AC Main Power Distribution Panels
PN 8074 / PN 3074 / PN 8174 / PN 3174
PN 8409 / PN 3409 / PN 8509 / PN 3509

Panel Specifications
Voltage Rating:  PN 8074 / 3074 / 8409 / 3409 120 Volts AC
    PN 8174 / 3174 / 8509 / 3509 230 Volts AC
Panels are rated for these voltages and are so marked in order to comply with ABYC standards.
Amperage Rating: Panel Buses are sized for 100 Amperes of continuous current.
Material: 0.125” 5052-H32 Aluminum Alloy
Primary Finish: Chemical Treatment per Mil Spec C-5541C
Final Panel Finish: Graphite color 2 part textured Polyurethane
Overall Dimensions: 4.44” x 6.69” 112.8mm x 169.9mm 8409/3409/8509/3509
Mounting Centers: 4.42” x 10.42” 112.3mm x 264.7mm 8074/3074/8174/3174
5.25” x 7.50” 133.4mm x 190.5mm 8409/3409/8509/3509

Panel Features
PN 8074/PN 3074/PN 8174/PN 3174/PN 8409/PN 3409/PN 8509/PN 8074/PN 3074/PN 8409/PN 3409/PN 8509
• CE marked, Complies with European Standards
• 0-50 Ampere AC Ammeter
PN 8074 / PN 3074 / PN 8409 / PN 3409 - 120 Volt AC
• One double-pole 30 Ampere AC main circuit breaker
• PN 8074 / PN 3074 - five 15 Ampere branch circuit breakers installed
• PN 8409 / PN 3409 - three 15 Ampere branch circuit breakers installed
• 0-150 Volt AC voltmeter
PN 8174 / PN 3174 / PN 8509 / PN 3509 - 230 Volt AC
• One double-pole 16 Ampere AC main circuit breaker
• PN 8174 / PN 3174 - five 8 Ampere branch circuit breakers installed
• PN 8509 / PN 3509 - three 8 Ampere branch circuit breakers installed
• 0-250 Volt AC voltmeter

Installation

1. Disconnect all AC and DC power
   Disconnect all AC power originating on or off the vessel. This includes inverters, generators, shore power attachments and any other device capable of supplying AC power to the ship’s circuits.
   Disconnect the main positive DC cable from all batteries to eliminate the possibility of a short circuit and to disable the inverter while installing the distribution panel.

2. Select mounting location and cut opening
   If this panel is to serve as your main shore power disconnect circuit breaker, select a location which is not more than 10 feet from the shore power inlet or the electrical attachment point of a permanently installed shore power cord as measured along the conductors of the feed wires. If it is more than 10 feet additional fuses or circuit breakers must be installed within 10 feet of the shore power inlet.
   Select a mounting location which is protected from water on the panel front and back and is not in an area where flammable vapors from propane, gasoline or lead acid batteries accumulate. The circuit breakers used in marine electrical panels are not ignition protected and may ignite such vapors.
   Using the panel template provided, make a cut out in the mounting surface where the distribution panel is to be mounted. Do not yet fasten the panel to the mounting surface.

3. Install branch circuit wires
   Determine the proper wire size for each branch circuit using the chart below. Verify that the standard circuit breakers installed in the panel are correct for each branch circuit. Remove and replace any that are incorrectly sized. The circuit breaker must have a rating less than the allowable amperage of the wire, yet greater than the circuit’s continuous current.

Allowable Amperage of Conductors

<table>
<thead>
<tr>
<th>Wire Size (AWG)</th>
<th>Outside Engine Spaces</th>
<th>Inside Engine Spaces</th>
</tr>
</thead>
<tbody>
<tr>
<td>16</td>
<td>25.0</td>
<td>21.3</td>
</tr>
<tr>
<td>14</td>
<td>35.0</td>
<td>29.8</td>
</tr>
<tr>
<td>12</td>
<td>45.0</td>
<td>38.3</td>
</tr>
<tr>
<td>10</td>
<td>60.0</td>
<td>51.0</td>
</tr>
<tr>
<td>8</td>
<td>80.0</td>
<td>68.0</td>
</tr>
<tr>
<td>6</td>
<td>120.0</td>
<td>102.0</td>
</tr>
<tr>
<td>4</td>
<td>160.0</td>
<td>136.0</td>
</tr>
<tr>
<td>2</td>
<td>210.0</td>
<td>178.5</td>
</tr>
</tbody>
</table>

Note: This chart assumes wire with 105°C insulation rating and no more then 2 conductors are bundled. Not suitable for sizing flexible shore power cords.

Guarantee
Any Blue Sea Systems’ product with which a customer is not satisfied may be returned for a refund or replacement at any time.

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4. **Install feed circuit wires**

Install the feed wires from the shore power inlet or other AC source, referring to the wire sizing chart to select the correct wire size. Connect the black AC hot, white AC neutral and green AC safety ground as shown in the illustration.

If the feed wires are from the shore power inlet or the electrical attachment point of a permanently installed shore power cord and the inlet or attachment point is more than 10 feet from this panel, an additional fuses or circuit breakers must be installed within 10 feet of the shore power inlet. The measurement is made along the conductors.

5. **Installation of Backlight System**

The backlight board is a DC device. When installing it in an AC panel both wire leads must be connected to an appropriate DC source and ground.

Connect the yellow negative wire to a DC ground. Connect the red positive wire to any DC positive supply, usually a switch that controls the vessel’s other nighttime illumination.

6. **Apply branch circuit labels and mount panel**

Remove the blank labels installed in the panel before installing your branch circuit labels. Apply a label for each of the branch circuits from the 30 basic labels provided. If the appropriate label is not included, individual labels are available from Blue Sea Systems for specific applications. Refer to the label order form for a complete listing of individual labels.

Fasten the panel to the mounting surface using the panel mounting screws supplied with the panel.

7. **Testing**

Connect the vessel’s shore power and verify the Reverse Polarity light is not illuminated. If the red Reverse Polarity light is on then either the hot and ground or the hot and neutral wires have been crossed. Starting at the panel, trace the connections back as far as necessary to locate the error.

Using a multimeter where the power source is connected to the panel verify:

PN 8074 / PN 3074 / PN 8409 / PN 3409 - 120 Volt AC
a. 120 volts between hot and neutral (nominal, this may vary depending on source voltage)
b. 120 volts between hot and ground.
c. 0 volts between neutral and ground.

PN 8174 / PN 3174 / PN 8509 / PN 3509 - 230 Volt AC
a. 230 volts between hot and neutral (nominal, this may vary depending on source voltage)
b. 230 volts between hot and ground.
c. 0 volts between neutral and ground.

Turn on each branch circuit to verify power to each circuit.

**Optional Branch LED’s**

This Panel is supplied with LED’s pre-installed in all optional branch positions. For future expansion of the panel remove the hot leg of the LED from the AC Neutral Bus and connect it to the Load side of the branch circuit breaker.

**Note**

All Blue Sea Systems’ electrical distribution panels are furnished with 15 amp or 8 amp circuit breakers for branch circuits. 15 amp circuit breakers are used in all 120 volt panels and 8 amp circuit breakers are used in all 230 volt panels. These ratings were selected to minimize the need for removing the panel’s circuit breakers and reinstalling different size circuit breakers. It is very rare to have more than this amount of current flowing in any one circuit. Therefore, these circuit breakers will satisfy the vast majority of marine circuit protection situations.

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**Wiring Diagram**

AC Power Distribution Panel with Voltmeter and Ammeter
PN 8074 / PN 3074 shown for reference