

IsoBoost™ 50 SST
IsoBoost™ 60 SST

*AUTOMATIC SHORELINE TRANSFORMER
WITH SOFT START TECHNOLOGY*

**INSTALLATION INSTRUCTIONS &
OWNER'S MANUAL**

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INTRODUCING... ISOBOOST WITH SOFT START TECHNOLOGY

Thank you for purchasing the IsoBoost! Your IsoBoost 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 IsoBoost increases the boat's voltage when it falls below a preset threshold due to low shoreline voltage. The IsoBoost gives you the reliability and assurance that adequate voltage is provided for all the AC equipment on the boat.

SoftStart Technology prevents in-rush current from tripping Ground Fault Interrupting Devices. Such devices are typically represented by the following acronyms: ELCI, GFCI, RCD.

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 IsoBoost is an automatic voltage correcting shoreline isolation transformer intended for boats with 50 amp (IsoBoost 50) or 60 amp (Iso Boost 60) 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. Note: Switching points automatically adjusted for 50Hz electrical service. The IsoBoost 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 IsoBoost'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 IsoBoost 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 IsoBoost is ready for normal operation. SoftStart Technology will have no effect on continuous normal operation.

IMPORTANT SAFETY INSTRUCTIONS

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

Warnings



DANGER

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"

3069 Solomon's Island Road
Edgewater, MD 21037
Telephone: 410/956-1050
FAX: 410/456-2737

NFPA Standard 302
"Pleasure and Commercial Motor Craft"

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

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 IsoBoost must be made in accordance with all applicable standards and regulations.

Environmental Precaution

The IsoBoost 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 IsoBoost 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 IsoBoost. See the sections in this manual on *Maintaining the IsoBoost*, *Troubleshooting the IsoBoost* and *Warranty & Customer Service*.

INSTALLING THE ISOBOOST

Choosing an Electrical Wiring Method

There are two wiring methods that can be used to install the IsoBoost as an isolation transformer in accordance with *ABYC E-11 Alternating Current (AC) Electrical Systems on Boats*. A third method, also in accordance with *ABYC E-11*, can be used to install the IsoBoost as a polarization transformer if desired. The third 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, Figure 2 and Figure 3 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
3069 Solomon's Island Road
Edgewater, MD 21037
Telephone: 410/956-1050
FAX: 410/456-2737*

Wired as an Isolation Transformer

The only difference between the two methods below is that in Method 2, a Ground Fault Protector (GFP) must be used instead of just a circuit breaker, and the shore grounding conductor is not wired past the inlet of the boat.

Note: Method 1 is most commonly used.

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

Isolation Transformer System with Single-Phase 240-Volt Input, 120/240-Volt Single-Phase Output with Boat Grounded Secondary. Shield grounded on shore and metal case grounded on boat. The ungrounded shore current-carrying conductors are connected from the power inlet to the primary winding of the isolation transformer through an overcurrent protection device which simultaneously opens both current carrying conductors. Do not connect the shore neutral. 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.

Polarization of conductors must be observed in all circuits.

The green grounding wire from the shore is connected to the shore power inlet shell which is insulated from metal-hulled boats. Do not connect the shore green wire to the boat ground.

The grounded neutral from the secondary of the isolation transformer and the case of the transformer are connected to the system ground, neutral conductor and engine negative terminal or its bus.

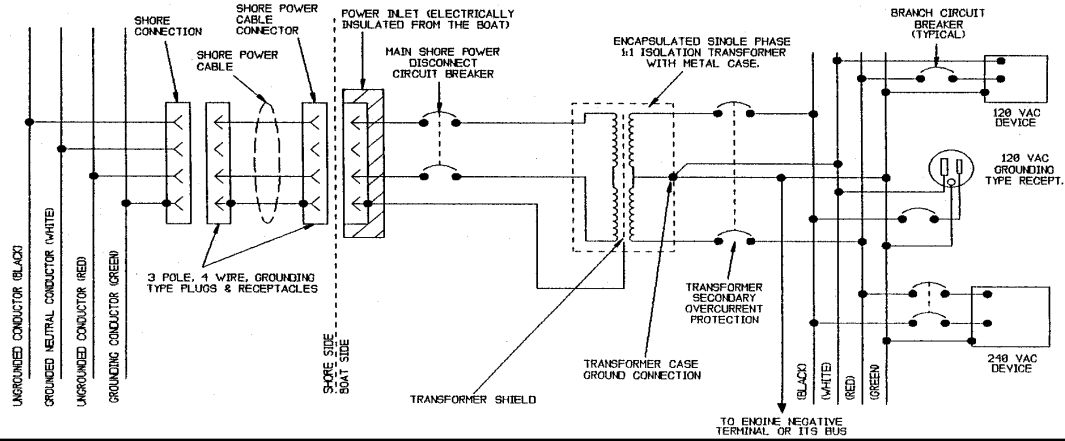


Figure 1. Electrical Diagram – Method 1 (see Figure 5 for wiring connections)

Isolation Transformer System with Single-Phase 240-Volt Input, 120/240-Volt Single-Phase Output, Ground Fault Protection and a Grounded Secondary. Shield and Metal Case Grounded on Boat – The ungrounded shore current-carrying conductors are connected from the power inlet to the primary winding of the isolation transformer through a ground fault 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.

Polarization of conductors must be observed in all circuits.

The green grounding wire from the shore power inlet is not connected to the to the isolation transformer shield or case nor to the boat ground.

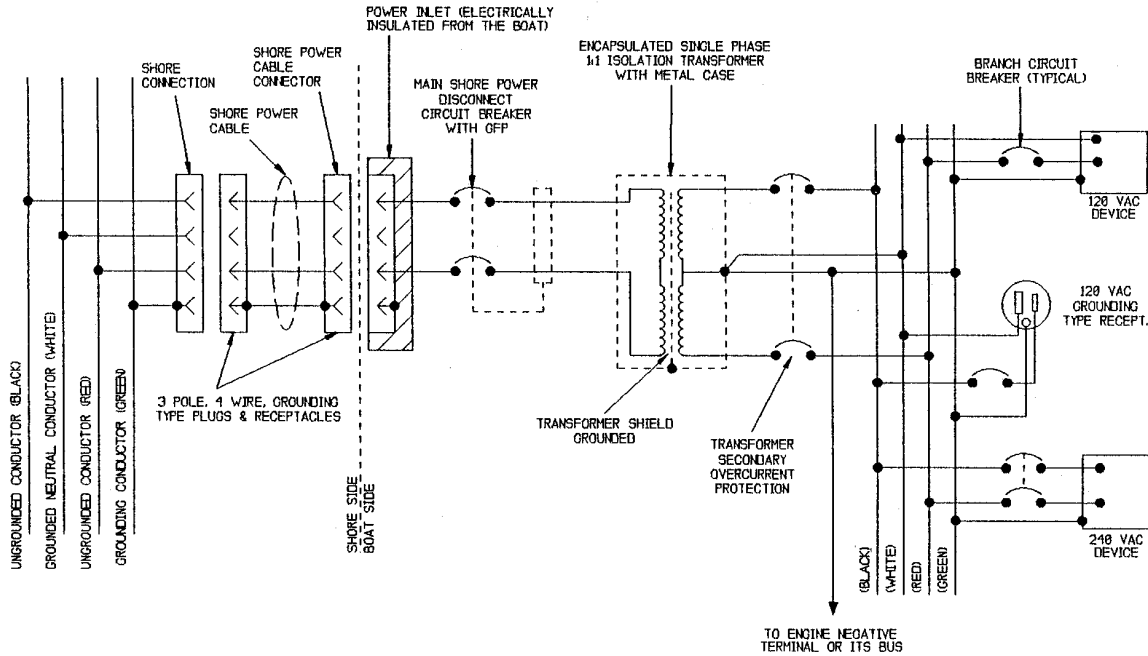


Figure 2. Electrical Diagram – Method 2 (see Figure 6 for wiring connections)

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.

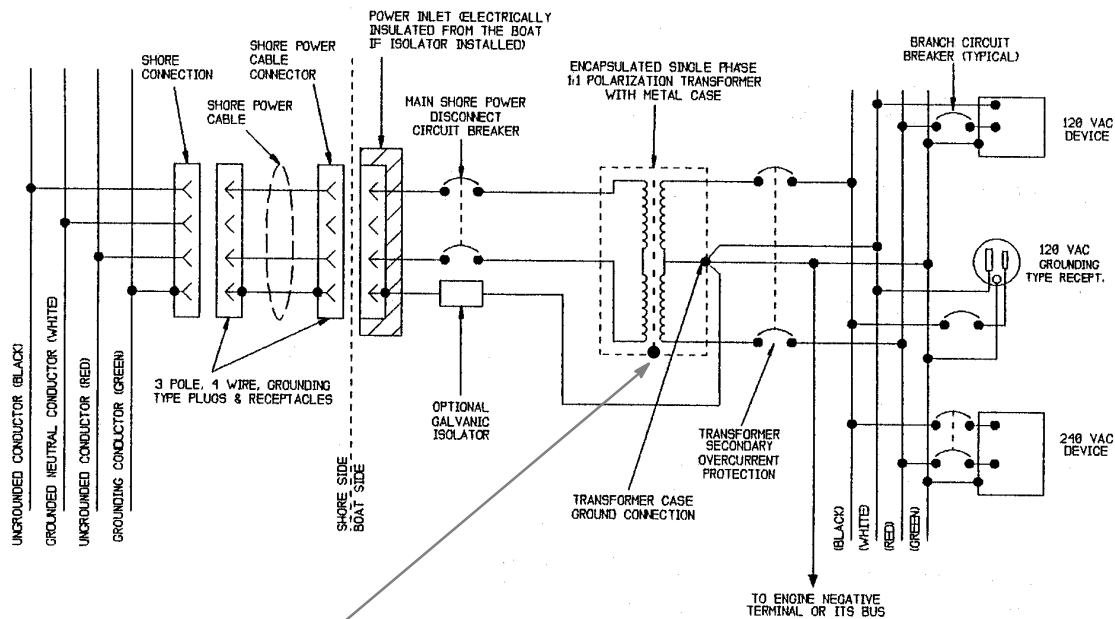
Single-Phase 240-Volt Input, 120/240-Volt Output Polarization Transformer System with Shore Grounding (Green) Conductor – The ungrounded shore current-carrying conductors are connected from the power inlet to the primary winding of the polarization transformer through an overcurrent protection device 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.



Note: Charles Marine Products Note: Shield to be connected to case ground on IsoBoost.

Figure 3. Electrical Diagram – Method 3 (see Figure 7 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 IsoBoost 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 IsoBoost 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 IsoBoost 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 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 IsoBoost may reach high temperatures. To avoid burns locate the IsoBoost in an area where persons will not come in contact with the unit.

Four 1/2” holes, 1” from each end of the IsoBoost have been provided for rigging and hoisting the unit (see Figure 4). Typically, shackles are used for hoisting.

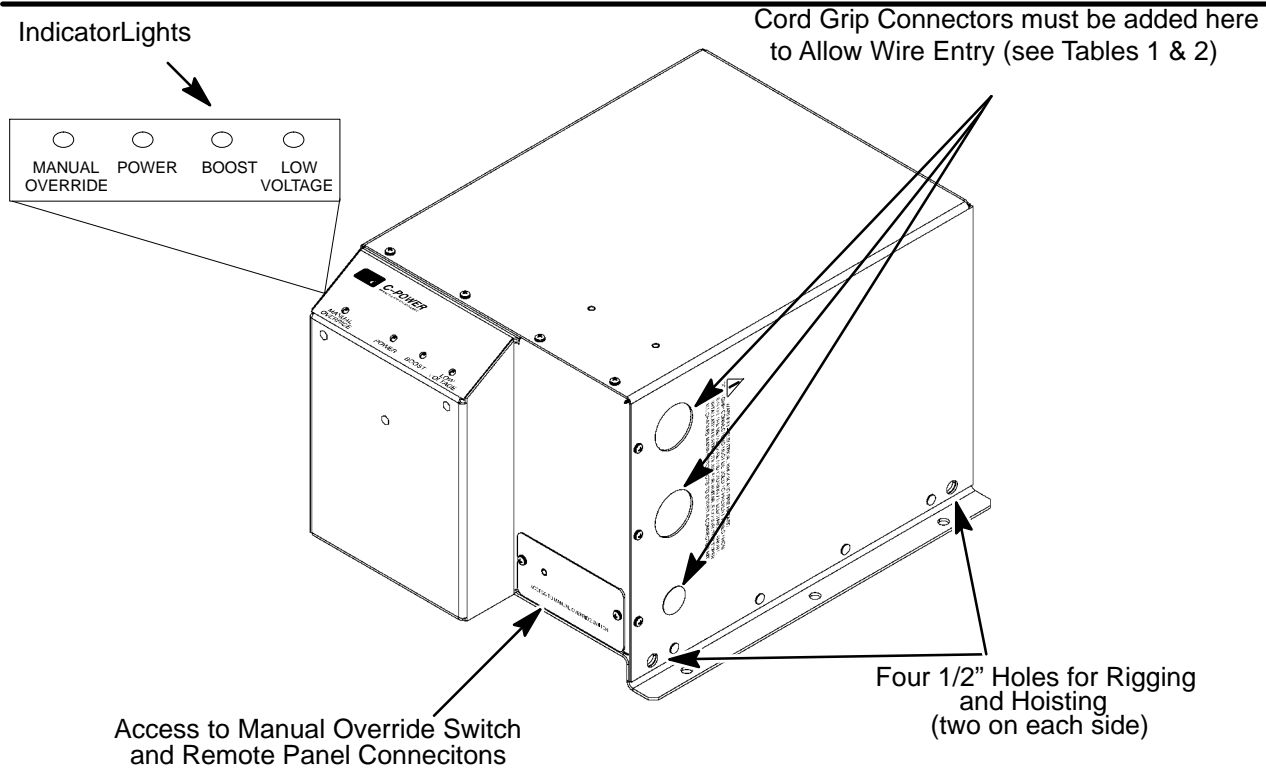


Figure 4. IsoBoost Access Openings and Indicators

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 $\frac{3}{8}$ " ($\frac{3}{8}$ inches) 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. All hardware must be corrosion-resistant stainless steel or cadmium plated steel.

Mounting the IsoBoost

The IsoBoost 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 IsoBoost 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 IsoBoost and drill six marked holes with the proper-sized drill bit. |
| 4. | Re-align the IsoBoost’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 IsoBoost 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 IsoBoost and drill six marked holes with the proper-sized drill bit |
| 4. | Re-align the IsoBoost’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, stranded, 600 volt rating, UL type AWM, UL 1426 or equivalent, or a UL listed marine shore power cable. See ABYC standard E-8 for more details on conductor types and sizing (gauge).

Choosing Electrical Wiring Hardware

The usual application for the IsoBoost is as an isolation transformer. In this application, there is no fault current path for the wiring from the shore power inlet to the IsoBoost 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 IsoBoost 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 IsoBoost.

Table 1 lists the parts approved by Charles Marine Products for use with the IsoBoost.

Table 1. 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

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 IsoBoost and the output line going to the boat's AC electrical system per AB4C E-11 standard.

Making IsoBoost 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 5, Figure 6, Figure 7 or Figure 8 based on the chosen wiring method. |
| 9. | Tighten the cord grip connectors. |
| 10. | Re-install the front cover. |

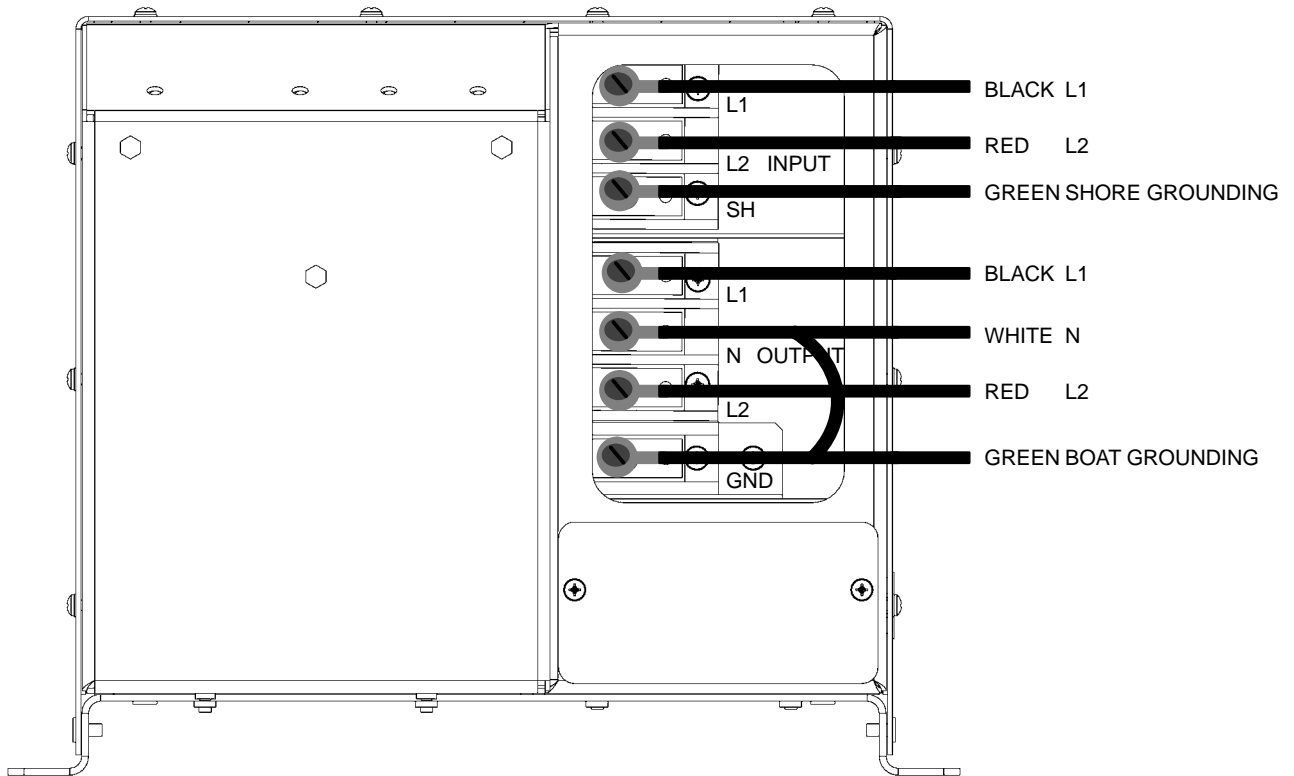


Figure 5. Typical Wiring as an Isolation Transformer – Method 1 (see Figure 1 for Electrical Diagram)

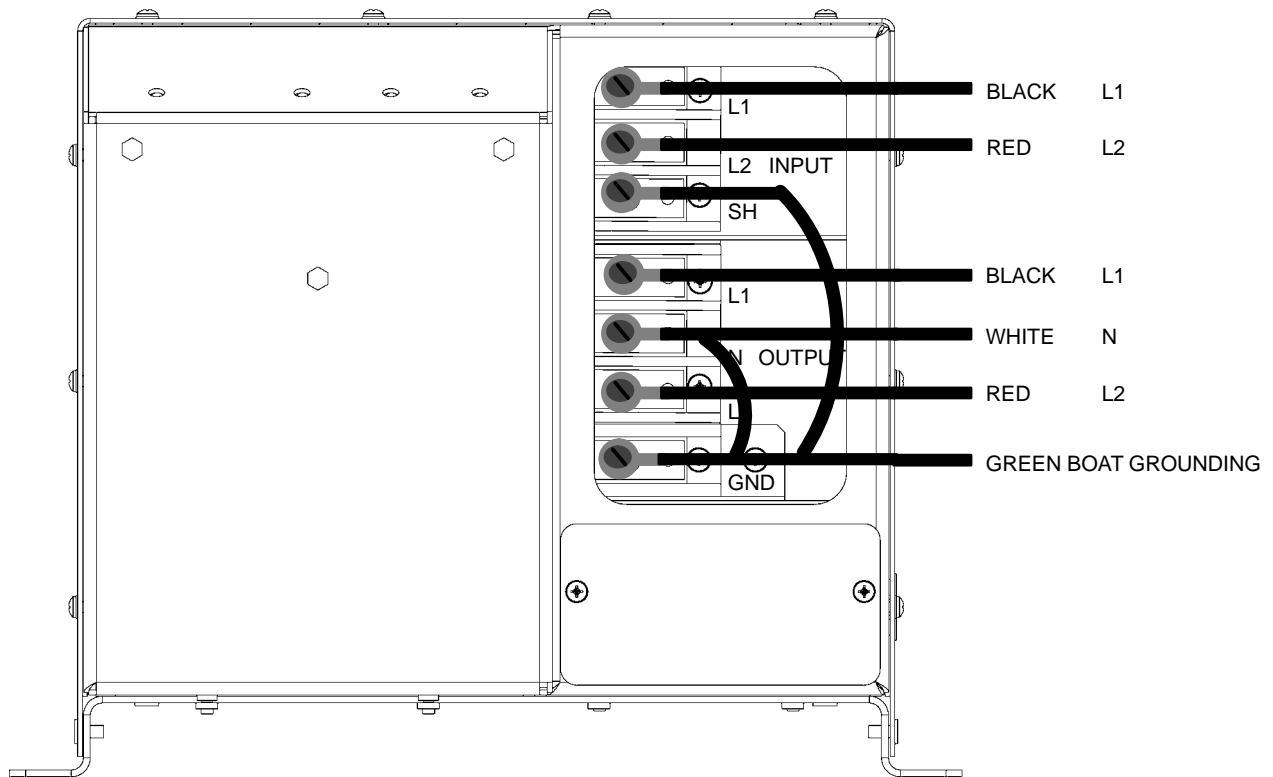


Figure 6. Typical Wiring as an Isolation Transformer with Primary Ground Fault Protector – Method 2 (see Figure 2 for Electrical Diagram)

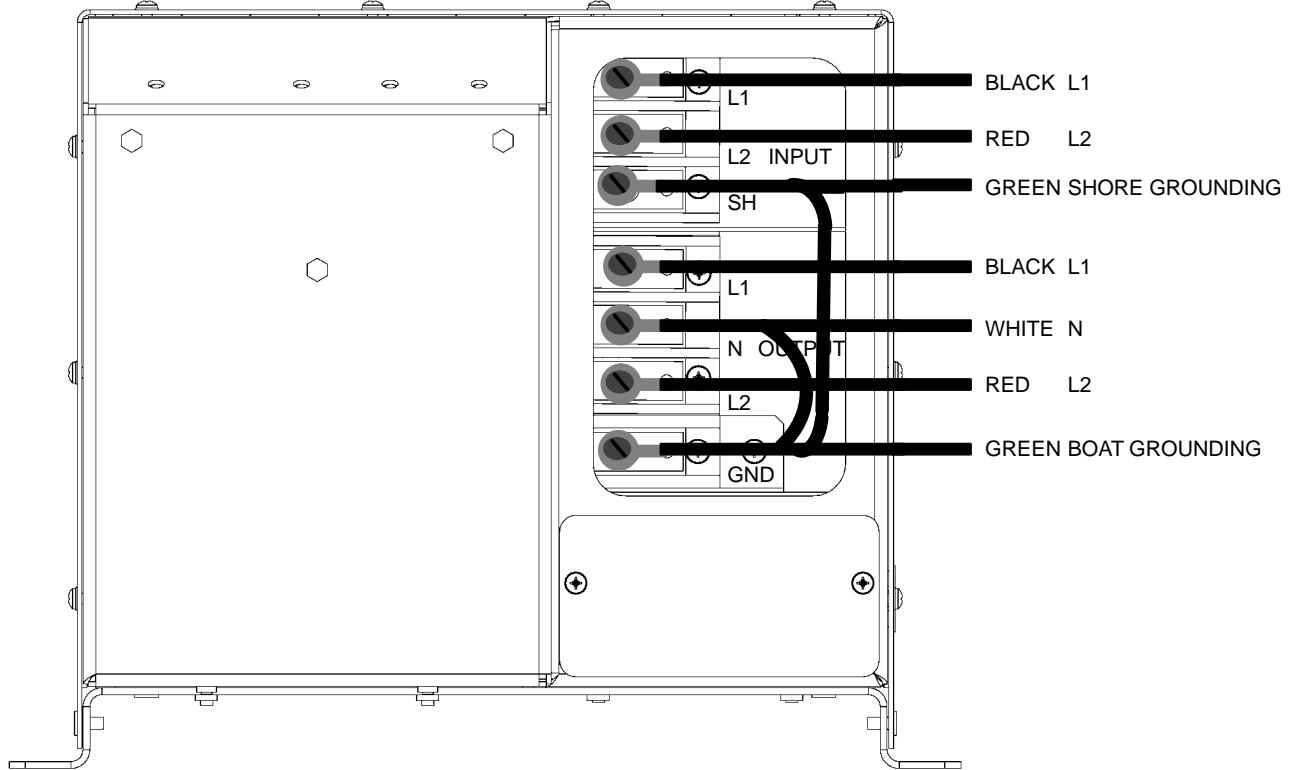


Figure 7. Typical Wiring as a Polarization Transformer – Method 3 (see Figure 3 for Electrical Diagram)

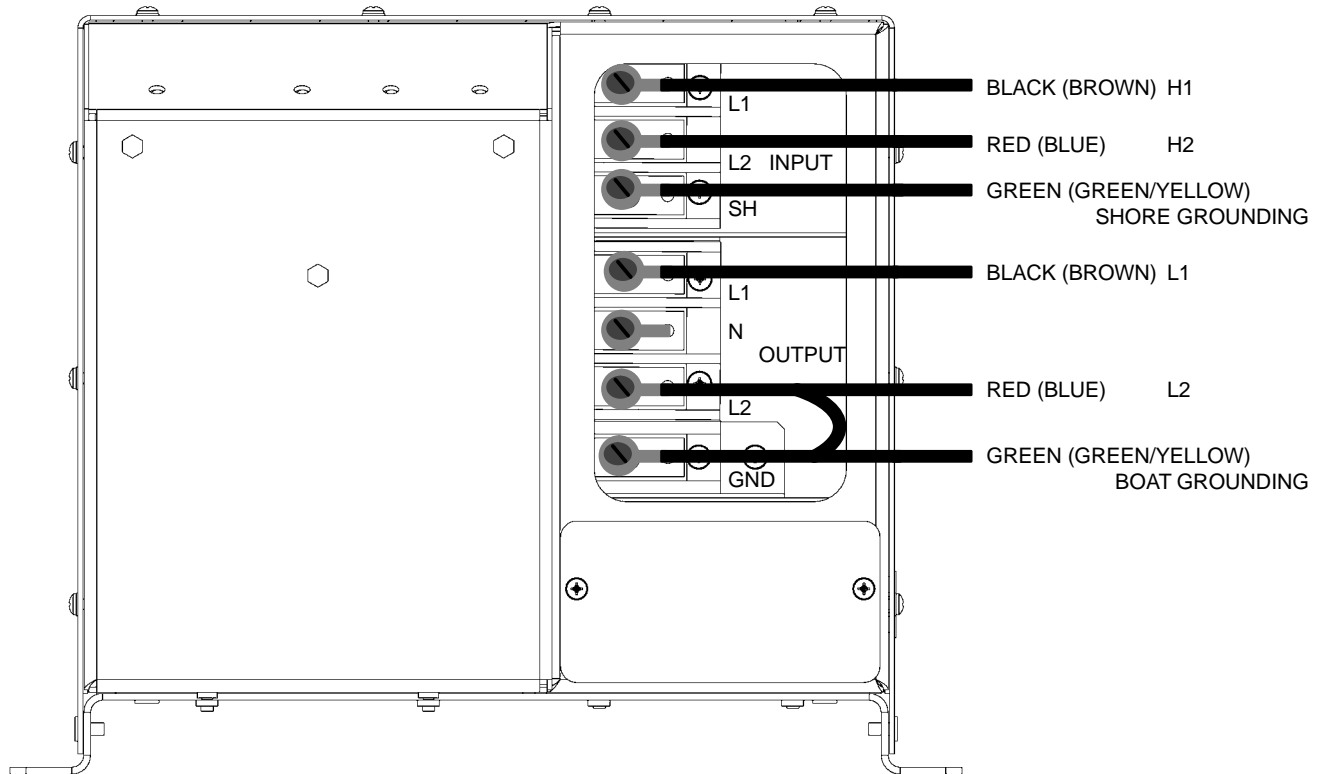


Figure 8. Typical Wiring as European 3-Wire, Single Phase 230

Securing Covers

After all connections and terminations have been made, the terminal access cover should be re-installed 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 IsoBoost 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 IsoBoost.

| 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 IsoBoost 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 IsoBoost 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 IsoBoost 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 IsoBoost 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 IsoBoost 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 (60 Hz) or 190 VAC (50 Hz), the unit will enter "boost mode" and the boat voltage will increase approximately 15 percent. If the boat voltage reaches 253 VAC (60 Hz) or 240 VAC (50 Hz) the boost mode will be deactivated and the boat voltage will equal shore voltage.

If the boat voltage goes down to 204 VAC (shore voltage is 178 VAC since the unit is in boost mode), the low voltage light will begin blinking. If the boat voltage stays below 192 VAC for more than four seconds, the IsoBoost's output is turned off. Power will not be supplied again until shore voltage has increased by at least 20 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 IsoBoost

The operating status or condition of the IsoBoost can be determined by looking at the four lights (red, green, yellow, 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.

Table 3. Operating Status Indication

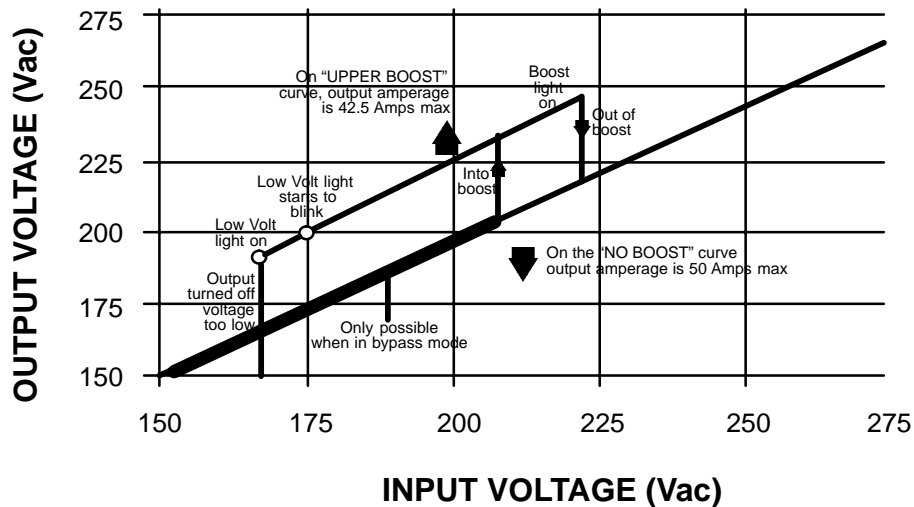
| Manual Override (red) | Power (green) | Boost (yellow) | Low Voltage (red) | IsoBoost Status |
|-----------------------|---------------|----------------|-------------------|--|
| Off | Off | Off | Off | No power. Either the shore power is turned off or the circuit breaker to the unit is off. If the shore power and/or circuit breaker are on refer to the section in this manual on <i>Troubleshooting</i> . |
| Off | On | Off | Off | Boat voltage equals shore voltage. |
| Off | On | On | Off | Boat voltage is boosted 15% higher than shore voltage. |
| Off | On | On | Blinks | Boat voltage is between 204 VAC and 192 VAC. |
| Off | Off | Off | On | No output. Output voltage went below 192 VAC for more than 4 seconds. |
| On | Off | Off | Off | The unit has been switched to the manual override mode. Boat voltage equals shore voltage. |

When power is first applied to the IsoBoost there will be no output. It will take approximately four seconds for the unit to turn on and supply power to the boat. This delay assures that quick changes in line voltage do not cause the IsoBoost to switch modes when it is not needed.

When the IsoBoost switches into or out of boost mode there will be a brief loss of power lasting no more than a few hundredths of a second while the transformer taps are switched inside the unit.

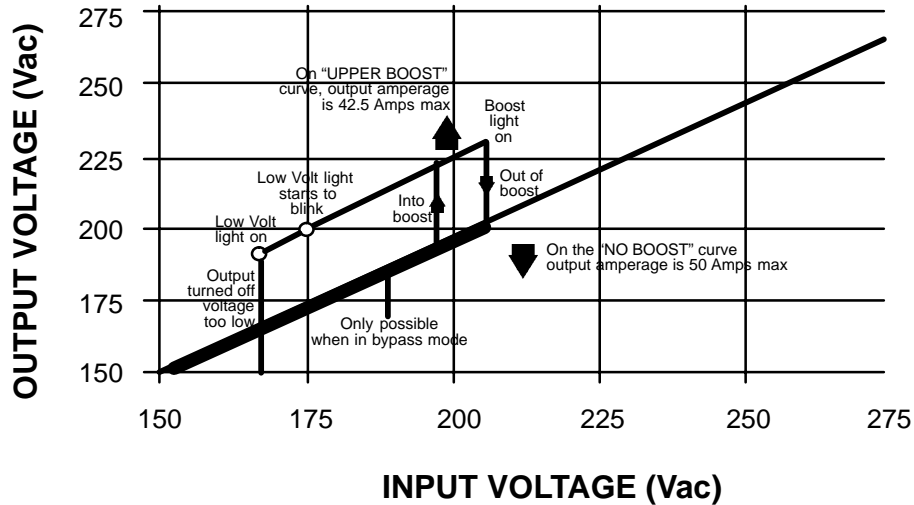
The IsoBoost has automatic 50/60 Hz selecting. The voltage transition points vary with the frequency of the AC input power. Figure 9 shows the 60 Hz transition points. Figure 10 shows the 50 Hz transition points.

Figure 9 and Figure 10 illustrate how the IsoBoost functions.



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

Figure 9. Voltage Chart – 60 Hz



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

Figure 10. Voltage Chart – 50 Hz

Thermal Protection

The IsoBoost is equipped with a built in thermostat (temperature switch) that is embedded in the transformer windings. In the event of sustained overload or overheating due to inadequate ventilation, this device will operate and shut down the unit. When this occurs all control power to the unit is disabled, all 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 thermostat will automatically reset and the IsoBoost 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 IsoBoost. |

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 ISOBOOST

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 IsoBoost 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 IsoBoost, first check all connections and retest. If all connections are good, see if the problem is covered in Table 4. If the problem is not covered in Table 4, or if the IsoBoost still malfunctions after performing the solution given, contact Charles Marine Products for technical assistance.

Table 4. Troubleshooting Suggestions

| Item | Condition | Solution |
|------|---|--|
| 1. | The green (power) light will not come on. | Check breaker(s) in shoreside power pedestal, the boat’s main AC breaker, and the breaker(s) for the IsoBoost. If breaker(s) is 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 low voltage service. In this case, the IsoBoost 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 IsoBoost 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. | Unit will not boost | 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 RGA information (see the section in this manual <i>Warranty & Customer Service</i>). |
| 4. | Unit suddenly stops operating after functioning with a high current draw and all circuit breakers at the dock and in the boat are still in the “on” position. | The thermal protection embedded within the unit may have activated and shut down the unit. This will be more likely to occur in a very hot engine room. Allow the unit to cool. It may take an hour or so for AC power to return. To reduce the units operating temperature cool the engine room and remove some of the AC loads. If power does not return contact Charles Marine Products for technical assistance, repair, and possible RGA information (see the section in this manual <i>Warranty & Customer Service</i>). |

WARRANTY & CUSTOMER SERVICE

Warranty

Charles Marine Products warrants the IsoBoost 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. Complete and return the warranty registration card within ten (10) days of purchase to establish proof of ownership and validate the warranty coverage. 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 IsoBoost 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
2. Ship or mail the IsoBoost 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 IsoBoost to you.

Service Center and Correspondence

To contact the Service Center via telephone directly:

217.932.5288 (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

Correspondence can be sent to Corporate Headquarters via the address below. *Do not* ship an IsoBoost unit to this address:

Charles Industries, Ltd.

Marine & Industrial Group

5600 Apollo Drive

Rolling Meadows, IL 60008-4049

USA

www.charlesindustries.com

SPECIFICATIONS

The physical specifications of the IsoBoost are listed in Table 5.

Table 5. IsoBoost with Softstart Technology Specifications

| Feature | Specification |
|---------------------------------------|--|
| Input Voltage | 208/240 VAC |
| Input Current | 50 Amps-IsoBoost 50 60 Amps-IsoBoost 60 |
| Output Voltage (nominal) | 120/240 VAC |
| Maximum Output Current in Boost Mode | 42.5 Amps-IsoBoost 50 51 Amps-IsoBoost 60 |
| Maximum Output Current Non-Boost Mode | 50 Amps-IsoBoost 50 60 Amps-IsoBoost 60 |
| KVA Continuous | 12.0 KVA |
| Operating Frequency | 50/60 Hz |
| °C Rise Insulation System 220A | 110° C |
| Insulation Class | H |
| % Impedance | 2.14 |
| Operating Temperature | 0° to 50° C |
| Approximate Weight | 235 pounds (261Kg) |
| Length | 18 inches (45.7cm) |
| Width (including mounting feet) | 15 inches (38.1cm) |
| Width (excluding the mounting feet) | 13 inches (33.0cm) |
| Height (with the mounting feet) | 12 inches (30.5cm) |

FCC Statement

FCC Class B: This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: 1.) This device may not cause harmful interference, and 2.) this device must accept any interference received, including interference that may cause undesired operation.

