DC Power Distribution Panel
PN 8273 / PN 8373  6 Position Water Resistant
PN 8274 / PN 8374  3 Position Water Resistant

Panel Specifications
Voltage Rating: Panels are rated for 12 or 24 volts DC
Amperage Rating: Switches and Circuit Breakers,
15 amperes maximum for 24 volt systems
20 amperes maximum for 12 volt systems
Cumulative Rating: 45 Amperes
Circuit Indicator: LED embedded in switch, rated 100,000 hour 1/2 life
Material: 0.100" 5052-H32 Aluminum Alloy
Primary Finish: Chemical Treatment per Mil Spec C-5541
Final Panel Finish: White/Black color 2 part textured Polyurethane
Panel Depth: 2-3/4" 69.90mm
PN Inches Millimeters
Overall Dimensions: 8273/8373 4-1/2 x 7-1/2 114.30 x 190.50
8274/8374 4-1/2 x 3-3/4 114.30 x 95.250
Mounting Centers: 8273/8373 3-21/32 x 6-21/32 93.20 x 169.40
8274/8374 3-21/32 x 2-29/32 93.20 x 74.20
Water Resistant: Will withstand the water exposures normally encountered in above deck applications: Salt spray, rain, hose washdowns, momentary immersions.

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)

Wire Sizing Chart

1. Calculate the maximum sustained amperage of the circuit. Measure the length of the circuit from the power source to the load and back.
2. Decide whether the circuit runs in an engine space or non engine space. Engine spaces are assumed to be at 50 degrees C, non engine spaces are assumed to be at 30 degrees C.
3. Multiply the maximum current times the length of the circuit to calculate Famps (Feet x amps).
4. Base the wire on either the 3% or 10% voltage drop. In general, items which affect the safe operation of the boat and its passengers (running lights, bilge blowers, electronics and distribution panel supply circuits) use 3%; all other loads use 10% (cabin lights, bait pumps).
5. Starting in the column which has the right voltage and voltage drop shown at the top, run down the list of numbers until arriving at a value which is greater than the calculated Famps. Move left to the Ampacity column to verify that the total amperage of the circuit does not exceed the maximum allowable amperage of the wire size for that row. If it does, move down until the wire ampacity exceeds the circuit ampereage. Finally, move left to the wire size column to select the wire size.

Examples
a. A 12 volt system at 10% drop with a 40’ circuit x 45 amps = 1800 Famps. A wire size of 8 is required.
b. A 24 volt system at 3% drop with a 10’ circuit x 100 amps = 1000 Famps. A wire size of 6 is required.
1. Disconnect all AC and DC power
Before starting, disconnect the main positive cable from all batteries to eliminate the possibility of a short circuit while installing the distribution panel. Also disconnect the AC shore power cord from the boat to eliminate the possibility of electrocution from AC wiring in the proximity of the DC distribution panel.

2. Select mounting location and cut opening
Select a mounting location which is not in an area where flammable vapors from propane, gasoline or lead acid batteries accumulate. This panel is 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. Select positive feed wire
Determine the positive feed (red) wire size by calculating the total amperage of the circuits that will be routed through the panel. Blue Sea Systems’ water resistant electrical panels are rated at 45 amp total capacity. The positive feed wire must be sized for 3% voltage drop at the 45 amp panel rating or the maximum amperage that will be routed through the panel in any particular installation, whichever is less. It is recommended that the positive feed wire be sized for the full panel capacity, which, in most cases, will require at least 8 AWG wire, assuming a 10 foot wire run between the panel and the batteries in 12 volt systems. Refer to the Wire Sizing Chart for other situations.

Remember that the length of the circuit is the total of the positive wire from the power source and the negative wire back to the DC Negative Bus. Be certain that there is a fuse or circuit breaker of the correct size protecting the positive feed wire.

4. Install LED negative feed wire
Use a 16 AWG wire to connect the LED negative feed (yellow) wire to the DC Negative Bus.

5. Install branch circuit wires
Determine the proper wire size for each branch circuit using the guidelines in step 3. Verify that the standard 15 amp circuit breakers installed in the panel are large enough for each branch circuit. Remove and replace with a higher amperage any that are undersized (15 amp maximum for 24 volt or 20 amp for 12 volt systems). Connect a positive (red) branch circuit wire to the load terminal of each switch. Connect each negative (yellow) branch circuit wire to a DC Negative Bus such as Blue Sea Systems’ BusBar PN 2301 or MiniBus PN 2304.

6. Apply branch circuit labels
For each branch circuit, select a label from the 60 basic labels provided, and apply it to the recessed area on the front of the panel.

7. Mount Panel with water resistant gasket
A gasket has been included for sealing the panel against the mounting surface. The gasket will easily stretch around the panel when applied from the front. Place the gasket between the panel and the mounting surface. Make sure all surfaces are clean and free from debris. Using the panel mounting screws supplied with the panel, screw down the panel to the mounting surface.

8. Testing
Reconnect the main positive cable to the battery terminals and turn the main switch on to supply power to the panel. Turn on all branch circuits and test the voltage at the panel. Compare this voltage to the battery terminal voltage to determine that the voltage drop is within 3%. With all branch circuits still on, test the voltage at one device on each circuit to determine that there is a 3% or 10% drop as is appropriate.

Note
This Blue Sea Systems water resistant electrical distribution panel is furnished with 15 amp push button circuit breakers. This rating was selected to minimize the need for removing the circuit breakers and reinstalling different size circuit breakers. 15 amp circuit breakers will satisfy the vast majority of marine circuit protection situations.

Applicable Standards
• United States Coast Guard Code of Federal Regulations 33, Part 183, Subpart I, Electrical Systems on Boats.