

# GALVANIC ISOLATOR ASSEMBLY INSTRUCTIONS

## PARTS YOU WILL NEED.

2 Bridge rectifiers.

Aluminum heatsink - you need at least 30 square inches per side. Thickness should be at least 1/8" to provide thermal conductivity. It can be any shape but a piece of 2" x 2" x 12" aluminum angle extrusion is ideal.

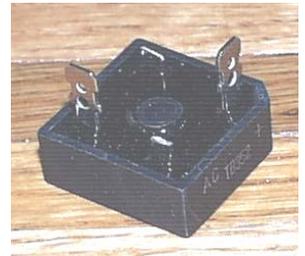
2 pieces of # 8 or #6 gauge marine grade stranded wire. One to reach from the service entry ground terminal to where you will mount the isolator. One to connect to the cable that you will remove from that terminal. You could solder or crimp directly to this wire if you want. If you have any choice, these wires should be green for correct identification.

2 of #10-24 x about 7/8" stainless bolts with nuts, length depending on the heat sink thickness.

Mounting screws for the final installation. Since the supplied rectifiers are isolated from the heatsink, there is no concern about insulating the heatsink from any boat hardware.

## ASSEMBLY.

Identify the terminal near the corner that is beveled. This terminal is also oriented at right angles to the other three and marked +. You will retain this terminal and the terminal diagonally opposite and cut off the other two on both rectifier bridges - they are not used and cutting them off makes room for the wire with less chance of shorting.



Space the rectifiers about 4" apart on the heatsink and drill the mounting holes. Drill two holes in the other side of the angle for mounting to the boat. Remove any burrs and attach the rectifier bridges to the heatsink. If you have a little heatsink compound, or even a little white grease under them to seal any air cavities it will help but it is not essential. Be very careful not to get any grease on the terminals or you will have trouble soldering later. Orient them so one beveled terminal on one is opposite the non beveled on the other.

Solder each lead so it connects to the beveled terminal on one and to the non-beveled on the other.

Alternatively you could split the conductors 50-50 and crimp a quick connect terminal on each half which then gets pushed onto the appropriate pair of terminals.



# DIY GALVANIC ISOLATOR INSTALLATION

## **DISCLAIMER:**

This is a do-it-yourself construction. The function of the isolator in the ground circuit of your boat can be critical for safety. If you are not confident in your ability to assemble and install this device you should seek professional help. Yandina's responsibility is limited to the warranty on any components provided. Beyond that, the user takes full responsibility for the quality of construction and the regular testing.

## **HOW IT WORKS:**

The Galvanic Isolator puts two silicon diodes in series with the ground connection of your shore power connection. Each diode provides 0.6 volts isolation to DC electrolysis currents for a total of 1.2 volts. An additional set of diodes provides protection for the opposite polarity.

If you get a wiring fault on your boat, the voltage from the fault will exceed the 1.2 volt threshold so the isolator goes into conduction and conveys the fault current back to the shore power outlet, but small voltages are insulated.

Wiring faults can be divided into three classes.

## **1. High current short circuit.**

In this case, hundreds, or even thousands of amps are suddenly placed on the ground lead and have to be conducted through the isolator. These currents will trip the circuit breaker very rapidly. The isolator diodes will withstand these currents long enough to trip the breaker.

## **2. Medium current short.**

This is usually a wiring error where the returning current is going through the ground wire instead of the neutral. The current is coming from a normal load so it will be usually limited to something less than the circuit breaker rating (30 or 50 amps). Since the breaker won't trip on this current, the isolator has to be able to withstand this current continuously. A B Y C recommendations require a capacity of 135% of rated current or 67.5 amps for the 50 amp circuits. Our isolator is rated for 70 amps AC continuous. Considerable heating will occur if it is carrying maximum current for an extended period.

## **3. Low current short.**

This is typically leakage to ground from an appliance or device that has got wet. These currents are quite small and the ground connection prevents the

device from giving you a shock. Although the isolator will carry these currents with no problem, you should avoid using this capability for an extended period since the galvanic protection is not being provided when it is conducting AC current to ground.

## **INSTALLATION:**

The Galvanic Isolator is connected in series with the green ground wire that connects to your shore power inlet. If you have multiple shore power inlets, join the green wires together and connect them to one side of the isolator. The circuit is insulated from the aluminum frame so you can mount it directly on conducting surfaces. The location should be DRY since this isolator is not waterproof. Keep in mind that under certain (unusual) circumstances the aluminum heatsink can get VERY hot. The mounting, therefore should have adequate ventilation and mounting it securely to a heat conducting surface will reduce the maximum temperature reached. No protection is needed from the wiring as all voltages are less than 2 volts.