

# ProSafe Isolation Transformer

## Owner's Manual and Installation Guide



model	description	UL part no.	kilovolt amps	input current	input/output voltage	frequency	output current	size (d x w x h)	weight
21036	ProSafe Isolation Transformer 3.6 KVA	411-SA02-036	3.6 KVA	30 amps	120 VAC	60 Hz	30 amps	6.75" x 7.5" x 9.63"	65 lbs.
21038	ProSafe Isolation Transformer 3.8 KVA	411-SU02-038	3.8 KVA	32/16 amps	120/240 VAC	50/60 Hz	32/16 amps	6.75" x 7.5" x 9.63"	70 lbs.
21040	ProSafe Isolation Transformer 12.0 KVA 60 Hz	411-SA02-120	12.0 KVA	50 amps	120/240 VAC*	60 Hz	25/50 amps	8.5" x 13.5" x 16"	175 lbs.
21042	ProSafe Isolation Transformer 12.0 KVA 50/60 Hz	411-SU02-120	12.0 KVA	50 amps	120/240 VAC*	50/60 Hz	25/50 amps	8.5" x 13.5" x 16"	175 lbs.

\*12 KVA transformer is 220 Volt center tapped

### Important Notice-

**Please do not discard this manual. Carefully read this manual for proper installation and operation instructions of this device.**

**It is essential for the safety of your boating family and other boating families around you that this product be properly installed.**

For all Product, Installation or Service questions please call ProMariner direct at 1-800-824-0524 Eastern Time 8:30am – 5:00pm

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## Introduction

Congratulations on your purchase of the ProSafe Isolation Transformer. The ProSafe Isolation Transformer is designed for 120 or 240 volt input, 120, 120/240 (3 wire) or 240 volt output. The transformers are rated at 3.6, 3.8 and 12 KVA. Additionally, the 3.8KVA model #21038 and the 12KVA model #21042 are 50/60hz compatible in an effort to provide maximum flexibility in various applications. Both the primary (input) and secondary (output) windings may be reconnected for various voltages.

**The ProMariner ProSafe Isolation Transformer has been engineered by Jefferson Electric to meet the below requirements of the ABYC standards:**

11.9.1. If used, an isolation transformer shall be of the encapsulated type and shall meet the requirements of UL 1561, Dry Type General Purpose and Power Transformers.

11.9.1.1. A metallic shield shall be located between the primary and secondary winding and be electrically insulated from all other portions of the transformer.

It shall be designed to withstand, without breakdown, a high potential test of 4000 volts AC, 60Hz, for one minute, applied between the shield and all other components such as windings, core, and outside enclosure.

11.9.1.2. A separate insulated wire lead or terminal identified as the shield connection is to be solidly connected only to the shield, and brought out for external connection and shall be equal to or greater than the aggregate circular mil area of the largest transformer phase conductor(s).

11.9.1.3. The shield and its connection are to be of sufficient ampacity to provide a sustained fault current path for either the primary or secondary windings to ensure operation of the main shore power disconnect circuit breaker when subjected to a fault current level in accordance with ABYC TABLE V - B.

11.9.1.4. The transformer shall be tested and labeled by an independent laboratory to establish compliance with the requirements of E-11.9.

11.9.1.5. The transformer case is to be metallic with a grounding terminal provided.

**For More Information on this or other ABYC standards, please contact the American Boat and Yacht Council:**

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

## Theory of operation- Why you need a ProSafe Isolation Transformer

When properly installed and connected, the ProSafe Isolation Transformer will provide isolation between shore and boat power while maintaining a one to one turns ratio, meaning the shore voltage is equal to boat voltage.

This is a high quality product, however, it is possible to unknowingly abuse or misapply a transformer, therefore reducing its life expectancy. These installation and operation instructions set out the guidelines for peak performance of the ProSafe Isolation Transformer. The information contained in this manual outlines for the user the proper inspection, installation and maintenance required of these transformers.

With the ProSafe Isolation Transformer, a boat's electrical system and common grounding conductor are not connected to the shore-side system. Power is transferred from the shore-side electrical system to the boat's electrical system by magnetic coupling. Specifically, this means there is no direct electrical connection between the shore-side, earth-grounded AC power and the boat's AC power systems. The shore grounding is connected to a shield that is placed between the primary (shore) and secondary (boat) transformer windings. This shield ensures isolation of the boat because of its placement between the primary and secondary windings within the transformer. In the unlikely but possible event a breakdown occurs within the ProSafe Isolation Transformer, the shield can bear the fault current of a properly sized shore supply circuit breaker long enough for the breaker to trip.

Properly installed, the ProSafe Isolation Transformer will electrically isolate AC shore power from the boat's AC power system, reducing galvanic corrosion due to a direct AC shore power connection. This occurs because grounding one leg of the transformer secondary on board the boat results in the establishment of a "neutral" ground. When the ProSafe Isolation Transformer is properly installed, shoreline polarity is no longer a concern and the use of a galvanic isolator is not needed.

Additionally, ProSafe Isolation Transformers are engineered to supply superior line noise reduction and spike suppression, providing high quality AC power from less than perfect power sources.

## **TRANSFORMER DESIGN FOR SOUND REDUCTION**

ProSafe Isolation Transformers are "sound-controlled" in construction so that sound levels consistent with industry standards are achieved. Transformer coils are precision wound under measured constant tension to insure continual, vibration-free performance. Low noise levels in the core are maintained by using specially designed clamps for bolting the core into a tight unified assembly. All clamping bolts are tightened to an optimum torque level. Additional sound reduction is realized by impregnation with polymerizing varnish cured by a special baking process. Cabinet styles have their core and coils mounted to the cabinet on neoprene pads for reduction of conducted sound. The case is formed and assembled using dampening agents to reduce transmitted sound. The result is ultra quiet operation for the user.

## Installation Warnings

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### **SAFETY FIRST-**

Follow all precautions in the important safety instructions section in this manual. Pay close attention to the DANGER, WARNING and CAUTION boxes within this manual and labeled on the unit.

### **WARNING:**

**ELECTRICAL POTENTIALS HAZARDOUS TO HUMAN LIFE CAN EXIST WITHIN THIS EQUIPMENT WHEN ENERGIZED. DISCONNECT ALL INPUT POWER BEFORE OPENING CASE OR TOUCHING INTERNAL PARTS. USE PROPER LOCK-OUT / TAG-OUT PROCEDURES. THE INFORMATION CONTAINED HEREIN MAY NOT COVER ALL VARIATIONS IN EQUIPMENT OR PROVIDE FOR ALL CONTINGENCIES WHICH MAY BE MET DURING INSTALLATION, OPERATION AND MAINTENANCE.**

### **INSPECTION UPON RECEIVING**

Transformers should be carefully inspected upon receipt to ensure that no damage has occurred during shipment. Any damage should be reported at once and a claim placed against the transportation company.

### **INSPECTION DURING INSTALLATION**

The transformer should be carefully inspected for any damage due to handling after receipt. The nameplate rating on the unit should be checked against the job specifications to ensure installation of the correct transformer. The transformer should be connected only as described on the label found on the inside of the transformer cover or as shown in this manual.

Taps should be adjusted, if necessary, to match the available line voltage. Any bolted electrical connections, including taps, should be checked and tightened since fasteners may have loosened during shipment.

### **Warning- Fire Hazard**

Primary and secondary over-current protection and conductor sizing must be in accordance with ABYC recommendations.

### **Warning- Fire Hazard**

Do not store any equipment on or next to transformer; The ProSafe Isolation Transformer is designed to operate hot and must have free air flow to prevent over heating or damaging of neighboring objects.

### **Warning- Shock Hazard**

In-water and on board shock hazard; The ProSafe Isolation Transformer must be connected in accordance with these installation instructions.

### **Warning- Electrical Shock and Fire Hazard**

The ProSafe isolation transformer is designed for installation inside an engine room or similar compartment inside the boat. Assure that the location of installation will not be subject to rain, snow, excessive moisture or excessive heat.

**Warning- Installation Precaution** Boat wiring should only be done by qualified personnel as it can cause shock, corrosion and other hazards if not done properly. For more information on this subject contact the **American Boat and Yacht Council (ABYC)**.

## **Installation & Operating Safety**

ProSafe Isolation Transformers are provided with an access cover to facilitate installation and should never be operated without this access cover securely mounted in place.

**CAUTION: ONLY QUALIFIED PERSONNEL SHOULD INSTALL, INSPECT, OR MAINTAIN TRANSFORMERS SINCE THE NORMAL OPERATING VOLTAGES CAN BE HAZARDOUS.**

### **INSTALLATION OF THE TRANSFORMER**

In addition to fore mentioned safety concerns, proper installation of the transformer is required to insure quiet transformer and prevent the development of objectionable sound levels. The following installation rules are to be followed for a quiet Installation:

- Consider the installation and location of the transformer before engaging in installation. Modifications to correct sound can be expensive.
- Place sound dampening pads between the transformer and its mounting surface.
- Install transformer as far away as possible from any area where sound is objectionable.

### **TRANSFORMER LIFE**

Transformer life is dependent upon the thermal degradation of the insulation system which in turn is dependent upon the winding temperature and duration of operation at that Temperature.

Factors which affect transformer life are line voltage, load current, load cycle, ambient temperature, and other environmental conditions such as moisture, corrosive atmosphere, vibration, and maintenance. Normal conditions of operation are covered in this manual and in various industry standards.

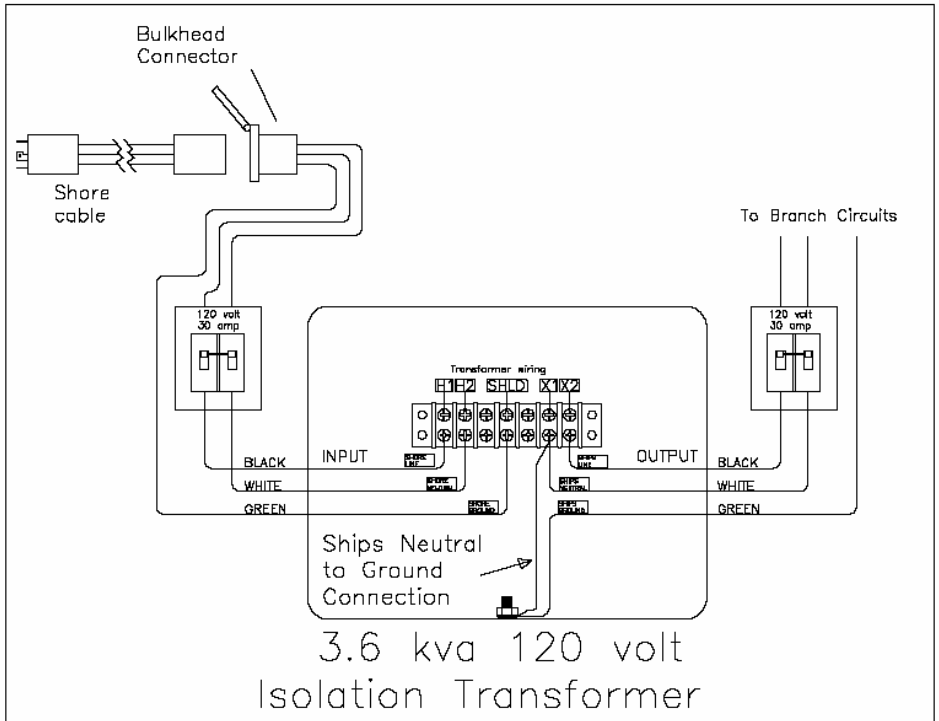
### **CIRCUITS, TAPS AND CONNECTIONS**

The ProMariner ProSafe Isolation transformer has up to four input and four output terminals. Four input terminals accommodate a single input voltage when inter-connected. Four output terminals provide a single output voltage or two voltages and a neutral when inter-connected.

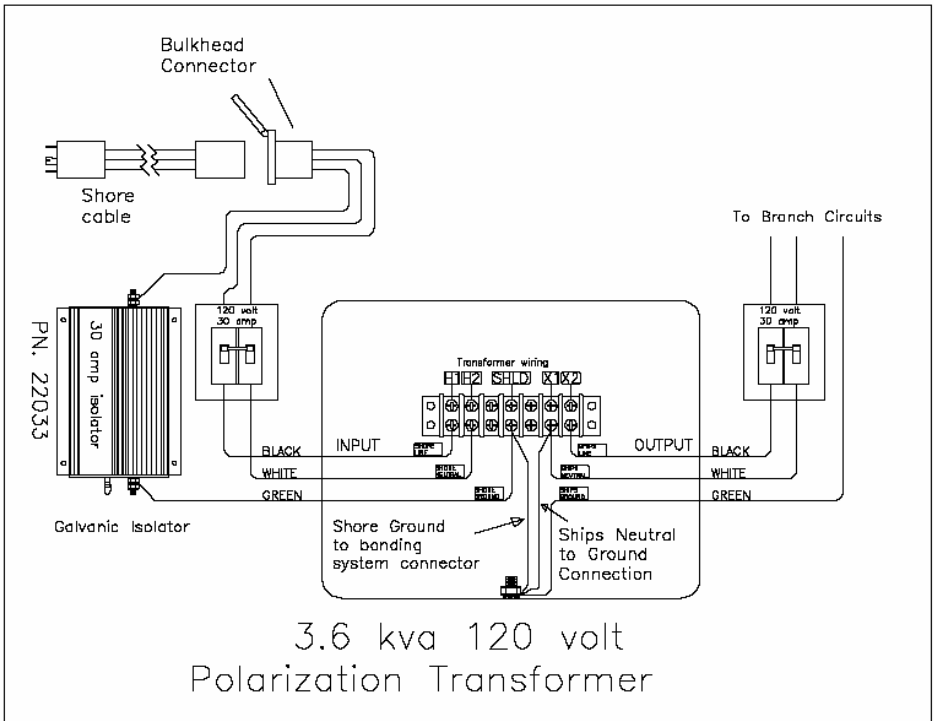
**Connections:** Input and output wires must be connected to their respective terminals with an appropriately sized lug rated for the input or output current.

**The following wiring diagrams are sample configurations that can be used with the ProSafe Isolation Transformers:**

# 30 amp/120volt/60hz U.S. Isolation Transformer Wiring Diagram using 3.6 kva Transformer

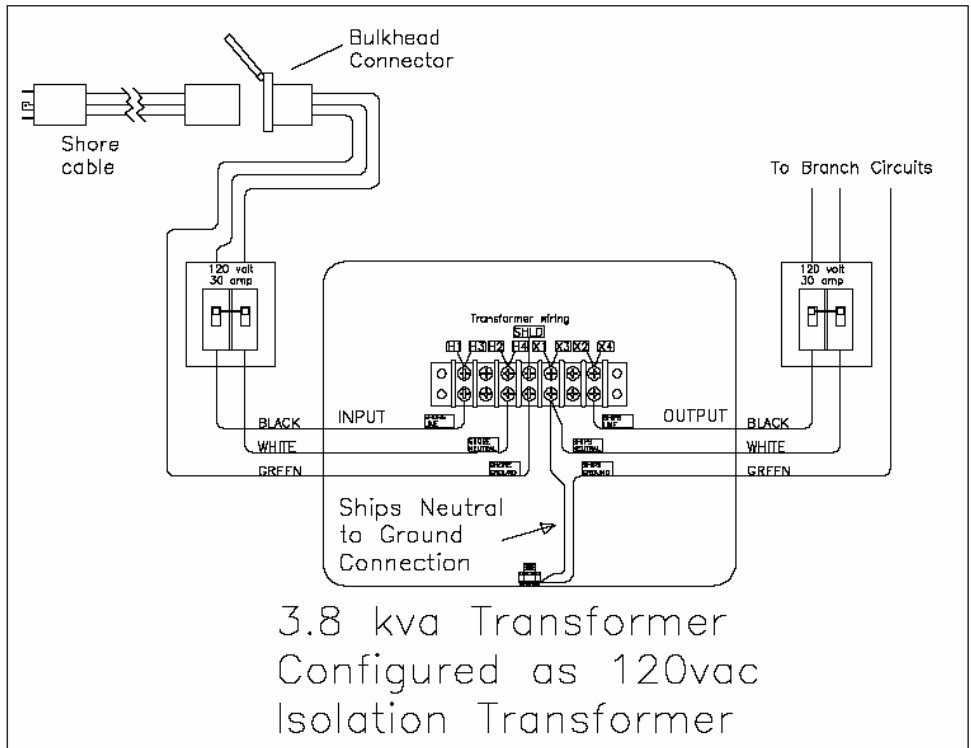


# 30 amp/120volt/60hz U.S. Polarization Transformer Wiring Diagram using 3.6 kva Transformer

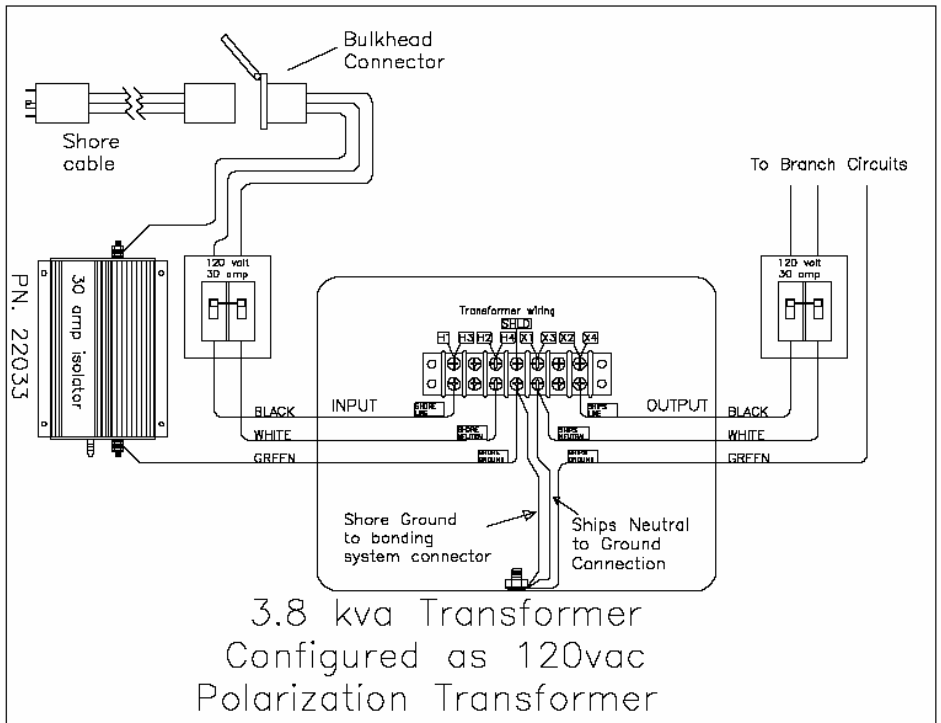




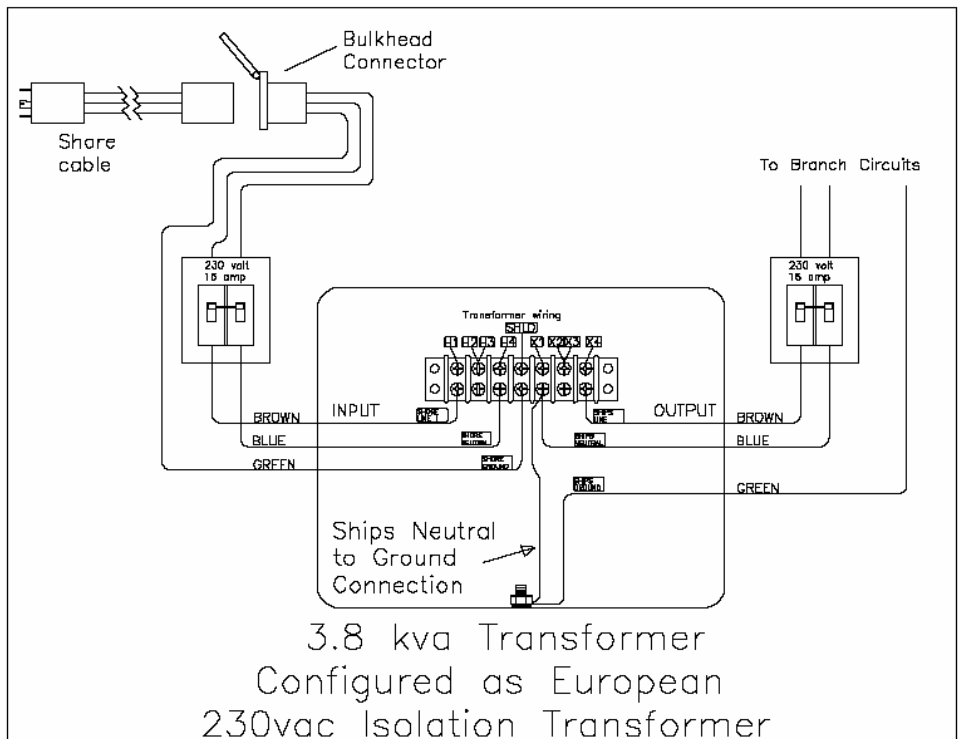
# 30 amp/120volt/60hz U.S. Isolation Transformer Wiring Diagram using 3.8 kva Transformer



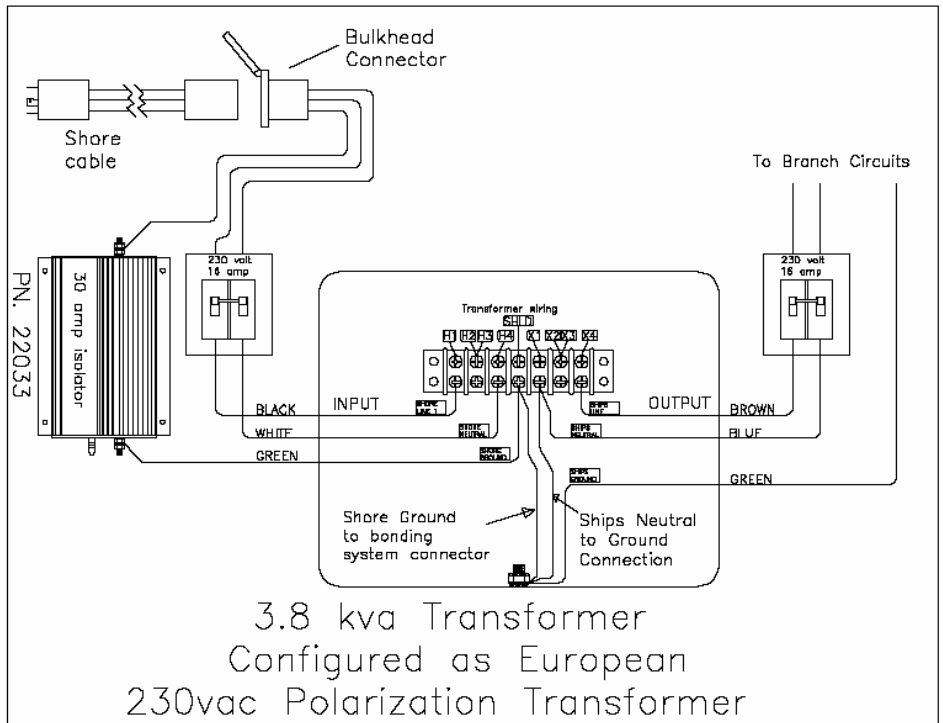
# 30 amp/120volt/50hz U.S. Polarization Transformer Wiring Diagram using 3.8 kva Transformer



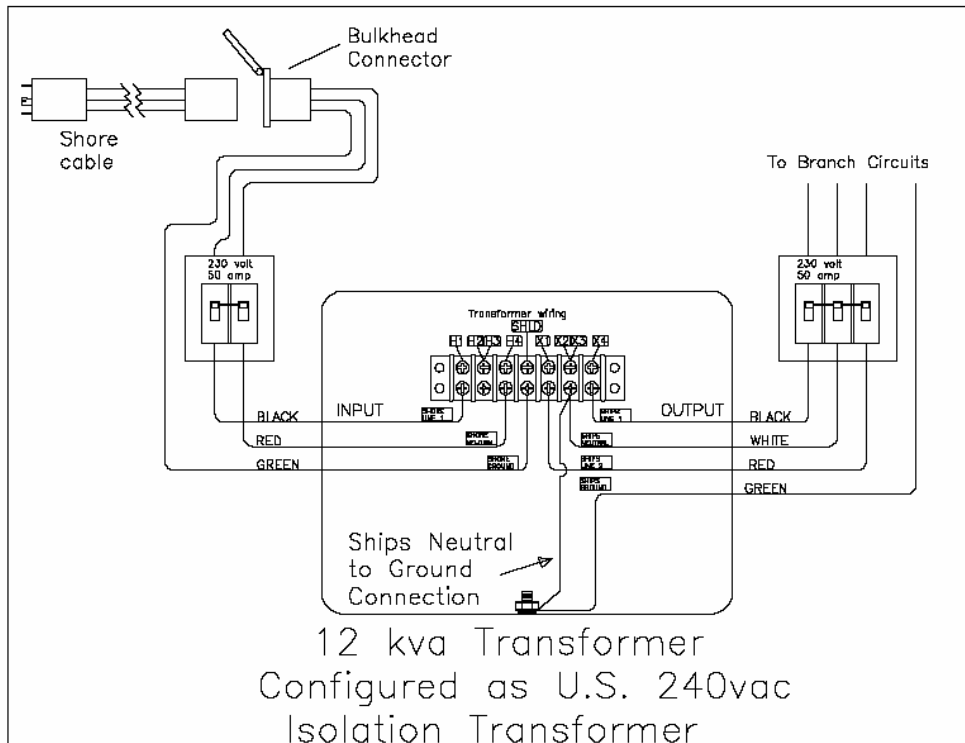
# 16amp/230volt/50hz European Isolation Transformer Wiring Diagram using 3.8 kva Transformer



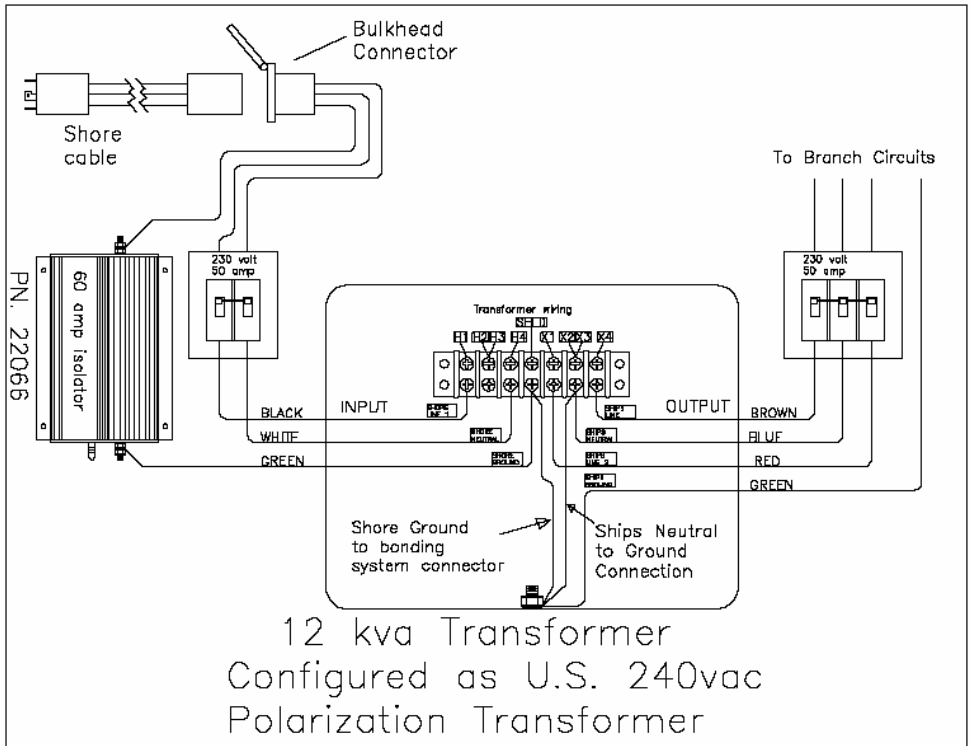
# 16amp/230volt/50hz European Polarization Transformer Wiring Diagram using 3.8 kva Transformer



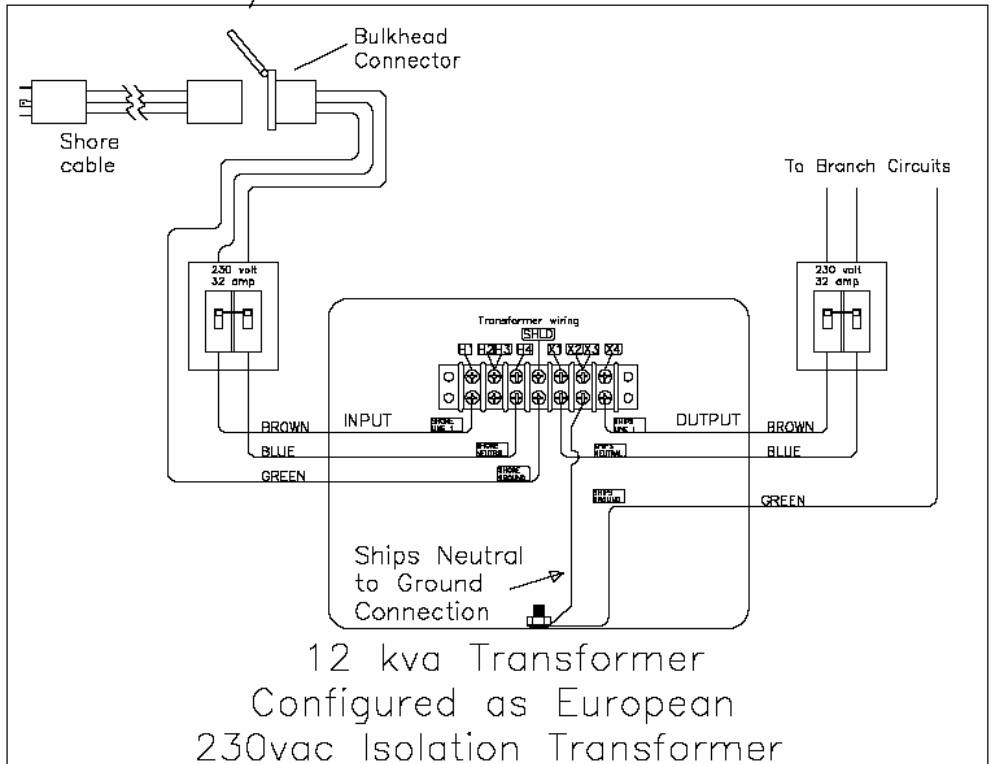
# 50amp/240volt/60hz U.S. Isolation Transformer Wiring Diagram using 12.0 kva Transformer



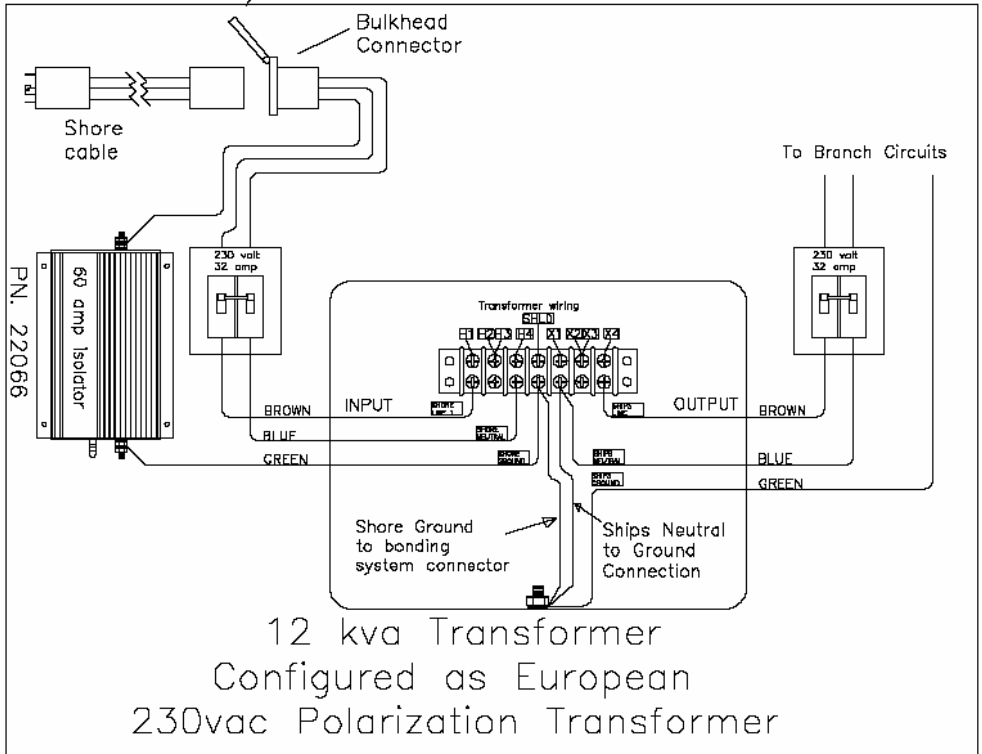
# 50amp/240volt/60hz U.S. Polarization Transformer Wiring Diagram using 12.0 kva Transformer



# 32amp/230volt/50hz European Isolation Transformer Wiring Diagram using 12.0kva 50/60hz Transformer

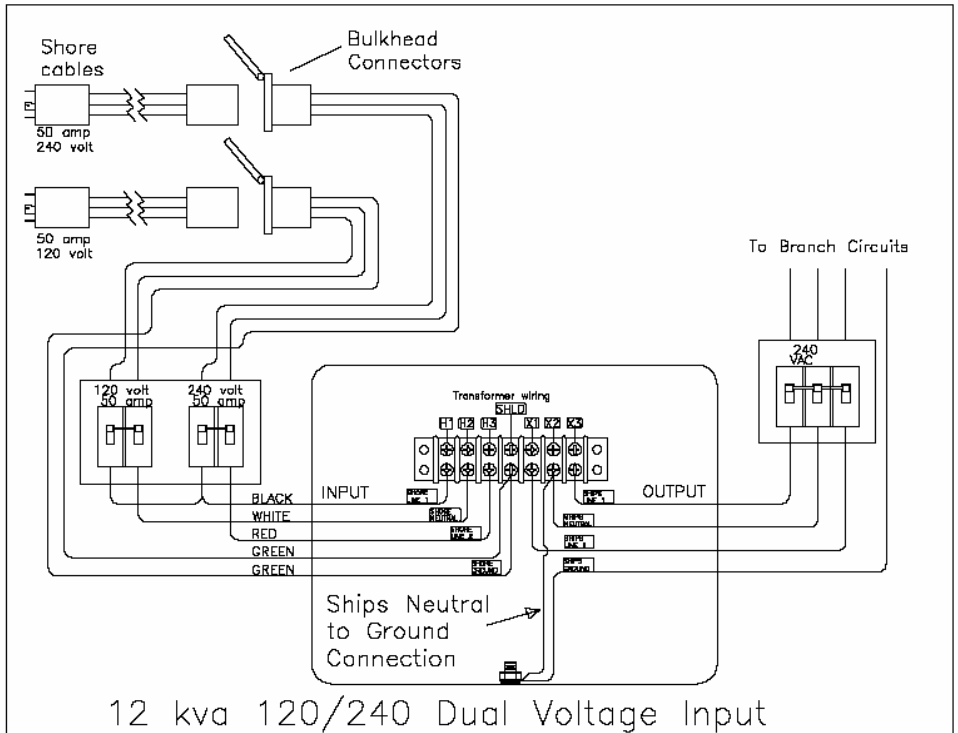


# 32amp/230volt/50hz European Polarization Transformer Wiring Diagram using 12.0kva 50/60hz Transformer





50amp/240volt/60hz or 50 amp/120volt/60hz  
"INPUT" U.S. Isolation Transformer Wiring  
Diagram using 12.0 kva Transformer



## **MAINTENANCE**

**CAUTION - Because of the presence of deadly high voltages troubleshooting should be done by qualified service personnel only.**

ProMariner's ProSafe Isolation Transformers contain no moving parts and require very little maintenance because of their rugged and durable construction. Periodic inspection and care are recommended practices especially if the transformer is operating in a harsh environment.

### **CAUTION:**

**ALTHOUGH TRANSFORMERS ARE STATIC DEVICES, IT IS NECESSARY TO USE FORETHOUGHT COUPLED WITH CARE IN INSTALLATION. THIS WILL RESULT IN SATISFACTORY PERFORMANCE OVER A LONG PERIOD OF TIME. THE MINIMUM REQUIREMENTS FOR INSTALLATION AND MAINTENANCE AND LIMITATIONS OF OPERATION HAVE BEEN SET FORTH IN THIS MANUAL.**

**FOLLOWING THESE PROCEDURES WILL RESULT IN SATISFACTORY PERFORMANCE, WHEREAS DISREGARDING THEM CAN VOID THE WARRANTY.**

The inspection for loose connections, condition of terminal board, overheating, rust, paint deterioration, and general condition of the unit by a qualified service technician is recommended. Corrective measures should be taken if necessary.

If there is a problem with your ProSafe Isolation Transformer, first check to see all connections are accurate and secure, and then retest. If all connections are good, contact ProMariner for technical assistance.

Removal of dust, dirt and debris from the external enclosure surfaces is encouraged and may be performed while the transformer is in operation. (Do not use water)

Internal maintenance would include:

1. Inspection and tightening of bolted connections.
2. Removal of dirt can be accomplished using a vacuum cleaner or low-pressure (<20 psi) dry compressed air.

## THE FOLLOWING IS FOR QUALIFIED SERVICE TECHNITIONS ONLY-

**If a ProSafe Isolation Transformer is being inspected, cleaned or worked on, the following safety steps must be observed to prevent serious injury or death due to the presence of potentially lethal high voltage:**

- 1) Remove all power from the sources in the primary and secondary circuits.
- 2) Remove all fuses from the power source. Additionally, trip circuit breakers and take appropriate action to prevent the accidental resetting of the circuit breakers.
- 3) Short out transformer secondaries before connecting and disconnecting equipment.
- 4) To prevent potentially lethal high voltage & current levels, always connect a load to the secondary side of the transformer before applying power to the primary. A voltmeter connected with alligator clips is an excellent high-resistance load.

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21042	ProSafe Isolation Transformer 12.0 KVA 50/60 Hz	411-SU02-120	12.0 KVA	50 amps	120/240 VAC*	50/60 Hz	25/50 amps	8.5" x 13.5" x 16"	175 lbs.

\*12 KVA transformer is 220 Volt center tapped

## ➤ Customer Service & Warranty

We are committed to customer satisfaction and value your business. If at any time you experience a problem with your new ProSafe Isolation Transformer simply call us at 1-800-824-0524 for technical support.

### **ProSafe Isolation Transformer Five Year Limited Factory Warranty**

Each product is guaranteed against defects in material and workmanship to the original consumer in normal use for five full years from the date of purchase. Professional Mariner, LLC will at its discretion will repair or replace free of charge any defects in material or workmanship. The following conditions apply:

- **Warranty is calculated from date of manufacture if not registered within two weeks of sale. (Register your product at [www.promariner.com](http://www.promariner.com))**
- **Warranty void if unauthorized repairs were attempted.**
- **Customer is responsible for returning the product to Professional Mariner, LLC. Inbound shipping costs must be prepaid.**
- **This warranty does not cover blemishes due to normal wear and tear or damages caused by accidents, abuse alterations or misuse.**

Purchase or other acceptance of the product shall be on the condition and agreement that Professional Mariner SHALL NOT BE LIABLE FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES OF ANY KIND. (Some states do not allow the exclusion or limitation of consequential damages, so the above limitations may not apply to you.) This warranty is made in lieu of all other obligations or liabilities on the part of Professional Mariner. Professional Mariner neither assumes nor authorizes any person for any obligation or liability in connection with the sale of this product.

To make a claim under warranty, call our customer service line at 1-800-824-0524 or write directly to Professional Mariner, LLC at P.O. Box 968, Rye, NH 03870, identifying the product and describing the application used in. Follow the company's return policy, which will be provided by the company. Professional Mariner will make its best effort to repair or replace the product, if found to be defective within the terms of the warranty, within 30 days after return of the product to the company. Professional Mariner will ship the repaired or replaced product back to the purchaser.

This warranty provides to you specific legal rights and you may also have other rights, which vary from state to state. This warranty is in lieu of all other, expressed or implied.

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P.O. Box 968  
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Fax: (603) 433-4442

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Factory Service Center  
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Factory Service  
TEL: 1-800-824-0524  
8:30 - 5:00 Eastern Time  
[www.promariner.com](http://www.promariner.com)

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