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XPower Inverter 175, 300, 700



Owner's Guide

About Xantrex

Xantrex Technology Inc. is a world-leading supplier of advanced power electronics and controls with products from 50 watt mobile units to one MW utility-scale systems for wind, solar, batteries, fuel cells, microturbines, and backup power applications in both grid-connected and stand-alone systems. Xantrex products include inverters, battery chargers, programmable power supplies, and variable speed drives that convert, supply, control, clean, and distribute electrical power.

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XPower Inverter 175, 300, 700 Owner's Guide

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1 Introduction

Thank you for purchasing the Xantrex XPower inverter. The XPower inverter is part of a family of advanced high-performance power inverters from Xantrex, the leader in high frequency inverter design.

Connected to the 12 volt outlet in your vehicle, the XPower inverter efficiently and reliably powers a wide variety of AC loads, such as compact TVs and VCRs, laptops, camcorder and cell phone chargers, compact fluorescent lights, and soldering irons.

The XPower inverter uses reliable solid state power electronics for years of safe, trouble-free operation and includes automatic safety monitoring circuitry to protect it, and your battery, from inadvertent overload conditions.

Read this guide before connecting or using the XPower inverter, and save it for future reference. The main topics in the guide are:

- Safety information (page 3)
- XPower inverter features (page 13)
- Instructions for connecting the inverter (page 8)

- Operating guidelines (page 15)
- Troubleshooting information (page 20)
- Specifications (page 25)
- Warranty and service information (page 27)
- Overload shutdown
- Over temperature shutdown
- Short circuit protection

2 Important Safety Information

Misusing or incorrectly connecting the XPower inverter may damage the equipment or create hazardous conditions for users. Read the following safety instructions and pay special attention to all Caution and Warning statements in the guide.

Warnings identify conditions that may result in personal injury or loss of life.

Cautions identify conditions or practices that may damage the unit or other equipment.

Warnings and Cautions



WARNING

Keep children away from the XPower inverter. The inverter generates the same potentially lethal AC power as a normal household wall outlet. Treat the outlet with respect!



WARNING

The XPower inverter housing may become uncomfortably warm, reaching 140° F (60° C) under extended high power operation. Ensure that at least 2 inches (5 cm) of air surround the inverter. During operation, keep it away from materials that may be affected by high temperatures.



WARNING

Do not use the XPower inverter in the presence of flammable fumes or gases, such as in the bilge of a gasoline powered boat, or near propane tanks. Do not use the XPower inverter in an enclosure containing automotive-type, lead-acid batteries. These batteries, unlike sealed batteries, vent explosive hydrogen gas, which can be ignited by sparks from electrical connections.



CAUTION: Output non-sinusoidal

Some chargers for small nickel-cadmium batteries can be damaged if connected to the XPower inverter. Do not use the inverter with the following appliances:

- Small battery-operated appliances like rechargeable flashlights, some rechargeable shavers, and night lights that are plugged directly into an AC receptacle to recharge.
- Battery chargers used in hand power tools.
 These chargers display a warning label stating that dangerous voltages are present at the charger battery terminals.



CAUTION

Do not connect live AC power to the XPower inverter's AC outlets. The inverter will be damaged even if it is switched OFF.

Do not connect any AC load that has its neutral conductor connected to ground to the XPower inverter.

Additional Safety Guidelines

- Do not insert foreign objects in the XPower inverter outlets or other openings.
- Never connect the inverter to power utility AC distribution wiring.
- Do not use the XPower inverter in temperatures over 100° F (40° C).
- Do not expose the XPower inverter to water, rain, snow, or spray.

Failure to follow these safety guidelines may cause personal injury and/or damage to the XPower inverter. It may also void your product warranty.

3 Safety Features

These advanced safety features are built into the XPower inverter:

- Electronic overload protection with automatic shutdown
- Built-in internal backup DC fuse
- Low battery voltage warning followed by automatic shutdown
- High-input voltage protection with automatic shutdown
- · Overheat protection with automatic shutdown
- Output short circuit protection

4 Installation Guidelines

Selecting a suitable location

For safe and optimum performance, install the XPower inverter in a location that is:

Dry Do not expose to water drip or spray.

Cool Operate only in ambient temperatures

between 0°C (32°F) and 40°C (104°F). Keep away from furnace heating vents or

other heat producing equipment.

Well Allow at least 2" (5 cm) clearance above and ventilated on all sides of the unit for proper cooling.

Safe Do not install the power inverter in a compartment with batteries or flammable

liquids, such as gasoline, or explosive vapors.

Clean and This is especially important if the power

free of inverter is used in a work environment.

5 Using the Inverter

The XPower inverter is capable of continuously powering most 120 V AC products that use 150 W or less for 175 W unit, 240 W or less for 300 W unit, and 500 W or less for 700 W unit. Its AC output waveform, called "modified-sine wave," is designed to function similarly to the sine wave shape of utility power.

The power, or "wattage," rating of AC products is the average power they use. When most AC products are first switched on, they initially consume more power than their power rating. TVs, monitors, and electric motors are examples of products that have high "surge" requirements at start up. Although the XPower inverter can supply momentary surge power as high as 300 W for the 175 W unit, 500 W for the 300 W unit, and 1000 W for the 700 W unit. occasionally some products rated less than 150 W for the 175 W unit, 240 W for the 300 W unit, and 500 W for the 700 W unit may exceed its surge capabilities and trigger its safety overload shutdown feature. If this problem occurs when attempting to operate several AC products at the same time, first try

switching on the inverter with all AC products switched off, then one by one switch each on, starting with the high surge product first.

Using the DC cable with cigarette lighter plug (300 W unit)

Due to the limitations of 12 V outlets in vehicles or boats, the XPower inverter should only be used to supply AC power to products that require 150 W (about 1.3 A) or less. If your application requires more than 150 W (but less than 240 W continuous) or has a high start-up surge, see "Using the DC cable clips."

1. Attach the ring type connector marked with red to the positive (+) DC terminal on the power inverter, and attach the ring connector marked with black to the negative (-) DC terminal.



CAUTION

A reverse polarity connection (positive to negative) may damage the power inverter. Damage caused by a reverse polarity connection is not covered under warranty.

- 2. Tighten the nut on each DC terminal by hand until it is snug. Do not over-tighten.
- 3. Insert the plug of this cable into the 12 V outlet and switch the unit ON.
- 4. When the power inverter is not in use, unplug it from the 12 V outlet to prevent slight discharge of the battery.

Using the DC cable clips (300 and 700 W units)

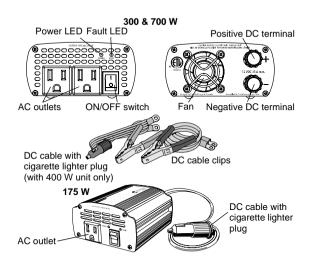
By directly connecting the power inverter to a 12 V battery using the DC cable clips, you can operate products with power requirements up to 240 W continuous for 300 W unit and 500 W continuous for 700 W unit.

- Follow steps 1 and 2 above (Using the DC Cable with cigarette lighter plug) to attach the ring type connectors.
- Attach the negative (black) clip to the negative (-) battery terminal.
- 3. Attach the positive (red) clip to the positive (+) battery terminal. Make sure both clips are securely connected to the battery terminals, as a

loose connection will cause the voltage to drop and may cause the cables to overheat, resulting in equipment damage or fire.

- 4. Switch the power inverter "ON."
- When the power inverter is not in use, disconnect the DC cable clips from the battery to prevent slight discharge of battery.

6 Indicators and Controls



- One AC outlet is provided on one end of the XPower inverter 175 W unit.
- Two AC outlets are provided on one end of the XPower inverter 300 and 700 W units. Any combination of 120 V AC products with a total continuous power consumption of 240 W or less for 300 W unit, and 500 W or less for 700 W unit may be plugged in.
- The ON/OFF switch enables output AC power at the AC outlet(s) when switched ON.
- The green POWER light indicates AC power is present at the AC outlet(s) and the XPower inverter is operating normally.
- The red FAULT light indicates inverter shutdown caused by low or high voltage, overload or excessive heat.

7 Inverter Operation

- When properly connected to a 12 V outlet or battery, turning the inverter switch ON, will illuminate the green POWER light, and deliver AC power to the outlet(s).
- Plug the AC product(s) you wish to operate into the AC outlet(s) and switch them on, one at a time
- 3. As the battery is used, voltage begins to fall. When the XPower inverter senses that the voltage at its DC input has dropped to 11 V, an audible alarm sounds. This allows time for computers or other sensitive devices to be shut down.
- 4. If the audible alarm is ignored, the XPower inverter will automatically shut down when the battery voltage drops to 10.5 V. This prevents the battery from being damaged. After auto shutdown, the red FAULT light illuminates.

Important: Vehicle batteries are designed to provide brief periods of very high current needed for engine starting. They are not intended for constant deep discharge. Regularly operating the XPower inverter from a vehicle battery until the low voltage alarm sounds will shorten the life of the battery. Consider connecting the power inverter to a separate deep-cycle battery if you will be frequently running electrical products for extended periods of time.

- 5. If an AC product rated higher than 150 W for the 175 W unit, 240 W for the 300 W unit, and 500 W for the 700 W unit (or which draws excessive surge power) is connected, the XPower inverter will shut down. The red FAULT light will turn on.
- 6. If the XPower inverter exceeds a safe operating temperature, due to insufficient ventilation or a high temperature environment, it will automatically shut down. The red FAULT light will turn on and the audio warning will sound.
- Should a defective battery charging system cause the battery voltage to rise to dangerously high levels, the XPower inverter will automatically shut down. The red FAULT light will turn on.

CAUTION

Although the XPower inverter incorporates protection against over-voltage, it may still be damaged if the input voltage exceeds 16 V.

- 8. The cooling fan on the 300 and 700 W units is designed to operate only when output power is greater than approximately 100 W. When the inverter is turned on, the fan may operate momentarily.
- In the event of an overload, low battery voltage or overheating, the XPower inverter will automatically shut down.

Battery Operating Time

Operating time will vary depending on the charge level of the battery, its capacity and the power level drawn by the particular AC load. With a typical vehicle battery and a 100 W load (such as a small TV), an operating time of 2 to 3 hours or more can be expected.

When using a vehicle battery as a power source, it is strongly recommended to start the vehicle every hour or two to recharge the battery before its capacity drops too low. The XPower inverter can operate while the engine is running, but the normal voltage drop that occurs during starting of the engine may trigger the inverter's low voltage shutdown feature.

Because the power inverter draws less than 0.15 A for the 175 W unit, 0.2 A for the 300 W unit, and 0.25 A for the 700 W unit with the ON/OFF switch in the ON position and with no AC products connected, it has minimal impact on battery operating times.

Interference with Electronic Equipment

Generally, most AC products operate with the XPower inverter just as they would with household AC power. Below is information concerning two possible exceptions.

Buzzing sound in audio systems and radios

Some inexpensive stereo systems, "boom boxes," and AM-FM radios have inadequate internal power supply filtering and "buzz" slightly when powered by the XPower inverter. Generally, the only solution is an audio product with a higher quality filter.

Television interference

The XPower inverter is shielded to minimize its interference with TV signals. However, with weak TV signals interference may be visible in the form of lines scrolling across the screen. The following should minimize or eliminate the problem:

- Increase the distance between the XPower inverter and the TV, antenna and cables.
- Adjust the orientation of the XPower inverter, television, antenna and cables.
- Maximize TV signal strength by using a better antenna and use shielded antenna cable where possible.

8 Troubleshooting

PROBLEM: AC product will not operate, no inverter lights are ON.

Possible cause	Remedy
Battery is defective.	Check battery and replace if required.
Inverter has been connected with reverse DC input polarity.	Check connection to battery. Probable inverter damage has occurred. Have unit repaired (not covered by warranty).
Loose cable connections.	Check cables and connections. Tighten as required.

PROBLEM: Inverter will run some small loads, but not larger ones.

Possible cause	Remedy
Voltage drop across DC cables.	Shorten cables or use heavier cables.

PROBLEM: Measured inverter output is too low.

Possible cause	Remedy
Standard "average- reading" AC voltmeter used to measure output voltage, resulting in an apparent reading 5 to 15 V too low.	Inverter's "modified sine wave" output requires "true RMS" voltmeter for accurate measurements.
Battery voltage is too low.	Recharge battery.

PROBLEM: Alarm is sounding.

Possible cause	Remedy
Low voltage shutdown or thermal shutdown has occurred.	Shorten cables or use heavier cables. Recharge battery. Allow unit to cool. Improve air circulation around unit. Locate unit to a cooler environment. Reduce load if continuous operation is required.

PROBLEM: Battery run time is less than expected.

Possible cause	Remedy
AC product power consumption is higher than rated.	Use a larger battery to make up for increased power requirement.
Battery is old or defective.	Replace battery.
Battery is not being properly charged.	Some chargers are not able to fully recharge a battery. Make sure you use a powerful charger.
Power dissipation in DC cables.	Use shorter/heavier DC cables.

PROBLEM: AC product will not operate, red FAULT light ON.

Possible cause	Remedy
AC product(s) connected are rated at more than the inverter's continuous power rating; overload shutdown has occurred.	Use a product with a power rating less than the inverter's continuous power rating.
AC product is rated less than the inverter's continuous power rating; high starting surge has caused overload shutdown.	Product exceeds inverter's surge capability. Use a product with starting surge power within the inverter's capability.
Battery is discharged (alarm is sounding).	Recharge battery.

Possible cause	Remedy
The inverter has overheated due to poor ventilation and has shut down.	Switch inverter OFF and allow to cool for 15 minutes. Clear blocked fan or remove objects covering unit. Move the inverter to a cooler place. Reduce load if continuous operation is required. Restart.

CUSTOMER SERVICE HOTLINE: 1-800-394-0440

9 Specifications

Specifications are subject to change without notice.

	175 W	300 W	700 W
AC output voltage (nominal)	120 VAC		
DC input voltage range	10.5–15.5 VDC		
Continuous AC output power	150 W	240 W	500 W
5 minutes AC output power	175 W	300 W	700 W
Maximum AC output surge power	300 W	500 W	1000 W
AC output frequency	60 ± 1Hz		
AC output waveform	Modified sine wave		
Battery drain with no AC load (at 12 V input)	0.15 A	0.20 A	0.25 A

Efficiency (maximum)	90%	90%	90%
Ambient operating temperature range	0 °C-40 °C (32 °F-104 °F)		
Low battery alarm trigger point (nominal)	11.0 V		
Low battery shut down point (nominal)	10.5 V		
High battery shut down point (nominal)	15.5 V		
$\begin{array}{c} \text{Dimensions} \\ (L \times W \times H) \end{array}$	5 1/8 × 4 1/8 × 2 1/4" (130 × 105 × 56 mm)	5 7/8 × 4 1/8 × 2 1/4" (149 × 105 × 56 mm)	7 1/4 × 4 1/8 × 2 1/4" (186 × 105 × 56 mm)
Weight	1 lb 3 oz (550 g)	1 lb 6 oz (655 g)	1 lb 14 oz (900 g)

10 Warranty and Return

Warranty

What does this warranty cover? This Limited Warranty is provided by Xantrex Technology, Inc. ("Xantrex") and covers defects in workmanship and materials in your XPower inverter. This warranty period lasts for 90 days from the date of purchase at the point of sale to you, the original end user customer. You require proof of purchase to make warranty claims.

What will Xantrex do? Xantrex will, at its option, repair or replace the defective product free of charge, provided that you notify Xantrex of the product defect within the Warranty Period, and provided that Xantrex through inspection establishes the existence of such a defect and that it is covered by this Limited Warranty.

Xantrex will, at its option, use new and/or reconditioned parts in performing warranty repair and building replacement products. Xantrex reserves the right to use parts or products of original or improved design in the repair or replacement. If Xantrex repairs or replaces a product, its warranty continues for the remaining portion of the original Warranty Period or 90 days from the date of the return

shipment to the customer, whichever is greater. All replaced products and all parts removed from repaired products become the property of Xantrex.

Xantrex covers both parts and labor necessary to repair the product, and return shipment to the customer via a Xantrex-selected non-expedited surface freight within the contiguous United States and Canada. Alaska and Hawaii are excluded. Contact Xantrex Customer Service for details on freight policy for return shipments outside of the contiguous United States and Canada.

How do you get service? If your product requires troubleshooting or warranty service, contact your merchant. If you are unable to contact your merchant, or the merchant is unable to provide service, contact Xantrex directly at:

Telephone: 1 800 394 0440 (toll free North America)

1 360 925 5097 (direct)

Fax: 1 800 994 7828 (toll free North America)

1 360 925 5143 (direct)

Email: customerservice@xantrex.com

Direct returns may be performed according to the Xantrex Return Material Authorization Policy described in your product manual. For some products, Xantrex maintains a network of regional Authorized Service Centers. Call Xantrex or check our website to see if your product can be repaired at one of these facilities.

What proof of purchase is required? In any warranty claim, dated proof of purchase must accompany the product and the product must not have been disassembled or modified without prior written authorization by Xantrex.

Proof of purchase may be in any one of the following forms:

- The dated purchase receipt from the original purchase of the product at point of sale to the end user, or
- The dated dealer invoice or purchase receipt showing original equipment manufacturer (OEM) status, or
- The dated invoice or purchase receipt showing the product exchanged under warranty

What does this warranty not cover? This Limited Warranty does not cover normal wear and tear of the product or costs related to the removal, installation, or troubleshooting of the customer's electrical systems. This warranty does not apply to and Xantrex will not be responsible for any defect in or damage to:

- a) the product if it has been misused, neglected, improperly installed, physically damaged or altered, either internally or externally, or damaged from improper use or use in an unsuitable environment;
- the product if it has been subjected to fire, water, generalized corrosion, biological infestations, or input voltage that creates operating conditions beyond the maximum or minimum limits listed in the Xantrex product specifications including high input voltage from generators and lightning strikes;
- the product if repairs have been done to it other than by Xantrex or its authorized service centers (hereafter "ASCs");
- the product if it is used as a component part of a product expressly warranted by another manufacturer;
- e) the product if its original identification (trade-mark, serial number) markings have been defaced, altered, or removed.

Disclaimer

Product

THIS LIMITED WARRANTY IS THE SOLE AND EXCLUSIVE WARRANTY PROVIDED BY XANTREX IN CONNECTION WITH YOUR XANTREX PRODUCT AND IS, WHERE PERMITTED BY LAW IN LIEU OF ALL OTHER WARRANTIES, CONDITIONS, GUARANTEES, REPRESENTATIONS, OBLIGATIONS AND LIABILITIES. EXPRESS OR IMPLIED. STATUTORY OR OTHERWISE IN CONNECTION WITH THE PRODUCT, HOWEVER ARISING (WHETHER BY CONTRACT, TORT, NEGLIGENCE, PRINCIPLES OF MANUFACTURER'S LIABILITY. OPERATION OF LAW, CONDUCT, STATEMENT OR OTHERWISE), INCLUDING WITHOUT RESTRICTION ANY IMPLIED WARRANTY OR CONDITION OF OUALITY. MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE TO THE EXTENT REQUIRED UNDER APPLICABLE LAW TO APPLY TO THE PRODUCT SHALL BE LIMITED IN DURATION TO THE PERIOD STIPULATED UNDER THIS LIMITED WARRANTY

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Exclusions

If this product is a consumer product, federal law does not allow an exclusion of implied warranties. To the extent you are entitled to implied warranties under federal law, to the extent permitted by applicable law they are limited to the duration of this Limited Warranty. Some states and provinces do not allow limitations or exclusions on implied warranties or on the duration of an implied warranty or on the limitation or exclusion of incidental or consequential damages, so the above limitation(s) or exclusion(s) may not apply to you. This Limited Warranty gives you specific legal rights. You may have other rights which may vary from state to state or province to province.

Warning: Limitations On Use

Please refer to your product manual for limitations on uses of the product.

SPECIFICALLY, PLEASE NOTE THAT THE XPOWER INVERTER SHOULD NOT BE USED IN CONNECTION WITH LIFE SUPPORT SYSTEMS OR OTHER MEDICAL EQUIPMENT OR DEVICES. WITHOUT LIMITING THE GENERALITY OF THE FOREGOING, XANTREX MAKES NO REPRESENTATIONS OR WARRANTIES REGARDING THE USE OF THE XANTREX XPOWER INVERTER IN CONNECTION WITH LIFE SUPPORT SYSTEMS OR OTHER MEDICAL EOUIPMENT OR DEVICES.

Please note that the XPower inverter is not intended for use as an uninterruptible power supply and Xantrex makes no warranty or representation in connection with any use of the product for such purposes.

Return Material Authorization Policy

Before returning a product directly to Xantrex you must obtain a Return Material Authorization (RMA) number and the correct factory "Ship To" address. Products must also be shipped prepaid. Product shipments will be refused and returned at your expense if they are unauthorized, returned without an RMA number clearly marked on the outside of the shipping box, if they are shipped collect, or if they are shipped to the wrong location.

When you contact Xantrex to obtain service, please have your instruction manual ready for reference and be prepared to supply:

- The serial number of your product
- Information about the installation and use of the unit
- Information about the failure and/or reason for the return
- A copy of your dated proof of purchase

Return Procedure

- Package the unit safely, preferably using the original box and packing materials. Please ensure that your product is shipped fully insured in the original packaging or equivalent. This warranty will not apply where the product is damaged due to improper packaging.
- 2. Include the following:
 - The RMA number supplied by Xantrex
 Technology, Inc. clearly marked on the outside of
 the box.
 - A return address where the unit can be shipped.
 Post office boxes are not acceptable.
 - A contact telephone number where you can be reached during work hours.
 - A brief description of the problem.
- Ship the unit prepaid to the address provided by your Xantrex customer service representative.

If you are returning a product from outside of the USA or Canada In addition to the above, you MUST include return freight funds and are fully responsible for all documents, duties, tariffs, and deposits.

If you are returning a product to a Xantrex Authorized Service Center (ASC) A Xantrex return material authorization (RMA) number is not required. However, you must contact the ASC prior to returning the product or presenting the unit to verify any return procedures that may apply to that particular facility.

Out of Warranty Service

If the warranty period for your XPower inverter has expired, if the unit was damaged by misuse or incorrect installation, if other conditions of the warranty have not been met, or if no dated proof of purchase is available, your inverter may be serviced or replaced for a flat fee.

To return your XPower inverter for out of warranty service, contact Xantrex Customer Service for a Return Material Authorization (RMA) number and follow the other steps outlined in "Return Procedure" on page 35.

Payment options such as credit card or money order will be explained by the Customer Service Representative. In cases where the minimum flat fee does not apply, as with incomplete units or units with excessive damage, an additional fee will be charged. If applicable, you will be contacted by Customer Service once your unit has been received.