

M-Series

Hydraulic-Magnetic Circuit Breaker

PRODUCT WEBPAGE

request sample, configure part



Miniature Circuit Breaker

The M-Series hydraulic-magnetic circuit breakers offer high performance in a compact, front panel mount design. Multiple agency approvals and options for terminals, panel hardware and actuator styles allow for extensive design flexibility. Wiping contacts assure longevity. These miniature circuit breakers are available as a one to two or parallel pole configuration, rated from 0.02 to 50 amps, up to 250VAC/80VDC with a max IC of 1,000 amps; 600 amps TUV and 500 amps VDE.

| | | | |
|------------|---------------|----------------|-----------|
| 1-2 | 0.2-50 | 125/250 | 80 |
| Poles | Amps | VAC Max | VDC Max |

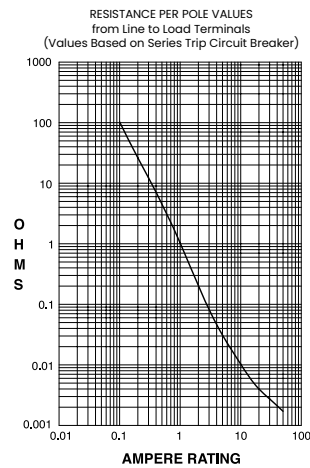
Typical Applications

- Telecom
- Marine
- Power Supplies
- Commercial Food
- Transportation
- Generators
- Medical Equipment

Tech Specs

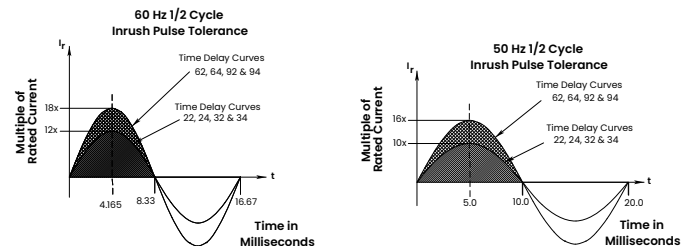
Electrical

| | |
|-------------------------|---|
| 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. |
| Standard Voltage Coils | DC - 6V, 12V; AC - 120V, 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. |



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

Pulse Tolerance Curves



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. |
| Number of Poles | 1 or 2 |
| Internal Circuit Config. | 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 |

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 |

Tech Specs

Tables

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

| 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 | | Without Backup Fuse | Without Backup Fuse | UL | CSA | | | | | | | | | | | |
| | | | | | | | With Backup Fuse | Without Backup Fuse | | | | | | | | | | | | | | | |
| Series | 32 | DC | --- | 0.02 - 15 | --- | 1 | --- | 1000 | --- | --- | TC1, 2, OL1, UI | TC1, 2, OL1, UI | | | | | | | | | | | |
| | | | | --- | 15.1 - 25 | | | | | | TC1, 2, OL0, UI | TC1, 2, OL0, UI | | | | | | | | | | | |
| | 50 ² | | | 0.02 - 7.5 | --- | TC1, 2, OL0, UI | | | | | TC1, 2, OL0, UI | | | | | | | | | | | | |
| | | | | 65 | 0.02 - 15 | --- | | | | | 2 | TC1, 2, OL1, UI | TC1, 2, OL1, UI | | | | | | | | | | |
| | --- | | | | 15.1 - 25 | TC1, 2, OL0, UI | | | | | TC1, 2, OL0, UI | | | | | | | | | | | | |
| | 65 ^{1,2} | | | 0.02 - 15 | --- | 1 | | | | | TC1, 2, OL1, UI | TC1, 2, OL1, UI | | | | | | | | | | | |
| | | --- | 15.1 - 30 | TC1, 2, OL0, UI | TC1, 2, OL0, UI | | | | | | | | | | | | | | | | | | |
| | 65 | 50 / 60 | 1 | 0.02 - 15 | --- | 2 | 5000 ³ | --- | --- | --- | TC1, 2, OL1, C1 | TC1, 2, OL1, C1 | | | | | | | | | | | |
| | | | | --- | 15.1 - 25 | | | | | | TC1, 2, OL0, C1 | TC1, 2, OL0, C1 | | | | | | | | | | | |
| | 80 ¹ | | | 0.02 - 15 | --- | 1 | | | | | --- | 600 | --- | --- | --- | TC1, 2, OL1, UI | TC1, 2, OL1, UI | | | | | | |
| | | | | --- | 15.1 - 30 | | | | | | | | | | | TC1, 2, OL0, UI | TC1, 2, OL0, UI | | | | | | |
| | 125 | | | 0.02 - 15 | --- | | | | | | | | | | | 1 | --- | 1000 | --- | --- | --- | TC1, 2, OL1, UI | TC1, 2, OL1, UI |
| | | | | --- | 15.1 - 30 | | | | | | | | | | | | | | | | | TC1, 2, OL0, UI | TC1, 2, OL0, UI |
| | 250 ² | 1 - 30 | --- | 1 | --- | | 360 | --- | --- | --- | | | | | | TC1, OL1, U2 | | TC3, OL1, U3 | | | | | |
| | | 0.02 - 12 | --- | | | | | | | | | | | | | 1000 | | TC1, 2, OL1, UI | | | | TC1, 2, OL1, UI | |
| | 250 | --- | 12.1 - 18 | 2 | | --- | 1000 ⁴ | | | | --- | --- | --- | TC1, 2, OL0, C1 | TC1, 2, OL0, C1 | | | | | | | | |
| 0.02 - 15 | | --- | 1000 | | | | | | | | | | | TC1, 2, OL1, UI | TC1, 2, OL1, UI | | | | | | | | |
| --- | 15.1 - 30 | 2 | | --- | | | 1000 | | | | | | | TC1, 2, OL0, UI | TC1, 2, OL0, UI | | | | | | | | |
| 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.

| 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, UI | TC1, 2, OL1, UI | | | | | | | |
| | | | | --- | 15.1 - 25 | | | | | | | | TC1, 2, OL0, UI | TC1, 2, OL0, UI | | | | | | | |
| | 50 ² | | | 0.02 - 7.5 | --- | 2 | | | | | | | 5000 | --- | --- | --- | --- | TC1, 2, OL0, UI | TC1, 2, OL0, UI | | |
| | | | | 65 | 0.02 - 15 | | | | | | | | | | | | | --- | TC1, 2, OL1, UI | TC1, 2, OL1, UI | |
| | --- | | | | 15.1 - 25 | TC1, 2, OL0, UI | | | | | | | | | | | | TC1, 2, OL0, UI | | | |
| | 65 ³ | | | 0.02 - 15 | --- | 1 | | | | | | | | | | | | --- | 600 ⁴ | --- | --- |
| | | --- | 15.1 - 30 | TC1, 2, OL0, C1 | TC1, 2, OL0, C1 | | | | | | | | | | | | | | | | |
| | 80 ¹ | 0.02 - 15 | --- | 1 | --- | 1000 | --- | --- | --- | TC1, 2, OL1, UI | TC1, 2, OL1, UI | | | | | | | | | | |
| | | --- | 15.1 - 30 | | | | | | | TC1, 2, OL0, UI | TC1, 2, OL0, UI | | | | | | | | | | |
| | 125 | 50 / 60 | 1 | 0.02 - 15 | | --- | | | | 1 | --- | --- | --- | --- | TC1, 2, OL1, UI | TC1, 2, OL1, UI | | | | | |
| | | | | 1 - 15 | | --- | | | | | | | | | 360 | TC1, OL1, U2 | TC3, OL1, U3 | | | | |
| | 250 | | | 0.02 - 12 | | --- | | | | 2 | | | | | | --- | 1000 | --- | --- | --- | TC1, 2, OL1, UI |
| | | | | 0.02 - 20 | | --- | | | | | | | | | 360 | | | | | | TC1, 2, OL0, UI |
| | 250 | | | 1 - 12 | --- | 1 | --- | 360 | --- | --- | | | | | | | --- | | | | TC1, OL1, U2 |

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

Tech Specs

Tables

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

| 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 | | | | 1000 | --- |
| | 80 | | 0.10 - 30 | | 600 | 600 |

Notes:
1. Available only with Special Catalog Number

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

| 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 | | | | 1000 | |

Notes:
1. Available only with Special Catalog Number

Agency Approvals

UL 1077

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

UL 489A

Communications Equipment (Guide CCN/DITT, File E189195)

CSA Accepted

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

VDE Certified

EN60934, VDE 0642 under File 10537

TUV Certified

EN60934, under License No. R9671109

Time Delay Specs

To view all hydraulic-magnetic circuit breaker time delay values, please visit www.carlingtech.com/sites/default/files/documents/Carling-HM-CB-Time-Delays.pdf

Ordering Scheme Rocker – Parallel Pole

Sample Part Number

M E 2 - P - D2 - 650 - 5 - A 1 2 - B - T

Selection 1 2 3 4 5 6 7 8 9 10 11 12

1. SERIES

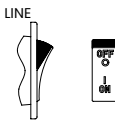
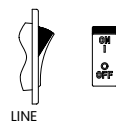
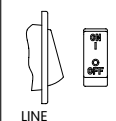
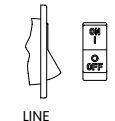
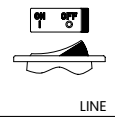
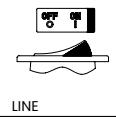
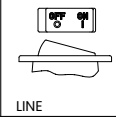
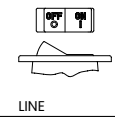
M

2. ACTUATOR ¹

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 |  LINE |  LINE |  LINE |  LINE |
| HORIZONTAL |  LINE |  LINE |  LINE |  LINE |

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 |

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

Notes:

- ¹ Remainder of Rocker same color as Visi
² Aux Switch only available with screw terminals

[Configure Complete Part Number >](#)

[Browse Standard Parts >](#)

Ordering Scheme

Handle/Pushbutton – Parallel Pole

Sample Part Number M M 2 - P - D2 - 650 - 5 - 1 B B - B - T

Selection 1 2 3 4 5 6 7 8 9 10 11 12

1. SERIES

M

2. ACTUATOR ¹

M Paddle
T Push-Pull

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 |

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. BUSHING COLOR

B Black

12. AGENCY APPROVAL

T UL 489A Listed

Notes:

1 Remainder of Rocker same color as Visi
2 Aux Switch only available with screw terminals

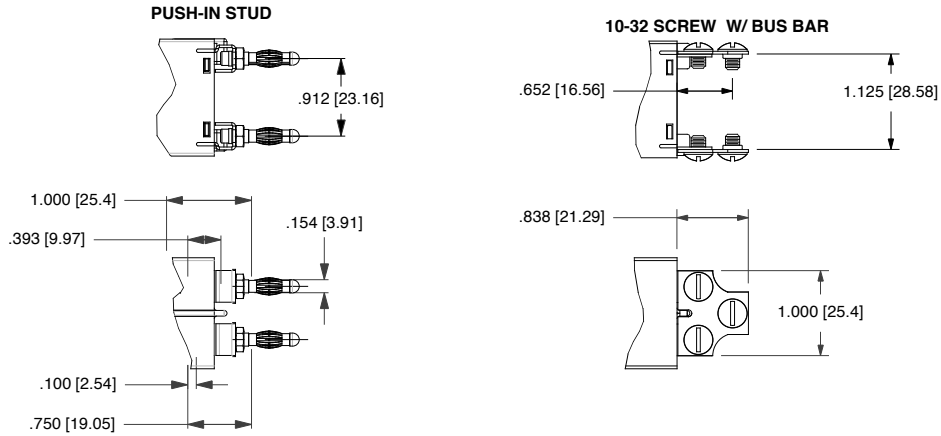
[Configure Complete Part Number >](#)

[Browse Standard Parts >](#)

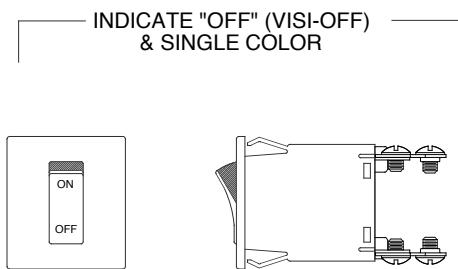
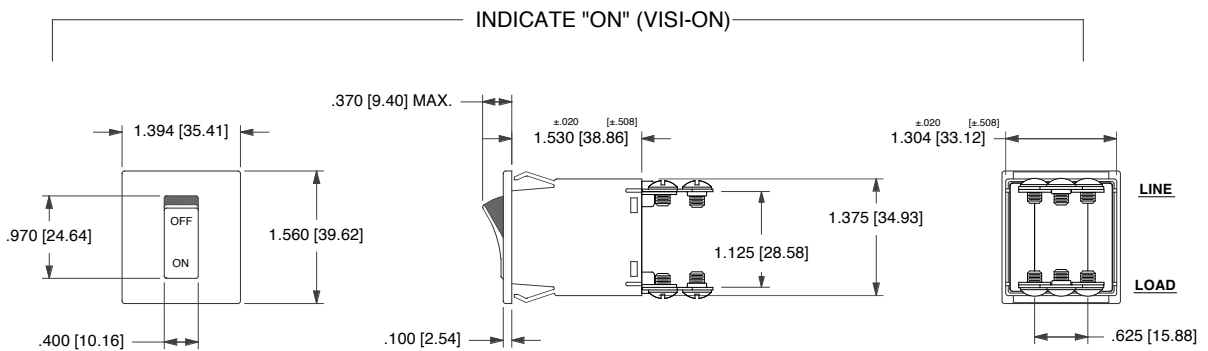
Dimensional Specs Parallel Pole

inches [millimeters]

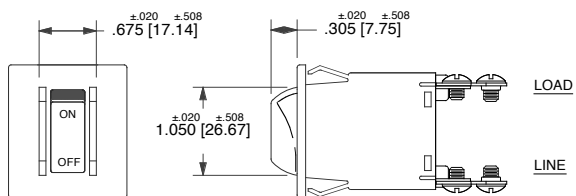
PARALLEL POLE TERMINAL OPTIONS



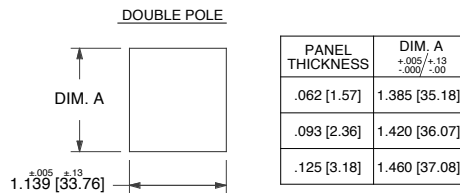
ROCKER ACTUATOR DETAIL



ROCKERGUARD CONFIGURATION



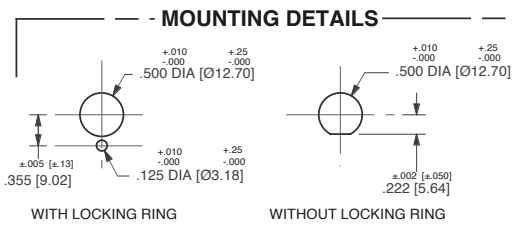
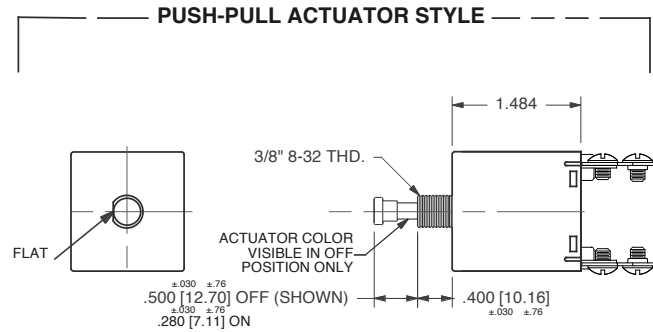
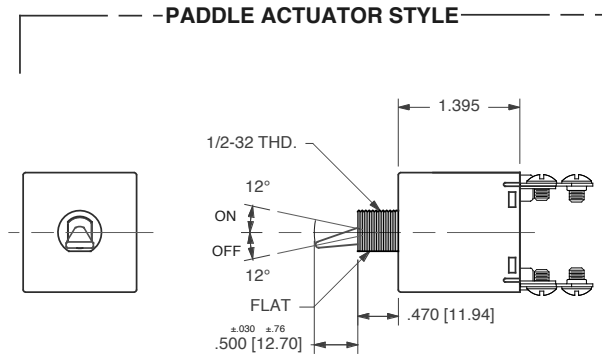
PANEL CUT - OUT DETAIL (ROCKER)



- Notes:
- 1 Tolerance ± 0.10 [25] unless otherwise specified.
 - 2 Dimensions apply to both rocker styles.
 - 3 I-o, on-off or dual legends available for vertical or horizontal mounting.
 - 4 Notice that circuit breaker line and load terminal orientation on indicate "off" is opposite that of indicate "on".

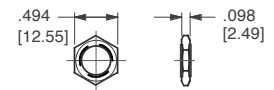
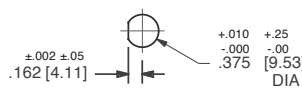
Dimensional Specs Parallel Pole

inches [millimeters]



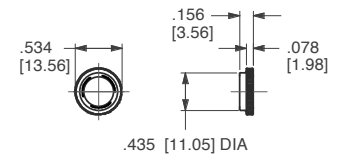
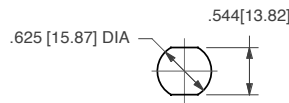
MOUNTING DETAILS

PANEL HARDWARE



PUSH-PULL, PUSH TO RESET

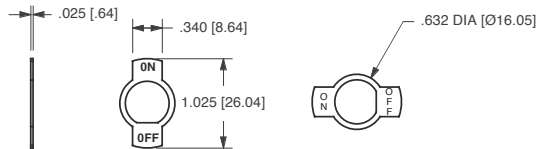
HEX NUT



SNAP-IN BUSHING

PANEL DRESS NUT

LEGEND PLATES

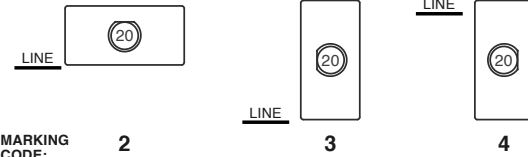


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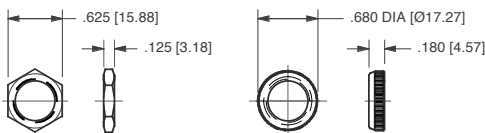
B

C

BUTTON MARKING ORIENTATION

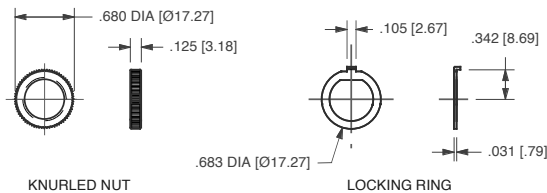


PANEL HARDWARE



HEX NUT

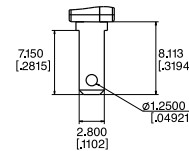
PANEL DRESS NUT



KNURLED NUT

LOCKING RING

.110QC AUXILIARY SWITCH TERMINALS



Notes:

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

Ordering Scheme

Rocker - UL 1077 Recognized

Sample Part Number **M G 2 - B - 34 - 620 - 1 - H C 6 - 7 - C**

Selection 1 2 3 4 5 6 7 8 9 10 11 12

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

3. POLES

1 One 2 Two

4. CIRCUIT 2

without Auxiliary Switch
A Switch Only (no coil), Maintained Contacts
B Series Trip (Current)

with Auxiliary Switch, Silver Contacts
M Series Trip (Current) Aux Switch .110 QC x .020 QC
P 3 Switch Only, Maintained Contacts .080 Dia, Round Solder Turret
R 3,15 Switch Only, Maintained Contacts .080 Dia x .020 Flat Q.C.
S 3 Series Trip (Current) .060 Dia, Round Solder Turret
U 3,15 Series Trip, Maintained Contacts .080 Dia x .020 Flat Q.C.

with Auxiliary Switch, Gold Contacts
3 3,15 Switch Only, Maintained Contacts .080 Dia x .020 Flat Q.C.
5 3,15 Series Trip, Maintained Contacts .080 Dia x .020 Flat Q.C.
9 Series Trip (Current) Aux Switch .110 QC x .020 QC

Terminal Type:
3 .080 Dia, Round Solder Turret
5 .060 Dia, Round Solder Turret
9 .080 Dia x .020 Flat Q.C.

5. FREQUENCY & TIME DELAY

| | |
|--|--|
| 03 DC 50/60Hz, Switch Only | 32 11 DC, 50/60Hz Short |
| 10 DC Instantaneous | 34 11 DC, 50/60Hz Medium |
| 12 DC Short | 62 50/60Hz Short, High-inrush |
| 14 DC Medium | 64 50/60Hz Medium, High-inrush |
| 20 50/60Hz Instantaneous | 72 DC, Short, High-inrush |
| 22 50/60Hz Short | 74 DC, Medium, High-inrush |
| 24 50/60Hz Medium | 92 11 DC, 50/60Hz Short, High-inrush |
| 30 11 DC, 50/60Hz Instantaneous | 94 11 DC, 50/60Hz Medium, High-inrush |

| Voltage | | | Full Load Amp Rating | | General Purpose Amps | | Tungsten Lamp Rating | | Poles Breaking |
|------------|-----------|-------|----------------------|--------------------------|----------------------|---------------------------------|----------------------|--------------------------|----------------|
| Max Rating | Frequency | Phase | Max Amps | Current Coil Rating Code | Max Amps | Choose Current Coil Rating Code | Max Amps | Current Coil Rating Code | |
| 32 | DC | - | 15 | 615 | 25 | 625 | - | - | 1 |
| 50 | DC | - | - | - | 7.5 | Consult Factory | - | - | 1 |
| 65 | DC | 1 | 15 | 615 | 25 | 625 | - | - | 2 |
| 125 | 50/60Hz | 1 | 15 | 615 | 25 | 625 | 15 | 615 | 1 |
| 250 | 50/60Hz | 1 | 12 | 612 | - | - | - | - | 1 |
| 250 | 50/60Hz | 1 | 15 | 615 | 25 | 625 | - | - | 2 |

Notes:

- One actuator is located in the center of each multi-pole breaker.
- For Switch Only circuits, select Current Coil Rating from the above chart.
- 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 & Switch Only circuits, & is not available in single pole illuminated breakers, or Back Connected Screw or Push-in Stud terminals.
- 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.
- On Visi-Rockers, Visi portion of rocker cannot be the same color as bezel.
- For LED (DC or rectified AC) applications, LED is mounted in the center of the rocker actuator with electrical characteristics: 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 = 100uA at 3V. Customer supplies the proper external resistor limiting current to these values.
- 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 20A, VDE 15A, UL Recognized and CSA Accepted to 30 amps.
- Screw Terminals or Push-in Stud recommended above 20 amps.
- TUV/VDE must have I-O or Dual Legends. Legend required on Visi-Rockers.
- 30 amp rating not available with delay's 30, 32, 34, 92 or 94.
- Screw Terminals are VDE certified only with use of ring terminal attached to wire.
- 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.

6. CURRENT RATING (AMPERES)

| CODE | AMPERES | 225 | 0.250 | 420 | 2.000 | 710 | 10.500 |
|------|---------|-----|-------|-----|--------|-----|--------|
| 020 | 0.020 | 230 | 0.300 | 522 | 2.250 | 611 | 11.000 |
| 025 | 0.025 | 235 | 0.350 | 425 | 2.500 | 711 | 11.500 |
| 030 | 0.030 | 240 | 0.400 | 527 | 2.750 | 612 | 12.000 |
| 035 | 0.035 | 245 | 0.450 | 430 | 3.000 | 712 | 12.500 |
| 040 | 0.040 | 250 | 0.500 | 435 | 3.500 | 613 | 13.000 |
| 045 | 0.045 | 255 | 0.550 | 440 | 4.000 | 614 | 14.000 |
| 050 | 0.050 | 260 | 0.600 | 445 | 4.500 | 615 | 15.000 |
| 055 | 0.055 | 265 | 0.650 | 450 | 5.000 | 616 | 16.000 |
| 060 | 0.060 | 270 | 0.700 | 455 | 5.500 | 617 | 17.000 |
| 065 | 0.065 | 275 | 0.750 | 460 | 6.000 | 618 | 18.000 |
| 070 | 0.070 | 280 | 0.800 | 465 | 6.500 | 620 | 20.000 |
| 075 | 0.075 | 285 | 0.850 | 470 | 7.000 | 622 | 22.000 |
| 080 | 0.080 | 290 | 0.900 | 475 | 7.500 | 624 | 24.000 |
| 085 | 0.085 | 295 | 0.950 | 480 | 8.000 | 625 | 25.000 |
| 090 | 0.090 | 410 | 1.000 | 485 | 8.500 | 630 | 30.000 |
| 095 | 0.095 | 512 | 1.250 | 490 | 9.000 | | |
| 210 | 0.100 | 415 | 1.500 | 495 | 9.500 | | |
| 215 | 0.150 | 517 | 1.750 | 610 | 10.000 | | |
| 220 | 0.200 | | | | | | |

7. TERMINAL 12

| | |
|-----------------------------------|----------------------------|
| 1 Push-On 0.250 Tab (Q.C.) | 3 Screw 8-32 (Bus Type) 9 |
| 2 Screw 8-32 with Upturned Lugs 9 | A Push-In Stud 13 |
| | P Printed Circuit Board 14 |

8. ROCKER ILLUMINATION

Non-illuminated
Neon 4
 without resistor, 120VAC/250VAC
LED 6, 7
 without resistor
 with resistor, 4-8 VDC
 with resistor, 9-16 VDC

| | |
|----------------------------|----------|
| A Neon Green Glow 7 | |
| B Red Green Amber | |
| D Blue White | K |
| E Gray Black | L |
| F Orange Black | M |

9. ACTUATOR & LEGEND COLOR

| | | |
|--------------------------|---|--------|
| Solid Color | Actuator | Legend |
| 1 White | White | Black |
| 2 Black | Black | White |
| 3 Red | Red | White |
| 4 Green | Green | White |
| 5 Blue | Blue | White |
| 6 Yellow | Yellow | Black |
| 7 Gray | Gray | Black |
| 8 Orange | Orange | Black |
| Visi-Rocker 5 | Visi & Legend (remainder of rocker same color as bezel) | |
| 1 White | White | |
| 2 Black | Black | |
| 3 Red | Red | |
| 4 Green | Green | |
| 5 Blue | Blue | |
| 6 Yellow | Yellow | |
| 7 Gray | Gray | |
| 8 Orange | Orange | |
| Illuminated 7 | Actuator | Legend |
| A Clear | Clear | White |
| B Red Transparent | Red Transparent | White |
| C Green Transparent | Green Transparent | White |
| D Amber Transparent | Amber Transparent | White |
| E Smoke Gray Transparent | Smoke Gray Transparent | White |
| F White Translucent | White Translucent | Black |

10. LEGEND 10

| | |
|-----------------------|--------------------|
| 1 No Legend | 5 I - O Horizontal |
| 2 ON - OFF Vertical | 6 Dual Vertical |
| 3 ON - OFF Horizontal | 7 Dual Horizontal |
| 4 I - O Vertical | |

11. BEZEL COLOR/STYLE 5,8

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

12. AGENCY APPROVAL 9,10

| |
|--|
| C UL 1077 Recognized & CSA Accepted |
| D VDE Certified to IEC/EN 60934, UL Recognized & CSA Accepted |
| E TUV Certified to IEC/EN 60934, UL Recognized & CSA Accepted |

Configure Complete Part Number >

Browse Standard Parts >

Ordering Scheme

Rocker - UL 489A Listed & 1077 Recognized

Sample Part Number M A 1 - B - 14 - 620 - 1 - A 1 6 - 2 - J

Selection 1 2 3 4 5 6 7 8 9 10 11 12

1. SERIES

M

2. ACTUATOR 1

| | | | | |
|-------------------------------------|---------------------------------|----------------------------------|-----------------------------|---------------------------------|
| Non-Illuminated single color | | Two Color Visi-Rocker | | Illuminated single color |
| A Angled | B Flat | D Indicate ON | E Indicate OFF | 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

1 One

4. CIRCUIT 2

| | |
|--|-------------------------------|
| without Auxiliary Switch | Terminal Type: |
| B Series Trip (Current) | .110 QC x .020 QC |
| with Auxiliary Switch, Silver Contacts | |
| M Series Trip (Current) Aux Switch | .060 Dia, Round Solder Turret |
| S 3 Series Trip (Current) | .080 Dia x .020 Flat Q.C. |
| U 3,13 Series Trip, Maintained Contacts | |
| with Auxiliary Switch, Gold Contacts | |
| 5 3,13 Series Trip, Maintained Contacts | .080 Dia x .020 Flat Q.C. |
| 9 Series Trip (Current) Aux Switch | .110 QC x .020 QC |

5. FREQUENCY & TIME DELAY

| | |
|----------------------------|-----------------------------------|
| 10 DC Instantaneous | 72 DC, Short, High-inrush |
| 12 DC Short | 74 DC, Medium, High-inrush |
| 14 DC Medium | |

6. CURRENT RATING (AMPERES)

| CODE | AMPERES | | | | | | |
|------|---------|-----|-------|-----|--------|-----|--------|
| 020 | 0.020 | 225 | 0.250 | 420 | 2.000 | 710 | 10.500 |
| 025 | 0.025 | 230 | 0.300 | 522 | 2.250 | 611 | 11.000 |
| 030 | 0.030 | 235 | 0.350 | 425 | 2.500 | 711 | 11.500 |
| 035 | 0.035 | 240 | 0.400 | 527 | 2.750 | 612 | 12.000 |
| 040 | 0.040 | 245 | 0.450 | 430 | 3.000 | 712 | 12.500 |
| 045 | 0.045 | 250 | 0.500 | 435 | 3.500 | 613 | 13.000 |
| 050 | 0.050 | 255 | 0.550 | 440 | 4.000 | 614 | 14.000 |
| 055 | 0.055 | 260 | 0.600 | 445 | 4.500 | 615 | 15.000 |
| 060 | 0.060 | 265 | 0.650 | 450 | 5.000 | 616 | 16.000 |
| 065 | 0.065 | 270 | 0.700 | 455 | 5.500 | 617 | 17.000 |
| 070 | 0.070 | 275 | 0.750 | 460 | 6.000 | 618 | 18.000 |
| 075 | 0.075 | 280 | 0.800 | 465 | 6.500 | 620 | 20.000 |
| 080 | 0.080 | 285 | 0.850 | 470 | 7.000 | 622 | 22.000 |
| 085 | 0.085 | 290 | 0.900 | 475 | 7.500 | 624 | 24.000 |
| 090 | 0.090 | 295 | 0.950 | 480 | 8.000 | 625 | 25.000 |
| 095 | 0.095 | 410 | 1.000 | 485 | 8.500 | 630 | 30.000 |
| 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

| | |
|--|-----------------------------------|
| 1 Push-On 0.250 Tab (Q.C.) | 3 Screw 8-32 (Bus Type) 9 |
| 2 Screw 8-32 with Upturned Lugs 9 | A Push-In Stud 11 |
| | P Printed Circuit Board 12 |

8. ROCKER ILLUMINATION

| | |
|---------------------------------|------------------------|
| Non-illuminated Neon 4 | A Green Glow 7 |
| without resistor, 120VAC/250VAC | B C |
| LED 5,7 | Red Green Amber |
| without resistor | D G K |
| with resistor, 4-8 VDC | E H L |
| with resistor, 9-16 VDC | F J M |

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

10. LEGEND 10

| | |
|------------------------------|---------------------------|
| 1 No Legend | 5 I - O Horizontal |
| 2 ON - OFF Vertical | 6 Dual Vertical |
| 3 ON - OFF Horizontal | 7 Dual Horizontal |
| 4 I - O Vertical | |

11. BEZEL COLOR/STYLE 6,8

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

12. AGENCY APPROVAL 9,10

| |
|--|
| J UL 489A Listed & TUV Certified to IEC/EN 60934 |
| M UL 1077 Recognized & CSA Accepted |
| N TUV Certified to IEC/EN 60934, UL Recognized & CSA Accepted |
| T UL 489A Listed |

Notes:

- One actuator is located in the center of each multi-pole breaker.
- For Switch Only circuits, select Current Coil Rating from the above chart.
- 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 & Switch Only circuits, & is not available in single pole illuminated breakers, or Back Connected Screw or Push-In Stud terminals.
- 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 = 100uA 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.
- UL Recognized, CSA Accepted, UL489A Listed, and TUV Certified to 30 amps. Screw Terminals recommended above 20 amps.
- Polarity Sensitive Construction
- 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.

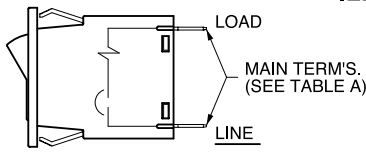
[Configure Complete Part Number >](#)

[Browse Standard Parts >](#)

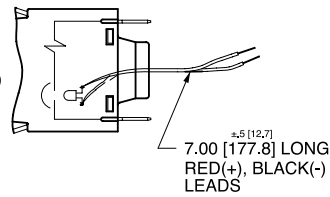
Circuit & Terminal Diagrams Rocker

inches [millimeters]

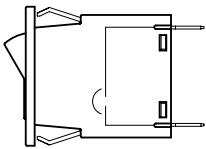
SERIES TRIP



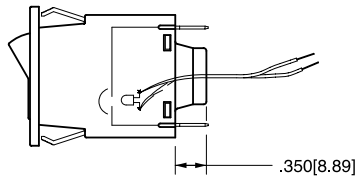
SERIES TRIP W/ ILLUMINATED ROCKER



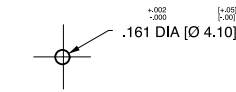
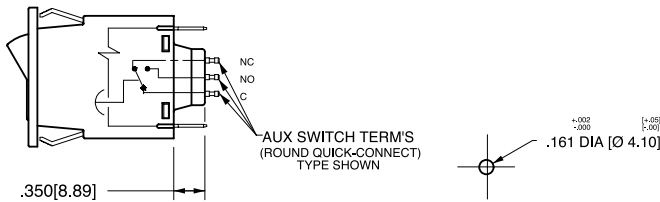
SWITCH ONLY



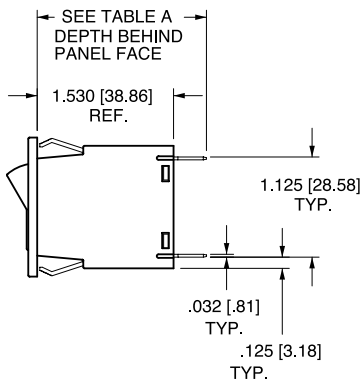
SWITCH ONLY W/ ILLUMINATED ROCKER



SERIES TRIP W/ AUXILIARY SWITCH

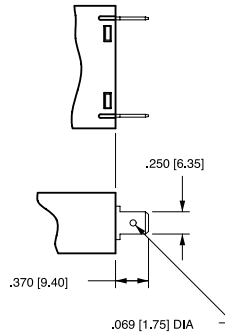


PUSH-IN STUD MATING HOLE

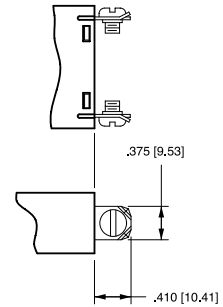


TERMINAL DIMENSIONAL DETAIL

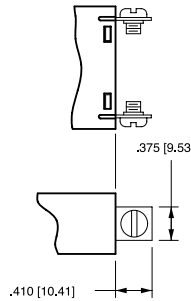
TAB (Q.C.) TERMINAL



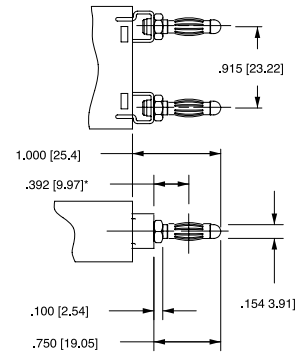
SCREW TERMINAL #8-32 WITH UPTURNED LUGS



SCREW TERMINAL #8-32 BUS

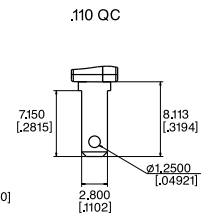
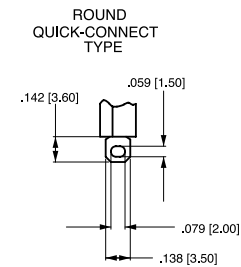
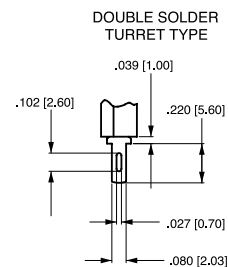
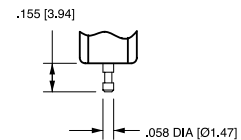
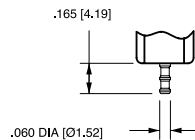


PUSH-IN STUD TERMINAL



*CENTERLINE OF PUSH-IN STUD CONTACT AREA

AUXILIARY SWITCH TERMINALS



*AVAILABLE THROUGH SPECIAL CATALOG PART NUMBER

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.

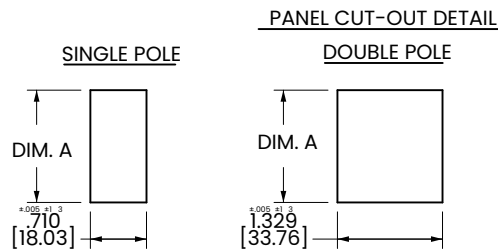
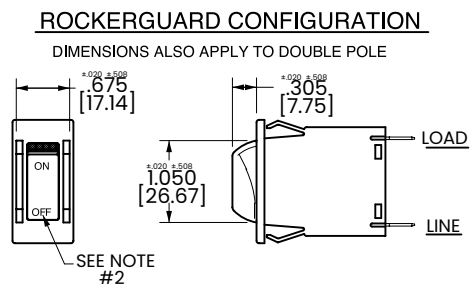
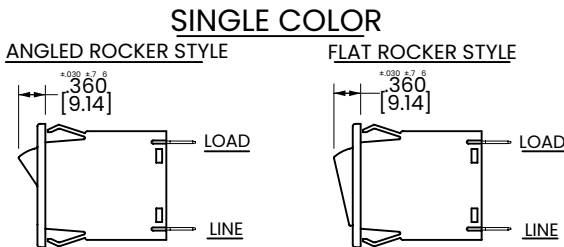
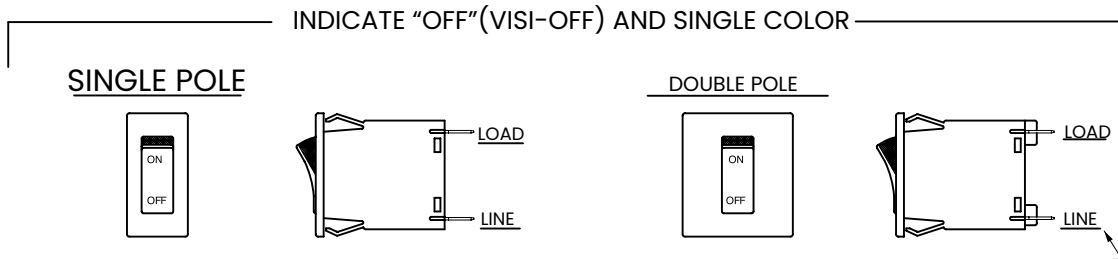
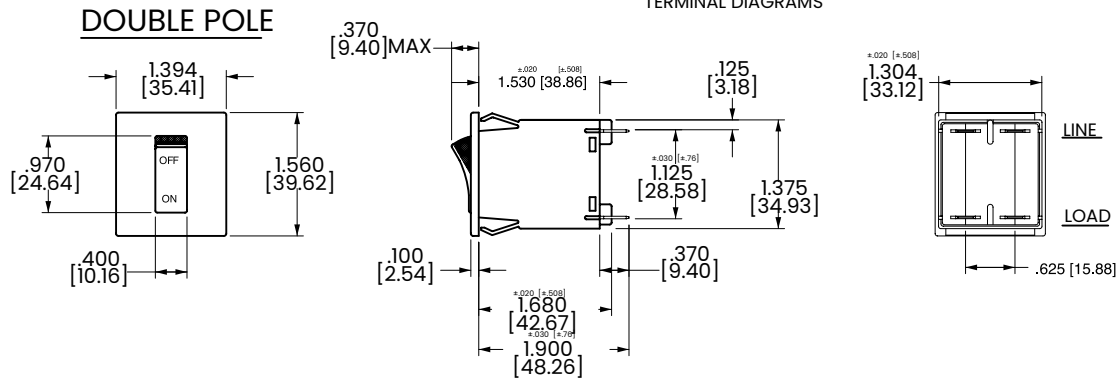
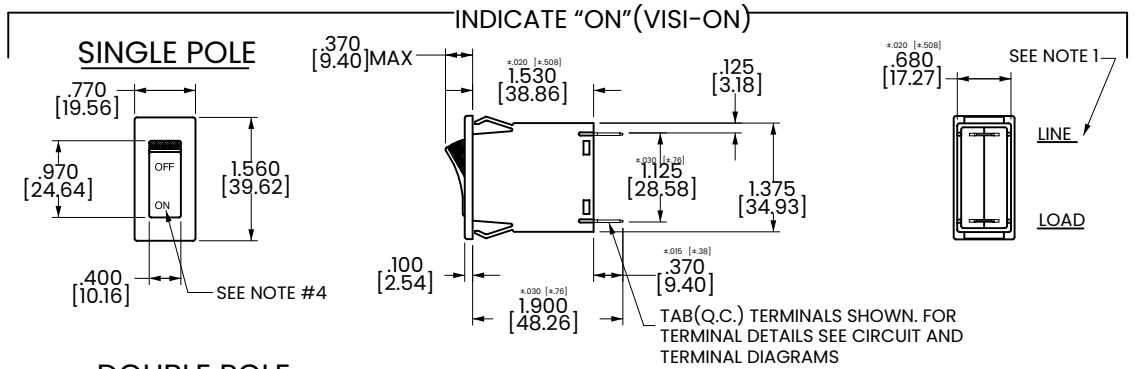
** RECOMMENDED TIGHTENING TORQUE 12-15 IN LBS [1.4-2.7 NM]

Notes:

- 1 Tolerance ± 0.020 [.51] unless otherwise specified.
- 2 Schematic shown represents current trip circuit.

Dimensional Specs Rocker

inches [millimeters]



| PANEL THICKNESS | DIM. A +0.05 / +0.3 +0.00 / -0.0 |
|-----------------|--|
| .062 [1.57] | 1.385 [35.18] |
| .093 [2.36] | 1.420 [36.07] |
| .125 [3.18] | 1.460 [37.08] |

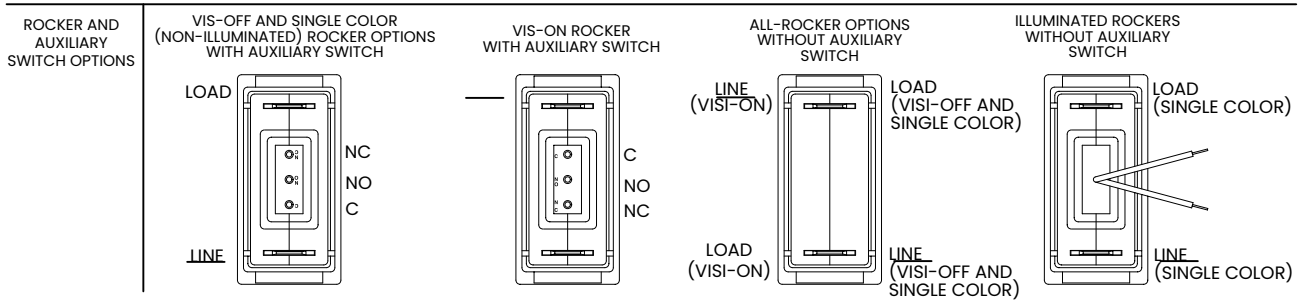
Notes:

- 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 legend, rotate front view clockwise 90°.
- 3 Tolerance ± 0.20 [.51] unless otherwise specified.

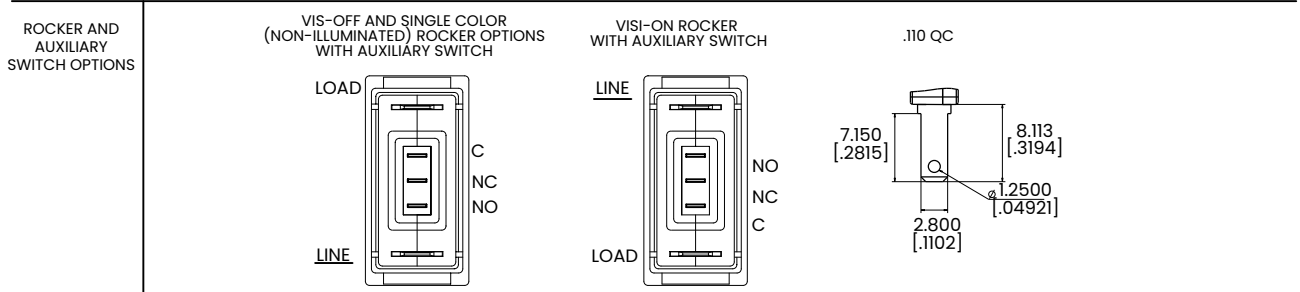
Supplementary Diagrams Rocker

ONE POLE

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

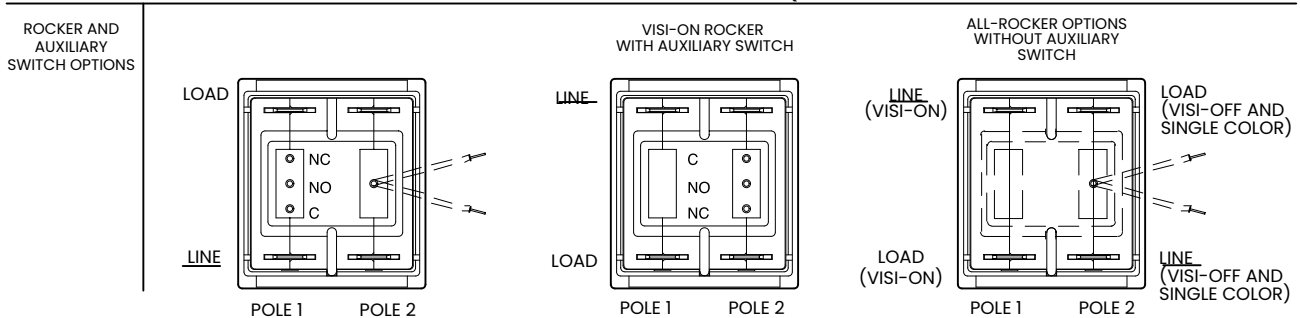


SINGLE POLE/ROCKER BREAKERS SHOWN WITH FLAT QC AND FLAT SOLDER LUG AUX.SWITCH TERMINALS

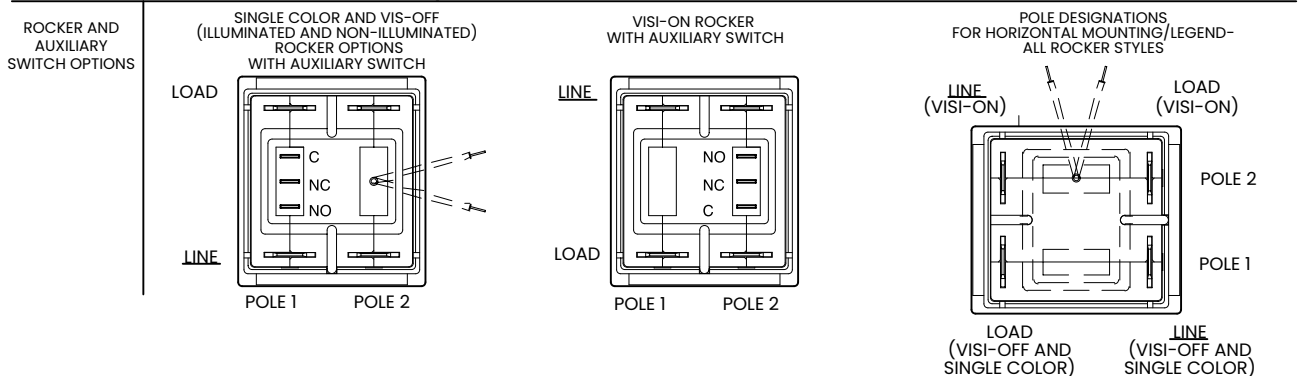


TWO POLE

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



Ordering Scheme

Handle/Pushbutton - UL 1077 Recognized



Sample Part Number **M M 1 - B - 34 - 260 - 1 - 1 B B - C - B**

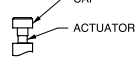

Selection 1 2 3 4 5 6 7 8 9 10 11 12



1. SERIES

M

2. ACTUATOR 1,4

Handle
M Paddle  **N** Baton 

Push Button
T Push-Pull  **U** Push To Reset 

Push Button with Snap-In Mounting
V Push-Pull  **W** Push To Reset 

3. POLES

1 One **2** Two

4. CIRCUIT 2

without Auxiliary Switch
A Switch Only (no coil), Maintained Contacts
B Series Trip (Current)

with Auxiliary Switch, Silver Contacts **Terminal Type:**
M Series Trip (Current) Aux Switch .110 QC x .020 QC
P 3 Switch Only, Maintained Contacts .060 Dia, Round Solder Turret
R 3,12 Switch Only, Maintained Contacts .080 Dia x .020 Flat Q.C.
S 3 Series Trip (Current) .060 Dia, Round Solder Turret
U 3,12 Series Trip, Maintained Contacts .080 Dia x .020 Flat Q.C.

with Auxiliary Switch, Gold Contacts
3 3,12 Switch Only, Maintained Contacts .080 Dia x .020 Flat Q.C.
5 3,12 Series Trip, Maintained Contacts .080 Dia x .020 Flat Q.C.
9 Series Trip (Current) Aux Switch .110 QC x .020 QC

5. FREQUENCY & TIME DELAY

| | |
|---------------------------------------|---|
| 03 DC 50/60Hz, Switch Only | 32 8 DC, 50/60Hz Short |
| 10 DC Instantaneous | 34 8 DC, 50/60Hz Medium |
| 12 DC Short | 62 50/60Hz Short, High-inrush |
| 14 DC Medium | 64 50/60Hz Medium, High-inrush |
| 20 50/60Hz Instantaneous | 72 DC, Short, High-inrush |
| 22 50/60Hz Short | 74 DC, Medium, High-inrush |
| 24 50/60Hz Medium | 92 8 DC, 50/60Hz Short, High-inrush |
| 30 8 DC, 50/60Hz Instantaneous | 94 8 DC, 50/60Hz Medium, High-inrush |

| Voltage | | | Full Load Amp Rating | | General Purpose Amps | | Tungsten Lamp Rating | | Poles Breaking |
|------------|-----------|-------|----------------------|--------------------------|----------------------|---------------------------------|----------------------|--------------------------|----------------|
| Max Rating | Frequency | Phase | Max Amps | Current Coil Rating Code | Max Amps | Choose Current Coil Rating Code | Max Amps | Current Coil Rating Code | |
| 32 | DC | - | 15 | 615 | 25 | 625 | - | - | 1 |
| 50 | DC | - | - | - | 7.5 | Consult Factory | - | - | 1 |
| 65 | DC | 1 | 15 | 615 | 25 | 625 | - | - | 2 |
| 125 | 50/60Hz | 1 | 15 | 615 | 25 | 625 | 15 | 615 | 1 |
| 250 | 50/60Hz | 1 | 12 | 612 | - | - | - | - | 1 |
| 250 | 50/60Hz | 1 | 15 | 615 | 25 | 625 | - | - | 2 |

- Notes:
- One actuator is located in the center of each multi-pole breaker. Actuator codes V & W limited to single pole breakers only.
 - Switch Only circuits are not available with Push-To-Reset actuators. For Switch Only circuits, select Current Coil Rating from the above chart.
 - 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 connect screw or push-in stud terminals.
 - Actuator color is only visible in the OFF position on Push-Pull actuators.
 - All units except snap-in mounting have one hex nut installed on bushing for use behind the panel.
 - Other colors available. Consult factory.
 - TUV 20A, VDE 15A. UL Recognized and CSA Accepted to 30 amps. Screw Terminals or Push-in Stud recommended above 20 amps.
 - 30 amp rating not available with delay's 30, 32, 34, 92 or 94.
 - Screw Terminals are VDE certified only with use of ring terminal attached to wire.
 - 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.

6. CURRENT RATING (AMPERES)

| CODE | AMPERES | 225 | 0.250 | 420 | 2,000 | 710 | 10,500 |
|------|---------|-----|-------|-----|--------|-----|--------|
| 020 | 0.020 | 225 | 0.250 | 420 | 2,000 | 710 | 10,500 |
| 025 | 0.025 | 230 | 0.300 | 522 | 2,250 | 611 | 11,000 |
| 030 | 0.030 | 235 | 0.350 | 425 | 2,500 | 711 | 11,500 |
| 035 | 0.035 | 240 | 0.400 | 527 | 2,750 | 612 | 12,000 |
| 040 | 0.040 | 245 | 0.450 | 430 | 3,000 | 712 | 12,500 |
| 045 | 0.045 | 250 | 0.500 | 435 | 3,500 | 613 | 13,000 |
| 050 | 0.050 | 255 | 0.550 | 440 | 4,000 | 614 | 14,000 |
| 055 | 0.055 | 260 | 0.600 | 445 | 4,500 | 615 | 15,000 |
| 060 | 0.060 | 265 | 0.650 | 450 | 5,000 | 616 | 16,000 |
| 065 | 0.065 | 270 | 0.700 | 455 | 5,500 | 617 | 17,000 |
| 070 | 0.070 | 275 | 0.750 | 460 | 6,000 | 618 | 18,000 |
| 075 | 0.075 | 280 | 0.800 | 465 | 6,500 | 620 | 20,000 |
| 080 | 0.080 | 285 | 0.850 | 470 | 7,000 | 622 | 22,000 |
| 085 | 0.085 | 290 | 0.900 | 475 | 7,500 | 624 | 24,000 |
| 090 | 0.090 | 295 | 0.950 | 480 | 8,000 | 625 | 25,000 |
| 095 | 0.095 | 410 | 1,000 | 485 | 8,500 | 630 | 30,000 |
| 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 9

| | |
|--|-----------------------------------|
| 1 Push-On 0.250 Tab (Q.C.) | 3 Screw 8-32 (Bus Type) 7 |
| 2 Screw 8-32 with Upturned Lugs 7 | A Push-in Stud 10 |
| | P Printed Circuit Board 11 |

8. ROCKER ILLUMINATION

| 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. ACTUATOR & LEGEND COLOR 4,5

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

10. LEGEND

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)
1 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)
1 No Marking

11. BUSHING COLOR 6

B Black

12. AGENCY APPROVAL 7

C UL 1077 Recognized & CSA Accepted
D VDE Certified to IEC/EN 60934, UL Recognized & CSA Accepted
E TUV Certified to IEC/EN 60934, UL Recognized & CSA Accepted

Ordering Scheme

Handle/Pushbutton - UL 489A Listed & 1077 Recognized



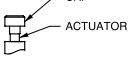



Sample Part Number **M M 1 - B - 14 - 620 - 1 - 1 B B - B - J**

Selection 1 2 3 4 5 6 7 8 9 10 11 12

1. SERIES

M

2. ACTUATOR 1,5

| | |
|---|--|
| Handle M Paddle  | N Baton  |
| Push Button T Push-Pull  | U Push To Reset  |
| Push Button with Snap-In Mounting V Push-Pull  | W Push To Reset  |

3. POLES

1 One

4. CIRCUIT 2

| | |
|---|--|
| without Auxiliary Switch B Series Trip (Current) | Terminal Type: .110 QC x .020 QC |
| with Auxiliary Switch, Silver Contacts M Series Trip (Current) Aux Switch | .060 Dia, Round Solder Turret |
| S ³ Series Trip (Current) | .080 Dia x .020 Flat Q.C. |
| U ^{3,11} Series Trip, Maintained Contacts | .080 Dia x .020 Flat Q.C. |
| with Auxiliary Switch, Gold Contacts 5 ^{3,11} Series Trip, Maintained Contacts | .080 Dia x .020 Flat Q.C. |
| 9 Series Trip (Current) Aux Switch | .110 QC x .020 QC |

5. FREQUENCY & TIME DELAY

| | |
|-------------------------------------|---|
| 03 DC 50/60Hz, Switch Only | 32 DC, 50/60Hz Short |
| 10 DC Instantaneous | 34 DC, 50/60Hz Medium |
| 12 DC Short | 62 50/60Hz Short, High-inrush |
| 14 DC Medium | 64 50/60Hz Medium, High-inrush |
| 20 50/60Hz Instantaneous | 72 DC, Short, High-inrush |
| 22 50/60Hz Short | 74 DC, Medium, High-inrush |
| 24 50/60Hz Medium | 92 DC, 50/60Hz Short, High-inrush |
| 30 DC, 50/60Hz Instantaneous | 94 DC, 50/60Hz Medium, High-inrush |

6. CURRENT RATING (AMPERES)

| CODE | AMPERES | | | | | | |
|------|---------|-----|-------|-----|--------|-----|--------|
| 020 | 0.020 | 225 | 0.250 | 420 | 2.000 | 710 | 10.500 |
| 025 | 0.025 | 230 | 0.300 | 522 | 2.250 | 611 | 11.000 |
| 030 | 0.030 | 235 | 0.350 | 425 | 2.500 | 711 | 11.500 |
| 035 | 0.035 | 240 | 0.400 | 527 | 2.750 | 612 | 12.000 |
| 040 | 0.040 | 245 | 0.450 | 430 | 3.000 | 712 | 12.500 |
| 045 | 0.045 | 250 | 0.500 | 435 | 3.500 | 613 | 13.000 |
| 050 | 0.050 | 255 | 0.550 | 440 | 4.000 | 614 | 14.000 |
| 055 | 0.055 | 260 | 0.600 | 445 | 4.500 | 615 | 15.000 |
| 060 | 0.060 | 265 | 0.650 | 450 | 5.000 | 616 | 16.000 |
| 065 | 0.065 | 270 | 0.700 | 455 | 5.500 | 617 | 17.000 |
| 070 | 0.070 | 275 | 0.750 | 460 | 6.000 | 618 | 18.000 |
| 075 | 0.075 | 280 | 0.800 | 465 | 6.500 | 620 | 20.000 |
| 080 | 0.080 | 285 | 0.850 | 470 | 7.000 | 622 | 22.000 |
| 085 | 0.085 | 290 | 0.900 | 475 | 7.500 | 624 | 24.000 |
| 090 | 0.090 | 295 | 0.950 | 480 | 8.000 | 625 | 25.000 |
| 095 | 0.095 | 410 | 1.000 | 485 | 8.500 | 630 | 30.000 |
| 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

| | |
|--|---------------------------------------|
| 1 Push-On 0.250 Tab (Q.C.) | 3 Screw 8-32 (Bus Type) ⁴ |
| 2 Screw 8-32 with Upturned Lugs ⁴ | A Push-in Stud ⁹ |
| | P Printed Circuit Board ¹⁰ |

8. ROCKER ILLUMINATION

| 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. ACTUATOR & LEGEND COLOR 5,6

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

10. LEGEND

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)

1¹² 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)

1 No Marking

11. BUSHING COLOR 7

B Black

12. AGENCY APPROVAL 8

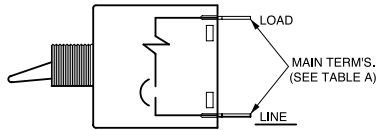
| | |
|---|---|
| J | UL 489A Listed, TUV Certified to IEC/EN 60934 |
| M | UL 1077 Recognized, CSA Accepted |
| N | UL Recognized, TUV Certified to IEC/EN 60934 |
| T | UL 489A Listed |

- One actuator is located in the center of each multi-pole breaker. Actuator codes V & W limited to single pole breakers only.
- Switch Only circuits are not available with Push-To-Reset actuators. For Switch Only circuits, select Current Coil Rating from the above chart.
- 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.
- Screw terminals or Push-in Stud recommended above 20 amps.
- Actuator color is only visible in the OFF position on Push-Pull actuators.
- All units have one hex nut installed on bushing for use behind the panel.
- Other colors available. Consult factory.
- UL Recognized, CSA Accepted and UL Listed to 30 amps.
Polarity Sensitive Construction
- 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.
- Push-Pull actuator style is available with the rated amps marked on the cap in white. For no marking, choose code "1".

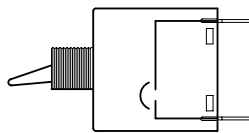
Circuit & Terminal Diagrams Handle

inches [millimeters]

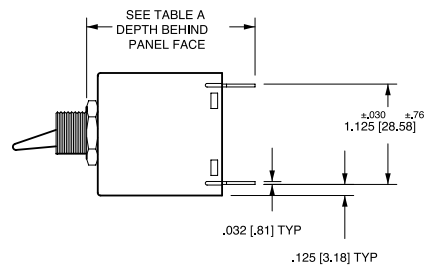
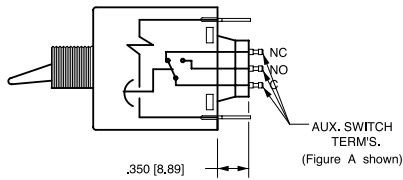
SERIES TRIP



SWITCH ONLY



SERIES TRIP W/ AUXILIARY SWITCH



| TABLE A | | |
|----------------|---------------------------|---------------------------|
| | TERMINAL DESCRIPTION | DEPTH BEHIND PANEL FACE * |
| 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 [51.69] |
| | 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

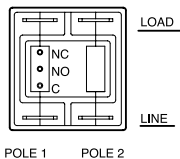


FIG. A

FLAT QC AND SOLDER LUG AUX SWITCH TERMINALS

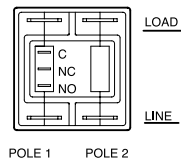
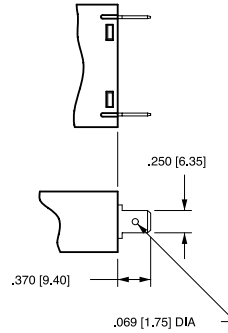


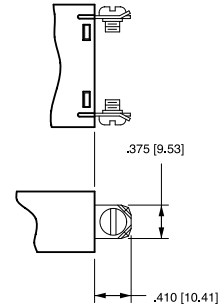
FIG. B

TERMINAL DIMENSIONAL DETAIL

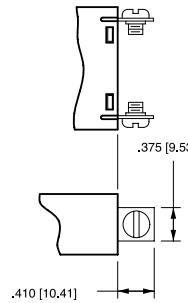
TAB (Q.C.) TERMINAL



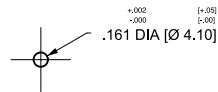
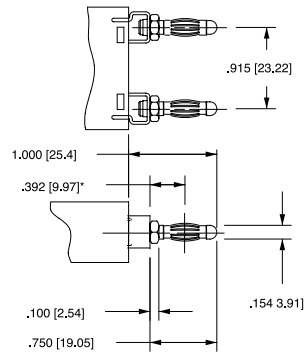
SCREW TERMINAL #8-32 WITH UPTURNED LUGS



SCREW TERMINAL #8-32 BUS



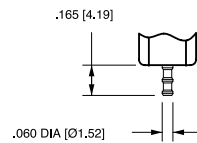
PUSH-IN STUD TERMINAL



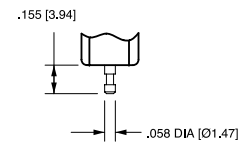
PUSH-IN STUD MATING HOLE

*CENTERLINE OF PUSH-IN STUD CONTACT AREA

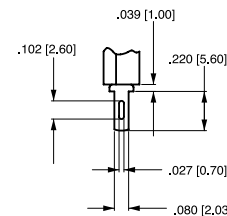
AUXILIARY SWITCH TERMINALS



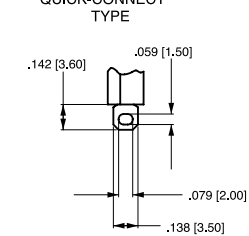
DOUBLE SOLDER TURRET TYPE



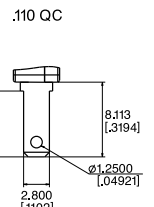
ROUND QUICK-CONNECT TYPE



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



FLAT SOLDER LUG TYPE



*AVAILABLE THROUGH SPECIAL CATALOG PART NUMBER

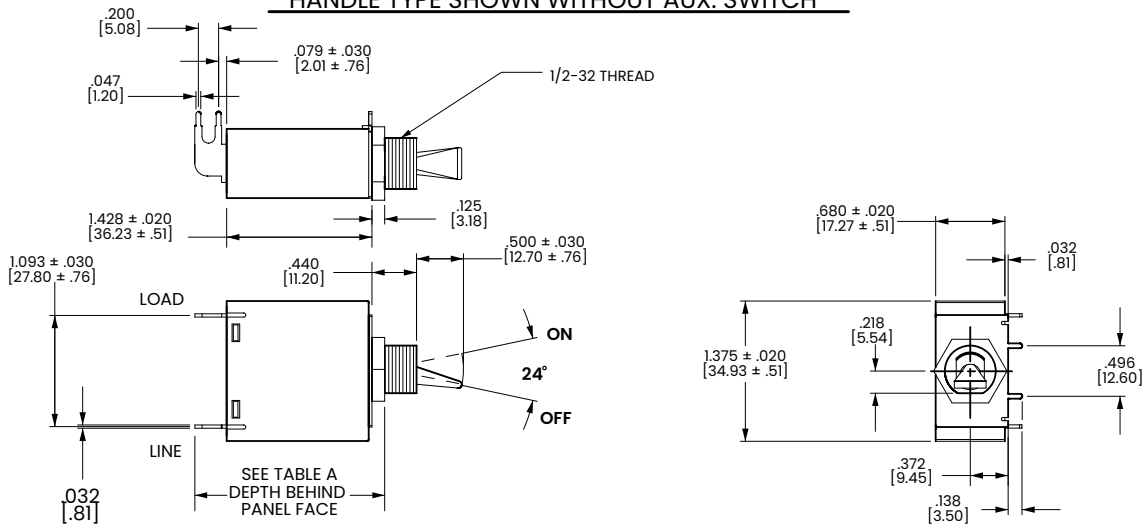
Notes:

1 Tolerance ±.020 [.51] unless otherwise specified.

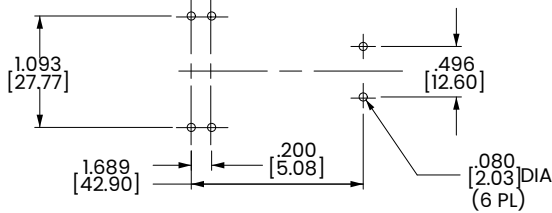
PC Terminal Diagrams Handle

inches [millimeters]

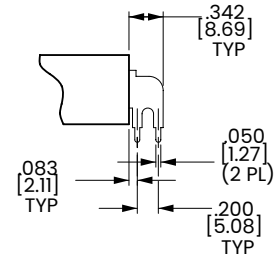
HANDLE TYPE SHOWN WITHOUT AUX. SWITCH



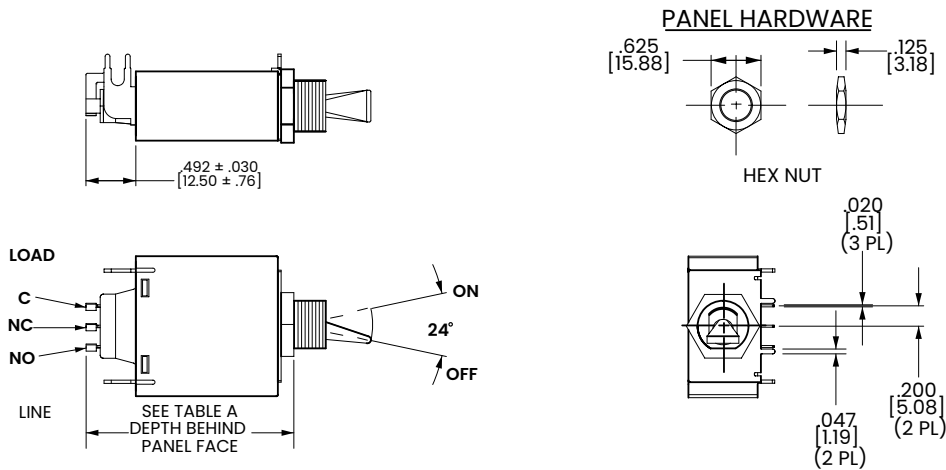
P.C. FOOTPRINT



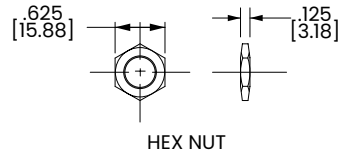
P.C. TERMINAL



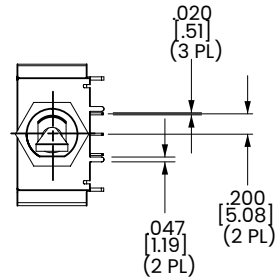
HANDLE TYPE SHOWN WITH AUX. SWITCH



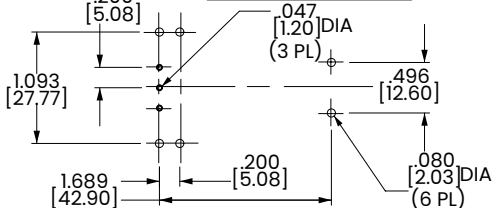
PANEL HARDWARE



HEX NUT



P.C. FOOTPRINT



| TABLE A | | |
|-------------|-----------------------|---------------------------|
| | TERMINAL DESCRIPTION | DEPTH BEHIND PANEL FACE * |
| | PRINTED CIRCUIT BOARD | 1.957 [49.70] |
| AUX. SWITCH | PRINTED CIRCUIT BOARD | 2.449 [62.20] |

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

Notes:

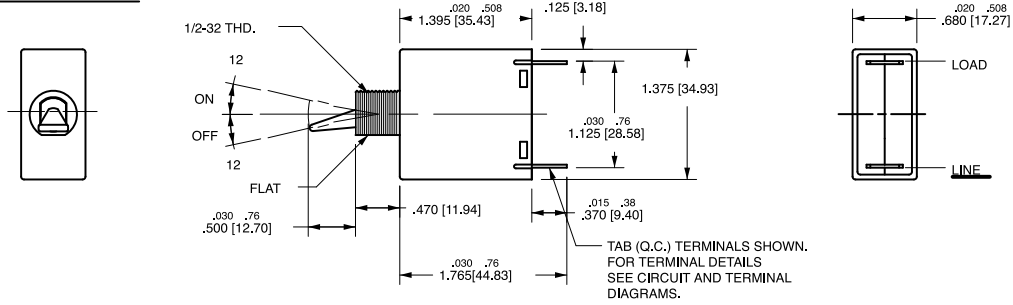
1 Tolerance ±.020 [.51] unless otherwise specified.

Dimensional Specs Handle

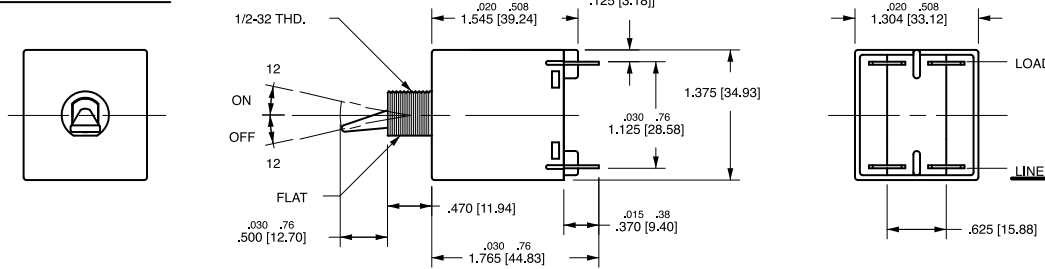
inches [millimeters]

PADDLE ACTUATOR STYLE

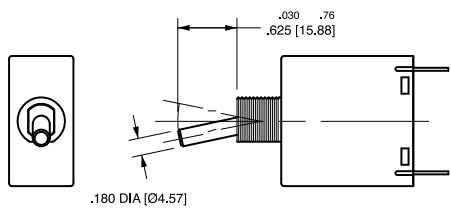
SINGLE POLE



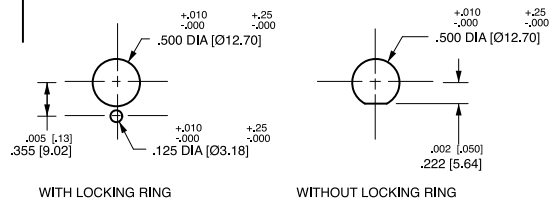
DOUBLE POLE



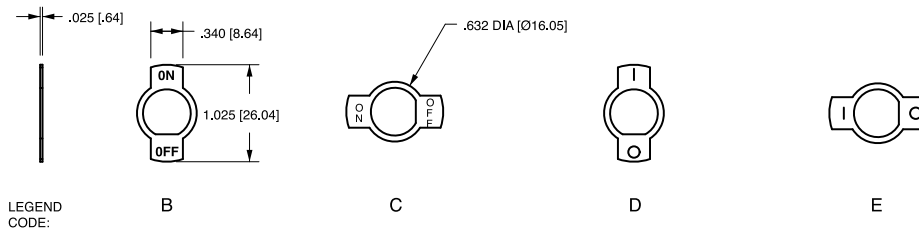
BATON ACTUATOR STYLE



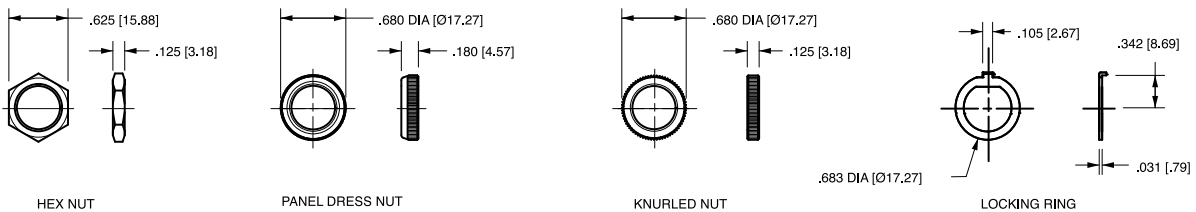
MOUNTING DETAILS



LEGEND PLATES



PANEL HARDWARE

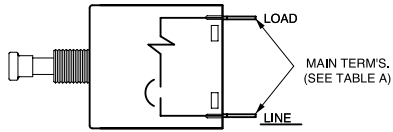


Notes:
1 Tolerance ± 0.020 [.51] unless otherwise specified.

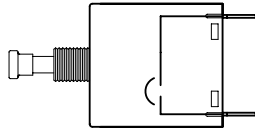
Circuit & Terminal Diagrams Pushbutton

inches [millimeters]

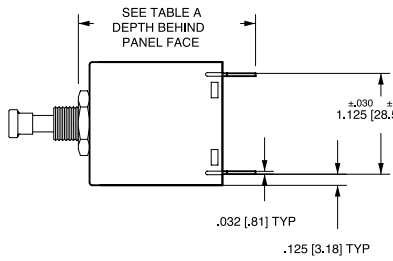
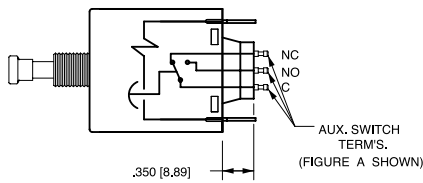
SERIES TRIP



SWITCH ONLY



SERIES TRIP W/ AUXILIARY SWITCH



| 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

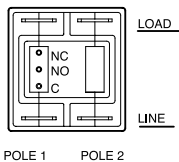


FIG. A

FLAT QC AND SOLDER LUG AUX SWITCH TERMINALS

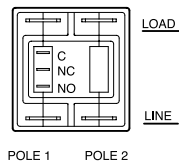
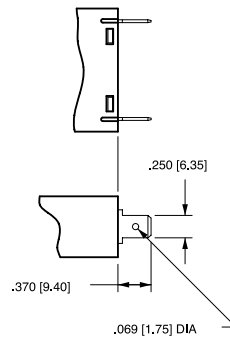


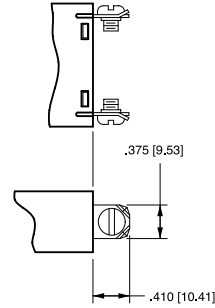
FIG. B

TERMINAL DIMENSIONAL DETAIL

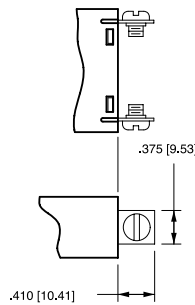
TAB (Q.C.) TERMINAL



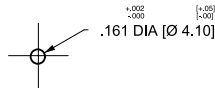
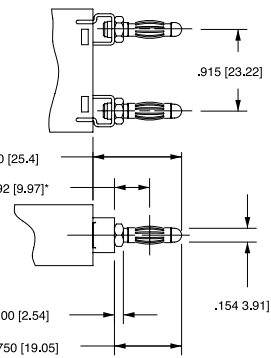
SCREW TERMINAL #8-32 WITH UPTURNED LUGS



SCREW TERMINAL #8-32 BUS



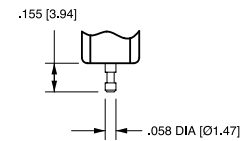
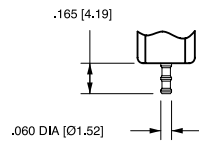
PUSH-IN STUD TERMINAL



PUSH-IN STUD MATING HOLE

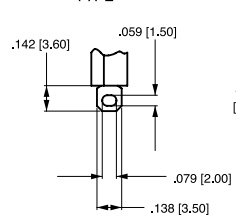
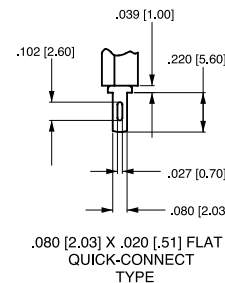
*CENTERLINE OF PUSH-IN STUD CONTACT AREA

AUXILIARY SWITCH TERMINALS



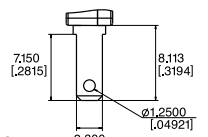
DOUBLE SOLDER TURRET TYPE

ROUND QUICK-CONNECT TYPE



FLAT SOLDER LUG TYPE

.110 QC



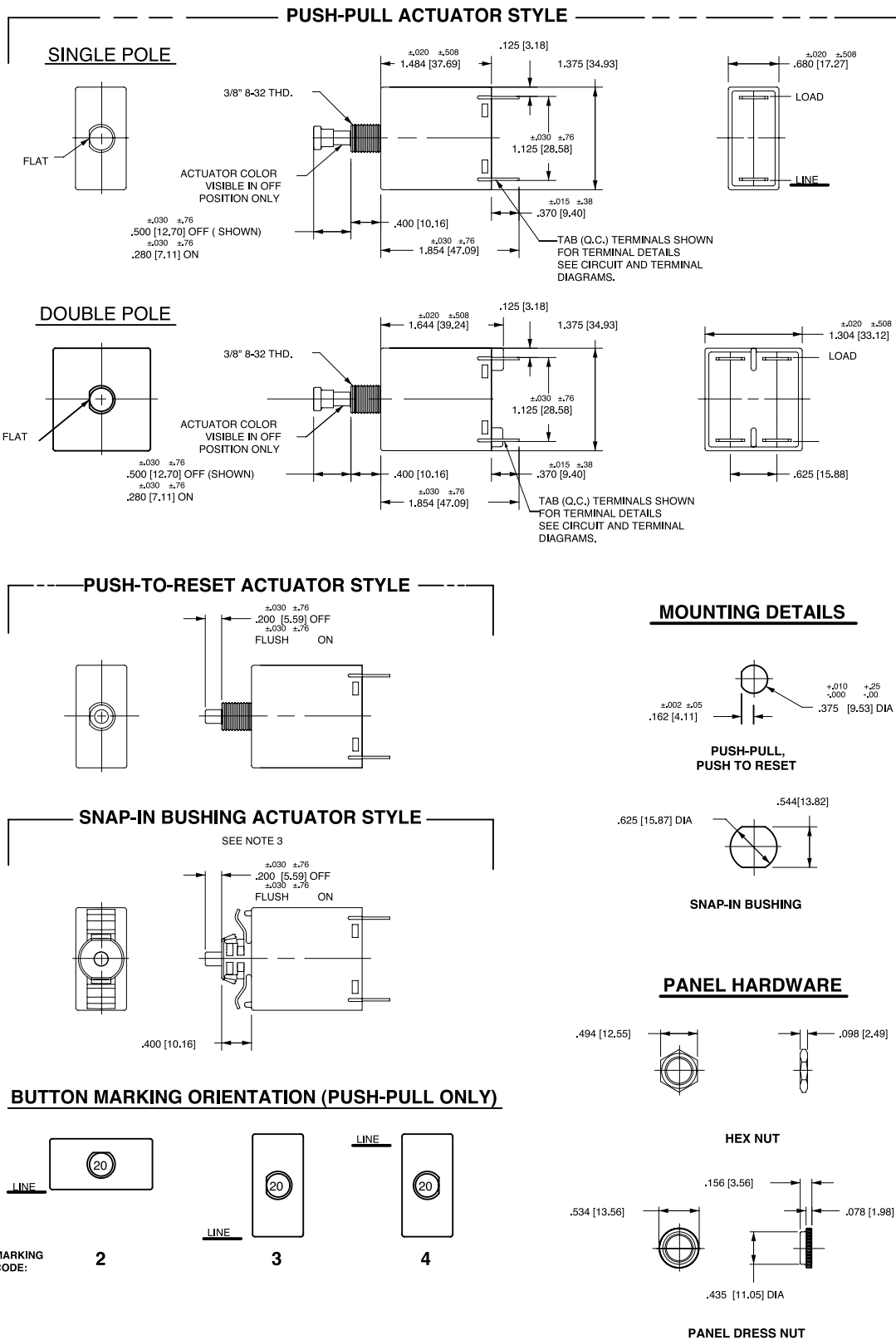
*AVAILABLE THROUGH SPECIALL CATALOG PART NUMBER

Notes:

1 Tolerance ± 0.020 [.51] unless otherwise specified.

Dimensional Specs Pushbutton

inches [millimeters]

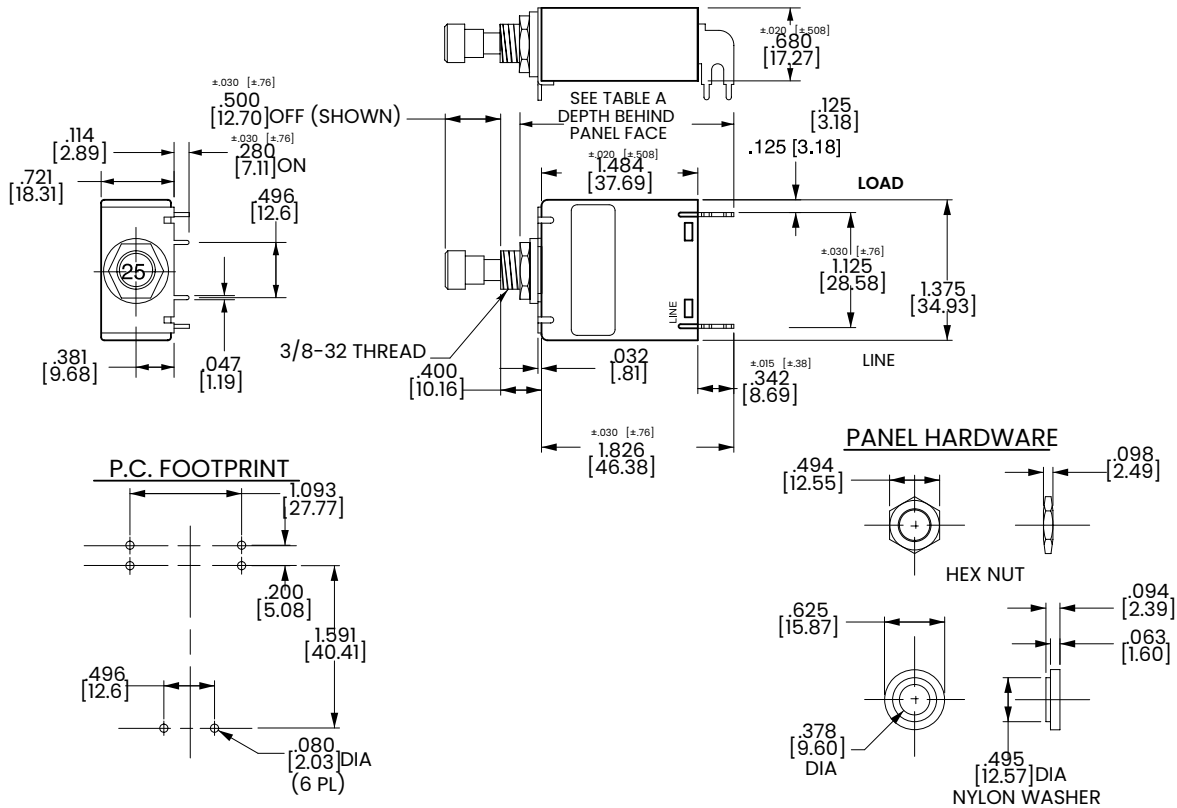


Notes:
 1 All dimensions are in inches [millimeters].
 2 Available with Push-Pull or Push-to-Reset Actuators

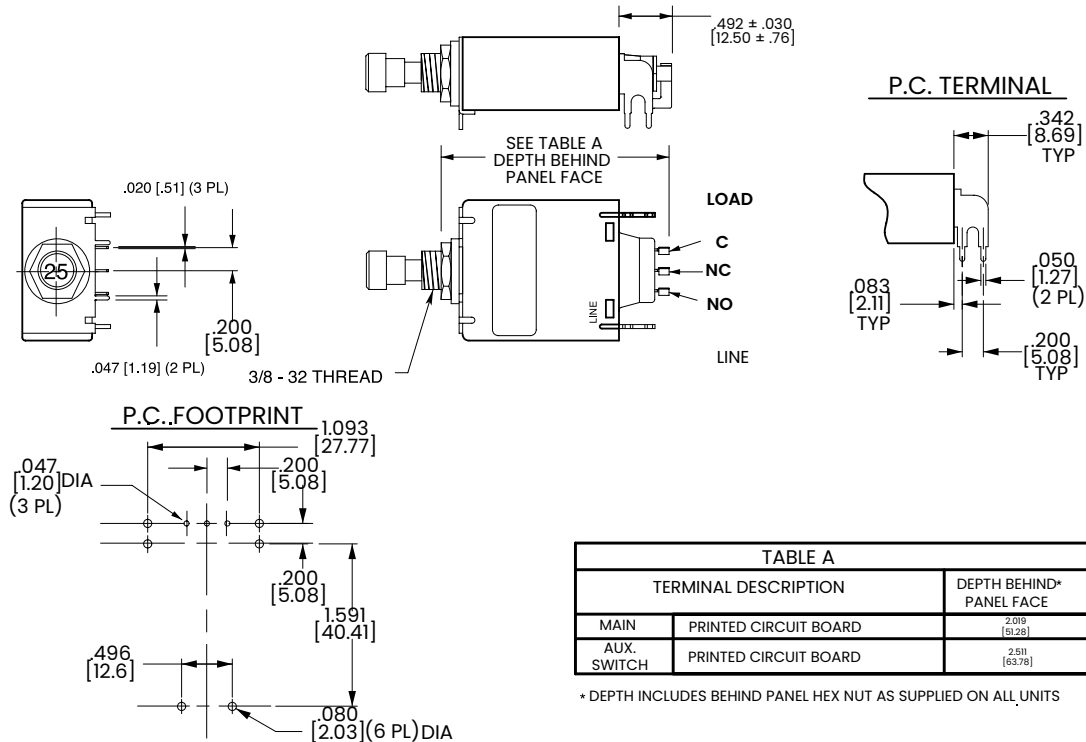
PC Terminal Diagrams Push-Pull

inches [millimeters]

PUSH-PULL TYPE SHOWN WITHOUT AUX. SWITCH



PUSH-PULL TYPE SHOWN WITH AUX. SWITCH



| TABLE A | | |
|----------------------|-----------------------|-----------------------------|
| TERMINAL DESCRIPTION | | DEPTH BEHIND* PANEL FACE |
| MAIN | PRINTED CIRCUIT BOARD | 2.019 [51.28] |
| AUX. SWITCH | PRINTED CIRCUIT BOARD | 2.51 [63.78] |

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

Notes:

1 Tolerance ± 0.020 [.51] unless otherwise specified.

Time Delay

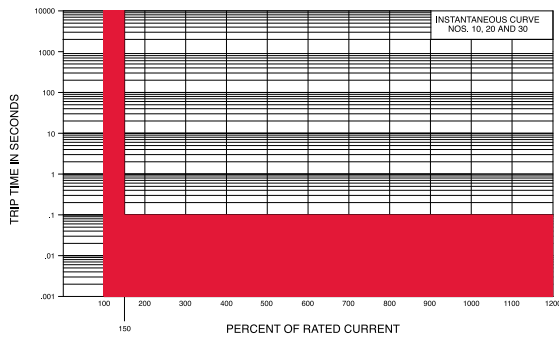
| M, MS-SERIES TIME DELAY VALUES | | | | | | | | | | |
|--------------------------------|--------------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| TRIP TIME SECONDS | PERCENT OF RATED CURRENT | | | | | | | | | |
| | 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:

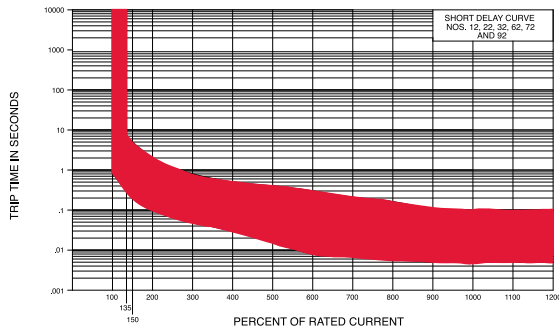
- 1 Delay Curves 12,14, 22, 24, 32, 34, 62, 64, 72, 74, 92, 94: Breakers to hold 100% and must trip at 135% of rated current and greater within the time limit shown in this curve.
- 2 Delay Curves 10, 20, 30: Breakers to hold 100% and must trip at 150% of rated current and greater within the time limit 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

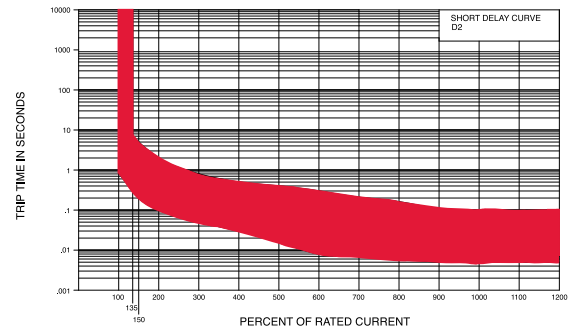
Instantaneous



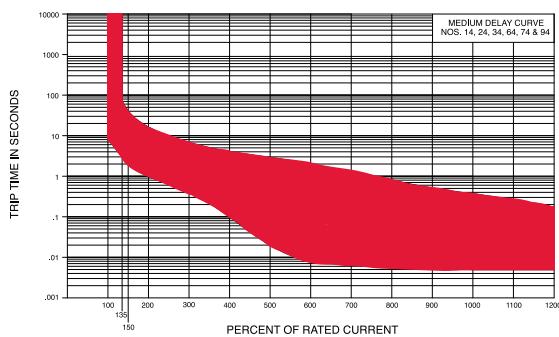
Short



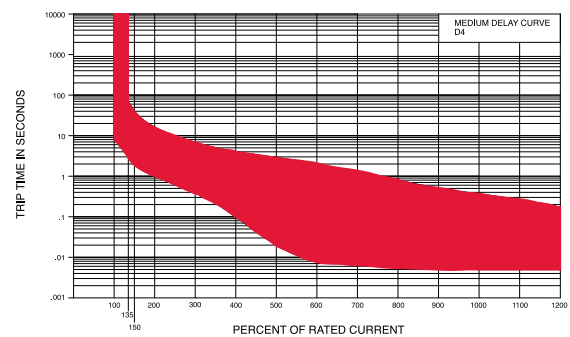
Short D2



Medium



Medium D4



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