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xantrex



Fleet Power 1000
Fleet Power 1000 W/AP
Fleet Power 1500
Fleet Power 2000
Fleet Power 2500

Owner's Manual

Fleet Power Inverter / Charger

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Smart choice for power

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Owner's Manual

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About This Manual

Purpose

The purpose of this Owner's Manual is to provide explanations and procedures for installing, operating, maintaining, and troubleshooting the Fleet Power Inverter / Charger.

Scope

The Manual provides safety guidelines, detailed planning and setup information, procedures for installing the inverter, as well as information about operating and 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 Manual is intended for anyone who needs to install and operate the Fleet Power Inverter / Charger. Installers should be certified technicians or electricians.

Organization

This Manual is organized into four chapters and one appendix.

Chapter 1, "Introduction", Chapter 1 contains information describing the features and functions of the Fleet Power Inverter / Charger.

Chapter 2, "Installation", Chapter 2 describes the installation procedures for the Fleet Power.

Chapter 3, "Operation", Chapter 3 contains information on the operation of the Fleet Power.

Chapter 4, "Troubleshooting", Chapter 4 describes possible problems and potential solutions.

Appendix A, "Specifications", Appendix A shows the specifications for all models of the Fleet Power.

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 unit or other equipment.

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

This manual includes information on four different models of the Fleet Power Inverter / Charger; the Fleet Power 1000 (which includes the Fleet Power 1000 W/AP), the Fleet Power 1500, the Fleet Power 2000, and the Fleet Power 2500. Unless specified, use of the name Fleet Power Inverter / Charger or Fleet Power should be taken to mean all four models.

Abbreviations, Definitions, and Acronyms

GFCI (Ground Fault Circuit Interrupter) A protective device that rapidly de-energizes a circuit when current to ground exceeds a predetermined value.

LED (Light Emitting Diode) Indicator light

Power Sharing The ability of the charger to reduce its output when the AC power being consumed by the charger and external AC loads connected to the output of the inverter are in excess of the input breaker rating.

Related Information

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

Important Safety Instructions



WARNING

This chapter contains important safety and operating instructions. Read and keep this Owner's Manual for future reference.



WARNING: Limitations on use

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



WARNING: Risk of electric shock

For continued protection against risk of electric shock, use only the ground-fault circuit interrupter (GFCI) type receptacles detailed in this Owner's Manual. Other types may fail to operate properly when connected to the inverter, resulting in a potential shock hazard.

-
1. Before installing and using the Fleet Power, read all instructions and cautionary markings on the Fleet Power, the batteries, and all appropriate sections of this guide.
 2. Do not expose the Fleet Power to rain, snow, spray, or bilge water. To reduce risk of fire hazard, do not cover or obstruct the ventilation openings. Do not install the Fleet Power in a zero-clearance compartment. Overheating may result.
 3. Use only attachments recommended or sold by the manufacturer. Doing otherwise may result in a risk of fire, electric shock, or injury to persons.
 4. 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 Fleet Power with damaged or substandard wiring.
 5. Do not operate the Fleet Power if it has received a sharp blow, been dropped, or otherwise damaged in any way. If the Fleet Power is damaged, see the Warranty section.
 6. Do not disassemble the Fleet Power. It contains no user-serviceable parts. See Warranty for instructions on obtaining service. Attempting to service the Fleet Power 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.

7. To reduce the risk of electrical shock, disconnect both AC and DC power from the Fleet Power before attempting any maintenance or cleaning or working on any circuits connected to the Fleet Power. Turning off controls will not reduce this risk.
8. The Fleet Power must be provided with an equipment-grounding conductor connected to the AC input ground.

Explosive gas precautions



WARNING: Explosion hazard

1. Working in the vicinity of batteries may be dangerous. Batteries can generate explosive gases during normal operation. Therefore, you must read this guide and follow the instructions exactly before installing or using your Fleet Power.
2. This equipment contains components which tend to produce arcs or sparks. To prevent fire or explosion, do not install the Fleet Power in compartments containing batteries or flammable materials, or in locations that require ignition-protected equipment. This includes any space containing gasoline-powered machinery, fuel tanks, as well as joints, fittings, or other connections between components of the fuel system.
3. 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.

Precautions When Working With Batteries



WARNING: Explosion or fire hazard

1. Follow all instructions published by the battery manufacturer and the manufacturer of the equipment in which the battery is installed.
2. Make sure the area around the battery is well ventilated.
3. Never smoke or allow a spark or flame near the engine or batteries.
4. Use 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.
5. Remove all metal items, like rings, bracelets, and watches when working with batteries. Batteries can produce a short circuit current high enough to weld metal to skin, causing a severe burn.
6. Have someone within range of your voice or close enough to come to your aid when you work near a battery.
7. Have plenty of fresh water and soap nearby in case battery acid contacts skin, clothing, or eyes.
8. Wear complete eye protection and clothing protection. Avoid touching your eyes while working near batteries.
9. 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.
10. If you need to remove a battery, always remove the ground terminal from the battery first. Make sure all accessories are off so you don't cause a spark.

Precautions for Using Rechargeable Appliances



CAUTION: Equipment damage

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

Some chargers for small rechargeable batteries can be damaged if connected to the Fleet Power. Do not use the following with the Fleet Power:

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

Important: if you are unsure about using your rechargeable appliance with the Fleet Power, contact the equipment manufacturer to find out if there are high voltages at the battery terminals or if the appliance incorporates the use of transformers.

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Introduction

Chapter 1 contains information describing the features and functions of the Fleet Power Inverter / Charger.

Description

The Fleet Power Inverter / Charger (Fleet Power) is a self-contained backup power system.

The Fleet Power can perform four distinct functions:

- Inverts DC power to AC power to run AC loads.
- Provides automatic transfer switching between inverter power and incoming AC power.
- Provides automatic 3-Stage battery charging, plus manual battery equalizing.
- Converts AC power to DC power to run DC loads.

Features

The features of the Fleet Power include the following:

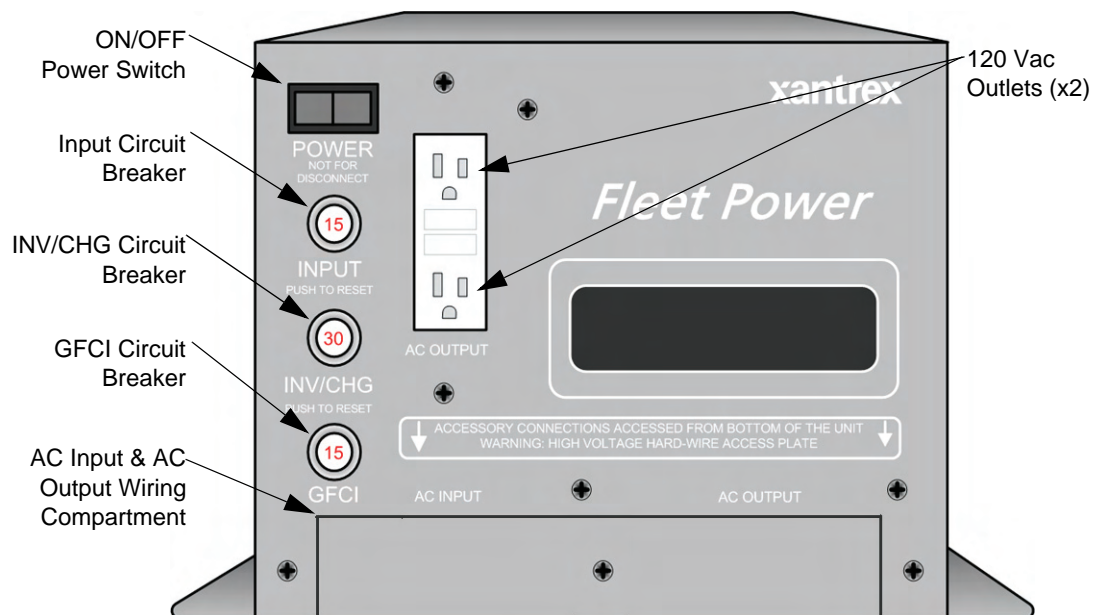


Figure 1-1 Fleet Power Front Panel Features
(Fleet Power 1500 shown)

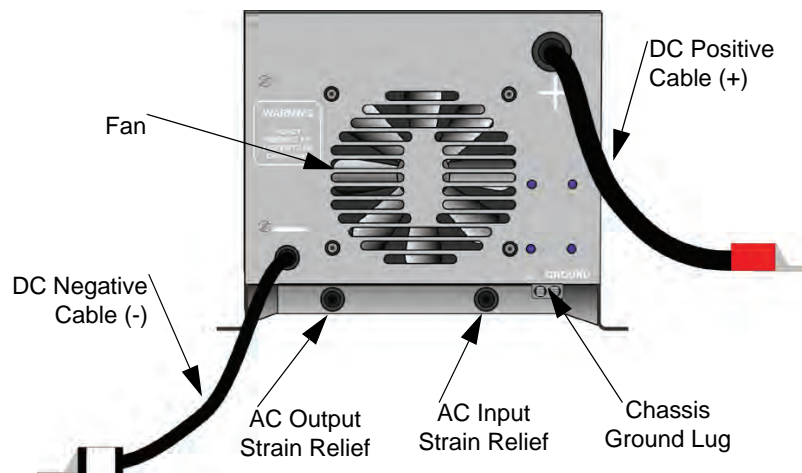


Figure 1-2 Fleet Power Rear Panel Features

Circuit Breaker Protection

External Circuit Breakers

Fleet Powers are circuit breaker protected. The size of the circuit breakers vary by model. Some circuit breakers are external and can be reset by pushing the button back in. The others are internal, non-user replaceable and will require that the fault condition that tripped them be resolved.

The Fleet Power 1000 has a 12 amp INV/CHG circuit breaker on the front of the unit that protects against sustained inverter overloads over 1440 watts and the AC input to the battery charger. The 15 amp circuit breaker on the unit protects the incoming AC circuit which is transferred through to the loads via the GFCI.

The Fleet Power 1500 has a 20 amp INV/CHG circuit breaker that protects against sustained inverter overloads over 2400 watts.

The Fleet Power 2000 has a 25 amp INV/CHG circuit breaker that protects against sustained inverter overloads over 3000 watts and the AC input to the battery charger.

The Fleet Power 2500 has a 30 amp INV/CHG circuit breaker on the unit that protects against sustained inverter over loads over 3600 watts. The 30 amp circuit breaker protects the incoming AC leg which feeds the battery charger.

Introduction

Internal Circuit Breakers The 30 amp INPUT circuit breaker (15 amp for Fleet Power 1000) on the units protect the incoming AC circuit which is transferred through to the loads connected by the hardwire output and feeds the battery charger.

 The 15 amp circuit breaker protects the GFCI outlet on the Fleet Power 1500, Fleet Power 2000 and Fleet Power 2500. When a circuit breaker trips, the circuit breaker is reset by pushing the button back in.

Table 1-1 Circuit Breaker Protection by Model

Model	INV/CHG Circuit Breaker Size	INPUT Circuit Breaker Size	GFCI Breaker Size	Overload Threshold
Fleet Power 1000 ^a	12 amp	15 amp	N/A	1440 watts
Fleet Power 1500	20 amp	30 amp	15 amp	2400 watts
Fleet Power 2000	25 amp	30 amp	15 amp	3000 watts
Fleet Power 2500	30 amp	30 amp	15 amp	3600 watts

a.Including Fleet Power 1000 W/AP

Electronic Protection

Fast acting electronic circuits protect the inverter from extreme overloads and short circuits. Other protection includes a low and high battery cutoff and automatic shutdown if over temperature occurs. The fault condition must be eliminated before reset will occur. Example: remove overload, recharge batteries or allow to cool. Reset by cycling the power switch OFF/ON.

Power Sharing

When connected to shorepower or using a generator, the battery charger and transfer functions are engaged. A unique power sharing feature automatically reduces the AC consumption of the battery charger allowing necessary AC power to the load. This prevents the circuit breaker from tripping. This feature can be adjusted using the remote control panel. This feature is set at the transfer rating of each unit by default.

Inverter Functions

Output The output is a modified sinewave and is compatible with appliances, tools and other 120 Vac equipment. Momentary surge power of three times the inverter rating is available for starting electric motors. High efficiency insures the longest possible battery life between recharges.

The inverter provides regulated 120-Volt AC power and crystal controlled frequency at 60Hz from a deep-cycle battery bank in specified watts:

Table 1-2 Inverter Output in Watts

Model Number	Output Watts
Fleet Power 1000 ^a	1000 watts
Fleet Power 1500	1500 watts
Fleet Power 2000	2000 watts
Fleet Power 2500	2500 watts

a.Including Fleet Power 1000 W/AP

Automatic Transfer Switch The 30 amp (15 amp on the Fleet Power) transfer switch allows the Fleet Power Inverter / Charger to be connected to an external AC source and transfer the source through to the loads. When disconnected, the transfer switch allows automatic switching back to the inverter.

DC Loads With an external AC source connected, the Fleet Power charger also serves the functions of a AC-to-DC converter (or DC Power Supply) to power any of the DC loads which are connected to the unit.

Charger Functions

Fleet Power battery chargers are electronically controlled and are rated as follows:

Table 1-3 Charger Output in Amps

Model Number	Output Amps
Fleet Power 1000 ^a	50 amps
Fleet Power 1500	75 amps
Fleet Power 2000	100 amps
Fleet Power 2500	130 amps

a.Including Fleet Power 1000 W/AP

They are designed to rapidly and optimally recharge either wet or gel cell deep-cycle batteries. These settings are adjustable using the optional remote.

Battery Charging

Battery charging is accomplished in three automatic stages:

- Bulk Charge,
- Acceptance Charge, and
- Float Charge.

In addition, using the remote control, a manually-engaged Equalizing Charge cycle is possible.

Remote Control

The optional Fleet Power Remote Control Panel provides a power switch, system status LEDs, DC Volts and DC Amps LED bargraphs. On the back of the remote is a set of dip switches which allow adjustment of the following:

- Manual Initiation of Equalize Charging
- Ambient Battery Temperature
- Battery Type
- Charger Mode (Auto or Controlled)
- Power Sharing

2

Installation

Chapter 2 describes the installation procedures for the Fleet Power.

Precautions

Ensure that you have read and understand the Warning and Cautions detailed in “Important Safety Instructions” on page v.



WARNING: Risk of electric shock

For continued protection against risk of electric shock, use only the ground fault circuit interrupter (GFCI) type receptacles detailed in this owner's manual. Other types may fail to operate properly when connected to this inverter, resulting in a potential shock hazard.



WARNING: Risk of electric shock

Both AC & DC voltage sources are terminated inside this equipment. Each circuit must be individually opened before servicing.



WARNING: Risk of electric shock

Ensure that the Power Switch is turned OFF before you begin any installation.



WARNING

Ensure all wiring conforms to local and national electrical codes. If in doubt, consult a qualified electrician.

Important:: The output of this device is not sinusoidal. It has a maximum total harmonic distortion of 47% and a maximum single harmonic of 34%.

Choosing a Location

The Fleet Power must only be installed in a location that is:

Dry	Do not allow water or other liquids to drop or splash on it.
Cool	While the unit will safely operate at ambient air temperatures between 14 °F and 140 °F (-10 °C and 60 °C)—the cooler the better within this range.
Ventilated	Allow at least 5 inches (12.5 cm) of clearance around the Fleet Power for air flow. Ensure that the ventilation openings are not obstructed.
Safe	Do not install the Fleet Power or panel in the same compartment as batteries or in any compartment capable of storing flammable liquids like gasoline.
Protected from battery gases	Do not mount the Fleet Power or panel where it will be exposed to gases produced by batteries. Battery gases are corrosive, and prolonged exposure to battery gases will damage them.

Mounting

You may mount the unit horizontally (on a shelf) or vertically (on a wall or bulkhead). If mounted vertically, you must orient the unit so the switch and the circuit breakers are facing up and the fan and battery cables are facing down.

Important: The connectors for the remote control and the chassis ground bonding lug, as well as for the AC wires, are located on the bottom of the unit. Be sure to make these connections before bolting the unit down.

Grounding

For safety purposes, the chassis of the inverter/charger must be connected to your AC ground system. The chassis ground bonding lug is located on the bottom of the unit, see Figure 1-2, “Fleet Power Rear Panel Features” on page 1–3. This connector can accept two wires; the first is used to connect the unit to AC ground, the second can be used to connect other AC equipment to ground.

Important: The connectors for the chassis ground bonding lug, as well as for the AC wires, are located on the bottom of the unit. Be sure to make these connections before bolting the unit down.

To connect the chassis of the unit to AC ground:

1. Use bare copper insulated wire, solid or stranded.
2. Use green insulated wire (8 AWG for Fleet Power 1000 and 6 AWG for Fleet Power 1500, Fleet Power 1500, and Fleet Power 2000).
3. Strip one end and use a screwdriver to secure it to the chassis ground bonding lug on the rear of the Fleet Power.
4. Connect the wire to the ground in your AC electrical system, typically the vehicle chassis.
5. Make sure the connection is clean and tight.
6. Connect the AC input and AC output green wires to the chassis ground bonding lug on the rear of the Fleet Power.
It is important to connect these wires to the AC ground bus in the circuit breaker panel.

Important: The battery cables are not connected to ground or the chassis of the unit.

Neutral Bonding

For safety purposes, the Fleet Power inverter/charger unit internally bonds the AC output neutral to the AC ground when the unit is OFF or in the inverter mode. When incoming AC power is applied and the transfer switch is engaged, the internal neutral-to-ground bond is automatically lifted.

This means that when the vehicle is connected to shore power, the grounding system is connected to the shore power ground, where neutral and earth ground are bonded together. This technique insures safety in all conditions and conforms to the requirements of the NEC.

AC Wiring

Refer to Figure 1-1 on page 1-2 and Figure 1-2 on page 1-3 for AC wiring locations.



CAUTION

Do not back-feed the AC output of the inverter with incoming AC power. A back-feed occurs when AC power from shore power or generator is connected to the output of the inverter. This will damage the inverter and void the warranty. Remember that incoming AC must be fed only to the AC input and never to the AC output. Always check for AC voltage before connecting wires to the AC output. Do NOT turn the inverter ON until all AC connections have been made. Back-feeding the inverter voids the warranty.



CAUTION

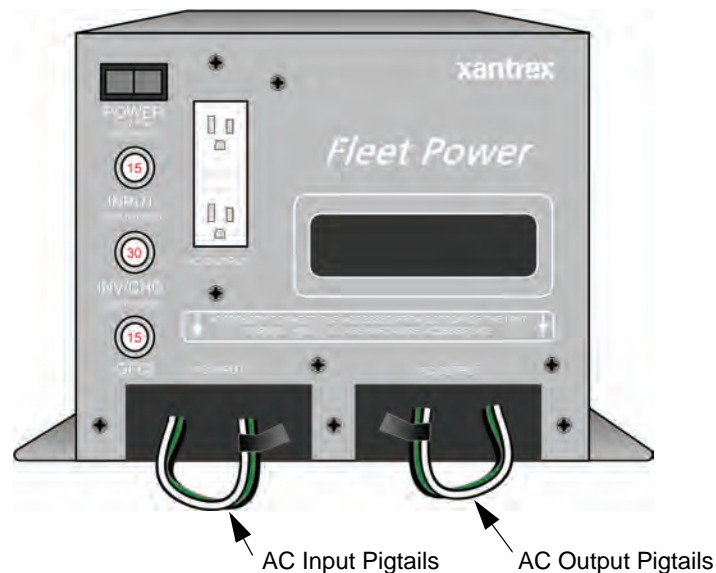
Do not connect the AC input to the AC output. In effect, this would be plugging the battery charger into the inverter. This could occur if the unit is connected to the entire leg of a circuit breaker panel, then a circuit breaker on that leg is used to feed the battery charger. This will cause the unit to oscillate ON and OFF when the unit is in inverter mode.

Important: The Fleet Power 1000 W/AP has AC output available at the front panel GFCI, not at the AC output compartment. The AC output compartment is a blank compartment.

To connect the AC wiring:

1. Use a screwdriver to remove the screws which secure the AC wiring compartment cover plate.
The compartment is divided into 2 sections; one labeled AC Input, one labeled AC Output.
Each side contains 3 pigtails (black, white and green) and six wire nut connectors.

Black	Hot or Line
White	Neutral
Green	Ground

**Figure 2-1** AC Wiring Compartment

2. Route the AC wires through the strain reliefs in the bottom of the unit, see Figure 1-2, "Fleet Power Rear Panel Features" on page 1-3.

Important: Conventional metal strain reliefs are provided. These can be replaced by plastic strain reliefs for additional corrosion resistance or 3/4 inch conduit fittings if the wiring will be routed through the conduit.
Use proper wire sizes according to the NEC.

3. When you have completed the AC Input and AC Output wiring (procedures below), carefully tuck the wires into the AC wiring compartment.
4. Replace the AC wiring compartment cover plate.

AC Input

To connect the AC input:

1. Feed the 3 conductor AC input wire through the strain relief (see Figure 1-2 on page 1–3) and into the AC input compartment. You should have 6 inches of individually insulated black, white and green wire.
2. Strip 1/2 inch of insulation off each conductor.
3. Connect the wires to the pigtails in the AC wiring compartment (see Figure 2-1 on page 2–5), black to black, white to white and green to green.

AC Output

The AC output for the Fleet Power, is available at both the GFCI outlet and at the AC output compartment.

To install the AC output:

1. Feed the 3 conductor AC output wire through the strain relief (see Figure 1-2 on page 1–3) and into the AC output compartment.
2. Strip 1/2 inch of insulation off each conductor.
3. Connect the wires to the pigtails in the AC wiring compartment (see Figure 2-1 on page 2–5), black to black, white to white and green to green.
4. Tug firmly on each connection to make sure they are secure. Check these connections first if the unit is not operating properly.

Important: If you are not connecting the hardwire output wires, make certain they can not cause a short circuit to the wiring compartment



CAUTION

Do not connect incoming AC from any source to the AC output of the unit. This is known as back-feeding and will damage the unit and void the warranty.

Routing the remote cable away from AC and DC wires will minimize the potential for interference which may affect the LED bargraphs.

The remote control cable can be extended up to 50 feet if required. Use standard 4 or 6 conductor telephone cable. Use a single length cable with no connectors or in-line splices. If phone cable is left over, coil it up and store it in an area away from AC equipment to prevent electrical interference.

DC Wiring

If you have a Fleet Power W/AP unit, refer to “Fleet Power 1000 W/AP DC Wiring” on page 2–9 for the wiring instructions.



WARNING: Shock hazard

Always use proper wire and connectors. The proper battery cable size is critical because considerable amperage flows in the DC circuit. Fusing the positive DC cable is required. The AC wire size is dependant on potential current in the circuit. Consult the NEC (National Electric Code) for proper wire gauge.



CAUTION

If installing in a system which includes an existing battery charger or converter, make sure these do not operate from the inverter output AC power. This sets up a power loop which, due to inefficiencies, will quickly drain the batteries.



CAUTION

To meet electrical codes, a fuse must be installed in the positive battery cable within 18 inches of the battery post. This fuse is intended to protect the battery and cables against a dead short circuit. The inverter is protected internally and will not blow a properly sized fuse.



CAUTION

Fleet Power inverter/chargers are not protected against DC reverse polarity. Be very careful to connect the negative and positive cable correctly or damage will result and the warranty will be void.

Important: Keep the overall length of each battery cable less than 10 feet. If needed, attach short extension cables. Do not use frame ground or a ground bonding system as a current carrying conductor. Run the negative cable directly to the battery bank. If the positive and negative cables run parallel to each other, twist the cables together. This will minimize the adverse effects of inductance.

Important: DC wiring is generally very simple, the positive and negative cables from the inverter/charger are connected to the house or auxiliary battery. In the case of multiple batteries the interconnecting jumper cables must be of the same AWG as those supplied with the inverter/charger.

Important: If multiple battery banks are to be charged, a battery selector switch can be installed, allowing the banks to be charged either individually or simultaneously. A solenoid can also be used.

Two battery cables are provided with the unit. Both are black, the positive cable has a piece of red heat shrink insulation on the end. High current will pass through the DC wiring. All wires must be properly sized and all connections clean and tight.

It is recommended that the battery cables not be lengthened, however, it is possible to extend the cables if necessary. Extension cables must be 00 AWG or the same type of wire supplied with the unit, and the total length for each battery cable must not exceed 10 feet.

Make sure the connections to the extension cables are tight and properly insulated. Do not attempt to open the case and replace battery cables.

See Figure 1-2, "Fleet Power Rear Panel Features" on page 1–3.

To connect the DC wiring:

1. Connect the negative cable directly to the negative post of the battery bank or the ground side of a current shunt.
Do not use the vehicle frame as the negative conductor.
2. Tighten the negative cable securely.
3. Fuse and connect the positive battery cable to the positive post of the battery bank, or through a selector switch to one or more battery banks.
4. A spark may be generated when the final battery connection is made. This is normal and do not be alarmed, however, do not make the final connection in the presence of flammable fumes.

Fleet Power 1000 W/AP DC Wiring

The Fleet Power 1000 W/AP is specially fitted with an Anderson Plug on the ends of the DC cables. Observe correct polarity when attaching the plug to your fixture.

Remote Control Wiring

The remote control is supplied with a 25 or 50 foot section of telephone cable for connection to the unit. Plug one end of the cable into the remote connector on the bottom of the unit labeled remote and the other end into the connector on the back of the remote control panel.

Battery Cable Fusing

A fuse is required by the NEC to protect the battery and cables. The fuse must be installed in the positive battery cable, within 18 inches of the battery.

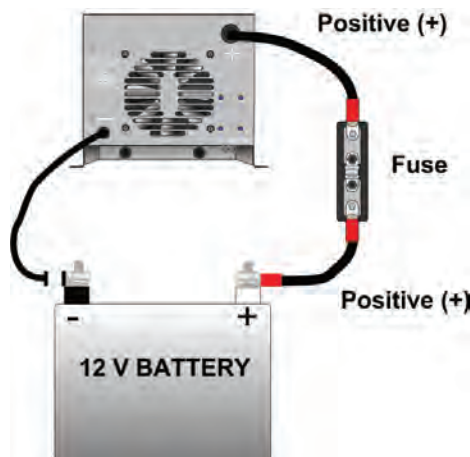


Figure 2-2 Battery Fuse

Recommended Fuse: Littlefuse Class T JLLN

This fuse with fuse holder is available from your dealer.

For Fleet Power 1000 and Fleet Power 1500:

200 amp Fuse & Holder PN# TF200

200 amp Fuse Only PN# TFB200

For Fleet Power 2000 and Fleet Power 2500:

300 amp Fuse & Holder PN# TF300

300 amp Fuse Only PN# TFB300

Ground Fault Circuit Interrupters

In order to conform to the NEC, certain branch circuits must be equipped with a Ground Fault Circuit Interrupter (GFCI). Please consult the code or a qualified electrician for details. Any such branch circuit must be protected by a circuit breaker consistent with the GFCI rating.

Underwriters Laboratories has tested the following GFCI, and its use is recommended. Receptacle Type:

Hubbell

Catalog Number GFR5252WA

Rated: 15 amps at 120 Volts AC

Fleet Power inverter/ chargers provide an integral GFCI outlet which is protected by a circuit breaker. This GFCI outlet does not protect the hardwire AC output. The hardwire AC output is protected by a non-GFCI circuit breaker on the Fleet Power. The first outlet from the hardwire output should be GFCI protected to comply with applicable codes and standards.

The GFCI Receptacle is designed to protect from line-to-ground shock hazards which could occur from defective power tools or appliances operating from this device. It does not prevent line-to-ground electric shock, but does limit the time of exposure to a period considered safe for a normally healthy person. It does not protect persons against line-to-line, or line-to neutral faults.



WARNING: Shock hazard

Persons with heart problems or other conditions which make them susceptible to electric shock may still be injured by ground faults on circuits protected by the GFCI Receptacle. No safety devices yet designed will protect against all hazards or carelessly handled or misused electrical equipment or wiring.

The GFCI Receptacle does not protect against short circuits or overloads. This is the function of the circuit breaker.



WARNING: Shock hazard

Any line-to-ground fault condition indicated by a tripped GFCI must be corrected. Grounded fault conditions are dangerous to personnel and property. Should you identify conditions not described in these instructions, contact a qualified electrician.

Power Failure

In the event of power failure which has not affected the breaker:

1. Unplug all cord connected appliances and tools from the GFCI receptacle
 2. Restore power by pressing in the RESET button on the GFCI receptacle.
 3. To test, press the TEST button.
The RESET button will pop out indicating that power is off at the GFCI protected outlets.
 4. Push the RESET back in and reconnect the appliances one at a time. A defective appliance which trips the GFCI should be repaired at once.
 5. If the RESET button will not stay in after all appliances have been disconnected from the circuit, the GFCI outlet has failed.
 6. If the RESET button does not pop out when the TEST button is pressed, protection is lost. Do not use.
-



WARNING: Shock hazard

For maximum protection against electrical shock hazard, test your ground fault circuit interrupter at least once a month.

To test the GFCI:

1. Push TEST button.
The RESET button will pop out.
Power is now ON or shore power is ON indicating that the device is functioning properly.
2. If RESET does not pop out when testing, do not use this circuit.
Protection is lost.
3. To restore power, push the RESET button.

Installation Options

Option 1: 15, 20 or 30 Amp Shore Power, Inverter Runs Entire Panel

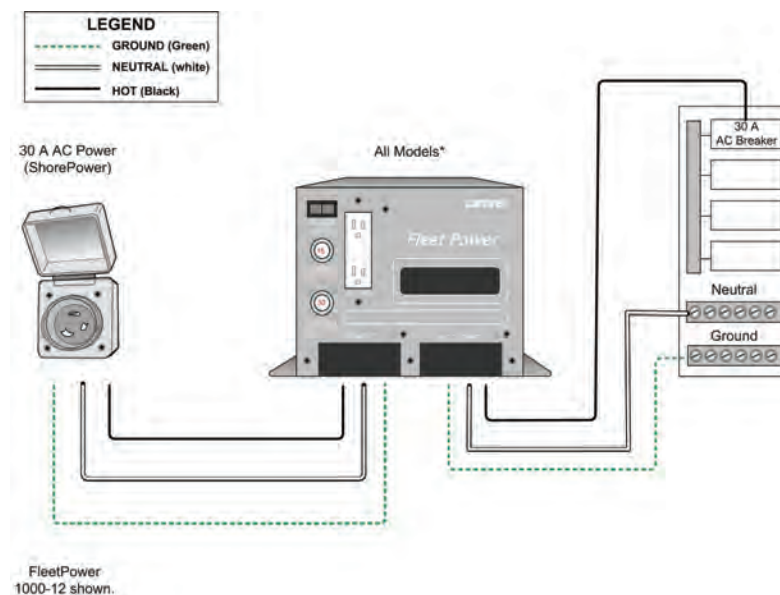
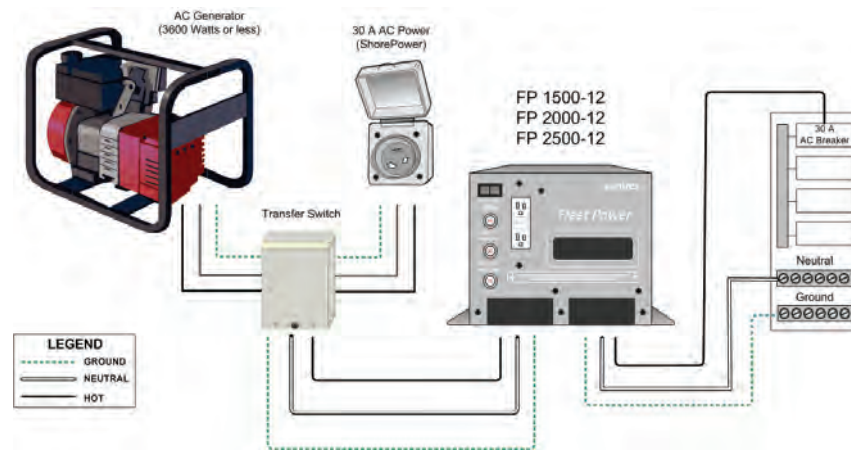


Figure 2-3 Installation Option 1

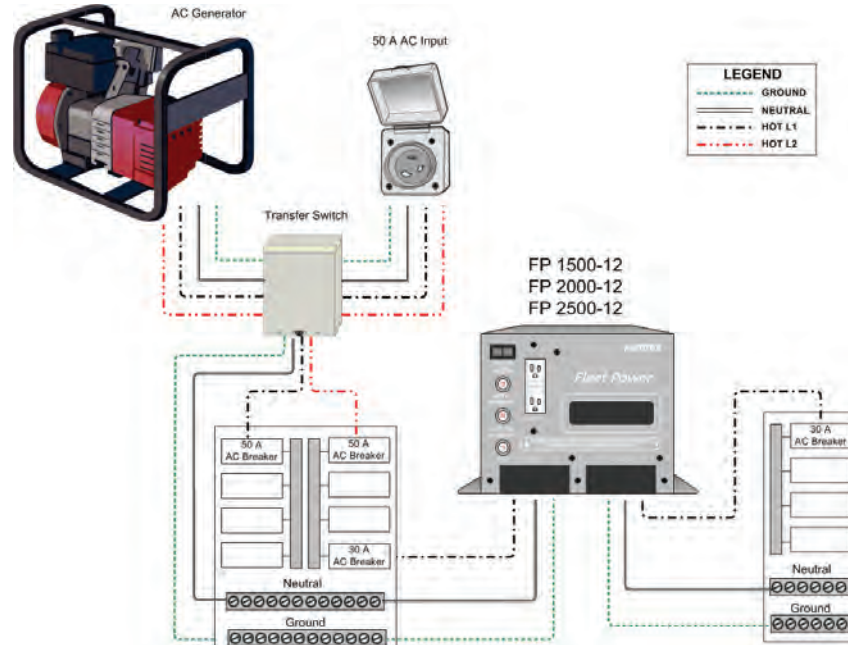
In this system, the shore power is the only external AC power source available. The entire circuit breaker panel is connected to the output of the inverter/charger. Things to consider are:

- When you unplug from shore power, be sure to turn OFF any appliances or tools that you do not want on the inverter. This will prevent overloading the inverter or a rapid discharge of the battery bank.
- Power Sharing should be set for the same value as the input shore power breaker.
- If a converter or battery charger was originally wired into the system, it should be disconnected. Do not allow a converter/charger to operate on the inverter power. This type of power loop will only discharge the batteries.
- Fleet Power 1000 has 15 amp transfer only.
- Use the hardwire output for 30 amp transfer on the Fleet Power 1500, Fleet Power 2000, and Fleet Power 2500.

Option 2: 30 Amp Shore Power and Generator, Inverter Runs Entire Panel**Figure 2-4** Installation Option 2

This system has 2 sources of AC power; shore power and generator. There is a transfer switch between these two AC sources. The output of this transfer switch is switched to the input of the inverter/ charger where it is passed through to the circuit breaker panel.

The same considerations for installation option 1 apply to this installation.



In this system, the main circuit breaker panel contains many loads that will not operate from the inverter such as air conditioning, stove, water or space heater. The AC receptacle circuits are removed from the main circuit breaker panel and a 30 amp sub-panel is installed. A 30 amp branch circuit breaker on the main panel feeds the AC input of the inverter/charger, and feeds the sub-panel through the inverter's internal transfer switch.

DC Wiring Options



WARNING: Shock hazard

For Installations using Battery Switches: No other DC loads should be connected to the common on the battery switch. This will prevent their operation directly from charger power when the battery switch is OFF.

Option 1: Two Battery System Using Manual Battery Switch

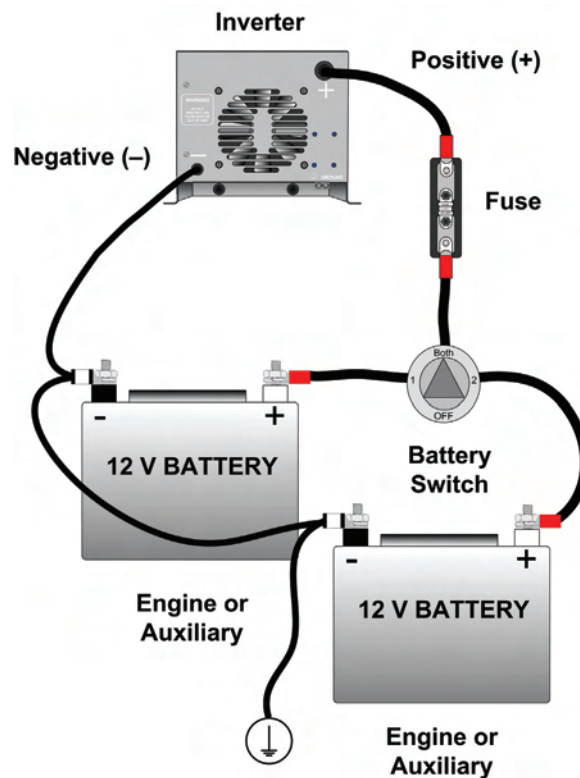


Figure 2-6 DC Wiring Option 1

This system is simple and effective, providing the user with the ability to choose between either battery for inverter use or charging.

When charging, the battery switch is typically left in the "All" or "Both" position so that both batteries are charged. When using the inverter, the inverter battery should be selected with the battery switch.

The inverter/charger's negative battery cable should be connected directly to the battery that will normally supply the inverter. A fuse should be installed in the positive cable within 18 inches of the battery. If the cables to the switch exceed 18 inches, each cable will require a fuse.

Option 2: Two Battery System Using a Solenoid or other Isolator for Engine Battery Charging

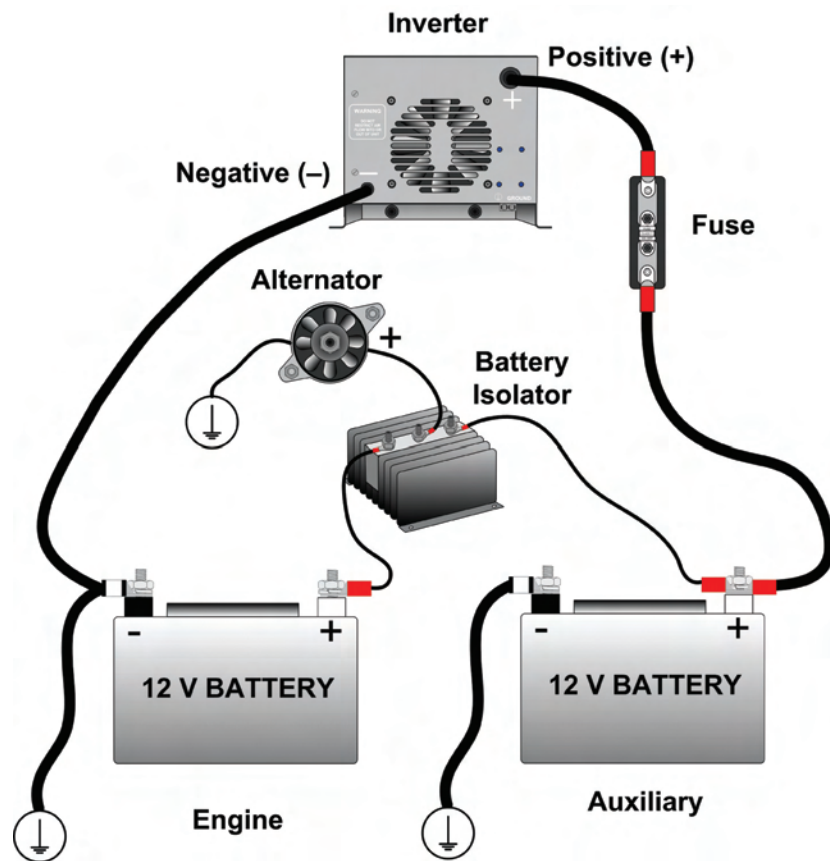
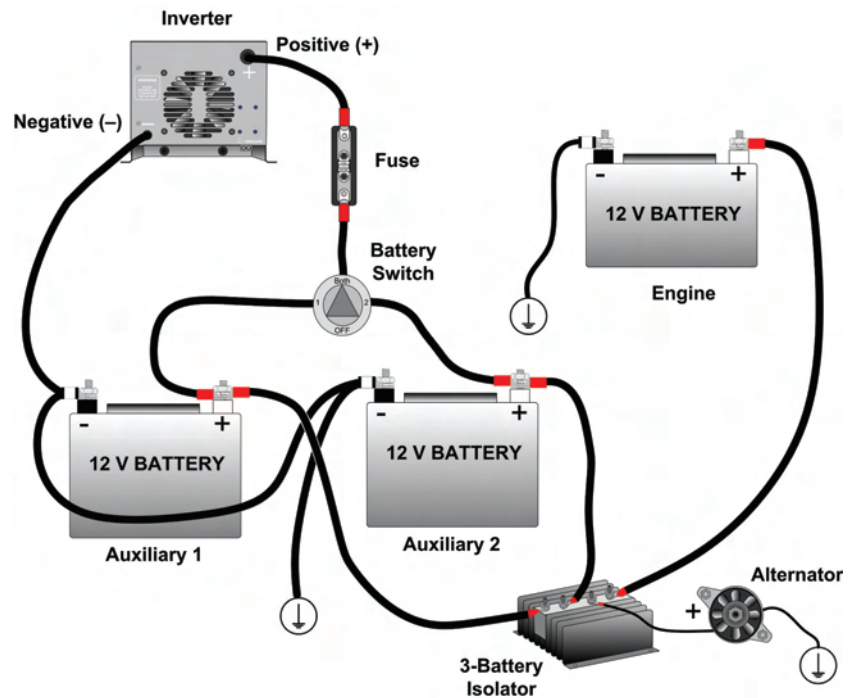


Figure 2-7 DC Wiring Option 2

This system allows charging of both batteries from an alternator, but the inverter can only draw power from the auxiliary battery. This prevents accidental discharge of the engine battery by the inverter. A paralleling solenoid or other isolator will parallel the batteries whenever either battery is being charged.

Option 3: Two Auxiliary Batteries with Battery Switch and One Engine Battery**Figure 2-8** DC Wiring Option 3

This system allows the inverter to use either auxiliary battery. The engine battery can always be charged by the alternator, but cannot be discharged by the inverter. The user can select between the two auxiliary batteries with the battery switch for charging or for inverter operation.

Option 4: Three Batteries Connected with Battery Switches

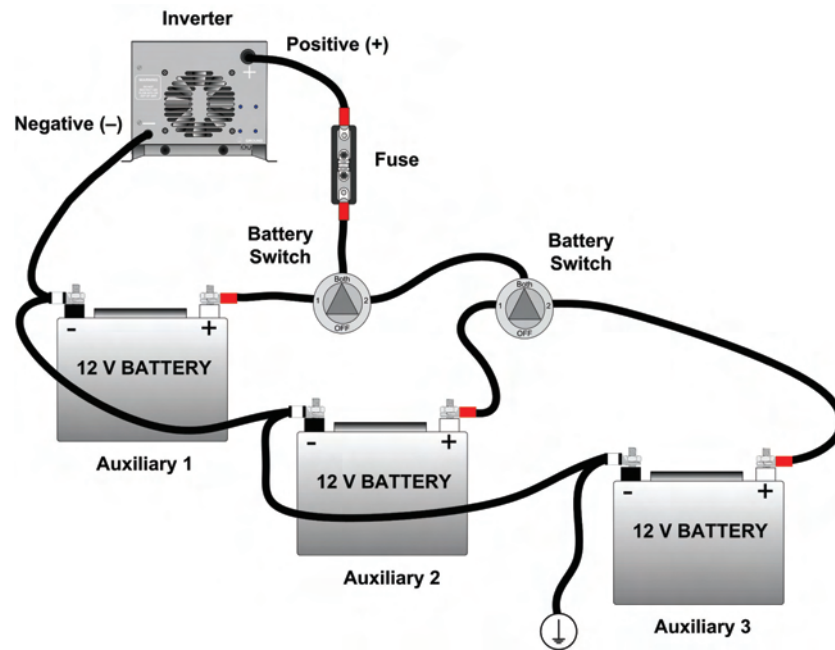


Figure 2-9 DC Wiring Option 4

This allows any combination of three battery banks to be charged by or selected to run the inverter.

If both switches are on "all", then all batteries are in parallel. Batteries can be independently added to or removed from the system by selecting the appropriate switch position.

3

Operation

Chapter 3 contains information on the operation of the Fleet Power.

Power Switch

The Power Switch is located on the front panel (see Figure 1-1 on page 1–2). This switch controls ON/OFF and RESET for the inverter. Expect a 3 second delay when the power switch is turned ON before the unit is activated.

If the unit is connected to external AC power, the battery charger and transfer switch will continue to function, regardless of the position of the switch.

When external AC power is removed and the power switch is in the ON position, the inverter will automatically be ON. If the switch is in the OFF position and external AC power is removed, the inverter will be OFF.

Inverter overload protection, transfer switching, power sharing and battery charger regulation will all function automatically.

If installed with the remote control panel, the power switch on the unit should be left in the OFF position.

Remote Control Panel

An optional remote control panel is available which offers several features not found on the unit. The remote control panel provides LED bargraphs which show system status, battery voltage, and DC Amps in both inverter and charge modes. These bargraphs can also display dip switch positions and shut down conditions.

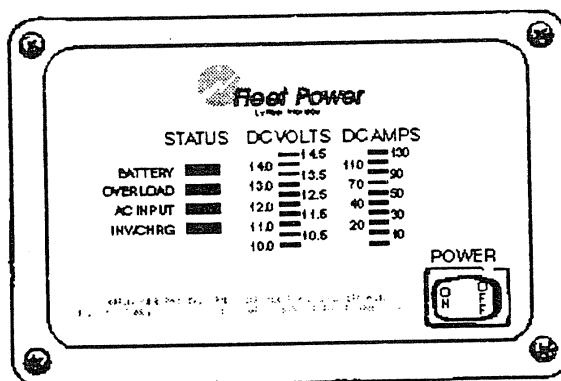


Figure 3-1 Remote Control Panel

Remote Power Switch	The switch on the remote is used to control the inverter and can also be used to control the battery charger function. When a remote control is used, the power switch on the inverter should be left in the OFF position.
System Status LEDs	These 4 LEDs monitor the system as described in Table 3-1.

Table 3-1 Status LEDs

Status LED	Purpose
INV/CHRG (Inverter/Charger)	Power ON light. LED illuminates whenever the power switch is on (inverter ON) or when there is incoming AC power and the charger comes on.
AC Input	LED illuminates when incoming AC power has been applied and the transfer relays have engaged. There is a 7 – 12 second delay from the time the AC is applied and the LED illuminates.
Steady Overload	LED illuminates when there is an over-temperature condition and the unit has shut down. The unit will automatically reset after it has cooled down.
Blinking Overload	Inverter mode: LED illuminates when inverter has shut down. Diagnose problem using the DC Amps bargraph. Charger mode: LED illuminates when there is an over-temperature condition and the unit has shut down. Reset the unit after it has cooled down by cycling the power switch.
Steady Battery	LED illuminates when there is a High or Low Battery warning condition. Inverter mode: Battery > 15.25 or < 10.50 volts Charger mode: Battery > 15.25 or < 10.00 volts
Blinking Battery	LED illuminates when there is either a shutdown or the unit is equalizing. Battery > 15.50 volts, will auto-reset at 15.25. Inverter mode: Battery < 10.00 volts, will auto reset at charger float voltage or upon AC input. Charger mode: Battery < 8.00 volts for 1 minute, remove all DC loads and manually reset by cycling the power switch or disconnecting and reapplying shorepower.

DC Volts Bargraph	These LEDs indicate battery voltage as measured inside the unit. Each LED segment indicates 0.5 Volts. If an overload occurs and the unit shuts down, the DC Volts bargraph will stop indicating battery voltage and display the dip switch settings. It will return to indicating battery voltage only after the unit has been reset.
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Operation

DC Amps Bargraph

These LEDs approximate DC input current in inverter mode and DC output current in battery charger mode. Two ranges are used -- below 50 amps each segment represents a 10 amp increment, above 50 amps each segment represents a 20 amp increment. Above 130 amps, a flashing LED segment indicates the value displayed plus 100 amps (flashing 50 LED is equal to 50 + 100 or 150 amps DC).

If a shutdown occurs, the DC Amps bargraph will stop indicating DC amps and will indicate the type of problem. Each LED segment indicates a different problem as described in "Fault Lights" on page 4-2.

Remote Dip Switches

On the back of the Fleet Power remote control panel is a set of 8 dip switches which are used to make several adjustments. On the switch block, each switch is numbered . . . 1 through 8 and the ON position is indicated. The switch settings can be changed at any time, even while the unit is operating. Following is a discussion of each adjustment. Refer to Table 3-2 on page 3-6 for dip switch programming.

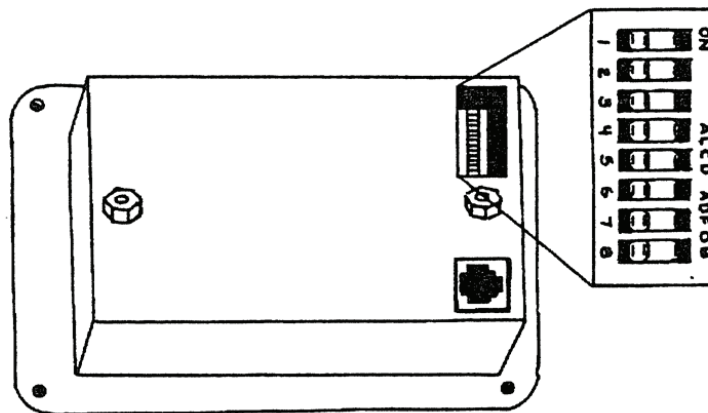


Figure 3-2 Remote Dip Switch Settings

SWITCH 1: Manual Equalizing

Cycling this switch ON for 1 second, then OFF, will initiate an equalizing charge cycle. The battery charger must be engaged before cycling the switch. The dip switch must always be returned to the OFF position. If it is left ON, an equalizing charge cycle will initiate every time the charger is engaged - this could cause battery damage.

	<p>The equalizing cycle is timed to last 8 hours from the time the switch is cycled, at which point the charger resumes normal charging in the float stage.</p> <p>The battery LED blinks when equalizing.</p>
SWITCH 2 & 3: Battery Type	<p>Gel cell and wet cell batteries have slightly different charge voltage requirements. Optimum battery charging is temperature dependent. For these reasons, the dip switches allow four different battery charger voltage set points, depending on battery type and ambient temperature:</p> <p>Cool Wet Cell < 80 degrees F.</p> <p>Warm Wet Cell > 80 degrees F.</p> <p>Cool Gel Cell < 80 degrees F.</p> <p>Warm Gel Cell > 80 degrees F.</p> <p>Refer to Table 3-3 on page 3–11 for the specific voltages for each setting.</p>
SWITCH 4: Auto Charge	<p>With the switch in the OFF position, the remote panel ON/OFF switch only controls the inverter operation. With the switch turned ON, it allows the power ON/OFF switch on the front of the remote to control the battery charger as well as the inverter.</p>
SWITCH 5 & 6:	<p>Not used for adjustments.</p>
SWITCH 7 & 8: Power Sharing	<p>These switches should be set to match the value of the circuit breaker which protects the incoming AC power. They may also limit the output current from the battery charger.</p> <p>Use the 5 amp setting for small generators, or for charging deeply discharged batteries.</p>
Dip Switch Status	<p>You can check the position of the dip switches by quickly cycling the power switch OFF/ON twice. The DC Volts bargraph will cease to display battery voltage and will indicate the settings of each dip switch. In this mode the bottom LED will illuminate if switch 1 is on; the second LED will illuminate if switch 2 is on, etc. Dip switch settings are indicated for 10 seconds after which time the display returns to indicating battery voltage.</p> <p>Factory default settings for all dip switches are in the OFF position.</p>

Table 3-2 Dip Switch Programming

Feature	Switch Number		Set Point			
Equalize or 3 stage charging	1					
	Toggle ON/OFF		Equalize (Do not leave on)			
	OFF		3 stage charging ^a			
Battery charging	2	3				
	ON	ON	Warm gel cell (> 80°F)			
	OFF	ON	Cool gel cell (> 80°F)			
	ON	OFF	Warm wet cell (> 80°F)			
	OFF	OFF	Cool wet cell (< 80°F) ^a			
Auto charge	4					
	ON		Disable: charger responds to ON/OFF switch			
	OFF		Enable: charger on when AC connected ^a			
	5	6	Not used			
Power sharing	7	8	1000	1500	2000	2500
	ON	ON	2.5 amps	5 amps	5 amps	5 amps
	OFF	ON	5 amps	15 amps	15 amps	15 amps
	ON	OFF	10 amps	20 amps	20 amps	20 amps
	OFF	OFF	15 amps ^a	30 amps ^a	30 amps ^a	30 amps ^a

a.Indicates factory default setting

Remote Control Wiring

The remote control panel is supplied with 25 or 50 ft. of telephone cable. The cable supplied may be 6 conductor, however, only 4 conductor is required. You may buy standard 4 conductor telephone cable and run up to 50 ft., if desired. Use only a single length of telephone wire, do not splice.

Battery Charging

Completely recharging wet cell deep cycle batteries requires the battery voltage to be raised beyond what is known as the gassing point. This is the voltage at which the battery begins to bubble and gas is given off. If charging stops short of this point, sulfate is left on the plates and deterioration of the battery begins. The gassing point will vary with battery temperature.

Gel cell batteries must not be charged to their gassing point. In fact, high voltage charging which gasses these batteries is harmful to them. They typically require a lower bulk charge voltage and a higher float voltage. Consult the battery manufacturer for specifications.

Conventional Battery Chargers

Most conventional battery chargers are single-stage constant voltage chargers. They must stop short of the gassing point or they will overcharge the battery bank. Therefore, most 12 volt battery chargers bring the battery voltage up to about 13.8 Volts.

This presents two problems. First, since the battery voltage does not reach the gassing point, sulfate is left on the plates. Second, 13.8 volts is close enough to the gassing point that some gas will escape, and the wet cell battery will need to be frequently topped off with distilled water.

Conventional battery chargers also suffer from another inherent characteristic of design, which is a tapering output. While they will deliver their rated current into a deeply discharged battery, as the battery becomes charged and the voltage rises, the output current of the charger tapers down. This taper continues as the battery is charged, taking a very long time to reach an acceptable recharge.

Fleet Power Battery Chargers

Fleet Power battery chargers are designed to overcome the limitations of conventional chargers by utilizing 3 distinct stages, each designed for optimal recharging of both wet cell and gel cell deep-cycle batteries.



WARNING: Shock hazard

Fleet Power battery chargers are on whenever there is AC power connected to the charger input, regardless of the condition of the ON/OFF switch. This feature can be disabled by setting the dip switch #4 (back of the remote) to ON so that the charger will also be controlled by the ON/OFF switch.

Each time the battery charger is engaged, the 3 stages proceed automatically, resulting in an efficient, complete recharge and safe battery maintenance. Use of the remote control provides the ability to periodically apply an 8-hour timed equalizing charge.

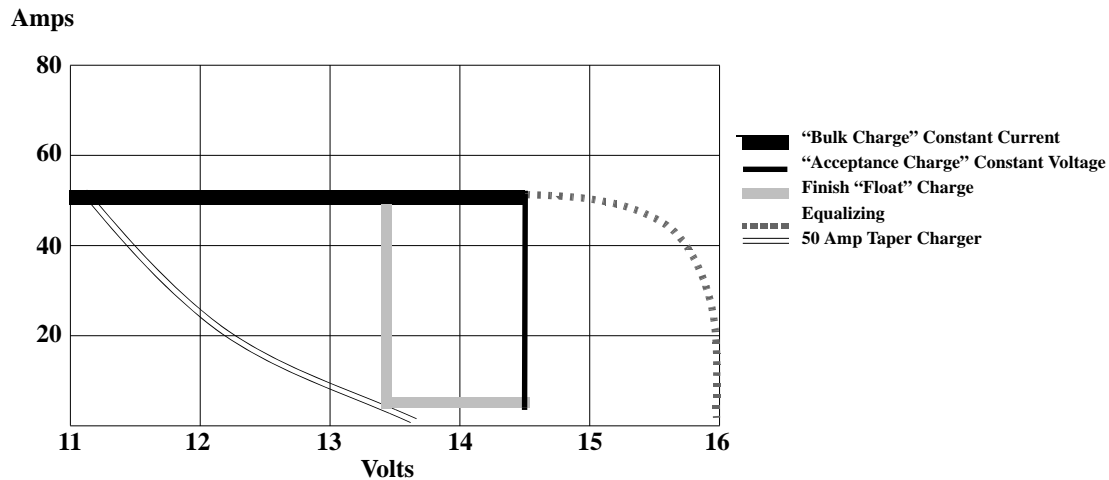


Figure 3-3 Benefits of Fleet Power vs. Traditional Chargers

Battery Charger Stages

Stage 1: Bulk Charge

During the bulk charge stage most of the charge current is delivered to the battery bank. This phase is engaged as soon as the battery charger is activated. Full rated charger current is delivered to the battery bank until the bulk charge voltage limit is reached. This results in a relatively rapid recharge.

Generally, a wet cell battery bank should not be charged up to the gassing point at a rate which exceeds 25% of its capacity. In other words, a 12 volt battery bank of 520 amp-hours should not be charged at over 130 amps.

Gel cell batteries can accept a higher rate of charge. Consult the manufacturer for specifications.

Stage 2: Acceptance Charge

The acceptance stage immediately follows the bulk charge stage. During this stage the battery voltage is held constant at the bulk charge voltage limit and the current gradually ramps down. During this stage the battery is accepting its final amount of charge current and the last of the sulfate on the plates is removed.

	<p>The acceptance stage lasts until the charge current reaches about 6-7 amps. A timer will terminate the acceptance stage if this current level is not reached. This timer is set automatically when the dip switches for battery type are set. Maximum acceptance time is 1 hour for wet cells and 3 hours for gel cells. Gel cell acceptance time can be increased because the battery is not gassing. Expect wet cell batteries to gas somewhat during acceptance, this is a necessary part of the charging process.</p>
<p>Stage 3: Float Charge</p>	<p>When the acceptance stage is terminated, either because the charge current ramped down to 6-7 amps or the timer engaged, battery charger current will shut off. The unit monitors the battery voltage while it drifts down from the bulk charge voltage limit. When it reaches the float voltage set point, the float charge stage is engaged.</p> <p>The float charge stage holds the battery voltage at a lower level, where it is safe for long term battery maintenance. During the float charge stage, the full output current of the battery charger is available to operate any DC appliances that may be on the system, while constantly maintaining the float charge voltage.</p> <p>The battery charger remains in the float charge stage indefinitely until the charger is disconnected from incoming AC power.</p>
<p>Stage 4: Equalizing Charge</p>	<p>This is the only battery charger stage which is not engaged automatically. It must be manually initiated each time it is necessary to equalize using a dip switch on the back of the remote control. Applying an equalizing charge is not possible without the use of a remote.</p>



WARNING: Explosion hazard

1. Do not equalize gel cell batteries with the remote programmed for wet cells.
2. Always monitor the equalize charge. Provide proper ventilation for battery fumes. Do not allow any sparks during equalizing. If one or more cells begin to overflow, terminate the equalize charge.
3. Check and top off the battery electrolyte both before and after the equalizing charge. Do not expose the battery plates to air. Leave the battery caps on while equalizing.
4. Remove all loads from the DC system before equalizing. Some DC loads may not tolerate the high charge voltage.
5. Do not leave the equalize dip switch in the ON position. It must be cycled OFF and left in the OFF position. If left ON, the unit will engage the equalizing cycle every time the battery charger is engaged.

Periodic equalizing is recommended by most wet cell deep-cycle battery manufacturers. There are no firm rules for how often an equalizing charge should be applied, but once a month is a good rule of thumb for batteries which are regularly cycled, less often for systems in only occasional use.

The equalizing charge is a timed, 8 hour cycle. If desired, it can be ended by interrupting the AC power to the charger at any time during the cycle. Equalizing should be engaged after the batteries have been fully charged by a normal battery charging cycle. The battery voltage will increase to 16.3 using the cool temperature wet cell setting. This will cause the battery bank to gas profusely and will accomplish the following:

- Removal of residual sulfate. Each time a battery is cycled (discharged and re charged), a small amount of sulfate is left on the plates. Over time, this gradual build-up of sulfate will compromise the performance of the battery. By applying an equalizing charge, the sulfate is returned back to the electrolyte, raising the specific gravity and fully exposing the active material of the plates.
- Bring all cells to the same potential.
All lead-acid batteries are made up of individual 2 Volt cells. As the battery bank is cycled, slight differences in the cells result in different cell voltages, affecting the over all charge effectiveness. Equalizing brings all cells up to the same voltage and the electrolyte in each cell to the same specific gravity.
- Mixing up of the electrolyte. Electrolyte in battery cells tend to separate into layers of acid and water. The vigorous boiling action of the battery during equalizing serves to physically mix the electrolyte.

Equalizing is not required on gel cell batteries. You will note that if the dip switches are set in one of the two gel cell positions, the equalizing charge voltage is the same as the bulk charge voltage, therefore, equalizing is equivalent to an 8-hour acceptance stage and is not harmful.

To initialize equalization:

1. Complete a full charging cycle.
2. Optional: To limit the DC current during equalizing to less than 15 amps, toggle dip switches 7 and 8 from OFF to ON before starting the equalize charge.
3. Switch off all AC loads that are on the output of the inverter/charger.
4. Toggle dip switch 1 from OFF to ON.
5. End the equalization cycle at any time before the 8 hours are complete by interrupting the AC power to the charger.

Charging Over-Discharged Batteries

Charging into a battery bank with a terminal voltage of less than 8 Volts presents a special problem for the unit. If this situation arises, the unit will attempt to charge for 1 minute. If the inverter senses excessive ripple voltage, it will shut down to protect itself.

To successfully charge an over discharged battery, you must remove as much DC load as possible. Set dip switches 7 and 8 to the ON position to limit the amount of charge current and the resulting ripple voltage. After the battery voltage has reached 10 volts, these switches can be set to their previous positions.

Important: If a continuous DC load in excess of the charge rate is placed on the battery bank, eventually the battery voltage will drop below 8 Volts and the battery charger will shut off. This load must be significantly reduced and the power to the charger cycled to resume charging.

Blinking of the battery LED on the remote control while charging is a warning that an over-discharge is imminent and that the DC load should be reduced.

Important: Equalize only after a regular charge cycle.

Battery Charger Voltage Settings

Table 3-3 Battery Charger Voltage Settings

Battery Type and Temperature	Bulk Voltage/ Max Time	Float Voltage	Equalize Voltage
12 volt wet cell cool temp.	13.9 / 1 hr.	13.3	15.8
12 volt wet cell warm temp.	14.3 / 1 hr.	13.4	16.3
12 volt gel cell warm temp.	14.1 / 1 hr.	13.8	14.1
12 volt gel cell cool temp.	14.4 / 1 hr.	13.8	14.4

4

Troubleshooting

Chapter 4 describes possible problems and potential solutions.

Fault Lights

LED Number	Indication
LED 1	Illuminates if the unit shuts down for any reason.
LED 2	Over-temperature: The unit is too hot. Turn the unit off and allow it to cool down.
LED 3	Failure: The unit has detected a failure. Call customer support (see page WA-1)
LED 4	Overload: The unit has overloaded. This may be caused by too large a load being applied or short circuit. Reset the unit by cycling the power switch or plugging the unit in to incoming AC power.
LED 5	Battery Overload: The unit has overloaded. This may be caused by excessively discharged batteries.
LED 6	Incoming AC Backfeed: Incoming AC power is faulty. Disconnect the AC power and correct the situation as this is potentially damaging to the unit.
LED 7	Triac Thermal Run Away: Unit is too hot. Turn the unit off and allow it to cool down.
LED 8	High Battery Voltage Shutdown: This error occurs during charge mode when the charging sources have too high voltage. Check the charging sources. Reset the unit by cycling the power switch.
LED 9-10	Not used for troubleshooting.

Potential Problems

Problem	Things to Check
No inverter output	<ol style="list-style-type: none"> 1. Battery voltage under load. 2. Battery connections and DC fuse. 3. Circuit breaker on front panel. 4. Thermal condition, high powered loads or inadequate ventilation may cause overheating. 5. Overloads or short circuit, check for excessive loads or bad wiring connections. 6. Reset button on GFCI outlet.
Low inverter output voltage	Confirm that your volt meter is a true RMS meter. Standard volt meters will not accurately read the waveform of the inverter and may read anywhere from 90 to 120 volts. If a true RMS meter is not available, check the brightness of an incandescent light bulb - if it appears normal, the output voltage is properly regulated.
Little or no output from the battery charger	<ol style="list-style-type: none"> 1. Wiring connections - check both the AC and DC connections. 2. AC input voltage - low voltage input will result in low DC output current. Expect reduced charger output from generators under 3,500 watts. 3. AC reverse polarity - check for voltage between the incoming white and green wires. If 120 volts is measured, this is reverse polarity.
Slow microwave oven cooking	Microwave ovens will normally cook slow on inverters due to a slightly low peak AC voltage. 2. Cooking speed will be determined by battery voltage. Low voltage results in increased cooking time. Support the battery bank with an alternator or other charging source for quicker cooking.
Slow digital clock	Digital clocks either employ an internal time base or derive their time base from the incoming AC waveform. The frequency is usually well regulated at 60 Hz. The clock either counts the number of peaks in the waveform or the number of times the waveform crosses zero volts. The circuitry to count the zero crossing events is more popular. The longer zero cross time of the inverter's modified sinewave may cause double clocking, resulting in a faster clock.



Specifications

Appendix A shows the specifications for all models of the Fleet Power.

Specifications are subject to change without notice.

Specifications

	Fleet Power 1000 ^a	Fleet Power 1500	Fleet Power 2000	Fleet Power 2500
Nominal Battery Voltage	12 VDC	12 VDC	12 VDC	12 VDC
Battery Voltage Range	10.0 – 15.5 VDC	10.0 – 15.5 VDC	10.0 – 15.5 VDC	10.0 – 15.5 VDC
Low Battery Cutout	10 VDC	10 VDC	10 VDC	10 VDC
AC Input Voltage Range	90 – 130 VAC	90 – 130 VAC	90 – 130 VAC	90 – 130 VAC
Frequency Regulation	0.05% @ 60 Hz			
Inverter Output Power (continuous)	1000 VA	1500 VA	2000 VA	2500 VA
Inverter Voltage Regulation	120 V ± 5% True RMS			
Wave Shape	Modified Sine Wave			
Surge Power (15 seconds)	3000 VA	4000 VA	4500 VA	5200 VA
Output AC Amps	8.33 A	12.50 A	16.67 A	20.83 A
Input DC Amps Nominal	100 A	150 A	200 A	250 A
Power Factors Allowed	All	All	All	All
Full Load Efficiency	85%	85%	84%	86%
Peak Efficiency	92%	92%	93%	94%
Protection	Circuit breaker, Electronic, Thermal, High battery, Low battery			
Transfer Switch	15 A	30 A	30 A	30 A
GFCI	Yes	Yes	Yes	Yes
Charging Rate	50 A	75 A	100 A	130 A
Bulk Charge Voltage	14.3 VDC ^b			
Float Charge Voltage	13.4 VDC ^a			
Equalizing Charge Voltage	16.3 VDC ^a			
Battery Cables	Yes	Yes	Yes	Yes
Hardwire	Yes	Yes	Yes	Yes
Status Panel	Optional remote or Link			
Weight	31 lbs.	45 lbs.	52 lbs.	56 lbs.
Dimensions	12 × 9¾ × 7 in.	12 × 11½ × 8¾ in.	12 × 11½ × 8¾ in.	12 × 11½ × 8¾ in.
Safety Approvals	cULus Listed to UL 458 and CSA C22.2 No. 107.1			
Emergency Vehicle	Complies with Federal Specification KKK-A-1822 for ambulance applications.			

a.Including the Fleet Power 1000 W/AP

b.Indicates adjustable settings with the optional remote control

Warranty and Return 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 Fleet Power Inverter / Charger. This warranty period lasts for twelve (12) months from the date of purchase at the point of sale to you, the original end user customer. 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 "What proof of purchase is required?"

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

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

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

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

Telephone: 1 800 670 0707 (toll free North America)
1 360 925 5097 (direct)

Fax: 1 800 994 7828 (toll free North America)
1 360 925 5143 (direct)

Email: customerservice@xantrex.com

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

Warranty and Return

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

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

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

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

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

Disclaimer

Product

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 ANY SPECIAL, INDIRECT, INCIDENTAL OR CONSEQUENTIAL DAMAGES, LOSSES, COSTS OR EXPENSES HOWEVER ARISING WHETHER IN CONTRACT OR TORT INCLUDING WITHOUT RESTRICTION ANY ECONOMIC LOSSES OF ANY KIND, ANY LOSS OR DAMAGE TO PROPERTY, ANY PERSONAL INJURY, ANY DAMAGE OR INJURY ARISING FROM OR AS A RESULT OF MISUSE OR ABUSE, OR THE INCORRECT INSTALLATION, INTEGRATION OR OPERATION OF THE PRODUCT.

Exclusions

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

Return Material Authorization Policy

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

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

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

Record these details in "Information About Your System" 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 and that the ASC repairs this particular Xantrex product.

Out of Warranty Service

If the warranty period for your Fleet Power Inverter / Charger 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 Fleet Power Inverter / Charger 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 Fleet Power Inverter / Charger package, record the following information and be sure to keep your proof of purchase.

- ☐ Serial Number _____
- ☐ Product Number _____
- ☐ 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 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 _____

Xantrex Technology Inc. 1 800 670 0707 Tel toll free NA 1 360 925 5097 Tel direct 1 800 994 7828 Fax toll free NA 1 360 925 5143 Fax direct customerservice@xantrex.com www.xantrex.com	
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