

Stray Current and Your Boat

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If you connect your boat to shore power be aware that you need to protect your boat from damaging effects of galvanic corrosion between your boat, your neighbor's boat and the marina. We all have sacrificial zincs on many areas of the boat and when they are being sacrificed too quickly you have the potential of stray current. Understanding how this happens is technical and confusing but the solution is pretty simple. You need to require some method of "isolating" your boat from stray current. There are two choices to accomplish this, Galvanic Isolator or an Isolation Transformer. So, what is the difference between the two choices?

Galvanic Isolators are inexpensive and simple to install but can fail thus requiring regular checking. Isolation Transformers are far more expensive and very heavy but rarely fail. Let's look at each choice.

Galvanic Isolator. The most common method is to install a galvanic isolator to the shore power safety ground (e.g. Green Wire). This will block all low voltage DC current from flowing in the shore power safety ground wire, thus protecting your boat from other boats, the marina and other boats from your boat. It breaks the corrosion current path and isolates your boat thus preventing some sources of corrosion while keeping the safety grounded connected. It is important to use "fail Safe" galvanic isolators. Non "Fail Safe" isolators typically disconnect the AC ground when they fail, removing the safety grounded protection which is what you should do. Galvanic isolators only protect up to 1.2 VDC and there are possibilities you can have higher VDC which will allow corrosion to take place even though your galvanic isolator is functioning correct, but is rare.

I recommend the Promariner Prosafe galvanic isolator which is available in 30 or 50 amp models. The 50 amp model will support 2 30amp shore connections. Testing a galvanic isolator is a simple process and needs to be done to ensure you have the protection you need. They don't always survive lightning strikes or breaker trips but they are a great option to protect your boat.

Isolation Transformer. Isolation transformers block all DC voltage and in addition also addresses reverse polarity issues. This is a much better option but... A 30 amp transformer can weigh almost 100lbs while a 50 amp unit almost 300lbs. In the future new changes to the standards for transformers allow for high frequency transformers for our smaller boats which will greatly reduce the weight and make them more popular. So, if you can afford the higher price, higher weight

and size these are the best option and should be used. A popular brand for isolation transformers for boat builders is Charles Industries.

If your boat is connected to shore power and is in salt water, you must have some kind of protection for your boat, at the very least install a “fail safe” galvanic isolator on your boat. Your boat and neighbors’ boats will appreciate the protection this provides.

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