



**Carling Technologies™**  
Innovative Designs. Powerful Solutions.

# GFCI / ELCI

*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:

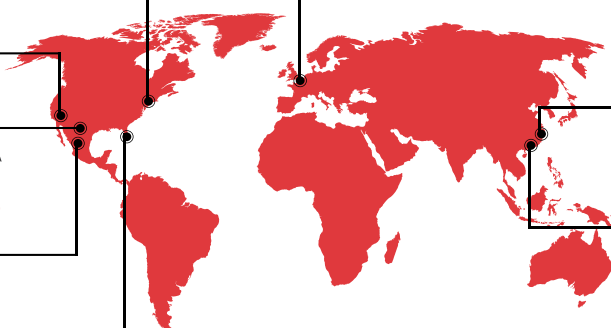
Carling Technologies  
World Headquarters  
Plainville, CT, USA  
ISO9001:2008  
ISO/TS16949:2009

Maretron  
Phoenix, AZ, USA

Carling Technologies  
Brownsville, TX, USA  
ISO14001:2004  
ISO9001:2008  
ISO/TS16949:2009

Carling Technologies  
Matehuala, Mexico  
ISO14001:2004  
ISO9001:2008  
ISO/TS16949:2009

Carling Technologies  
Jupiter, FL, USA



Carling Technologies  
European Headquarters  
Exeter, UK  
ISO9001:2008  
ISO/TS16949:2009

Carling Technologies  
Kowloon, Hong Kong  
ISO9001:2008  
ISO/TS16949:2009

Carling Technologies  
Zhongshan, China  
ISO14001:2004  
ISO9001:2008  
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:

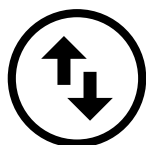


2200+  
EMPLOYEES

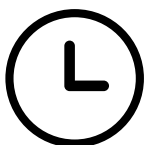


150+  
ENGINEERS

## COMPETITIVE ADVANTAGES<sup>+</sup>



Vertical  
Integration



Reliable &  
On-Time Delivery



Excellent  
Customer Service



Innovative &  
Eco-Friendly Products



70+  
DISTRIBUTORS



50+  
REP FIRMS

### GFCI/ELCI Circuit Protection

This catalog features Carling Technologies’ current line of GFCIs/ELCIs products, which offer maximum equipment protection against overload and short circuits.

Carling’s Equipment leakage circuit breakers function as hydraulic-magnetic circuit breakers, offering customized overload and short circuit protection. In addition, they sense and guard against faults to ground using innovative electronics technologies. With the exception of small amounts of leakage, the current returning to the power supply will be equal to the current leaving the power supply. If the difference between the current leaving and returning through the earth leakage circuit breaker exceeds the leakage sensitivity setting, the breaker trips and its LED illuminates. The LED gives a clear indication that the trip occurred as a result of leakage to ground. This protection helps prevent serious equipment damage and fire.

**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. Please visit [www.carlingtech.com](http://www.carlingtech.com) for the latest information on all our products.

**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](mailto:custservice@carlingtech.com)

**Custom Design Solutions** are available for OEMs that require specific product design and performance.

**Other Circuit Protection Products** such as thermal protection and ground fault circuit protection are also available. Please refer to [www.carlingtech.com](http://www.carlingtech.com) for a complete list of product offering.

<b>Table of Contents</b>	Page
Product Selector Guide.....	2

<b>PB-Series</b>	
Introduction .....	3
General Specifications.....	4
Ordering Scheme.....	5
Dimensional Specifications.....	6
Wiring Diagrams .....	8
Panel Seal Ordering Scheme .....	9
Panel Seal Drawings .....	10
Time Delays .....	11

<b>PC-Series</b>	
Introduction .....	12
General Specifications.....	14
Ordering Scheme.....	16
Wiring Diagrams .....	17
Dimensions .....	19
Panel Seal Ordering Scheme .....	20
Panel Seal Drawings .....	21
Time Delay Curves.....	22



PB-Series



PC-Series

<b>POLES</b>	1-3 poles, 3rd pole switched neutral	1-poles (1 circuit breaker + 1 GFCI sensor module), 120V, 2-pole (2 circuit breakers + 1 GFCI sensor module), 120/240V, or 120V with neutral break 2-pole (2 circuit breakers + 1 GFCI sensor module), 240VAC, 3-pole 120/240V with neutral break (sensor module has 2 pole width)
<b>ACTUATOR STYLE</b>	handle, rocker, flat rocker	handle, rocker, flat rocker, push-to-reset
<b>LEAKAGE CURRENT TRIP LEVEL</b>	30mA & 6mA	30mA & 6mA
<b>LEAKAGE CURRENT TRIP TIME</b>	For 30mA leakage trip: ≤ 22.2mA, shall not trip 30mA, shall trip within .10 seconds, complying with UL-1053 & ABYC E11.  For 6mA leakage trip: ≤25ms	For 30mA leakage trip: ≤ 22.2mA, shall not trip 30mA, shall trip within .10 seconds, complying with UL-1053 & ABYC E11.  For 6mA leakage trip: ≤25ms
<b>MAX CURRENT &amp; VOLTAGE RATINGS</b>	0.10-30A@120/240VAC	0.10-50A@120/240VAC - 240VAC
<b>MAX INTERRUPTING CAPACITY</b>	5,000A	5,000A
<b>AVAILABLE CIRCUITS</b>	series trip	series trip
<b>TERMINATION</b>	.250" tabs, 8-32, 10-32, M4,M5 screw with upturned lugs, 8-32, 10-32, M4,M5 screw, bus type	10-32 threaded stud
<b>MOUNTING METHOD</b>	front panel	front panel
<b>OPERATING TEMPERATURE</b>	-35° C to +65° C	-35° C to +65° C
<b>APPROVALS</b>	UL 489, UL 1077, UL 1500	CSA Approved, UL 1053, UL 1500

\*Manufacturer reserves the right to change product information without prior notice

# PB-Series

## GFCI/ELCI & PANEL SEAL

The new PB-Series, AC Residual Current Circuit Breaker with Overcurrent Protection (RCBO), combines the ground fault protection of a GFCI with the familiar overcurrent tripping characteristics of a normal circuit breaker. It utilizes the hydraulic magnetic principle which provides precise operation and performance even when exposed to extremely hot and/or cold application environments. These precision mechanisms are temperature stable and are not adversely affected by temperature changes in their operating environment. As such, derating considerations due to temperature variations are not normally required, and heat-induced nuisance tripping is avoided.



### Resources:

[Download 3D CAD Files](#)

[IGS >](#) [STP >](#)

### Product Highlights:

- Overload, short circuit and ground fault protection in a single package
- Handle or rocker style actuators
- Wiping Contacts - Mechanical linkage with two-step actuation - cleans contacts, provides high, positive contact pressure & longer contact life.
- A trip-free mechanism, a safety feature which makes it impossible to manually hold the contacts closed during overload or fault conditions.
- A common trip linkage between all poles, another safety feature, ensures that an overload in one pole will trip all adjacent poles.
- Front panel mounting
- Integral push-to-test button

### Benefits:

- Increases safety around boats and marinas
- Protects against electrical shock hazards in areas near water
- Protects against defects in wires & conductors
- Reduces fire and shock hazards from defects in permanently installed appliances such as water heaters, battery chargers, lighting fixtures, etc.
- Detects lower level ground faults which do not trip ordinary circuit breakers, but can lead to fires, and shock hazards for boating occupants

### Typical Applications:

- Marine
- Generators
- Lighting

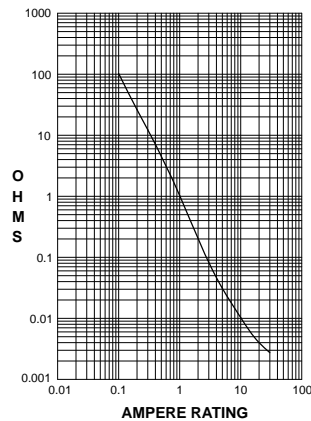
**Electrical Tables**

**Table A:** UL Listed configurations and performance capabilities as Circuit Breakers.

PB-SERIES TABLE A					
Circuit Configuration	Voltage			Current Rating (Amps)	Interrupting Capacity (Amps)
	Max Rating	Frequency	Phase		
Series	120	60	1	10 - 30	5000

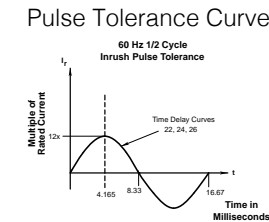
**Electrical**

Maximum Voltage 120/240VAC 60 Hz  
 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 amps. Other ratings available, see ordering scheme.  
 Insulation Resistance Minimum of 100 Megohms at 500 VDC.  
 Dielectric Strength UL, CUL - 1500 V 60 Hz for one minute between all electrically isolated terminals. PB-Series circuit breakers comply with the 8mm spacing and 3750V 60 Hz dielectric requirements from hazardous voltage to operator accessible surfaces and between adjacent poles  
 Impedance Values from Line to Load Terminal



Ampere Rating

CURRENT (AMPS)	TOLERANCE (%)
0.10 - 5.0	± 15
5.10 - 20.0	± 25
20.10 - 30.0	± 35



**Leakage To Ground**

Standard Must Trip 120/240VAC 60 Hz  
 Leakage Current Ratings 5 & 30 milliamps. 5± 1mA  
 For other ratings, consult factory.  
 Trip Time 300 ms Max. @ 100%, 40ms Max. @ 500% of must trip leakage current.  
 Test Button On unit face along side of actuator.

**Mechanical**

Endurance 10,000 ON-OFF operations @ 6 per minute; with rated Current & Voltage.  
 Trip Free All PB-Series Circuit Breakers will trip on overload or ground fault, even when Handle is forcibly held in the ON position.  
 Trip Indication The operating Handle moves positively to the OFF position when an overload or ground fault causes the breaker to trip.

**Physical**

Number of Poles 1 - 3 poles, where the third pole is neutral  
 Internal Circuit Config. Series Trip  
 Weight Approximately 65 grams/pole. (2.32 ounces/pole.)  
 Standard Colors Housing- Black; Actuator - See Ordering Scheme.

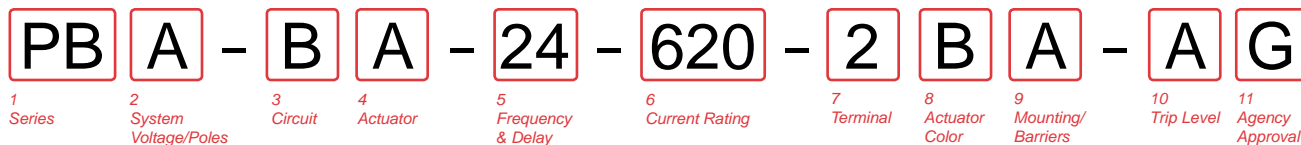
**Environmental**

Designed and tested in accordance with requirements of specification MIL-PRF- 55629 and MIL-STD-202 as follows:  
 Shock Withstands 100 Gs, 6ms, sawtooth while carrying rated current per Method 213, Test Condition "1". 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 -35° C to +65° C  
 Corrosion Tested FMG Test. 3 weeks @ 30°C 75% RH, 100ppb H2S, 20ppb Cl2, 200ppb NO2

**Agency Certifications**

**UL Listed**  
 UL Standard 489 Circuit Breakers, Molded Case, (Guide DIVQ, File E129899)  
 UL Standard 1077 Supplementary Protectors  
 UL Standard 1053 Ground Fault Sensing and Relaying Equipment

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

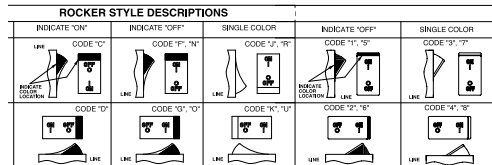


**1 SERIES**  
PB

**2 SYSTEM VOLTAGE / POLES**  
**A** 120 VAC single phase, one pole  
**B** 120/240 VAC single phase, two pole  
**C** 120/240 VAC single phase with switched neutral, three pole  
**D** 120 VAC two pole with switched neutral

**3 CIRCUIT**  
**B** Series Trip (Current)

**4 ACTUATOR 1**  
**Handle**  
**A** one per pole  
**B** one per multipole unit  
**Two Color Curved Visi-Rocker**  
**C** Indicate ON, vertical legend  
**D** Indicate ON, horizontal legend  
**F** Indicate OFF, vertical legend  
**G** Indicate OFF, horizontal legend  
**Single Color Curved Rocker**  
**J** Vertical legend  
**K** Horizontal legend  
**Two Color Flat Visi-Rocker**  
**1** Indicate OFF, vertical legend  
**2** Indicate OFF, horizontal legend  
**Single Color Flat Rocker**  
**3** Vertical legend  
**4** Horizontal legend



**5 FREQUENCY & DELAY**  
**22** 60Hz Short  
**24** 60Hz Medium  
**26** 60Hz Long

**6 CURRENT RATING (AMPERES)**

CODE	AMPERES	CODE	AMPERES	CODE	AMPERES	CODE	AMPERES
210	0.100	285	0.850	450	5.000	712	12.500
215	0.150	290	0.900	455	5.500	613	13.000
220	0.200	295	0.950	460	6.000	614	14.000
225	0.250	410	1.000	465	6.500	615	15.000
230	0.300	512	1.250	470	7.000	616	16.000
235	0.350	415	1.500	475	7.500	617	17.000
240	0.400	517	1.750	480	8.000	618	18.000
245	0.450	420	2.000	485	8.500	620	20.000
250	0.500	522	2.250	490	9.000	622	22.000
255	0.550	425	2.500	495	9.500	624	24.000
260	0.600	527	2.750	610	10.000	625	25.000
265	0.650	430	3.000	710	10.500	630	30.000
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		

**7 TERMINAL 2**  
**1<sup>3</sup>** Push-On 0.250 Tab (Q.C.)  
**2** Screw 8-32 w/upturned lugs  
**3** Screw 8-32 (Bus Type)  
**4** Screw 10-32 w/upturned lugs  
**5** Screw 10-32 (Bus Type)  
**B** Screw M5 w/upturned lugs  
**C** Screw M4 w/upturned lugs  
**E** Screw M4 (Bus Type)  
**H** Screw M5 (Bus Type)

**8 ACTUATOR COLOR & LEGEND**

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

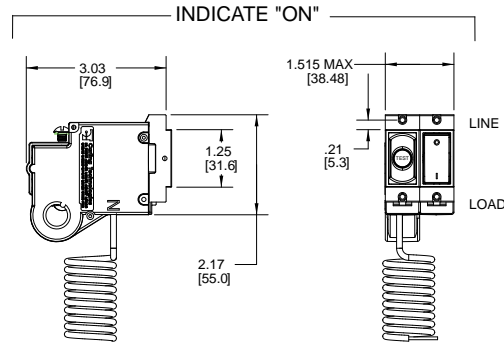
**9 MOUNTING/BARRIERS**  
 MOUNTING STYLE Threaded Insert, 2 per pole  
**A** 6-32 X 0.195 inches yes  
**B** ISO M3 x 5mm yes

**10 LEAKAGE CURRENT TRIP LEVEL - MAX. TRIP CURRENT**  
**A** 5 MA (CLASS A GFCI) <sup>3,4</sup>  
**E** 30 MA (ELCI)

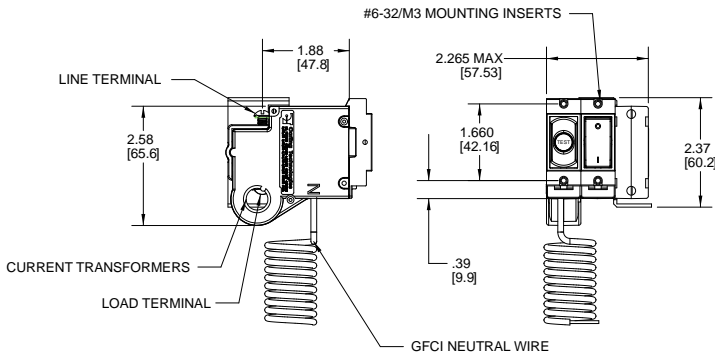
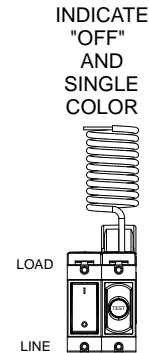
**11 AGENCY APPROVAL**  
**G** UL489 Listed, CSA Certified  
**C** UL1077  
**I** UL1077/UL1500 Ignition Protected <sup>5</sup>

- Notes:  
 1 Actuator Code:  
 A: Handle tie pin spacer(s) and retainers provided unassembled with multi-pole units.  
 B: Handle location as viewed from front of breaker:  
 2 pole - left pole 3 pole - center pole  
 2 Screw Terminals are recommended on ratings greater than 20 amps.  
 3 Available with leakage current trip level - Max trip current code E, and agency approval C.  
 4 30mA per UL1053, available with agency approval codes C & G.  
 5 UL1500 only available with 30MA trip level.

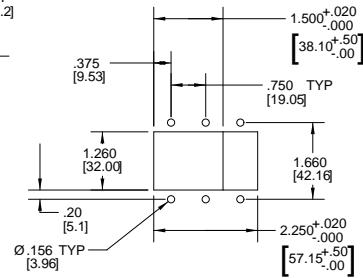
Dimensional Specifications: in. [mm]



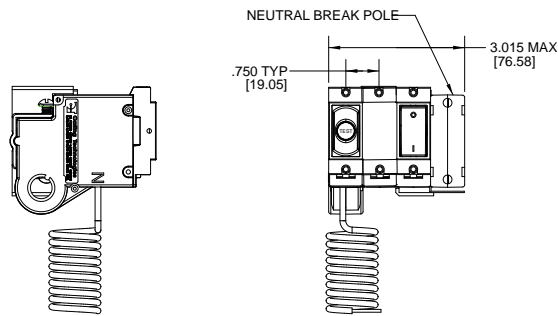
1-POLE 120 VAC VERSION



2-POLE 120/240 VAC VERSION

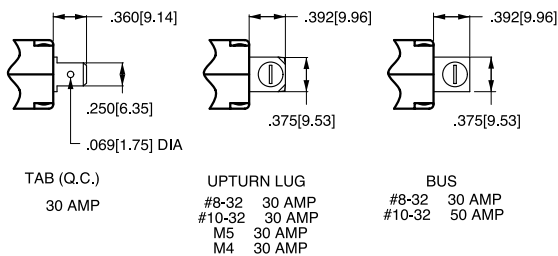


PANEL CUTOUT



2-POLE 120/240 VAC WITH NEUTRAL BREAK

TERMINAL DIMENSIONAL DETAIL & RATING



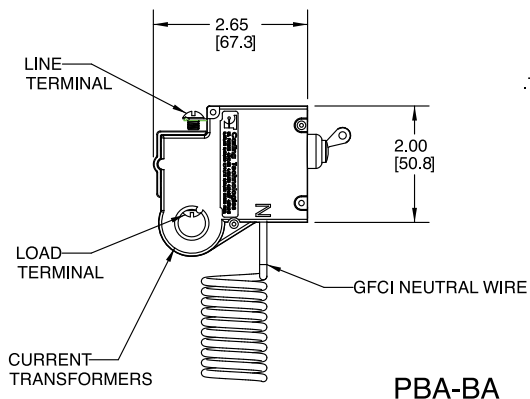
Notes:  
1 All dimensions are in inches [millimeters].  
2 Tolerance ±.020 [5.1] unless otherwise specified.

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]

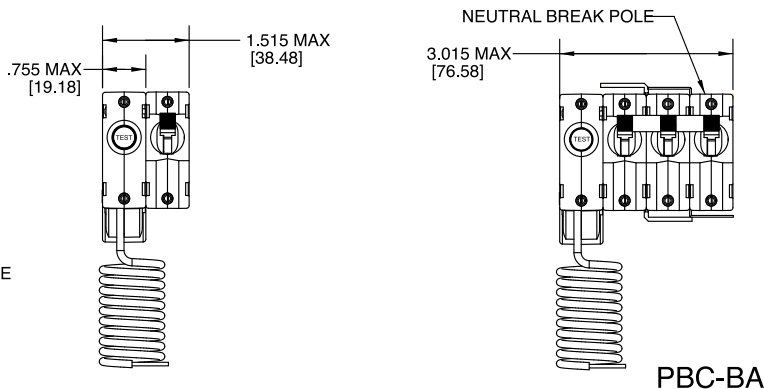


Dimensional Specifications: in. [mm]

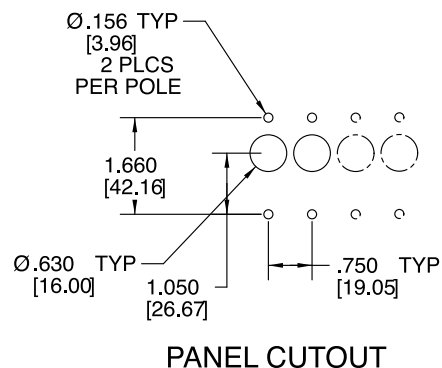
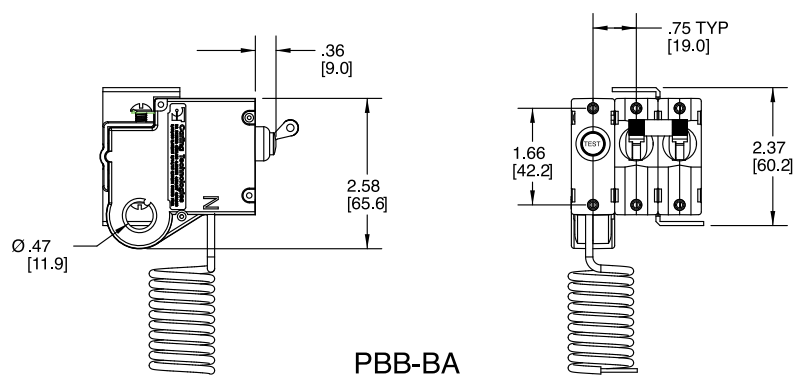
TYPICAL 1-POLE 120 VAC VERSION



TYPICAL 2-POLE 120/240 VAC WITH NEUTRAL BREAK VERSION

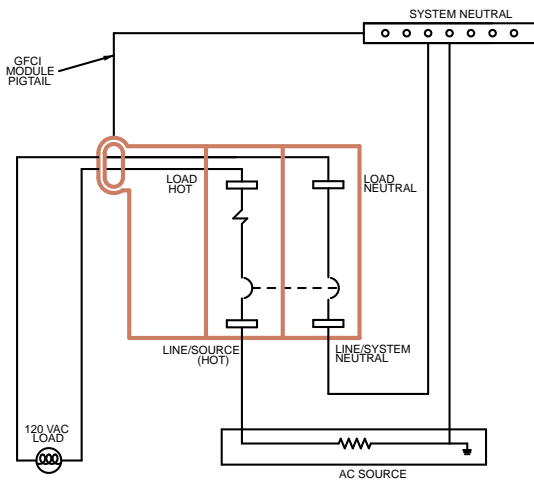


TYPICAL 2-POLE 120/240 VAC VERSION



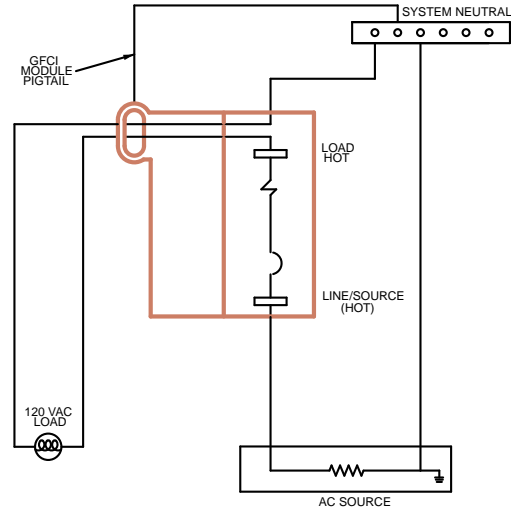
- Notes:
- 1 All dimensions are in inches [millimeters].
  - 2 Tolerance  $\pm 0.020$  [51] unless otherwise specified.

120 VAC with Switched Neutral



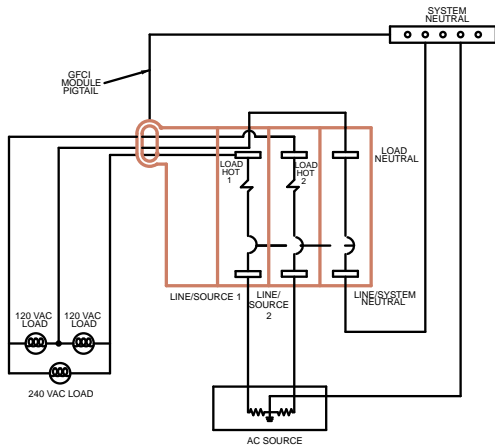
120 VAC WITH SWITCHED NEUTRAL

120 VAC without Switched Neutral



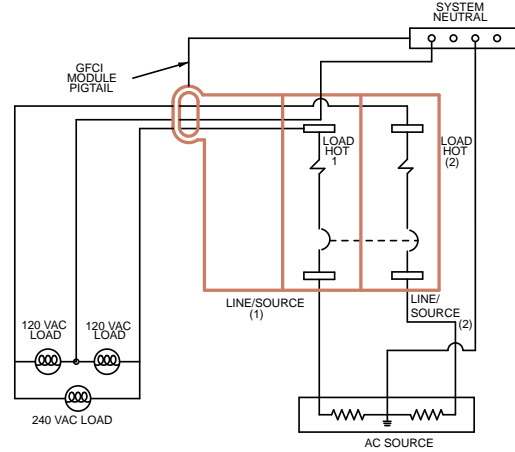
120 VAC WITHOUT SWITCHED NEUTRAL

120/240 VAC with Switched Neutral

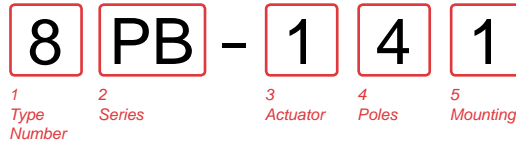


120 VAC WITH SWITCHED NEUTRAL

120/240 VAC without Switched Neutral



120 VAC WITHOUT SWITCHED NEUTRAL



**1 TYPE NUMBER**  
8 Circuit Breaker Assembly

**2 SERIES**  
PB

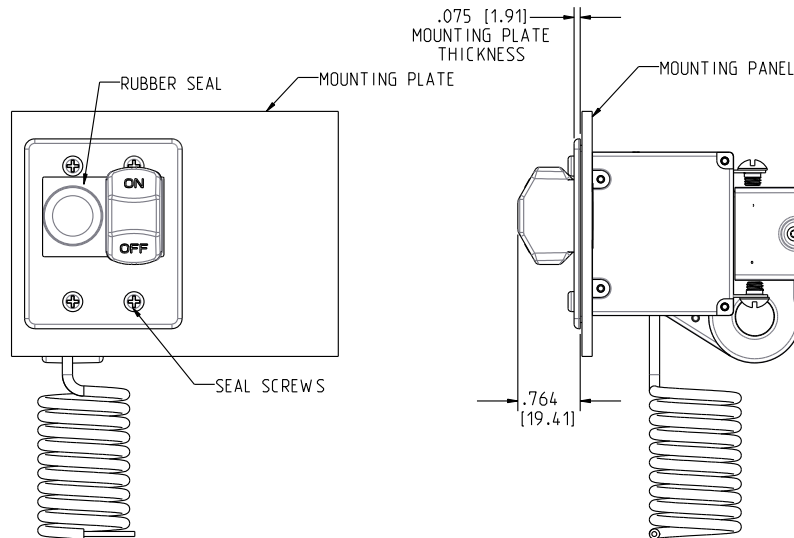
**3 ACTUATOR TYPE**  
1 Handle, one per pole  
2 Handle, one per multipole unit  
A Rocker<sup>2</sup>

**4 POLES PER UNIT - INCLUDING ELECTRONIC MODULE**  
2 Two  
3 Three  
4 Four

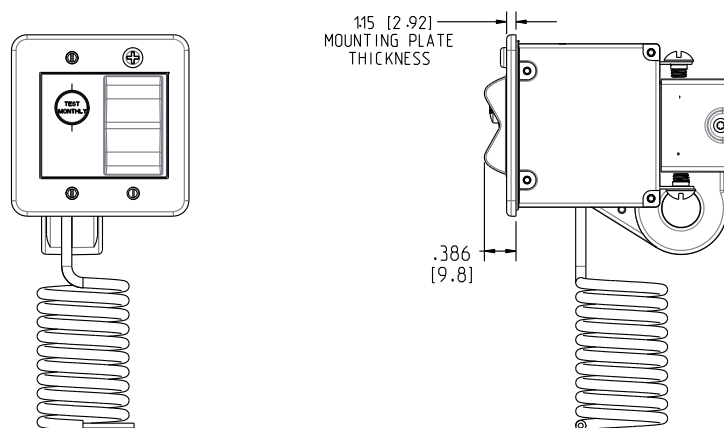
**5 MOUNTING SCREWS / PLATE MATERIAL<sup>1</sup>**  
1 6-32 Thread Phillips Head  
2 M-3 Thread Phillips Head  
3 6-32 Thread Slotted Head  
4 M-3 Thread Slotted Head  
5 6-32 Thread Phillips Head with Stainless Steel Plate  
6 M-3 Thread Phillips Head with Stainless Steel Plate  
7 6-32 Thread Slotted Head with Stainless Steel Plate  
8 M-3 Thread Slotted Head with Stainless Steel Plate

Notes:  
1 Screws supplied to accommodate mounting panel thickness of 1/8" ± 1/32". Consult Factory for additional options  
2 Available for Flat and Curved Rocker options - No Rockerguard Bracket

### Handle Style Panel Seal

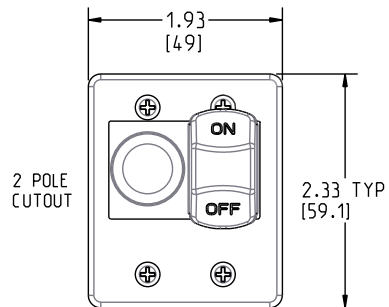


### Rocker Style Panel Seal

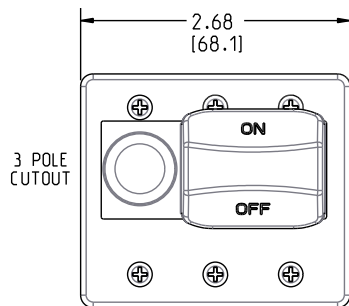


### Handle Actuator

HANDLE, 1 PER POLE

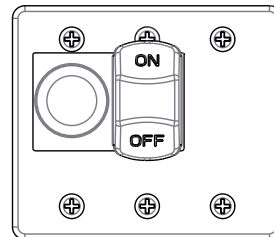


8PB-12

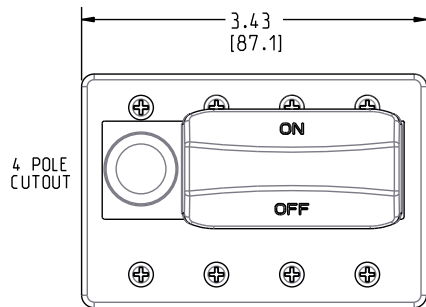


8PB-13

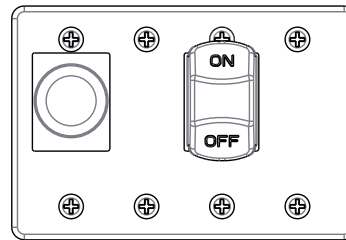
HANDLE, 1 PER MULTIPOLE UNIT



8PB-23

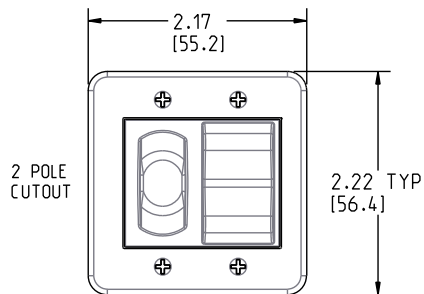


8PB-14

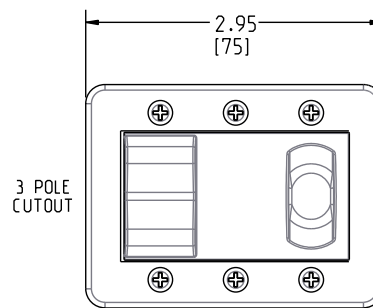


8PB-24

### Rocker Actuator



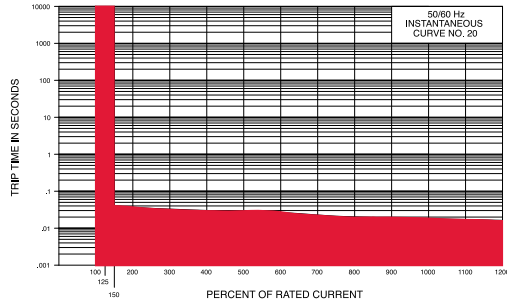
8PB-A2



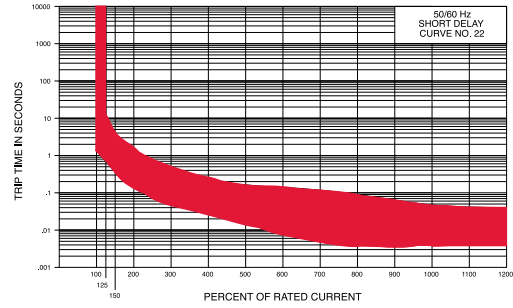
8PB-A3

## Time Delay Curves

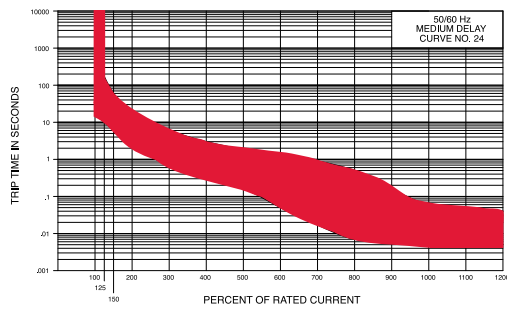
### Instantaneous



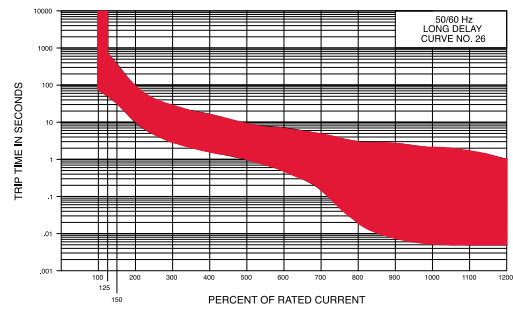
### Medium



### Short



### Long



# PC-Series

## GFCI/ELCI & PANEL SEAL

The PC-Series, AC Residual Current Circuit Breaker with Overcurrent Protection (RCBO), combines the ground fault protection of a GFCI with the familiar overcurrent tripping characteristics of a normal circuit breaker. The PC-Series utilizes the hydraulic-magnetic principle which provides precise operation and performance even when exposed to extremely hot and/or cold application environments.



### Resources:

Download 3D CAD Files

[IGS >](#)

[STP >](#)

### Product Highlights:

- ◆ Overload, short circuit and ground fault protection in a single package
- ◆ Handle style actuators and rocker style “acuguard”
- ◆ Wiping Contacts - Mechanical linkage with two-step actuation - cleans contacts, provides high, positive contact pressure & longer contact life
- ◆ A trip-free mechanism, a safety feature which makes it impossible to manually hold the contacts closed during overload or fault conditions.
- ◆ A common trip linkage between poles ensures that an overload in one pole will trip all adjacent poles.
- ◆ Front panel mounting
- ◆ Integral push-to-test button
- ◆ Two integrated LED indicators show if a breaker is closed w/ Line Voltage present, or has opened due to leakage current, opened due to overcurrent, or closed w/ no Line Voltage present.
- ◆ Optional Hot/Neutral reversal detection and protection

### Benefits:

- ◆ Increases safety around boats, marinas and generators
- ◆ Protects against electrical shock hazards in areas near water
- ◆ Protects against defects in the wires & conductors
- ◆ Reduces fire and shock hazards from defects in permanently installed appliances such as water heaters, battery chargers, lighting fixtures, etc.
- ◆ Detects low level ground faults, which do not trip ordinary circuit breakers, that can lead to fires and shock hazards for boating occupants

### Typical Applications:

- ◆ Marine
- ◆ Generators
- ◆ Lighting

# PC-Series Switch

## DESIGN FEATURES

### MOUNTING PLATE

Available in stainless steel or zinc chromate plated carbon steel



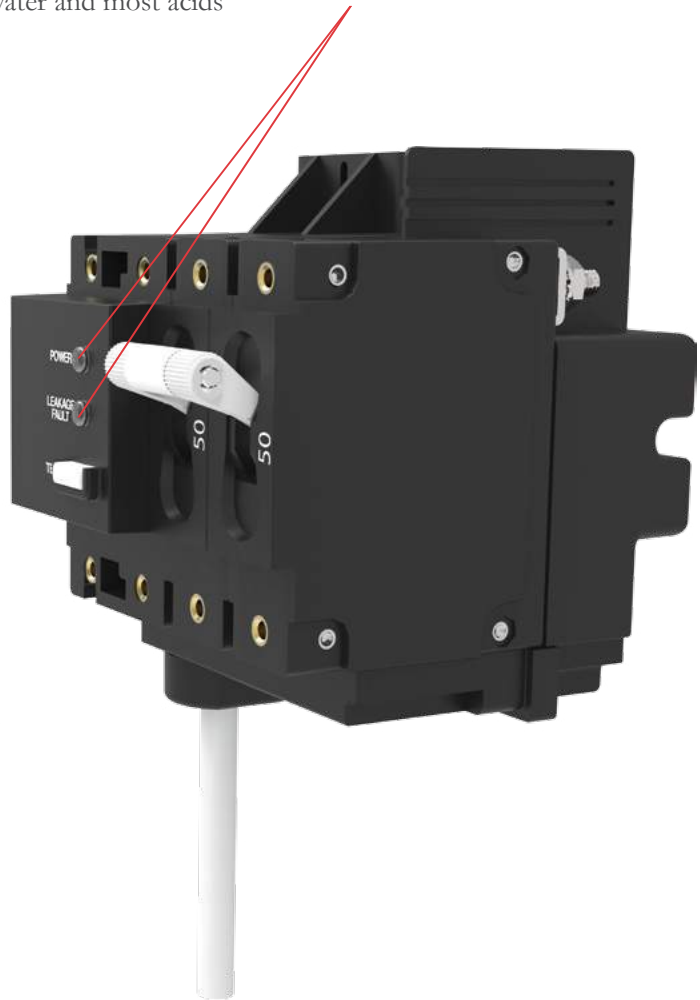
### OPTIONAL SEAL

IP66/67 panel seals provide ideal protection against salt spray, ozone, dust, water and most acids



### LEDs

Two separate lights that indicate power and ground fault leakage



## Electrical Tables

**Table A:** UL Listed & CSA Certified configurations as a Ground Fault Circuit Interruptor

PC-SERIES TABLE A: UL Listed / CSA 22.2 No. 144.1 Configurations as a Ground Fault Circuit Interruptor							
Circuit Configuration	Voltage			Current Rating (Amps)	Short Circuit Capacity (Amps)	Ground Fault Trip Level (Milliamps)	Notes
	Max Rating	Frequency	Phase				
Series	120	50 / 60	1	1 - 50	5000	6	1 or 2 Poles. One pole of a two pole unit must be Neutral
	120 / 240	50 / 60	1	1 - 50	5000	6	1 or 2 Poles. One pole of a three pole unit must be Neutral

**Table B:** UL Recognized as an Earth Leakage Circuit Interruptor - 120 and 120/240V

PC-SERIES TABLE B: UL Recognized Configurations as an Earth Leakage Circuit Interruptor							
Circuit Configuration	Voltage			Current Rating (Amps)	Short Circuit Capacity (Amps)	Ground Fault Trip Level (Milliamps)	Notes
	Max Rating	Frequency	Phase				
Series	120	50 / 60	1	1 - 50	5000	30	1 or 2 Poles. One pole of a two pole unit must be Neutral
	120 / 240	50 / 60	1	1 - 50	5000	30	1 or 2 Poles. One pole of a three pole unit must be Neutral
Series Ignition Protection	120	50 / 60	1	1 - 50	3000	30	1 or 2 Poles. One pole of a two pole unit must be Neutral
	120 / 240	50 / 60	1	1 - 50	5000	30	1 or 2 Poles. One pole of a three pole unit must be Neutral

**Table C:** UL Recognized as an Earth Leakage Circuit Interruptor - 240V

PC-SERIES TABLE C: UL Recognized Configurations as an Earth Leakage Circuit Interruptor - 240V							
Circuit Configuration	Voltage			Current Rating (Amps)	Short Circuit Capacity (Amps)	Ground Fault Trip Level (Milliamps)	Notes
	Max Rating	Frequency	Phase				
Series	240	50 / 60	1	1 - 30	5000	30	2 or 3 Poles. One pole of a two pole unit must be Neutral. Suffix 11
Series Ignition Protection	240	50 / 60	1	1 - 50	5000	30	2 or 3 Poles. One pole of a three pole unit must be Neutral. Suffix 12

## Agency Certifications

UL Standard 489	Circuit Breakers, Molded Case, (Guide DIVQ, File E129899)
UL Standard 1077	Supplementary Protectors
CSA 22.2 No. 144.1	Class A Ground Fault Circuit Interrupters
UL Standard 1053	Ground Fault Sensing and Relaying Equipment
UL Standard 1500	Ignition Protection

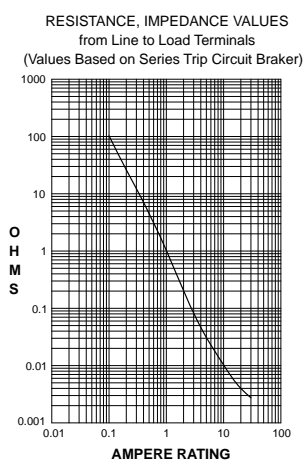


### Electrical

Current Ratings 1 - 50 Amps maximum  
 Voltage Rating 120VAC, 120/240VAC, 240VAC  
 Current Trip Level 30mA & 6mA  
 Current Trip Time For 30mA leakage trip:  
 ≤ 22.2mA, shall not trip  
 30mA, shall trip within .10 seconds  
 The above complies with & ABYC E11. For 6mA leakage trip: ≤25ms  
 50/60 Hz for 30mA leakage trip  
 60 Hz for 6mA leakage trip

Operating Frequency 5,000 Amps

Interrupt Capacity  
 Impedance



CURRENT (AMPS)	TOLERANCE (%)
0.10 - 5.0	± 15
5.10 - 20.0	± 25
20.10 - 50.0	± 35

### Innovative Features

Indicator Two integrated LEDs, Red & Green  
 ♦ **Green LED On, Red LED Off**  
 Line Voltage is present, the breaker is closed, and the device is protecting the circuits against over current and leakage current.  
 ♦ **Green LED Off, Red LED On**  
 The device has detected leakage current and has opened the circuit breaker.  
 ♦ **Green LED Flashing, Red LED Off**  
 The circuit breaker has opened due to over current or has been turned off manually  
 ♦ **Green LED Off, Red LED Off**  
 Line Voltage is not present  
 ♦ **Green LED Flashing, Red LED Off, Amber LED ON**  
 Indicates Hot & Neutral are reversed and the circuit breaker is open

Neutral Protection When neutral is grounded on load side of circuit

Test Button Located on Ground Fault Module

### Mechanical

Endurance 10,000 ON-OFF operations @ 6 per minute; with rated Current & Voltage.  
 Trip Free Trips on short circuit, overload or leakage to ground, even when actuator is forcibly held in the "On" position

### Physical

Number of Poles (Breakers only) 1-pole (1 Circuit Breaker + 1 GFCI Sensor Module), 120V  
 2-pole (2 Circuit Breakers + 1 GFCI Sensor Module), 120/240V or 120V with Neutral Break. 240VAC two pole. 3-pole 120/240V with Neutral Break (Sensor module has 2 pole width) Circuit Breaker Line Side: #10-32, Threaded stud. GFCI Sensor Module Load Side: #10-32 threaded stud. Neutral pigtail. Front Panel, #6-32 and M3 threaded inserts.

Termination  
 Mounting  
 Actuator Handle, Flat Rocker, Curved Rocker (with or without rocker guard), Push-to-Reset Rocker

### Environmental

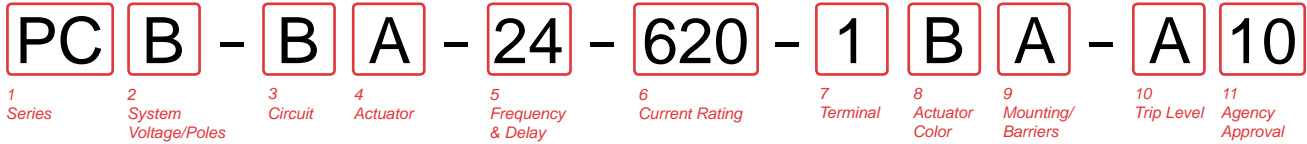
Designed and tested in accordance with requirements of specification MIL-PRF- 55629 and MIL-STD-202G as follows:

Shock Withstands 100 G, 6ms, sawtooth at rated current per Method 213, Test Condition "I".

Vibration Withstands 0.06" excursion from 10-55 Hz, and 10 G 55-500 Hz, a rated current per Method 204C, Test Condition A. Instantaneous & ultrashort curves tested at 90% of rated current.

Moisture Resistance 93% RH at 30°C for 168 Hours.  
 Operating Temperature -35°C to +66°C  
 Corrosion **Humidity:** 30±2°C, 70±2% relative humidity  
**Mixed Flowing Gases:** 100 ppb H<sub>2</sub>S, 20 ppb Cl<sub>2</sub>, 200±50 ppb NO<sub>2</sub>

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



**1 SERIES**  
PC

**2 SYSTEM VOLTAGE / POLES**  
**A** 120 VAC single phase, 1 pole  
**B** 120/240 VAC single phase, 2 pole  
**C** 120/240 VAC single phase with switched neutral, 3 pole  
**D** 120 VAC single phase with switched neutral, 2 pole  
**E** 120 VAC single phase with reversed polarity indicator, 2 pole  
**F** 120/240 VAC single phase with reversed polarity indicator, 3 pole  
**G** 240 VAC single phase, 2 pole

**3 CIRCUIT**  
**B** Series Trip (Current)

**4 ACTUATOR**  
**Handle**  
**A** 1 per breaker pole  
**B** 1 per unit  
**Two Color Curved Visi-Rocker**  
**C** Indicate ON, vertical legend  
**D** Indicate ON, horizontal legend  
**F** Indicate OFF, vertical legend  
**G** Indicate OFF, horizontal legend  
**Single Color Curved Rocker**  
**J** Vertical legend  
**K** Horizontal legend  
**Two Color Curved Visi-Rocker Push-to-Reset**  
**N** Indicate OFF, Vertical legend  
**O** Indicate OFF, Horizontal legend

**Single Color Curved Rocker Push-to-Reset**  
**R** Vertical legend  
**U** Horizontal legend  
**Two Color Flat Visi-Rocker**  
**1** Indicate OFF, vertical legend  
**2** Indicate OFF, horizontal legend  
**Single Color Flat Rocker**  
**3** Vertical legend  
**4** Horizontal legend  
**Two Color Flat Visi-Rocker Push-to-Reset**  
**5** Indicate OFF, vertical legend  
**6** Indicate OFF, horizontal legend  
**Single Color Flat Rocker Push-to-Reset**  
**7** Vertical legend  
**8** Horizontal legend

ROCKER STYLE DESCRIPTIONS				
INDICATE "ON"	INDICATE "OFF"	SINGLE COLOR	INDICATE "OFF"	SINGLE COLOR
CODE "0"	CODE "1", "N"	CODE "1", "R"	CODE "1", "S"	CODE "3", "T"
CODE "0"	CODE "1", "O"	CODE "1", "U"	CODE "1", "V"	CODE "1", "W"

**5 FREQUENCY & DELAY**  
**20** 50/60Hz Instantaneous  
**21** 50/60Hz Ultra Short  
**22** 50/60Hz Short  
**24** 50/60Hz Medium  
**26** 50/60Hz Long

**6 CURRENT RATING (AMPERES)**

CODE	AMPERES	CODE	AMPERES	CODE	AMPERES	CODE	AMPERES
410	1.000	445	4.500	610	10.000	618	18.000
512	1.250	450	5.000	710	10.500	620	20.000
415	1.500	455	5.500	611	11.000	622	22.000
517	1.750	460	6.000	711	11.500	624	24.000
420	2.000	465	6.500	612	12.000	625	25.000
522	2.250	470	7.000	712	12.500	630	30.000
425	2.500	475	7.500	613	13.000	635	35.000
527	2.750	480	8.000	614	14.000	640	40.000
430	3.000	485	8.500	615	15.000	650	50.000
435	3.500	490	9.000	616	16.000		
440	4.000	495	9.500	617	17.000		

**7 TERMINAL**  
**1** Stud, 10-32 threaded

**8 ACTUATOR COLOR & LEGEND**

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

**9 MOUNTING/BARRIERS**

ACTUATOR	MOUNTING STYLE	BARRIERS
A	6-32 X 0.195 inches Threaded Insert, 2 per pole	yes
B	ISO M3 x 5mm Rockerguard Bezel Threaded Insert, 2 per pole	yes
C	6-32 X 0.195 inches Standard Bezel with Recessed Off-Side Flat Rocker Threaded Insert, 2 per pole	yes
D	ISO M3 x 5mm	yes
E	6-32 X 0.195 inches Push-to-Reset Bezel Threaded Insert, 2 per pole	yes
F	ISO M3 x 5mm	yes
G	6-32 X 0.195 inches Push-to-Reset Bezel Threaded Insert, 2 per pole	yes
H	ISO M3 x 5mm	yes

**10 LEAKAGE CURRENT TRIP LEVEL - MAX. TRIP CURRENT**  
**A** 6 MA (CLASS A GFCI)  
**E** 30 MA (ELCI) 1,2

**11 AGENCY APPROVAL**  
**AA** without Approvals  
**10** CSA certified  
**11** UL 1053 1,2  
**12** UL 1053 & UL 1500 1,2

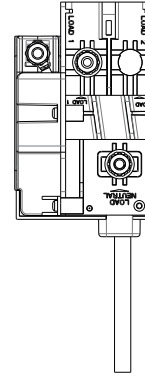
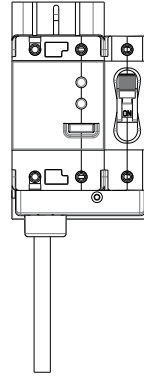
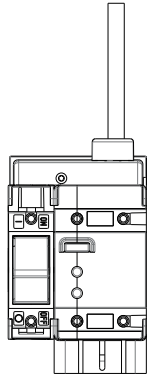
Notes:  
 1 This device meets the requirements of ABCY E11.  
 2 30mA per UL1053, available with agency approval codes 11 & 12.

INDICATE OFF / SINGLE COLOR  
ROCKER ACTUATOR

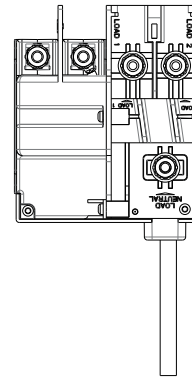
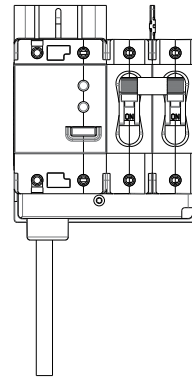
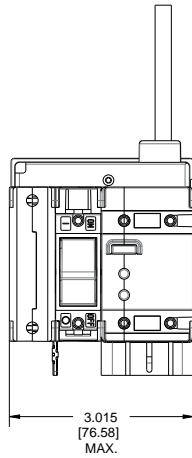
HANDLE / INDICATE ON  
ROCKER ACTUATOR

TERMINAL  
LOCATIONS

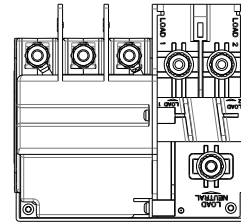
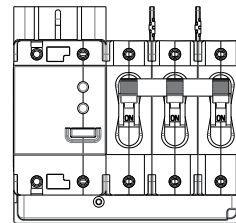
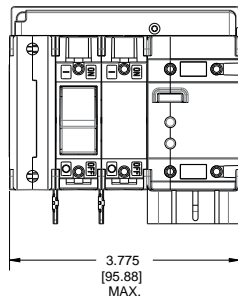
PCA  
120 VAC  
VERSION



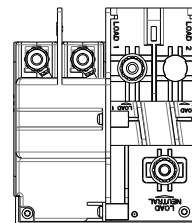
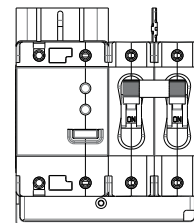
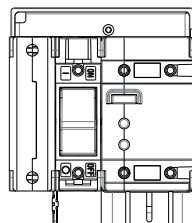
PCB  
120/240 VAC  
VERSION



PCC  
120/240 VAC  
VERSION  
W/ NEUTRAL BREAK



PCD  
120 VAC  
VERSION  
W/NEUTRAL BREAK

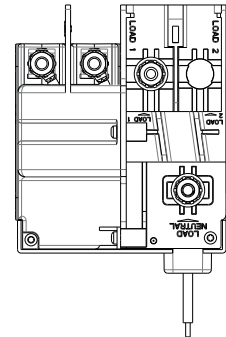
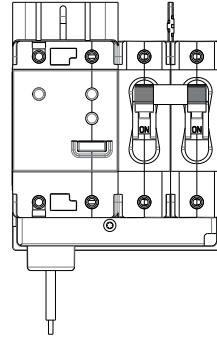
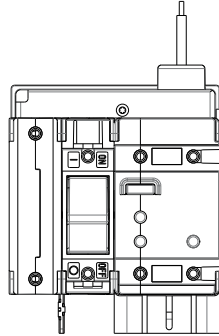


INDICATE OFF / SINGLE COLOR  
ROCKER ACTUATOR

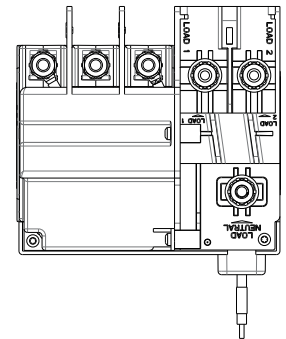
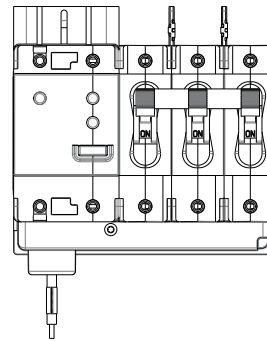
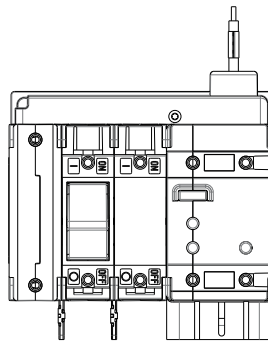
HANDLE / INDICATE ON  
ROCKER ACTUATOR

TERMINAL  
LOCATIONS

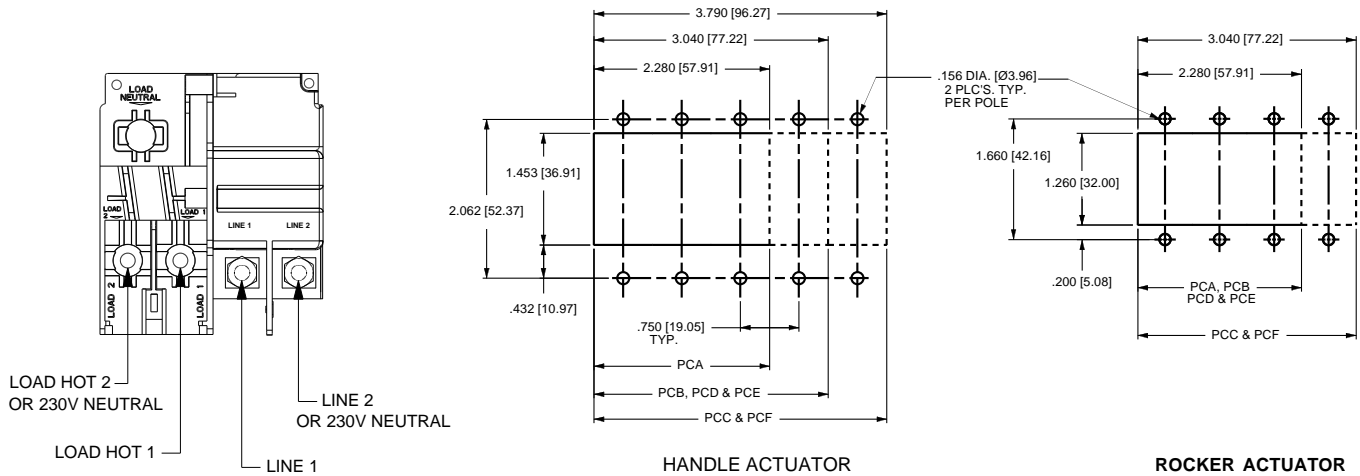
PCE  
120 VAC VERSION  
W/ REVERSE POLARITY  
INDICATOR



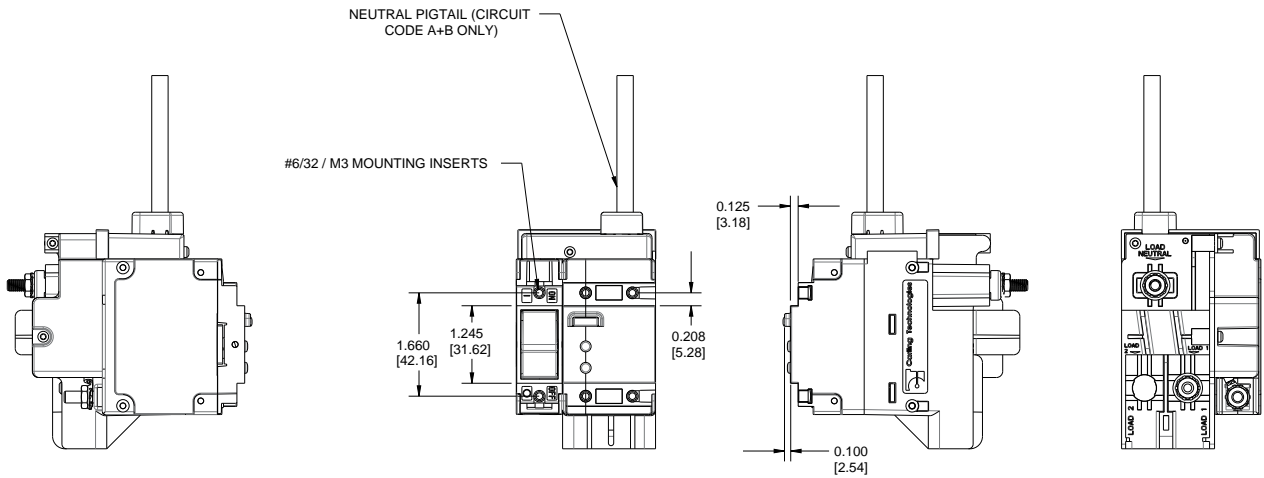
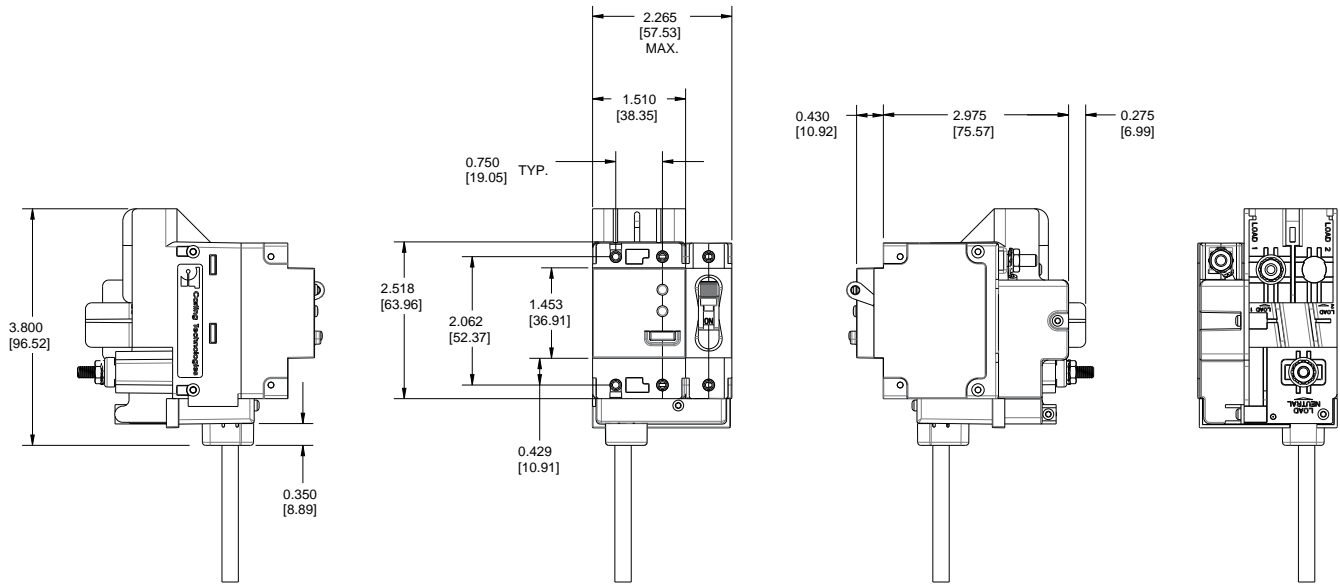
PCF  
120/240 VAC VERSION  
W/ REVERSE POLARITY  
INDICATOR



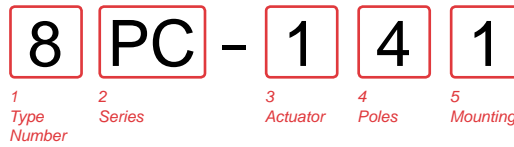
NOTE: NEUTRAL & GROUND PIGTAIL WIRES - SUPPLIED 12" LONG MIN. (CIRCUIT CODES A,B,E & F)



PANEL CUTOUT DETAIL  
TOLERANCES ±.005 [0.12]



Notes:  
For additional circuit breaker dimensions, reference the C-Series Breakers in the Carling Circuit Protection catalog



**1 TYPE NUMBER**  
8 Circuit Breaker Assembly

**2 SERIES**  
PC

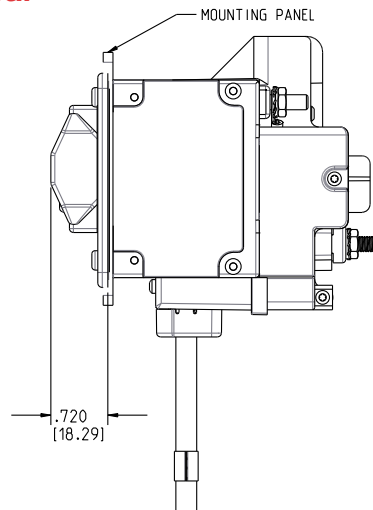
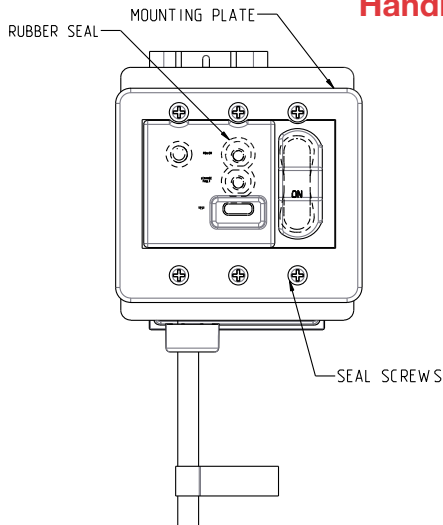
**3 ACTUATOR TYPE**  
1 Handle, one per pole  
2 Handle, one per multipole unit  
A Rocker<sup>2</sup>

**4 POLES PER UNIT - INCLUDING ELECTRONIC MODULE**  
3 Three  
4 Four  
5 Five

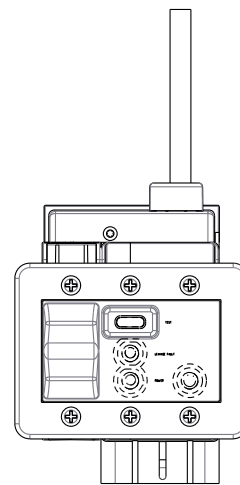
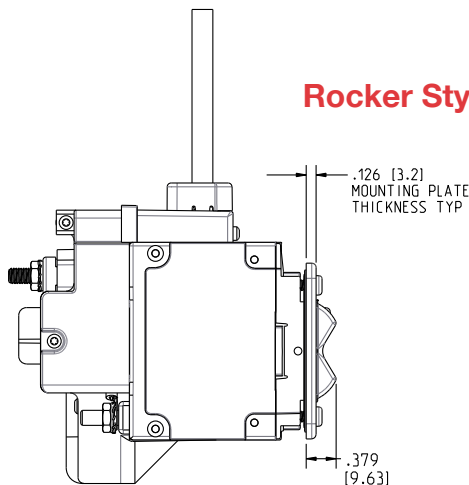
**5 MOUNTING SCREWS / PLATE MATERIAL<sup>1</sup>**  
1 6-32 Thread Phillips Head  
2 M-3 Thread Phillips Head  
3 6-32 Thread Slotted Head  
4 M-3 Thread Slotted Head  
5 6-32 Thread Phillips Head w/ Stainless Steel Plate  
6 M-3 Thread Phillips Head w/ Stainless Steel Plate  
7 6-32 Thread Slotted Head w/ Stainless Steel Plate  
8 M-3 Thread Slotted Head w/ Stainless Steel Plate

Notes:  
1 Screws supplied to accommodate mounting panel thickness of 1/8" ± 1/32". Consult Factory for additional options  
2 Available for Flat and Curved Rocker options - No Rockerguard Bracket

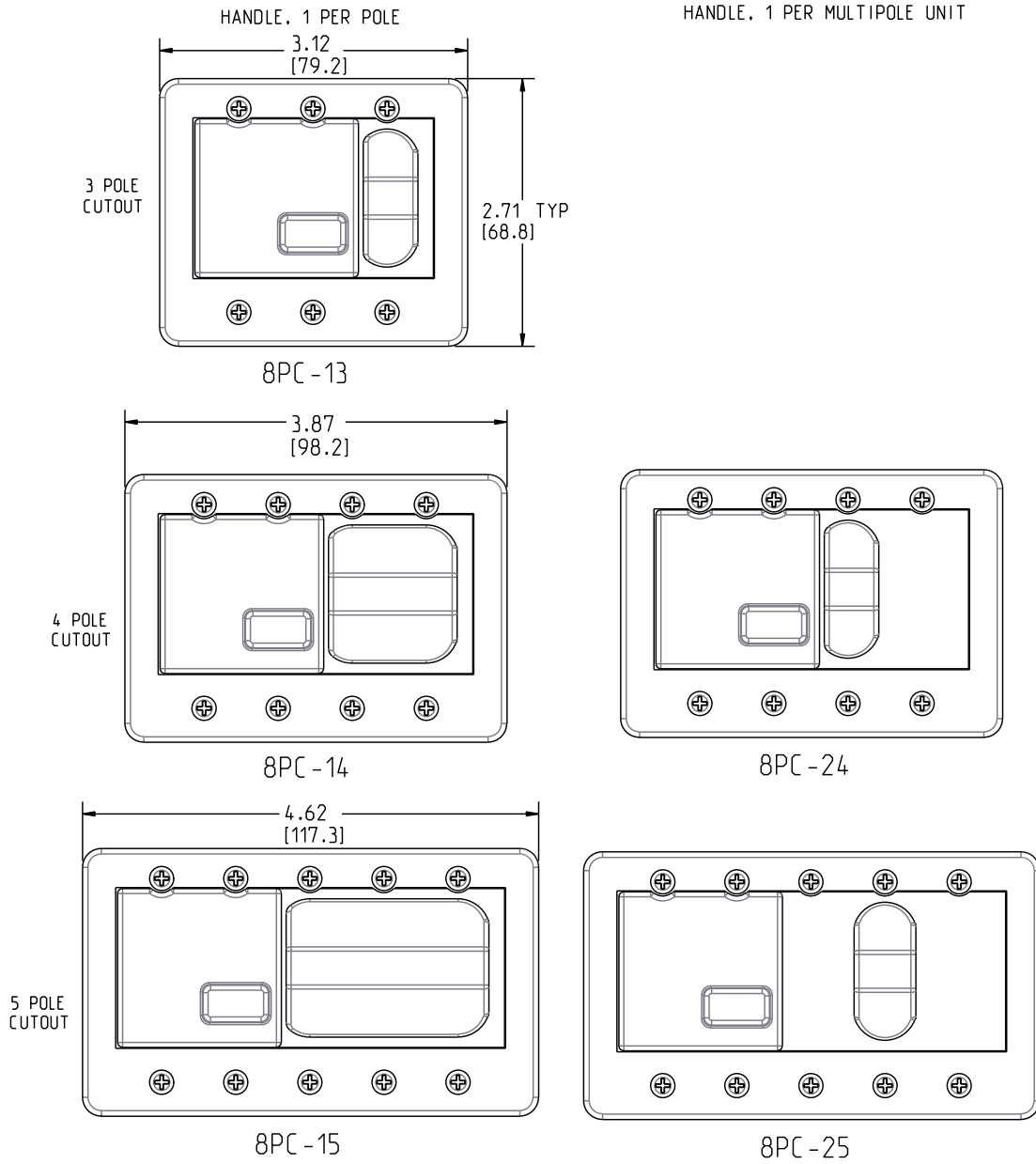
**Handle Style Panel Seal**



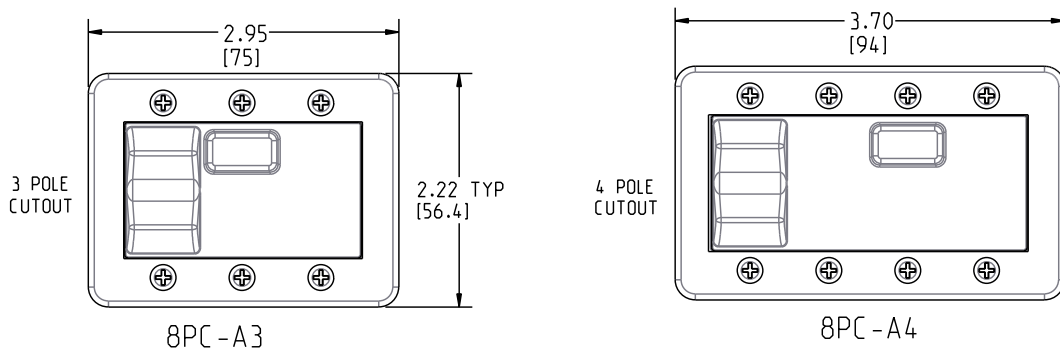
**Rocker Style Panel Seal**



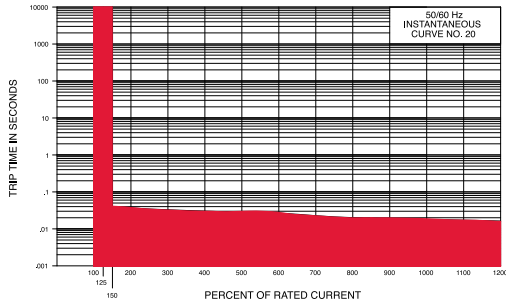
**Handle Actuator**



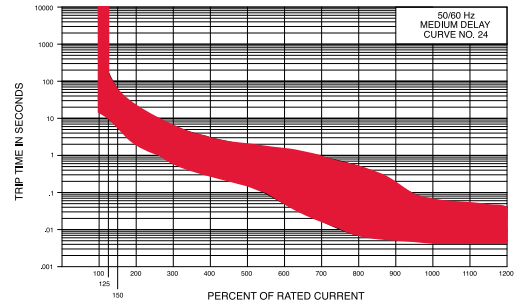
**Rocker Actuator**



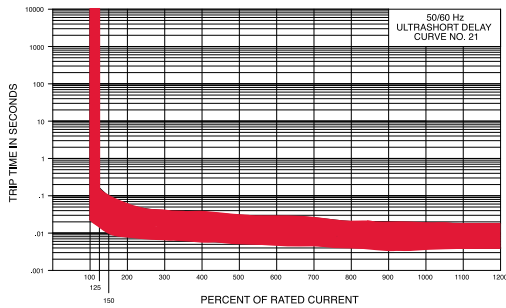
## Time Delay Curves Instantaneous



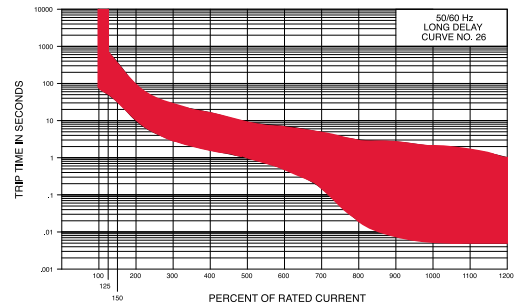
## Medium



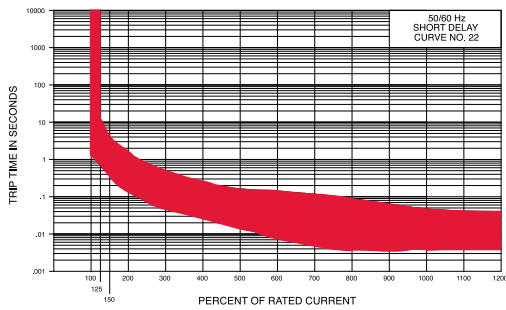
## Ultra Short



## Long



## Short



Time Delay Values									
Percent of Rated Current									
Delay	100%	125%	150%	200%	400%	600%	800%	1000%	1200%
<b>20</b>	No Trip	May Trip	.040 MAX	.035 MAX	.030 MAX	.025 MAX	.020 MAX	.017 MAX	.015 MAX
<b>21</b>	No Trip	.014 - .150	.011 - .095	.008 - .055	.006 - .035	.005 - .027	.005 - .021	.004 - .018	.004 - .017
<b>22</b>	No Trip	.700 - 12.0	.350 - 4.00	.130 - 1.30	.027 - .220	.008 - .130	.004 - .090	.004 - .045	.004 - .040
<b>24</b>	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
<b>26</b>	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

**Notes:**

Other time delay values available, consult factory.

Delay Curves 21,22,24,26: Breakers to hold 100% and must trip at 125% of rated current and greater within the time limit shown in this curve.

Delay Curve 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.

The minimum inrush pulse tolerance handling capability is 12 times the rated current. These values are based on a 60 Hz 1/2 cycle, 8.33 ms pulse.



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](http://carlingtech.com) or scan the QR codes below for complete details.

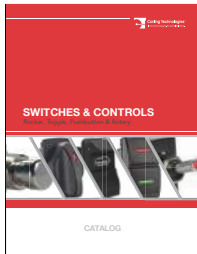
[www.carlingtech.com](http://www.carlingtech.com)



Watch Company Profile Video



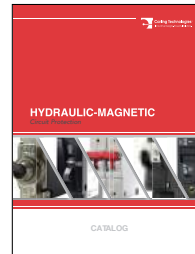
Switches & Controls



*catalog*

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

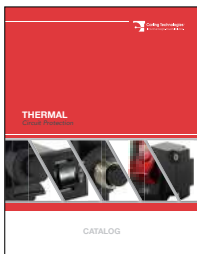
Hydraulic-Magnetic



*catalog*

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

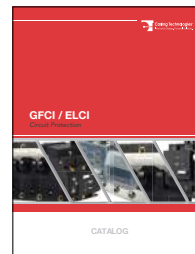
Thermal



*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

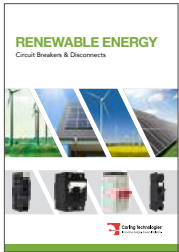


catalog

brochure

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

### Renewable Energy

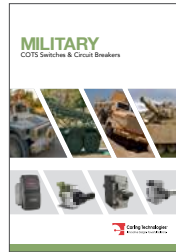


catalog

brochure

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

### Military



catalog

brochure

Complete line of CO/TS (*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

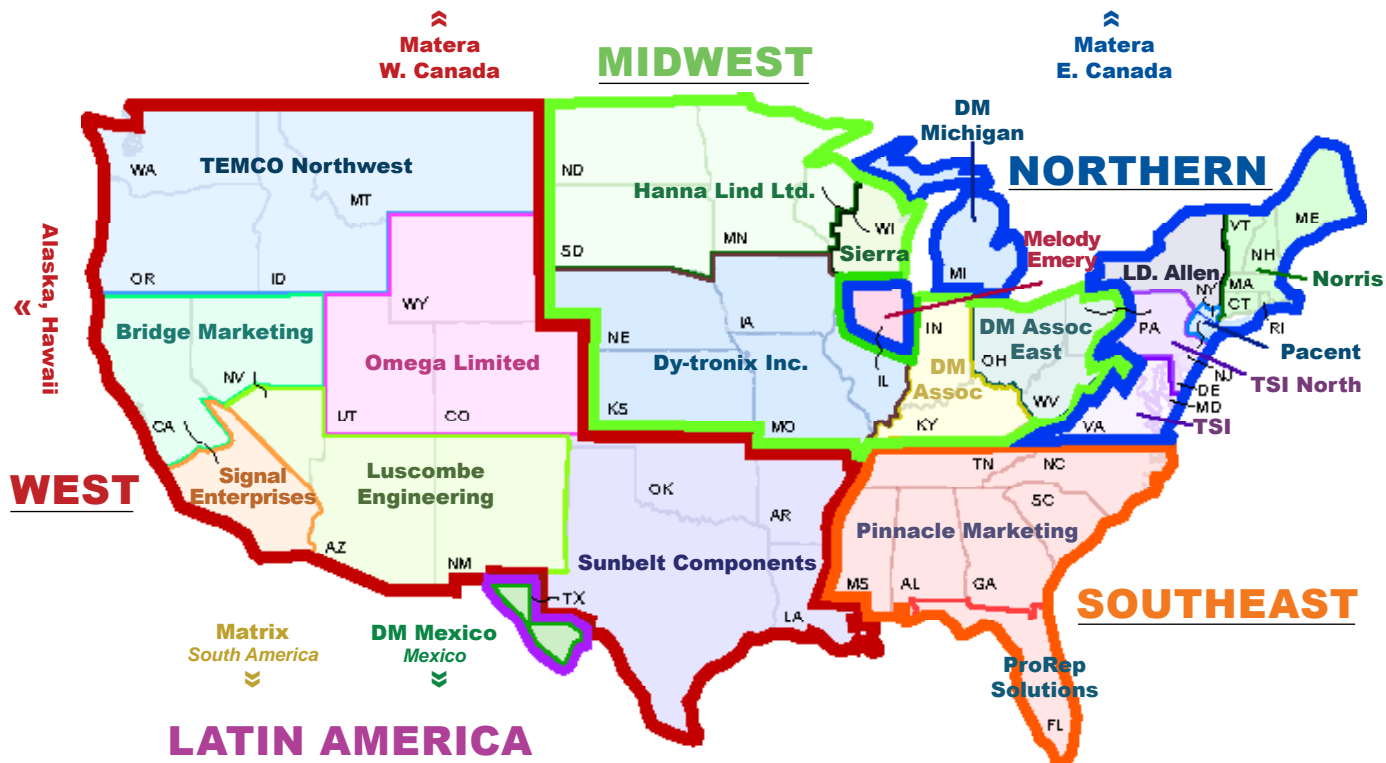


brochure

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

### Authorized Sales Representatives

Click on the group name on the map below to find your local representative or visit [www.carlingtech.com/findarep](http://www.carlingtech.com/findarep).



Americas



Europe  
Middle East  
Africa



Asia-Pacific  
Oceania

### 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](http://www.carlingtech.com/company-profile).

To view all of Carling’s environmental, quality, health & safety certifications please visit [www.carlingtech.com/environmental-certifications](http://www.carlingtech.com/environmental-certifications)

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