Need an Inverter?

Five of the most commonly asked questions

Power inverters – the devices that convert standard battery (DC) power to AC household power – are becoming more commonplace in the trucking industry.

In fact, Xantrex, a leading supplier of inverters, says shipments have risen sharply since early 2011 and the company expects this trend to continue in the next few years.

With interest at an all-time high, questions still abound about inverters. According to Don Wilson, Xantrex's sales application specialist, "research and knowing what you need is critical prior to making a purchase. One size does not fit all and inverter quality varies greatly."

Wilson says five questions typically rise above all others when owner operators try to determine which inverter to purchase.

What Size Should I Buy?

Far and away, Wilson says "what size" is the Number 1 and most important question he hears from drivers.

"It's easy to say get the biggest inverter on the market and you'll be covered for all your needs," Wilson says. "But that's not the best advice. Each driver should do a self-examination on how they will use an inverter – what items they want powered and what items will be used at the same time. That will help you 'right size' the inverter for your operation."

As an example, Wilson says drivers will often run a microwave, TV and laptop all at the same time. "On each device you'll see a wattage number," he said. "A microwave might be rated at 1,000 watts, a TV at 250 watts, and a laptop at 95. Add them up to see how much continuous power you'll need and then add 20 percent. So, in this case you'll need just over 1,600 watts. Next, round up to find an inverter that meets your power needs. Xantrex, for example, offers an 1,800 watt unit, and that's what we would recommend."

Others, who want to use an inverter for recharging laptops, phones and running TVs for example, could get by with a 400-watt unit. "Inverter sizes range from 300 watt cigarette lighter plug-in inverters to 5,000-watt units."

While determining continuous power is an important consideration, so is "surge power."

"Whenever you power-up any device, the initial load is more – and sometimes double – what the continuous power requirement is," Wilson says. "So the surge rating on quality inverters should be about double. So, an 1,800-watt inverter can handle a short 3,600-watt power surge requirement."

Next, Wilson says to research how long the inverter can handle the surge. "The longer the better," he says. "Some on the market can handle only a few milliseconds of surge before the power draw shuts down the inverter. Others can last five seconds or more, and that's what you should look for."

What Type of Inverter Should I buy – Sine or Modified Sine Wave?

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

"Both work well in a truck environment, but for those running sensitive electronics or products that are plugged into their own chargers – like a drill or a toothbrush – sine wave is the preferred choice," says Wilson. "Since sine wave is the same power as what you get at home, the voltage is consistent without spikes or drops. So, the device you're powering reacts just as it would if you were plugged in at home.

But, in most cases, modified sine wave power is just fine in operating most electronics and appliances with the exception of few sensitive applications."

As for the price difference? Wilson says the gap has narrowed and today most higher wattage sine wave inverters cost about 15-to 20 percent more than a modified inverter.

Don Wilson, at right, sales application specialist for Xantrex, talks with a truck operator at a recent trade show about inverters. Wilson says the most frequent question he hears from drivers is what size of inverter should I use. His advice to drivers - do a self-examination on how they will use an inverter – what items they want powered and what items will be used at the same time. That will help them 'right size' the inverter for their operation.

With a sine wave unit, you'll notice a slight decrease in the efficiency rating since electronics within the inverter use power to keep electrical levels consistent," says Wilson. "It's not much – we have an 87 percent efficiency rating on a Xantrex 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 is better in overall performance."

Is it OK for Me to Install the Inverter Myself?

"Yes and no," says Wilson. "You're dealing with electricity. So if you're not comfortable handling wiring at your house, you better not try it in your rig.

"If you're working on a 12-volt lighter plug or a 300W inverter for the laptop, installation should prove to be no problem. But, for larger inverters that require hard-wiring, fusing, voltage-drop calculations, and knowledge of applicable safety standards, I cannot stress enough how important it is to get it right the first time."

Wilson says there is a bevy of things to consider when installing an inverter, starting with 'where it should go' and making sure there is adequate ventilation to allow heat to dissipate. "And you have to look at wire sizing and the distance between the inverter and plug-ins which can be put in the sleeper; Plus the distance between the battery and inverter. There's a lot to consider."

"We really recommend either an OEM install when you purchase a new truck, or have the installation done by an authorized dealer," continues Wilson. "The OEMS have installation down to a science and it's done on the line to rigid specs. Truck and aftermarket dealers also have the experience, so it's worth spending a few extra bucks to have the installation done right, the first time."

What Kind of Reliability Can I Expect?

"When it comes to reliability, the old adage, 'you get what you pay for' comes into play," says Wilson. "You will pay more for an inverter which has a 'Regulatory Listed' approval – such as UL or ETL with UL 458 rating. This means the inverter was inspected and approved by an independent agency which safeguards against issues with electricity. Buying an inverter that is not Regulatory Listed tells you 'buyer beware.' We've seen these types of products actually shock users, plus internally they often can't protect themselves against power surges."

Wilson says that inverters installed by truck manufacturers all are UL approved, but inverters sold at truck stops are a different story. "Only 10-to 20 percent will be Regulatory Listed," says Wilson.

Wilson also suggests you look for how inverters are internally tested for quality control. "If the manufacturer you're considering tests to ensure quality, then they'll likely promote that fact in their marketing material, or on their web site," he says. "And, those inverters that have been tested will last longer versus inverters from manufacturers which don't spend the time and money to ensure quality. A quality inverter should last well beyond its warranty period."

Wilson says inverters will occasionally shut down, but quality inverters do so without damaging themselves. "If dust or cat hair, for instance, gets inside the inverter, it can cause it to overheat. A higher watt Xantrex inverter, for example, has an error code that lets you know what the problem is – in this case it will tell you that you are overheating and to check the fan. A simple cleaning or 'blowing out' will correct the problem and you'll be back up and running. Other inverters could leave you guessing as to what the problem is.

"And, if you overload the inverter, placing more wattage demands on the inverter than it can handle, the inverter will shut down. The difference between a quality inverter and low-end inverter is how they deal with a shut down. A quality inverter is designed to shut down with no ill effects. A low-end inverter can 'wear out' after multiple overloads."

Should I Get an Inverter with a Battery Charger?

"The simple answer is yes if you can use 'shore power' (electrical outlets at home or on the road at terminals, loading docks, or truck stop)," says Wilson. "When plugged in, you can run everything you're running with your inverter for as long as you want, plus you recharge and top off your batteries. The more you can use shore power, the better, as it prolongs the life of your batteries."

According to Wilson, most installations use the inverter off the truck's starting batteries and quality inverters will have a low voltage disconnect (LVD) to shut down when voltage drops to 11.7 volts. This ensures the truck will have enough juice to start.

"Check on the LVD feature before you buy an inverter," cautions Wilson. "Many inverters on the market will run the batteries down to 10.5 volts which will let you run your electrical devices longer in the cab and sleeper. However, you won't be able to start your truck unless your truck comes equipped with its own LVD.

"Another option is to run two dedicated deep-cycle batteries and connect them to your inverter," continues Wilson. "Deep cycle batteries were built to be drawn down to a 50 percent state of charge, or 10.5 volts. This gives you double to triple the amount of continuous power to run your hotel loads."

How much power (watts) do you need?