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
   This panel is not intended to serve as the main AC circuit breaker panel. A double pole circuit breaker that breaks both the AC hot and neutral legs (such as Blue Sea Systems’ PN 8029) must be installed in 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.

   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.

   Connect each branch circuit hot (black) to the appropriate load terminal. Connect each branch circuit neutral (white) to one of the screws on the neutral bus. Connect each branch safety ground wire (green) to one of the screws of the safety ground bus.

   Do not confuse the neutral current carrying wires (sometimes called grounding) with the green normally non-current carrying wires (sometimes called grounding). These two wires must be connected only at the source of power, nowhere else.

Wire sizing chart
Use the wire sizing chart below to determine the minimum branch and feed circuit wire sizes.

<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: For wire with 105°C insulation rating and no more than 2 conductors are bundled. Not suitable for sizing flexible shore power cords.
4. **Install feed circuit wires**
   Install the feed wires from from the AC main circuit breaker panel 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.

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 circuit labels and mount panel**
   Apply a label for each source from the 10 basic labels provided. 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**
   - Using a multimeter where the power source is connected to the panel verify:
     
     **PN 8478 / PN 3478 / PN 8479 / PN 3479-120 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 8578 / PN 3578 / PN 8579 / PN 3579-230 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**
   This Blue Sea Systems electrical distribution panels is 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.

**The Purpose of a Panel**
   There are five purposes of a marine electrical panel:
   - Power distribution
   - Circuit (wire) protection
   - Circuit ON/OFF switching
   - Metering of voltage and amperage (in panels with meters)
   - Condition Indication (circuit energized)

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**Applicable Standards**

**Related Products from Blue Sea Systems**
- High Amperage Fuses and Circuit Breakers for positive feed wires
- High Amperage Battery Switches
- Terminal Blocks and Common Bus Connectors
- AC Distribution Panels
- DC Distribution Panels
- AC and DC Digital and Analog Voltmeters and Ammeters

**Useful Reference Books**