

CX-Series Circuit Breaker

Carling Technologies is proud to introduce the CX-Series circuit breaker, which features a unique and innovative patent pending 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:

- ♦ Ideal for integration into photovoltaic renewable energy systems. The CX-Series circuit breaker can be designed into the system's combiner box or main disconnect.
- ♦ Ideal for integration into Information Technologies' power distribution equipment utilizing high DC voltage input.



Additional Features:

- ♦ 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.



Carling Technologies™

Innovative Designs. Powerful Solutions.

Innovative Designs. Powerful Solutions.

**Product Bulletin #137
September 2011**

Carling Technologies, Inc.

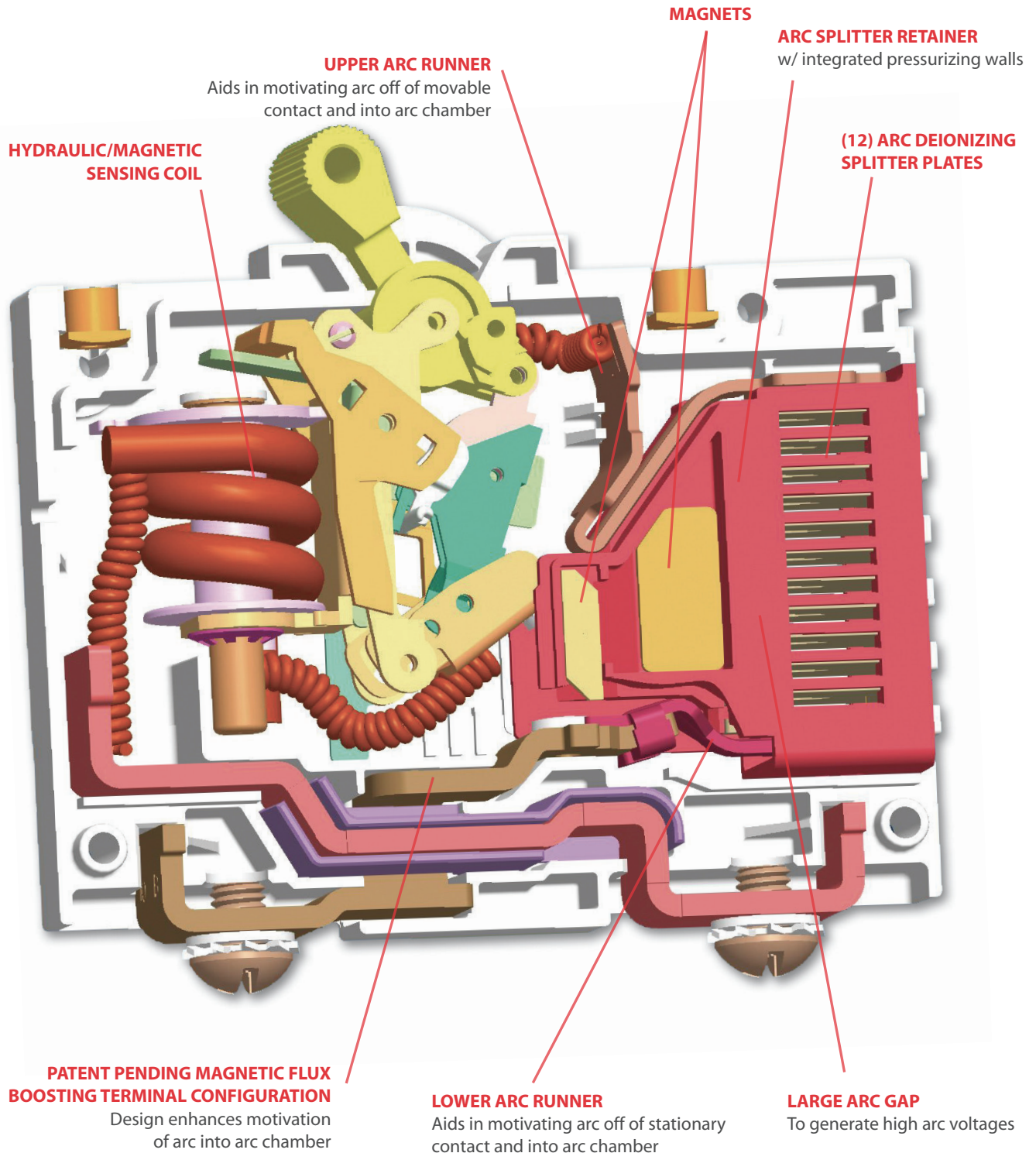
60 Johnson Avenue • Plainville, CT 06062-1177

Phone: (860) 793-9281 • Fax: (860) 793-9231

Email: sales@carlingtech.com • www.carlingtech.com

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: UL 489 LISTED BRANCH CIRCUIT BREAKERS					
CIRCUIT CONFIGURATION	VOLTAGE		MAX CURRENT RATING AMPS	INTERRUPT CAPACITY AMPS	NUMBER OF POLES
	MAX RATING	FREQUENCY			
SERIES	250	DC	15	5,000	1
	250 / 500	DC	15	10,000	2

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

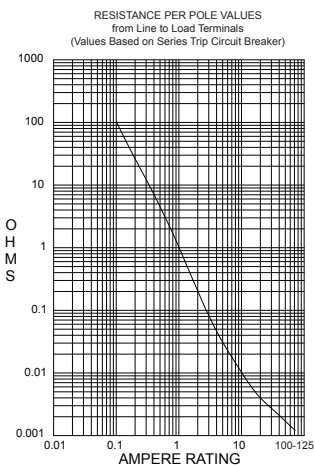
CX SERIES TABLE B: UL 1077 COMPONENT SUPPLEMENTARY PROTECTOR						
CIRCUIT CONFIGURATION	VOLTAGE		CURRENT RATING AMPS	INTERRUPT CAPACITY AMPS	NUMBER OF POLES	APPLICATION CODE
	MAX RATING	FREQUENCY				
SERIES	300	DC	1 - 75	5,000	1	TCI, OL0, U3
	300	DC	76 - 125	3,000	1	TCI, OL0, U3
	440	DC	1 - 30	10,000	2	TCI, OL0, U3
	440	DC	31 - 50	5,000	2	TCI, OL0, U3
	600	DC	1 - 75	5,000	2	TCI, OL0, U3
	600	DC	76 - 100	3,000	2	TCI, OL0, U3
SWITCH ONLY ¹	600	DC	1 - 100		2 or 3	---

1 - Requires inclusion of a relay trip voltage coil

Electrical

Maximum Voltage Overload

Minimum of 100Megohms at 500 VDC. 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,

Mechanical

Endurance

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).

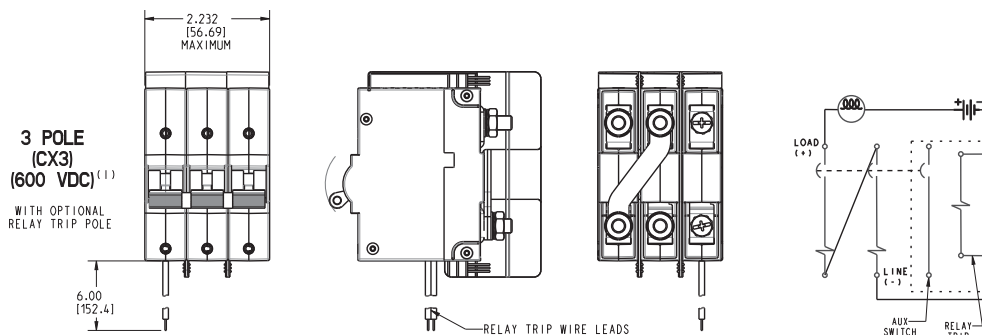
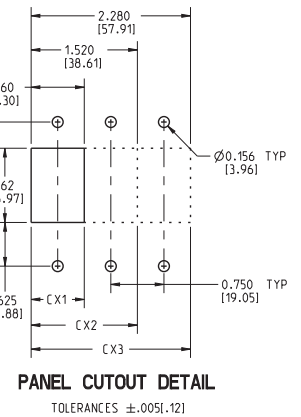
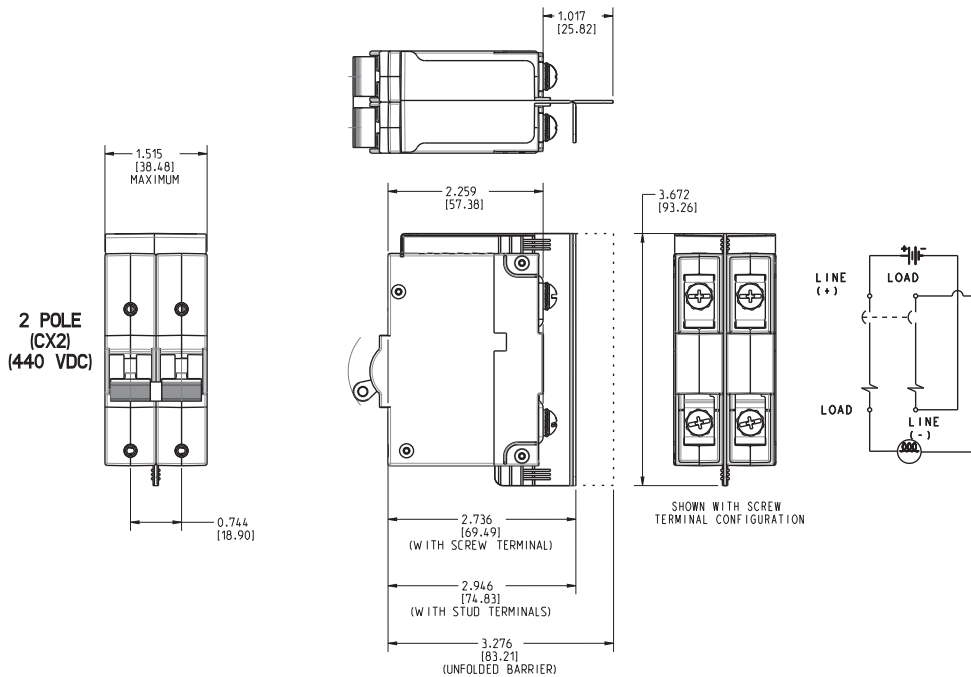
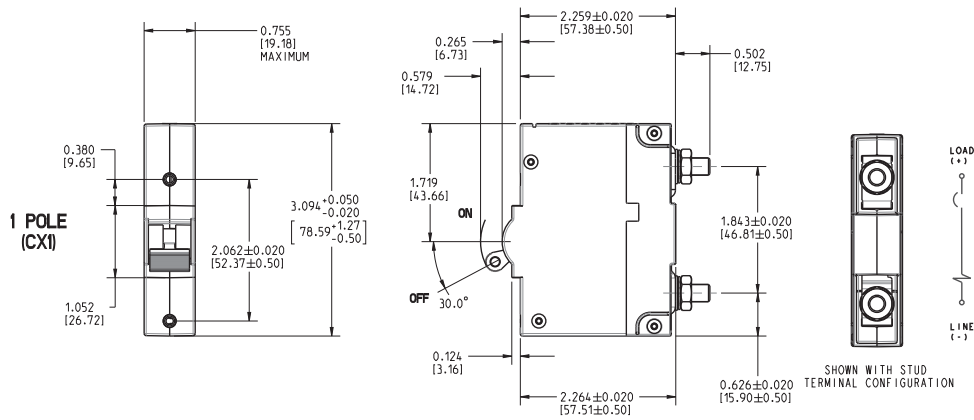
Thermal Shock

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).

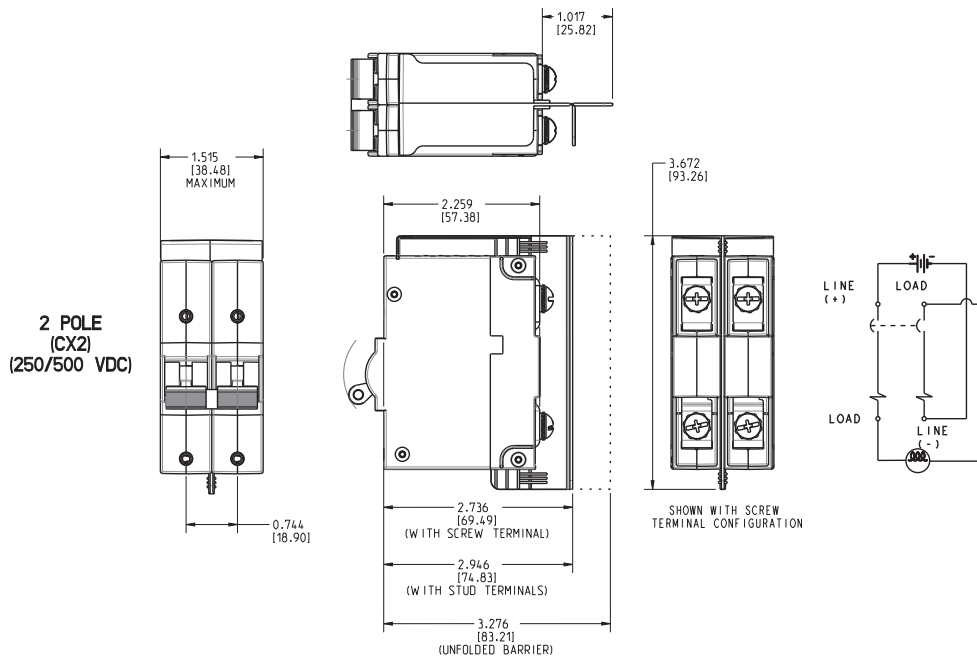
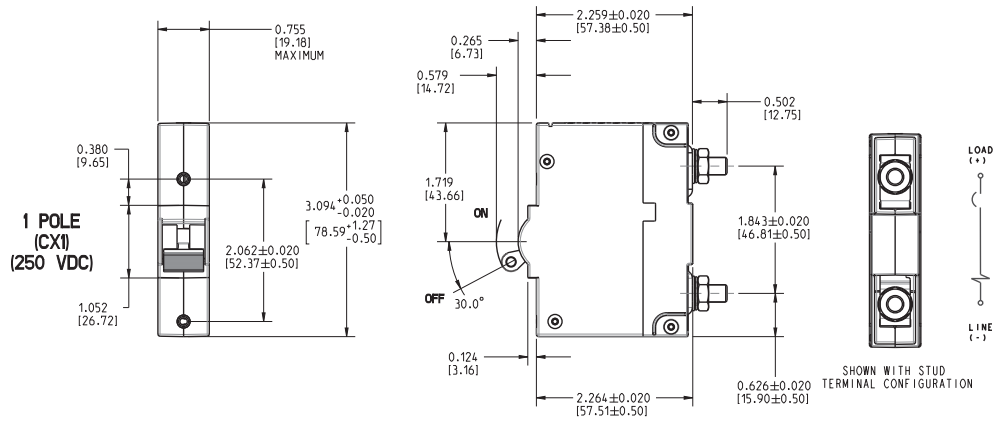
Operating Temperature -40°C to +85°C.

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

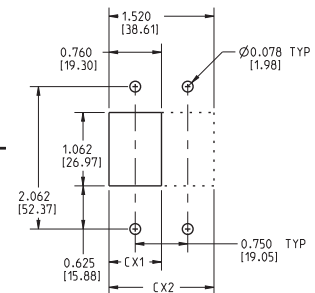
4 | CX-Series Circuit Breaker UL1077– Dimensional Specifications in. [mm]



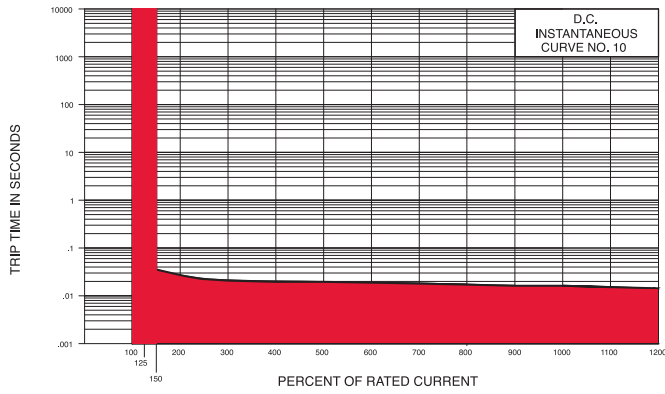
(1) 600V RATING REQUIRES MINIMUM OF 2 PROTECTED POLES



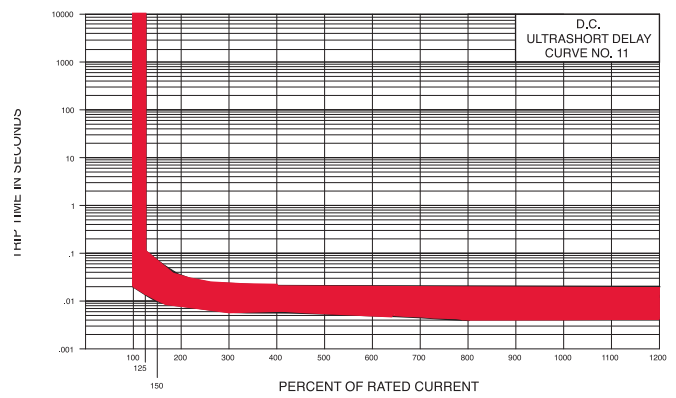
PANEL CUTOUT DETAIL
TOLERANCES ±.005[.12]



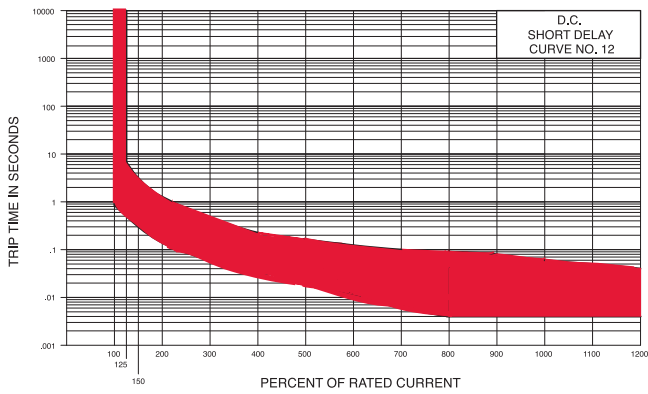
Instantaneous - DC 10



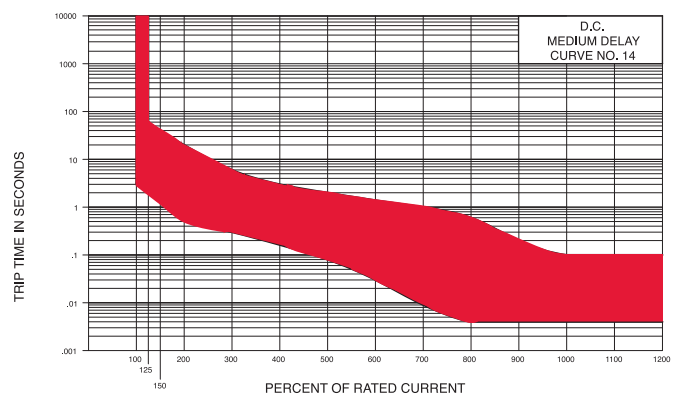
Ultrashort - DC 11



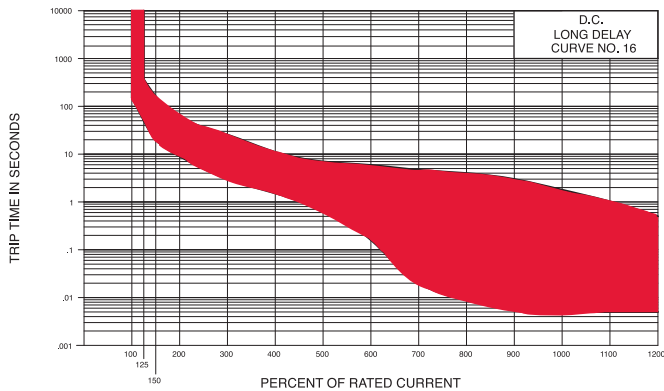
Short - DC 12

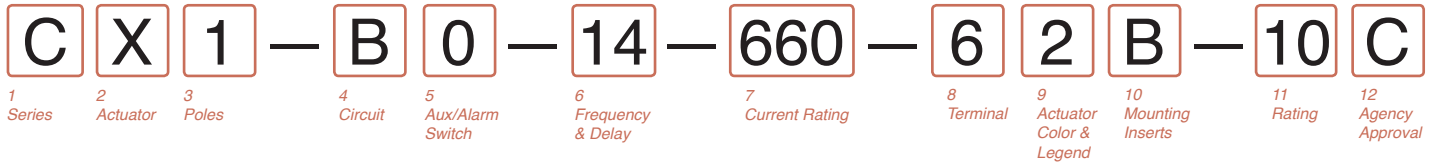


Medium - DC 14



Long - DC 16



**1 SERIES****C****2 ACTUATOR****X** Handle, one per pole**3 POLES**

1	One	2	Two	3	Three
---	-----	---	-----	---	-------

4 CIRCUIT**A**¹ Switch Only (no coil)**B** Series Trip (current)**G**¹ Relay Trip (voltage)**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

7^o CURRENT RATING (AMPERES)

CODE	AMPERES						
220	0.200	420	2.000	611	11.000	670	70.000
225	0.250	522	2.250	711	11.500	675	75.000
230	0.300	425	2.500	612	12.000	680	80.000
235	0.350	527	2.750	712	12.500	685	85.000
240	0.400	430	3.000	613	13.000	690	90.000
245	0.450	435	3.500	614	14.000	695	95.000
250	0.500	440	4.000	615	15.000	810	100.000
255	0.550	445	4.500	616	16.000	911	115.000
260	0.600	450	5.000	617	17.000	912	125.000
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**3** Stud, 1/4-20**5** Screw Terminal, M5**6** Stud, M6**9 ACTUATOR 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

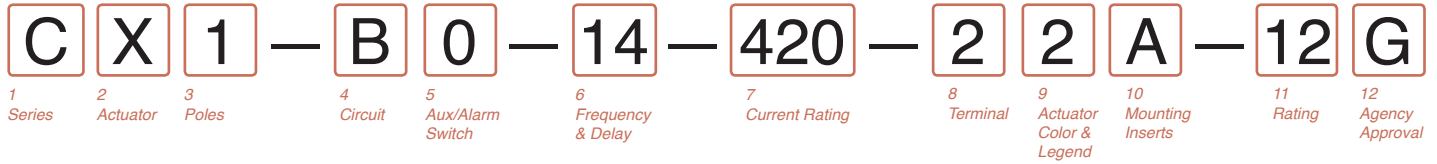
10 MOUNTING INSERTS**A** 6-32 Thread w/o terminal bus**B** M3 Thread w/o terminal bus**11 MAX. APPLICATION RATING**

10	300VDC	11 ⁴	440VDC	06 ⁵	600VDC
-----------	--------	------------------------	--------	------------------------	--------

12 AGENCY APPROVAL**A** Without approvals**C** UL 1077 Recognized

Notes:

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



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

7¹ CURRENT RATING (AMPERES)

CODE	AMPERES				
220	0.200	280	0.800	430	3.000
225	0.250	285	0.850	435	3.500
230	0.300	290	0.900	440	4.000
235	0.350	295	0.950	445	4.500
240	0.400	410	1.000	450	5.000
245	0.450	512	1.250	455	5.500
250	0.500	415	1.500	460	6.000
255	0.550	517	1.750	465	6.500
260	0.600	420	2.000	470	7.000
265	0.650	522	2.250	475	7.500
270	0.700	425	2.500	480	8.000
275	0.750	527	2.750	485	8.500

8 TERMINAL

2 Screw Terminal, 10-32
3 Stud, 1/4-20

5 Screw Terminal, M5
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

13¹ 250 / 500VDC

12 AGENCY APPROVAL

A Without approvals
G UL 489 Listed

Notes:

1 250/500 rating requires two pole breaker