The PC-Series is an AC Residual Current Circuit Breaker with Overcurrent Protection (RCBO) that combines ground fault protection with the familiar overcurrent tripping characteristics of a normal circuit breaker to protect against low-level faults when installed near water. Based on the principles of hydraulic-magnetic design, the breaker also operates reliably when exposed to extreme heat or cold.

**Typical Applications**
- Marine
- Water Heaters
- AC main ground fault protection for a boat’s entire AC electrical system
- Battery Chargers

<table>
<thead>
<tr>
<th>Poles</th>
<th>Amps</th>
<th>VAC</th>
<th>Interrupting Capacity</th>
</tr>
</thead>
<tbody>
<tr>
<td>1–3</td>
<td>0.1–50</td>
<td>120/240</td>
<td>5,000A Max</td>
</tr>
</tbody>
</table>
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, ground fault leakage

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

**Electrical**

<table>
<thead>
<tr>
<th>Spec</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current Ratings</td>
<td>50 Amps maximum</td>
</tr>
<tr>
<td>Voltage Ratings</td>
<td>120 VAC, 120/240 VAC</td>
</tr>
<tr>
<td>Dielectric Strength</td>
<td>1480 VAC, 60Hz for 1 minute between all electrically isolated terminals</td>
</tr>
<tr>
<td>Insulation Resistance</td>
<td>Minimum of 100 Megohms at 500VDC</td>
</tr>
<tr>
<td>Leakage Current Trip Time</td>
<td>≤ 25 ms</td>
</tr>
<tr>
<td>EMI</td>
<td>UL 943 / IEC 61000-4-6, 0.5V 150KHz ~ 230 MHz</td>
</tr>
<tr>
<td>Operating Frequency</td>
<td>50/60 Hz</td>
</tr>
<tr>
<td>Reverse Polarity</td>
<td>A reversed line / load connection to the circuit breaker shall not cause damage to the device</td>
</tr>
<tr>
<td>Grounded Neutral</td>
<td>When neutral is grounded on load side of circuit</td>
</tr>
<tr>
<td>Overload</td>
<td>50 operations @ 600% of rated current on Breakers</td>
</tr>
<tr>
<td>Switched Neutral</td>
<td>2nd Pole on 120V and 3rd Pole on 120/240V, Optional</td>
</tr>
</tbody>
</table>

**Manual Test**

To be performed at least every month by pressing the test button on the ELCI to verify the device’s ability to respond and trip when subjected to simulated leakage. Current imbalance is sufficient to cause tripping at 85% of rated voltage. Line Power at L1 is required.

**Impedance (Across Circuit breaker only)**

![Impedance Chart]

**Physical**

<table>
<thead>
<tr>
<th>Spec</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Poles</td>
<td>1-pole (1 Circuit Breaker + 1 ELCI Sensor Module), 120V. 2-pole (2 Circuit Breakers + 1 ELCI Sensor Module), 120/240V or 120V with Switched Neutral. 3-pole (3 Circuit Breakers + 1 ELCI Sensor Module), 120/240V with Switched Neutral.</td>
</tr>
<tr>
<td>Mounting</td>
<td>Front Panel, #6–32 or M3 threaded inserts.</td>
</tr>
<tr>
<td>Actuator</td>
<td>Handle, Flat Rocker, Curved Rocker (with or without rocker guard), Push-to-Reset Rocker</td>
</tr>
<tr>
<td>Internal Circuit Config.</td>
<td>Circuit Breaker, Series Trip Switch (only with over-current protection)</td>
</tr>
<tr>
<td>Weight</td>
<td>1-pole: approx. 300 grams (10.6 ounces). 2-pole: approx. 375 grams (13.2 ounces) 3-pole: approx. 500 grams (17.6 ounces)</td>
</tr>
<tr>
<td>Standard Colors</td>
<td>Housing – Black, Test Button – White, Text – White</td>
</tr>
</tbody>
</table>

**Environmental**

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

<table>
<thead>
<tr>
<th>Spec</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shock</td>
<td>Withstands 100 G, 6ms, sawtooth at rated current per Method 213, Test Condition “I”.</td>
</tr>
<tr>
<td>Thermal Shock</td>
<td>Method 107D, Condition A (5-cycle at -55°C to +25°C to +85°C to +25°C)</td>
</tr>
<tr>
<td>Vibration</td>
<td>Withstands 0.06&quot; excursion from 10–55 Hz, and 10 G 55–500 Hz at rated current per Method 204C, Test Condition A. Instantaneous &amp; ultrashort curves tested at 90% of rated current.</td>
</tr>
<tr>
<td>Moisture Resistance</td>
<td>93% RH at 30°C for 168 Hours.</td>
</tr>
<tr>
<td>Operating Temperature</td>
<td>-35°C to +66°C</td>
</tr>
<tr>
<td>Corrosion</td>
<td>3 weeks&lt;br&gt;Humidity: 30±2°C, 70±2% relative humidity&lt;br&gt;Mixed Flowing Gases: 100 ppb H2S, 20 ppb Cl2, 200±50 ppb NO2</td>
</tr>
</tbody>
</table>

**Mechanical**

<table>
<thead>
<tr>
<th>Spec</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Endurance</td>
<td>10,000 “On-Off” Operations at 6 per minute; 6000 with Rated Current &amp; Voltage (3000 test button and 3000 manual operations) and 4000 on/off operations with no load.</td>
</tr>
<tr>
<td>Trip Free</td>
<td>Trips on short circuit, overload or leakage to ground, even when actuator is forcibly held in the “On” position</td>
</tr>
</tbody>
</table>

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

Agency Approvals

UL 1053  Ground Fault Sensing and Relaying Equipment
UL 1500  Ignition Protection

Tables

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

<table>
<thead>
<tr>
<th>Circuit Configuration</th>
<th>Voltage (V)</th>
<th>Current Rating (Amps)</th>
<th>Short Circuit Capacity (Amps)</th>
<th>Ground Fault Trip Level (Milliamps)</th>
<th>Construction Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>120</td>
<td>50 / 60</td>
<td>1</td>
<td>1 - 50</td>
<td>30</td>
</tr>
<tr>
<td></td>
<td>120 / 240</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Series Ignition</td>
<td>120</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Protection</td>
<td>120 / 240</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1 or 2 Poles. One pole of a two pole unit must be Neutral</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2 or 3 Poles. One pole of a three pole unit must be Neutral</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Circuit Configuration</th>
<th>Voltage (V)</th>
<th>Current Rating (Amps)</th>
<th>Short Circuit Capacity (Amps)</th>
<th>Ground Fault Trip Level (Milliamps)</th>
<th>Construction Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>240</td>
<td>50 / 60</td>
<td>1</td>
<td>1 - 50</td>
<td>30</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Series Ignition</td>
<td>240</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Protection</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2 or 3 Poles. One pole of a three pole unit must be Neutral. Suffix 11</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2 or 3 Poles. One pole of a three pole unit must be Neutral. Suffix 12</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

ELCI Test Instructions

1. Turn “OFF” the Breaker actuator. Turn on the power to the panel. The green and red LED’s should be off.
2. Turn “ON” the Breaker actuator. The green “POWER” LED should show steady illumination and the red “LEAKAGE FAULT” LED should flash every 3 seconds to indicate a successful self-test.
3. Depress the “TEST” button. This will cause the actuator to move to the “OFF” position and the red LED to turn on and show steady illumination, indicating that the ELCI is functioning properly. The green LED will also go from steady to off. If the actuator fails to move to the “OFF” position or the red LED fails to illuminate, the unit MUST be replaced.
4. Turn the Breaker actuator to the “ON” position. The green LED should flash every 3 seconds and the Red LED should show be off.
5. This test is to be performed on a monthly basis and recorded on the “Monthly Test Reminder” label.

ELCI LED Indication

Indicator - Two integrated LEDs, Red & Green
1. 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.
2. Green LED Off, Red LED On – The device has detected leakage current and has opened the circuit breaker.
3. Green LED Flashing, Red LED Off – The circuit breaker has opened due to over current or has been turned off manually
4. Green LED Off, Red LED Off – Line Voltage is not present
5. 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
Stud, 10-32 threaded

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

ROCKER STYLE DESCRIPTIONS

Configure Complete Part Number >
Browse Standard Parts >
Dimensional Specs

inches [millimeters]

INDICATE OFF / SINGLE COLOR
ROCKER ACTUATOR

HANDLE / INDICATE ON
ROCKER ACTUATOR

TERMINAL
LOCATIONS

PCA
120 VAC
VERSION

3.015
[76.58]
MAX.

3.775
[95.88]

PCB
120/240 VAC
VERSION

3.055
[77.56]
MAX.

PCC
120/240 VAC
VERSION
W/ NEUTRAL BREAK

3.775
[95.88]
MAX.

PCC & PCF
ROCKER ACTUATOR
TOLERANCES ±.005 [.12]

PCD & PCE
PCA, PCB

TYP.
2.280
[57.91]

1.453
[36.91]

2.062
[52.37]

.432
[10.97]

.200
[5.08]

1.660
[42.16]

1.260
[32.00]

2 PLC'S. TYP.
PER POL

.156
DIA. [Ø3.96]

Dimensional Specs

inches [millimeters]
**Dimensional Specs**

inches [millimeters]

**NOTE: NEUTRAL** - SUPPLIED 12’’ LONG MIN. (CIRCUIT CODES A,B,E & F)

**HANDLE ACTUATOR**

**ROCKER ACTUATOR**

**PANEL CUTOUT DETAIL**

TOLERANCES ±.005 [.12]

**NEUTRAL PIGTAIL (CIRCUIT CODE A+B ONLY)**

#6/32 / M3 MOUNTING INSERTS

**Max Points**

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

Sample Part Number
8 PC - 1 4 1

Selection

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

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

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 Style Panel Seal

Rocker Style Panel Seal
Dimensional Specs

Handle Actuator

3 POLE CUTOUT

4 POLE CUTOUT

5 POLE CUTOUT

Rocker Actuator

3 POLE CUTOUT

4 POLE CUTOUT
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.
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About Carling

Founded in 1920, Carling Technologies is a leading manufacturer of electrical and electronic switches and assemblies, circuit breakers, electronic controls, power distribution units, and multiplexed power distribution systems. With six 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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