

ELF™ current-limiting dropout fuse



General

Eaton's Cooper Power™ series ELF™ current-limiting dropout fuse is a full range current-limiting fuse designed for mounting in an industry standard interchangeable cutout that is presently used for expulsion fuses. The ELF fuse is designed to be used to protect pole-type transformers, single-phase and three-phase laterals and underground taps.

The full-range current-limiting rating ensures reliable operation of all overloads and fault currents. The element construction consists of two separate sections (low-current section and high-current section) which are self-contained in one housing. The low-current section provides consistent, reliable clearing of all currents high enough to melt the element. The high-current section is a punched-hole ribbon design which controls peak arc voltage levels and limits both current and energy (I^2t) let-through levels during high-current fault clearing operation.

The ELF dropout fuse operates silently, unlike expulsion fuses. In addition, the explosive shower that exists with an explosive fuse operation is eliminated. This offers increased safety to line personnel during circuit energization operations. In addition, the reliable drop open design makes locating the fault easy.

Production tests

Tests are conducted on 100% of production in accordance with Eaton requirements.

- Physical Inspection
- I^2t Testing
- Resistance Testing
- Helium Mass Spectrometer Leak Testing

Installation

The ELF fuse is designed to be mounted in 15 kV and 27 kV, (110 kV, 125 kV or 150 kV BIL) rated interchangeable open distribution cutouts including Eaton's Type L, S&C Type XS, Hubble Type C™ and ABB Type ICX™ cutouts. Designs for use in 35 kV (170 kV BIL) rated ABB Series V™ cutouts are also available.

It is easy to install using a clampstick due to its small size. Refer to *Service Information MN132028EN ELF Current-Limiting Dropout Fuse Installation Instructions* for installation instructions.

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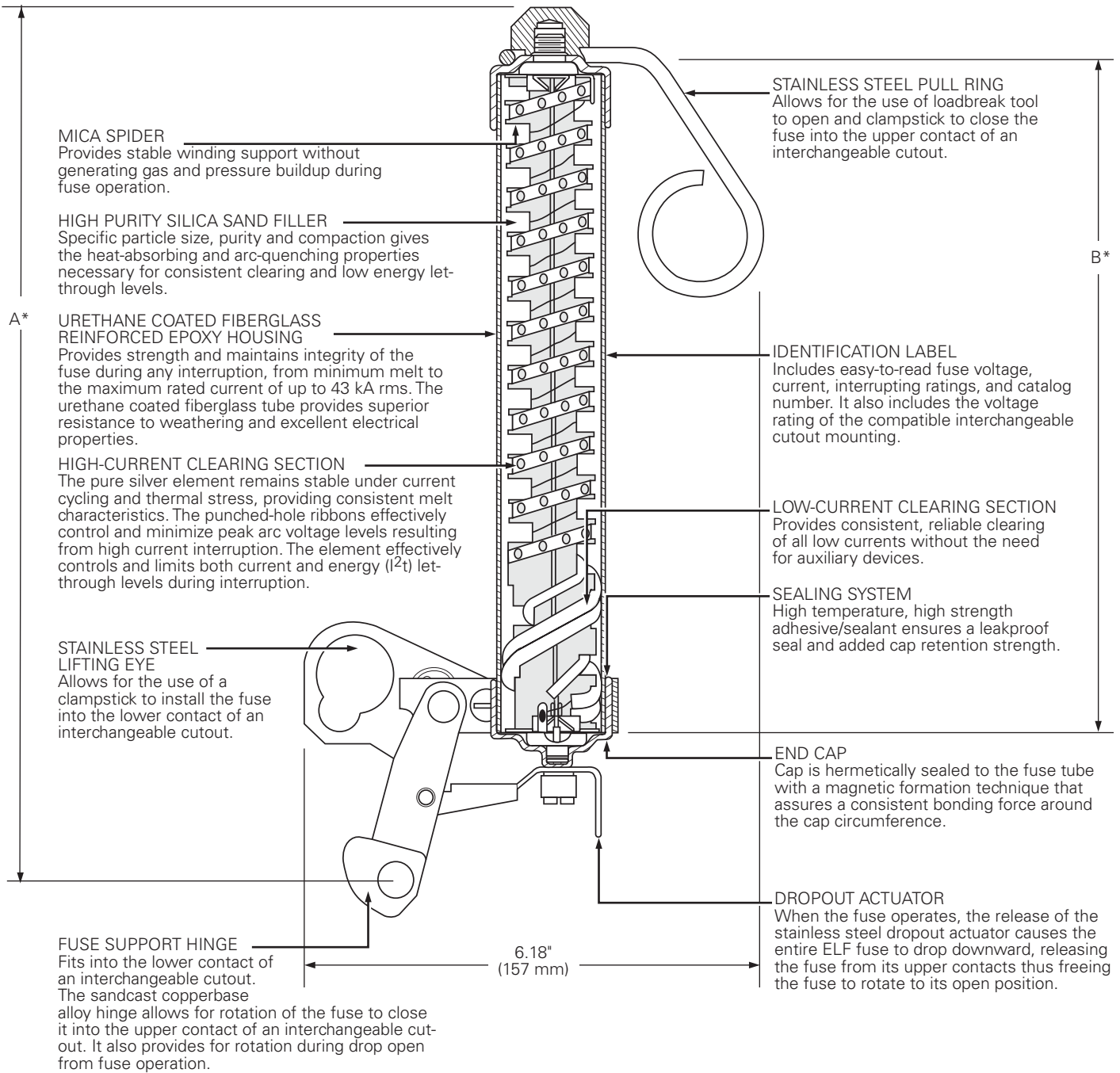


Figure 1. Line illustration of single-barrel ELF fuse cutaway with dimensions.

* See Table 5, 6, or 7 for dimensions A and B.

Table 1. ELF Fuse Electrical Ratings and Characteristics

| Fuse Ratings | | Cutout Rating | | Continuous Current Ratings (A) ^a | | | Minimum Melt I ² t (A ² • s) | Maximum Clear I ² t (A ² • s) | Maximum Interrupting Current (A rms symmetrical) |
|--------------|-------------|---------------|----------|---|--------|------|--|---|--|
| Voltage (kV) | Current (A) | Voltage (kV) | BIL (kV) | 25°C | 40°C | 55°C | | | |
| 8.3 | 6 | 15 | 110 | 8 | 7 | 6 | 520 | 4550 | 31000 |
| | 8 | | | 12 | 11 | 11 | 1150 | 6500 | |
| | 12 | | | 18 | 17 | 16 | 1150 | 7000 | |
| | 18 | | | 25 | 24 | 23 | 1350 | 8600 | |
| | 20 | | | 27 | 26 | 25 | 2000 | 11700 | |
| | 25 | | | 34 | 33 | 31 | 2900 | 17000 | |
| | 30 | | | 43 | 41 | 39 | 4000 | 20000 | |
| | 40 | | | 50 | 48 | 46 | 8000 | 39000 | |
| | 50* | | | 68 | 65 | 62 | 16000 | 65000 | |
| | 65* | | | 78 | 75 | 71 | 20000 | 100000 | |
| | 80* | | | 95 | 91 | 87 | 32000 | 150000 | |
| 100* | 120 | 114 | 109 | 46000 | 215000 | | | | |
| 15.0 | 6 | 15 | 110 | 8 | 7 | 6 | 520 | 4550 | 20000 |
| | 8 | | | 12 | 11 | 11 | 1150 | 6500 | |
| | 12 | | | 18 | 17 | 16 | 1150 | 7000 | |
| | 18 | | | 25 | 24 | 23 | 1350 | 8600 | |
| | 20 | | | 27 | 26 | 25 | 2000 | 11700 | |
| 8.3 | 6 | 27 | 150 | 8 | 7 | 6 | 520 | 4550 | 31000 |
| | 8 | | | 12 | 11 | 11 | 1150 | 6500 | |
| | 12 | | | 18 | 17 | 16 | 1150 | 7000 | |
| | 18 | | | 25 | 24 | 23 | 1350 | 8600 | |
| | 20 | | | 27 | 26 | 25 | 2000 | 11700 | |
| | 25 | | | 34 | 33 | 31 | 2900 | 17000 | |
| | 30 | | | 43 | 41 | 39 | 4000 | 20000 | |
| | 40 | | | 50 | 48 | 46 | 8000 | 39000 | |
| | 50* | | | 68 | 65 | 62 | 16000 | 65000 | |
| | 65* | | | 78 | 75 | 71 | 20000 | 100000 | |
| | 80* | | | 95 | 91 | 87 | 32000 | 150000 | |
| 100* | 120 | 114 | 109 | 46000 | 215000 | | | | |
| 15.0** | 6 | 27 | 150 | 8 | 7 | 6 | 520 | 4550 | 43000 |
| 15.0** | 8 | | | 12 | 11 | 11 | 1150 | 6500 | 43000 |
| 15.0** | 12 | | | 18 | 17 | 16 | 1150 | 7000 | 43000 |
| 15.0** | 18 | | | 25 | 24 | 23 | 1350 | 8600 | 43000 |
| 15.0** | 20 | | | 27 | 26 | 25 | 2000 | 11700 | 43000 |
| 15.0** | 25 | | | 34 | 33 | 31 | 2900 | 17000 | 43000 |
| 15.0 | 30 | | | 43 | 41 | 39 | 5100 | 25000 | 20000 |
| 15.0** | 30* | | | 43 | 41 | 39 | 5100 | 25000 | 43000 |
| 15.0** | 40* | | | 50 | 48 | 46 | 8000 | 39000 | 43000 |
| 15.0** | 50* | | | 68 | 65 | 62 | 16000 | 65000 | 43000 |
| 23.0 | 6 | | | 27 | 150 | 8 | 7 | 6 | 520 |
| | 8 | 12 | 11 | | | 11 | 1150 | 7000 | |
| | 12 | 18 | 17 | | | 16 | 1150 | 8000 | |
| | 18 | 25 | 24 | | | 23 | 1350 | 10000 | |
| | 20 | 27 | 26 | | | 25 | 2000 | 14000 | |
| | 25* | 34 | 33 | | | 31 | 2900 | 20000 | |
| 30* | 43 | 41 | 39 | 5100 | 30000 | | | | |
| 24.0 | 6 | 36 | 170 | 8 | 7 | 6 | 520 | 5200 | 13000 |
| | 8 | | | 12 | 11 | 11 | 1150 | 7000 | |
| | 12 | | | 18 | 17 | 16 | 1150 | 8000 | |
| | 18 | | | 25 | 24 | 23 | 1350 | 10000 | |
| | 20 | | | 27 | 26 | 25 | 2000 | 14000 | |

Notes: a. For temperatures other than listed, a deration factor of 0.26% per °C can be applied.
 * Multi-barrel design
 ** 15 kV, 125 kV BIL, 6 through 25 A (single barrel part numbers FAK44W6 through FAK44W25) and 30 through 50 A (double barrel part numbers FAK44W30P, FAK44W40, and FAK44W50) have been tested and approved for 17.2 kV application.

Table 2. Recommended ELF Current-Limiting Dropout Fuse Voltage Ratings

| System Voltage (kV) | | Recommended Fuse Ratings (kV) | | | |
|---------------------|-------------|----------------------------------|-------------------------|-----------------------------|-----------------|
| | | Four-Wire Multi-Grounded Neutral | | Three-Wire Wye or Delta | |
| Nominal | Maximum | Single-Phase | Three-Phase | Single-Phase (Line-to-Line) | Three-Phase |
| 2.4 | 2.54 | – | – | 8.3 | 8.3 |
| 4.16/2.4 | 4.4/2.54 | 8.3 | 8.3 | – | – |
| 4.16 | 4.4 | – | – | 8.3 | 8.3 |
| 4.8 | 5.08 | – | – | 8.3 | 8.3 |
| 6.9 | 7.26 | – | – | 8.3 | 8.3 |
| 7.2 | 7.62 | – | – | 8.3 | 8.3 |
| 7.97 | 8.4 | – | – | 8.3 | 8.3 |
| 8.32/4.8 | 8.8/5.08 | 8.3 | 8.3 | – | – |
| 11.0 | 12.0 | – | – | 15 | 15 |
| 12.0/6.93 | 12.7/7.33 | 8.3 | 15 or 8.3 ^a | – | – |
| 12.47/7.2 | 13.2/7.62 | 8.3 | 15 or 8.3 ^a | – | – |
| 12.47 | 13.2 | – | – | 15 | 15 |
| 13.2/7.62 | 13.97/8.07 | 8.3 | 15 or 8.3 ^a | – | – |
| 13.2 | 13.97 | – | – | 15 | 15 |
| 13.8/7.97 | 14.52/8.38 | 8.3 | 15 or 8.3 ^a | – | – |
| 13.8 | 14.52 | – | – | 15 | 15 |
| 14.4 | 15.24 | – | – | 15 | 15 |
| 16.3 | 17.1 | – | – | 15 ^c | 15 ^c |
| 20.78/12.0 | 22.0/12.7 | 15 | 23 or 15 ^a | – | – |
| 22.0 | 24.0 | – | – | 23 ^b | 23 ^b |
| 22.86/13.2 | 24.2/13.97 | 15 | 23 or 15 ^a | – | – |
| 23.0 | 24.34 | – | – | 23 ^b | 23 ^b |
| 24.9/14.4 | 26.4/15.24 | 15 | 23 or 15 ^{a,c} | – | – |
| 34.5/19.92 | 36.51/21.08 | 23 | – | – | – |

- Notes:**
- a. This lower voltage fuse rating may be used if either of the following conditions are met:
 - 1) If the probability and a line-to-line and a three-phase ungrounded fault is very low.
 - or-
 - 2) If all of the below conditions are met:
 - If the probability of a three-phase ungrounded primary fault is very low.
 - If a secondary breaker or other series connected device is used to interrupt secondary faults.
 - If no more than 50% of the secondary load is delta connected.
 - If the line-to-line primary fault current is high enough to assure simultaneous operation of two fuses by melting at a maximum of 0.2 seconds.
 - b. A 23 kV rated fuse is recommended where 125 kV BIL interchangeable cutout mountings are used and a 24 kV rated fuse is recommended where 170 kV BIL interchangeable cutout mountings are used.
 - c. 15 kV, 125 kV BIL, 6 through 25 A (single barrel part numbers FAK44W6 through FAK44W25) and 30 through 50 A (double barrel part numbers FAK44W30P, FAK44W40, and FAK44W50) are recommended for this application.

Table 3. Recommendations for Distribution Transformers in Single-Phase Applications (Refer to Figure 3 for primary voltage connections, Figures A and D.) †

| Fuse Voltage | 8.3 kV | | 8.3 kV | | 8.3 kV | | 15.0 kV | |
|-------------------------------------|------------|------------------|-------------|------------------|------------|----------------|-------------|----------------|
| System Voltage | 2400 Δ | | 4160 Y/2400 | | 4800 Δ | | 8320 Y/4800 | |
| Single-Phase Transformer Size (kVA) | Figure A | | Figure D | | Figure A | | Figure D | |
| | Rated Amps | Fuse Rating | Rated Amps | Fuse Ratings | Rated Amps | Fuse Ratings | Rated Amps | Fuse Ratings |
| 10 | 4.17 | 6 | 4.17 | 6 | 2.08 | 6 ^a | 2.08 | 6 ^a |
| 15 | 6.25 | 12 ^a | 6.25 | 12 ^a | 3.13 | 6 | 3.13 | 6 |
| 25 | 10.42 | 18 | 10.42 | 18 | 5.21 | 8 | 5.21 | 8 |
| 37.5 | 15.63 | 20 | 15.63 | 20 | 7.81 | 12 | 7.84 | 12 |
| 50 | 20.83 | 30 | 20.83 | 30 | 10.42 | 18 | 10.42 | 18 |
| 75 | 31.25 | 40 | 31.25 | 40 | 15.63 | 20 | 15.63 | 20 |
| 100 | 41.67 | 50 | 41.67 | 50 | 20.83 | 30 | 20.83 | 30 |
| 167 | 69.58 | 80 | 69.58 | 80 | 34.79 | 50 | 34.79 | 50 |
| 250 | 104.17 | 100 ^d | 104.17 | 100 ^d | 52.08 | 65 | 52.08 | 65 |
| 333 | 138.75 | — | 138.75 | — | 69.38 | 80 | 69.38 | 80 |

| Fuse Voltage | 8.3 kV | | 8.3 kV | | 8.3 kV | | 15.0 kV | |
|-------------------------------------|------------|-----------------|--------------|-----------------|--------------|-----------------|------------|-----------------|
| System Voltage | 7200 Δ | | 12470 Y/7200 | | 13200 Y/7620 | | 12000 Δ | |
| Single-Phase Transformer Size (kVA) | Figure A | | Figure D | | Figure D | | Figure A | |
| | Rated Amps | Fuse Rating | Rated Amps | Fuse Ratings | Rated Amps | Fuse Ratings | Rated Amps | Fuse Ratings |
| 10 | 1.39 | 6 ^a | 1.39 | 6 ^a | 1.31 | 6 ^a | .83 | 6 ^a |
| 15 | 2.08 | 6 ^a | 2.08 | 6 ^a | 1.97 | 6 ^a | 1.25 | 6 ^a |
| 25 | 3.47 | 6 | 3.47 | 6 | 3.28 | 6 | 2.08 | 6 ^a |
| 37.5 | 5.21 | 8 | 5.21 | 8 | 4.92 | 8 | 3.13 | 6 |
| 50 | 6.94 | 12 ^a | 6.94 | 12 ^a | 6.56 | 12 ^a | 4.17 | 6 |
| 75 | 10.42 | 18 | 10.42 | 18 | 9.84 | 18 ^a | 6.25 | 12 ^a |
| 100 | 13.89 | 20 | 13.89 | 20 | 13.12 | 18 | 8.33 | 12 |
| 167 | 23.19 | 30 | 23.19 | 30 | 21.92 | 30 | 13.92 | 20 |
| 250 | 34.72 | 50 | 34.72 | 50 | 32.81 | 40 ^b | 20.83 | 30 |
| 333 | 46.25 | 65 | 46.25 | 65 ^c | 43.70 | 50 | 27.75 | 40 |
| 500 | 69.44 | 80 | 69.44 | 80 ^c | 65.62 | 80 ^c | 41.67 | 50 |

| Fuse Voltage | 15.0 kV | | 15.0 kV | | 15.0 kV | | 23.0 kV | |
|-------------------------------------|------------|----------------|------------|-----------------|---------------|-----------------|---------------|----------------|
| System Voltage | 13200 Δ | | 14400 Δ | | 24940 Y/14400 | | 34500 Y/19920 | |
| Single-Phase Transformer Size (kVA) | Figure A | | Figure A | | Figure D | | Figure D | |
| | Rated Amps | Fuse Rating | Rated Amps | Fuse Ratings | Rated Amps | Fuse Ratings | Rated Amps | Fuse Ratings |
| 10 | .76 | 6 ^a | .69 | 6 ^a | .69 | 6 ^a | .50 | 6 ^a |
| 15 | 1.14 | 6 ^a | 1.04 | 6 ^a | 1.04 | 6 ^a | .75 | 6 ^a |
| 25 | 1.89 | 6 ^a | 1.74 | 6 ^a | 1.74 | 6 ^a | 1.25 | 6 ^a |
| 37.5 | 2.84 | 6 ^a | 2.60 | 6 ^a | 2.60 | 6 ^a | 1.88 | 6 ^a |
| 50 | 3.79 | 6 | 3.47 | 6 | 3.47 | 6 | 2.51 | 6 ^a |
| 75 | 5.68 | 8 | 5.21 | 8 | 5.21 | 8 | 3.77 | 6 |
| 100 | 7.58 | 12 | 6.94 | 12 ^a | 6.94 | 12 ^a | 5.02 | 8 |
| 167 | 12.65 | 18 | 11.60 | 18 | 11.60 | 18 | 8.38 | 12 |
| 250 | 18.94 | 25 | 17.36 | 25 | 17.36 | 25 | 12.55 | 18 |
| 333 | 25.23 | 30 | 23.13 | 30 | 23.13 | 30 | 16.72 | 25 |
| 500 | 37.88 | 50 | 34.72 | 50 | 34.72 | 50 | 25.10 | 30 |

† See notes on page 7.

Effective March 2019

Table 4. Recommendations for Distribution Transformers in Three-Phase Applications (Refer to Figure 3 for primary voltage connections, Figures B, C, E, and F) †

| Fuse Voltage | 8.3 kV | | | | 8.3 kV | | 8.3 kV | | 8.3 kV | | | |
|------------------|------------|------------------|------------|-----------------|-------------|------------------|------------|----------------|------------|--------------|-------------|----------------|
| System Voltage | 2400 Δ | | Figure C | | 4160 Y/2400 | | 4800 Δ | | Figure C | | 8320 Y/4800 | |
| Single-Phase kVA | Rated Amps | Fuse Rating | Rated Amps | Fuse Ratings | Rated Amps | Fuse Ratings | Rated Amps | Fuse Ratings | Rated Amps | Fuse Ratings | Rated Amps | Fuse Ratings |
| 10 | 4.17 | 6 | 7.22 | 12 ^a | 4.17 | 6 | 2.08 | 6 ^a | 3.61 | 6 | 2.08 | 6 ^a |
| 15 | 6.25 | 12 ^a | 10.83 | 18 | 6.25 | 12 ^a | 3.13 | 6 | 5.41 | 8 | 3.13 | 6 |
| 25 | 10.42 | 18 | 18.04 | 25 | 10.42 | 18 | 5.21 | 8 | 9.02 | 12 | 5.21 | 8 |
| 37.5 | 15.63 | 20 | 27.06 | 40 | 15.63 | 20 | 7.81 | 12 | 13.53 | 18 | 7.84 | 12 |
| 50 | 20.83 | 30 | 36.09 | 50 | 20.83 | 30 | 10.42 | 18 | 18.04 | 25 | 10.42 | 18 |
| 75 | 31.25 | 40 | 54.13 | 80 | 31.25 | 40 | 15.63 | 20 | 27.06 | 40 | 15.63 | 20 |
| 100 | 41.67 | 50 | 72.17 | 100 | 41.67 | 50 | 20.83 | 30 | 36.08 | 50 | 20.83 | 30 |
| 167 | 69.58 | 80 | 120.28 | — | 69.58 | 80 | 34.79 | 50 | 60.14 | 80 | 34.79 | 50 |
| 250 | 104.17 | 100 ^d | 180.42 | — | 104.17 | 100 ^d | 52.08 | 65 | 90.21 | — | 52.08 | 65 |
| 333 | 138.75 | — | 240.56 | — | 138.75 | — | 69.38 | 80 | 120.28 | — | 69.38 | 80 |

| Fuse Voltage | 8.3 kV | | | | 15.0 kV or 8.3 kV ^d | | 15.0 kV or 8.3 kV ^d | | 15.0 kV | | | |
|------------------|------------|-----------------|------------|--------------|--------------------------------|-----------------|--------------------------------|-----------------|------------|-----------------|------------|-----------------|
| System Voltage | 7200 Δ | | Figure C | | 12470 Y/7200 | | 13200 Y/7620 | | Figure B | | 12000 Δ | |
| Single-Phase kVA | Rated Amps | Fuse Rating | Rated Amps | Fuse Ratings | Rated Amps | Fuse Ratings | Rated Amps | Fuse Ratings | Rated Amps | Fuse Ratings | Rated Amps | Fuse Ratings |
| 15 | 2.08 | 6 ^a | 3.61 | 6 | 2.08 | 6 ^a | 1.97 | 6 ^a | 1.25 | 6 ^a | 2.17 | 6 ^a |
| 25 | 3.47 | 6 | 6.01 | 8 | 3.47 | 6 | 3.28 | 6 | 2.08 | 6 ^a | 3.61 | 6 |
| 37.5 | 5.21 | 8 | 9.02 | 12 | 5.21 | 8 | 4.92 | 8 | 3.13 | 6 | 5.41 | 8 |
| 50 | 6.94 | 12 ^a | 12.03 | 18 | 6.94 | 12 ^a | 6.56 | 12 ^a | 4.17 | 6 | 7.22 | 12 ^a |
| 75 | 10.42 | 18 | 18.04 | 25 | 10.42 | 18 | 9.84 | 18 ^a | 6.25 | 12 ^a | 10.83 | 18 |
| 100 | 13.89 | 20 | 24.06 | 30 | 13.89 | 20 | 13.12 | 18 | 8.33 | 12 | 14.43 | 20 |
| 167 | 23.19 | 30 | 40.10 | 50 | 23.19 | 30 | 21.92 | 30 | 13.92 | 20 | 24.06 | 30 |
| 250 | 34.72 | 50 | 60.14 | 80 | 34.72 | 50 | 32.81 | 40 ^b | 20.83 | 30 | 36.08 | 50 |
| 333 | 46.25 | 65 | 80.19 | 100 | 46.25 | 65 ^c | 43.70 | 50 | 27.75 | 40 | 48.11 | 50 |
| 500 | 69.44 | 80 | 120.28 | — | 69.44 | 80 ^c | 65.62 | 80 ^c | 41.67 | 50 | 72.17 | — |

| Fuse Voltage | 15.0 kV | | | | 15.0 kV | | 15 kV ^{d, e} | | | |
|------------------|------------|----------------|------------|-----------------|------------|-----------------|-----------------------|----------------|---------------|-----------------|
| System Voltage | 13200 | | Figure C | | 14400 | | Figure C | | 24940 Y/14400 | |
| Single-Phase kVA | Rated Amps | Fuse Rating | Rated Amps | Fuse Ratings | Rated Amps | Fuse Ratings | Rated Amps | Fuse Ratings | Rated Amps | Fuse Ratings |
| 10 | .76 | 6 ^a | 1.31 | 6 ^a | .69 | 6 ^a | 1.20 | 6 ^a | .69 | 6 ^a |
| 15 | 1.14 | 6 ^a | 1.97 | 6 ^a | 1.04 | 6 ^a | 1.80 | 6 ^a | 1.04 | 6 ^a |
| 25 | 1.89 | 6 ^a | 3.28 | 6 | 1.74 | 6 ^a | 3.01 | 6 | 1.74 | 6 ^a |
| 37.5 | 2.84 | 6 | 4.92 | 8 | 2.60 | 6 ^a | 4.51 | 8 ^a | 2.60 | 6 ^a |
| 50 | 3.79 | 6 | 6.56 | 12 ^a | 3.47 | 6 | 6.01 | 8 | 3.47 | 6 |
| 75 | 5.68 | 8 | 9.84 | 18 ^a | 5.21 | 8 | 9.02 | 12 | 5.21 | 8 |
| 100 | 7.58 | 12 | 13.12 | 25 | 6.94 | 12 ^a | 12.03 | 18 | 6.94 | 12 ^a |
| 167 | 12.65 | 18 | 21.87 | 30 | 11.60 | 18 | 20.05 | 25 | 11.60 | 18 |
| 250 | 18.94 | 25 | 32.80 | 50 | 17.36 | 25 | 30.07 | 40 | 17.36 | 25 |
| 333 | 25.23 | 30 | 43.74 | — | 23.13 | 30 | 40.09 | 50 | 23.13 | 30 |
| 500 | 37.88 | 50 | 65.61 | — | 34.72 | 50 | 60.14 | — | 34.72 | 50 |

* The recommended fuse sizes for this connection are based on equal size transformers in the bank. If a larger transformer is used in the bank for supplying single-phase loads, the fuse selections should be based on the larger transformer kVA.

† See notes on page 7.

Notes: (Table 4): Recommended fuse ratings are based on the use of ELF fuse time-current characteristics in R240-91-42, R240-91-43 and R240-91-44. Recommendations provide overload protection (fusing ratio) between 200-300% rated load.

$$\text{Fusing Ratio} = \frac{\text{Fuse Min. Melt Current at 300 sec.}}{\text{Transformer Full Load Current}} \times 100$$

- a. Fuse allows more than 300% load for 300 seconds.
- b. 8.3 kV rated fuse is a single-barrel fuse, 15 kV rated fuse is a double-barrel fuse.
- c. Available only at 8.3 kV.
- d. This lower voltage fuse rating may be used if either of the following conditions are met:
 - 1) If the probability of a line-to-line or a three-phase ungrounded fault is very low.

-OR-

- 2) If all of the below conditions are met:
 - If the probability of a three-phase ungrounded primary fault is very low.
 - If a secondary breaker or other series connected device is used to interrupt secondary faults.
 - If no more than 50% of the secondary load is delta connected.
 - If the line-to-line primary fault current is high enough to assure simultaneous operation of two fuses by melting at a maximum of 0.2

seconds.

- e. 15 kV, 125 kV BIL 6 through 25 A (single-barrel part numbers FAK44W6 through FAK44W25) and 30 through 50 A (double-barrel part numbers KAF44W30P, FAK44W40, and FAK44W50) are recommended for this application.

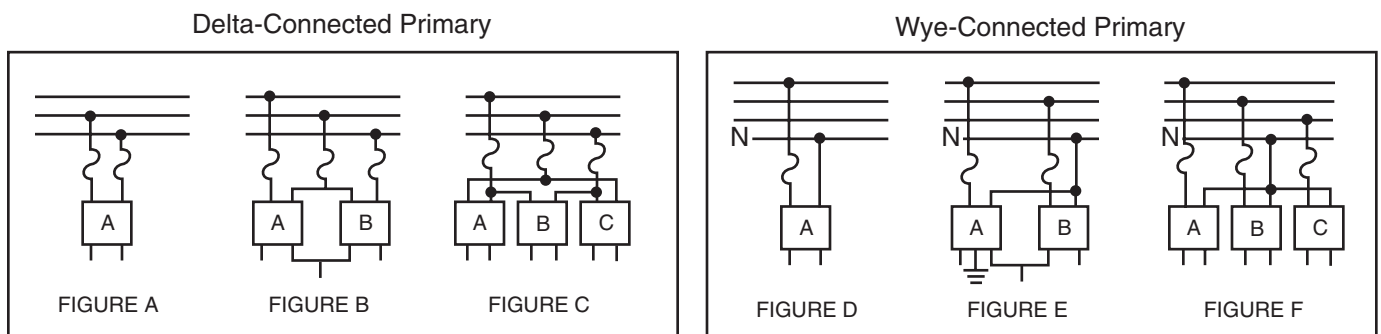


Figure 2. Schematic of primary voltage system connections.

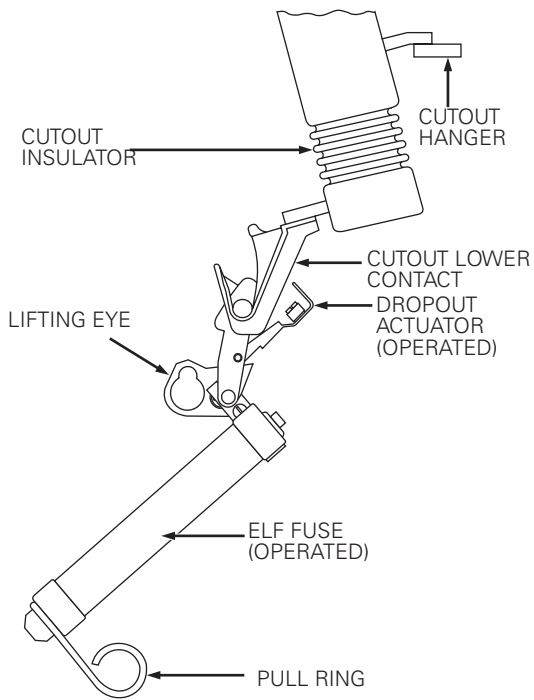


Figure 3. ELF fuse in interchangeable cutout after dropping open due to operation of dropout actuator.

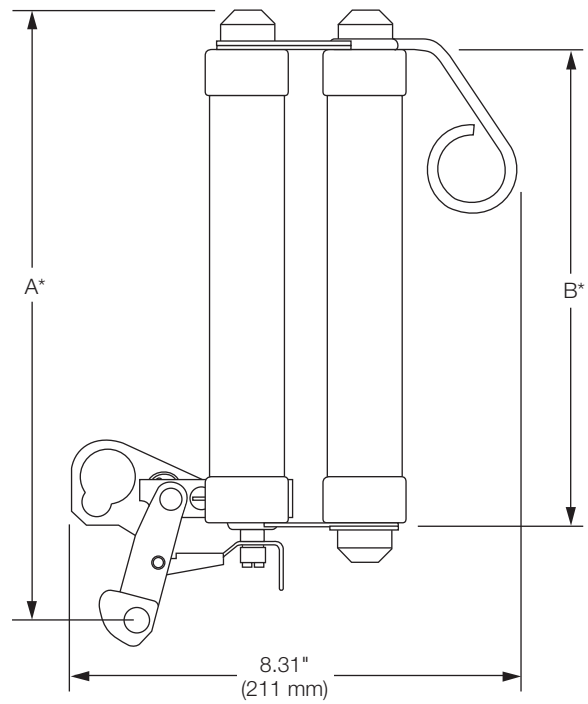


Figure 4. Double-barrel ELF fuse dimensions.

* See Table 5, 6, or 7 for dimensions A and B.

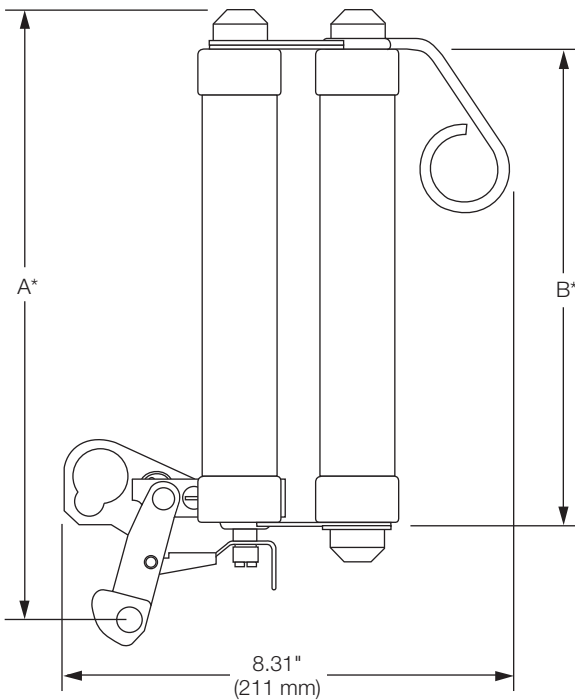
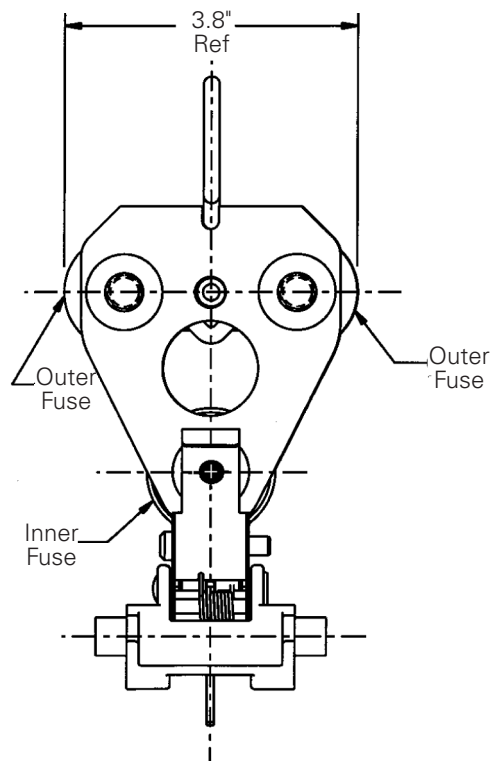


Figure 5. Triple-barrel ELF fuse dimensions.



* See Table 5 or 6 for dimensions A and B.

Operation

When the ELF fuse clears a fault, the dropout actuator operates and allows the fuse to drop open in the cutout. (Refer to Figure 3.)

Ordering information

To order an ELF current-limiting dropout fuse, determine the amperage rating and the voltage ratings of the application, specify required fuse from Tables 5, 6, or 7.

Table 5. ELF Current-Limiting Dropout Fuse Catalog Numbers for 15 kV, 110 kV BIL Interchangeable Cutouts

| Fuse Rating | | | Dimensions | | |
|--------------|--------------------|-------------------------|------------|-----------------|----------------|
| Voltage (kV) | Current Rating (A) | ELF Fuse Catalog Number | Figure | A | B |
| 8.3 | 6 | FAK23W6 | 1 | 11.37" (289 mm) | 8.83" (224 mm) |
| | 8 | FAK23W8 | 1 | | |
| | 12 | FAK23W12 | 1 | | |
| | 18 | FAK23W18 | 1 | | |
| | 20 | FAK23W20 | 1 | | |
| | 25 | FAK23W25 | 1 | | |
| | 30 | FAK23W30 | 1 | | |
| | 40 | FAK23W40 | 1 | | |
| | 50 | FAK23W50* | 4 | | |
| | 65 | FAK23W65* | 4 | | |
| | 80 | FAK23W80* | 4 | | |
| 100 | FAK23W100** | 5 | | | |
| 15.0 | 6 | FAK24W6 | 1 | 11.37" (289 mm) | 8.83" (224 mm) |
| | 8 | FAK24W8 | | | |
| | 12 | FAK24W12 | | | |
| | 18 | FAK24W18 | | | |
| | 20 | FAK24W20 | | | |

* Double-barrel design

** Triple-barrel design

Table 6. ELF Current-Limiting Dropout Fuse Catalog Numbers for 15 kV, 125 kV or 150 kV BIL and 27 kV, 125 kV BIL Interchangeable Cutouts

| Fuse Rating | | ELF Fuse Catalog Number | Figure | Dimensions | |
|--------------|--------------------|-------------------------|--------|--------------------|--------------------|
| Voltage (kV) | Current Rating (A) | | | A | B |
| 8.3 | 6 | FAK43W6 | 1 | 15.16" (385 mm) | 12.34" (313 mm) |
| | 8 | FAK43W8 | 1 | | |
| | 12 | FAK43W12 | 1 | | |
| | 18 | FAK43W18 | 1 | | |
| | 20 | FAK43W20 | 1 | | |
| | 25 | FAK43W25 | 1 | | |
| | 30 | FAK43W30 | 1 | | |
| | 40 | FAK43W40 | 1 | | |
| | 50 | FAK43W50* | 4 | | |
| | 65 | FAK43W65* | 4 | | |
| 80 | FAK43W80* | 4 | | | |
| 100 | FAK43W100** | 5 | | | |
| 15.0*** | 6 | FAK44W6 | 1 | 15.16" (385 mm) | 12.34" (313 mm) |
| 15.0*** | 8 | FAK44W8 | 1 | | |
| 15.0*** | 12 | FAK44W12 | 1 | | |
| 15.0*** | 18 | FAK44W18 | 1 | | |
| 15.0*** | 20 | FAK44W20 | 1 | | |
| 15.0*** | 25 | FAK44W25 | 1 | | |
| 15.0 | 30 | FAK44W30 | 1 | | |
| 15.0*** | 30 | FAK44W30P* | 4 | | |
| 15.0*** | 40 | FAK44W40* | 4 | | |
| 15.0*** | 50 | FAK44W50* | 4 | | |
| 23.0 | 6 | FAK45W6 | 1 | 15.16" (385 mm) | 12.34" (313 mm) |
| | 8 | FAK45W8 | 1 | | |
| | 12 | FAK45W12 | 1 | | |
| | 18 | FAK45W18 | 1 | | |
| | 20 | FAK45W20 | 1 | | |
| | 25 | FAK45W25* | 4 | | |
| | 30 | FAK45W30* | 4 | | |

* Double-barrel design

** Triple-barrel design

***15 kV, 125 kV BIL, 6 through 25 A (single barrel part numbers FAK44W6 through FAK44W25) and 30 through 50 A (double barrel part numbers FAK44W30P, FAK44W40, and FAK44W50) have been tested and approved for 17.2 kV application.

Table 7. ELF Current-Limiting Dropout Fuse Catalog Numbers for 36 kV, 170 kV BIL ABB Cutouts*

| Fuse Rating | | ELF Fuse Catalog Number | Figure | Dimensions | |
|--------------|--------------------|-------------------------|--------|--------------------|-------------------|
| Voltage (kV) | Current Rating (A) | | | A | B |
| 24.0 | 6 | FAK46W6 | 1 | 18.55" (471 mm) | 15.7" (399 mm) |
| | 8 | FAK46W8 | | | |
| | 12 | FAK46W12 | | | |
| | 18 | FAK46W18 | | | |
| | 20 | FAK46W20 | | | |

* 36 kV ABB Non-Loadbreak Cutout Series V

Additional information

Refer to the following reference literature for application recommendations:

- B240-12060 CAL Fire Exempt Full-Range, Current-Limiting Dropout Fuse Reduces Fire Risk on Distribution Lines
 - PA132007EN Protect Your Upstream Personnel and Investment While Increasing Distribution Reliability with the ELF Fuse
 - R240-66-1 ELF Fuse Coordination Tables with Protecting Fuse Links
 - R240-66-2 ELF Fuse Coordination Tables with Protected Fuse Links
 - R240-91-42 8.3 kV ELF Fuse Time-Current Characteristic Curves
 - R240-91-43 15.0 kV ELF Fuse Time-Current Characteristic Curves
 - R240-91-44 23.0 kV ELF Fuse Time-Current Characteristic Curves
 - MN132028EN ELF Current-Limiting Dropout Fuse Installation Instructions
 - 93033 Application Solutions Provided with ELF Fuse
 - CP-9415 ELF Certified Test Report
- Contact your Eaton representative for more information.

Table 8. ELF Fuse Ratings for 15 kV UltraSIL Polymer-Insulated and Porcelain Type L Fuse Cutouts

| ELF Fuse Rating Code* | | ELF Fuse Ratings | |
|-----------------------|---------|------------------|-----------|
| Digit 8 | Digit 9 | Voltage kV | Current A |
| 3 | A | 8.3 | 6 |
| 3 | B | 8.3 | 8 |
| 3 | C | 8.3 | 12 |
| 3 | D | 8.3 | 18 |
| 3 | E | 8.3 | 20 |
| 3 | F | 8.3 | 25 |
| 3 | G | 8.3 | 30 |
| 3 | H | 8.3 | 40 |
| 3 | J | 8.3 | 50** |
| 3 | K | 8.3 | 65** |
| 3 | L | 8.3 | 80** |
| 4 | A | 15.0 | 6 |
| 4 | B | 15.0 | 8 |
| 4 | C | 15.0 | 12 |
| 4 | D | 15.0 | 18 |
| 4 | E | 15.0 | 20 |

a For temperatures other than listed, a deration factor of 0.26% per °C can be applied.

* Replace digits 8 and 9 of the catalog number with the correct ELF fuse rating codes.

** Double-barrel design

Note: For more information regarding the ELF fuse, refer to Catalog section CA132027EN.

Table 9. ELF Fuse Ratings for 27 kV UltraSIL Polymer-Insulated and Porcelain Type L Fuse Cutouts

| ELF Fuse Rating Code* | | ELF Fuse Ratings | |
|-----------------------|---------|------------------|-----------|
| Digit 8 | Digit 9 | Voltage kV | Current A |
| 3 | A | 8.3 | 6 |
| 3 | B | 8.3 | 8 |
| 3 | C | 8.3 | 12 |
| 3 | D | 8.3 | 18 |
| 3 | E | 8.3 | 20 |
| 3 | F | 8.3 | 25 |
| 3 | G | 8.3 | 30 |
| 3 | H | 8.3 | 40 |
| 3 | J | 8.3 | 50** |
| 3 | K | 8.3 | 65** |
| 3 | L | 8.3 | 80** |
| 4 | A | 15.0*** | 6 |
| 4 | B | 15.0*** | 8 |
| 4 | C | 15.0*** | 12 |
| 4 | D | 15.0*** | 18 |
| 4 | E | 15.0*** | 20 |
| 4 | F | 15.0*** | 25 |
| 4 | G | 15.0*** | 30** |
| 4 | H | 15.0*** | 40** |
| 4 | J | 15.0*** | 50** |
| 5 | A | 23.0 | 6 |
| 5 | B | 23.0 | 8 |
| 5 | C | 23.0 | 12 |
| 5 | D | 23.0 | 18 |
| 5 | E | 23.0 | 20 |
| 5 | F | 23.0 | 25** |
| 5 | G | 23.0 | 30** |

a For temperatures other than listed, a deration factor of 0.26% per °C can be applied.

* Replace digits 8 and 9 of the catalog number with the correct ELF fuse rating codes.

** Double-barrel design

*** These ELF fuses have been tested and approved for a 17.2 kV application.

Note: For more information regarding the ELF fuse, refer to Catalog section CA132027EN.

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For Eaton's Cooper Power series ELF fuse
product information call 1-877-277-4636 or
visit: www.eaton.com/cooperpowerseries.