

CX-Series Circuit Breaker

The CX-Series circuit breaker features a unique and innovative arc-quenching configuration that allows the breaker to safely handle high amperage and high DC voltage applications in a compact package.

By using a patent pending magnetic flux boosting terminal configuration, a strong magnetic field is created thus motivating the arc into an enhanced arc chamber improving the breaker's overall performance and reliability.

The permanent magnets located at the entrance of the arc chamber combined with the upper and lower arc runner increase the magnetic blow out force and aid in motivating the arc off of the contacts and into the arc chamber.

An enhanced arc chamber features arc splitter retainers with integrated pressurizing walls, which facilitates heat transfer from the arc thereby providing additional cooling and quick transition into the magnetically induced splitter plates. In turn, the twelve (12) splitter plates attract, segment and cool the arc for full extinction.

Combined, these innovative features make the CX-Series breaker the best in class, providing stable performance even in the most demanding applications.

Applications:

- ♦ The CX-Series is UL 489B approved and ideal for integration into the combiner box or main disconnect of photovoltaic renewable energy systems.
- ♦ Ideally suitable for integration into Information Technologies' power distribution equipment utilizing high DC voltage input.



Additional Features:

- ♦ UL 489B approved
- ♦ Temperature stable hydraulic/magnetic overcurrent sensing technology.
- ♦ Optional relay trip circuit permitting remote operator system shut down.
- ♦ Choice of 6-32 or M3 mounting inserts providing secure panel mount installation.
- ♦ Choice of handle colors and legends, consult factory for details.



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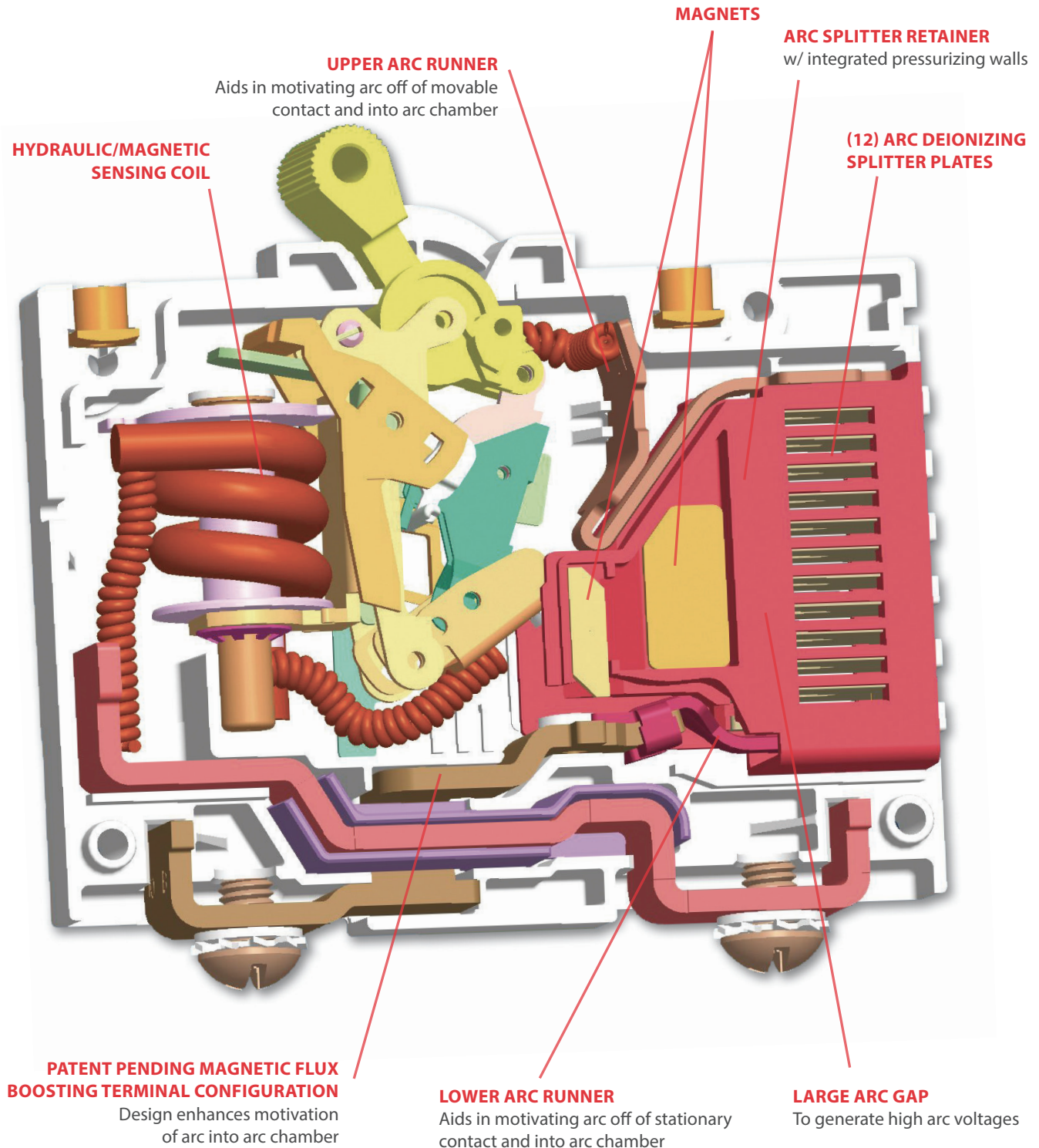
Innovative Designs. Powerful Solutions.

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CX-Series Circuit Breaker

DESIGN FEATURES



Electrical Tables

Table A: Lists UL Listed (UL489) configuration and performance capabilities as a Molded Case Circuit Breaker

| CX SERIES TABLE A : UL489 LISTED BRANCH CIRCUIT BREAKERS | | | | | |
|--|-------------|-----------|-------------------------|------------------------------|-----------------|
| CIRCUIT CONFIGURATION | VOLTAGE | | MAX CURRENT RATING AMPS | INTERRUPTING CAPACITY (AMPS) | NUMBER OF POLES |
| | MAX. RATING | FREQUENCY | | | |
| SERIES | 250 | D.C. | 15 | 5,000 | 1 |
| | 250 / 500 | D.C. | 15 | 10,000 | 2 |

Table C: Lists UL Listed (UL489B) configuration and performance capabilities as a Molded Case Switch

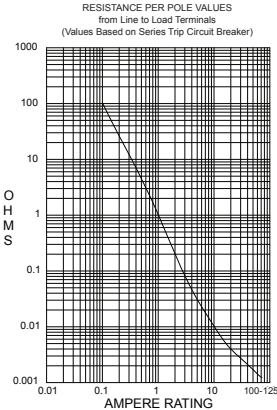
| CX SERIES TABLE C : UL489B LISTED PHOTOVATIC MOLDED CASE SWITCH | | | | | | |
|---|------------|-----------|----------------|-----------------------|----------------------------|---|
| CIRCUIT CONFIGURATION | VOLTAGE | | | CURRENT RATING (AMPS) | INTERRUPTING RATING (AMPS) | CONSTRUCTION NOTES |
| | MAX RATING | FREQUENCY | POLES | | | |
| SERIES | 600 | DC | 2 ¹ | 50 - 100 | 600 | May have a third pole that is a voltage trip pole |
| | 600 | DC | 4 ² | 110 - 175 | 600 | May have a fifth pole that is a voltage trip pole |

Notes:

- 1 Two poles in series.
- 2 Two poles in series in parallel with 2 poles in series.

Electrical

Maximum Voltage 600 VDC
 Overload 50 operations at 600% of rated current for UL489, and at 150% of rated current for UL1077.



| Current (amps) | Tolerance (%) |
|----------------|---------------|
| 0.1 -5.0 | 15% |
| 5.1-20.0 | 25% |
| 20.1-125 | 35% |

Physical

Number of Poles 1- 2 poles, + Auxiliary Switch Pole.
 Termination 10-32 or M5 Screw Terminals 1/4-20 or M6 Threaded Stud Terminals.
 Termination Barrier Standard with multi-pole constructions.
 Mounting Threaded insert: #6-32 UNC-2B, or M3X0.5-6H B ISO (2 per pole).
 Actuator Handle, 1 per pole.
 Internal Circuit Config. Series Trip
 Materials Housing - Glass filled Polyester
 Handle - Glass filled Polyester
 Line/Load Terminals - Copper Alloy.
 Weight ~150 Grams (~5.3 Ounces).
 Standard Color Housing - Gray.
 Handle - White, Black, Red, Green, Blue, Yellow, Gray,

Table B: Lists UL Recognized configurations and performance capabilities as a Component Supplementary Protector

| CX SERIES TABLE B : UL1077 COMPONENT SUPPLEMENTARY PROTECTOR | | | | | | |
|--|-------------|-----------|-------------------------|------------------------------|-----------------|------------------|
| CIRCUIT CONFIGURATION | VOLTAGE | | MAX CURRENT RATING AMPS | INTERRUPTING CAPACITY (AMPS) | NUMBER OF POLES | APPLICATION CODE |
| | MAX. RATING | FREQUENCY | | | | |
| SERIES | 300 | D.C. | 1 - 75 | 5,000 | 1 | TC1, OL0, U3 |
| | 300 | D.C. | 76 - 125 | 3,000 | 1 | TC1, OL0, U3 |
| | 440 | D.C. | 1 -30 | 10,000 | 2 | TC1, OL0, U3 |
| | 440 | D.C. | 31 - 50 | 5,000 | 2 | TC1, OL0, U3 |
| | 600 | D.C. | 1 - 75 | 3,000 | 2 | TC1, OL0, U3 |
| | 600 | D.C. | 76 - 100 | 5,000 | 2 | TC1, OL0, U3 |
| SWITCH ONLY ¹ | 600 | D.C. | 1 - 100 | 3,000 | 2 or 3 | --- |

Notes:

- 1 Requires inclusion of a relay trip voltage coil

Mechanical

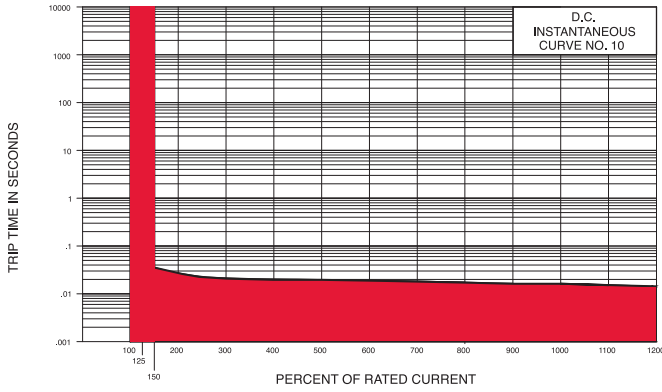
Endurance Max 10,000 ON-OFF operations @ 6 per minute; 6000 with rated current & voltage, and 4,000 cycles mechanical.
 Trip Free Trips on overload even when actuator is forcibly held in the "On" position.
 Trip Indication The operating handle moves positively to the "Off" position when an overload causes the breaker to trip.

Environmental

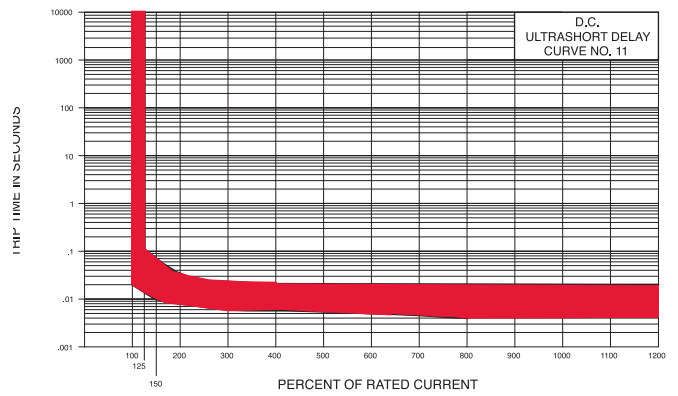
Shock Withstands 100 Gs, 6ms saw tooth while carrying rated current per MIL-PRF-55629 and MIL-STD-202G, Method 213G, Test Condition "I". Instantaneous and ultra short curves tested at 90% of rated current.
 Vibration Withstands 0.060" excursion from 10-55 Hz & 10 Gs 55-500 Hz, at rated current per MIL-PRF-55629 and MILSTD-202G, Method 240D, Test Cond. A. Instantaneous & ultrashort curves tested at 90% of rated current.
 Moisture Resistance MIL-PRF-55629 and MIL-STD-202G, Method 106G, i.e., Ten 24-hour cycles at +25°C to +65°C, 80-98% RH.
 Salt Spray Method 101, Condition A (90-95% RH at 5% NaCl Solution, 96 hrs).
 Thermal Shock MIL-PRF-55629 and MIL-STD-202G, Method 107G, Condition A (5-cycles at -55°C to +25°C to +85°C to +25°C).
 Operating Temperature -40°C to +85°C.

*Manufacturer reserves the right to change product specification without prior notice.

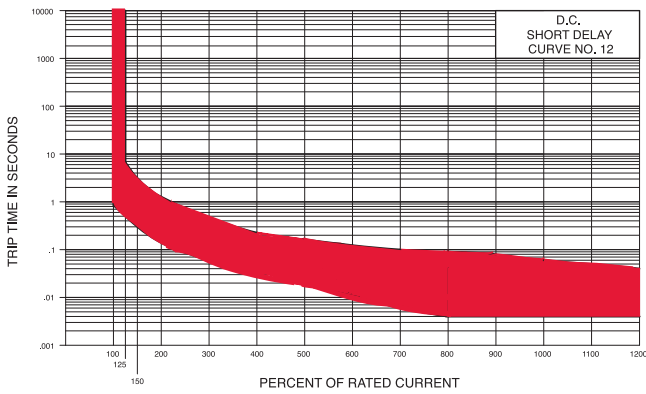
Instantaneous - DC 10



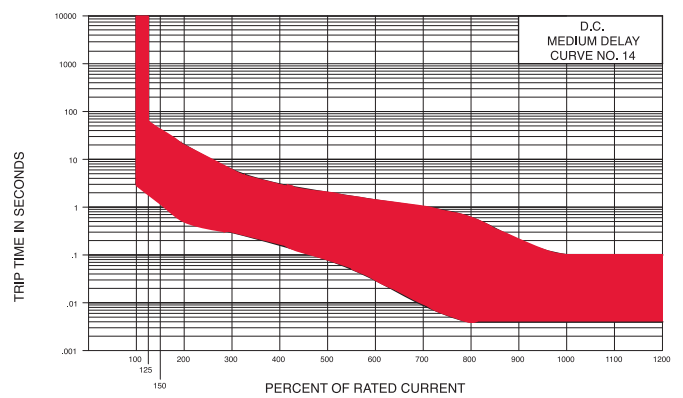
Ultrashort - DC 11



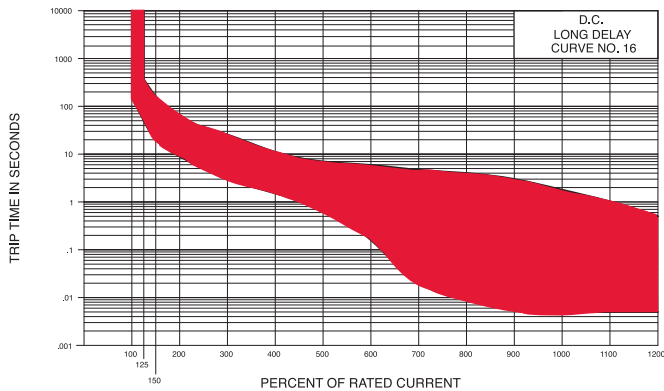
Short - DC 12

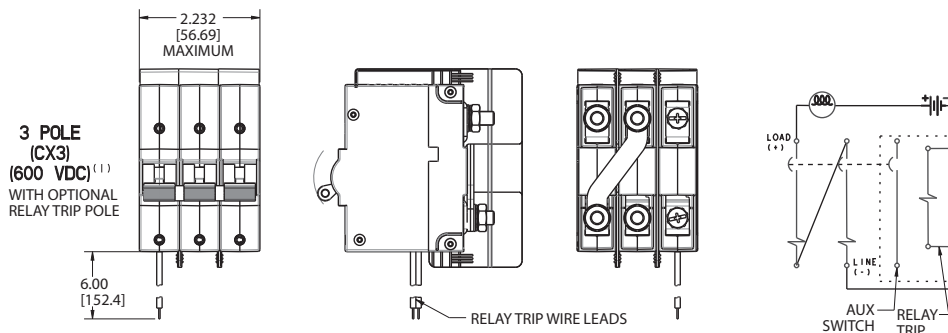
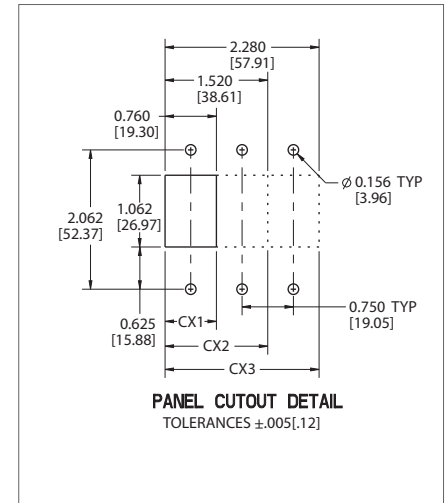
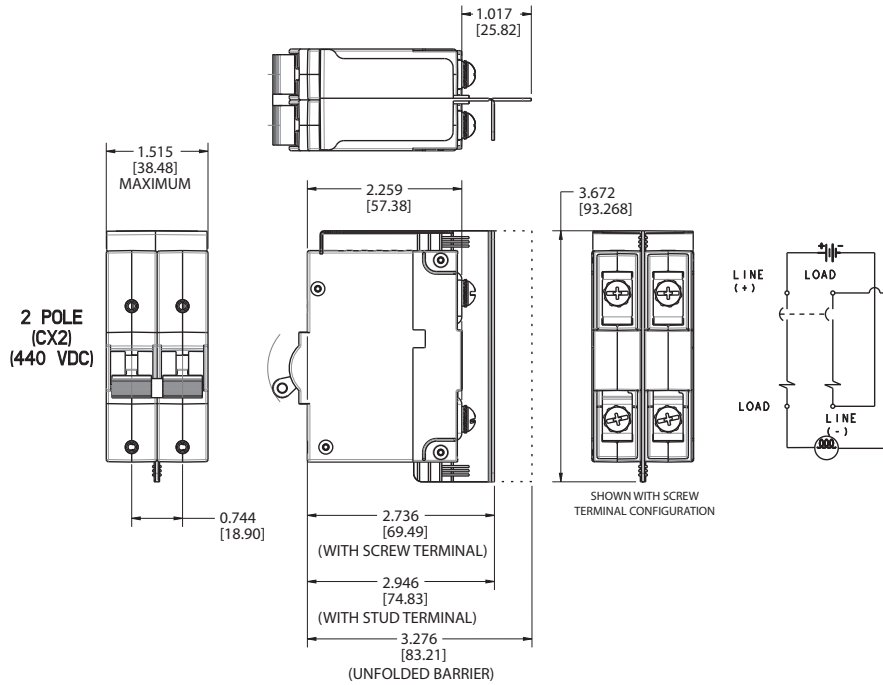
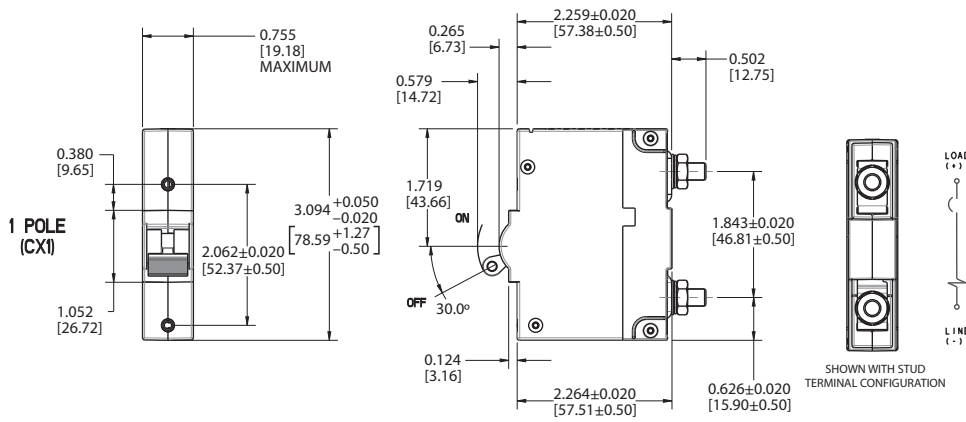


Medium - DC 14

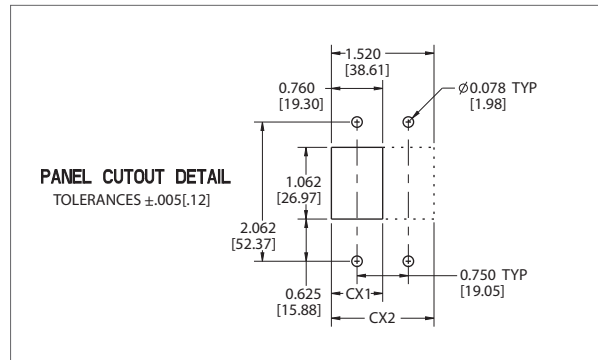
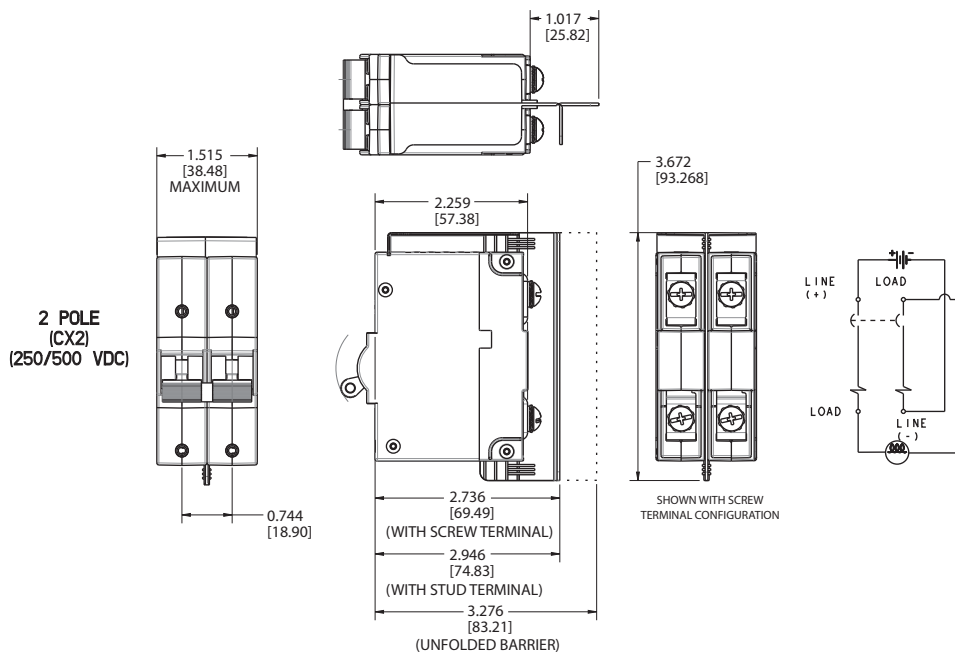
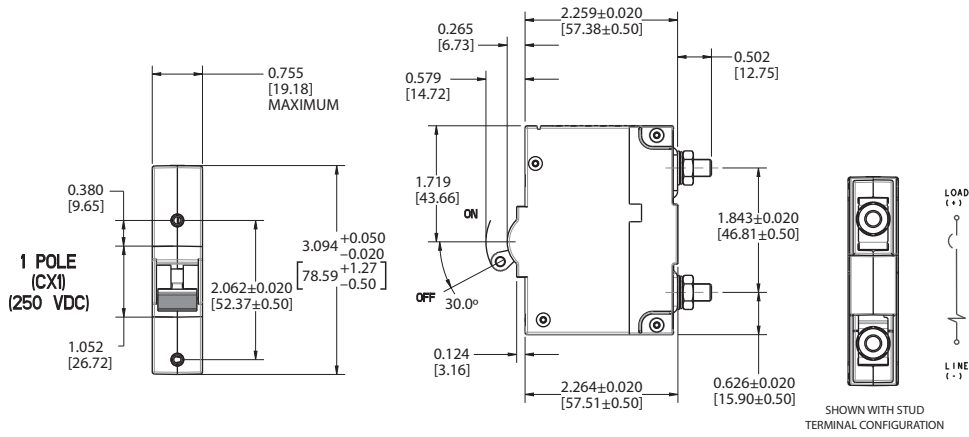


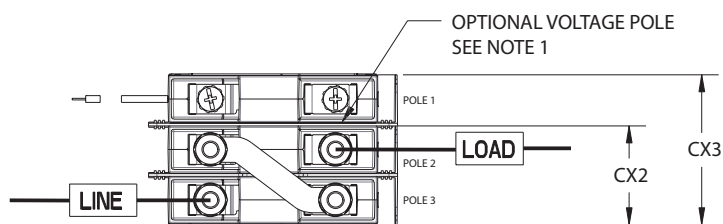
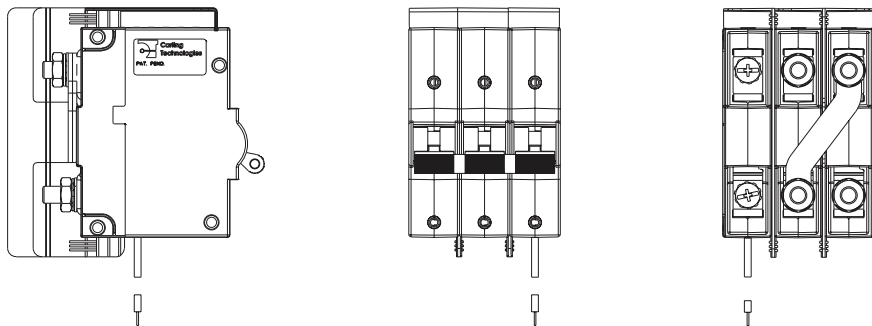
Long - DC 16



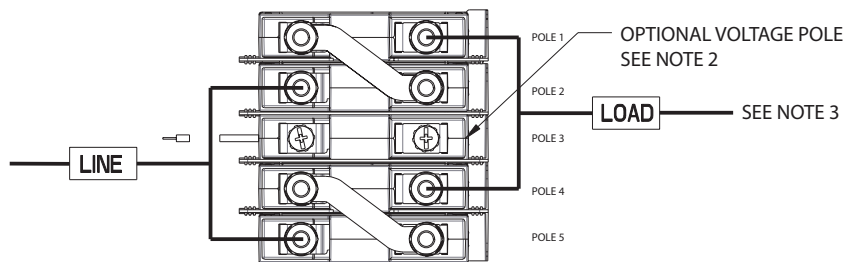


(1) 600V RATING REQUIRED MINIMUM OF 2 PROTECTED POLES





CX3 - 2 POLE SWITCH (CX2) SHOWN
WITH OPTIONAL VOLTAGE POLE
50A-100A DEVICE, 600VDC



CX5 - 4 POLE SWITCH (CX4) SHOWN
WITH OPTIONAL VOLTAGE POLE
101A-175A DEVICE, 600VDC

Notes:

- 1 3 pole configuration supplied with voltage coil on pole 1. Optional location pole 3. Consult factory.
- 2 5 pole configuration supplied with voltage coil in center pole. (Pole 3)
- 3 Line & Load connections requires bus connection as shown.
Minimum cross section .127 in² (81.94 mm²)



1 SERIES

C

2 ACTUATOR

X Handle, one per pole

3 POLES^{1,2}

| | |
|---------|--------|
| 2 Two | 4 Four |
| 3 Three | 5 Five |

4 CIRCUIT

S Switch Only

5 RELAY TRIP VOLTAGE COIL RATING^{1,2}

| |
|-------------------------------|
| 0 w/o Relay Trip Voltage Coil |
| A 12 VDC |
| B 24 VDC |
| C 32 VDC |
| D 48 VDC |

6 FREQUENCY & DELAY

03 DC Switch Only

7 CURRENT RATING (AMPERES)^{1,3}

| 2-Pole Section | | 4-Pole Section | |
|----------------|---------------|----------------|---------------|
| 650 | 50.00 | 811 | 110.00 |
| | | | |
| | | | |
| | | | |
| 810 | 100.00 | 917 | 175.00 |

8 TERMINAL^{4,5}

| |
|--|
| 3 Stud, 1/4-20 |
| 6 Stud, M6 |
| A Stud, 1/4-20, w/ 10-32 Screw Terminals on Voltage Pole |
| B Stud, M6, w/ M5 Screw Terminals on Voltage Pole |

9 HANDLE COLOR & LEGEND

| Actuator Color | I-O | ON-OFF | Dual | Legend Color |
|----------------|-----|--------|------|--------------|
| White | A | B | 1 | Black |
| Black | C | D | 2 | White |
| Red | F | G | 3 | White |
| Green | H | J | 4 | White |
| Blue | K | L | 5 | White |
| Yellow | M | N | 6 | Black |
| Gray | P | Q | 7 | Black |
| Orange | R | S | 8 | Black |

10 MOUNTING INSERTS

| | |
|---------------|-------------|
| A 6-32 Thread | B M3 Thread |
|---------------|-------------|

11 MAX. APPLICATION RATING

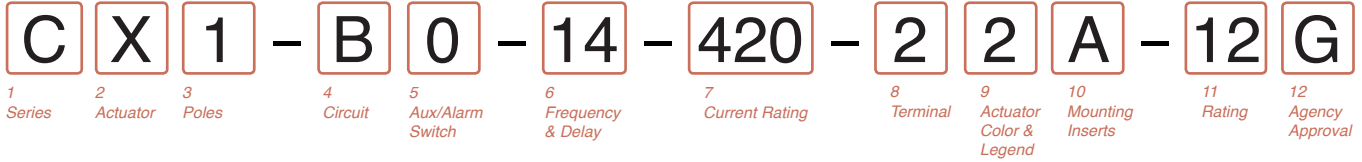
06 600VDC

12 AGENCY APPROVAL

| |
|---------------------|
| A Without approvals |
| 14 UL489B Listed |

Notes:

- 1 2 Pole Unit is required for ratings between 50A - 100A.
4 Pole Unit is required for ratings between 110A - 175A.
- 2 A Relay Trip Voltage Coil Pole may be added to either the 2 or 4 Pole construction. The addition of this extra pole dictates a change in the designation for the number of poles in selection 3.
- 3 For Current Ratings between 50A - 100A select current code 810 (100A).
For Current Ratings between 101A - 175A select current code 917 (175A).
- 4 Voltage Pole must have screw terminals.
Switch Pole must have stud terminals.
- 5 On 3 Pole Unit, Voltage Pole to be located at P1 as standard.
On 5 Pole Unit, Voltage Pole to be located at P3 as standard.



1 SERIES
C

2 ACTUATOR
X Handle, one per pole

3 POLES
1 One 2 Two

4 CIRCUIT
B Series Trip (current)

5 AUXILIARY/ALARM SWITCH
0 w/o Aux Switch

6 FREQUENCY & DELAY
11 DC Ultra Short
12 DC Short
14 DC Medium
16 DC Long

7⁶ CURRENT RATING (AMPERES)

| CODE | AMPERES | CODE | AMPERES | CODE | AMPERES | CODE | AMPERES |
|------|---------|------|---------|------|---------|------|---------|
| 220 | 0.200 | 280 | 0.800 | 430 | 3.000 | 490 | 9.000 |
| 225 | 0.250 | 285 | 0.850 | 435 | 3.500 | 495 | 9.500 |
| 230 | 0.300 | 290 | 0.900 | 440 | 4.000 | 610 | 10.000 |
| 235 | 0.350 | 295 | 0.950 | 445 | 4.500 | 710 | 10.500 |
| 240 | 0.400 | 410 | 1.000 | 450 | 5.000 | 611 | 11.000 |
| 245 | 0.450 | 512 | 1.250 | 455 | 5.500 | 711 | 11.500 |
| 250 | 0.500 | 415 | 1.500 | 460 | 6.000 | 612 | 12.000 |
| 255 | 0.550 | 517 | 1.750 | 465 | 6.500 | 712 | 12.500 |
| 260 | 0.600 | 420 | 2.000 | 470 | 7.000 | 613 | 13.000 |
| 265 | 0.650 | 522 | 2.250 | 475 | 7.500 | 614 | 14.000 |
| 270 | 0.700 | 425 | 2.500 | 480 | 8.000 | 615 | 15.000 |
| 275 | 0.750 | 527 | 2.750 | 485 | 8.500 | | |

8 TERMINAL
2 Screw Terminal, 10-32 5 Screw Terminal, M5
3 Stud, 1/4-20 6 Stud, M6

9 ACTUATOR COLOR & LEGEND

| Acuator Color | I-O | ON-OFF | Dual | Legend Color |
|---------------|-----|--------|------|--------------|
| White | A | B | 1 | Black |
| Black | C | D | 2 | White |
| Red | F | G | 3 | White |
| Green | H | J | 4 | White |
| Blue | K | L | 5 | White |
| Yellow | M | N | 6 | Black |
| Gray | P | Q | 7 | Black |
| Orange | R | S | 8 | Black |

10 MOUNTING INSERTS
A 6-32 Thread B M3 Thread

11 MAX. APPLICATION RATING
12 250VDC 13' 250 / 500VDC

12 AGENCY APPROVAL
A Without approvals
G UL 489 Listed

Notes:
1 250/500 rating requires two pole breaker



1 SERIES
C

2 ACTUATOR
X Handle, one per pole

3 POLES
1 One 2 Two 3 Three

4 CIRCUIT
A¹ Switch Only (no coil) G¹ Relay Trip (voltage)
B Series Trip (current)

5 AUXILIARY SWITCH
0 w/o Aux Switch³

6 FREQUENCY & DELAY
03 DC 50/60Hz, Switch Only
10 DC Instantaneous
11 DC Ultra Short
12 DC Short
14 DC Medium
16 DC Long

7⁶ CURRENT RATING (AMPERES)

| CODE | AMPERES | | | | |
|------|---------|-----|--------|-----|--------|
| 220 | 0.200 | 420 | 2.000 | 611 | 11.000 |
| 225 | 0.250 | 522 | 2.250 | 711 | 11.500 |
| 230 | 0.300 | 425 | 2.500 | 612 | 12.000 |
| 235 | 0.350 | 527 | 2.750 | 712 | 12.500 |
| 240 | 0.400 | 430 | 3.000 | 613 | 13.000 |
| 245 | 0.450 | 435 | 3.500 | 614 | 14.000 |
| 250 | 0.500 | 440 | 4.000 | 615 | 15.000 |
| 255 | 0.550 | 445 | 4.500 | 616 | 16.000 |
| 260 | 0.600 | 450 | 5.000 | 617 | 17.000 |
| 265 | 0.650 | 455 | 5.500 | 618 | 18.000 |
| 270 | 0.700 | 460 | 6.000 | 620 | 20.000 |
| 275 | 0.750 | 465 | 6.500 | 622 | 22.000 |
| 280 | 0.800 | 470 | 7.000 | 624 | 24.000 |
| 285 | 0.850 | 475 | 7.500 | 625 | 25.000 |
| 290 | 0.900 | 480 | 8.000 | 630 | 30.000 |
| 295 | 0.950 | 485 | 8.500 | 635 | 35.000 |
| 410 | 1.000 | 490 | 9.000 | 640 | 40.000 |
| 512 | 1.250 | 495 | 9.500 | 650 | 50.000 |
| 415 | 1.500 | 610 | 10.000 | 660 | 60.000 |
| 517 | 1.750 | 710 | 10.500 | 665 | 65.000 |

8 TERMINAL
2 Screw Terminal, 10-32 5 Screw Terminal, M5
3 Stud, 1/4-20 6 Stud, M6

9 ACTUATORCOLOR & LEGEND

| Actuator Color | I-O | ON-OFF | Dual | Legend Color |
|----------------|-----|--------|------|--------------|
| White | A | B | 1 | Black |
| Black | C | D | 2 | White |
| Red | F | G | 3 | White |
| Green | H | J | 4 | White |
| Blue | K | L | 5 | White |
| Yellow | M | N | 6 | Black |
| Gray | P | Q | 7 | Black |
| Orange | R | S | 8 | Black |

10 MOUNTING INSERTS
A 6-32 Thread w/o terminal bus B M3 Thread w/o terminal bus

11 MAX. APPLICATION RATING
10 300VDC 11⁴ 440VDC 06⁵ 600VDC

12 AGENCY APPROVAL
A Without approvals
C UL 1077 Recognized

- Notes:
- 1 Only available when tied to a protected pole. Requires special P/N. Consult factory.
 - 2 Voltage trip circuit coil not rated for continuous duty - use instantaneous delay code 10.
 - 3 Contacts rated for 20A @ 80VDC.
 - 4 440VDC rating not available with factory installed terminal bus
 - 5 600VDC only available with factory installed terminal bus
 - 6 Single pole units available up to 125A, multipole units limited to 100A max.
 - 7 3-pole units must include one auxiliary switch pole (circuit code A or G). Requires special P/N. Consult factory.
 - 8 Screw terminals are limited to 50A max.