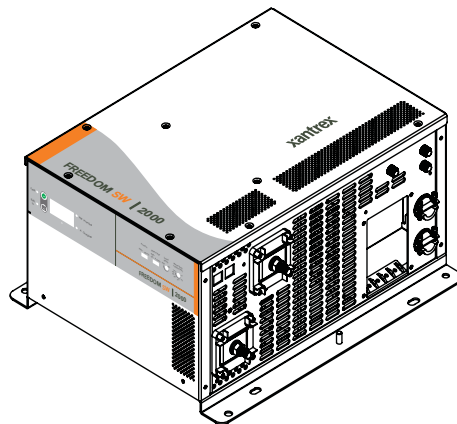
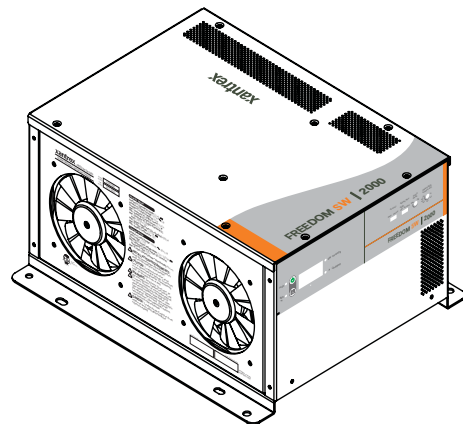


Smart choice for power™

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Owner's Guide

Freedom SW 2000

Sine Wave Inverter/Charger

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About This Guide

Purpose

The purpose of this Owner's Guide is to provide explanations and procedures for operating, troubleshooting, and maintaining the Freedom SW 2000 Inverter/Charger.

Scope

The Guide provides safety and operating guidelines as well as information on configuring the inverter/charger. It also provides information about troubleshooting the unit. It does not provide details about particular brands of batteries. You need to consult individual battery manufacturers for this information.

Audience

The Guide is intended for users and operators of the Freedom SW 2000 Inverter/Charger.

Conventions Used

The following conventions are used in this guide.

DANGER

STATEMENT OF HAZARD

Contains statements of avoidance or strict compliance.

Failure to follow these instructions will result in death or serious injury.

WARNING

STATEMENT OF HAZARD

Contains statements of avoidance or strict compliance.

Failure to follow these instructions can result in death or serious injury.

CAUTION

STATEMENT OF HAZARD

Contains statements of avoidance or strict compliance.

Failure to follow these instructions can result in minor or moderate injury.

CAUTION

STATEMENT OF HAZARD

Contains statements of avoidance or strict compliance.

Failure to follow these instructions can damage the unit and/or damage other equipment.

IMPORTANT: These notes describe things which are important for you to know, however, they are not as serious as a caution or warning.

Related Information

You can find more information about Xantrex Technology Inc. as well as its products and services at **www.xantrex.com**.

NOTE: The Installation Guide (Document Part Number: 975-0527-01-01) is primarily intended for qualified installers who need to install and configure the Freedom SW 2000 Inverter/Charger. The installer should have knowledge and experience in installing electrical equipment, knowledge of the applicable installation codes, and awareness of the hazards involved in performing electrical work and how to reduce those hazards. A qualified technician or electrician has this knowledge and experience.

Important Safety Instructions

IMPORTANT: READ AND SAVE THIS OWNER'S GUIDE FOR FUTURE REFERENCE.

This chapter contains important safety and installation instructions for the Freedom SW 2000 Inverter/Chargers. Each time, before using the Freedom SW 2000 Inverter/Charger, READ ALL instructions and cautionary markings on or provided with the inverter/charger, the batteries, and all appropriate sections of this guide.

NOTE: The Freedom SW 2000 Inverter/Charger contains no user-serviceable parts. See "Warranty and Return Information" on page 30 for guidance.

DANGER

ELECTRICAL SHOCK HAZARD

- Do not expose the Freedom SW 2000 to rain, snow, spray, or bilge water. This inverter/charger is designed for indoor use only.
- Do not operate the inverter/charger if it has received a sharp blow, been dropped, has cracks or openings in the enclosure including if the fuse cover has been lost, damaged, or will not close, or otherwise damaged in any other way.
- Do not disassemble the inverter/charger. Internal capacitors remain charged after all power is disconnected.
- Disconnect both AC and DC power from the inverter/charger before attempting any maintenance or cleaning or working on any circuits connected to the inverter/charger. See note below.
- Do not operate the inverter/charger with damaged or substandard wiring. Make sure that all wiring is in good condition and is not undersized.

Failure to follow these instructions will result in death or serious injury.

NOTE: Turning off the inverter/charger using the on/off switch on the front panel will not reduce an electrical shock hazard.

DANGER

FIRE AND BURN HAZARD

Do not cover or obstruct the air intake vent openings and/or install in a zero-clearance compartment.

Failure to follow these instructions will result in death or serious injury.

DANGER

EXPLOSION HAZARD

- Charge only properly rated (such as 12 V) lead-acid (GEL, AGM, Flooded, or lead-calcium) rechargeable batteries because other battery types may explode and burst.
- Do not work in the vicinity of lead-acid batteries. Batteries generate explosive gases during normal operation. See note #1.
- Do not install and/or operate in compartments containing flammable materials or in locations that require ignition-protected equipment. See notes #2 and #3.

Failure to follow these instructions will result in death or serious injury.

NOTES:

1. Follow these instructions and those published by the battery manufacturer and the manufacturer of any equipment you intend to use in the vicinity of the battery. Review cautionary markings on these products and on the engine.
2. This inverter/charger contains components which tend to produce arcs or sparks.
3. Locations include any space containing gasoline-powered machinery, fuel tanks, as well as joints, fittings, or other connections between components of the fuel system.

Precautions When Working With Batteries

WARNING

BURN FROM HIGH SHORT-CIRCUIT CURRENT, FIRE AND EXPLOSION FROM VENTED GASES HAZARDS

- Always wear proper, non-absorbent gloves, complete eye protection, and clothing protection. Avoid touching your eyes and wiping your forehead while working near batteries. See note #4.
- Remove all personal metal items, like rings, bracelets, and watches when working with batteries. See notes #5 and #6 below.
- Never smoke or allow a spark or flame near the engine or batteries.
- Never charge a frozen battery.

Failure to follow these instructions can result in death or serious injury.

NOTES:

1. Locate the Freedom SW 2000 Inverter/Charger unit away from batteries in a well ventilated compartment.
2. Always have someone within range of your voice or close enough to come to your aid when you work near a lead-acid battery.
3. Always have plenty of fresh water and soap nearby in case battery acid contacts skin, clothing, or eyes.
4. If battery acid contacts skin or clothing, wash immediately with soap and water. If acid enters your eye, immediately flood it with running cold water for at least twenty minutes and get medical attention immediately.
5. Use extra caution to reduce the risk of dropping a metal tool on the battery. It could spark or short circuit the battery or other electrical parts and could cause an explosion.
6. Batteries can produce a short circuit current high enough to weld a ring or metal bracelet or the like to the battery terminal, causing a severe burn.
7. When removing a battery, always remove the negative terminal from the battery first for systems with grounded negative. If it is grounded positive, remove the positive terminal first. Make sure all loads connected to the battery and all accessories are off so you don't cause an arc.

Precautions When Preparing to Charge

WARNING

EXPOSURE TO CHEMICALS AND GASES HAZARD

- Make sure the area around the battery is well ventilated.
- Make sure the voltage of the batteries matches the output voltage of the inverter/charger.
- Be careful to keep corrosion from coming into contact with your eyes and skin when cleaning battery terminals.

Failure to follow these instructions can result in death or serious injury.

NOTES:

- Study and follow all of the battery manufacturer's specific precautions, such as removing or not removing cell caps while charging, whether equalization is acceptable for your battery, and recommended rates of charge.
- For flooded non-sealed batteries, add distilled water in each cell until battery acid reaches the level specified by the battery manufacturer. This helps to purge excessive gas from cells. Do not overfill. For a battery without removable cell caps, carefully follow manufacturer's instructions.

Precautions When Placing the Inverter/Charger

CAUTION

RISK OF DAMAGE TO THE INVERTER/CHARGER

- Never allow battery acid to drip on the inverter/charger when reading gravity, or filling battery.
- Never place the Freedom SW 2000 Inverter/Charger unit directly above batteries; gases from a battery will corrode and damage the inverter/charger.
- Do not place a battery on top of the inverter/charger.

Failure to follow these instructions can damage the unit and/or damage other equipment.

Regulatory

The Freedom SW 2000 Inverter/Charger is Certified to appropriate US and Canadian standards. For more information see “Regulatory Approvals” on page 29.

The Freedom SW 2000 Inverter/Charger is intended to be used for RV, marine, and commercial applications. It is not intended for other applications as it may not comply with the additional safety code requirements needed for those other applications. See “Limitations On Use” below.

WARNING

LIMITATIONS ON USE

- Do not use in connection with life support systems or other medical equipment or devices.
- Do not use in ambulances or other life-saving emergency vehicles.

Failure to follow these instructions can result in death or serious injury.

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Introduction

This chapter describes the standard features of a Freedom SW 2000, as well as its protection features. It also provides information on the different parts of the Freedom SW 2000.

Thank you for purchasing the Freedom Sine Wave 2000 Inverter/Charger from Xantrex Technology Inc. The Freedom SW 2000 is one of the finest inverter/chargers on the market today, incorporating state-of-the-art technology and high reliability.

The inverter features an AC pass-through circuit, powering your in-vehicle, consumer appliances from utility or generator power while charging the batteries. When utility power is disconnected or the generator is stopped, the in-vehicle battery backup system keeps your appliances powered until utility power is restored. Internal protection circuits prevent over-discharge of the batteries by shutting down the inverter when a low battery condition occurs. When utility or generator power is restored, the inverter transfers to the AC source and recharges the batteries.

The front panel features indicator lights and a user interface display for reading system status, and controls to customize the inverter settings for your battery bank.

The Freedom SW 2000 is an economical product designed to provide a reliable supply of electricity to all the essential circuits in the RV, boat, or commercial vehicle when disconnected from utility power (i.e., shore power, campground, etc.) The critical loads can be powered for hours or days, depending on the size of the system battery bank and power consumption of appliances. When utility or generator power returns, the batteries are quickly recharged to ensure they will be ready to supply mobile power during the next trip.

Freedom SW 2000 Materials List

The Freedom SW 2000 ships with the following items:

- one Freedom SW 2000 unit,
- owner's and installation guides,
- Battery Temperature Sensor (BTS),
- Freedom SW remote panel with 25-foot communications cable,
- DC terminal covers (one red, one black) with two sets of screws, and
- two sets of nuts and washers for the DC terminals.

NOTE: If any of the items are missing, contact Xantrex or any authorized Xantrex dealer for replacement. See "Contact Information" on page i.

IMPORTANT: Keep the carton and packing material in case you need to return the Freedom SW 2000 for servicing.

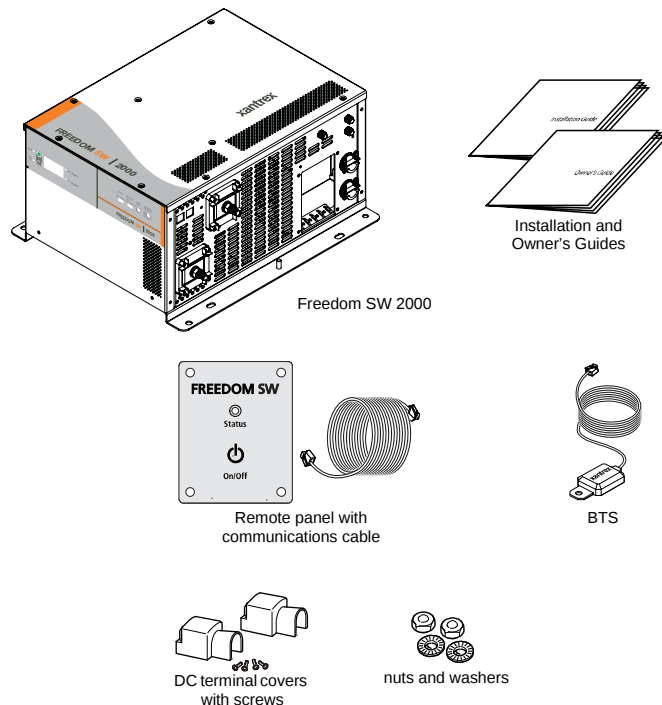


Figure 1 Materials List

Standard and Protection Features

The Freedom SW 2000 provides the following standard features:

- true sine wave output which operates AC appliances and equipment normally using utility-grade AC power via a standard AC wall outlet,
- three-stage battery charger¹,
- fully automatic AC transfer relay²,
- inverter and battery charger controls are located on the front panel,
- high power efficiency in invert mode³,
- low power consumption⁴,
- power factor correction⁵,
- low electromagnetic interference (EMI), and
- automatic charge resumption, if required, after AC power interruption.

1. When batteries are fully charged, the inverter/charger will go into standby mode to reduce the energy draw from the utility.

2. The built-in battery charger-to-AC transfer relay automatically switches power from the utility to the inverter and handles a maximum rating of 30 A of current at 120 VAC.

3. Inverter/charger operates at over 90% efficiency through most of its power range in invert mode

4. Uses less than 2 watts of power while in standby mode and in search mode, it consumes less than 4.7 watts of power.

5. Power factor correction reduces apparent power consumption and maximizes efficiency.

The Freedom SW 2000 provides the following protection features:

- ambient over temperature shutdown,
- high and low battery voltage protection,
- battery temperature sensor (BTS) failure/battery temperature out-of-range fault protection,
- bad battery fault protection⁶,
- DC output over voltage protection during charge mode,
- AC transfer relay failure protection,
- AC output overload and short circuit protection during invert mode,
- AC backfeed ⁷protection,
- locked⁸ or disconnected fan protection,
- short circuit protection for the BTS and communication connector ports including protection from incorrectly inserting the remote panel communication cable plug into the BTS port and vice versa, and
- battery reverse polarity protection.

6. During charging, if the battery voltage stays below 8.5 volts, charging stops and fault reported via the front panel display and Fault LED.

7. An AC backfeed error occurs when the AC output of the inverter/charger is connected or routed back to the AC input terminal or when an external AC source is connected to the Freedom SW 2000 unit's AC output terminals. When this occurs, all inverter and charger functions are shut down.

8. A locked fan fault occurs when the fan's blades are hindered from turning by objects such as accumulated debris that can obstruct the fan's operation. The Freedom SW 2000 shuts down upon fault detection, sounds a continuous alarm, and reports the fault via the front panel display and Fault LED.

The Battery Temperature Sensor (BTS) provides these protection features:

- battery under temperature charging protection preventing battery charging at -20 °C (-4 °F) or below,
- battery over temperature charging protection preventing battery charging at 60 °C (140 °F) or higher, and
- charging voltage compensation based on the temperature of the battery the BTS is connected to.

The Remote Panel provides the following features:

- can be mounted up to 7.5 m (25 ft) away for remote control and monitoring,
- ability to switch the inverter ON or OFF,
- ability to display status via an LED status indicator, and
- 12-volt lockout feature.

Freedom SW 2000 Inverter/Charger Features

This section describes the different parts of the Freedom SW 2000.

Front and Side Panels

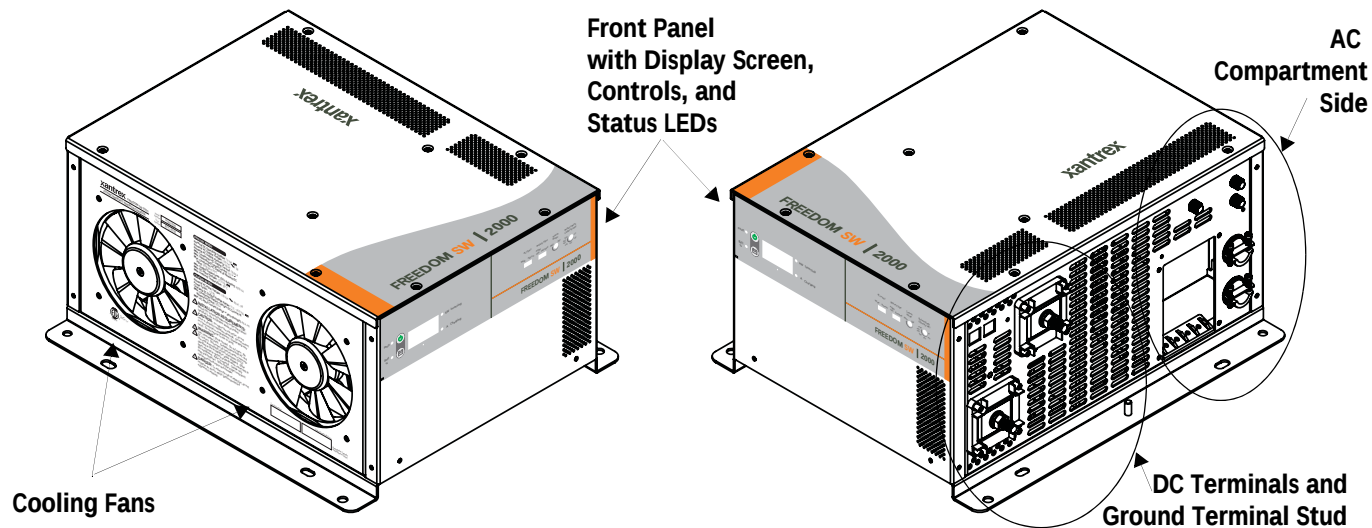


Figure 1 Freedom SW 2000 Front and Side Panels

AC Compartment Side

The AC side of the Freedom SW 2000 has one breaker (item 1) for inverter AC output (20 A max for 120 VAC/60 Hz), which protects the internal inverter relay and the components on the AC control and filter board.

There is a second breaker (item 2) for charger AC input (30 A max for 120 VAC/60 Hz), which protects the internal charge relay and the components on the AC filter board.

There is also a third breaker (item 3) for pass-through AC input (30 A max for 120 VAC/60 Hz), which protects the internal pass-through relay and wiring from the AC output to the user-installed branch circuit breaker.

These breakers are rated for the maximum charge rate and pass-through current allowed according to the rating of the internal relays.

Appropriately sized branch-rated circuit breakers must be installed directly on the AC output circuits to protect output circuits and wiring. Consult your local electrical code for selection of these branch-rated output circuit breakers.

Item	Description
1	Inverter 20 A AC output circuit breaker reset button
2	Charger 30 A AC input circuit breaker reset button
3	Pass-through 30 A AC input circuit breaker reset button
4	AC output (L, N, G) terminals– the terminals are labeled as L for Line, N for Neutral, and G for Ground.
5	Knockout with strain-relief device for AC output cables.

Item	Description
6	Knockout with strain-relief device for AC input cables.
7	AC input (L, N, G) terminals– the terminals are labeled as L for Line, N for Neutral, and G for Ground.

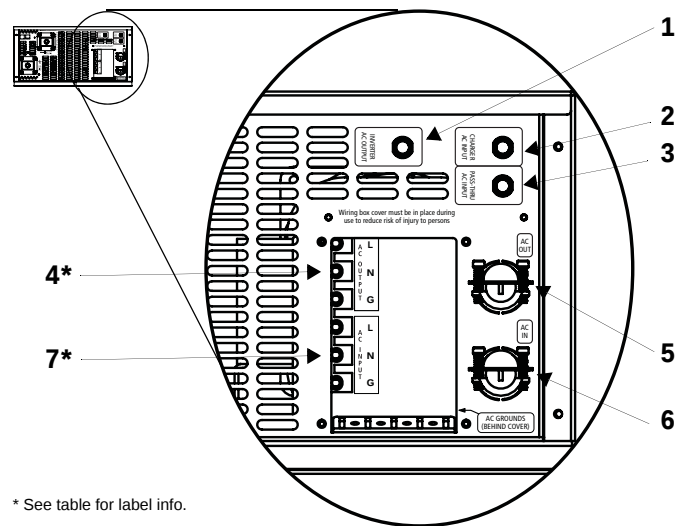


Figure 2 Freedom SW 2000 AC Side

DC Terminals and Ground Terminal Stud

The DC side of the Freedom SW 2000 has the equipment ground lug, the positive (+) battery terminal, and the negative (-) battery terminal plus the remote switch com port and battery temperature sensor com port.

Item	Description
1	Battery Temperature Sensor (BTS) com port
2	Remote Switch com port
3	Positive (+) DC battery cable terminal
4	Negative (-) DC battery cable terminal
5	Ground terminal stud

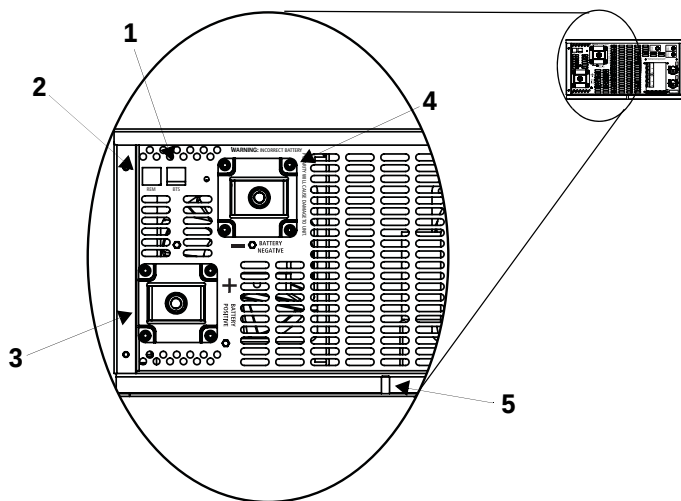


Figure 3 Freedom SW 2000 DC Side

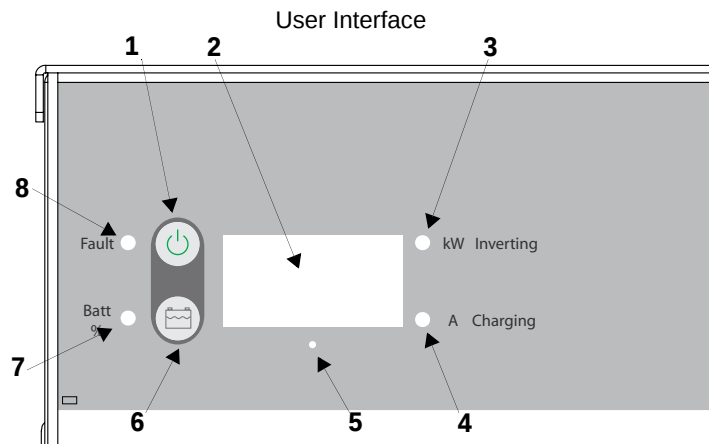
Operating The Freedom SW 2000

Front Panel User Interface

The front panel of the Freedom SW 2000 is equipped with a user interface, comprised of indicator lights and a display screen to provide inverter/charger status at a glance.

The front panel is also equipped with a service control interface on the right side of the front panel intended for set-up and service use only.

Below the display screen there is a pin-hole type push button to transition the Freedom SW 2000 into battery equalize mode.



Service Control Interface

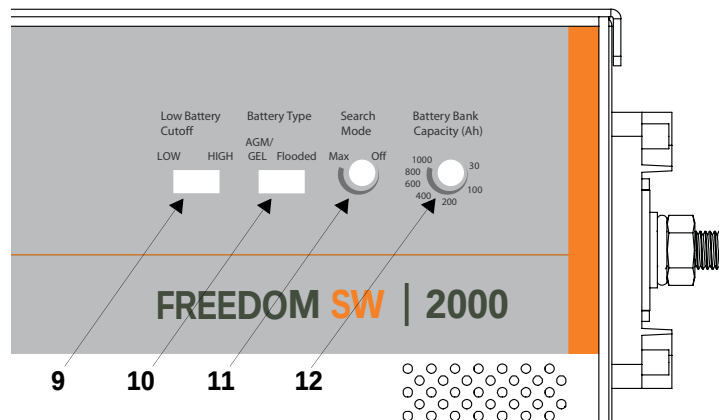


Figure 4 Front Panel User and Service Control Interfaces

For a description of the User Interface, see next table.

For a description of the Service Control Interface, see table on “Service Control Interface” on page 11.

Item	User Interface Item	Operation and/or Description
1	ON/STANDBY Switch	Press to transition the Freedom SW 2000 from OFF mode to ON. Freedom SW 2000 restarts in invert mode (if only DC power present) or charge mode (AC input and DC power present). Press to clear faults and warnings.
2	Display screen	Displays the power in kW when the Freedom SW 2000 is in invert mode. Displays the current in Amps when the Freedom SW 2000 is in charge mode. Displays the battery level in % when the battery level switch is pressed. Alternately flashes the warning code and either power or current (depending on mode) when there is an active warning (see “Front Panel User and Service Control Interfaces” on page 8). Displays the fault code when there is an active fault (see “Front Panel User and Service Control Interfaces” on page 8). Displays “---” when the Freedom SW 2000 is in standby mode (charge mode indicator light is solid green) or when the Freedom SW 2000 is OFF (charge mode indicator light is not illuminated). Displays “---” when the Freedom SW 2000 has been manually transitioned to OFF Mode from charge mode (charge mode indicator light is not illuminated). Display is blank when the Freedom SW 2000 has been manually transitioned to OFF Mode from invert mode (no indicator lights are illuminated).
3	Invert Mode Indicator LED	Indicator light is illuminated when the Freedom SW 2000 is in invert mode. Indicator light is flashing when the Freedom SW 2000 is load sensing. Indicator light is off when the Freedom SW 2000 is in charge mode. Indicator light is off when the Freedom SW 2000 has been manually transitioned to OFF Mode.

Item	User Interface Item	Operation and/or Description
4	Charge Mode Indicator LED	Indicator light is illuminated orange when the Freedom SW 2000 is in the bulk stage of charge mode. Indicator light is flashing orange when the Freedom SW 2000 is in the absorption stage of charge mode. Indicator light is illuminated green when the Freedom SW 2000 is in the float stage of charge mode or when the unit is in standby mode (in this case the display shows “---” instead of the current in Amps). Indicator light is illuminated red when the Freedom SW 2000 has entered an equalize cycle but is in the bulk or absorption stage of the cycle. Indicator light is flashing red when the Freedom SW 2000 has entered an equalize cycle and is currently equalizing the batteries. Indicator light is off when the Freedom SW 2000 is in invert mode. Indicator light is off when the Freedom SW 2000 has been manually transitioned to OFF Mode.
5	Equalize Mode Pin-Hole Switch	Press for at least 5 seconds, using a paper clip, to transition the Freedom SW 2000 into equalize mode (see “Equalize Charging” on page 16). During equalize mode press for at least 5 seconds, using a paper clip, to cancel equalization.
6	Battery Level Switch	Press to show the current battery level in % on the display screen.
7	Battery Level Indicator LED	Indicator light is illuminated when the battery level switch is being pressed.
8	Fault Indicator LED	Indicator light flashes red when the Freedom SW 2000 has entered a warning condition. Indicator light is illuminated red when the Freedom SW 2000 has entered a fault condition.
Not shown	Audible Alarm	Beeps when any of the front panel switches are pressed. Beeps when the battery temperature sensor is plugged in. Beeps at 1 second intervals in the event of a warning Beeps continuously in the event of a fault (press ON/STANDBY switch to clear the fault and stop the audible alarm).

Service Control Interface

There are several service controls on the inverter's front panel that provide adjustments for the battery charger to accommodate battery type and size, AC input stability and energy saving preferences. These controls are intended for service users only and should be set once during initial setup.

The service controls may be modified to suit the specific configuration.

See Figure 4 on page 8 for an illustration of the Service Control Interface.

Item	Service Control Interface Item	Operation and/or Description
9	Low Battery Cutoff Selector	Move the two-position slide switch to set either High or Low. Choose the High setting for disconnecting DC voltage at 11.8 V. Choose the Low setting for disconnecting DC voltage at 10.5 V. See "Low Battery Cutoff" on page 13.
10	Battery Type Selector	Move the two-position slide switch to set either flooded batteries or gel/AGM batteries. See caution note below. During equalize mode, move the switch briefly to gel/AGM and back to Flooded to cancel the equalization.
11	Search Mode Control	Use a small jeweller's style flat-head screwdriver to adjust the current threshold required to bring the inverter out of search mode into full inverter operation. With search mode enabled, the inverter minimizes energy consumption by pulsing the AC output looking for an applied load, rather than remaining at full inverter operation when there is no load. Disabling the threshold by setting the potentiometer fully counter-clockwise to the OFF setting causes the inverter to remain on (in full power operation) even when there is no applied load.

Item	Service Control Interface Item	Operation and/or Description															
12	Battery Bank Capacity Selector /Charge Current Control	Use a small jeweller's style flat-head screwdriver to adjust the potentiometer to match the Ah of your battery bank. The setting allows the inverter to calculate the over-discharge protection values and also the transition criteria between Bulk, Absorption and Float stages of charge mode. The potentiometer should be adjusted as close as possible to the actual capacity of the battery bank for optimum charging. If your bank is greater than 1000 Ah, then set the potentiometer to 1000 Ah. When set at 200 Ah or above, the charge current control is automatically at maximum. For settings between 30 Ah and 200 Ah, the charge current is linearly determined between 14% and 100% of the maximum charge rate. NOTE: If using dual inverters configurations, set each charger for half the value. CAUTION RISK OF EQUIPMENT DAMAGE Do not use batteries requiring different charging voltages with the Freedom SW 2000. See table below and cross-reference the information provided by the battery manufacturer. Failure to follow these instructions can damage the unit and/or damage other equipment. <table><tr><th>Profile</th><th>Description</th><th>Bulk/Absorption</th><th>Equalize</th><th>Float</th></tr><tr><td>Flooded</td><td>Flooded lead acid</td><td>14.6 V</td><td>16 V</td><td>13.4 V</td></tr><tr><td>Sealed</td><td>Gel/AGM lead acid</td><td>14.1 V</td><td>N/A</td><td>13.5 V</td></tr></table>	Profile	Description	Bulk/Absorption	Equalize	Float	Flooded	Flooded lead acid	14.6 V	16 V	13.4 V	Sealed	Gel/AGM lead acid	14.1 V	N/A	13.5 V
Profile	Description	Bulk/Absorption	Equalize	Float													
Flooded	Flooded lead acid	14.6 V	16 V	13.4 V													
Sealed	Gel/AGM lead acid	14.1 V	N/A	13.5 V													

Low Battery Cutoff

Low battery cutoff (LBCO) protection shuts down the inverter at a specified voltage (see setpoints below) to protect the batteries from over discharge damage. LBCO is automatically enabled on the Freedom SW 2000 unit, when they are turned on and operating in invert mode.

The two setpoints are: 11.8 V for High and 10.5 V for Low.

When the battery terminal voltage falls below the selected voltage setpoint, a low battery warning (*FBB*) is triggered and displayed on the front panel with a beeping alarm. If this warning persists for more than 60 seconds, the LBCO protection is triggered and the inverter turns-off the output. If the battery voltage recovers above the LBCO setpoint, the warning clears by itself. The user may be able to arbitrarily clear this warning by reducing the connected load on the output of the inverter.

Setting the Search Mode Threshold

To set the Search Mode Watts:

1. Remove the AC input source from the inverter. The inverter switches to battery operation. Ensure all inverter supported appliances are switched OFF.
2. Turn the potentiometer completely clockwise (to MAX).
3. Switch on the load which will trigger the inverter to full power. This could be a lamp located in a convenient location if the power goes out. The light may flicker as the inverter searches the line for a load. The invert mode indicator light blinks 2-3 times a second, indicating the inverter is in Search Mode.

4. Slowly turn the potentiometer counter-clockwise (toward Off) when the proper setting is found, the lamp and the invert mode indicator light will illuminate.
5. Turn the lamp OFF for a moment. The inverter should switch back to Search Mode. Turn the lamp ON. Ensure the inverter comes out of Search Mode. Adjust the potentiometer up or down as necessary.

IMPORTANT: The Search Mode only activates when the unit is operating in invert mode (from batteries) to prevent unnecessary battery discharge when electrical power is not required. If the inverter is supporting loads that must constantly be powered, turn the search mode off by setting the potentiometer fully counter-clockwise to the OFF position.

IMPORTANT: Some loads constantly draw power even though they are switched OFF, such as TVs with instant-ON circuits, microwaves with digital displays, and VCRs. It is best to operate these devices from another circuit, install a switch to turn these OFF completely or do not use the Search Mode.

Remote Control

Freedom SW 2000 is designed to operate with a remote control unit. The remote control unit incorporates a membrane switch with a single green indicator light display combination to start and stop the inverter, and provides overall system operating status.

The remote control must be connected prior to switching the inverter ON; otherwise, the micro-controller will not recognize (or respond to) the remote. If the remote is not recognized, switch the inverter to STANDBY and then ON using the inverter's front panel ON/STANDBY switch.

Start-up

Once the inverter is properly connected to the batteries, AC input source, and loads (using a sub-panel) the inverter is ready for operation. Recheck the controls and ensure they are in the proper position. Recheck all wiring and ensure it is correct.

Starting the inverter:

1. Apply DC power to the inverter by switching on the DC disconnect circuit breaker and then pressing the ON/STANDBY switch once. The inverter will go through a self-test.
 - each of the indicator lights will flash in sequence
 - the cooling fan will turn on momentarily
 - the transfer relay will switch
 - the temperature sensors will be checked for open or short circuit
2. After the self-test the unit will start inverting.
3. Apply AC power to the inverter.
4. The inverter starts charging the batteries in the Bulk mode, indicated by the Charge Mode indicator light illuminating orange. It takes about 15 seconds for the unit to transition from invert mode to charge mode after the application of qualified AC.
5. Using a true RMS AC voltmeter, check the output voltage of the inverter. This voltage can be checked at either the AC terminal block or in the sub-panel (between the line and neutral). The voltage should be approximately 120 volts AC.

6. Switch the AC input disconnect circuit breaker to OFF. The inverter will go into invert mode (if a sufficient load is applied to the AC output while in the search mode). The Invert Mode indicator light will illuminate indicating the inverter is active. The voltage on the AC output of the inverter will be approximately 120 volts AC.
7. Reapply the AC power by switching the AC input disconnect to ON. Allow the batteries to fully recharge.

IMPORTANT: The unit will not use inverter (or battery) power for AC output as long as AC input (utility or generator) is available to the inverter.

Charge Mode

Three-Stage Charging

The three-stage charging mode employs the following sequence to maintain batteries: **Bulk, Absorption, and Float**.

Whenever nominal AC is present at the inverter's input the unit passes input power through to the connected load and begins charging the batteries, indicated by the Charge Mode indicator light.

Bulk Charge

Bulk charge is the first stage in the charging process and provides the batteries with a controlled, constant current. The Charge Mode indicator light is illuminated orange. Once the battery voltage rises to the bulk voltage threshold, the charger then switches to the absorption mode.

Absorption Charge

Absorption charge is the second stage of battery charging and provides the batteries a controlled, constant voltage. The Charge Mode indicator light is flashing orange.

During this stage the current supplied to the batteries slowly decreases. When the current equals the programmed return amps value (5% of the battery capacity setting) set with the Battery Bank Capacity potentiometer, the charger switches to the third stage—float.

IMPORTANT: If there are DC loads connected to the battery, the current may never decrease to the level to initiate the float stage. The inverter/

charger incorporates a timer circuit which starts counting when AC voltage is applied. The length of time is variable based on the amp-hours of the battery bank connected. To ensure that the charger does not stay indefinitely in the absorption charge mode, the timer automatically switches to the float charge mode after one to several hours according to this general formula: (amp-hours ÷ 200 amps) yielding **X** hours ± 5 minutes.

For example:

Amp-hour Range (Ah)	Time (in hours)
30 to 200	1
201 to 400	2
401 to 600	3

Float Charge

Float charge, the final stage of battery charging, maintains a charge to the batteries for seven days as long as AC is present on the inverter's input. Float charging reduces battery gassing, minimizes watering requirements (for flooded batteries) and ensures the batteries are in a constant state of readiness. The Charge Mode indicator light is illuminated green.

After remaining in float charge stage for seven days, the Freedom SW 2000 will restart the bulk charge stage.

OFF Mode

You can manually transition the Freedom SW 2000 to OFF while in Invert Mode by pressing the ON/STANDBY switch once. In OFF Mode, no indicator lights are illuminated and the display screen shows blank.

Once in OFF Mode, if qualified AC power becomes available then the unit automatically starts charging. However, when AC becomes unavailable, the unit will not transition to Invert Mode until the ON/STANDBY switch is pressed once.

Equalize Charging

Equalize charging is a special mode of battery charging. During use, the battery's cells can become unequal in the voltage and current they can deliver, which effects the run time. Equalizing stirs up the electrolyte, distributing the acid, and removing the sulfate from the plates. Equalizing the batteries every month or two (depending on usage) prolongs the life of the batteries and provides better battery performance.

The Freedom SW 2000 will enter a Bulk and Absorption cycle first, before transitioning to Equalize Mode. When the Freedom SW 2000 transitions to equalize mode, it has up to one hour to reach an equalize voltage of 16.0 VDC. The charging current is determined by the battery Ah set-point as described on page 12. After reaching the equalize voltage, the equalize cycle will continue for another one hour equalizing batteries at a constant voltage of 16.0 VDC. The Charge Mode indicator light is illuminated solid red during Bulk and Absorption of an equalize cycle and is flashing red during Equalize Mode.

If the batteries are successfully equalized, the Freedom SW 2000 will switch to Float Mode and continue with normal operation.

If the equalize voltage set-point (16.0 VDC) is not reached within an hour after transitioning to Equalize Mode, the Freedom SW 2000 will switch to Float Mode and continue with normal operation while displaying the Failed to Equalize Warning (F 14). This code is only a warning that never transitions into a fault mode. It is active until it is cleared by pressing the ON/STANDBY switch once. If the Freedom SW 2000 fails to equalize the batteries, try another Equalize Cycle and if it fails to equalize again check and replace your batteries as needed.

DANGER

EXPLOSION HAZARD

- Do not equalize Gel/AGM batteries. Equalize only flooded, unsealed or vented batteries.
- Provide adequate ventilation and remove all sources of ignition when equalizing.

Failure to follow these instructions will result in death or serious injury.

CAUTION

RISK OF DC-CONNECTED EQUIPMENT DAMAGE

Remove DC loads while equalizing to prevent high battery voltage from damaging connected DC appliances and other equipment.

Failure to follow these instructions can damage the unit and/or damage other equipment.

To transition the Freedom SW 2000 to Equalize Mode:

1. Remove all DC loads connected to the batteries.
2. Ensure the Battery Type Selector switch is set to flooded (see Figure 4 on page 8 for reference).
3. Remove all battery vent caps.
4. Check the battery water level, it should be just over the top of the plates (do not overfill). Use only distilled water for filling batteries.

IMPORTANT: Recheck the water level after equalize charging and refill if necessary.

5. Press the Equalize Mode pin-hole type switch for at least 5 seconds, using a paper clip or something similar, to put the Freedom SW 2000 into equalize mode.

If another equalize cycle is required after equalization has finished, press the Equalize Mode switch again for 5 seconds.

IMPORTANT: See the Xantrex website for the Application Note titled “Battery Banks for Inverter Systems” for additional information on battery care and maintenance.

To cancel Equalize Mode:

- Press the Equalize Mode pin-hole type switch for at least 5 seconds, using a paper clip or something similar.
or
- Move the Battery Type Selector Switch briefly to gel/AGM and then back to flooded.

Troubleshooting

Table 1-1 shows the possible error codes on the display screen and the description of the fault or warning.

Table 1-2 provides a list of possible error conditions that may occur, their possible causes, and possible solutions to resolve the error condition.

When the Freedom SW 2000 is in Warning status, the Fault LED is flashing red, the audible alarm is beeping at one second intervals and the display is alternately showing the error code and the power or current (depending on Invert or Charge mode of the inverter).

When the Freedom SW 2000 is in Fault status, the Fault LED is solid red, the audible alarm is beeping continuously and the display is continuously showing the error code.

If the reason for the error is corrected while the Freedom SW 2000 is still in Warning status, not Fault status, then the unit will automatically clear the warning and restart. If the error has progressed to Fault status then the unit will shut down and will have to be manually restarted.

To clear a fault and restart the unit:

1. Press the ON/STANDBY switch once to clear the error.
2. Press the ON/STANDBY switch again to manually turn the Freedom SW 2000 ON.

Possible Error Codes

Table 1-1 Error Codes

Error Code	Fault or Warning	Description	Solution
<i>F01</i>	Fault	Fan or fans are locked or disconnected.	This is a mechanical blockage of the fan/s. Ensure the Freedom SW 2000 is fully OFF. Carefully inspect for foreign objects lodged in the fan/s and remove as necessary. Manually restart the unit. If condition persists, contact your authorized service centre.
<i>F02</i>	Warning	The Freedom SW 2000 is over heating. Unit is still functioning, but if the over heating is not corrected in 40 seconds the warning will become a fault.	Allow the Freedom SW 2000 to cool. Improve ventilation around the unit or install in a cooler location.
<i>F02</i>	Fault	The <i>F02</i> warning has persisted until it has become a fault. The Freedom SW 2000 has stopped inverting or charging and is waiting to cool down before automatically restarting.	Allow the Freedom SW 2000 to cool. Improve ventilation around the unit or install in a cooler location.

Table 1-1 Error Codes

Error Code	Fault or Warning	Description	Solution
F03	Warning	The Freedom SW 2000 has not detected a battery temperature sensor during startup test. After five seconds, this warning will automatically clear. The battery temperature sensor connected to the Freedom SW 2000 has an error. Normal inverting and charging is not affected by this warning. The Freedom SW 2000 will continue the charge cycle using the last known temperature reading, then it will continue at the default temperature of 25 °C (77 °F).	Either connect a battery temperature sensor, or be aware of the impact of not using one. Press the ON/STANDBY switch once to clear fault. Check the battery temperature sensor connections and replace the battery temperature sensor if necessary.
F03	Fault	The battery temperature sensor connected to the Freedom SW 2000 has detected a temperature outside of the safe operating temperature of -20 °C and 60 °C (-4 °F and 140 °F).	Freedom SW 2000 has shut down for safety reasons. Check the batteries and adjust location/ventilation of the batteries. Manually restart unit.
F04	Fault	Freedom SW 2000 AC transfer relay has failed .	Freedom SW 2000 has shut down for safety reasons. Manually restart the unit. If condition persists, contact Xantrex for service.
F05	Warning	The electrical devices connected to the AC output of the Freedom SW 2000 have exceeded the power rating of the unit (overload). Either there are too many devices or a device has too much power consumption. Unit is still functioning, but if the over load does not self-correct in ten seconds the warning will become a fault.	No action required, warning is in place to prevent shutdown in the event of a quick, self-corrected power surge.

Table 1-1 Error Codes

Error Code	Fault or Warning	Description	Solution
<i>F05</i>	Fault	The <i>F05</i> Warning has persisted until it has become a fault. The electrical devices connected to the AC output of the Freedom SW 2000 have exceeded the power rating of the unit (overload). Either there are too many devices or a device has too much power consumption.	Check the power rating of connected electrical devices. Remove electrical devices until the combined power consumption is less than the power level of your Freedom SW 2000 (see the table on page iv). Manually restart unit.
<i>F06</i>	Warning	The Freedom SW 2000 has been short circuited at the AC output. Unit is still functioning, but if the short circuit does not self-correct within ten seconds the warning will become a fault.	No action required, warning is in place to prevent shutdown in the event of a quick, self-corrected short at the inverter output.
<i>F06</i>	Fault	The <i>F06</i> warning has persisted until it has become a fault.	Check connected loads for short circuits. This condition is also present in case of extreme overloading (i.e. when load requires more than 200% of the rated output current).
<i>F07</i>	Fault	The AC side of the Freedom SW 2000 is attempting to backfeed (AC backfeed error) to the AC grid as the result of another fault.	Freedom SW 2000 has shut down for safety reasons. Manually restart unit. If condition persists, contact Xantrex for service.
<i>F08</i>	Warning	At least one connected battery has dropped below the low battery cutoff (LBCO) threshold set. Unit is still functioning, but if the low battery does not self-correct within 60 seconds the warning will become a fault.	Charge batteries. Reduce AC load.
<i>F08</i>	Fault	The <i>F08</i> warning has persisted until it has become a fault. At least one connected battery has dropped below the LBCO threshold set.	Charge batteries.

Table 1-1 Error Codes

Error Code	Fault or Warning	Description	Solution
<i>F 10</i>	Warning	Input voltage from a connected battery (or a combination of batteries in the bank) is too high for the Freedom SW 2000 (battery voltage goes above 15.5 V for 12 V units, or above 31 V for 24 V units). Unit is still functioning, but if the high battery does not self-correct within five seconds the warning will become a fault.	No action required, warning is in place to prevent shutdown in the event of a quick, self-corrected power surge.
<i>F 10</i>	Fault	The <i>F 10</i> warning has persisted until it has become a fault. Input voltage from a connected battery (or a combination of batteries in the bank) is too high for the Freedom SW 2000 (battery voltage goes above 15.5 V for 12 V units, or above 31 V for 24 V units).	Measure the total equivalent battery voltage and replace or remove any that exceed the battery bank size requirements of your Freedom SW 2000 (see the table on page iv). Manually restart unit.
<i>F 11</i>	Warning	The AC output voltage has dropped below the AC output voltage set points. Unit is still functioning, but if the low voltage does not self-correct within 120 seconds the warning will become a fault.	Reduce AC load and verify battery input voltage. If adjustment of load level does not clear the warning, then no further action is required, warning is in place to prevent shutdown in the event of a quick, self-corrected issue.
<i>F 11</i>	Fault	The <i>F 11</i> Warning has persisted until it has become a fault.	Freedom SW 2000 has shut down for safety reasons. Manually restart unit. If condition persists, contact Xantrex for service.
<i>F 12</i>	Fault	At least one connected battery is bad (battery voltage has dropped below 8.5 V during charging).	Check all batteries and replace any faulty ones. Manually restart unit.

Table 1-1 Error Codes

Error Code	Fault or Warning	Description	Solution
<i>F 13</i>	Warning	The DC output voltage has risen above the DC output voltage set points. Unit is still functioning, but if the high voltage does not self-correct within 30 seconds the warning will become a fault.	No action required, warning is in place to prevent shutdown in the event of a quick, self-corrected issue.
<i>F 13</i>	Fault	The <i>F 13</i> Warning has persisted until it has become a fault.	Freedom SW 2000 has shut down for safety reasons. Manually restart unit. If condition persists, contact Xantrex for service.
<i>F 14</i>	Warning	At least one battery did not reach the target equalize set-point voltage (equalize incomplete) during the one hour equalization stage. Normal inverting and charging is not affected by this warning.	Press the ON/STANDBY switch once to clear the fault. Check batteries and replace if necessary.

Possible Error Conditions

Table 1-2 Troubleshooting the Freedom SW 2000

Error Condition	Possible Cause	Solution
Freedom SW 2000 will not turn on during initial power up.	Batteries are not connected, loose battery-side connections.	Check the batteries and cable connections.
No AC output voltage and no indicator lights ON.	Freedom SW 2000 has been manually transitioned to OFF mode.	Press the ON/STANDBY switch to transition back to Invert Mode (only DC power present) or Charge Mode (AC and DC power present).
AC output voltage is low and the inverter turns loads ON and OFF.	Low battery.	Check the condition of the batteries and recharge if possible. Replace the batteries.
AC loads are receiving low voltage.	Loose AC output connections.	Check all AC output connections.
Inverter is ON, but it is not powering any loads.	Inverter output breaker has tripped. Inverter has entered Search mode.	Reset the AC output breaker and power-cycle the unit. On the front panel, turn the knob counter-clockwise to minimum or adjust it to below the minimum load connected to the output.

Table 1-2 Troubleshooting the Freedom SW 2000

Error Condition	Possible Cause	Solution
Charger is inoperative and unit will not accept AC.	AC voltage has dropped out-of-tolerance	Check the AC voltage for proper voltage and frequency (depending on model). See “Specifications” on page 28.
	Loose AC input connections.	Check all AC output wiring connections.
	AC charge breaker is open.	Reset AC charge breaker (see “Freedom SW 2000 AC Side” on page 6 for location).
Charger is supplying a lower charge rate.	Charger controls are improperly set.	Refer to the section on adjusting the “Charger Rate”.
	Low AC input voltage (120 VAC RMS required for full charger output).	Repair or replace generator.
	Loose or corroded battery connections.	Check and clean all DC connections.
	Loose AC input connections.	Check all AC output wiring connections.

Table 1-2 Troubleshooting the Freedom SW 2000

Error Condition	Possible Cause	Solution
Charge mode indicator light: - indicates charging, but no charge is going to the batteries. - is ON, but loads are not receiving power.	AC input breaker on the side of the inverter is open. Open AC output breakers or fuses and AC wiring connections.	Reset AC input breaker (see “Freedom SW 2000 AC Side” on page 6 for location). If there is good AC voltage on inverter's AC output terminal block, then check for open AC output breakers or fuses and AC wiring connections.
Charger turns OFF while charging from a generator.	High AC input voltages from the generator.	Load the generator down with a heavy load. Turn the generator output voltage down.
Input breaker trips while charging.	The input circuit is overloaded.	Check that the amount of current drawn by both the charger ^a and connected AC pass-through loads from the generator/shore power does not exceed 30 amps. Reduce connected AC loads or reduce the battery Ah setting to limit the AC current draw.
Sensitive loads turn off temporarily when transferring between grid and inverting.	Inverter's 95 VAC transfer voltage may be too low to sustain certain loads. See Installation Guide (Document Part Number: 975-0527-01-01) and “Specifications” on page 28.	Unit cannot serve as an uninterruptible power supply. Install a UPS if possible.

a. Refer to Table 1-3, “Maximum Charger AC Current” on page 27 to determine the maximum AC current the charger can draw.

Table 1-3 Maximum Charger AC Current

Battery Ah (Ah)	Charging AC Input Current at 120 VAC Flooded/Gel (A) ^a
30	2.5
75	6.7
100	9.5
200 or more	16.0

a. approximate

Specifications

NOTE: Specifications are subject to change without prior notice.

Physical Specifications

Base Unit Dimensions and Weight:

L × W × H	385×340×200 mm (15.2×13.4×7.9 in.)
Net Weight	27 kg (59.5 lbs)

Environmental Specifications

Invert mode:Operating range	0 to 40 °C (32 to 104 °F) at full power. 40 to 60 °C (104 to 140 °F) at 80% derated power.
Charge mode: • Operating range • 50% derating	0 to 40 °C (32 to 104 °F) 40.5 to 50 °C (105 to 122 °F)
Storage	–55 to 75 °C (–67 to 167 °F)
Altitude: • Operating • Non-operating	4,572 m (15,000 feet) 15,240 m (50,000 feet)
Mounting	deck mount, wall mount with fans and DC/AC sides facing sideward

Electrical Specifications

AC Nominal Input Voltage (rms)	120 VAC
Maximum AC Input Voltage (rms)	140 VAC
AC Input Transfer Voltage range	95–135 VAC
Frequency: (± 0.04% Crystal controlled)	60 Hz nominal, 55–65 Hz operating range
Maximum AC Input Breaker rating	30 A
Nominal AC Input Current ^a Pass-through plus charging combined	24 A
AC Input Current at Max. Charge Rate ^b	16 A
Continuous Inverter Power (@ 40°C)	2000 W
Rated AC Output Current (Inverter mode)	17 A
Maximum Efficiency	92%
AC Output Voltage (rms)	120 VAC
Max. AC Output Overcurrent Protection (Inverter mode)	20 A

Electrical Specifications

Surge Capability/Maximum Output and Duration:	
Overload 10 sec Rating	4000 W
Short Circuit 10 sec Rating	80±8 Apk
DC Current at Rated Power	252 A
DC Input Voltage (nominal) ^c	12.6 VDC
DC Input Voltage Range	11.0—15.0 VDC
DC Charger Rate (Adjustable) ±6%	14 to 100 A
Power Factor while Charging	0.89
Tare Loss (with search mode enabled)	< 5 W
Voltage Regulation (max.)	104—127 VAC
Voltage Regulation (Typical)	108—125 VAC
Waveform	true sine wave
Load Power Factor (allowed)	0.8 to 1.0 (leading or lagging)

Electrical Specifications

Adjustable Load Sensing Range	5 watts minimum to 240 watts maximum
Force Air Cooling	Two variable speed fans

a. This is the minimum AC input current required, at nominal input voltage, to obtain full continuous rated pass-through and maximum battery charging while adhering to the 80% ampacity rule of North American electrical codes.

b. In bulk mode (at nominal input AC and nominal DC voltage).

c. Product may not meet voltage regulation specifications at other than "Input Nominal" at full-rated load.

Regulatory Approvals

Safety	CSA 107.1, UL 458 with marine supplement, ABYC E11 - Alternating Current and Direct Current Electrical Systems on Boats, and ABYC A31 - Battery Chargers and Inverters.
EMC	FCC Part 15B Class B, Ind. Canada ICES-0003 Class B

Warranty and Return Information

Warranty

What does this warranty cover and how long does it last? This Limited Warranty is provided by Xantrex Technology Inc. (“Xantrex”) and covers defects in workmanship and materials in your Freedom Sine Wave 2000 Inverter/Charger. This warranty period lasts for 24 months from the date of purchase at the point of sale to you, the original end user customer, unless otherwise agreed in writing (the “Warranty Period”). You will be required to demonstrate proof of purchase to make warranty claims.

This Limited Warranty is transferable to subsequent owners but only for the unexpired portion of the Warranty Period. Subsequent owners also require original proof of purchase as described in “What proof of purchase is required?”

What will Xantrex do? During the Warranty Period Xantrex will, at its option, repair the product (if economically feasible) 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,

Hawaii and outside of the United States and Canada are excluded. Contact Xantrex Customer Service for details on freight policy for return shipments from excluded areas.

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

Telephone: 1 800 670 0707 (toll free North America)
1 408 987 6030 (direct)

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

Email: customerservice@xantrex.com

Website: www.xantrex.com

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

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

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

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

What does this warranty not cover? Claims are limited to repair and replacement, or if in Xantrex's discretion that is not possible, reimbursement up to the purchase price paid for the product. Xantrex will be liable to you only for direct damages suffered by you and only up to a maximum amount equal to the purchase price of the product.

This Limited Warranty does not warrant uninterrupted or error-free operation of the product or 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 but not limited to 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) component parts or monitoring systems supplied by you or purchased by Xantrex at your direction for incorporation into the product;
- f) the product if its original identification (trade-mark, serial number) markings have been defaced, altered, or removed;
- g) the product if it is located outside of the country where it was purchased; and
- h) any consequential losses that are attributable to the product losing power whether by product malfunction, installation error or misuse.

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.

IN NO EVENT WILL XANTREX BE LIABLE FOR: (A) ANY SPECIAL, INDIRECT, INCIDENTAL OR CONSEQUENTIAL DAMAGES, INCLUDING LOST PROFITS, LOST REVENUES, FAILURE TO REALIZE EXPECTED SAVINGS, OR OTHER COMMERCIAL OR ECONOMIC LOSSES OF ANY KIND, EVEN IF XANTREX HAS BEEN ADVISED, OR HAD REASON TO KNOW, OF THE POSSIBILITY OF SUCH DAMAGE; (B) ANY LIABILITY ARISING IN TORT, WHETHER OR NOT ARISING OUT OF XANTREX'S NEGLIGENCE, AND ALL LOSSES OR DAMAGES TO ANY PROPERTY OR FOR ANY PERSONAL INJURY OR ECONOMIC LOSS OR DAMAGE CAUSED BY THE CONNECTION OF A PRODUCT TO ANY OTHER DEVICE OR SYSTEM; AND (C) ANY DAMAGE OR INJURY ARISING FROM OR AS A RESULT OF MISUSE OR ABUSE, OR THE INCORRECT INSTALLATION, INTEGRATION OR OPERATION OF THE PRODUCT BY PERSONS NOT AUTHORIZED BY XANTREX.

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, PROVINCES AND JURISDICTIONS 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, PROVINCE TO PROVINCE OR JURISDICTION TO JURISDICTION.

Return Material Authorization Policy

For those products that are not being repaired in the field and are being returned to Xantrex, 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 on page 34.

Return Procedure

Package the unit safely, preferably using the original box and packing materials. Please ensure that your product is shipped fully insured in the original packaging or equivalent. This warranty will not apply where the product is damaged due to improper packaging.

Include the following:

- The RMA number supplied by Xantrex Technology Inc. clearly marked on the outside of the box.
- A return address where the unit can be shipped. Post office boxes are not acceptable.
- A contact telephone number where you can be reached during work hours.
- A brief description of the problem.

Ship the unit prepaid to the address provided by your Xantrex customer service representative.

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

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

Out of Warranty Service

If the warranty period for your product 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 unit may be serviced or replaced for a flat fee.

To return your product 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 33.

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 Freedom Sine Wave 2000 Inverter/Charger package, record the following information and be sure to keep your proof of purchase.

- ☐ Serial Number _____
- ☐ Product Number 815-2000
- ☐ Purchased From _____
- ☐ Purchase Date _____

If you need to contact Customer Service, please record the following details before calling. This information will help our representatives give you better service.

- ☐ Type of installation (e.g. _____
RV, truck)
- ☐ Length of time inverter/
charger has been installed _____
- ☐ Battery/battery bank size _____
- ☐ Battery type (e.g. flooded, _____
sealed gel cell, AGM)

- ☐ DC wiring size and length _____
- ☐ Alarm sounding? _____
- ☐ Description of indicators
on front panel _____
- ☐ Appliances operating
when problem occurred _____
- ☐ Description of problem _____

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