

# AC Main Source Selector Panels

PN 8032 / PN 3032 / PN 8061 / PN 3061

## 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:   | Double Pole AC / DC Magnetic Breakers<br>65VDC/277VAC Maximum   |                    |
| Amperage Rating:    | PN 8032 / PN 3032 is rated for 30 amp service<br>PN 8061 / PN 3061 is rated for 50 amp service  |                    |
| Voltage Rating:     | Panel is rated for 120 Volts AC and is so marked in order to comply with ABYC standards   |                    |
| Overall Dimensions: | <b>Inches</b>   | <b>Millimeters</b> |
|                     | 5-1/4 x 3-3/4   | 133.40 x 95.30     |
| Mounting Centers:   | 4-7/16 x 2-15/16  | 112.70 x 74.60     |
| Standards:          | This panel, when properly installed, complies with all applicable <i>Standards and Recommended Practices</i> of the American Boat and Yacht Council as well as United States Coast Guard 33 CFR Sub Part 1. |                    |

## The Purpose of the AC Main Source Selector Panel

Alternating Current (AC) power changes polarity 60 times per second in the US, Canada and Latin America and 50 times per second in Europe. This is the frequency of the power and is referred to as Hertz (or the now outdated term "cycle"). Because of this alternating nature of AC power, two live sources of AC power, such as shore power and inverter power, or shore power and a generator, cannot be electrically connected. The AC Main Source Selector panel is designed to connect two sources of AC power to a common circuit while preventing both sources from being connected to the circuit simultaneously.

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## ⚠ WARNING ⚠

- ✔ It is not possible within the scope of these instructions to fully acquaint the installer with all the knowledge of electrical systems that may be necessary to correctly install this product. If the installer is not knowledgeable in electrical systems we strongly recommend that an electrical professional be retained to make the installation.
- ✔ If either the panel front or back is to be exposed to water it must be protected with a waterproof shield.
- ✔ The panels must not be installed in explosive environments such as gasoline engine rooms or battery compartments as the circuit breakers are not ignition proof.
- ✔ The vessel's shore power cord must be disconnected from shoreside power before installing this electrical panel.
- ✔ If an inverter is installed on the vessel its power leads must be disconnected at the battery before the panel installation. Be aware that many inverters have a "sleep mode" in which their voltage potential may not be detectable with measuring equipment.
- ✔ If an AC Generator is installed aboard it must be stopped and rendered inoperable before the panel is installed.
- ✔ Verify that no other AC source is connected to the vessel's wiring before the panel is installed.

## 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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# 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 source 1, source 2 and output wires

Install the feed wires from AC source 1 and AC source 2. 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 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, 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.

**Allowable Amperage of Conductors**

| Wire Size (AWG) | Outside Engine Spaces | Inside Engine Spaces |
|-----------------|-----------------------|----------------------|
| 16              | 25.0                  | 21.3                 |
| 14              | 35.0                  | 29.8                 |
| 12              | 45.0                  | 38.3                 |
| 10              | 60.0                  | 51.0                 |
| 8               | 80.0                  | 68.0                 |
| 6               | 120.0                 | 102.0                |
| 4               | 160.0                 | 136.0                |
| 2               | 210.0                 | 178.5                |

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.

# Installation (continued)

## 4. Interrupt Ratings

If complete ABYC compliance is desired, verify that the circuit breaker supplied in this panel as shown in Table A meets the interrupt rating requirements of Table B.

**Table A: Interrupt Ratings**

| A-Series Double Pole 10-50 Amp          |            |                 |                |
|---|------------|-----------------|----------------|
| UL 1077-UL/CSA (US/Canada) <sup>1</sup> |            |                 |                |
| Voltage                                 | Current    | w/o Fuse Backup | Fuse Backup    |
| 125/250 VAC                             | 0.02 - 30A | 3000A           | -              |
| 125/250 VAC                             | 31 - 50A   | 2000A           | -              |
| 277 VAC                                 | 0.02 - 30A | -               | 5000A 100A Rk5 |

<sup>1</sup>UL Recognized

**Table B: Minimum Interrupt Rating**

| AC Shore Power Source | Main Circuit Breaker | Branch Circuit Breaker |
|-----------------------|----------------------|------------------------|
| 120V - 30A            | 3000A                | 3000A                  |
| 120V - 50A            | 3000A                | 3000A                  |
| 120/240V - 50A        | 5000A                | 3000A                  |
| 240V - 50A            | 5000A                | 3000A                  |

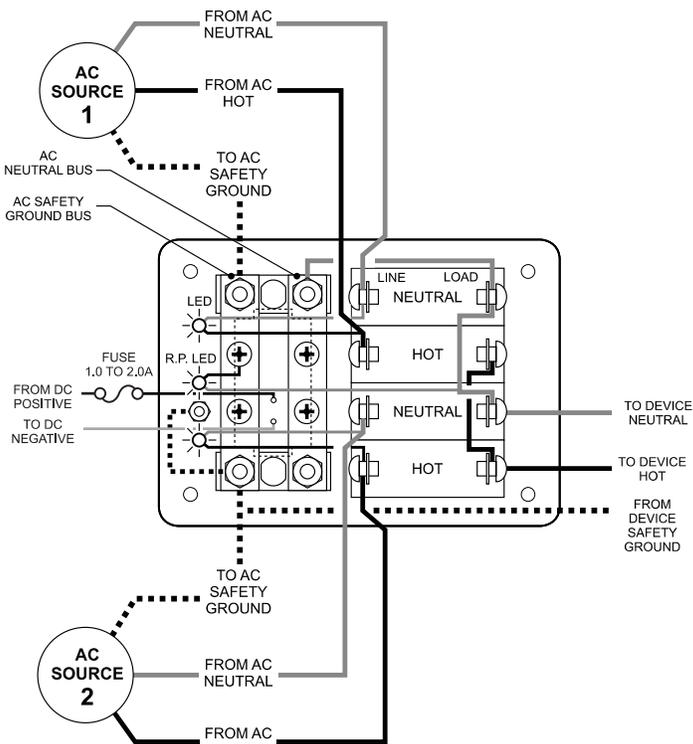
## 5. Installation of Backlight System

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 circuit form the 10 basic labels provided. Fasten the panel to the mounting surface.



**Wiring Diagram**

AC Source Selector Panel  
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## 7. Testing

- ✓ Connect the vessel's shore power and verify the Reverse Polarity light is not illuminated. Verify that the green LED is illuminated to ensure that power is present at the panel. 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:
  - 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.
- ✓ Turn off the shore power and test with the alternate source.

## 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

- Calder, Nigel, 1996: *Boatowner's Mechanical and Electrical Manual*, 2nd edition, Blue Ridge Summit, PA: TAB Books, Inc.
- Wing, Charlie, 1993: *Boatowner's Illustrated Handbook of Wiring*, Blue Ridge Summit, PA: TAB Books, Inc.

