

Product Line Overview

Product Line Description



Molded Case Circuit Breaker Product Family

Cutler-Hammer Molded Case Circuit Breakers by Eaton Corporation are designed to provide circuit protection for low voltage distribution systems. They are described by NEMA as, "... a device for closing and interrupting a circuit between separable contacts under both normal and abnormal conditions," and furthermore as, "... a breaker assembled as an integral unit in a supporting and enclosing housing of insulating material." The National Electrical Code (NEC®) describes them as, "A device designed to open and close a circuit by non-automatic means, and to open the circuit automatically on a predetermined overload of current, without injury to itself when properly applied within its rating."

So designed, Cutler-Hammer circuit breakers protect conductors against overloads and conductors and connected apparatus, such as motors and motor starters, against short circuits.

In low voltage distribution systems, there are many varied applications of molded case circuit breakers. Eaton offers the most comprehensive family of molded case circuit breakers in the industry.

This section of circuit breakers includes:

- Thermal-Magnetic Trip Breakers.
- Electronic rms Trip Breakers.
- Molded Case Switches.
- Motor Circuit Protectors.
- Current Limiting Breakers.
- Special Application Breakers.

Modified Breakers

Cutler-Hammer breakers can be ordered with internal accessories installed. These modified breakers will be subject to an addition charge.

| | |
|-------------------|-----------------|
| Modified Breakers | \$75 List Adder |
|-------------------|-----------------|

Special Calibration

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.

| | |
|-------------------|-----------|
| Suffix H01 400 Hz | 20% Adder |
|-------------------|-----------|

50°C Calibration

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. (No price adder.) (No UL label.)

Moisture-Fungus Treatment

All 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 | \$375 + 20% Adder |
|---------------------------|-------------------|

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 | 20% Adder |
|--------------------------|-----------|

Marine Applications

F- to R-Framed 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 special nameplating, and plug-in adapter kits. When plug-in adapter kits are used, no terminals need be supplied.

Circuit breakers can also be supplied to meet UL 489 Supplement SA (Marine Use) and UL 489 Supplement SB (Naval Use).

UL 489 Supplement SA applies to vessels over 65 feet (19.8 m) in length. Requirements include 40°C ambient calibration, special labeling, and no use of aluminum conductors or terminals. (No 50°C.)

| | |
|---------------------|-----------|
| Suffix H08 "Marine" | 10% Adder |
|---------------------|-----------|

Or you can choose to add 50°C ambient but then there is no "UL" mark.

| | |
|----------------------|-----------|
| Suffix VH08 "Marine" | 10% Adder |
|----------------------|-----------|

UL 489 Supplement SB requires partial 50°C ambient calibration, vibration testing, special nameplating and no use of aluminum conductors or terminals. Eaton chooses to always fully calibrate to 50°C ambient. ("Naval" labeled per UL but no "UL" mark due to 50°C label.)

| | |
|---------------------|-----------|
| Suffix VH09 "Naval" | 10% Adder |
|---------------------|-----------|

Standards and Certifications

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 (NEMA) 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 (CSA) Standard C22.2 No. 5, Service Entrance and Branch Circuit Breakers.
- International Electrotechnical Commission Recommendations IEC 60947-2, Circuit Breakers.
- Japanese T-Mark Standard Molded Case Circuit Breakers.

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- 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.

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.

Open breakers do not have service entrance ratings. Service entrance rating is part of the enclosure.

Quick Reference

Table 12-130. Industrial Circuit Breakers

| Circuit Breaker Type | Continuous Ampere Rating at 40°C | No. Poles | Volts | | Type of Trip ① | Federal Specification W-C-375b | UL Listed Interrupting Ratings (rms Symmetrical Amperes) | | | | | | | | Page Number |
|----------------------|----------------------------------|-----------|----------|---------|----------------|--------------------------------|--|---------|-----|-----|-----|-----|-----------|-----|-------------|
| | | | ac | dc | | | ac (kV) | | | | | | dc (kV) ② | | |
| | | | | | | | 120 | 120/240 | 240 | 277 | 480 | 600 | 125 | 250 | |
| G-Frame | | | | | | | | | | | | | | | |
| GHB | 15 – 100 | 1 | 120 | 125 | N.I.T.U. | 11a | 65 | — | — | — | — | — | 14 | — | 12-80 |
| GHB | 15 – 100 | 2, 3 | 240 | 125/250 | N.I.T.U. | 10b, 11b, | — | — | 65 | — | — | — | — | 14 | 12-80 |
| GHB | 15 – 100 | 1 | 277 | 125 | N.I.T.U. | 12b, 14b, | — | — | — | 14 | — | — | 14 | — | 12-80 |
| GHB | 15 – 100 | 2, 3 | 480Y/277 | 125/250 | N.I.T.U. | 15b | — | — | — | 14 | 14 | — | — | 14 | 12-80 |
| HGHB | 15 – 30 | 1 | 277 | 125 | N.I.T.U. | 12c, 13a, 13b | 65 | — | — | 25 | — | — | 14 | — | 12-80 |
| GHQ | 15 – 20 | 1 | 277 | — | N.I.T.U. | — | 65 | — | — | 14 | — | — | — | — | 12-80 |
| GHBS | 15 – 30 | 1, 2 | 480Y/277 | — | — | — | 65 | 65 | — | 14 | — | — | — | — | 11-19 |
| GBHS | 15 – 20 | 1, 2 | 600Y/347 | — | N.I.T.U. | — | — | — | — | — | 10 | — | — | — | 11-19 |
| GD | 15 – 50 | 2 | 480 | 125/250 | N.I.T.U. | 13b | — | — | 65 | — | 14 | — | — | 10 | 12-79 |
| GD | 15 – 100 | 3 | 480 | 250 | N.I.T.U. | 13b | — | — | 65 | — | 22 | — | — | 10 | 12-79 |
| GHC | 15 – 100 | 1 | 120 | 125 | N.I.T.U. | 12c, 13a | 65 | — | — | — | — | — | 14 | — | 12-82 |
| GHC | 15 – 100 | 2, 3 | 240 | 125/250 | N.I.T.U. | 13b | — | — | 65 | — | — | — | — | 14 | 12-82 |
| GHC | 15 – 100 | 1 | 277 | 125 | N.I.T.U. | 12c, 13a | — | — | — | 14 | — | — | 14 | — | 12-82 |
| GHC | 15 – 100 | 2, 3 | 480Y/277 | 125/250 | N.I.T.U. | 13b | — | — | — | 14 | 14 | — | — | 14 | 12-82 |
| HGHC | 15 – 30 | 1 | 277 | 125 | N.I.T.U. | — | 65 | — | — | 25 | — | — | 14 | — | 12-82 |
| F-Frame | | | | | | | | | | | | | | | |
| EDB | 100 – 225 | 2, 3 | 240 | 125 | N.I.T.U. | — | — | — | 22 | — | — | — | 10 | — | 12-85 |
| EDS | 100 – 225 | 2, 3 | 240 | 125 | N.I.T.U. | — | — | — | 42 | — | — | — | 10 | — | 12-85 |
| ED | 15 – 225 | 2, 3 | 240 | 125 | N.I.T.U. | 12b | — | — | 65 | — | — | — | 10 | — | 12-85 |
| EDH | 100 – 225 | 2, 3 | 240 | 125 | N.I.T.U. | 14b | — | — | 100 | — | — | — | 10 | — | 12-85 |
| EDC | 100 – 225 | 2, 3 | 240 | 125 | N.I.T.U. | 1 | — | — | 200 | — | — | — | 10 | — | 12-85 |
| EHD | 15 – 100 | 1 | 277 | 125 | N.I.T.U. | 13a | — | — | — | 14 | — | — | 10 | — | 12-85 |
| EHD | 15 – 100 | 2, 3 | 480 | 250 | N.I.T.U. | 13b | — | — | 18 | — | 14 | — | — | 10 | 12-85 |
| FDB | 15 – 150 | 2, 3 | 600 | 250 | N.I.T.U. | 18a | — | — | 18 | — | 14 | 14 | — | 10 | 12-85 |
| FDB | 15 – 150 | 4 | 600 | 250 | N.I.T.U. | ③ | — | — | 18 | — | 14 | 14 | — | 10 | 12-85 |
| FD | 15 – 150 | 1 | 277 | 125 | N.I.T.U. | 13a | — | — | — | 35 | — | — | 10 | — | 12-85 |
| FD | 15 – 225 | 2, 3 | 600 | 250 | N.I.T.U. | 22a | — | — | 65 | — | 35 | 18 | — | 10 | 12-85 |
| FD | 15 – 225 | 4 | 600 | 250 | N.I.T.U. | ③ | — | — | 65 | — | 35 | 18 | — | 10 | 12-85 |
| FDE | 15 – 225 | 3 | 600 | — | N.I.T. | — | — | — | 65 | — | 35 | 18 | — | — | 12-85 |
| HFD | 15 – 150 | 1 | 277 | 125 | N.I.T.U. | 13a | — | — | — | 65 | — | — | 10 | — | 12-85 |
| HFD | 15 – 225 | 2,3 | 600 | 250 | N.I.T.U. | ③ | — | — | 100 | — | 65 | 25 | — | 22 | 12-85 |
| HFD | 15 – 225 | 4 | 600 | 250 | N.I.T.U. | ③ | — | — | 100 | — | 65 | 25 | — | 22 | 12-85 |
| HFDE | 15 – 225 | 3 | 600 | — | N.I.T. | — | — | — | 100 | — | 65 | 25 | — | — | 12-85 |
| FDC ④ | 15 – 225 | 2, 3 | 600 | 250 | N.I.T.U. | 24a | — | — | 200 | — | 100 | 35 | — | 22 | 12-85 |
| FDC ④ | 15 – 225 | 4 | 600 | 250 | N.I.T.U. | ③ | — | — | 200 | — | 100 | 35 | — | 22 | 12-85 |
| FDCE ④⑤ | 15 – 225 | 3 | 600 | — | N.I.T. | — | — | — | 200 | — | 100 | 25 | — | — | 12-85 |

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

② 2-pole circuit breaker, or two poles of 3-pole circuit breaker at 250 Vdc.

③ Not defined in W-C-375b.

④ Current limiting.

⑤ Check with Eaton for availability.

F-Frame



Typical F-Frame Breaker



F-Frame Breaker with Electronic Trip Unit

Product Description

- All Eaton’s Cutler-Hammer F-Frame Circuit Breakers by are HACR rated.
- All circuit breakers 10 through 30 amperes are suitable for HID (high intensity discharge) use.
- All F-Frame circuit breakers are suitable for reverse feed use



Technical Data and Specifications

Table 12-148. UL 489 Interrupting Capacity Ratings

| Circuit Breaker Type | Number of Poles | Interrupting Capacity (kA Symmetrical Amperes) | | | | | |
|----------------------|-----------------|--|-----|-----|-----|-----------------------|-------------------|
| | | Volts ac (50/60 Hz) | | | | Volts dc ^① | |
| | | 240 | 277 | 480 | 600 | 125 | 250 ^{②③} |
| EDB | 2, 3 | 22 | — | — | — | 10 | — |
| EDS | 2, 3 | 42 | — | — | — | 10 | — |
| ED | 2, 3 | 65 | — | — | — | 10 | — |
| EDH | 2, 3 | 100 | — | — | — | 10 | — |
| EDC | 2, 3 | 200 | — | — | — | 10 | — |
| EHD | 1 | — | 4 | — | — | 10 | — |
| | 2, 3 | 18 | — | 14 | — | — | 10 |
| FDB | 2, 3, 4 | 18 | — | 14 | 14 | — | 10 |
| FD, | 1 | — | 35 | — | — | 10 | — |
| FDE ^④ | 2, 3, 4 | 65 | — | 35 | 18 | — | 10 |
| HFD, | 1 | — | 65 | — | — | 10 | — |
| HFDE ^④ | 2, 3, 4 | 100 | — | 65 | 25 | — | 22 |
| FDC ^⑤ , | 2, 3, 4 | 200 | — | 100 | 25 | — | 22 |
| FDCE ^{④⑤⑥} | | | | | | | |

- 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.
- ④ Electronics available on 3-pole only, no dc rating for FDE, HFDE, FDCE.
- ⑤ Current limiting.
- ⑥ Check with Eaton for availability.

Table 12-149. IEC 157-1 (P1) Interrupting Capacity Ratings (P1)

| Circuit Breaker Type | Number of Poles | Interrupting Capacity (kA Symmetrical Amperes) | | | | | |
|----------------------|-----------------|--|----------|-----|-----|-----------------------|-------------------|
| | | Volts ac (50/60 Hz) | | | | Volts dc ^⑦ | |
| | | 220, 240 | 380, 415 | 440 | 500 | 125 | 250 ^{⑧⑨} |
| EDB | 2, 3 | 22 | — | — | — | 10 | — |
| EDS | 2, 3 | 42 | — | — | — | 10 | — |
| ED | 2, 3 | 65 | — | — | — | 10 | — |
| EDH | 2, 3 | 100 | — | — | — | 10 | — |
| EDC | 2, 3 | 200 | — | — | — | 10 | — |
| EHD | 1 | — | 14 | — | — | 10 | — |
| | 2, 3 | 18 | — | 14 | — | — | 10 |
| FDB | 2, 3, 4 | 18 | 14 | 14 | 14 | — | 10 |
| FD | 1 | 35 | — | — | — | 10 | — |
| | 2, 3, 4 | 65 | 35 | 35 | 18 | — | 10 |
| HFD | 1 | 65 | — | — | — | 10 | — |
| | 2, 3, 4 | 100 | 65 | 65 | 25 | — | 22 |
| FDC | 2, 3, 4 | 200 | 100 | 100 | 35 | — | 22 |

- ⑦ dc ratings apply to substantially non-inductive circuits.
- ⑧ 2-pole circuit breaker, or two poles of 3-pole circuit breaker.
- ⑨ Time constant is 3 milliseconds minimum at 10 kA and 8 milliseconds minimum at 22 kA.

Table 12-150. Digitrip Electronic Trip Units

| Circuit Breaker Type | Frame | Ratings |
|----------------------|-------|--|
| FDE, HFDE, FDCE | 225 | 100, 110, 125, 150, 160, 175, 200, 225 |
| FDE, HFDE, FDCE | 160 | 60, 70, 80, 90, 100, 125, 150, 160 |
| FDE, HFDE, FDCE | 80 | 15, 20, 30, 40, 50, 60, 70, 80 |

Dimensions/Weights

Table 12-152. Dimensions in Inches (mm)

| Number of Poles | Width | Height | Depth |
|-----------------|--------------|--------------|-------------|
| 1 | 1.38 (35.1) | 6.00 (152.4) | 3.38 (86.0) |
| 2 | 2.75 (70.0) | 6.00 (152.4) | 3.38 (86.0) |
| 3 | 4.13 (105.0) | 6.00 (152.4) | 3.38 (86.0) |
| 4 | 5.50 (139.7) | 6.00 (152.4) | 3.38 (86.0) |

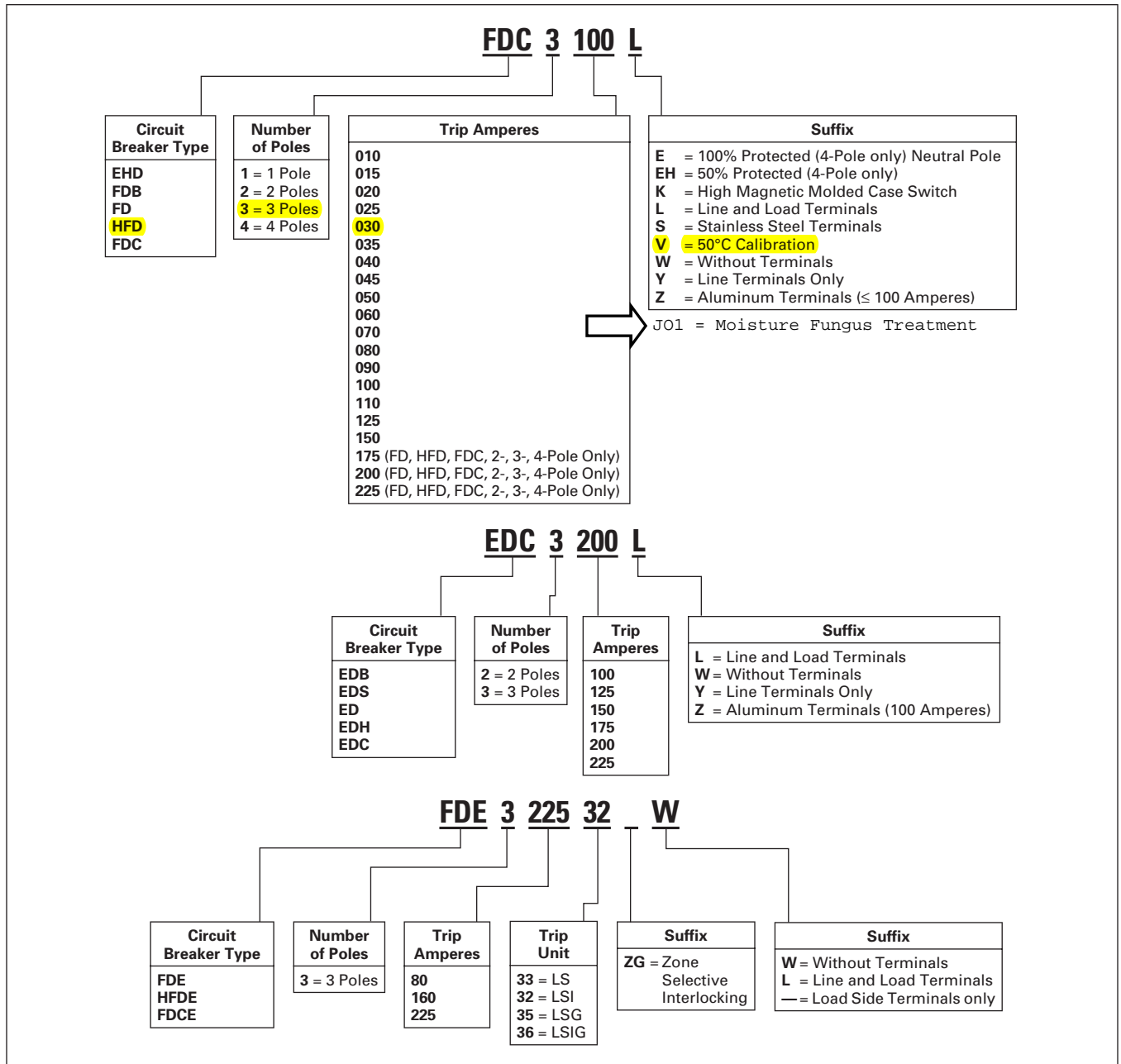
Table 12-153. Approximate Shipping Weight, Lbs. (kg)

| Breaker Type | Number of Poles | | | |
|------------------------|-----------------|---------|-----------|---------|
| | 1 | 2 | 3 | 4 |
| ED, EDB, EDS, EDH, EDC | — | 3 (1.4) | 4.5 (2.0) | — |
| EHD, FDB, FD, HFD, FDC | 2 (.9) | 3 (1.4) | 4.5 (2.0) | 6 (2.7) |
| FDE, HFDE, FDCE | — | — | 4.5 (2.0) | — |

Product Selection

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.

Table 12-154. Circuit Breaker Catalog Numbering System



F-Frame

Table 12-158. Type FD Thermal-Magnetic Circuit Breakers with Non-Interchangeable Trip Units

| Max. Cont. Ampere Rating at 40°C | 600 Vac Maximum, 250 Vdc | | | | | | 277 Vac Maximum, 125 Vdc | | 600 Vac Maximum, 250 Vdc | | | | | |
|----------------------------------|--|----------------|---------------|----------------|---------------|----------------|---|----------------|--------------------------|----------------|---------------|----------------|---------------|--|
| | 14 kAIC at 600 Vac | | | | | | 35 kAIC at 277 Vac | | 35 kAIC at 480 Vac | | | | | |
| | Type FDB (Includes Terminals on Load End Only) | | | | | | Type FD (Includes Terminals on Load End Only) | | | | | | | |
| | 2-Pole | | 3-Pole | | 4-Pole | | 1-Pole | | 2-Pole | | 3-Pole | | 4-Pole | |
| Catalog Number | Price U.S. \$ | Catalog Number | Price U.S. \$ | Catalog Number | Price U.S. \$ | Catalog Number | Price U.S. \$ | Catalog Number | Price U.S. \$ | Catalog Number | Price U.S. \$ | Catalog Number | Price U.S. \$ | |
| 10 ① | FDB2010 | | FDB3010 | | FDB4010 | | FD1010 | | — | | — | | — | |
| 15 | FDB2015 | | FDB3015 | | FDB4015 | | FD1015 ② | | FD2015 | | FD3015 | | FD4015 | |
| 20 | FDB2020 | | FDB3020 | | FDB4020 | | FD1020 ② | | 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 | |

① Not UL listed. 5 kAIC interrupting rating.
 ② UL listed for SWD applications, see NEC Article 240-83(d).

Table 12-159. Types HFD and FDC Thermal-Magnetic Circuit Breakers with Non-Interchangeable Trip Units

| Max. Cont. Ampere Rating at 40°C | 277 Vac Maximum, 125 Vdc | | | | 600 Vac Maximum, 250 Vdc | | | | 600 Vac Maximum, 250 Vdc | | | | |
|----------------------------------|--|----------------|---------------|----------------|--------------------------|----------------|---------------|----------------|---|----------------|---------------|----------------|---------------|
| | 65 kAIC at 277 Vac | | | | 65 kAIC at 480 Vac | | | | 100 kAIC at 480 Vac | | | | |
| | Type HFD (Includes Terminals on Load End Only) | | | | | | | | Type FDC Current Limiting (Includes Terminals on Load End Only) | | | | |
| | 1-Pole | | 2-Pole | | 3-Pole | | 4-Pole | | 2-Pole | | 3-Pole | | 4-Pole |
| Catalog Number | Price U.S. \$ | Catalog Number | Price U.S. \$ | Catalog Number | Price U.S. \$ | Catalog Number | Price U.S. \$ | Catalog Number | Price U.S. \$ | Catalog Number | Price U.S. \$ | Catalog Number | Price U.S. \$ |
| 15 | HFD1015 ③ | | HFD2015 | | HFD3015 | | HFD4015 | | FDC2015 | | FDC3015 | | FDC4015 |
| 20 | HFD1020 ③ | | 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 |

③ UL listed for SWD applications, see NEC Article 240-83(d).

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.

Table 12-165. Accessories

| Description | Reference Page | 1-Pole | | | 2-Pole | | | 3-Pole ① | | | 4-Pole | | | |
|--|----------------|--------|------|-------|--------|-------|--------|----------|--------|-------|--------|--------|-------|---------|
| | | Center | Left | Right | Left | Right | Center | Left | Center | Right | Left | Center | Right | Neutral |
| Internal Accessories (Only one internal accessory per pole) | | | | | | | | | | | | | | |
| Alarm Lockout Switch (Make Only) | 12-217 | ■ | | | | | | | | | | | | |
| Alarm Lockout (Make/Break) | 12-217 | | | ■ | □ | | | □ | ■ | | | | | |
| Alarm Lockout (2Make/2Break) | 12-217 | | | ■ | □ | | | □ | ■ | | | | | |
| Auxiliary Switch (1A, 1B) | 12-220 | | | ■ | ■ | | | ■ | ■ | | | | | ■ |
| Auxiliary Switch (2A, 2B) | 12-220 | | | ■ | ■ | | | ■ | ■ | | | | | ■ |
| Auxiliary Switch and Alarm Switch Combination | 12-223 | | | ■ | □ | | | □ | ■ | | | | | |
| Shunt Trip — Standard | 12-226 | | | ■ | ■ | | | ■ | ■ | | | | | ■ |
| Shunt Trip — Low Energy | 12-231 | | | ■ | ■ | | | ■ | ■ | | | | | |
| Undervoltage Release Mechanism | 12-232 | | | ■ | ■ | | | ■ | ■ | | | | | |
| External Accessories | | | | | | | | | | | | | | |
| End Cap Kit | 12-243 | | | ● | | | | ● | | | | | | ● |
| Keeper Nut | 12-243 | ● | | ● | | | | ● | | | | | | ● |
| Control Wire Terminal Kit | 12-244 | ● | | ● | | | | ● | | | | | | ● |
| Multiwire Connectors | 12-245 | ● | | ● | | | | ● | | | | | | ● |
| Base Mounting Hardware | 12-246 | ● | | ● | | | | ● | | | | | | ● |
| Terminal Shields | 12-248 | ● | | ● | | | | ● | | | | | | ● |
| Terminal End Covers | 12-249 | | | | | | | ● | | | | | | |
| Interphase Barriers | 12-249 | | | ● | | | | ● | | | | | | ● |
| Non-Padlockable Handle Block | 12-251 | ■ | | ■ | | | | ■ | | | | | ■ | |
| Snap-on Padlockable Handle Lock Hasp | 12-251 | ■ | | ■ | | | | ■ | | | | | ■ | |
| Padlockable Handle Lock Hasp | 12-252 | | | | ■ | □ | | | □ | □ | | | | □ |
| Cylinder Lock | 12-252 | | | | | ■ | | | | | | | | |
| Key Interlock Kit | 12-253 | | | | ■ | □ | | | □ | □ | | | | □ |
| Sliding Bar Interlock — Requires Two Breakers | 12-254 | | | | | | | ● | | | | | | |
| Walking Beam Interlock — Requires Two Breakers | 12-254 | | | | | | | ● | | | | | | ● |
| Electrical (Solenoid and Motor) Operators | 12-255 | | | | | | | ● | | | | | | ● |
| Plug-in Adapters | 12-257 | | | ● | | | | ● | | | | | | ● |
| Rear Connecting Studs | 12-258 | ● | | ● | | | | ● | | | | | | ● |
| Panelboard Connecting Straps | 12-261 | ● | | ● | | | | ● | | | | | | ● |
| Handle Mechanisms | 12-262 | | | | | | | ● | | | | | | |
| LFD Current Limiter | 12-268 | | | | | | | ● | | | | | | |
| IQ Energy Sentinel | 12-268 | | | ● | | | | ● | | | | | | |
| Modifications (Refer to Eaton) | | | | | | | | | | | | | | |
| Special Calibration | — | ● | | ● | | | | ● | | | | | | ● |
| Moisture Fungus Treatment | 12-73 | ● | | ● | | | | ● | | | | | | ● |
| Freeze-Tested Circuit Breakers | — | ● | | ● | | | | ● | | | | | | ● |
| Marine Application | — | ● | | ● | | | | ● | | | | | | ● |

■ Applicable in indicated pole position

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

● Accessory available/Modification available

① Internal accessories are listed with Underwriters Laboratories (UL) for factory installation. They are not listed with UL for field installation. Any one internal accessory may be mounted in the left pole. Only a specialty built 1A/1B auxiliary switch may be mounted in the right pole. Factory reference part number for the 1A/1B auxiliary switch is A1X1RPKFDE.