

## Why use an Isolation Transformer?

Galvanic corrosion is a problem for all boat owners. If not dealt with, metals in contact with the water may disintegrate. Your galvanic protection system which, for most boaters, consists of a sacrificial anode of Mil Spec Zinc installed under the water and internally wired to all metal fittings that are submerged or partially submerged under the water. The internal wiring is called a "bonding" system.

When you utilize AC Shore Power onboard the boat you are electrically connecting your boat to your marina neighbors and the marina docks and metal objects. The connections are made via the water and via the shore power safety ground.

In a perfect world this would not present a problem. Everyone would be equipped with a galvanic protection system that would take care of their boats only. In the real world this will never happen unless every one takes their boat out of the water.

To reduce or eliminate any interaction between neighboring boats and/or the marina itself, you need to have some method of "Isolating" your boat. The most common method of isolation is to install a "Galvanic" isolator into the shore power safety ground. The only thing this galvanic isolator does is block all low voltage (under approximately 1.2vdc) DC currents from flowing in the shore power safety ground wire. The galvanic isolator does an adequate job for the majority of installations.

One of the problems that the galvanic isolator can not handle is any DC voltage faults that are over approximately 1.2VDC. The current just flows and things still can be destroyed. **The Marine Isolation Transformer** eliminates this problem as the Safety ground wire that is incorporated into the boats wiring does not connect physically to the shore side wiring. The isolation transformer eliminates all physical electrical connections between the boats wiring and the shore wiring.

The ABYC (American Boat and Yacht Council) has recently introduced a new standard for "Galvanic" isolators. The new standard requires that approved "Galvanic" isolators be equipped with a "Status Monitor". While this capability is possible it is very expensive and it does not change the limitations of this technology. The cost of a galvanic isolator with status monitor will be very close to the price of the new Charles IsoGuard marine isolation transformers.

Marine Isolation Transformers also give you protection for your onboard electrical/electronic systems from potential shore side hazards including voltage transients, spikes and noise. There is also no need for galvanic isolators or polarity alarms.

Caution: Standard "Polarity" transformers do not meet the marine specifications. Because of the special wiring required to install the Marine transformer into the boats wiring system. Two of the items that are required in a "Marine" transformer is that the core of the transformer is insulated from the mounting enclosure. The Charles transformers are totally encapsulated to accomplish this. (Encapsulation also makes the transformer very quiet.) The other item is a full current carrying shield. Non-Marine transformers may have shields but they are intended to act as a "noise" type shield and are very light weight and in most cases are not capable of carrying the full current rating of the transformer. Because they can not carry the full current that could be present in a fault condition they could cause an open circuit and render the safety ground system non operative. This could present the possibility of a shock hazard.