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Best Practices for Marketing Inverters

Retailers who better understand the devices can help their customers find the right model to meet their needs.



By DON WILSON

Don Wilson is a sales application engineer with Xantrex Power Solutions, a leader in the development, manufacturing and marketing of advanced power electronic products and systems for mobile power markets, including the RV industry. For more information on Xantrex, or to view many columns and educational videos, visit the company website at www.xantrex.com.

Power inverters – the devices that convert standard battery (DC) power to AC household power – have become very popular in RV circles and are now commonplace within the North American RV community. When understood and installed properly, these nifty products significantly enhance the overall experience for campers and tailgaters.

However, what is a welcome reception for the educated can prove both challenging and difficult among the uninitiated.

For many years, inverters were one of the most misunderstood electronic components in an RV. The critical factor for a successful system is to make absolutely sure that whomever is responsible for selection and installation does his or her homework in advance — prior to purchase. Knowledge is power. One size definitely does not fit all in this category.

Fortunately, efforts within the industry to educate the RVing public are showing benefits as RV industry inverter sales and installations are on the rise, with forecasts for continued growth.

So, what are some of the top questions that tend to come up at dealerships and ser-

vice shops that retail and install inverters? Based upon the many years Xantrex has in the RV industry, the following six questions are most commonly asked and are most important to be addressed. These include:

1. Size – Does it matter?

Hands-down, the single most frequently asked question is: “What size inverter do I need?”

Unfortunately, many RVers mistakenly believe or assume that size is everything and bigger is better.

Inverter sizes range from 300-watt cigarette lighter plug-in inverters to 5,000-watt units, and what one is best depends upon several factors. Each installer should thoroughly and carefully survey electrical system size and power usage to understand exactly how the owners will use an inverter. This includes what items customers want powered and what items will be used at the same time. That will help “right size” the inverter for each unique operation.

As an example, RVers may run a microwave, TV and laptop simultaneously. So to calculate how much power is required, start by looking on each device for a wattage

Inverters are available in low-frequency and high-frequency applications. Low-frequency inverters tend to surge more than high-frequency inverters, but high-frequency inverters tend to be lighter than their low-frequency counterparts. The point is not to make quick assumptions based on size or weight, but take time to understand the needs of the application and then make a decision.



TABLE 1: How much power (watts) do you need?

Microwave: 1,000
TV: 250
Hot Plate: 1,300
DVD Player: 40
Laptop: 95
Hair Dryer: 1,500
Electric Blanket: 200
Portable Heater: 1,000 to 1,500
Electric toothbrush: 2

number. For example, a microwave might be rated at 1,000 watts, a TV at 250 watts, and a laptop at 95.

Add them up to determine how much continuous power you'll need at once; and then add 20 percent. So, in this example, you'll require just over 1,600 watts. Round up to find an inverter that meets your combined power needs.

In addition to continuous power, another important consideration is "surge power." Notably, whenever you power up any device, the initial load is always more – and sometimes more than double – the continuous power requirement. So the surge rating on quality inverters should be about double the continuous power rating. An 1,800-watt inverter, therefore, is capable of handling a short 3,600-watt power surge requirement.

And there's more: How long can the inverter handle the surge?

The longer the better is the right answer. Some inverters on the market are only equipped to handle a few milliseconds of surge before the power draw shuts down



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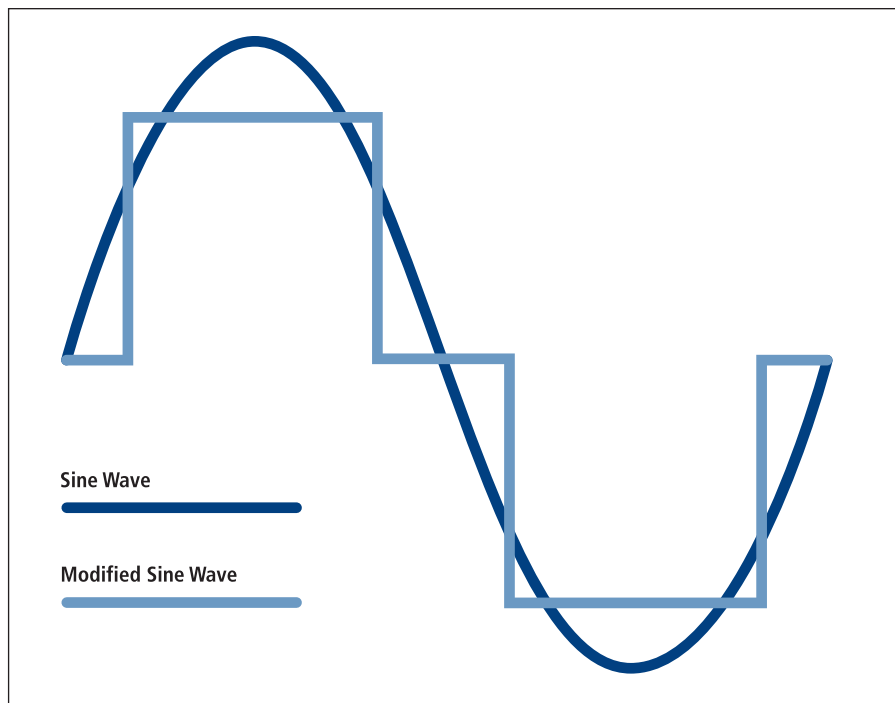
RV PRO's New Staff Writer

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There are two types of inverters on the market: sine wave and modified sine wave. For those RVers running sensitive electronics or products that are plugged into their own chargers, sine wave is the preferred choice, as the voltage is consistent without spikes or drops. By comparison, modified sine wave power works equally well in operating most electronics and appliances, with the exception of the more sensitive applications like laser printers, digital clocks and some electric blankets.

the inverter. Be sure to ask, understand the requirement, and compare the options.

Chris Hanrahan of Tekris Power, a service center that specializes in Prevost and MCI conversions with 24VDC systems to Class C campers with 200Ahr battery banks, has this advice for RV dealers: "Please help the customer choose the correct inverter and charger by thoroughly interviewing them about their application and planned usage. This includes counting their planned daily Ahr usage."

2. Type of Power – Sine or modified sine wave?

"Will my new coffee pot or refrigerator be affected by a modified sine wave? Can I use my laptop with modified sine wave? These are some of questions I get asked," Hanrahan says.

There are two types of inverters on the market: sine wave and modified sine wave.

Both work well in an RV environment, but for those running sensitive electronics

or products that are plugged into their own chargers, sine wave is the preferred choice. Because sine wave is the same power as what RVers use at home, the voltage is consistent without spikes or drops. Using sine wave will cause the device RVers are powering onboard to react just as it would if they were plugged in at home.

By comparison, modified sine wave power works equally well in operating most electronics and appliances, with the exception of the more sensitive applications like laser printers, digital clocks and some electric blankets.

For example, with a sine wave unit, users will notice a slight decrease in the efficiency rating, given that electronics within the inverter use power to keep electrical levels consistent. It's not much. At Xantrex, for example, the company has an 87 percent efficiency rating on a sine wave unit compared to 92 percent on a modified inverter. It's like the difference between running a 6-cylinder car versus 4-cylinder car. That 4-cylinder car may get a bit better fuel economy, but the 6-cylinder delivers better overall performance.

The price difference between the two? Sine wave inverters used to be twice the cost of a comparable modified sine wave inverter. However, the gap has narrowed, and today, most of the higher wattage sine wave inverters will run only about 15 to 20 percent more than their modified sine wave counterparts.

3. Installation – Can I do it?

There are multiple considerations necessary when installing an inverter, ranging from where it should go, to ensuring there is adequate ventilation to allow heat to dissipate. In addition, wire sizing, the distance between the inverter and appliances, and the distance between the battery and inverter, among others, must be thoroughly analyzed.

It's truly worth spending a few extra bucks to have the installation done right the first time. However, with some attention to detail, all inverters have the same basic connections. Those are AC input, AC output,

DC, and Data. The Data connections may be to a battery temperature sensor, or a remote control.

5. Reliability – How important is it?

When it comes to reliability, the old adage “you get what you pay for” definitely rings true. Yes, you will pay more

“For many years, inverters were one of the most misunderstood and least appreciated electronic components in an RV. The critical factor and key for success is to make absolutely sure that whomever is responsible for selection and installation does his or her homework in advance — prior to purchase. Knowledge is power.”

for an inverter that has a “regulatory listed” approval — such as UL or ETL with UL458 rating. This approval confirms that the inverter was inspected and approved by an independent agency which safeguards against issues with electricity.

UL458 is the listing for inverters and chargers in mobile applications. They must meet strict vibration, environmental, and thermal requirements that non-UL458 units do not. The RV Industry Association calls out this UL listing for all inverters and chargers installed in an RV.

Also, RVIA specifies DC and AC wiring standards in an RV, and has requirements that are met by UL458-listed inverters. The main requirement is that the neutral and ground are bonded together within the inverter. Any inverter that is not UL458 listed does not meet that criteria.

Though it may have a lower price tag, it's definitely buyer beware. Xantrex staff members have seen these types of products actually shock users. Plus, internally they

often can't protect themselves against failure due to power surges.

Another critical consideration?

Look for how inverters are internally tested in the quality control process. If the manufacturer tests to ensure quality, then it will likely promote that fact in its marketing materials or on its website. As a rule, those inverters that have been tested will last longer versus inverters from manufacturers that don't invest in quality measures. A high-quality and reputable inverter often lasts beyond its warranty period.

Inverters may occasionally shut down, but quality inverters do so without damage. If dust or cat hair, for instance, gets inside the inverter, it can cause it to overheat. Some inverters have an error code that immediately identifies the problem. In this case, it will advise users of overheating and instruct them to check the fan.

A simple cleaning or “blowing out” will easily correct the problem and have them back up and running in no time. A cheaper inverter, on the other hand, may simply fail to operate and leave users guessing as to the source of and fix for the problem.

If RVers overload the inverter, placing more wattage demands on the inverter than it can handle will cause the inverter to shut down. The difference between a quality inverter and low-end inverter is how they respond to shutdowns. The quality inverter will shut down with no ill effects, while the cheaper alternative often wears out following multiple overloads.

6. Battery charging – Should RVers opt for an inverter with a built-in battery charger?

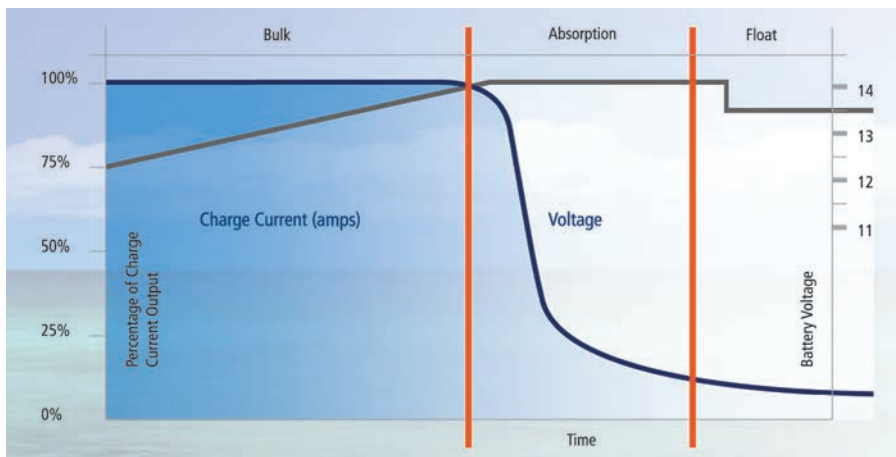
The simple answer is yes, if they have “shore power” or a generator available. When plugged in, RVers can operate everything they are running with their inverter for as long as desired, plus they can recharge and top off their batteries. The more RVers can use shore power, or their generator, the better — as it prolongs the life of their batteries.

The other benefit is that a three-stage charger, when compared to the typical RV converter, does a much better job of fully

charging the batteries without damaging them through over-charge.

RV converters are more of a static power supply than a complete battery charger. Many RVers are opting to remove the converter and replace it with an inverter that includes a built-in charger in its place. It's usually only slightly larger, but charges more completely, increasing the lifespan of the batteries. Plus, it gives the added benefit of AC power while dry camping.

Most built-in chargers are power factor corrected (PFC), which means they can use far less AC power to provide DC at the same rate as their standard converter counterparts. These devices also utilize a battery temperature sensor (BTS), which can dial in the specific charging requirements as the environment changes. No RV converter has that ability. However, an inverter with a three-stage charger without PFC or a BTS is still better than a static converter. **PRO**



The three stages of battery charging from an inverter are: bulk, absorption and float.

A three-stage charger, when compared to the typical RV converter, does a much better job of fully charging the batteries without damaging them through over-charge.

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