

AC Power Distribution Panels

PN 8158/ PN 3158/ PN 8159/ PN 3159/ PN 8165/ PN 3165
PN 8560/ PN 3560/ PN 8561/ PN 3561/ PN 8580/ PN 3580

Panel Specifications

Material: 0.125" 5052-H32 Aluminum Alloy
 Primary Finish: Chemical Treatment per Mil Spec C-5541
 Final Panel Finish: Graphite color 2 part textured Polyurethane
 Circuit Breakers: 8 amp Single Pole Carlingswitch B Series AC/DC
 Magnetic Breakers 65VDC/277VAC maximum
 Amperage Rating: Panel Main Bus rated for 50 amps maximum
 Voltage Rating: Panels are rated for 230 volts AC and are so
 marked in order to comply with ABYC standards

| Overall Dimensions: | PN | Inches | Millimeters |
|---------------------|-----------|--------------------|---------------|
| | 8158/3158 | 5-1/4 x 3-3/4 | 133.4 x 95.3 |
| | 8159/3159 | 5-1/4 x 7-1/2 | 133.4 x 190.5 |
| | 8165/3165 | 14-3/4 x 7-1/2 | 374.7 x 190.5 |
| | 8560/3560 | 14-3/4 x 4-1/2 | 374.7 x 114.3 |
| | 8561/3561 | 10-1/2 x 7-1/2 | 266.7 x 190.5 |
| | 8580/3580 | 5-1/4 x 11-1/4 | 133.4 x 285.8 |
| Mounting Centers: | 8158/3158 | 4-7/16 x 2-15/16 | 112.7 x 74.6 |
| | 8159/3159 | 4-7/16 x 6-11/16 | 112.7 x 169.9 |
| | 8165/3165 | 13-29/32 x 6-11/16 | 353.6 x 169.9 |
| | 8560/3560 | 13-29/32 x 3-11/16 | 354.0 x 93.7 |
| | 8561/3561 | 9-11/16 x 6-11/16 | 246.1 x 169.9 |
| | 8580/3580 | 4-7/16 x 10-7/16 | 112.7 x 265.1 |

Standards: This panel, when properly installed, complies with all applicable Standards and Recommended Practices of the American Boat and Yacht Council as well as United States Coast Guard 33 CFR Sub Part 1.

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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

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 8129) 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 wire sizing chart. Verify that the standard 8 amp 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 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.

Wire sizing chart

Use the wire sizing chart below to determine the proper 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. Install feed circuit wires

Install the feed wires 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 to their corresponding buses. In the case of the 24 position panel, the black AC hot, white AC neutral and green AC safety ground should be connected to the middle bus structure.

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

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.

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:
 - 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.

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 branch circuit breaker.

Note

This Blue Sea Systems electrical distribution panel is furnished with 8 amp AC/DC circuit breakers for all branch circuits. This rating was selected to minimize the need for removing the panel's circuit breakers and reinstalling different size circuit breakers. It is rare to have more than 8 amps of current flowing in any one circuit. Therefore, 8 amp circuit breakers will satisfy the vast majority of marine circuit protection situations.

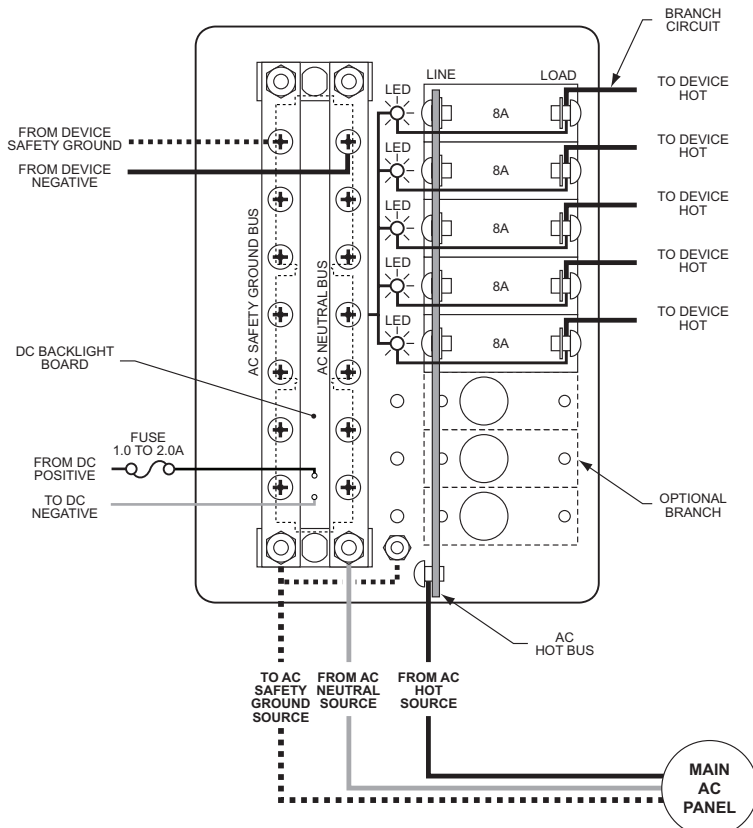
Related Products from Blue Sea Systems

- 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

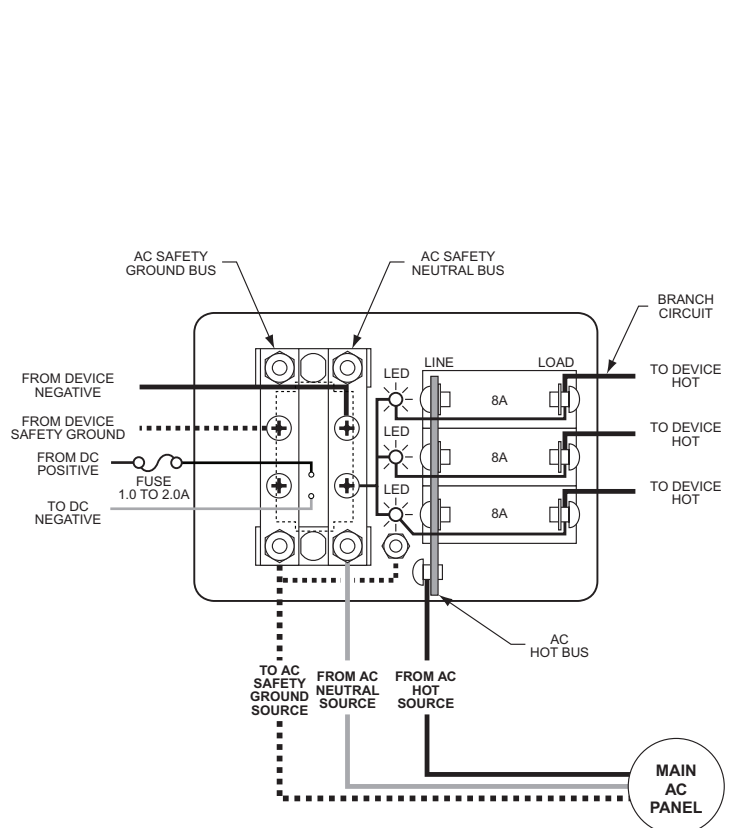
Useful Reference Books

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.



Wiring Diagram
AC Distribution Panel
PN 8159 / PN 3159



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