AC Main Source Selector Panels  
PN 7373

Panel Specifications

- 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
- Circuit Breakers: 50 amp Triple Pole AC Magnetic Breakers
- Amperage Rating: Panel Main Circuit Breaker is rated for 50 amps maximum
- Voltage Rating: Panels are rated for 120/240 volts AC and are so marked in order to comply with ABYC standards
- Overall Dimensions: 5-1/4 x 11-1/4" 133.4 x 285.8 mm
- Mounting Centers: 4-7/16" x 10-7/16" 112.7 x 265.1 mm

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


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 negative 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, an additional circuit breaker 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 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 minimum wire size. Connect the black AC hot, red AC hot, white AC neutral and green AC safety ground as shown in the illustration. The circuit breaker must have a rating less the allowable amperage of the wire, yet greater than the circuit’s continuous current.

Because device terminations are frequently rated for less than 105°C and there may be sheathing or thermal insulation around wires, a wire size of at least 8 AWG is recommended for 50A circuits.

Do not confuse the neutral current carrying wires (sometimes called ground) 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.

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 circuit breaker must be installed within 10 feet of the shore power inlet. The measurement is made along the conductors.

Wire sizing chart

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 then 2 conductors are bundled. Not suitable for sizing flexible shore power cords.
4. 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. Do not confuse the red DC positive with the red AC hot.

5. Apply circuit labels and mount panel

Apply a label for each of the branch circuits from the 30 basic labels provided. If the appropriate label is not included, the Extended Label Set of 120 labels may be ordered from your marine supplier (PN 8067). Individual labels are also available from Blue Sea Systems for specific applications. Refer to the label order form for a complete listing of individual labels.

Do not fasten the panel in place until testing is completed.

6. Testing

- Connect the shore power cable to the boat AC power inlet. Do not connect the shore power cable to the shore power pedestal. Instead run the shore power cable such that the shore power plug is next to the AC panel. With an Ohmmeter verify that the pins of the shore power plug are connected to the appropriate terminals of the panel. Refer to ABYC E-11 Figure 13 or 14 or NEC / NEMA documents for the standard pin arrangements for your plug.

- Check your connections to the generator or other source. Begin with the breaker at the source turned off. If the second source is on board, the neutral (white) coming from that source should be connected to the grounding system. Verify that connection with the ohmmeter. There should be no continuity between the “hot” wires and the neutral except the power available LED’s. The ohmmeter should indicate greater than 25K Ohms from black to white and red to white on the incoming lines. If the onboard source is a generator or an isolation transformer there should be continuity between the black, white and red wires when the circuit breaker at the generator or the secondary of the transformer is turned on.

- Connect the vessel’s shore power cord to a 120V/240V shore source and verify the Reverse Polarity light is not illuminated. If the red Reverse Polarity light is on then either a hot and ground or a hot and neutral wire have been crossed or the neutral wire is open. 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 7373 - 120/240 Volt AC
    - a. 120 volts between each hot and neutral (nominal, this may vary depending on source voltage)
    - b. 120 volts between each hot and ground.
    - c. 240 volts between the two hots, L1 and L2.
    - d. 0 volts between neutral and ground.

- Check that the panel voltmeter reads L1 120V, L2 =120V, L1-L2 = 240V. These are nominal voltages; the exact reading will correspond to your local source. If the shore source is two feeds from a 3 phase system, L1-L2 will read approximately 208V.


7. Mounting

Support the wires and provide for the wires to fold into the wiring compartment without undue stress. Be sure no wires are in a position where the panel mounting screws will damage the wire installation when the panel is installed.

Fasten the panel to the mounting surface using the panel mounting screws supplied with the panel or other screws suitable to the mounting surface.

8. 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 appropriate branch circuit breaker.

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
Wiring Diagram
AC Main Distribution Panel
PN 7373
Installation (continued)

Wiring Diagram
Meter Wiring Installation
PN 7373