The 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.

**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

**Resources:**
- Configure a Complete Part
- Download CAD & Sales Drawing
Electrical Tables

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

<table>
<thead>
<tr>
<th>Circuit Configuration</th>
<th>Voltage (VAC)</th>
<th>Frequency (Hz)</th>
<th>Phase</th>
<th>Current Rating (Amps)</th>
<th>Interrupting Capacity (Amps)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Series</td>
<td>120/240</td>
<td>60</td>
<td>1</td>
<td>0.10 - 30</td>
<td>5000</td>
</tr>
<tr>
<td>Series Ignition Protection</td>
<td>120/240</td>
<td>60</td>
<td>1</td>
<td>0.10 - 30</td>
<td>3000</td>
</tr>
</tbody>
</table>

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.

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 "I". Ultrashort 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.

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.

Agency Certifications

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

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

PB

### 2 SYSTEM VOLTAGE / POLES

<table>
<thead>
<tr>
<th>Letter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>120 VAC single phase, one pole</td>
</tr>
<tr>
<td>B</td>
<td>120/240 VAC single phase, two pole</td>
</tr>
<tr>
<td>C</td>
<td>120/240 VAC single phase with switched neutral, three pole</td>
</tr>
<tr>
<td>D</td>
<td>120 VAC two pole with switched neutral</td>
</tr>
</tbody>
</table>

### 3 CIRCUIT

<table>
<thead>
<tr>
<th>Letter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>B</td>
<td>Series Trip</td>
</tr>
</tbody>
</table>

### 4 ACTUATOR 1

<table>
<thead>
<tr>
<th>Handle</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>one per pole</td>
</tr>
<tr>
<td>B</td>
<td>one per multipole unit</td>
</tr>
</tbody>
</table>

### 2 Color Curved Visi-Rocker

<table>
<thead>
<tr>
<th>Color</th>
<th>Actuator Code</th>
<th>Legend</th>
</tr>
</thead>
<tbody>
<tr>
<td>White</td>
<td>A</td>
<td>Black</td>
</tr>
<tr>
<td>Black</td>
<td>C</td>
<td>N/A</td>
</tr>
<tr>
<td>Red</td>
<td>F</td>
<td>White</td>
</tr>
<tr>
<td>Green</td>
<td>H</td>
<td>Red</td>
</tr>
<tr>
<td>Blue</td>
<td>K</td>
<td>Green</td>
</tr>
<tr>
<td>Yellow</td>
<td>M</td>
<td>Blue</td>
</tr>
<tr>
<td>Gray</td>
<td>P</td>
<td>Yellow</td>
</tr>
<tr>
<td>Orange</td>
<td>R</td>
<td>Black</td>
</tr>
</tbody>
</table>

### 4 ACTUATOR COLOR & LEGEND

<table>
<thead>
<tr>
<th>Handle</th>
<th>Rocker Actuator Color</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>I-O</td>
</tr>
<tr>
<td>B</td>
<td>ON-OFF</td>
</tr>
<tr>
<td>C</td>
<td>Dual</td>
</tr>
<tr>
<td>D</td>
<td>Single</td>
</tr>
<tr>
<td>E</td>
<td>Visi-Rocker</td>
</tr>
</tbody>
</table>

### 5 FREQUENCY & DELAY

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>21</td>
<td>50 / 60Hz Ultra Short</td>
</tr>
<tr>
<td>22</td>
<td>50 / 60Hz Short</td>
</tr>
<tr>
<td>24</td>
<td>50 / 60Hz Medium</td>
</tr>
<tr>
<td>26</td>
<td>50 / 60Hz Long</td>
</tr>
</tbody>
</table>

### 6 CURRENT RATING (AMPERES)

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>210</td>
<td>0.100</td>
</tr>
<tr>
<td>215</td>
<td>0.150</td>
</tr>
<tr>
<td>220</td>
<td>0.200</td>
</tr>
<tr>
<td>225</td>
<td>0.250</td>
</tr>
<tr>
<td>230</td>
<td>0.300</td>
</tr>
<tr>
<td>235</td>
<td>0.350</td>
</tr>
<tr>
<td>240</td>
<td>0.400</td>
</tr>
<tr>
<td>245</td>
<td>0.450</td>
</tr>
<tr>
<td>250</td>
<td>0.500</td>
</tr>
<tr>
<td>255</td>
<td>0.550</td>
</tr>
<tr>
<td>260</td>
<td>0.600</td>
</tr>
<tr>
<td>265</td>
<td>0.650</td>
</tr>
<tr>
<td>270</td>
<td>0.700</td>
</tr>
<tr>
<td>275</td>
<td>0.750</td>
</tr>
<tr>
<td>280</td>
<td>0.800</td>
</tr>
</tbody>
</table>

### 7 TERMINAL

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Push-On 0.250 Tab (Q.C.)</td>
</tr>
<tr>
<td>2</td>
<td>Screw 8-32 w/upturned lugs</td>
</tr>
<tr>
<td>3</td>
<td>Screw 8-32 (Bus Type)</td>
</tr>
<tr>
<td>4</td>
<td>Screw 10-32 w/upturned lugs</td>
</tr>
<tr>
<td>5</td>
<td>Screw M5 w/upturned lugs</td>
</tr>
<tr>
<td>6</td>
<td>Screw M4 w/upturned lugs</td>
</tr>
<tr>
<td>7</td>
<td>Screw M4 (Bus Type)</td>
</tr>
<tr>
<td>8</td>
<td>Screw M5 (Bus Type)</td>
</tr>
</tbody>
</table>

### 8 ACTUATOR COLOR & LEGEND

<table>
<thead>
<tr>
<th>Handle</th>
<th>Rocker Actuator Color</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>I-O</td>
</tr>
<tr>
<td>B</td>
<td>ON-OFF</td>
</tr>
<tr>
<td>C</td>
<td>Dual</td>
</tr>
<tr>
<td>D</td>
<td>Single</td>
</tr>
<tr>
<td>E</td>
<td>Visi-Rocker</td>
</tr>
</tbody>
</table>

### 9 MOUNTING / BARRIERS

<table>
<thead>
<tr>
<th>MOUNTING STYLE</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Threaded Insert, 2 per pole</td>
</tr>
<tr>
<td>B</td>
<td>M3 x 5mm</td>
</tr>
</tbody>
</table>

### 10 LEAKAGE CURRENT TRIP LEVEL - MAX. TRIP CURRENT

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>5 MA (CLASS A GFCI)</td>
</tr>
<tr>
<td>2</td>
<td>30 MA (ELCI)</td>
</tr>
</tbody>
</table>

### 11 AGENCY APPROVAL

<table>
<thead>
<tr>
<th>Agency Approval</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>without Approvals</td>
</tr>
<tr>
<td>G</td>
<td>UL489 Listed, CSA Certified</td>
</tr>
<tr>
<td>C</td>
<td>UL1077</td>
</tr>
<tr>
<td>C</td>
<td>UL1077 / UL1500 Ignition Protected</td>
</tr>
</tbody>
</table>

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. 30mA per UL1053, available with agency approval codes C & G.
4. UL1500 only available with 30MA trip level.
Dimensional Specifications: in. [mm]

1-POLE 120 VAC VERSION

2-POLE 120/240 VAC VERSION

2-POLE 120/240 VAC WITH NEUTRAL BREAK

TERMINAL DIMENSIONAL DETAIL & RATING

TABLE A
TIGHTENING TORQUE SPECIFICATIONS

Notes:
1. All dimensions are in inches [millimeters].

EMAIL: sales@carlingtech.com  Application Support: team2@carlingtech.com
Phone: (860) 793-9281  Fax: (860) 793-9231  www.carlingtech.com
Dimensional Specifications: in. [mm]

TYPICAL 1-POLE 120 VAC VERSION

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

Notes:
1. All dimensions are in inches [millimeters].

Dimensions:
- PBA-BA
- PBC-BA
- PBB-BA
- PANEL CUTOUT

Email: sales@carlingtech.com   Application Support: team2@carlingtech.com
Phone: (860) 793–9281   Fax: (860) 793–9231   www.carlingtech.com
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

120/240 VAC with Switched Neutral

120/240 VAC without Switched Neutral

120/240 VAC without Switched Neutral

Email: sales@carlingtech.com   Application Support: team2@carlingtech.com
Phone: (860) 793–9281   Fax: (860) 793–9231   www.carlingtech.com
### Handle Style Panel Seal

- **Rubber Seal**
- **Mounting Plate**
- **Mounting Screws**

![Handle Style Panel Seal Diagram]

### Rocker Style Panel Seal

- **Rubber Seal**
- **Mounting Plate**
- **Mounting Screws**

![Rocker Style Panel Seal Diagram]

---

### Ordering Scheme

<table>
<thead>
<tr>
<th>Type Number</th>
<th>Series</th>
<th>Actuator</th>
<th>Poles</th>
<th>Mounting</th>
</tr>
</thead>
<tbody>
<tr>
<td>8 PB</td>
<td>1</td>
<td>4</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

#### 1 TYPE NUMBER
- 8: Circuit Breaker Assembly

#### 2 SERIES
- 2: Series

#### 3 ACTUATOR TYPE
- 1: Handle, one per pole
- 2: Handle, one per multipole unit
- A: Rocker

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

#### 5 MOUNTING SCREWS / PLATE MATERIAL
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 Actuator

- **8PB-12**
  - 2 Pole Cutout
  - Handle, 1 per pole
  - Dimensions: 1.93 [49.1mm] and 2.33 TYP [59.1mm]

- **8PB-13**
  - 3 Pole Cutout
  - Handle, 1 per pole
  - Dimensions: 2.60 [68.1mm]

- **8PB-14**
  - 4 Pole Cutout
  - Handle, 1 per pole
  - Dimensions: 3.43 [87.1mm]

- **8PB-23**
  - Handle, 1 per pole
  - Dimensions: 2.68 [68.1mm]

- **8PB-24**
  - Handle, 1 per pole
  - Dimensions: 3.43 [87.1mm]

### Rocker Actuator

- **8PB-A2**
  - 2 Pole Cutout
  - Dimensions: 2.17 [55.2mm] and 2.22 TYP [56.4mm]

- **8PB-A3**
  - 3 Pole Cutout
  - Dimensions: 2.95 [75.1mm]
Time Delay Curves

Ultra Short

Medium

Short

Long
Authorized Sales Representatives and Distributors

Click on a region of the map below to find your local representatives and distributors or visit www.carlingtech.com/findarep.

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 ISO9001 and IATF16949 registered manufacturing facilities and technical sales offices worldwide, Carling Technologies Sales, Service and Engineering teams do much more than manufacture electrical components, they engineer powerful solutions! To learn more about Carling please visit www.carlingtech.com/company-profile.

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