

# Xantrex™ XW Hybrid Inverter/Charger

Xantrex XW4024 230 50

Xantrex XW4548 230 50

Xantrex XW6048 230 50

## Installation Guide





# Xantrex XW Hybrid Inverter/Charger

## Installation Guide

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865-1035-61 (Xantrex XW6048 230 50), 865-1040-61 (Xantrex XW4548 230 50), and 865-1045-61 (Xantrex XW4024 230 50)

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**Information About Your System**

As soon as you open your product, record the following information and be sure to keep your proof of purchase.

Serial Number \_\_\_\_\_

Product Number \_\_\_\_\_

Purchased From \_\_\_\_\_

Purchase Date \_\_\_\_\_

# About This Guide

## Purpose

The purpose of this Installation Guide is to provide explanations and procedures for installing the Schneider Electric Xantrex XW Power System.

## Scope

This Guide provides safety guidelines, detailed planning, and procedures for installing the Xantrex XW Inverter/Charger and related system components (the Xantrex XW Power System). It does not provide details about configuration, operation, maintenance, or troubleshooting. See the Operation Guide or Owner's Manual of each device for this information. This Guide also does not provide details about particular brands of batteries. Consult individual battery manufacturers for this information.

## Audience

This Guide is intended for anyone installing the Xantrex XW Power System. Installers must be certified technicians or electricians.

## Organization

This guide is organized into two chapters and one appendix.

Chapter 1, "Introduction" lists and describes the components and basic features of the Xantrex XW Power System.

Chapter 2, "Inverter/Charger Installation" describes how to mount and install the Xantrex XW Inverter/Charger.

Appendix A, "Specifications" provides the electrical and mechanical specifications for the Xantrex XW Power System.

## Conventions Used

The following conventions are used in this guide.



### **WARNING**

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



### **CAUTION**

Cautions identify conditions or practices that could result in damage to the Xantrex XW Power System components or other equipment.

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## Related Information

For additional information about operating the Xantrex XW Inverter/Charger, see the Xantrex XW Inverter/Charger Operation Guide (975-0385-01-02).

For more information about related components, refer to:

- Xantrex XW Power System Installation Overview (975-0238-01-01)
- Xantrex XW System Control Panel Owner's Guide (975-0298-01-01)
- Xantrex XW Solar Charge Controller Owner's Guide (975-0283-01-01)
- Xantrex XW Automatic Generator Start Owner's Guide (975-0307-01-01)

These guides are available at [www.schneider-electric.com](http://www.schneider-electric.com). Printed copies are included with the components.

For more information about Schneider Electric as well as its products and services, visit [www.schneider-electric.com](http://www.schneider-electric.com).

# Important Safety Instructions

SAVE THESE INSTRUCTIONS

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## **WARNING**

This chapter contains important safety and operating instructions. Read and keep this Installation Guide for future reference.

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## **WARNING: Limitations on use**

The Xantrex XW Power System is not intended for use in connection with life support systems or other medical equipment or devices.

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1. Before using the Xantrex XW Series Inverter/Charger, read all instructions and cautionary markings on the Xantrex XW Series Inverter/Charger and the batteries, as well as all appropriate sections of this guide.
2. Make sure that the Xantrex XW Series Inverter/Charger is installed according to the guidelines and procedures in this Installation Guide.
3. Do not expose the Xantrex XW Series Inverter/Charger to rain, snow, or spray. To reduce risk of fire, do not cover or obstruct the ventilation openings.
4. Use only attachments recommended or sold by Schneider Electric. Doing otherwise may result in a risk of fire, electric shock, or injury to persons.
5. To avoid a risk of fire and electric shock, make sure that existing wiring is in good condition and that the wire is not undersized. Do not operate the Xantrex XW Series Inverter/Charger with damaged or substandard wiring.
6. Do not operate the Xantrex XW Series Inverter/Charger if it has received a sharp blow, been dropped, or been otherwise damaged in any way. If the Xantrex XW Series Inverter/Charger is damaged, see your warranty.
7. Do not disassemble the Xantrex XW Series Inverter/Charger. It contains no user-serviceable parts. See the warranty for instructions on obtaining service. Attempting to service the Xantrex XW Series Inverter/Charger yourself may result in a risk of electrical shock or fire and will void your warranty. Internal capacitors remain charged after all power is disconnected.
8. To reduce the risk of electrical shock, authorized service personnel must disconnect both AC and DC power from the Xantrex XW Series Inverter/Charger before attempting any maintenance or cleaning or working on any circuits connected to the Xantrex XW Series Inverter/Charger. Putting the unit in Standby mode will not reduce this risk.
9. To reduce the chance of short-circuits, authorized service personnel must use insulated tools when installing or working with this equipment.





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# 1

## Introduction

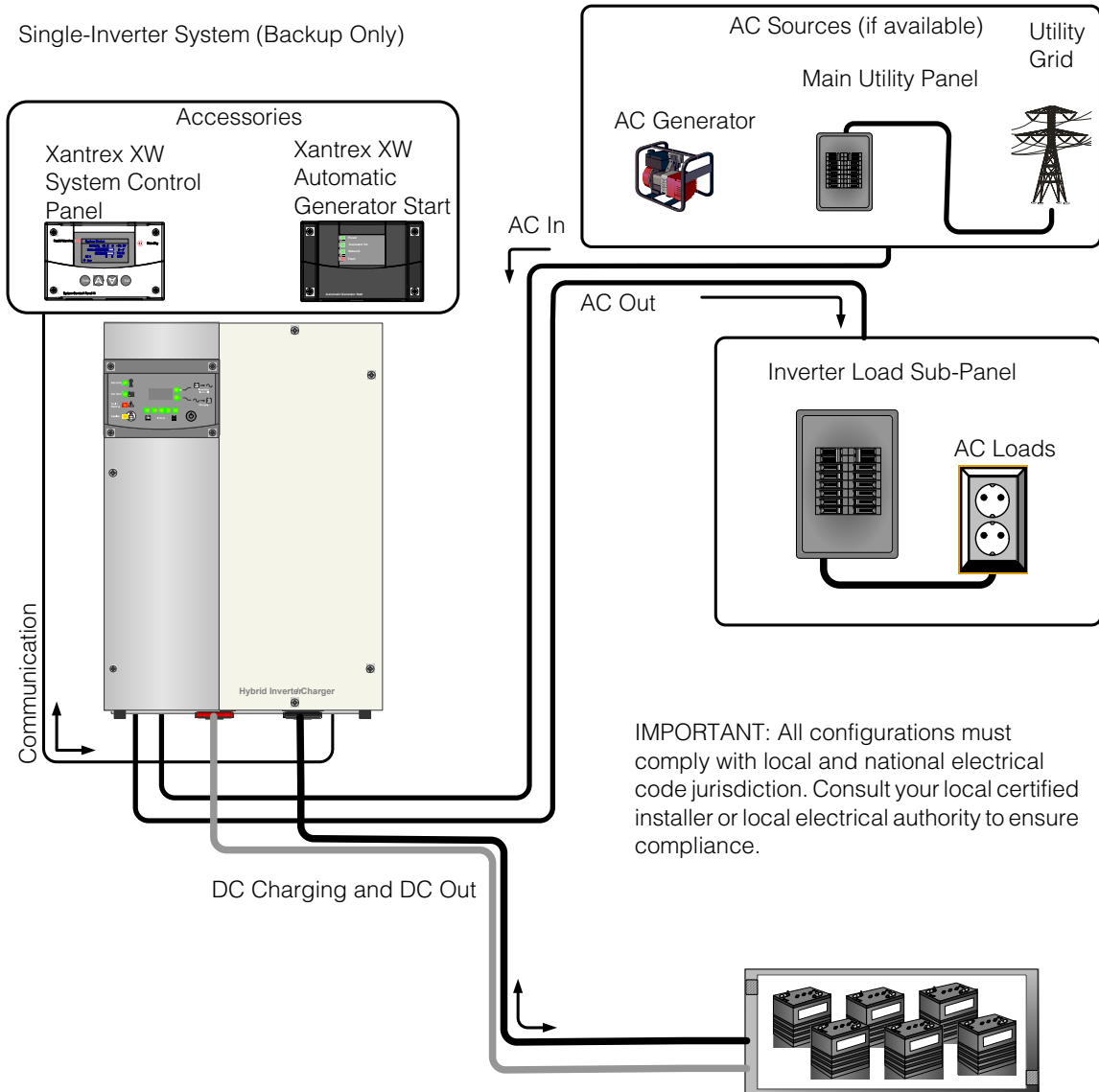
Chapter 1, “Introduction” lists and describes the components and basic features of the Xantrex XW Power System.

<b>For this Topic</b>	<b>See....</b>
“System Overview”	page 1-2
“System Components and Accessories”	page 1-4

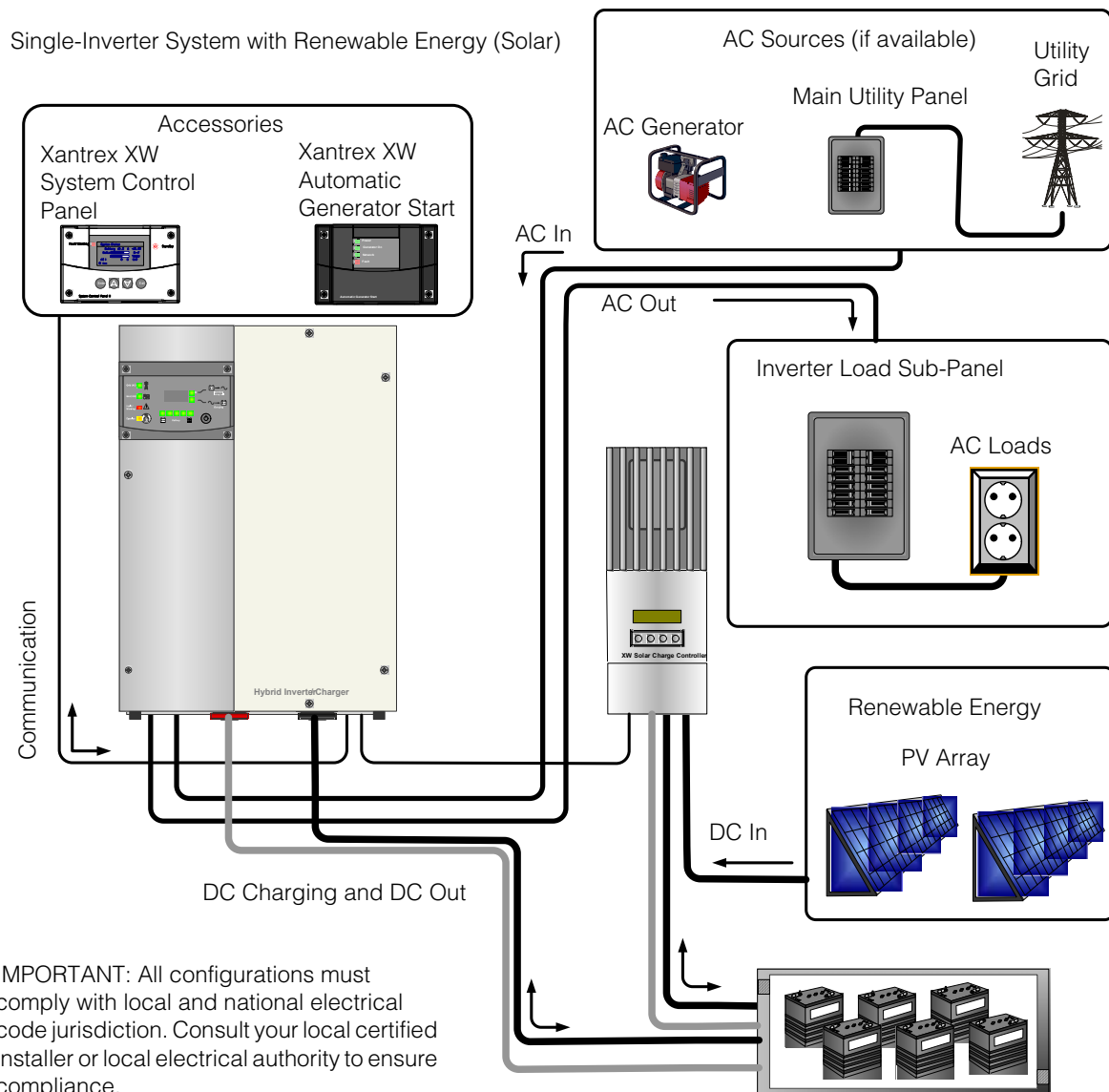
## System Overview

The Xantrex XW Power System consists of several devices, components, and optional accessories that, when installed together, create a renewable energy power system that can be customized to suit nearly any application—off-grid, grid-tie, or backup.

### System Diagram



**Figure 1-1** Xantrex XW Power System Installation with Backup Only Example



**Figure 1-2** Xantrex XW Power System Installation with Renewable Energy Example

## System Components and Accessories

### Xantrex XW Inverter/Charger

The Xantrex XW Inverter/Charger is a modular “building block” sine-wave inverter/charger that can be used for both residential and commercial stand-alone, grid-backup, and grid-tie applications with battery energy storage. The Xantrex XW Series Inverter/Charger is a self-contained DC to AC inverter, battery charger, and AC transfer switch.

Up to four inverters can be installed in parallel to create larger 230-volt, single-phase systems, allowing for increased capacity. Multiple Xantrex XW Inverter/Chargers can also be connected to create a three-phase system. One inverter per phase is required, and up to two inverters can be connected in parallel on each phase.



**Figure 1-3** Xantrex XW Inverter/Charger

A Battery Temperature Sensor (Part Number 808-0232-02) is included with the Xantrex XW Inverter/Charger. The Battery Temperature Sensor monitors the temperature of the battery bank and adjusts the charging accordingly. For installation instructions, see page 2–18.

## Xantrex XW Conduit Box

The Xantrex XW Conduit Box (Part Number 865-1025) is available to enclose the bottom of the Xantrex XW Inverter/Charger and protect the cabling. Use of the conduit box may be required depending on the local electrical code. Consult the local electrical authority to make sure the installation is code-compliant.



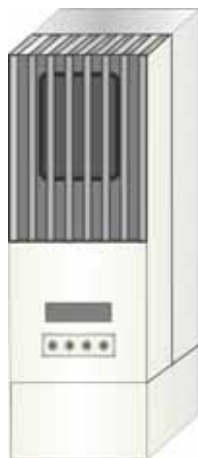
**Figure 1-4** Xantrex XW Conduit Box

The Xantrex XW Conduit Box comes in two pieces and mounts directly to the bottom of the inverter/charger with keyhole slots and screws. It is secured to the inverter by two #10-32 screws on the bottom of the inverter, and it is secured to the wall by two screws (not provided).

Internal wire barriers (or raceways) are included to keep communications wires separate from AC and DC power wires. The Xantrex XW Conduit Box also includes multiple cable strap points.

## Xantrex XW Solar Charge Controller

The Xantrex XW Solar Charge Controller (Part Number 865-1030-1) is a 60 amp charge controller with integrated Photovoltaic Ground Fault Protection (PVGFP) and separate Battery Temperature Sensor. The Xantrex XW Solar Charge Controller can be used with 12-, 24-, 36-, 48-, and 60-volt battery systems. When the Xantrex XW Solar Charge Controller is used with the Xantrex XW Inverter/Charger, it is limited to 24- or 48-volt battery banks. The Xantrex XW Solar Charge Controller automatically detects the 24- or 48-volt settings.



**Figure 1-5** Xantrex XW Solar Charge Controller

## Xantrex XW System Control Panel

The Xantrex XW System Control Panel (Part Number 865-1050) features a graphical, backlit liquid crystal display that shows system configuration and diagnostic information for all devices connected to the network. When installed as a Xantrex XW Power System accessory, the Xantrex XW System Control Panel eliminates the need for separate control panels for each device and gives a single point of control to set up and monitor an entire Xantrex XW Power System.

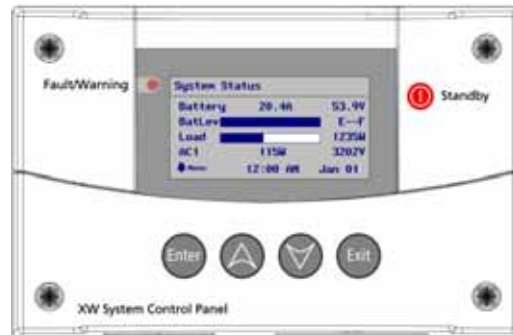


Figure 1-6 Xantrex XW System Control Panel

## Xantrex XW Automatic Generator Start

The Xantrex XW Automatic Generator Start (Part Number 865-1060) can automatically activate a generator to provide a Xantrex XW Series Inverter/Charger with power to recharge depleted batteries or assist with heavy loads.

The Xantrex XW Automatic Generator Start is compatible with popular generators, and it can be configured to start the generator in response to low battery voltage, thermostat operation, or load size on the inverter battery. A quiet time setting prevents the generator from starting at inconvenient times. LEDs display the status of the Xantrex XW Automatic Generator Start, while all settings are programmed through the Xantrex XW System Control Panel.

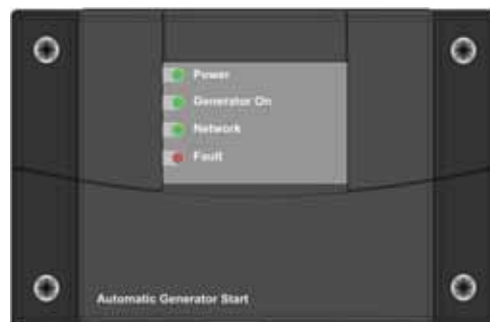


Figure 1-7 Xantrex XW Automatic Generator Start



<b>Generator</b>	The generator should be a 230V, single-phase generator with automatic starting capabilities.
<b>Generator Compatibility</b>	The Xantrex XW Automatic Generator Start supports most two- and three-wire generator starters. Some manufacturers include, but are not limited to, Onan (Quiet Diesel, gasoline, and LP), Power Tech, Generac, Northern Lights, Fisher Panda, Westerbeke, Kohler, Honda, and Yamaha. Check with the generator manufacturer to make sure your generator has automatic starting capabilities and is compatible with the Xantrex XW Automatic Generator Start. For more information, see the Xantrex XW Automatic Generator Start Owner's Guide.
<b>Xantrex XW System Control Panel</b>	A Xantrex XW System Control Panel is required to configure the Xantrex XW Automatic Generator Start and monitor generator starting and stopping activity.



# 2

## Inverter/Charger Installation

Chapter 2, “Inverter/Charger Installation” describes how to mount and install the Xantrex XW Inverter/Charger.

<b>For this Topic</b>	<b>See...</b>
“Pre-Installation”	page 2-2
“Step 1: Installing the Mounting Plate”	page 2-4
“Step 2: Mounting the Inverter”	page 2-7
“Step 3: Installing Communications Cables”	page 2-8
“Step 4: Wiring the Inverter”	page 2-12
“Step 5: Installing Additional Inverters”	page 2-33

## Pre-Installation

Before installing the Xantrex XW Inverter/Charger, read all instructions and cautionary markings located in this manual.

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**Important:** Obtain the appropriate permits, if necessary, prior to starting this installation. **Installations must meet all local codes and standards.** Installations of this equipment must only be performed by skilled personnel such as qualified electricians and certified renewable energy system installers.

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### **WARNING: Personal Injury**

The Xantrex XW Inverter/Charger weighs approximately 54 kg. To prevent personal injury, always use proper lifting techniques and have someone available to assist with lifting during installation.

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## Location

The Xantrex XW Inverter/Charger is certified for indoor (heated or unheated) installations only.

### **Close to battery bank**

Locate the inverter as close as possible to the batteries to keep the battery cable length short. The maximum recommended battery cable length is 3 meters.

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### **WARNING: Explosion and Corrosion Hazard**

Do not locate the inverter directly above the batteries or in the same compartment as vented batteries.

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Locate any electronic equipment susceptible to radio frequency and electromagnetic interference as far away from the inverter as possible.

### **Fire safety**

Do not locate the inverter near readily flammable materials such as cloth, paper, straw, or plastic sheeting. Flammable materials should be kept a minimum distance of 600 mm from the top surface and 300 mm from either side surface and the front of the Xantrex XW Inverter/Charger.

## Knockout Preparation

Remove your choice of knockouts from the chassis to facilitate conduit installation for wire runs. Make sure no debris from this procedure remains inside the inverter enclosure.

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**Important:** Do not drill, cut, or punch holes into the Xantrex XW Inverter/Charger. Use only the knockouts provided for conduit entry.

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## Clearance Requirements

Provide a minimum clearance of 150 mm (300 mm is preferred) around the top and 150 mm at the bottom of the inverter for ventilation. The front of the inverter must have at least one meter of clearance. Make sure that the vents are not obstructed with foreign objects and that the minimum clearances are met.



**Figure 2-1** Clearance Requirements

## Mounting

The Xantrex XW Power System is designed to be mounted on a vertical surface. The supporting surface must be strong enough to support a minimum of 60 kg for a single inverter/charger. To facilitate installation, a wall mounting plate (Part Number 210-0462-01-01) is provided for each Xantrex XW Inverter/Charger. The mounting plate and hardware on the Xantrex XW Inverter/Charger are designed to meet standards for structural and seismic stability.

## Step 1: Installing the Mounting Plate

Each Xantrex XW Inverter/Charger requires a separate mounting plate. This bracket is first attached to the wall, and then the inverter/charger is attached to the wall bracket.

The wall bracket is attached to the wall with lag bolts or other fasteners, provided by the installer. A minimum of four 6 mm diameter fasteners are required. The fasteners must be sufficiently strong to support the weight of the inverter/charger. The type of fastener required to secure the mounting plate varies according to the vertical surface and wall structure of the installation location.

The wall bracket has mounting holes spaced 400 mm apart and is designed to span two wall studs spaced 400 mm on-center. Additional mounting holes are also provided for flexibility in mounting options. If the wall does not have 400-mm on-center studs, the installer must provide adequate supports for the brackets. For example, a sheet of plywood can be attached to the wall, and the wall brackets can then be attached to plywood.

The brackets are designed to interlock (as shown in Figure 2-3), so that additional mounting plates are easily installed without additional measuring or levelling.

**Table 2-1** Mounting Plate Fastener Recommendations

Structure	Required Fastener	Number of Screws Per Bracket
Wood studs at 400 mm (on center - O.C.)	6 mm Ø × 89 mm long lag screw	Four
Wood studs not at 400 mm O.C. (20 mm minimum plywood panel required)	6 mm Ø × 25mm long wood screw	Six
Steel studs at 400 mm O.C. (minimum 18 gauge)	6 mm Ø self-drilling screw	Four

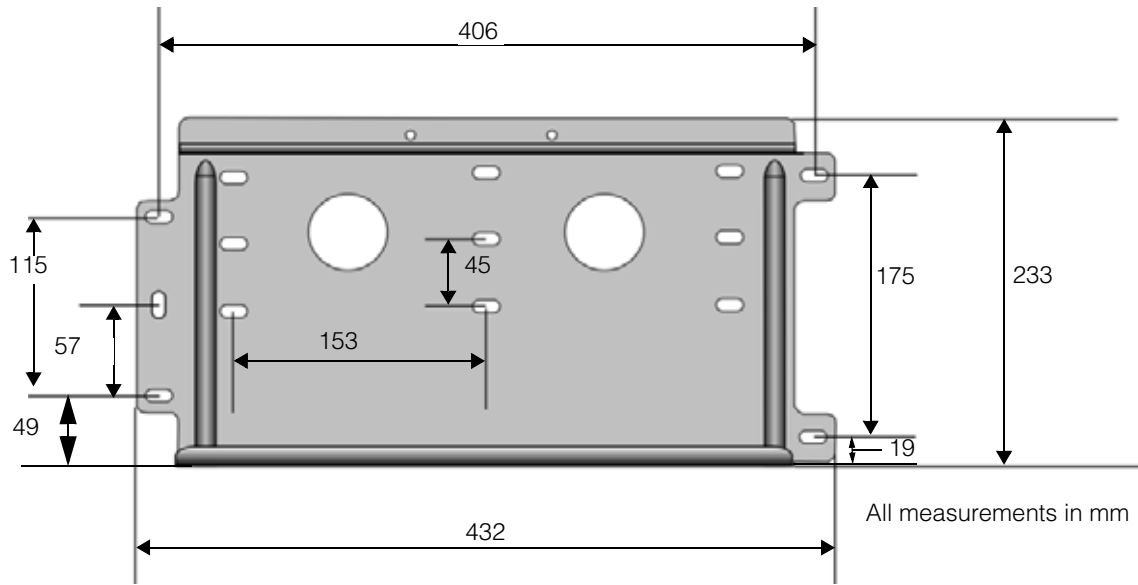
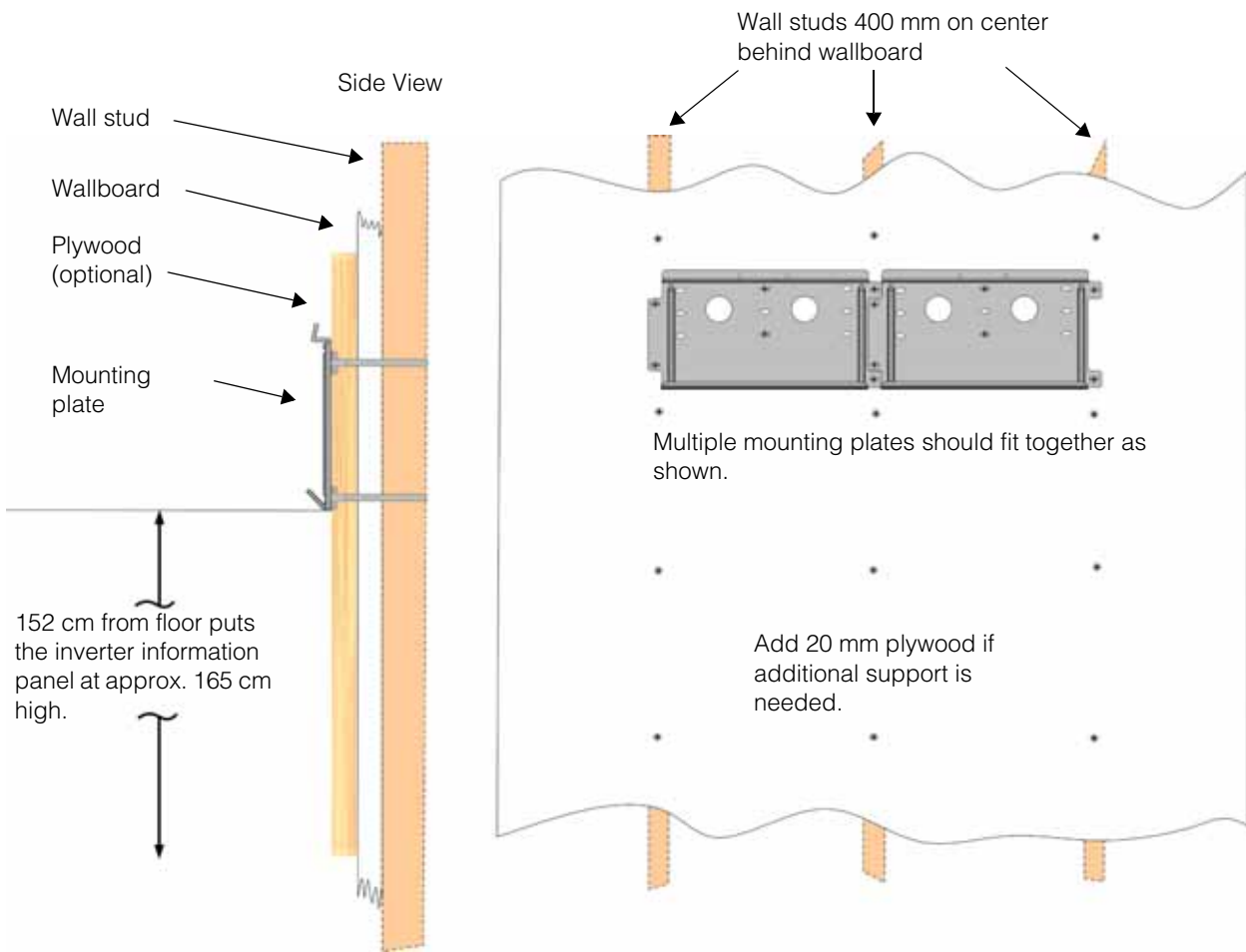


Figure 2-2 Mounting Plate Dimensions



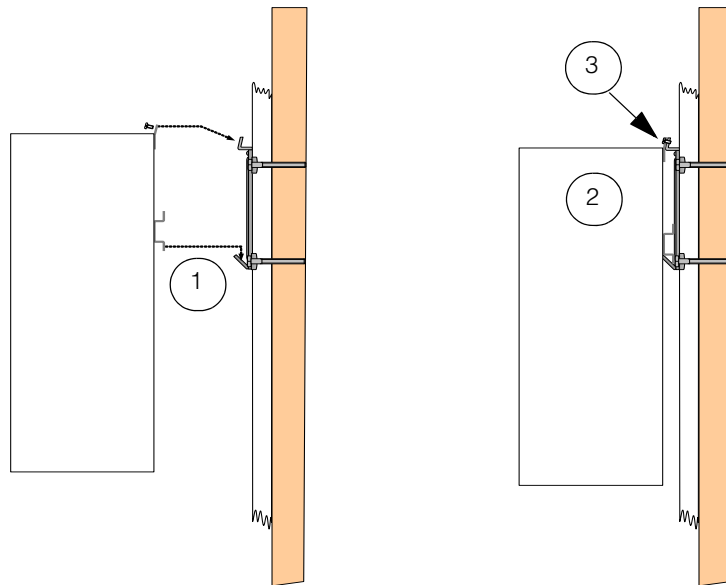
- 1 Locate the wall studs.
- 2 If necessary, enhance the support surface with a 20 mm plywood panel secured to the wall studs. The plywood should span at least three wall studs.
- 3 Use hardware (not provided) sized to support the weight of the equipment to secure the plywood to the wall.
- 4 Using a level, secure the first mounting bracket to the wall. Use recommended anchoring hardware to secure the plate (see Table 2-1).
- 5 Mount the next bracket adjacent to the first one. The brackets are designed to interlock, so additional mounting brackets are easily installed without additional measuring or levelling.

**Figure 2-3** Mounting the Bracket for the Xantrex XW Inverter/Charger or Distribution Panel



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## Step 2: Mounting the Inverter



1 Align the flange on the back of the Xantrex XW Inverter/Charger with the bottom edge of the mounting plate.

2 Lower the flange on the inverter onto the mounting plate.

CAUTION: Before releasing the full weight of the inverter, make sure it is seated properly on the mounting plate.

3 Secure the top of inverter with two #10 self-tapping screws (provided).

**Figure 2-4** Mounting the Xantrex XW Inverter/Charger

## Step 3: Installing Communications Cables

Two types of communication cables must be installed, depending on your installation requirements:

1. Xantrex Xanbus™ network cables—to connect the Xantrex XW Inverter/Charger to other Xantrex Xanbus-enabled devices. Connecting Xantrex XW Inverter/Chargers and other network components with Xantrex Xanbus network cables simplifies and automates configuration, control, and monitoring of the Xantrex XW Power System.
2. AC Sync cables—to connect the Xantrex XW Inverter/Charger to other Xantrex XW Inverter/Chargers in multiple-unit installations. The AC Sync cables provide communication and AC control between multiple Xantrex XW Inverter/Chargers.

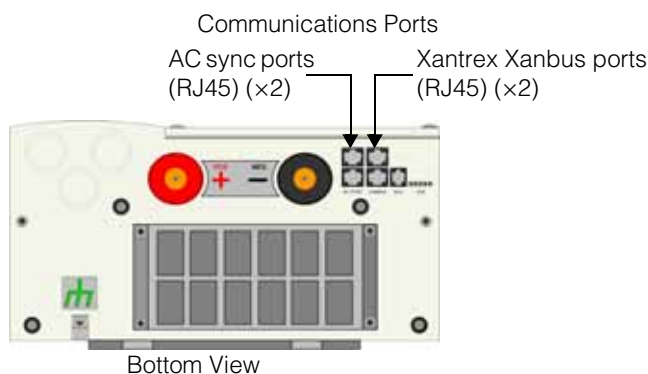


Figure 2-5 Xantrex XW Inverter/Charger Communications Ports

### Guidelines for Routing the Communications Cables



#### **WARNING: Shock hazard**

Do not route the Xantrex Xanbus or AC Sync cables in the same conduit or panel as the AC and DC power cabling.

For maximum performance of your network, follow these guidelines when routing the communications cables.

- Route the cables away from sharp edges that might damage the insulation. Avoid sharp bends in the cable—no less than a 100 mm radius.
- Allow for some slack in the cable tension.
- Keep the alignment of wire pairs inside the sheath as straight as possible.
- Allow separation between communications and power cables (communications cables should only cross a power cable at right angles).
- Do not staple the cable with metal cable staples. Use appropriate hardware fasteners to avoid damage to the cable.
- Support horizontal cables using J hooks or cable trays.

The total length of the network, including all connected Xantrex Xanbus-enabled devices and the Xantrex XW Inverter/Charger, cannot exceed 40 m.

## Xantrex Xanbus Network Components

A Xantrex Xanbus network consists of the following components:

- Xantrex Xanbus-enabled devices—these include the Xantrex XW System Control Panel, the Xantrex XW Inverter/Charger, Xantrex XW Automatic Generator Start, and Xantrex XW Charge Controller. The maximum number of Xantrex Xanbus-enabled devices in a Xantrex XW Power System is eight.
- Xantrex Xanbus power supply—the network must have at least one device with a power supply to run the network. The total network current supplied by all the power-sourcing devices must be greater than or equal to the total current drawn by the power consuming devices. The power supply must be capable of providing 15 VDC/200 mA to each device. The Xantrex XW Inverter/Charger can provide sufficient network power.

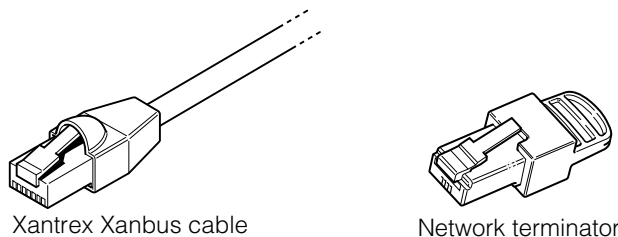
For example, in a system with an inverter/charger, a Xantrex XW System Control Panel, and a Xantrex XW Automatic Generator Start, the inverter/charger is a power-sourcing device capable of providing 800 mA at 15 VDC while the two other devices each consume a maximum of 200 mA for a total maximum consumption of 400 mA. In this example, the network is properly configured from a power perspective because the power source is capable of providing more current than is needed: 800 mA > 400 mA.

- Xantrex Xanbus cables—each Xantrex Xanbus-enabled device is connected by a Category 5 (CAT 5 or CAT 5e) cable, a standard cable available from Schneider Electric or any computer supply store. The cable consists of eight conductors in four twisted pairs with an RJ45 modular connector wired to the T568A standard.



### CAUTION: Equipment Damage

Do not use crossover cable.



**Figure 2-6** Xantrex Xanbus Cable and Network Terminators

- Network terminators—the Xantrex Xanbus network must be properly terminated at each end to ensure the communication signal quality on the network. If the network is not properly terminated, signal quality is degraded and performance on the network is reduced. Permanent configuration without terminators is not supported by Schneider Electric. The Xantrex XW Series Inverter/Charger and other Xantrex Xanbus-enabled devices ship with one terminator. Depending on your network layout, this terminator may need to be inserted into another device elsewhere in the network.

## Network Layout

Each device on the network is linked with separate lengths of Xantrex Xanbus cable, as shown in Figure 2-7.



### CAUTION: Unpredictable device behavior

Do not connect one end of the network to the other to make a ring.

Two terminators are required to ensure the communication signal quality on the network. The Xantrex Xanbus-enabled devices at each end of the chain must have a terminator inserted into their open network ports.

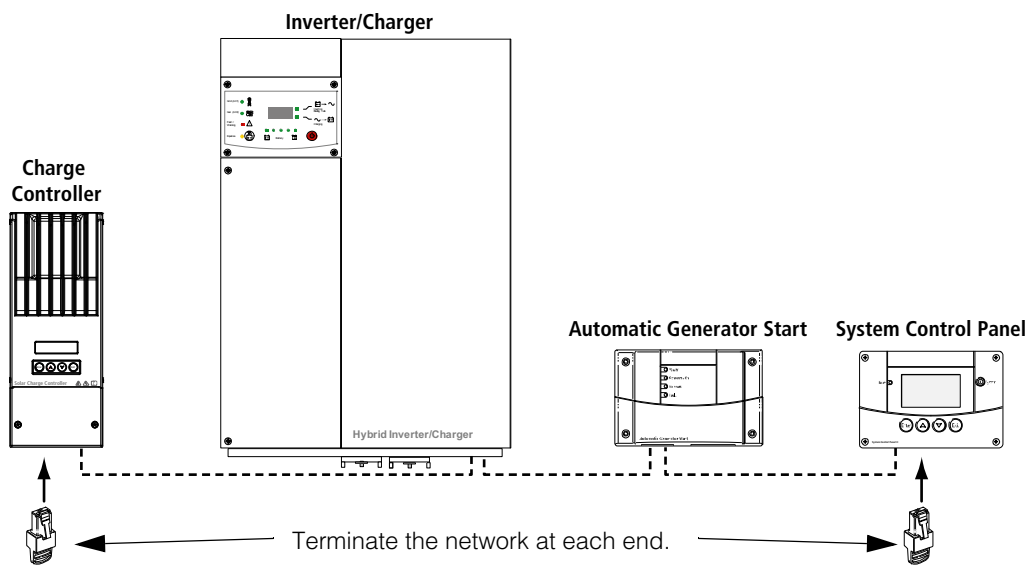


Figure 2-7 Xantrex Xanbus Network Layout

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## Connecting Xantrex Xanbus-Enabled Devices

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**Important:** Installing and replacing Xantrex Xanbus-enabled devices in an existing system must be performed with the Xantrex XW Power System in Standby mode. For more information about Standby mode, see the Xantrex XW System Control Panel Owner's Guide.

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### **CAUTION: Equipment Damage**

Connect only to other Xantrex Xanbus compatible devices.

Although the cabling and connectors used in this network system are the same as Ethernet connectors, this network is not an Ethernet system. Equipment damage may result from attempting to connect Xantrex Xanbus to different systems.

---

#### **To connect the Xantrex Xanbus-enabled devices:**

1. Determine and prepare the location for each device. Refer to the installation instructions for each device.
2. Determine and measure the required cable length, taking into consideration the network layout, the routing, and strain relief requirements. Do not exceed the total recommended cable length of 40 m.
3. Mount the devices according to the installation instructions for each device.
4. Use an appropriate length of Xantrex Xanbus cable to connect each device.
5. Insert a terminator into the open network port of the Xantrex Xanbus-enabled device at each end of the network. See Figure 2-7.

## Connecting AC Sync Cables

Connect AC Sync cables in the same daisy-chain layout as Xantrex Xanbus network cables (see Figure 2-7). Network terminators are not required for AC Sync connections.

#### **To install the AC Sync cables:**

1. Insert the cable into one of the two AC Sync ports in inverter #1.
2. In a two-inverter system, connect the AC Sync cable between inverter #1 and inverter #2.

In a three-inverter system, connect an AC Sync cable between inverter #1 and inverter #2, and then connect another AC Sync cable between the second AC Sync port in inverter #2 and an AC Sync port in inverter #3.

## Step 4: Wiring the Inverter

This section provides procedures for making AC and DC connections between the Xantrex XW Inverter/Charger, the batteries, and the inverter load sub-panel.

### Batteries

See the FAQs section of the Schneider Electric Web site for information on determining battery bank requirements.

Consider the following recommendations for battery use:

- Use only deep discharge types for inverter applications.
- Use the same battery type for all batteries in the bank.
- Use only batteries from the same lot and date in your battery bank. This information is usually printed on a label located on the battery.



#### **CAUTION: Damage to Equipment**

The Xantrex XW Inverter/Charger is intended to operate with batteries as its source of DC power. Do not connect DC power sources, such as PV arrays, wind turbines, or micro-hydro turbines, directly to the Xantrex XW Inverter/Charger without a battery. Connect DC power sources to a charge controller such as the Xantrex XW Solar Charge Controller instead. If DC power sources are connected directly to the inverter, the DC rating of the inverter can be exceeded and the inverter can be damaged.

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### Battery Bank Requirements

The DC voltage of the inverter must match the nominal voltage of the system and all battery-connected devices. If the inverter is a 24-volt inverter, then the battery bank and all battery-connected devices in the system must be configured for 24 volts.

---

**Important:** The minimum recommended battery bank is 100 Ah. The inverter is designed to operate with batteries and should not be operated without them. Also, do not allow the battery bank to become completely discharged. If the voltage of the battery bank falls below 10 volts, the Xantrex XW Power System will not operate.

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### Battery Cable Requirements



#### **WARNING: Fire Hazard**

Undersized cables can overheat and melt, creating a fire hazard when subjected to heavy (peak) loads. Always use cable of proper size and length, rated for the amperage of the inverter and batteries.

---

**Important:** Use only fine-stranded copper cables for battery and inverter DC connections. Do not use coarse-stranded wire. The lack of flexibility could damage battery and inverter terminals.

<b>Battery cable length</b>	Runs should be kept as short as practical. Length should not exceed 3 m. For best performance, the positive and negative cables should run alongside each other. Avoid cable loops.
<b>Battery cable lugs</b>	Battery cables must have crimped copper compression lugs or crimped and soldered copper compression lugs. Soldered connections alone are not acceptable. Lugs must be rated for use with fine-stranded cable.
<b>Overcurrent protection</b>	For safety and compliance with regulations, battery overcurrent protection is required. Fuses and disconnects must be sized to protect the wiring in the system and are required to open before the wire reaches its maximum current carrying capability.
<b>Terminal covers</b>	Color-coded, snap-on DC terminal covers are provided to prevent accidental contact with the terminals. Terminal covers are required for all installations. It is also recommended that the shank of the ring terminals (cable lugs) be covered with heat shrink or some other form of insulation.

**Table 2-2** Recommended Battery Cable Size Versus Length

Inverter Model	Up to 1.5m (90°C wire)	Up to 3 m (90°C wire)
Xantrex XW4024 230 50	120 mm <sup>2</sup> (#4/0 AWG)	120 mm <sup>2</sup> (#4/0 AWG)
Xantrex XW4548 230 50	70 mm <sup>2</sup> (#2/0 AWG)	120 mm <sup>2</sup> (#4/0 AWG)
Xantrex XW6048 230 50	120 mm <sup>2</sup> (#4/0 AWG)	120 mm <sup>2</sup> (#4/0 AWG)

**Important:** Your local electrical code may require both overcurrent protection and a disconnect switch for residential and commercial electrical systems. These items are not supplied with the inverter.

**Table 2-3** Battery Cable (in conduit) to Maximum Breaker/Fuse Size

Cable Size Required	Maximum Breaker/Fuse Size
70 mm <sup>2</sup> (#2/0 AWG)	175 amps
120 mm <sup>2</sup> (#4/0 AWG)	250 amps

## Torque Values for the Xantrex XW Series Inverter/Charger

**Table 2-4** Torque Values for AC Wiring (AC Terminals and Ground Bar)

Wire Size		Torque Value	
AWG	mm <sup>2</sup>	In-lb	N-m
14–10	2.5–6	35	4
8	10	40	4.5
6–4	16–25	45	5.1

**Table 2-5** Torque Values for the Chassis Ground Lug

Wire Size		Torque Value	
AWG	mm <sup>2</sup>	In-lb	N-m
6-4	16-25	45	5.1
3-2	25-35	50	5.6

**Table 2-6** Torque Values for the Inverter Battery Terminals

Torque Value	
Ft-lbs	N-m
15	20.4

## Inverter Grounding

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**Important:** The grounding requirements vary by country and by application. All installations must comply with national and local codes. Consult local and national codes for specific grounding and bonding requirements for the desired installation.

---

The Xantrex XW Inverter/Charger and Xantrex XW Solar Charge Controller are provided with ground terminals that must be reliably connected to ground (protective earth) by appropriately sized equipment grounding conductors. System grounding for the AC and DC systems must be done according to code. Refer to the grounding information in this manual and all applicable installation codes.

## Feed-in Protection Requirements

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**Important:** Installers must make allowance for the amount of power that can be fed into a distribution panel and the means and location for feed-in, in accordance with local electrical code.

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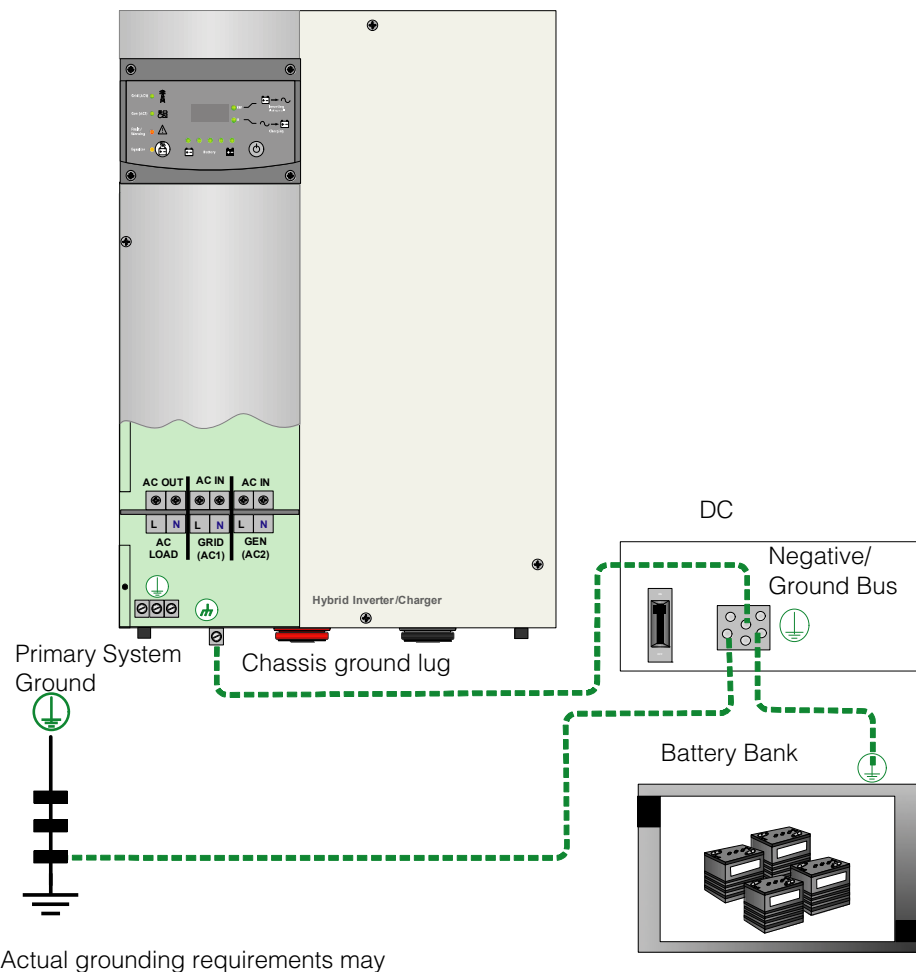
## Making DC Connections

This section describes how to make DC connections between the inverter/charger and the batteries. Battery cables must be provided by the installer (see Table 2-2 on page 2-13). This section also provides procedures for installing the battery temperature sensor.

## Grounding the DC System

The inverter's chassis ground lug is located along the rear edge of the unit (see Figure 2-8) and is used to connect the chassis of the inverter to the DC grounding system. The terminal accepts wires from #14 AWG to #2 AWG (2.5 mm<sup>2</sup> to 35 mm<sup>2</sup>).

System grounding for the DC system, which typically involves bonding (connecting) the battery negative circuit to ground, is dependent on the system configuration. In some cases, the battery negative will be bonded to ground in another device such as a charge controller. If a grounded DC system is desired or required by code, make sure that the system bonding is done in one location only and that all conductors and connections comply with applicable codes.



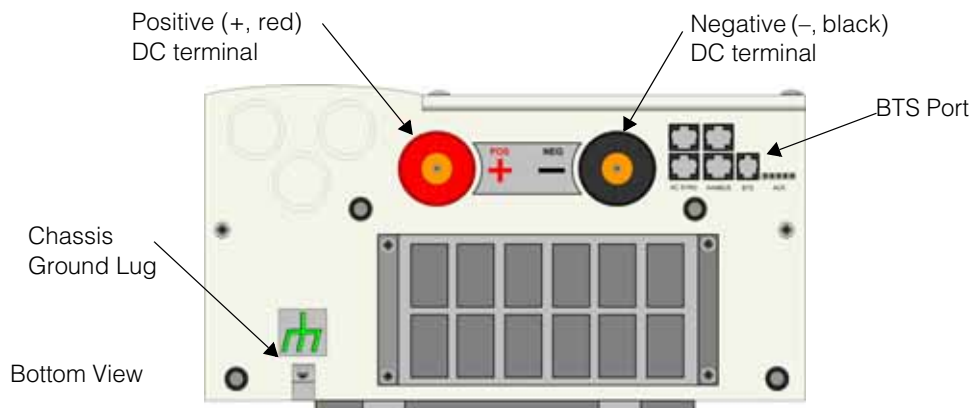
**Figure 2-8** DC Grounding Using a DC Disconnect

## Connecting the Batteries



### WARNING: Shock Hazard

Make sure that all AC and DC breakers are switched off before connecting or disconnecting the battery cables, and make sure that all sources of power (both AC and DC) are disconnected from the inverter.



**Figure 2-9** Xantrex XW Inverter/Charger DC Connections

#### To connect DC cables to the Xantrex XW Inverter/Charger:

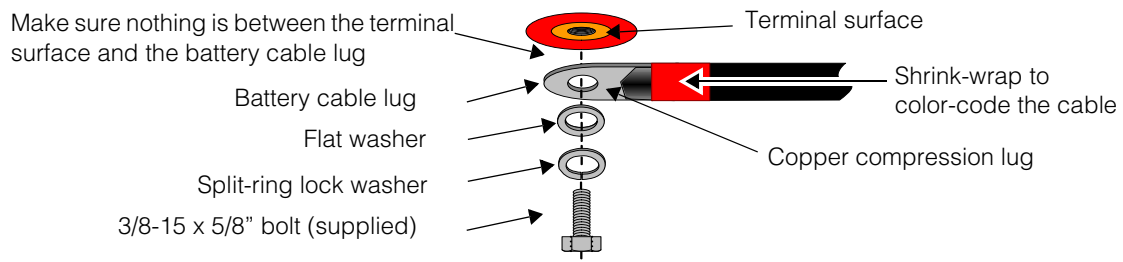
1. Route the DC cables from the battery bank to the inverter/charger.
2. Install a DC fuse and disconnect switch or a DC circuit breaker between the inverter/charger and the battery. They must be installed in the positive side of the DC circuit, as close as possible to the battery. See Figure 2-9, “Xantrex XW Inverter/Charger DC Connections” on page 2–16.

This protects your battery and wiring in case of accidental shorting. Before proceeding, make sure the DC disconnect switch is open or that the DC circuit breaker is turned off.

3. Connect one connector on the POSITIVE (+) cable to the POSITIVE DC terminal on the inverter/charger. Be careful to observe proper polarity. Figure 2-10 shows the proper stacking order of hardware. Use a wrench to tighten the bolt to the required torque.
4. Connect the other connector to the POSITIVE (+) terminal on the fuse or breaker. Observe polarity carefully while completing the installation.  
Follow the fuseholder or breaker manufacturer’s torque recommendation.
5. Connect the NEGATIVE (-) battery cable to the NEGATIVE (-) DC terminal on the inverter/charger. Be careful to observe proper polarity. Figure 2-10 shows the proper stacking order of hardware. Use a wrench to tighten the bolt to the required torque.
6. Before proceeding, check that the cable polarity is correct: POSITIVE (+) on the inverter/charger is connected to the POSITIVE (+) on the battery and the NEGATIVE (-) cable is connected to the NEGATIVE (-) terminal on the inverter/charger.

**Important:** The next step is the last cable connection. A spark is normal when this connection is made.

7. Connect the other end of the cable to the NEGATIVE (-) terminal on the battery.
8. Use a wrench to tighten the bolt to the required torque.
9. Attach the DC terminal covers.



**Figure 2-10** Battery Cable Connection



### **CAUTION: Damage to Equipment**

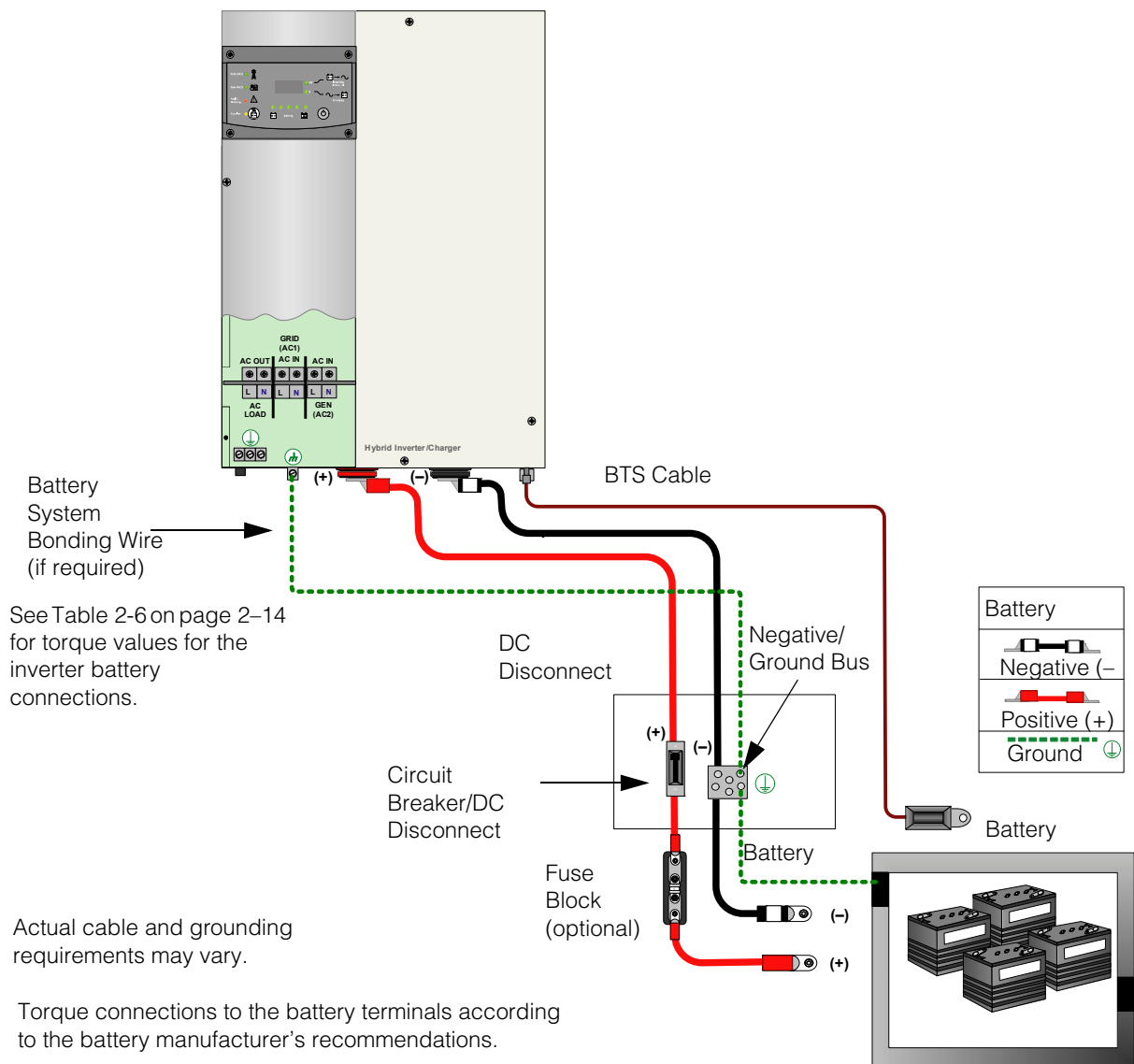
Do not put anything between the battery cable lug and the terminal surface. Overheating of the terminal may occur. Do not apply any type of antioxidant paste until after the battery cable wiring is tightened. The same applies for all DC connections. Do not over-tighten; observe all recommended torque values.



### **CAUTION: Reverse Polarity Damage**

Before making the final DC connection or closing the DC breaker or disconnect, check cable polarity at both the battery and the inverter/charger. Positive (+) must be connected to positive (+). Negative (-) must be connected to negative (-).

Reverse polarity damage is not covered by warranty.



### Installing the Battery Temperature Sensor

The Battery Temperature Sensor (BTS) regulates battery charging based on battery temperature. Installing a sensor extends battery life by preventing overcharging in warm temperatures and undercharging in cold temperatures. The BTS is supplied with the Xantrex XW Inverter/Charger. The replacement part number is 808-0232-02.

---

**To install the Battery Temperature Sensor:**

1. Insert the Battery Temperature Sensor plug into the BTS port. See Figure 2-9 and Figure 2-11.
2. Route the cable to the battery enclosure and connect the ring terminal on the BTS directly to a battery terminal (recommended), or use the adhesive backing on the sensor back to attach the sensor to any side of the battery to be monitored.

If using the adhesive backing, install the BTS on the side of the battery below the electrolyte level. It is best to place the sensor between batteries and place the batteries in an insulated box to reduce the influence of the ambient temperature outside the battery enclosure.

---

**Note:** If other Xantrex Xanbus-connected components supply a BTS or are BTS-enabled, it is not necessary to install all of them at once. Only one BTS needs to be installed.

However, if multiple battery banks are being used, multiple sensors can be installed. In this case, the system uses the highest temperature from all the input as its operational parameter.

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## Making AC Connections

This section describes how to make AC connections between the Xantrex XW Inverter/Charger, the main utility panel, and the inverter load sub-panel. All wiring must be provided by the installer.



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**CAUTION: Damage to the Inverter**

The inverter's AC output must never be wired to the utility or generator output. This will cause severe damage to the inverter which is not covered under the warranty.

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Do not use an RCD<sup>1</sup>-equipped AC source to power the Xantrex XW Inverter/Charger grid or generator inputs. The AC input filters on the Xantrex XW Inverter/Charger may cause nuisance tripping of ground fault-protected outputs.

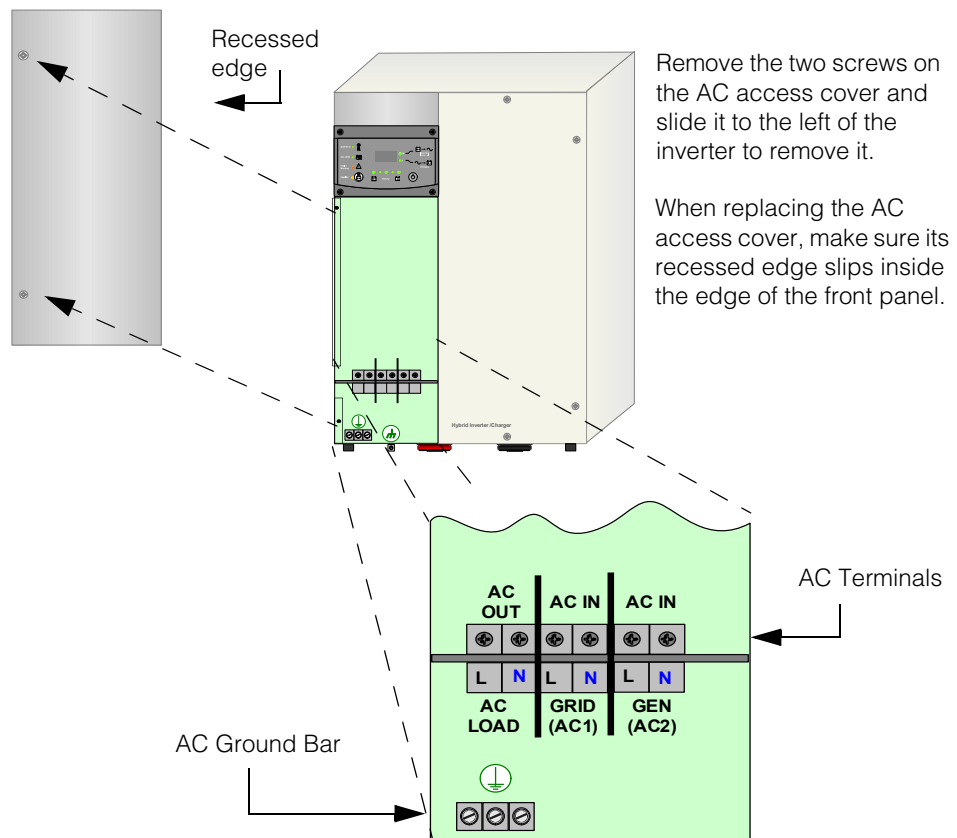
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1. Residual Current Detection

## Accessing the AC Terminal Block and AC Ground Bar

The AC terminal block includes two terminals each (L and Neutral) for AC Grid input, AC Generator input, and AC Load connections. The neutrals are connected to each other, requiring only one neutral connection when the installation uses a Xantrex XW Power Distribution Panel. Without the Xantrex XW Power Distribution Panel, additional neutral connections may be required at the input sources.

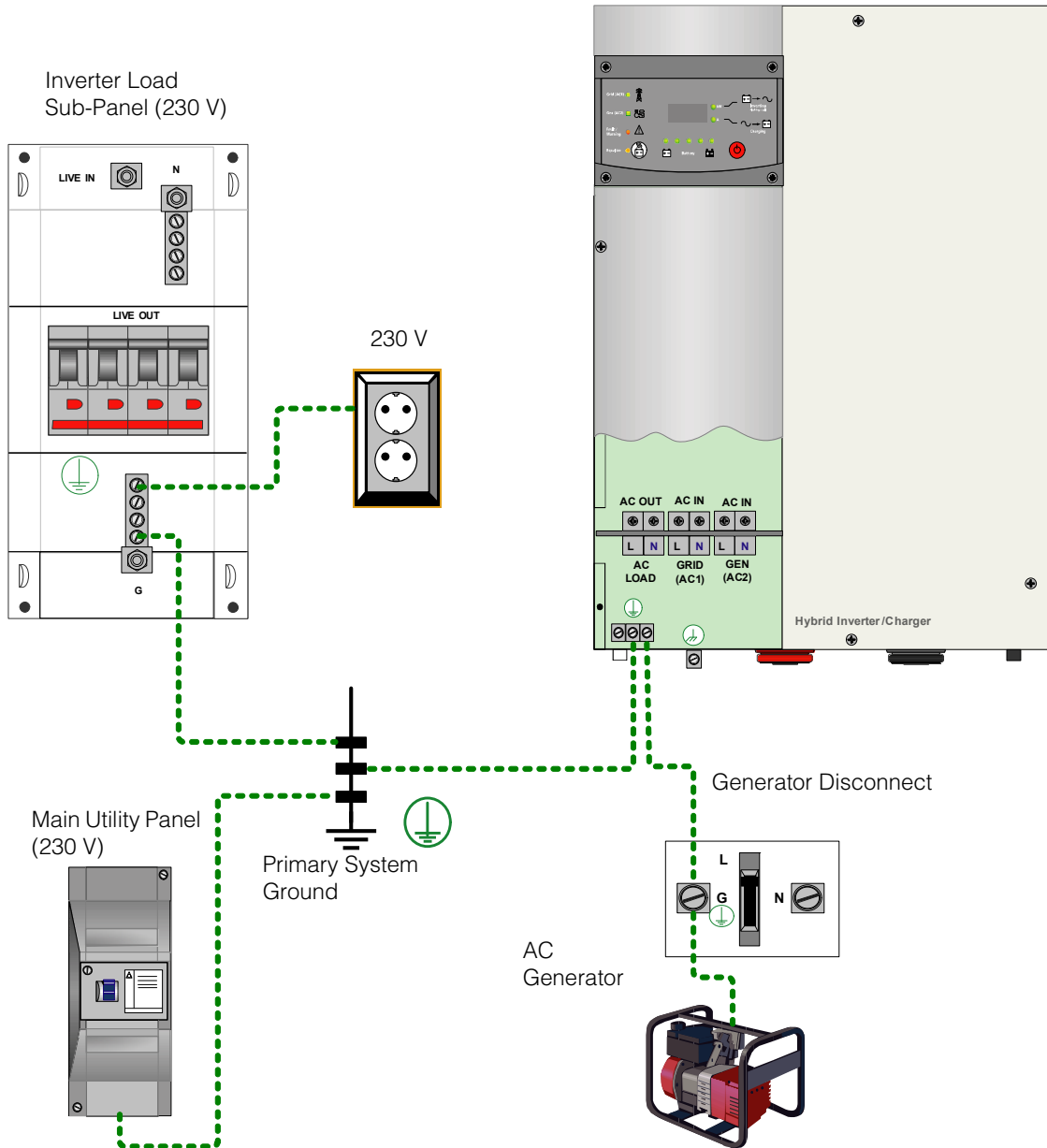
The AC terminal block is located on the left side of the inverter beneath the AC access cover. See Figure 2-12.



**Figure 2-12** AC Terminal Block and Ground Bar

## AC Equipment Grounding

See Table 2-4 on page 2-13 for torque values for the AC terminal and AC Ground bar.



Actual grounding requirements may

**Figure 2-13** AC Equipment Grounding

## AC Wiring to the Inverter Load Sub-Panel

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### **WARNING: Shock Hazard**

Before making any electrical connections, make sure all AC and DC disconnect devices are in the OPEN (disconnect) position.



### **CAUTION: Damage to the Inverter**

The inverter's AC output must never be wired to the utility or generator output. This will cause severe damage to the inverter which is not covered under warranty.

---

An inverter load sub-panel (also known as an inverter AC distribution panel) and AC conduit must be installed before AC wiring is connected to the inverter.

#### **To install the inverter load sub-panel and conduit:**

1. Determine the location for the inverter load sub-panel, and install it according to the manufacturer's directions.
2. Install an AC conduit between the Xantrex XW Inverter/Charger and the inverter load sub-panel.
3. Determine which circuits the inverter will power, and install the appropriate circuit breakers into the inverter panel.
4. For on-grid systems:
  - a) Disconnect all power to the main utility panel.
  - b) Determine which circuits will be supplied by the inverter(s) and remove their wires from the main panel.
  - c) Reroute these wires to the new inverter load sub-panel.
5. Remove unused breakers from utility panel.
6. Install a 60-amp maximum (disconnect) main circuit breaker in the inverter panel. Later, this will be wired to the inverter's output.



## AC System Bonding



### **WARNING: Fire and Shock Hazard and Risk of Equipment Damage**

Verify that only one neutral-to-ground bond exists in the system. Having more than one neutral-to-ground bond in a system violates local electrical codes, may create a shock or fire hazard, and may cause some sensitive equipment to malfunction.

#### **System Bonding for On-grid Systems**

**System Bonding** Refers to connection (bonding) of one of the current-carrying conductors of an electrical system to ground. This creates a “grounded conductor” or “neutral” that is at ground potential, but is separate from the equipment ground conductor. System bonding must be done in one place only to avoid ground loops, and it must be done differently in on-grid and off-grid systems.

The Xantrex XW Inverter/Charger does not connect the neutral to ground. The AC input neutral is already bonded to ground by the incoming utility grid system. The installer must not connect the neutral to ground in any additional location.

The Xantrex XW Inverter/Charger does not switch or disconnect the AC neutral in any mode of operation, so even in invert (back-up) mode, the inverter load sub-panel neutral is bonded to ground by the utility grid system. It must not be grounded again in the inverter load sub-panel.

#### **System Bonding for Off-grid Systems**

- In a system without a generator, or with a generator that does not provide a grounded neutral, the connection from neutral to ground must be made by the installer in the inverter load sub-panel.
- In a system with a generator that provides a grounded neutral, no additional connection from neutral to ground is needed. The installer must not connect neutral to ground in the inverter load sub-panel.

## AC Wiring to the Xantrex XW Inverter/Charger



### **WARNING: Shock Hazard**

Before making any electrical connections, make sure all AC and DC disconnect devices are in the OPEN (disconnect) position.

Make sure the AC system, including the Xantrex XW Inverter/Charger and generator, is correctly grounded according to local electrical codes. See “AC Equipment Grounding” on page 2–21.

#### **To connect the inverter to the inverter load sub-panel:**

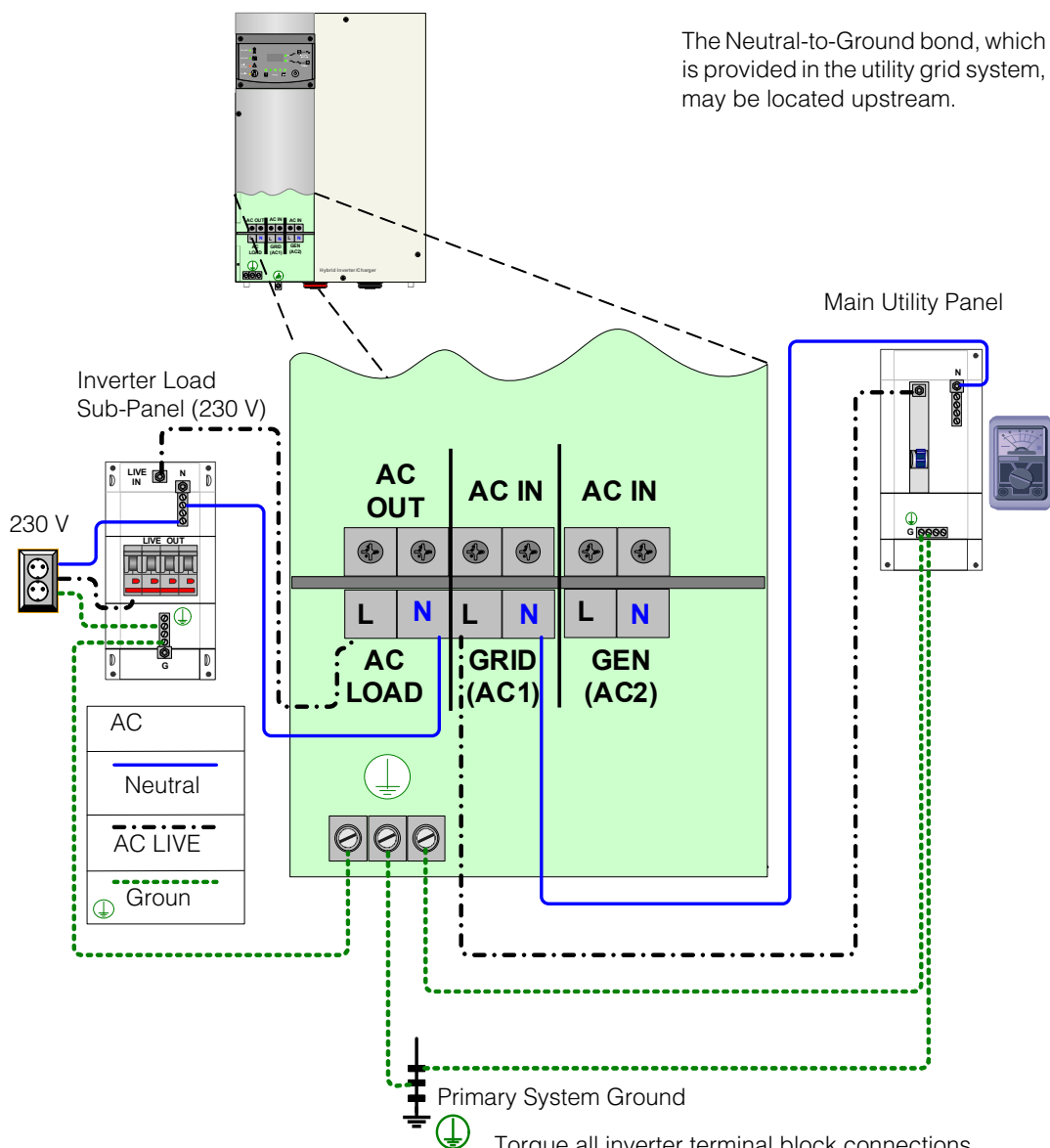
1. See Figure 2-14. Connect the neutral wire from the inverter panel neutral bus to the N-LOAD terminal on the inverter.
2. Connect the L (LIVE) wire from the input terminal on the inverter panel to the AC Load (L-LOAD) terminal on the inverter.

**To connect the inverter to the main utility panel:**

1. See Figure 2-14. Connect the neutral wire from the main utility panel to the inverter GRID (AC1) neutral terminal.
2. Connect the AC LIVE wire from the main utility panel to the inverter GRID (AC1) L terminal.

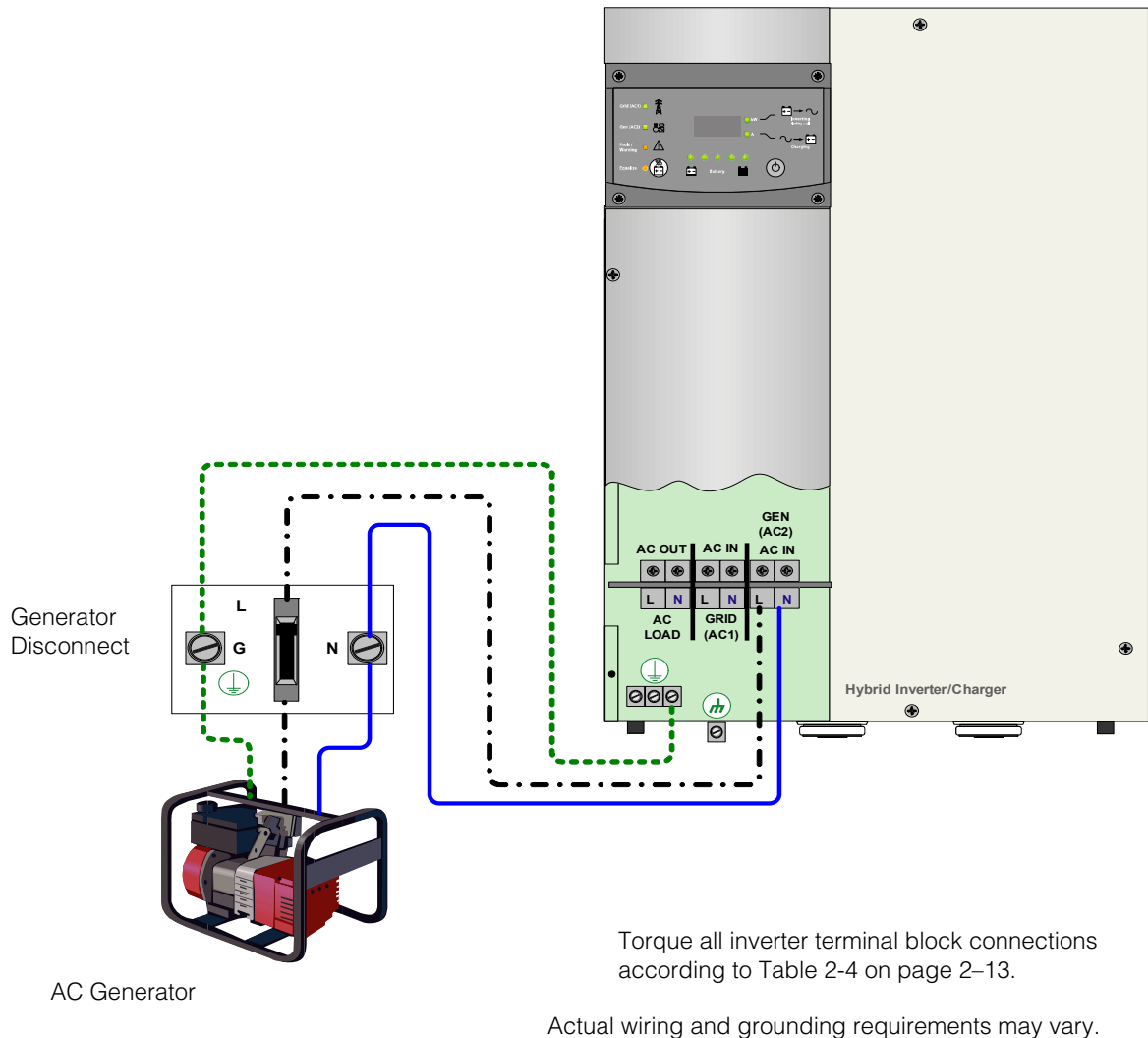
**To connect the inverter to the AC generator:**

1. See Figure 2-15. Connect the neutral wire from the generator breaker or disconnect to the inverter GEN (AC2) neutral terminal.
2. Connect the AC LIVE wire from the generator breaker or disconnect to the inverter GEN (AC2) L terminal.



Actual wiring and grounding requirements may vary.

**Figure 2-14** Wiring the Xantrex XW Inverter/Charger to the Inverter Load Sub-Panel and Utility Grid



**Figure 2-15** Generator Wiring to the Inverter

## Auxiliary (AUX) Port

The auxiliary output is designed to provide the following functions:

- Auxiliary 12 VDC power supply
- Remote power off

The auxiliary port provides 12 VDC/250 mA output to control a relay, fan, indicator light, or other device. The auxiliary output can be configured (using a Xantrex XW System Control Panel) to trigger in response to:

- low battery voltage
- high battery voltage
- low battery temperature
- high battery temperature
- any device fault

The auxiliary output can also be triggered manually using the Xantrex XW System Control Panel.

The 12 VDC output can trigger a relay to disconnect batteries from the inverter/charger when battery voltage or temperature are out of the ideal range.



Figure 2-16 AUX Port Location

## AUX+12V Voltage Supply

DC voltage is available between JU-1 (AUX +12 V) and JU-3 (AUX-COM, signal return). The power available at these terminals is 12 VDC, and maximum current is 250 mA (3 watts).

The AUX+ 12 V and AUX-COM terminals can be used to power a relay (3 watts maximum). Additional fuses are not required, but may be required for some installations. The default status of AUX+ 12 V is OFF.

## AUX-RPO: User Remote Power Off (RPO)

Connecting JU-2 (AUX-RPO) and JU-3 (AUX-COM) terminals together through an external switch (normal open contact) provides the system shut off function if the switch is closed.

The external switch, if pressed, overrides the control provided from the front panel.

If the external switch is cleared (not pressed), the system can be enabled back from the front panel.

Select an external switch with normal open contact. Consult your system designer or qualified technician for specific installation instructions.

## User Line Wiring

Use twisted pairs of #24 AWG to #12 AWG (0.5 mm<sup>2</sup> to 2.5 mm<sup>2</sup>) for connections. Carefully route the wires away from high power load cables to minimize noise effects on signal integrity.

## AUX Port Terminal Assignments

**Table 2-7** User Connector Terminals and Functions

Pin	Reference	Name	Function
JU-1	AUX+12V	+12 V User Voltage Supply	+12 VDC Voltage source: 250 mA maximum
JU-2	AUX-RPO	Remote Power Off	Remote Power Off Logic Level: Active Low. Activating this signal shuts down system operation.
JU-3	AUX-COM	Common Ground Reference	Return Common Ground Reference for 12V, Remote Power Off signals.
JU-4	Not Operational	Not Operational	Not Operational
JU-5	Not Operational	Not Operational	Not Operational

## Basic Functional Test - Single Inverter

The following steps perform a basic functional test of the Xantrex XW Inverter/Charger. If any test fails, refer to the Troubleshooting section in the Xantrex XW Hybrid Inverter/Charger Operation Guide for assistance.

### Confirm All Connections

Once the AC and DC wiring have been installed and connected, go back over all connections and make sure they are secure and have been installed correctly.

### Applying DC Power to the Inverter



#### **CAUTION: Reverse Polarity Damage**

Before making the final DC connection or closing the DC breaker or disconnect, check cable polarity at both the battery and the inverter/charger. Positive (+) must be connected to positive (+). Negative (-) must be connected to negative (-).

Reverse polarity damage is not covered by warranty.

---

#### **To apply DC power to the inverter:**

1. Before applying DC power to the inverter, measure the voltage and polarity of the battery cables (measure at the battery side of the disconnect or breaker).

---

**Important:** Voltage should be between 40 to 64 volts for a 48-volt system, and 20 to 32 volts for a 24-volt system. If the DC voltage is low, the battery bank must be charged externally. Charge the battery bank, and then restart the functional test.

If the DC voltage is lower than the Low Battery Cut Out (LBCO) setting (46 volts for a 48-volt system and 23 volts for a 24-volt system) a DC Under Voltage Fault (F48) will be triggered. If the DC voltage is lower than the default LBCO voltage, lower the LBCO setting accordingly to avoid triggering the fault.

If the DC voltage is lower than 40 volts for a 48-volt system or 20 volts for a 24-volt system, the battery should be charged externally.

---

2. Apply battery power to the inverter by closing the battery bank DC disconnect.

The inverter will power up and the display will turn on, but the inverter will remain in Standby mode (as shown in Figure 2-17).

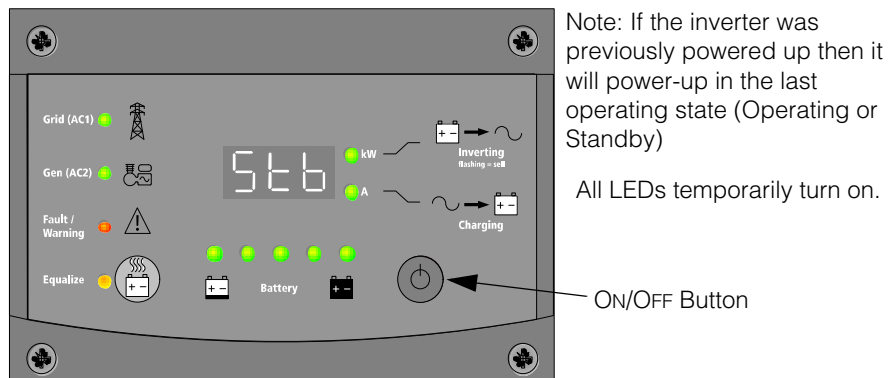


Figure 2-17 Power-up Display

## Enable the Inverter



### CAUTION: Equipment Damage

Prior to activating the inverter, make sure that all AC loads are disconnected from the output of the inverter.

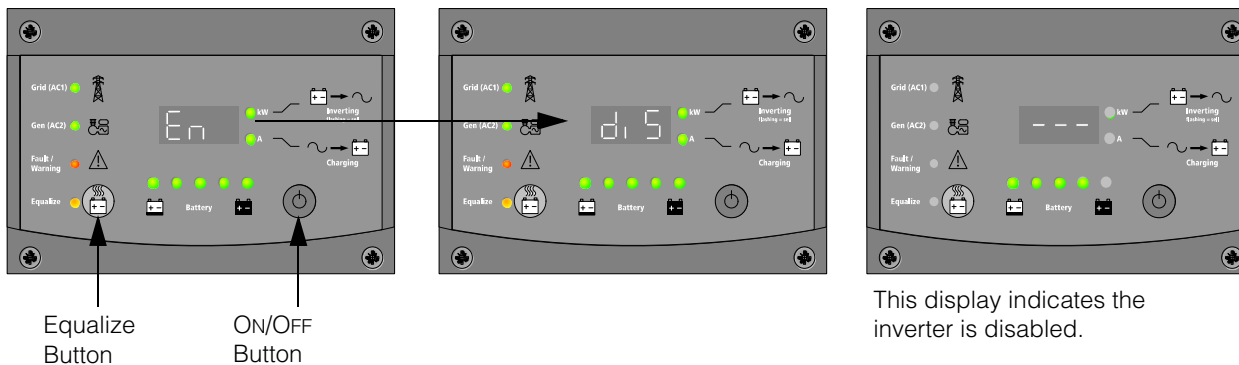
By default, Invert mode is enabled and the unit should start inverting upon transitioning from Standby mode. If Invert mode is disabled, the display will show “- - -” once out of Standby mode. If the unit powers up in Standby mode, press the ON/OFF button momentarily to change the mode from Standby to Operating.

#### To enable the inverter:

- ◆ Press the inverter’s ON/OFF button and the Equalize button at the same time.  $E_n$  briefly appears on the inverter information panel to indicate that the inverter is enabled.

#### To disable the inverter:

- ◆ Press the inverter’s ON/OFF button and the Equalize button at the same time.  $d_{15}$  briefly appears on the inverter information panel to indicate that the inverter is disabled.



Briefly press the Equalize button and the ON/OFF button at the same time to enable or disable Invert mode.

**Figure 2-18** Enable the Inverter

3. Monitor the INVERT (Green kW) LED to confirm which mode the inverter is in:
  - LED is off—Invert mode is disabled. The inverter/charger is not powering the AC loads. However, if qualified AC is present from the utility or a generator, it is passed through to the loads.
  - *ScH* on the display—The inverter/charger is in the Search mode and is looking for an AC load greater than the Search Watts setting (default = 25 watts).
  - LED is on—The inverter/charger is on. The inverter is operating and is able to provide power to the AC loads. This is the default mode on initial power-up once the unit is taken out of Standby mode.

If the inverter is not operating or the INVERT LED (kW) does not turn on, check all connections. Check the inverter’s DC voltage on the positive (+) and negative (–) terminals. Check the Fault LED. If the Fault LED is on, check for a fault code on the information panel. Correct the reported fault if possible and clear the fault. If the DC voltage is low, the battery bank needs to be charged externally. Charge the battery bank and restart the functional test.

## AC Voltage Check

---

**Important:** This test requires the use of a voltmeter.

---

### To perform an AC voltage check:

1. With the inverter on (INVERT [green, kW] LED is on and steady), verify the AC voltage at the AC Loads block terminal L-Load to N-Load.
2. Verify that neutral is bonded to ground in the system by measuring the live and neutral voltages relative to ground. Neutral-to-ground should equal zero (0) volts.
3. After confirming the correct AC voltage, turn on your AC output breaker and place a load on the inverter (plug in a light or other load to an outlet the inverter is powering).
4. Confirm that the AC load just applied works properly.



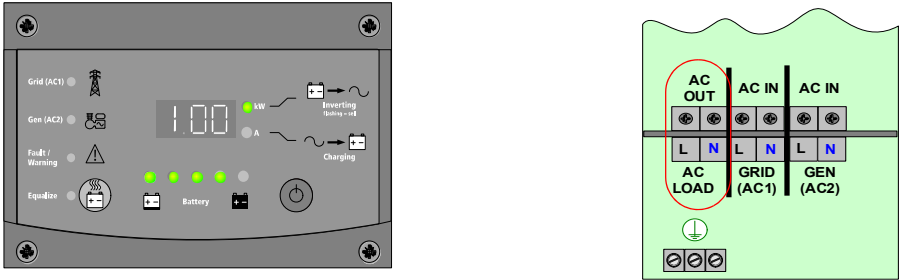


Figure 2-19 Checking AC Voltage

### Confirming Battery Charger Operation

To confirm battery charger operation:

- 1. Apply AC from grid or generator, and then confirm voltage.
- 2. Check LEDs (AC1 or AC2) on the front panel. One of them must be on for the unit to charge. Check the amp “A” LED. If the “A” LED is on, the unit is charging and the battery current is displayed on the information panel.

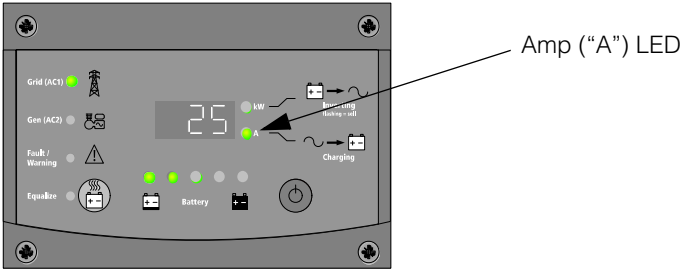


Figure 2-20 Checking Charging Operation

**Important:** Unless the inverter/charger settings have been changed, the inverter will charge as if it has a large (> 440 Ah) flooded battery bank (factory default setting). Therefore, ALL systems may need to have the battery charging set points configured to avoid damage to the batteries.

This completes the functional test. If all tests pass, the inverter is ready for use. If any of the inverter’s internal set points need to be adjusted, consult the configuration chapter of the operation guide.

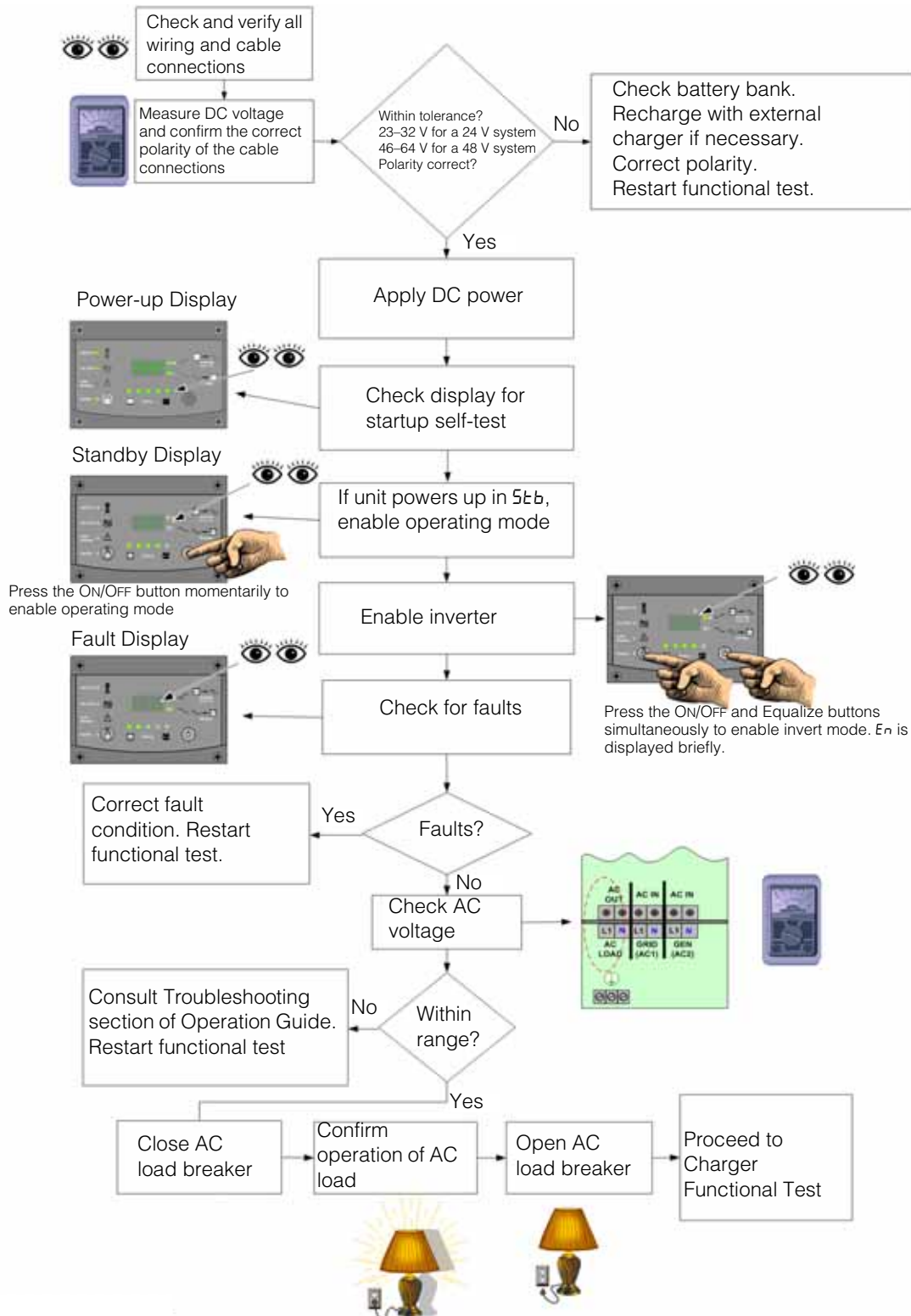


Figure 2-21 Functional Test for Single Inverter Systems

## Step 5: Installing Additional Inverters

### Installation Steps

#### To install multiple inverters:

1. Disconnect all power from the system.
2. Mount additional inverters. See “Step 1: Installing the Mounting Plate” on page 2–4 and “Step 2: Mounting the Inverter” on page 2–7.
3. Install conduit and cable clamps for DC cables, AC wiring, and AC Sync cables in accordance with local electrical codes.
4. Install Xantrex Xanbus and AC Sync cables as required. See “Step 3: Installing Communications Cables” on page 2–8.
5. Install a Xantrex XW System Control Panel. When installing more than one inverter at a location, a Xantrex XW System Control Panel is required to give each inverter (and other Xantrex Xanbus-enabled devices) a unique name and to modify the factory-installed default settings to match and support the installation.
6. Install additional breakers and components in the inverter load sub-panel and the main utility panel to accommodate the extra inverters.
7. Connect DC wiring.
8. Connect AC wiring.

---

## Basic Functional Test—Multiple Inverters

The following steps perform a basic functional test of multiple Xantrex XW Inverter/Chargers. If any test fails, refer to the Troubleshooting section in the Xantrex XW Hybrid Inverter/Charger Operation Guide for assistance.

### To perform a functional test on multiple inverters:

1. Check/verify all wiring and cable connections.
2. Measure DC voltage at the DC terminals on the inverter and confirm that it is within range and has correct polarity. The default acceptable range is 23–32 VDC for 24 V systems or 46–64 VDC for 48 V systems.
3. Connect DC power to the first inverter.
4. Check the inverter's display for startup self-test during which all LEDs will flash momentarily. Once the self-test is complete, the inverter displays **5**ⓧ**b**.  
The Fault/Warning LED may flash for a few seconds but eventually will turn off. If the Fault/Warning LED persists, make sure the battery temperature sensor is connected. Also, if the inverter has been pre-configured, it may go straight into normal operating mode.
5. Using the Xantrex XW System Control Panel, set the first (Master) inverter's device number.
  - a) Go to the inverter's Advanced Settings menu by pressing the down arrow, and then Enter from System Status screen. Next, simultaneously press Enter + up arrow + down arrow.
  - b) Select the Multi Unit Config menu.
  - c) Change Dev Number from "00" to "01". The inverter will now appear as XW6048 01 (or XW4548 01 or XW4024 01) on the Xantrex XW System Control Panel.
  - d) If performing a test on a three-phase installation, change Invtr Mode to "3Ph L1Master." For more information, see "Three Phase Configuration" in the Xantrex XW Hybrid Inverter/Charger Operation Guide.
  - e) Press Exit until the Xantrex XW System Control Panel displays the System Status screen again.
6. Connect DC power to the next inverter.
7. Check the inverter display for startup self-test during which all LEDs will flash momentarily. Once the self-test is complete, the inverter displays **5**ⓧ**b**. (If the inverter has been pre-configured, it may go straight into normal operating mode or display **F**ⓧ**b** warning.)
8. Using the Xantrex XW System Control Panel, set the second (Slave) inverter's device number and inverter mode.
  - a) Select the new inverter XW6048 00 (or XW4548 00 or XW4024 00) from the Select Device menu. You can also press the down arrow from the System Status screen until the home screen for Xantrex XW Inverter/Charger 00 is displayed, and then press Enter.
  - b) Go to the inverter's Advanced Settings > Multi-Unit Config menu.
  - c) Change Dev Number from "00" to "02" (or the next number that has not been used). The inverter will now appear as XW6048 02 (or XW4548 02 or XW4024 02) on the Xantrex XW System Control Panel.

- d) Change Invtr Mode from “1Ph Master” to “1Ph Slave”. If performing a test in a three-phase installation, change the Invtr Mode to “3Ph L1Slave,” “3Ph L2Slave,” or “3Ph L3Slave” depending on the line to which the unit is connected.
  - e) Press Exit until the Xantrex XW System Control Panel displays the System Status screen again.
9. Check for faults. If fault conditions exist, correct them and then restart the Functional Test.
  10. If a third inverter is installed, repeat steps to configure it as a Slave.
  11. Using the Xantrex XW System Control Panel, enable the system.
    - a) Go to the System Settings menu.
    - b) Change System Mode to “Operating.”
    - c) Press Exit until the Xantrex XW System Control Panel displays the System Status screen again.
  12. Confirm that the Master inverter displays “0.00” and the Slaves display “---” on their front panels.
  13. Check for faults. If fault conditions exist, correct and then restart the Functional Test.
  14. Check voltage at AC LOAD terminals of the Master Inverter.
  15. Switch the AC Load breakers on.
  16. Confirm operation of connected AC loads.
  17. Disconnect AC LOAD breakers.
  18. Using the Xantrex XW System Control Panel, reduce the Maximum Charge Rate.
    - a) From the System Status screen, go to the Select Device menu. Select System Settings, and then enable Cascading (if not enabled). With Cascading enabled, a change to a setting in one inverter will automatically apply to other inverters in the system.
    - b) Go to Advanced Settings > Charger Settings in one of the inverters.
    - c) Set Max Chg Rate to 10%.
    - d) Press Exit until the Xantrex XW System Control Panel displays the System Status screen again.
  19. Switch AC Input breakers on. Note that all inverters in the system must be connected to the same AC Input source before they will qualify the source.
  20. Confirm that inverters start charging. Note that with Max Chg Rate set to 10% the maximum charge rate is limited to 10 A on each inverter. Depending on the battery bank’s state of charge, the output from one or more inverters may quickly drop to zero. This is considered normal operation.
  21. Check for faults. If fault conditions exist, correct and then restart the Functional Test.

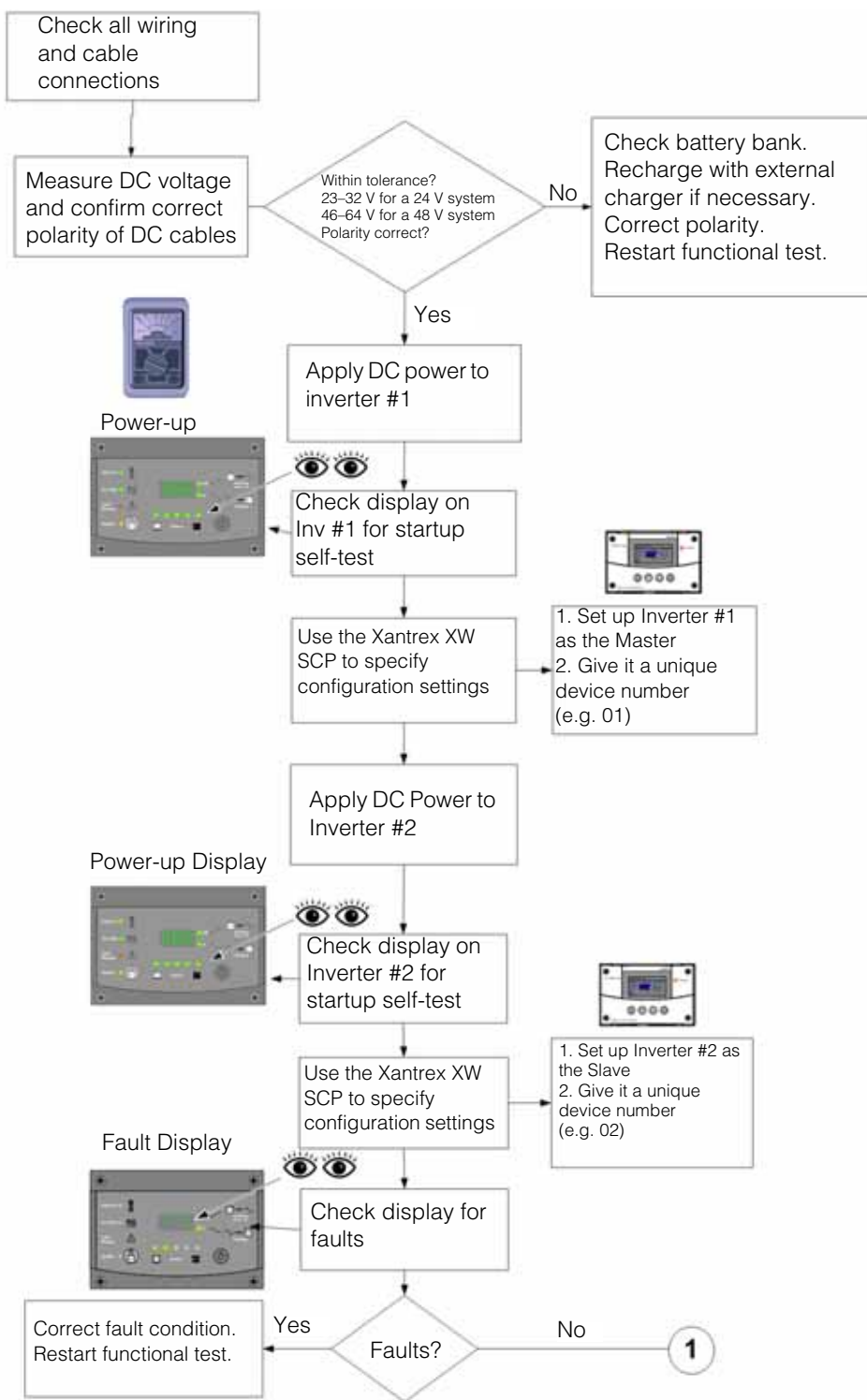


Figure 2-22 Functional Test for Multiple Inverters - Page 1 of 2

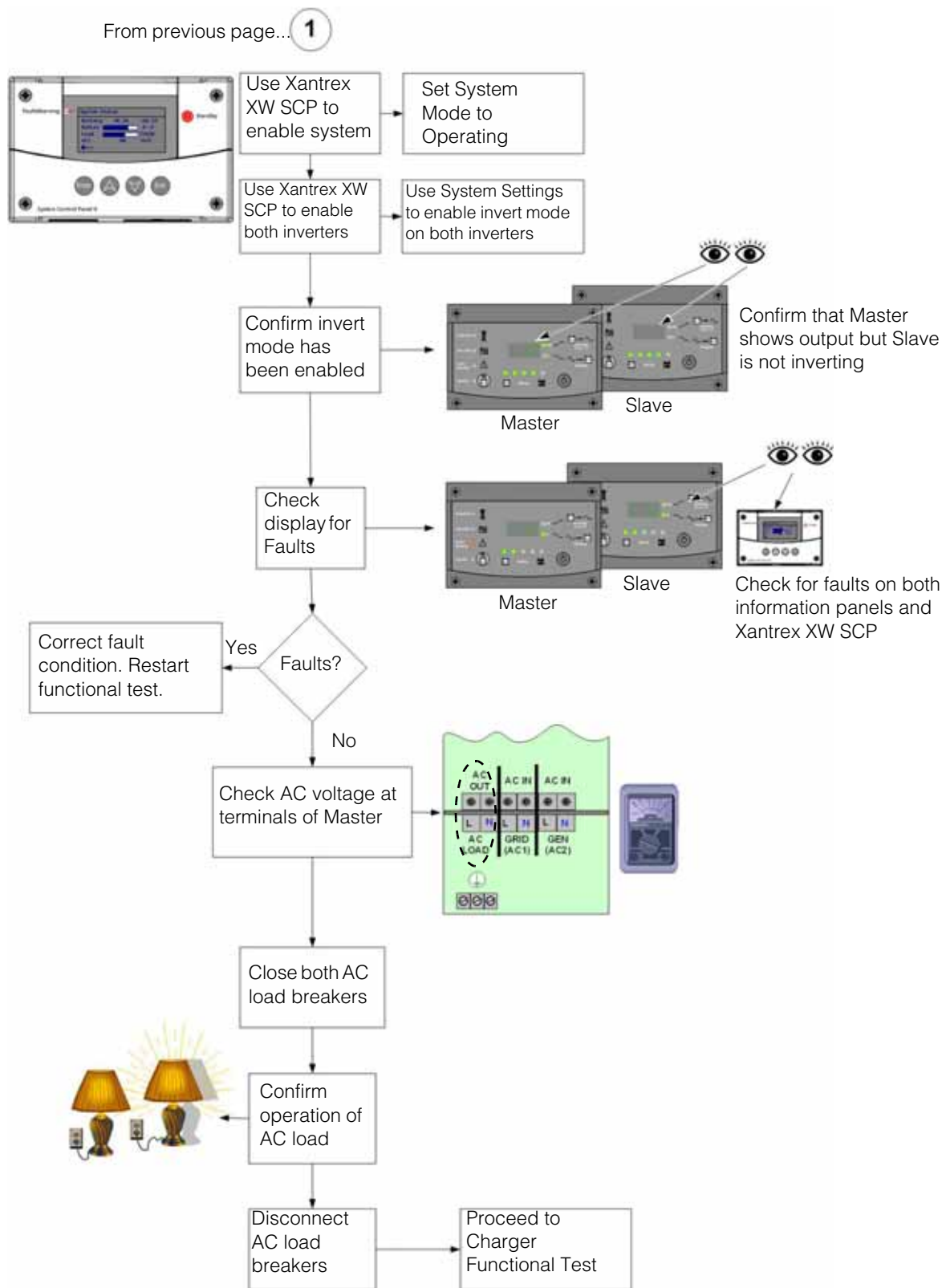


Figure 2-23 Functional Test for Multiple Inverters - Page 2 of 2





# A

# Specifications

Appendix A, “Specifications” provides the electrical and mechanical specifications for the Xantrex XW Power System.

## Electrical Specifications

**Table A-1** Xantrex XW Power System Electrical Specifications

	<b>Xantrex XW6048 230 50</b>	<b>Xantrex XW4548 230 50</b>	<b>Xantrex XW4024 230 50</b>
Continuous Output Power	6,000 W	4,500 W	4,000 W
Surge Rating	12,000 W (15 s)	9,000 W (20 s)	8,000 W (20 s)
Surge Current	53 A <sub>rms</sub> (15 s)	40 A <sub>rms</sub> (20 s)	35 A <sub>rms</sub> (20 s)
Peak Efficiency	95.4%	95.6 %	94.0%
Full Load Efficiency	92%	93.0 %	89%
Waveform	True Sine Wave		
Idle Consumption—invert mode, no load	28 W	26 W	24 W
Idle Consumption—search mode	< 7 W		
AC Output Voltage	230 Vac ±3%		
AC Input Voltage Range (Bypass/Charge Mode)	156–280 Vac		
AC Input Breaker	60 A		
AC Input Frequency Range (Bypass/Charge Mode)	45–55 Hz (default) 40–68 Hz (allowable)		
AC Output Continuous Current	26.1 A	19.6 A	17.4 A
AC Output Frequency	50.0 ±0.1 Hz		
Total Harmonic Distortion	< 5% at rated power		
Automatic Transfer Relay	56 A		
Auxiliary Relay Output	0–12 Vdc, maximum 250 mA DC		
DC Input Voltage (Nominal)	50.4 Vdc	50.4 Vdc	25.2 Vdc
DC Input Voltage Range	40–64 Vdc	40–64 Vdc	20–32 Vdc
DC Current at Nominal Power	131 A	96 A	178 A
Continuous Charge Rate at Nominal Voltage	100 A	85 A	150 A
Power Factor Corrected Charging	PF (0.98)		

## Xantrex XW Series Inverter/Charger Overload Capability

Loads connected to the inverter are seldom constant, and large loads are often operated for short periods. To accommodate larger loads, the Xantrex XW Inverter/Charger can temporarily exceed its continuous output power rating. The graphs below illustrate approximate operation time versus load.

Inverter operation time during overload is limited by both inverter internal temperature protection and by the product of AC output current and elapsed time.

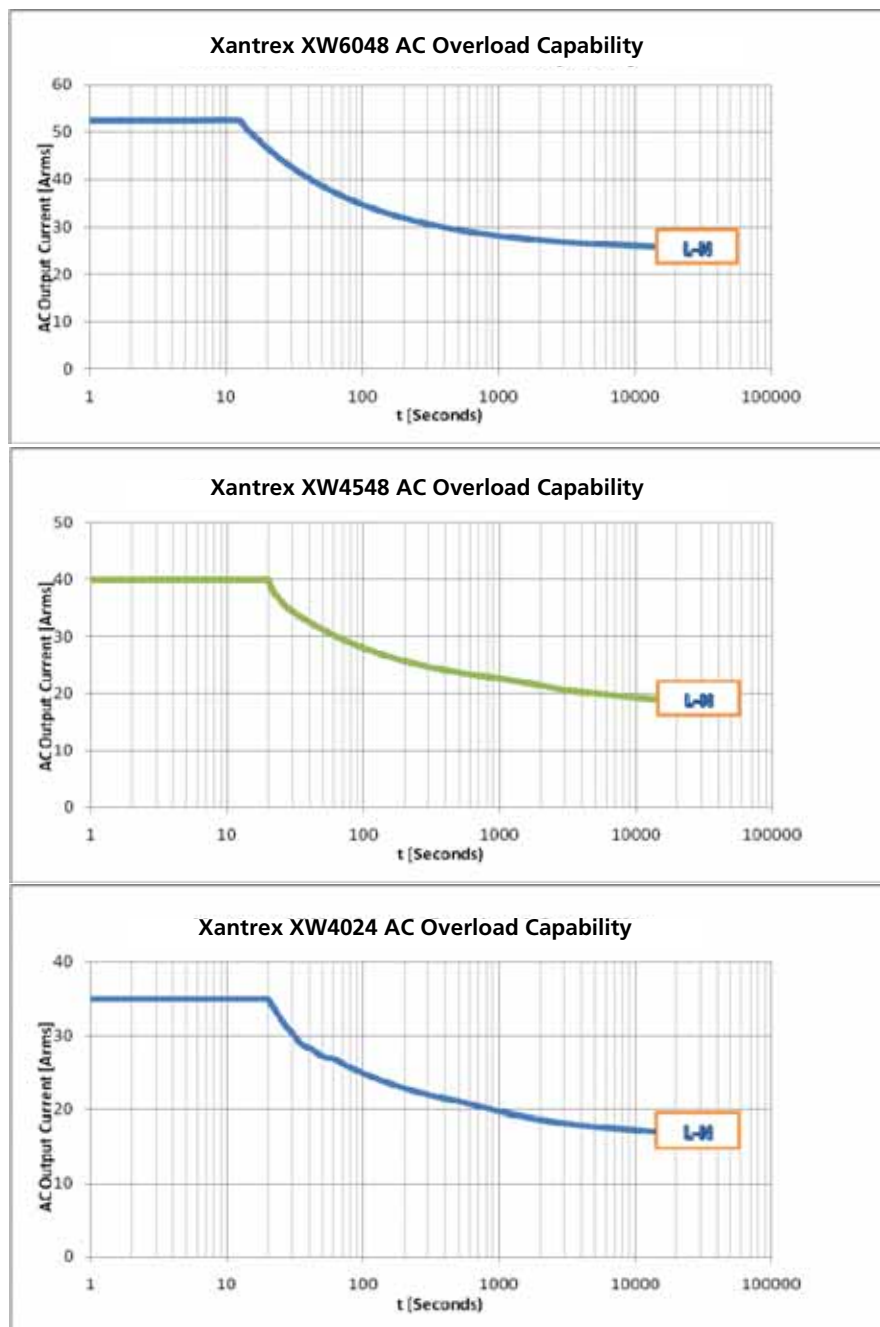


Figure A-1 Xantrex XW Series Inverter/Charger AC Overload Capability

## Output Power Versus Ambient Temperature

When the internal temperature of the Xantrex XW Series Inverter/Charger exceeds a preset limit, it begins to limit output power automatically so that maximum internal temperatures are not exceeded.

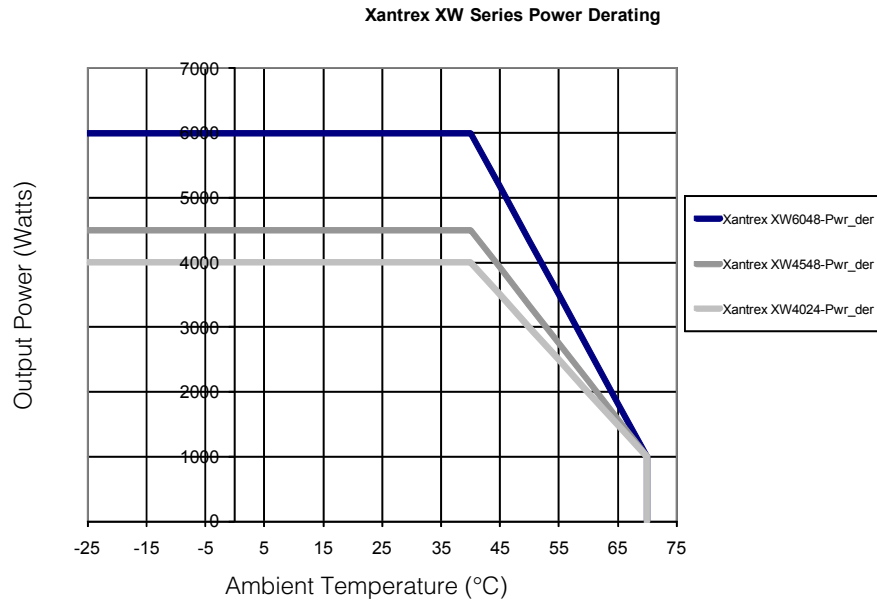
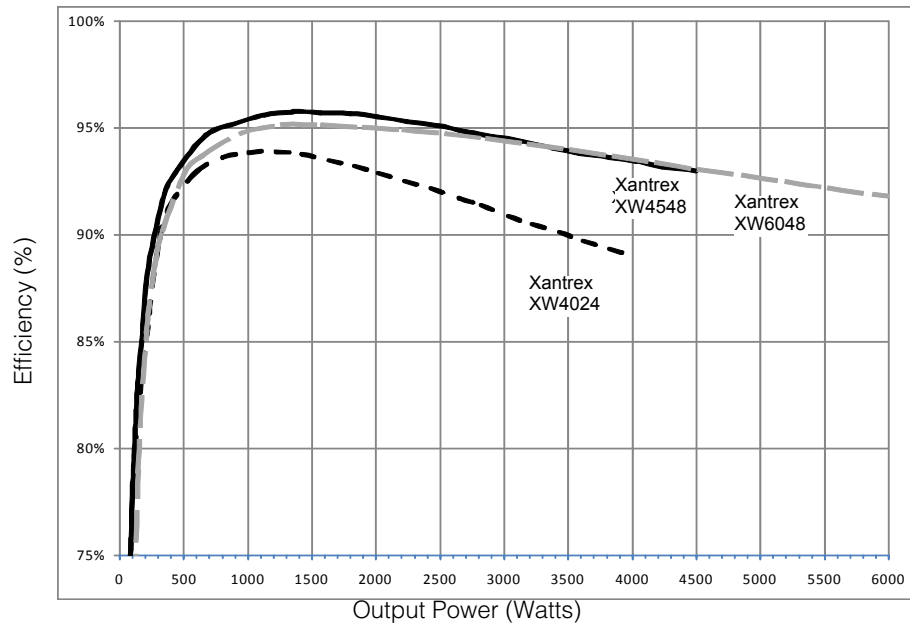


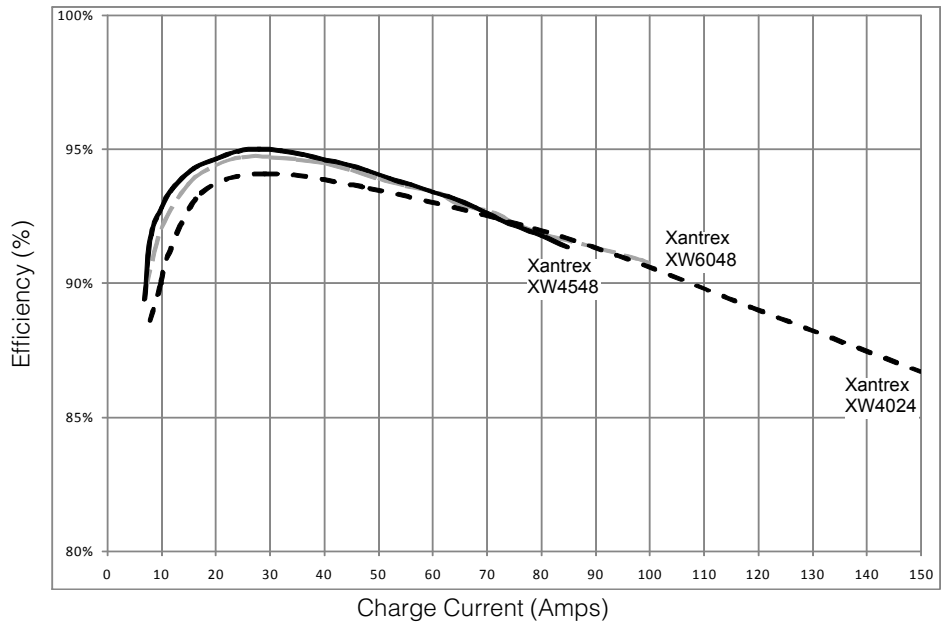
Figure A-2 Output Power Versus Ambient Temperature

## Xantrex XW Series Inverter/Charger Efficiency

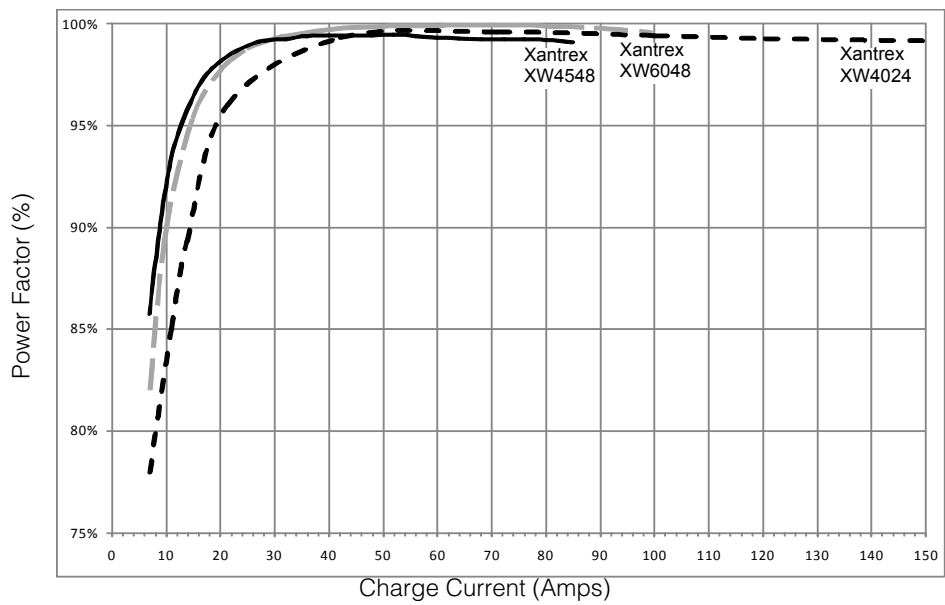
### Inverting Efficiency (Typical)



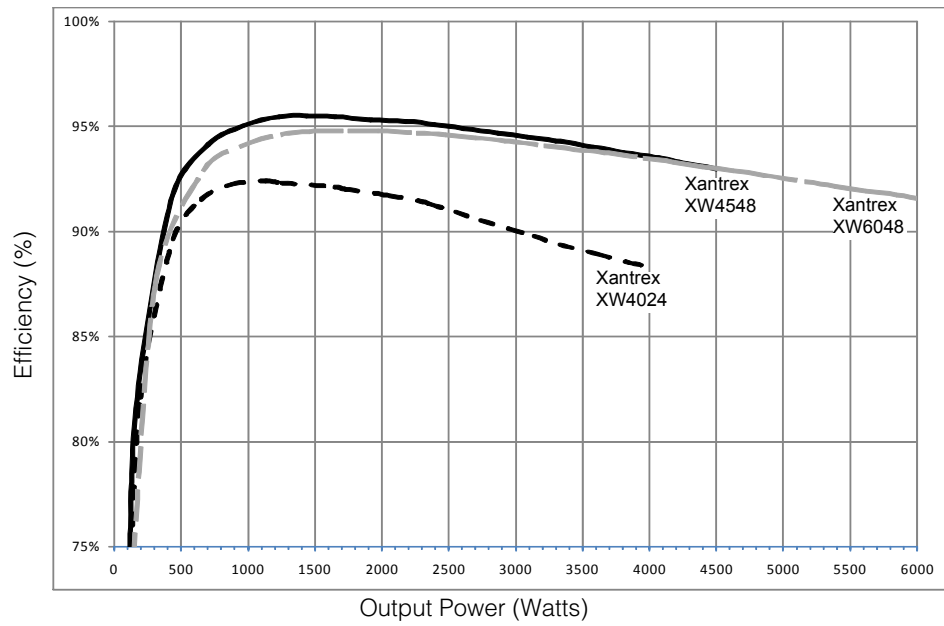
**Charging Efficiency (Typical)**



**Charging Efficiency (Power Factor Corrected)**



### Grid-Tie Sell Mode Efficiency (Typical)



## Mechanical Specifications

**Table A-2** Xantrex XW Power System Mechanical Specifications

Model	Xantrex XW6048 230 50	Xantrex XW4548 230 50	Xantrex XW4024 230 50
Supported Battery Types	Flooded (default), Gel, AGM, Custom		
Battery bank size	100–10000 Ah		
Non Volatile Memory	Yes		
Display Panel	<p>Status LEDs indicate AC In status, faults/warnings, equalize mode, and battery level.</p> <p>Three-character display indicates output power or charge current, and fault/warning codes.</p> <p>ON/OFF and equalize button.</p>		
System Network	Xantrex Xanbus (publish-subscribe network, no need for hubs or special cards)		
Enclosure Type	IP 20, indoor, unheated		
Rated Temperature Range (meets all specifications)	0–40 °C		
Operational Temperature Range	-25–70 °C		
Storage Temperature Range	-40–85 °C		
Inverter Dimensions (H × W × D)	580 × 410 × 230 mm		
Shipping Dimensions (H × W × D)	711 × 572 × 394 mm		
Inverter Weight	57 kg	52 kg	52 kg
Shipping Weight	60 kg	55 kg	55 kg

## Accessories

Accessory	Part Number
Power Distribution Panel	865-1015
Xantrex XW Conduit Box	865-1025
Inverter #2 Connection Kit	865-1020
Xantrex XW MPPT60 150 Solar Charge Controller	865-1030-1
Xantrex XW System Control Panel	865-1050
Xantrex XW Automatic Generator Start	865-1060
Network cables	3 ft (0.9 m): 809-0935 25 ft (7.6 m): 809-0940 75 ft (22.9 m): 809-0942
Network terminators	100-0224-01-01

## Regulatory Approvals

CE marked and complies with the following:

Low Voltage Directive 2006/95/EC, per:

- EN50178 "Electronic Equipment for Use in Power Installations".

EMC Directive 2004/108/EC, per:

- EN61000-6-3 "Emission Standard for Residential, Commercial, and Light-Industrial Environments"
- EN61000-6-1 "Immunity for Residential, Commercial, and Light-Industrial Environments"

RCM marked and complies with the following:

- AS 4777.2 "Inverter requirements"
- AS 4777.3 "Grid protection requirements"
- AS/NZS 3100 "General requirements for electrical equipment"



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