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**DCCB**

**Installation Guide**

# **Sine Wave Plus DC Conduit Box (DCCB) Installation Guide**

[www.xantrex.com](http://www.xantrex.com)



# **Sine Wave Plus DC Conduit Box (DCCB)**

## **Installation Guide**

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## Date and Revision

July 2003 Revision A

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# About This Guide

## Purpose

The purpose of this **Installation Guide** is to provide explanations and procedures for installing the **Sine Wave Plus DC Conduit Box (DCCB)**.

## Scope

The **Sine Wave Plus DC Conduit Box (DCCB) Installation Guide** provides safety guidelines and procedures for installing the **DCCB**.

## Audience

This **Guide** is intended for those who need to install the **Sine Wave Plus DC Conduit Box**. Only skilled personnel, such as certified electricians and certified renewable energy technicians should attempt installation of this equipment. Skills required include the ability to read and understand how to follow single line wiring diagrams.

## Organization

This **Guide** consists of one chapter.

Chapter 1, “Installation” provides installation and wiring instructions for the Sine Wave Plus DC Conduit Box (DCCB).

Warranty and Product Information is provided at the end of the manual.

## Conventions Used

The following conventions are used in this guide.



### WARNING

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

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### CAUTION

Cautions identify conditions or practices that could result in damage to the unit or other equipment.

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**Important:** These notes describe things which are important for you to know, but not as serious as a caution or warning.

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## Abbreviations and Acronyms

AC	Alternating Current
ASC	Authorized Service Center
AWG	American Wire Gauge
BTS	Battery Temperature Sensor
DC	Direct Current
DCCB	DC Conduit Box
RMA	Return Material Authorization

## Related Information

You can find more information about Xantrex Technology Inc. as well as its products and services at **[www.xantrex.com](http://www.xantrex.com)**.

# Important Safety Instructions



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## WARNING

This chapter contains important safety and operating instructions for the **Sine Wave Plus DC Conduit Box (DCCB)**. Read and keep this Installation Guide for future reference.

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1. Before installing the **DCCB**, read all instructions and cautionary markings on the **DCCB**, the batteries, and all appropriate sections of this guide.
2. Do not expose the **DCCB** to rain, snow, or spray. To reduce risk of fire hazard, do not cover or obstruct the ventilation openings.
3. Do not install the **DCCB** in a zero-clearance compartment. The **Sine Wave Plus inverter** that is attached may overheat. Minimum clearance for ventilation around unit must be 6 inches (152 mm) at the end and the top. For maximum ventilation, 12 inches (305 mm) clearance is recommended.
4. The **DCCB** is designed to be permanently connected to your **Sine Wave Plus inverter**.
5. Installations of this equipment should only be performed by skilled personnel such as qualified electricians and Certified Renewable Energy (RE) System Installers to ensure adherence to the local and national electrical codes applicable in your installation. For a list of Xantrex Certified RE dealers, please visit our website at [www.XantrexREdealers.com](http://www.XantrexREdealers.com).
6. To avoid a risk of fire and electric shock, make sure that existing wiring is in good condition and that wire is not undersized. Do not operate the inverter with damaged or substandard wiring.
7. To reduce the risk of electrical shock, disconnect both AC and DC power from the system before attempting any maintenance or cleaning or working on the **DCCB**.
8. The **DCCB** is provided with two (2) equipment-grounding lugs that must be connected to the inverter equipment ground and the system ground.

## Explosive gas precautions

1. Working in the vicinity of lead-acid batteries is dangerous. Batteries generate explosive gases during normal operation. Therefore you must read this guide and follow the instructions exactly before installing the **DCCB**.
2. To reduce the risk of battery explosion, follow these instructions and those published by the battery manufacturer and the manufacturer of the equipment in which the battery is installed.

## Certifications

CSA certified to the following standards:

- UL 1741, and
- CSA 107.1-01



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# 1

## Installation

Chapter 1, “Installation” provides installation and wiring instructions for the **Sine Wave Plus DC Conduit Box (DCCB)**.

The following topics are covered in this chapter.

See:	for this topic:
page 2	“Introduction”
page 3	“Specifications”
page 4	“Code Compliance”
page 4	“Installation Tools and Materials”
page 5	“Safety Plate (SP-1) (Option)”
page 5	“Pre-installation”
page 8	“Install the DCCB on the Inverter”
page 8	“Wiring Procedures”

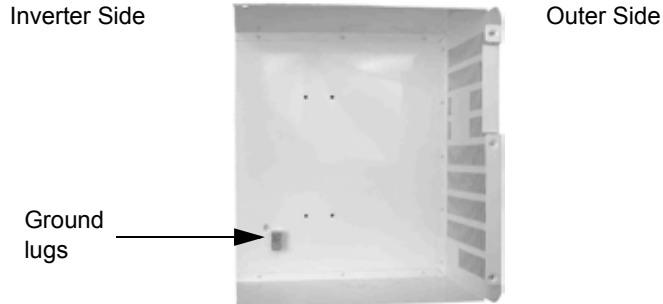
## Introduction

The DC Conduit Box (**DCCB**) connects to the DC side of the inverter and accepts DC conduit runs. The **DCCB** provides protection to the DC cables connected to the inverter.



**Figure 1** DC Conduit Box, Top View

This guide provides instructions for installing the **DCCB** on the inverter and running DC cables through it to the DC side of the inverter.



**Figure 2** DC Conduit Box, Base With Top Cover Removed

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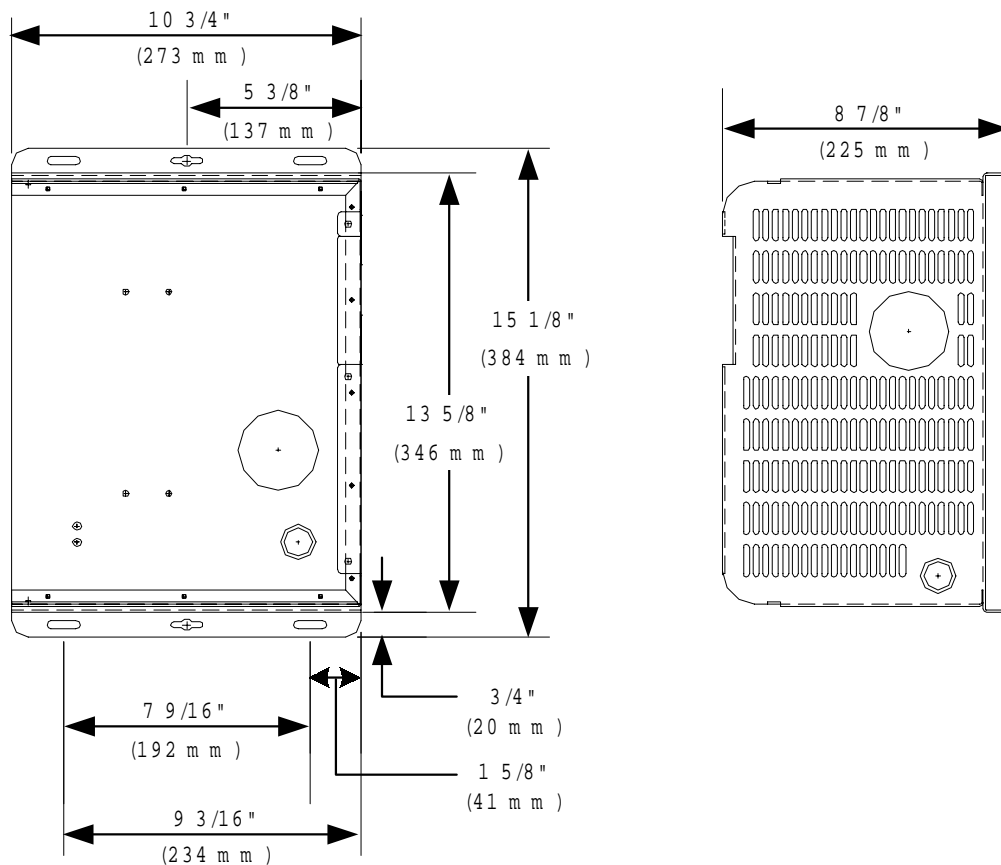
**Important:** Before installing the **DCCB**, read all instructions and cautionary markings located in this manual and in your inverter manual.

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Although the DC electrical system may be “low voltage”, significant hazards may still be present, particularly from short-circuits of the battery system. Inverter systems, by their nature, involve power from multiple sources (e.g., inverter, generator, utility, batteries, and solar arrays) that add hazards and complexity that can be very challenging.

# Specifications

Dimensions	15 1/8" (H) x 10 3/4" (W) x 8 7/8" (D) (384 mm x 273mm x 225mm)
Weight	8 lb (4 kg)
Shipping Weight	11 lb (5 kg)
Enclosure	Indoor rated
Finish	Powdercoat
Color	White
Ground Wire	#14 - #2 AWG acceptable (2 lugs available)
Certifications	CSA certified to UL 1741 and CSA 107.1-01



**Figure 3** DCCB Dimensions (Not To Scale)

## Code Compliance

Governing installation codes vary depending on the location and type of installation. Installations of this equipment should only be performed by skilled personnel such as qualified electricians and Certified Renewable Energy (RE) System Installers to ensure adherence to the local and national electrical codes applicable in your application.

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**Important:** Be sure to obtain the appropriate permits, if necessary, prior to starting this installation.

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## Installation Tools and Materials

### Tools Required

The following tools may be required for installing this equipment.

- ☐ Wire strippers
- ☐ Assorted open-end wrenches or socket wrench and fittings
- ☐ Torque wrench
- ☐ Electrical tape
- ☐ Multi meter (AC/DC volts, frequency)
- ☐ Assorted Phillips screwdrivers
- ☐ Slotted screwdriver
- ☐ Level
- ☐ Pencil
- ☐ Utility knife

### Hardware / Materials Required

The following materials may be required for completing this installation.

- ☐ Conduits, bushings, and appropriate fittings for wire runs
- ☐ Wire nuts
- ☐ DC fuses and/or DC disconnects
- ☐ Electrical wire of appropriate size and length
- ☐ Battery cables
- ☐ Battery cable lugs (depending on types of battery cables used)
- ☐ Breaker panels
- ☐ Ground busses, bars, and/or rods
- ☐ Six #10 wood screws or ¼ inch (6 mm) lagbolts and washers

## Safety Plate (SP-1) (Option)

An optional safety plate (SP-1) is available to close the DCCBs opening to prevent accidental contact with any DC power within the DCCB if the inverter is ever removed. The safety plate is not included with the DCCB but can be ordered separately if needed.

## Pre-installation



### WARNING

Ensure that no DC voltage is being supplied to the inverter and that no AC voltage is present on the AC wiring. Failure to do so could cause serious injury or death.

#### Location

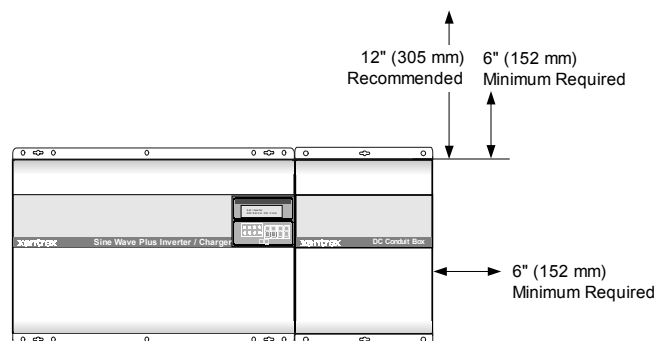
Be sure to allow sufficient space for the **DCCB** to be mounted directly adjacent to the inverter's DC side. Also consider the additional weight and ventilation space requirements of the **DCCB**.

#### Ventilation Requirements

Minimum clearance for ventilation around **DCCB** must be at least 6 inches (152 mm) at the end and at the top. The minimum clearance is needed to prevent recirculating hot air from the inverter's exhaust (DC side) from going back into the inverter's intake (AC side).

For maximum ventilation, 12 inches (305 mm) is recommended around the top.

Please refer to the Sine Wave Plus Inverter/Charger Owner's Guide for additional location considerations.



**Figure 4** Space and Clearance Requirements

## Removing the Top Cover

Remove the **DCCB** cover to prepare the knockouts and proceed with installing DC cabling of the inverter and **DCCB**.

### To remove the **DCCB** cover:

1. Remove the three #12 Phillips head screws and lock washers from the top of the front cover. Remove the two #8 Phillips head Sems screws from the sides of the cover. See [Figure 5 on page 1–7](#).
  - a) Place the loose screws somewhere safe where they will not be lost.
2. Lift the cover off the **DCCB**.
  - a) If the **DCCB** is already attached to the inverter, slide the cover away from the inverter before lifting, to dislocate the **DCCB** cover tabs from the inverter slots.

## Knockout Removal

### Removing Knockouts

Knockout preparation should be done before mounting the **DCCB**.

1. Determine which knockouts need to be removed to accommodate the DC wiring of the inverter and remove them. See [Figure 5](#) for knockout locations.
2. Ensure that all metal shavings are removed before proceeding with the rest of the installation.

### Installing Bushings

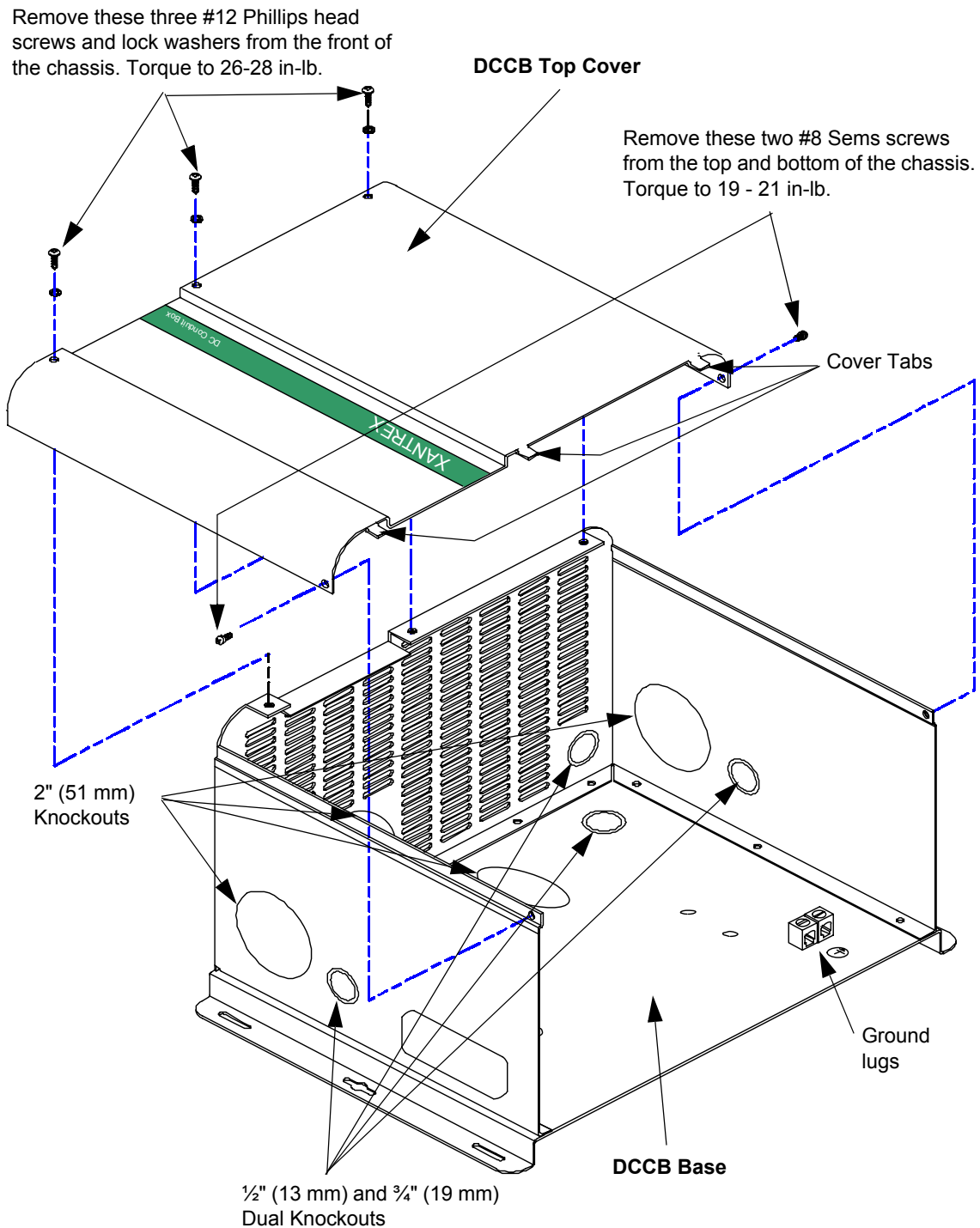
Install appropriately sized conduit bushings in the knockout openings to protect the DC wires from the metal edge of the knockout opening.

## Replacing the Top Cover

### To replace the **DCCB** cover:

1. Place the cover on top of the **DCCB** with the screw holes lined up.
  - a) If the **DCCB** is already attached to the inverter, insert the three cover tabs into the appropriate slots on the DC side of the inverter.
2. Replace the three #12 Phillips head screws and lock washers in the front of the cover. Torque these screws to 26-28 in-lb.
3. Replace the two #8 Phillips head Sems screws on the sides of the cover. Torque these screws to 19-21 in-lb.





**Figure 5** Removing the Top Cover and Knockout Locations

## Install the DCCB on the Inverter

Install the **DCCB** on the inverter as follows:

1. Carefully align the base of the DCCB next to the DC end of inverter ensuring that the mounting rails of both the inverter and the DCCB are aligned evenly and that the base is as close as possible to the inverter.

**Important:** Ensure that the **DCCB** is mounted no more than 1/16" (2 mm) from the DC end of the inverter.

2. Secure the base in place with six #10 wood screws or ¼ inch (6 mm) lagbolts and washers of an appropriate length in the six mounting holes on the mounting rails of the **DCCB** base.

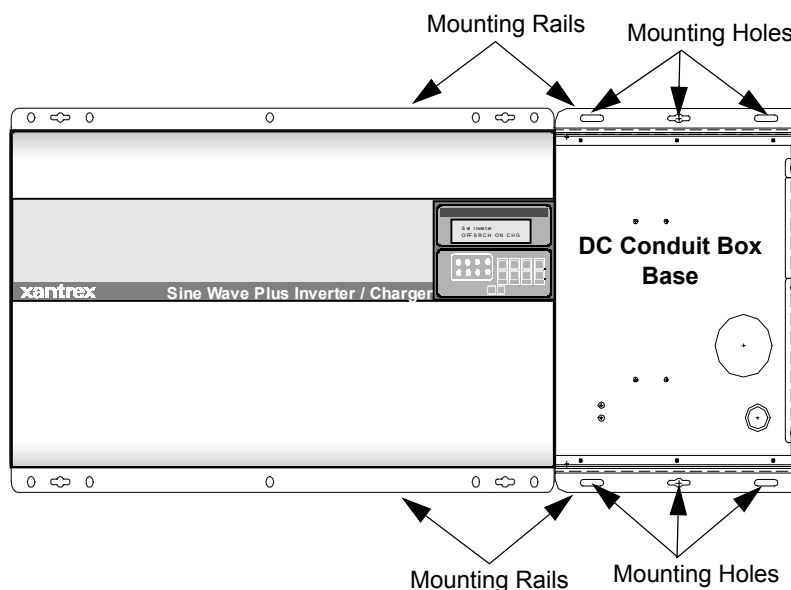


Figure 6 Installing the DCCB to the Inverter

## Wiring Procedures



### CAUTION

The battery negative connection is only grounded at one point. This is usually the chassis bonding lug in the DC Disconnect Box.

## Grounding the DCCB

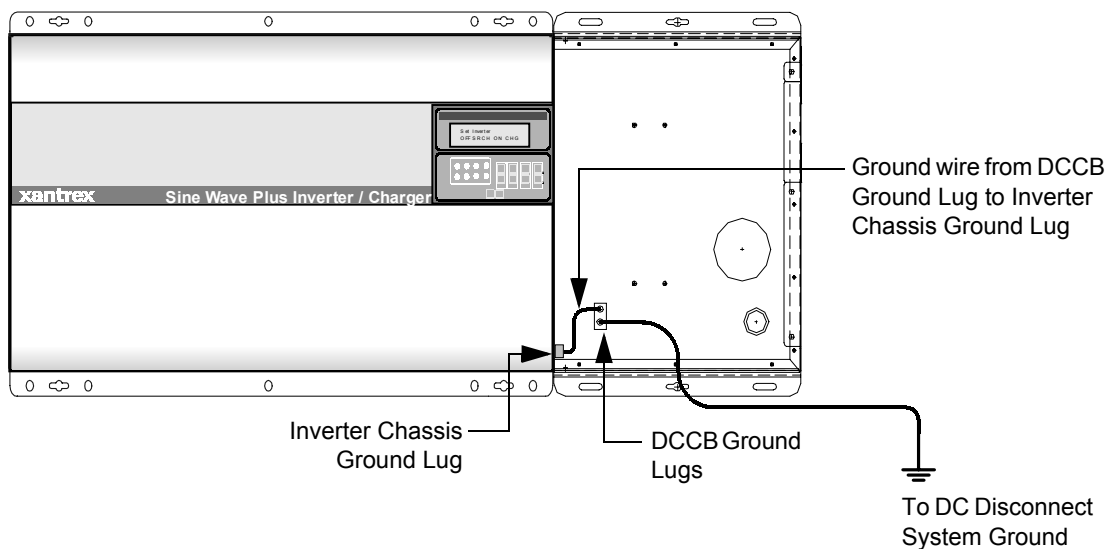
The **DCCB** is grounded by attaching a ground wire from the primary DC system ground to one of the grounding lugs in the **DCCB**. The inverter may be grounded by attaching a ground wire from the second ground lug in the **DCCB** to the chassis ground lug on the DC side of the inverter.

**Table 1** **DCCB** Ground Wire and Fuse Size Chart

Battery DC Disconnect Size	Minimum Size of Copper Ground Wire	DCCB Ground Lug Wire Torque Spec (hand torqued)
60 Amp	#10 AWG	35 in-lb
100 Amp	#8 AWG	40 in-lb
200 Amp	#6 AWG	45 in-lb
300+ Amp	#2 AWG or greater	50 in-lb

### To ground the **DCCB**:

1. Determine the appropriate length and wire gauge (see [Table 1](#)) for the **DCCB** ground wire and cut to size. Strip the connecting end, approximately 3/8" (10 mm).
2. Connect a ground wire from the DC system ground to one of the ground lugs in the **DCCB**.
3. Connect a ground wire from the inverter chassis ground lug to the second ground lug in the **DCCB**.



**Figure 7** Grounding the DCCB

## DC Wiring Instructions

With the **DCCB** installed, the battery cables will pass-through the **DCCB** to the inverter. Follow the instructions in your inverter manual for safe connection of those cables to the inverter.

### To connect DC cables:

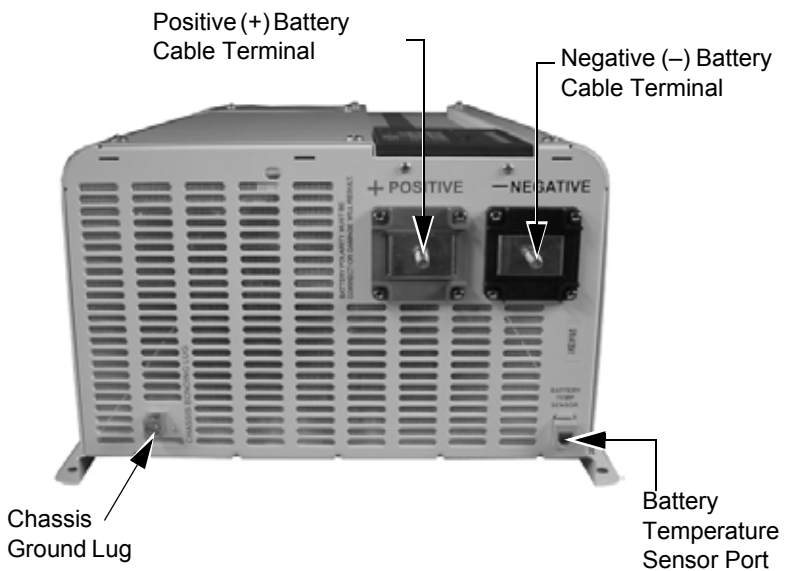
- ◆ Follow the instructions in your inverter manual for connecting the positive (+) and negative (–) cables to the inverter. The cable should pass through conduit into the **DCCB** enclosure, and then directly to the inverter positive (+) and negative (–) terminals.

## Additional Accessory Wiring

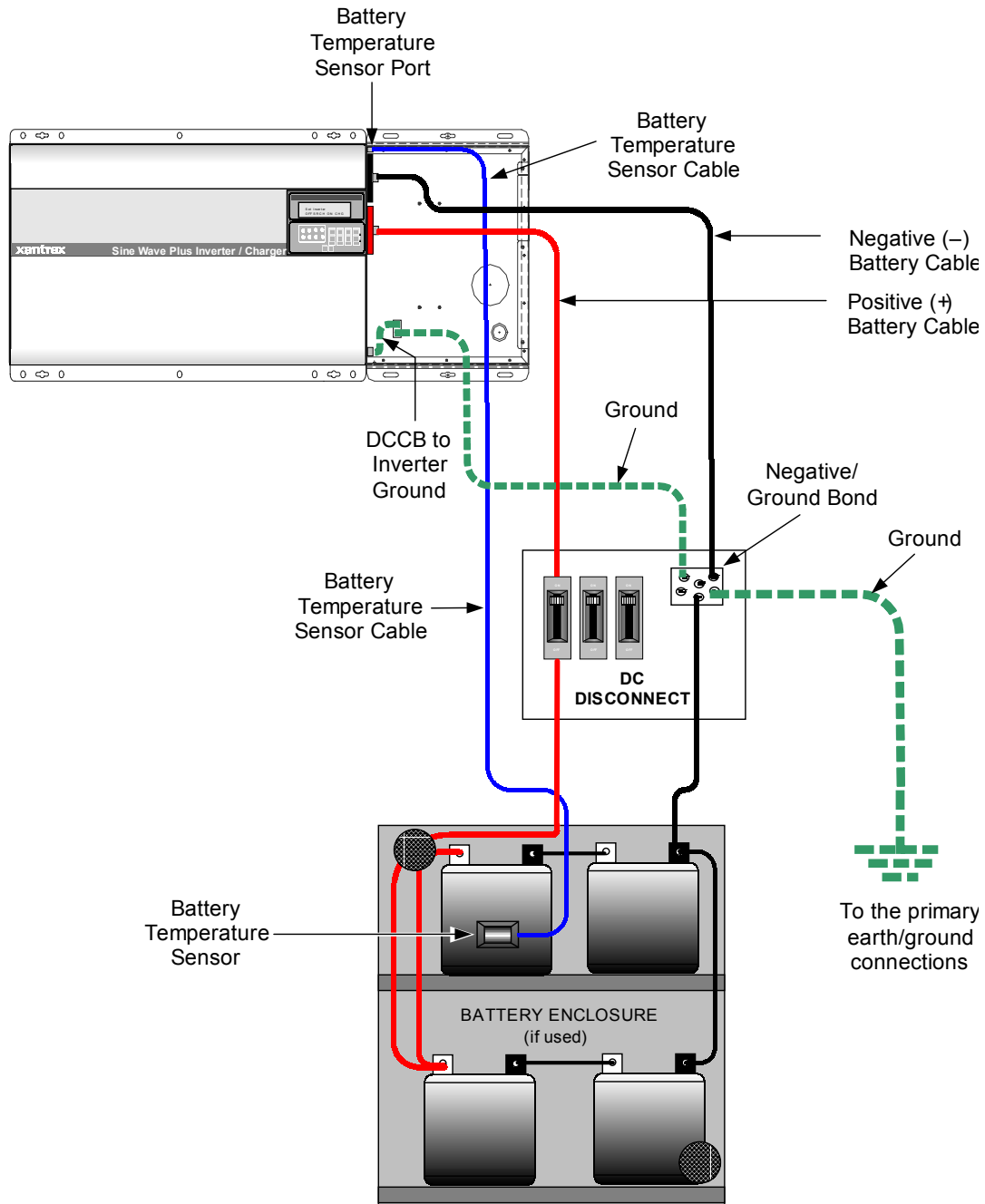
If you have a BTS connected to your inverter, then you will need to pass its connecting wire through the **DCCB** to the DC side of the inverter (see [Figure 9](#)).

Connect the BTS to a battery in the battery box prior to running the BTS cable through either the DC cable conduit, or a separate conduit to avoid any possible damage to the DC battery cables.

See your inverter manual and BTS manual for further information about the installation and configuration of this accessory.



**Figure 8** Sine Wave Plus Battery Terminals and BTS Port



**Figure 9** DC Wiring and Battery Temperature Sensor Wiring



# Warranty and Product Information

## 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 **Sine Wave Plus DC Conduit Box**. This warranty lasts for a Warranty Period of **two (2) years** from the date of purchase at point of sale to you, the original end user customer.

This Limited Warranty is transferable to subsequent owners but only for the unexpired portion of the Warranty Period.

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

Xantrex will, at its option, use new and/or reconditioned parts in performing warranty repair and building replacement products. Xantrex reserves the right to use parts or products of original or improved design in the repair or replacement. If Xantrex repairs or replaces a product, its warranty continues for the remaining portion of the original Warranty Period or 90 days from the date of the return shipment to the customer, whichever is greater. All replaced products and all parts removed from repaired products become the property of Xantrex.

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

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

Phone: 1-800-670-0707 (toll free)

1-360-435-8826 (direct)

Fax: 1-360-435-3457

Email: [CustomerService@xantrex.com](mailto:CustomerService@xantrex.com)

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

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.

## Warranty and Product Information

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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

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

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### Exclusions

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



## Warning: Limitations On Use

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

SPECIFICALLY, PLEASE NOTE THAT THE **SINE WAVE PLUS DC CONDUIT BOX** SHOULD NOT BE USED IN CONNECTION WITH LIFE SUPPORT SYSTEMS OR OTHER MEDICAL EQUIPMENT OR DEVICES. WITHOUT LIMITING THE GENERALITY OF THE FOREGOING, XANTREX MAKES NO REPRESENTATIONS OR WARRANTIES REGARDING THE USE OF THE XANTREX **SINE WAVE PLUS DC CONDUIT BOX** IN CONNECTION WITH LIFE SUPPORT SYSTEMS OR OTHER MEDICAL EQUIPMENT OR DEVICES.

Please note that the **Sine Wave Plus DC Conduit Box** is not intended for use as an uninterruptible power supply and Xantrex makes no warranty or representation in connection with any use of the product for such purposes.

## Return Material Authorization Policy

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

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

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

Record these details in on [page WA-4](#).

## Return Procedure

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

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

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

## Out of Warranty Service

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

To return your **Sine Wave Plus DC Conduit Box** for out of warranty service, contact Xantrex Customer Service for a Return Material Authorization (RMA) number and follow the other steps outlined in “[Return Procedure](#)” on page [WA-3](#).

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

## Information About Your System

As soon as you open your **Sine Wave Plus DC Conduit Box** package, record the following information and be sure to keep your proof of purchase.

- ☐ Purchased From \_\_\_\_\_
- ☐ Purchase Date \_\_\_\_\_

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Customer Service 1, 4

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