PowerSource 400 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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Date and Revision

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Part Number and Product Number

975-0265-01-01, 852-0400

Contact Information

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IMPORTANT SAFETY INSTRUCTIONS

Operating PowerSource 400 incorrectly or misusing it may damage the equipment or create hazardous conditions for the user.

SAVE THESE INSTRUCTIONS—This manual contains important instructions for PowerSource 400 that should be followed during installation and operation.

Important: Before using your PowerSource 400, be sure to read and save these safety instructions.

WARNING: Shock hazard. Keep away from children.

PowerSource 400 generates the same potentially lethal AC power as a normal household wall outlet.

- Do not insert foreign objects into the AC Outlet or the ventilation holes.
- Do not expose this product to water, rain, snow, or spray.
- Do not, under any circumstances, connect the unit to utility power AC distribution wiring.

WARNING: Risk of injury or loss of life

Do not use PowerSource 400 in connection with life support systems or other medical equipment or devices.

WARNING: Explosion hazard

Do not use this product where there are flammable fumes or gases.

WARNING: Electric shock and energy hazard

Do not remove cover. No user serviceable parts inside. Refer servicing to qualified service personnel.

WARNING: Shock and burn hazard

A battery can present a risk of electrical shock or burn from high short-circuit current.

CAUTION: Risk of damage to the PowerSource 400

The unit will not work when connected to any AC load that has its neutral conductor connected to ground. Such loads include AC distribution wiring and house wiring.

FCC Information to the User

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and the receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Guidelines for Use

Important: The PowerSource 400 is not suitable for use with certain products and loads

The continuous output wattage of this product is limited to 320 watts total when supplying backup power from its batteries. This limit applies to the total of all items plugged into the product.

This output wattage is not sufficient to run the following products:

- Items producing heat: examples include toasters, microwaves, heaters, pellet stove igniters
- Motor loads with high startup power surge requirements: Sump pumps, circular saws, larger power tools, refrigerators

Visit **www.xantrex.com** for higher power solutions.

Precautions for Using Rechargeable Appliances

CAUTION

When the PowerSource 400 is supplying backup power from its batteries, its output is a non-sinusoidal modified sine wave, which is different from pure sine wave utility-supplied electricity. Certain types of load equipment may be damaged.

Most rechargeable battery-operated equipment uses a separate charger or transformer that is plugged into an AC receptacle and produces a low voltage charging output.

Some chargers for rechargeable batteries can be damaged if connected to the PowerSource 400.

Do not use the following with the PowerSource 400:

- Small battery-operated appliances like flashlights, razors and night lights that can be plugged directly into an AC receptacle to recharge.
- Some chargers for battery packs used in hand power tools. These chargers display a warning label stating that dangerous voltages are present at the battery terminals.

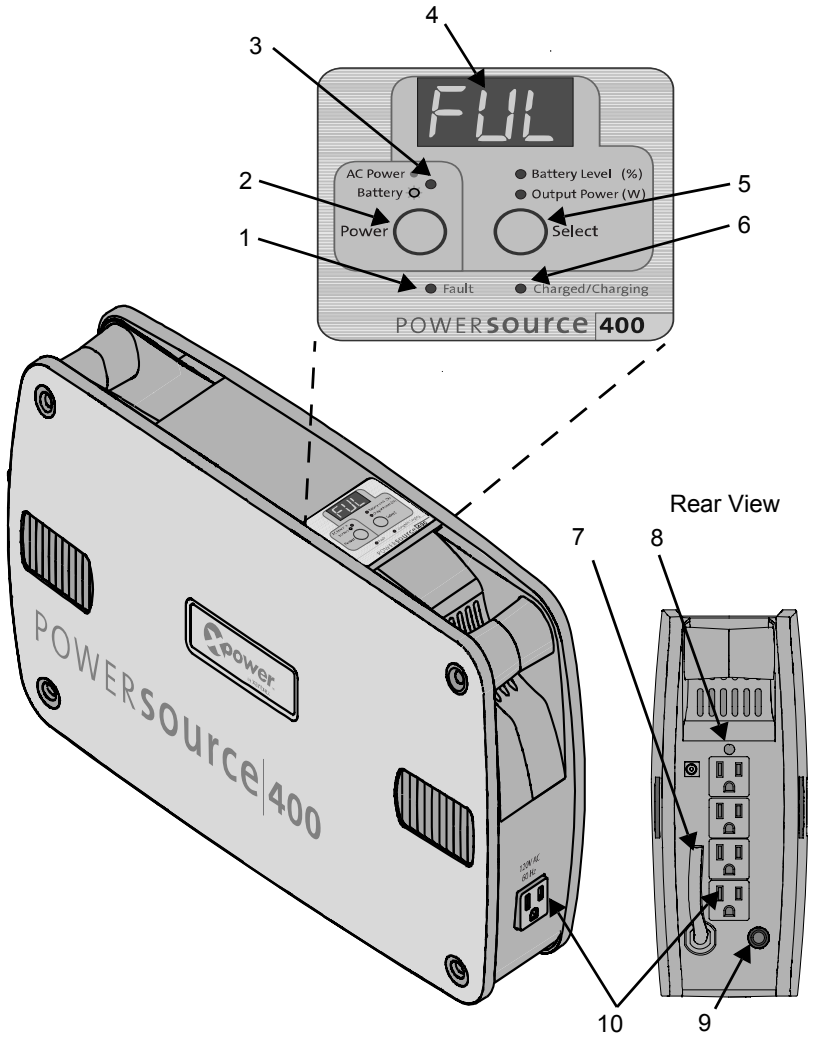
Note: If you are unsure about using your rechargeable appliance with the PowerSource 400, contact the equipment manufacturer to determine the rechargeable appliance's compatibility with the modified sine wave (non-sinusoidal) AC wave form.

Products with Potential Problems

Some products, including the types listed below, may be damaged if they are connected to the PowerSource 400:

- Speed controllers found in some fans, power tools, kitchen appliances, and other loads may be damaged.
- Metal halide arc (MHI) lights can be damaged.

Features



Feature	Description
1	**Fault LED** illuminates red when PowerSource 400 has an operation fault.
2	**Power button** turns PowerSource 400 on and off when pressed for at least 2 seconds. • Turning the unit on activates the LED screen and the five AC outlets. When the unit is on, the unit can charge itself, provide AC power when connected to utility power, and provide backup power. • Turning the unit off removes power from the five AC outlets, even when the AC Power Cord is connected to utility power.
3	**AC Power/Battery LED** illuminates green when utility power is available and flashes amber when PowerSource 400 is running off its internal battery to provide backup power.
4	**LED Screen** indicates charging status, power draw from the PowerSource 400 (W), or battery capacity (%). The screen also shows error codes to aid troubleshooting.
5	**Select Button** displays PowerSource 400 Battery Level (%) or Output Power (W).
6	**Charged/Charging LED** (green) illuminates when PowerSource 400 is fully recharged and flashes while PowerSource 400 is recharging.
7	**AC Power Cord**
8	**Blue LED** illuminates the rear AC outlets when a power outage occurs.
9	**15 A circuit breaker** protects PowerSource 400's AC outlets and your applications from overload conditions.
10	**Five 120V AC outlets** for powering office equipment and household appliances that draw a maximum total of 400 watts. All outlets are surge protected and backed up by the PowerSource 400 internal battery.

Installation and Operation

Important: PowerSource 400 should be used or stored in a temperature-controlled, indoor area away from direct sunlight, moisture or conductive contaminants. Allow a minimum of 3 inches of space around the unit for optimal ventilation.

Important: **PowerSource 400 must be charged immediately before storage or use.** This will protect the battery inside from damage and will ensure extended usage run time. A complete charge may take up to 20 hours when recharged from a 120 VAC wall outlet.

CAUTION

- Do not plug surge-protected power bars into the unit's 120 VAC outlets.
- Do not connect an AC power source to the 120 VAC outlets.
- Do not connect the unit's AC power cord to its 120 VAC outlets.

To install PowerSource 400:

1. Plug the power cord directly into a wall outlet (not into a surge protector or power strip).
2. Connect your electronic devices or small household appliances to the five AC outlets of the PowerSource 400.
3. Turn on the unit by pressing the Power button for at least 2 seconds. The green AC Power LED confirms that the PowerSource 400 is on and ready to provide backup power.

   When the battery needs recharging, the LED screen flashes "CHG" five times, then the battery capacity (%) once. This pattern of flashing continues until the battery capacity reaches 100% and "FUL" appears on the screen.

Backup Power Feature

The unit's five 120 VAC outlets are permanently backed up by the internal battery. To activate the AC outlets, turn on the unit using the Power button. During a power outage or other utility problem (such as brownouts and over-voltages), PowerSource 400 will keep running the connected products for up to 8 hours, depending on the power draw of your application. When utility power is restored, the unit automatically recharges its internal battery.

Important: When connected to utility power, the unit automatically provides AC power from its internal battery when the utility voltage falls outside the 105–135 VAC range. The blue LED also turns on automatically to illuminate the rear AC outlets.

Operation Guide

Condition	LED status	Alarm status	Alarm stops sounding when…
Normal operation—Unit is on and supplies utility power to the application. The internal battery is fully charged.	AC Power LED and Charged/Charging LED are solid green. Screen shows "FUL."	None	Not applicable
Backup power—Unit supplies power from its internal battery.	Battery LED is flashing amber.	One beep when the power outage occurs.	Unit beeps once when it returns to normal operation or when it is turned off.
Low battery warning—Unit is supplying battery power to the application connected to its AC outlets and the battery is close to complete discharge status.	Battery LED is flashing amber.	Begins beeping once every 10 seconds 10 minutes before unit shuts down.	Unit returns to normal operation, or when it is turned off.
Overload shutdown—During normal operation or backup power operation an AC outlet overload was detected.	Fault LED on. Screen shows Error code E03.	One beep per second. Unit shuts down after 5 seconds/beeps.	Not applicable
Under-voltage shutdown—During backup power operation the battery power has been completely exhausted. No power is available at the AC outlets.	No LED on.	No sound	Not applicable. Unit starts recharging the internal battery when utility power is restored. Turn on the unit to restore normal operation.
Over-temperature shutdown—Unit has shut down to protect its internal circuitry from high temperatures.	Fault LED on. Screen shows error code E04.	One beep per second for two minutes before shutdown, then sounds continuously for five seconds upon shutdown.	The unit is turned off or when the unit shuts down.
Recharging internal battery—Unit is recharging its internal battery after utility power has been restored.	AC Power LED is green. Charged/Charging LED flashes amber. Screen shows "CHG" alternating with battery capacity (%).	No sound	Not applicable. Screen shows "FUL" when unit is completely charged.

AC Power Capabilities

Power Consumption of Loads	Normal Operation with Utility Power	Ability to Provide Backup Power
Up to 320 W	Yes.	Yes, continuous.
320 to 400 W	Yes	Yes, up to five minutes.
400 to 1000 W	Yes.	No. Overload shutdown.
Over 1000 W	No. Overload shutdown.	No. Overload shutdown.

To check the total power consumption of the products plugged into PowerSource 400, press the Select button and view the Output Power (W) on the screen.

When you plug an additional product into the PowerSource 400 and the new total power consumption exceeds 400 W, the unit beeps five times to notify you that the power consumption is beyond the unit's capability to supply backup power. Unplug or substitute one or more products connected to the PowerSource 400. To return to the default display ("CHG" or "FUL"), press the Select button.

Run Time on Typical Products

Product	Watts[a]	Run Time[b]	Product	Watts[a]	Run Time[b]
Laptop computer	25	15 h	Table lamp	40	9 h
Inkjet printer	8	55 h	Desktop computer	67	5 h
Cordless phone	5	92 h	17" LCD monitor	35	10 h
Cell phone	5	92 h	13" TV	50	7 h
Internet modem	6	81 h	Clock radio	8	55 h

a.Average power consumption as measured on loads tested under regular operating conditions. Rated power may differ from average power consumption.
b.Run time as measured on tested loads.

Run Time for Combinations of Products

Product	Run Time[b]
Laptop, inkjet printer, cordless phone, Internet modem	up to 8 h
Desktop computer, 17" LCD monitor, inkjet printer, Internet modem, cordless phone	up to 2.5 h
Cordless phone, 13" TV, clock radio, table lamp	up to 4 h

Power Management Tips

During a power outage, maximizing PowerSource 400 run time is essential to keep your home/small office running or to stay connected to the outside world through TV and radio news or cellphone/VoIP phone. Therefore, in order to maximize the run time for combinations of office products plugged into PowerSource 400, you may want to use the following alternatives:

Use...	Instead of...
Inkjet printer	Laser printer
Laptop, or desktop computer with LCD monitor	Desktop computer with CRT monitor
Monitor energy saving mode settings	Bright monitor settings
7 or 13" TVs	Big screen TVs
Small desk lamps (25 to 40 W)	High-wattage lamps

Battery Replacement

The battery pack in this product consists of two 20 amp-hour batteries. When they come to the end of their useful service life they may be replaced with equivalent sealed lead acid batteries by a qualified battery technician. Suitable replacement batteries are Panasonic #LC-X1220P and EnerSys #NPX-80. Information on other replacement battery brands and dealers is in the battery replacement guide in the Frequently Asked Questions (FAQ) section of the Xantrex Support site at **www.xantrex.com/support**.

Recycling

PowerSource 400 is designed to provide years of service. However, when the internal batteries reach the end of their service life, and if you choose not to have a qualified technician replace them, the PowerSource 400 itself is no longer of use. The internal batteries may be replaced following the instructions in "Battery Replacement" above.

Because the internal batteries contain lead, which can be hazardous if exposed to the environment, the batteries and the PowerSource 400 should be recycled or safely disposed of at your local recycling depot. Do not dispose of the batteries and the PowerSource 400 with common household waste. Please ask your local authorities about recycling services that are available in your area.

Troubleshooting

Understanding Error Codes

If the products connected to PowerSource 400 do not operate and the alarm is sounding, check PowerSource 400 LED screen for an error code.

Error	Possible Cause	Solution
E01	Low voltage shutdown because battery is discharged.	Recharge battery by plugging the AC power cord into a wall outlet.
E03	Overload shutdown while supplying backup power. The AC product(s) connected are consuming more than PowerSource 400's five-minute power rating.	Use products with a total power consumption within PowerSource 400's continuous power rating of 320 W.
	The AC products connected have a surge power that exceeds PowerSource 400 surge capability.	Use products with a total starting surge power within PowerSource 400's capability of 640 W.
	The AC products connected are short-circuited	Have the load serviced by a qualified technician.
E04	Over-temperature shutdown has occurred. PowerSource 400 has overheated due to poor ventilation, excessive ambient temperature, or power demand beyond the unit's five-minute output power capability.	Disconnect products from the AC outlets. Allow the unit to cool for 20 minutes. Clear blocked fan or remove objects covering unit. Move the unit to a cooler place. Reduce load to less than 320 W if continuous operation is required.

Troubleshooting Reference

Problem	Problem/Symptom	Solution
PowerSource 400 will not turn on.	Battery is discharged and utility power is not available at the wall outlet.	Ensure power is available at the wall outlet.
No power available at the 120 VAC outlets.	AC outlet has been overloaded or the circuit breaker has tripped.	Reduce the number of products plugged into the AC outlets. Check the circuit breaker at the back of the unit. If necessary, reset the breaker by pushing it fully inward.
Products connected to unit lose power.	PowerSource 400 has detected an overload condition.	Make sure the products plugged into the AC outlets are not overloading the five-minute output power rating of the unit when supplying backup power. Try removing or substituting some of the products.
	PowerSource 400 has detected an over-temperature condition.	Disconnect products from the AC outlets. Make sure the products plugged into the AC outlets are not overloading the continuous output power rating of the unit when supplying backup power. Allow the unit to cool, increasing ventilation if necessary. If the unit is left on, it restarts automatically when the unit cools down 20 degrees.
	PowerSource 400 has exhausted its available battery power.	PowerSource 400 shuts down when all available battery power has been used. Allow the unit to recharge for 20 hours before continuing to use the unit.
	PowerSource 400 may require service.	Contact Xantrex Technical Support for further troubleshooting (see "Contact Information" on page 1).
Products connected to unit malfunction or overheat.	Products connected to PowerSource 400 do not accept modified sine wave form.	Your application is not compatible with PowerSource 400 modified sine wave output. See "Precautions for Using Rechargeable Appliances" on page 2.
Inadequate run time.	PowerSource 400 battery is not fully charged.	Charge the battery by leaving PowerSource 400 plugged into a wall outlet at least 20 hours.
	Battery is near the end of its useful life.	As the battery ages, the available run time decreases. The internal battery also ages prematurely if PowerSource 400 is installed in a hot environment. See "Battery Replacement" on page 5.

Specifications

Electrical Specifications

Output Specifications	
Output power (max. continuous)	320 W (650 VA)
Output power (5 minutes)	400 W
Surge power (peak)	640 W
Output voltage (nominal)	120 VAC
Output frequency	60 Hz ±1 Hz
Output wave form	Modified sine wave
Transfer switch	12 A/12 milliseconds
Surge suppression	Yes
Inverter on (no-load current draw)	< 0.35 A (battery drain)
Charging time	20 hours from 120 VAC
12 V DC Specifications	
Internal battery type	Sealed lead acid, AGM
Internal battery capacity	40 amp-hours
Internal battery voltage	12 VDC (nominal)
Low battery alarm	11.0 V (nominal)
Low battery shutdown	10.5 V (nominal)
Internal charger charging current	2 A DC maximum

General Specifications

Operating/Storage temperature	32 °F–86 °F (0 °C–30 °C)/32 °F–104 °F (0 °C–40 °C)
Dimensions (H × W × L)	18.5 × 4.25 × 10.5" (47 × 10.8 × 26.7 cm)
Weight	32 lb (14.5 kg)
Approvals	
UL Listed to UL 1778 2nd Edition and CSA C22.2 no. 107.1-01 standby UPS Standards FCC Class B	

All specifications are subject to change without notice.

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 PowerSource 400. This warranty period lasts for 1 year 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.

If your product requires warranty service or troubleshooting, please contact your dealer. If you are unable to contact your dealer, or the dealer is unable to provide service, contact Xantrex directly at:

Telephone: 1 360 925 5059 (direct)
Fax: 1 360 925 5143 (direct)
Email: customerservice@xantrex.com

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;

b) 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;

c) the product if repairs have been done to it other than by Xantrex or its authorized service centers (hereafter "ASCs");

d) 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

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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.

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