

Series C F-Frame molded-case circuit breaker with 210+ electronic trip unit



The Series C® F-Frame is equipped with the 210+ electronic trip unit and features LSI and LI protection settings. The F-Frame breaker is NEMA®, UL® and CSA® listed.

Design flexibility

- Three frames cover ampere range from 40 A to 225 A, reducing stock requirements and providing more flexibility than thermal-magnetic breakers
- Each trip unit includes seven ampere ratings and 10 protection profiles
- Two protection types, LI and LSI, offer options for adjustability and coordination of systems

Design savings

- Uses accessories available on current F-Frame breaker
- Same physical dimensions and terminal locations as thermal-magnetic and 310+ electronic F-Frame breakers
- Available for aftermarket replacement of any F-Frame when electronic trip units are preferred
- Reduced cost from F-Frame 310+ offering of electronic trip unit
- Three trip units cover ampere range from 40 A to 225 A, reducing in-house stock and offering more flexibility

Easy-to-use 210+ trip unit

- Two simple rotary dials adjust settings for amperage and protection levels
- Status indication LED notifies the user of operational status

A full range of accessories

- In addition to using the same internal accessories as the standard F-Frame, the FDE with 210+ offers various handle locks, plug-in adapters and handle mechanisms
- Includes same shunt trip and undervoltage release accessory options as other FD breakers, and the same left-hand side auxiliary and bell alarm contact options
- A special 1A/1B auxiliary contact can be installed on the right-hand side; this contact must be factory installed
- Uses a functional test kit in common with the 310+ and ACB Digitrip™ (MTST230V); a new cable is included in the test kit to test 210+ trip units



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Available features

| Feature | Availability |
|---|--------------|
| UL 489 and CSA C22.2 No. 5 | Y |
| Shunt-trip | Y ❶ |
| Auxiliary switch | Y ❶ |
| Bell alarm | Y ❶ |
| Combination alarm/auxiliary switch | Y ❶ |
| Undervoltage release | Y ❶ |
| Handle mechanism—Flex Shaft™ | Y |
| Handle mechanism—through-the-door rotary | Y |
| Handle mechanism—direct mounted | Y |
| Plug-in blocks, trip-on drawout | Y |
| Rear-connecting studs | Y |
| Lock-offs | Y |
| Interlocks | Y |
| Finger-safe shields and interphase barriers | Y |
| Multiple conductor terminals | Y |
| Electrical operator | Y |

❶ 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 specially built 1A/1B auxiliary switch may be factory mounted in the right pole.

FDE, HFDE and FDCE ratings and ampere ranges

| Specification | Description | | | |
|---|--------------|---|--------------|-------------|
| | Breaker type | FDE | HFDE | FDCE ❶ |
| Short-circuit current ratings (kA rms) AC 50–60 Hz | | | | |
| NEMA UL 489 | 240 Vac | 65 | 100 | 200 |
| | 480 Vac | 35 | 65 | 100 |
| | 600 Vac | 18 | 25 | 25 |
| Number of poles | 3 | 3 | 3 | 3 |
| Adjustable Long-time pickup CSA 22.2 No. 5 | 225 A | A = 100, B = 110, C = 125, D = 150, E = 175, F = 200, G = 225 | | |
| | 150 A ❷ | A = 70, B = 80, C = 90, D = 100, E = 110, F = 125, G = 150 | | |
| | 100 A | A = 40, B = 50, C = 60, D = 70, E = 80, F = 90, G = 100 | | |
| Protection types | LI, LSI | | | |
| Dimensions in inches (mm) | | H | W | D |
| | Three-pole | 6.00 (152.4) | 4.13 (104.9) | 3.38 (85.9) |
| Weight (approximate) lbs (kg) | | 4.5 (2.0) | 4.5 (2.0) | 4.5 (2.0) |

❶ Contact Eaton for availability.

❷ 150 A frame only available in protection style LI.

References

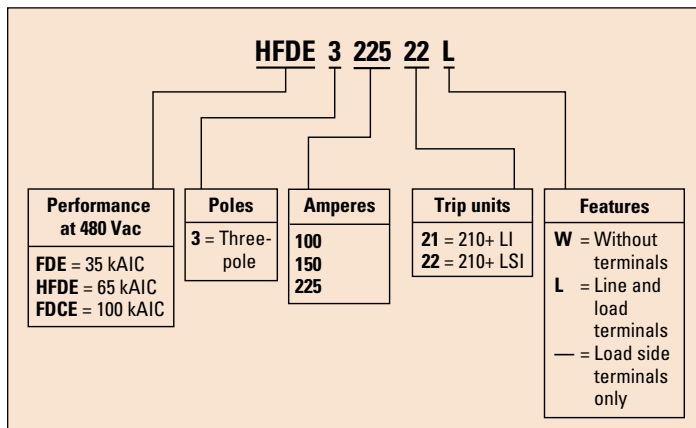
| Document | Publication number |
|----------------|--------------------|
| Technical data | TDO1203013E |
| FAQ | MZ01203001E |

To learn more, visit Eaton.com/210plus

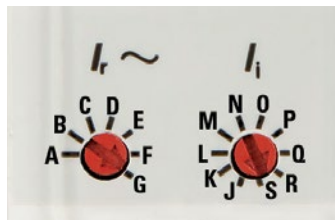
FDE 210+ trip unit features

- No rating plug required
- Factory-installed only; non-interchangeable
- Available with LI or LSI protection profiles
- Three frames with wide ampere ranges: 40–100 A, 70–150 A and 100–225 A
- Fixed long time delay (10 sec at 6 x I_n)
- Thermal memory
- Sealable clear cover to comply with UL and CSA requirements
- Optional wire seal for cover (Cat. No. 5108A03H01)
- Adjustable short-time delay pickup (LSI): 2–10 x I_n
- Multiple SD time delay options (LSI): INST, 150 ms, 300 ms and I²t response
- Adjustable Instantaneous pickup (LI): 2–12 x I_n
- Status indicator LED
- Push-to-trip button
- Optional self-powered plug-in test kit (Cat. No. MTST230V)

FDE 210+ ordering guidelines



LI trip unit controls

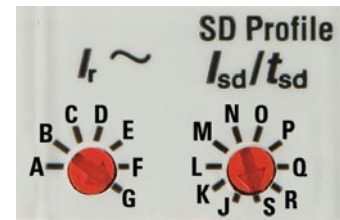


LI protection settings

| Setting | I _n (xI _n) |
|---------|-----------------------------------|
| J | 2 |
| K | 2.5 |
| L | 3 |
| M | 3.5 |
| N | 4 |
| O | 5 |
| P | 6 |
| Q | 8 |
| R | 10 |
| S | 12 ❶ |

❶ S position on 225 A frame set to breaker override value of 2400 A.

LSI trip unit controls



LSI protection settings

| Setting | I _{sd} (xI _n) | t _{ds} |
|---------|------------------------------------|------------------|
| J | 2 | 150 |
| K | 2 | 300 |
| L | 2 | I ² t |
| M | 4 | Inst |
| N | 4 | 150 |
| O | 4 | I ² t |
| P | 6 | Inst |
| Q | 6 | 300 |
| R | 10 | 150 |
| S | 10 | 300 |



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