

SmartBoost 50™

AUTOMATIC SHORELINE TRANSFORMER

INSTALLATION INSTRUCTIONS & OWNER'S MANUAL



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INTRODUCING... THE SmartBoost 50™

Thank you for purchasing the new SmartBoost 50™ automatic transformer. Your SmartBoost 50™ monitors the shore power and adapts it to maintain a safe operating voltage for your vessel's AC power system.

When shore power drops below 208 VAC the SmartBoost 50™ will provide a 13% voltage boost to the AC system. The yellow light on the SmartBoost 50™ as well as a yellow light on the optional remote panel displays the boost indication. If the input voltage drops to 177 VAC the remote panel (optional) will display a flashing red light, but will continue to operate in the boost mode. If the input voltage drops to 166 VAC the SmartBoost 50™ will display a solid red light on the remote panel (optional) and shut down until the input voltage increases to above 177 VAC.

The SmartBoost 50™ will be a successful part of your vessel's electrical system when properly installed. This instruction manual was prepared as a guide for the installation and operation of your SmartBoost 50™. Please take the time to review this manual before beginning installation so you may fully understand the operation of the SmartBoost 50™.

CAUTION

The SmartBoost 50™ must be used in conjunction with an isolation or polarization transformer.

Manual Purpose

This manual lists important safety precautions then covers installation, operation, maintenance, troubleshooting, warranty, and customer service information.

IMPORTANT SAFETY INSTRUCTIONS

SAVE THESE INSTRUCTIONS. This manual contains important safety and operating instructions for the Smart Boost 50™. Read the entire manual before beginning installation.

WARNING

To guard against electric shock keep fingers out of the wire connection area, and avoid contact with terminal connections.

Environmental Precaution

Do not expose the SmartBoost 50™ to rain, snow, excessive moisture or heat.

Application Precaution

This unit is intended for hard-wired, permanent, on-board applications. Use of attachments not recommended or sold by Charles Marine Products may result in risk of fire, electrical shock, or personal injury.

Damaged Unit Precaution

Do not operate the SmartBoost 50™ if it has received a sharp blow, been dropped, or otherwise damaged. See the *Warranty and Customer Service* section for return information.

Disassembly Precaution

Do not disassemble the SmartBoost 50™.

WARNING – ELECTRICAL SHOCK AND FIRE HAZARD

Cord grip connectors must be used to prevent wires from chafing on the metal case and causing an electrical short. Use Charles Marine part# 97-001120-A or equivalent.

Installation Precaution

Boat wiring is a complex task that can cause corrosion, shock, and other hazards if not properly done by trained and experienced personnel. For more information on this subject contact the **American Boat and Yacht Council (ABYC)** or see the standards and regulations below:

**American Boat and Yacht Council E-11
“AC & DC Electrical Systems on Boats”**

613 Third Street, Suit 10
Annapolis, MD 21403

Telephone: 410-990-4460
 Fax: 410-990-4466

**NFPA Standard 302.
 "Pleasure and Commercial Motor Craft"**

National Fire Protection Association
 1 Battery March Park
 P.O. Box 9101
 Quincy, MA 02269-9401
 Telephone: 800-344-3555

Rules & Regulations for Recreational Boats Excerpts from the United States Code (USC) and the Code of Federal Regulations (CFR) (U.S. Coast Guard Regulations) are available from the American Boat and Yacht Council listed above.

Note: Installation of the SmartBoost 50™ must be made in accordance with all applicable standards and regulations.

INSTALLING THE SmartBoost 50™

Selecting Mounting Location

The SmartBoost 50™ should be mounted horizontally or vertically on a flat surface, in a protected area away from rain, spray, or direct sunlight. Clearance should be six inches on all four sides and the top.

Selecting Mounting Hardware

The four bolts or screws required to secure the SmartBoost 50™ must be 5/16 inches in diameter. Bolts or screws should be backed with a flat washer and kept vibration free with a split ring lock washer. All hardware should be corrosion resistant.

Mounting Dimensions

Figure 1 contains the mounting dimensions of the SmartBoost 50™. All dimensions shown are in inches.

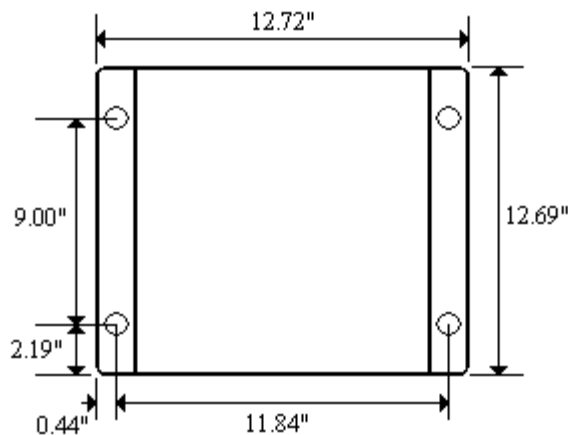


Figure 1. SmartBoost 50™ Mounting Dimensions

Mounting the SmartBoost 50™

Use the following steps to mount the SmartBoost 50™.

WARNING

Use care when drilling to avoid contact with any wires or live components.

Step	Action
1.	With the SmartBoost 50™ positioned and flush in the desired location, mark the four mounting holes. Figure 1 diagram can also be used to mark the mounting holes.
2.	Remove the SmartBoost 50™ and drill holes using proper drill bit.
3.	Re-align the SmartBoost 50™ and fasten unit to mounting surface with four corrosion resistant screws or bolts.
4.	Firmly secure all mounting hardware.

Selecting Electrical Hardware

The SmartBoost 50™ is intended for hard wiring in a permanent location. Conduit or other proper marine electrical installation hardware should be used.

Choosing Appropriate Wire Gauge

Input and output conductors should be at least 6 AWG. Use ¼ inch ring terminals for input and output terminal block connections.

Using Isolation Transformers (Required)

It is recommended that the SmartBoost 50™ be installed on the secondary side of an isolation transformer. When connected to the secondary side of the isolation transformer the SmartBoost 50™ becomes part of the isolated AC system.



**Before working on any electrical equipment, first determine that there is no live power!
Turn off power before opening terminal cover and making any connections!**

Making SmartBoost 50™ Connections

Use the following steps to connect the SmartBoost 50™ to an isolation transformer.

Step	Action
1.	Turn off shore power and verify no voltage is present on the secondary side of the isolation transformer.
2.	Remove the terminal block cover to expose input and output connections.
3.	Connect the black conductor to L1 and red conductor to L2 to the SmartBoost 50™'s AC INPUT terminals. Connect the green ground conductor to the terminal marked G. See Figure 2.
4.	Connect the vessel's AC panel feed wires (black, L1 and red, L2) to the SmartBoost 50™'s AC OUTPUT terminals. Connect the neutral conductor to the terminal marked N. Connect the green ground conductor to the terminal marked G. There should now be two conductor wires on both the N and G terminals. See Figure 2.
5.	When wired as stated here, a separate bond (ground wire) is not needed. The SmartBoost 50™ is bonded internally.
6.	Verify all connections are properly tightened.
7.	Reinstall the terminal block cover.

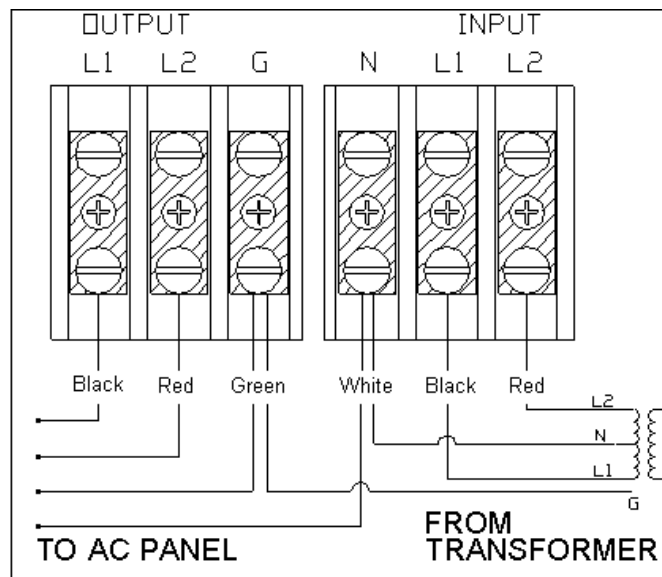


Figure 2. SmartBoost 50™ Connections

Remote Panel (Optional)

The remote panel (part# 93-SMTBREMOTE-A) will increase the status monitoring ability of the SmartBoost 50™. The remote panel displays Power, Boost, and Low Voltage indicator lights.

The remote Power, Boost and Low Voltage indicator lights will display the same indicator lights that appear on the SmartBoost 50™. If the input voltage falls to 177 VAC the red low voltage indicator light will flash. When the input voltage falls to below 166 VAC the SmartBoost 50™ will shut down and the red indicator light will remain constantly on.

Table 1. Indicator Lights

Green (Power)	Yellow (Boost)	Red (Low Voltage)	SmartBoost 50™ Status
Off	Off	Off	No Power. Breaker has tripped; shore power (one or both lines) has been lost.
On	Off	Off	1:1 mode, output voltage is equal to input voltage.
On	On	Off	Boost mode, output voltage is approximately 13% higher than input.
On	On	Flashing	Input voltage has dropped below 177 VAC.
Off	Off	On (constant)	Input voltage has dropped below 166 VAC. Power is off.

Remote Connections to SmartBoost 50™

Remote wire connections should be made to the SmartBoost 50™ as shown in Figure 3.

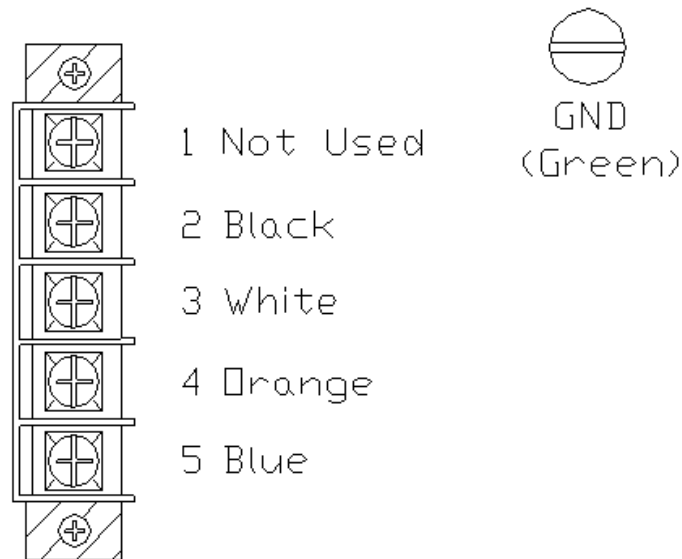


Figure 3. Remote Connections to SmartBoost 50™

WARNING

ALL wiring MUST conform to ABYC recommendation, National Fire Protection Association, state, local, and any other applicable codes.

OPERATING THE SmartBoost 50™

Proper Operation

When properly installed, the SmartBoost 50™ will automatically monitor the input voltage. If the input voltage drops below 208 VAC, the SmartBoost 50™ will boost the output voltage by approximately 13%. Then, if the input voltage reaches 223 VAC the SmartBoost 50™ will switch to the 1:1 (no boost) mode. If the input voltage falls below 166 VAC the SmartBoost 50™ will shut down protecting on board equipment from low voltage damage.

Manual Override

The manual override switch is located underneath the access cover on the left hand side. It is intended to be in the normal position (switch to the left). When the manual override switch is moved to the MAN.OVR position the manual override light will turn on and the 1:1 mode is forced, the boost function is then disabled. The control board is also bypassed in this position as well as all optional remote display indicator lights. The only light remaining on will be the manual override indicator inside the unit.

Powering Up

After wiring is complete and all access covers are in place, shore power may be applied. The green AC Power light should be on. The Boost light may or may not be on depending on input voltage. If the AC Power light is not on, consult the *Troubleshooting* section of this manual.

TROUBLESHOOTING

Table 2. Troubleshooting Suggestions

Item	Symptom	Solution
1.	Power (green) light will not come on	Check main shore power disconnect breakers and shore side breakers at the pedestal. Make certain the shore power cord is plugged in securely. Also, make certain the manual override switch is set to normal mode.

2.	Power (green) light is on but, unit will not boost when input voltage is below 208 VAC	Check to see if the SmartBoost 50™ functions in manual override. Call customer service.
3.	SmartBoost 50™ only functions in manual override	Possible control board problem. Call customer service.

WARRANTY AND CUSTOMER SERVICE

Warranty

The CHARLES Marine & Industrial Group warrants the unit will be free from defects in materials and workmanship that cause mechanical failure for one (1) year, as set forth in the Limited Warranty. Notice of any alleged defect in material or workmanship must be provided within thirty (30) days of discovering the problem, and within the warranty period. Follow the procedure outlined below to obtain warranty service.

Service Center and Repair Correspondence

Note: Do not attempt to service the unit. Contact the Service Center.

To contact the Service Center via telephone directly:

800-830-6523 (Toll Free)
 217-932-2317 (Voice)
 217-932-2473 (FAX)

Call to obtain a Returned Materials Authorization (RMA) number prior to returning any unit to Charles Industries.

Return the unit for repairs to the Service & Repair Center address below:

Charles Industries, Ltd.
 Marine & Industrial Group
 503 NE 15th Street
 Casey, IL 62420-2054
 USA

Correspondence can be sent to Corporate Headquarters via the address below:

Note: Do not return the unit to this address.

Charles Industries, Ltd.
 Marine & Industrial Group
 5600 Apollo Drive
 Rolling Meadows, IL 60008-4049
 USA
 847-806-6300
 www.charlesindustries.com

SPECIFICATIONS

Table 3. Smart Boost 50™ Specifications

Feature	Specification
Input Voltage	177 – 255 VAC
Operating Frequency	50/60 Hz
Maximum Input Current	50 Amps

Feature	Specification
Output Voltage	200 – 255 VAC
Maximum Output Current	50 Amps (43 Amps in Boost Mode)
Efficiency at Maximum Output	98%
Operating Temperature	14° to 122° Fahrenheit (–10° to 50° Celsius)
Weight	50 pounds (22.7 Kilograms)
Height	9.0 inches (22.9 Centimeters)
Width (including mounting flange)	12.7 inches (32.3 Centimeters)
Depth	12.7 inches (32.3 Centimeters)

