The Purpose of a Panel

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

Applicable Standards

- American Boat and Yacht Council (ABYC)
- United States Coast Guard 33 CFR Sub Part 1.

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, gas 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 feed and output wires
   Install the feed wires from the AC source. Install the output wires. Refer 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.

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

   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, additional fuses or circuit breakers must be installed within 10 feet of the shore power inlet. The measurement is made along the conductors.

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: This chart assumes wire with 105°C insulation rating and no more than 2 conductors are bundled. Not suitable for sizing flexible shore power cords.
4. Apply circuit labels and mount panel

Apply a label for the circuit from the 10 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 included with the panel for a complete listing of individual labels.

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

5. 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 8077 / 3077 / 8079 / 3079-120 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 8177 / 3177 / 8179 / 3179-230 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.

Related Products from Blue Sea Systems
- PanelBack Insulating Covers
- 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

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