

KEVO'S BOATING TIPS & MORE

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Power Inverters

Over the last few years, marine power inverters have become more and more sophisticated to accommodate recreational boaters' increased demands for AC power anytime and anywhere. Technical advancement is taking onboard power management to new levels and bringing with it new features and challenges to consider when choosing the right model for your nautical needs.

Marine power inverters convert DC power into AC power. They are designed to run standard business and household appliances when shore power is not available or when running a generator is impractical or inappropriate.

How to Choose the Right Inverter

Many factors go into choosing the right power inverter. First of all, consider your power needs. To do this you need to add up all of the power usage from all of the appliances you plan on using at the same time on your vessel. For instance, if you have a TV that requires 200 watts of power and a microwave requiring 1,200 watts of power and a coffee maker that requires 150 watts, you will probably want a converter with at least 2,000 watts of power.

What to Look for:

WAVE FORM: There are basically two types of AC power produced by today's marine inverter systems: Modified Sine Wave (MSW) and True Sine Wave (TSW).

MSW AC power is sufficient to run most run-of-the-mill appliances found on vessels, such as hair dryers and coffee makers. However, this type of power may not work well with sophisticated electronics like plasma TVs and high-quality stereo systems. You may get lines running across the screen of the TV or background noise on your stereo.

TSW inverters have historically been more expensive than MSW inverters, but the price of TSW inverters is coming down. TSW inverters provide "utility quality" AC power.

SURGE CAPABILITY: Many appliances such as TVs require a "surge" of power to start up well beyond the operational needs of the appliance. For instance, a TV requiring 200 watts of power may temporarily need 600 watts of power to turn on. If it doesn't get the power, it won't turn on. An inverter's surge rating is typically two or three times its continuous power rating.

REMOTE CONTROL: A remote control panel is another important consideration when choosing an inverter, because it provides convenient control of the inverter from inside the cabin. Remote control panels

are generally a necessity with large, hardwired inverters since this is the only way to do advance set-up and system monitoring. Sophisticated inverter/chargers can have remotes with large LCD screens to display status and provide inverter operation and configuration, without having to go to the inverter itself. This is

especially important if the inverter is located in a hard-to-reach location.

INVERTER LOCATION: There are three major issues to address when choosing the best location to mount an inverter on a vessel. First, it should be positioned no more than 10 feet from the (inverter) battery banks. If it is farther than 10 feet, voltage may drop, requiring oversized gauge wiring. Second, it should be located in a cool, dry and well-ventilated place. Finally, inverters are not "ignition protected." This means they should not be located in the engine compartments of gasoline-powered vessels. However, it is safe to mount an inverter in the engine compartment of a diesel-powered vessel.

BATTERY SELECTION: High-quality, deep-cycle batteries using wet, gel or AGM (Absorbed Glass Mat) technologies are recommended. Deep-cycle batteries are designed specifically for a deep discharge and rapid recharge. Ignition batteries should not be used with large inverter applications.

INVERTER/CHARGERS: Most large inverters do more than just invert DC power to AC power; many also include a battery charger and an AC transfer switch. Integrating these components offers convenience and cost advantages. For example, when external AC power is available, the inverter/charger routinely recharges the house and ignition batteries and allows surplus AC power to pass through and power downstream AC loads such as TVs. When AC power is disconnected, the unit immediately inverts DC power to AC electricity. This switching process is automatic and the installation is less expensive and simpler than installing multiple products to accomplish the same goal.

When evaluating chargers, look for the "multi-stage" units that use power-factor-corrected charging techniques to recharge deep-cycle batteries. Multi-stage charging recharges the batteries in three distinct phases: bulk, absorption and float. Each stage of the recharge process has precisely regulated voltage and current levels to ensure accurate recharging without risk of overcharging and battery damage. This process is highly recommended when charging deep-cycle batteries. In fact, some



Xantrex Inverter/Charger Remote Control Panel.

battery manufacturers require their batteries to be charged with three-stage chargers for their warrantee to be valid.

Power-factor-corrected chargers are recommended because they charge batteries faster than a regular charger can. These types of chargers are more efficient and effectively minimize the amount of AC power needed to fully recharge batteries. As a result, more of the incoming AC power is available to support other AC loads needing power during the charging process, which in turn helps reduce the chance of an overload and a tripped circuit breaker.

Battery Capacity

Inverters must have enough battery capacity to make them useful without having to constantly recharge.

Most appliances and electronic equipment indicate the wattage on the back panel or on a plate secured to the appliance. Add up the wattage of each appliance you plan to operate using the inverter. Multiply the wattage of each



The Xantrex MS 2,000-Watt Inverter/Charger.

appliance by the number of hours of use while using inverter power. Next, divide this figure by 10. This will give you an estimate of the “amp hours” you will need from your battery bank. A 1,000-watt inverter should have at least 200 amp hours of battery capacity to draw on. By this estimate, you will be able to run all of your appliances at the same time for one full hour or

50 percent of available power for two hours, and will consume approximately 50 percent of your battery power.

Kevo's Tip:

The recreational marine industry seems to be drifting toward full DC power on vessels as opposed to generator power. In the future, the primary purpose of the genset will be to recharge the batteries, not to provide AC power for appliances. TSW inverters are probably the best value for the money. Our vessel, *Her Way*, has a Heart 2,000-watt interface link inverter system with four golf cart batteries connected in series for power. It works perfectly and adds a great deal of comfort and enjoyment to our boating experience. I have never met an experienced mariner who regretted installing an inverter system on a vessel.

As always, feedback is appreciated. I can be reached at 925/890-8428 or kevo@yachtsmanmagazine.com.

Be safe & happy boating! ⚓