

ISO-BOOST™₅₀ SAFETech™
ISO-BOOST™₁₀₀ SAFETech™

AUTOMATIC ISOLATION AND BOOSTING TRANSFORMER
WITH NEW SEAMLESS AUTOMATIC FORTIFIED ELECTRONICS TECHNOLOGY

**INSTALLATION INSTRUCTIONS &
OWNER'S MANUAL**

Contents

- INTRODUCING... ISO-BOOST™ SAFETech™ TRANSFORMERS 3**
 - Manual Purpose 3
- APPLICATION 3**
 - SAFETech™ 3
- IMPORTANT SAFETY INSTRUCTIONS 4**
 - Warnings 4
 - Installation Precaution 4
 - Environmental Precaution 5
 - Application Precaution 5
 - Damaged Unit Precaution 5
 - Disassembly Precaution 5
- INSTALLING THE ISO-BOOST™ 5**
 - Choosing an Electrical Wiring Method 5
 - Wired as an Isolation Transformer..... 6
 - Wired as a Polarization Transformer 7
 - Choosing Mounting Location 7
 - Choosing Mounting Hardware..... 9
 - Mounting the Iso-Boost™ 9
 - Choosing the Appropriate Wire Type and Gauge..... 10
 - Choosing Electrical Wiring Hardware..... 10
 - Overcurrent Protection..... 12
 - Making Iso-Boost™ Connections12
 - Securing Covers.....15
 - Applying Power.....15
 - Connecting Remote Panel..... 15
- OPERATING THE ISO-BOOST™ 16**
 - Safety First..... 16
 - Proper Operation..... 16
 - Monitoring the Operation of the Iso-Boost™ 16
 - Thermal Protection 17
 - Using the Manual Override 17
- MAINTAINING THE ISO-BOOST™ 18**
- TROUBLESHOOTING 18**
- WARRANTY & CUSTOMER SERVICE..... 19**
 - Warranty..... 19
 - Warranty Service and Repair 20
- SPECIFICATIONS..... 21**

INTRODUCING... ISO-BOOST™ SAFETech™ TRANSFORMERS

Thank you for purchasing the Iso-Boost™! Your Iso-Boost™ combines a shoreline isolation transformer with a voltage sensing and switching circuit providing the ability to automatically increase the line voltage on your boat, all in a single unit. The isolation transformer completely isolates input power from output power giving you an improved degree of safety and preventing galvanic current corrosion due to the direct connection to AC shore power. The Iso-Boost™ increases the boat's voltage when it falls below a preset threshold due to low shoreline voltage. The Iso-Boost™ gives you the reliability and assurance that adequate voltage is provided for all the AC equipment on the boat.

Manual Purpose

With your personal safety in mind, this manual lists important safety precautions first, then covers installation, operation, maintenance, troubleshooting, warranty, and customer service information.

APPLICATION

The Iso-Boost™ is an automatic voltage correcting shoreline isolation transformer intended for boats with 50 amp (Iso-Boost™ 50) or 100 amp (Iso-Boost™ 100) service. Properly installed it will electrically isolate AC shore power from the boat's AC power system reducing galvanic current corrosion due to the AC shore power connection. The output voltage is boosted (increased) by 15% if the supplied voltage is too low. This low voltage commonly occurs when connecting to marina power sources that are derived from a 208 volt system rather than from a 240 volt (60Hz electrical service) system. The Iso-Boost™ can extend the useful life of many electrical components installed on the boat.

The boat's electrical system and grounding conductor are not actually connected to the shoreside system when you use the Iso-Boost™'s isolation transformer. Power is transferred from the shoreside electrical system to the boat's electrical system by magnetic coupling. This means there is no direct electrical connection between the earth-grounded shore AC power and boat AC power. The shore grounding conductor is connected to a shield that is wound between the primary (shore) and secondary (boat) transformer windings. This shield assures isolation on the boat by providing a protective layer between primary and secondary windings within the transformer. In the unlikely event of a breakdown within the transformer, the shield can withstand the fault current of a properly sized shore supply circuit breaker long enough for the breaker to trip.

SoftStart Technology is employed to limit the in-rush current into the transformer during power-up. Every time the Iso-Boost™ with SoftStart Technology is connected to the AC source, a current limiting device slows the in-rush of current into the transformer to prevent the unintentional tripping of the Ground Fault Interrupting Device. A few seconds after the AC source is connected, the SoftStart Technology automatically releases and the Iso-Boost™ is ready for normal operation. SoftStart Technology will have no effect on continuous normal operation.

SAFETech™

The ultimate in marine transformer performance and safety... Automatic Isolation and Boosting Transformers with new Seamless Automatic Fortified Electronics technology can transition into Boost mode or to non-boost mode seamlessly without power interruptions. Fortified Electronics more accurately sense when to provide boost and when to drop out of boost. The circuitry has been designed to provide greater resistance to EMI/RFI emissions and AC power line distortion. Additional thermal protection is provided. If the unit exceeds operating temperatures or draws excessive current, it will automatically shut down until the internal temperatures return to a safe operating level. The unit will automatically start back up when conditions return to normal levels. A cooling fan has also been added to assist cooling of the internal electronics.

IMPORTANT SAFETY INSTRUCTIONS

SAVE THESE INSTRUCTIONS. This manual contains important safety and operating instructions for the Iso-Boost™. Read the entire manual before use. Also read all instructions and cautions for and on the Iso-Boost™.



Warnings

This device is not ignition protected. Avoid serious injury or death from fire or explosion. Do not install in compartment containing gasoline-fueled engines or gasoline tanks, or in areas where ignition-protected equipment is required.

WARNING — HIGH VOLTAGE

To avoid serious injury or death from high voltage electrical shock, disconnect AC shore power before opening panel.

WARNING — FIRE HAZARD

Primary and secondary overcurrent protection and conductor sizing must be in accordance with manufacturer’s installation instructions.

WARNING

On-board and in-water shock hazard. The transformer must be connected in accordance with manufacturer’s installation instructions.

WARNING — FIRE HAZARD

Do not store equipment on or next to transformer. This unit is designed to operate hot and must have free air flow to prevent overheating or charring of adjacent material.

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. See installation instructions for suitable connector types or call Charles Marine Products to order a connector kit.

Installation Precaution

Boat wiring is a complex task that can pose shock, corrosion and other hazards if not done properly by trained, 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 “Alternating Current (AC) Electrical
Systems on Boats”

613 Third Street, Suite 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 Batterymarch Park

Quincy, MA 02169-7471
 Telephone: 617 770-3000

Rules and 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 Iso-Boost™ must be made in accordance with all applicable standards and regulations.

Environmental Precaution

The Iso-Boost™ is intended for installation inside an engine room or elsewhere on the interior of the boat. Be careful that the location will not subject the unit to rain, snow, excessive moisture, or excessive heat.

Application Precaution

These units are 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 Iso-Boost™ if it has received a sharp blow, been dropped, immersed in water or otherwise damaged. See the section in this manual on *Warranty & Customer Service* for repair information.

Disassembly Precaution

Do not disassemble the Iso-Boost™. See the sections in this manual on *Maintaining the Iso-Boost™*, *Troubleshooting the Iso-Boost™* and *Warranty & Customer Service*.

INSTALLING THE ISOBOOST

Choosing an Electrical Wiring Method

There is one wiring method that can be used to install the Iso-Boost™ as an isolation transformer in accordance with *ABYC E-11 Alternating Current (AC) Electrical Systems on Boats*. A second method, also in accordance with *ABYC E-11*, can be used to install the Iso-Boost™ as a polarization transformer if desired. The second method is not preferred because wiring the unit in the manner described circumvents the AC grounding conductor isolation between shore and boat power and may require the use of a galvanic isolator to reduce galvanic corrosion.

Note: Figure 1 and Figure 2 are reprinted with permission from the American Boat and Yacht Council (ABYC). To obtain the complete standard referenced or any other standards contact:

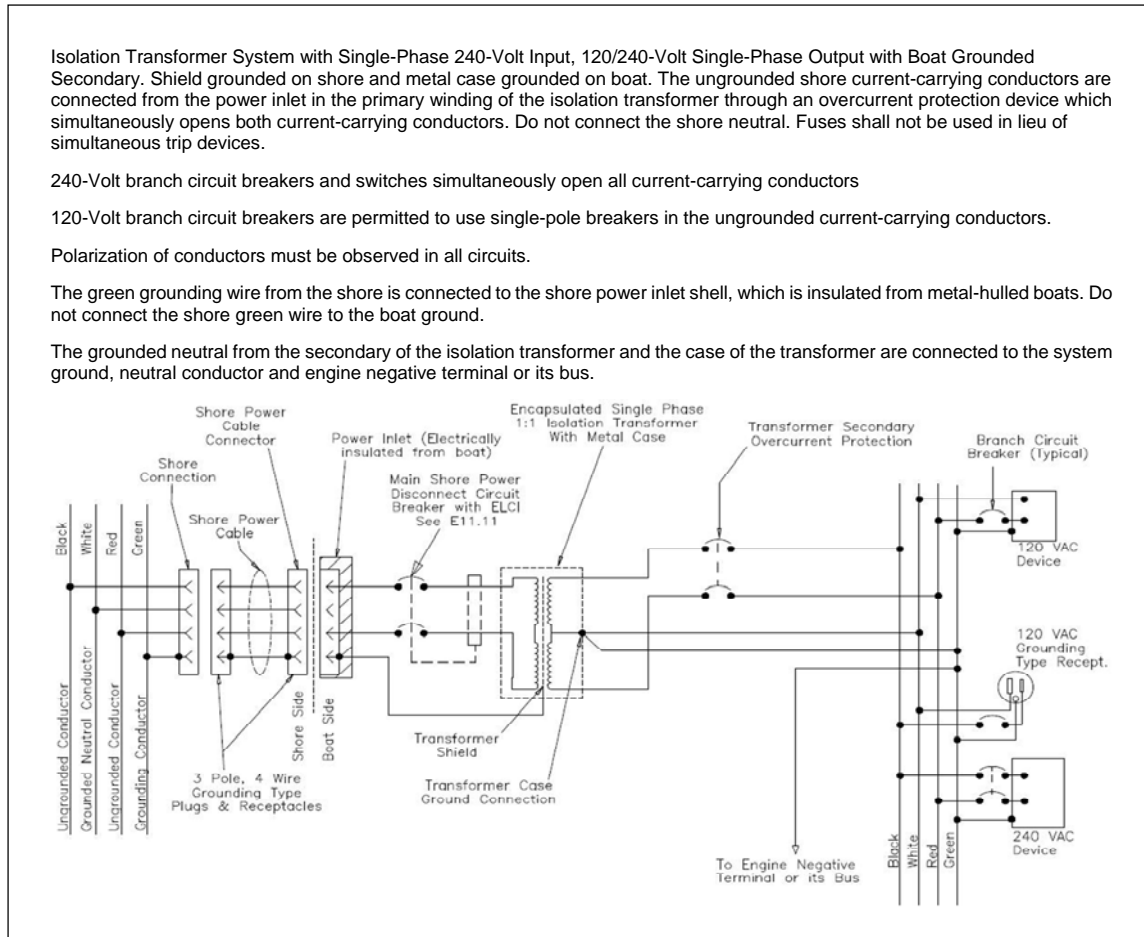
*American Boat and Yacht Council
613 Third Street, Suite 10
Annapolis, MD 21403
Telephone: (410) 990-4460
FAX: (410) 990-4466*

Wired as an Isolation Transformer

Note: Method 1 is most commonly used.

Note: These diagrams do not illustrate complete systems. Refer to the appropriate ABYC text.

Figure 1. Electrical Diagram - Method 1 (see Figure 4 for wiring connections)



Wired as a Polarization Transformer

In this method the shield and the shore grounding conductor are wired directly to the transformer neutral (N) and case ground (GND). An optional galvanic isolator is also shown in-line with the shoreline grounding wire.

Single-Phase 240-Volt Input, 120/240-Volt Output Polarization Transformer System with Shore Grounding (Green) Conductor – The ungrounded shore current-carrying conductors are connected from the power inlet to the primary winding of the polarization transformer through an overcurrent protection device which simultaneously opens both current-carrying shore conductors. Fuses shall not be used in lieu of simultaneous trip devices.

240-Volt branch circuit breakers and switches simultaneously open all current-carrying conductors.

120-Volt branch circuit breakers are permitted to use single-pole breakers in the ungrounded current-carrying conductors.

The shore grounded (green) conductor is connected from the shore power cable and the boat's power inlet directly to all non-current carrying parts of the AC electrical system including the transformer case and to the engine terminal or its bus without interposing switches or overcurrent protection devices.

NOTE: This diagram does not illustrate a complete system. Refer to the appropriate ABYC text.

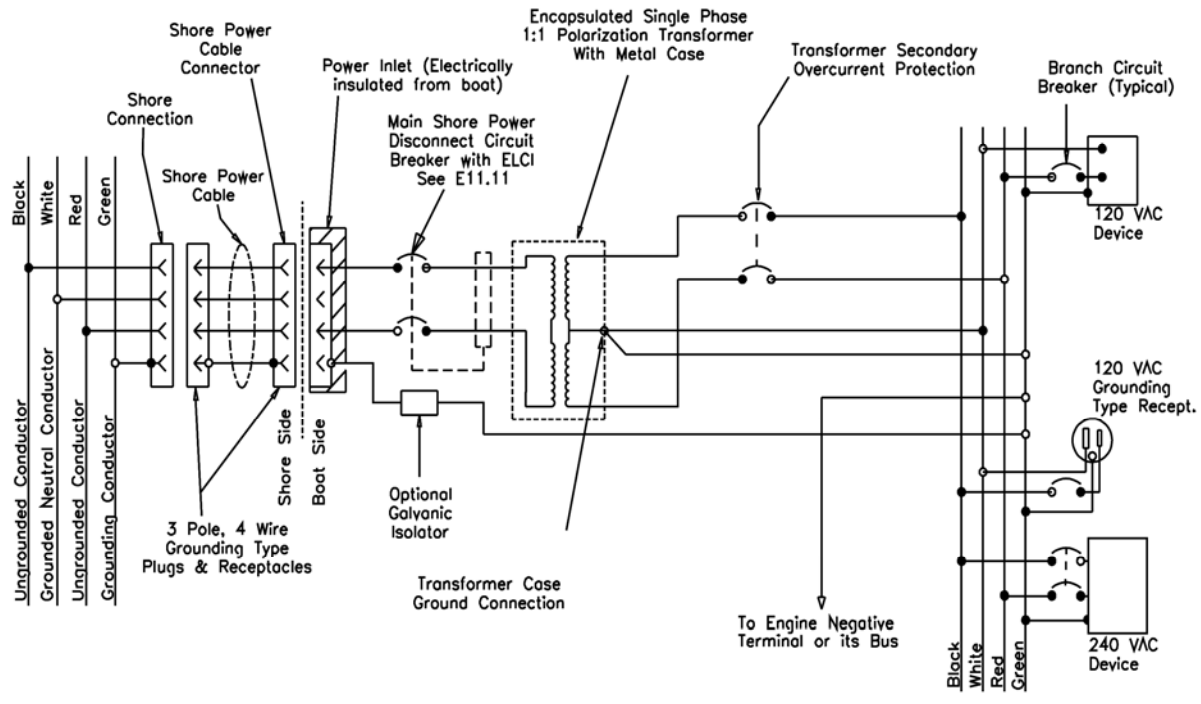


Figure 2. Electrical Diagram - Method 2 (see Figure 5 for wiring connections)

Choosing Mounting Location

After selecting a wiring method, the mounting location must be chosen. Like any piece of transformer-operated equipment, the Iso-Boost™ will produce a noticeable “hum” when it is energized, although not nearly as loud as non-encapsulated transformers. Consideration should be given to not mounting the Iso-Boost™ in or immediately adjacent to areas where you will prefer it quiet, such as sleeping quarters. Locations to avoid are under bunks or on the opposite side of an uninsulated bulkhead immediately adjacent to the head of a bunk. The Iso-Boost™ should be mounted either vertically on a bulkhead with the access panel at the bottom or horizontally on the deck in a protected area away from rain or spray. When mounted vertically the bottom must be at least 24 inches above the deck or other equipment to avoid damage from splash and to ensure adequate access to wiring connections. The unit must be mounted in a secure location capable of supporting the full weight of approximately 250/575 pounds. Proper ventilation around the case is important. Allow at least six inches on all four sides of the unit for air circulation

and cooling. During normal operation the case of the Iso-Boost™ may reach high temperatures. To avoid burns locate the Iso-Boost™ in an area where persons will not come in contact with the unit.

Four 1/2" holes, 1" from each end of the Iso-Boost™ have been provided for rigging and hoisting the unit (see Figures 3 and 3A). Typically, shackles are used for hoisting.

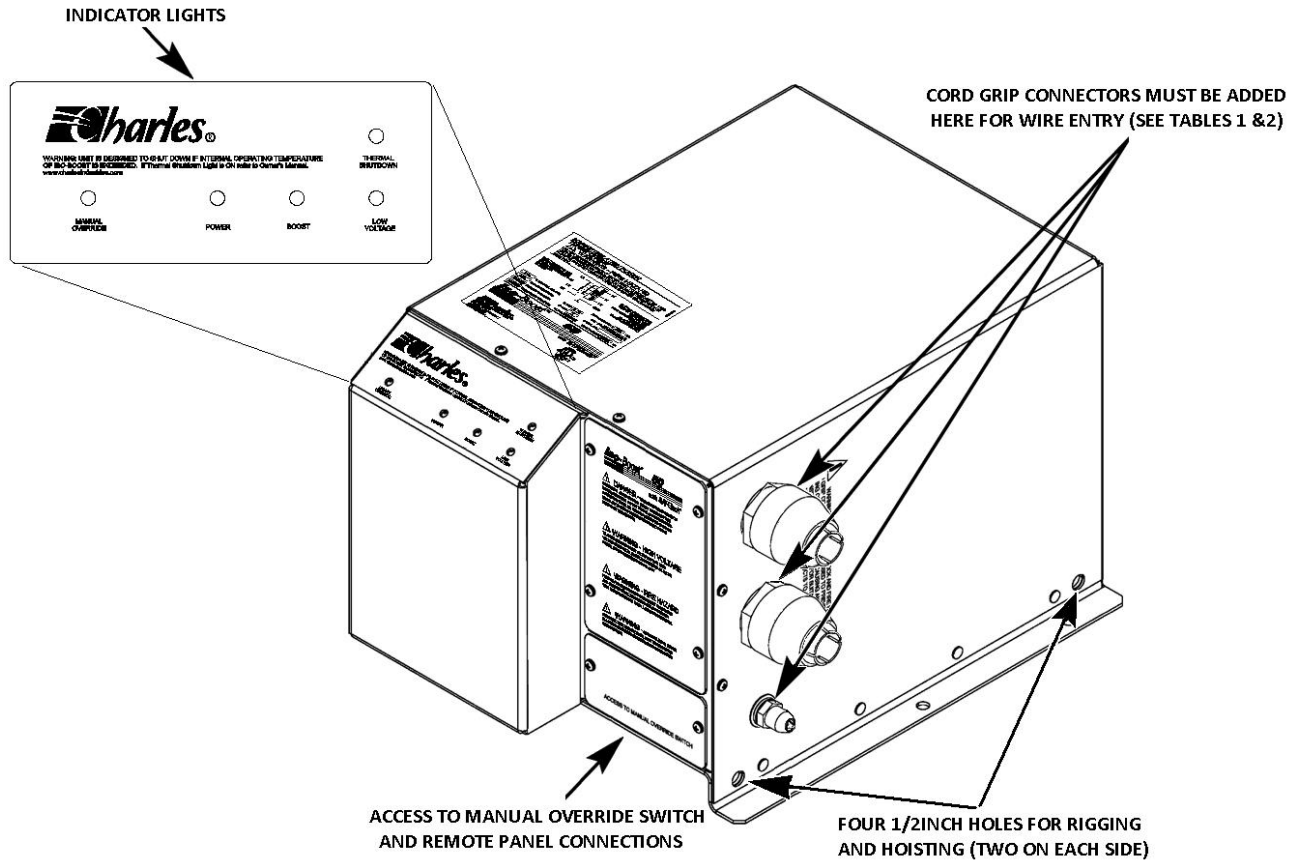


Figure 3. Iso-Boost™ 50 Access Openings and Indicators

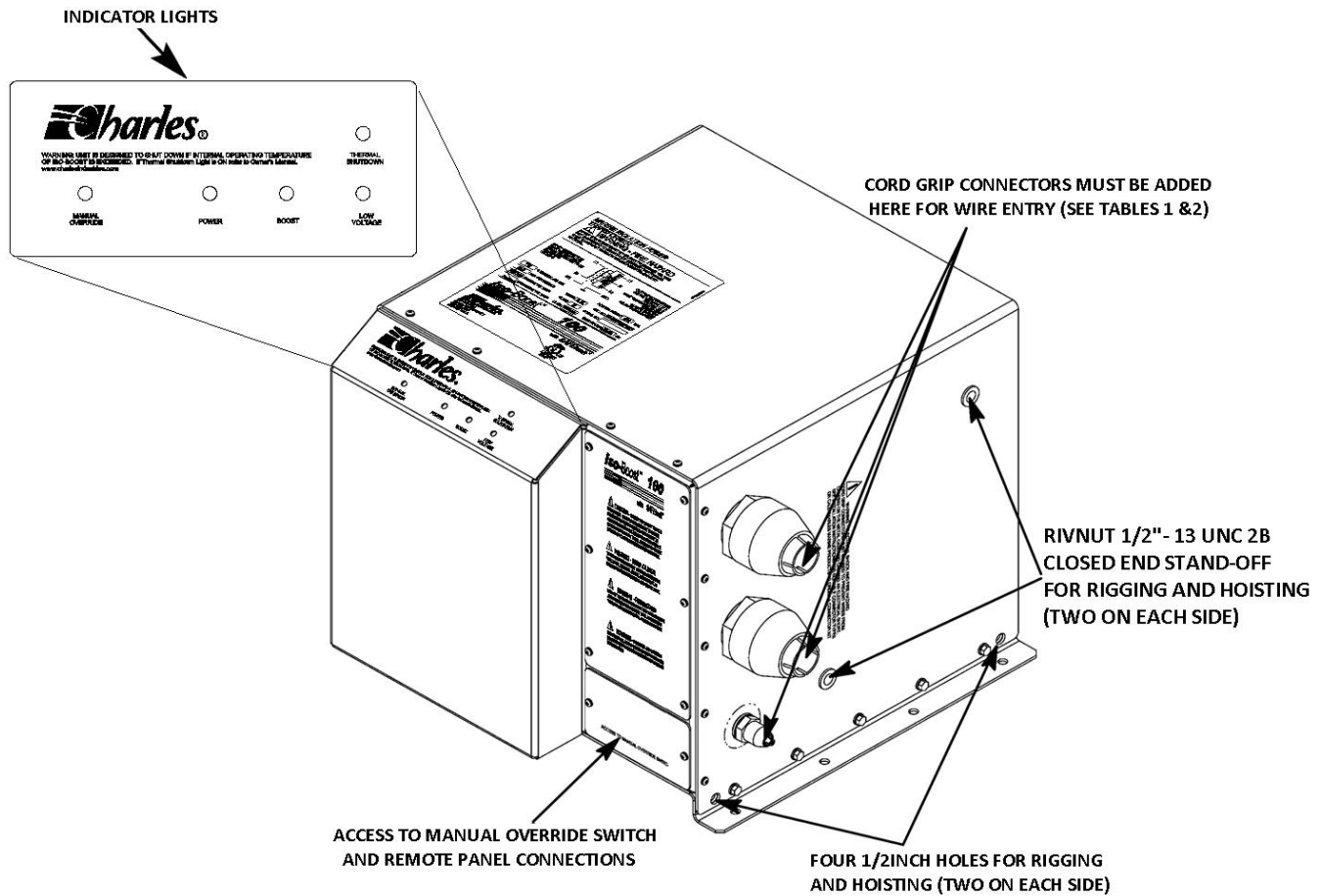


Figure 3A. Iso-Boost™ 100 Access Openings and Indicators

WARNING – FIRE HAZARD

Do not store equipment on or next to transformer. This unit is designed to operate hot and must have free air flow to prevent overheating or charring of adjacent materials.

Choosing Mounting Hardware

As with any marine equipment, secure mounting is of utmost importance. You will need to provide six bolts or screws that will be used to secure the unit. They must be 3/8 inch diameter. The screws or bolts you choose should be backed with a flat washer and kept vibration free with a split-ring lock washer. If using bolts, they must be secured on both sides of the bulkhead and also backed with a washer or washer plate. If using screws, they should be at least 1” long for Iso-Boost™ 50 or 1.5” long for Iso-Boost™ 100. All hardware must be corrosion-resistant stainless steel or cadmium plated steel.

Mounting the Iso-Boost™

The Iso-Boost™ may be mounted horizontally on a deck or vertically on a bulkhead.

CAUTION

Use appropriate equipment to hoist and rig unit. Care should be taken to ensure safety of individuals.

Horizontal Mount

WARNING — ELECTRICAL SHOCK HAZARD

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

Step	Action
1.	Carefully lower and position the Iso-Boost™ on the deck in the exact location the unit will be installed. <i>Note: The control panel and wiring enclosures should be visible and accessible.</i>
2.	Mark the location of the mounting holes on the deck.
3.	Remove the Iso-Boost™ and drill six marked holes with the proper-sized drill bit.
4.	Realign the Iso-Boost™'s mounting holes with the drilled holes and fasten the unit to the deck with the appropriate mounting hardware.
5.	Firmly secure all mounting hardware.

Vertical Mount

WARNING — ELECTRICAL SHOCK HAZARD

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

Step	Action
1.	Carefully lower and position the Iso-Boost™ on the bulkhead in the exact location the unit will be installed. <i>Note: The control panel should be at the bottom to ensure proper cooling of the unit.</i>
2.	Mark the location of the mounting holes on the deck.
3.	Remove the Iso-Boost™ and drill six marked holes with the proper-sized drill bit
4.	Re-align the Iso-Boost™'s mounting holes with the drilled holes and fasten the unit to the bulkhead with the appropriate mounting hardware
5.	Firmly secure all mounting hardware.

Choosing the Appropriate Wire Type and Gauge

All input and output conductors should be at least 6 AWG (for 50A) or 2 AWG (for 100A), stranded, 600 volt rating, UL type AWM, UL 1426 or equivalent, or a UL listed marine shore power cable. See ABYC standard E-11 for more details on conductor types and sizing (gauge).

Choosing Electrical Wiring Hardware

The usual application for the Iso-Boost™ is as an isolation transformer. In this application, there is no fault current path for the wiring from the shore power inlet to the Iso-Boost™ input connections. For this reason, the wiring should only be done with a jacketed cable (.030 inches jacket thickness minimum) such as UL type 1426 boat cable or by using a UL listed marine cable set wire (type SO or equivalent). This wiring should be installed in the boat in a protected area and routed to avoid contact with sharp edges or hot surfaces.

WARNING — ELECTRICAL SHOCK HAZARD AND FIRE HAZARD

Cord grip connectors must be used to prevent wires from chafing on the metal case and causing an electrical short. See installation instructions for suitable connector types or call Charles Marine Products to order a connector kit.

The Iso-Boost™ is intended for hard-wiring in a permanent location. Cord grip connectors with water sealing bushings and strain relief are required to secure wires or cables going into or out of the Iso-Boost™.

Table 1, 1A and 1B list the parts approved by Charles Marine Products for use with the Iso-Boost™.

Table 1. Iso-Boost™ 50 Recommended Cord Grip Connectors and Accessories

Description*	Cord Type	Manufacturer	Catalog Number	Sealing Washer	Locknut
Cord Range .472-.787	6/3 Boat Cable	Heyco	8443	3263	LN 1-1/4
Cord Range .510-.790	6/3 Boat Cable	Remke	RD29LR	SOR-4	LN 125
Cord Range .709-1.000	6/4 Boat Cable	Heyco	8441	3263	LN 1-1/4
Cord Range .700-.980	6/4 Boat Cable	Remke	RD29LA	SOR-4	LN 125
Cord Range .890-1.090	6/4 Boat Cable or 6/3 Cordset	Thomas & Betts	2702	5265	144
Cord Range 1.080-1.280	6/4 Cordset	Thomas & Betts	2703	5265	144

*All connectors have a 1 1/4" hub size and are straight connectors

Table 1A. Iso-Boost™ 100 Recommended Cord Grip Connectors and Accessories

Description*	Cord Type	Manufacturer	Catalog Number	Sealing Washer	Locknut
Cord Range 1.390-1.650	2/4 Boat Cable or 2/3 Cordset	Thomas and Betts	2707	5266	145

*All connectors have a 1 1/2" hub size and are straight connectors.

Table 1B. Iso-Boost™ Recommended Accessories

Description	Charles Catalog Number	Kit Includes
ISO50 Straight Strain Relief Kit with .875-1.26 cord range	97-001120-A	2–Straight cord grips with hardware
ISO50-90 Degree Strain Relief Kit with 1.25 cord range	97-001755-A	2–90-degree liquid-tight cord grips with hardware
ISO50 Installation Kit	97-ISOKIT12-A	1–97-001120-A above, 10' connection cable and 50Amp breaker with housing
ISO100 Straight Strain Relief Kit with 1.39 – 1.65 cord range	97-001121-A	2 – Straight cord grips with hardware
ISO100 90 Degree Strain Relief Kit with 1.5 cord range	97-001741-0	2 – 90 Degree liquid tight cord grips with hardware
ISO100 Installation Kit	97-ISOKIT24-A	1–97-001121-A above, 10' connection cable and 100AMP breaker w/housing

Remote Panel Kit	93-ISOBREMOTE-A	Remote status panel with 50' connection cable
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Overcurrent Protection

Overcurrent protection must be provided at the time of installation by circuit breakers on both the primary (shore) and secondary (boat) circuits. A two-pole circuit breaker is required for both the shore power line going into the Iso-Boost™ and the output line going to the boat's AC electrical system per ABYC E-11 standard.

Making Iso-Boost™ Connections

WARNING — HIGH VOLTAGE

To avoid serious injury or death from high voltage electrical shock, disconnect AC shore power before opening panel.

The wiring installation will depend on the method chosen in the section titled *Choosing an Electrical Wiring Method*. Follow the procedure below to make the appropriate connections.

Step	Action
1.	Remove the front cover.
2.	Install the cord grip connectors using the sealing gaskets and locknuts.
3.	Undo the chucks from the cord grip connectors.
4.	Slide the cord grip connectors down and over the cables from the primary (shore power) and to the secondary (boat) circuit breakers.
5.	Insert the cables through the cord grip connectors and cut to length.
6.	Strip back the insulation.
7.	Crimp ring or captive spade terminals on all wires using an appropriate tool.
8.	Connect all wiring as shown in Figure 4, Figure 5, or Figure 6 based on the chosen wiring method.
9.	Tighten the cord grip connectors.
10.	Reinstall the front cover.

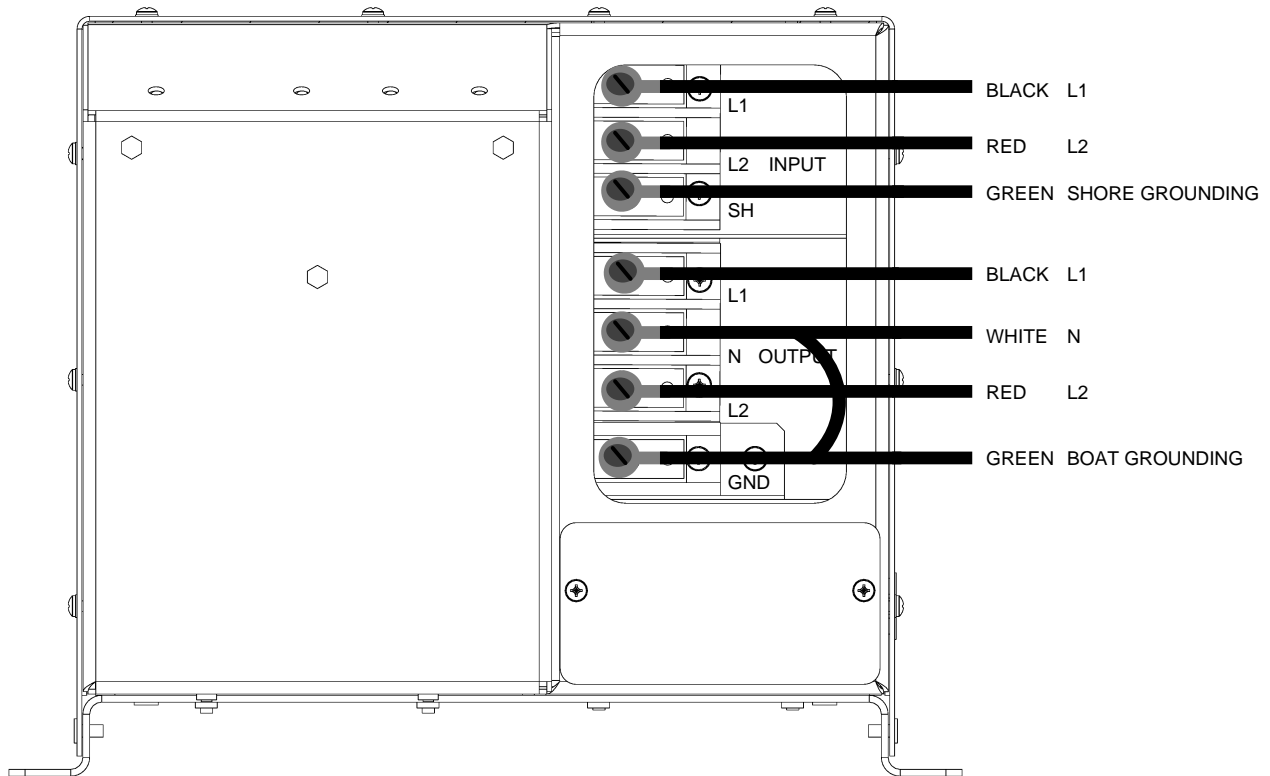


Figure 4. Typical Wiring as an Isolation Transformer - Method 1 (see Figure 1 for Electrical Diagram)

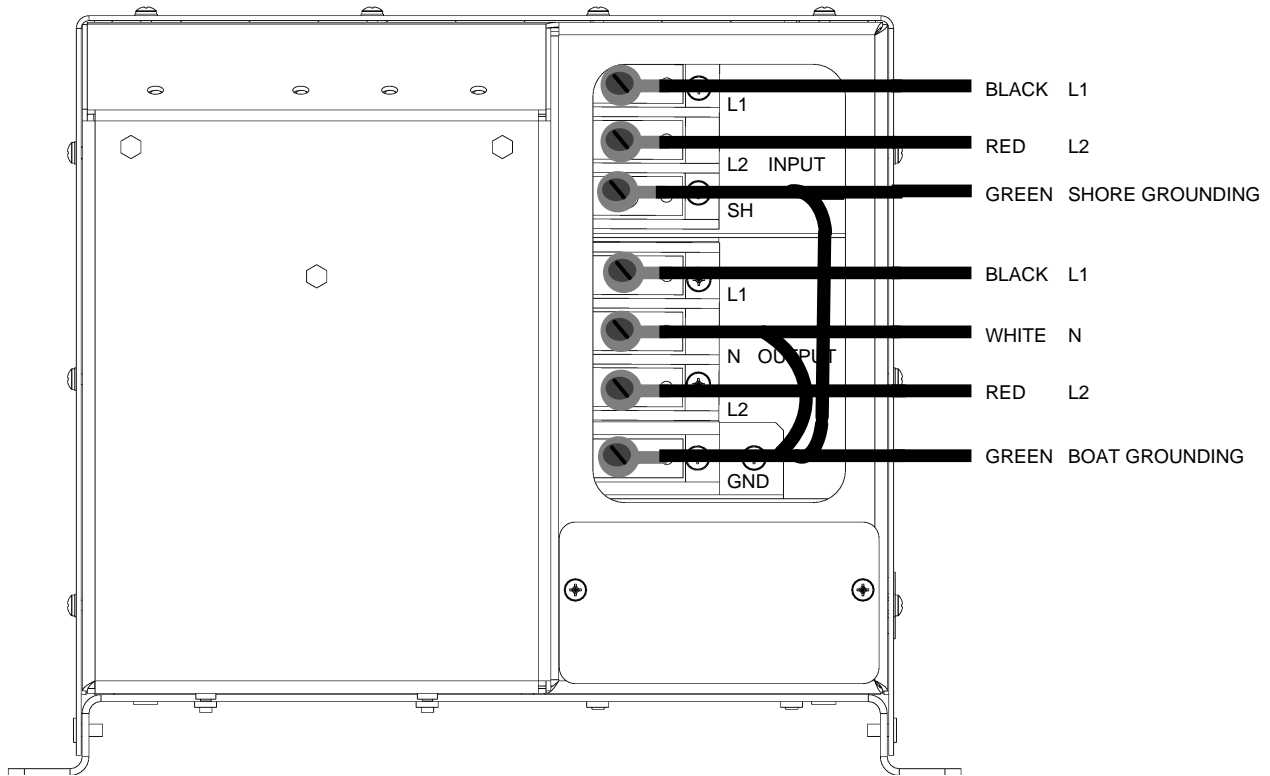


Figure 5. Typical Wiring as a Polarization Transformer - Method 2 (see Figure 2 for Electrical Diagram)

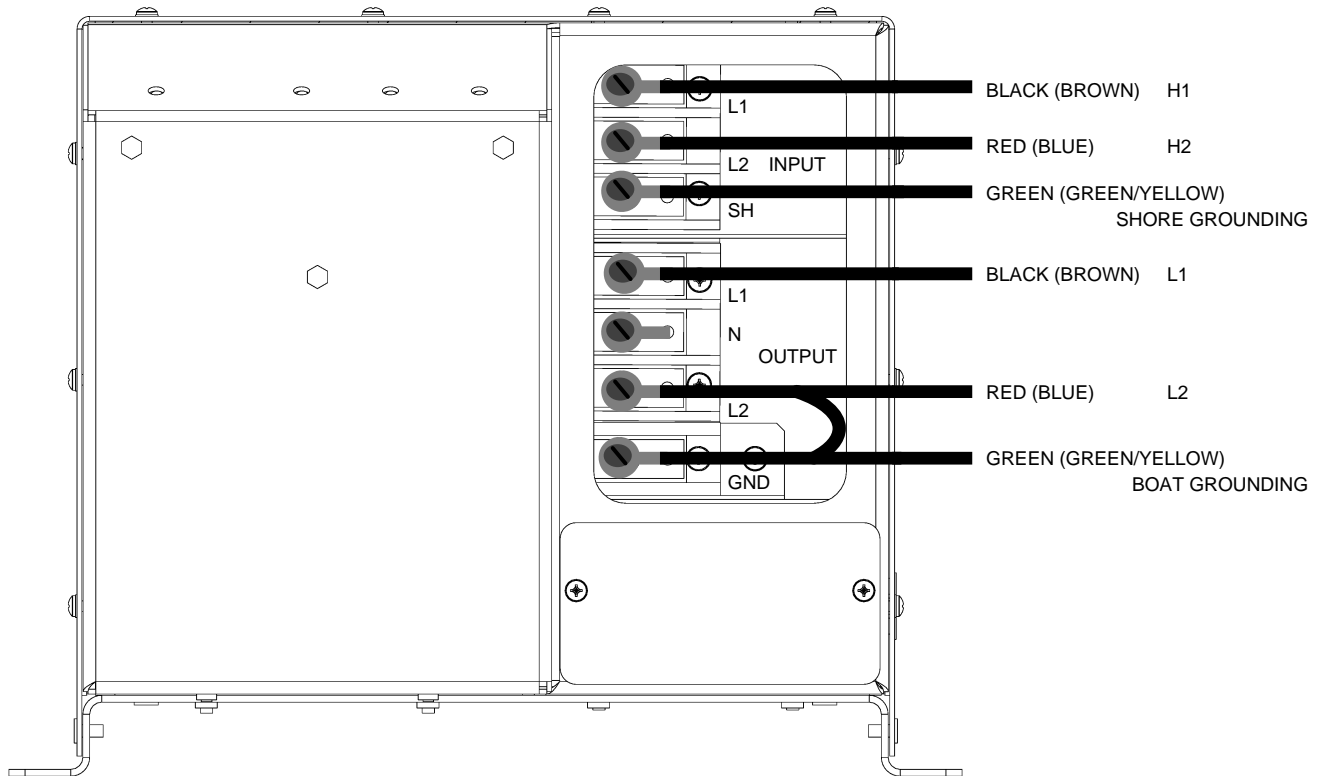


Figure 6. Typical Wiring as European 3-Wire, Single Phase 230

Securing Covers

After all connections and terminations have been made, the terminal access cover should be reinstalled using all hardware supplied.

Applying Power

Power should only be applied after all connections and terminations have been made and the terminal access cover is secure. Plug in the shore power and turn on the appropriate circuit breakers to apply power. Refer to the section on *Proper Operation*.

Connecting Remote Panel (Optional)

The optional remote panel allows you to monitor the operating status of your Iso-Boost™ without having to go physically look at it. Contact Charles Marine Products Customer Service for more information.

Follow the procedure below to connect the optional remote panel to the Iso-Boost™.

Step	Action
1.	Disconnect AC shore power.
2.	Remove the front cover.
3.	Remove the end cap (hole plug).
4.	Install the cord grip connector using the sealing gasket and locknut (reference Table 2 for Charles Marine Products approved fittings).
5.	Undo the chuck from the cord grip connector.
6.	Using 6 conductor cable with 16 to 22 gauge stranded wire rated for 600 volts, slide the chuck down and over the wire.
7.	Insert the wire through the cord grip connector and cut to length.
8.	Strip back the insulation.
9.	Secure captive spade terminals on each conductor.
10.	Connect terminal one (1) of the remote terminal block on the Iso-Boost™ to terminal one (1) of the remote unit.
11.	Connect terminals 2 through 5 in a similar manner.
12.	Connect the ground stud terminal located in the remote terminal access area to the grounding conductor connected to the grounding stud on the remote panel.
13.	Secure the front cover.
14.	Drill a three-inch hole where the remote panel will be mounted.
15.	Using the remote panel as a guide, mark the hole locations for the four corner holes.
16.	Put the remote panel aside and drill the four holes.
17.	Route the remote panel cable from the Iso-Boost™ up to the remote panel in accordance with all applicable standards and regulations.
18.	Using captive spade terminals, connect the same color wire that was connected to terminal one (1) on the Iso-Boost™ to terminal one (1) on the remote panel.
19.	Connect terminals 2 through 5 in a similar manner.
20.	Connect the grounding wire attached to the Iso-Boost™ remote grounding stud to the grounding stud on the remote panel.
21.	Using four flat-head screws, secure the remote panel in place.

Table 2. Recommended Conduit Fittings (Remote Panel)

Description*	Cord Type	Manufacturer	Catalog Number	Sealing Washer	Locknut
Cord Range .125-.375	22-6	Thomas & Betts	2930	5263	142
Cord Range .310-.560	18-6, 22-6	Thomas & Betts	2931	5263	142
Cord Range .500-.750	16-6, 18-6	Thomas & Betts	2932	5263	142
Cord Range .454-.629	18-6	Heyco	3460	3261	LN 3/4
Cord Range .545-.709	16-6, 18-6	Heyco	3234	3261	LN 3/4
*All connectors have a 3/4" hub size and are straight connectors					

OPERATING THE ISOBOOST

Safety First

Follow all precautions in the *IMPORTANT SAFETY INSTRUCTIONS* section in this manual. Pay close attention to the DANGER, WARNING and CAUTION boxes both within this manual and labeled on the unit.

Proper Operation

When properly installed and connected, the Iso-Boost™ will provide isolation between shore and boat power while monitoring and reacting to the boat’s available voltage. If the boat voltage goes below 208 VAC, the unit will enter “boost mode” and the boat voltage will increase approximately 15 percent. If the boat voltage reaches 253 VAC boost mode will be deactivated and the boat voltage will equal shore voltage.

If the boat voltage goes down to 208 VAC (shore voltage is 180 VAC since the unit is in boost mode), the low voltage light will begin blinking. If the boat voltage stays below 200 VAC for more than four seconds, the Iso-Boost™’s output is turned off. Power will not be supplied again until shore voltage has increased by at least 15 VAC. This feature protects the boat’s electrical equipment from being operated at voltages well below their ratings.

The manual override switch can be used to disable the monitoring circuit and is described in its own section.

Note: All voltages are +/- 3 VAC.

Monitoring the Operation of the Iso-Boost™

The operating status or condition of the Iso-Boost™ can be determined by looking at the five lights (red, green, yellow, red, and red) on the side of the unit or on the optional remote panel. Refer to Table 3 for a description of the possible light combinations, determined by various shore supply electrical conditions. If the unit has a combination of lights other than those listed, either a bulb has burned out or there may be a problem with the unit. The cooling fan will automatically start and stop as needed to maintain an optimal internal temperature.

Table 3. Operating Status Indication

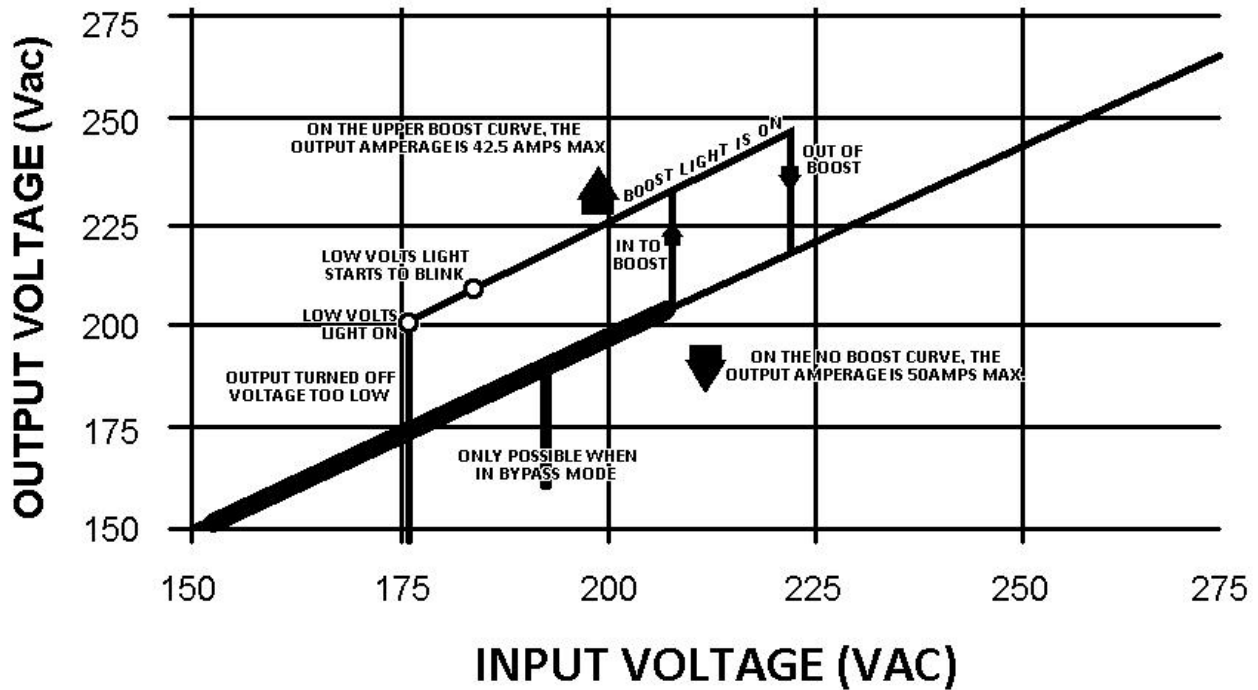
Manual Override (red)	Power (green)	Boost (yellow)	Low Voltage (red)	Overtemp (red)	Iso-Boost™ Status
Off	Off	Off	Off	Off	NO POWER. No shore power source present OR, Unit is in protective Suggestions Table 4.
Off	On	Off	Off	Off	NON-BOOST. Boat voltage equals shore voltage.
Off	On	On	Off	Off	BOOST. Boat voltage is boosted 15% higher than shore voltage.
Off	On	On	Blinks	Off	LOW POWER. Boat voltage is between 204 VAC and 192 VAC.
Off	Off	Off	On	Off	OUTPUT OFF. Output voltage went below 192 VAC for more than 4 s
On	Off	Off	Off	Off	MANUAL OUTPUT ON. The unit has been switched to the manual ov

Off	Off	Off	Off	On	OVERTEMP. One or more of the temperature switches has enabled and will continue.
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When power is first applied to the Iso-Boost™ it will immediately turn on and supply power to the boat in the non-boosted mode. After 4 seconds of continuous operation, the Iso-Boost™ will enable the boosted mode if necessary. This delay assures that quick changes in line voltage do not cause the Iso-Boost™ to switch modes when it is not needed.

When the Iso-Boost™ switches into or out of boost mode there will be no loss of power with the Seamless Boost technology.

Figure 7 illustrates how the Iso-Boost™ functions.



Note: All voltages listed assume negligible voltage drops due to wiring.

Figure 7. Voltage Chart – 50/60 Hz

Thermal Protection

The Iso-Boost™ is equipped with built-in thermostats (temperature switches) that are embedded in the transformer windings. In the event of sustained overload or overheating due to inadequate ventilation, these devices will operate and shut down the unit. When this occurs all control power to the unit is disabled, the OVERTEMP indicator will be on, while all other status lights will be off and the unit will not function—there will be no output power.

Allow the unit to cool down. This may take an hour or so, depending on ambient conditions. The thermostats will automatically reset and the Iso-Boost™ will resume normal operation.

Using the Manual Override

A manual override switch has been provided in the event that a user wishes to disable the monitoring and control circuitry. This may be the case if the unit continuously disables the output due to going beyond low voltage limits or

the *Troubleshooting* section in this manual recommends switching to this mode. Refer to the following procedure to change the manual override switch.

CAUTION — POSSIBLE EQUIPMENT DAMAGE

The user assumes the risk of applying voltage outside the boat’s electrical equipment specifications if the monitoring circuitry is disabled with the manual override feature.

Step	Action
1.	Turn off all power to the unit
2.	Remove the small door labeled “Access to Manual Override Switch” with a Philips screwdriver
3.	Locate the toggle switch labeled “Standard Operation” or “Manual Override”
4.	Flip the switch to “Standard Operation” or “Manual Override”
5.	Replace the access door
6.	Apply power to the Iso-Boost™.

Note: In manual override mode only the red light will be on and the boat voltage will equal the shore voltage. Isolation is maintained in manual override mode.

MAINTAINING THE ISO-BOOST™

WARNING — HIGH VOLTAGE

To avoid serious injury or death from high voltage electrical shock, disconnect the AC shore power before attempting any maintenance or cleaning.

No adjustment or maintenance is required for the Iso-Boost™ other than periodic cleaning of the outside cabinet with a dry cloth and inspecting all connections for tightness and corrosion by a qualified service person.

TROUBLESHOOTING

If there is a problem with the Iso-Boost™, first check all connections, circuit breakers and retest. If all connections and circuit breakers are good, see if the problem is covered in Table 4. If the problem is not covered in Table 4, or if the Iso-Boost™ still malfunctions after performing the solution given, refer to the Charles Industries website (www.charlesindustries.com), or contact Charles Marine Products for technical assistance.

Table 4. Troubleshooting Suggestions

Item	Condition	Solution
1.	The green (power) light will not illuminate when first connected	Check the breaker at the shoreside power pedestal and the boat’s shore power input breaker. If the breaker(s) are functioning correctly, check wire connections for tightness and proper color coding. Make certain no AC power is present when checking.
2.	The yellow (boost) and red (no output) lights go on and off in an alternating pattern.	The boat may be plugged into a low voltage service. In this case, the Iso-Boost™ will always be in a boost mode unless voltage drops below the preset “low voltage cutoff” point. A drop in voltage may be caused by a high current draw on-board placed on a highly-resistive line coming from the dock. Once the Iso-Boost™ shuts

		off, the current draw is removed allowing the voltage to rise to an acceptable level for the unit to turn on and boost again. Again the current draw exists, dropping the voltage to the shut-off point, continuing the cycle. Be sure all connections are tight. Shortening unnecessarily long shore power cords or turning off some electrical load may also help.
3	The unit will go into and out of boost when shoreside power is above 225v.	The boat may be plugged into a poor shoreside power service with high resistance causing voltage drop as a large draw appears onboard. The boat may be subjected to excessive electronic emissions that interfere with the Iso-boost™ control board. Switch the Iso-boost™ to manual override and bypass the automatic boost until the boat has moved, or the item creating the emissions has been corrected. If the Iso-boost™ does not correct itself once the emissions are removed, contact Charles Marine Products for technical assistance, repair, and possible RMA information (see the section in this manual <i>Warranty & Customer Service</i>).
4	Unit will not boost and the shoreside power is below 208v.	Check if the unit is in the “Standard” mode of operation. If the unit is in the “Standard” mode of operation and will not boost contact Charles Marine Products for technical assistance, repair, and possible RMA information (see the section in this manual <i>Warranty & Customer Service</i>).
5	Unit suddenly stops operating after functioning with a high-current draw,	No Power output, no lights are illuminated and the Iso-boost™ is hot. Confirm the vessel and shoreside circuit breakers are ON. If all breakers are ON, it is possible the embedded protection has put the Iso-Boost™ into thermal shutdown mode. Allow the Iso-Boost™ to cool and reduce ambient temperature of engine room or compartment where Iso-Boost™ is installed. Selectively turn off high-draw current equipment. Reactivation time will vary depending upon ambient temperature and applied loads. If power does not return after extended cooling time, contact Charles Marine for technical assistance. If power does not return contact Charles Marine Products for technical assistance, repair, and possible RMA information (see the section in this manual <i>Warranty & Customer Service</i>).

WARRANTY & CUSTOMER SERVICE

Warranty

Charles Marine Products warrants the Iso-Boost™ will be free from defects in materials and workmanship which cause mechanical failure for one (1) year, as set forth in the Limited Warranty. Review this warranty carefully for information on what is covered by its terms. You must provide notice of any alleged defect in material of workmanship within thirty (30) days of discovering the problem, and within the warranty period. Follow the procedure outlined below to obtain warranty service.

Warranty Service and Repair

If the unit fails to operate properly after following all the instructions in the manual, or if the Iso-Boost™ requires service, take the following steps:

1. Contact Charles Marine Products Customer Service and obtain a "Returned Material Authorization" (RMA) number and a Service Center address. Please have the catalog number and serial number available at the time of the call. This information is located on the top of the unit, on the unit label.
2. Ship or mail the Iso-Boost™ together with the RMA to the appropriate Service Center. Shipping costs to and from the Service Center are your responsibility
3. When service is completed, Charles Marine Products will return the Iso-Boost™ to you.

Service Center and Correspondence

To contact the Service Center via telephone directly:

217.932.5292 (Voice)

217.932.2943 (FAX)

Correspondence can be sent to the Service & Repair Center via the address below. Returned units should be sent to this address:

Charles Service Center

503 N.E. 15th Street

Casey, IL 62420-2054

USA

www.charlesindustries.com

SPECIFICATIONS

The physical specifications of the Iso-Boost™ are listed in Table 5.

Table 5. Iso-Boost™ with Seamless Automatic Fortified Electronics Technology - Specifications

Feature	Specification 50A	Specification 100A
Input Voltage	208/240 VAC	208/240VAC
Input Current	50 Amps	100Amps
Output Voltage (nominal)	120/240 VAC	120/240 VAC
Maximum Output Current in Boost Mode	42.5 Amps	85 Amps
Maximum Output Current Non-Boost Mode	50 Amps	100 Amps
KVA Continuous	12.0 KVA	24.0 KVA
Operating Frequency	50/60 Hz	50/60Hz
°C Rise Insulation System 220A	110°C	110°C
Insulation Class	H	H
% Impedance	2.14	2.14
Operating Temperature	0° to 50° C	0° to 50° C
Approximate Weight	235 pounds (106Kg)	575 pounds (261Kg)
Length	18 inches (45.7cm)	24 inches (61cm)
Width (including mounting feet)	15 inches (38.1cm)	20 inches (50.8cm)
Width (excluding the mounting feet)	13 inches (33.0cm)	18 inches (45.7cm)
Height (with the mounting feet)	12 inches (30.5cm)	21 inches (53.3cm)