

# Service Tips from the Pros



## A few 'Basics' about Power Converters

The design and construction of power converters has changed significantly during the past 20-years as have the costs to manufacture them. Until 20-years ago, converters were primarily transformer-based devices. These include the linear converters & the ferro-resonant converters...sometimes referred to as 'float' converters.

The technology that displaced those heavy old workhorses utilize what's referred to as 'switch-mode' technology. Very simply, a series of small switches called MOSFETs (metal oxide semi-conductors) are switched on & off at a high voltage & at high frequency to convert AC power to DC power. The latest buzz in the RV industry includes the 3-Stage converters & the temperature compensating converters. Due to increasing power requirements on the larger RVs, the converter manufacturers now have models with power output touching the 90-amp threshold.

**PARALLAX  
POWER  
SUPPLY LLC.**

**7400 SERIES  
CONVERTER/CHARGER**

- Filtered DC Power
- Quiet Operation
- Compact, Lightweight Design
- Two Year Warranty

• Outputs Available: 30, 40, 45, 55, and 65 amps

*Example of currently used & past  
'switch-mode' converters*

Power Converters 'convert' 120-Volt AC power to 12-Volt DC power – nearly a 10-fold reduction in voltage, and converters also change the output wave- form from an alternating current (i.e. a sine-wave (@ 60-cycles / Hz) to a linear or constant output.... i.e. similar to the output from a 12-volt battery, but in a range between 13.6 – 14.5 volts.

Electrically speaking, there are '2' sides to a power converter – namely the 120-Volt AC side (high-voltage input), and the 12-Volt DC side (low-voltage output). To comply with F.C.C. requirements, the AC side contains filtration devices to limit the amount of RF (radio frequency) that is generated / emitted by the high frequency MOSFETs. The DC side also contains filtering components to keep the output power "clean". A significant portion of the DC filtering is accomplished by use of capacitors... i.e. simple devices that absorbs electrical surges & spikes... then gives it back when conditions

allow. Although an electronic converter can easily support sensitive electronics without a battery interface, it's important to remember that the RVs house battery package actually contributes to the filtering effort! Batteries are a capacitor – a super-sized capacitor! This is the primary reason the house batteries should be connected & in-the-mix when the RV is plugged into shore power or the generator is being used.

## Power converters should not be confused with 'battery chargers'

Although power converters make fantastic battery chargers, there are important differences that must be understood. Generally speaking, a battery charger is intended for one purpose – charging 6 & 12-Volt batteries...and many have a boost feature for jump-starting an engine. Perhaps an over-simplified explanation, but a power converter is designed to be connected to an electrical load, and these can include resistive loads, inductive loads and capacitive loads. Examples would include: an incandescent lamp; a water pump or range hood fan motor; a furnace p.c. board or a 12-Volt florescent lamp, and a power converter must be capable of providing reasonably clean power (wattage) up to the units rated output... while maintaining proper voltage thresholds. Very simply, a converter must be capable of ramping up its power output to satisfy the loads placed on the coach electrical system by the customer...including the recharging of discharged house batteries.

PD9245C  
45 Amp. RV Converter

