

MARINE ISOLATION TRANSFORMERS

BY BRIDGEPORT MAGNETICS GROUP

In 2017 NEC lowered the maximum permitted ground fault protection for boats on shore-power from 100mA to 30 mA

Leakage current varies from boat to boat. Unfortunately, even with all electrical systems in good working order it will often exceed 30 mA. This will trip the GFI circuit breaker in the pedestal and leave the boat without power to operate the bilge pump.

The solution is to install a Marine-Puck on your boat

Background-

Marine-Puck boat isolation transformers share the construction and general principles of our **Iso-Puck** program of Medical grade Isolation transformers. **Iso-Puck** (www.isopuck.com) are used by medical device manufacturers and in health care facilities to protect patients and staff from life threatening shocks caused by faulty insulation in wiring and equipment. **Iso-Puck** transformers comply with the strict UL/IEC 60601 standard for medical equipment.



Boats on Shore Power

In a boat, plugged in to a shore power pedestal an isolation transformer eliminates any electrical continuity between the electrical grid and the boat. Shore power is fed to the primary windings and electrical systems on board are connected to the secondary windings, completely isolating the boat from Shore Ground and preventing any unsafe situation. The isolation eliminates possible galvanic corrosion of metal hulls and outboard engine components. It also prevents nuisance tripping of shore installed GFI (ground fault interrupt) systems when the boat is on shore power.

Marine-Puck transformers feature a toroidal isolation transformer, which is embedded in solid Epoxy resin and contained in a cup shaped Polycarbonate (LEXAN) enclosure. Shore side and boat side power cords protrude from the epoxy potting material and seal the transformer hermetically from the outside meaning that the transformer can be mounted on board, inside or outside onto a deck or bulkhead wherever convenient. Installing a Marine-Puck lowers leakage current to less than 1 milliampere, far exceeding the protection level of any commercial GFI device.

There are several advantages of using toroidal transformers versus conventional transformers on board a vessel.

- Toroids are 30-50% lighter and more compact.
- They are more efficient, cooler running.
- They are quiet. No annoying hum while drawing shore power.
- When resin encapsulated in a non-metallic enclosure they are double insulated (class II devices). No ground connection or neutral bond is required on either side.

Marine-Pucks are mounted by means of a central through carriage-bolt or lag screw. They are prevented from rotating by means of a single stainless fastener through a tab at the periphery.

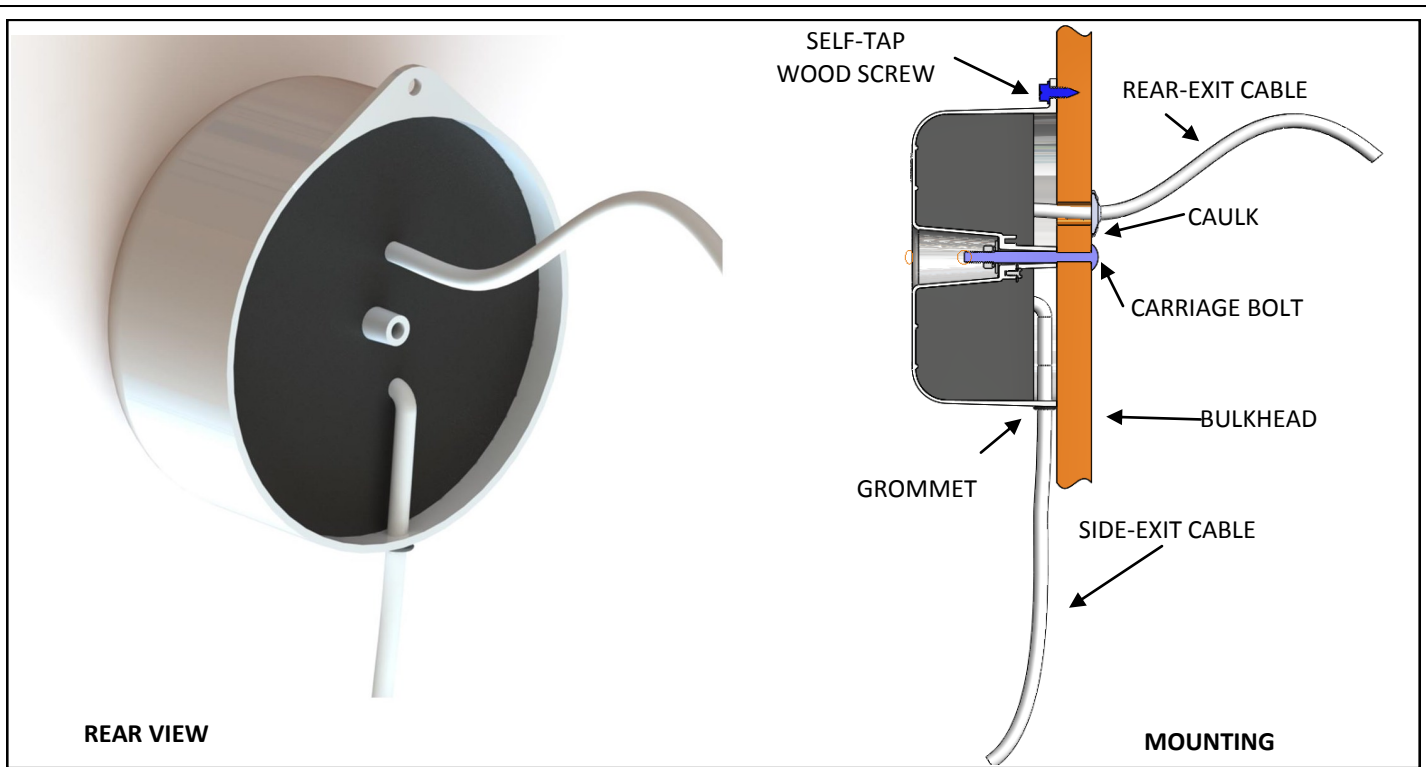
Input and output cables can exit from the rear through pre-bored holes in the deck or bulkhead, or holes can be field drilled (using a step drill) in the **Marine-Puck** lower rim. Grommets are included.

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Specifications	MP 3.6 (3.6kVA)	MP 6 (6kVA)	Dual MP 6 (12 KVA)
Input voltage 60Hz AC	120V or 240V	120V or 240V	240V
Input current	30A or 15A	50A or 25A	50A
Output voltage	120V or 240V	120V or 240V	120V or 240V
Output current	30A or 15A	50A or 25A	100 or 50A
Impedance %	2.8	2.8	2.8
KVA Continuous	3.6	6.0	12.0
Insulation class	B 130 C	B 130C	B 130C
Hi-Pot test voltage	4000V AC RMS	4000V AC RMS	4000V AC RMS
Ambient temperature	-20 to +40 deg. C.	-20 to +40 deg. C	-20 to +40 deg. C
Dimensions	10"OD x 5" ht.	12.6"OD x 6.5" ht.	2 x 12.6" OD x 6.5" Ht.
Approximate weight.	45 lbs.	75 lbs.	150 lbs.
Main mount.	3/8" carriage bolt	1/2" carriage bolt	2 pc. 1/2" carriage bolt

Marine-Puck mounts on top of or below deck or on a bulkhead, internally or externally. Input and output cables may exit from the rear through the mounting surface or from the side of the **Marine-Puck** near the lower rim in any orientation

Marine quality sealed input and output cables feature 4 conductor 12AWG stranded, color coded leads.

Installation: Marine-Puck may be user configured by connecting the dual 120V primary and secondary windings in parallel or in series when hard-wiring into input side or output side circuit breakers.

A pre-magnetizing circuit prevents nuisance tripping of the input circuit breaker due to inrush current surge .

WIRING DIAGRAMS

