

Xantrex Power Factor Corrected Charging

A converter's power factor rating can be explained as its ability to effectively use incoming AC power. The more efficiently the converter uses incoming AC, the higher the power factor it will have and the less AC power it will consume. With less incoming AC power required by the converter there is more available AC power available for a microwave, TV and other AC loads on the RV.

The power factor correction (PFC) circuit is designed to draw a sinusoidal current from the AC input line that is exactly in phase with the input voltage. As a result, the converter exhibits a power factor that is very close to unity or one, which is ideal. Xantrex power factor corrected converters are rated at greater than 0.95 power factor, compared to a rating of approximately 0.7 power factor for converters that are not power factor corrected. The improved power factor results in approximately 30% less AC input current required to deliver the same DC charging current.

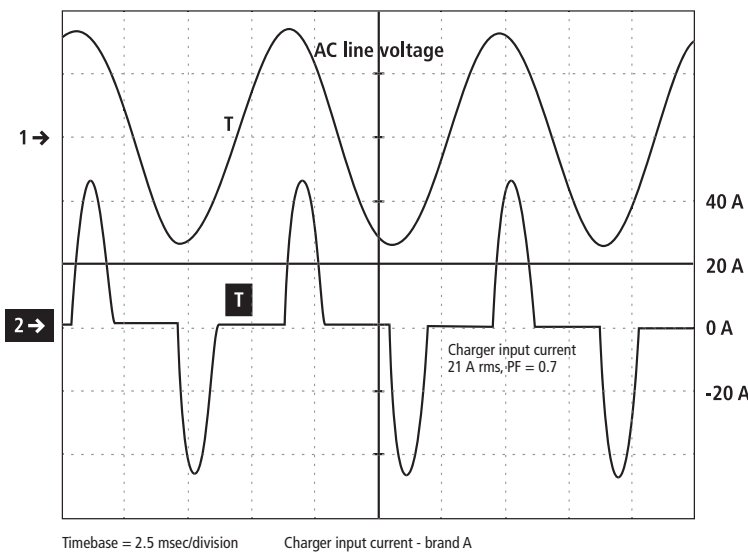


Figure 1: Quasi-square wave inverter-charger – current draw in charger mode
Source: The PROsine technology Advantage – Statpower (Xantrex) Whitepaper

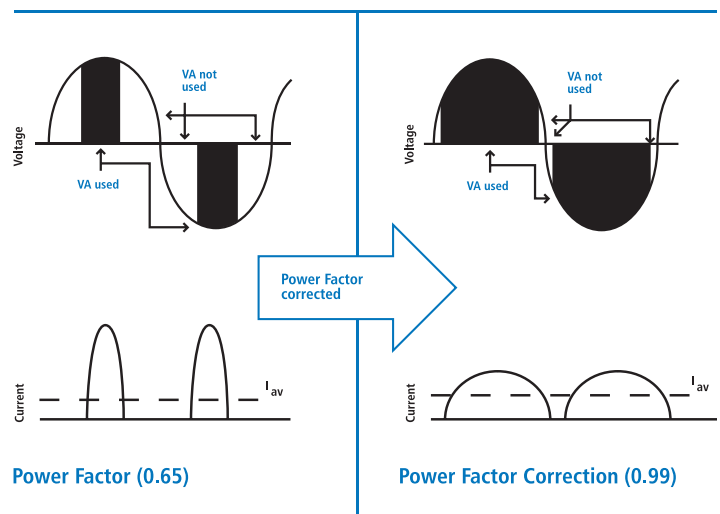


Figure 2: Power Factor: The ratio of true power to apparent power
Source: Pioneer Magnetics®

The Benefits to PFC Charging

A converter is one of the largest AC loads on an RV. A significant benefit of Xantrex power factor corrected (PFC) converters is that more of the incoming AC power to an RV is available to support other AC loads. PFC charging minimizes the amount of AC power needed to run your charger at full power. This maximizes available AC power usage, and given the limitations of park power or generator runtime, reduces the risk that AC loads running during battery charging will overload the system and trip the incoming AC circuit breaker.

Another benefit of PFC charging is the significant reduction in electrical noise, minimized through its phase-matching of input current draw to the input voltage, so it does not interfere with the operation of TVs, radios and satellite receivers.

All Xantrex converters feature power factor corrected charging for low electrical interference and maximum AC power available to the power-hungry RV.

PFC Charging Example

The following example highlights the advantages of a Xantrex power factor corrected converter. Both products listed below supply the same real power for charging, but the Xantrex converter requires less AC current to achieve the same result.

| | Xantrex Converter | Competitor's Converter |
|------------------|-------------------|------------------------|
| Charging voltage | 14.2 V | 13.6 V |
| Charging current | 60 A | 55 A |
| Charging Power | 850 W | 750 W |
| Efficiency | 85% | 80% |
| Power factor | 0.97 | 0.70 |
| Input current | 9 A | 13 A |

Loads that can be operated with 30-amp service

| Appliance AC Load Draw | | Cumulative AC Load Draw (AC amps) | |
|-----------------------------------|------|-----------------------------------|-------------------------------|
| | | Xantrex 60 amp Converter | Competitor's 55 amp Converter |
| Converter | 9 A | 9 A | 13 A |
| Roof Air Conditioner (11,000 BTU) | 12 A | 21 A | 25 A |
| Coffee Pot (600 W) | 5 A | 26 A | 30 A |
| TV | 2 A | 28 A | |
| DVD | 1 A | 29 A | |
| Satellite | 1 A | 30 A | |

| Other typical load | |
|---------------------|-------|
| Microwave (1,100 W) | 9.5 A |