipped separately.

| Frame | Catalog Number | Instruction Leaflet/FRED Number |
|-------|----------------|---------------------------------|
| F     | WBL1           | 29C300                          |
| K     | WBL3           | 29C301                          |
| L, M  | WBL4           | 29C302                          |
| N     | WBL5           | 29C303                          |
| R     | WBL6           | 29C304                          |

## Electrical Operator

Electrical Operator<sup>①</sup>

The electrical (solenoid) operator is a single solenoid mechanism that enables local and remote circuit breaker ON, OFF, and reset switching. The electrical operator is mounted on the circuit breaker cover within the trimline of the circuit breaker. The electrical operator uses a unique bistable latch that allows the device to operate using one solenoid. The accessory provides high-speed switching with a maximum operating time of 5 cycles (80 ms) making it suitable for generator synchronizing applications.

Means are provided for remote electrical operation and for local manual operation. A special slide includes provisions for padlocking the circuit breaker handle in the OFF position. The slide will accept three padlock shackles with a maximum diameter of 1/4-inch (6 mm) each. An interlock electrically disconnects the solenoid when the electrical operator cover is removed. The above table provides electrical rating data for the electrical (solenoid) operator.

The electrical (solenoid) operator is Underwriters Laboratories, Inc., listed as a circuit breaker accessory under UL File E64983.

## Ordering Information

## F-Frame

Electrical Rating Data<sup>②</sup>

| Voltage                              | Frequency      | Inrush Current Amperes | Maximum Operating Time | Fuse <sup>③</sup> Amperes |
|--------------------------------------|----------------|------------------------|------------------------|---------------------------|
| 120 <sup>④</sup><br>240 <sup>④</sup> | 50/60 Hz<br>Ac | 10<br>5                | 5 cycles<br>(80 ms)    | 3<br>2                    |
| 120 <sup>⑤</sup><br>240 <sup>⑤</sup> | Dc<br>Dc       | 14<br>8                | 5 cycles<br>(80 ms)    | 3-5<br>2-3                |

Instruction Leaflet/FRED Number 29C200 (AC); 29C210 (DC)

## Electrical Operator

| Voltage        | Frequency | Terminal Block         | 18-Inch Pigtail Lead   |
|----------------|-----------|------------------------|------------------------|
| Catalog Number |           |                        |                        |
| 120<br>240     | Ac        | EOP1T07<br>EOP1T11     | EOP1P07<br>EOP1P11     |
| 120<br>240     | Dc        | EOP1T07DC<br>EOP1T11DC | EOP1P07DC<br>EOP1P11DC |

## J-Frame

Electrical Rating Data<sup>⑤⑥⑦⑧</sup>

| Voltage (V) <sup>③</sup> | Inrush Current (A) | Fuse (A) |
|--------------------------|--------------------|----------|
| 120<br>240               | 24<br>12           | 6<br>4   |

Instruction Leaflet/FRED Number 29C202 (AC); 29C211 (DC)

## Electrical Operator

| Operating Voltage | Frequency      | Terminal Block         |
|-------------------|----------------|------------------------|
| Catalog Number    |                |                        |
| 120<br>240        | 50/60 Hz<br>Ac | EOP2T07<br>EOP2T11     |
| 120<br>240        | Dc             | EOP2T07DC<br>EOP2T11DC |

## K-Frame

Electrical Rating Data<sup>⑤⑥⑦⑧</sup>

| Voltage (V) <sup>③</sup> | Inrush Current (A) | Fuse (A) |
|--------------------------|--------------------|----------|
| 120<br>240               | 24<br>12           | 6<br>4   |

Instruction Leaflet/FRED Number 29C202 (AC); 29C211 (DC)

## Electrical Operator

| Operating Voltage | Frequency      | Terminal Block         |
|-------------------|----------------|------------------------|
| Catalog Number    |                |                        |
| 120<br>240        | 50/60 Hz<br>Ac | EOP3T07<br>EOP3T11     |
| 120<br>240        | Dc             | EOP3T07DC<br>EOP3T11DC |

① The electrical operator design is endurance tested for 10,000 electrical operations.

② Use current-limiting type fuse where required.

③ Tolerance: +10%, -15% of nominal voltage.

④ Tolerance: ±10% of nominal voltage.

⑤ Underwriters laboratories listed under UL file E64983.

⑥ The electrical operator design has been endurance tested for 6,000 electrical operations.

⑦ Frequency: 50/60 Hz.

⑧ Maximum operating time: 5 cycles (80 ms).



## Electrical Operator

The motor operator allows the circuit's breaker to be opened, closed, or reset remotely. It also has a lock-off capability and provisions for manual operation.

The motor operator contains a reversible motor connected to a ball screw. The ball screw drives the circuit breaker handle. Limit switches and relays are used to control the motor.

The motor operator is UL listed as a recognized component suitable for field installation on all type L-frame circuit breakers and molded case switches under UL File E64124.

From the point of energization of the closing mechanism at 85% voltage, the closing time is 30 cycles  $\pm$  10%.

## Ordering Information

## L- and M-Frames

## Electrical Rating Data ①②③④

| Voltage (V)⑤         | Inrush Current (A) |
|----------------------|--------------------|
| 120 Ac<br>208<br>240 | 8<br>5<br>4        |
| 125 Dc<br>24         | 9<br>27            |

Instruction Leaflet/FRED Number 29C203

## Electrical Operator

| Operating Voltage        | Frequency | Terminal Block                                |
|--------------------------|-----------|-----------------------------------------------|
|                          |           | Catalog Number                                |
| 120<br>208<br>240<br>480 | 50/60 Hz  | EOPM4T07<br>EOPM4T11<br>EOPM4T11A<br>EOPM4T15 |
| 125<br>24                | Dc        | EOPM4T26<br>EOPM4T21                          |

## N-Frame

## Electrical Rating Data ①③⑥⑦

| Voltage (V)⑤             | Frequency | Inrush Current (A) | Fuse (A) |
|--------------------------|-----------|--------------------|----------|
| 120<br>208<br>240<br>480 | 50/60 Hz  | 25<br>21<br>19     | 6<br>4   |
| 48<br>125                | Dc        | 80<br>13           |          |

Instruction Leaflet/FRED Number 29C204

## Electrical Operator

| Operating Voltage        | Frequency | Pigtail Leads                            |
|--------------------------|-----------|------------------------------------------|
|                          |           | Catalog Number                           |
| 120<br>208<br>240<br>480 | 50/60 Hz  | EOP5T07<br>EOP5T09<br>EOP5T11<br>EOP5T15 |
| 48<br>125                | Dc        | EOP5T22<br>EOP5T26                       |

## R-Frame

Available Motor Operator Ratings  
and Operating Conditions ⑧⑨⑩⑪

| Rating Voltage (V)⑫ | Frequency                  | Motor Inrush Current (A) |
|---------------------|----------------------------|--------------------------|
| 120<br>240<br>48    | 50/60 Hz<br>50/60 Hz<br>Dc | 40<br>27<br>53           |

Instruction Leaflet/FRED Number 29C205

## Electrical Operator

| Operating Voltage | Frequency                  | Factory Installed Terminal Block |
|-------------------|----------------------------|----------------------------------|
|                   |                            | Catalog Number                   |
| 120<br>240<br>48  | 50/60 Hz<br>50/60 Hz<br>Dc | EOP6T08K<br>EOP6T11K<br>EOP6T21K |

① Underwriters Laboratories Inc. listed under UL File E64983.

② The electrical operator design has been endurance tested for 6,000 electrical operations.

③ Frequency: 50/60 Hz.

④ Maximum operating time: 5 cycles (80 ms).

⑤ Tolerance: +10%, -15% of nominal voltage.

⑥ The electrical operator design has been endurance tested for 2,500 electrical operations.

⑦ Maximum operating time: 12 cycles max. Operator is an intermittent duty device. The safe duty cycle (OFF to ON to OFF) should not exceed one per minute.

⑧ Operator is an intermittent duty service. The safe duty cycle (OFF to ON to OFF) should not exceed one per minute.

⑨ Electric Operating time at rated voltage;  
(a) To turn breaker ON – 1/2 second max.  
(b) To turn breaker OFF – 1/2 second max.

⑩ Motor operating temperature; Class "A" temperature limits apply.

⑪ A minimum 1 kVA power source is recommended for motor operation.

⑫ Applied voltage should be no less than 85% or no more than 110% of rated.



## Plug-in Adapters

### Plug-in Adapters



Plug-in adapters simplify installation and front removal of circuit breakers. Individual line and load plug-in adapters are available for rear connection applications on 2-, 3-, and 4-pole circuit breakers. Common mounting plates for line- and load-end adapters are available.

### Ordering Information

#### F-Frame

| Continuous Current Rating (Amperes) | 2-Pole       | 3-Pole     | 4-Pole     |
|-------------------------------------|--------------|------------|------------|
|                                     | Style Number |            |            |
| 100                                 | 507C036G13   | 507C036G15 | 179C968G03 |
| 150-225                             | 507C036G14   | 507C036G16 | 179C968G04 |
| Mounting Plate                      | 176C511H01   | 507C047H01 | ①          |

Instruction Leaflet/FRED Number 13782

#### K-Frame

| Continuous Current Rating (Amperes) | Catalog Number |        |        |
|-------------------------------------|----------------|--------|--------|
|                                     | 2-Pole         | 3-pole | 4-Pole |
| 400                                 | PAD32          | PAD33  | PAD34  |
| Mounting Plate                      | ②              | PMP33  | PMP34  |

Instruction Leaflet/FRED Number 15378

#### L-Frame

| Continuous Current Rating (Amperes) | Catalog Number |            |
|-------------------------------------|----------------|------------|
|                                     | 2-Pole         | 3-pole     |
| 600                                 | 506C059G03     | 506C059G04 |
| Mounting Plate                      | 504C824H01     | 504C824H01 |

Instruction Leaflet/FRED Number 29C314

#### J-Frame

| Continuous Current Rating (Amperes) | Terminal End                      | 2-Pole                                 | 3-Pole                                 | 4-Pole                        |
|-------------------------------------|-----------------------------------|----------------------------------------|----------------------------------------|-------------------------------|
|                                     |                                   | Style/Catalog Number                   |                                        |                               |
| 250                                 | Line<br>Load<br>1 Line and 1 Load | 1260C86G05<br>1260C86G07<br>506C144G27 | 1260C86G06<br>1260C86G08<br>506C144G28 | 1231C67G01<br>1231C67G02<br>— |
| Mounting Plate                      | —                                 | ②                                      | PMP23                                  | —                             |

Instruction Leaflet/FRED Number 149321

#### M-Frame

| Continuous Current Rating (Amperes) | Catalog Number |            |
|-------------------------------------|----------------|------------|
|                                     | 2-Pole         | 3-Pole     |
| 800                                 | 2614D53G05     | 2614D53G06 |
| Mounting Plate                      | 1290C73H01     |            |

Instruction Leaflet/FRED Number 15073

#### N-Frame

| Continuous Current Rating (Amperes) | Style Number |            |
|-------------------------------------|--------------|------------|
|                                     | 2-Pole       | 3-pole     |
| 1200                                | 2614D53G03   | 2614D53G04 |
| Mounting Plate                      | 1290C73H01   |            |

Instruction Leaflet/FRED Number 13782

① Refer to Cutler-Hammer for availability.

② Use 3-pole mounting plate for 2-pole circuit breaker.

## Rear Connecting Studs

## Rear Connecting Studs

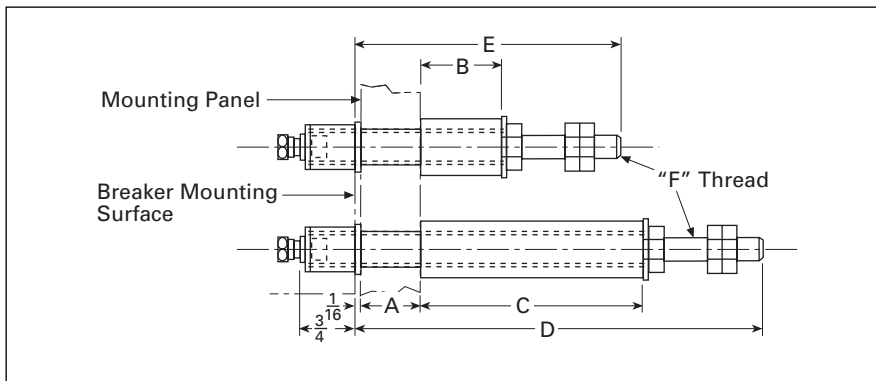


Rear connecting studs are available in several sizes to accommodate specific fixed-mounted circuit breaker applications.

Each rear connecting stud assembly consists of one stud and one tube. To maintain proper clearances between poles, select alternate long and short stud assemblies for circuit breakers with more than one pole. One assembly is required for line-end and one for load-end of each pole. Tubes must be ordered separately. Connecting studs are available only with English thread sizes.

## Ordering Information

## F-Frame



| Stud<br>Ampere<br>Rating | Stud Style<br>Number | Panel Thickness<br>(Inches) | Tube Length<br>(Inches) |   |  | Tube<br>Style<br>Number | Dimensions<br>(Inches) |   |   |
|--------------------------|----------------------|-----------------------------|-------------------------|---|--|-------------------------|------------------------|---|---|
|                          |                      | A                           | B                       | C |  |                         | D                      | E | F |

## For 15A to 100A Circuit Breakers

|            |            |                 |         |        |            |       |       |            |
|------------|------------|-----------------|---------|--------|------------|-------|-------|------------|
| 100A Short | 451D874G01 | 1               | 11/16   | —      | 32B9446H20 | —     | 3-5/8 | 15/16 - 18 |
| 100A Short | 451D874G01 | 1-1/16 to 15/16 | 13/8    | —      | 32B9446H21 | —     | —     |            |
| 100A Short | 451D874G01 | 3/8 to 5/8      | 1-11/16 | —      | 32B9446H22 | —     | —     |            |
| 100A Short | 451D874G01 | 1/4 to 5/16     | 2       | —      | 32B9446H23 | —     | —     |            |
| 100A Long  | 451D874G02 | 1               | —       | 3-7/16 | 32B9446H24 | 6-1/8 | —     |            |
| 100A Long  | 451D874G02 | 1-1/16 to 15/16 | —       | 3-3/4  | 32B9446H25 | —     | —     |            |
| 100A Long  | 451D874G02 | 3/8 to 5/8      | —       | 4-1/16 | 32B9446H26 | —     | —     |            |
| 100A Long  | 451D874G02 | 1/4 to 5/16     | —       | 4-3/8  | 32B9446H27 | —     | —     |            |

## For 110A to 150A Circuit Breakers

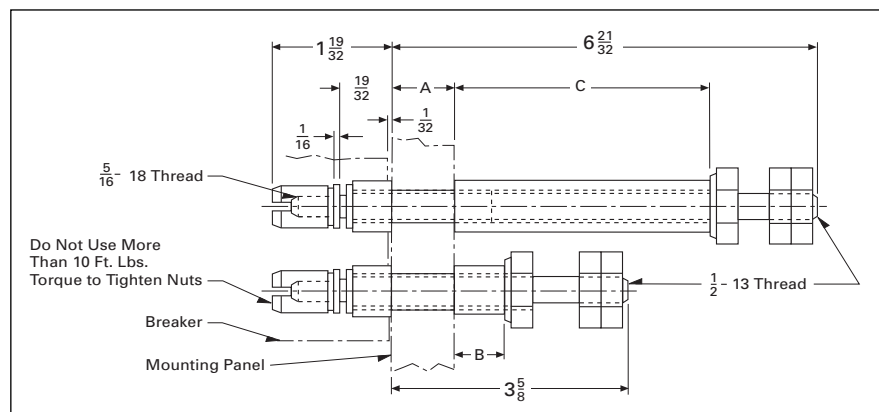
|            |            |                |         |        |            |       |       |           |
|------------|------------|----------------|---------|--------|------------|-------|-------|-----------|
| 150A Short | 374D883G01 | 1              | 11/16   | —      | 374D883H06 | —     | 4-1/4 | 1/16 - 14 |
| 150A Short | 374D883G01 | 11/16 to 15/16 | 13/8    | —      | 374D883H07 | —     | —     |           |
| 150A Short | 374D883G01 | 3/8 to 5/8     | 1-11/16 | —      | 374D883H08 | —     | —     |           |
| 150A Short | 374D883G01 | 1/4 to 5/16    | 2       | —      | 374D883H09 | —     | —     |           |
| 150A Long  | 374D883G02 | 1              | —       | 3-7/16 | 374D883H10 | 7-1/2 | —     |           |
| 150A Long  | 374D883G02 | 11/16 to 15/16 | —       | 3-3/4  | 374D883H11 | —     | —     |           |
| 150A Long  | 374D883G02 | 3/8 to 5/8     | —       | 4-1/16 | 374D883H12 | —     | —     |           |
| 150A Long  | 374D883G02 | 1/4 to 5/16    | —       | 4-3/8  | 374D883H13 | —     | —     |           |

## Rear Connecting Studs

### Rear Connecting Studs

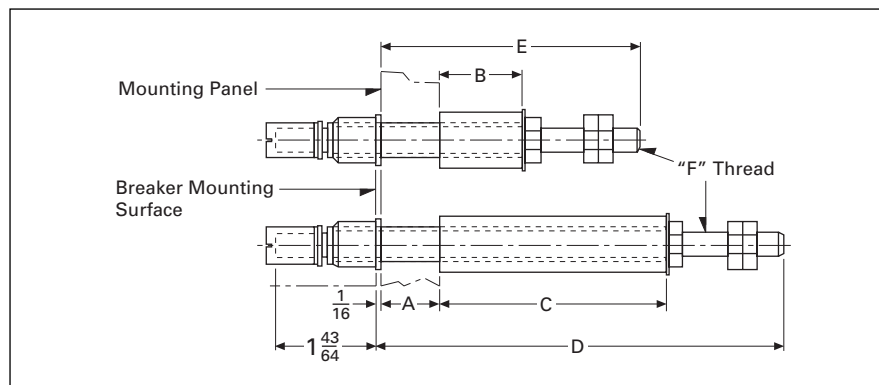
#### Ordering Information

##### J-Frame



| Stud<br>Ampere<br>Rating | Stud Style Number | Panel<br>Thickness<br>(Inches) | Tube Length<br>(Inches) |      | Tube Style Number |
|--------------------------|-------------------|--------------------------------|-------------------------|------|-------------------|
|                          |                   | A                              | B                       | C    |                   |
| 250A Short               | 5010D23G01        | 3/4 – 1                        | 27/32                   | —    | 456D983H05        |
| 250A Short               | 5010D23G01        | 1/2 – 3/4                      | 1-3/32                  | —    | 456D983H06        |
| 250A Short               | 5010D23G01        | 1/4 – 1/2                      | 1-1/32                  | —    | 456D983H07        |
| 250A Long                | 5010D23G02        | 3/4 – 1                        | —                       | 37/8 | 5010D23H05        |
| 250A Long                | 5010D23G02        | 1/2 – 3/4                      | —                       | 41/8 | 5010D23H06        |
| 250A Long                | 5010D23G02        | 1/4 – 1/2                      | —                       | 43/8 | 5010D23H07        |

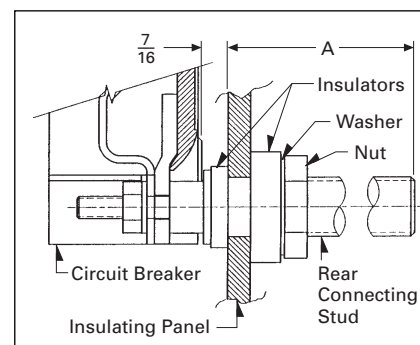
##### K-Frame



| Stud Length | Stud Style Number | Panel Thickness (Inches) | Tube Length (Inches) |         | Standard Tube Style Number | Dimensions (Inches) |         |          |
|-------------|-------------------|--------------------------|----------------------|---------|----------------------------|---------------------|---------|----------|
|             |                   | A                        | B                    | C       |                            | D                   | E       | F        |
| 400A Short  | 6642C14G02        | 3/4 to 1                 | 27/32                | —       | 313C909H17                 | —                   | 3-21/32 | 3/4 - 16 |
| 400A Short  | 6642C14G04        | 1/2 to 3/4               | 1-3/32               | —       | 313C909H18                 | —                   | —       | —        |
| 400A Short  | 6642C14G06        | 1/4 to 1/2               | 1-11/32              | —       | 313C909H19                 | —                   | —       | —        |
| 400A Long   | 6642C14G03        | 3/4 to 1                 | —                    | 3-25/32 | 313C909H20                 | —                   | —       | —        |
| 400A Long   | 6642C14G05        | 1/2 to 3/4               | —                    | 4-1/32  | 313C909H21                 | 6-37/64             | —       | —        |
| 400A Long   | 6642C14G07        | 1/4 to 1/2               | —                    | 4-9/32  | 313C909H22                 | —                   | —       | —        |

① Not UL listed.

##### L-Frame



| Stud Length (A) | Stud Style Number |
|-----------------|-------------------|
| 5-15/32         | 314C960G07        |
| 7-31/32         | 314C960G08        |
| 10-15/32        | 314C960G09        |

##### M-Frame①

| Stud Ampere Rating | Diameter, Inches and Thread | Extension Back of Breaker, Inches | Stud Style Numbers |
|--------------------|-----------------------------|-----------------------------------|--------------------|
| 225                | 1/2-13                      | 3-21/32                           | 314C960G01         |
| 400                | 3/4-16                      | 5-29/32                           | 314C960G04         |
| 400                | 3/4-16                      | 8-13/32                           | 314C960G05         |
| 400                | 3/4-16                      | 10-29/32                          | 314C960G06         |
| 600                | 1-12                        | 5-29/32                           | 314C960G07         |
| 600                | 1-12                        | 8-13/32                           | 314C960G08         |
| 600                | 1-12                        | 10-29/32                          | 314C960G09         |
| 800                | 1-1/8-12                    | 5-29/32                           | 314C960G10         |
| 800                | 1-1/8-12                    | 8-13/32                           | 314C960G11         |
| 800                | 1-1/8-12                    | 10-29/32                          | 314C960G12         |

##### N-Frame①

| Stud Ampere Rating | Diameter, Inches and Thread | Extension Back of Breaker, Inches | Stud Style Numbers |
|--------------------|-----------------------------|-----------------------------------|--------------------|
| 800                | 1-1/8-12                    | 5-1/2                             | 623B222G01         |
| 800                | 1-1/8-12                    | 8                                 | 623B222G02         |
| 800                | 1-1/8-12                    | 10-1/2                            | 623B222G03         |
| 1200               | 1-1/4-12                    | 5-1/2                             | 373B375G04         |
| 1200               | 1-1/4-12                    | 10-1/2                            | 373B375G03         |

## Panelboard Connecting Straps

## Panelboard Connecting Straps



Panelboard connecting straps are used to connect the circuit breaker terminals to the panelboard bus. The panelboard connecting straps are available with various ratings for outside and center poles. (Field installation only.)

## Ordering Information

Panelboard connecting straps are available to meet the needs of most standard panelboard applications. Style numbers for mounting brackets for CDP panelboard installations are also included.

Refer to panelboard manufacturer for compatibility.

## F-Frame

## Panelboard Connecting Straps

| Bus Spacing (Inches) | Continuous Current Rating (Amperes) | Pole Connector Type |         |
|----------------------|-------------------------------------|---------------------|---------|
|                      |                                     | Center              | Outside |
|                      |                                     | Style Number        |         |

## 5-3/4-Inch Deep Box, 600 Vac Maximum

|       |     |            |            |
|-------|-----|------------|------------|
| 2-3/4 | 50  | 673B142G02 | 673B142G09 |
| 2-3/4 | 100 | 673B142G02 | 673B142G10 |
| 2-3/4 | 150 | 673B142G04 | 673B142G03 |
| 3-1/2 | 50  | 1253C72G01 | 1253C72G03 |
| 3-1/2 | 100 | 1253C73G03 | 1253C73G06 |
| 3-1/2 | 150 | 1253C73G01 | 1253C73G05 |

## Mounting Bracket

| Number of Poles | Style Number |
|-----------------|--------------|
| 2               | 624B600H02   |
| 3               | 624B600H01   |

## J-Frame

## Panelboard Connecting Straps

| Bus Spacing (Inches) | Continuous Current Rating (Amperes) | Pole Connector Type |            |
|----------------------|-------------------------------------|---------------------|------------|
|                      |                                     | Center              | Outside    |
|                      |                                     | Style Number        |            |
| 3-1/2                | 250                                 | 2600D26G01          | 2600D26G02 |

## Mounting Bracket

| Number of Poles | Style Number |
|-----------------|--------------|
| 2, 3            | 1576707      |

## K-Frame

## Panelboard Connecting Straps

| Bus Spacing (Inches) | Continuous Current Rating (Amperes) | Pole Connector Type |            |
|----------------------|-------------------------------------|---------------------|------------|
|                      |                                     | Center              | Outside    |
|                      |                                     | Style Number        |            |
| 3-1/2                | 400                                 | 4212B78G02          | 4212B77G01 |

## Mounting Bracket

| Number of Poles | Style Number |
|-----------------|--------------|
| 2, 3            | 208B264H01   |

## L-Frame

## Panelboard Connecting Straps

| Continuous Current Rating (Amperes) | Pole Connector Type |            |
|-------------------------------------|---------------------|------------|
|                                     | Center              | Outside    |
| Style Number                        |                     |            |
| 600                                 | 624B609G01          | 506C052G01 |

## Mounting Bracket

| Number of Poles | Style Number |
|-----------------|--------------|
| 2, 3            | 208B297H01   |

## M-Frame

## Panelboard Connecting Straps

| Bus Spacing (Inches) | Continuous Current Rating (Amperes) | Connector Type    | Pole Connector Type                    |
|----------------------|-------------------------------------|-------------------|----------------------------------------|
|                      |                                     |                   | Style Number                           |
| 3-1/2                | 800                                 | Short Medium Long | 314C996G01<br>314C996G02<br>314C996G03 |

## Mounting Bracket

| Style Number |
|--------------|
| 315C270H01   |

## N-Frame

## Panelboard Connecting Straps

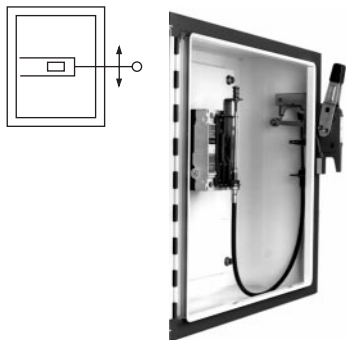
| Bus Spacing (Inches) | Continuous Current Rating (Amperes) | Connector Type    | Pole Connector Type                    |
|----------------------|-------------------------------------|-------------------|----------------------------------------|
|                      |                                     |                   | Style Number                           |
| 3-1/2                | 1200                                | Short Medium Long | 505C606G04<br>505C606G05<br>505C606G06 |

## Mounting Bracket (Four (4) Required)

| Style Number |
|--------------|
| 315C270H01   |

## Handle Mechanisms

### Flange Mounted Flex Shaft™



The Flex Shaft type handle mechanism is an extra heavy-duty handle mechanism designed for mounting in flange-type enclosures. An operating handle, flexible shaft, and mechanism are required for standard application.

The handle can be locked in the RESET position with up to three padlocks. The handle is suitable for Types 1, 3R, 4①, 4X①, and 12 fabricated enclosures. The handle fits the industry standard cutout.

Eight lengths of shafts are available for use with the wide range of depths of various enclosures (3 feet through 10 feet). These choices enable this mechanism to be mounted in various depth, width, and height enclosures.

**Note:** when selecting the length of shaft, ensure minimum bending radius of 4 inches is maintained to operate properly.

The standard method of shipment includes the mechanism preset at the factory; however, minor field adjustments may be required.

For this publication, the term Circuit Breaker shall also include the molded case switch and Series C motor circuit protector (HMCP).

UL File E64893.

### Ordering Information

Catalog Number includes complete assembly consisting of C371 handle, flexible shaft, operating mechanism, and door interlock hardware to fit industry standard flange cutout.

| Length of Flex Shaft<br>(in feet) | Catalog<br>Number |
|-----------------------------------|-------------------|
|-----------------------------------|-------------------|

#### F-Frame②

|    |        |
|----|--------|
| 3  | F1S03C |
| 4  | F1S04C |
| 5  | F1S05C |
| 6  | F1S06C |
| 7  | F1S07C |
| 8  | F1S08C |
| 9  | F1S09C |
| 10 | F1S10C |

Instruction Leaflet/FRED Number 15609

#### J-Frame②

|    |        |
|----|--------|
| 3  | F2S03C |
| 4  | F2S04C |
| 5  | F2S05C |
| 6  | F2S06C |
| 7  | F2S07C |
| 8  | F2S08C |
| 9  | F2S09C |
| 10 | F2S10C |

Instruction Leaflet/FRED Number 15605

#### K-Frame②

|    |        |
|----|--------|
| 3  | F3S03C |
| 4  | F3S04C |
| 5  | F3S05C |
| 6  | F3S06C |
| 7  | F3S07C |
| 8  | F3S08C |
| 9  | F3S09C |
| 10 | F3S10C |

Instruction Leaflet/FRED Number 15604

#### L- and M-Frames

|    |       |
|----|-------|
| 4  | F4S04 |
| 5  | F4S05 |
| 6  | F4S06 |
| 10 | F4S10 |

Instruction Leaflet/FRED Number 15606

#### N-Frame

|    |       |
|----|-------|
| 4  | F5S04 |
| 5  | F5S05 |
| 6  | F5S06 |
| 10 | F5S10 |

Instruction Leaflet/FRED Number 15606

#### R-Frame

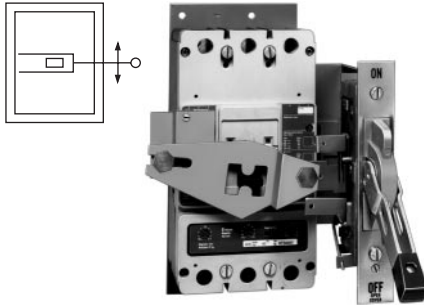
|   |       |
|---|-------|
| 4 | F6S04 |
| 5 | F6S05 |
| 6 | F6S06 |

Instruction Leaflet/FRED Number 15606

① Type 4/4X handle mechanisms are available. Add suffix X to complete catalog number.

② Add suffix I to complete catalog number for IEC handle. Add suffix L to complete catalog number for 6-inch handle.

## Handle Mechanisms

Flange Mounted  
Type SM Safety

The SM safety handle mechanism provides a means of externally operating a circuit breaker mounted in an enclosure and is designed to reduce the possibility of circuit breaker tampering. The handle mechanism is especially suited for use in automotive and machine tool industries through its conformance to Type 12 and J. I. C. requirements. A specially modified handle mechanism for Type 4 enclosure application is also available order by description. The handle mechanism will accept up to three padlock shackles, each with a maximum diameter of 3/8 inch (9.52mm). UL File E64893.

## Ordering Information

| Description                         | Catalog Number  |        |
|-------------------------------------|-----------------|--------|
| F-Frame                             |                 |        |
| Right-Hand Mounting Enclosure Cover | Hinged on Left  | SM150R |
| Left-Hand Mounting Enclosure Cover  | Hinged on Right | SM150L |

Instruction Leaflet/FRED Number 14439

**J-Frame**

|                                     |                 |                |
|-------------------------------------|-----------------|----------------|
| Right-Hand Mounting Enclosure Cover | Hinged on Left  | <b>SM250JR</b> |
| Left-Hand Mounting Enclosure Cover  | Hinged on Right | <b>SM250JL</b> |

Instruction Leaflet/FRED Number 29C274

**K-Frame**

|                                     |                 |                |
|-------------------------------------|-----------------|----------------|
| Right-Hand Mounting Enclosure Cover | Hinged on Left  | <b>SM400KR</b> |
| Left-Hand Mounting Enclosure Cover  | Hinged on Right | <b>SM400KL</b> |

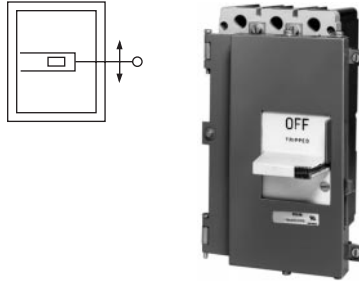
Instruction Leaflet/FRED Number 29C274

**L- and M-Frames**

|                 |               |
|-----------------|---------------|
| Hinged on Left  | <b>SM600R</b> |
| Hinged on Right | <b>SM600L</b> |

Instruction Leaflet/FRED Number 29C284

① Width spacer kits cannot be used with short rod at minimum enclosure depth.

Through-the-Door  
Type MC Motor Control

The MC motor control handle mechanism is a linear-operating, fixed-depth mechanism designed for through-the-door mounting in standardized and shallow depth enclosures. The handle mechanism provides positive operation and direct disconnect status indication. It is interlocked with the enclosure door so that the door can be opened only when the handle is set to OFF. (A defeater, supplied with the handle mechanism, can be used to bypass the interlock for maintenance and inspection.) The handle mechanism will accept up to three padlock shackles, each with a maximum diameter of 3/8 inch (7.92 mm). UL File E56845.

## Ordering Information

| Description                            | Catalog Number   |
|----------------------------------------|------------------|
| <b>F-Frame</b>                         |                  |
| For use with Type 1 Enclosure Catalog  | <b>SMCU150FD</b> |
| For use with Type 12 Enclosure Catalog | <b>CMCU150FD</b> |

Instruction Leaflet/FRED Number 14572

**J-Frame**

|                                        |                  |
|----------------------------------------|------------------|
| For use with Type 1 Enclosure Catalog  | <b>SMCU250JD</b> |
| For use with Type 12 Enclosure Catalog | <b>CMCU250JD</b> |

Instruction Leaflet/FRED Number 29C273

**K-Frame**

|                                        |                  |
|----------------------------------------|------------------|
| For use with Type 1 Enclosure Catalog  | <b>SMCU400KD</b> |
| For use with Type 12 Enclosure Catalog | <b>CMCU400KD</b> |

Instruction Leaflet/FRED Number 29C273

**M-Frames**

|                                        |                  |
|----------------------------------------|------------------|
| For use with Type 1 Enclosure Catalog  | <b>SMCU600LD</b> |
| For use with Type 12 Enclosure Catalog | <b>CMCU600LD</b> |

Instruction Leaflet/FRED Number 29C283

**Handle Mechanisms**
**Through-the-Door Rotary**


These compact rotary handle mechanisms are especially designed for use with the GD/GC/GHC circuit protection devices. The Close-Coupled version is designed for mounting in a shallow enclosure, while the Vari-Depth is suitable for deep enclosures.

Both G-frame handle mechanisms are suitable for use on Type 1 enclosures. In addition, the Vari-Depth handle mechanism is offered for use with Types 3R, 12, and 4X enclosures.

The new handles are a compact, plastic, general purpose design which is easy to install. These mechanisms are commonly used where high volume, standardized enclosures are being fabricated.

The Close-Coupled design is available with or without a shroud. The handle is offered in two colors; black or yellow. An escutcheon ring and interlock clip are provided as standard. This standard design includes a lock-off feature.

The Vari-Depth design includes an operating mechanism, shaft, and external handle. The handle is available in two colors; black or yellow. An external lock-off is included in the handle design. The shaft may be cut to size to fit the enclosure.

UL and CSA listed.

**Ordering Information**

| Breaker Frame | Enclosure Type | Handle Color | Shaft Length | Shroud Included | Catalog Number |
|---------------|----------------|--------------|--------------|-----------------|----------------|
|---------------|----------------|--------------|--------------|-----------------|----------------|

**G-Frame Vari-Depth Design**

(Catalog Number includes complete assembly consisting of handle, shaft, and operating mechanism.)

|           |               |        |           |   |                 |
|-----------|---------------|--------|-----------|---|-----------------|
| GD/GC/GHC | Type 1        | Black  | 14 inches | — | <b>HRGCV11L</b> |
| GD/GC/GHC | Type 1        | Yellow |           |   | <b>HRGCV31L</b> |
| GD/GC/GHC | Type 3R/12/4X | Black  |           |   | <b>HRGCV14L</b> |
| GD/GC/GHC | Type 3R/12/4X | Yellow |           |   | <b>HRGCV34L</b> |

**G-Frame Close-Coupled Design**

(Catalog Number includes complete assembly consisting of operating handle and door interlock.)

|           |        |        |   |     |                |
|-----------|--------|--------|---|-----|----------------|
| GD/GC/GHC | Type 1 | Black  | — | No  | <b>HRGCC10</b> |
| GD/GC/GHC | Type 1 | Black  |   | Yes | <b>HRGCC1S</b> |
| GD/GC/GHC | Type 1 | Yellow |   | No  | <b>HRGCC30</b> |
| GD/GC/GHC | Type 1 | Yellow |   | Yes | <b>HRGCC3S</b> |

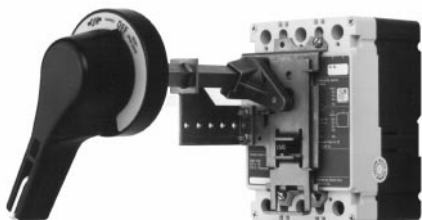
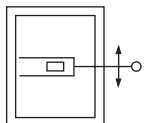
Instruction Leaflet/FRED Number 15567 (Close Coupled);

Instruction Leaflet/FRED Number 15569 (Variable Depth)



## Handle Mechanisms

## Through-the-Door Rotary



The general purpose rotary handle mechanisms are suitable for use with Types 1, 3R, (4, 4X), and 12 fabricated enclosures. They are designed for use with Series C F-frame circuit breakers, molded case switches, and motor circuit protectors (HMCP).

Required for a standard application are the operating handle, shaft, and mechanism.

The operating handle has been designed to meet NFPA 79 requirements. It may be mounted in either the horizontal or the vertical direction. The handle was ergonomically designed with extra clearance for a "gloved hand" to operate. It may be padlocked in the OFF position utilizing 3 padlocks.

The standard label on the operating handle indicates ON/Tripped/OFF/Reset. UL File E64893

To meet the various enclosure depths, four variable depth shafts are offered (6-inch, 12-inch, 16-inch, and 24-inch). Each shaft includes a support brace to ensure proper alignment. In addition, the 16-inch and 24-inch extra long shafts include an adjustable support bracket.

The standard mechanism located on the breaker does include means for internally locking the breaker in the "OFF" position with up to three padlocks each with a maximum diameter of .312-inch.

## Ordering Information

| Shaft Length<br>(Inches) | Complete Catalog Number <sup>①</sup> | Separate Style Number        |                                |                    | Catalog Number         |                        |
|--------------------------|--------------------------------------|------------------------------|--------------------------------|--------------------|------------------------|------------------------|
|                          |                                      | Standard Handle <sup>③</sup> | Breaker Mechanism <sup>④</sup> | Shaft <sup>⑤</sup> | IEC IP65 <sup>⑤⑥</sup> | IEC IP66 <sup>⑤⑥</sup> |

## F-Frame

|    |        |            |            |            |         |          |
|----|--------|------------|------------|------------|---------|----------|
| 6  | HM1R06 | 6648C22G01 | 6648C23G11 | 4217B37G04 | WHM1R06 | WHM1R06X |
| 12 | HM1R12 | 6648C22G01 | 6648C23G11 | 4217B37G01 | WHM1R12 | WHM1R12X |
| 16 | HM1R16 | 6648C22G01 | 6648C23G11 | 4217B37G02 | WHM1R16 | WHM1R16X |
| 24 | HM1R24 | 6648C22G01 | 6648C23G11 | 4217B37G03 | WHM1R24 | WHM1R24X |

Instruction Leaflet/FRED Number 15594

## J-Frame

|    |        |            |            |            |         |          |
|----|--------|------------|------------|------------|---------|----------|
| 6  | HM2R06 | 6648C22G01 | 6648C23G02 | 4217B37G04 | WHM2R06 | WHM2R06X |
| 12 | HM2R12 | 6648C22G01 | 6648C23G02 | 4217B37G01 | WHM2R12 | WHM2R12X |
| 16 | HM2R16 | 6648C22G01 | 6648C23G02 | 4217B37G02 | WHM2R16 | WHM2R16X |
| 24 | HM2R24 | 6648C22G01 | 6648C23G02 | 4217B37G03 | WHM2R24 | WHM2R24X |

Instruction Leaflet/FRED Number 15599

## K-Frame

|    |        |            |            |            |         |          |
|----|--------|------------|------------|------------|---------|----------|
| 6  | HM3R06 | 6648C22G01 | 6648C23G13 | 4217B37G04 | WHM3R06 | WHM3R06X |
| 12 | HM3R12 | 6648C22G01 | 6648C23G13 | 4217B37G01 | WHM3R12 | WHM3R12X |
| 16 | HM3R16 | 6648C22G01 | 6648C23G13 | 4217B37G02 | WHM3R16 | WHM3R16X |
| 24 | HM3R24 | 6648C22G01 | 6648C23G13 | 4217B37G03 | WHM3R24 | WHM3R24X |

Instruction Leaflet/FRED Number 15600

## L- and M-Frames

|    |        |            |            |            |         |          |
|----|--------|------------|------------|------------|---------|----------|
| 6  | HM4R06 | 6648C22G11 | 6648C23G07 | 4217B37G04 | WHM4R06 | WHM4R06X |
| 12 | HM4R12 | 6648C22G11 | 6648C23G07 | 4217B37G01 | WHM4R12 | WHM4R12X |
| 16 | HM4R16 | 6648C22G11 | 6648C23G07 | 4217B37G02 | WHM4R16 | WHM4R16X |
| 24 | HM4R24 | 6648C22G11 | 6648C23G07 | 4217B37G03 | WHM4R24 | WHM4R24X |

Instruction Leaflet/FRED Number 15601

## N-Frame

|    |        |            |            |            |         |          |
|----|--------|------------|------------|------------|---------|----------|
| 6  | HM5R06 | 6648C22G11 | 6648C23G07 | 4217B37G04 | WHM5R06 | WHM5R06X |
| 12 | HM5R12 | 6648C22G11 | 6648C23G07 | 4217B37G01 | WHM5R12 | WHM5R12X |
| 16 | HM5R16 | 6648C22G11 | 6648C23G07 | 4217B37G02 | WHM5R16 | WHM5R16X |
| 24 | HM5R24 | 6648C22G11 | 6648C23G07 | 4217B37G03 | WHM5R24 | WHM5R24X |

Instruction Leaflet/FRED Number 15602

Type 4/4X handles are similar to standard handles except they include an internal neoprene gasket. Type 4/4X handle style number is 6648C22G03. Due to gasketing effect between the handle and the housing, the handle may not indicate a tripped position.

## Accessories

As an option, an auxiliary switch is offered so that the control panel builder may electrically indicate the status of the breaker. This accessory would be mounted on the mechanism and comes with 24-inch pigtail leads.

|              |            |
|--------------|------------|
| Style Number | 5108A61G01 |
|--------------|------------|

**Refer to CD-ROM, SA.74A.01.T.E, for replacement type Vari-depth and AMT handle mechanisms.**

- ① Complete catalog number includes the standard handle, mechanism, shaft, and support brace/bracket.
- ② Handle is designed suitable for Types 1, 3R, and 12 enclosures. Use style number 6648C22G03 for Type 4/4X handle or add X suffix to complete catalog number.
- ③ The standard handle label indicates ON/Tripped/OFF/Reset.
- ③ Breaker mechanism includes a shaft support bracket and its parts.
- ④ Longer shafts (16-inch and 24-inch) include an adjustable support extension.
- ⑤ IEC Handle Mechanism supplied with Metric thread mounting hardware.
- ⑥ Complete Catalog Number includes a handle, mechanism and shaft.



**Handle Mechanisms**
**Door Hardware**
**F-, J-, K-, L- and M-Frames**

Door Hardware listed in this section may be used with Types SM and AMT handle mechanisms.

Three choices of door hardware and an auxiliary handle are offered to provide the best latching scheme for individual needs. The door hardware is designed with a provision for padlocking, and a coin-proof slot that requires the use of a tool to open the door.

Select desired hardware below. Additional latches can be ordered from accessories section if desired.

| Hardware Item                                                                       | Description and Catalog Number                                                                                                                                                                                 |
|-------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|   | With sliding latches for smaller panels up to approx. 30-inch high.<br><br>Catalog Number<br>Right Hand: <b>DH1R</b><br>Left Hand: <b>DH1L</b><br><br>Instruction Leaflet/FRED Number 13327(L); 13326(R)       |
|  | With 2-roller latches for intermediate panels up to approx. 40-inch high.<br><br>Catalog Number<br>Right Hand: <b>DH2R</b><br>Left Hand: <b>DH2L</b><br><br>Instruction Leaflet/FRED Number 13325(L); 13324(R) |
|  | With 3-roller latches for larger panels, approx. 40-inch and higher.<br><br>Catalog Number<br>Right Hand: <b>DH3R</b><br>Left Hand: <b>DH3L</b><br><br>Instruction Leaflet/FRED Number 13323(L); 13322(R)      |
|  | Auxiliary handle for larger panels.<br><br>Catalog Number<br>Right Hand: <b>DH4R</b><br>Left Hand: <b>DH4L</b>                                                                                                 |

**Note:** Right-hand enclosure cover hinged on left, left-hand enclosure cover hinged on right.

**Accessories**
**Dress Nameplates:**

Required to meet automotive specifications. Mounts from inside enclosure and covers operating mechanism mounting bolts; makes mechanism non-removable when enclosure door is closed.



| Description     | Style Number      |
|-----------------|-------------------|
| Dress Nameplate | <b>373D260G05</b> |

**Electrical Interlock Kit:** Provides 1 N.C. and 1 N.O. contacts (SPDT switch) for use with auxiliary circuits. Mounts to end of mechanism housing as shown.



| Description              | Style Number      |
|--------------------------|-------------------|
| Electrical Interlock Kit | <b>622B747G01</b> |

**Auxiliary Latch Kits:** Provide an additional latch for use with applications where two point latching may not be adequate.


**Sliding Latch**

**Rolling Latch**

| Description                                    | Style Number      |
|------------------------------------------------|-------------------|
| <b>For Door Hardware Using Sliding Latches</b> |                   |
| Right- or Left-Hand Mounting                   | <b>622B747G01</b> |
| <b>For Door Hardware Using Rolling Latches</b> |                   |
| Right-Hand Mounting                            | <b>370D801G04</b> |
| Left-Hand Mounting                             | <b>370D802G04</b> |

**Door Operated Interlock Defeater Kit for Type SM Mechanisms**

Required when door hardware is not used, operates as door closes. Additional method of securing door such as screw latch, also required (supplied by box manufacturer).

| Description                          | Style Number      |
|--------------------------------------|-------------------|
| Door Operated Interlock Defeater Kit | <b>623B214G02</b> |

**Remote Mounting Kit (J-Frame)**

Enables the operating mechanism to be mounted remotely on a vertical centerline from the circuit breaker or disconnect switch.

| Description         | Style Number      |
|---------------------|-------------------|
| Remote Mounting Kit | <b>505C367G01</b> |

**Handle Extension**


Handle extension is not included with J-, K-, L-, and M-Frame breakers. It must be purchased separately.

| Frame       | Catalog Number |
|-------------|----------------|
| <b>J, K</b> | <b>HEX3</b>    |
| <b>L, M</b> | <b>HEX4</b>    |

Handle extension is included with breaker with N- and R-Frame breakers.

| Frame    | Catalog Number |
|----------|----------------|
| <b>N</b> | <b>HEX5</b>    |
| <b>R</b> | <b>HEX6</b>    |

Type LFD



The LFD current limiter is an accessory that bolts to the load end of a standard FDB or FD thermal-magnetic circuit breaker, providing 200,000A interrupting capacity at up to 600 Vac. LFD current limiters for thermal-magnetic circuit breakers are listed with Underwriters Laboratories, Inc., under File E47239.

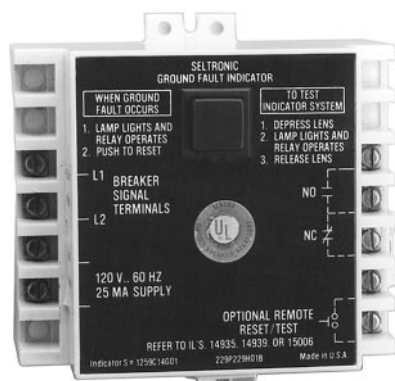
Ordering Information

| Circuit Breaker Rating Amperes① | Catalog Number |
|---------------------------------|----------------|
| 15-70                           | LFD3070R       |
| 80-160                          | LFD3150R       |

Instruction Leaflet/FRED Number 29C407

① Underwriters Laboratories Inc. listed under UL File E64983.

## Ground Fault Alarm Unit



The Ground Fault Alarm Unit is a remotely mounted device with a combination indicating light/test button that will light when the breaker trips or alarms on ground fault. The Ground Fault Alarm Unit requires a separate 120 Vac power source to power the light and the internal relay which has 1 N.O. and 1 N.C. contacts for remote indication. The Ground Fault Alarm Unit can be panel mounted for ordering with an optional face mounting bracket. For use on Digitrip 310 only. K- through N-frame.

### Ordering Information

| Catalog Number                            |
|-------------------------------------------|
| <b>GFAU</b> – Ground Fault Alarm Unit     |
| Style Number                              |
| <b>1264C67G01</b> – Face Mounting Bracket |

Instruction Leaflet/FRED Number 29C614 Diagram

## IQ Energy Sentinel



The IQ Energy Sentinel is a highly accurate, microprocessor-based, breaker-mounted device designed to

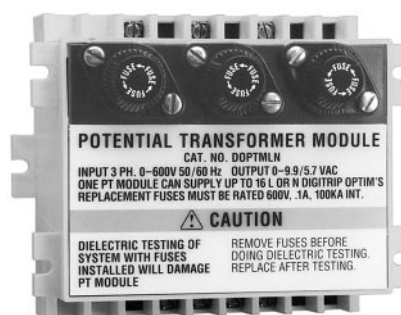
monitor power and energy readings. It represents an alternative to watt meters, watt-hour meters, and watt demand meters. Key advantages include savings in space, lower installation costs, and remote monitoring capability.

The IQ Energy Sentinel mounts on the load side of a Series C F-frame (150 ampere) circuit breaker. It can be applied on three-phase, four-wire systems, or single-phase, three-wire systems with voltage connected through phases A and C.

Instruction Leaflet/FRED Number 17437

For more information see Descriptive Bulletin 8178.

## Potential Transformer Module



The Potential Transformer Module is required for Series C, Digitrip OPTIM 1050, to provide a voltage input to allow the trip unit to monitor power and energy as well as power factor. The Potential Transformer Module is a 6 VA transformer with a primary voltage input of up to 600V line to line. Three 0.1 ampere fuses are provided on the primary of the transformer and can be used for isolation purposes during dielectric testing. The device is normally panel mounted and can feed up to 16 OPTIM trip units.

### Ordering Information

| Description                  | Catalog Number |
|------------------------------|----------------|
| Potential Transformer Module | <b>DOPTMLN</b> |

Instruction Leaflet/FRED Number 29C894 Diagram

## Solid-State (Electronic) Portable Test Kit

The solid-state (electronic) portable test kit provides verification of performance of all ratings of Digitrip 310 electronic trip units installed in Series C circuit breakers while in service under varying load and/or phase imbalance. The test kit operates on 120-volt, 50/60 Hz power; it includes complete instructions and test times for testing long time, short time/instantaneous operation and optional ground fault operation of the circuit breaker.

### Ordering Information

| Description                                | Catalog Number |
|--------------------------------------------|----------------|
| Solid-State (Electronic) Portable Test Kit | <b>STK2</b>    |

① Model 550 OPTIMs require the Cutler-Hammer PowerNet field upgrade kit.

## OPTIM System Components

Breaker Interface Module  
(BIM)

The Breaker Interface Module (BIM) is a panel mounted user interface device that is mounted on the front of an electrical assembly or at a remote location. The BIM is used to access, configure, test and display information for OPTIM trip units and other devices. The BIM consists of four display windows, eight function buttons, 18 LEDs, and a graphical time/current curve to provide breaker status, operational information, protection status and energy monitoring. A 24 Vdc power supply is required to provide power to the BIM. This is supplied by the switchboard builder to Cutler-Hammer specifications. The BIM is a member of the Cutler-Hammer PowerNet family of communicating devices that connects OPTIM trip units, Digitrip RMS 810/910 trip units and energy sentinels as a subnetwork system. The BIM can also be connected to a main network via a PONI module to Cutler-Hammer PowerNet software.

## Ordering Information

Catalog Number

BIM

Instruction Leaflet/FRED Number 29C893

## Digitrip OPTIMizer



The Digitrip OPTIMizer is a handheld programmer that is used to access, configure, test and display information from OPTIM trip units. The OPTIMizer plugs into the front of an OPTIM trip unit via an eight-pin telephone jack and is powered by a nine-volt battery or the auxiliary power module. In addition, a three-pin INCOM network connection is also provided to program other OPTIM devices on the system. An Auxiliary Power Module connection provides a trip test when control power is not present at the breaker. The OPTIMizer is supplied as a standard package to include the programmer, the eight-pin connection cord, battery and carrying case. The Auxiliary Power Module is optional.

## Ordering Information

Catalog Number

OPTIMizer – Standard Package

Instruction Leaflet/FRED Number 29C892

## Auxiliary Power Module



The Auxiliary Power Module is a power supply requiring 120 Vac input at 50 or 60 Hz that provides a 32 Vdc output<sup>①</sup>. The Auxiliary Power Module provides control power for testing an OPTIM trip unit when other means of control power is not available or for continuous OPTIMizer operation versus temporary with a battery. The Auxiliary Power Module connects into the top of the Digitrip OPTIMizer via a keyed receptacle. The main application for the Auxiliary Power Module would be for the testing of a stand-alone non-communicating OPTIM breaker that ordinarily would not have control power.

## Ordering Information

Catalog Number

PRTAAPM

Cutler-Hammer PowerNet  
Software

Series C Digitrip OPTIM trip units can communicate back to a central Personal Computer by installing Cutler-Hammer PowerNet software<sup>②</sup>. In addition other software packages are available to allow the user to configure the trip units as well as monitor system performance.

Instruction Leaflet/FRED Number 29C890

① The OPTIMizer can work off of 32 Vdc control power, although 24 Vdc is the standard on OPTIM breakers.

② Model 550 OPTIMIS require the Cutler-Hammer PowerNet field upgrade kit.

## Note: 24 Vdc Power Supply

A 24 Vdc power supply is required for all Digitrip OPTIM trip units that are required to communicate either on the main Cutler-Hammer PowerNet network or as a subnetwork to a BIM. The breaker's load is 45 mA of current. Typically one power supply is required per switchboard and can provide control power to a BIM and the OPTIM trip units. The 24 Vdc power supply should be an "isolated high quality" power supply with a "CE" label, and is normally provided by the switchboard manufacturer to Cutler-Hammer recommendations.

## Special Calibration<sup>①</sup>

Special non-UL-listed calibrations are available for certain ambient temperatures other than 40°C and for frequencies other than 50/60 Hz or Dc. Reduced interrupting ratings will apply for 400 Hz applications. Maximum thermal calibration is limited to 135A at 400 Hz.

Suffix H01 400 Hz.

See Application Data 29-160 for information regarding special conditions.

## 50°C Calibration<sup>①</sup>

Add suffix "V" to catalog number for complete breaker, listed above, when ordering listed ampere ratings for breakers to be used in 50°C ambients.

## Moisture-Fungus Treatment

All Series C circuit breaker cases are molded from glass-polyester which does not support the growth of fungus. Any parts which are susceptible to the growth of fungus will require special treatment.

Suffix J01 Fungus Treated

## Freeze-Tested Circuit Breakers

The circuit breakers may be ordered with freeze testing. This option uses special lubrication and mechanical operation is verified at -40°C.

Suffix F01 Freeze Tested.

## Marine Applications

F-Frame circuit breakers can be supplied to meet the following marine specifications:

U.S. Coast Guard CFR 46 ABS –  
American Bureau of Shipping  
IEEE 45

These specifications generally require molded case circuit breakers to be supplied with 50°C ambient calibration, special nameplating, and plug-in adapter kits. When plug-in adapter kits are used, no terminals need be supplied.

Series C circuit breakers can also be supplied to meet UL489 Supplement SA (Marine Use) and UL489 Supplement SB (Naval Use).

UL489 Supplement SA applies to vessels over 65 feet in length. Requirements include 40°C ambient calibration, special labeling, and no use of aluminum conductors or terminals.

Suffix H08 "Marine."

UL489 Supplement SB requires 50°C ambient calibration, vibration testings, special nameplating and no use of aluminum conductors or terminals.

Suffix H09 "Naval."

<sup>①</sup> Not listed with Underwriters Laboratories, Inc.

<sup>②</sup> For use with standard 35 mm DIN rail such as, 35 x 7.5 or 15 mm per DIN EN50022.



**NEMA 1 General Purpose**

**Surface or Flush Mounting**  
**15-1200 Ampere Range**  
**600 Volts Ac, 500 Volts Dc**

NEMA 1 enclosed breakers are designed for indoor use in commercial buildings, apartment buildings and other areas where a general purpose enclosure is applicable. The breaker is front operable and is capable of being padlocked in the Off position. (Padlocking not available on enclosures for Quicklag® breakers.) Ratings through 1200 amperes are listed with Underwriters Laboratories, Inc. as suitable for service entrance application. Both surface and flush mounted enclosures are available. UL File Number E7819. CSA File Number LR84319.

**NEMA 3R Rainproof Surface Mounting**

**Interchangeable Hubs (through 400 amperes)**  
**15-1200 Ampere Range**  
**600 Volts Ac, 500 Volts Dc**

This general purpose outdoor service center employs a circuit breaker inside a weatherproof sheet steel enclosure to serve as a main disconnect and protective device for feeder circuits. The operating handle can be padlocked in the Off position, and is interlocked to prevent the door from opening when the breaker is On. Ratings through 1200 amperes are listed by Underwriters Laboratories, Inc. as suitable for service entrance application. UL File Number E7819. CSA File Number LR84319.

**NEMA 4/4X, 5 Water and Dustproof**

**Stainless Steel – Type 304**  
**Surface Mounting**  
**15-1200 Ampere Range**  
**600 Volts Ac, 500 Volts Dc**

This enclosure meets NEMA 4/4X and 5 requirements for water and dustproof applications and has no knockouts or other openings. It is particularly well suited for use in dairies, borax mines, breweries, paper mills and other process industries. The operating handle can be padlocked in the Off position, and is interlocked to prevent the door from opening when the breaker is On. Ratings through 1200 amperes are Underwriters Laboratories, Inc. listed as suitable for service entrance application. UL File Number E7819. CSA File Number LR84319.

**NEMA 12 Dustproof Surface Mounting**

**No Knockouts or Other Openings**  
**15-1200 Ampere Range**  
**600 Volts Ac, 500 Volts Dc**

The Type 12 enclosure is designed in line with specifications for special industry application where unusually

severe conditions involving oil, coolant, dust and other foreign materials exist in the operating atmosphere. The handle padlocks in the Off position and the cover is interlocked with the handle mechanism to prevent opening the cover with the circuit breaker in the On position. Ratings through 1200 amperes are listed by Underwriters Laboratories, Inc. as suitable for service entrance application. A NEMA 12 semi-dust-tight design which includes knockouts is available. These units are rated 15-400 amperes, 600 volts Ac, 500 volts Dc. UL File Number E7819. CSA File Number LR84319.

**NEMA 7, 9 Hazardous Location**

**Cast Aluminum, Explosionproof**  
**Surface Mounting**  
**15-800 Ampere Range**  
**600 Volts Ac, 250 Volts Dc**

Hazardous location, Class I, Groups B (except XFDN050), C, D; Class II, Groups E, F, G. This special service cast aluminum enclosure is supplied with a wide, machined flanged cover to prevent igniting outside atmospheres by arcing from inside the enclosure. Front operable, the handle padlocks in the Off position. Enclosures rated 600 amperes and above have lift-off hinges for ease of assembly. UL and cUL File Number E71279.

Enclosure Only Catalog Numbers Selection Guide<sup>①</sup>

| Breaker Frame                                                | Breaker<br>Ampere Range | Enclosure                                                    |                                                                |
|--------------------------------------------------------------|-------------------------|--------------------------------------------------------------|----------------------------------------------------------------|
|                                                              |                         | NEMA Class                                                   | Catalog Number                                                 |
| Series C® Breakers                                           |                         |                                                              |                                                                |
| GC, GHC, GD<br>2- and 3-Pole only<br>GHCGFEP®<br>1-Pole Only | 15-100                  | 1 Surface<br>3R<br>12<br>12K<br>4/4X, 5 St. Steel            | SGDN100®<br>RGDN100<br>JGDN100<br>DGDN100<br>WGDN100           |
| EHD, FD, FDB,<br>HFD, FDC                                    | 15-100                  | 1 Surface<br>1 Flush<br>3R<br>12<br>12K<br>4/4X, 5 St. Steel | SFDN100<br>FFDN100<br>RFDN100<br>JFDN100<br>DFDN100<br>WFDN100 |
| EHD, FD, FDB<br>HFD, FDC                                     | 15-50<br>60-225④        | 7/9 Cast Aluminum<br>7/9 Cast Aluminum                       | XFDN050<br>XFDN225                                             |
| FD, FDB, HFD, FDC,<br>ED, EDH, EDC                           | 125-225                 | 1 Surface<br>1 Flush<br>3R<br>12<br>12K<br>4/4X, 5 St. Steel | SFDN225<br>FFDN225<br>RFDN225<br>JFDN225<br>DFDN225<br>WFDN225 |
| JD, JDB, HJD, JDC                                            | 125-250                 | 1 Surface<br>1 Flush<br>3R<br>12<br>12K<br>4/4X, 5 St. Steel | SJDN250<br>FJDN250<br>RJDN250<br>JJDN250<br>DJDN250<br>WJDN250 |
| JD, JDB, HJD, JDC                                            | 125-250                 | 7/9 Cast Aluminum                                            | XJDN250                                                        |
| KD, KDB, HKD, KDC, DK                                        | 125-400                 | 1 Surface<br>1 Flush<br>3R<br>12<br>12K<br>4/4X, 5 St. Steel | SKDN400<br>FKDN400<br>RKDN400<br>JKDN400<br>DKDN400<br>WKDN400 |
| KD, KDB, HKD, KDC, DK                                        | 125-400                 | 7/9 Cast Aluminum                                            | XKDN400                                                        |
| LD, LDB, HLD, LDC                                            | 300-600                 | 1 Surface<br>3R<br>12<br>4/4X, 5 St. Steel                   | SLDN600<br>RLDN600<br>JLDN600<br>WLDN600                       |
| LD, LDB, HLD, LDC<br>MD, MDS                                 | 300-600<br>400-800      | 7/9 Cast Aluminum                                            | XMCN800                                                        |
| MD, MDS, ND, NDC,<br>HND                                     | 400-1200                | 1 Surface<br>3R<br>12<br>4/4X, 5 St. Steel                   | SNDN1200<br>RNDN1200<br>JNDN1200<br>WNDN1200                   |
| ND, HND, NDC                                                 |                         | 7/9 Cast Aluminum                                            | XNDN1200                                                       |

Earth Leakage Breakers<sup>⑤</sup>

|                                        |        |                                                 |                                                                                                              |
|----------------------------------------|--------|-------------------------------------------------|--------------------------------------------------------------------------------------------------------------|
| ELFD, ELHFD and ELFDC<br>(3-Pole Only) | 15-100 | 1 Surface<br>1 Flush<br>3R<br>12<br>12K<br>4/4X | <b>SFD100E</b><br><b>FFD100E</b><br><b>RFDN100E</b><br><b>JFDN100E</b><br><b>DFDN100E</b><br><b>WFDN100E</b> |
|----------------------------------------|--------|-------------------------------------------------|--------------------------------------------------------------------------------------------------------------|

## Current Limit-R Breakers

|                  |         |                                            |                                                                          |
|------------------|---------|--------------------------------------------|--------------------------------------------------------------------------|
| FCL              | 15-100  | 3R<br>12<br>12K<br>4/4X, 5 St. Steel       | <b>RFDN150</b><br><b>JFDN150</b><br><b>DFDN150</b><br><b>WFDN150</b>     |
| LCL <sup>⑥</sup> | 125-400 | 1 Surface<br>3R<br>12<br>4/4X, 5 St. Steel | <b>SNDN1200</b><br><b>RNDN1200</b><br><b>JNDN1200</b><br><b>WNDN1200</b> |

## TRI-PAC® Breakers

|                   |         |                                      |                                                                          |
|-------------------|---------|--------------------------------------|--------------------------------------------------------------------------|
| FB-P              | 15-100  | 3R<br>12<br>12K<br>4/4X, 5 St. Steel | <b>RFDN150</b><br><b>JFDN150</b><br><b>DFDN150</b><br><b>WFDN150</b>     |
| LA-P <sup>⑦</sup> | 70-400  | 1 Surface<br>3R<br>12<br>4/4X        | <b>SNDN1200</b><br><b>RNDN1200</b><br><b>JNDN1200</b><br><b>WNDN1200</b> |
| NB-P              | 500-800 | 12<br>4/4X, 5 St. Steel              | <b>JNDPN800</b><br><b>WNDPN800</b>                                       |

Neutral Kits, Insulated and Groundable<sup>⑧</sup>

| Maximum Enclosure Rating (Amperes) | Main Lug Size Cu/Al                             | Ground Lug Size Cu/Al | Catalog Number |
|------------------------------------|-------------------------------------------------|-----------------------|----------------|
| 100                                | (1) 14-1/0                                      | (1) 14-1/0            | <b>INK100</b>  |
| 250                                | (1) 6-350 kcmil                                 | (1) 4-300 kcmil       | <b>INK250</b>  |
| 400                                | (1) 4-750 kcmil or<br>(2) 1/0-250 kcmil         | (1) 4-300 kcmil       | <b>INK400</b>  |
| 600                                | (2) 250-500 kcmil                               | (1) 4-300 kcmil       | <b>INK600</b>  |
| 1200                               | (3) 1/0 to 750 kcmil or<br>(4) 1/0 to 750 kcmil | (1) #6-250 kcmil      | <b>INK1200</b> |

## Raintight Hubs

|  | Hub Diameter in Inches     |                                 | Catalog Number                                                                         |
|------------------------------------------------------------------------------------|----------------------------|---------------------------------|----------------------------------------------------------------------------------------|
|                                                                                    | <b>Small Hubs</b>          |                                 |                                                                                        |
|                                                                                    | For use with RGDN and RFDN | 3/4<br>1<br>1-1/4<br>1-1/2<br>2 | <b>DS075H1</b><br><b>DS100H1</b><br><b>DS125H1</b><br><b>DS150H1</b><br><b>DS200H1</b> |
|                                                                                    | <b>Large Hubs</b>          |                                 |                                                                                        |
| For use with RJDN. (RKDN has two cutouts)                                          |                            | 2<br>2-1/2<br>3                 | <b>R1H200</b><br><b>R1H250</b><br><b>R1H300</b>                                        |
| Required if using Type DS hubs on RJDN and RKDN enclosures.                        |                            |                                 | <b>R1HA</b>                                                                            |

All rainproof enclosures 30A through 400A are shipped with plate over cutout. Hubs are not supplied with screws on 30A through 400A enclosures. Use screws from plate.

Breather and Drain, Hazardous Enclosures<sup>⑤</sup>

| Description                                                                                                                                                                                                                              | Compliance                                                                                                                | Conduit Opening | Catalog Number |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------|-----------------|----------------|
| A Universal Breather/ Drain Fitting is installed in the top of an enclosure to provide ventilation to minimize condensation and in the bottom to allow drainage of accumulated condensation while maintaining explosion proof integrity. | Type BD:<br>NEMA 7 – Class I, Groups C, D; Class I, Zone 1, Group IIB<br>NEMA 9 – Class II, Groups F, G                   | 1/2             | <b>XPBD2</b>   |
|                                                                                                                                                                                                                                          | Type DBB:<br>NEMA 7 – Class I, Groups B, C, D; Class I, Zone 1, Group IIB + Hydrogen<br>NEMA 9 – Class II, Groups E, F, G | 1/2             | <b>XPDBB50</b> |

- ① Enclosures only shown above; if an assembled enclosed circuit breaker is required refer to Cutler-Hammer Satellite.
- ② Suitable for use with one-pole breaker base mounting plate kit. OCCBP required.
- ③ Enclosure must have date stamp later than 4-15-98.
- ④ Maximum wire size: 4/0.
- ⑤ Availability to be announced.
- ⑥ LCL requires additional adapter plate 1223C06G01.
- ⑦ LA-P requires additional adapter plate S/N 1223C06G02.
- ⑧ If ground fault protection is required, contact regional satellite.

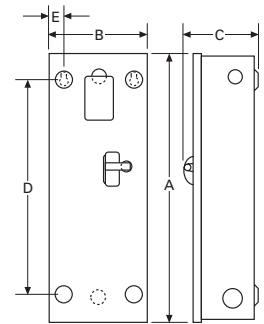
## Dimensions and Shipping Weights

Not to be used for construction purposes unless approved.

Inches and Millimeters.

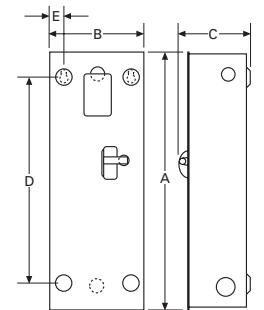
## NEMA 1 Surface Mounted

| Catalog Number | App. Wt. Lbs. | Max. Amperes | Dimensions        |      |                   |     |                   |     |                   |      |                  |    | Conduit Sizes, Inches        |
|----------------|---------------|--------------|-------------------|------|-------------------|-----|-------------------|-----|-------------------|------|------------------|----|------------------------------|
|                |               |              | A                 |      | B                 |     | C                 |     | D                 |      | E                |    |                              |
|                |               |              | Inches            | mm   | Inches            | mm  | Inches            | mm  | Inches            | mm   | Inches           | mm |                              |
| SGDN100        | 12            | 100          | 17½               | 444  | 8⅝ <sub>32</sub>  | 214 | 6⅝ <sub>32</sub>  | 160 | 13⅝ <sub>32</sub> | 331  | 1⅝ <sub>64</sub> | 31 | ¼, ½, ¾, 1, 1¼, 1½, 2, 2½    |
| SFDN100        | 12            | 100          | 17½               | 444  | 8⅝ <sub>32</sub>  | 214 | 6⅝ <sub>32</sub>  | 160 | 13⅝ <sub>32</sub> | 331  | 1⅝ <sub>64</sub> | 31 | ¼, ½, ¾, 1, 1¼, 1½, 2, 2½    |
| SFDN150        | 15            | 150          | 23¼               | 591  | 8⅝ <sub>32</sub>  | 214 | 6⅝ <sub>32</sub>  | 160 | 18¾               | 476  | 1⅝ <sub>64</sub> | 31 | ¼, ½, ¾, 1, 1¼, 1½, 2, 2½    |
| SFDN225        | 15            | 225          | 23¼               | 591  | 8⅝ <sub>32</sub>  | 214 | 6⅝ <sub>32</sub>  | 160 | 18¾               | 476  | 1⅝ <sub>64</sub> | 31 | ¼, ½, ¾, 1, 1¼, 1½, 2, 2½    |
| SJDN250        | 31            | 250          | 34⅞ <sub>64</sub> | 881  | 10⅝ <sub>64</sub> | 227 | 7⅞ <sub>64</sub>  | 183 | 30                | 762  | 1⅞               | 48 | ¼, ½, 2, 2½, 3               |
| SKDN400        | 53            | 400          | 38⅜ <sub>16</sub> | 986  | 11⅜ <sub>16</sub> | 281 | 10⅝ <sub>16</sub> | 278 | 34                | 869  | 2⅝ <sub>32</sub> | 58 | ¼, ½, ¾, 1, 1½, 2, 2½, 3, 3½ |
| SLDN600        | 81            | 600          | 45⅞               | 1165 | 14⅜ <sub>16</sub> | 364 | 12⅝               | 314 | 46⅞ <sub>16</sub> | 1183 | 1⅞ <sub>32</sub> | 48 | ¼, ½, ¾, 3, 3½, 4            |
| SNDN1200       | 178           | 1200         | 61⅜ <sub>32</sub> | 1555 | 21⅜ <sub>16</sub> | 545 | 15⅝ <sub>32</sub> | 391 | 61⅜ <sub>32</sub> | 1571 | 1⅝ <sub>32</sub> | 50 |                              |



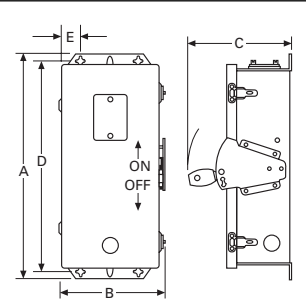
## NEMA 1 Flush Mounted

|         |    |     |                   |      |                   |     |                   |     |                   |     |                  |    |                              |
|---------|----|-----|-------------------|------|-------------------|-----|-------------------|-----|-------------------|-----|------------------|----|------------------------------|
| FFDN100 | 12 | 100 | 18⅜ <sub>16</sub> | 478  | 9⅞ <sub>32</sub>  | 247 | 6⅞ <sub>32</sub>  | 160 | 13⅜ <sub>32</sub> | 331 | 1⅝ <sub>64</sub> | 47 | ¼, ½, ¾, 1, 1¼, 1½, 2, 2½    |
| FFDN150 | 15 | 150 | 24⅞ <sub>16</sub> | 624  | 9⅞ <sub>32</sub>  | 247 | 6⅞ <sub>32</sub>  | 160 | 18¾               | 476 | 1⅝ <sub>64</sub> | 47 | ¼, ½, ¾, 1, 1¼, 1½, 2, 2½    |
| FFDN225 | 15 | 225 | 24⅞ <sub>16</sub> | 624  | 9⅞ <sub>32</sub>  | 247 | 6⅞ <sub>32</sub>  | 160 | 18¾               | 476 | 1⅝ <sub>64</sub> | 47 | ¼, ½, ¾, 1, 1¼, 1½, 2, 2½    |
| FJDN250 | 32 | 250 | 36⅞ <sub>64</sub> | 915  | 12⅞ <sub>64</sub> | 311 | 7⅞ <sub>64</sub>  | 183 | 30                | 762 | 1⅞               | 48 | ¼, ½, 2, 2½, 3               |
| FKDN400 | 53 | 400 | 40⅞               | 1019 | 12⅞               | 314 | 10⅝ <sub>16</sub> | 278 | 34                | 869 | 2⅞ <sub>16</sub> | 75 | ¼, ½, ¾, 1, 1½, 2, 2½, 3, 3½ |



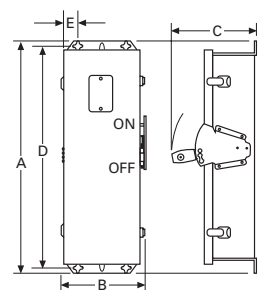
## NEMA 12, 12K Dustproof

|          |     |      |                   |      |                   |     |                   |     |                   |      |                  |     |                              |
|----------|-----|------|-------------------|------|-------------------|-----|-------------------|-----|-------------------|------|------------------|-----|------------------------------|
| JGDN100  | 14  | 100  | 19⅝ <sub>32</sub> | 506  | 8⅞ <sub>32</sub>  | 225 | 9⅞ <sub>16</sub>  | 237 | 18⅜ <sub>32</sub> | 471  | 1⅝ <sub>64</sub> | 43  |                              |
| JFDN100  | 14  | 100  | 19⅝ <sub>32</sub> | 506  | 8⅞ <sub>32</sub>  | 225 | 9⅞ <sub>16</sub>  | 237 | 18⅜ <sub>32</sub> | 471  | 1⅝ <sub>64</sub> | 43  |                              |
| JFDN150  | 18  | 150  | 25⅞ <sub>32</sub> | 652  | 8⅞ <sub>32</sub>  | 225 | 9⅞ <sub>16</sub>  | 237 | 24⅞ <sub>32</sub> | 617  | 1⅝ <sub>64</sub> | 43  |                              |
| JFDN225  | 18  | 225  | 25⅞ <sub>32</sub> | 652  | 8⅞ <sub>32</sub>  | 225 | 9⅞ <sub>16</sub>  | 237 | 24⅞ <sub>32</sub> | 617  | 1⅝ <sub>64</sub> | 43  |                              |
| JJDN250  | 37  | 250  | 37⅞ <sub>32</sub> | 953  | 11⅞ <sub>16</sub> | 294 | 10⅞ <sub>32</sub> | 260 | 35⅞ <sub>64</sub> | 909  | 1⅞ <sub>16</sub> | 49  |                              |
| JKDN400  | 58  | 400  | 41⅞ <sub>16</sub> | 1059 | 11¾               | 298 | 14⅞ <sub>16</sub> | 357 | 39⅞ <sub>16</sub> | 1014 | 1⅜ <sub>32</sub> | 150 |                              |
| JLDN600  | 81  | 600  | 48⅞ <sub>16</sub> | 1227 | 14⅞ <sub>32</sub> | 379 | 15⅞               | 394 | 46⅞ <sub>16</sub> | 1183 | 1⅞ <sub>64</sub> | 49  |                              |
| JNDPN800 | 110 | 800  | 63⅞ <sub>32</sub> | 1545 | 22                | 559 | 17⅞               | 448 | —                 | —    | —                | —   |                              |
| JNDN1200 | 170 | 1200 | 63⅞ <sub>32</sub> | 1545 | 22                | 559 | 17⅞               | 448 | 61⅞ <sub>32</sub> | 1571 | 1⅜ <sub>32</sub> | 50  |                              |
| DGDN100  | 16  | 100  | 19⅝ <sub>32</sub> | 506  | 8⅞ <sub>32</sub>  | 225 | 9⅞ <sub>16</sub>  | 237 | —                 | —    | —                | —   | ¼, ½, ¾, 1, 1¼, 1½, 2, 2½    |
| DFDN100  | 16  | 100  | 19⅝ <sub>32</sub> | 506  | 8⅞ <sub>32</sub>  | 225 | 9⅞ <sub>16</sub>  | 237 | —                 | —    | —                | —   | ¼, ½, ¾, 1, 1¼, 1½, 2, 2½    |
| DFDN150  | 19  | 150  | 25⅞ <sub>32</sub> | 652  | 8⅞ <sub>32</sub>  | 225 | 9⅞ <sub>16</sub>  | 237 | —                 | —    | —                | —   | ¼, ½, ¾, 1, 1¼, 1½, 2, 2½    |
| DFDN225  | 19  | 225  | 25⅞ <sub>32</sub> | 652  | 8⅞ <sub>32</sub>  | 225 | 9⅞ <sub>16</sub>  | 237 | —                 | —    | —                | —   | ¼, ½, ¾, 1, 1¼, 1½, 2, 2½    |
| DJDN250  | 36  | 250  | 37⅞ <sub>32</sub> | 953  | 11⅞ <sub>16</sub> | 294 | 10⅞ <sub>32</sub> | 260 | —                 | —    | —                | —   | ¼, ½, 2, 2½, 3               |
| DKDN400  | 53  | 400  | 41⅞ <sub>16</sub> | 1059 | 11¾               | 298 | 14⅞ <sub>16</sub> | 357 | —                 | —    | —                | —   | ¼, ½, ¾, 1, 1½, 2, 2½, 3, 3½ |



## NEMA 3R Rainproof

|          |     |      |                   |      |                   |     |                   |     |                   |      |                  |    |                       |
|----------|-----|------|-------------------|------|-------------------|-----|-------------------|-----|-------------------|------|------------------|----|-----------------------|
| RGDN100  | 14  | 100  | 19⅝ <sub>32</sub> | 458  | 8⅞ <sub>32</sub>  | 225 | 9⅞ <sub>16</sub>  | 237 | 18⅜ <sub>32</sub> | 471  | 1⅝ <sub>64</sub> | 43 | ¼, ½, ¾, 1, 1¼, 2, 2½ |
| RFDN100  | 14  | 100  | 19⅝ <sub>32</sub> | 458  | 8⅞ <sub>32</sub>  | 225 | 9⅞ <sub>16</sub>  | 237 | 18⅜ <sub>32</sub> | 471  | 1⅝ <sub>64</sub> | 43 | ¼, ½, ¾, 1, 1¼, 2, 2½ |
| RFDN150  | 19  | 150  | 25⅞ <sub>32</sub> | 603  | 8⅞ <sub>32</sub>  | 225 | 9⅞ <sub>16</sub>  | 237 | 24⅞ <sub>32</sub> | 617  | 1⅝ <sub>64</sub> | 43 | ¼, ½, ¾, 1, 1¼, 2, 2½ |
| RFDN225  | 19  | 225  | 25⅞ <sub>32</sub> | 603  | 8⅞ <sub>32</sub>  | 225 | 9⅞ <sub>16</sub>  | 237 | 24⅞ <sub>32</sub> | 617  | 1⅝ <sub>64</sub> | 43 | ¼, ½, ¾, 1, 1¼, 2, 2½ |
| RJDN250  | 40  | 250  | 37⅞ <sub>32</sub> | 891  | 11⅞ <sub>16</sub> | 294 | 10⅞ <sub>32</sub> | 260 | 35⅞ <sub>64</sub> | 909  | 1⅞ <sub>16</sub> | 49 | ¼, ½, 2, 2½, 3        |
| RKDN400  | 60  | 400  | 41⅞ <sub>16</sub> | 997  | 11¾               | 298 | 14⅞ <sub>16</sub> | 357 | 39⅞ <sub>16</sub> | 1014 | 1⅜ <sub>32</sub> | 50 | ¼, ½, ¾, 2½, 3, 3½    |
| RLDN600  | 84  | 600  | 48⅞ <sub>16</sub> | 1227 | 14⅞ <sub>32</sub> | 379 | 15⅞               | 394 | 46⅞ <sub>16</sub> | 1183 | 1⅞ <sub>64</sub> | 49 | ¼, ½, ¾, 3, 3½, 4     |
| RNDN1200 | 175 | 1200 | 63⅞ <sub>32</sub> | 1615 | 22                | 559 | 17⅞               | 448 | 61⅞ <sub>32</sub> | 1571 | 1⅜ <sub>32</sub> | 50 |                       |



(Continued)



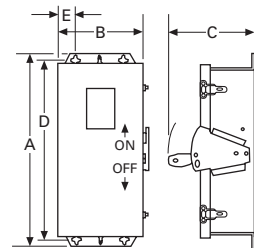
## Dimensions and Shipping Weights

Not to be used for construction purposes unless approved.

Inches and Millimeters.

### NEMA 4/4X, 5 Stainless Steel

| Catalog Number | App. Wt. Lbs. | Max. Amperes | Dimensions                      |      |                                 |     |                                 |     |                                 |      |                                |    |
|----------------|---------------|--------------|---------------------------------|------|---------------------------------|-----|---------------------------------|-----|---------------------------------|------|--------------------------------|----|
|                |               |              | A                               |      | B                               |     | C                               |     | D                               |      | E                              |    |
|                |               |              | Inches                          | mm   | Inches                          | mm  | Inches                          | mm  | Inches                          | mm   | Inches                         | mm |
| WGDN100        | 16            | 100          | 19 <sup>3</sup> / <sub>32</sub> | 506  | 8 <sup>7</sup> / <sub>32</sub>  | 225 | 9 <sup>1</sup> / <sub>16</sub>  | 237 | 18 <sup>1</sup> / <sub>32</sub> | 471  | 1 <sup>4</sup> / <sub>64</sub> | 43 |
| WFDN100        | 16            | 100          | 19 <sup>3</sup> / <sub>32</sub> | 506  | 8 <sup>7</sup> / <sub>32</sub>  | 225 | 9 <sup>1</sup> / <sub>16</sub>  | 237 | 18 <sup>1</sup> / <sub>32</sub> | 471  | 1 <sup>4</sup> / <sub>64</sub> | 43 |
| WFDN150        | 20            | 150          | 25 <sup>2</sup> / <sub>32</sub> | 652  | 8 <sup>7</sup> / <sub>32</sub>  | 225 | 9 <sup>1</sup> / <sub>16</sub>  | 237 | 24 <sup>3</sup> / <sub>32</sub> | 617  | 1 <sup>4</sup> / <sub>64</sub> | 43 |
| WFDN225        | 20            | 225          | 25 <sup>2</sup> / <sub>32</sub> | 652  | 8 <sup>7</sup> / <sub>32</sub>  | 225 | 9 <sup>1</sup> / <sub>16</sub>  | 237 | 24 <sup>3</sup> / <sub>32</sub> | 617  | 1 <sup>4</sup> / <sub>64</sub> | 43 |
| WJDN250        | 39            | 250          | 37 <sup>1</sup> / <sub>2</sub>  | 953  | 11 <sup>7</sup> / <sub>16</sub> | 294 | 10 <sup>3</sup> / <sub>32</sub> | 260 | 35 <sup>4</sup> / <sub>64</sub> | 909  | 1 <sup>5</sup> / <sub>16</sub> | 49 |
| WKDN400        | 60            | 400          | 41 <sup>1</sup> / <sub>16</sub> | 1059 | 11 <sup>3</sup> / <sub>4</sub>  | 298 | 14 <sup>1</sup> / <sub>16</sub> | 357 | 39 <sup>1</sup> / <sub>16</sub> | 1014 | 1 <sup>3</sup> / <sub>32</sub> | 50 |
| WLDN600        | 88            | 600          | 48 <sup>3</sup> / <sub>16</sub> | 1227 | 14 <sup>2</sup> / <sub>32</sub> | 379 | 15 <sup>1</sup> / <sub>2</sub>  | 394 | 46 <sup>9</sup> / <sub>16</sub> | 1183 | 1 <sup>5</sup> / <sub>64</sub> | 49 |
| WNDN1200       | 185           | 1200         | 63 <sup>1</sup> / <sub>32</sub> | 1545 | 22                              | 559 | 17 <sup>7</sup> / <sub>8</sub>  | 448 | 61 <sup>7</sup> / <sub>32</sub> | 1571 | 1 <sup>3</sup> / <sub>32</sub> | 50 |



### NEMA 4/4X, 5 Stainless Steel

| Catalog Number | Breaker Size (Amperes) | Overall Enclosure              |                                |                                |                                | Enclosure Mounting             |    |     | Conduit                       |                               | Hinged Cover                  | Standard Conduit              |             | Weight (lbs.) | Dia. No. |
|----------------|------------------------|--------------------------------|--------------------------------|--------------------------------|--------------------------------|--------------------------------|----|-----|-------------------------------|-------------------------------|-------------------------------|-------------------------------|-------------|---------------|----------|
|                |                        | A                              | B                              | C                              | D                              | E                              | F  | G   | H                             | I                             |                               | Size                          | Location    |               |          |
| XFDN050        | 50                     | 15                             | 10 <sup>3</sup> / <sub>8</sub> | 8 <sup>3</sup> / <sub>4</sub>  | 5 <sup>3</sup> / <sub>16</sub> | 9                              | 12 | 1/2 | 1 <sup>3</sup> / <sub>4</sub> | 3 <sup>3</sup> / <sub>4</sub> | 2 <sup>5</sup> / <sub>8</sub> | 1 <sup>1</sup> / <sub>4</sub> | 2 & 7       | 34            | 1        |
| XFDN225        | 100/225                | 25 <sup>1</sup> / <sub>2</sub> | 12 <sup>1</sup> / <sub>2</sub> | 10 <sup>3</sup> / <sub>8</sub> | 7 <sup>3</sup> / <sub>8</sub>  | 10 <sup>1</sup> / <sub>2</sub> | 20 | 1/2 | 2                             | 3 <sup>3</sup> / <sub>4</sub> | 4 <sup>3</sup> / <sub>4</sub> | 2                             | 2 & 7       | 70            | 1        |
| XJDN250        | 250                    | 38 <sup>1</sup> / <sub>2</sub> | 13                             | 11 <sup>1</sup> / <sub>4</sub> | 8 <sup>3</sup> / <sub>4</sub>  | 11 <sup>1</sup> / <sub>2</sub> | 28 | 1/2 | 2 <sup>1</sup> / <sub>8</sub> | 3 <sup>1</sup> / <sub>2</sub> | 5 <sup>1</sup> / <sub>2</sub> | 2 <sup>1</sup> / <sub>2</sub> | 2 & 7       | 120           | 1        |
| XKDN400        | 400                    | 44 <sup>3</sup> / <sub>4</sub> | 18                             | 12 <sup>3</sup> / <sub>4</sub> | 9 <sup>3</sup> / <sub>4</sub>  | 10                             | 45 | 1/2 | 3                             | 4                             | 5 <sup>1</sup> / <sub>2</sub> | 3                             | 1, 3 & 6, 8 | 180           | 2        |
| XMCN800        | 600/800                | 50 <sup>3</sup> / <sub>4</sub> | 20 <sup>3</sup> / <sub>4</sub> | 15                             | 12 <sup>1</sup> / <sub>2</sub> | 22                             | 40 | 1/2 | 4                             | 5                             | 6                             | 4                             | 1, 3 & 6, 8 | 460           | 3        |
| XNDN1200       | 1200①                  | 65                             | 25                             | 15 <sup>1</sup> / <sub>4</sub> | 12 <sup>3</sup> / <sub>4</sub> | 23 <sup>1</sup> / <sub>2</sub> | 50 | 1/2 | 6 <sup>1</sup> / <sub>2</sub> | 4 <sup>3</sup> / <sub>4</sub> | 7                             | 4                             | 1, 3 & 6, 8 | 600           | 3        |

CONDUIT POSITION NO.

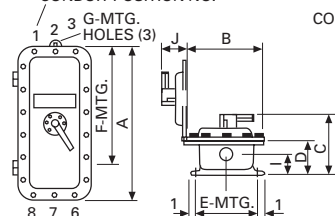


Diagram 1

#### Conduit Openings

Refer to outline dimensions for size and location of standard conduit openings. In addition, 1/2-inch openings are drilled and tapped for breather and drain. Unless ordered with breather and drain, these openings are plugged. Refer to Cutler-Hammer for list price of breather and drain.

CONDUIT POSITION NO.

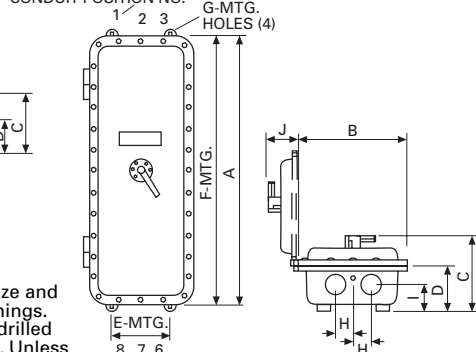


Diagram 2

CONDUIT POSITION NO.

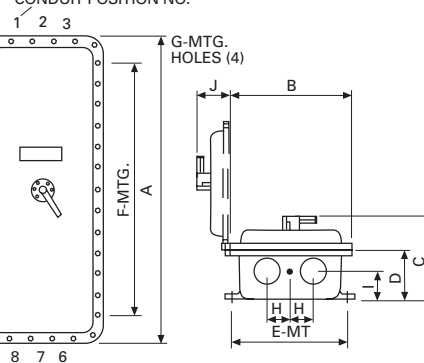
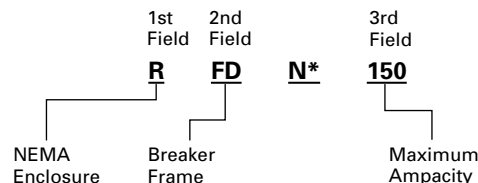


Diagram 3

## Circuit Breaker Enclosure Interpretation Data

| 1st Field<br>Enclosure Type |           |   | 2nd Field<br>Breaker Family |      | 3rd Field<br>Maximum Ampacity |  |
|-----------------------------|-----------|---|-----------------------------|------|-------------------------------|--|
| NEMA 1                      | Flush     | F | G-Frame                     | 50   |                               |  |
|                             | Surface   | S | F-Frame                     | 100  |                               |  |
| NEMA 3R                     |           | R | J-Frame                     | 150  |                               |  |
| NEMA 12                     |           | J | K-Frame                     | 225  |                               |  |
| NEMA 12K                    |           | D | L-Frame                     | 250  |                               |  |
| NEMA 4, 4X, 5               | Stainless | W | M-Frame                     | 400  |                               |  |
| NEMA 7/9                    | Cast Al.  | X | N-Frame                     | 600  |                               |  |
|                             |           |   |                             | 1200 |                               |  |



\* "N" in this position indicates enclosure complies with 1981 NEC gutter space requirement.

① Power cables must enter and leave from opposite ends (through feed).

## Standards

Series C<sup>®</sup> molded case circuit breakers are designed to conform with the following standards:

- Underwriters Laboratories, Inc., Standard UL 489, Molded Case Circuit Breakers and Circuit Breaker Enclosures
- National Electrical Manufacturers Association Standards Publication No. AB1-1993, Molded Case Circuit Breakers
- Australian Standard AS 2184, Molded Case Circuit Breakers
- British Standards Institution Standard BS 4752: Part 1, Switchgear and Control Gear Part 1: Circuit Breakers
- Canadian Standards Association Standard C22.2 No. 5, Service Entrance and Branch Circuit Breakers
- International Electrotechnical Commission Recommendations IEC 157-1, Circuit Breakers
- Japanese T-Mark Standard Molded Case Circuit Breakers
- South African Bureau of Standards, Standard SABS 156, Standard Specification for Molded Case Circuit Breakers
- Swiss Electro-Technical Association Standard SEV 157-1, Safety Regulations for Circuit Breakers
- Union Technique de l'Electricite Standard NF C 63-120, Low Voltage Switchgear and Control Gear Circuit Breaker Requirements
- Verband Deutscher Elektrotechniker (Association of German Electrical Engineers) Standard VDE 0660, Low Voltage Switchgear and Control Gear, Circuit Breakers

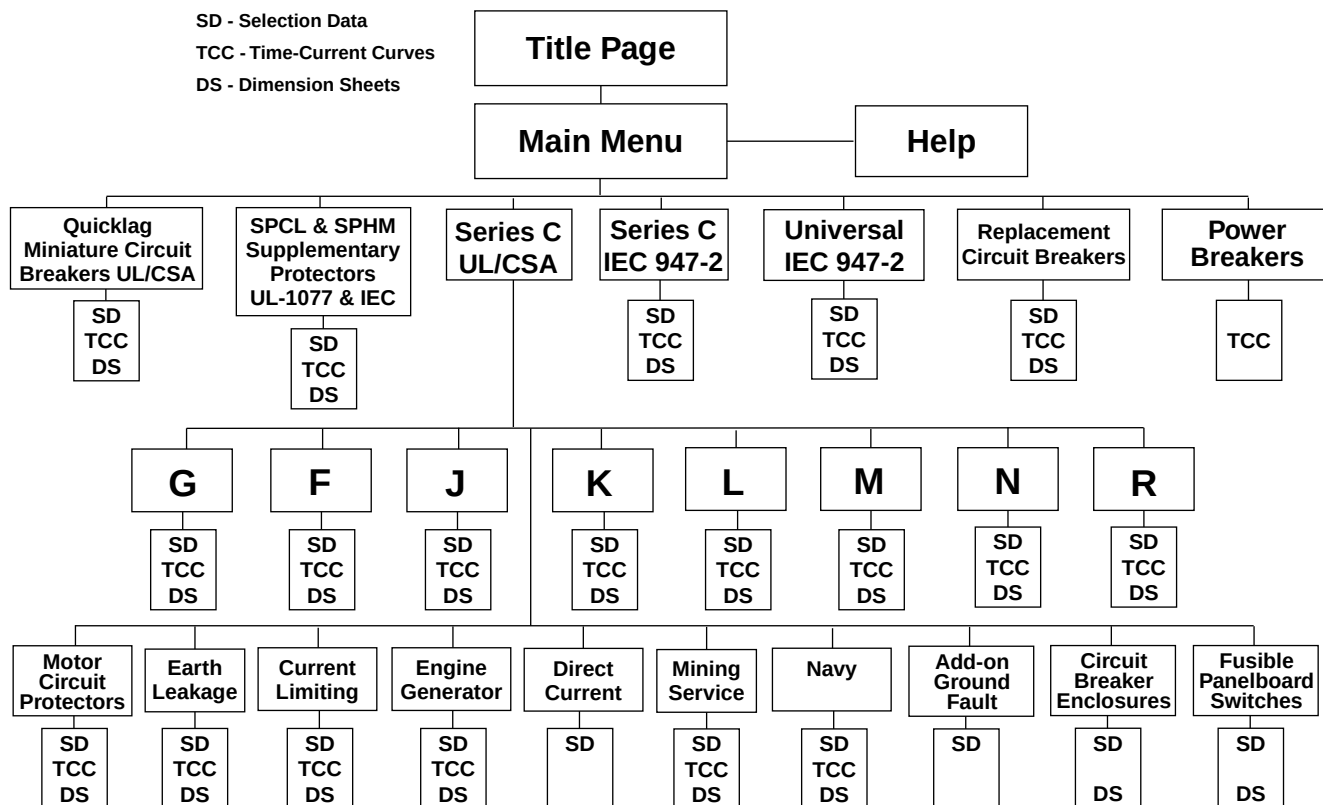
Conformance with these standards satisfies most local and international codes, assuming user acceptability and simplified application.

Series C molded case circuit breakers equal or exceed Federal Specification Classification W-C-375b requirements for the particular class associated with the circuit breaker frame being considered.

## Further Information

Circuit Breaker  
CD-ROM SA.74A.01.T.E

## Navigation Chart of CD-ROM



## System Requirements

- Processor: 486 or faster (Pentium® or Pentium Pro recommended)
- Operating System: Microsoft Windows 95, Windows 98, Windows NT 3.5, or Windows NT 4.0
- Memory: 8 MB of available RAM (16 MB recommended)
- Available Hard Disk Storage Space: 12 MB
- Devices: a CD-ROM drive and a mouse
- Monitor: minimum 640 x 480 resolution and 8-bit color (256 colors)

## Installation Instructions

- This is an autorun CD. Just insert this disk in the CD-ROM drive and wait for it to launch.

CD-ROM Installation Help Line: U.S.: 1-800-270-5134  
Outside of the United States: Contact your local Cutler-Hammer sales office.

If the CD is not included in this Product Guide, contact Cutler-Hammer Fulfillment Center at 1-800-957-7050 and ask for SA.74A.01.T.E.