

# POWER

# UP

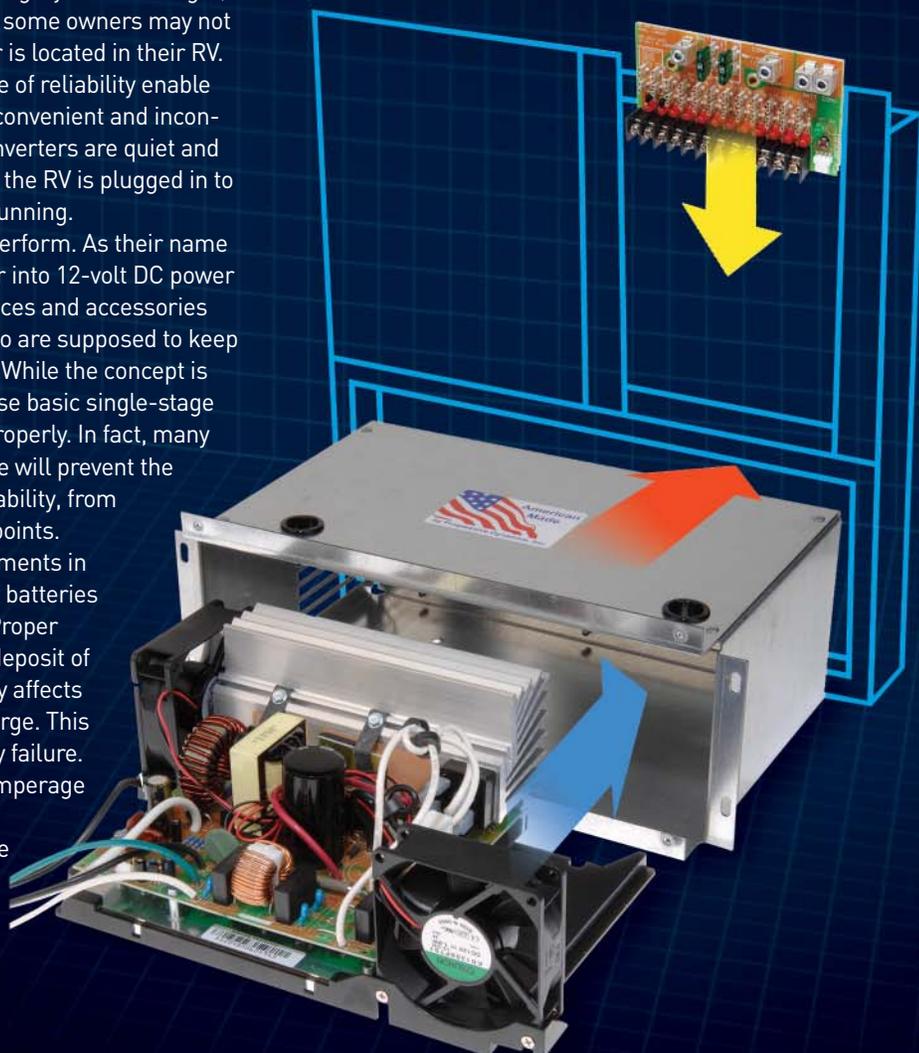
CONVERTERS ARE DESIGNED TO PROVIDE 12-VOLT DC CURRENT AND CHARGE BATTERIES — BUT NOT ALL ARE CREATED EQUAL

**P**ower converters fall into the category of “out of sight, out of mind” — literally. In fact, some owners may not even know where the converter is located in their RV. Compact size and a high degree of reliability enable manufacturers to install converters in convenient and inconspicuous places. Modern electronic converters are quiet and efficient, operating automatically when the RV is plugged in to shorepower or when the generator is running.

Converters have two basic jobs to perform. As their name implies, they *convert* 120-volt AC power into 12-volt DC power for running multiple 12-volt DC appliances and accessories without draining the batteries. They also are supposed to keep the batteries at least partially charged. While the concept is good, reality suggests that many of these basic single-stage converters do not condition batteries properly. In fact, many supply only a float charge, which in time will prevent the batteries from reaching maximum capability, from both power supply and longevity standpoints.

The rising cost of lead and advancements in technology have catapulted the price of batteries significantly during the past 20 years. Proper charging will help prevent sulfation, a deposit of lead sulfate on the plates that adversely affects the ability of the battery to accept a charge. This condition is the leading cause of battery failure.

Today’s converters have different amperage output ratings, depending on the RV’s 12-volt DC system requirement, and the



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**Progressive Dynamics offers a lower section replacement/upgrade converter with a built-in Charge Wizard that constantly manages the RV’s batteries.**

ratings usually range from 45 to 90 amps in single and multistage configurations that may include an equalization mode designed to help batteries live a maximum life. Here's an encapsulation of what's out there.

### Multistage Converter/Chargers

Multistage converter/chargers with an equalization process are an effective method of charging lead-acid or other types of batteries. For many years, the only available converters had a simple single-stage or fixed voltage design with an output of approximately 13.2 volts DC. There are thousands of these converters in use.

Electrical systems have advanced with the use of printed circuit boards and sensitive electronic equipment, creating the need for a more comprehensive charging system. The benefits are faster charging rates and cleaner DC voltage output. For instance, an 80 percent recharge can occur in two to three hours, instead of the roughly 24-hour charge rate of a single-stage

**Parallax Power Supply's converter/charger utilizes a unique temperature-compensation feature designed to maximize output in extreme temperatures.**



converter/charger. Replacing an old single-stage converter with a multistage model may seem complicated, but it is well worth the time and expense, especially considering the former never properly conditions batteries.

### High-Output Converters

RV electrical systems have more power demands than ever. Several companies offer 80- and 90-amp converter/chargers to meet the highest demands of today's advanced systems. Parallax offers a 90-amp converter/charger (model 5490TC) with temperature compensation and a proprietary Power Factor correction. With this latter feature, the electronic circuit uses

120-volt AC input current much more efficiently, producing up to 90 amps of DC output yet drawing only the current required to run a 65-amp converter.

Living in areas of extreme ambient temperatures presents challenges, even for the best batteries. Ambient temperatures affect the way batteries charge or discharge and, of course, that leads to longevity expectations. Parallax's TC series utilizes unique temperature-compensation technology. Temperature-compensated charging will improve performance, whether the battery is a flooded lead-acid type, AGM or gel cell.

Typically, a battery may be subject to excess fluid loss during high ambient



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temperatures. Parallax's TempAssure converters will compensate and adjust to an ideal charge voltage based on battery temperature. Parallax offers an upgraded power-supply module with temperature compensation (model 4400 TAU) for its series 4400 and 5400 converters. Parallax, formerly Magnetek Converters, also offers electronic upgrades for older Magnetek power centers, including a temperature-compensation model.

Progressive Dynamics, also known as Intelli-Power, builds RV converters and chargers that feature a two-year no-hassle warranty and are made in the United States. Progressive Dynamics developed its first power converter for the RV market in 1968 and in 1993 began manufacturing electronic power converters. The "new" design gave RV manufacturers a reliable electronic power converter that was smaller and lighter than what had previously been available. Since then, Progressive Dynamics has been



**(Above left)** If you suspect that the converter is not functioning, check the AC outlet for 120-volt power. These outlets are controlled by the GFCI. **(Above right)** Magnetek's (Parallax) lower section upgrade kit has recently been installed. **(Right)** The Intelli-Power Charge Wizard is a great upgrade for 9100 Series converters.



improving its converter/chargers.

The company's 80-amp converters with the built-in Charge Wizard (models PD9280V and PD 9180V) offer automatic electronic current that reduces output

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voltage when maximum charge capacity is reached. The company's patented Total Charge Management System (TCMS) technology senses when batteries are low or are in need of a fast charge and will automatically increase the voltage to 14.4 volts DC. The TCMS will charge a 125 amp-hour battery to 80 percent capacity in roughly two to three hours while attaining a complete charge in approximately 15 hours.

Standard features on all Intelli-Power models include reverse-polarity protection that guards against damage resulting from improper battery connection, low-voltage protection that automatically shuts the converter down if input voltage is insufficient, and electronic current that automatically reduces output voltage when maximum battery charge has been attained. An automatic thermal shutdown feature will power off the converter when temperatures exceed 150 degrees F, protecting the converter from damage due to excess heat.

Progressive Dynamics also offers a Charge Wizard (model PD9105V) that's designed as a retrofit for its 9100 series converters, effectively changing from a single-stage to a four-stage converter. The Charge Wizard constantly monitors battery voltage and battery usage, then selects one of the following four operation modes: boost, normal, storage or equalization.

The Charge Wizard has been shown to increase battery life by as much as two to three times and is designed to eliminate battery over- and under-charging frequently associated with less-sophisticated battery chargers. The Charge Wizard is easy to install via a simple plug-in system.

Iota Engineering offers its DLS series with exceptionally clean DC power output for sensitive electronic circuits. With current limiting and thermal overload protection, the DLS models can be used without a battery in the system. This can be an advantage, since the DLS models do

not produce a high AC ripple voltage that can adversely affect some electronic appliances.

In the past, living in an RV park 365 days a year required a battery to be onboard at all times to act as a capacitor for DC voltage spikes. Iota's patented IQ4 Smart Charge Controller will transform the standard DLS series converters into a four-stage charger. The four-stage charging system will reduce battery charging time and minimize excess gassing, often caused by high voltage. The IQ4 delivers boost, absorption and float segments as well as an equalization phase. An LED indicator light flashes at different speeds to display the charging activity, and it will even indicate a fault state, should an overvoltage condition be detected. If overvoltage occurs, the converter will be kept in the float mode until it is reset.

Xantrex TrueCharge2 battery chargers are microprocessor controlled and deliver a two- or three-stage charge to any type of deep-cycle battery. These units are not easily affected by low or high AC power from less-than-perfect shorepower or a generator. Temperature-compensated charging, a battery-equalization feature and the ability to charge a completely dead battery that has been in storage too long makes this charger practical for RVers in need of better performance. Xantrex's reverse-polarity protection will mitigate accidents when replacing batteries in the future.

The TrueCharge2 models have the ability to parallel stack— this allows two of the chargers to work together for up to 120 amps of output. Xantrex went one step further by adding a storage mode that turns on every 21 days for proper charging of batteries that are in storage. Xantrex offers a remote panel (part number 808-8040-1) that

**Iota Engineering's IQ4 Smart Charge Controller converts its DLS Series converters to a four-stage charger.**



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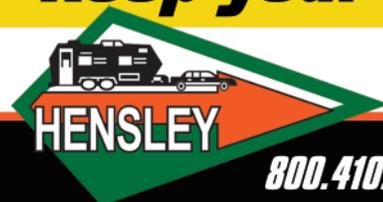
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allows the user to monitor all aspects of battery charging. Add the temperature sensor (part number 808-0 232-01) for operation in extreme temperature climates. With 20-, 40- and 60-amp chargers, Xantrex has the models RVers need for battery care and performance.

### Basic Troubleshooting

Modern electronic converter/chargers are very durable and should last without maintenance for many years. But problems can arise. If you suspect that the converter in your RV is no longer charging, here are a few helpful tips for troubleshooting in the field.

Converters need adequate AC voltage for proper operation. Start by checking for voltage at the outlet into which the converter is plugged or wired. Use a handheld voltmeter (multimeter) to confirm voltage to the converter. This electrical circuit is sometimes protected by a ground fault circuit interrupter (GFCI). If voltage is not present, check the GFCI reset button to see if it has been tripped. Most modern electronic converters have a set of fuses visible in the back section of their housings. If you suspect the converter is not working, check the fuses. Caution: Use fuses that are exact replacements only.

Upgrading to a multistage charger, whether by replacement of the unit itself or by adding new components, will make a big difference in battery performance. With a number of high-tech options to choose from, it's easy to find all the power and versatility your RV needs. 🚐

## SOURCES

**Iota Engineering**  
520-294-3292, [www.iotaengineering.com](http://www.iotaengineering.com)

**Parallax Power Supply**  
800-730-2557  
[www.parallaxpower.com/esm.htm](http://www.parallaxpower.com/esm.htm)

**Progressive Dynamics**  
269-781-4241, [www.progressivedyn.com](http://www.progressivedyn.com)

**Xantrex**  
800-670-0707, [www.xantrex.com](http://www.xantrex.com)