

TELECOM/DATACOM

Circuit Protection



CATALOG

FOUNDED IN 1920



Since its founding, Carling Technologies has continually forged a tradition of leadership in quality and product innovation.

There are few products that Carling Technologies hasn't turned "ON" and fewer industries that haven't turned to Carling for solutions. With ISO and TS registered manufacturing facilities and technical sales offices worldwide, Carling ranks among the world's largest manufacturers of circuit breakers, switches, power distribution units, digital switching systems and electronic controls.



SWITCHES & CONTROLS

- Rocker
- Toggle
- Pushbutton
- Rotary

CIRCUIT PROTECTION

- Hydraulic-Magnetic
- Thermal
- GFCI / ELCI

CUSTOM SOLUTIONS

- PDU's
- Keypads
- Control Modules

MULTIPLEXED POWER SYSTEMS

- HMI Devices & I/O Modules
- Programmable Displays
- Data Communication Interfaces
- Electrical Systems Monitoring

STRATEGIC MARKETS SERVED:



On/Off Highway



Marine



Telecom/Datacom



Military



Renewable Energy

GLOBAL LOCATIONS:

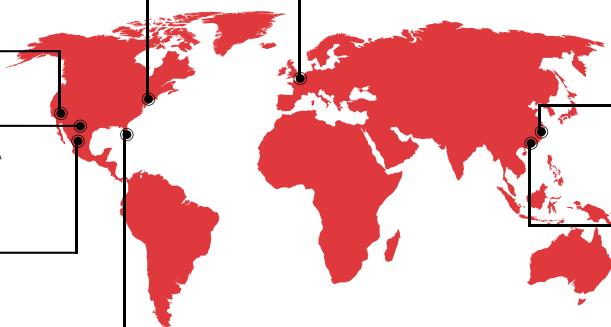
Carling Technologies
World Headquarters
Plainville, CT, USA
ISO 9001:2008
ISO/TS16949:2009

Maretron
Phoenix, AZ, USA

Carling Technologies
Brownsville, TX, USA
ISO 14001:2004
ISO 9001:2008
ISO/TS16949:2009

Carling Technologies
Matehuala, Mexico
ISO 14001:2004
ISO 9001:2008
ISO/TS16949:2009

Carling Technologies
Jupiter, FL, USA



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Carling Technologies
Kowloon, Hong Kong
ISO 9001:2008
ISO/TS16949:2009

Carling Technologies
Zhongshan, China
ISO 14001:2004
ISO 9001:2008
ISO/TS16949:2009

OTHER SERVED INDUSTRIES:



Medical



Industrial Control



Audio / Visual



Commercial Food



HVAC



Floor Care



Generators



Small Appliances



Security Systems



Test & Measurement

WORLDWIDE NUMBERS:

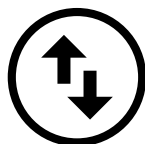


2200+
EMPLOYEES



150+
ENGINEERS

COMPETITIVE ADVANTAGES⁺



Vertical
Integration



Reliable &
On-Time Delivery



Excellent
Customer Service



Innovative &
Eco-Friendly Products



70+
DISTRIBUTORS



50+
REP FIRMS

Telecom/Datacom

Circuit Protection

Carling Technologies offers a full line of innovative, high-performance and reliable circuit breakers that meet all current datacom/telecom industry performance and design requirements insuring continued services and maximum circuit protection.

These circuit breakers are ideally suited for the rigors and confined spaces found in today's telecom/datacom power distribution units and rack systems. In other words, Carling circuit breakers protect against unnecessary power outages while providing design features that exceed today's expectations.

Within This Catalog, you will find comprehensive product information for each product series including applications, specifications and ordering schemes.

Available Online are tools such as part configurator, product selectors and stock checks. For the latest information on all our products, please visit www.carlingtech.com





Application Solution Engineers are readily available to assist you in selecting the appropriate product for your application. For further assistance, please email us at custservice@carlingtech.com

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Watch Market Video



| CIRCUIT PROTECTION | | | | |
|--|---|---|---|--|
| |  N-Series |  L-Series |  CX-Series |  M-Series |
| Number of Poles | 1-2 | 1-3 | 1-2, + auxiliary switch pole | 1-2 |
| Actuator Style | flush rocker, with or without push to reset guard | rocker, with or without guard | handle, 1 per pole | solid color: angled rocker, paddle, baton, push-to-reset pushbutton, push-pull pushbutton two color: visi-rocker illuminated: angled rocker, flat rocker |
| Available Delays | AC: ultrashort, short, medium, long, short-high inrush, medium-high inrush, long-high inrush | AC: ultrashort, short, medium, long, short-high inrush, medium-high inrush, long-high inrush | DC: instant, ultrashort, short, medium & long | AC/DC: instantaneous, short, medium, hi-inrush |
| Max Current & Voltage Ratings | 1-20A@240/277VAC 1-30A@120/240VAC | .1-32A@120/240VAC .1-20A@415/240VAC, 3 pole | UL Recognized 0.2-115A@600VDC UL Listed 0.2-15A@250/500VDC 0.2-50A@205/410VDC | 1 Pole: 0.02-15FLA@32VDC, 125VAC 15.1-25GPA@32VDC, 125VAC 0.02-12FLA@250VAC 0.02-7.5GPA@50VDC 0.02-30GPA@65VDC, 80VDC 2 Pole: 0.02-15FLA@65VDC, 250VAC 15.1-25GPA@65VDC, 250VAC Parallel Pole: 31-50GPA@80VDC |
| Max Interrupting Capacity | 22,000 amps | 5000 amps | UL Listed and UL Recognized up to 10,000 amps | 1 Pole: 1,000A@32VDC 1,000A@125VAC 2 Pole: 1,000A@65VDC 1,000A@250VAC Parallel Pole: 600A@80VDC |
| Auxiliary Switch Rating | n/a | n/a | 20A@80VDC (GO circuit) | 7A@250VAC 0.1A@125VAC (gold contacts) 7A (res.)@28VDC 4A (ind.)@28VDC 0.25A@80VDC |
| Available Circuits | series trip | series trip | series trip | series and switch only parallel pole |
| Terminal Options | screw terms | 10-32, 8-32, M5 & M4 screw | 10-32 or M5 screw terminals 1/4-20 or M6 threaded stud | .250" QC tabs 8-32 screw with upturned lugs 8-32, 10-32 screw (bus type) push in stud terminals |
| Mounting Method | threaded insert: #6-32 x .195 inches ISO M3 x 5mm | threaded insert: #6-32 UNC-2B, or M3X0.5-6H B ISO (2 per pole) | threaded insert: #6-32 UNC-2B, or M3X0.5-6H B ISO (2 per pole) | snap-in front panel threaded bushing |
| Agency Approvals | UL489, TUV (EN60947-2) | UL 489, cUL, TUV (EN60934-2) | UL489, UL1077, TUV (EN60934-2) | UL recognized, CSA, VDE, TUV, UL489A listed |

*Options and approvals shown may apply to specific construction combinations only, consult factory for clarification.
 Manufacturer reserves the right to change product specifications without prior notice.

CIRCUIT PROTECTION

| |  A-Series |  B-Series |  C-Series |  F-Series |
|--|--|--|---|--|
| Number of Poles | 1-6 (handle) 1-3 (rocker & metal toggle) | 1-6 | 1-6 (handle) 1-3 (rocker & metal toggle) | 1-3 |
| Actuator Style | sealed metal toggle handle rocker paddle | handle rocker | sealed metal toggle handle rocker | handle |
| Available Delays | AC, DC, AC/DC: instantaneous, ultra-short, short, medium & long AC, DC: high inrush-short, medium & long | AC, DC, AC/DC: instantaneous, ultra-short, short, medium & long AC, DC: high inrush-short, medium & long | AC, DC, AC/DC: instant, ultrashort, short, medium & long AC, DC: high inrush-short, medium & long | AC, DC: short, medium & long |
| Max Current & Voltage Ratings | 0.02-30A@277VAC, 80VDC 31.0-50A@125/250VAC, 65VDC | 0.02-30A@277VAC, 80VDC 0.02-30A@125/250VAC, 65VDC | UL Listed: 0.02-250A@80VDC 0.1-100A@125VDC 0.02-70A@120VAC 0.02-20A@240VAC UL Recognized: 0.02-30A@480WYE/277VAC 2 Pole, 1Ø; 3 Pole, 3Ø 0.02-50A@277VAC 0.02-100A@250VAC, 80VDC 0.02-100A@120V/ 240VAC, 65VDC | UL489 Listed: 50-250A@125VDC 100-250A@120/240VAC 100-250A@277VAC 100-250A@208Y/120, 3ØVAC UL489A Listed 250-700A@125VDC |
| Max Interrupting Capacity | 7500A@80VDC, UL only 3000A@120/250VAC, UL only 5000A@277VAC, with fuse backup | 7500A@80 VDC, UL only 3000A@125/250VAC, UL only 5000A@277VAC, with fuse backup | UL Listed: 50000A@80VDC, 1P only 10000A@120VAC 5000A@125VDC/240VAC UL Recognized: 7500A@80VDC 3000A@125/250VAC, UL only 5000A@250VAC listed construction 5000A@480WYE/277VAC with fuse backup | 50000A@125VDC 10000A@120/240, 277, 208Y/120VAC |
| Auxiliary Switch Rating | 10.1A@125VAC 0.1A@125VAC (gold contacts) 0.5A@65VDC 0.1A@80VDC | 10.1A@125VAC 0.1A@125VAC (gold contacts) 0.5A@65VDC 0.1A@80VDC | 10.1A@250VAC 0.1A@125VAC (gold contacts) 0.5A@80VDC | 10.1A@250VAC 0.5A@65VDC 0.1A@80VDC |
| Available Circuits | series, shunt, relay, switch only, series with remote shutdown, relay & shunt trip dual coil | series, shunt, relay, switch only, series with remote shutdown, relay & shunt trip dual coil, mid-trip with alarm switch | series, shunt, relay, switch only, series with remote shutdown, relay & shunt trip dual coil, mid- trip with alarm switch | series & switch only with or without metering shunt trip |
| Terminal Options | .250" QC tabs 8-32 & 10-32 screw (& metric), PCB | .250" QC tabs, 8-32 & 10-32 screw (& metric), PCB | 10-32 stud, 1/4-20 stud, 10-32 screw with saddle clamp, 7/16 clip & push-in | 3/8-16 stud, 3/8-16 screw & box wire connector |
| Mounting Method | threaded inserts: front panel snap-in | threaded inserts: front panel snap-in | threaded inserts | rear or front panel |
| Agency Approvals | UL, CSA, VDE, TUV (rocker), UL1500, UL489A | UL, CSA, VDE, TUV (rocker), UL1500, UL489, UL489A | UL, CSA, VDE, TUV, UL1500, UL489, UL489A | cUL, TUV, UL489, UL489A |

*Options and approvals shown may apply to specific construction combinations only, consult factory for clarification.

N-Series

CIRCUIT BREAKER

The high-performance N-Series hydraulic-magnetic circuit breaker is ideally suited for the rigors and confined spaces of telecom and datacom power distribution units and rack systems. Its innovative, low profile design features easily accessible load and line terminals and sliding barriers for effortless installation. The optional current transformer allows for remote outlet metering and monitoring of power usage thus facilitating load adjustments and maximizing efficiency. A patent pending, flush-rocker actuator and push-to-reset guard offer additional protection against accidental switching.



Resources:

[Download 3D CAD Files](#)

[IGS >](#)

[STP >](#)

[Watch Product Video](#)



Product Highlights:

- ♦ 240 VAC, 277 VAC, 120/240 VAC
- ♦ UL 489 Compliant Sliding Terminal Barriers
- ♦ 22,000 Amps Max Interrupting Capacity
- ♦ 1 – 30 Amps Current Rating
- ♦ Optional Current Transformer
- ♦ EN60947-2 Certified

N-Series

DESIGN FEATURES

CURRENT TRANSFORMER

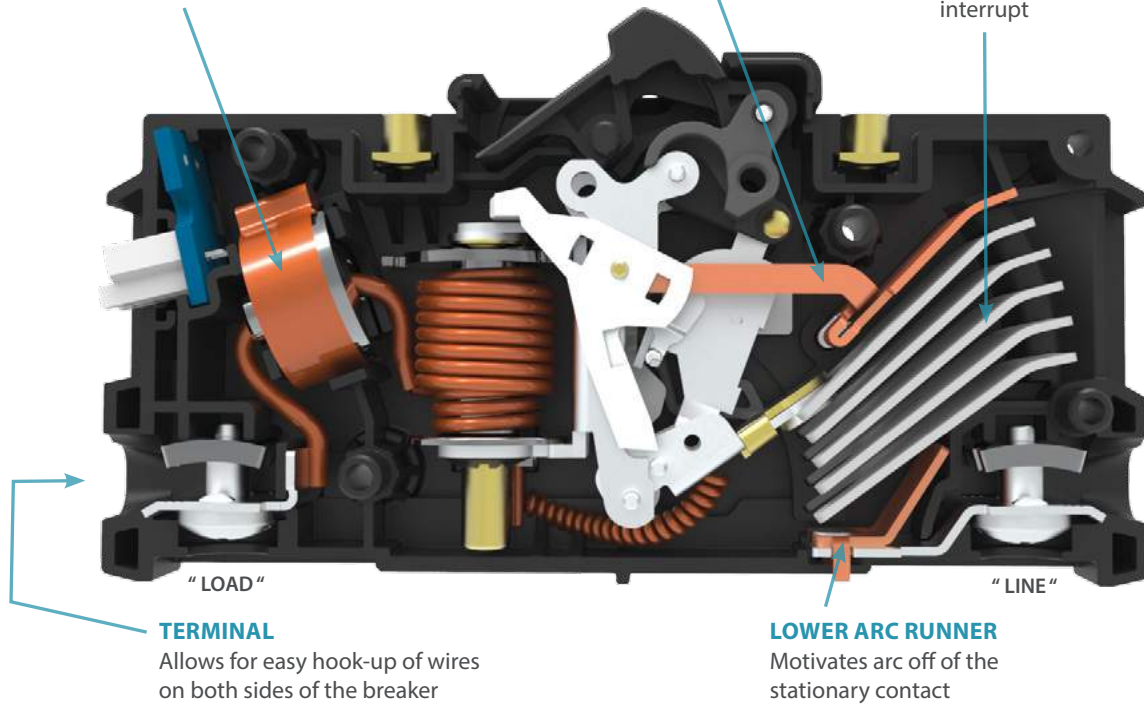
Remote current sensing via molex connector

UPPER ARC RUNNER

Optional, for 277 VAC rated breakers

GRIDS (5x)

Arc deionizing splitter plates that increase arc voltage for quick interrupt



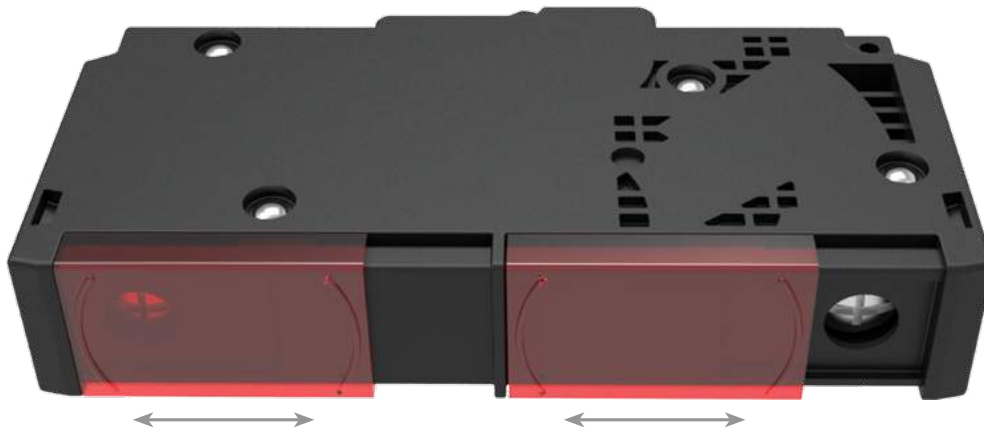
TERMINAL

Allows for easy hook-up of wires on both sides of the breaker

LOWER ARC RUNNER

Motivates arc off of the stationary contact

SLIDING TERMINAL BARRIERS



Electrical Tables

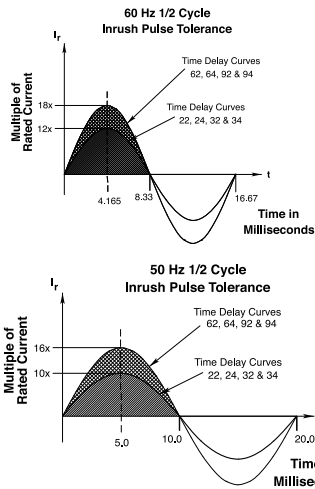
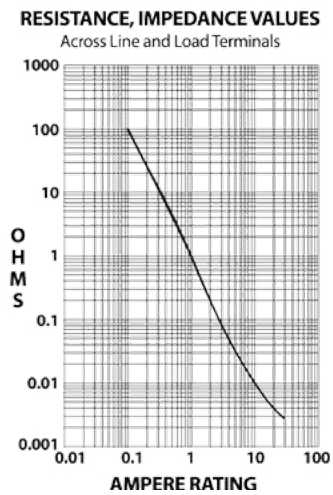
Table 1: Voltage and Current Ratings

| N-SERIES TABLE 1: ELECTRICAL RATINGS | | | | | | |
|--------------------------------------|----------------|-----------------|---------------------------|---------|-----------------------|---------|
| VOLTAGE | CURRENT (AMPS) | NUMBER OF POLES | INTERRUPT CAPACITY (AMPS) | | | |
| | | | UL 489 | | EN60947-2 (Ics & Icu) | |
| | | | 1-20 A | 21-30 A | 1-20 A | 21-30 A |
| 120/240 VAC | 1 - 30 | 2 | 10000 | 5000 | 5000 | 5000 |
| 240 VAC | 1 - 20 | 1 | 22000 | N/A | 5000 | 5000 |
| 277 VAC | 1 - 20 | 1 | 10000 | N/A | N/A | N/A |

Table 2: Time Delay

| N-SERIES TABLE 2: TIME DELAY OPTIONS | | |
|--------------------------------------|----------|-------------------|
| DELAY CURVE NUMBER | VOLTAGE | DESCRIPTION |
| 21 | 50/60 Hz | Ultrashort |
| 22 | 50/60 Hz | Short |
| 24 | 50/60 Hz | Medium |
| 26 | 50/60 Hz | Long |
| 42 | 50/60 Hz | Hi-inrush, Short |
| 44 | 50/60 Hz | Hi-inrush, Medium |
| 46 | 50/60 Hz | Hi-inrush, Long |

Electrical: Impedance / Resistance



| CURRENT (AMPS) | TOLERANCE (%) |
|----------------|---------------|
| 0.10 - 5.0 | ± 15 |
| 5.1 - 30.0 | ± 25 |

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

Electrical

Current Metering

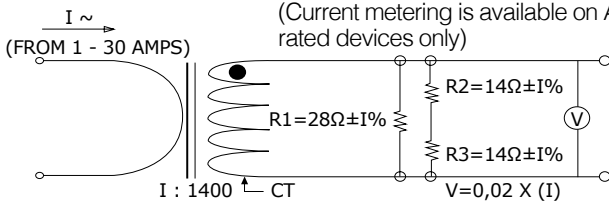
Integrated current transformer.
 Measurement range: 1-30 Amps.
 Voltage output: 10mV per Amp
 according to the formula below:
 $2 \text{ (Amp)} \leq I \leq 30 \text{ (Amp)}$

$$V = 0.01 \cdot I \pm 2\%$$

$$\left| \frac{\frac{V}{I} - \frac{V_{10}}{I_{10}}}{\frac{V_{10}}{I_{10}}} \right| \leq 0.85\%$$

Where V=CT output in volts
 V_{10} =CT output in volts with
 $I=I_{10}=10 \text{ (A)}$; I =primary current in
 amperage (50/60 Hz). Phase shift
 between primary current and CT
 output is $0.25 \pm 0.25^\circ$. Maximum
 crest factor of primary current is 1.73.
 R1 shall be integrated in the breaker.
 R2 and R3 are provided by end user
 and external to the breaker.
 Connection: below Load Terminal.
 2-pin connector, Molex 35362-0250.
 Mating Connector housing – Molex
 PN35507-0200.

(Current metering is available on AC
 rated devices only)



Dielectric Strength

UL, CSA-1960V 50/60 Hz for one
 minute between all electrically
 isolated terminals. Comply
 with the 8mm spacing and 3750V
 50/60 Hz dielectric requirements
 from hazardous voltage to
 operator accessible surfaces and
 between main circuits of adjacent
 poles per Publications EN 60950
 and VDE 0805

Insulation Resistance
 Overload

Minimum of 100 Megohms @ 500VDC
 50 operations @ 600% of rated current
 for AC rated devices

Interrupt Capacity

See table 1

Mechanical

Endurance

10,000 “On-Off” operations @ 6 per
 minute; with rated current & voltage

Trip Free

Trips on overload even when
 actuator is forcibly held in the “On”
 position

Trip Indication

The operating actuator moves
 positively to the “Off” position
 when an overload causes the
 breaker to trip

Environmental

Environmental
 Operating Temperature
 Vibration

MIL-PRF-55629 and MIL-STD-202G
 -40°C to +85°C
 Withstands 0.06” excursion
 from 10-55 Hz and 10Gs 55-500 Hz
 at rated current per MIL-PRF-55629
 and MIL-STD-202G, Method 204D,
 Test Condition A. Instantaneous and
 ultra-short curves tested at 90% of
 rated current

Shock

Withstands 50 Gs, 6 ms saw tooth
 while carrying rated current per
 MIL-PRF-55629 and MIL-STD-202G,
 Method 213B, test condition “I”.
 Instantaneous and ultra short curves
 tested at 90% of rated current

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)

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
 Method 101, Condition A (90-95%
 RH @ 5% NaCl Solution, 96hrs)

Salt Spray

Physical

Number of Poles
 Termination

1 - 2 poles
 Wire ready and touch proof wire
 clamp (See Figure 1). Accepts up to
 (2) #10 AWG wires per terminal.
 Designed for use with solid,
 stranded and flexible stranded
 wires, with or without ferrule or pin
 terminals. Also accepts straight fork
 and flanged fork terminals.

Termination Torque
 Termination Barrier

15-20 in-lbs (Line & Load terminals)
 Integral sliding barrier to comply
 with spacing requirements
 (See figure 1)

Mounting

Threaded Insert: #6-32 UNC-2B, or
 M3X0.5-6H B ISO (2 per Pole)

Insert Termination Torque
 Actuator

7-9 in-lbs
 Rocker, with or without guard
 (See figures 1, 2, and 4)

Internal Circuit Config.
 Materials

Series Trip
 Housing - Glass Filled Polyester
 Rocker – Nylon
 Line/Load Terminals - Copper Alloy;
 Bright Acid Tin Plated

Weight

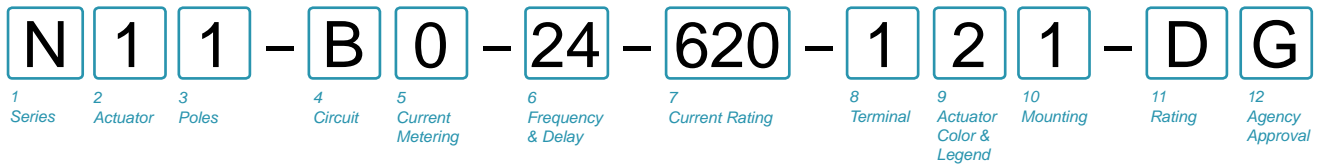
~107 grams (~3.76 ounces) per pole

Standard Color

Housing – Black. Rocker - Several
 (See ordering scheme for colors)

Agency Approvals

UL 489, cUL, TUV EN60947-2



1 SERIES

N N-Series Circuit Breaker

2 ACTUATOR

- 1 Single Color Low Profile Rocker, Vertical Legend
- 2 Single Color Low Profile Rocker, Horizontal Legend
- 3 Single Color Push To Reset Low Profile Rocker, Vertical Legend
- 4 Single Color Push To Reset Low Profile Rocker, Horizontal Legend

3 POLES

- 1 One
- 2 Two

4 CIRCUIT

B Series Trip (current)

5 CURRENT METERING

- 0 Without Current Transformer
- 1 Integrated Current Transformer, 1 per unit ¹
- 2 Integrated Current Transformer, 1 per pole

6 FREQUENCY & DELAY

- | | |
|-------------------------|-------------------------------|
| 21 50/60 Hz Ultra Short | 42 50/60 Hz Short, HI-Inrush |
| 22 50/60 Hz Short | 44 50/60 Hz Medium, HI-Inrush |
| 24 50/60 Hz Medium | 46 50/60 Hz Long, HI-Inrush |
| 26 50/60 Hz Long | |

7 CURRENT RATING (AMPERES)

| CODE | AMPERES | CODE | AMPERES | CODE | AMPERES | CODE | AMPERES |
|------|---------|------|---------|------|---------|------|---------|
| 410 | 1.00 | 440 | 4.00 | 490 | 9.00 | 615 | 15.00 |
| 512 | 1.25 | 445 | 4.50 | 495 | 9.50 | 616 | 16.00 |
| 415 | 1.50 | 450 | 5.00 | 610 | 10.00 | 617 | 17.00 |
| 517 | 1.75 | 455 | 5.50 | 710 | 10.50 | 618 | 18.00 |
| 420 | 2.00 | 460 | 6.00 | 611 | 11.00 | 620 | 20.00 |
| 522 | 2.25 | 465 | 6.50 | 711 | 11.50 | 622 | 22.00 |
| 425 | 2.50 | 470 | 7.00 | 612 | 12.00 | 624 | 24.00 |
| 527 | 2.75 | 475 | 7.50 | 712 | 12.50 | 625 | 25.00 |
| 430 | 3.00 | 480 | 8.00 | 613 | 13.00 | 630 | 30.00 |
| 435 | 3.50 | 485 | 8.50 | 614 | 14.00 | | |

8 TERMINAL

- 1 Screw Terminal

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

- 1 6-32 x .195 inches Threaded Inserts
- 2 ISO M3 x 5 mm Threaded Inserts

11 APPLICATION RATING

- C 120/240 VAC (2 Pole only)
- D 240 VAC ²
- F 277 VAC ³

12 AGENCY APPROVAL

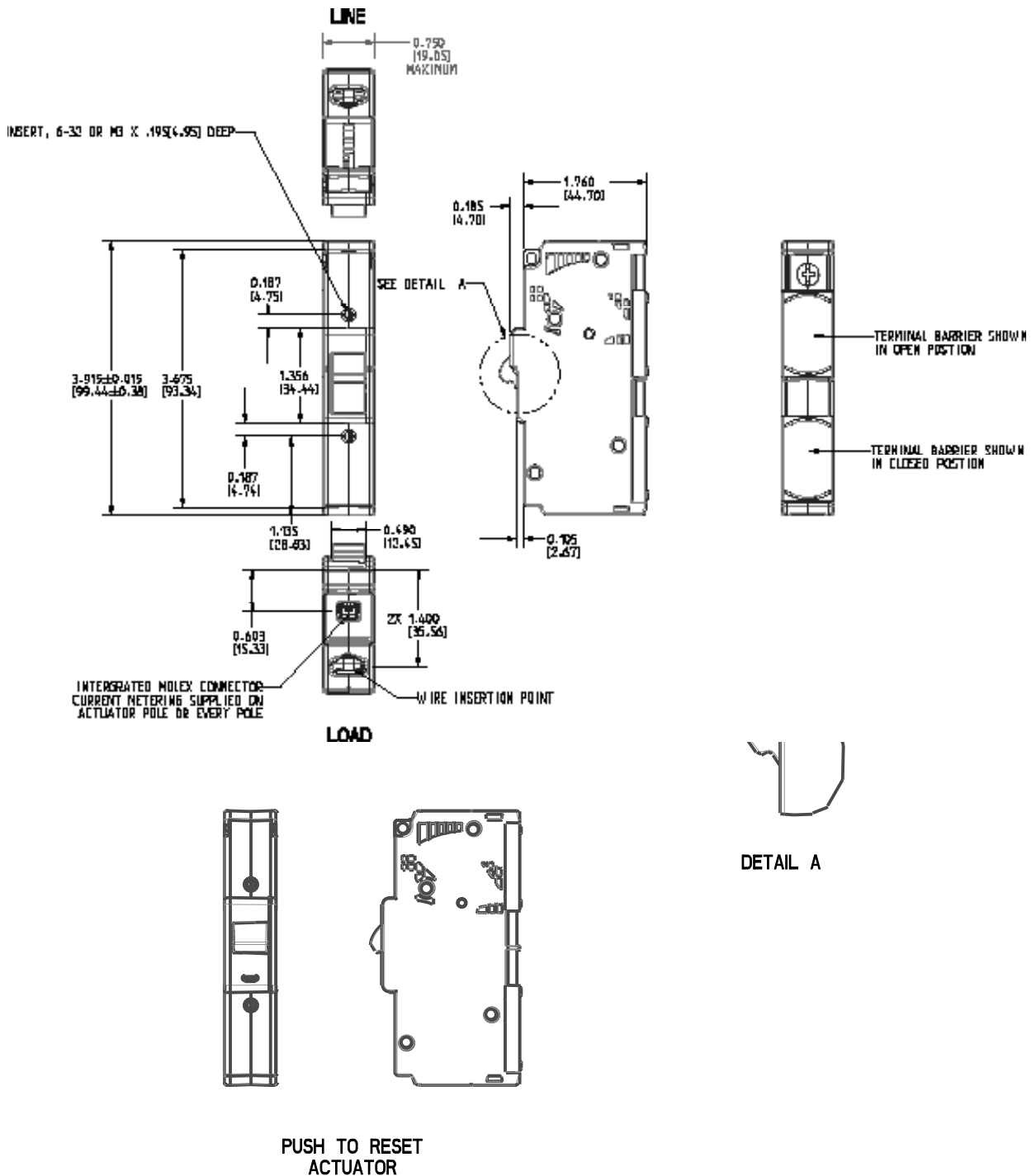
- A Without Approvals
- G UL 489 Listed
- 3 UL 489 Listed, TUV Certified ⁴

Notes:

- 1 On multi pole units one current transformer is supplied on the actuator pole
- 2 Available up to 20 amps
- 3 Voltage rating F only available as a 1 pole device at 20 amps maximum
- 4 TUV approval requires dual (I-O, ON-OFF) markings

Dimensional Specifications: in. [mm]

Figure 1. N-Series 1-Pole Construction



Notes:

- 1 All dimensions are in inches [millimeters].
- 2 Tolerance ±0.020 [0.51] unless otherwise specified.

Dimensional Specifications: in. [mm]

Figure 2. N-Series 2-Pole Construction

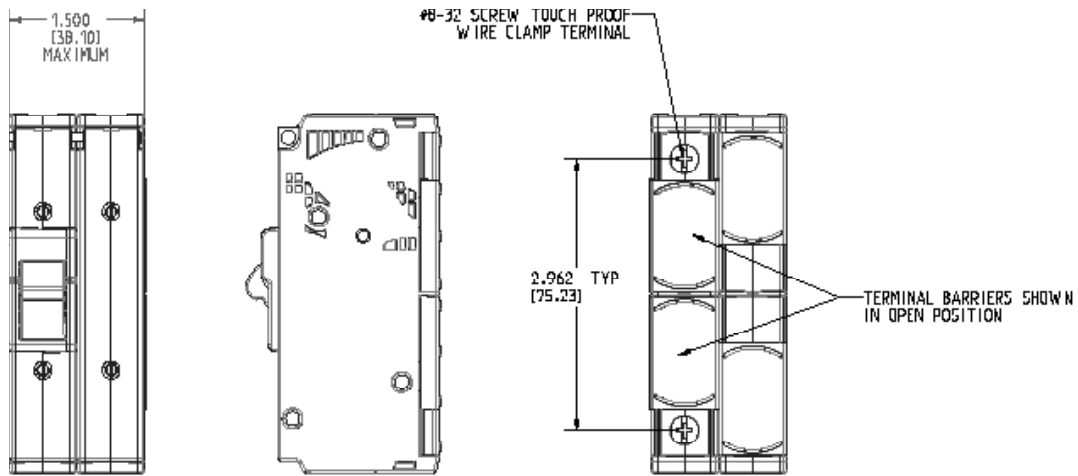
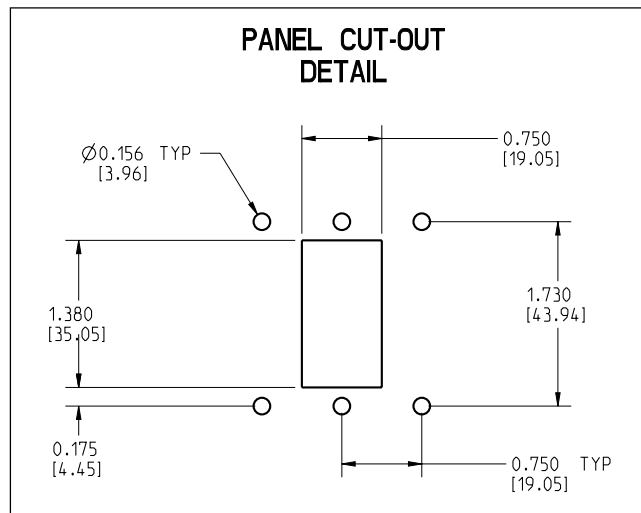


Figure 3. N-Series Panel Cut-Out



Notes:

- 1 All dimensions are in inches [millimeters].
- 2 Tolerance ± 0.020 [51] unless otherwise specified.

L-Series

CIRCUIT BREAKER

The L-Series high performance, compact hydraulic-magnetic circuit breaker is ideally suited for the rigors and confined spaces found in today's telecom/datacom power distribution units and rack systems. It provides best in class performance in an innovative low profile, space saving package complementing the overall spatial objectives required by telecommunications and data-communications systems designers in their quest to reduce the overall size of equipment, while increasing transmission capacity.

The optional current transformer allows outlet metering and monitoring of power usage thus facilitating load adjustments and maximizing efficiency. Further, a patent pending flush rocker actuator design and optional push-to-reset guard offers additional protection against accidental switching.

Number of poles: 1-3. Maximum current and voltage ratings: .2-32A, 120/240-240VAC. Maximum interrupting capacity: 5000 Amps.



Resources:

[Download 3D CAD Files](#)

[IGS >](#)

[STP >](#)

[Watch Product Video](#)



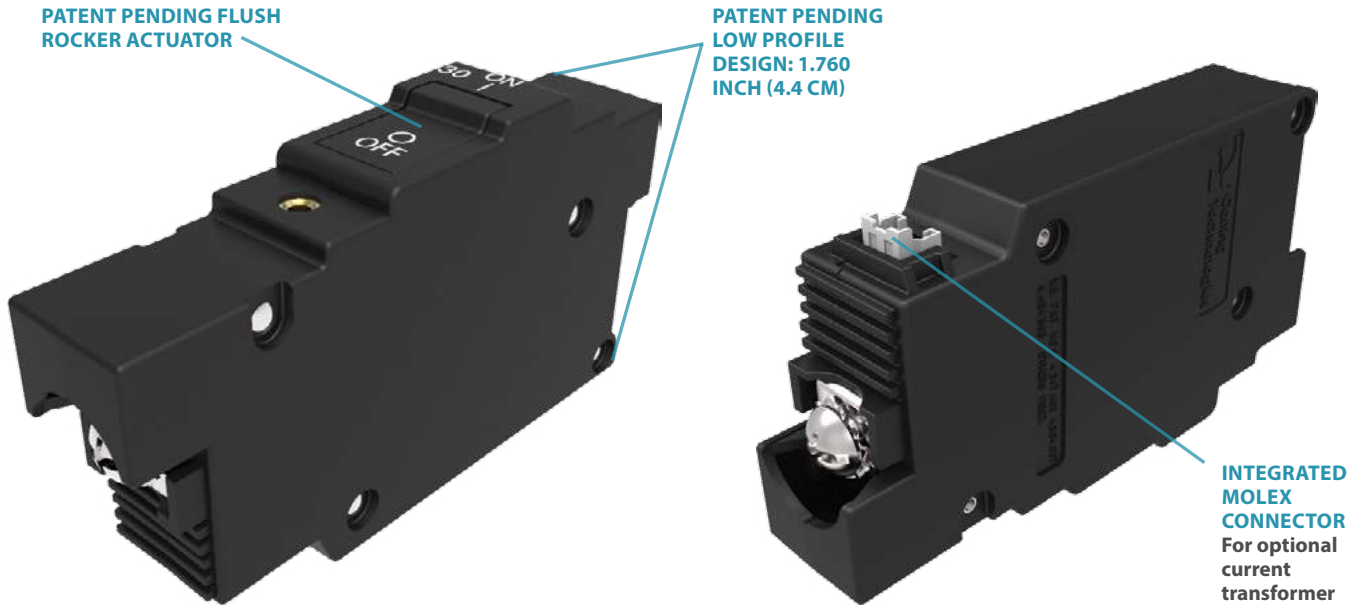
Product Highlights:

- Optional current transformer
- Ultra low profile design saves valuable space
- Optional handle guard actuator
- UL 489 LISTED Branch Circuit breaker
- Designed for worldwide datacenter compatibility with up to 240VAC ratings

L-Series

DESIGN FEATURES

1-Pole Configuration with Low Profile Rocker Actuator



2-Pole Configuration with Push-To-Reset Guard



Electrical Tables

Voltage, Current and IC Ratings

| Voltage (VAC) | Current (Amps) | Number of Poles | Phase | Current Metering | Interrupt Capacity | | |
|---------------|----------------|-----------------|-------|------------------|--------------------|---------|-------|
| | | | | | UL489 (Amps) | EN60934 | |
| | | | | | | Icn | Inc |
| 240 | 0.1 - 32 | 1 | 1 | Yes | 5000 | 3000 | 10000 |
| 240 | 0.1 - 32 | 2* | 1 | Yes | 5000 | 3000 | 10000 |
| 240 | 0.1 - 20 | 3 | 3 | Yes | 5000 | 3000 | 5000 |
| 415/240 | 0.1 - 20 | 3 | 3 | Yes | --- | 3000 | 5000 |
| 120/240 | 0.1 - 32 | 2 | 1 | Yes | 5000 | 3000 | 10000 |
| 120/240 | 0.1 - 32 | 3** | 1 | Yes | 5000 | 3000 | 10000 |

Notes:

* Breaking both sides of the line

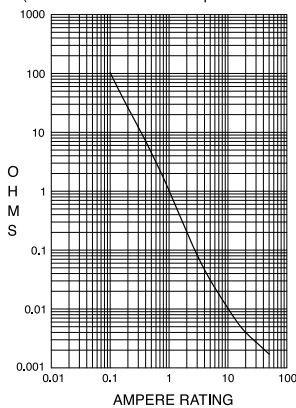
** 3rd pole to be neutral break

Time Delay

| Delay Curve Number | Voltage | Description |
|--------------------|----------|-------------------|
| 21 | 50/60 Hz | Ultrashort |
| 22 | 50/60 Hz | Short |
| 24 | 50/60 Hz | Medium |
| 26 | 50/60 Hz | Long |
| 42 | 50/60 Hz | Hi-inrush, Short |
| 44 | 50/60 Hz | Hi-inrush, Medium |
| 46 | 50/60 Hz | Hi-inrush, Long |

Impedance

RESISTANCE, IMPEDANCE VALUES
from Line to Load Terminals
(Values Based on Series Trip Circuit Breaker)



| CURRENT (AMPS) | TOLERANCE (%) |
|----------------|---------------|
| 0.10 - 5.0 | ± 15 |
| 5.1 - 32.0 | ± 25 |

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

Electrical

Current Metering

Integrated current transformer.
 Measurement range: 1-32 Amps
 Voltage output: 10mV per Amp
 according to the formula below:
 $2(\text{Amp}) \leq I \leq 32(\text{Amp})$
 $V = 0.01 \times I \pm 2\%$

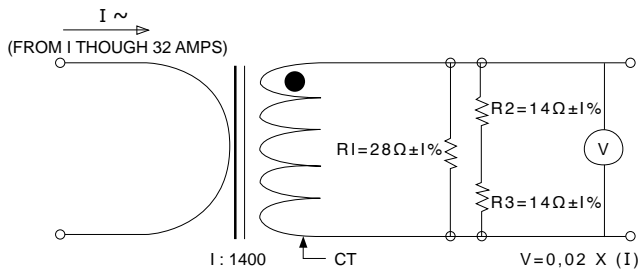
$$\left| \frac{\frac{V - V_{10}}{I - I_{10}}}{\frac{V_{10}}{I_{10}}} \right| \leq 0.85\%$$

Where V=CT output in volts V10=CT output in volts with I=I10=10 (A); I=primary current in amperage (50/60 Hz). Phase shift between primary current and CT output is $0.25 \pm 0.25^\circ$. Maximum crest factor of primary current is 1.73.

R1 shall be integrated in the breaker. R2 and R3 are provided by end user and external to the breaker.

Connection:

below Load Terminal. 2-pin connector, Molex 35362-0250. Mating Connector housing – Molex PN35507-0200. Dielectric Strength UL, CSA-1960V 50/60 Hz for one minute between all electrically isolated terminals. Comply with the 8mm spacing and 3750V 50/60 Hz dielectric requirements from hazardous voltage to operator accessible surfaces and between main circuits of adjacent poles per Publications EN 60950 and VDE 0805



Insulation Resistance

Minimum of 100 Megohms@500VDC

Overload

50 operations @ 600% of rated

Interrupt Capacity

See Table 1

Environmental

Environmental
 Operating Temp
 Vibration

MIL-PRF-55629 and MIL-STD-202G
 -40°C to +85 °C
 Withstands 0.06” excursion from 10-55 Hz and 10Gs 55-500 Hz at rated current per MIL-PRF-55629 and MIL-STD-202G, Method 204D, Test Condition A. Instantaneous and ultra-short curves tested at 90% of rated current.

Shock

Withstands 100 Gs, 6 ms saw tooth while carrying rated current per MIL-PRF-55629 and MIL-STD-202G, Method 213B, Test Condition “I”. Instantaneous and ultra short curves tested at 90% of rated current.

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).

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 @ 5% NaCl Solution, 96hrs)

Physical

Number of Poles
 Termination

1-3 poles
 Screw Terminals with the following thread sizes: 10-32, 8-32, M5, M4 Standard for 2 & 3 poles

Termination Barrier
 Mounting

Threaded Insert: #6-32 UNC-2B, or M3X0.5-6H B ISO (2 per Pole)

Actuator
 Internal Circuit Config.
 Materials

Rocker, with or without guard
 Series Trip
 Housing - Glass Filled Polyester
 Rocker – Nylon 6/6
 Line/Load Terminals – Copper Alloy;
 Bright Acid Tin Plated

Weight
 Standard Color

~107 Grams (~3.76 Ounces) per pole
 Housing - Black, Rocker - Black

Mechanical

Endurance

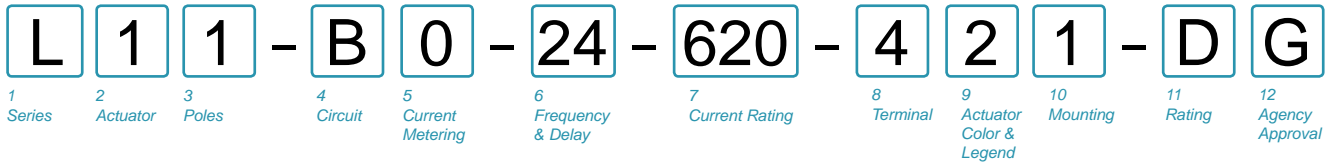
10,000 “On-Off” Operations @ 6 per minute; 6000 cycles with rated Current and Voltage; 4000 cycles without electrical load.

Trip Free

Trips on overload even when actuator is forcibly held in the “On” position.

Trip Indication

The operating actuator moves positively to the “Off” position when an overload causes the breaker to trip



1 SERIES
L

2 ACTUATOR
 1 Single Color Low Profile Rocker, Vertical Legend
 2 Single Color Low Profile Rocker, Horizontal Legend
 3 Single Color Push to Reset Low Profile Rocker, Vertical Legend
 4 Single Color Push to Reset Low Profile Rocker, Horizontal Legend

3 POLES
 1 One
 2 Two
 3 Three

4 CIRCUIT
 B Series Trip (current)

5 CURRENT METERING
 0 Without Current Transformer
 1² Integrated Current Transformer, 1 per unit
 2 Integrated Current Transformer, 1 per pole

6 FREQUENCY & DELAY
 21 50/60Hz Ultra Short
 22 50/60Hz Short
 24 50/60Hz Medium
 26 50/60Hz Long
 42 50/60Hz Short, Hi-Inrush
 44 50/60Hz Medium, Hi-Inrush
 46 50/60Hz Long, Hi-Inrush

7 CURRENT RATING (AMPERES)

| CODE | AMPERES | | | | |
|------|---------|-----|-------|-----|--------|
| 210 | 0.100 | 415 | 1.500 | 610 | 10.000 |
| 215 | 0.150 | 517 | 1.750 | 710 | 10.500 |
| 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 | 632 | 32.000 |
| 410 | 1.000 | 490 | 9.000 | | |
| 512 | 1.250 | 495 | 9.500 | | |

8 TERMINAL
 2 Screw Terminal, 8-32 (Bus Type)
 4 Screw Terminal, 10-32 (Bus Type)
 E Screw Terminal, M4 (Bus Type)
 H Screw Terminal, M5 (Bus Type)

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 |

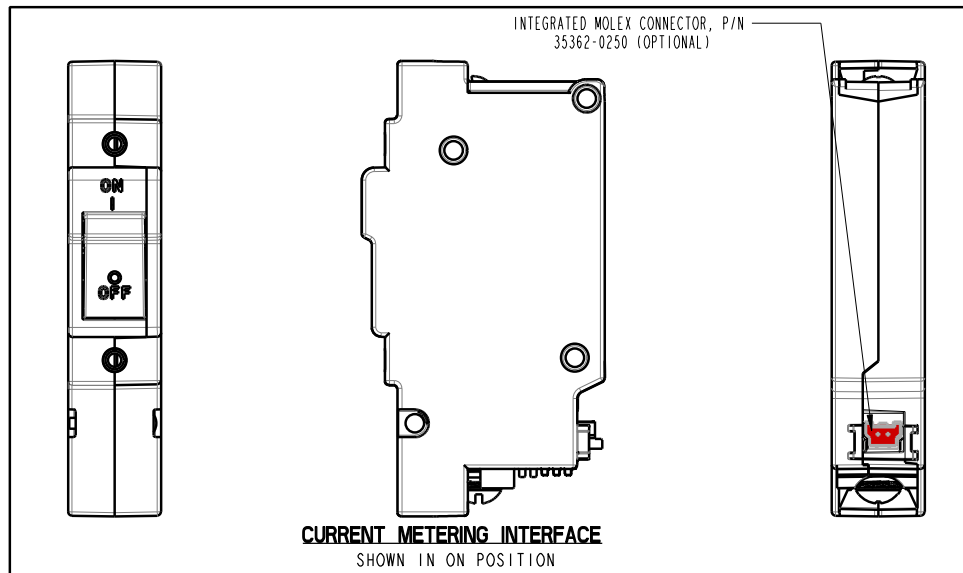
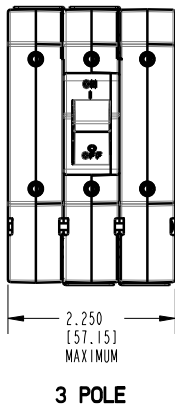
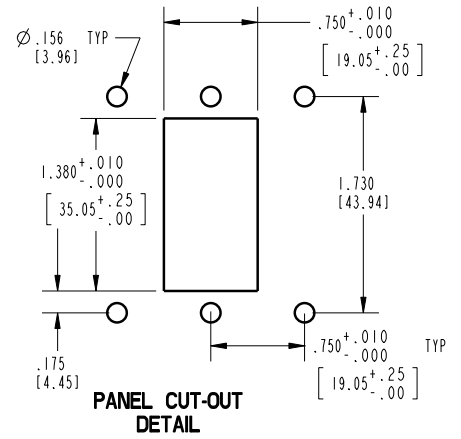
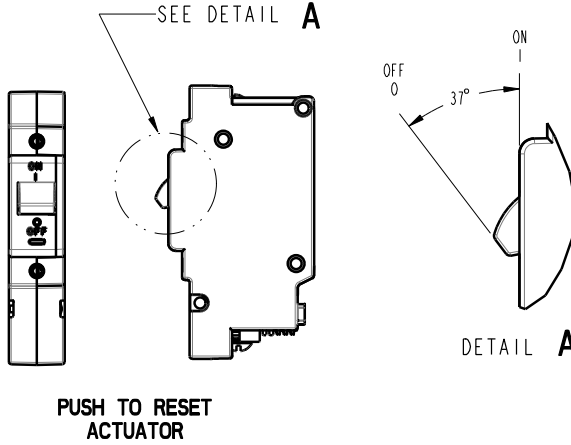
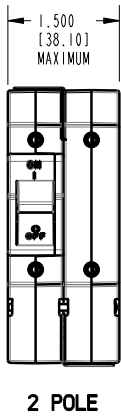
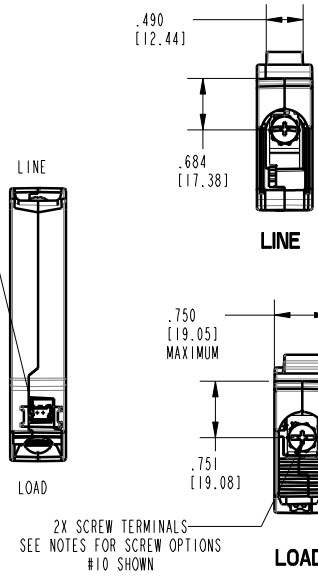
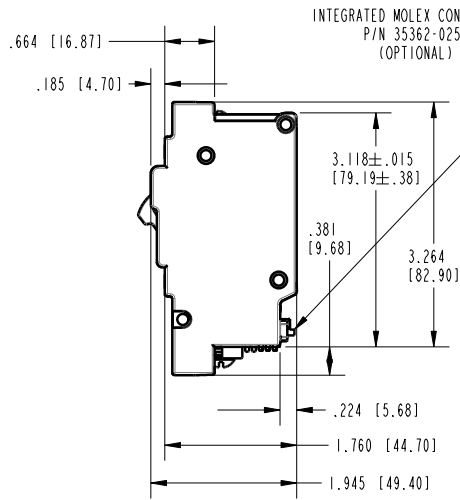
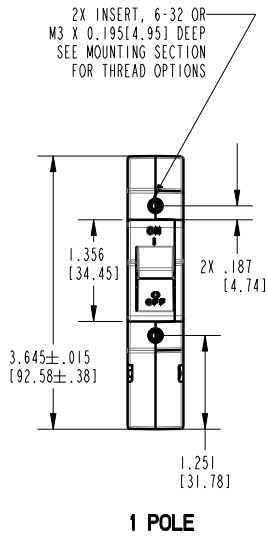
10 MOUNTING INSERTS³
 1 6-32 X .195 Threaded Inserts
 A 6-32 X .195 Threaded Inserts with Terminal Barrier
 2 ISO M3 X 5 mm Threaded Inserts
 B ISO M3 X 5 mm Threaded Inserts with Terminal Barrier

11 MAX. APPLICATION RATING
 C¹ 120/240 VAC (2 or 3 Pole only)
 D 240 VAC
 P⁴ 415Y/240 VAC (TUV only) 240 VAC 3 phase Delta

12 AGENCY APPROVAL
 A Without approvals
 G UL 489 Listed
 3 UL 489 Listed, TUV Certified

Notes:
 1 3 Pole units available only when one of three poles is neutral
 2 On Multi Pole units one current transformer is supplied on the actuator pole
 3 Terminal barriers are required on multi poles breaker
 4 Voltage rating P only available as a 3 pole device 20A max

Dimensional Specifications: in. [mm]



- Notes:
- 1 All dimensions are in inches [millimeters].
 - 2 Screws have combination head
 - 3 Screw thread options: #8-32, #10-32, M4X.7, M5X.8

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.



Resources:

[Download 3D CAD Files](#)

[IGS >](#)

[STP >](#)

[Watch Product Video](#)



Product Highlights:

- UL 489 & UL 489B Listed
- TUV Certified IEC/EN 60947-2
- Temperature stable hydraulic-magnetic overcurrent sensing technology
- Optional relay trip circuit permitting remote operator system shut down
- Perfect fit for 380VDC Applications

Only Telecom-Datacom applicable ordering schemes and drawings are shown in this catalog. For complete product details, please visit www.carlingtech.com

CX-Series

DESIGN FEATURES

HYDRAULIC/MAGNETIC SENSING COIL

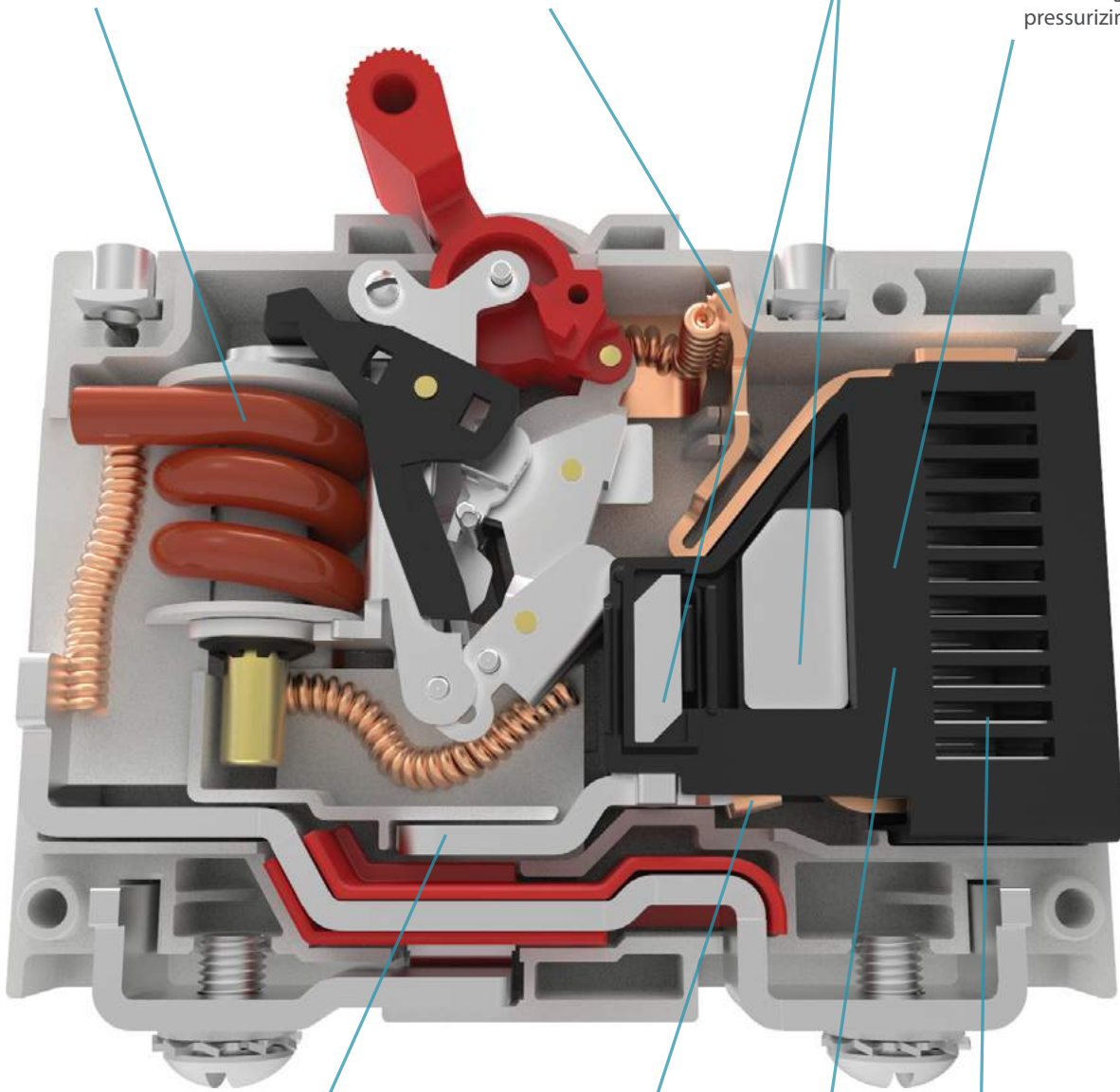
UPPER ARC RUNNER

Aids in motivating arc off of movable contact and into arc chamber

MAGNETS

ARC SPLITTER RETAINER

with integrated pressurizing walls



PATENT PENDING MAGNETIC FLUX BOOSTING TERMINAL CONFIGURATION

Design enhances motivation of arc into arc chamber

LOWER ARC RUNNER

Aids in motivating arc off of stationary contact and into arc chamber

LARGE ARC GAP

To generate high arc voltages

(12) ARC DEIONIZING SPLITTER PLATES

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 |
| | 410 / 205 | D.C. | 50 | 10,000 | 2 |

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 - 63 | 5,000 | 2 | TC1, OL0, U3 |
| | 600 | D.C. | 1 - 75 | 5,000 | 2 | TC1, OL0, U3 |
| | 600 | D.C. | 76 - 115 | 3,000 | 2 | TC1, OL0, U3 |
| SWITCH ONLY ¹ | 600 | D.C. | 1 - 115 | ---- | 2 or 3 | --- |

Notes:

1 Requires inclusion of a relay trip voltage coil

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.

Table D: TUV Certified Configuration to IEC / EN 60947-2. Low Voltage Switch gear and Control gear - Circuit Breakers

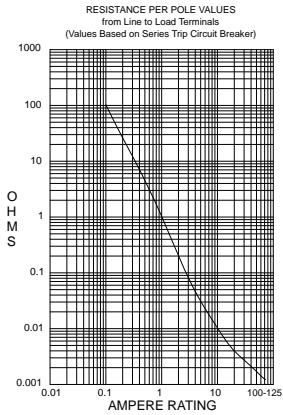
| CX-SERIES TABLE D : TUV IEC/EN 60947-2 LOW VOLTAGE SWITCH GEAR & CONTROL GEAR / CIRCUIT BREAKER | | | | | |
|---|-------------|-----------|-------|-----------------------|-----------------------|
| CIRCUIT CONFIGURATION | VOLTAGE | | | CURRENT RATING (AMPS) | INTERRUPTING CAPACITY |
| | MAX. RATING | FREQUENCY | POLES | | ICS / ICU (AMPS) |
| SERIES | 440 | DC | 2 | 1-63 | 4,000 |

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

Electrical

Maximum Voltage
Overload

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



| CURRENT (AMPS) | TOLERANCE (%) |
|----------------|---------------|
| 0.10 - 5.0 | 15 |
| 5.1 - 20.0 | 25 |
| 20.1 - 50.0 | 35 |

Physical

Number of Poles
Termination
Terminals
Termination Barrier
Mounting
Actuator
Internal Circuit Config.
Materials

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

Weight
Standard Color

Mechanical

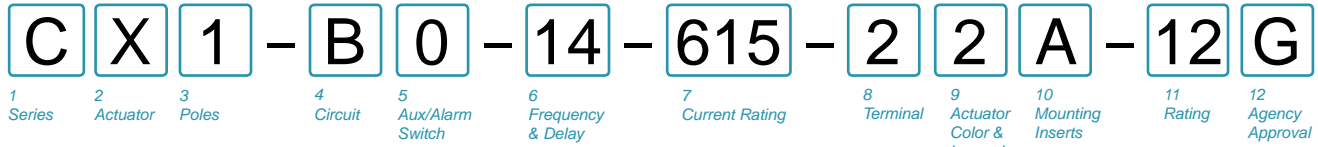
Endurance
Trip Free
Trip Indication

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

Environmental

Shock
Vibration
Moisture Resistance
Salt Spray
Thermal Shock
Operating Temperature

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
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.
MIL-PRF-55629 and MIL-STD-202G, Method 106G, i.e., Ten 24-hour cycles at +25°C to +65°C, 80-98% RH.
Method 101, Condition A (90-95% RH at 5% NaCl Solution, 96 hrs).
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).
-40°C to +85°C.



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 Without Aux Switch

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

7 CURRENT RATING (AMPERES)

| CODE | AMPERES | | | | | | |
|------|---------|-----|------|-----|-------|-----|-------|
| 220 | 0.20 | 295 | 0.95 | 460 | 6.00 | 614 | 14.00 |
| 225 | 0.25 | 410 | 1.00 | 465 | 6.50 | 615 | 15.00 |
| 230 | 0.30 | 512 | 1.25 | 470 | 7.00 | 616 | 16.00 |
| 235 | 0.35 | 415 | 1.50 | 475 | 7.50 | 617 | 17.00 |
| 240 | 0.40 | 517 | 1.75 | 480 | 8.00 | 618 | 18.00 |
| 245 | 0.45 | 420 | 2.00 | 485 | 8.50 | 620 | 20.00 |
| 250 | 0.50 | 522 | 2.25 | 490 | 9.00 | 622 | 22.00 |
| 255 | 0.55 | 425 | 2.50 | 495 | 9.50 | 624 | 24.00 |
| 260 | 0.60 | 527 | 2.75 | 610 | 10.00 | 625 | 25.00 |
| 265 | 0.65 | 430 | 3.00 | 710 | 10.50 | 630 | 30.00 |
| 270 | 0.70 | 435 | 3.50 | 611 | 11.00 | 635 | 35.00 |
| 275 | 0.75 | 440 | 4.00 | 711 | 11.50 | 640 | 40.00 |
| 280 | 0.80 | 445 | 4.50 | 612 | 12.00 | 645 | 45.00 |
| 285 | 0.85 | 450 | 5.00 | 712 | 12.50 | 650 | 50.00 |
| 290 | 0.90 | 455 | 5.50 | 613 | 13.00 | | |

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

9 ACTUATOR COLOR & LEGEND

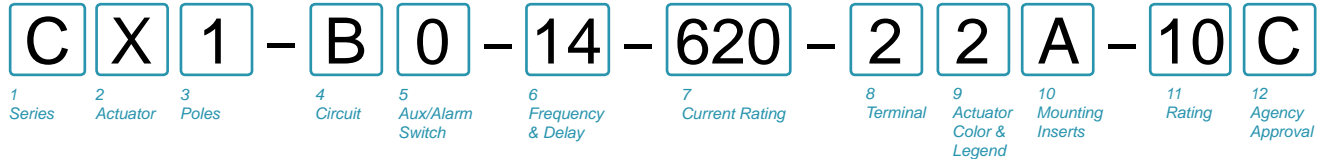
| Actuator Color | I-O | ON-OFF | Dual | Legend Color |
|----------------|-----|--------|------|--------------|
| White | A | B | 1 | Black |
| Black | C | D | 2 | White |
| Red | F | G | 3 | White |
| Green | H | J | 4 | White |
| Blue | K | L | 5 | White |
| Yellow | M | N | 6 | Black |
| Gray | P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

10 MOUNTING INSERTS
A 6-32 Thread
B M3 Thread

11 MAX. APPLICATION RATING
12 250 VDC
13 250/500 VDC ¹
15 205/410 VDC

12 AGENCY APPROVAL
A Without Approvals
G UL 489 Listed
S UL 489 Listed, TUV to IEC60947-2 ¹

Notes:
¹ Only Available with 250/500 VDC up to 15 amps.



1 SERIES
C

2 ACTUATOR
X Handle, one per pole

3 POLES⁷
1 One
2 Two
3 Three
4 Four¹⁰

4 CIRCUIT
A Switch Only (no coil)^{1, 9}
B Series Trip (current)
G Relay Trip (voltage)^{1, 2, 3, 9}

5 AUXILIARY SWITCH
0 Without Aux Switch

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 CURRENT RATING (AMPERES)⁶

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

8 TERMINAL⁸
2 Screw, 10-32
3 Stud, 1/4-20
5 Screw, 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 |

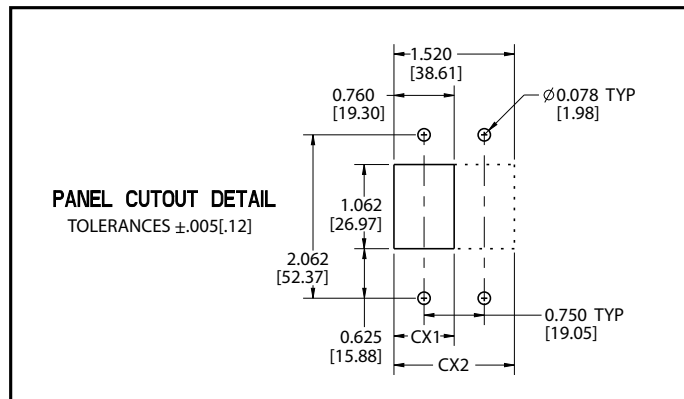
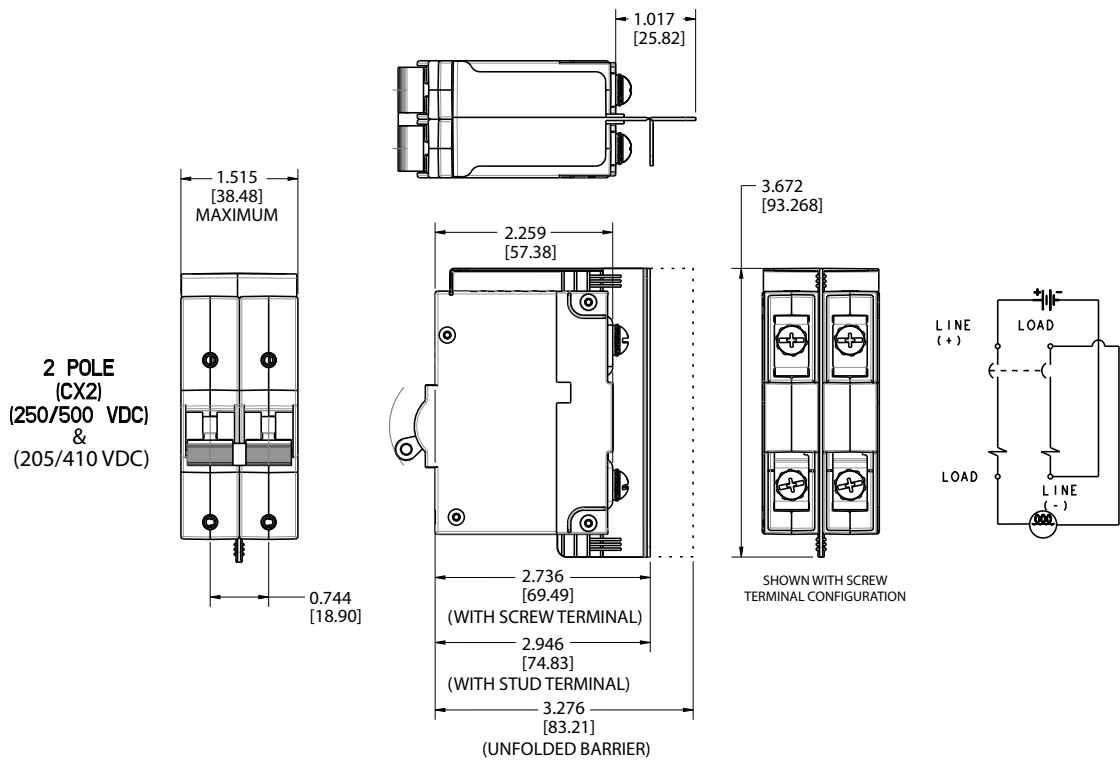
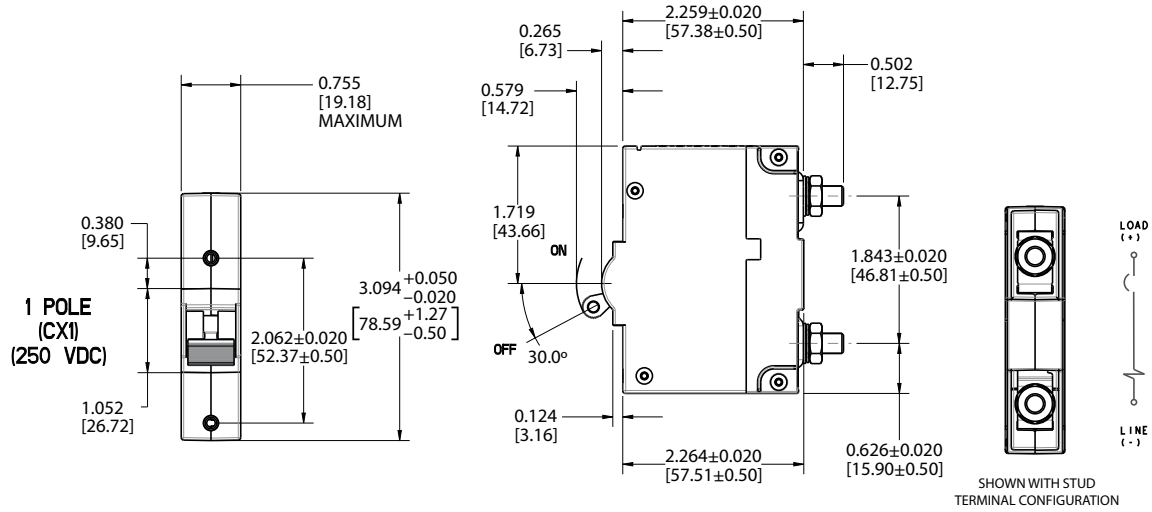
10 MOUNTING INSERTS
A 6-32 Thread
B M3 Thread

11 MAX. APPLICATION RATING
10 300VDC
11 440 VDC without factory installed terminal bus⁴
14 440VDC with factory installed terminal bus⁴
06 600VDC⁵

12 AGENCY APPROVAL
A Without Approvals
C UL 1077 Recognized
W UL 1077 Recognized & TUV Certified IEC/ EN 60947-2⁹

- Notes:
- 1 Only available when tied to a protected pole
Requires special P/N consult factory for details
 - 2 Voltage trip circuit coil not rated for continuous duty - use instantaneous delay code 10
 - 3 Contacts Rated for 20A @ 80 VDC
 - 4 440VDC Rating available in two different wiring configurations.
(see next page for more details)
 - 5 600 VDC only available with factory installed terminal bus (see next page for more details)
 - 6 Single pole units available up to 125A, multi pole units limited to 115A Max.
(see next page for more details)
 - 7 3 Pole units must include one Auxiliary switch pole (circuit code A or G) - Requires Special Part Number. (see next page for more details)
 - 8 Screw Terminals are limited to 50A max.
 - 9 Agency approval code W only available with 440 VDC rating & circuit code B.
 - 10 4 Pole 600 VDC units only available up to 75A Max. (see next page for more details)

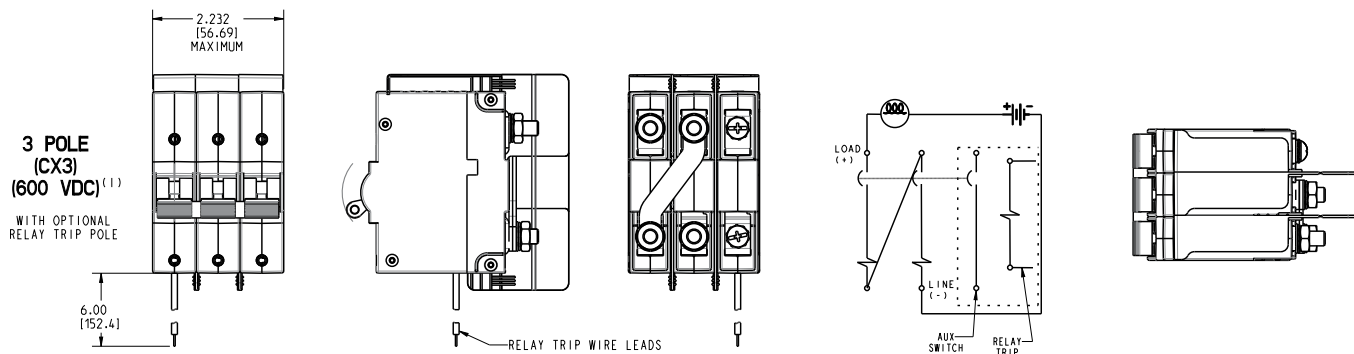
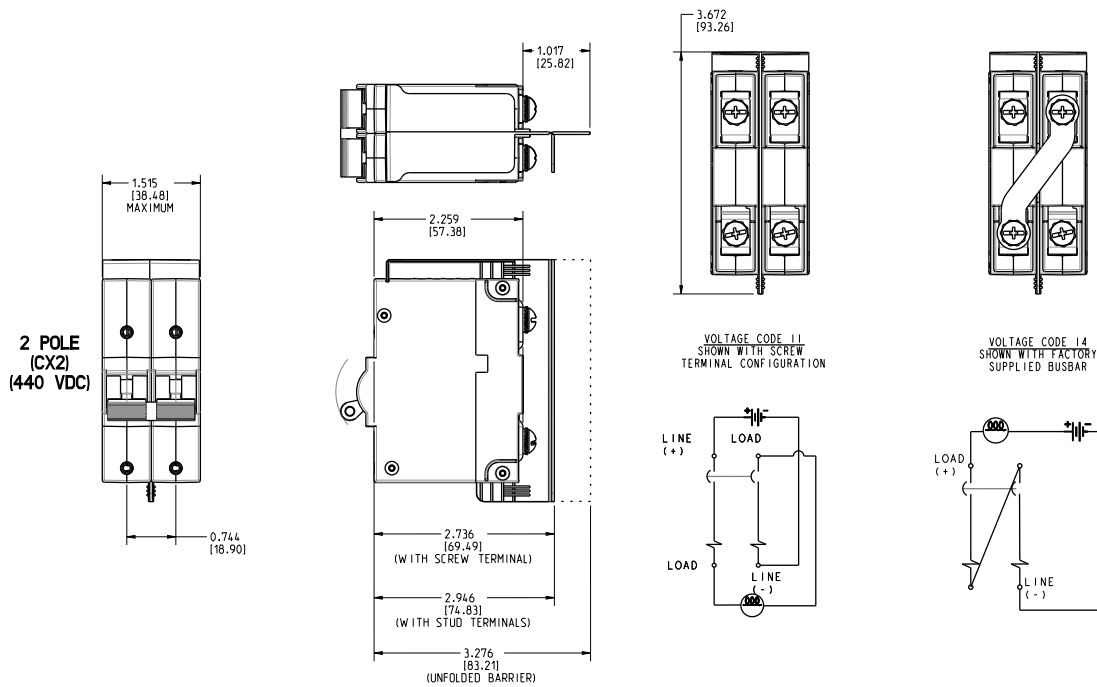
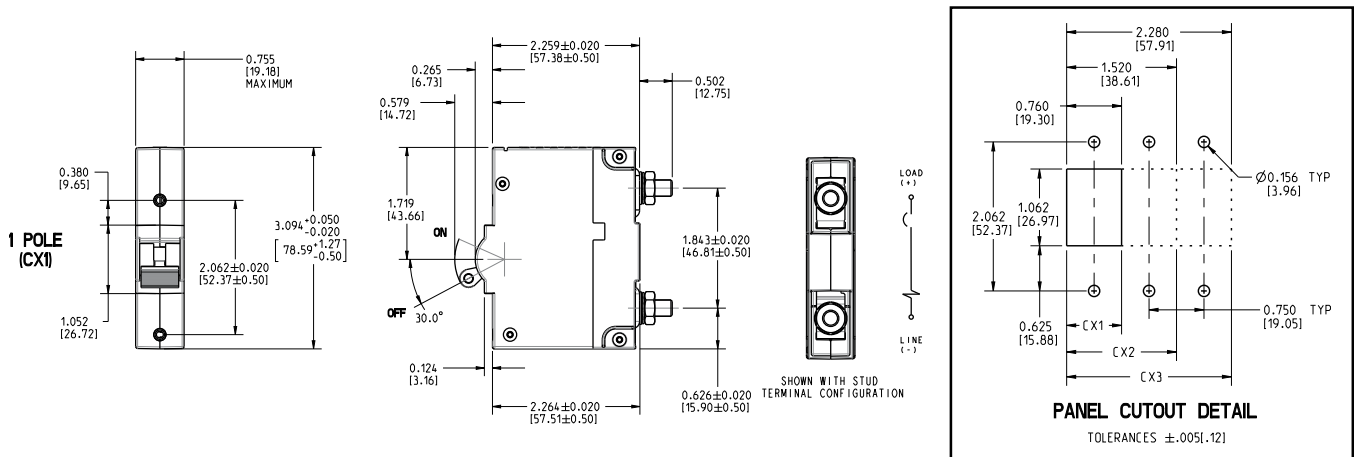
Dimensional Specifications: in. [mm]



Notes:

- 1 All dimensions are in inches [millimeters].
- 2 Tolerance ±.020 [51] unless otherwise specified.

Dimensional Specifications: in. [mm]



- Notes:
- 1 All dimensions are in inches [millimeters].
 - 2 600V Rating requires minimum of 2 protected poles

M-Series

CIRCUIT BREAKER

The M-Series is a low cost, miniature, hydraulic-magnetic circuit breaker which features a compact, space saving design, front panel snap-in mounting and a vertically mounted parallel pole configuration. It features various styling options to maximize your design flexibility. Choices include rocker, illuminated rocker, paddle and baton style handle actuators, push-to-reset and push-pull pushbutton actuators, as well as Visi-Rocker two color actuators. Our exclusive Rockerguard bezel helps prevent inadvertent actuation and a wiping contact mechanism assures long-term reliability.

The M-Series circuit breakers are available with 1, 2 or parallel poles, 0.02 to 50 amp ratings, and 125 and 250VAC or 80VDC versions. With over 16 different time delays, 5 terminal styles, a variety of panel hardware, various colors, and legend imprinting, it assures suitability for most any application design.



Resources:

[Download 3D CAD Files](#)

[IGS >](#)

[STP >](#)

Product Highlights:

- Parallel pole configuration fits in one rack unit
- MIL-PRF-55629
- MIL STD 202 compliant
- MIL-PRF-39019F ingress protection
- Sealed toggle actuator
- Compact design

Only Telecom-Datcom applicable ordering schemes and drawings are shown in this catalog. For complete product details, please visit www.carlingtech.com

Electrical

Maximum Voltage 125/250 VAC 50/60 Hz, 80 VDC (See Rating Tables.)

Current Ratings Standard current coils: 0.100, 0.250, 0.500, 0.750, 1.00 thru 15.0 in 1 amp increments, 18.0, 20.0, 25.0, 30.0. Other ratings available - see Ordering Scheme.

Auxiliary Switch Rating SPDT; 7A 250VAC, 7A (Res) 28VDC, 4A (Ind.) 28VDC, 0.25A 80VDC (Res) (silver contacts), 0.1A 125VAC (gold contacts).

Insulation Resistance Minimum of 100 Megohms at 500 VDC.

Dielectric Strength UL, CSA 1500V, 50/60 Hz for one minute between all electrically isolated terminals. M-Series Circuit Breakers comply with the 8mm spacing and 3750 V 50/60Hz dielectric requirements from hazardous voltage to operator accessible surfaces, per Publications IEC 380, 435, 950, EN 60950 and VDE 0805.

Resistance, Impedance Values from Line to Load Terminal - based on Series Trip Circuit Breaker.

Mechanical

Endurance 10,000 ON-OFF operations @ 6 per minute with rated Current and Voltage.

Trip Free All M-Series Circuit Breakers will trip on overload, even when actuator is forcibly held in the ON position.

Trip Indication The actuator moves positively to the OFF position when an overload causes the circuit breaker to trip.

Physical

Number of Poles 1 or 2

Internal Circuit Configs. Series with or without Auxiliary Switch. Switch Only with or without Auxiliary Switch.

Weight Approximately 30 grams/pole (Approximately 1.07 ounces/pole)

Standard Colors See Ordering Scheme.a

Environmental

Designed in accordance with requirements of specification MIL PRF-55629 & MIL-STD-202G as follows:

Shock Withstands 100 Gs, 6ms, sawtooth while carrying rated current per Method 213, Cond. I. Instantaneous curves tested at 80% of rated current.

Vibration Withstands 0.060" excursion from 10-55 Hz, and 10 Gs 55-500 Hz, at rated current per Method 204C, Test Condition A. Instantaneous curves tested at 80% of rated current.

Moisture Resistance Method 106D, i.e., ten 24-hour cycles @ + 25°C to +65°C, 80-98% RH.

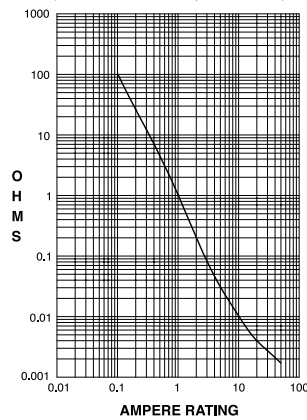
Salt Spray Method 101, Condition A (90-95% RH @ 5% NaCl Solution, 96 hrs).

Thermal Shock Method 107D, Condition A (Five cycles @ -55°C to +25°C to +85°C to +25°C).

Operating Temperature -40° C to +85° C

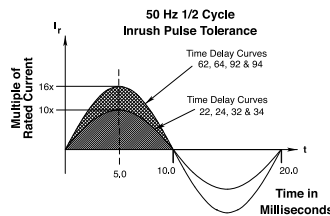
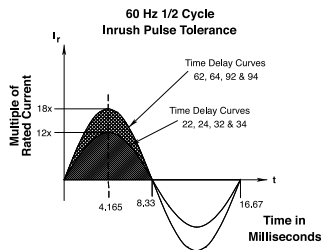
Chemical Resistance Only the outside surfaces of the case and the handles may be cleaned with detergents or alcohol. Organic (hydrocarbon based) solvents are not recommended because they attack plastics. Caution should be taken when solvents are used to clean and remove flux from terminals. Lubricants should not be introduced into the handle/ bushing openings

RESISTANCE PER POLE VALUES from Line to Load Terminals (Values Based on Series Trip Circuit Breaker)



| CURRENT (AMPS) | TOLERANCE (%) |
|----------------|---------------|
| 0.10 - 20.0 | ± 25 |
| 20.1 - 50.0 | ± 35 |

Pulse Tolerance Curves



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

Electrical Tables

Table A: Lists UL Recognized and CSA Accepted configurations & performance capabilities as a Component Supplementary Protector.

| M-SERIES TABLE A: COMPONENT SUPPLEMENTARY PROTECTORS | | | | | | | | | | |
|--|-------------------|-----------|-----------|----------------|----------------------|-------------------|-------------------------------|---------------------|-------------------|-----------------|
| Circuit Configuration | Voltage | | | Current Rating | | Poles Breaking | Short Circuit Capacity (Amps) | | Application Codes | |
| | Max Rating | Frequency | Phase | Full Load Amps | General Purpose Amps | | UL / CSA | | UL | CSA |
| | | | | | | | With Backup Fuse | Without Backup Fuse | | |
| Series | 32 | DC | --- | 0.02 - 15 | --- | 1 | --- | 1000 | TC1, 2, OL1, U1 | TC1, 2, OL1, U1 |
| | | | | --- | 15.1 - 25 | 1 | --- | 1000 | TC1, 2, OL0, U1 | TC1, 2, OL0, U1 |
| | 50 ² | DC | --- | 0.02 - 7.5 | --- | 1 | --- | 1000 | TC1, 2, OL0, U1 | TC1, 2, OL0, U1 |
| | | | | 0.02 - 15 | --- | 2 | --- | 1000 | TC1, 2, OL1, U1 | TC1, 2, OL1, U1 |
| | 65 | DC | --- | --- | 15.1 - 25 | 2 | --- | 1000 | TC1, 2, OL0, U1 | TC1, 2, OL0, U1 |
| | | | | 0.02 - 15 | --- | 1 | --- | 1000 | TC1, 2, OL1, U1 | TC1, 2, OL1, U1 |
| | 65 ^{1,2} | DC | --- | --- | 15.1 - 30 | 1 | --- | 1000 | TC1, 2, OL0, U1 | TC1, 2, OL0, U1 |
| | | | | 0.02 - 15 | --- | 2 | 5000 ³ | --- | TC1, 2, OL1, C1 | TC1, 2, OL1, C1 |
| | 65 | DC | --- | --- | 15.1 - 25 | 2 | 5000 ³ | --- | TC1, 2, OL0, C1 | TC1, 2, OL0, C1 |
| | | | | 0.02 - 15 | --- | 1 | --- | 600 | TC1, 2, OL1, U1 | TC1, 2, OL1, U1 |
| | 80 ¹ | DC | --- | --- | 15.1 - 30 | 1 | --- | 600 | TC1, 2, OL0, U1 | TC1, 2, OL0, U1 |
| | | | | 0.02 - 15 | --- | 1 | --- | 1000 | TC1, 2, OL1, U1 | TC1, 2, OL1, U1 |
| | 125 | 50 / 60 | 1 | 0.02 - 15 | --- | 1 | --- | 1000 | TC1, 2, OL1, U1 | TC1, 2, OL1, U1 |
| | | | | --- | 15.1 - 30 | 1 | --- | 1000 | TC1, 2, OL0, U1 | TC1, 2, OL0, U1 |
| 1 - 30 | | | | --- | 1 | --- | 360 | TC1, OL1, U2 | TC3, OL1, U3 | |
| 250 ² | 50 / 60 | 1 | 0.02 - 12 | --- | 1 | --- | 1000 | TC1, 2, OL1, U1 | TC1, 2, OL1, U1 | |
| 250 | 50 / 60 | 1 | --- | 12.1 - 18 | 1 | 1000 ⁴ | --- | TC1, 2, OL0, C1 | TC1, 2, OL0, C1 | |
| 250 | 50 / 60 | 1 | 0.02 - 15 | --- | 2 | --- | 1000 | TC1, 2, OL1, U1 | TC1, 2, OL1, U1 | |
| | | | --- | 15.1 - 30 | 2 | --- | 1000 | TC1, 2, OL0, U1 | TC1, 2, OL0, U1 | |
| | | | 1 - 30 | --- | 2 | --- | 360 | TC1, OL1, U2 | TC3, OL1, U3 | |

- Notes:
 1 Polarity Sensitive
 2 Available only with Special Catalog Number. Consult Factory.
 3 Requires Branch Circuit Backup with a UL Listed type K-5 or RK-5 fuse rated 30 Amps maximum
 4 Requires Branch Circuit Backup with a UL Listed type K-5 or RK-5 fuse rated 60 Amps maximum

Table B: Lists UL Recognized, CSA Accepted and TUV and VDE Certified configurations and performance capabilities as a Component Supplementary Protector.

| M-SERIES TABLE B: COMPONENT SUPPLEMENTARY PROTECTORS | | | | | | | | | | | | |
|--|-----------------|-----------|-------|----------------|----------------------|----------------|-------------------------------|---------------------|------------------|---------------------|-------------------|-----------------|
| Circuit Configuration | Voltage | | | Current Rating | | Poles Breaking | Short Circuit Capacity (Amps) | | | | Application Codes | |
| | Max Rating | Frequency | Phase | Full Load Amps | General Purpose Amps | | UL / CSA | | VDE / TUV | | UL | CSA |
| | | | | | | | With Backup Fuse | Without Backup Fuse | With Backup Fuse | Without Backup Fuse | | |
| Series | 32 | DC | --- | 0.02 - 15 | --- | 1 | --- | 1000 | 3000 | 500 | TC1, 2, OL1, U1 | TC1, 2, OL1, U1 |
| | | | | --- | 15.1 - 25 | 1 | --- | 1000 | 3000 | 500 | TC1, 2, OL0, U1 | TC1, 2, OL0, U1 |
| | 50 ² | DC | --- | 0.02 - 7.5 | --- | 1 | --- | 1000 | 3000 | 500 | TC1, 2, OL0, U1 | TC1, 2, OL0, U1 |
| | | | | 0.02 - 15 | --- | 2 | --- | 1000 | 3000 | 500 | TC1, 2, OL1, U1 | TC1, 2, OL1, U1 |
| | 65 | DC | --- | --- | 15.1 - 25 | 2 | --- | 1000 | 3000 | 500 | TC1, 2, OL0, U1 | TC1, 2, OL0, U1 |
| | | | | 0.02 - 15 | --- | 2 | 5000 | --- | 3000 | 500 | TC1, 2, OL1, C1 | TC1, 2, OL1, C1 |
| | 65 ³ | DC | --- | --- | 15.1 - 30 | 2 | 5000 | --- | 3000 | 500 | TC1, 2, OL0, C1 | TC1, 2, OL0, C1 |
| | | | | 0.02 - 15 | --- | 1 | --- | 600 ⁴ | --- | 500 | TC1, 2, OL1, U1 | TC1, 2, OL1, U1 |
| | 80 ¹ | DC | --- | --- | 15.1 - 30 | 1 | --- | 600 ⁴ | --- | 500 | TC1, 2, OL0, U1 | TC1, 2, OL0, U1 |
| | | | | 0.02 - 15 | --- | 1 | --- | 1000 | 3000 | 500 | TC1, 2, OL1, U1 | TC1, 2, OL1, U1 |
| | 125 | 50 / 60 | 1 | 0.02 - 15 | --- | 1 | --- | 360 | 3000 | 500 | TC1, OL1, U2 | TC3, OL1, U3 |
| | | | | 1 - 15 | --- | 1 | --- | 1000 | 3000 | 500 | TC1, 2, OL1, U1 | TC1, 2, OL1, U1 |
| | 250 | 50 / 60 | 1 | 0.02 - 12 | --- | 1 | --- | 1000 | 3000 | 500 | TC1, 2, OL1, U1 | TC1, 2, OL1, U1 |
| | | | | 0.02 - 20 | --- | 2 | --- | 1000 | 3000 | 500 | TC1, 2, OL0, U1 | TC1, 2, OL0, U1 |
| 1 - 12 | | | | --- | 1 | --- | 360 | 3000 | 500 | TC1, OL1, U2 | TC3, OL1, U3 | |

- Notes:
 1 Polarity Sensitive
 2 Available only with Special Catalog Number. Consult Factory.
 3 Requires Branch Circuit Backup with a UL Listed type K-5 or RK-5 fuse rated 30 Amps maximum
 4 TUV only, not VDE
 5 Requires backup protection with a thermal magnetic circuit breaker rated 32 amps and having a Type C trip characteristic per EN60898/DIN VDE 0641 (C32A) for ratings greater than 15amps, and a thermal magnetic circuit breaker rated 16 amps and having a Type C trip characteristic per EN60898/DIN VDE 0641 (C16A) for ratings 15 amps and less

Electrical Tables

Table C: Lists UL489A Listed and TUV Certified configurations and performance capabilities for use in Communications Equipment.

| M-SERIES TABLE C: UL489A Listed (Communications Equipment - Polarity Sensitive) | | | | | | |
|--|-----------------|-----------|-------------------------------------|----------------|------------------------------|-----|
| Circuit Configuration | Voltage | | Current Rating General Purpose Amps | Poles Breaking | Interrupting Capacity (Amps) | |
| | Max Rating | Frequency | | | Without Backup Fuse | |
| | | | | | UL489A | TUV |
| Series | 80 | DC | 0.02 - 30 | 1 | 600 | --- |
| | 65 ¹ | DC | 0.02 - 30 | 1 | 1000 | --- |
| | 80 | DC | 0.10 - 25 | 1 | 600 | 600 |

Notes:
1. Available only with Special Catalog Number

Table D: Lists UL489A Listed configurations and performance capabilities for use in Communications Equipment.

| M-SERIES TABLE D: Parallel Pole Construction UL489A Listed (Communications Equipment - Polarity Sensitive) | | | | | | |
|---|-----------------|-----------|-------------------------------------|----------------|------------------------------|--|
| Circuit Configuration | Voltage | | Current Rating General Purpose Amps | Poles Breaking | Interrupting Capacity (Amps) | |
| | Max Rating | Frequency | | | Without Backup Fuse | |
| | | | | | UL489A | |
| Series | 80 | DC | 31 - 50 | 2 | 600 | |
| | 65 ¹ | DC | 31 - 50 | 2 | 1000 | |

Notes:
1. Available only with Special Catalog Number


Agency Certifications

UL Recognized
UL Standard 1077


Component Recognition Program as Protectors, Supplementary (Guide CCN/QVNU2, File E75596)

CSA Accepted


Component Supplementary Protector (Class 3215 30, File 047848 0 000)
CSA Standard C22.2 No. 235

UL Listed
UL Standard 489A


Communications Equipment (Guide CCN/DITT, File E189195)

VDE Certified


EN60934, VDE 0642 under File 10537

TUV Certified


EN60934, under License No. R9671109



1 SERIES
M

2 ACTUATOR

Single Color
A Angled
B Flat

Two Color Visi
D Indicate ON
E Indicate OFF

Single Color Translucent
F Angled
G Flat

| STYLE | INDICATE - "ON" (CODE-D) | INDICATE - "OFF" (CODE-E) | FLAT (CODES-B & G) | ANGLED (CODES-A & F) |
|------------|-----------------------------|------------------------------|-----------------------|-------------------------|
| VERTICAL | | | | |
| HORIZONTAL | | | | |

3 POLES
2 Two

4 CIRCUIT/AUXILIARY SWITCH 2
P Series Trip Current (Parallel Pole)
with Auxiliary Switch, Silver Contacts
Q Series Trip Current (Parallel Pole) .110 x 0.20 Q.C
with Auxiliary Switch, Gold Contacts
R Series Trip Current (Parallel Pole) .110 x 0.20 Q.C

5 FREQUENCY & TIME DELAY
D2 DC Short
D4 DC Medium

6 CURRENT RATING (AMPERES)

| CODE | AMPERES |
|------|---------|
| 631 | 31.000 |
| 635 | 35.000 |
| 640 | 40.000 |
| 645 | 45.000 |
| 650 | 50.000 |

Notes:
1 Reminder of Rocker same color as Visi
2 Aux Switch only available with screw terminals

7 TERMINAL
A Push in Stud
5 10-32 Screw (Bus Type)

8 ILLUMINATION
Non-Illuminated
A Non-Illuminated

9 ACTUATOR COLOR & LEGEND

| | Actuator Visi 1 | Legend |
|---|-----------------|--------|
| 1 | White | Black |
| 2 | Black | White |
| 3 | Red | White |
| 4 | Green | White |
| 5 | Blue | White |
| 6 | Yellow | Black |
| 7 | Gray | Black |
| 8 | Orange | Black |

10 LEGEND
2 ON - OFF Vertical
3 ON - OFF Horizontal
6 Dual Vertical
7 Dual Horizontal

11 BEZEL COLOR
A White without Rockerguard
B Black without Rockerguard
G Gray without Rockerguard
1 White with Rockerguard
2 Black with Rockerguard
7 Gray with Rockerguard

12 AGENCY APPROVAL
T UL 489A Listed



1 SERIES
M

2 ACTUATOR
M Paddle
T Push-Pull

3 POLES
2 Two

4 CIRCUIT/AUXILIARY SWITCH ¹
P Series Trip Current (Parallel Pole)
with Auxiliary Switch, Silver Contacts
Q Series Trip Current (Parallel Pole) .110 x 0.20 Q.C
with Auxiliary Switch, Gold Contacts
R Series Trip Current (Parallel Pole) .110 x 0.20 Q.C

5 FREQUENCY & TIME DELAY
D2 DC Short
D4 DC Medium

6 CURRENT RATING (AMPERES)

| CODE | AMPERES |
|------|---------|
| 631 | 31.000 |
| 635 | 35.000 |
| 640 | 40.000 |
| 645 | 45.000 |
| 650 | 50.000 |

7 TERMINAL
A Push in Stud
5 10-32 Screw (Bus Type)

8 ACTUATOR COLOR & LEGEND

| Handle | | Push Button | |
|--------|--------|-------------|--------|
| 1 | White | A | White |
| 2 | Black | B | Black |
| 3 | Red | C | Red |
| 4 | Green | D | Green |
| 5 | Blue | E | Blue |
| 6 | Yellow | F | Yellow |
| 7 | Gray | G | Gray |
| 8 | Orange | H | Orange |

9 FRONT PANEL HARDWARE

Handle
A No outer Panel Hardware
B Knurled Nut, Bright Nickel
C Knurled Nut, Bright Nickel with Locking Ring
D Knurled Nut, Black
E Knurled Nut, Black with Locking Ring
F Panel Dress, Bright Nickel
G Panel Dress, Bright Nickel with Locking Ring
H Panel Dress, Black
J Panel Dress, Black with Locking Ring

Push Button
1 No outer Panel Hardware
2 Knurled Nut, Bright Nickel

10 LEGEND PLATE / BUTTON MARKING

Handle Actuator Legend Plate
B ON - OFF Vertical
C ON - OFF Horizontal

Push-Pull Actuator Legend Plate
2 Rated Amps Horizontal
3 Rated Amps Line Side Down
4 Rated Amps Line Side Up

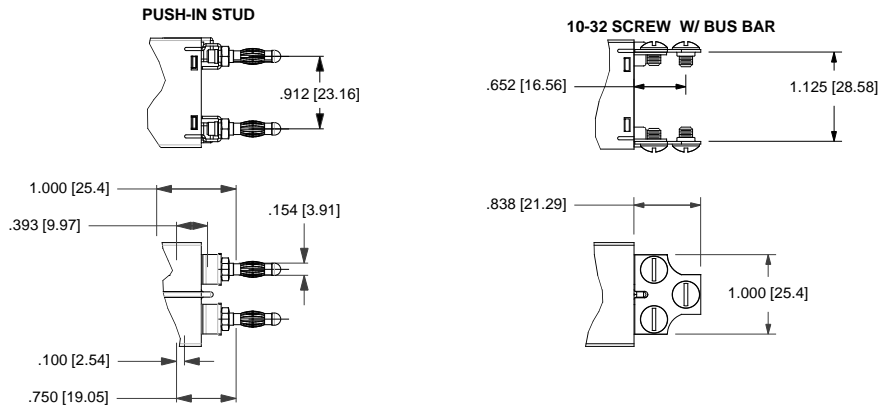
11 BRUSHING COLOR
B Black

12 AGENCY APPROVAL
T UL 489A Listed

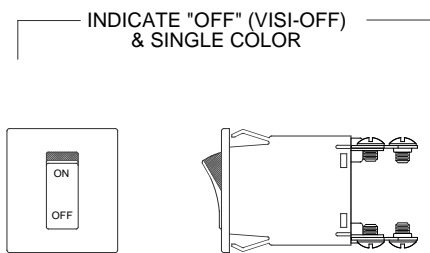
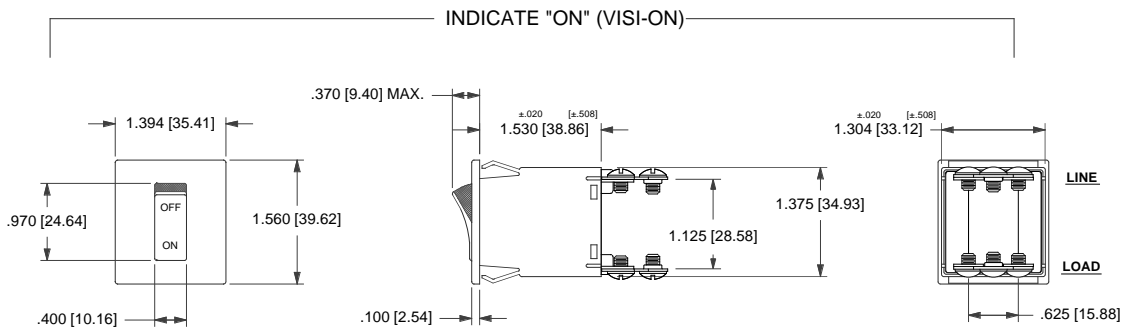
Notes:
1 Aux Switch only available with screw terminals

Dimensional Specifications: in. [mm]

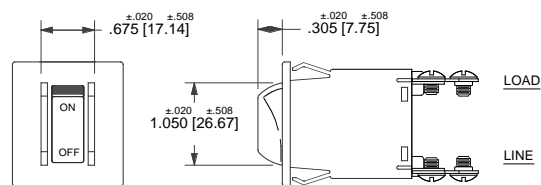
PARALLEL POLE TERMINAL OPTIONS



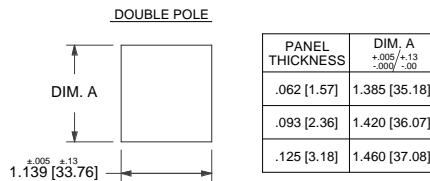
ROCKER ACTUATOR DETAIL



ROCKERGUARD CONFIGURATION



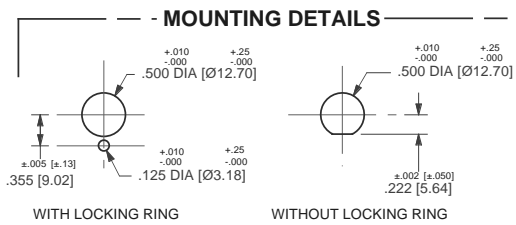
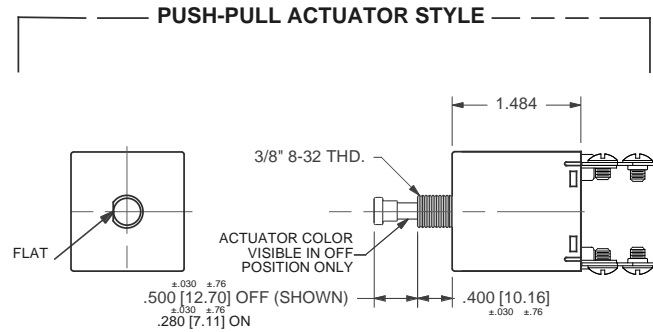
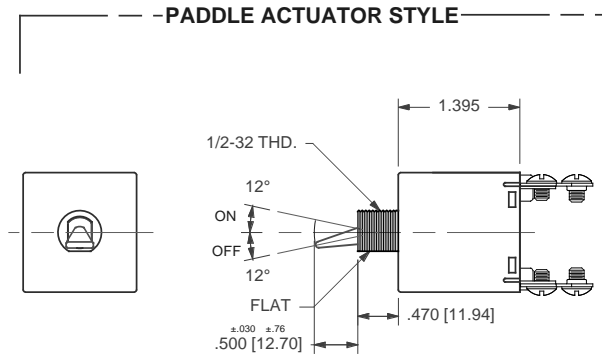
PANEL CUT - OUT DETAIL (ROCKER)



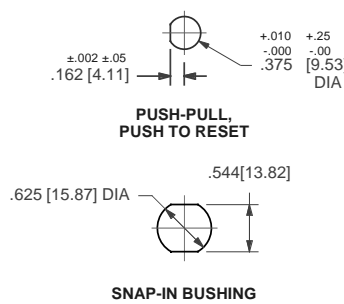
Notes:

- 1 All dimensions are in inches [millimeters].
- 2 Tolerance ±.010 [.25] unless otherwise specified.
- 3 Dimensions apply to both rocker styles.
- 4 I-o, on-off or dual legends available for vertical or horizontal mounting.
- 5 Notice that circuit breaker line and load terminal orientation on indicate "off" is opposite that of indicate "on".

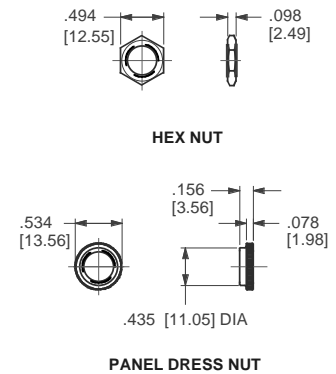
Dimensional Specifications: in. [mm]



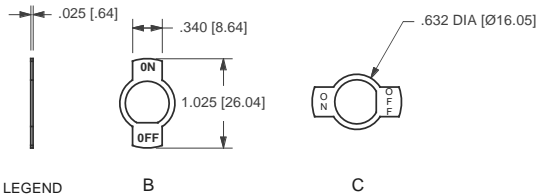
MOUNTING DETAILS



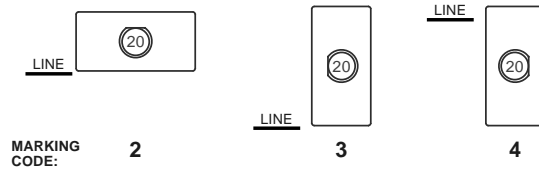
PANEL HARDWARE



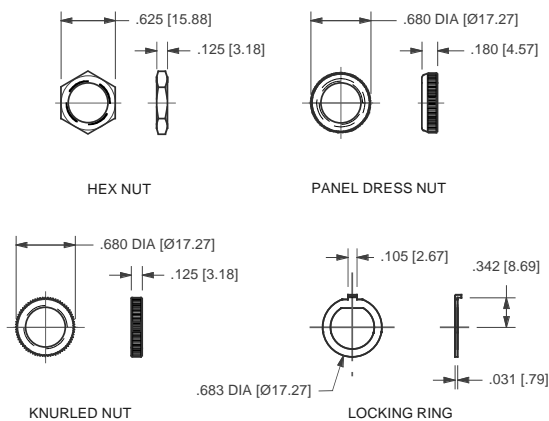
LEGEND PLATES



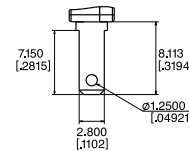
BUTTON MARKING ORIENTATION



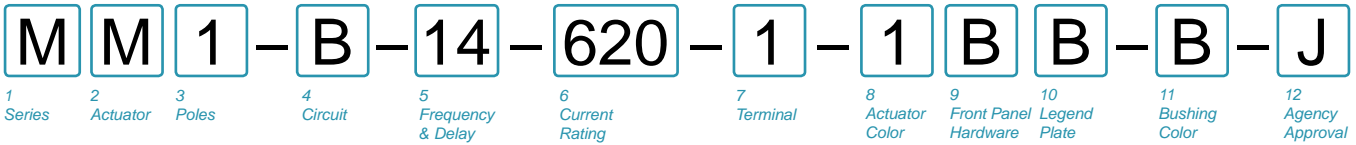
PANEL HARDWARE



.110QC AUXILIARY SWITCH TERMINALS



- Notes:
- All dimensions are in inches [millimeters].
 - Tolerance ±.010 [.25] unless otherwise specified.
 - Dimensions apply to both rocker styles.
 - I-o, on-off or dual legends available for vertical or horizontal mounting.
 - Notice that circuit breaker line and load terminal orientation on indicate "off" is opposite that of indicate "on".



1 SERIES
M

2 ACTUATOR 1

Handle
M Paddle N Baton

Push Button
T Push-Pull U⁸ Push To Reset

Push Button with Snap-In Mounting
V Push-Pull W⁸ Push To Reset

3 POLES
1 One

4 CIRCUIT

without Auxiliary Switch
B Series Trip (Current)

with Auxiliary Switch, Silver Contacts
M Series Trip (Current) Aux Switch
S³ Series Trip (Current)
T^{3,4} Series Trip (Current)
U^{3,13} Series Trip, Maintained Contacts

with Auxiliary Switch, Gold Contacts
4^{2,3} Series Trip (Current)
5^{3,12} Series Trip, Maintained Contacts
9 Series Trip (Current) Aux Switch

Terminal Type:
.110 QC x .020 QC
.060 Dia, Round Solder Turret
.058 Dia, Round Q.C.
.080 Dia x .020 Flat Q.C.
.058 Dia, Round Q.C.
.080 Dia x .020 Flat Q.C.
.110 QC x .020 QC

5 FREQUENCY & DELAY

| | |
|---------------------|--------------------------|
| 10 DC Instantaneous | 72 DC, Short, Hi-Inrush |
| 12 DC Short | 74 DC, Medium, Hi-Inrush |
| 14 DC Medium | |

6 CURRENT RATING (AMPERES)

| CODE | AMPERES | | | | |
|------|---------|-----|-------|-----|--------|
| 020 | 0.020 | 225 | 0.250 | 420 | 2.000 |
| 025 | 0.025 | 230 | 0.300 | 522 | 2.250 |
| 030 | 0.030 | 235 | 0.350 | 425 | 2.500 |
| 035 | 0.035 | 240 | 0.400 | 527 | 2.750 |
| 040 | 0.040 | 245 | 0.450 | 430 | 3.000 |
| 045 | 0.045 | 250 | 0.500 | 435 | 3.500 |
| 050 | 0.050 | 255 | 0.550 | 440 | 4.000 |
| 055 | 0.055 | 260 | 0.600 | 445 | 4.500 |
| 060 | 0.060 | 265 | 0.650 | 450 | 5.000 |
| 065 | 0.065 | 270 | 0.700 | 455 | 5.500 |
| 070 | 0.070 | 275 | 0.750 | 460 | 6.000 |
| 075 | 0.075 | 280 | 0.800 | 465 | 6.500 |
| 080 | 0.080 | 285 | 0.850 | 470 | 7.000 |
| 085 | 0.085 | 290 | 0.900 | 475 | 7.500 |
| 090 | 0.090 | 295 | 0.950 | 480 | 8.000 |
| 090 | 0.095 | 410 | 1.000 | 485 | 8.500 |
| 210 | 0.100 | 512 | 1.250 | 490 | 9.000 |
| 215 | 0.150 | 415 | 1.500 | 495 | 9.500 |
| 220 | 0.200 | 517 | 1.750 | 610 | 10.000 |

7 TERMINAL 4

| | |
|---------------------------------|---------------------------------------|
| 1 Push-On 0.250 Tab (Q.C.) | A ¹⁰ Push-In Stud |
| 2 Screw 8-32 with Upturned Lugs | P ¹¹ Printed Circuit Board |
| 3 Screw 8-32 (Bus Type) | |

8 ACTUATOR COLOR & LEGEND 5

| Gloss Handle | Push-Button | Actuator Color |
|--------------|-------------|----------------|
| 1 | A | White |
| 2 | B | Black |
| 3 | C | Red |
| 4 | D | Green |
| 5 | E | Blue |
| 6 | F | Yellow |
| 8 | H | Orange |

9 FRONT PANEL HARDWARE 6

| No outer Panel Hardware | Handle | Push-Button |
|---------------------------------|--------|-------------|
| Knurled Nut | A | 1 |
| Bright nickel | B | 2 |
| Bright nickel with locking ring | C | |
| Black | D | |
| Black with locking ring | E | |
| Panel Dress Nut | F | |
| Bright nickel | G | |
| Bright nickel with locking ring | H | |
| Black | J | |
| Black with locking ring | | |

10 LEGEND PLATE / BUTTON MARKING

Handle Actuator Legend Plate (Actuator Styles M & N)
A No Legend Plate
B ON - OFF Vertical
C ON - OFF Horizontal
D I - O Vertical
E I - O Horizontal

Push-Pull Actuator Button Cap (Actuator Styles T & V)
1⁸ No Marking
2 Rated Amps Horizontal
3 Rated Amps Line Side Down
4 Rated Amps Line Side Up

Push-to-Reset Actuator Button (Actuator Styles U & W)
1⁸ No Marking

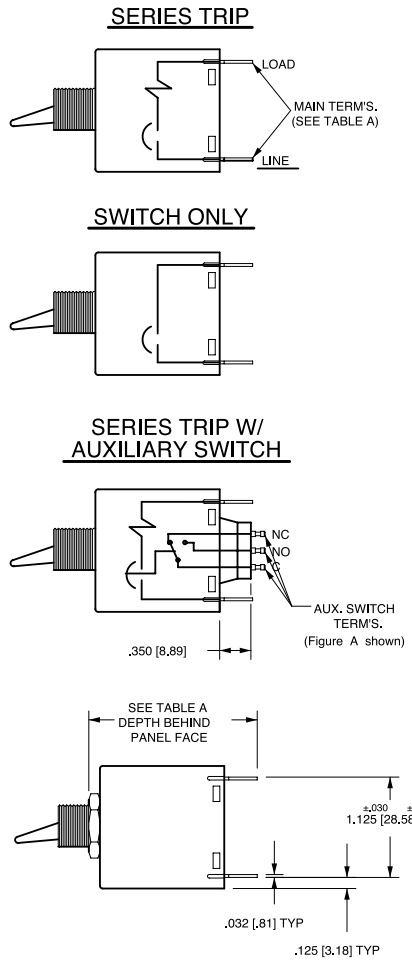
11 BUSHING COLOR 7
B Black

12 AGENCY APPROVAL 9

| | |
|---|------------------------------|
| J | UL489A Listed, TUV Certified |
| M | UL Recognized, CSA Accepted |
| N | UL Recognized, TUV Certified |
| T | UL489A Listed |

1 One actuator is located in the center of each multi-pole breaker. Actuator codes V & W limited to single pole breakers only.
2 One Auxiliary Switch is supplied per breaker. On two-pole breakers, standard Auxiliary Switch mounting is in pole one. Auxiliary Switch option limited to Series Trip and Switch Only circuits. Not available with Back Connected Screw or Push-in Stud terminals.
3 Mates with AMP .058" diameter pin receptacles including 60983-1 (gold plated) and 60983-3 (tin plated).
4 Screw terminals or Push-in Stud recommended above 20 amps.
5 Actuator color is only visible in the OFF position on Push-Pull actuators.
6 All units have one hex nut installed on bushing for use behind the panel.
7 Other colors available. Consult factory.
8 Not available with UL489A Listed breakers.
9 TUV certified to 25 amps. UL Recognized, CSA Accepted and UL Listed to 30 amps.
10 Terminal code A available with circuit codes A & B only.
11 Printed circuit board available with UL recognized approval only.
12 Auxiliary switch (flat Q.C.) available with UL recognized approvals only.

Circuit & Terminal Diagrams: in. [mm]



| TABLE A | | DEPTH BEHIND PANEL FACE * |
|----------------------|---------------------------|---------------------------|
| TERMINAL DESCRIPTION | | |
| MAIN | TAB (Q.C) | 1.890 [48.00] |
| | SCREW (#8-32) | 1.930 [49.03] |
| | PUSH-IN STUD | 2.520 [64.00] |
| AUX. ** SWITCH | DOUBLE SOLDER TURRET TYPE | 2.035 [51.68] |
| | ROUND Q.C TYPE | 2.025 [51.44] |
| | FLAT QUICK-CONNECT | 2.129 [54.08] |
| | FLAT SOLDER LUG | 2.012 [51.10] |

*DEPTH INCLUDES BEHIND PANEL HEX NUT AS SUPPLIED ON ALL UNITS.

** WHEN CALLED FOR ON MULTI-POLE UNITS, ONLY ONE AUX. SWITCH IS NORMALLY SUPPLIED, MOUNTED AS SHOWN IN FIG. A

MULTI-POLE IDENTIFICATION SCHEME

SOLDER TURRET AND ROUND QC AUX SWITCH TERMINALS

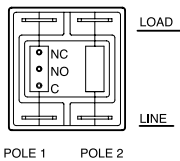


FIG. A

FLAT QC AND SOLDER LUG AUX SWITCH TERMINALS

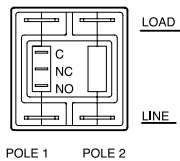
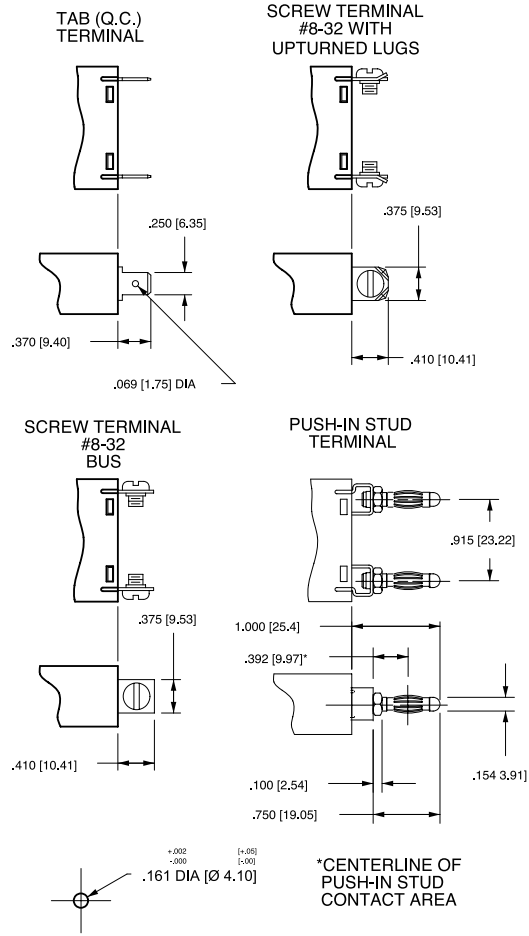
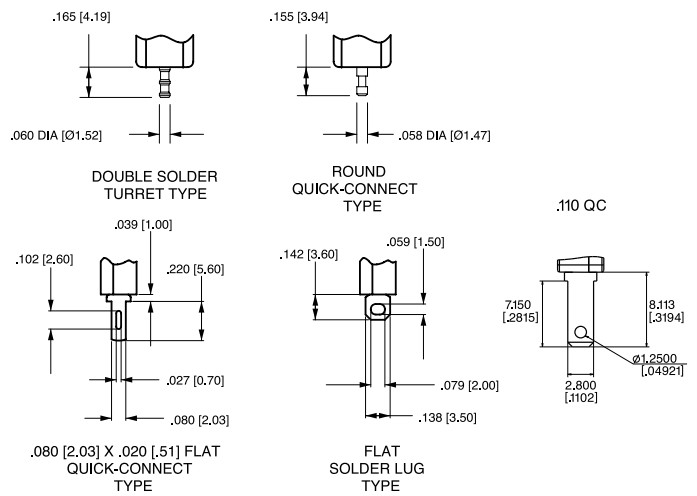


FIG. B

TERMINAL DIMENSIONAL DETAIL



AUXILIARY SWITCH TERMINALS

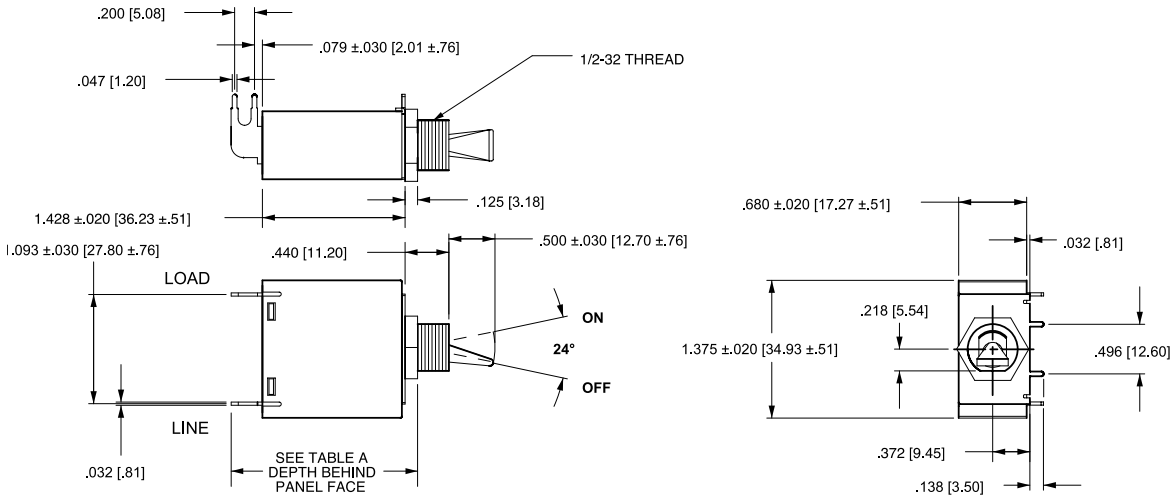


Notes:

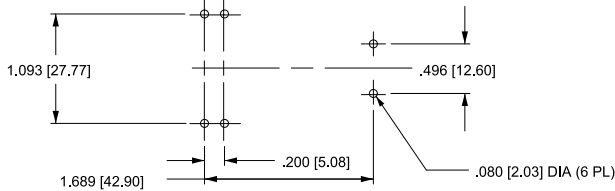
- All dimensions are in inches [millimeters].
- Tolerance ±.020 [.51] unless otherwise specified.

PC Terminal Diagrams: in. [mm]

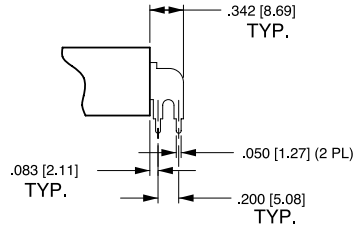
HANDLE TYPE SHOWN WITHOUT AUX. SWITCH



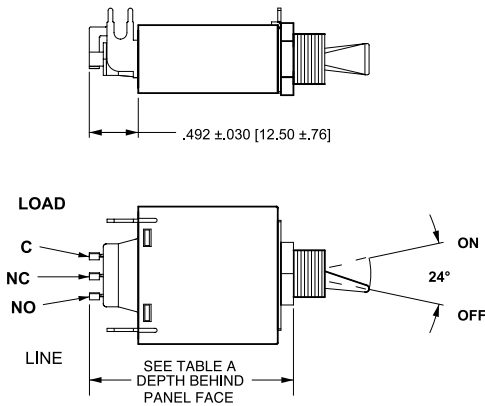
P.C. FOOTPRINT



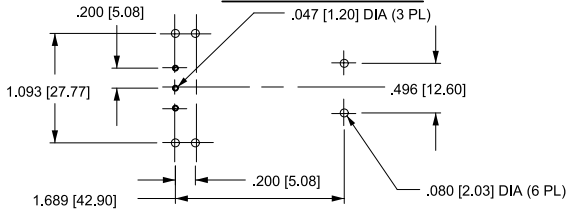
P.C. TERMINAL



HANDLE TYPE SHOWN WITH AUX. SWITCH



P.C. FOOTPRINT



PANEL HARDWARE

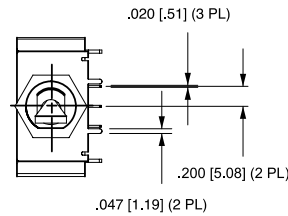
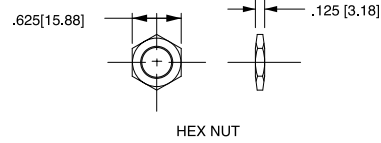


TABLE A

| TERMINAL DESCRIPTION | | DEPTH BEHIND PANEL FACE * |
|----------------------|-----------------------|---------------------------|
| MAIN | PRINTED CIRCUIT BOARD | 1.957 [49.71] |
| AUX. SWITCH | PRINTED CIRCUIT BOARD | 2.449 [62.20] |

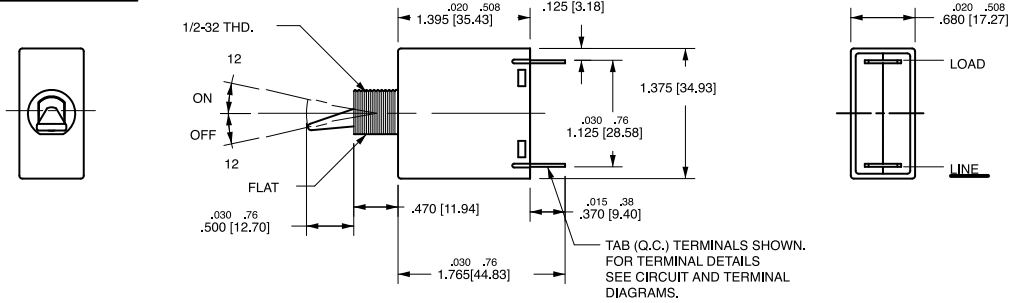
*DEPTH INCLUDES BEHIND PANEL HEX NUT AS SUPPLIED ON ALL UNITS

- Notes:
 1 All dimensions are in inches [millimeters].
 2 Tolerance ± 0.020 [51] unless otherwise specified.

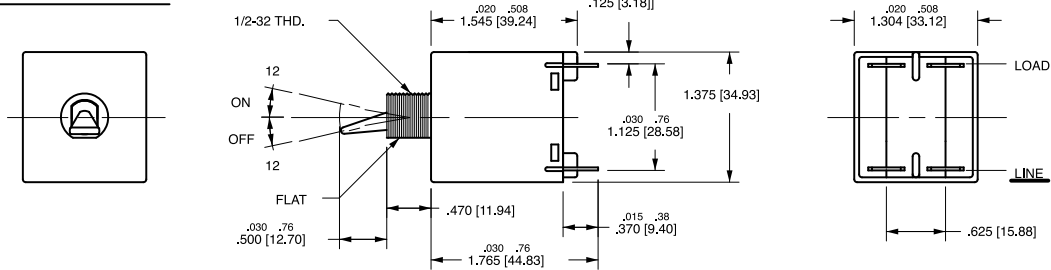
Dimensional Specifications: in. [mm]

PADDLE ACTUATOR STYLE

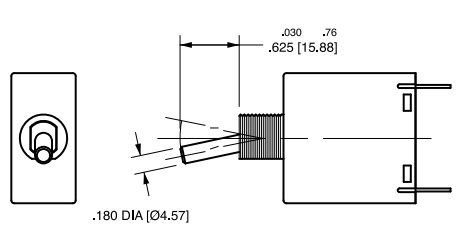
SINGLE POLE



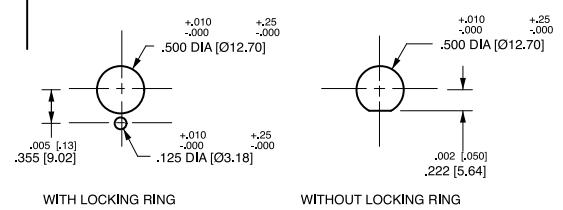
DOUBLE POLE



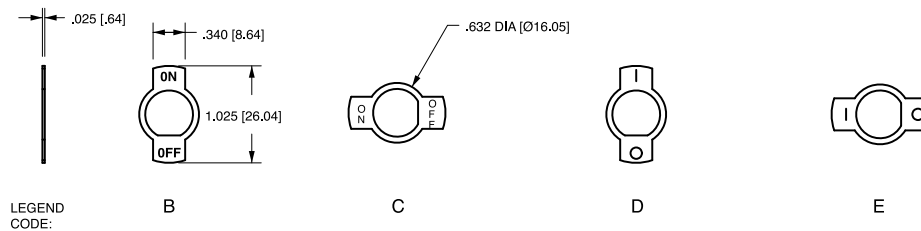
BATON ACTUATOR STYLE



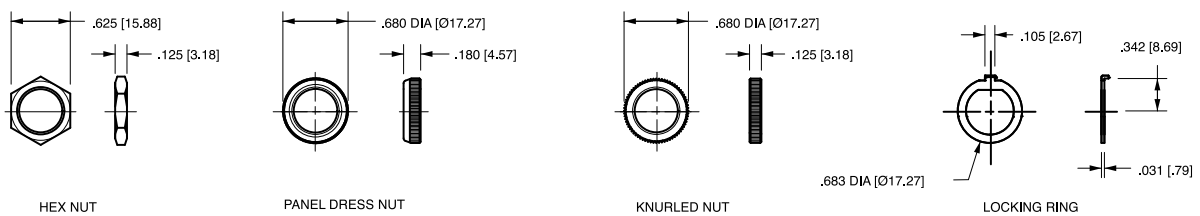
MOUNTING DETAILS



LEGEND PLATES



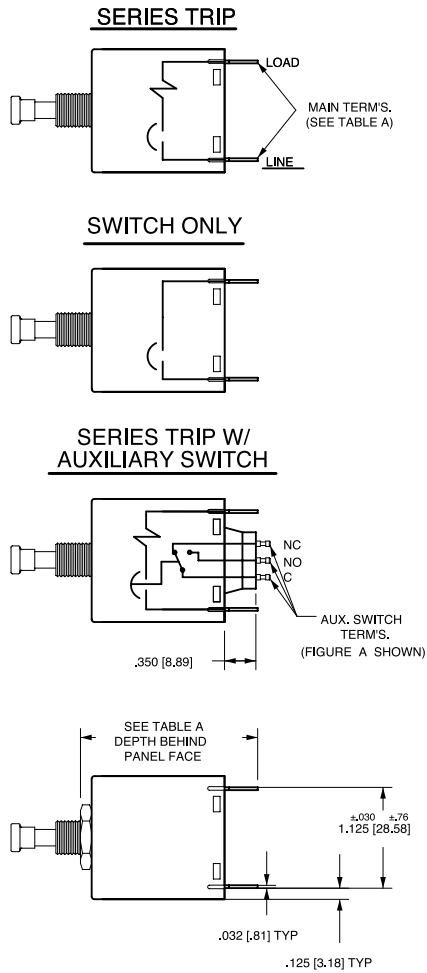
PANEL HARDWARE



Notes:

- 1 All dimensions are in inches [millimeters].
- 2 Tolerance ± 0.020 [.51] unless otherwise specified.

Circuit & Terminal Diagrams: in. [mm]



| TABLE A | | |
|----------------------|---------------------------|---------------------------|
| TERMINAL DESCRIPTION | | DEPTH BEHIND PANEL FACE * |
| MAIN | TAB (Q.C.) | 1.952 [49.57] |
| | SCREW (#8-32) | 1.992 [50.60] |
| | PUSH-IN STUD | 2.582 [65.58] |
| AUX. ** SWITCH | DOUBLE SOLDER TURRET TYPE | 2.097 [53.26] |
| | ROUND Q.C. TYPE | 2.087 [53.01] |
| | FLAT QUICK-CONNECT | 2.191 [55.65] |
| | FLAT SOLDER LUG | 2.074 [52.68] |

*DEPTH INCLUDES BEHIND PANEL HEX NUT AS SUPPLIED ON ALL UNITS.

**WHEN CALLED FOR ON MULTI-POLE UNITS, ONLY ONE AUX. SWITCH IS NORMALLY SUPPLIED, MOUNTED AS SHOWN IN FIG. A

MULTI-POLE IDENTIFICATION SCHEME

SOLDER TURRET AND ROUND QC AUX SWITCH TERMINALS

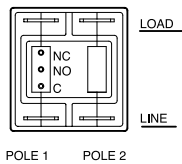


FIG. A

FLAT QC AND SOLDER LUG AUX SWITCH TERMINALS

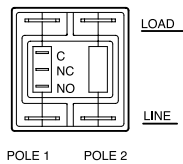
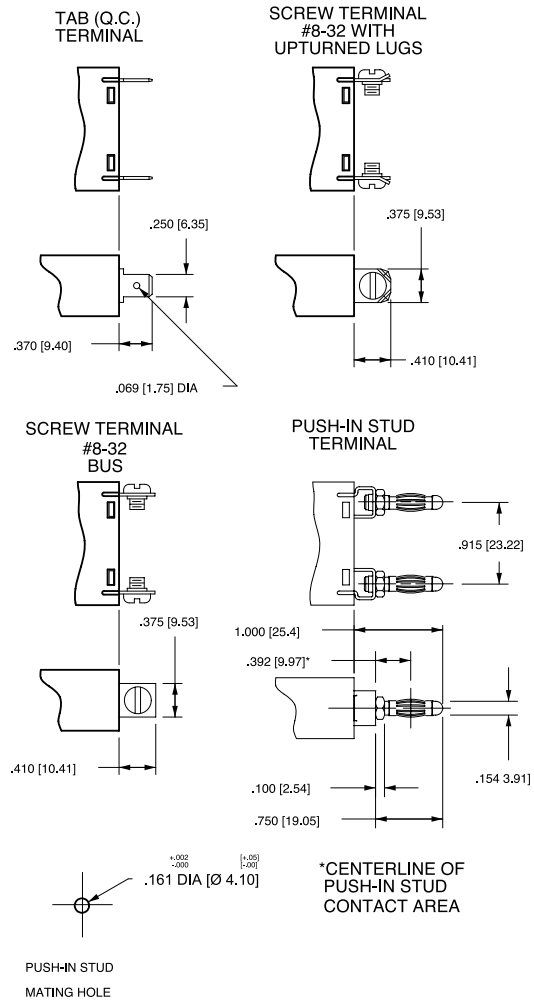


FIG. B

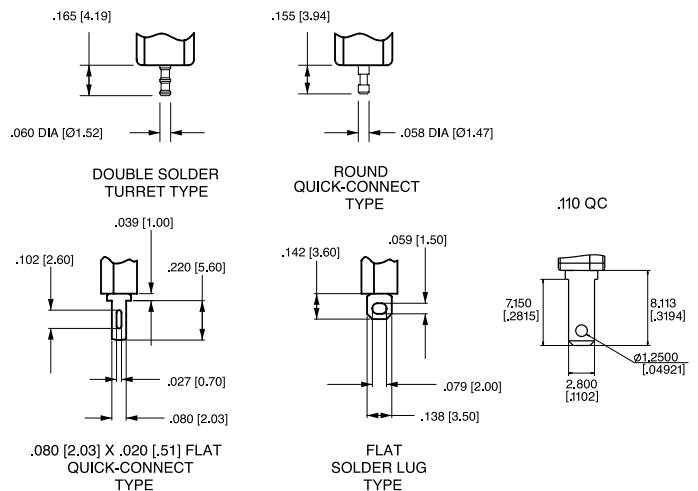
Notes:

- All dimensions are in inches [millimeters].
- Tolerance $\pm .020$ [.51] unless otherwise specified.

TERMINAL DIMENSIONAL DETAIL

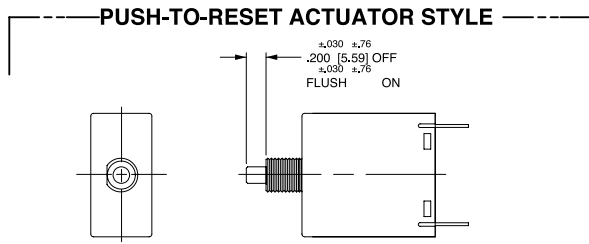
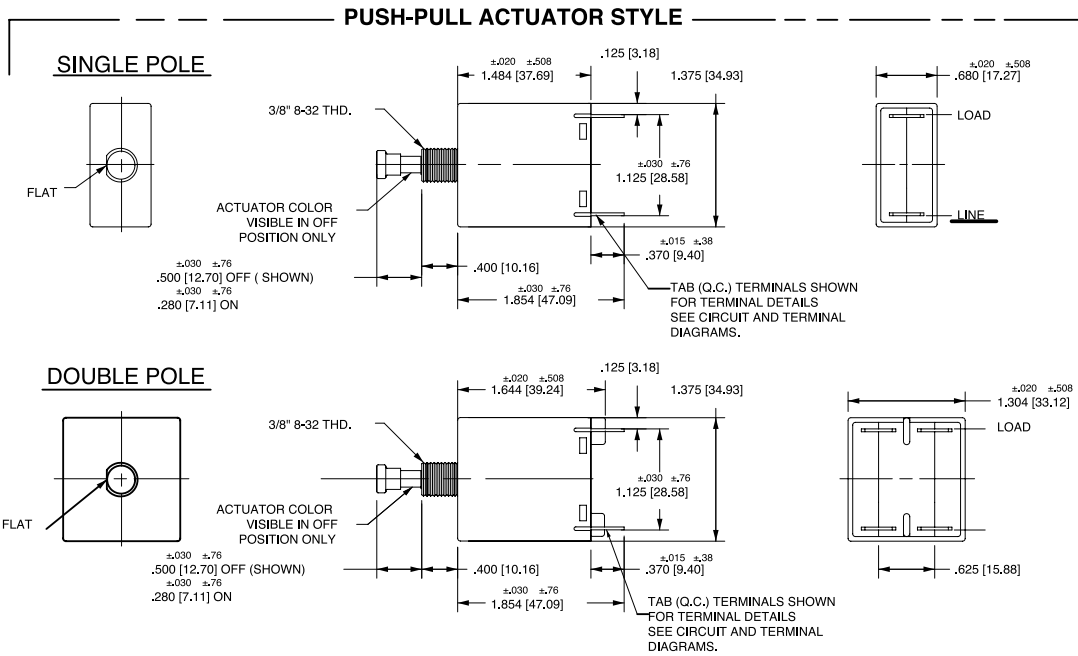


AUXILIARY SWITCH TERMINALS

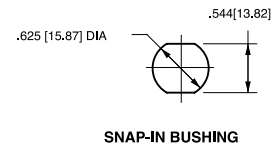
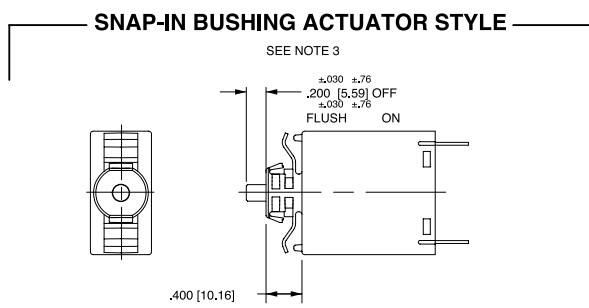
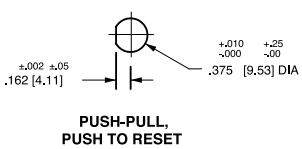


*AVAILABLE THROUGH SPECIAL CATALOG PART NUMBER

Dimensional Specifications: in. [mm]



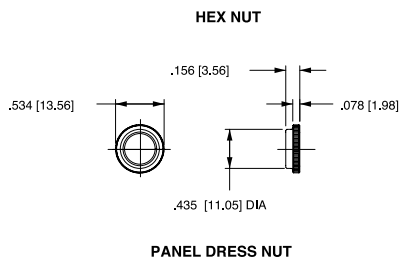
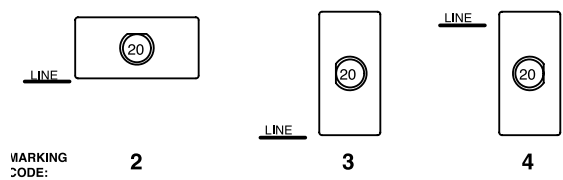
MOUNTING DETAILS



PANEL HARDWARE



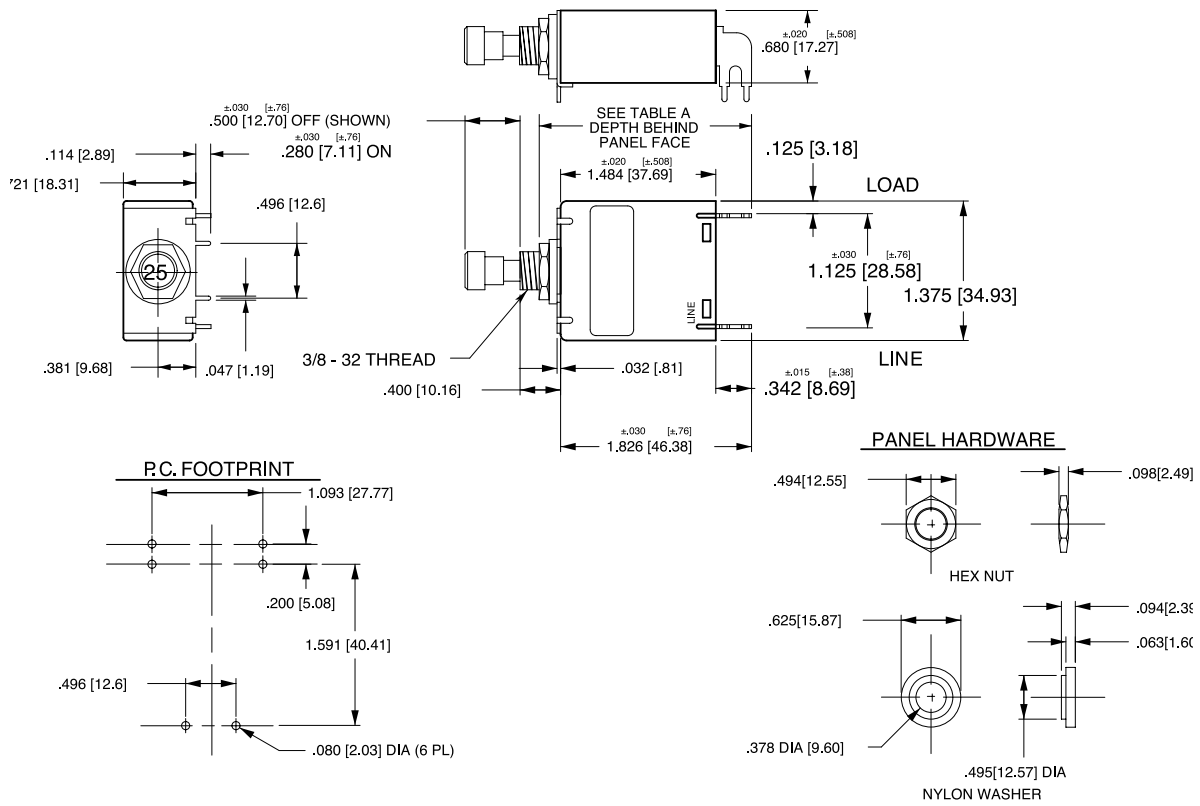
BUTTON MARKING ORIENTATION (PUSH-PULL ONLY)



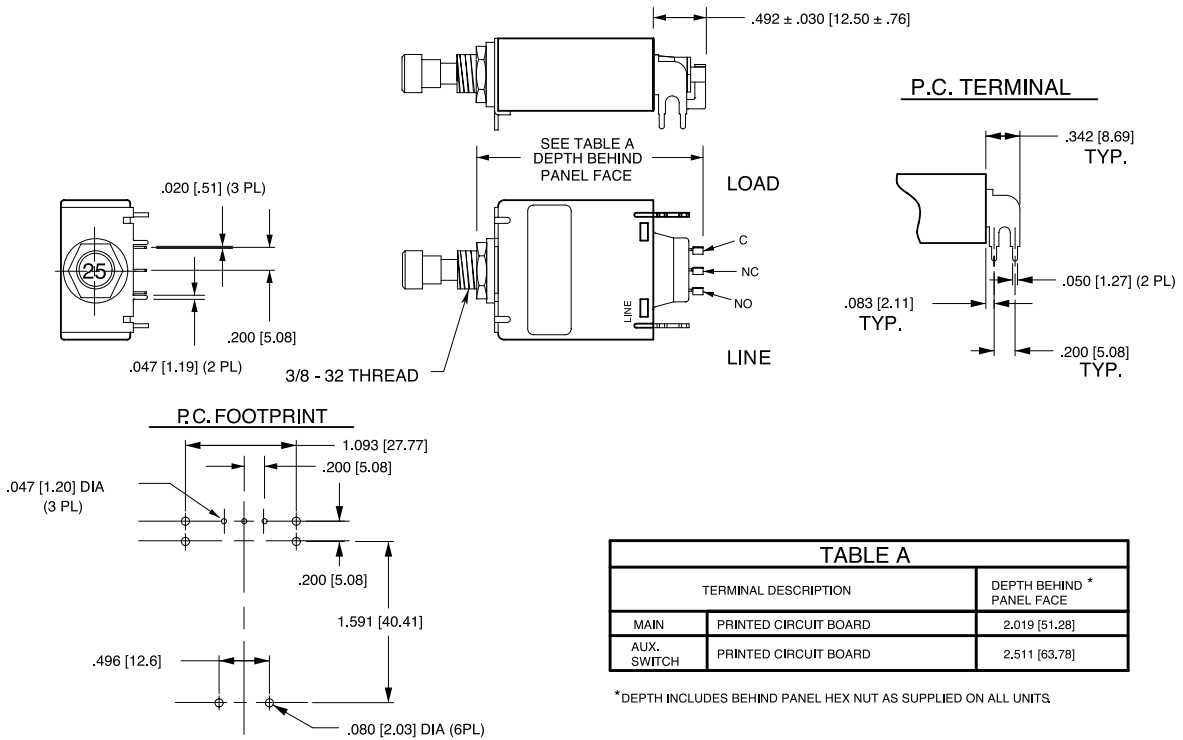
Notes:
 1 All dimensions are in inches [millimeters].
 2 Tolerance ± 0.20 [5.1] unless otherwise specified.
 3 Available with Push-Pull or Push-to-Reset Actuators

PC Terminal Diagrams: in. [mm]

PUSH-PULLTYPE SHOWN WITHOUT AUX. SWITCH

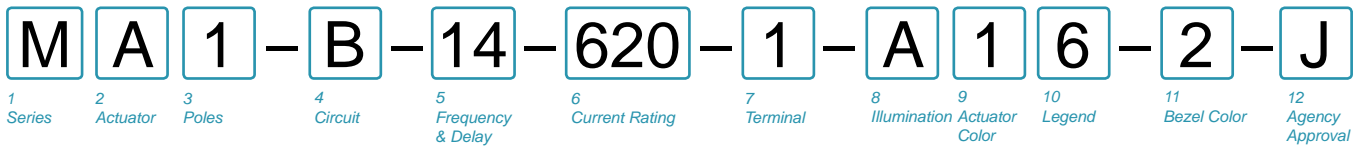


PUSH PULL TYPE SHOWN WITH AUX. SWITCH



Notes:

- All dimensions are in inches [millimeters].
- Tolerance ± 0.020 [.51] unless otherwise specified.



1 SERIES
M

2 ACTUATOR ¹
Non-Illuminated single color
A Angled
B Flat

Two Color Visi-Rocker
D Indicate ON
E Indicate OFF

illuminated single color
F Angled
G Flat

| STYLE | INDICATE "ON" (CODES A, D) | INDICATE "OFF" (CODES B, E) | FLAT (CODES B, G) | ANGLED (CODES A, F) |
|------------|----------------------------|-----------------------------|-------------------|---------------------|
| VERTICAL | | | | |
| HORIZONTAL | | | | |

3 POLES
1 One

4 CIRCUIT ²
without Auxiliary Switch
B Series Trip (Current)

with Auxiliary Switch, Silver Contacts
M Series Trip (Current) Aux Switch
S ³ Series Trip (Current)
T ^{3,4} Series Trip (Current)
U ^{3,16} Series Trip, Maintained Contacts

with Auxiliary Switch, Gold Contacts
4 ^{3,4} Series Trip (Current)
5 ^{3,16} Series Trip, Maintained Contacts
9 Series Trip (Current) Aux Switch

Terminal Type:
 .110 QC x .020 QC
 .060 Dia, Round Solder Turret
 .058 Dia, Round Q.C.
 .080 Dia x .020 Flat Q.C.

| 5 FREQUENCY & DELAY | 14 | DC Medium |
|---------------------|----|-----------------------|
| 10 DC Instantaneous | 72 | DC, Short, Hi-Inrush |
| 12 DC Short | 74 | DC, Medium, Hi-Inrush |

6 CURRENT RATING (AMPERES)

| CODE | AMPERES | | | | |
|------|---------|-----|-------|-----|--------|
| 020 | 0.020 | 225 | 0.250 | 420 | 2.000 |
| 025 | 0.025 | 230 | 0.300 | 522 | 2.250 |
| 030 | 0.030 | 235 | 0.350 | 425 | 2.500 |
| 035 | 0.035 | 240 | 0.400 | 527 | 2.750 |
| 040 | 0.040 | 245 | 0.450 | 430 | 3.000 |
| 045 | 0.045 | 250 | 0.500 | 435 | 3.500 |
| 050 | 0.050 | 255 | 0.550 | 440 | 4.000 |
| 055 | 0.055 | 260 | 0.600 | 445 | 4.500 |
| 060 | 0.060 | 265 | 0.650 | 450 | 5.000 |
| 065 | 0.065 | 270 | 0.700 | 455 | 5.500 |
| 070 | 0.070 | 275 | 0.750 | 460 | 6.000 |
| 075 | 0.075 | 280 | 0.800 | 465 | 6.500 |
| 080 | 0.080 | 285 | 0.850 | 470 | 7.000 |
| 085 | 0.085 | 290 | 0.900 | 475 | 7.500 |
| 090 | 0.090 | 295 | 0.950 | 480 | 8.000 |
| 090 | 0.095 | 410 | 1.000 | 485 | 8.500 |
| 210 | 0.100 | 512 | 1.250 | 490 | 9.000 |
| 215 | 0.150 | 415 | 1.500 | 495 | 9.500 |
| 220 | 0.200 | 517 | 1.750 | 610 | 10.000 |

- Notes:
- One actuator is located in the center of each multi-pole breaker.
 - One Auxiliary Switch is supplied per breaker. Auxiliary Switch option limited to Series Trip & Switch Only circuits, and is not available in single pole illuminated breakers, or with Back Connected Screw or Push-in Stud terminals.
 - Mates with AMP .058" diameter pin receptacles: 60983-1 (gold plated) & 60983-1 (tin plated).
 - For neon bulb applications at 120VAC @ 47K, 1/4 WATT and for 250VAC applications @ 150K, 1/4 WATT, external resistors must be supplied by customer.
 - For LED (DC or rectified AC) applications, LED is mounted in the center of the rocker actuator with electrical characteristics as follows: 100 millicandela at 20mA; Maximum power dissipation = 75mW at 25°C; Maximum forward current = 25mA; Typical forward voltage = 2.1V at 20mA; Typical reverse current = 100µA at 3V. Customer supplies the proper external resistor limiting current to these values.
 - On Visi-Rocker breakers, Visi portion of rocker cannot be the same color as the bezel.
 - Rocker color for LED's and green neon lamp must be clear, smoke gray, white translucent or match color of LED or neon lamp.
 - Other colors available. Consult factory.
 - TUV Certified to 25 amps. UL Recognized, CSA Accepted and UL489A Listed to 30 amps. Screw Terminals recommended above 20 amps.
 - UL489A Listed must have ON-OFF or Dual legends. TUV Certified approvals must have I - O or Dual legends.
 - Terminal code A available with circuit codes A & B only.
 - Printed circuit board available with UL recognized approval only.
 - Auxiliary switch (flat Q.C.) available with UL recognized approvals only.

7 TERMINAL

| | |
|---------------------------------|---------------------------------------|
| 1 Push-On 0.250 Tab (Q.C.) | A ¹¹ Push-In Stud |
| 2 Screw 8-32 with Upturned Lugs | P ¹² Printed Circuit Board |
| 3 Screw 8-32 (Bus Type) | |

8 ROCKER ILLUMINATION
Non-illuminated
Neon ⁴
 without resistor, 120VAC/250VAC
LED ^{7, 8}
 without resistor
 with resistor, 4-8 VDC
 with resistor, 9-16 VDC

| | |
|---------|-------------------------|
| A Neon | Green Glow ⁸ |
| B Red | Green |
| D Amber | Amber |
| E Green | Green |
| F White | White |
| H Black | Black |
| J Black | Black |

9 ACTUATOR & LEGEND COLOR

| Solid Color | Actuator | Legend |
|-------------|----------|--------|
| 1 | White | Black |
| 2 | Black | White |
| 3 | Red | White |
| 4 | Green | White |
| 5 | Blue | White |
| 6 | Yellow | Black |
| 7 | Gray | Black |
| 8 | Orange | Black |

Visi-Rocker ⁶ Visi & Legend (remainder of rocker same color as bezel)

| | |
|---|--------|
| 1 | White |
| 2 | Black |
| 3 | Red |
| 4 | Green |
| 5 | Blue |
| 6 | Yellow |
| 7 | Gray |
| 8 | Orange |

Illuminated ⁷

| | |
|--------------------------|--------|
| A Actuator | Legend |
| B Clear | White |
| C Red Transparent | White |
| D Green Transparent | White |
| E Amber Transparent | White |
| F Smoke Gray Transparent | White |
| F White Translucent | Black |

10 LEGEND ¹⁰

| | |
|---|---|
| 1 | No Legend (Single Color or Illuminated Rocker Options Only) |
| 2 | ON - OFF Vertical |
| 3 | ON - OFF Horizontal |
| 4 | I - O Vertical |
| 5 | I - O Horizontal |
| 6 | Dual Vertical |
| 7 | Dual Horizontal |

11 BEZEL COLOR / STYLE ⁸

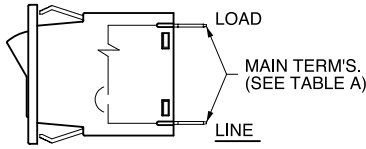
| Color | without Rockerguard | with Rockerguard |
|-------|---------------------|------------------|
| White | A | 1 |
| Black | B | 2 |
| Gray | G | 7 |

12 AGENCY APPROVAL ⁹

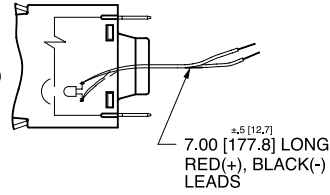
| | |
|---|---|
| J | UL489A Listed & TUV Certified |
| M | UL Recognized & CSA Accepted |
| N | TUV Certified, UL Recognized & CSA Accepted |
| T | UL489A Listed |

Circuit & Terminal Diagrams: in. [mm]

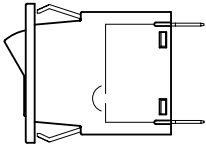
SERIES TRIP



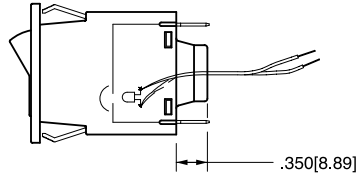
SERIES TRIP W/ ILLUMINATED ROCKER



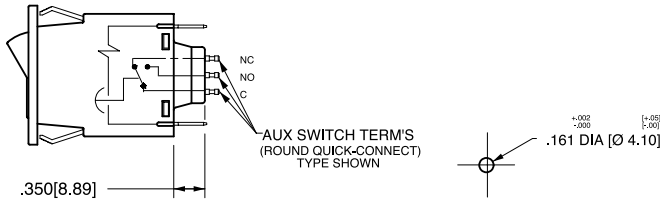
SWITCH ONLY



SWITCH ONLY W/ ILLUMINATED ROCKER



SERIES TRIP W/ AUXILIARY SWITCH



PUSH-IN STUD
MATING HOLE

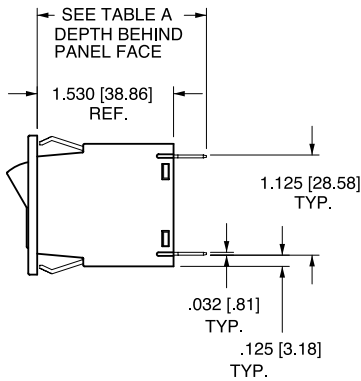


TABLE - A

| TERMINAL DESCRIPTION | | DEPTH BEHIND PANEL FACE |
|----------------------|---------------------------|-------------------------|
| MAIN | TAB (Q.C.) | 1.900 [48.26] |
| | SCREW (#8-32)** | 1.940 [49.28] |
| | PUSH-IN STUD | 2.530 [64.26] |
| *AUX. SWITCH | DOUBLE SOLDER TURRET TYPE | 2.045 [51.94] |
| | ROUND Q.C. TYPE | 2.035 [51.69] |
| | FLAT QUICK CONNECT | 2.139 [54.33] |
| | FLAT SOLDER LUG | 2.022 [51.36] |

* AUX. SWITCH IS NOT AVAILABLE ON SINGLE POLE ILLUMINATED UNITS. WHEN CALLED FOR ON MULTI-POLE UNITS, ONLY ONE AUX. SWITCH IS NORMALLY SUPPLIED, MOUNTED AS SHOWN ON CLA-8003.

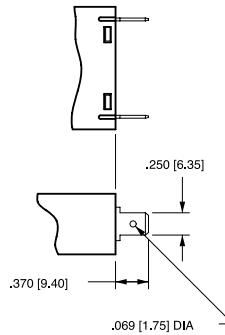
** RECOMMENDED TIGHTENING TORQUE 12-15 IN LBS [1.4-2.7 NM]

Notes:

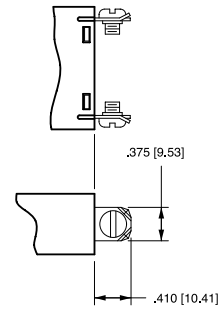
- All dimensions are in inches [millimeters].
- Tolerance $\pm .020$ [.51] unless otherwise specified.
- Schematic shown represents current trip circuit.

TERMINAL DIMENSIONAL DETAIL

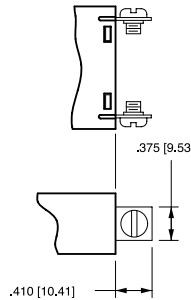
TAB (Q.C.) TERMINAL



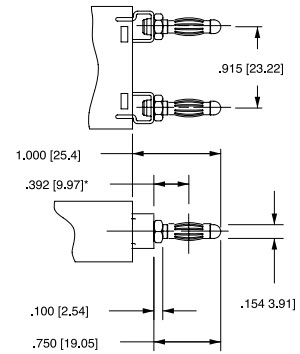
SCREW TERMINAL #8-32 WITH UPTURNED LUGS



SCREW TERMINAL #8-32 BUS

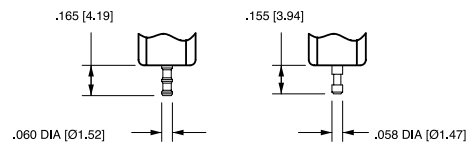


PUSH-IN STUD TERMINAL

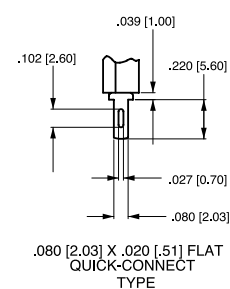


*CENTERLINE OF
PUSH-IN STUD
CONTACT AREA

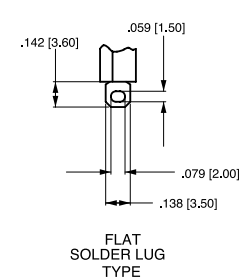
AUXILIARY SWITCH TERMINALS



DOUBLE SOLDER TURRET TYPE

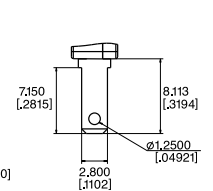


ROUND QUICK-CONNECT TYPE



*AVAILABLE THROUGH SPECIAL
CATALOG PART NUMBER

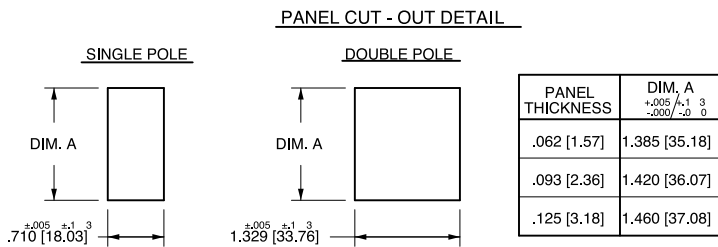
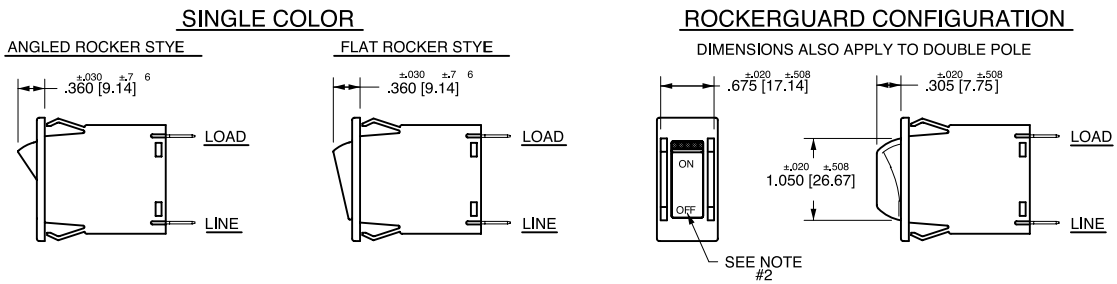
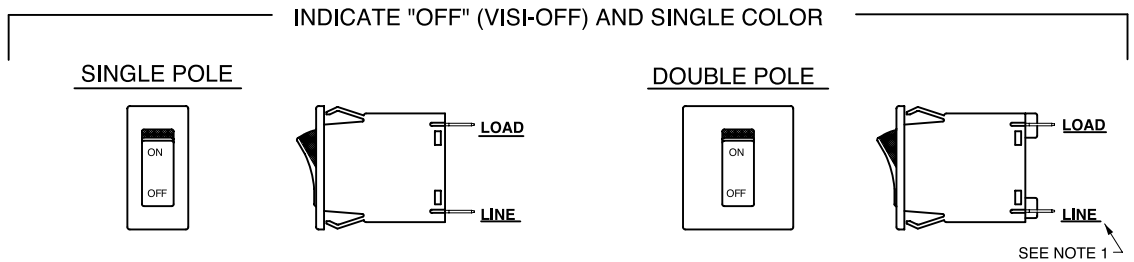
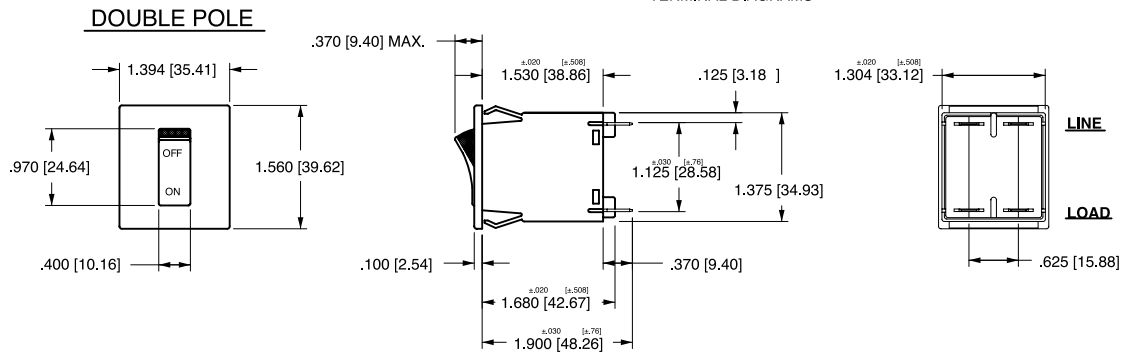
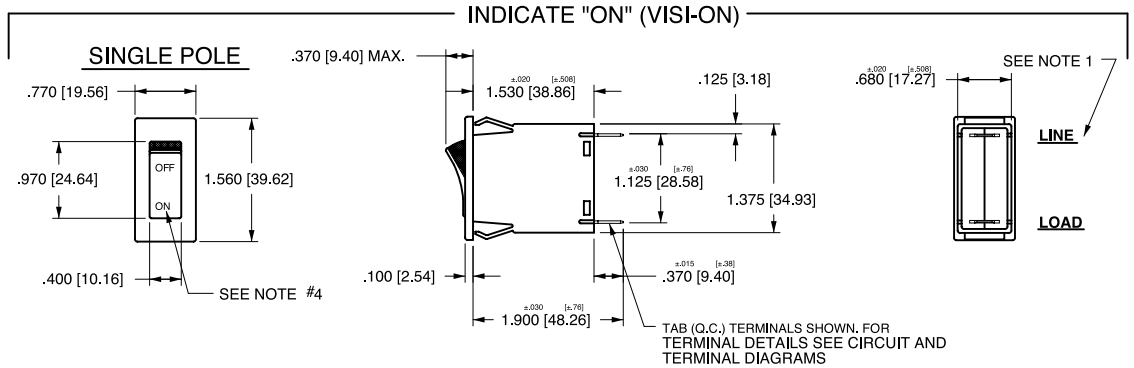
.110 QC



FLAT SOLDER LUG TYPE

.080 [2.03] X .020 [.51] FLAT
QUICK-CONNECT
TYPE

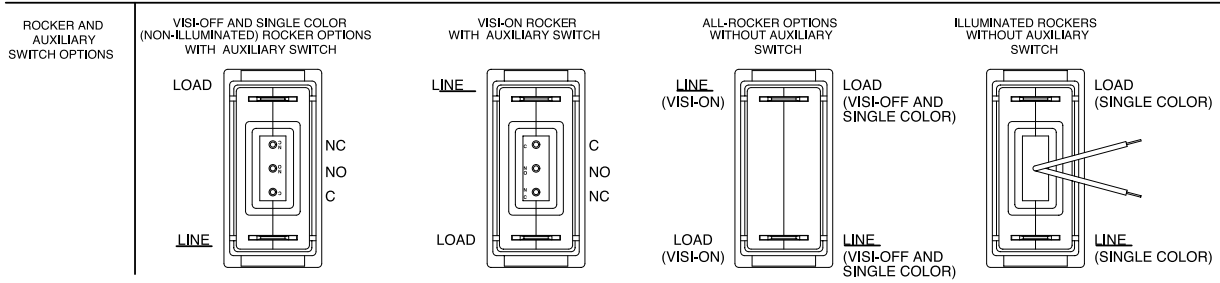
Dimensional Specifications: in. [mm]



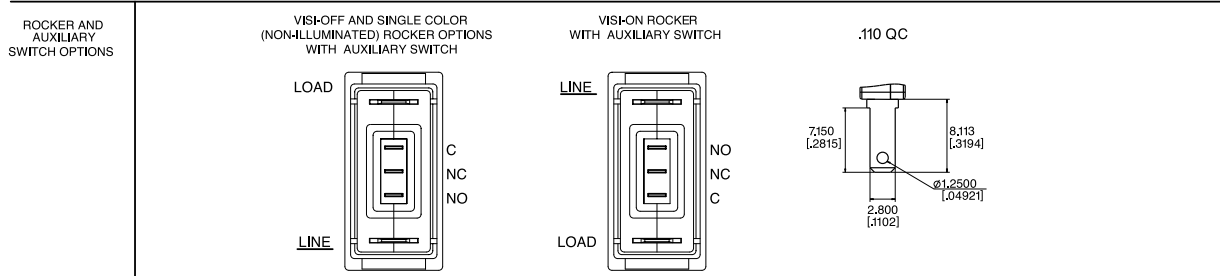
- Notes:
- 1 Dimensions apply to all variations shown. Notice that circuit breaker line & load terminal orientation on indicate OFF is opposite of indicate ON.
 - 2 I-O, ON-OFF or dual legends available for vertical or horizontal mounting. For pole orientation with horizontal mounting, rotate front view clockwise 90°.
 - 3 All dimensions are in inches [millimeters].
 - 4 Tolerance ± 0.20 [51] unless otherwise specified.

ONE POLE

SINGLE POLE / ROCKER BREAKERS SHOWN WITH DOUBLE SOLDER TURRET AND ROUND QC AUX. SWITCH TERMINALS

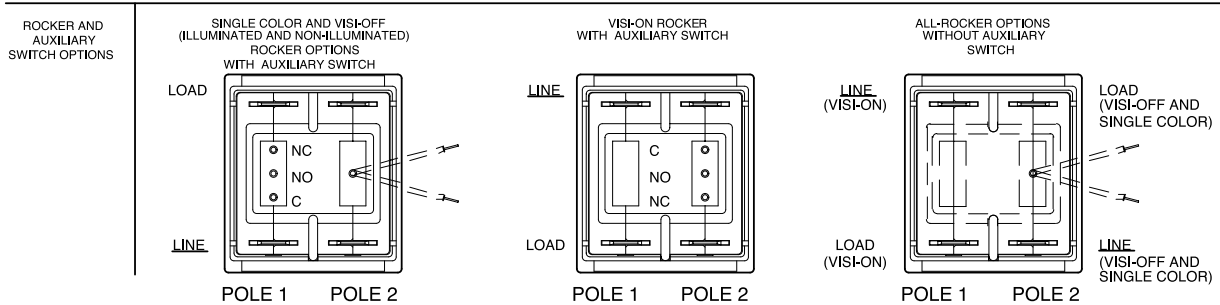


SINGLE POLE / ROCKER BREAKERS SHOWN WITH FLAT QC AND FLAT SOLDER LUG AUX. SWITCH TERMINALS

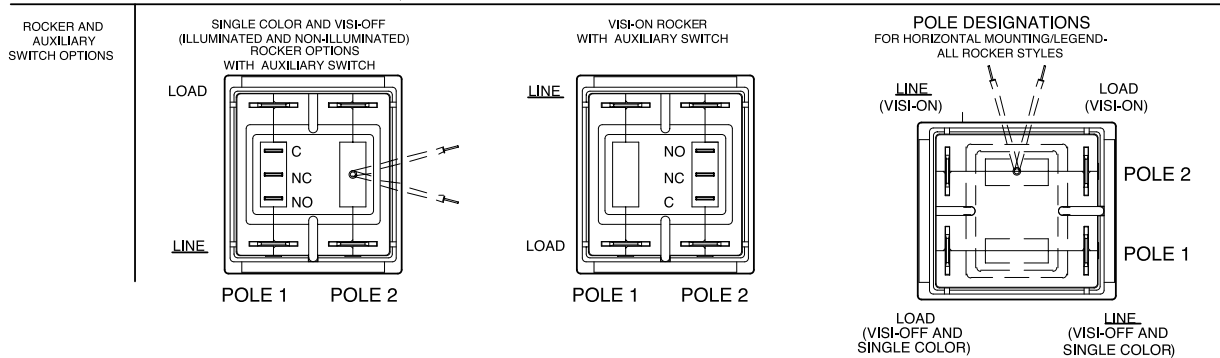


TWO POLE

DOUBLE POLE / ROCKER BREAKERS SHOWN WITH DOUBLE SOLDER TURRET AND ROUND QC AUX. SWITCH TERMINALS



DOUBLE POLE / ROCKER BREAKERS SHOWN WITH FLAT QC AND FLAT SOLDER LUG AUX. SWITCH TERMINALS



A-Series

CIRCUIT BREAKER

Well known for their proven reliability, Carling Technologies' A-Series hydraulic magnetic circuit breakers are compact, temperature stable and designed for precision operation in OEM markets requiring general purpose as well as full load amp applications. When front panel operation and aesthetics demand a clean, contemporary design, the visi-rocker or paddle actuators are ideally suitable. A sealed toggle actuator style is also available and ideal for harsh environment applications requiring additional sealing protection. Optional rocker-guard and push-to-reset bezels, which help prevent inadvertent actuation, are also available.

1-6 poles; ratings from 0.02 to 50 amps, up to 277VAC or 80VDC; UL Recognized, UL Listed, UL1500, UL1077, TUV, VDE & CSA



Product Highlights:

- ◆ Up to 50 amps in a compact size
- ◆ Various actuator styles
- ◆ Sealed metal toggle option tested to MIL-PRF-55629C. Meets IP68 Requirements

Only Telecom-Datcom applicable ordering schemes and drawings are shown in this catalog. For complete product details, please visit www.carlingtech.com

Electrical

Maximum Voltage 277VAC 50/60 Hz, 80VDC
 Current Ratings Standard current coils: 0.100, 0.250, 0.500, 0.750, 1.00, 2.50, 5.00, 7.50, 10.0, 15.0, 20.0, 25.0, 30.0, 35.0, 40.0, 50.0. Other ratings available - consult ordering scheme.
 Standard Voltage Coils DC-6V, 12V; AC-120V, Other ratings available, consult ordering scheme.
 Auxiliary Switch Rating SPDT; 10.1 A - 250VAC, 1.0 A-65VDC/0.5 A - 80 VDC, 0.1A - 125VAC (with gold contacts).
 Insulation Resistance Minimum: 100 Megohms at 500 VDC
 Dielectric Strength UL, CSA - 1500V 60 Hz for one minute between all electrically isolated terminals. A-Series rocker circuit breakers comply with the 8mm spacing & 3750V dielectric requirements from hazardous voltage to operator accessible surfaces per EN 60950 and VDE 0805.
 Resistance, Impedance Values from Line to Load Terminal - based on Series Trip Circuit Breaker.

Mechanical

Endurance 10,000 ON-OFF operations @ 6 per minute; with rated Current & Voltage.
 Trip Free All A-Series Circuit Breakers will trip on overload, even when the actuator is forcibly held in the ON position.
 Trip Indication The operating actuator moves positively to the OFF position when an overload causes the circuit breaker to trip. When mid-trip handle is specified, the handle moves to the mid position on electrical trip of the circuit breaker. When mid-trip handle with alarm switch is specified, the handle moves to the mid position & the alarm switch actuates when the circuit breaker is electrically tripped.

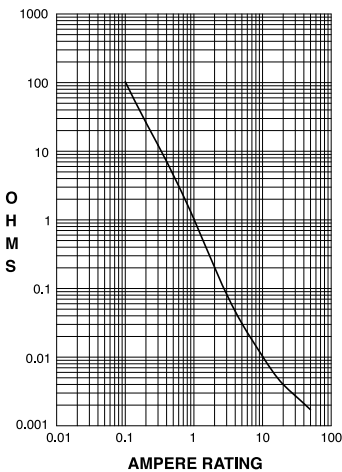
Physical

Number of Poles 1 - 6 Poles (handle) and 1-3 poles (rocker) at 30 Amps or less. 1 and 2 poles at 31 Amps thru 50 Amps.
 Internal Circuit Config. Series, (with or without auxiliary switch), Shunt and Relay with current or voltage trip coils, Dual Coil, Switch Only with or without auxiliary switch.
 Weight Approximately 65 grams/pole. (Approximately 2.32 ounces/pole)
 Standard Colors Housing - Black; Actuator- See Ordering Scheme.

Environmental

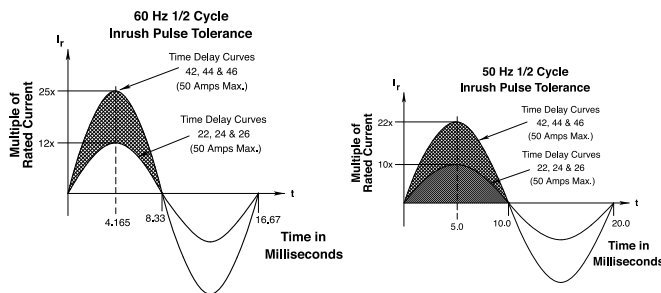
Designed and tested in accordance with requirements of specification MIL-PRF-55629 & MIL-STD-202 as follows:
 Shock Withstands 100 Gs, 6ms, sawtooth while carrying rated current per Method 213, Test Condition "I". Instantaneous and ultra-short curves tested @ 90% of rated current.
 Vibration Withstands 0.060" excursion from 10-55 Hz, and 10 Gs 55-500 Hz, at rated current per Method 204C, Test Condition A. Instantaneous and ultrashort curves tested at 90% of rated current.
 Moisture Resistance Method 106D; ten 24-hour cycles @ + 25°C to +65°C, 80-98% RH.56 days @ +85°C, 85% RH.
 Salt Spray Method 101, Condition A (90-95% RH @ 5% NaCl Solution, 96 hrs).
 Thermal Shock Method 107D, Condition A (Five cycles @ -55°C to +25°C to +85°C to +25°C).
 Operating Temperature -40° C to +85° C

RESISTANCE PER POLE VALUES from Line to Load Terminals (Values Based on Series Trip Circuit Breaker)



| CURRENT (AMPS) | TOLERANCE (%) |
|----------------|---------------|
| 0.10 - 5.0 | 15 |
| 5.1 - 20.0 | 25 |
| 20.1 - 50.0 | 35 |

Pulse Tolerance Curves



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

Electrical Tables

Table A: Lists UL Recognized & CSA Accepted configurations and performance capabilities as a Component Supplementary Protector.

| A-SERIES TABLE A: COMPONENT SUPPLEMENTARY PROTECTORS | | | | | | | | | | | |
|--|------------|-----------|----------------|----------------|----------------------|-------------------------------|---------------------|-------------------|-----------------|--------------------|-----------------|
| Circuit Configuration | Voltage | | | Current Rating | | Short Circuit Capacity (Amps) | | Application Codes | | Construction Notes | |
| | Max Rating | Frequency | Phase | Full Load Amps | General Purpose Amps | UL / CSA | | UL | CSA | | |
| | | | | | | With Backup Fuse | Without Backup Fuse | | | | |
| Series | 32 | DC | --- | 0.02 - 15 | --- | --- | 5000 | TC1, OL1, U2 | TC1, OL1, U2 | | |
| | 65 | DC | --- | 31 - 50 | --- | --- | 7500 | TC1, 2, OL1, U1 | TC1, 2, OL1, U1 | | |
| | 80 | DC | --- | 0.02 - 30 | --- | --- | 7500 | TC1, 2, OL1, U1 | TC1, 2, OL1, U1 | | |
| | | | | --- | 31 - 50 | --- | 7500 | TC1, 2, OL0, U1 | TC1, 2, OL0, U1 | | |
| | 125 | 50 / 60 | 1 | 0.02 - 30 | --- | --- | 3000 | TC1, OL1, U2 | TC1, OL1, U2 | Rocker Version | |
| | 125 | 50 / 60 | 1 | 1 - 50 | --- | --- | 2000 | TC1, OL1, U2 | TC1, OL1, U2 | | |
| | 125 | 50 / 60 | 1 ⁴ | 1 - 50 | --- | --- | 1000 | TC1, OL1, U2 | TC3, OL1, U3 | | |
| | 125 / 250 | 50 / 60 | 1 ³ | 0.02 - 30 | --- | --- | 3000 | TC1, 2, OL1, U2 | TC1, 2, OL1, U2 | Rocker Version | |
| | 125 / 250 | 50 / 60 | 1 ³ | 0.02 - 50 | --- | --- | 3000 | TC1, 2, OL1, U2 | TC1, 2, OL1, U2 | Handle | |
| | 250 | 50 / 60 | 1 | 0.02 - 30 | --- | --- | 1500 | TC1, 2, OL0, U2 | TC1, 2, OL0, U2 | Single Pole Break | |
| | | | | 0.02 - 30 | --- | --- | 3000 | TC1, OL1, U2 | TC1, OL1, U2 | Two Pole Break | |
| | | | | --- | --- | --- | 3000 | TC1, 2, OL0, U1 | TC1, 2, OL0, U1 | | |
| | | | | 1 ⁴ | 1 - 50 | --- | --- | 1000 | TC1, OL1, U2 | TC3, OL1, U3 | |
| | | | | 3 | 0.02 - 30 | --- | 5000 ² | --- | --- | TC1, 2, OL1, C1 | TC1, 2, OL1, C1 |
| 3 | | | | 31 - 50 | --- | 2000 ¹ | --- | --- | TC1, 2, OL1, C1 | TC1, 2, OL1, C1 | |
| 277 | 50 / 60 | 1 | 0.02 - 30 | --- | --- | 5000 ¹ | --- | TC1, 2, OL1, C1 | TC1, 2, OL1, C1 | | |
| Dual Coil | 32 | DC | --- | 0.02 - 50 | --- | --- | 5000 | TC1, OL1, U2 | TC1, OL1, U2 | | |
| | 65 | DC | --- | 0.02 - 50 | --- | --- | 7500 | TC1, 2, OL1, U1 | TC1, 2, OL1, U1 | | |
| | 80 | DC | --- | 0.02 - 30 | --- | --- | 7500 | TC1, 2, OL1, U1 | TC1, 2, OL1, U1 | | |
| | | | | --- | 31 - 50 | --- | 7500 | TC1, 2, OL0, U1 | TC1, 2, OL0, U1 | | |
| | 125 | 50 / 60 | 1 | 0.02 - 30 | --- | --- | 3000 | TC1, OL1, U2 | TC1, OL1, U2 | Rocker Version | |
| | | | | 1 - 50 | --- | --- | 2000 | TC1, OL1, U2 | TC1, OL1, U2 | | |
| | 125 | 50 / 60 | 1 ⁴ | 0.02 - 30 | --- | --- | 1000 | TC1, OL1, U2 | TC3, OL1, U3 | | |
| | 125 / 250 | 50 / 60 | 1 ³ | 0.02 - 30 | --- | --- | 3000 | TC1, 2, OL1, U1 | TC1, 2, OL1, U1 | Rocker Version | |
| | 125 / 250 | 50 / 60 | 1 ³ | 0.02 - 50 | --- | --- | 3000 | TC1, 2, OL1, U2 | TC1, 2, OL1, U2 | | |
| | 250 | 50 / 60 | 1 | 0.02 - 30 | --- | --- | 1500 | TC1, OL0, U2 | TC1, OL0, U2 | Single Pole Break | |
| | | | | 0.02 - 30 | --- | --- | 3000 | TC1, OL1, U2 | TC1, OL1, U2 | Two Pole Break | |
| | | | | --- | 31 - 50 | --- | --- | 3000 | TC1, 2, OL0, U1 | TC1, 2, OL0, U1 | |
| | | | | 1 ⁴ | 1 - 50 | --- | --- | 1000 | TC1, OL1, U2 | TC3, OL1, U3 | |
| | | | | 3 | 0.02 - 30 | --- | 5000 ² | --- | --- | TC1, 2, OL1, C1 | TC1, 2, OL1, C1 |
| 3 | | | | 31 - 50 | --- | 2000 ¹ | --- | --- | TC1, 2, OL1, C1 | TC1, 2, OL1, C1 | |
| 277 | 50 / 60 | 1 | 0.02 - 30 | --- | --- | 5000 ¹ | --- | TC1, 2, OL1, U1 | TC1, 2, OL1, U1 | | |
| Shunt | 80 | DC | --- | 0.02 - 30 | --- | --- | 7500 | TC1, 2, OL1, U1 | TC1, 2, OL1, U1 | | |
| | 125 / 250 | 50 / 60 | 1 | 0.02 - 30 | --- | --- | 3000 | TC1, 2, OL1, U1 | TC1, 2, OL1, U1 | | |
| | 250 | 50 / 60 | 1 | 0.02 - 30 | --- | --- | 3000 | TC1, 2, OL1, U1 | TC1, 2, OL1, U1 | | |
| | | | 3 | 0.02 - 30 | --- | 5000 ² | --- | --- | TC1, 2, OL1, C1 | TC1, 2, OL1, C1 | |
| | 277 | 50 / 60 | 1 | 0.02 - 30 | --- | --- | 5000 ¹ | --- | TC1, 2, OL1, C1 | TC1, 2, OL1, C1 | |
| Relay | 80 | DC | --- | 0.02 - 30 | --- | --- | 7500 | TC1, 2, OL1, U1 | TC1, 2, OL1, U1 | | |
| | 125 / 250 | 50 / 60 | 1 ³ | 0.02 - 30 | --- | --- | 3000 | TC1, 2, OL1, U1 | TC1, 2, OL1, U1 | | |
| | 250 | 50 / 60 | 1 | 0.02 - 30 | --- | --- | 3000 | TC1, 2, OL1, U1 | TC1, 2, OL1, U1 | | |
| | | | 3 | 0.02 - 30 | --- | 5000 ² | --- | --- | TC1, 2, OL1, C1 | TC1, 2, OL1, C1 | |
| | 277 | 50 / 60 | 1 | 0.02 - 30 | --- | --- | 5000 ¹ | --- | TC1, 2, OL1, C1 | TC1, 2, OL1, C1 | |
| Switch Only | 65 | DC | --- | 0.02 - 50 | --- | not applicable | | | | | |
| | 80 | DC | --- | 0.02 - 30 | --- | | | | | | |
| | 250 | 50 / 60 | 1 | --- | 31 - 50 | | | | | | |
| | | | 3 | 0.02 - 50 | --- | | | | | | |
| | 277 | 50 / 60 | 1 | 0.02 - 30 | 31 - 50 | | | | | | |

Notes:
 1 Requires branch circuit backup with a UL LISTED Type K5 or RK5 fuse (15A minimum) at no more than 4 times the rating of the protector.
 2 Same as note 1, except that backup fuse is limited to 80 A maximum.
 3 2 pole protector required (with one pole per power line) for: 125/250 VAC, 1 pole protector required for: 125 VAC, 1Ø Power System.
 4 Satisfies the requirements of clause 11.2.8.2.5 of CSA STD C22.2 No 100 for the use of supplementary protectors with portable generators.

Electrical Tables

Table B: Lists UL Recognized, CSA Accepted, VDE & TUV Certified configurations & performance capabilities as a Component Supplementary Protector.

| A-SERIES TABLE B: COMPONENT SUPPLEMENTARY PROTECTORS | | | | | | | | | | | | | | | | |
|--|-------------|-----------|---------|----------------|-----------------------------------|-------------------------------|---------------------|------------------------|----------------------|------------------------|----------------------|-------------------|---------------|-------------------------------|----------------------------|----------------------------|
| CIRCUIT CONFIGURATION | VOLTAGE | | | CURRENT RATING | | SHORT CIRCUIT CAPACITY (AMPS) | | | | | | APPLICATION CODES | | VDE CONSTRUCTION NOTES | | |
| | MAX. RATING | FREQUENCY | PHASE | FULL LOAD AMPS | GENERAL PURPOSE AMPS ¹ | UL/CSA | | VDE | | TUV | | UL | CSA | | | |
| | | | | | | WITH BACKUP FUSE | WITHOUT BACKUP FUSE | (Inc) WITH BACKUP FUSE | (Inc) WITHOUT BACKUP | (Inc) WITH BACKUP FUSE | (Inc) WITHOUT BACKUP | | | | | |
| SERIES | 65 | DC | — | 0.10 - 50 | — | — | 7500 | — | — | 5000 | 3000 | TC1,2, OL1,U1 | TC1,2, OL1,U1 | World Market Breaker TUV Only | | |
| | 80 | DC | — | 0.10 - 30 | — | — | 7500 | 3000 | 1500 | 3000 | 1500 | TC1,2, OL1,U1 | TC1,2, OL1,U1 | Handle Version 1 Pole Only | | |
| | | | | 31 - 50 | 31 - 50 | — | 7500 | 3000 | 1500 | 3000 | 1500 | TC1,2, OL0,U1 | TC1,2, OL0,U1 | Handle Version 1 Pole Only | | |
| | | | | 0.10 - 30 | — | — | 7500 | 3000 | 1500 | 3000 | 1500 | TC1,2, OL1,U1 | TC1,2, OL1,U1 | Rocker Version 1 - 3 Poles | | |
| | | | | 31 - 32 | — | — | 7500 | 3000 | 1500 | 3000 | 1500 | TC1,2, OL1,U1 | TC1,2, OL1,U1 | Rocker Version 2 Pole Only | | |
| | | | | 31 - 50 | 31 - 50 | — | 7500 | 3000 | 1500 | 3000 | 1500 | TC1,2, OL0,U1 | TC1,2, OL0,U1 | Rocker Version 1 Pole Only | | |
| | 250 | 50 / 60 | 1 | 0.10 - 30 | — | — | 3000 | 3000 | 1500 | 5000 | 1500 | TC1,2, OL1,U1 | TC1,2, OL1,U1 | Rocker Version 1 - 3 Poles | | |
| | | | | 31 - 50 | 31 - 50 | — | 3000 | — | — | 5000 | 1500 | TC1,2, OL0,U1 | TC1,2, OL0,U1 | Rocker Version 1 - 3 Poles | | |
| | | | | 31 - 32 | — | — | 3000 | 6000 | 1500 | 5000 | 1500 | TC1,2, OL1,U1 | TC1,2, OL1,U1 | Rocker Version 2 Pole Only | | |
| | | | | 1 | 0.10 - 30 | — | — | 3000 | 6000 | 1500 | 5000 | 1500 | TC1, OL1,U2 | TC1, OL1,U2 | Rocker Version 2 Pole Only | |
| | | | | 1 ⁴ | 1 - 50 | — | — | 1000 | — | — | 5000 | 1500 | TC1, OL1,U2 | TC3, OL1,U3 | Rocker Version 1 - 3 Poles | |
| | | | | 3 | 0.10 - 30 | — | — | 5000 ³ | — | 3000 | 1500 | 3000 | 1500 | TC1,2, OL1,C1 | TC1,2, OL1,C1 | Rocker Version 1 - 3 Poles |
| | | | | 31 - 50 | — | — | 2000 ² | — | 3000 | 1500 | 3000 | 1500 | TC1,2, OL1,C1 | TC1,2, OL1,C1 | Rocker Version 1 - 3 Poles | |
| | DUAL COIL | 80 | DC | — | 0.10 - 30 | — | — | 7500 | 3000 | 1500 | 3000 | 1500 | TC1,2, OL1,U1 | TC1,2, OL1,U1 | Rocker Version 1 - 3 Poles | |
| | | 250 | 50 / 60 | 1 | 0.10 - 30 | — | — | 3000 | 3000 | 1500 | 5000 | 1500 | TC1,2, OL1,U1 | TC1,2, OL1,U1 | Rocker Version 1 - 3 Poles | |
| 30 - 50 | | | | | 31 - 50 | — | 3000 | — | — | 5000 | 1500 | TC1,2, OL0,U1 | TC1,2, OL0,U1 | Rocker Version 1 - 3 Poles | | |
| 0.10 - 30 | | | | | — | — | 5000 ³ | — | 3000 | 1500 | 3000 | 1500 | TC1,2, OL1,C1 | TC1,2, OL1,C1 | Rocker Version 1 - 3 Poles | |
| 31 - 50 | | | | | — | — | 2000 ² | — | — | 3000 | 1500 | TC1,2, OL1,C1 | TC1,2, OL1,C1 | Rocker Version 1 - 3 Poles | | |
| SHUNT | 80 | DC | — | 0.10 - 30 | — | — | 7500 | 3000 | 1500 | 3000 | 1500 | TC1,2, OL1,U1 | TC1,2, OL1,U1 | Handle Version 1 Pole Only | | |
| | | | | 0.10 - 30 | — | — | 7500 | 3000 | 1500 | 3000 | 1500 | TC1,2, OL1,U1 | TC1,2, OL1,U1 | Rocker Version 1 - 3 Poles | | |
| | 250 | 50 / 60 | 1 | 0.10 - 30 | — | — | 3000 | 3000 | 1500 | 5000 | 1500 | TC1,2, OL1,U1 | TC1,2, OL1,U1 | Rocker Version 1 - 3 Poles | | |
| | | | | 30 - 50 | 31 - 50 | — | 3000 | — | — | 5000 | 1500 | TC1,2, OL0,U1 | TC1,2, OL0,U1 | Rocker Version 1 - 3 Poles | | |
| | | | | 0.10 - 30 | — | — | 5000 ³ | — | 3000 | 1500 | 3000 | 1500 | TC1,2, OL1,C1 | TC1,2, OL1,C1 | Rocker Version 1 - 3 Poles | |
| | | | | 31 - 50 | — | — | 2000 ² | — | — | 3000 | 1500 | TC1,2, OL1,C1 | TC1,2, OL1,C1 | Rocker Version 1 - 3 Poles | | |
| | | | | 3 | 0.10 - 30 | — | — | 5000 ³ | — | 3000 | 1500 | 3000 | 1500 | TC1,2, OL1,C1 | TC1,2, OL1,C1 | Rocker Version 1 - 3 Poles |

Notes:

- 1 General Purpose Ratings for UL/CSA Only.
- 2 Requires branch circuit backup with a UL LISTED Type K5 or RK5 fuse (15A minimum) at no more than 4 times the rating of the protector.
- 3 Same as note 2, except that backup fuse is limited to 80 A maximum.
- 4 Satisfies the requirements of clause 11.2.8.2.5 of CSA STD C22.2 No 100 for the use of supplementary protectors with portable generators.

Electrical Tables

Table C: Lists UL Recognized, CSA Accepted configurations and performance capabilities as Protectors, Supplementary for Marine Electrical and Fuel Systems (Guide PEQZ2, File E75596). Ignition Protected per UL 1500. UL Classified Small Craft Electrical Devices, Marine in accordance with ISO 8846 (Guide UZMK, File MQ1515) as Marine Supplementary Protectors.

| A-SERIES TABLE C: UL1500 (Marine Ignition Protected) | | | | | | | |
|--|-----------------|-----------|----------------|----------------|-------------------------------|-------------------|------------|
| CIRCUIT CONFIGURATION | VOLTAGE | | | CURRENT RATING | SHORT CIRCUIT CAPACITY (AMPS) | APPLICATION CODES | |
| | MAX. RATING | FREQUENCY | PHASE | FULL LOAD AMPS | WITHOUT BACKUP FUSE | UL | CSA |
| SERIES | 14 ¹ | DC | --- | 0.02 - 50 | 5000 | TC1,OL1,U1 | TC1,OL1,U1 |
| | 32 ¹ | DC | --- | 0.02 - 50 | 5000 | TC1,OL1,U2 | TC1,OL1,U2 |
| | 65 | DC | --- | 0.02 - 50 | 3000 | TC1,OL1,U1 | TC1,OL1,U1 |
| | 125 | 50 / 60 | 1 | 0.02 - 50 | 3000 | TC1,OL1,U2 | TC1,OL1,U2 |
| | 125 / 250 | 50 / 60 | 1 ² | 0.02 - 50 | 3000 | TC1,OL1,U2 | TC1,OL1,U2 |
| | 250 | 50 / 60 | 1 | 0.02 - 30 | 1500 | TC1,OL1,U1 | TC1,OL1,U1 |

Notes:

- 1 Available with special catalog number only (consult factory).
- 2 2 pole protector required (with one per power line) for 125 / 250 VAC. 1 pole protector required for 125 VAC 1 phase power system

Table D: Lists UL Listed configurations and performance capabilities as Circuit Breakers for use in Communications Equipment (Guide DITT, File E189195), under UL489A.

| A-SERIES TABLE D: UL489A (COMMUNICATIONS EQUIPMENT) | | | | |
|---|-------------|-----------|----------------------|------------------------------|
| CIRCUIT CONFIGURATION | VOLTAGE | | CURRENT RATING | INTERRUPTING CAPACITY (AMPS) |
| | MAX. RATING | FREQUENCY | GENERAL PURPOSE AMPS | WITHOUT BACKUP FUSE |
| SERIES | 80 | DC | 0.10 - 50 | 5000 |
| | 80 | DC | 60 - 90 ¹ | 5000 |

Notes:

- 1 Parallel Pole Construction

Agency Certifications

UL Recognized

UL Standard 1077



Component Recognition Program as Protectors Supplementary (Guide CCN/QVNU2, File E75596)

CSA Accepted



Component Supplementary Protector under Class 3215 30, File 047848 0 000 CSA Standard C22.2 No. 235

UL Standard 508



Switches, Industrial Control (Guide CCN/NRNT2, File E148683)

TUV Certified



EN60934, under License No. R72103448

UL Standard 1500



Protectors, Supplementary for Marine Electrical & Fuel Systems (Guide PEQZ2, File E75596) Ignition Protection

VDE Certified



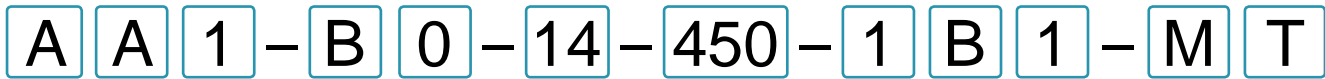
EN60934, VDE 0642 under File No. 10537

UL Listed

UL Standard 489A



Communications Equipment (Guide CCN/DITT, File E189195)



1 Series 2 Actuator 3 Poles 4 Circuit 5 Aux/Alarm Switch 6 Frequency & Delay 7 Current Rating 8 Terminal 9 Actuator Color 10 Mounting/Barriers 11 Max. Appl. Rating 12 Agency Approval

1 SERIES
A

2 ACTUATOR ¹
A Handle, one per pole
S Mid-Trip Handle, one per pole
T Mid-Trip Handle, one per pole & Alarm Switch

3 POLES ²
1 One
2 Two
3 Three
4 Four

4 CIRCUIT
B Series Trip (Current)

5 AUXILIARY/ALARM SWITCH ²
0 without Aux Switch **7** S.P.S.T., 0.110 Q.C. Term. (Gold Contacts)
1 S.P.D.T., 0.093 Q.C. Term. **8** S.P.S.T., 0.187 Q.C. Term.
2 S.P.D.T., 0.110 Q.C. Term. **9** S.P.D.T., 0.187 Q.C. Term.

6 FREQUENCY & DELAY
11 DC Ultra Short **52³** DC, Short, Hi-Inrush
12 DC Short **54³** DC, Medium, Hi-Inrush
14 DC Medium **56³** DC, Long, Hi-Inrush
16 DC Long

7 CURRENT RATING (AMPERES)

| CODE | AMPERES | | | | |
|------|---------|-----|-------|------------------|--------|
| 210 | 0.100 | 285 | 0.850 | 455 | 5.500 |
| 215 | 0.150 | 290 | 0.900 | 460 | 6.000 |
| 220 | 0.200 | 295 | 0.950 | 465 | 6.500 |
| 225 | 0.250 | 410 | 1.000 | 470 | 7.000 |
| 230 | 0.300 | 512 | 1.250 | 475 | 7.500 |
| 235 | 0.350 | 415 | 1.500 | 480 | 8.000 |
| 240 | 0.400 | 517 | 1.750 | 485 | 8.500 |
| 245 | 0.450 | 420 | 2.000 | 490 | 9.000 |
| 250 | 0.500 | 522 | 2.250 | 495 | 9.500 |
| 255 | 0.550 | 527 | 2.750 | 610 | 10.000 |
| 260 | 0.600 | 430 | 3.000 | 710 | 10.500 |
| 265 | 0.650 | 435 | 3.500 | 611 | 11.000 |
| 270 | 0.700 | 440 | 4.000 | 711 | 11.500 |
| 275 | 0.750 | 445 | 4.500 | 612 | 12.000 |
| 280 | 0.800 | 450 | 5.000 | 712 | 12.500 |
| | | | | 613 | 13.000 |
| | | | | 614 | 14.000 |
| | | | | 615 | 15.000 |
| | | | | 616 | 16.000 |
| | | | | 617 | 17.000 |
| | | | | 618 | 18.000 |
| | | | | 620 | 20.000 |
| | | | | 622 | 22.000 |
| | | | | 624 | 24.000 |
| | | | | 625 | 25.000 |
| | | | | 630 | 30.000 |
| | | | | 635 ³ | 35.000 |
| | | | | 640 ³ | 40.000 |
| | | | | 645 ³ | 45.000 |
| | | | | 650 ³ | 50.000 |

8 TERMINAL ⁵
1⁶ Push-On 0.250 Tab (Q.C.) **9** Screw 10-32 (Bus Type) & 30° bend
2 Screw 8-32 with upturned lugs **B** Screw M5 with upturned lugs & 30° bend
3⁷ Screw 8-32 (Bus Type) **F** Screw M5 with upturned lugs & 30° bend
4 Screw 10-32 with upturned lugs **G** Screw M5 (Bus Type) & 30° bend
5⁷ Screw 10-32 (Bus Type) **H** Screw M5 (Bus Type)
6 Screw 8-32 with upturned lugs & 30° bend **M⁷** M6 Threaded Stud
7 Screw 8-32 (Bus Type) & 30° bend **P⁸** Printed Circuit Board Terminals
8 Screw 10-32 with upturned lugs & 30° bend **Q⁹** Push-In Stud

9 ACTUATOR COLOR & LEGEND

| Actuator Color | ON-OFF | Dual | Legend Color |
|------------------------------------|----------|----------|--------------|
| White | B | 1 | Black |
| Black | D | 2 | White |
| Red | G | 3 | White |
| Green | J | 4 | White |
| Blue | L | 5 | White |
| Yellow | N | 6 | Black |
| Gray | Q | 7 | Black |
| Orange | S | 8 | Black |
| Black (short handle) ¹⁰ | U | 9 | White |

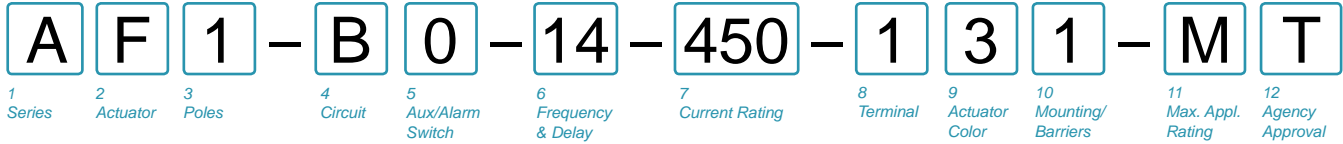
10 MOUNTING / BARRIERS

| MOUNTING STYLE | BARRIERS |
|---|----------|
| Threaded Insert, 2 per pole | |
| 1 6-32 x 0.195 inches | no |
| A 6-32 x 0.195 inches | yes |
| 2 ISO M3 x 5mm | no |
| B ISO M3 x 5mm (multipole only) | yes |
| Front panel Snap-In, 0.75" wide bezel | |
| 5 without Handguard | no |
| 6 without Handguard (multipole only) | yes |
| Front panel Snap-In, 0.96" wide bezel | |
| 7 without Handguard, 1-pole 0.96" wide; multipole units have .105" bezel overhang on all sides | no |
| 8 without Handguard, 1-pole 0.96" wide; (multipole only) .105" bezel overhang on all sides | yes |

11 MAXIMUM APPLICATION RATING
M 80 DC

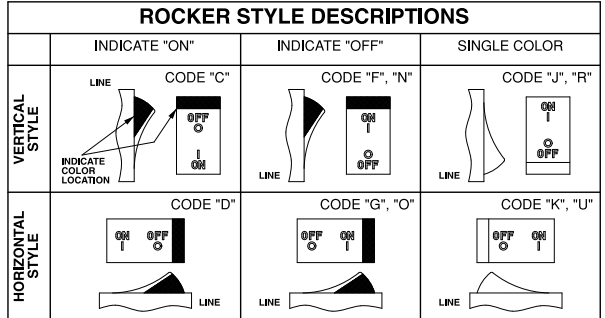
12 AGENCY APPROVAL
T UL489A Listed
K UL489A Listed, VDE Certified
J UL489A Listed, TUV Certified

Notes:
¹ Actuator Code:
A: Handle tie pin spacer(s) and retainers provided un-assembled with multi-pole units.
S: Handle moves to mid-position only upon electrical trip of the breaker.
T: Handle moves to mid-position and alarm switch activates only upon electrical trip of the breaker.
² On multi-pole breakers, one auxiliary switch is supplied, mounted in the extreme right pole.
³ VDE Certified to 30 amps. UL489A Listed to 50 amps.
⁴ VDE Certification available with single pole breakers only. UL489A Listing available with one and two pole breakers.
⁵ Screw Terminals are recommended on ratings greater than 20 amps. Ratings over 30 amps are only available with Terminal Codes 5, 9 G, H, M and Q.
⁶ Terminal Code 1 (Push-On) available up to 25 amps with VDE Certification and 30 amps with UL489A Listing, but is not recommended over 20 amps.
⁷ Terminal Codes 3, 5 and H (Bus Type) with VDE, are supplied with Lock Washers, and Terminal Code M (M6 Threaded Stud) with VDE is supplied with Lock and Flat Washers. These breakers are only VDE Certified when the washers are used.
⁸ Single pole breakers with Terminal Code P (Printed Circuit Board) are available up to 30 amps with VDE Certification and 50 amps with UL489A Listing.
⁹ Terminal Code Q not available with VDE certification.
¹⁰ Single pole only.



1 SERIES
A

2 ACTUATOR 1
Two Color Visi-Rocker
C Indicate ON, vertical legend
D Indicate ON, horizontal legend
F Indicate OFF, vertical legend
G Indicate OFF, horizontal legend
Single color
J Vertical legend
K Horizontal legend
Push-To-Reset, Visi-Rocker
N Indicate OFF, vertical legend
O Indicate OFF, horizontal legend
Push-To-Reset, Single color
R Vertical legend
U Horizontal legend



3 POLES 2
1 One
2 Two
3 Three

4 CIRCUIT
B Series Trip (Current)

5 AUXILIARY / ALARM SWITCH 2
0 without Aux Switch
1 S.P.D.T., 0.093 Q.C. Term.
2 S.P.D.T., 0.110 Q.C. Term.
7 S.P.S.T., 0.110 Q.C. Term. (Gold Contacts)
8 S.P.S.T., 0.187 Q.C. Term.
9 S.P.D.T., 0.187 Q.C. Term.

6 FREQUENCY & DELAY
11 DC Ultra Short
12 DC Short
14 DC Medium
16 DC Long
52 DC, Short, Hi-Inrush
54 DC, Medium, Hi-Inrush
56 DC, Long, Hi-Inrush

7 CURRENT RATING (AMPERES)

| CODE | AMPERES | 285 | 0.850 | 455 | 5.500 | 613 | 13.000 |
|------|---------|-----|-------|-----|--------|-----|--------|
| 210 | 0.100 | 285 | 0.850 | 455 | 5.500 | 613 | 13.000 |
| 215 | 0.150 | 290 | 0.900 | 460 | 6.000 | 614 | 14.000 |
| 220 | 0.200 | 295 | 0.950 | 465 | 6.500 | 615 | 15.000 |
| 225 | 0.250 | 410 | 1.000 | 470 | 7.000 | 616 | 16.000 |
| 230 | 0.300 | 512 | 1.250 | 475 | 7.500 | 617 | 17.000 |
| 235 | 0.350 | 415 | 1.500 | 480 | 8.000 | 618 | 18.000 |
| 240 | 0.400 | 517 | 1.750 | 485 | 8.500 | 620 | 20.000 |
| 245 | 0.450 | 420 | 2.000 | 490 | 9.000 | 622 | 22.000 |
| 250 | 0.500 | 522 | 2.250 | 495 | 9.500 | 624 | 24.000 |
| 255 | 0.550 | 527 | 2.750 | 610 | 10.000 | 625 | 25.000 |
| 260 | 0.600 | 430 | 3.000 | 710 | 10.500 | 630 | 30.000 |
| 265 | 0.650 | 435 | 3.500 | 611 | 11.000 | 635 | 35.000 |
| 270 | 0.700 | 440 | 4.000 | 711 | 11.500 | 640 | 40.000 |
| 275 | 0.750 | 445 | 4.500 | 612 | 12.000 | 645 | 45.000 |
| 280 | 0.800 | 450 | 5.000 | 712 | 12.500 | 650 | 50.000 |

8 TERMINAL 5
1⁶ Push-On 0.250 Tab (Q.C.)
2 Screw 8-32 with upturned lugs
3⁷ Screw 8-32 (Bus Type)
4⁷ Screw 10-32 with upturned lugs
5⁷ Screw 10-32 (Bus Type)
6 Screw 8-32 with upturned lugs & 30° bend
7 Screw 8-32 (Bus Type) & 30° bend
8 Screw 10-32 with upturned lugs & 30° bend
9 Screw 10-32 (Bus Type) & 30° bend
B Screw M5 with upturned lugs
F Screw M5 with upturned lugs & 30° bend
G Screw M5 (Bus Type) & 30° bend
H Screw M5 (Bus Type)
M⁷ M6 Threaded Stud
P⁸ Printed Circuit Board Terminals
Q⁹ Push-In Stud

9 ACTUATOR COLOR & LEGEND

| Actuator or Visi-Color ¹⁰ | Marking: | | Marking Color | |
|--------------------------------------|----------|--------------------|---------------|-------------|
| | ON-OFF | Dual ¹⁰ | Single Color | Visi-Rocker |
| White | B | 1 | Black | White |
| Black | D | 2 | White | n/a |
| Red | G | 3 | White | Red |
| Green | J | 4 | White | Green |
| Blue | L | 5 | White | Blue |
| Yellow | N | 6 | Black | Yellow |
| Gray | Q | 7 | Black | Gray |
| Orange | S | 8 | Black | Orange |

10 MOUNTING / BARRIERS 11

| | STANDARD ROCKER BEZEL Threaded Insert, 2 per pole | BARRIERS |
|----------|--|----------|
| 1 | 6-32 x 0.195 inches | no |
| A | 6-32 X 0.195 inches (multi-pole units only) | yes |
| 2 | ISO M3 x 5mm | no |
| B | ISO M3 x 5mm (multi-pole units only) | yes |
| | ROCKERGUARD & PUSH-TO-RESET BEZEL Threaded Insert, 2 per pole | |
| 3 | 6-32 x 0.195 inches | no |
| C | 6-32 x 0.195 inches (multi-pole units only) | yes |
| 4 | ISO M3 x 5mm | no |
| D | ISO M3 x 5mm (multi-pole units only) | yes |
| | FRONT PANEL SNAP-IN BRACKET, 0.744" [18.90mm] wide bezel | |
| 8 | without Rockerguard (single pole units only) | no |
| H | with Rockerguard (single pole units only) | no |
| | FRONT PANEL SNAP-IN BRACKET, 0.96" [24.48mm] wide bezel | |
| 9 | without Rockerguard (single pole units only) | no |
| J | with Rockerguard (single pole units only) | no |

11 MAXIMUM APPLICATION RATING
M 80 DC

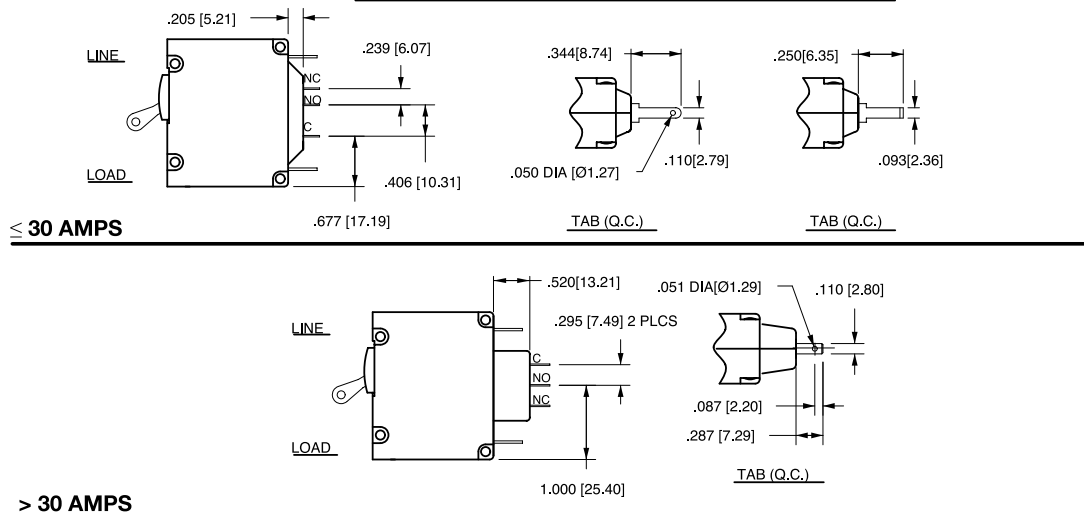
12 AGENCY APPROVAL
T UL489A Listed
K UL489A Listed, VDE Certified
J UL489A Listed, TUV Certified

Notes:
1 Push-To-Reset actuators have OFF portion of rocker shrouded.
2 Multi-pole breakers have all breakers identical except when specifying Auxiliary switch and/or mixed poles, and have one rocker per breaker.
3 Auxiliary Switch breakers with Series Trip circuits: ≤30A, are supplied with standard half shells. 30-50A are supplied with extended boat (B-Style) half shells.
4 VDE Certification available with single pole breakers only. UL489A Listing available with one and two pole breakers.
5 Screw Terminals are recommended on ratings greater than 20 amps. Ratings over 30 amps are only available with Terminal Codes 5, 9, G, H, M and Q.
6 Terminal Code 1 (Push-On) available up to 25 amps with TUV or VDE Certification and 30 amps with UL489A Listing, but is not recommended over 20 amps.
7 Terminal Codes 3, 5 and H (Bus Type) with TUV or VDE, are supplied with Lock Washers, and Terminal Code M (M6 Threaded Stud) with VDE is supplied with Lock and Flat Washers. These breakers are only TUV or VDE Certified when the washers are used.
8 Single pole breakers with Terminal Code P (Printed Circuit Board) are available up to 30 amps with VDE Certification and 50 amps with UL489A Listing.
9 Terminal Code Q not available with VDE certification.
10 Color shown is Visi and Legend with remainder of rocker black. Dual = ON-OFF/I-O legend.
11 Legend on Push-to-reset bezel/shroud is white with single color actuator codes R & U. Legend on Push-To-Reset bezel/shroud matches Visi-Color of rocker with actuator codes N & O. Rockerguard available with actuator codes C through K

Circuit & Terminal Diagrams: in. [mm]

| CIRCUIT BREAKER PROFILE | CIRCUIT SCHEMATIC | | CIRCUIT SCHEMATIC | |
|-------------------------|--|--|---|---|
| | ANSI | CIRCUIT CODE | ANSI | CIRCUIT CODE |
| 2 TERMINALS | SWITCH ONLY (NO COIL) | A 0 | SERIES TRIP | BC 0 |
| 5 TERMINALS | SWITCH ONLY (NO COIL) WITH AUXILIARY SWITCH | A 1 2 3 4 | SERIES TRIP WITH (3) AUXILIARY/ALARM SWITCH | BC 1 2 3 4 |
| 3 TERMINALS | SHUNT TRIP | DE 0 | DUAL COIL; SERIES TRIP CURRENT COIL, SHUNT TRIP VOLTAGE COIL | H 0 |
| 4 TERMINALS | RELAY TRIP | FG 0 | DUAL COIL; SERIES TRIP CURRENT COIL, RELAY TRIP VOLTAGE COIL | K 0 |

AUXILIARY/ALARM SWITCH TERMINAL DETAIL



- Notes:
- 1 All dimensions are in inches [millimeters].
 - 2 Tolerance $\pm .020$ [.51] unless otherwise specified.
 - 3 Alarm Switch available with .110 x .020 Q.C. & Solder Lug Terminals Only.

Circuit & Terminal Diagrams: in. [mm]

| HANDLE POSITION VS. AUX/ALARM SWITCH MODE | | | | | | |
|---|-----------------|------------------|-----------------|-------------------|-----------------|-------------------------------------|
| CIRCUIT BREAKER MODE | STANDARD C/B | | MID TRIP C/B | | MID TRIP C/B | |
| | HANDLE POSITION | AUX. SWITCH MODE | HANDLE POSITION | ALARM SWITCH MODE | HANDLE POSITION | AUX. SWITCH MODE (w/o ALARM SWITCH) |
| OFF | | | | | | |
| ON | | | | | | |
| ELECTRICAL TRIP | | | | | | |

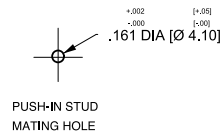
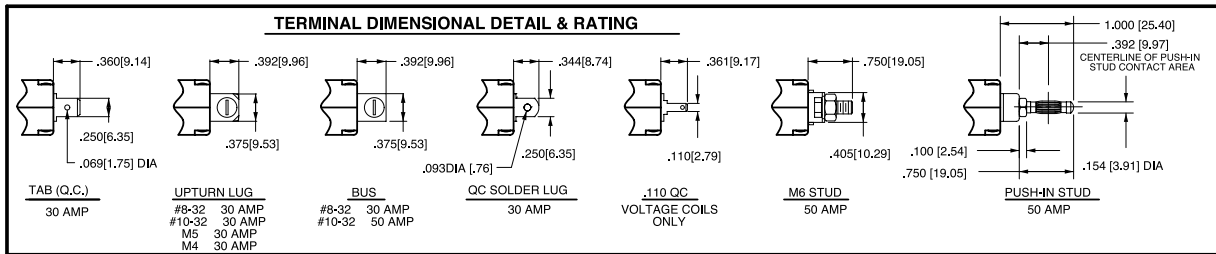


TABLE A TIGHTENING TORQUE SPECIFICATIONS

| THREAD SIZE | TORQUE |
|-----------------------------------|---------------------------|
| #6-32 & M3 MOUNTING HARDWARE | 7-9 IN-LBS [0.8-1.0 NM] |
| #8-32 & M4 THREAD TERMINAL SCREW | 12-15 IN-LBS [1.4-1.7 NM] |
| #10-32 & M5 THREAD TERMINAL SCREW | 15-20 IN-LBS [1.7-2.3 NM] |

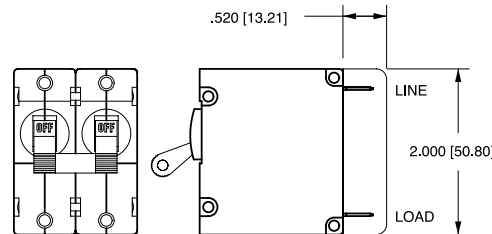
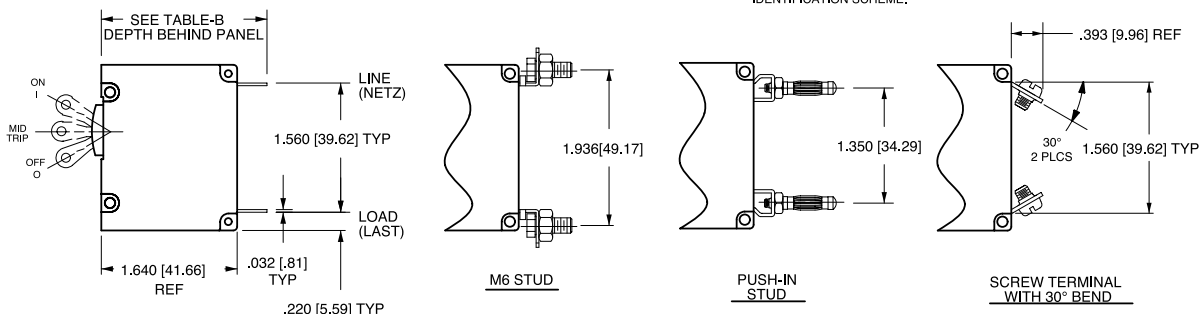


TABLE B

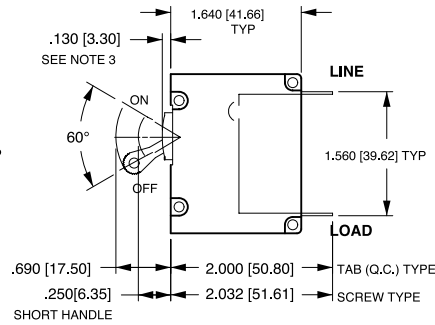
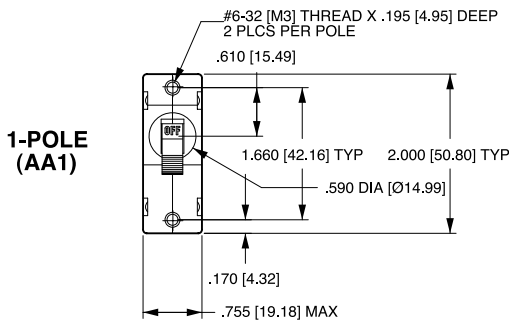
| TERMINAL DESCRIPTION | | DEPTH BEHIND PANEL |
|--------------------------|-----------------------------|--------------------|
| MAIN | TAB (Q.C.) | 2.000 [50.80] |
| | SCREW TYPE | 2.032 [51.60] |
| SHUNT, RELAY & DUAL COIL | TAB (Q.C.) | 2.207 [56.10] |
| | SCREW #8-32 W/UPTURNED LUGS | 2.364 [60.05] |
| AUX. SWITCH* | .093 TAB (Q.C.) | 2.095 [53.20] |
| | .110 TAB (Q.C.) | 2.189 [55.60] |
| | SOLDER TYPE | 1.970 [50.00] |

* AVAILABLE ON SERIES TRIP AND SWITCH ONLY CIRCUITS. WHEN CALLED FOR ON MULTI-POLE UNITS, ONLY ONE AUX. SWITCH IS NORMALLY SUPPLIED, AS SHOWN IN MULTI-POLE IDENTIFICATION SCHEME.

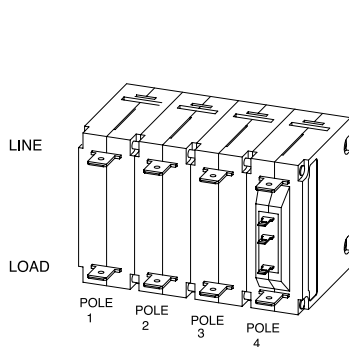
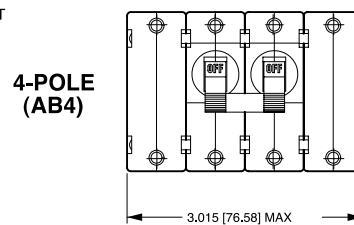
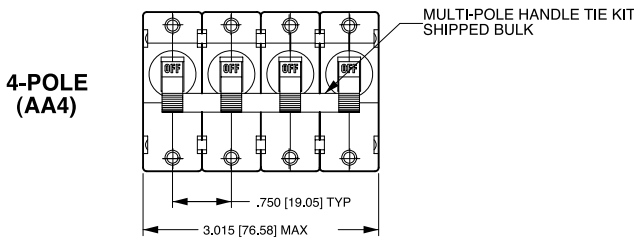
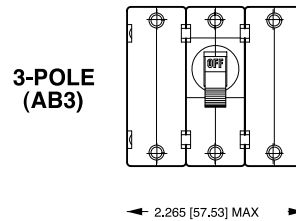
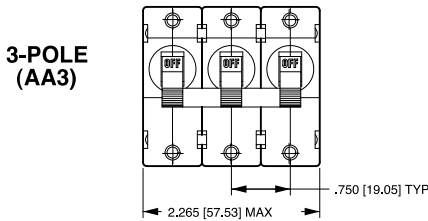
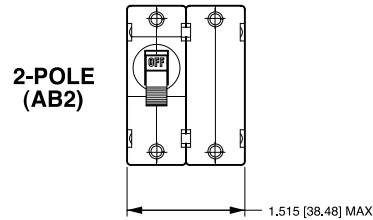
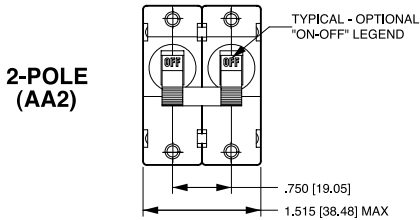


- Notes:
- All dimensions are in inches [millimeters].
 - Tolerance ± 0.02 [.51] unless otherwise specified.
 - Alarm Switch available with .110 x .020 QC & solder lug terminals only.

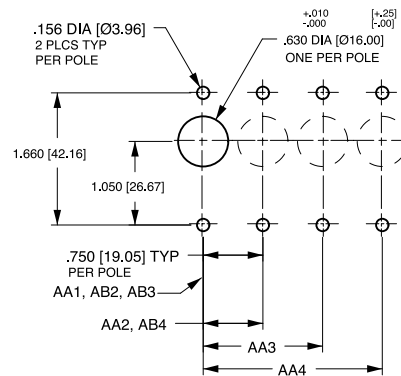
Dimensional Specifications: in. [mm]



TAB (Q.C.) TYPE TERMINALS IN SERIES TRIP CIRCUIT CONFIGURATION SHOWN. FOR OTHER CONFIGURATIONS, SEE CIRCUIT AND TERMINAL DIAGRAMS.



MULTI-POLE IDENTIFICATION SCHEME AS VIEWED FROM TERMINAL END OF BREAKER.

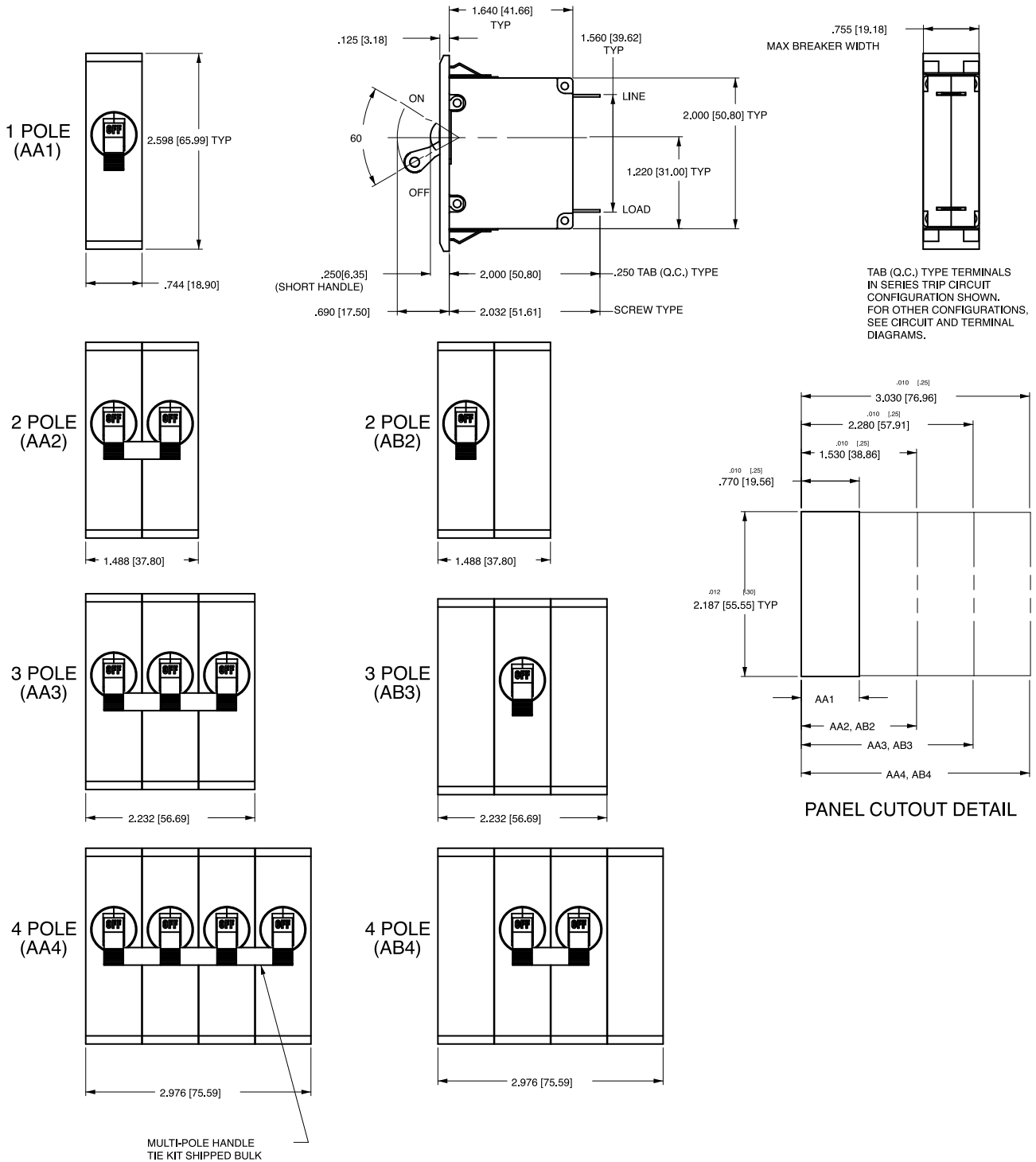


TOLERANCES ±.005 [±.12] UNLESS OTHERWISE SPECIFIED

Notes:

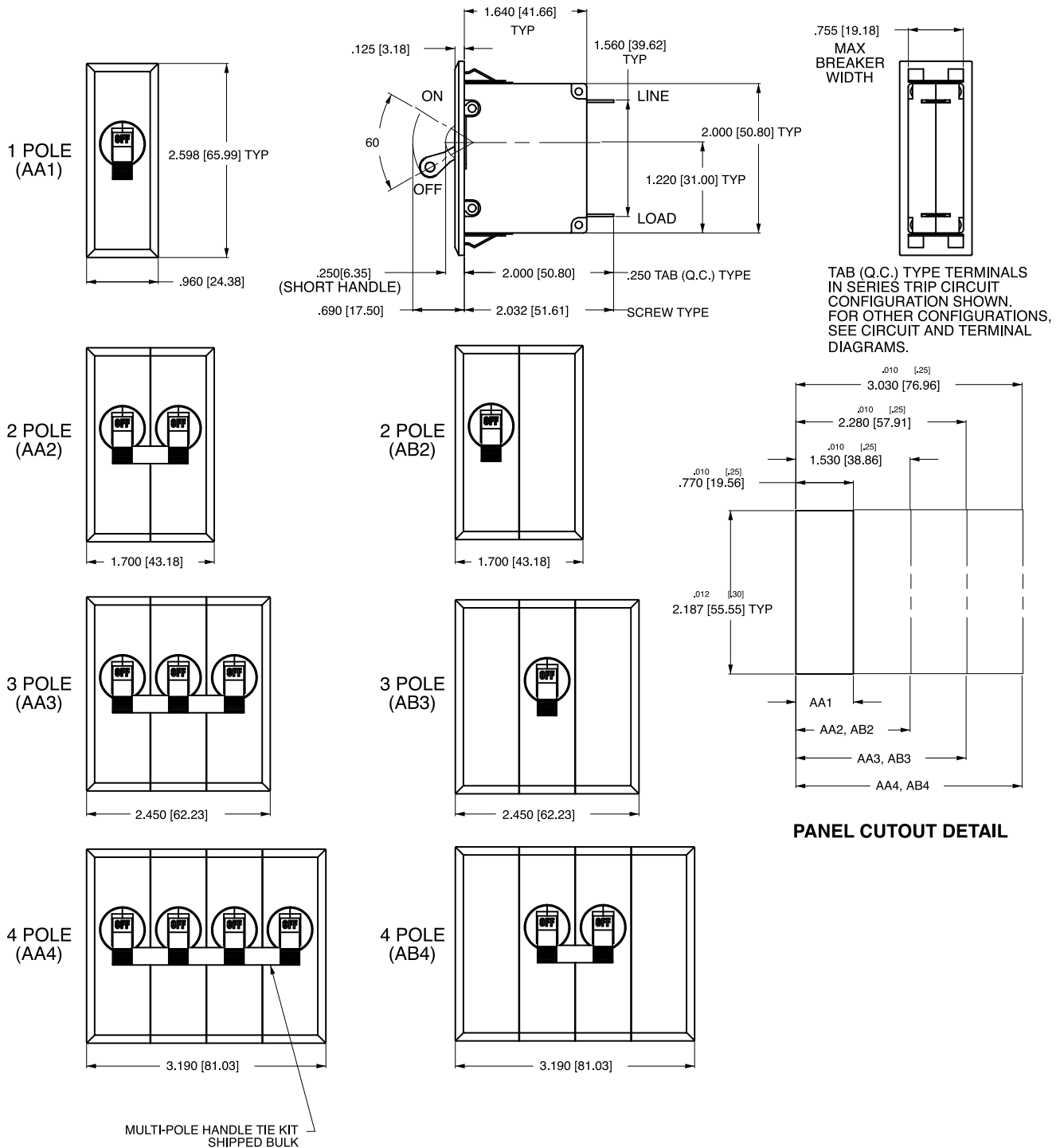
- 1 All dimensions are in inches [millimeters].
- 2 Tolerance ± 0.20 [.51] unless otherwise specified.
- 3 For agency code P = .150 [3.81].

Dimensional Specifications: in. [mm]

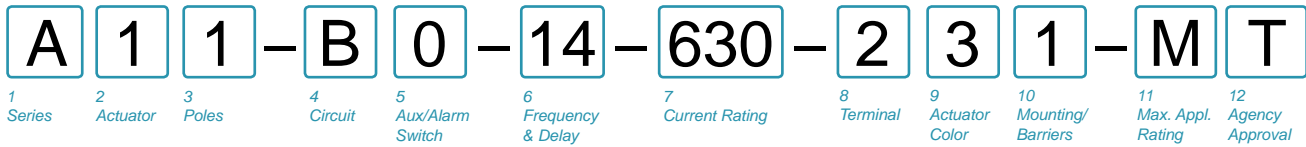


- Notes:
 1 All dimensions are in inches [millimeters].
 2 Recommended panel thickness: .040 [1.02] to .100 [2.54].
 3 Tolerance $\pm .020$ [.51] unless otherwise specified.

Dimensional Specifications: in. [mm]



- Notes:
- 1 All dimensions are in inches [millimeters].
 - 2 Recommended panel thickness: .040 [1.02] to .100 [2.54].
 - 3 Tolerance ± 0.020 [.51] unless otherwise specified.



1 SERIES
A

2 ACTUATOR 1
Two Color Visi-Rocker
 1 Indicate OFF, vertical legend
 2 Indicate OFF, horizontal legend
Single color
 3 Vertical legend
 4 Horizontal legend
Push-To-Reset, Visi-Rocker
 5 Indicate OFF, vertical legend
 6 Indicate OFF, horizontal legend
Push-To-Reset, Single color
 7 Vertical legend
 8 Horizontal legend

| | INDICATE "OFF" | SINGLE COLOR |
|------------------|-------------------|-------------------|
| VERTICAL STYLE | CODE "1", "5" | CODE "3", "7" |
| HORIZONTAL STYLE | CODE "2", "6" | CODE "4", "8" |

3 POLES 2
 1 One 2 Two 3 Three

4 CIRCUIT
 B Series Trip (Current)

5 AUXILIARY / ALARM SWITCH 3
 0 without Aux Switch 7 S.P.S.T., 0.110 Q.C. Term. (Gold Contacts)
 1 S.P.D.T., 0.093 Q.C. Term. 8 S.P.S.T., 0.187 Q.C. Term.
 2 S.P.D.T., 0.110 Q.C. Term. 9 S.P.D.T., 0.187 Q.C. Term.

6 FREQUENCY & DELAY
 11 DC Ultra Short 52 DC, Short, Hi-Inrush
 12 DC Short 54 DC, Medium, Hi-Inrush
 14 DC Medium 56 DC, Long, Hi-Inrush
 16 DC Long

7 CURRENT RATING (AMPERES)

| CODE | AMPERES | | | | |
|------|---------|-----|-------|-----|----------|
| 020 | 0.020 | 225 | 0.250 | 420 | 2.000 |
| 025 | 0.025 | 230 | 0.300 | 522 | 2.250 |
| 030 | 0.030 | 235 | 0.350 | 527 | 2.750 |
| 035 | 0.035 | 240 | 0.400 | 430 | 3.000 |
| 040 | 0.040 | 245 | 0.450 | 435 | 3.500 |
| 045 | 0.045 | 250 | 0.500 | 440 | 4.000 |
| 050 | 0.050 | 255 | 0.550 | 445 | 4.500 |
| 055 | 0.055 | 260 | 0.600 | 450 | 5.000 |
| 060 | 0.060 | 265 | 0.650 | 455 | 5.500 |
| 065 | 0.065 | 270 | 0.700 | 460 | 6.000 |
| 070 | 0.070 | 275 | 0.750 | 465 | 6.500 |
| 075 | 0.075 | 280 | 0.800 | 470 | 7.000 |
| 080 | 0.080 | 285 | 0.850 | 475 | 7.500 |
| 085 | 0.085 | 290 | 0.900 | 480 | 8.000 |
| 090 | 0.090 | 295 | 0.950 | 485 | 8.500 |
| 095 | 0.095 | 410 | 1.000 | 490 | 9.000 |
| 100 | 0.100 | 512 | 1.250 | 495 | 9.500 |
| 115 | 0.150 | 415 | 1.500 | 610 | 10.000 |
| 220 | 0.200 | 517 | 1.750 | 710 | 10.500 |
| | | | | 635 | 4 35.000 |
| | | | | 640 | 4 40.000 |
| | | | | 645 | 4 45.000 |
| | | | | 650 | 4 50.000 |

8 TERMINAL 5
 1 6 Push-On 0.250 Tab (Q.C.) 9 Screw 10-32 (Bus Type) & 30° bend
 2 Screw 8-32 with upturned lugs B Screw M5 with upturned lugs
 3 7 Screw 8-32 (Bus Type) F Screw M5 with upturned lugs & 30° bend
 4 Screw 10-32 with upturned lugs G Screw M5 (Bus Type) & 30° bend
 5 7 Screw 10-32 (Bus Type) H Screw M5 (Bus Type)
 6 Screw 8-32 with upturned lugs & 30° bend M 7 M6 Threaded Stud
 7 Screw 8-32 (Bus Type) & 30° bend P 8 Printed Circuit Board Terminals
 8 Screw 10-32 with upturned lugs & 30° bend Q 9 Push-In Stud

9 ACTUATOR COLOR & LEGEND

| Actuator or Visi-Color 11 | Marking: | | Marking Color | |
|---------------------------|----------|---------|---------------|-------------|
| | ON-OFF | Dual 11 | Single Color | Visi-Rocker |
| White | B | 1 | Black | White |
| Black | D | 2 | White | n/a |
| Red | G | 3 | White | Red |
| Green | J | 4 | White | Green |
| Blue | L | 5 | White | Blue |
| Yellow | N | 6 | Black | Yellow |
| Gray | Q | 7 | Black | Gray |
| Orange | S | 8 | Black | Orange |

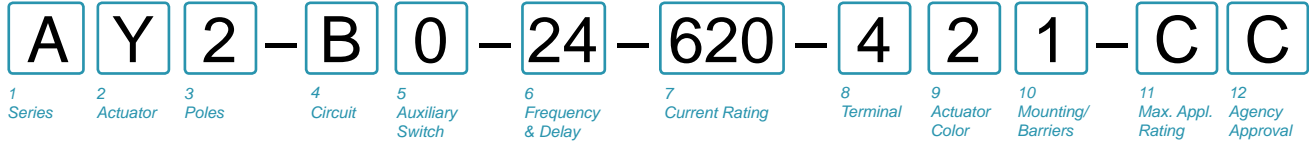
10 MOUNTING / BARRIERS 12

| | STANDARD ROCKER BEZEL | BARRIERS |
|---|--|----------|
| | Threaded Insert, 2 per pole | |
| | FLAT ROCKER ACTUATOR | |
| 1 | 6-32 x 0.195 inches | no |
| A | 6-32 X 0.195 inches (multi-pole units only) | yes |
| 2 | ISO M3 x 5mm | no |
| B | ISO M3 x 5mm (multi-pole units only) | yes |
| | RECESSED OFF SIDE ROCKER ACTUATOR | |
| 5 | 6-32 x 0.195 inches | no |
| E | 6-32 x 0.195 inches (multi-pole units only) | yes |
| 6 | ISO M3 x 5mm | no |
| F | ISO M3 x 5mm (multi-pole units only) | yes |
| | PUSH-TO-RESET BEZEL, Threaded Insert, 2 per pole | |
| 3 | 6-32 x 0.195 inches | no |
| C | 6-32 x 0.195 inches (multi-pole units only) | yes |
| 4 | ISO M3 x 5mm | no |
| D | ISO M3 x 5mm (multi-pole units only) | yes |

11 MAXIMUM APPLICATION RATING
 M 80 DC

12 AGENCY APPROVAL
 T UL489A Listed
 J UL489A Listed, TUV Certified

- Notes:
- 1 Push-To-Reset actuators have OFF portion of rocker shrouded.
 - 2 Multi-pole breakers have all breakers identical except when specifying Auxiliary switch and/or mixed poles, and have one rocker per breaker.
 - 3 Auxiliary Switch breakers with Series Trip circuits: ≤ 30A, are supplied with standard half shells. 30-50A are supplied with extended boat (B-Style) half shells.
 - 4 VDE Certification available with single pole breakers only. UL489A Listing available with one and two pole breakers.
 - 5 Screw Terminals are recommended on ratings greater than 20 amps. Ratings over 30 amps are only available with Terminal Codes 5, 9, G, H, M and Q.
 - 6 Terminal Code 1 (Push-On) available up to 25 amps with TUV or VDE Certification and 30 amps with UL489A Listing, but is not recommended over 20 amps.
 - 7 Terminal Codes 3, 5 and H (Bus Type) with TUV or VDE, are supplied with Lock Washers, and Terminal Code M (M6 Threaded Stud) with VDE is supplied with Lock and Flat Washers. These breakers are only TUV or VDE Certified when the washers are used.
 - 8 Single pole breakers with Terminal Code P (Printed Circuit Board) are available up to 30 amps with VDE Certification and 50 amps with UL489A Listing.
 - 9 Terminal Code Q not available with VDE certification.
 - 10 Color shown is Visi and Legend with remainder of rocker black. Dual = ON-OFF/I-O legend.
 - 11 Legend on Push-to-reset bezel/shroud is white with single color actuator codes R & U.
 - 12 Legend on Push-To-Reset bezel/shroud matches Visi-Color of rocker with actuator codes N & O. Rockerguard available with actuator codes C through K



1 SERIES
A

2 ACTUATOR 1
Y Single Color Recessed Paddle Actuator with Vertical Legends

3 POLES 2
1 One **2** Two **3** Three

4 CIRCUIT
A Switch-Only (No Coil) **F** Relay Trip (Current)
B Series Trip (Current) **G** Relay Trip (Voltage)
C Series Trip (Voltage) **H** Dual Coil with Shunt Trip Voltage Coil
D Shunt Trip (Current) **K** Dual Coil with Shunt Trip Current Coil
E Shunt Trip (Voltage)

5 AUXILIARY SWITCH
0 without Aux Switch
1 S.P.D.T. with 0.093 Q.C. Terminals
2 S.P.D.T. with 0.110 Q.C. Terminals
3 S.P.D.T. with 0.139 Solder Lug Terminals
4 S.P.D.T. with 0.110 Q.C. Terminals (Gold Contacts)
5 S.P.D.T. with 0.093 Q.C. Terminals (Gold Contacts)
6 S.P.S.T.-N.O. with 0.139 Solder Lug Terminals
7 S.P.S.T.-N.O. with 0.110 Q.C. Terminals (Gold Contacts)
8 S.P.S.T.-N.O. with 0.187 Q.C. Terminals
9 S.P.D.T. with 0.187 Q.C. Terminals

6 FREQUENCY & DELAY 3

| | |
|-----------------------------------|-------------------------------------|
| 3 DC, 50/60 Hz Switch Only | 22 50/60 Hz Short |
| 10 DC Instantaneous | 24 50/60 Hz Medium |
| 11 DC Ultra Short | 26 50/60 Hz Long |
| 12 DC Short | 42 50/60 Hz Short Hi-Inrush |
| 14 DC Medium | 44 50/60 Hz Medium Hi-Inrush |
| 16 DC Long | 46 50/60 Hz Long Hi-Inrush |
| 20 50/60 Hz Instantaneous | 52 DC, Short, Hi-Inrush |
| 21 50/60 Hz Ultra Short | 54 DC, Medium, Hi-Inrush |
| | 56 DC, Long, Hi-Inrush |

7 CURRENT RATING (AMPERES) 4

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

OR VOLTAGE COIL (NORMAL RATED VOLTAGE)

| CODE | AMPERES | | | | |
|------------|---------|------------|-------|------------|--------|
| A06 | 6 DC | A32 | 32 DC | J12 | 12 AC |
| A12 | 12 DC | A48 | 48 DC | J18 | 18 AC |
| A18 | 18 DC | A65 | 65 DC | J24 | 24 AC |
| A24 | 24 DC | J06 | 6 AC | J48 | 48 AC |
| | | | | J65 | 65 AC |
| | | | | K20 | 120 AC |
| | | | | L40 | 240 AC |

8 TERMINAL

| | |
|--|--|
| 1 Push-On 0.250 Tab (Q.C.) | C Screw, M4 with upturned lugs |
| 2 Screw 8-32 with upturned lugs | E Screw, M4 (Bus Type) |
| 3 Screw 8-32 (Bus Type) | F Screw M5 with upturned lugs & 30° bend |
| 4 Screw 10-32 with upturned lugs | G Screw M5 (Bus Type) & 30° bend |
| 5 Screw 10-32 (Bus Type) | H Screw M5 (Bus Type) |
| 6 Screw 8-32 with upturned lugs & 30° bend | L 0.250 Q.C./Solder Lug |
| 7 Screw 8-32 (Bus Type) & 30° bend | M M6 Threaded Stud |
| 8 Screw 10-32 with upturned lugs & 30° bend | P Printed Circuit Board Terminals |
| 9 Screw 10-32 (Bus Type) & 30° bend | Q Push-In Stud |
| B Screw M5 with upturned lugs | R Screw, M4 with upturned lugs & 30° Bend |
| | S Screw, M5 with upturned lugs |
| | T Screw, M4 with upturned lugs |

9 ACTUATOR COLOR & LEGEND 5

| 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 / BARRIERS

| | | |
|--|----------|-----|
| 1 6-32 x 0.195 inches | BARRIERS | no |
| A 6-32 X 0.195 inches (multi-pole units only) | | yes |
| 2 ISO M3 x 5mm | | no |
| B ISO M3 x 5mm (multi-pole units only) | | yes |

11 MAXIMUM APPLICATION RATING 6

| |
|--|
| A 65 VDC |
| C 120/240 VAC (Available only on 2 or 3-Pole units) |
| K 120 VAC |
| M 80 DC |

12 AGENCY APPROVAL 7

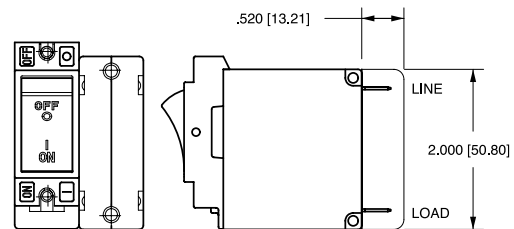
| |
|---|
| A Without Approvals |
| C UL Recognized and CSA Accepted |
| T UL 489A |

Notes:
 1 All standard catalog numbers are supplied with Vertical Legends. For Horizontal or other non-standard legends, choose "X" and order as a special catalog number.
 2 For rating (T) 2 & 3 Pole not available.
 3 Frequency and Time Delay ratings of (03, 20, 21, 22, 24, 26, 42, 44, 46) not available with approval T.
 4 Voltage Coil Ratings starting with (J, K, or L) not available with approval T.
 5 "OFF" and/or "O" Legends are on Bracket and are only visible when the Paddle Actuator is in the off position.
 6 Maximum Application Ratings (C & K) not available with approval T.
 7 Not all approvals are available in all constructions. Consult factory for details.

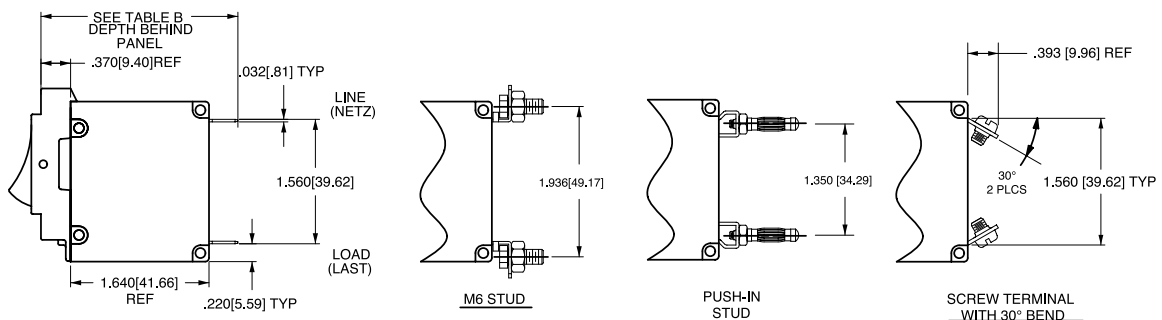
Circuit & Terminal Diagrams: in. [mm]

| CIRCUIT BREAKER PROFILE | CIRCUIT SCHEMATIC | | CIRCUIT CODE | AUX. SWITCH CODE | CIRCUIT SCHEMATIC | | CIRCUIT CODE | AUX. SWITCH CODE |
|-------------------------|--|-----|--------------|------------------|---|-----|--------------|------------------|
| | ANSI | IEC | | | ANSI | IEC | | |
| 2 TERMINALS | SWITCH ONLY (NO COIL) | | A | 0 | SERIES TRIP | | B C | 0 |
| 5 TERMINALS | SWITCH ONLY (NO COIL) WITH AUXILIARY SWITCH (4) | | A | 1 4 2 2 | SERIES TRIP WITH AUXILIARY SWITCH (4) | | B C | 1 4 2 2 |
| 3 TERMINALS | SHUNT TRIP | | D E | 0 | DUAL COIL; SERIES TRIP CURRENT COIL, SHUNT TRIP VOLTAGE COIL | | H | 0 |
| 4 TERMINALS | RELAY TRIP | | F G | 0 | DUAL COIL; SERIES TRIP CURRENT COIL, RELAY TRIP VOLTAGE COIL | | K | 0 |

| TERMINAL DESCRIPTION | | DEPTH BEHIND PANEL |
|--------------------------|-----------------------------|--------------------|
| MAIN | TAB (Q.C.) | 2.370 [60.20] |
| | SCREW TYPE | 2.402 [61.01] |
| SHUNT, RELAY & DUAL COIL | TAB (Q.C.) | 2.577 [65.46] |
| | SCREW #8-32 W/UPTURNED LUGS | 2.734 [69.44] |
| AUX. SWITCH* | .093 TAB (Q.C.) | 2.465 [62.61] |
| | .110 TAB (Q.C.) | 2.559 [65.00] |
| | SOLDER TYPE | 2.340 [59.44] |

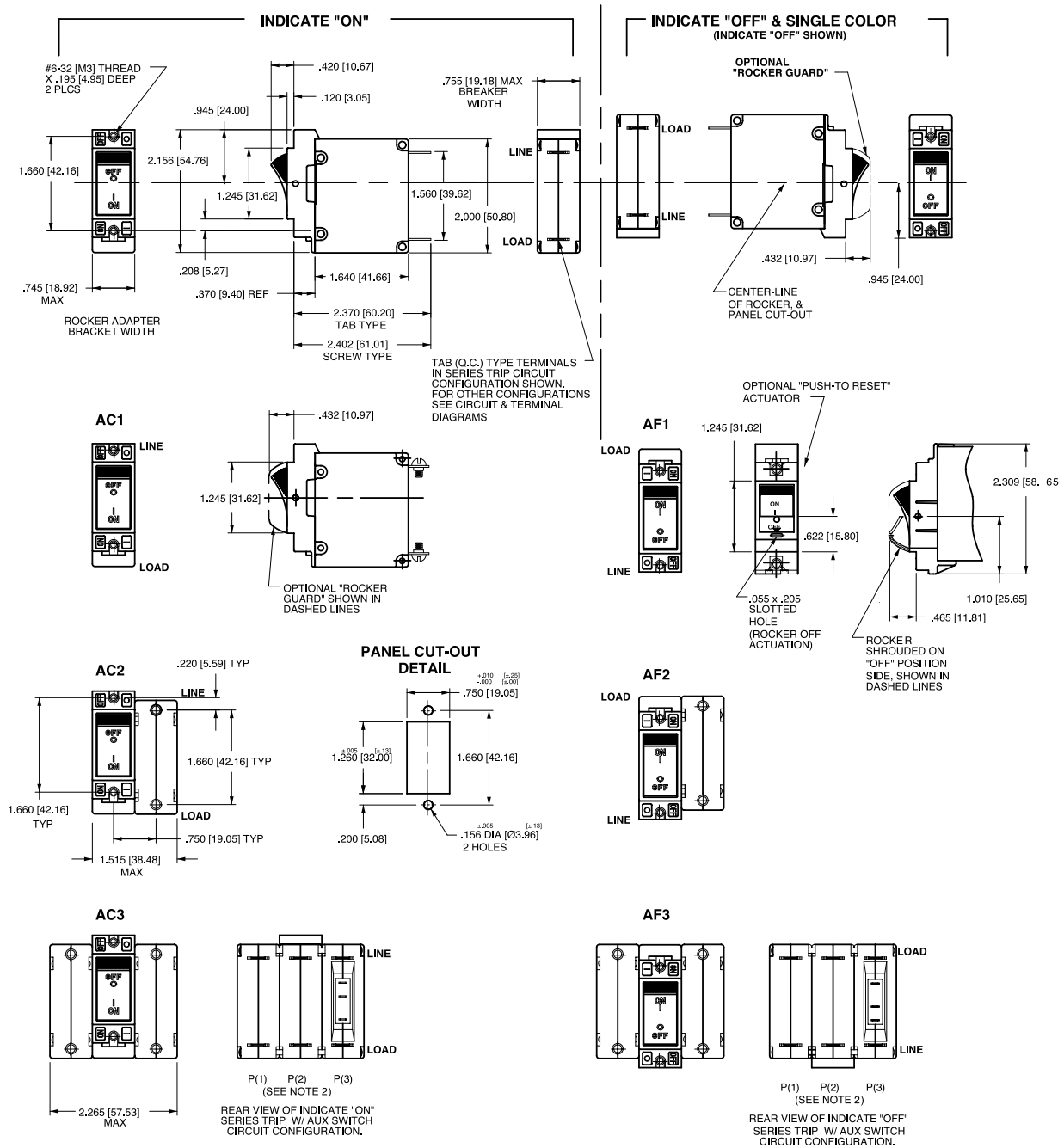


* AVAILABLE ON SERIES TRIP AND SWITCH ONLY CIRCUITS. WHEN CALLED FOR ON MULTI-POLE UNITS, ONLY ONE AUX. SWITCH IS NORMALLY SUPPLIED, AS VIEWED IN MULTI-POLE IDENTIFICATION SCHEME.



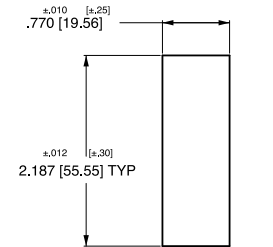
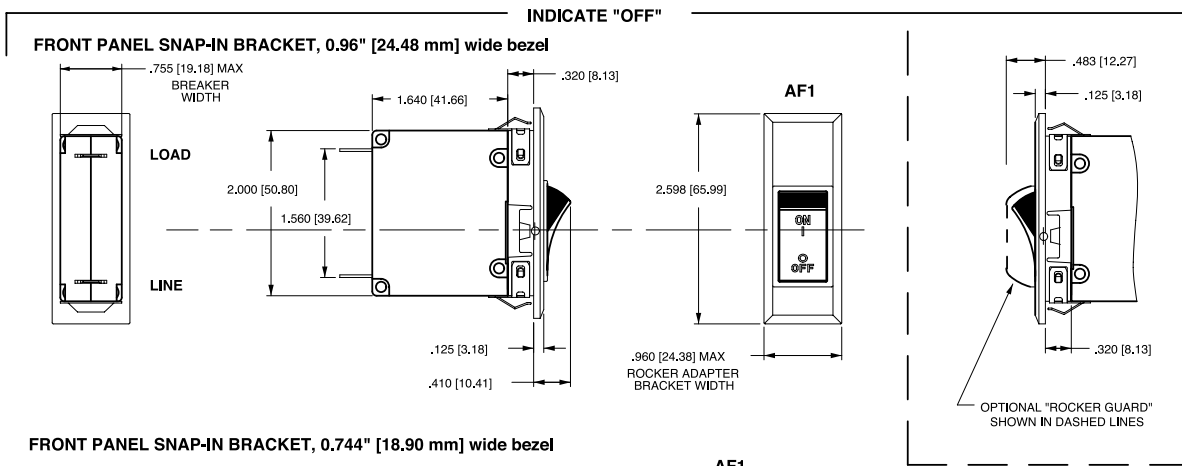
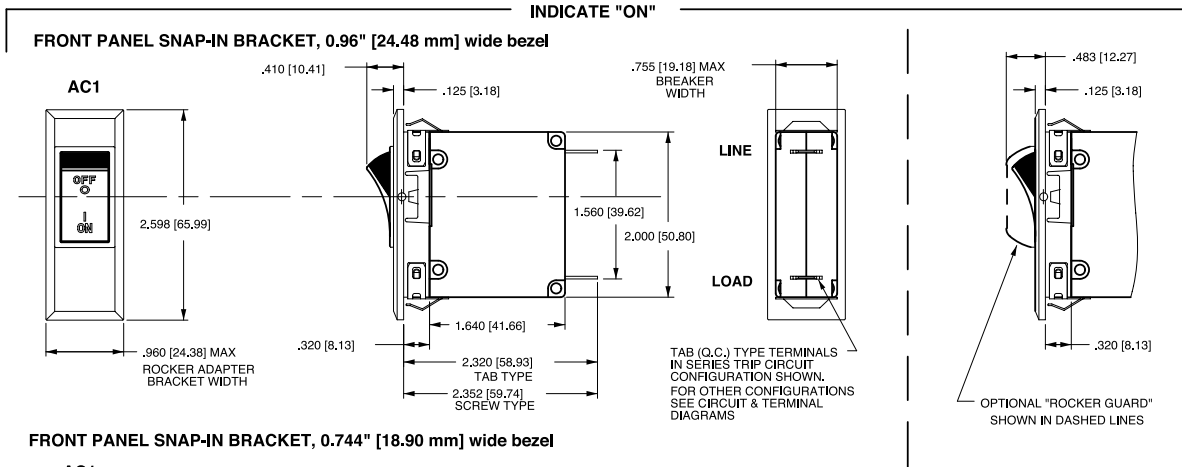
- Notes:
- All dimensions are in inches [millimeters].
 - Tolerance $\pm .020$ [.51] unless otherwise specified.
 - Schematic shown represents current trip circuit.
 - Circuits shown for >30 amps / VDE.

Dimensional Specifications: in. [mm]



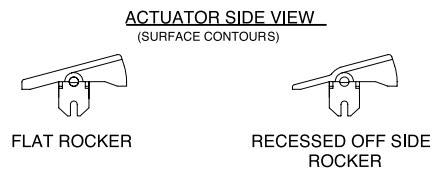
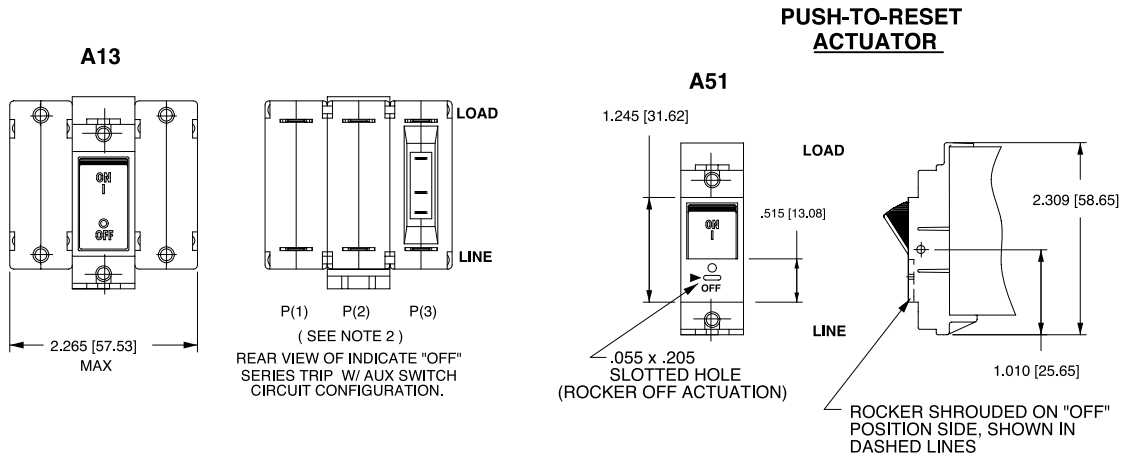
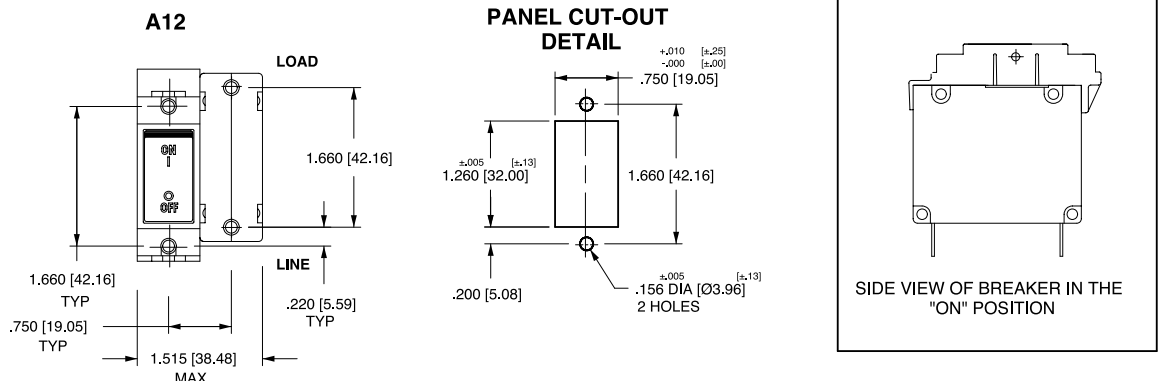
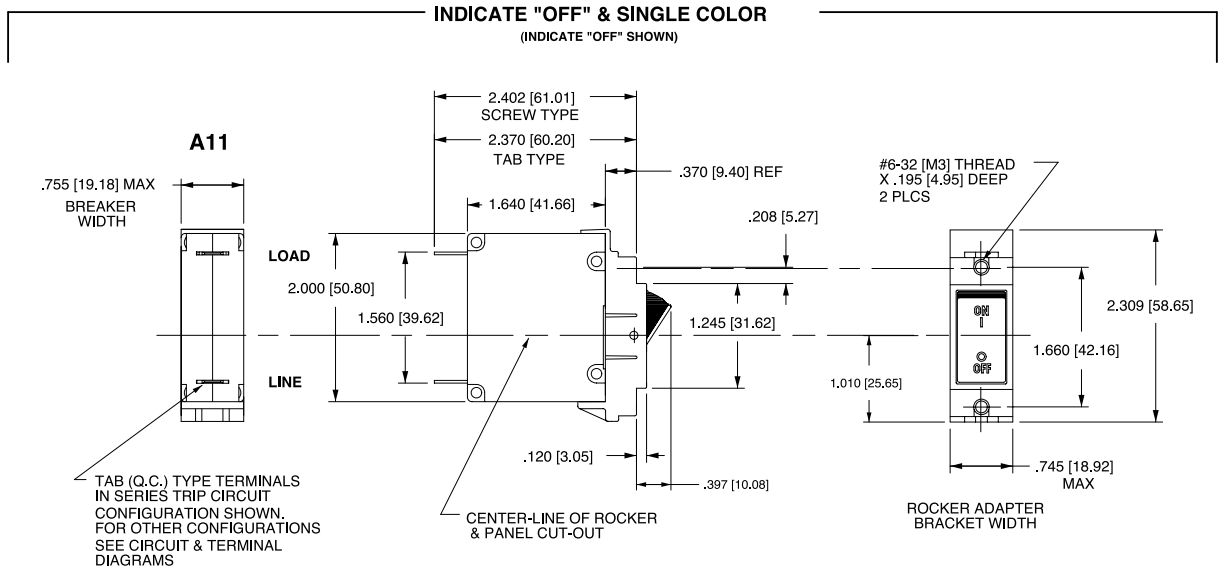
- Notes:
- 1 Dimensions apply to all variations shown. Notice that circuit breaker line & load terminal orientation on indicate OFF is opposite of indicate ON.
 - 2 For pole orientation with horizontal legend, rotate front view clockwise 90°.
 - 3 All dimensions are in inches [millimeters].
 - 4 Tolerance ± 0.20 [.51] unless otherwise specified.

Dimensional Specifications: in. [mm]



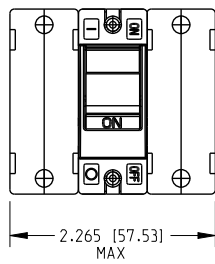
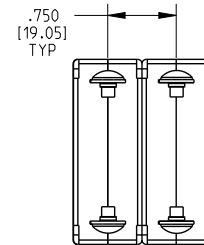
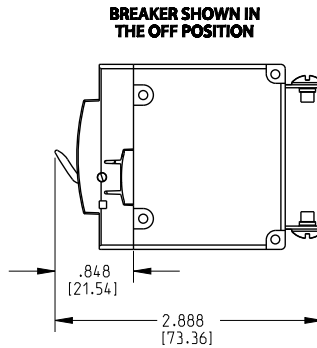
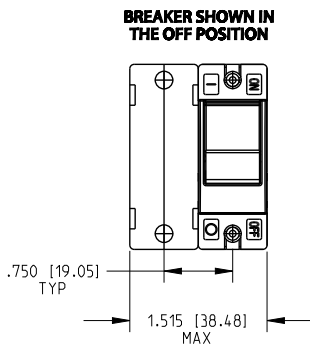
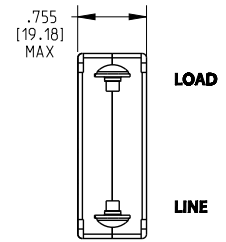
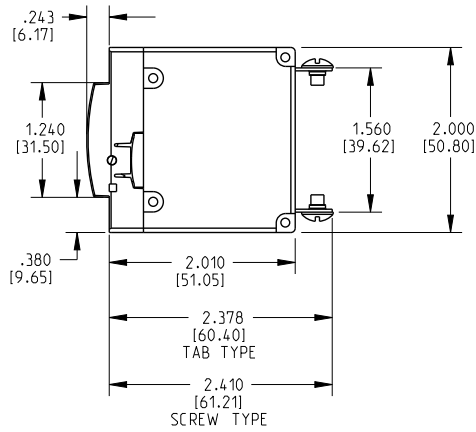
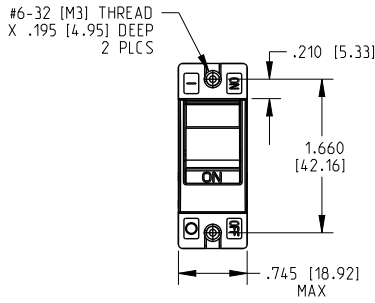
- Notes:
- 1 Dimensions apply to all variations shown. Notice that circuit breaker line & load terminal
 - 2 For pole orientation with horizontal legend, rotate front view clockwise 90°. Orientation on indicate "OFF" is opposite of indicate "ON"
 - 3 Recommended panel thickness: .04 0 [1.02] to .100 [2.54]
 - 4 All dimensions are in Inches [millimeters].
 - 5 Tolerance ± 0.020 [.51] unless otherwise specified.

Dimensional Specifications: in. [mm]

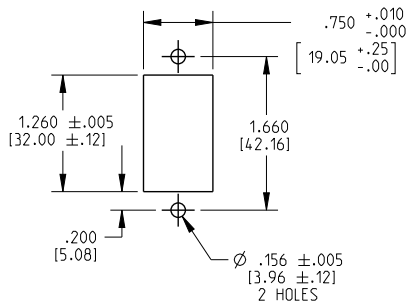


- Notes:
- 1 All dimensions are in inches [millimeters].
 - 2 For pole orientation with horizontal legend, rotate front view clockwise 90°.
 - 3 Tolerance ± 0.20 [±.51] unless otherwise specified.

Dimensional Specifications: in. [mm]



PANEL CUT-OUT DETAIL

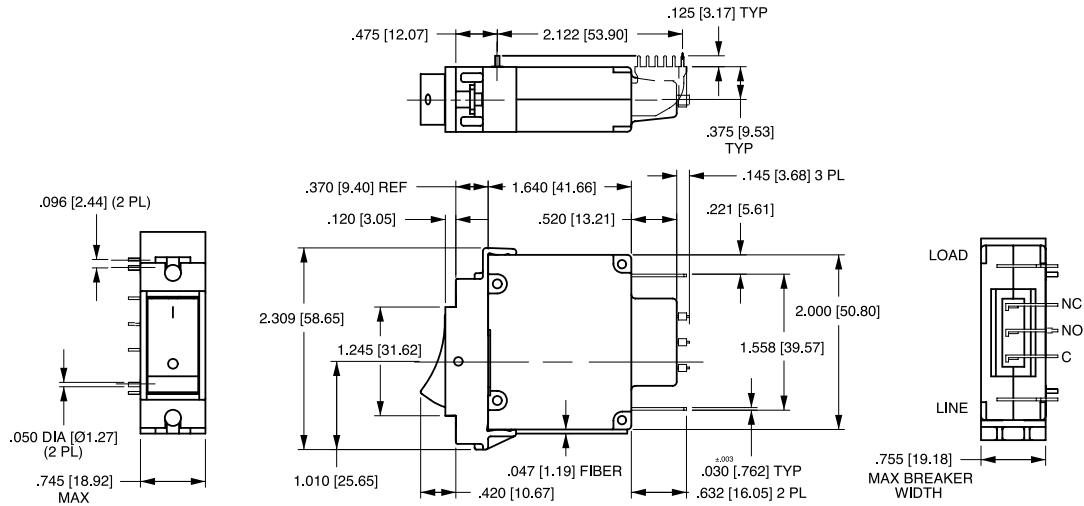


Notes:

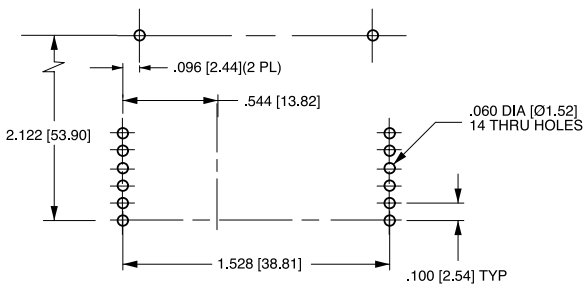
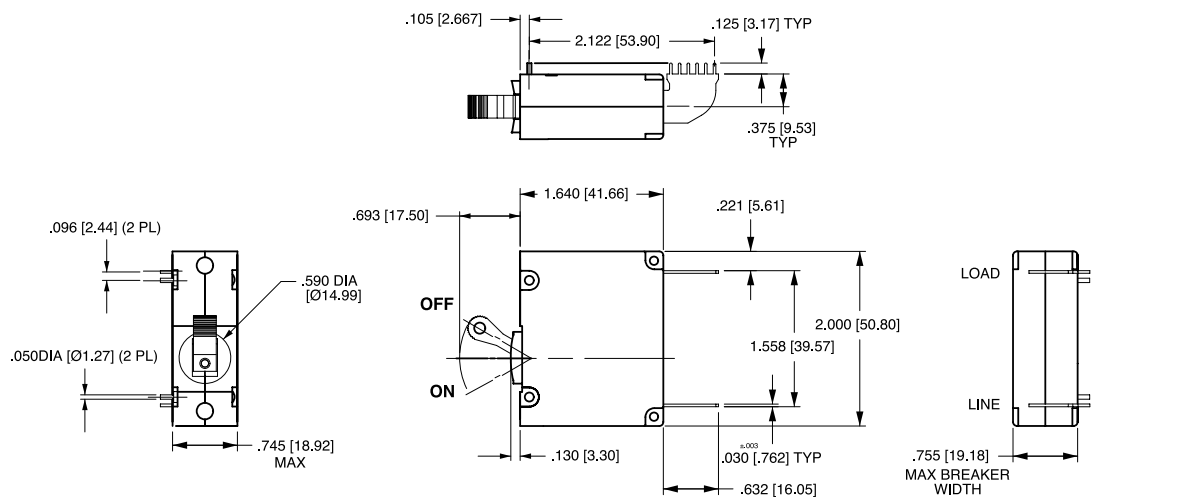
- 1 All dimensions are in inches [millimeters].
- 2 Tolerance ± 0.20 [51] unless otherwise specified

PC Terminal Diagrams: in. [mm]

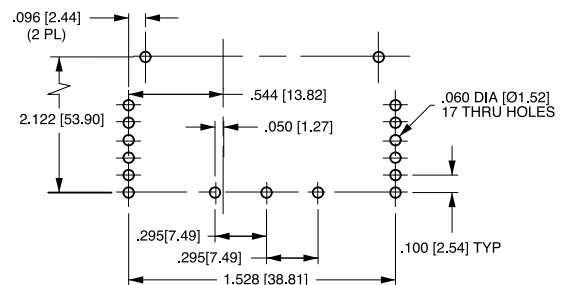
A-SERIES ROCKER



A-SERIES HANDLE



P.C. FOOT PRINT



P.C. FOOT PRINT WITH AUX. SWITCH

- Notes:
- 1 Drawing illustrates A-Series with VDE certification.
 - 2 All dimensions are in inches [millimeters].
 - 3 Tolerance ± 0.20 [.51] unless otherwise specified

B-Series

CIRCUIT BREAKER

Carling Technologies' B-Series hydraulic magnetic circuit breakers are specifically designed for applications requiring extra insulation and tongue and groove half-shell constructions. The B-Series carries global regulatory safety approvals for spacing requirements and are ideal for use as general purpose as well as full load amp applications. Available with various choices of time delays, terminals, actuator styles, with a wide range of standard colors and imprinting.

1-6 poles; ratings from 0.02 to 50 amps, up to 277VAC or 80VDC; UL recognized, CSA, VDE -0642, TUV, UL-1500, UL489A Listed



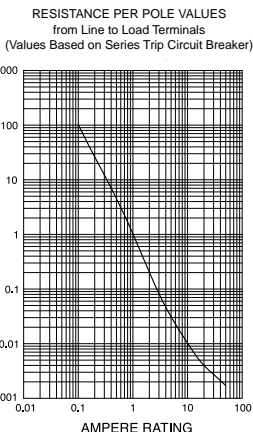
Product Highlights:

- Meet CSA Standard 22.2 No. 100 for the Generator & Welder markets
- Extra insulation and tongue & groove half-shell constructions
- UL Recognized - UL Standard 508, 1077, 1500
- UL Listed - UL Standard 489, 489A
- CSA Accepted
- TUV Certified
- VDE Certified

Only Telecom-Datcom applicable ordering schemes and drawings are shown in this catalog. For complete product details, please visit www.carlingtech.com

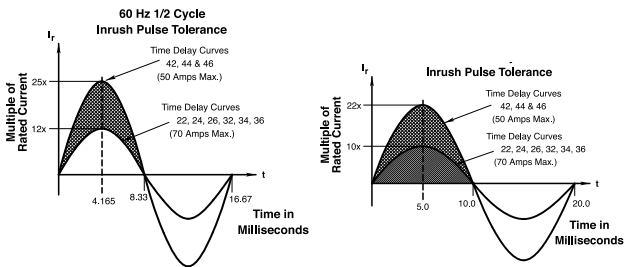
Electrical

Maximum Voltage 277VAC 50/60 Hz, 80VDC
 Current Ratings Standard current coils: 0.100, 0.250, 0.500, 0.750, 1.00, 2.50, 5.00, 7.50, 10.0, 15.0, 20.0, 25.0, 30.0, 35.0, 40.0 and 50.0 amps. Other ratings available, see ordering scheme.
 Standard Voltage Coils DC - 6V, 12V; AC - 120V, other ratings available, see ordering scheme.
 Auxiliary Switch Rating SPDT; 10.1 AMPS - 250VAC, 1.0A 65 VDC or 0.5A 80 VDC, 0.1 Amps - 125VAC (with gold contacts). VDE-1.0 Amp - 125VAC.
 Insulation Resistance Minimum of 100 Megohms at 500 VDC.
 Dielectric Strength UL, CSA-1500 V 50/60 Hz for one minute between all electrically isolated terminals. B-Series circuit breakers comply with the 8mm spacing and 3750V 50/60 Hz dielectric requirements from hazardous voltage to operator accessible surfaces, between adjacent poles and from main circuits to auxiliary circuits per Publications EN 60950 and VDE 0805.
 Resistance, Impedance Values from Line to Load Terminal - based on Series Trip Circuit Breaker.



| CURRENT (AMPS) | TOLERANCE (%) |
|----------------|---------------|
| 0.10 - 5.0 | 15 |
| 5.1 - 20.0 | 25 |
| 20.1 - 50.0 | 35 |

Pulse Tolerance Curves



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

Mechanical

Endurance 10,000 ON-OFF operations @ 6 per minute; with rated Current and Voltage.
 Trip Free All B-Series Circuit Breakers will trip on overload, even when Handle 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.
 Number of Poles 1 - 6 poles at 30 Amps or less. 1 and 2 poles at 31 Amps thru 50 Amps.
 Internal Circuit Config. Series, (with or without auxiliary switch), Shunt and Relay with current or voltage trip coils, Dual Coil, Switch Only (with or without auxiliary switch).
 Weight Approximately 65 grams/pole. (Approximately 2.32 ounces/pole.)
 Standard Colors Housing- Black; Actuator - See Ordering Scheme.

Physical

Environmental

Designed and tested in accordance with requirements of specification MIL-PRF-55629 & MIL-STD-202 as follows:
 Shock Withstands 100 Gs, 6ms, sawtooth while carrying rated current per Method 213, Test Condition "I". Instantaneous and ultra-short curves tested @ 90% of rated current.
 Vibration Withstands 0.060" excursion from 10-55 Hz, and 10 Gs 55-500 Hz, at rated current per Method 204C, Test Condition A. Instantaneous and ultrashort curves tested at 90% of rated current.
 Moisture Resistance Method 106D, i.e., ten 24-hour cycles @ + 25°C to +65°C, 80-98% RH.
 Salt Spray Method 101, Condition A (90-95% RH @ 5% NaCl Solution, 96 hrs).
 Thermal Shock Method 107D, Condition A (Five cycles @ -55°C to +25°C to +85°C to +25°C).
 Operating Temperature -40° C to +85° C

Electrical Tables

Table A: Lists UL Recognized & CSA Certified configurations and performance capabilities as a Component Supplementary Protector.

| B-SERIES TABLE A: COMPONENT SUPPLEMENTARY PROTECTORS | | | | | | | | | | |
|--|-------------|-----------|----------------|----------------|----------------------|-------------------------------|---------------------|-------------------|---------------|--------------------|
| CIRCUIT CONFIGURATION | VOLTAGE | | | CURRENT RATING | | SHORT CIRCUIT CAPACITY (AMPS) | | APPLICATION CODES | | CONSTRUCTION NOTES |
| | MAX. RATING | FREQUENCY | PHASE | FULL LOAD AMPS | GENERAL PURPOSE AMPS | UL/CSA | | UL | CSA | |
| | | | | | | WITH BACKUP FUSE | WITHOUT BACKUP FUSE | | | |
| SERIES | 65 | DC | -- | 31 - 50 | -- | -- | 7500 | TC1,2, OL1,U1 | TC1,2, OL1,U1 | |
| | 80 | DC | -- | 0.02 - 30 | -- | -- | 7500 | TC1,2, OL1,U1 | TC1,2, OL1,U1 | |
| | | | | --- | 31 - 50 | -- | 7500 | TC1,2, OL0,U1 | TC1,2, OL0,U1 | |
| | 125 | 50 / 60 | 1 | 1 - 50 | -- | -- | 2000 | TC1, OL1,U2 | TC1, OL1,U2 | |
| | 125 | 50 / 60 | 1 ⁴ | 1 - 50 | -- | -- | 1000 | TC1, OL1,U2 | TC3, OL1,U3 | |
| | 125 / 250 | 50 / 60 | 1 ³ | 0.02 - 30 | -- | -- | 3000 | TC1,2, OL1,U1 | TC1,2, OL1,U1 | |
| | 250 | 50 / 60 | 1 | 0.02 - 30 | -- | -- | 1500 | TC1, OL0,U2 | TC1, OL0,U2 | Single Pole Break |
| | | | | 0.02 - 30 | -- | -- | 3000 | TC1, OL1,U2 | TC1, OL1,U2 | Two Pole Break |
| | | | | --- | 31 - 50 | -- | 3000 | TC1,2, OL0,U1 | TC1,2, OL0,U1 | |
| | | | 1 ⁴ | 1 - 50 | -- | 1000 | TC1, OL1,U2 | TC3, OL1,U3 | | |
| 3 | | | 0.02 - 30 | -- | 5000 ² | -- | TC1,2, OL1,C1 | TC1,2, OL1,C1 | | |
| | | | 31 - 50 | -- | 2000 ¹ | -- | TC1,2, OL1,C1 | TC1,2, OL1,C1 | | |
| 277 | 50 / 60 | 1 | 0.02 - 30 | -- | 5000 ¹ | -- | TC1,2, OL1,C1 | TC1,2, OL1,C1 | | |
| DUAL COIL | 65 | DC | -- | 0.02 - 50 | -- | -- | 7500 | TC1,2, OL1,U1 | TC1,2, OL1,U1 | |
| | 80 | DC | -- | 0.02 - 30 | -- | -- | 7500 | TC1,2, OL1,U1 | TC1,2, OL1,U1 | |
| | | | | --- | 31 - 50 | -- | 7500 | TC1,2, OL0,U1 | TC1,2, OL0,U1 | |
| | 125 | 50 / 60 | 1 | 1 - 50 | -- | -- | 2000 | TC1, OL1,U2 | TC1, OL1,U2 | |
| | 125 / 250 | 50 / 60 | 1 ³ | 0.02 - 30 | -- | -- | 3000 | TC1,2, OL1,U1 | TC1,2, OL1,U1 | |
| | 250 | 50 / 60 | 1 | 0.02 - 30 | -- | -- | 1500 | TC1, OL0,U2 | TC1, OL0,U2 | Single Pole Break |
| | | | | 0.02 - 30 | -- | -- | 3000 | TC1, OL1,U2 | TC1, OL1,U2 | Two Pole Break |
| | | | | --- | 31 - 50 | -- | 3000 | TC1,2, OL0,U1 | TC1,2, OL0,U1 | |
| | | | 1 ⁴ | 1 - 50 | -- | 1000 | TC1, OL1,U2 | TC3, OL1,U3 | | |
| | | | 3 | 0.02 - 30 | -- | 5000 ² | -- | TC1,2, OL1,C1 | TC1,2, OL1,C1 | |
| | | | 31 - 50 | -- | 2000 ¹ | -- | TC1,2, OL1,C1 | TC1,2, OL1,C1 | | |
| 277 | 50 / 60 | 1 | 0.02 - 30 | -- | 5000 ¹ | -- | TC1,2, OL1,U1 | TC1,2, OL1,U1 | | |
| SHUNT | 80 | DC | -- | 0.02 - 30 | -- | -- | 7500 | TC1,2, OL1,U1 | TC1,2, OL1,U1 | |
| | 125 / 250 | 50 / 60 | 1 ³ | 0.02 - 30 | -- | -- | 3000 | TC1,2, OL1,U1 | TC1,2, OL1,U1 | |
| | | | | 0.02 - 30 | -- | -- | 3000 | TC1,2, OL1,U1 | TC1,2, OL1,U1 | |
| | 250 | 50 / 60 | 3 | 0.02 - 30 | -- | 5000 ² | -- | TC1,2, OL1,C1 | TC1,2, OL1,C1 | |
| | | | | 0.02 - 30 | -- | 5000 ¹ | -- | TC1,2, OL1,C1 | TC1,2, OL1,C1 | |
| 277 | 50 / 60 | 1 | 0.02 - 30 | -- | 5000 ¹ | -- | TC1,2, OL1,C1 | TC1,2, OL1,C1 | | |
| RELAY | 80 | DC | -- | 0.02 - 30 | -- | -- | 7500 | TC1,2, OL1,U1 | TC1,2, OL1,U1 | |
| | 125 / 250 | 50 / 60 | 1 ³ | 0.02 - 30 | -- | -- | 3000 | TC1,2, OL1,U1 | TC1,2, OL1,U1 | |
| | | | | 0.02 - 30 | -- | -- | 3000 | TC1,2, OL1,U1 | TC1,2, OL1,U1 | |
| | 250 | 50 / 60 | 3 | 0.02 - 30 | -- | 5000 ² | -- | TC1,2, OL1,C1 | TC1,2, OL1,C1 | |
| 0.02 - 30 | | | | -- | 5000 ¹ | -- | TC1,2, OL1,C1 | TC1,2, OL1,C1 | | |
| SWITCH ONLY | 65 | DC | -- | 0.02 - 50 | -- | -- | -- | -- | -- | |
| | 80 | DC | -- | 0.02 - 30 | -- | -- | -- | -- | -- | |
| | | | | 0.02 - 30 | -- | -- | -- | -- | -- | |
| | 250 | 50 / 60 | 1 | --- | 31 - 50 | -- | -- | -- | -- | |
| 0.02 - 50 | | | | -- | -- | -- | -- | -- | | |
| 277 | 50 / 60 | 1 | 0.02 - 30 | 31 - 50 | -- | -- | -- | -- | | |

Notes:

- 1 Requires branch circuit backup with a UL LISTED Type K5 or RK5 fuse (15A minimum) at no more than 4 times the rating of the protector.
- 2 Same as note 1, except that backup fuse is limited to 80A maximum.
- 3 2 pole protector required (with one pole per power line) for: 250/125 VAC, 125/250 VAC and 208Y/120 VAC Power Systems. 1 pole protector required for : 125 VAC, 1Ø Power System.
- 4 Satisfies the requirements of clause 11.2.8.2.5 of CSA STD C22.2 No 100 for the use of supplementary protectors with portable generators.

Electrical Tables

Table B: Lists UL Recognized, CSA, VDE & TUV Certified configurations & performance capabilities as a Component Supplementary Protector.

| B-SERIES TABLE B: COMPONENT SUPPLEMENTARY PROTECTORS | | | | | | | | | | | | | | | | |
|--|-------------|-----------|-------------------|----------------|-----------------------------------|-------------------------------|---------------------|------------------------|---------------------------|------------------------|---------------------------|-------------------|---------------|--------------------|---------------|--|
| CIRCUIT CONFIGURATION | VOLTAGE | | | CURRENT RATING | | SHORT CIRCUIT CAPACITY (AMPS) | | | | | | APPLICATION CODES | | CONSTRUCTION NOTES | | |
| | MAX. RATING | FREQUENCY | PHASE | FULL LOAD AMPS | GENERAL PURPOSE AMPS ¹ | UL/CSA | | VDE | | TUV | | UL | CSA | | | |
| | | | | | | WITH BACKUP FUSE | WITHOUT BACKUP FUSE | (Inc) WITH BACKUP FUSE | (Inc) WITHOUT BACKUP FUSE | (Inc) WITH BACKUP FUSE | (Inc) WITHOUT BACKUP FUSE | | | | | |
| SERIES | 80 | DC | --- | 0.10 - 30 | — | — | 7500 | 3000 | 1500 | 3000 | 1500 | TC1,2, OL1,U1 | TC1,2, OL1,U1 | | | |
| | | | | 31 - 50 | 31 - 50 | — | 7500 | 3000 | 1500 | 3000 | 1500 | TC1,2, OL0,U1 | TC1,2, OL0,U1 | | | |
| | | | | 0.10 - 30 | — | — | 7500 | 3000 | 1500 | 3000 | 1500 | TC1,2, OL1,U1 | TC1,2, OL1,U1 | | | |
| | | | | 31 - 32 | — | — | 7500 | 3000 | 1500 | 3000 | 1500 | TC1,2, OL1,U1 | TC1,2, OL1,U1 | | | |
| | | | | 31 - 50 | 31 - 50 | — | 7500 | 3000 | 1500 | 3000 | 1500 | TC1,2, OL0,U1 | TC1,2, OL0,U1 | | | |
| | 250 | 50 / 60 | 1 | 0.10 - 30 | — | — | 3000 | 3000 | 1500 | 5000 | 1500 | TC1,2, OL1,U1 | TC1,2, OL1,U1 | | | |
| | | | | 31 - 50 | 31 - 50 | — | 3000 | — | — | 5000 | 1500 | TC1,2, OL0,U1 | TC1,2, OL0,U1 | | | |
| | | | | 31 - 32 | — | — | 3000 | 6000 | 1500 | 5000 | 1500 | TC1,2, OL1,U1 | TC1,2, OL1,U1 | | | |
| | | | | 0.10 - 30 | — | — | 1500 | 3000 | 1500 | 5000 | 1500 | TC1, OL0,U2 | TC1, OL0,U2 | Single Pole Break | | |
| | | | | 0.10 - 30 | — | — | 3000 | 3000 | 1500 | 5000 | 1500 | TC1, OL1,U2 | TC1, OL1,U2 | Two Pole Break | | |
| | | | | 0.10 - 30 | — | — | 5000 ³ | — | 3000 | 1500 | 3000 | 1500 | TC1,2, OL1,C1 | TC1,2, OL1,C1 | | |
| | | | | 3 | 0.10 - 30 | — | — | 1000 | 3000 | 1500 | 3000 | 1500 | TC1,2, OL1,C1 | TC1,2, OL1,C1 | | |
| 415 | 50 / 60 | 3 | 0.10 - 30 | — | — | 1000 | 3000 | 1500 | 3000 | 1500 | TC1,2, OL1,C1 | TC1,2, OL1,C1 | | | | |
| DUAL COIL | 80 | DC | --- | 0.10 - 30 | — | — | 7500 | 3000 | 1500 | 3000 | 1500 | TC1,2, OL1,U1 | TC1,2, OL1,U1 | | | |
| | | | | 0.10 - 30 | — | — | 3000 | 3000 | 1500 | 5000 | 1500 | TC1,2, OL1,U1 | TC1,2, OL1,U1 | | | |
| | 250 | 50 / 60 | 1 | 0.10 - 30 | — | — | 3000 | 3000 | 1500 | 5000 | 1500 | TC1,2, OL0,U1 | TC1,2, OL0,U1 | | | |
| | | | | 30 - 50 | 31 - 50 | — | 3000 | — | — | 5000 | 1500 | TC1,2, OL0,U1 | TC1,2, OL0,U1 | | | |
| | | | | 0.10 - 30 | — | — | 5000 ³ | — | 3000 | 1500 | 3000 | 1500 | TC1,2, OL1,C1 | TC1,2, OL1,C1 | | |
| 3 | 31 - 50 | — | 2000 ² | — | — | — | — | 3000 | 1500 | TC1,2, OL1,C1 | TC1,2, OL1,C1 | | | | | |
| | | | 0.10 - 30 | — | — | 7500 | 3000 | 1500 | 3000 | 1500 | TC1,2, OL1,U1 | TC1,2, OL1,U1 | | | | |
| SHUNT | 80 | DC | --- | 0.10 - 30 | — | — | 7500 | 3000 | 1500 | 3000 | 1500 | TC1,2, OL1,U1 | TC1,2, OL1,U1 | | | |
| | | | | 0.10 - 30 | — | — | 7500 | 3000 | 1500 | 3000 | 1500 | TC1,2, OL1,U1 | TC1,2, OL1,U1 | | | |
| | 250 | 50 / 60 | 1 | 0.10 - 30 | — | — | 3000 | 3000 | 1500 | 5000 | 1500 | TC1,2, OL1,U1 | TC1,2, OL1,U1 | | | |
| | | | | 30 - 50 | 31 - 50 | — | 3000 | — | — | 5000 | 1500 | TC1,2, OL0,U1 | TC1,2, OL0,U1 | | | |
| | | | | 0.10 - 30 | — | — | 5000 ³ | — | 3000 | 1500 | 3000 | 1500 | TC1,2, OL1,C1 | TC1,2, OL1,C1 | | |
| | | | | 3 | 0.10 - 30 | — | — | 2000 ² | — | — | — | 3000 | 1500 | TC1,2, OL1,C1 | TC1,2, OL1,C1 | |
| | | | | 3 | 31 - 50 | — | — | — | — | — | 3000 | 1500 | TC1,2, OL1,C1 | TC1,2, OL1,C1 | | |

Notes:
 1 General Purpose Ratings for UL/CSA Only.
 2 Requires branch circuit backup with a UL LISTED Type K5 or RK5 fuse (15A minimum) at no more than 4 times the rating of the protector.
 3 Same as note 1, except that backup fuse is limited to 80 A maximum.

Table C: Lists UL Recognized, CSA Certified configurations and performance capabilities as Protectors, Supplementary for Marine Electrical and Fuel Systems (CCN/Guide PEQZ2, File E75596). Ignition Protected per UL 1500. UL Classified Small Craft Electrical Devices, Marine in accordance with ISO 8846 (CCN/Guide UZMK, File MQ1515) as Marine Supplementary Protectors.

| B-SERIES TABLE C: UL1500 (Marine Ignition Protected) | | | | | | | |
|--|-----------------|-----------|----------------|----------------|-------------------------------|-------------------|--------------|
| CIRCUIT CONFIGURATION | VOLTAGE | | | CURRENT RATING | SHORT CIRCUIT CAPACITY (AMPS) | APPLICATION CODES | |
| | MAX. RATING | FREQUENCY | PHASE | | | UL | CSA |
| SERIES | 14 ¹ | DC | — | 0.02 - 50 | 5000 | TC1,2,OL1,U1 | TC1,2,OL1,U1 |
| | 32 ¹ | DC | — | 0.02 - 50 | 5000 | TC1,2,OL1,U2 | TC1,2,OL1,U2 |
| | 65 | DC | — | 0.02 - 50 | 3000 | TC1,2,OL1,U1 | TC1,2,OL1,U1 |
| | 125 / 250 | 50 / 60 | 1 ² | 0.02 - 50 | 1500 | TC1,2,OL1,U1 | TC1,2,OL1,U1 |
| | 250 | 50 / 60 | 1 | 0.02 - 30 | 1000 | TC1,2,OL1,U1 | TC1,2,OL1,U1 |

Notes:
 1 Available with special catalog number only (consult factory).
 2 2 pole protector required (with one pole per power line) for: 250/125 VAC, 125/250 VAC and 208Y/120 VAC Power Systems. 1 pole protector required for : 125 VAC, 1Ø Power System.

Table D: Lists UL Listed configurations and performance capabilities as Circuit Breakers for use in Communications Equipment (CCN/ Guide DITT, File E189195), under UL489A

| B-SERIES TABLE D: UL489A (COMMUNICATIONS EQUIPMENT) | | | | |
|---|-------------|-----------|----------------------|------------------------------|
| CIRCUIT CONFIGURATION | VOLTAGE | | CURRENT RATING | INTERRUPTING CAPACITY (AMPS) |
| | MAX. RATING | FREQUENCY | GENERAL PURPOSE AMPS | WITHOUT BACKUP FUSE |
| SERIES | 80 | DC | 0.10 - 50 | 5000 |
| | 80 | DC | 60 - 90 ¹ | 5000 |

Notes:
¹ Parallel Pole Construction

Table E: Lists UL Listed (489) configuration and performance capabilities as a Molded Case Circuit Breaker.

| B SERIES TABLE E : UL489 LISTED BRANCH CIRCUIT BREAKERS | | | | | | |
|---|-------------|-----------|-------|----------------|------------------------------|---|
| CIRCUIT CONFIGURATION | VOLTAGE | | | CURRENT RATING | INTERRUPTING CAPACITY (AMPS) | CONSTRUCTION NOTES |
| | MAX. RATING | FREQUENCY | PHASE | FULL LOAD AMPS | WITHOUT BACKUP FUSE | |
| | | | | | | |
| SERIES | 120 | 50 / 60 | 1 | 0.10 - 30 | 5,000 | 1 Pole |
| | 120 / 240 | 50 / 60 | 1 | 0.10 - 30 | 5,000 | 2 Poles |
| | 120 / 240 | 50 / 60 | 1 | 0.10 - 30 | 5,000 | 2 or 3 Poles (1 Pole of a 3 Pole Unit is for Neutral Break) |
| SHUNT TRIP DUAL COIL | 120 | 50 / 60 | 1 | 0.10 - 30 | 5,000 | 1 Pole |
| | 120 / 240 | 50 / 60 | 1 | 0.10 - 30 | 5,000 | 2 Poles |
| | 120 / 240 | 50 / 60 | 1 | 0.10 - 30 | 5,000 | 2 or 3 Poles (1 Pole of a 3 Pole Unit is for Neutral Break) |

Agency Certifications

UL Recognized

UL Standard 1077



Component Recognition Program as Protectors Supplementary (Guide CCN/QVNU2, File E75596)

CSA Accepted



Component Supplementary Protector under Class 3215 30, File 047848 0 000 CSA Standard C22.2 No. 235

UL Standard 508



Switches, Industrial Control (Guide CCN/NRNT2, File E148683)

TUV Certified



EN60934, under License No. R72103448

UL Standard 1500



Protectors, Supplementary for Marine Electrical & Fuel Systems (Guide PEQZ2, File E75596) Ignition Protection

VDE Certified



EN60934, VDE 0642 under File No. 10537

UL Listed

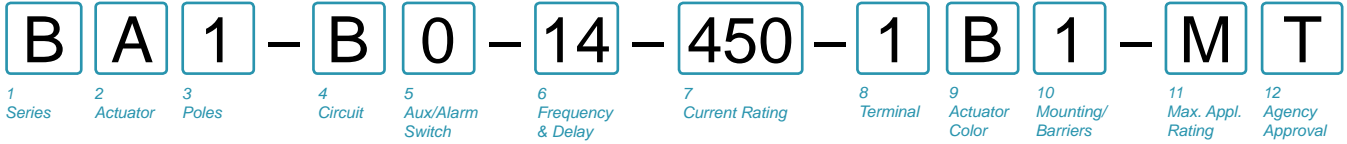
UL Standard 489



Circuit Breakers, Molded Case, (Guide DIVQ, File E129899)

UL Standard 489A

Communications Equipment (Guide CCN/DITT, File E189195)



1 SERIES
B

- 2 ACTUATOR** ¹
- A Handle, one per pole
 - B Handle, one per multipole unit
 - S Mid-Trip Handle, one per pole
 - T Mid-Trip Handle, one per pole & Alarm Switch

- 3 POLES** ²
- 1 One
 - 2 Two
 - 3 Three
 - 4 Four

- 4 CIRCUIT**
- B Series Trip (Current)

- 5 AUXILIARY / ALARM SWITCH** ²
- 0 without Aux Switch
 - 1 S.P.D.T., 0.093 Q.C. Term.
 - 2 S.P.D.T., 0.110 Q.C. Term.
 - 3 S.P.D.T., 0.110 Solder Lug
 - 7 S.P.S.T., 0.110 Q.C. Term. (Gold Contacts)
 - 8 S.P.S.T., 0.187 Q.C. Term.
 - 9 S.P.D.T., 0.187 Q.C. Term.

- 6 FREQUENCY & DELAY** ⁴
- 11 DC Ultra Short
 - 12 DC Short
 - 14 DC Medium
 - 16 DC Long
 - 52 DC, Short, Hi-Inrush
 - 54 DC, Medium, Hi-Inrush
 - 56 DC, Long, Hi-Inrush

7 CURRENT RATING (AMPERES)

| CODE | AMPERES | | | | | | |
|------|---------|-----|-------|-----|--------|-----|--------|
| 210 | 0.100 | 285 | 0.850 | 455 | 5.500 | 613 | 13.000 |
| 215 | 0.150 | 290 | 0.900 | 460 | 6.000 | 614 | 14.000 |
| 220 | 0.200 | 295 | 0.950 | 465 | 6.500 | 615 | 15.000 |
| 225 | 0.250 | 410 | 1.000 | 470 | 7.000 | 616 | 16.000 |
| 230 | 0.300 | 512 | 1.250 | 475 | 7.500 | 617 | 17.000 |
| 235 | 0.350 | 415 | 1.500 | 480 | 8.000 | 618 | 18.000 |
| 240 | 0.400 | 517 | 1.750 | 485 | 8.500 | 620 | 20.000 |
| 245 | 0.450 | 420 | 2.000 | 490 | 9.000 | 622 | 22.000 |
| 250 | 0.500 | 522 | 2.250 | 495 | 9.500 | 624 | 24.000 |
| 255 | 0.550 | 527 | 2.750 | 610 | 10.000 | 625 | 25.000 |
| 260 | 0.600 | 430 | 3.000 | 710 | 10.500 | 630 | 30.000 |
| 265 | 0.650 | 435 | 3.500 | 611 | 11.000 | 635 | 35.000 |
| 270 | 0.700 | 440 | 4.000 | 711 | 11.500 | 640 | 40.000 |
| 275 | 0.750 | 445 | 4.500 | 612 | 12.000 | 645 | 45.000 |
| 280 | 0.800 | 450 | 5.000 | 712 | 12.500 | 650 | 50.000 |

- 8 TERMINAL** ⁴
- 1⁵ Push-On 0.250 Tab (Q.C.)
 - 2 Screw 8-32 with upturned lugs
 - 3⁶ Screw 8-32 (Bus Type)
 - 4 Screw 10-32 with upturned lugs
 - 5⁶ Screw 10-32 (Bus Type)
 - 6 Screw 8-32 with upturned lugs & 30° bend
 - 7 Screw 8-32 (Bus Type) & 30° bend
 - 8 Screw 10-32 with upturned lugs & 30° bend
 - 9 Screw 10-32 (Bus Type) & 30° bend
 - B Screw M5 with upturned lugs & 30° bend
 - F Screw M5 with upturned lugs & 30° bend
 - G Screw M5 (Bus Type) & 30° bend
 - H Screw M5 (Bus Type)
 - J Screw M5 Back Connect
 - K Screw 10-32 Back Connect
 - M⁶ M6 Threaded Stud
 - N Screw M4 Back Connect
 - P⁷ Printed Circuit Board Terminals
 - Q⁸ Push-In Stud
 - Y Screw 8-32 Back Connect

9 ACTUATOR COLOR & LEGEND

| Actuator Color | ON-OFF | Dual | Legend Color |
|----------------|--------|------|--------------|
| White | B | 1 | Black |
| Black | D | 2 | White |
| Red | G | 3 | White |
| Green | J | 4 | White |
| Blue | L | 5 | White |
| Yellow | N | 6 | Black |
| Gray | Q | 7 | Black |
| Orange | S | 8 | Black |

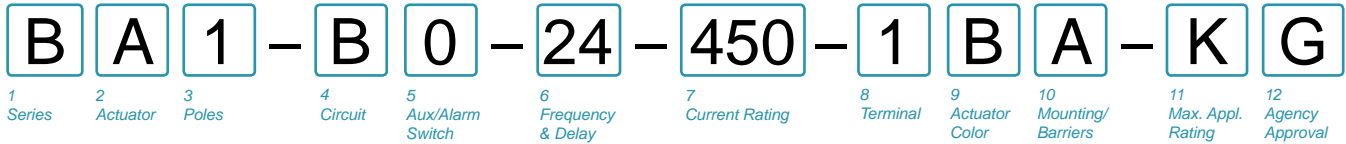
10 MOUNTING / BARRIERS

| | MOUNTING STYLE | BARRIERS |
|---|--|----------|
| | Threaded Insert, 2 per pole | |
| 1 | 6-32 x 0.195 inches | no |
| A | 6-32 x 0.195 inches (multi-pole units only) | yes |
| 2 | ISO M3 x 5mm | no |
| B | ISO M3 x 5mm | yes |
| | Rectangular Adapter Plate with mounting centers of 2.062 inches [52.37mm] and Threaded insert, 2 per pole | |
| 3 | 6-32 x 0.225 inches | no |
| C | 6-32 X 0.225 inches (multi-pole units only) | yes |
| 4 | ISO M3 x 6.5mm | no |
| D | ISO M3 x 6.5mm | yes |
| | Front panel Snap-In, 0.75" [19.05mm] wide bezel | |
| 5 | without Handleguard | no |
| 6 | without Handleguard (multipole only) | yes |
| | Front panel Snap-In, 0.96" wide bezel | |
| 7 | without Handleguard, 1-pole 0.96" wide; multipole units have .105" bezel overhang on all sides | no |
| 8 | without Handleguard, 1-pole 0.96" wide; (multipole only) .105" bezel overhang on all sides | yes |

- 11 MAXIMUM APPLICATION RATING**
- M 80 DC

- 12 AGENCY APPROVAL**
- T UL489A Listed
 - K UL489A Listed, VDE Certified
 - J UL489A Listed, TUV Certified

- Notes:
- 1 Actuator Code:
 - A: Handle tie pin spacer(s) and retainers provided unassembled with multi-pole units.
 - S: Handle moves to mid-position only upon electrical trip of the breaker.
 - T: Handle moves to mid-position and alarm switch activates only upon electrical trip of the breaker.
 - 2 On multi-pole breakers, one auxiliary switch is supplied, mounted in the extreme right pole.
 - 3 VDE Certification available with single pole breakers only. UL489A Listing available with one and two pole breakers.
 - 4 Screw Terminals are recommended on ratings greater than 20 amps. Ratings over 30 amps are only available with Terminal Codes 5, 9, G, H, J, K, M and Q.
 - 5 Terminal Code 1 (Push-On) available up to 25 amps with TUV or VDE Certification and 30 amps with UL489A Listing, but is not recommended over 20 amps.
 - 6 Terminal Codes 3, 5 and H (Bus Type) with TUV or VDE, are supplied with Lock Washers, and Terminal Code M (M6 Threaded Stud) with TUV or VDE is supplied with Lock and Flat Washers. These breakers are only TUV or VDE Certified when the washers are used.
 - 7 Single pole breakers with Terminal Code P (Printed Circuit Board) are available up to 30 amps with VDE Certification and 50 amps with UL489A Listing.
 - 8 Terminal Code Q not available with VDE approvals.



1 SERIES
B

2 ACTUATOR ¹
A Handle, one per pole
B Handle, one per multipole unit
S Mid-Trip Handle, one per pole
T Mid-Trip Handle, one per pole & Alarm Switch

3 POLES ²
1 One **2** Two **3** ³ Three

4 CIRCUIT
B Series Trip (Current)

5 AUXILIARY / ALARM SWITCH ⁴
0 without Aux Switch **3** S.P.D.T., 0.110 Solder Lug
1 S.P.D.T., 0.093 Q.C. Term. **8** S.P.S.T., 0.187 Q.C. Term.
2 S.P.D.T., 0.110 Q.C. Term. **9** S.P.D.T., 0.187 Q.C. Term.

6 FREQUENCY & DELAY
21 AC Ultra Short **42** AC, Short, Hi-Inrush
22 AC Short **44** AC, Medium, Hi-Inrush
24 AC Medium **46** AC, Long, Hi-Inrush
26 AC Long

7 CURRENT RATING (AMPERES)

| CODE | AMPERES | | | | |
|------|---------|-----|-------|-----|--------|
| 210 | 0.100 | 280 | 0.800 | 445 | 4.500 |
| 215 | 0.150 | 285 | 0.850 | 450 | 5.000 |
| 220 | 0.200 | 290 | 0.900 | 455 | 5.500 |
| 225 | 0.250 | 295 | 0.950 | 460 | 6.000 |
| 230 | 0.300 | 410 | 1.000 | 465 | 6.500 |
| 235 | 0.350 | 512 | 1.250 | 470 | 7.000 |
| 240 | 0.400 | 415 | 1.500 | 475 | 7.500 |
| 245 | 0.450 | 517 | 1.750 | 480 | 8.000 |
| 250 | 0.500 | 420 | 2.000 | 485 | 8.500 |
| 255 | 0.550 | 522 | 2.250 | 490 | 9.000 |
| 260 | 0.600 | 527 | 2.750 | 495 | 9.500 |
| 265 | 0.650 | 430 | 3.000 | 610 | 10.000 |
| 270 | 0.700 | 435 | 3.500 | 710 | 10.500 |
| 275 | 0.750 | 440 | 4.000 | 611 | 11.000 |
| | | | | 630 | 30.000 |

8 TERMINAL ⁴

| | | | |
|----------|---|----------|--|
| 1 | Push-On 0.250 Tab (Q.C.) | A | Load Terminal #8 Screw with QC Combination (Special Catalog #) |
| 2 | Screw 8-32 with upturned lugs | B | Screw M5 with upturned lugs |
| 3 | Screw 8-32 (Bus Type) | | & 30° bend |
| 4 | Screw 10-32 with upturned lugs | F | Screw M5 with upturned lugs |
| 5 | Screw 10-32 (Bus Type) | | & 30° bend |
| 6 | Screw 8-32 with upturned lugs & 30° bend | G | Screw M5 (Bus Type) & 30° bend |
| 7 | Screw 8-32 (Bus Type) & 30° bend | H | Screw M5 (Bus Type) |
| 8 | Screw 10-32 with upturned lugs & 30° bend | J | Screw M5 Back Connect |
| 9 | Screw 10-32 (Bus Type) & 30° bend | K | Screw 10-32 Back Connect |
| | | M | M6 Threaded Stud |
| | | N | Screw M4 Back Connect |
| | | Q | Push-In Stud |
| | | Y | Screw 8-32 Back Connect |

9 ACTUATOR COLOR & LEGEND ⁶

| Actuator Color | ON-OFF | Dual | Legend Color |
|----------------|----------|----------|--------------|
| White | B | 1 | Black |
| Black | D | 2 | White |
| Red | G | 3 | White |
| Green | J | 4 | White |
| Blue | L | 5 | White |
| Yellow | N | 6 | Black |
| Gray | Q | 7 | Black |
| Orange | S | 8 | Black |

10 MOUNTING / BARRIERS

| | MOUNTING STYLE | BARRIERS |
|----------|---|----------|
| | Threaded Insert, 2 per pole | |
| A | 6-32 x 0.195 inches (multi-pole units only) | yes |
| B | ISO M3 x 5mm | yes |
| | Rectangular Adapter Plate with mounting centers of 2.062 inches [52.37mm] and Threaded insert, 2 per pole ⁷ | |
| C | 6-32 X 0.225 inches (multi-pole units only) | yes |
| D | ISO M3 x 6.5mm | yes |
| 6 | Front panel Snap-In, 0.75" [19.05mm] wide bezel without Handguard (multipole only) | yes |
| 8 | Front panel Snap-In, 0.96" wide bezel without Handguard, 1-pole 0.96" wide; (multipole only) .105" bezel overhang on all sides | yes |

11 MAXIMUM APPLICATION RATING
C ⁸ 120/240VAC
K 120VAC

12 AGENCY APPROVAL
G UL489 Listed
3 UL489 Listed, TUV Certified

- Notes:
- Actuator Code:
 A: Handle tie pin spacer(s) and retainers provided un-assembled with multi-pole units.
 B: Handle location as viewed from front of breaker:
 2 pole - left pole 3 pole - center pole
 S: Handle moves to mid-position only upon electrical trip of the breaker. Available with circuit codes B, C, D, E, F, G, H and K.
 T: Handle moves to mid-position and alarm switch activates only upon electrical trip of the breaker. Available with circuit codes B & C.
 - All poles must be same polarity.
 - 3 pole units available only when 1 of 3 poles is neutral.
 - Auxiliary/Alarm Switch circuit must be same polarity as the main circuit. On multi-pole breakers, one auxiliary switch is supplied, mounted in the extreme right pole.
 - Screw Terminals are recommended on ratings greater than 20 amps.
 - Standard actuator colors are black and white.
 - Adapter plate with mounting centers of 2.082 inches. Available with Actuator Codes A, S and T.
 - Voltage Rating available with 2 and 3-pole breakers only.
 - Barriers supplied on multi-pole units only.

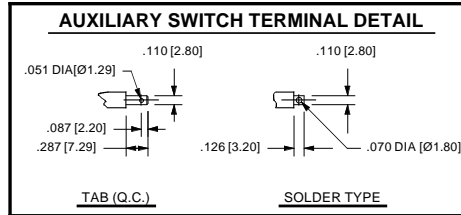
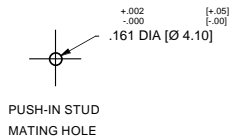
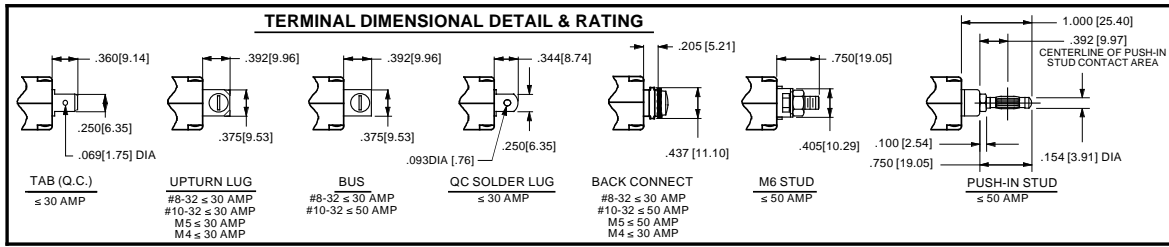
Circuit & Terminal Diagrams: in. [mm]

| | CIRCUIT SCHEMATIC | | CIRCUIT CODE | SWITCH CODE | CIRCUIT SCHEMATIC | | CIRCUIT CODE | AUX. SWITCH CODE |
|--|--|-----|--------------|-------------|---|-----|--------------|------------------|
| | ANSI | IEC | | | ANSI | IEC | | |
| <p>SERIES TRIP (2 TERM.S.)</p> | <p>SWITCH ONLY (NO COIL)</p> | | A | O | <p>SERIES TRIP</p> | | B | O |
| <p>SERIES TRIP W AUX SWITCH (5 TERM.S.)</p> | <p>SWITCH ONLY (NO COIL) WITH AUXILIARY SWITCH</p> | | A | 2 3 4 | <p>SERIES TRIP WITH AUXILIARY / ALARM SWITCH</p> | | B | 2 3 4 |
| <p>SHUNT TRIP (3 TERM.S.)</p> | <p>SHUNT TRIP</p> | | D E | 0 | <p>DUAL COIL; SERIES TRIP CURRENT COIL, SHUNT TRIP VOLTAGE COIL</p> | | H | 0 |
| <p>RELAY TRIP (4 TERM.S.)</p> | <p>RELAY TRIP</p> | | F G | 0 | <p>DUAL COIL; SERIES TRIP CURRENT COIL, RELAY TRIP VOLTAGE COIL</p> | | K | 0 |

| CIRCUIT BREAKER MODE | STANDARD C/B | | MID TRIP C/B | | MID TRIP C/B | |
|----------------------|-----------------|------------------|-----------------|-------------------|-----------------|-------------------------------------|
| | HANDLE POSITION | AUX. SWITCH MODE | HANDLE POSITION | ALARM SWITCH MODE | HANDLE POSITION | AUX. SWITCH MODE (w/o ALARM SWITCH) |
| OFF | | | | | | |
| ON | | | | | | |
| ELECTRICAL TRIP | | | | | | |

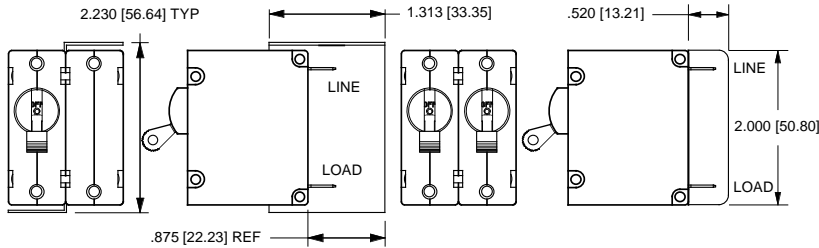
- Notes:
- All dimensions are in inches [millimeters].
 - Tolerance ±.020 [.51] unless otherwise specified.
 - Alarm Switch available with .110 x .020 Q.C. & Solder Lug Terminals Only.

Circuit & Terminal Diagrams: in. [mm]



**TABLE A
TIGHTENING TORQUE SPECIFICATIONS**

| THREAD SIZE | TORQUE |
|-----------------------------------|---------------------------|
| #6-32 & M3 MOUNTING HARDWARE | 7-9 IN-LBS [0.8-1.0 NM] |
| #8-32 & M4 THREAD TERMINAL SCREW | 12-15 IN-LBS [1.4-1.7 NM] |
| #10-32 & M5 THREAD TERMINAL SCREW | 15-20 IN-LBS [1.7-2.3 NM] |



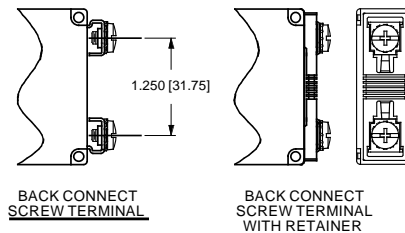
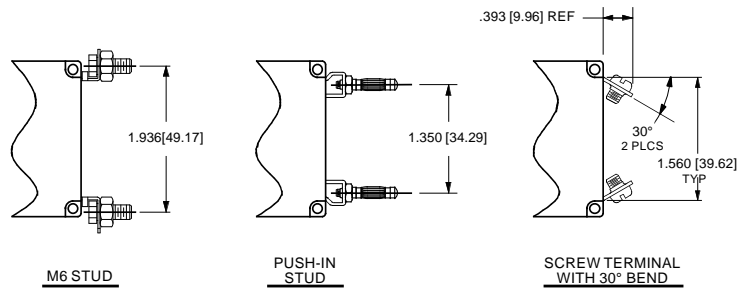
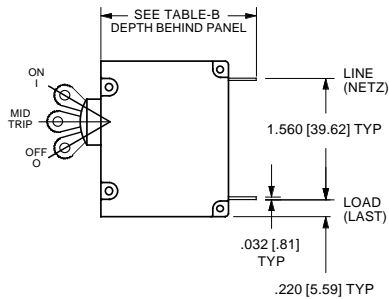
BARRIER FOR UL-489 MULTI-POLE BREAKERS

BARRIER FOR UL-RECOGNIZED MULTI-POLE BREAKERS

TABLE B

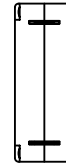
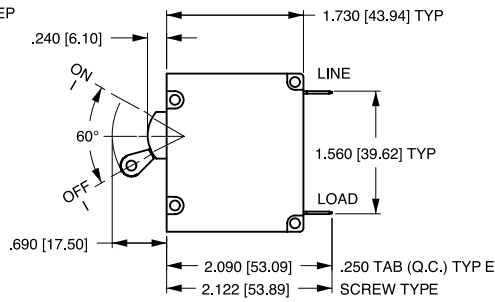
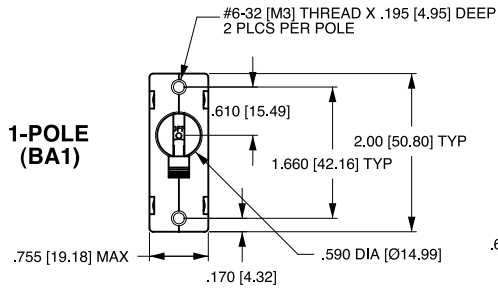
| TERMINAL DESCRIPTION | DEPTH BEHIND PANEL |
|--|--------------------|
| MAIN TAB (Q.C.) | 2.090 [53.09] |
| MAIN SCREW TYPE | 2.122 [53.90] |
| SHUNT, RELAY & DUAL COIL TAB (Q.C.) | 2.612 [66.35] |
| SHUNT, RELAY & DUAL COIL SCREW #8-32 W/UPTURNED LUGS | 2.644 [67.16] |
| AUX. SWITCH* TAB (Q.C.) .110 x .020 | 2.537 [64.44] |
| AUX. SWITCH* SOLDER TYPE | 2.348 [59.64] |

* AVAILABLE ON SERIES TRIP AND SWITCH ONLY CIRCUITS. WHEN CALLED FOR ON MULTI-POLE UNITS, ONLY ONE AUX. SWITCH IS NORMALLY SUPPLIED, AS SHOWN IN MULTI-POLE IDENTIFICATION SCHEME.

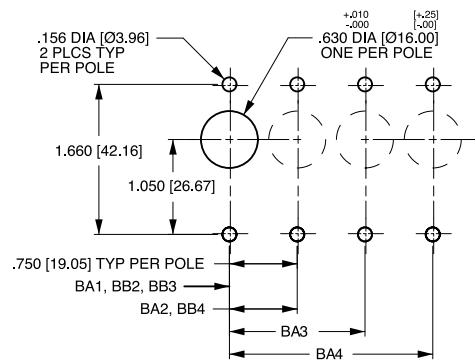
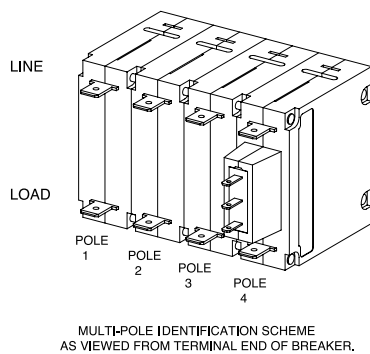
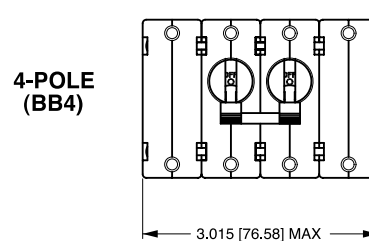
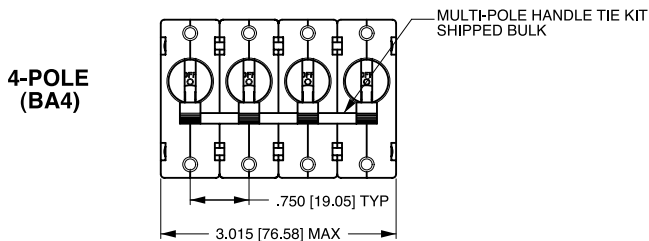
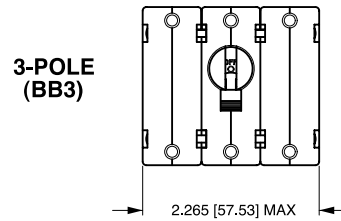
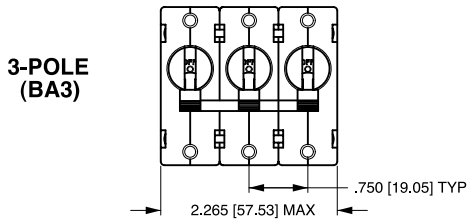
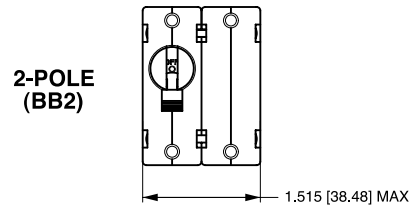
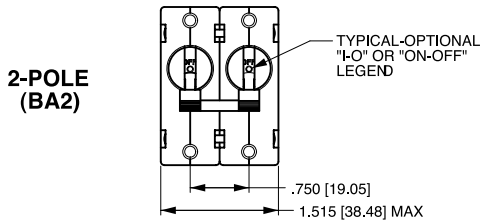


Notes:
 1 All dimensions are in inches [millimeters].
 2 Tolerance ±.020 [.51] unless otherwise specified.

Dimensional Specifications: in. [mm]

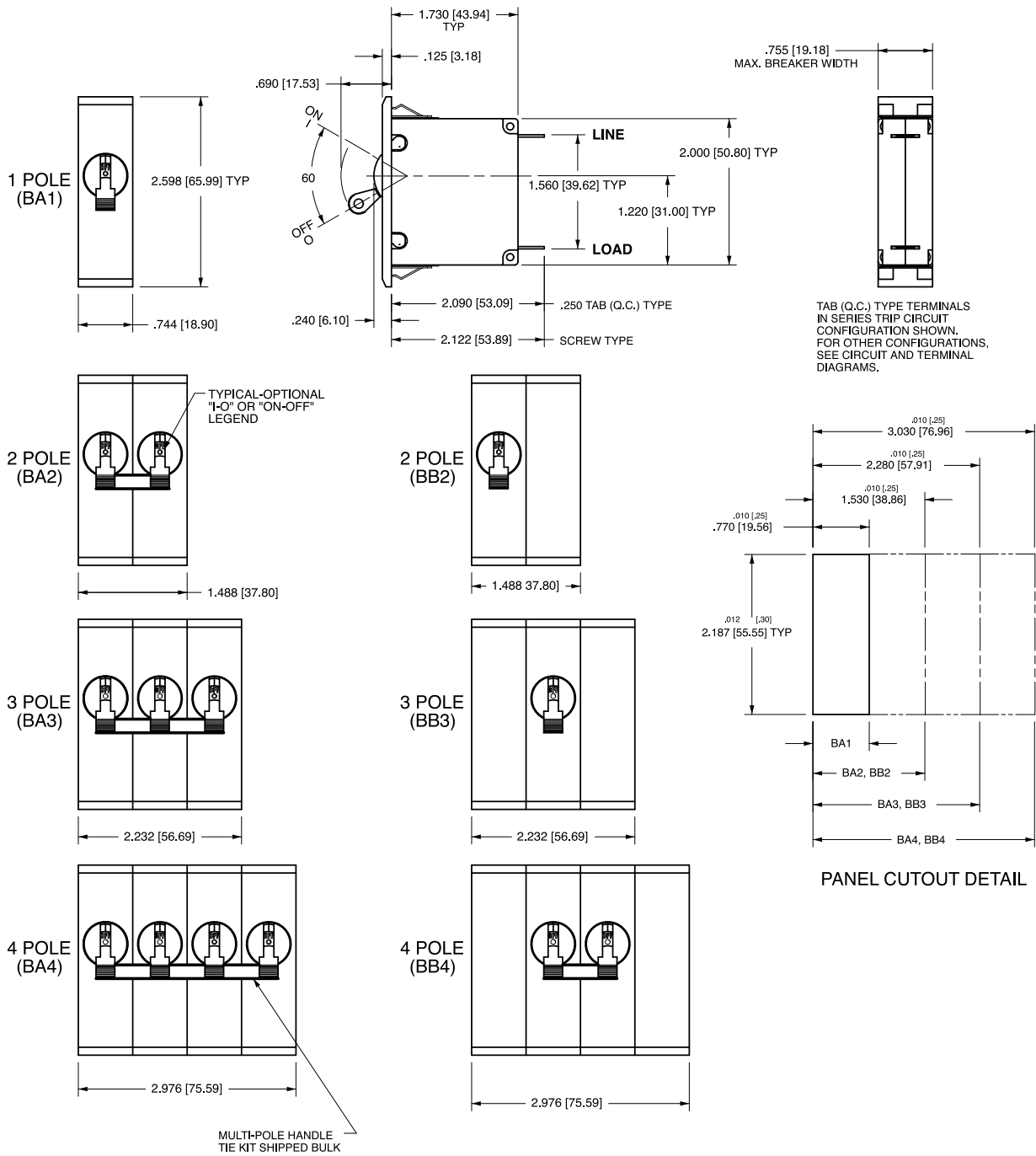


TAB (Q.C.) TYPE TERMINALS IN SERIES TRIP CIRCUIT CONFIGURATION SHOWN. FOR OTHER CONFIGURATIONS, SEE CIRCUIT AND TERMINAL DRAWINGS.



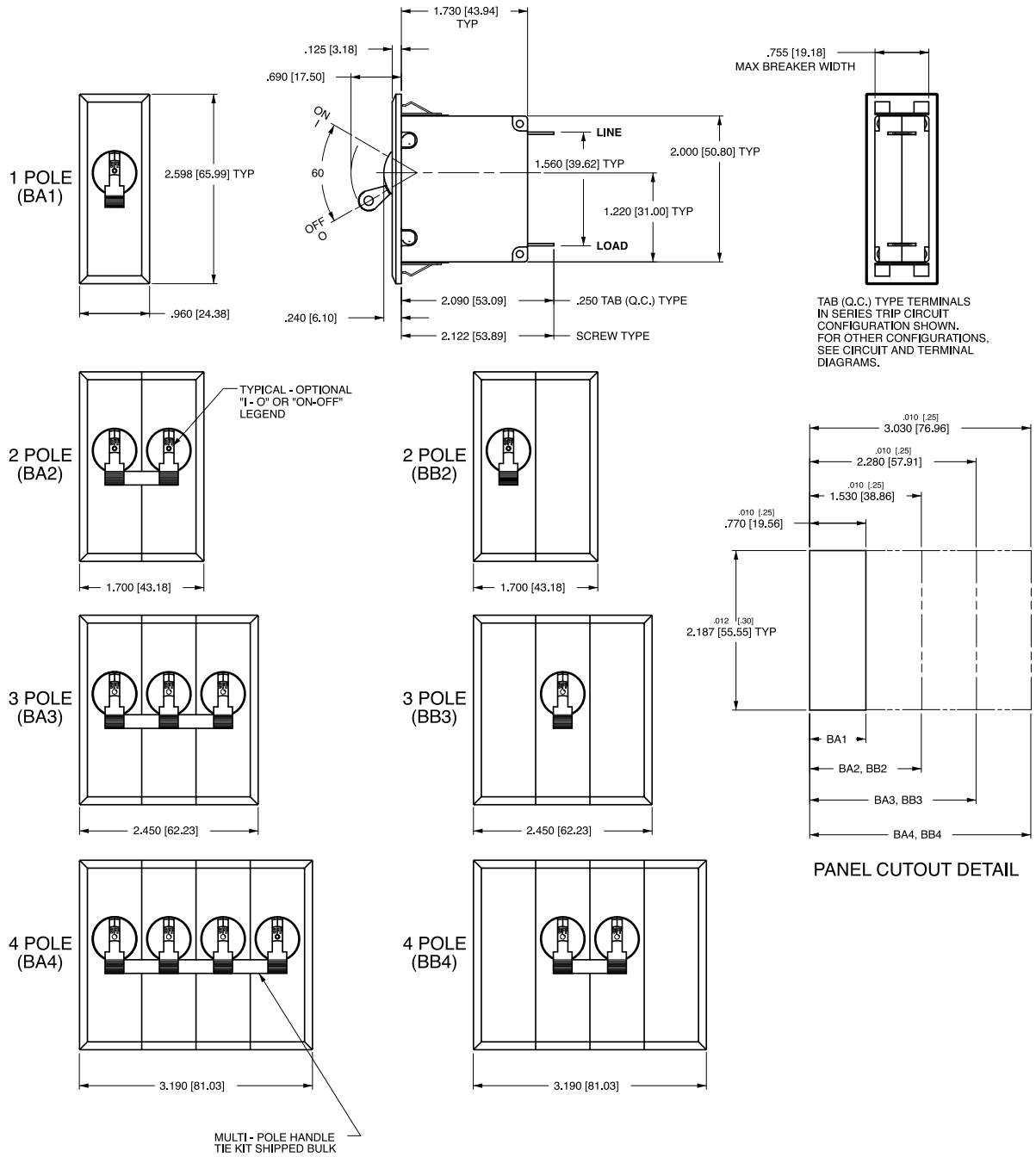
- Notes:
- 1 All dimensions are in inches [millimeters].
 - 2 Tolerance ± 0.20 [0.51] unless otherwise specified.

Dimensional Specifications: in. [mm]



- Notes:
 1 All dimensions are in inches [millimeters].
 2 Recommended panel thickness: .040 [1.02] to .100 [2.54].
 3 Tolerance ±.020 [.51] unless otherwise specified.

Dimensional Specifications: in. [mm]



Notes:

- 1 All dimensions are in inches [millimeters].
- 2 Recommended panel thickness: .040 [1.02] to .100 [2.54].
- 3 Tolerance ± 0.020 [.51] unless otherwise specified.

B F 1 - B 0 - 24 - 630 - 2 3 A - K G

1 Series 2 Actuator 3 Poles 4 Circuit 5 Aux/Alarm Switch 6 Frequency & Delay 7 Current Rating 8 Terminal 9 Actuator Color 10 Mounting/Barriers 11 Max. Appl. Rating 12 Agency Approval

1 SERIES

B

2 ACTUATOR

Two Color Visi-Rocker

- C** Indicate ON, vertical legend **J** Vertical legend
D Indicate ON, horizontal legend **K** Horizontal legend
F Indicate OFF, vertical legend
G Indicate OFF, horizontal legend

Single color

| ROCKER STYLE DESCRIPTIONS | | | |
|---------------------------|-----------------|-----------------|-----------------|
| | INDICATE "ON" | INDICATE "OFF" | SINGLE COLOR |
| VERTICAL STYLE | <p>CODE "C"</p> | <p>CODE "F"</p> | <p>CODE "J"</p> |
| | <p>CODE "D"</p> | <p>CODE "G"</p> | <p>CODE "K"</p> |
| HORIZONTAL STYLE | <p>CODE "D"</p> | <p>CODE "G"</p> | <p>CODE "K"</p> |

3 POLES 1,2

1 One **2** Two **3** Three

4 CIRCUIT

B Series Trip (Current)

5 AUXILIARY / ALARM SWITCH 4

- 0** without Aux Switch **7** S.P.S.T., 0.110 Q.C. Term.
1 S.P.D.T., 0.093 Q.C. Term. (Gold Contacts)
2 S.P.D.T., 0.110 Q.C. Term. **8** S.P.S.T., 0.187 Q.C. Term.
3 S.P.D.T., 0.110 Solder Lug **9** S.P.D.T., 0.187 Q.C. Term.

6 FREQUENCY & DELAY

- 21** AC Ultra Short **42** AC, Short, Hi-Inrush
22 AC Short **44** AC, Medium, Hi-Inrush
24 AC Medium **46** AC, Long, Hi-Inrush
26 AC Long

7 CURRENT RATING (AMPERES)

| CODE | AMPERES | CODE | AMPERES | CODE | AMPERES | CODE | AMPERES |
|------|---------|------|---------|------|---------|------|---------|
| 020 | 0.020 | 220 | 0.200 | 415 | 1.500 | 495 | 9.500 |
| 025 | 0.025 | 225 | 0.250 | 517 | 1.750 | 610 | 10.000 |
| 030 | 0.030 | 230 | 0.300 | 420 | 2.000 | 710 | 10.500 |
| 035 | 0.035 | 235 | 0.350 | 522 | 2.250 | 611 | 11.000 |
| 040 | 0.040 | 240 | 0.400 | 527 | 2.750 | 711 | 11.500 |
| 045 | 0.045 | 245 | 0.450 | 430 | 3.000 | 612 | 12.000 |
| 050 | 0.050 | 250 | 0.500 | 435 | 3.500 | 712 | 12.500 |
| 055 | 0.055 | 255 | 0.550 | 440 | 4.000 | 613 | 13.000 |
| 060 | 0.060 | 260 | 0.600 | 445 | 4.500 | 614 | 14.000 |
| 065 | 0.065 | 265 | 0.650 | 450 | 5.000 | 615 | 15.000 |
| 070 | 0.070 | 270 | 0.700 | 455 | 5.500 | 616 | 16.000 |
| 075 | 0.075 | 275 | 0.750 | 460 | 6.000 | 617 | 17.000 |
| 080 | 0.080 | 280 | 0.800 | 465 | 6.500 | 618 | 18.000 |
| 085 | 0.085 | 285 | 0.850 | 470 | 7.000 | 620 | 20.000 |
| 090 | 0.090 | 290 | 0.900 | 475 | 7.500 | 622 | 22.000 |
| 095 | 0.095 | 295 | 0.950 | 480 | 8.000 | 624 | 24.000 |
| 210 | 0.100 | 410 | 1.000 | 485 | 8.500 | 625 | 25.000 |
| 215 | 0.150 | 512 | 1.250 | 490 | 9.000 | 630 | 30.000 |

8 TERMINAL 5

- 1** ⁶ Push-On 0.250 Tab (Q.C.) **B** Screw M5 with upturned lugs
2 Screw 8-32 with upturned lugs **C** Screw M4 with upturned lugs
3 Screw 8-32 (Bus Type) **F** Screw M5 with upturned lugs & 30° bend
4 Screw 10-32 with upturned lugs **G** Screw M5 (Bus Type) & 30° bend
5 Screw 10-32 (Bus Type) **H** Screw M5 (Bus Type)
6 Screw 8-32 with upturned lugs & 30° bend **J** Screw M5 Back Connect
7 Screw 8-32 (Bus Type) & 30° bend **K** Screw 10-32 Back Connect
8 Screw 10-32 with upturned lugs & 30° bend **N** Screw M4 Back Connect
9 Screw 10-32 (Bus Type) & 30° bend **Y** Screw 8-32 Back Connect

9 ACTUATOR COLOR & LEGEND

| Actuator or Visi-Rocker 7 | Marking: | | Marking Color | |
|---------------------------|----------|----------|---------------|-------------|
| | ON-OFF | Dual 7 | Single Color | Visi-Rocker |
| White | B | 1 | Black | White |
| Black | D | 2 | White | n/a |
| Red | G | 3 | White | Red |
| Green | J | 4 | White | Green |
| Blue | L | 5 | White | Blue |
| Yellow | N | 6 | Black | Yellow |
| Gray | Q | 7 | Black | Gray |
| Orange | S | 8 | Black | Orange |

10 MOUNTING / BARRIERS

- MOUNTING STYLE** **BARRIERS 9**
Threaded Insert, 2 per pole
A 6-32 x 0.195 inches (multi-pole units only) yes
B ISO M3 x 5mm yes
ROCKERGUARD BEZEL
Threaded Insert, 2 per pole
C 6-32 X 0.225 inches (multi-pole units only) yes
D ISO M3 x 6.5mm yes

11 MAXIMUM APPLICATION RATING

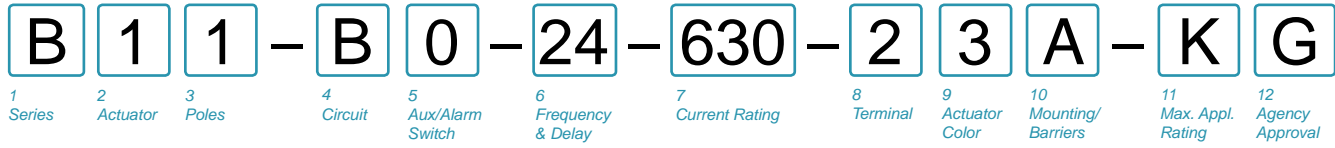
- C** ⁸ 120/240 VAC
K 120 VAC

12 AGENCY APPROVAL

- G** UL489 Listed
3 UL489 Listed, TUV Certified

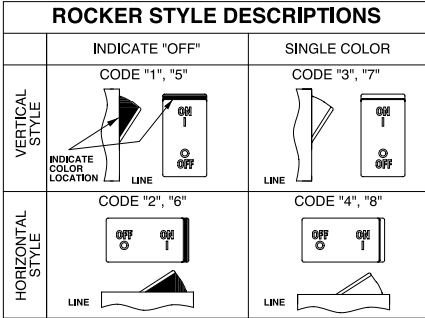
Notes:

- 1** Multi-pole breakers have all breakers identical except when specifying Auxiliary switch and/or mixed poles, and have one rocker per breaker.
2 All poles must be same polarity.
3 3 pole units available only when 1 of 3 poles is neutral.
4 On multi-pole breakers, one auxiliary switch is supplied, mounted in the extreme right pole.
5 Screw Terminals are recommended on ratings greater than 20 amps.
6 Terminal Code 1 (Push-On) available up to 30 amps, but are not recommended over 20 amps.
7 Dual Legend = ON-OFF/I-O
8 Voltage Rating available with 2 and 3-pole breakers only.
9 Barriers supplied on multi-pole units only.



1 SERIES
B

- 2 ACTUATOR 1**
Two Color Visi-Rocker
 1 Indicate OFF, vertical legend
 2 Indicate OFF, horizontal legend
Single color
 3 Vertical legend
 4 Horizontal legend
Push-To-Reset, Visi-Rocker
 5 Indicate OFF, vertical legend
 6 Indicate OFF, horizontal legend
Push-To-Reset, Single color
 7 Vertical legend
 8 Horizontal legend



- 3 POLES 2,3**
 1 One 2 Two 3⁴ Three

- 4 CIRCUIT**
 B Series Trip (Current)

- 5 AUXILIARY / ALARM SWITCH 4**
 0 without Aux Switch 7 S.P.S.T., 0.110 Q.C. Term.
 1 S.P.D.T., 0.093 Q.C. Term. (Gold Contacts)
 2 S.P.D.T., 0.110 Q.C. Term. 8 S.P.S.T., 0.187 Q.C. Term.
 3 S.P.D.T., 0.110 Solder Lug 9 S.P.D.T., 0.187 Q.C. Term.

- 6 FREQUENCY & DELAY**
 21 AC Ultra Short 42 AC, Short, Hi-Inrush
 22 AC Short 44 AC, Medium, Hi-Inrush
 24 AC Medium 46 AC, Long, Hi-Inrush
 26 AC Long

7 CURRENT RATING (AMPERES)

| CODE | AMPERES | | | | |
|------|---------|-----|-------|-----|-------|
| 020 | 0.020 | 220 | 0.200 | 415 | 1.500 |
| 025 | 0.025 | 225 | 0.250 | 517 | 1.750 |
| 030 | 0.030 | 230 | 0.300 | 420 | 2.000 |
| 035 | 0.035 | 235 | 0.350 | 522 | 2.250 |
| 040 | 0.040 | 240 | 0.400 | 527 | 2.750 |
| 045 | 0.045 | 245 | 0.450 | 430 | 3.000 |
| 050 | 0.050 | 250 | 0.500 | 435 | 3.500 |
| 055 | 0.055 | 255 | 0.550 | 440 | 4.000 |
| 060 | 0.060 | 260 | 0.600 | 445 | 4.500 |
| 065 | 0.065 | 265 | 0.650 | 450 | 5.000 |
| 070 | 0.070 | 270 | 0.700 | 455 | 5.500 |
| 075 | 0.075 | 275 | 0.750 | 460 | 6.000 |
| 080 | 0.080 | 280 | 0.800 | 465 | 6.500 |
| 085 | 0.085 | 285 | 0.850 | 470 | 7.000 |
| 090 | 0.090 | 290 | 0.900 | 475 | 7.500 |
| 095 | 0.095 | 295 | 0.950 | 480 | 8.000 |
| 100 | 0.100 | 300 | 1.000 | 485 | 8.500 |
| 110 | 0.110 | 310 | 1.100 | 490 | 9.000 |
| 125 | 0.125 | 325 | 1.250 | | |
| 150 | 0.150 | 350 | 1.500 | | |
| 200 | 0.200 | 400 | 2.000 | | |
| 250 | 0.250 | 450 | 2.500 | | |
| 300 | 0.300 | 500 | 3.000 | | |
| 350 | 0.350 | 550 | 3.500 | | |
| 400 | 0.400 | 600 | 4.000 | | |
| 450 | 0.450 | 650 | 4.500 | | |
| 500 | 0.500 | 700 | 5.000 | | |
| 550 | 0.550 | 750 | 5.500 | | |
| 600 | 0.600 | 800 | 6.000 | | |
| 630 | 0.630 | 830 | 6.300 | | |

- 8 TERMINAL 6**
 1⁷ Push-On 0.250 Tab (Q.C.) B Screw M5 with upturned lugs
 2 Screw 8-32 with upturned lugs C Screw M4 with upturned lugs
 3 Screw 8-32 (Bus Type) F Screw M5 with upturned lugs & 30° bend
 4 Screw 10-32 with upturned lugs G Screw M5 (Bus Type) & 30° bend
 5 Screw 10-32 (Bus Type) H Screw M5 (Bus Type)
 6 Screw 8-32 with upturned lugs & 30° bend J Screw M5 Back Connect
 7 Screw 8-32 (Bus Type) & 30° bend K Screw 10-32 Back Connect
 8 Screw 10-32 with upturned lugs & 30° bend N Screw M4 Back Connect
 9 Screw 10-32 (Bus Type) & 30° bend Y Screw 8-32 Back Connect

9 ACTUATOR COLOR & LEGEND

| Actuator or Visi-Color ⁸ | Marking: | | Marking Color | |
|-------------------------------------|----------|-------------------|---------------|-------------|
| | ON-OFF | Dual ⁸ | Single Color | Visi-Rocker |
| White | B | 1 | Black | White |
| Black | D | 2 | White | n/a |
| Red | G | 3 | White | Red |
| Green | J | 4 | White | Green |
| Blue | L | 5 | White | Blue |
| Yellow | N | 6 | Black | Yellow |
| Gray | Q | 7 | Black | Gray |
| Orange | S | 8 | Black | Orange |

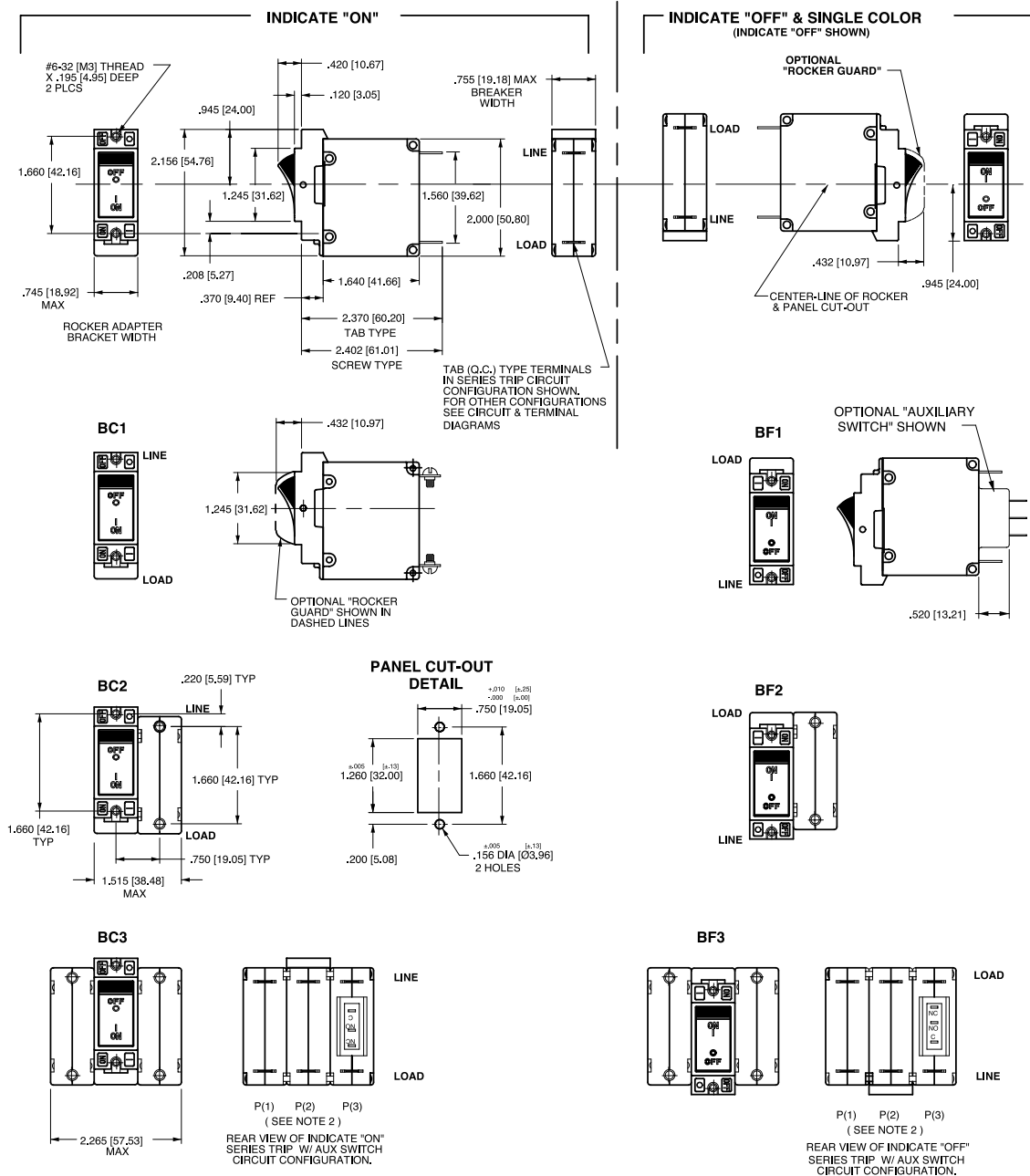
- 10 MOUNTING / BARRIERS 9**
STANDARD ROCKER BEZEL BARRIERS¹²
Threaded Insert, 2 per pole
FLAT ROCKER ACTUATOR
 A 6-32 x 0.195 inches (multi-pole units only) yes
 B ISO M3 x 5mm yes
RECESSED OFF SIDE ROCKER ACTUATOR¹⁰
 E 6-32 X 0.225 inches (multi-pole units only) yes
 F ISO M3 x 6.5mm yes
PUSH-TO-RESET BEZEL, Threaded Insert, 2 per pole
 C 6-32 x 0.195 inches yes
 D ISO M3 x 5mm yes

- 11 MAXIMUM APPLICATION RATING**
 C¹¹ 120/240 VAC
 K 120 VAC

- 12 AGENCY APPROVAL**
 G UL489 Listed
 3 UL489 Listed, TUV Certified

Notes:
 1 Push-To-Reset actuators have OFF portion of rocker shrouded.
 2 Multi-pole breakers have all breakers identical except when specifying Auxiliary switch and/or mixed poles, and have one rocker per breaker.
 3 All poles must be same polarity.
 4 3 pole units available only when 1 of 3 poles is neutral.
 5 On multi-pole breakers, one auxiliary switch is supplied, mounted in the extreme right pole.
 6 Screw Terminals are recommended on ratings greater than 20 amps.
 7 Terminal Code 1 (Push-On) available up to 30 amps, but are not recommended over 20 amps.
 8 Color shown is visi and legend with remainder of rocker black. Dual = ON-OFF/I-O legend.
 9 Legend on Push-to-reset bezel/shroud is white with single color actuator codes 7 & 8. Legend on Push-To-Reset bezel/shroud matches Visi-Color of rocker with actuator codes 5 & 6.
 10 Recessed "off-side" available with actuator codes 1, 2, 3 & 4. Legends on rocker are available in ink stamping only.
 11 Voltage rating available with 2 & 3-pole breakers only.
 12 Barriers supplied on multi-pole units only.

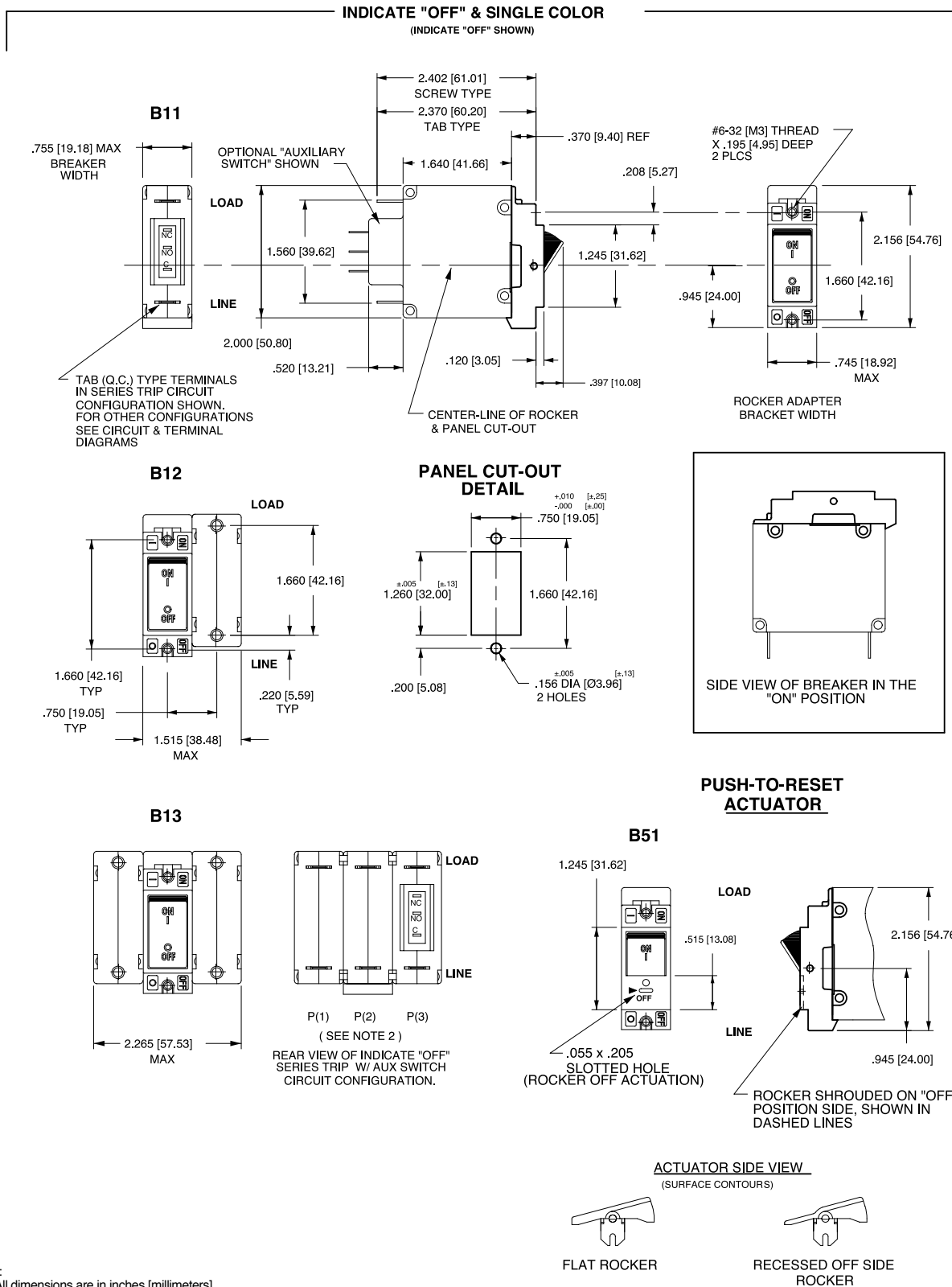
Dimensional Specifications: in. [mm]



Notes:

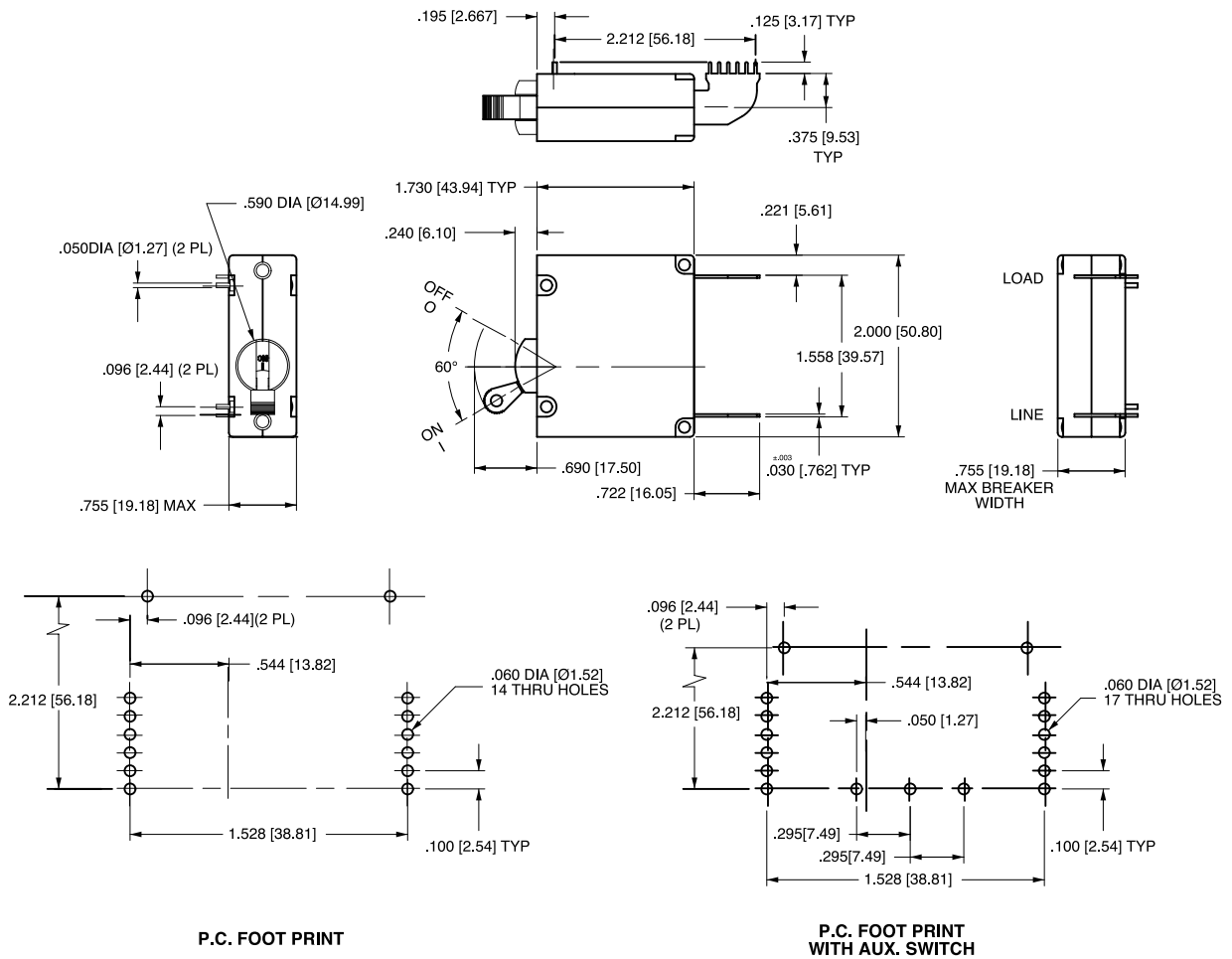
- 1 Dimensions apply to all variations shown. Notice that circuit breaker line & load terminal orientation on indicate "OFF" is opposite of indicate "ON".
- 2 For pole orientation with horizontal legend, rotate front view clockwise 90°.
- 3 All dimensions are in inches [millimeters].
- 4 Tolerance ±.020 [±.51] unless otherwise specified.

Dimensional Specifications: in. [mm]



- Notes:
- 1 All dimensions are in inches [millimeters].
 - 2 For pole orientation with horizontal legend, rotate front view clockwise 90°.
 - 3 Tolerance ±.010 [.25] unless otherwise specified.

PC Terminal Diagrams: in. [mm]



- Notes:
- 1 All dimensions are in inches [millimeters].
 - 2 For pole orientation with horizontal legend, rotate front view clockwise 90°.
 - 3 Tolerance ±.010 [.25] unless otherwise specified.

C-Series

CIRCUIT BREAKER

The C-Series hydraulic-magnetic circuit breakers are ideal for applications that require higher amperage and voltage handling capability in a smaller package. They are available in 1-6 poles, 0.02-100amps, UL Recognized up to 480VAC or 150VDC, UL489 Listed up to 240VAC or 125VDC, with choice of time delays, terminal options, actuator styles and colors. The C-Series employs a unique arc chute design which allows for higher interrupting capacities of up to 10,000 amps. New thermoset glass filled polyester half shell construction provides for increased mechanical and electrical strength. The wiping contacts, mechanical linkage with two step actuation, clean contacts providing high, positive contact pressure and longer contact life. Available with American Standard or Metric Threaded Stud terminals , or Saddle Clamp screw terminals. The optional mid-trip handle style actuator allows a visual indication of electrical overload with or without alarm feature.



Product Highlights:

- Extensive list of Agency Approvals
- Available with Standard or Metric Stud terminals, or Saddle Clamp screw terminals
- Optional mid-trip handle style actuator
- Unique arc chute design which allows for higher interrupting capacities of up to 10,000 amps
- Exclusive Rockerguard and Push-To-Reset bezel
- Available with new solid color and two-color Visi-rocker® actuators
- New thermoset glass filled polyester half shell construction

Only Telecom-Datcom applicable ordering schemes and drawings are shown in this catalog. For complete product details, please visit www.carlingtech.com

Electrical

Maximum Voltage AC, 480 WYE/277 VAC, 50/60 Hz (see Table A.)
 UL489: AC, 240 VAC. (See Table D), 50/60 Hz, 125 VDC

Current Rating Standard current coils: 0.100, 0.250, 0.500, 0.750, 1.00, 2.50, 5.00, 7.50, 10.0, 15.0, 25.0, 30.0, 35.0, 40.0, 50.0, 60.0, 70.0, 80.0, 90.0 and 100 amps. Other ratings available, see Ordering Scheme.

Standard Voltage Coils DC - 6V, 12V; AC - 120V; other ratings available, see Ordering Scheme.

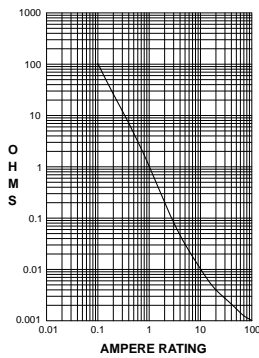
Auxiliary Switch Rating SPDT; 10.1 amps-250VAC, DC Aux. Switch 1.0A, 65 VDC. 0.5A, 80VDC, 1/4 HP, 125VAC, VDE & TUV 1.0 125 VAC.

Insulation Resistance Minimum of 100 Megohms at 500 VDC.

Dielectric Strength UL, CSA: 1960 V 50/60 Hz for one minute between all electrically isolated terminals. C-Series Circuit Breakers comply with the 8mm spacing and 3750V 50/60 Hz dielectric requirements from hazardous voltage to operator accessible surfaces, between adjacent poles and from main circuits to auxiliary circuits per Publications EN 60950 and VDE 0805.

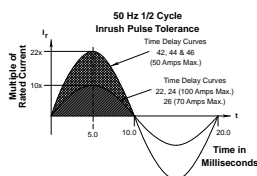
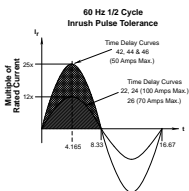
Resistance, Impedance Values from Line to Load Terminal - based on Series Trip Circuit Breaker.

RESISTANCE, IMPEDANCE VALUES from Line to Load Terminals (Values Based on Series Trip Circuit Breaker)



| CURRENT (AMPS) | TOLERANCE (%) |
|----------------|---------------|
| 0.10 - 5.0 | 15 |
| 5.1 - 20.0 | 25 |
| 20.1 - 50.0 | 35 |

Pulse Tolerance Curves



Mechanical

Endurance 10,000 ON-OFF operations @ 6 per minute; with rated current & voltage.

Trip Free All C-Series circuit breakers will trip on overload, even when actuator is forcibly held in the ON position.

Trip Indication The operating actuator moves positively to the OFF position when an overload causes the breaker to trip. With mid-trip, handle moves to the mid position on electrical trip of the circuit breaker. With mid trip handle with alarm switch, handle moves to the mid position and the alarm switch actuates when the circuit breaker is electrically tripped.

Physical

Number of Poles 1-6 poles ≤ 50A; 1-4 poles @ 51-70A; 1-2 poles 71-100A. UL489 Handle: 1 pole ≤ 100A, 2 pole ≤ 50A; Rocker: 1 pole ≤ 100A.

Internal Circuit Config. Series (with or without auxiliary switch, mid trip & mid trip with alarm switch) Shunt & Relay with current or voltage trip coils, Dual Coil, Switch Only (with or without aux. switch). UL489: Series (with or without auxiliary switch, mid-trip & midtrip with alarm switch).

Weight Approx. 112 grams/pole (3.95 oz).

Standard Colors Housing: Black

Environmental

Designed and tested in accordance with requirements of specification MIL-PRF-55629 & MIL-STD-202 as follows:

Shock Withstands 100 Gs, 6ms sawtooth while carrying rated current per Method 213, Test Condition "I". Instantaneous and ultrashort curves tested @ 90% of rated current.

Vibration Withstands 0.060" excursion from 10-55 Hz & 10 Gs 55-500 Hz, @ rated current per Method 204C, Test Cond. A. Instantaneous & ultrashort curves tested @ 90% of rated current.

Moisture Resistance Method 106D, i.e., ten 24-hour cycles @ +25°C to +65°C, 80-98% RH.

Salt Spray Method 101, Condition A (90-95% RH @ 5% NaCl Solution, 96 hrs).

Thermal Shock Method 107D, Condition A (five cycles @ -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.

Electrical Tables

Table A: Lists UL Recognized & CSA Accepted configurations and performance capabilities as a Component Supplementary Protector

| C-SERIES TABLE A: COMPONENT SUPPLEMENTARY PROTECTORS | | | | | | | | | | |
|--|-------------|-----------|-----------|----------------|----------------------|-------------------------------|---------------------|-------------------|---------------------------|--|
| CIRCUIT CONFIGURATION | VOLTAGE | | | CURRENT RATING | | SHORT CIRCUIT CAPACITY (AMPS) | | APPLICATION CODES | | NOTES |
| | MAX. RATING | FREQUENCY | PHASE | FULL LOAD AMPS | GENERAL PURPOSE AMPS | WITH BACKUP FUSE 1 | WITHOUT BACKUP FUSE | UL | CSA | |
| SERIES | 32 | DC | --- | 0.02 - 100 | --- | --- | 5000 | TC1, OL1, U2 | TC1, OL1, U2 | |
| | 48 | DC | --- | 110 - 150 | --- | --- | 5000 | TC1, OL1, U2 | TC1, OL1, U2 | |
| | 65 | DC | --- | 0.02 - 70 | --- | --- | 5000 | TC1,2, OL1,U1 | TC1,2, OL1,U1 | |
| | | | | --- | 71 - 100 | --- | 5000 | TC1,2, OL0,U1 | TC1,2, OL0,U1 | |
| | 80 | DC | --- | 0.02 - 70 | --- | --- | 7500 | TC1,2, OL1,U1 | TC1,2, OL1,U1 | |
| | | | | --- | 71 - 100 | --- | 7500 | TC1,2, OL0,U1 | TC1,2, OL0,U1 | |
| | 80 | DC | --- | 0.02 - 70 | --- | --- | 10,000 | TC1,2, OL1,U1 | TC1,2, OL1,U1 | Must Have Agency Code "L" |
| | | | | --- | 71 - 100 | --- | 10,000 | TC1,2, OL0,U1 | TC1,2, OL0,U1 | Must Have Agency Code "L" |
| | 125 | DC | --- | 0.02 - 50 | --- | --- | 5000 | TC1,2,OL1,U1 | TC1,2,OL1,U1 | Must Have Agency Code "L" |
| | 125 / 250 | DC | --- | 0.02 - 50 | --- | --- | 5000 | TC1,2,OL1,U1 | TC1,2,OL1,U1 | Must Have Agency Code "L" |
| | 250 | DC | --- | 0.02 - 50 | --- | --- | 5000 | TC1,2,OL1,U1 | TC1,2,OL1,U1 | Must Have Agency Code "L". 2 Pole Break Required for 250 Volts |
| | 125 | 50 / 60 | 1 | 0.02 - 100 | --- | --- | 3000 | TC1, OL1, U2 | TC1, OL1, U2 | Per Pole Rating |
| | | | | 0.02 - 100 | --- | --- | 5000 | TC1,2,OL1,U1 | TC1,2,OL1,U1 | Must Have Agency Code "L" |
| | 150 | DC | --- | --- | 80 - 100 | --- | 5000 | TC1, OL0, U3 | --- | Must Have Agency Code "L" |
| | 150 | DC | --- | --- | 101 - 175 | --- | 5000 | TC1, OL0, U3 | --- | Must Have Agency Code "L" Parallel Pole |
| | 125 / 250 | 50 / 60 | 1 | 0.02 - 100 | --- | --- | 3500 | TC1, OL1, U2 | TC1, OL1, U2 | |
| | | | | 0.02 - 50 | --- | --- | 3000 | TC1,2,OL1,U1 | TC1,2,OL1,U1 | 2 or 3 poles breaking single phase |
| | | | | 51 - 100 | --- | --- | 1000 | TC1,2,OL1,U1 | TC1,2,OL1,U1 | 2 or 3 poles breaking single phase |
| | | | | 0.02 - 100 | --- | --- | 5000 | TC1,2,OL1,U2 | TC1,2,OL1,U2 | 2 or 3 poles breaking single phase, "L" Agency Code |
| | | | | 0.02 - 50 | --- | --- | 3500 | TC1, OL1, U2 | TC1, OL1, U2 | Per Pole Rating |
| | | | | 0.02 - 100 | --- | --- | 5000 | TC1,2,OL1,U1 | TC1,2,OL1,U1 | Must Have Agency Code "L" |
| | 250 | 50 / 60 | 1 | 51 - 70 | --- | 5000 | --- | TC1,2,OL1,C1 | TC1,2,OL1,C1 | |
| | | | | --- | 0.02 - 100 | --- | 3000 | TC1, OL0, U2 | TC1, OL0, U2 | |
| | | | 3 | 0.02 - 70 | --- | 5000 | --- | TC1,2,OL1,C1 | TC1,2,OL1,C1 | 3 poles breaking 3 phase |
| | | | --- | 0.02 - 90 | --- | 5000 | TC1,2,OL0,U1 | TC1,2,OL0,U1 | Must Have Agency Code "L" | |
| 277 | 50 / 60 | 1 | 0.02 - 50 | --- | 5000 | --- | TC1,2,OL1,C1 | TC1,2,OL1,C1 | | |
| 480 / 277 | 50 / 60 | 3 | 0.02 - 30 | --- | 5000 | --- | TC1,2,OL1,C1 | TC1,2,OL1,C1 | 3 poles breaking 3 phase | |
| 480 | 50 / 60 | 1 | --- | 31 - 50 | 5000 | --- | TC1,2,OL0,C1 | TC1,2,OL0,C1 | | |
| | | | 0.02 - 30 | --- | 5000 | --- | TC1,2,OL1,C1 | TC1,2,OL1,C1 | 2 poles breaking 1 phase | |
| | | | --- | 31 - 50 | 5000 | --- | TC1,2,OL0,C1 | TC1,2,OL0,C1 | | |
| DUAL COIL | 80 | DC | --- | 0.02 - 50 | --- | --- | 7500 | TC1,2, OL1,U1 | TC1,2, OL1,U1 | |
| | 125 | 50 / 60 | 1 | 0.02 - 50 | --- | --- | 3000 | TC1, OL1, U2 | TC1, OL1, U2 | Per Pole Rating |
| | 125 / 250 | 50 / 60 | 1 | 0.02 - 50 | --- | --- | 3500 | TC1, OL1, U2 | TC1, OL1, U2 | 2 or 3 poles breaking single phase |
| | | | | 0.02 - 50 | --- | --- | 3000 | TC1,2,OL1,U1 | TC1,2,OL1,U1 | 2 or 3 poles breaking single phase |
| | 250 | 50 / 60 | 3 | 0.02 - 50 | --- | --- | 3500 | TC1, OL1, U2 | TC1, OL1, U2 | |
| | | | 0.02 - 50 | --- | --- | 3000 | TC1, OL0, U2 | TC1, OL0, U2 | Per Pole Rating | |
| | | | 0.02 - 50 | --- | 5000 | --- | TC1,2,OL1,C1 | TC1,2,OL1,C1 | | |
| 277 | 50 / 60 | 1 | 0.02 - 50 | --- | 5000 | --- | TC1,2,OL1,C1 | TC1,2,OL1,C1 | 3 poles breaking 3 phase | |
| SHUNT | 80 | DC | --- | 0.02 - 50 | --- | --- | 7500 | TC1,2, OL1,U1 | TC1,2, OL1,U1 | |
| | 277 | 50 / 60 | 1 | 0.02 - 50 | --- | 5000 | --- | TC1,2,OL1,C1 | TC1,2,OL1,C1 | |
| | 250 | 50 / 60 | 3 | 0.02 - 50 | --- | 5000 | --- | TC1,2,OL1,C1 | TC1,2,OL1,C1 | 3 poles breaking 3 phase |
| | 480 / 277 | 50 / 60 | 3 | 0.02 - 30 | --- | 5000 | --- | TC1,2,OL1,C1 | TC1,2,OL1,C1 | 3 poles breaking 3 phase |
| | | | | --- | 31 - 50 | 5000 | --- | TC1,2,OL0,C1 | TC1,2,OL0,C1 | |
| 480 | 50 / 60 | 1 | 0.02 - 30 | --- | 5000 | --- | TC1,2,OL1,C1 | TC1,2,OL1,C1 | 2 poles breaking 1 phase | |
| | | | --- | 31 - 50 | 5000 | --- | TC1,2,OL0,C1 | TC1,2,OL0,C1 | | |
| RELAY | 80 | DC | --- | 0.02 - 50 | --- | --- | 7500 | TC1,2, OL1,U1 | TC1,2, OL1,U1 | |
| | 277 | 50 / 60 | 1 | 0.02 - 50 | --- | 5000 | --- | TC1,2,OL1,C1 | TC1,2,OL1,C1 | |
| | 250 | 50 / 60 | 3 | 0.02 - 50 | --- | 5000 | --- | TC1,2,OL1,C1 | TC1,2,OL1,C1 | 3 poles breaking 3 phase |
| SWITCH ONLY | 65 | DC | --- | 0.02 - 70 | --- | --- | --- | --- | --- | |
| | | | | --- | 71 - 100 | --- | --- | --- | --- | |
| | 80 | DC | --- | 0.02 - 70 | --- | --- | --- | --- | --- | |
| | | | | --- | 71 - 100 | --- | --- | --- | --- | |
| | 125 | 50 / 60 | 1 | 0.02 - 100 | --- | --- | --- | --- | --- | |
| | 125 / 250 | 50 / 60 | 1 | 0.02 - 100 | --- | --- | --- | --- | --- | 2 or 3 poles breaking single phase |
| | 250 | 50 / 60 | 3 | 0.02 - 70 | --- | --- | --- | --- | --- | |
| 277 | 50 / 60 | 1 | 0.02 - 50 | --- | --- | --- | --- | --- | | |
| 480 / 277 | 50 / 60 | 3 | 0.02 - 30 | --- | --- | --- | --- | --- | 3 poles breaking 3 phase | |
| | | | --- | 31 - 50 | --- | --- | --- | --- | | |

Notes:

- Requires branch circuit backup with a UL LISTED Type K5 or RK5 fuse rated 15A minimum and no more than 4 times full load amps not to exceed 125A for 50 Amp or less rating and not to exceed 175 for 51 through 100 Amp rating

Electrical Tables

Table B: Lists UL Recognized and CSA Accepted configurations and performance capabilities as a Manual Motor Controller.

| C-SERIES TABLE B: MANUAL MOTOR CONTROLLERS | | | | | |
|--|------------------|-----------|-----------|----------------|--------------------|
| CIRCUIT CONFIGURATION | VOLTAGE | | | CURRENT RATING | HORSEPOWER RATINGS |
| | MAX. RATING | FREQUENCY | PHASE | FULL LOAD AMPS | MAX HP |
| SERIES, SHUNT & RELAY SWITCH ONLY | 120 ¹ | 50 / 60 | 1 | 0.02 - 50 | 7 1/2 |
| | 250 ¹ | 50 / 60 | 1 | 0.02 - 20 | 3 |
| | | | 3 | 0.02 - 20 | 5 |
| | 277 ¹ | 50 / 60 | 1 | 0.02 - 20 | 3 |
| 480 ² | 50 / 60 | 3 | 0.02 - 20 | 5 | |

Notes:

1 UL recognized and CSA Accepted at 480V refers to 3 & 4 pole versions used in a 3Ø, wye connected circuit or 2-pole version connected with 2 poles breaking. 1Ø and backed up with series fusing as stated above in note 1.

* Series, Shunt and Relay Trip - Voltage Coil Construction not current coils

Table C: Lists UL Recognized, CSA Accepted, VDE and TUV Certified configurations and performance capabilities as a Component Supplementary Protector.

| C-SERIES TABLE C: COMPONENT SUPPLEMENTARY PROTECTORS | | | | | | | | | | | | | | |
|--|-------------|-----------|-------|----------------|-----------------------------------|-------------------------------|---------------------|------------------------|--------------------------|------------------------|--------------------------|-------------------|---------------|-------------------------------|
| CIRCUIT CONFIGURATION | VOLTAGE | | | CURRENT RATING | | SHORT CIRCUIT CAPACITY (AMPS) | | | | | | APPLICATION CODES | | CONSTRUCTION NOTES |
| | MAX. RATING | FREQUENCY | PHASE | FULL LOAD AMPS | GENERAL PURPOSE AMPS ¹ | UL/CSA | | VDE | | TUV | | UL | CSA | |
| | | | | | | WITH BACKUP FUSE | WITHOUT BACKUP FUSE | (Inc) WITH BACKUP FUSE | (In) WITHOUT BACKUP FUSE | (Inc) WITH BACKUP FUSE | (In) WITHOUT BACKUP FUSE | | | |
| SERIES | 80 | DC | --- | 0.10 - 70 | --- | --- | 7500 | --- | 5000 | 5000 | 1500 | TC1.2, OL1,U1 | TC1.2, OL1,U1 | |
| | | | --- | 71 - 100 | 71 - 100 | --- | 10,000 | --- | 5000 | --- | 5000 | TC1.2, OL0,U1 | TC1.2, OL0,U1 | Agency Code F, H, J or R Only |
| | 125 | DC | --- | 1 - 50 | --- | --- | 5000 | --- | --- | --- | 5000 | TC1.2, OL1,U1 | TC1.2, OL1,U1 | Agency Code J or R Only |
| | | | --- | 0.10 - 50 | --- | --- | 5000 | --- | --- | --- | 5000 | TC1.2, OL1,U1 | TC1.2, OL1,U1 | Agency Code J or R Only, 2P |
| | 250 | 50 / 60 | 1 | 0.10 - 70 | --- | --- | 5000 | 3000 | 1500 | 3000 | 1500 | TC1.2, OL1,U1 | TC1.2, OL1,U1 | |
| | | | | 0.10 - 100 | --- | --- | 5000 | --- | --- | 5000 | 5000 | TC1.2, OL1,U1 | TC1.2, OL1,U1 | Agency Code J or R Only |
| | | | 3 | 0.10 - 90 | --- | --- | 5000 | --- | --- | 5000 | 5000 | TC1.2, OL1,U1 | TC1.2, OL1,U1 | Agency Code J or R Only |
| | 415 | 50 / 60 | 3 | 0.10 - 30 | --- | --- | 5000 | --- | 3000 | 1500 | 3000 | 1500 | TC1.2, OL1,C1 | TC1.2, OL1,C1 |
| --- | | | | | | 5000 | --- | 5000 | 2500 | 3000 | 1500 | TC1.2, OL1,C1 | TC1.2, OL1,C1 | Handle/ Agency F, H, J, or R |
| DUAL COIL | 80 | DC | --- | 0.10 - 30 | --- | --- | 7500 | --- | 1500 | 5000 | 1500 | TC1.2, OL1,U1 | TC1.2, OL1,U1 | |
| | 250 | 50 / 60 | 1 & 3 | 0.10 - 30 | --- | --- | 5000 | 3000 | 1500 | 3000 | 1500 | TC1.2, OL1,U1 | TC1.2, OL1,U1 | |
| SHUNT | 80 | DC | --- | 0.10 - 70 | --- | --- | 7500 | --- | 5000 | 5000 | 1500 | TC1.2, OL1,U1 | TC1.2, OL1,U1 | |
| | 250 | 50 / 60 | 1 & 3 | 0.10 - 70 | --- | --- | 5000 | 3000 | 1500 | 3000 | 1500 | TC1.2, OL1,U1 | TC1.2, OL1,U1 | |
| | 415 | 50 / 60 | 3 | 0.10 - 30 | --- | --- | 5000 | --- | 3000 | 1500 | 3000 | 1500 | TC1.2, OL1,C1 | TC1.2, OL1,C1 |
| | | | | | | 5000 | --- | 5000 | 2500 | 3000 | 1500 | TC1.2, OL1,C1 | TC1.2, OL1,C1 | Handle/ Agency F, H, J, or R |

Notes:

1. General Purpose ratings for UL/CSA only.

2. Requires branch circuit backup with a UL LISTED Type K5 or RK5 fuse rated 15A minimum and no more than 4 times full load amps not to exceed 125A for 50 Amp or less rating and not to exceed 175 for 51 through 100 Amp rating.

Table D: Lists UL Listed (489), CSA Certified (C22.2 No. 5.1-M) configuration and performance capabilities as a Molded Case Circuit Breaker.

| C SERIES TABLE D : UL489 LISTED BRANCH CIRCUIT BREAKERS | | | | | | |
|---|-------------|-----------|-----------|----------------|------------------------------|--|
| CIRCUIT CONFIGURATION | VOLTAGE | | | CURRENT RATING | INTERRUPTING CAPACITY (AMPS) | CONSTRUCTION NOTES |
| | MAX. RATING | FREQUENCY | PHASE | FULL LOAD AMPS | WITHOUT BACKUP FUSE | |
| SERIES | 80 | DC | --- | 0.10 - 100 | 50,000 ¹ | Limited to 2 Poles Max from 71 - 100 Amps. |
| | | | | | 10,000 | Limited to 2 Poles Max from 71 - 100 Amps. |
| | 125 | DC | --- | 0.10 - 100 | 5,000 | 1 - 3 Poles |
| | | | | | 5,000 | 1 or 2 Poles (2 Poles Required for 250 Volts) |
| | 120 | 50 / 60 | 1 | 0.10 - 50 | 10,000 | 1 - 3 Poles |
| | | | | | 5,000 | 1 - 3 Poles |
| | 120 / 240 | 50 / 60 | 1 | 0.10 - 50 | 5,000 | 2 or 3 Poles. 1 Pole of a 3 Pole Unit is Neutral |
| | | | | | 10000 ¹ | 2 or 3 Poles. 1 Pole of a 3 Pole Unit is Neutral |
| | 240 | 50 / 60 | 1 | 0.10 - 30 | 5,000 | 1Pole |
| | 240 | 50 / 60 | 1 | 0.10 - 20 | 5,000 | 2 Pole |
| 277 | 50 / 60 | 1 | 0.10 - 20 | 10,000 | 1Pole | |
| DUAL COIL | 120 | 50 / 60 | 1 | 0.10 - 30 | 10,000 | --- |

Notes from Table D:

1. Special catalog number required. Consult factory.

Electrical Tables

Table E: Lists UL Recognized, CSA Accepted configurations and performance capabilities as Protectors, Supplementary for Marine Electrical and Fuel Systems (Guide PEQZ2, File E75596). Ignition Protected per UL 1500. UL Classified Small Craft Electrical Devices, Marine in accordance with ISO 8846 (Guide UZMK, File MQ1515) as Marine Supplementary Protectors.

| C-SERIES TABLE E: UL1500 (Marine Ignition Protected) | | | | | | | | |
|--|-------------|-----------|-------|----------------|------------------------------|-------------------|--------------|----------------------------------|
| CIRCUIT CONFIGURATION | VOLTAGE | | | CURRENT RATING | INTERRUPTING CAPACITY (AMPS) | APPLICATION CODES | | CONSTRUCTION NOTES |
| | MAX. RATING | FREQUENCY | PHASE | | | UL | CSA | |
| SERIES | 48 | DC | --- | 0.02 - 100 | 5000 | TC1,2,OL1,U1 | TC1,2,OL1,U1 | — |
| | | | | 101 - 150 | 5000 | TC1,2,OL1,U1 | TC1,2,OL1,U1 | — |
| | 65 | DC | --- | 0.02 - 100 | 1500 | TC1,2,OL0,U1 | TC1,2,OL0,U1 | — |
| | | | | 80 | DC | --- | 0.02 - 70 | 1500 |
| | 125 | 50 / 60 | 1 | 0.02 - 70 | 5000 | TC1,2,OL1,U1 | TC1,2,OL1,U1 | — |
| | | | | 71 - 100 | 1500 | TC1,2,OL1,U1 | TC1,2,OL1,U1 | — |
| | 250 | 50 / 60 | 1 | 0.02 - 70 | 1500 | TC1,2,OL1,U1 | TC1,2,OL1,U1 | — |
| | | | | 71 - 100 | 1500 | TC1,2,OL1,U1 | TC1,2,OL1,U1 | 2 Poles Breaking Single Phase |

Table F: Lists UL Listed configurations and performance capabilities as Circuit Breakers for use in Communications Equipment (Guide DITT, File E189195), under UL489A.

| C-SERIES TABLE F : PARALLEL POLE CONSTRUCTION UL489A LISTED FOR COMMUNICATIONS EQUIPMENT | | | | |
|---|-------------|-----------|----------------|------------------------------|
| CIRCUIT CONFIGURATION | VOLTAGE | | CURRENT RATING | INTERRUPTING CAPACITY (AMPS) |
| | MAX. RATING | FREQUENCY | | |
| SERIES | 80 | DC | 110 - 250 | 10,000 |


Agency Certifications

UL Recognized
UL Standard 1077


Component Recognition Program as Protectors Supplementary (Guide CCN/QVNU2, File E75596)

CSA Accepted



Component Supplementary Protector under Class 3215 30, File 047848 0 000 CSA Standard C22.2 No. 235

UL Standard 508


Switches, Industrial Control (Guide CCN/NRNT2, File E148683)

CSA Certified



Circuit Breaker Model Case (Class 1432 01, File 093910), CSA Standard C22.2 No. 5.1 - M

UL Standard 1500


Protectors, Supplementary for Marine Electrical & Fuel Systems (Guide PEQZ2, File E75596) Ignition Protection

TUV Certified



EN60934, under License No. R72040875

UL Listed
UL Standard 489


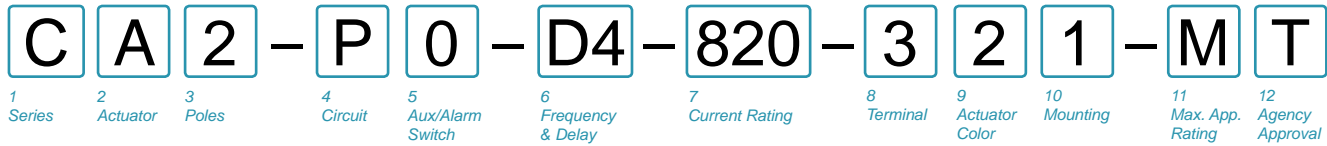
Circuit Breakers, Molded Case, (Guide DIVQ, File E129899)

VDE Certified


EN60934, VDE 0642 under File No. 10537

UL Standard 489A


Communications Equipment (Guide CCN/DITT, File E189195)



1 SERIES
C

2 ACTUATOR
A Handle, one per pole
S Mid-Trip Handle, one per pole ¹
T Mid-Trip, one per pole & Alarm Switch ¹

3 POLES ⁴
1 One 2 Two 3 Three

4 CIRCUIT
P Series Trip (parallel pole)

5 AUXILIARY / ALARM SWITCH

| | | | |
|---|--|---|--|
| 0 | without Aux Switch | 6 | S.P.S.T., 0.139 Solder Lug |
| 2 | S.P.D.T., 0.110 Q.C. Term. | 7 | S.P.S.T., 0.110 Q.C. Term. (Gold Contacts) |
| 3 | S.P.D.T., 0.139 Solder Lug | 8 | S.P.S.T., 0.187 Q.C. Term. (Gold Contacts) |
| 4 | S.P.D.T., 0.110 Q.C. Term. (Gold Contacts) | 9 | S.P.D.T., 0.187 Q.C. Term. |
| 5 | S.P.S.T., N.O., 0.110 Q.C. Term. (Gold Contacts) | | |

6 FREQUENCY & DELAY
D1 DC Ultra Short
D2 DC Short
D4 DC Medium
D6 DC Long

7 CURRENT RATING (AMPERES) ⁴

| CODE | AMPERES | |
|------|---------|--|
| 810 | 100.00 | 813 130.00 817 170.00 820 200.00 |
| 811 | 110.00 | 814 140.00 917 175.00 922 225.00 |
| 812 | 120.00 | 815 150.00 818 180.00 825 250.00 |
| 912 | 125.00 | 816 160.00 819 190.00 |

8 TERMINAL ⁵
3 Stud 1/4-20
6 Stud M6
A Plug-In Stud ³

9 ACTUATOR COLOR ²

| | LEGEND | | |
|--------|--------|------|--------------|
| | ON-OFF | Dual | Legend Color |
| White | B | 1 | Black |
| Black | D | 2 | White |
| Red | G | 3 | White |
| Green | J | 4 | White |
| Blue | L | 5 | White |
| Yellow | N | 6 | Black |
| Gray | Q | 7 | Black |
| Orange | S | 8 | Black |

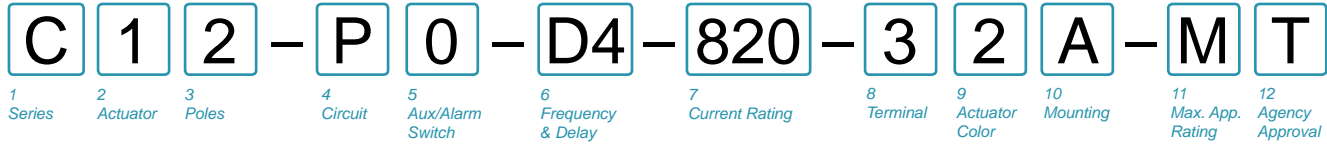
10 MOUNTING
Threaded Insert
1 6-32 x 0.195 inches
2 ISO M3 x 5mm

11 MAXIMUM APPLICATION RATING
M 80 DC

12 AGENCY APPROVAL
A Without Approval
K UL489A Listed, VDE Certified
T UL489A Listed
7 UL489A Listed, TUV Certified

Notes:

- Handle moves to Mid-Position only upon electrical trip of C/B when Actuator S is specified. When Actuator Code T is specified, handle moves to Mid Position and Alarm Switch actuates only upon electrical trip of C/B. Code T is only available with Circuit Code N.
- Standard Handle colors are White, Black, Red & Yellow.
- Breakers with Terminal Codes 3 & 6 are supplied with bus bars connecting the Line and Load Terminals. For Terminal Code A, Line and Load Terminals must be connected to a copper bus bar having a minimum cross-section of 0.078 square inches. Terminal code A not available on the single pole unit.
- Ratings for 101 to 125 amps are available in 1-pole size.
Ratings from 110 to 200 amps are available in 2-pole size.
For ratings from 225-250 amps, specify 3-pole size.
For ratings from 350-400 amps, specify 4-pole size.
- 1 pole only available with terminal codes 3 and 6.



1 SERIES
C

- 2 ACTUATOR**
- C** Curved Rocker, Two Color Visi, Indicate On, Vertical Legend
 - D** Curved Rocker, Two Color Visi, Indicate On, Horizontal Legend
 - F** Curved Rocker, Two Color Visi, Indicate Off, Vertical Legend
 - G** Curved Rocker, Two Color Visi, Indicate Off, Horizontal Legend
 - J** Curved Rocker, Single Color, Vertical Legend
 - K** Curved Rocker, Single Color, Horizontal Legend
 - N** Curved Rocker, Push To Reset, Two Color Visi, Vertical Legend
 - O** Curved Rocker, Push To Reset, Two Color Visi, Horizontal Legend
 - 1** Flat Rocker, Two Color Visi, Vertical Legend
 - 2** Flat Rocker, Two Color Visi, Horizontal Legend
 - 3** Flat Rocker, Single Color, Vertical Legend
 - 4** Flat Rocker, Single Color, Horizontal Legend
 - 5** Flat Rocker, Push To Reset, Two Color Visi, Vertical Legend
 - 6** Flat Rocker, Push To Reset, Two Color Visi, Horizontal Legend
 - 7** Flat Rocker, Push To Reset, Single Color, Vertical Legend
 - 8** Flat Rocker, Push To Reset, Single Color, Horizontal Legend

3 POLES²

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

4 CIRCUIT

P Series Trip (parallel pole)

- 5 AUXILIARY/ALARM SWITCH**
- | | |
|---|---|
| 0 without Aux Switch | 6 S.P.S.T., 0.139 Solder Lug |
| 2 S.P.D.T., 0.110 Q.C. Term. | 7 S.P.S.T., 0.110 Q.C. Term. (Gold Contacts) |
| 3 S.P.D.T., 0.139 Solder Lug | 8 S.P.S.T., 0.187 Q.C. Term. |
| 4 S.P.D.T., 0.110 Q.C. Term. (Gold Contacts) | 9 S.P.D.T., 0.187 Q.C. Term. |
| 5 S.P.S.T., N.O., 0.110 Q.C. Term. (Gold Contacts) | |

- 6 FREQUENCY & DELAY**
- D1** DC Ultra Short
 - D2** DC Short
 - D4** DC Medium
 - D6** DC Long

7 CURRENT RATING (AMPERES)²

| CODE | AMPERES | CODE | AMPERES | CODE | AMPERES |
|------------|---------|------------|---------|------------|---------|
| 810 | 100.00 | 813 | 130.00 | 817 | 170.00 |
| 811 | 110.00 | 814 | 140.00 | 818 | 180.00 |
| 812 | 120.00 | 815 | 150.00 | 819 | 190.00 |
| 812 | 120.00 | 816 | 160.00 | 820 | 200.00 |
| 812 | 120.00 | | | 822 | 225.00 |
| 812 | 125.00 | | | 825 | 250.00 |

- 8 TERMINAL**³
- 3** Stud 1/4-20
 - 6** Stud M6
 - A** Plug-In Stud¹

9 ACTUATOR COLOR

| | LEGEND | Dual | Legend Color |
|--------|----------|----------|--------------|
| White | B | 1 | Black |
| Black | D | 2 | White |
| Red | G | 3 | White |
| Green | J | 4 | White |
| Blue | L | 5 | White |
| Yellow | N | 6 | Black |
| Gray | Q | 7 | Black |
| Orange | S | 8 | Black |

- 10 MOUNTING**
- ROCKER / MOUNTING INSERT STYLE**
- A** Standard Rocker Bezel - 6-32 Inserts
 - B** Standard Rocker Bezel - M3 Inserts
 - C** Rocker Guard Bezel - 6-32 Inserts
 - D** Rocker Guard Bezel - M3 Inserts
 - E** Standard Bezel with recessed Off Side Flat Rocker - 6-32 Inserts
 - F** Standard Bezel with recessed Off Side Flat Rocker - M3 Inserts
 - G** Push to Reset Bezel - 6-32 Inserts
 - H** Push to Reset Bezel - M3 Inserts

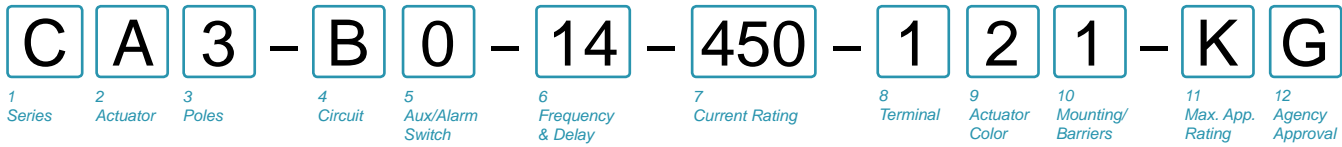
11 MAXIMUM APPLICATION RATING

M 80 DC

- 12 AGENCY APPROVAL**
- A** Without Approval
 - T** UL489A Listed
 - 7** UL489A Listed, TUV Certified

Notes:

- Breakers with Terminal Codes 3 & 6 are supplied with bus bars connecting the Line and Load Terminals. For Terminal Code A, Line and Load Terminals must be connected to a copper bus bar having a minimum cross-section of 0.078 square inches. Terminal code A not available on the single pole unit.
- Ratings for 101 to 125 amps are available in 1-pole size. Ratings from 110 to 200 amps are available in 2-pole size. For ratings from 225-250 amps, specify 3-pole size. For ratings from 350-400 amps, specify 4-pole size.
- 1 pole only available with terminal codes 3 and 6.



1 SERIES
C

2 ACTUATOR¹
A Handle, one per pole
B Handle, one per multipole unit
S Mid-Trip Handle, one per pole
T Mid-Trip Handle, one per pole & Alarm Switch

3 POLES²
1 One **2** Two **3** Three

4 CIRCUIT
B Series Trip (Current)

5 AUXILIARY / ALARM SWITCH³
0 without Aux Switch
2 S.P.D.T., 0.110 Q.C. Term. **6** S.P.S.T., 0.139 Solder Lug
3 S.P.D.T., 0.139 Solder Lug **8** S.P.S.T., 0.187 Q.C. Term.
4 S.P.D.T., 0.110 Q.C. Term. (Gold Contacts) **9** S.P.D.T., 0.187 Q.C. Term.

6 FREQUENCY & DELAY
11 DC Ultra Short **26** 50/60Hz Long
12 DC Short **42⁴** 50/60Hz Short, Hi-Inrush
14 DC Medium **44⁴** 50/60Hz Medium, Hi-Inrush
16 DC Long **46⁴** 50/60Hz Long, Hi-Inrush
21 50/60Hz Ultra Short **52⁴** DC Short, Hi-Inrush
22 50/60Hz Short **54⁴** DC Medium, Hi-Inrush
24 50/60Hz Medium **56⁴** DC Long, Hi-Inrush

- Notes:
1 Actuator Code:
A: Handle tie pin spacer(s) and retainers provided assembled with multi-pole units.
B: Handle located, as viewed from front of breaker in left pole. 2 pole maximum.
S: Handle moves to mid-position only upon electrical trip of the breaker.
T: Handle moves to mid-position and alarm switch activates only upon electrical trip of the breaker.
2 Standard multipole units have all poles identical except when specifying auxiliary switch and/or mixed poles.
2 & 3 pole circuit breakers required for 120/240 VAC (Maximum application rating code C) applications, have all poles identical except when specifying auxiliary / alarm switch which is normally supplied in extreme right pole per figure B. Terminal barriers are required on all multipole breakers.
Third pole is for 120/240 VAC applications requiring neutral disconnect. The 3rd pole has the same construction as poles 1 & 2.
3 On multi-pole breakers, one auxiliary switch is supplied, mounted in the extreme right pole.
VDE approval on auxiliary switch codes 2, 3 & 4 only.
Auxiliary / Alarm Switch with Independent Circuit ie: separate from breaker circuit, only available with circuit breakers rated 50 amp maximum at 80 VDC, 125 VDC, and 120 VAC. Auxiliary / Alarm Switch with Dependent Circuit ie: same as circuit breaker, is supplied from factory with common terminal of auxiliary / alarm switch connected to line terminal on 120/240 and 240 VAC ratings. Circuit breakers rated 120 VAC 50 amp maximum can be supplied with Auxiliary/Alarm switch common terminal connected to breaker line terminal. Consult factory for special catalog number.
4 Available up to 50 amps maximum.
5 Current ratings 71 - 100 with VDE approvals are available up to two poles maximum.
6 Terminal Codes 9 & C are not VDE approved.
7 Terminal Code 1 available to 60 amps maximum.
8 Terminal Codes 2, 4, 5 & C available to 50 amps maximum.
9 Terminal Codes 3, 6 & 9 available to 100 amps maximum.
10 Terminal Code A available to 100 amps maximum.
11 VDE and TUV approvals require Dual (I-O, ON-OFF) markings on all handles.
12 Barriers supplied on multi-pole units only.

7 CURRENT RATING (AMPERES)

| CODE | AMPERES | | | | |
|------|---------|-----|-------|-----|--------|
| 210 | 0.100 | 295 | 0.950 | 470 | 7.000 |
| 215 | 0.150 | 410 | 1.000 | 475 | 7.500 |
| 220 | 0.200 | 512 | 1.250 | 480 | 8.000 |
| 225 | 0.250 | 415 | 1.500 | 485 | 8.500 |
| 230 | 0.300 | 517 | 1.750 | 490 | 9.000 |
| 235 | 0.350 | 420 | 2.000 | 495 | 9.500 |
| 240 | 0.400 | 522 | 2.250 | 610 | 10.000 |
| 245 | 0.450 | 425 | 2.500 | 710 | 10.500 |
| 250 | 0.500 | 527 | 2.750 | 611 | 11.000 |
| 255 | 0.550 | 430 | 3.000 | 711 | 11.500 |
| 260 | 0.600 | 435 | 3.500 | 612 | 12.000 |
| 265 | 0.650 | 440 | 4.000 | 712 | 12.500 |
| 270 | 0.700 | 445 | 4.500 | 613 | 13.000 |
| 275 | 0.750 | 450 | 5.000 | 614 | 14.000 |
| 280 | 0.800 | 455 | 5.500 | 615 | 15.000 |
| 285 | 0.850 | 460 | 6.000 | 616 | 16.000 |
| 290 | 0.900 | 465 | 6.500 | 617 | 17.000 |

8 TERMINAL⁶

| | | | |
|----------------|----------------|-----------------|---------------------|
| 1 ⁷ | Stud 10-32 | 6 ⁹ | Stud M6 |
| 2 ⁸ | Screw 10-32 | 9 ⁹ | 7/16" Clip Terminal |
| 3 ⁹ | Stud 1/4-20 | A ¹⁰ | Plug-In Stud |
| 4 ⁸ | Stud M5 x 0.8 | C ⁸ | 5/16" Clip Terminal |
| 5 ⁸ | Screw M5 x 0.8 | | |

9 ACTUATOR COLOR & LEGEND¹¹

| Actuator Color | ON-OFF | Dual | Legend Color |
|----------------|----------|----------|--------------|
| White | B | 1 | Black |
| Black | D | 2 | White |
| Red | G | 3 | White |
| Green | J | 4 | White |
| Blue | L | 5 | White |
| Yellow | N | 6 | Black |
| Gray | Q | 7 | Black |
| Orange | S | 8 | Black |

10 MOUNTING / BARRIERS

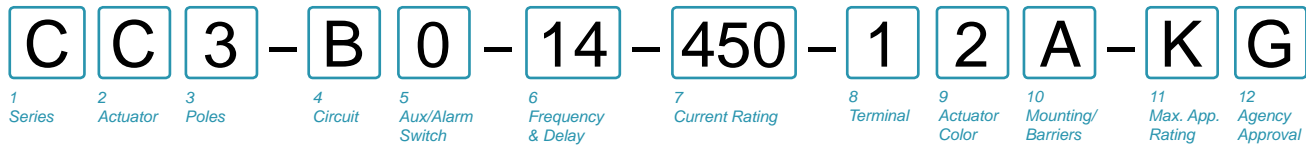
| MOUNTING STYLE | BARRIERS ¹² |
|------------------------|------------------------|
| Threaded Insert | |
| 1 6-32 x 0.195 inches | yes |
| 2 ISO M3 x 5mm | yes |

11 MAXIMUM APPLICATION RATING

| | |
|----------|-------------------------|
| A | 65 DC |
| B | 125 DC |
| C | 120/240 AC ² |
| D | 240 AC |
| K | 120 AC |
| F | 277 AC |
| M | 80 DC |

12 AGENCY APPROVAL¹¹

| | |
|----------|---|
| A | without approvals |
| F | UL489 Listed, CSA Certified & VDE Certified |
| G | UL489 Listed & CSA Certified |
| J | UL489 Listed, CSA Certified & TUV Certified |



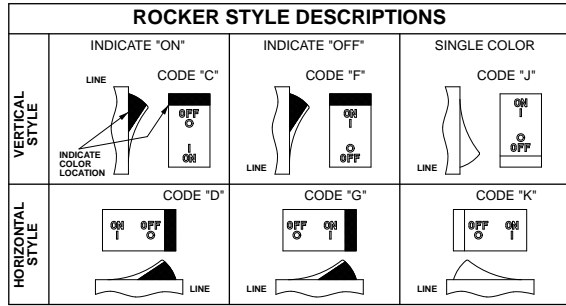
1 SERIES

C

2 ACTUATOR 1

Two Color Visi-Rocker

- C** Indicate ON, vertical legend
- D** Indicate ON, horizontal legend
- F** Indicate OFF, vertical legend
- G** Indicate OFF, horizontal legend
- J** Single color Vertical legend
- K** Single color Horizontal legend



3 POLES 1

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

4 CIRCUIT

- B** Series Trip (current)

5 AUXILIARY / ALARM SWITCH 2

- 0** without Aux Switch
- 2** S.P.D.T., 0.110 Q.C. Term.
- 3** S.P.D.T., 0.139 Solder Lug
- 4** S.P.D.T., 0.110 Q.C. Term. (Gold Contacts)
- 6** S.P.S.T., 0.139 Solder Lug
- 8** S.P.S.T., 0.187 Q.C. Term.
- 9** S.P.D.T., 0.187 Q.C. Term.

6 FREQUENCY & DELAY

- 11** DC Ultra Short
- 12** DC Short
- 14** DC Medium
- 16** DC Long
- 21** 50/60Hz Ultra Short
- 22** 50/60Hz Short
- 24** 50/60Hz Medium
- 26** 50/60Hz Long
- 42** 50/60Hz Short, Hi-Inrush
- 44** 50/60Hz Medium, Hi-Inrush
- 46** 50/60Hz Long, Hi-Inrush
- 52** DC Short, Hi-Inrush
- 54** DC Medium, Hi-Inrush
- 56** DC Long, Hi-Inrush

Notes:

- 1 Multi-pole breakers have all breakers identical except when specifying Auxiliary switch and/or mixed poles, and have one rocker per breaker.
- 2 On multi-pole breakers, one auxiliary switch is supplied, mounted in the extreme right pole.
- 3 Available up to 50 amps maximum.
- 4 Current ratings 71 - 100 with VDE approvals are available up to two poles maximum.
- 5 Terminal Code 1 available to 60 amps maximum.
- 6 Terminal Codes 2, 4, 5 & C available to 50 amps maximum.
- 7 Terminal Codes 3, 6, 9 & A available to 100 amps maximum.
- 8 Terminal Codes 9 & C are not VDE approved.
- 9 Color shown is visi and legend with remainder of rocker black
- 10 Dual = ON-OFF/I-O legend on actuator.
- 11 VDE and TUV approval requires Dual (I-O, ON-OFF) markings on rocker.
- 12 Rockerguard available with all actuator codes.
- 13 Barriers supplied on multi-pole units only.
- 14 2 & 3 pole circuit breakers required for 120/240 AC rating.

7 CURRENT RATING (AMPERES) 4

| CODE | AMPERES | CODE | AMPERES | CODE | AMPERES | CODE | AMPERES |
|------|---------|------|---------|------|---------|------|---------|
| 210 | 0.100 | 295 | 0.950 | 470 | 7.000 | 618 | 18.000 |
| 215 | 0.150 | 410 | 1.000 | 475 | 7.500 | 620 | 20.000 |
| 220 | 0.200 | 512 | 1.250 | 480 | 8.000 | 622 | 22.000 |
| 225 | 0.250 | 415 | 1.500 | 485 | 8.500 | 624 | 24.000 |
| 230 | 0.300 | 517 | 1.750 | 490 | 9.000 | 625 | 25.000 |
| 235 | 0.350 | 420 | 2.000 | 495 | 9.500 | 630 | 30.000 |
| 240 | 0.400 | 522 | 2.250 | 610 | 10.000 | 635 | 35.000 |
| 245 | 0.450 | 425 | 2.500 | 710 | 10.500 | 640 | 40.000 |
| 250 | 0.500 | 527 | 2.750 | 611 | 11.000 | 650 | 50.000 |
| 255 | 0.550 | 430 | 3.000 | 711 | 11.500 | 660 | 60.000 |
| 260 | 0.600 | 435 | 3.500 | 612 | 12.000 | 670 | 70.000 |
| 265 | 0.650 | 440 | 4.000 | 712 | 12.500 | 680 | 80.000 |
| 270 | 0.700 | 445 | 4.500 | 613 | 13.000 | 685 | 85.000 |
| 275 | 0.750 | 450 | 5.000 | 614 | 14.000 | 690 | 90.000 |
| 280 | 0.800 | 455 | 5.500 | 615 | 15.000 | 695 | 95.000 |
| 285 | 0.850 | 460 | 6.000 | 616 | 16.000 | 810 | 100.00 |
| 290 | 0.900 | 465 | 6.500 | 617 | 17.000 | | |

8 TERMINAL

- 1** 5 Stud 10-32
- 2** 6 Screw 10-32 with saddle & washer clamps
- 3** 7 Stud 1/4-20
- 4** 6 Stud M5 x 0.8
- 5** 6 Screw M5 x 0.8 with saddle & washer clamps
- 6** 7 Stud M6
- 9** 7,8 7/16" Clip Terminal
- A** 7,8 Plug-In Stud
- C** 6,8 5/16" Clip Terminal

9 ACTUATOR COLOR & LEGEND 11

| Actuator or Visi-Color | Marking: | Marking Color: | Single Color | Rocker/Handle | Visi-Rocker |
|------------------------|----------|----------------|--------------|---------------|-------------|
| White | B | 1 | Black | Black | White |
| Black | D | 2 | White | White | n/a |
| Red | G | 3 | White | White | Red |
| Green | J | 4 | White | White | Green |
| Blue | L | 5 | White | White | Blue |
| Yellow | N | 6 | Black | Black | Yellow |
| Gray | Q | 7 | Black | Black | Gray |
| Orange | S | 8 | Black | Black | Orange |

10 MOUNTING / BARRIERS 12

| | Standard Rocker Bezel Threaded Insert, 2 per pole | BARRIERS 13 |
|----------|---|-------------|
| A | 6-32 X 0.195 inches | yes |
| C | ISO M3 x 5mm | yes |
| | Rockerguard Bezel Threaded Insert, 2 per pole | |
| B | 6-32 x 0.195 inches | yes |
| D | ISO M3 x 5mm | yes |

11 MAXIMUM APPLICATION RATING

- A** 65 DC
- B** 125 DC
- C** 120/240 AC 14
- D** 240 AC
- F** 277 AC
- K** 120 AC
- M** 80 DC

12 AGENCY APPROVAL

- A** without approvals
- F** UL 489 Listed, CSA Certified, & VDE Certified
- G** UL 489 Listed & CSA Certified
- J** UL489 Listed, CSA Certified & TUV Certified



1 SERIES
C

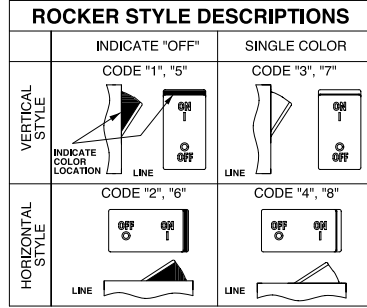
2 ACTUATOR ¹

Two Color Visi-Rocker

- 1 Indicate OFF, vertical legend
- 2 Indicate OFF, horizontal legend
- 3 Vertical legend
- 4 Horizontal legend

Push-To-Reset, Visi-Rocker

- 5 Indicate OFF, vertical legend
- 6 Indicate OFF, horizontal legend
- 7 Vertical legend
- 8 Horizontal legend



3 POLES ²

- 1 One
- 2 Two
- 3 Three

4 CIRCUIT

- B Series Trip (current)

5 AUXILIARY / ALARM SWITCH ²

- 0 without Aux Switch
- 2 S.P.D.T., 0.110 Q.C. Term.
- 3 S.P.D.T., 0.139 Solder Lug
- 4 S.P.D.T., 0.110 Q.C. Term. (Gold Contacts)
- 6 S.P.S.T., 0.139 Solder Lug
- 8 S.P.S.T., 0.187 Q.C. Term.
- 9 S.P.D.T., 0.187 Q.C. Term.

6 FREQUENCY & DELAY

- 11 DC Ultra Short
- 12 DC Short
- 14 DC Medium
- 16 DC Long
- 21 50/60Hz Ultra Short
- 22 50/60Hz Short
- 24 50/60Hz Medium
- 26 50/60Hz Long
- 42 ⁴ 50/60Hz Short, Hi-Inrush
- 44 ⁴ 50/60Hz Medium, Hi-Inrush
- 46 ⁴ 50/60Hz Long, Hi-Inrush
- 52 ⁴ DC Short, Hi-Inrush
- 54 ⁴ DC Medium, Hi-Inrush
- 56 ⁴ DC Long, Hi-Inrush

1 Notes:
 2 Push-to-reset actuators have OFF portion of rocker shrouded.
 3 Multi-pole breakers have all breakers identical except when specifying Auxiliary switch and/or mixed poles, and have one rocker per breaker.
 4 On multi-pole breakers, one auxiliary switch is supplied, mounted in the extreme right pole.
 5 Available up to 50 amps maximum.
 6 Current ratings 71 - 100 with VDE approvals are available up to two poles maximum.
 7 Terminal Code 1 available to 60 amps maximum.
 8 Terminal Codes 2, 4, 5 & C available to 50 amps maximum.
 9 Terminal Codes 3, 6, 9 & A available to 100 amps maximum.
 10 Terminal Codes 9 & C are not VDE approved.
 11 Color shown is visi and legend with remainder of rocker black
 12 Dual = ON-OFF/I-O legend on actuator.
 13 VDE and TUV approval requires Dual (I-O, ON-OFF) markings on rocker.
 14 Legend on push-to-reset bezel/shroud is white when single color rocker is ordered. Legend on push-to-reset bezel/shroud matches visi-color of rocker with actuator codes
 15 5 & 6.
 16 Recessed "OFF-SIDE" available with actuator codes 1, 2, 3, & 4. Legends on rocker are available in ink stamping only.
 17 Barriers supplied on multi-pole units only.
 18 2 & 3 pole circuit breakers required for 120/240 AC rating.

7 CURRENT RATING (AMPERES) ⁵

| CODE | AMPERES | CODE | AMPERES | CODE | AMPERES | CODE | AMPERES |
|------|---------|------|---------|------|---------|------|---------|
| 210 | 0.100 | 295 | 0.950 | 470 | 7.000 | 618 | 18.000 |
| 215 | 0.150 | 410 | 1.000 | 475 | 7.500 | 620 | 20.000 |
| 220 | 0.200 | 512 | 1.250 | 480 | 8.000 | 622 | 22.000 |
| 225 | 0.250 | 415 | 1.500 | 485 | 8.500 | 624 | 24.000 |
| 230 | 0.300 | 517 | 1.750 | 490 | 9.000 | 625 | 25.000 |
| 235 | 0.350 | 420 | 2.000 | 495 | 9.500 | 630 | 30.000 |
| 240 | 0.400 | 522 | 2.250 | 610 | 10.000 | 635 | 35.000 |
| 245 | 0.450 | 425 | 2.500 | 710 | 10.500 | 640 | 40.000 |
| 250 | 0.500 | 527 | 2.750 | 611 | 11.000 | 650 | 50.000 |
| 255 | 0.550 | 430 | 3.000 | 711 | 11.500 | 660 | 60.000 |
| 260 | 0.600 | 435 | 3.500 | 612 | 12.000 | 670 | 70.000 |
| 265 | 0.650 | 440 | 4.000 | 712 | 12.500 | 680 | 80.000 |
| 270 | 0.700 | 445 | 4.500 | 613 | 13.000 | 685 | 85.000 |
| 275 | 0.750 | 450 | 5.000 | 614 | 14.000 | 690 | 90.000 |
| 280 | 0.800 | 455 | 5.500 | 615 | 15.000 | 695 | 95.000 |
| 285 | 0.850 | 460 | 6.000 | 616 | 16.000 | 810 | 100.00 |
| 290 | 0.900 | 465 | 6.500 | 617 | 17.000 | | |

8 TERMINAL

- 1 ⁷ Stud 10-32
- 2 ⁸ Screw 10-32
- 3 ⁹ Stud 1/4-20
- 4 ⁸ Stud M5 x 0.8
- 5 ⁸ Screw M5 x 0.8
- 6 ⁹ Stud M6
- 9 ^{9,10} 7/16" Clip Terminal
- A ⁹ Plug-In Stud
- C ^{8,10} 5/16" Clip Terminal

9 ACTUATOR COLOR & LEGEND ¹²

| Actuator or Visi-Color | Marking: | Marking Color: |
|------------------------|---------------|---------------------------|
| Color: | ON-OFF | Dual ¹¹ |
| White | B | 1 |
| Black | D | 2 |
| Red | G | 3 |
| Green | J | 4 |
| Blue | L | 5 |
| Yellow | N | 6 |
| Gray | Q | 7 |
| Orange | S | 8 |
| | | Single Color |
| | | Rocker/Handle |
| | | Black |
| | | White |
| | | n/a |
| | | Red |
| | | Green |
| | | Blue |
| | | Yellow |
| | | Gray |
| | | Orange |

10 MOUNTING / BARRIERS ¹²

| | STANDARD ROCKER BEZEL | BARRIERS ¹⁵ |
|---|--|------------------------|
| | Threaded Insert, 2 per pole | |
| A | 6-32 X 0.195 inches | yes |
| C | ISO M3 x 5mm | yes |
| | RECESSED OFF ROCKER ¹⁴ | |
| | Threaded Insert, 2 per pole | |
| E | 6-32 x 0.195 inches | yes |
| F | ISO M3 x 5mm | yes |
| | PUSH-TO-RESET BEZEL ¹³ | |
| | Threaded Insert, 2 per pole | |
| B | 6-32 x 0.195 inches | yes |
| D | ISO M3 x 5mm | yes |

11 MAXIMUM APPLICATION RATING

- A 65 DC
- B 125 DC
- C 120/240 AC ¹⁶
- D 240 AC
- F 277 AC
- K 120 AC
- M 80 DC

12 AGENCY APPROVAL

- A without approvals
- G UL 489 Listed & CSA Certified
- J UL489 Listed, CSA Certified & TUV Certified

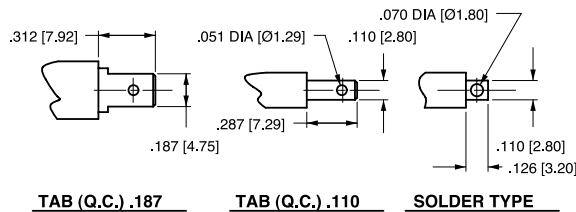
Circuit & Terminal Diagrams: in. [mm]

| DESCRIPTION | CODE | DIMENSIONAL DETAIL | RATING (AMPS) | | |
|--------------|------|--------------------|---------------|----|-----|
| | | | 25 | 50 | 100 |
| #10-32 STUD | 1 | | | | |
| M5 STUD | 4 | | | | |
| #1/4-20 STUD | 3 | | | | |
| M6 STUD | 6 | | | | |
| #1/4-20 STUD | 3 | | | | |
| M6 STUD | 6 | | | | |
| #10-32 SCREW | 2 | | | | |
| M-5 SCREW | 5 | | | | |

| DESCRIPTION | CODE | DIMENSIONAL DETAIL | RATING (AMPS) | | |
|----------------------|------|--------------------|---------------|----|-----|
| | | | 25 | 50 | 100 |
| .250 DOUBLE Q.C. | 7 | | | | |
| 7/16" CLIP TERMINALS | 9 | | | | |
| PUSH-IN STUD | A | | | | |

NOTES: TOLERANCE ON STUD LENGTHS IS $\pm .031$ [$\pm .79$] UNLESS OTHERWISE SPECIFIED.

AUXILIARY / ALARM SWITCH TERMINAL ³



| TIGHTENING TORQUE SPECIFICATIONS | |
|----------------------------------|---------------------------|
| THREAD SIZE | TORQUE |
| #6-32 [M3] MOUNTING INSERTS | 7-9 IN-LBS [0.8-1.0 NM] |
| #10-32 & M5 THD STUDS | 15-20 IN-LBS [1.7-2.3 NM] |
| #10-32 THD SCREW | 15-20 IN-LBS [1.7-2.3 NM] |
| #1/4-20 & M6 THD STUDS | 30-35 IN-LBS [3.4-4.0 NM] |

| TERMINAL HARDWARE | | | | |
|----------------------|-------|---------------------|---------------|---|
| TERMINAL DESCRIPTION | CODE | AGENCY APPROVAL | AMPERE RATING | HARDWARE SUPPLIED |
| #10-32 STUD | 1 | ALL | .02 - 50 | LOCK WASHER - FLAT WASHER - NUT |
| M5 STUD | 4 | ALL | .02 - 50 | LOCK WASHER - FLAT WASHER - NUT |
| #1/4-20 STUD | 3 | ALL | .02 - 80 | LOCK WASHER - FLAT WASHER - NUT |
| | | | 81 - 100 | LOCK WASHER - NUT - (2) FLAT WASHER - NUT |
| M6 STUD | 6 | ALL | .02 - 80 | LOCK WASHER - FLAT WASHER - NUT |
| | | | 81 - 100 | LOCK WASHER - NUT - (2) FLAT WASHER - NUT |
| #10-32 SCREW | 2 & 5 | UL RECOGNIZED | .02 - 50 | * SADDLE CLAMP - FLAT WASHER - SCREW |
| | | UL-489 LISTED | .02 - 50 | LOCK WASHER - FLAT WASHER - SCREW |
| | | TUV & VDE CERTIFIED | .02 - 16 | * SADDLE CLAMP - FLAT WASHER - SCREW |
| | | TUV & VDE CERTIFIED | 16.1 - 50 | LOCK WASHER - FLAT WASHER - SCREW |

* THE SADDLE CLAMP IS FOR DIRECT WIRE CONNECTION USE. DISCARD SADDLE CLAMP IF WIRE TERMINAL LUG IS USED

Notes:

- All dimensions are in inches [millimeters].
- Tolerance $\pm .020$ [.51] unless otherwise specified.
- Available on Series Trip and Switch Only Circuits when called for on multi-pole units. Only one auxiliary switch is normally supplied, as viewed in multi-pole identification scheme.

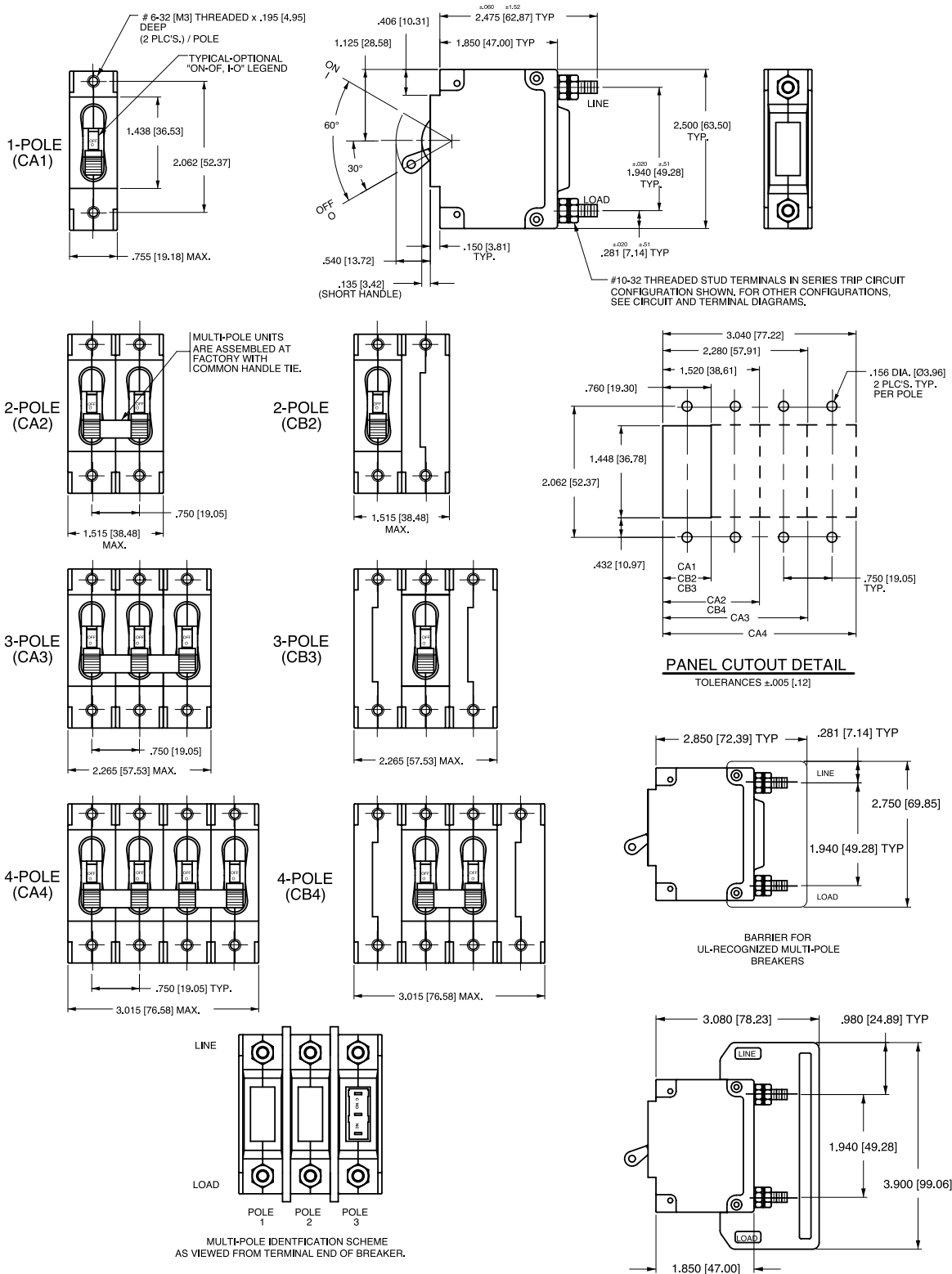
Circuit & Terminal Diagrams: in. [mm]

| | CIRCUIT SCHEMATIC | | CIRCUIT CODE | AUX SWITCH CODE | CIRCUIT SCHEMATIC | | CIRCUIT CODE | AUX SWITCH CODE | | | | |
|------------|---|--|--------------|-----------------|--|-----|--------------|-----------------|---|---|---|---|
| | ANSI | IEC | | | ANSI | IEC | | | | | | |
| | SWITCH ONLY (NO COIL) | | | | SERIES TRIP | | | | | | | |
| | SWITCH ONLY (NO COIL) WITH AUXILIARY SWITCH | | A | 0 | SERIES TRIP WITH AUXILIARY / ALARM SWITCH | | B | 0 | | | | |
| | SHUNT TRIP | | | | DUAL COIL; SERIES TRIP CURRENT COIL, SHUNT TRIP VOLTAGE COIL | | | | D | E | H | 0 |
| RELAY TRIP | | DUAL COIL; SERIES TRIP CURRENT COIL, RELAY TRIP VOLTAGE COIL | | | | | | | | | | |
| | | | | | | F | G | K | | | | |

| HANDLE POSITION VS. AUX/ALARM SWITCH MODE | | | | | |
|---|-----------------|------------------|-----------------|----------------------------|--|
| CIRCUIT BREAKER MODE | STANDARD C/B | | MID TRIP C/B | | |
| | HANDLE POSITION | AUX. SWITCH MODE | HANDLE POSITION | STANDARD ALARM SWITCH MODE | REVERSE ALARM SWITCH MODE ⁴ |
| OFF | | | | | |
| ON | | | | | |
| ELECTRICAL TRIP | | | | | |

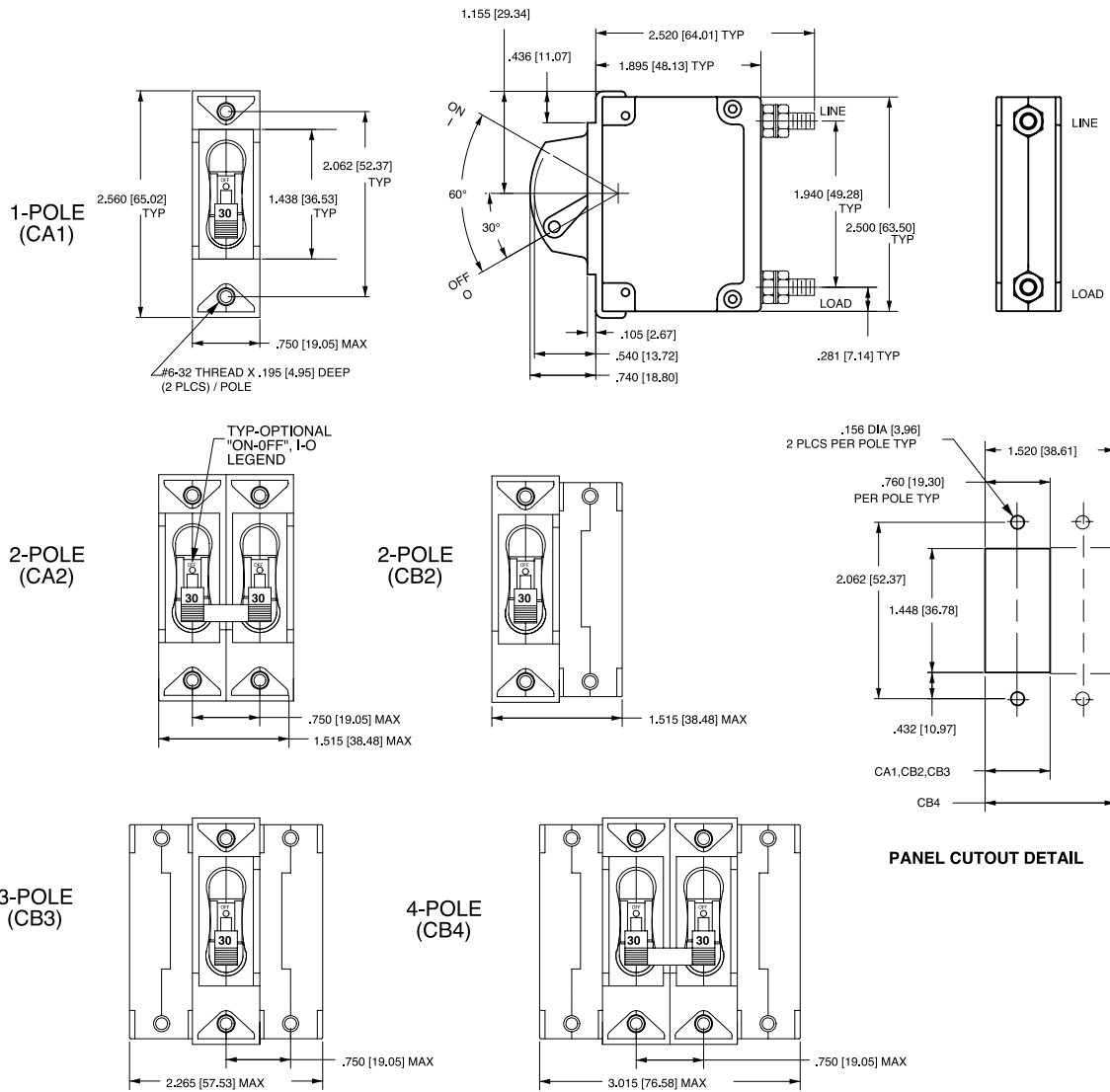
- Notes:
- All dimensions are in inches [millimeters].
 - Tolerance $\pm .020$ [.51] unless otherwise specified.
 - Schematic shown represents current trip circuits.
 - Available only as special catalog number.

Dimensional Specifications: in. [mm]

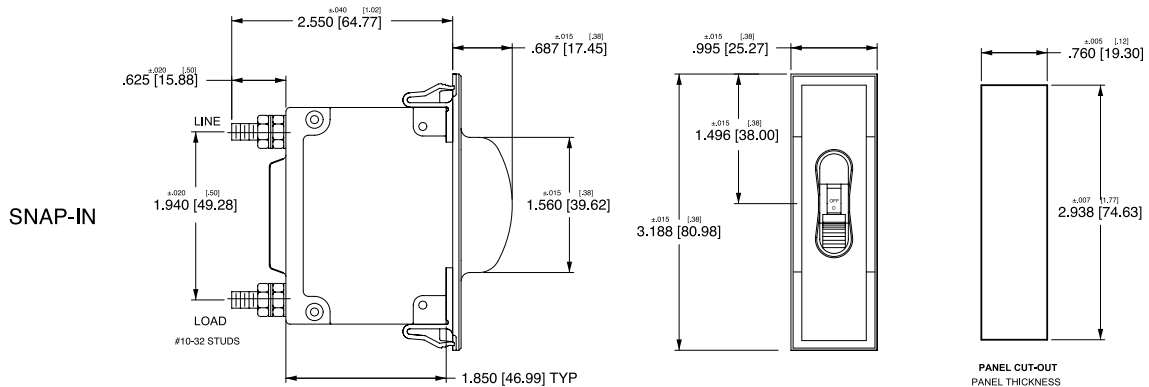


- Notes:
- All dimensions are in inches [millimeters].
 - Tolerance ±.020 [0.51] unless otherwise specified.

Dimensional Specifications: in. [mm]



*Handguard available as special catalog number only

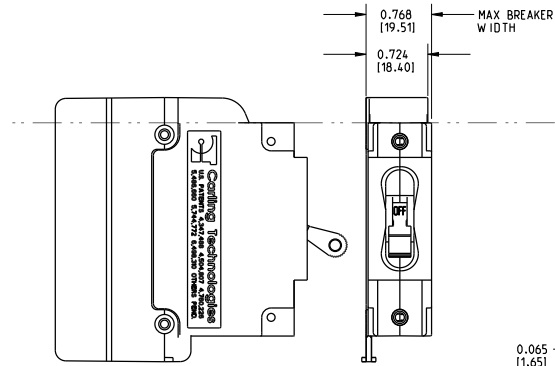


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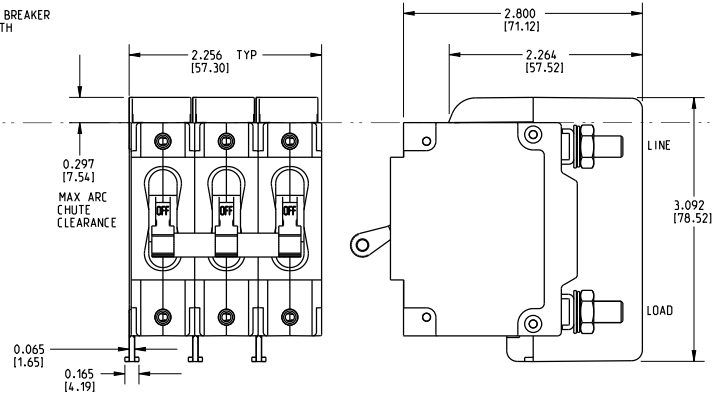
- 1 All dimensions are in inches [millimeters].
- 2 Tolerance ± 0.020 [.51] unless otherwise specified.

Dimensional Specifications: in. [mm]

1-POLE (CA1)
w/ ARC CHUTE BARRIER

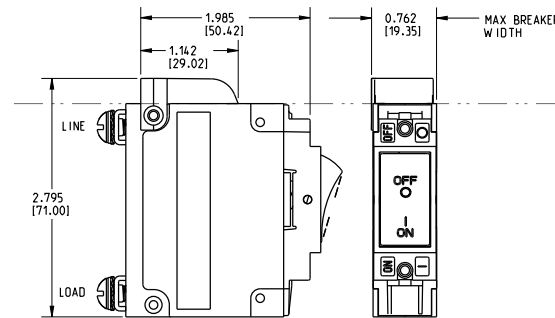


3-POLE (CA3)
w/ ARC CHUTE BARRIER

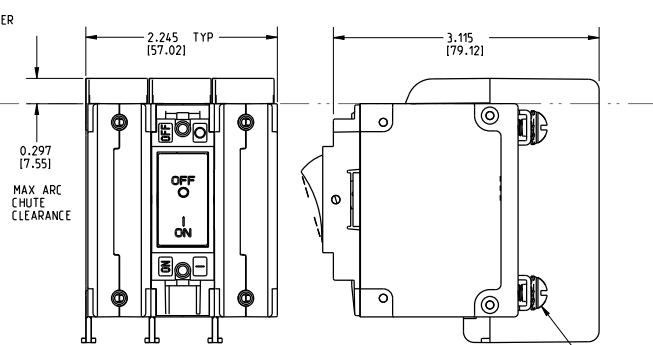


INDICATE "ON"

1-POLE (CC1, CD1)
w/ ARC CHUTE (NO BARRIER)



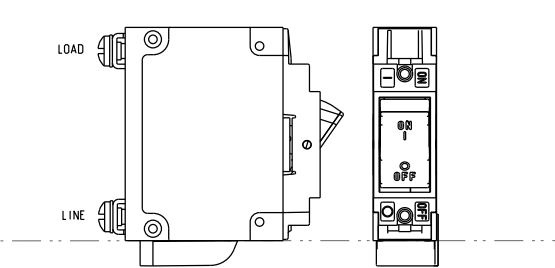
3-POLE (CC3, CD3)
w/ ARC CHUTE BARRIER



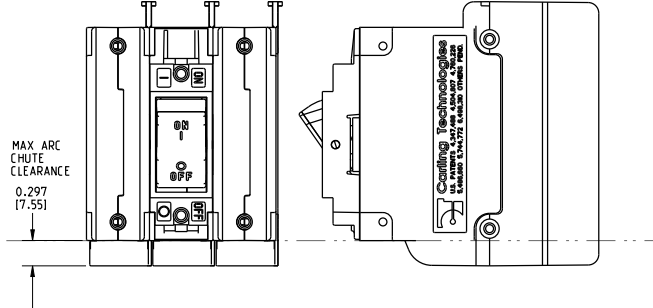
SCREW TYPE TERMINALS IN SERIES TRIP CIRCUIT CONFIGURATION SHOWN.

INDICATE "OFF" / SINGLE COLOR

1-POLE (CF1, CG1, C11, C21)
w/ ARC CHUTE (NO BARRIER)



3-POLE (CF3, CG3, C13, C23)
w/ ARC CHUTE BARRIER

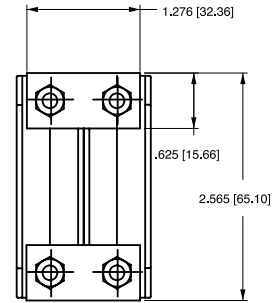
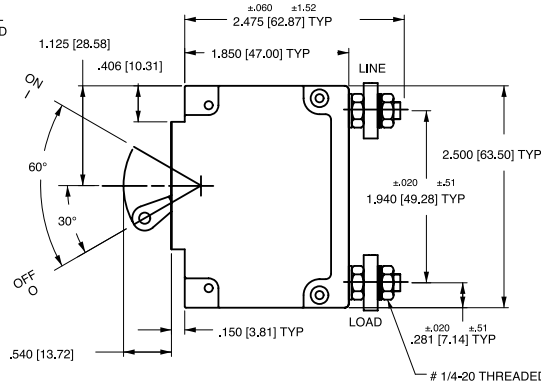
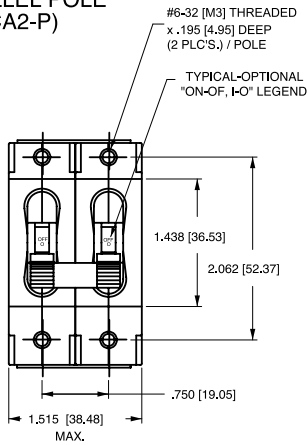


Notes:

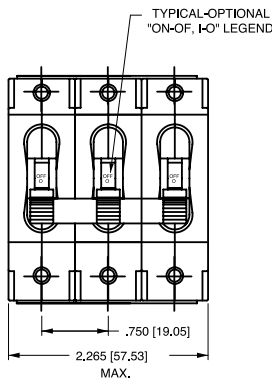
- 1 Only 1-pole and 3-pole configurations shown. Arc chute (without barrier) and arc chute barrier also available for 2-pole construction.
- 2 Dimensions apply to all variations shown.
- 3 Notice that line and load terminal orientation for indicate on and indicate off rocker circuit breakers are opposite.
- 4 Screw type terminals shown for Rocker style (CF1, C11, etc) circuit breakers. For other terminal configurations see circuit and terminal diagrams.
- 5 All dimensions are in inches [millimeters].
- 6 Tolerance $\pm .020$ unless otherwise specified.
- 7 Must be ordered under a special catalog number.

Dimensional Specifications: in. [mm]

PARALLEL POLE (CA2-P)

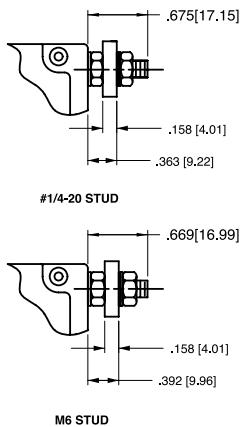
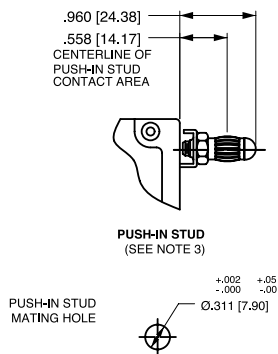


PARALLEL POLE (CA3-P)

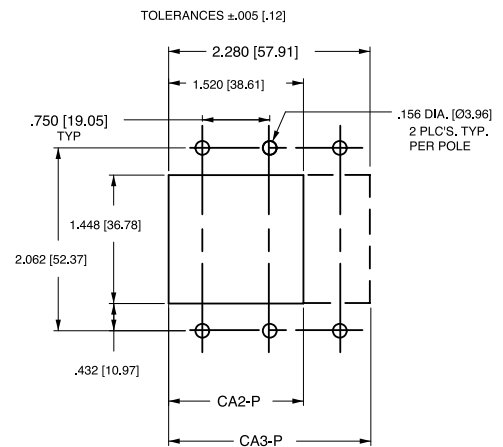


| CIRCUIT BREAKER PROFILE | CIRCUIT SCHEMATIC (CA2-P SHOWN) | | CIRCUIT CODE | AUX SWITCH CODE |
|-------------------------|---|-----|--------------|-----------------|
| | ANSI | IEC | | |
| | SERIES TRIP LINE LOAD LINE (NETZ) LOAD (LAST) | | P | 0 |
| | SERIES TRIP WITH AUXILIARY SWITCH LINE LOAD LINE (NETZ) LOAD (LAST) C NO NC | | P | 2 3 4 |

TERMINAL DETAILS

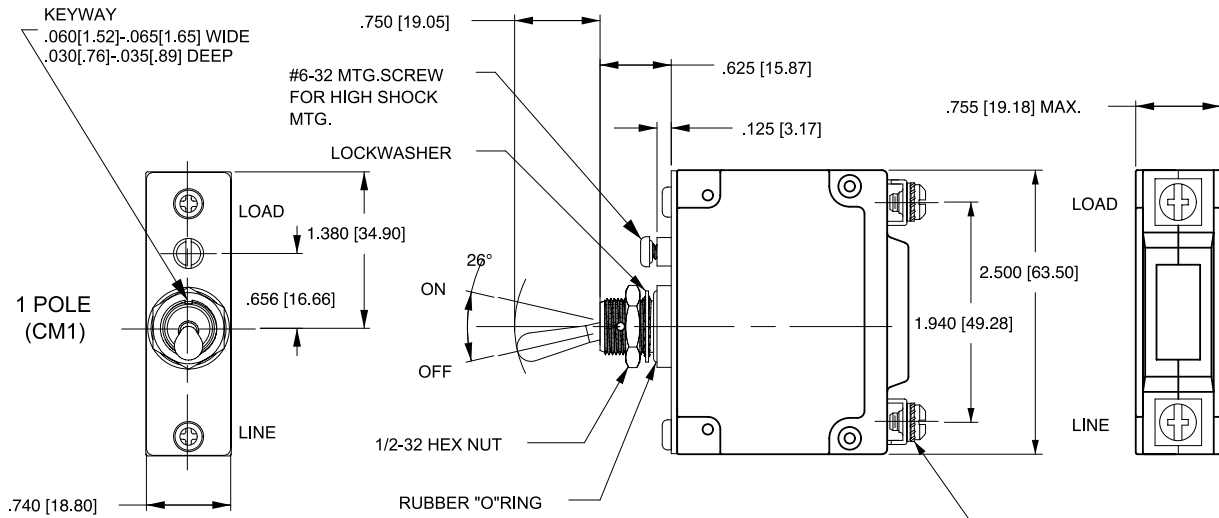


PANEL CUTOUT DETAIL

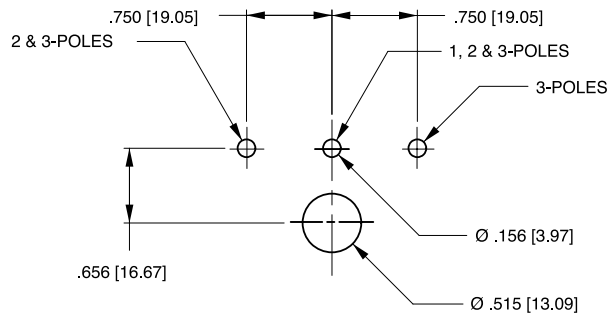
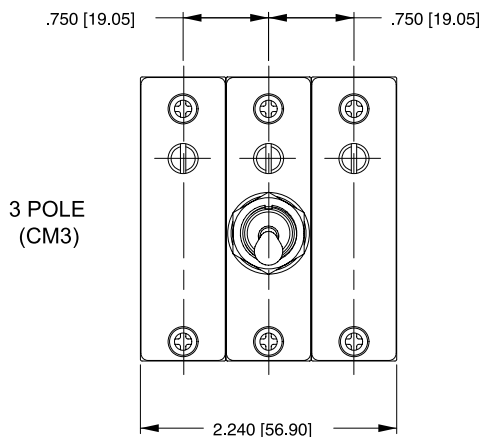
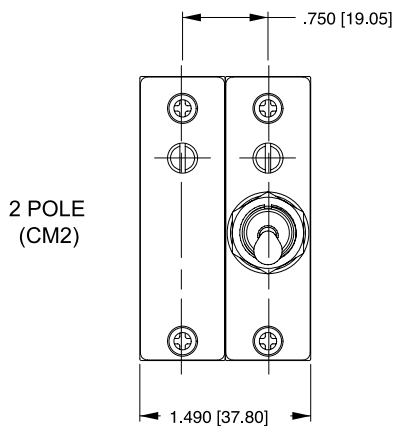


- Notes:
- All dimensions are in inches [millimeters].
 - Tolerance ±.020 [.51] unless otherwise specified.

Dimensional Specifications: in. [mm]



SCREW TYPE TERMINALS IN SERIES TRIP CIRCUIT CONFIGURATION SHOWN. FOR OTHER CONFIGURATIONS SEE CIRCUIT & TERMINAL DIAGRAMS



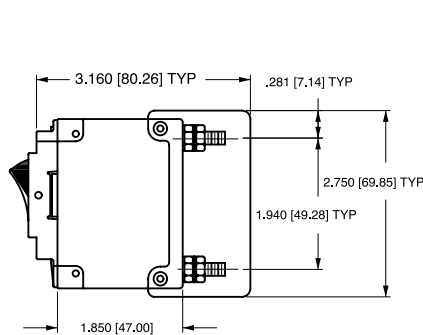
PANEL CUTOUT DETAIL
 TOLERANCES ±.005[.13]

Notes:

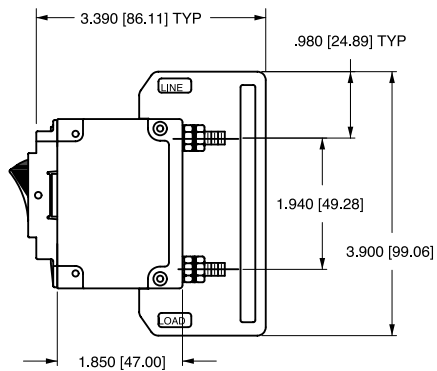
- 1 All dimensions are in inches [millimeters].
- 2 Tolerance ±.020 [.51] unless otherwise specified.

Circuit & Terminal Diagrams: in. [mm]

| CIRCUIT BREAKER PROFILE | CIRCUIT SCHEMATIC | | CIRCUIT CODE | AUX SWITCH CODE | CIRCUIT SCHEMATIC | | CIRCUIT CODE | AUX SWITCH CODE |
|---|---|-----|--------------|-----------------|---|-----|--------------|-----------------|
| | ANSI | IEC | | | ANSI | IEC | | |
| <p>2.160 [54.86] TYP .625 [15.88] TYP LINE MAIN TERM'S. (SEE TABLE A) LOAD SERIES TRIP (2 TERM'S.)</p> | SWITCH ONLY (NO COIL) LINE LINE (NETZ) LOAD LOAD (LAST) | | A | 0 | SWITCH TRIP LINE LINE (NETZ) (3) LOAD LOAD (LAST) | | BC | 0 |
| <p>.675 [17.15] TYP .970 [24.64] C NO NC 1.265 [32.13] AUX. SWITCH TERM'S. (3 PLCS.) SERIES TRIP W/AUX. SWITCH (5 TERM'S.)</p> | SWITCH ONLY (NO COIL) WITH AUXILIARY SWITCH LINE LINE (NETZ) LOAD LOAD (LAST) | | A | 2 3 4 | SERIES TRIP WITH AUXILIARY SWITCH LINE LINE (NETZ) (3) LOAD LOAD (LAST) | | BC | 2 3 4 |
| <p>SHUNT TRIP (3 TERM'S.)</p> | SHUNT TRIP LINE LINE (NETZ) (3) SHUNT SHUNT (NEBENSCHLUSS) LOAD LOAD (LAST) | | DE | 0 | DUAL COIL: SERIES TRIP CURRENT COIL, SHUNT TRIP VOLTAGE COIL LINE LINE (NETZ) LOAD LOAD (LAST) VOLTAGE COIL VOLTAGE COIL | | H | 0 |
| <p>1 2 3 4 .646 [16.41] .812 [20.62] TYP .646 [16.41] TYP SHUNT TRIP (4 TERM'S.)</p> | RELAY TRIP LINE (1) RELAY (RELAIS) LINE (NETZ) (3) LOAD (2) RELAY (RELAIS) RELAY (RELAIS) LOAD (LAST) | | FG | 0 | DUAL COIL: SERIES TRIP CURRENT COIL, RELAY TRIP VOLTAGE COIL LINE (1) RELAY (RELAIS) LINE (NETZ) (3) LOAD (2) RELAY (RELAIS) RELAY (RELAIS) LOAD (LAST) VOLTAGE COIL (2) VOLTAGE COIL (3) | | K | 0 |



BARRIER FOR UL-RECOGNIZED MULTI-POLE BREAKERS

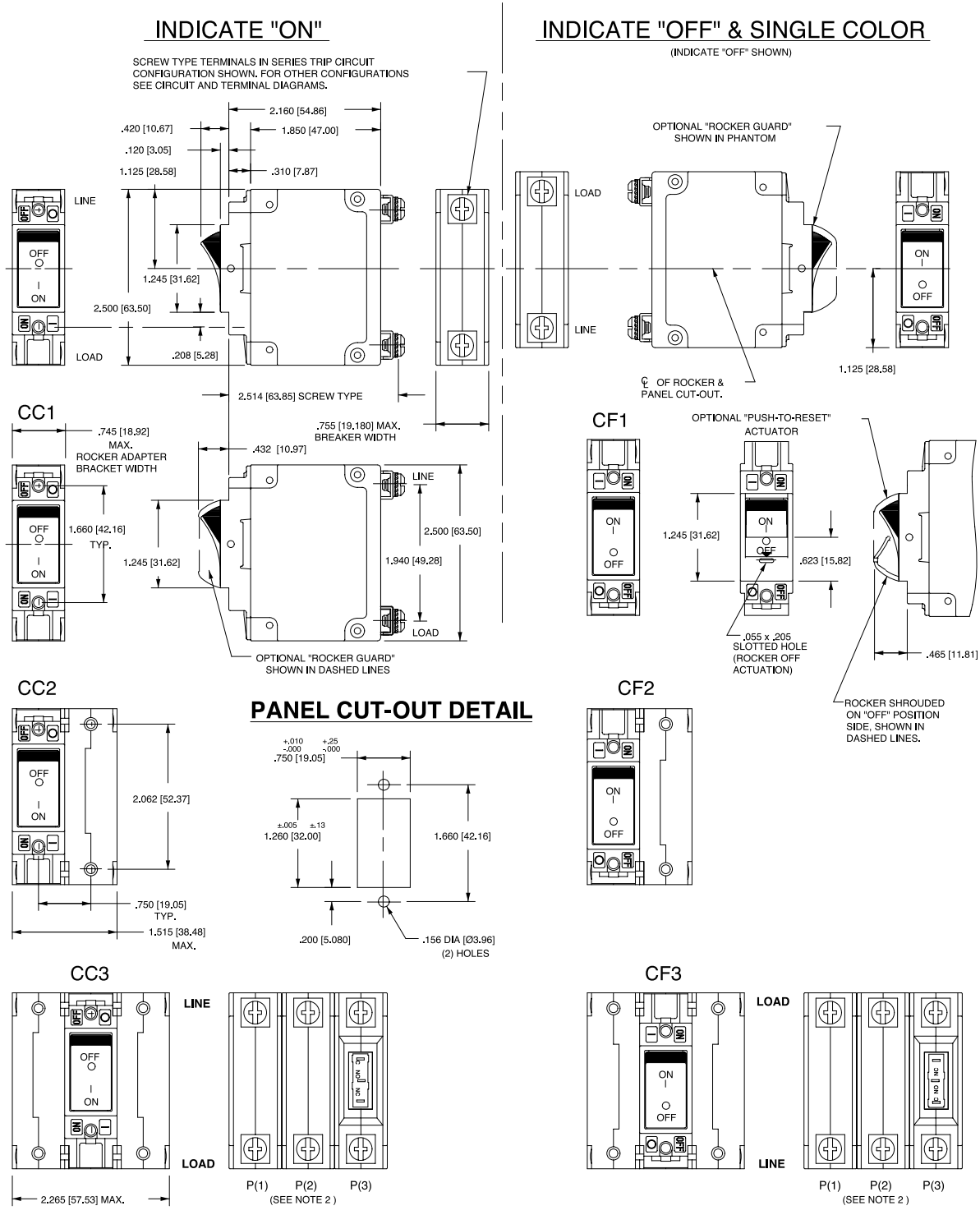


BARRIER FOR UL-489 LISTED MULTI-POLE BREAKERS

Notes:

- 1 All dimensions are in inches [millimeters].
- 2 Tolerance ± 0.020 [.51] unless otherwise specified.
- 3 Schematic shown represents current trip circuit.

Dimensional Specifications: in. [mm]

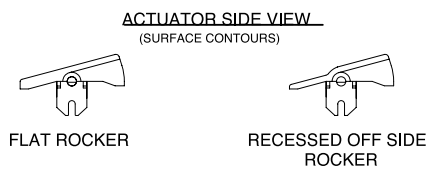
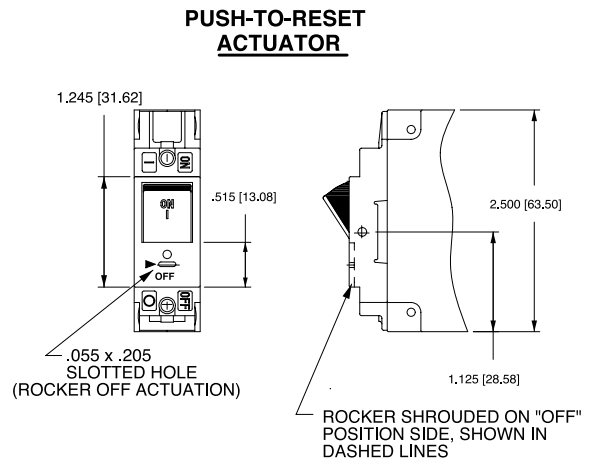
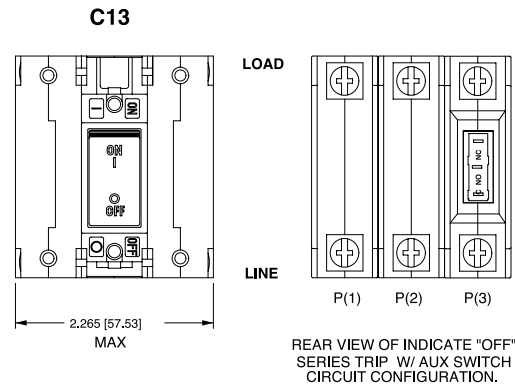
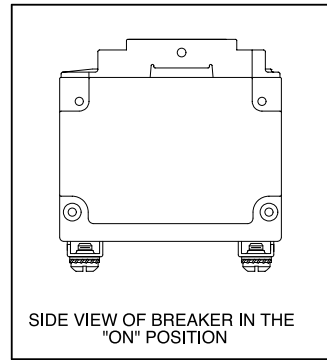
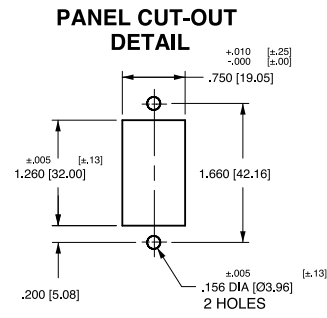
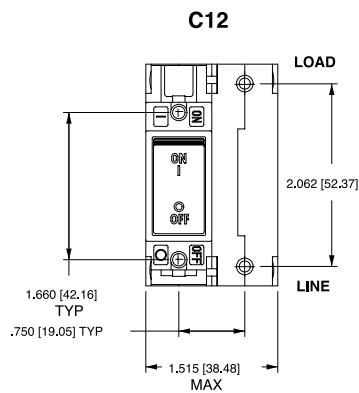
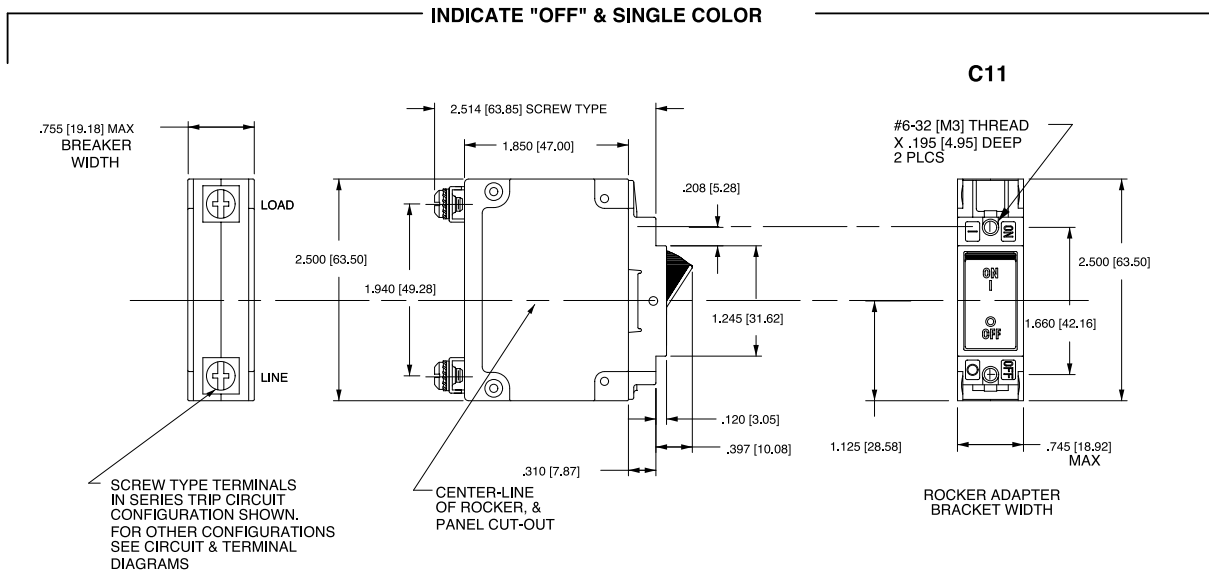


REAR VIEW OF INDICATE "ON" SERIES TRIP W/ AUX SWITCH CIRCUIT CONFIGURATION.

REAR VIEW OF INDICATE "OFF" SERIES TRIP W/ AUX SWITCH CIRCUIT CONFIGURATION.

- Notes:
- 1 Dimensions apply to all variations shown. Notice that circuit breaker line and load terminal orientation on indicate OFF is opposite of indicate ON.
 - 2 For pole orientation with horizontal legend, rotate front view clockwise 90°.
 - 3 All dimensions are in inches [millimeters].
 - 4 Tolerance ± 0.020 [.51] unless otherwise specified.

Dimensional Specifications: in. [mm]



- Notes:
- 1 For pole orientation with horizontal legend, rotate front view clockwise 90°.
 - 2 All dimensions are in inches [millimeters].
 - 3 Tolerance ±.020 [.51] unless otherwise specified.

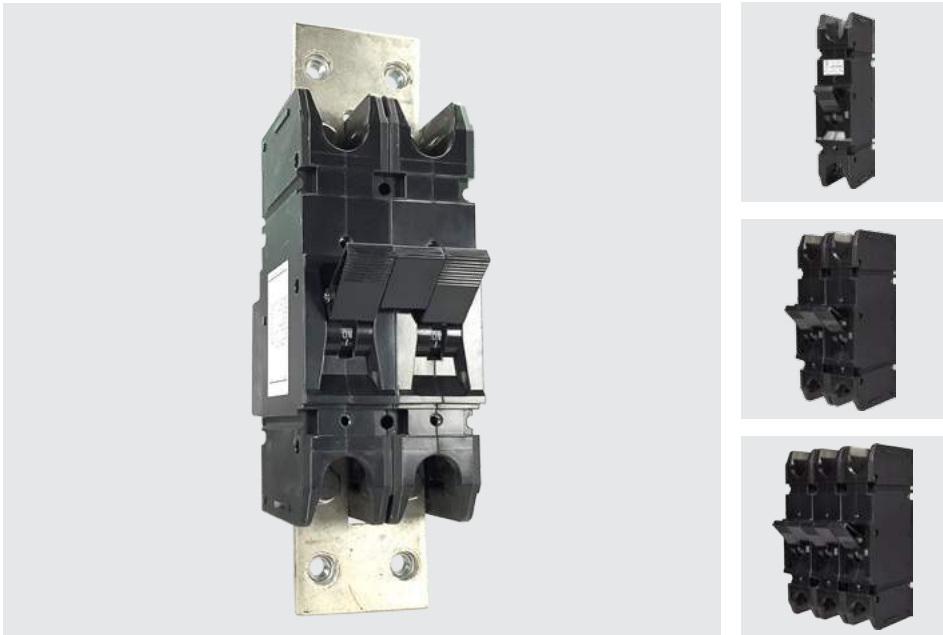
F-Series

F-Series

CIRCUIT BREAKER

The F-Series hydraulic-magnetic high amperage circuit breakers are designed to handle high current applications in extremely hot and/or cold locations. Due to its time-proven hydraulic-magnetic design, the F-Series load sensing mechanism is insensitive to changes in ambient or enclosure temperature, providing a consistent trip point over temperatures ranging from -40°C to $+85^{\circ}\text{C}$. Additionally, the F-Series circuit breakers come with a choice of overload time delays, making them ideal for critical applications having inductive loads.

Further, the F-Series breakers are available up to 700A and an optional 25 millivolt metering shunt construction provides a safe method for monitoring current flowing through the breaker by simply connecting a meter with light gauge wire to the appropriate terminals located on the shunt housing at the rear of the breaker. Applications can be customized by measuring and displaying percentage of current, watts or safe/danger zones.

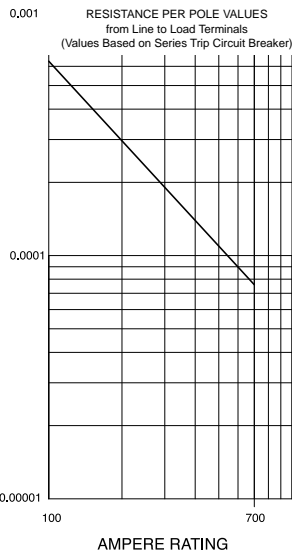


Product Highlights:

- AC ratings to UL 489
- DC voltage ratings up to 700A with metering shunt section
- Consistent trip point over temperatures ranging from -40°C to $+85^{\circ}\text{C}$
- Optional 25 millivolt metering shunt construction

Electrical

| | |
|-------------------------|--|
| Maximum Voltage | 125VDC, 277VAC |
| Current Ratings | Standard current coils: 100, 125, 150, 175, 225, 250 amps. 300, 350, 400, 500, 600, 700 amps available as parallel pole construction. |
| Auxiliary Switch Rating | SPDT; 10.1 Amps @ 250VAC, 1.0 Amps @ 65VDC, 0.5 Amps @ 80VDC 0.1 Amps @ 125VAC (with gold contacts). |
| Insulation Resistance | Minimum: 100 Megohms at 500 VDC |
| Dielectric Strength | 1960 VAC, 50/60 Hz for one minute between all electrically isolated terminals, except 2500 VAC for one minute between alarm/aux. switch and main terminals with contacts in open and closed position. F-Series circuit breakers comply with the 8mm spacing & 3750VAC 50/60 Hz dielectric requirements from hazardous voltage to operator accessible surfaces, between adjacent poles and from main circuits to auxiliary circuits per Publications EN 60950 and VDE 0805. |
| Resistance, Impedance | Values from Line to Load Terminal - based on Series Trip Circuit Breaker. |



| CURRENT (AMPS) | TOLERANCE (%) |
|----------------|---------------|
| 100 - 700 | 50 |

Mechanical

| | |
|-----------------|---|
| Endurance | 4000 ON-OFF operations with rated Current & Voltage & 4000 operations with no load (8000 operations total) @ 5 per minute. Parallel Pole construction: 1000 operations with rated Current and Voltage @ 5 per minute. |
| Trip Free | All F-Series Circuit Breakers will trip on overload, even when the actuator is forcibly held in the ON position. |
| Trip Indication | The operating actuator moves positively to the OFF position when an overload causes the circuit breaker to trip. |

Physical

| | |
|--------------------------|--|
| Number of Poles | 1 - 3 Poles Note: Ratings over 250 Amps only available with parallel pole. |
| Internal Circuit Config. | Series (with or without auxiliary switch), Switch Only (with or without auxiliary switch). |
| Available Accessories | Factory installed: DC Current Metering Shunt (25 mV @Ir) |
| Weight | Varies depending on construction. Consult factory. |
| Standard Colors | Housing - Black; Actuator- Black or White with contrasting ON-OFF legend. |

Environmental

Designed and tested in accordance with requirements of specification MIL-PRF-55629 & MIL-STD-202 as follows:

| | |
|-----------------------|---|
| Shock | Withstands 100 Gs, 6ms, sawtooth while carrying rated current per Method 213, Test Condition "I". Instantaneous and ultra-short curves tested @ 90% of rated current. |
| Vibration | Withstands 0.060" excursion from 10-55 Hz, and 10 Gs 55-500 Hz, at rated current per Method 204C, Test Condition A. Instantaneous and ultrashort curves tested at 90% of rated current. |
| Moisture Resistance | Method 106D; ten 24-hour cycles @ +25°C to +65°C, 80-98% RH.56 days @ +85°C, 85% RH. |
| Salt Spray | Method 101, Condition A (90-95% RH @ 5% NaCl Solution, 96 hrs). |
| Thermal Shock | Method 107D, Condition A (Five cycles @ -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.

Electrical Tables

Table A: Lists UL Listed (489) and CSA Certified (C22.2 N0. 5.1-M) configurations and performance capabilities as a Molded Case Circuit Breaker

| F SERIES TABLE A : UL489 LISTED BRANCH CIRCUIT BREAKERS | | | | | | |
|---|------------------------|-----------|-------|----------------------------------|------------------------------|----------------------------------|
| CIRCUIT CONFIGURATION | VOLTAGE | | | CURRENT RATING FULL LOAD AMPS | INTERRUPTING CAPACITY (AMPS) | |
| | MAX RATING | FREQUENCY | PHASE | | UL / CSA 1 - 3 POLES | TUV ² 1 or 2 POLES |
| SERIES | 125 | DC | --- | 50 - 250 | 50,000 | 25,000 |
| | 120 / 240 ¹ | 50 / 60 | 1 | 100 - 250 | 10,000 | --- |
| | 277 | 50 / 60 | 1 | 100 - 250 | 10,000 | --- |
| | 208Y / 120 | 50 / 60 | 3 | 100 - 250 | 10,000 | --- |

Notes:
 1 120/240V rating available in 2 or 3 poles. In a 3 pole construction the center pole is Neutral.
 2 TUV constructions are not available with AC ratings and 150-250 amp ratings only.

Table B: Lists UL Listed configurations and performance capabilities as Circuit Breakers for use in Communications Equipment (Guide DITT, File E189195), under UL489A

| F-SERIES TABLE B : UL489 LISTED BRANCH CIRCUIT BREAKERS | | | | |
|---|-------------|-----------|----------------------------------|---|
| CIRCUIT CONFIGURATION | VOLTAGE | | CURRENT RATING FULL LOAD AMPS | INTERRUPTING CAPACITY (AMPS) WITHOUT BACKUP FUSE |
| | MAX. RATING | FREQUENCY | | |
| SERIES | 125 | DC | 251 - 700 | 50,000 |

Agency Certifications

UL Listed

UL 489



Circuit Breakers , Molded Case (Guide DIVQ, File E129899) Complies with the requirements of the CSA Standard for Molded Case Circuit Breakers,

CANCSA- C22.2 No. 5.1 –M

Circuit Breakers for Use in Communications Equipment (Guide DITT, File E189195)

TUV Certified



IEC 60947-2

Low Voltage Switchgear and Control Gear under TUV License No. R72031058

UL 489A

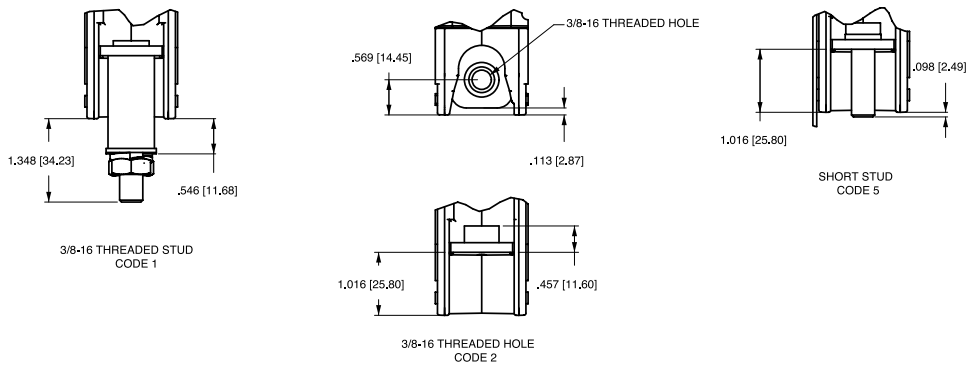


Circuit & Terminal Diagrams: in. [mm]

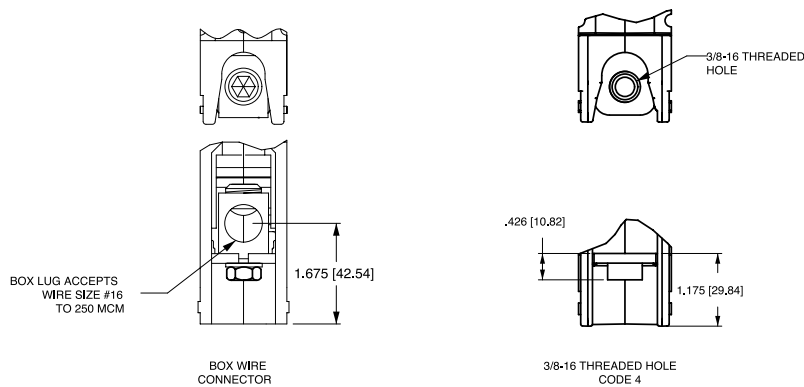
F SERIES NON-PARALLEL POLE CONSTRUCTION:

| CIRCUIT BREAKER PROFILE | CIRCUIT SCHEMATIC | | CIRCUIT CODE | AUX. SWITCH CODE | CIRCUIT SCHEMATIC | | CIRCUIT CODE | AUX. SWITCH CODE |
|--|-------------------|-----|--------------|-----------------------|-------------------|-----|--------------|-----------------------|
| | ANSI | IEC | | | ANSI | IEC | | |
| <p>SERIES TRIP (2 TERM.S.)</p> | | | A | 0 | | | BC | 0 |
| <p>SERIES TRIP W/AUX. SWITCH (5 TERM.S.)</p> | | | A | 2 3 4 5 9 | | | BC | 2 3 4 5 9 |

TERMINAL DETAILS BACK CONNECT



FRONT CONNECT



Notes:

- 1 All dimensions are in inches [millimeters].
- 2 Tolerance $\pm .020$ [.51] unless otherwise specified.

Circuit & Terminal Diagrams: in. [mm]

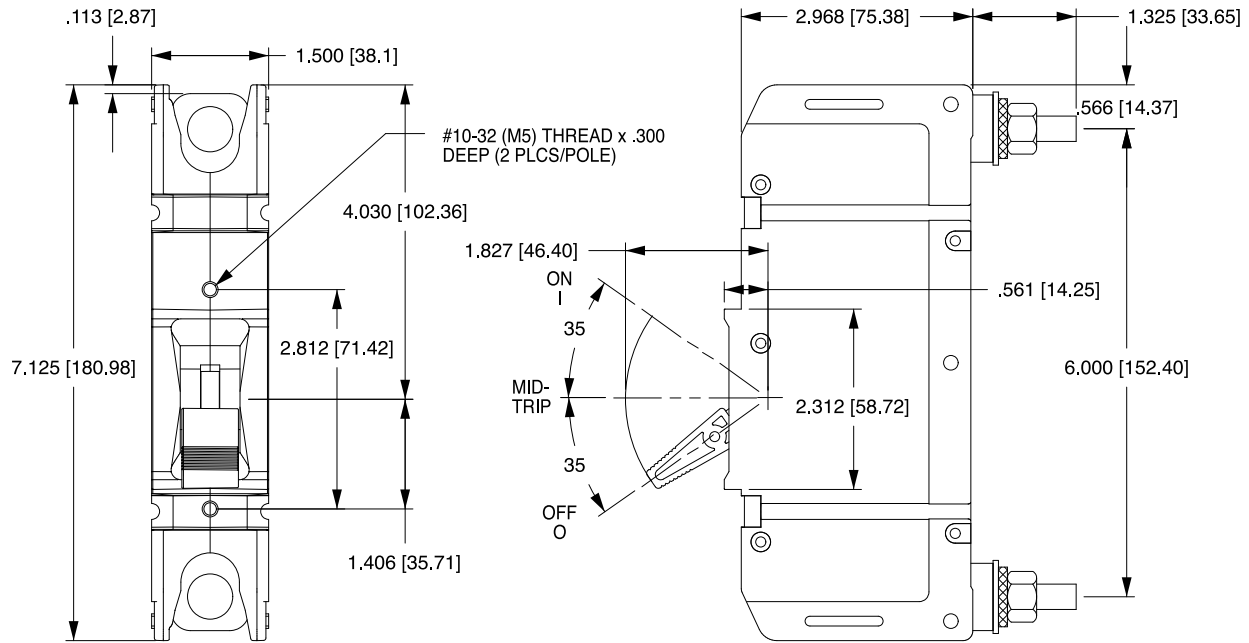
F-SERIES PARALLEL POLE CONSTRUCTION:

| CIRCUIT BREAKER PROFILE | CIRCUIT SCHEMATIC | | CIRCUIT CODE | AUX SWITCH CODE | CIRCUIT SCHEMATIC | | CIRCUIT CODE | AUX SWITCH CODE |
|--|---|------------------------|--------------|-----------------|---|------------------------|--------------|-----------------|
| | ANSI | IEC | | | ANSI | IEC | | |
| <p>SERIES TRIP (2 TERMS.)</p> | <p>SWITCH ONLY (NO COIL)</p> | <p>LINE (NETZ)</p> | A | 0 | <p>SERIES TRIP</p> | <p>LINE (NETZ) (3)</p> | BC | 0 |
| <p>SERIES TRIP W/AUX. SWITCH (5 TERMS.)</p> | <p>SWITCH ONLY (NO COIL) WITH ALARM OR AUX. SWITCH</p> | <p>LINE (NETZ)</p> | A | B | <p>SERIES TRIP WITH ALARM OR AUX. SWITCH</p> | <p>LINE (NETZ) (3)</p> | BC | B |
| <p>SERIES TRIP W/METERING SHUNT (4 TERMS.)</p> <p>(FOR 100-225 AMPS DIM = 2.000)</p> | <p>SWITCH ONLY (NO COIL) WITH METERING SHUNT</p> | <p>LINE (NETZ) (3)</p> | N | 0 | <p>SERIES TRIP CURRENT COIL WITH METERING SHUNT</p> | <p>LINE (NETZ) (3)</p> | M | 0 |
| <p>RELAY TRIP (4 TERMS.)</p> | <p>SWITCH ONLY WITH ALARM OR AUX. SWITCH AND METERING SHUNT</p> | <p>LINE (NETZ) (3)</p> | N | A | <p>SERIES TRIP WITH ALARM OR AUX. SWITCH AND METERING SHUNT</p> | <p>LINE (NETZ) (3)</p> | M | A |

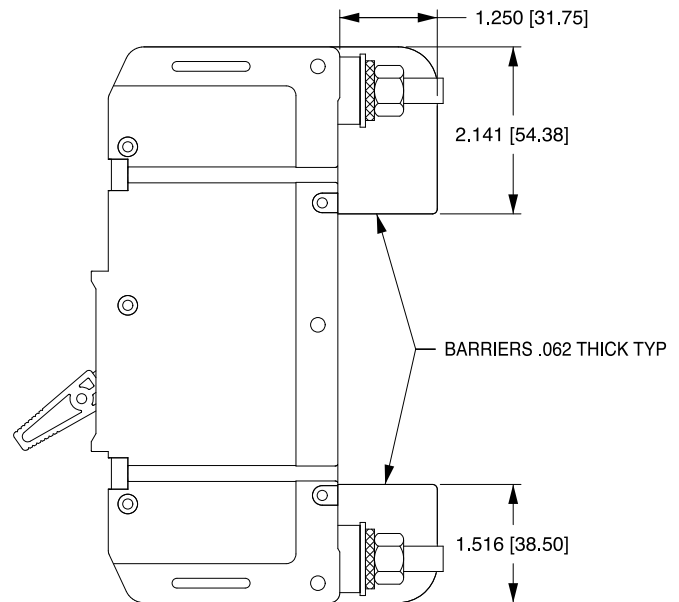
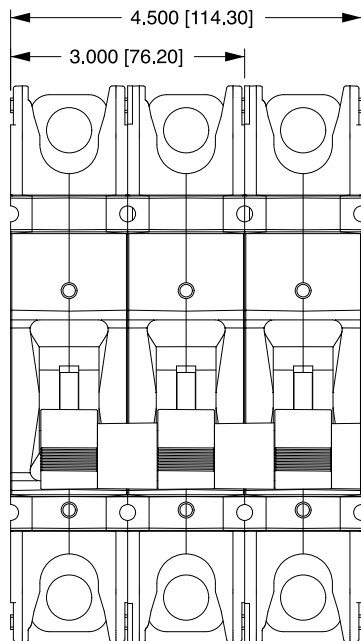
- Notes:
- 1 All dimensions are in inches [millimeters].
 - 2 Tolerance ± 0.020 [.51] unless otherwise specified.

Dimensional Specifications: in. [mm]

SERIES TRIP BACK CONNECT (STUD TERMINALS SHOWN)



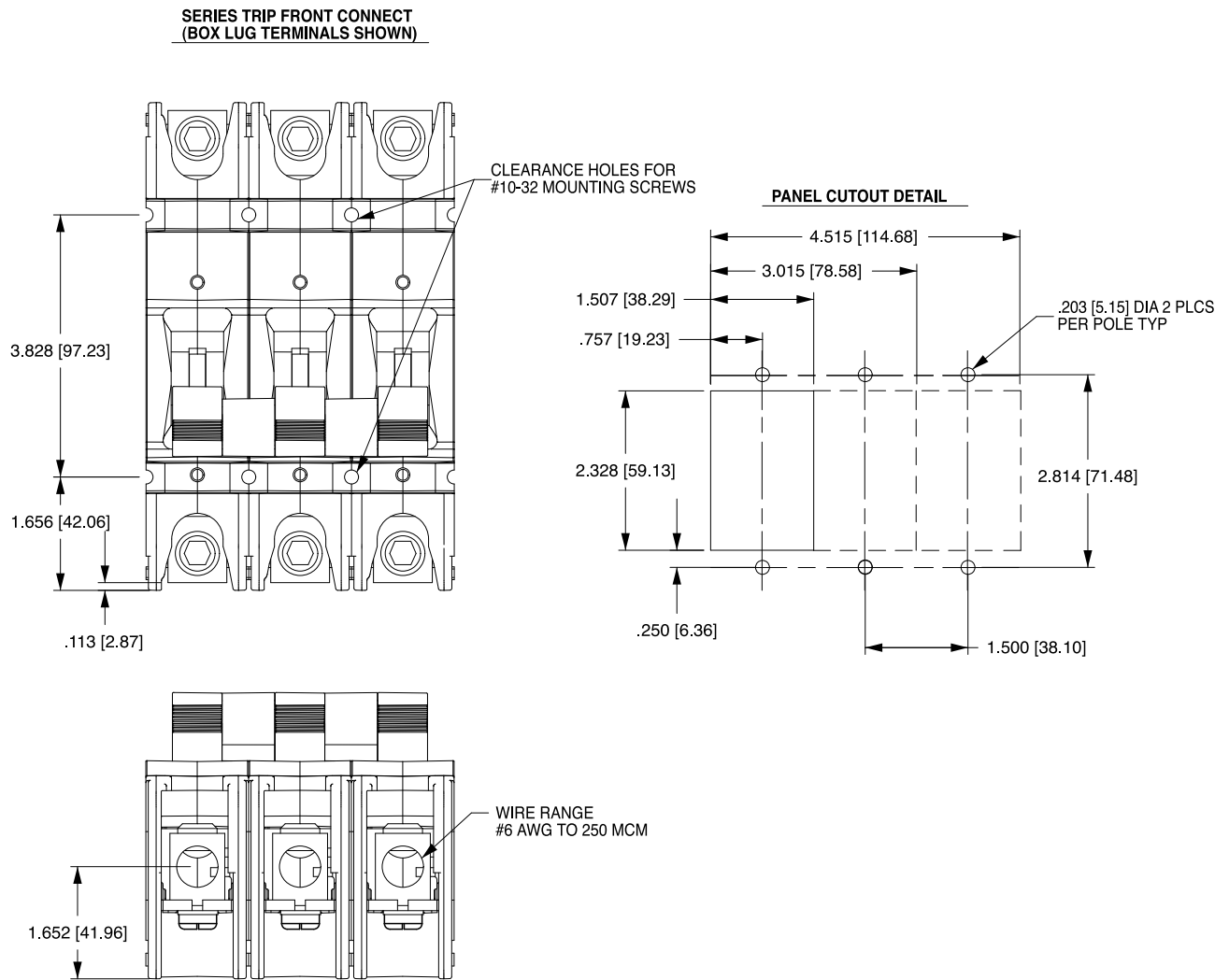
MULTIPOLE SERIES TRIP, SHOWING TERMINAL BARRIER



Notes:

- 1 All dimensions are in inches [millimeters].
- 2 Tolerance ± 0.020 [51] unless otherwise specified.

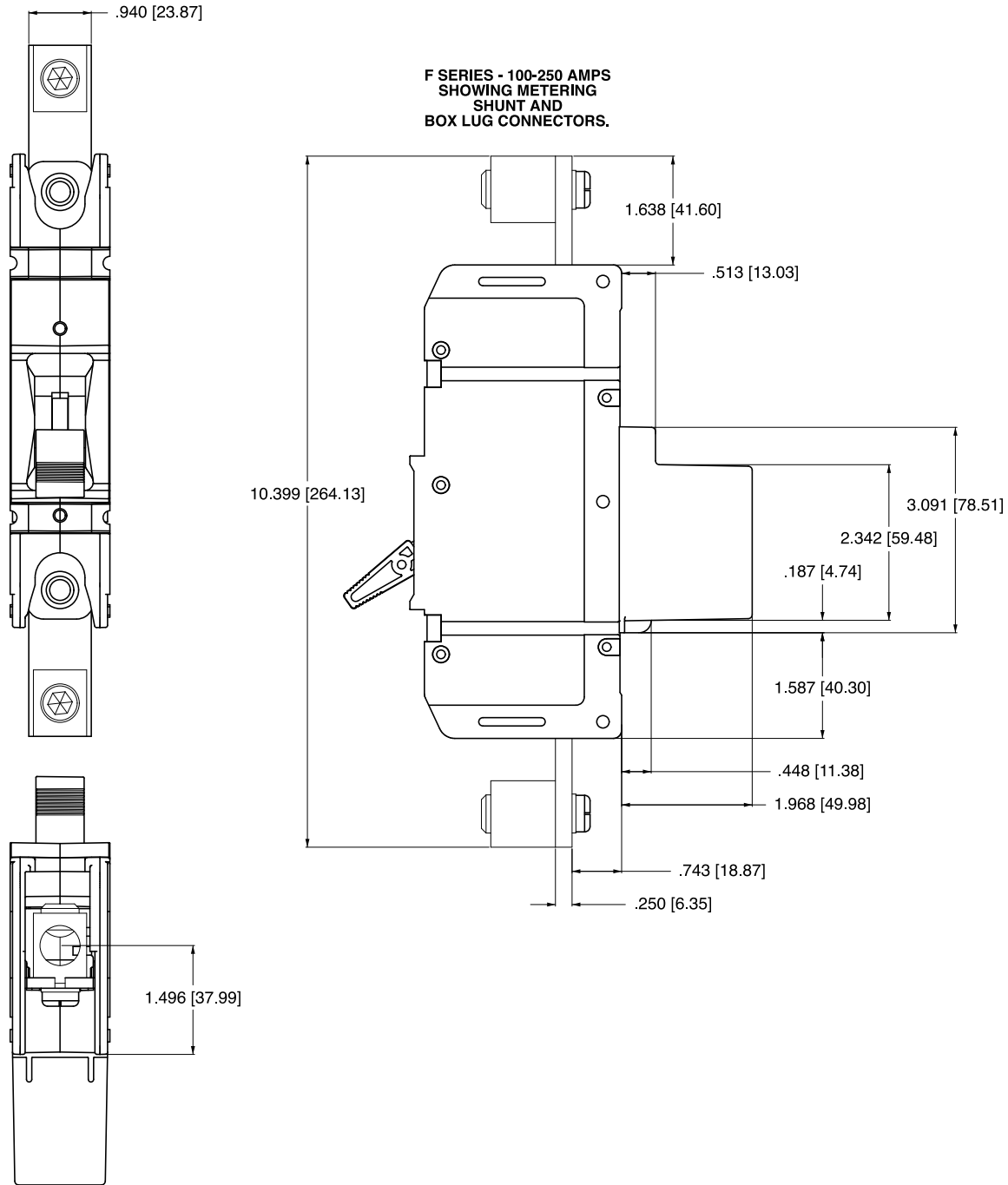
Dimensional Specifications: in. [mm]



Notes:

- 1 All dimensions are in inches [millimeters].
- 2 Tolerance ± 0.020 [.51] unless otherwise specified.

Dimensional Specifications: in. [mm]

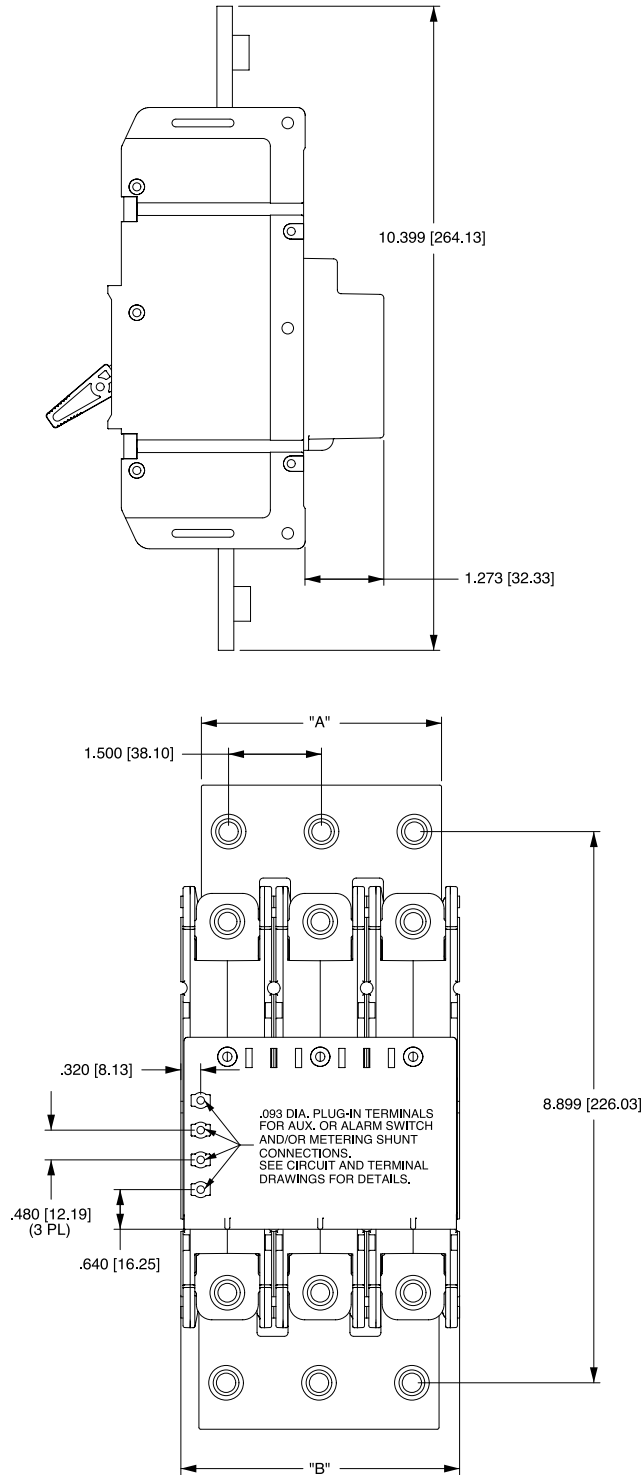


F-Series breakers are available up to 700A, and are also available with a 25 millivolt metering shunt construction. This optional construction provides a safe method for monitoring current flowing through the breaker by simply connecting a meter with light gauge wire to the appropriate terminals located on the shunt housing at the rear of the breaker. You can customize the application by measuring and displaying percentage of current, watts or safe/danger zones.

Notes:

- 1 All dimensions are in inches [millimeters].
- 2 Tolerance ± 0.020 [.51] unless otherwise specified.

Dimensional Specifications: in. [mm]



**F-SERIES PARALLEL POLE 250-700 AMPS
SHOWING FRONT CONNECT SCREW TERMINALS**

- Notes:
 1 All dimensions are in inches [millimeters].
 2 Tolerance ± 0.020 [.51] unless otherwise specified.

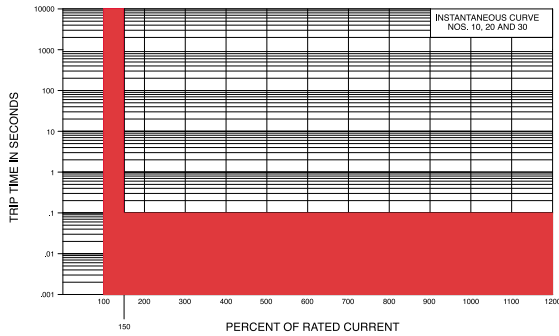
| M, MS-SERIES TIME DELAY VALUES | | | | | | | | | | |
|--------------------------------|--------------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| TRIP TIME SECONDS | PERCENT OF RATED CURRENT | | | | | | | | | |
| | Delay | 100% | 135% | 150% | 200% | 400% | 600% | 800% | 1000% | 1200% |
| | 10, 20, 30 | No Trip | May Trip | .100 Max | .100 Max | .100 Max | .100 Max | .100 Max | .100 Max | .100 Max |
| 12, 22, 32, 62, 72, 92 | No Trip | .300 - 7.00 | .200 - 5.00 | .100 - 2.00 | .030 - .500 | .008 - .300 | .006 - .150 | .005 - .100 | .005 - .100 | .005 - .100 |
| 14, 24, 34, 64, 74, 94 | No Trip | 3.00 - 70.0 | 2.00 - 40.0 | 1.00 - 15.0 | .100 - 4.00 | .008 - 2.00 | .006 - .800 | .005 - .350 | .005 - .160 | .005 - .160 |

Notes:

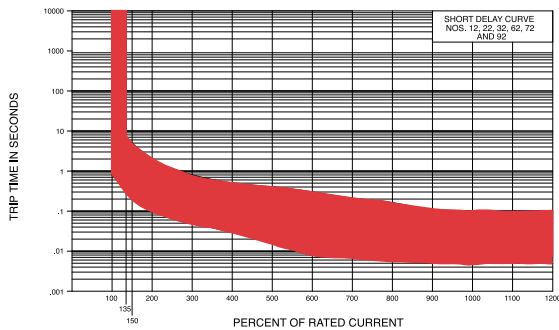
- 1 Delay Curves 12, 14, 22, 24, 32, 34, 62, 64, 72, 74, 92, 94: Breakers to hold 100% and must trip at 135% of rated current and greater within the time limit shown in this curve.
- 2 Delay Curves 10, 20, 30: Breakers to hold 100% and must trip at 150% of rated current and greater within the time limit shown in this curve.
- 3 All Curves: Curve data shown represents breaker response at ambient temperature of 77°F (25°C) with no preloading. Breakers are mounted in standard wall-mount position.
- 4 The minimum inrush pulse tolerance handling capability is 12 times the rated current on standard delays and 18 times the rated current on high inrush delays. These values are based on a 60 Hz 1/2 cycle, 8.33 ms pulse. High inrush delays should be specified for applications with high initial surge currents of short duration, such as switching power supplies, highly capacitive loads and transformer loads.

Dual Rated AC/DC

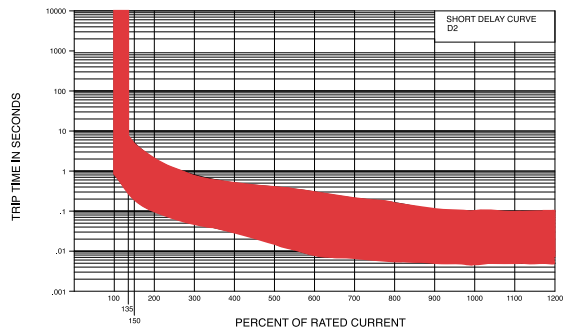
Instantaneous



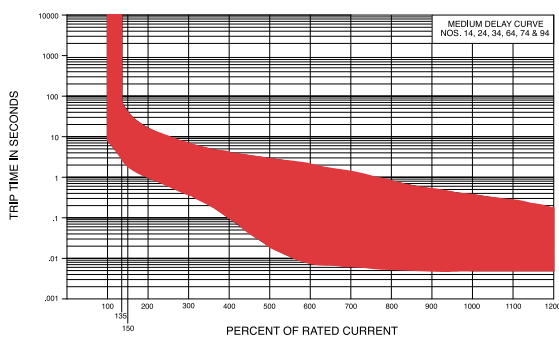
Short



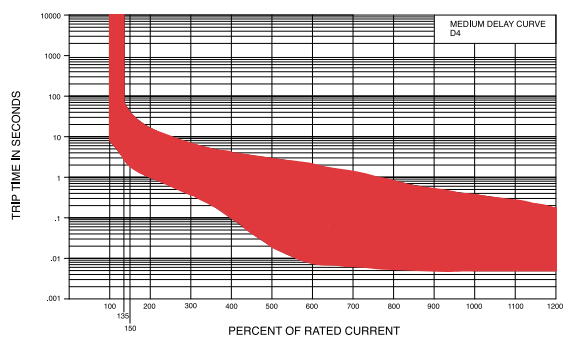
Short D2



Medium



Medium D4



| A, B, C, CX, D, G, H, L, N-SERIES TIME VALUES | | | | | | | | | | | |
|---|--------------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------|
| TRIP TIME (SECONDS) | PERCENT OF RATED CURRENT | | | | | | | | | | |
| | DELAY | 100% | 125% | 135% | 150% | 200% | 400% | 600% | 800% | 1000% | 1200% |
| 10 | No Trip | May Trip | --- | .032 MAX | .024 MAX | .020 MAX | .018 MAX | .016 MAX | .015 MAX | .013 MAX | |
| 11 | No Trip | .013 - .125 | --- | .010 - .070 | .008 - .032 | .006 - .020 | .005 - .020 | .004 - .020 | .004 - .020 | .004 - .020 | |
| 12 | No Trip | .500 - 6.50 | --- | .300 - 3.00 | .130 - 1.20 | .031 - .220 | .011 - .120 | .004 - .090 | .004 - .060 | .004 - .040 | |
| 14 | No Trip | 2.00 - 60.0 | --- | 1.20 - 40.0 | .600 - 20.0 | .150 - 3.00 | .030 - 1.30 | .004 - .600 | .004 - .100 | .004 - .100 | |
| 16 | No Trip | 45.0 - 345 | --- | 20.0 - 150 | 9.00 - 60.0 | 1.40 - 11.4 | .150 - 5.80 | .009 - 3.70 | .005 - 1.70 | .005 - .500 | |
| 20 | No Trip | May Trip | --- | .040 MAX | .035 MAX | .030 MAX | .025 MAX | .020 MAX | .017 MAX | .015 MAX | |
| 21 | No Trip | .014 - .150 | --- | .011 - .095 | .008 - .055 | .006 - .035 | .005 - .027 | .005 - .021 | .004 - .018 | .004 - .017 | |
| 22 | No Trip | .700 - 12.0 | --- | .350 - 4.00 | .130 - 1.30 | .027 - .220 | .008 - .130 | .004 - .090 | .004 - .045 | .004 - .040 | |
| 24 | No Trip | 10.0 - 160 | --- | 6.00 - 60.0 | 2.20 - 20.0 | .300 - 3.00 | .050 - 1.30 | .007 - .500 | .005 - .060 | .005 - .040 | |
| 26 | No Trip | 50.0 - 700 | --- | 32.0 - 350 | 10.0 - 90.0 | 1.50 - 15.0 | .500 - 7.00 | .020 - 3.00 | .006 - 2.00 | .005 - 1.00 | |
| 32 | No Trip | May Trip | .400 - 8.00 | .300 - 4.00 | .130 - 1.30 | .027 - .220 | .008 - .130 | .004 - .090 | .004 - .060 | .004 - .040 | |
| 34 | No Trip | May Trip | 1.80 - 100 | 1.20 - 60.0 | .600 - 20.0 | .150 - 3.00 | .030 - 1.30 | .004 - .600 | .004 - .110 | .004 - .100 | |
| 36 | No Trip | May Trip | 35.0 - 520 | 20.0 - 350 | 9.00 - 90.0 | 1.40 - 15.0 | .150 - 7.00 | .009 - 3.70 | .005 - 2.00 | .004 - 1.00 | |
| 42 | No Trip | .700 - 12.0 | --- | .400 - 6.00 | .180 - 2.30 | .050 - .600 | .026 - .300 | .018 - .200 | .014 - .150 | .012 - .130 | |
| 44 | No Trip | 7.00 - 100 | --- | 3.00 - 50.0 | 1.10 - 18.0 | .220 - 3.00 | .120 - 1.70 | .075 - 1.20 | .050 - .850 | .042 - .720 | |
| 46 | No Trip | 50.0 - 700 | --- | 31.0 - 350 | 12.0 - 150 | 1.50 - 20.0 | .700 - 10.0 | .404 - 7.90 | .260 - 6.50 | .198 - 5.80 | |
| 52 | No Trip | .500 - 6.50 | --- | .340 - 4.50 | .180 - 2.30 | .051 - .600 | .030 - .320 | .018 - .220 | .014 - .200 | .012 - .130 | |
| 54 | No Trip | 1.50 - 50.0 | --- | .750 - 35.0 | .350 - 18.0 | .110 - 3.00 | .070 - 1.70 | .045 - 1.40 | .039 - 1.30 | .035 - 1.30 | |
| 56 | No Trip | 45.0 - 345 | --- | 19.0 - 170 | 8.50 - 100 | 1.24 - 15.0 | .410 - 9.00 | .256 - 8.00 | .210 - 5.50 | .198 - 2.90 | |

Notes:

UL489 C-Series Breakers available with Delay Curves 11, 12, 14, 16, 21, 22, 24, 26, 42, 44, 46.

Delay Curves 11,12,14,16,21,22,24,26,42,44,46,52,54,56: Breakers to hold 100% and must trip at 125% of rated current and greater within the time limit shown in this curve.

Delay Curves 32,34,36: Breakers to hold 100% and must trip at 135% of rated current and greater within the time limit shown in this curve.

Delay Curves 10,20: Breakers to hold 100% and must trip at 150% of rated current and greater within the time limit shown in this curve.

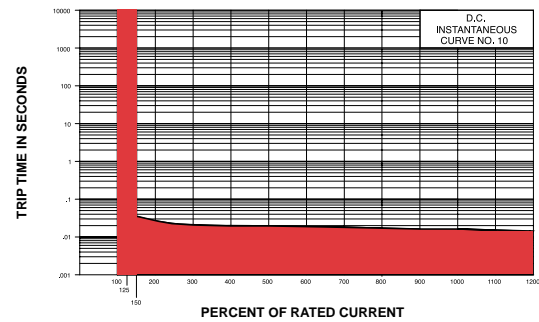
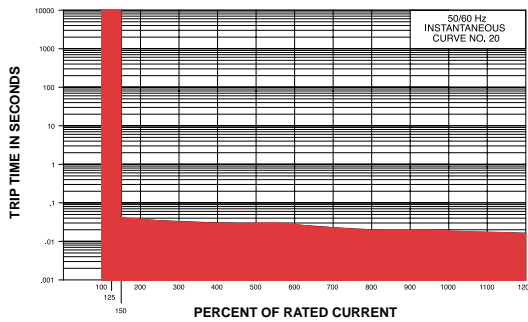
All Curves: Curve data shown represents breaker response at ambient temperature of 77°F (25°C) with no preloading. Breakers are mounted in standard wall-mount position.

On 50 amp and less current ratings, the minimum inrush pulse tolerance handling capability is 12 times the rated current on standard delays and 25 times the rated current on high inrush delays. These values are based on a 60 Hz 1/2 cycle, 8.33 ms pulse. High inrush delays should be specified for applications with high initial surge currents of short duration such as switching power supplies, highly capacitive loads and transformer loads.

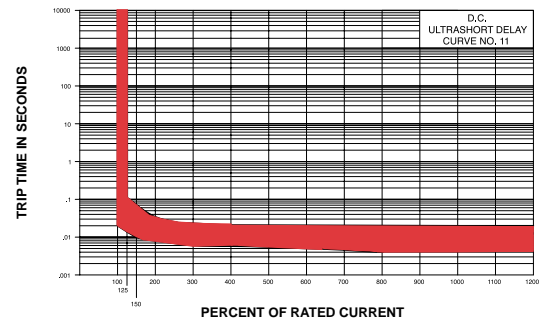
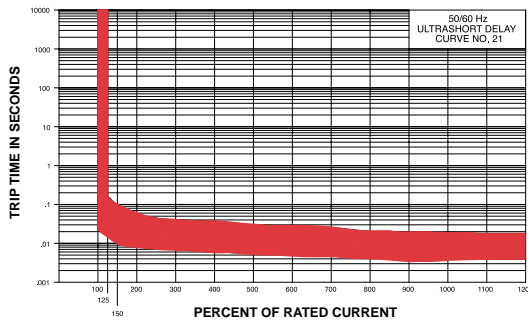
AC

DC

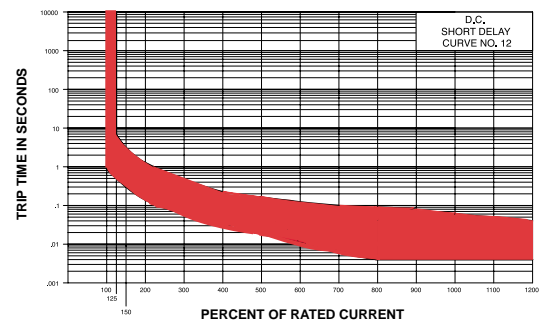
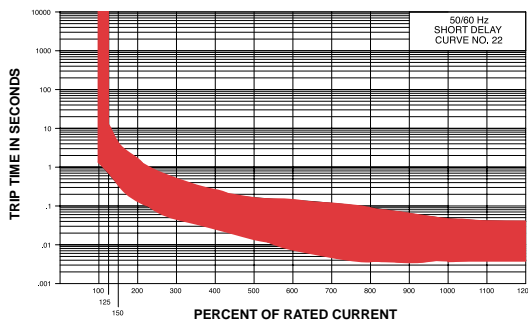
Instantaneous



Ultrashort

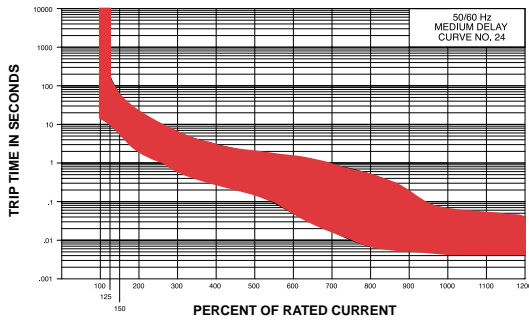


Short

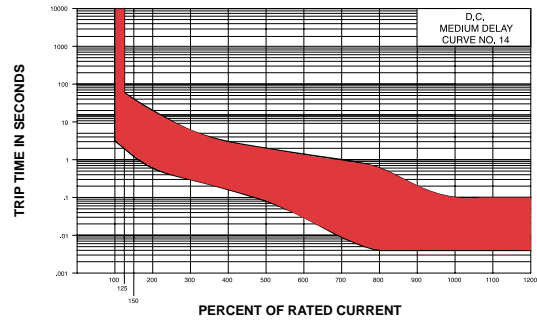


Medium

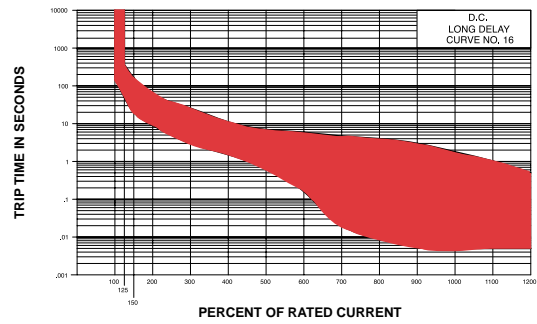
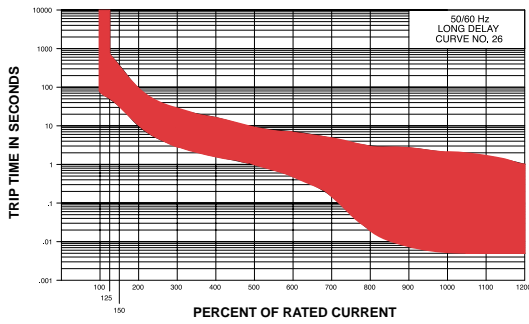
AC



DC

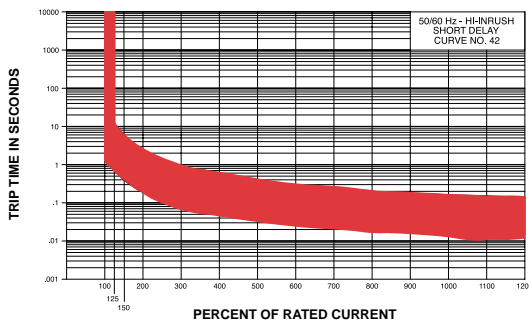


Long

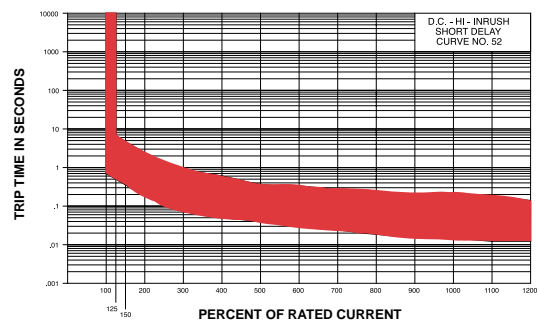


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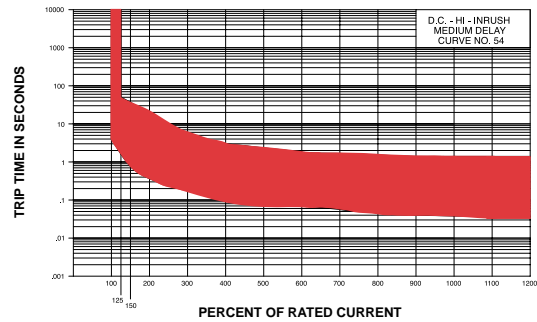
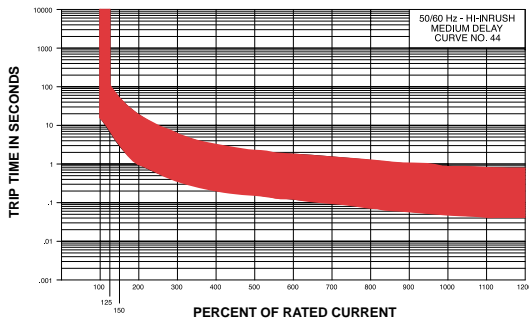
High Inrush AC



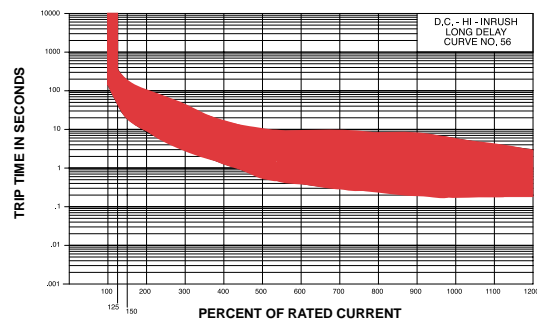
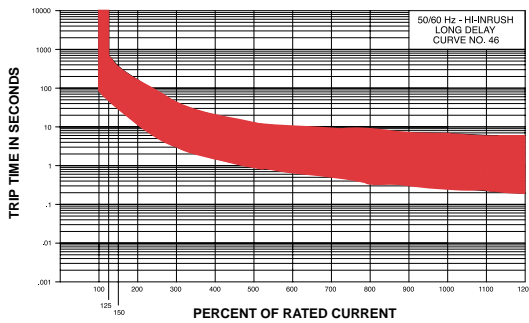
High Inrush DC



Medium

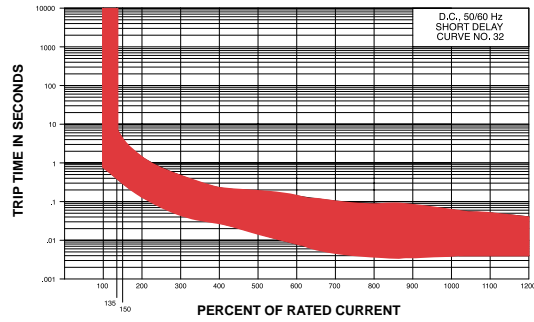


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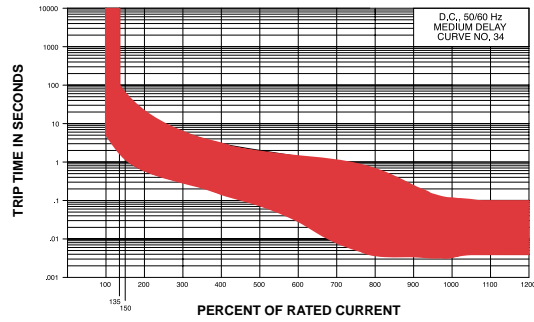


AC/DC

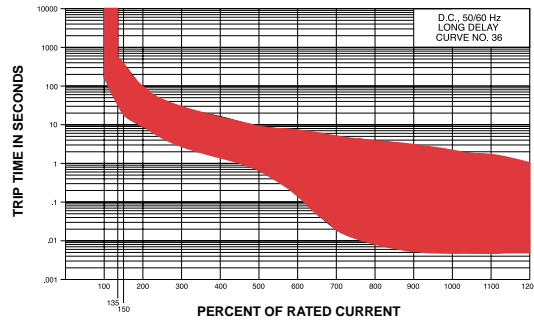
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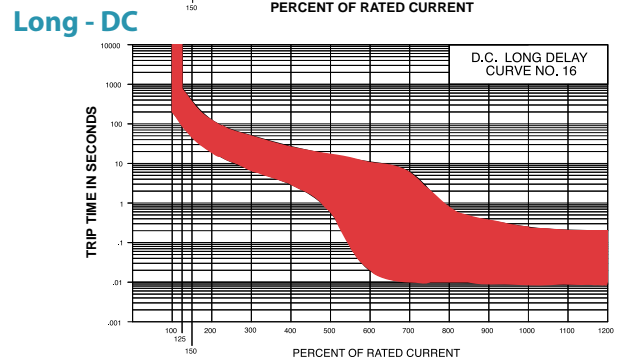
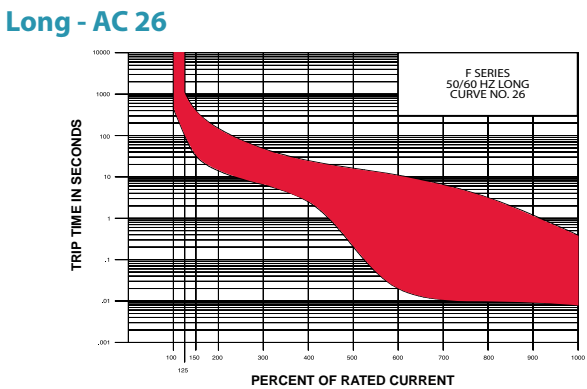
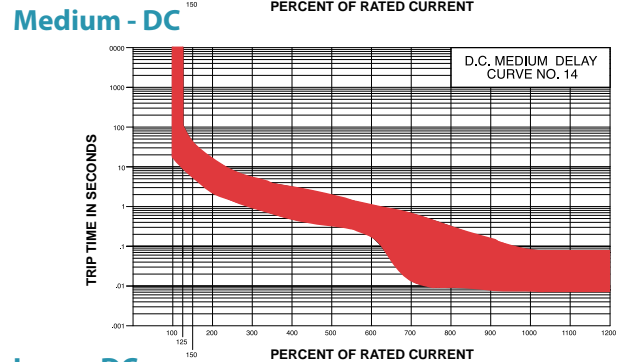
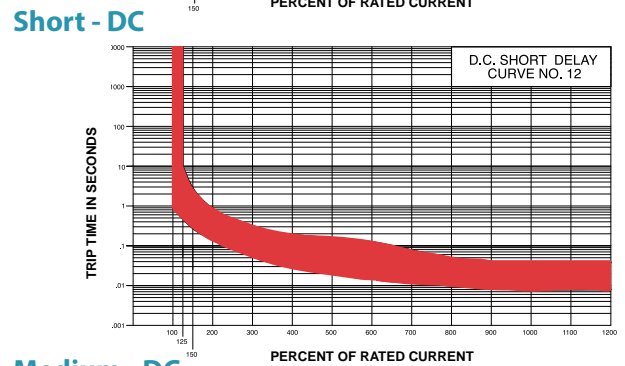
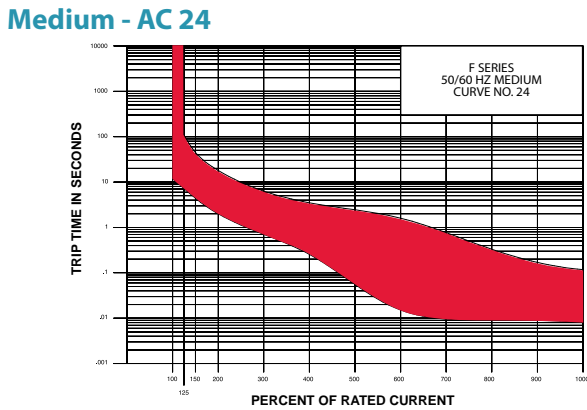
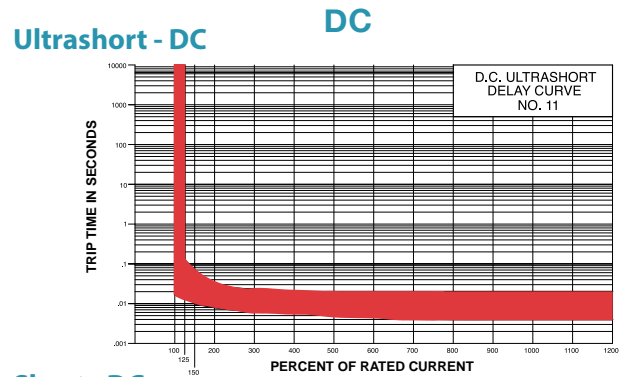
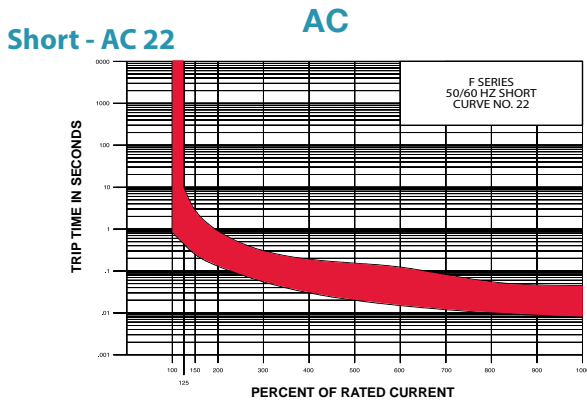
Medium



Long



| F-SERIES TIME DELAY VALUES | | | | | | | | | |
|----------------------------|--------------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| TRIP TIME SECONDS | PERCENT OF RATED CURRENT | | | | | | | | |
| | Delay | 100% | 125% | 150% | 200% | 400% | 600% | 800% | 1000% |
| 11 | No Trip | .013 - .125 | .010 - .070 | .008 - .032 | .006 - .020 | .005 - .020 | .004 - .020 | .004 - .020 | .004 - .020 |
| 12 | No Trip | .475 - 10.0 | .275 - 2.80 | .140 - .850 | .030 - .190 | .015 - .125 | .010 - .050 | .008 - .038 | .008 - .038 |
| 14 | No Trip | 10.0 - 110 | 6.00 - 40.0 | 2.50 - 15.0 | .500 - 3.00 | .180 - 1.00 | .010 - .280 | .008 - .080 | .008 - .080 |
| 16 | No Trip | 110 - 1000 | 60.0 - 400 | 22.0 - 150 | 4.00 - 25.0 | 1.00 - 5.50 | .010 - 1.80 | .008 - .390 | .008 - .390 |
| 22 | No Trip | .700 - 12.0 | .350 - 4.00 | .130 - 1.30 | .027 - .220 | .008 - .130 | .004 - .090 | .004 - .045 | .004 - .045 |
| 24 | No Trip | 10.0 - 160 | 6.00 - 60.0 | .220 - 20.0 | .300 - 3.00 | .050 - 1.30 | .007 - .500 | .005 - .060 | .005 - .060 |
| 26 | No Trip | 50.0 - 700 | 32.0 - 350 | 10.0 - 90.0 | 1.50 - 15.0 | .500 - 7.00 | .020 - 3.00 | .006 - 2.00 | .006 - 2.00 |



Custom Power Distribution Units

Drawing on over 90 years of experience in the development of power switching and protection components, Carling Technologies offers custom designed and standard AC and DC power distribution units that exceed the tough demands of today's applications while still offering safety, reliability and performance.

A dedicated engineering team was established to provide design support and consultation to today's taxed engineering staffs. Our goal is to design and develop a custom Power Distribution Unit or Battery Disconnect Panel that will meet your special requirements. Utilizing a comprehensive range of quality circuit protection and control products, you can specify the physical size of the enclosure and add your component requirements including temperature stable Carling Technologies' hydraulic-magnetic circuit breakers, ground fault circuit protectors, transient voltage surge suppressors, meters, power receptacles, relays, bus bars, hole plugs and LED's.

Carling Technologies also offers a variety of standard AC Power Distribution Units and standard DC Power Distribution Units, including three different product series of one rack unit (1RU) panels designed to fit industry standard rack systems. All one rack unit products provide front access and utilize plug-in style circuit breakers that are "hot swappable."

A standard Battery Disconnect Panels with ratings up to 700 amps and interrupting capacity of 50,000A@ 125VDC is also available in sizes as small as 1RU x 19" and up to 3RU.

Carling Technologies' expertise in power distribution and electrical design can help you meet your power needs. Contact us with your requirements today.



LAC1-Series

Versatile design allows custom configurations of branch circuits based on application Circuit breakers snap-in to Carling's exclusive circuit breaker mounting block, no need to hard wire breakers.



LDC1-Series

Hot "swappable" circuit breakers that can be installed, changed, or replaced in the field or factory Circuit breakers are front panel accessible.

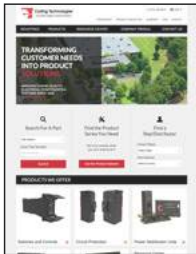


LBD1-Series

Panel incorporates Carling F-Series high amperage hy-mag breakers, providing superior level of performance Panels sized for maximum protection in the smallest size possible to conserve valuable cabinet space, starting with a compact 1RU x 19" rack rated up to 250amps @ 125VDC with a 50,000AIC.

There are several catalogs available featuring complete details on all Carling Technologies products. Below is a list of useful information such as catalogs, brochures and videos. Please visit our website at carlingtech.com or scan the QR codes below for complete details.

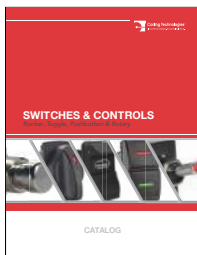
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Watch Company Profile Video



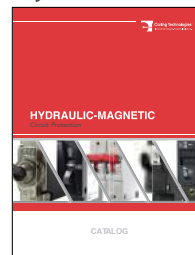
Switches & Controls



catalog

Complete line and ordering details for Switches & Control products including Rocker, Toggle, Pushbutton, and Rotary style switches.

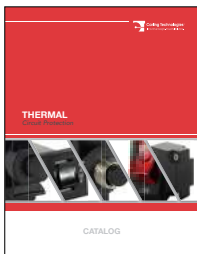
Hydraulic-Magnetic



catalog

Complete line and ordering details for all hydraulic-magnetic circuit breakers.

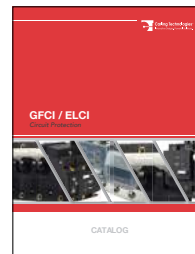
Thermal



catalog

Complete line and ordering details for all thermal circuit breakers.

GFCI / ELCI



catalog

Complete line and ordering details for all GFCIs/ELCIs.

Marine



catalog



brochure

Complete line of ELCIs, thermal and hydraulic-magnetic circuit breakers specific for marine applications.

On-Off Highway



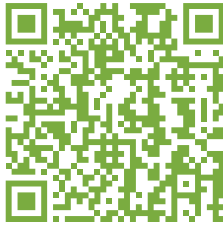
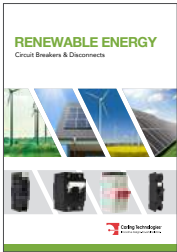
catalog



brochure

Complete line of switches, controls and custom solutions specific for on-off highway applications.

Renewable Energy



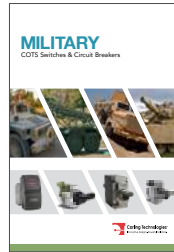
catalog



brochure

Complete line of circuit breakers and disconnect products specific for renewable energy applications.

Military



catalog



brochure

Complete line of COTS (*Commercial-Off-The-Shelf*) switches and circuit breakers specific for military applications.

Telecom/Datacom



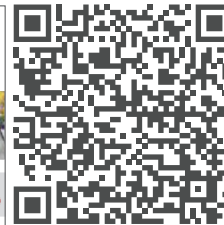
catalog



brochure

Complete line of hydraulic-magnetic circuit breakers specific for telecom/datacom applications.

Industrial Automation

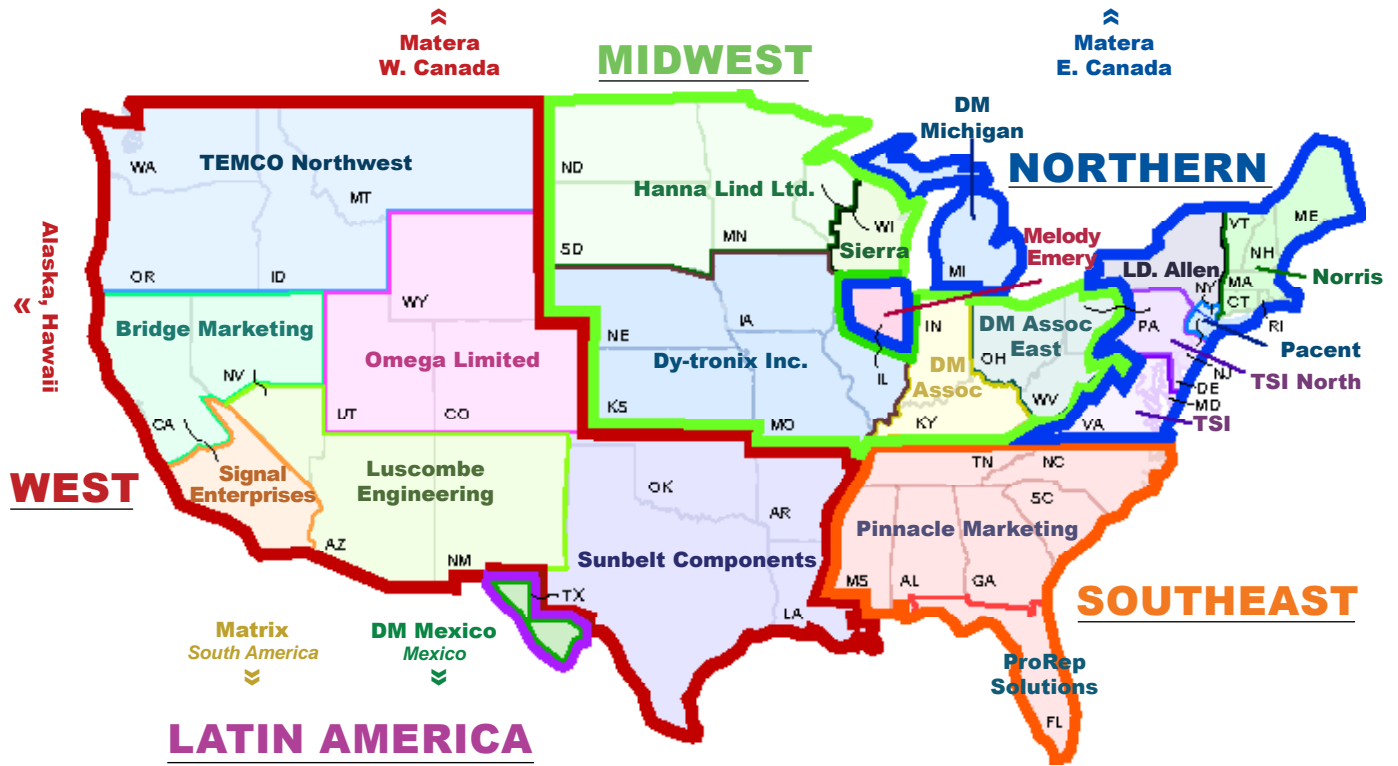


brochure

Complete line of switches and circuit breakers specific for industrial automation & controls applications.

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About Carling

Founded in 1920, Carling Technologies is a leading manufacturer of electrical and electronic switches and assemblies, circuit breakers, electronic controls, power distribution units, and multiplexed power distribution systems. With four ISO registered manufacturing facilities and technical sales offices worldwide, Carling Technologies Sales, Service and Engineering teams do much more than manufacture electrical components, they engineer powerful solutions! To learn more about Carling please visit www.carlingtech.com/company-profile.

To view all of Carling’s environmental, quality, health & safety certifications please visit www.carlingtech.com/environmental-certifications

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