

TRUECHARGE™2

12V 10A BATTERY CHARGER

Introduction

Thank you for purchasing the Truecharge2 12V 10A Battery Charger (PN: 804-1210). The battery charger provides an efficient three-step charge to smaller 12-volt lead-acid batteries (flooded, GEL, AGM, or Lead-calcium) used in recreational vehicles and boats. This product is part of a family of advanced personal renewable energy devices from Xantrex™, the leader in high-frequency inverter design and battery chargers.

The Truecharge2 12V 10A Battery Charger ships with the following items:

- one 12V 10A Battery Charger unit,
- owner's guide,
- strain-relief clamp for AC input cables, and
- three crimp connectors for AC wires.

READ THIS GUIDE BEFORE OPERATING THE TRUECHARGE2 12V 10A BATTERY CHARGER, AND SAVE IT FOR FUTURE REFERENCE.

IMPORTANT SAFETY INFORMATION

Misusing or incorrectly connecting the Truecharge2 12V 10A Battery Charger may damage the equipment or create hazardous conditions for users. Read the following safety instructions and pay special attention to all Caution and Warning statements in the guide.

⚠ DANGER

ELECTRICAL SHOCK HAZARD

- Do not expose the battery charger to rain, snow, spray, or bilge water.
- Do not operate the battery charger if it has received a sharp blow, been dropped, has cracks or openings in the enclosure, or is otherwise damaged in any other way.
- Do not disassemble the battery charger. There are no user-serviceable parts with the exception of a user-replaceable fuse at the DC output wiring compartment (see illustration in "Features"). Also, internal capacitors remain charged after all power is disconnected.
- Disconnect both AC and DC power from the battery charger before attempting any maintenance or cleaning or working on any circuits connected to the battery charger.
- Do not operate the battery charger with damaged or substandard wiring.

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

⚠ WARNING

EXPLOSION HAZARD

- Charge only properly rated 12-volt lead-acid (GEL, AGM, Lead-calcium, or Flooded) rechargeable batteries because other types may explode and burst.
- Do not work in the vicinity of lead-acid batteries. Batteries generate explosive gases during normal operation.
- Follow the instructions 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.

PHYSICAL INJURY HAZARD

This battery charger is not intended for use by persons (including children) with reduced physical, sensory, or mental capabilities or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the appliance by a person responsible for their safety. Children should be supervised to ensure that they do not play with the battery charger.

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

NOTE: Please read sections "Precautions When Working With Batteries", "Precautions When Preparing to Charge", and "Precautions When Placing the Battery Charger" before proceeding.

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.
- 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 Truecharge2 12V 10A Battery 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 battery 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:

1. Study and follow all of the battery manufacturer's specific precautions, such as removing or not removing cell caps while charging and recommended rates of charge.
2. 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 BATTERY CHARGER

⚠ DANGER

EXPLOSION HAZARD

Do not place the battery charger in machinery space or in areas containing gasoline tanks or fittings in which ignition-protected equipment is required.

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

CAUTION

RISK OF DAMAGE TO THE BATTERY CHARGER

- Never allow battery acid to drip on the battery charger when reading gravity, or filling battery.
- Never place the Truecharge2 12V 10A Battery Charger unit directly above batteries; gases from a battery will corrode and damage the charger.
- Do not place a battery or anything on top of the battery charger.

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

FCC INFORMATION TO THE USER

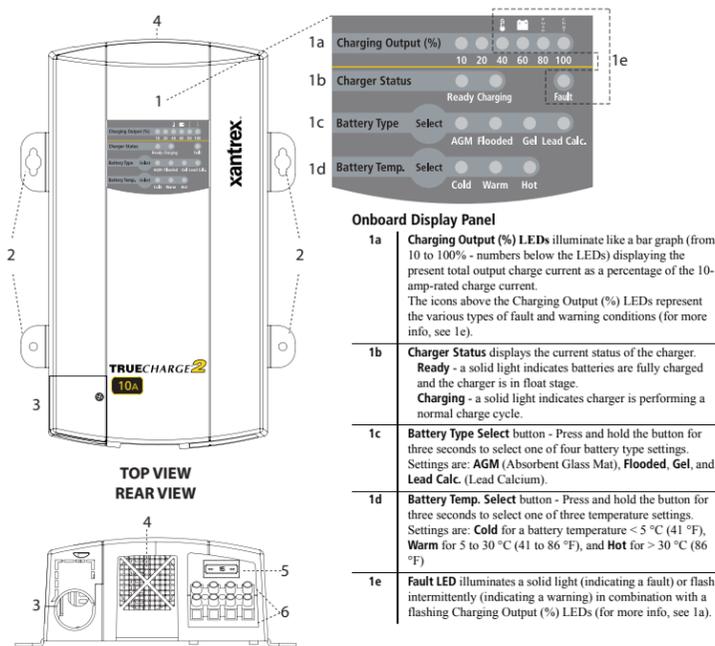
This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications.

However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

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

CAUTION: Unauthorized changes or modifications to the equipment could void the user's authority to operate the equipment.

Features



Truecharge2 12V 10A Battery Charger Features

Item	Description
1	Onboard Display Panel shows charging current (1a), charger status (1b), and fault and warning conditions (1e). It also controls battery charger settings such as battery type (1c) and temperature (1d).
2	Mounting Flanges are used to permanently install the product.
3	AC Wiring Compartment houses the AC cable with leads. Its cover is secured in place by a screw and provides the installer with easy access to the AC wiring compartment to allow for a trouble free installation. Remove and replace the cover (the screw does not separate from the cover) when installing the product.
4	Air Intake (at the front) and Exhaust Fan (at the rear)
5	User-replaceable Fuse can be replaced with a 15-amp fast-acting blade fuse such as Littelfuse® ATO/ATC 15A 32 V (blue).
6	DC Output terminal block has four contacts each in a plastic housing with a screw-on type contact. The terminal contacts are arranged from left to right as: Battery positive (+) for bank 1, Battery positive (+) for bank 2, Common battery negative (-), and a ground terminal.

STANDARD AND PROTECTION FEATURES

The **battery charger** provides the following features:

- two¹ full current-rated DC outputs,
- battery monitoring functions,
- correct charging voltage for batteries when connected to almost any single phase AC power outlet in the world,
- low electromagnetic interference (EMI),
- fully discharged battery charging²,
- battery reverse polarity protection via user-replaceable output fuse,
- ambient over-temperature shutdown and automatic recovery,
- battery over-charging protection,
- electronic current limiting provides protection against short circuit conditions on the charger's output,
- isolated design, and
- IP-32 drip protection rating³.

1. Each output can charge different batteries that either have the same chemistry or can tolerate the same charge sequence and voltage/current ratings.
2. The charger can initiate charging a non-damaged but zero voltage battery.
3. In three specific installation orientations.

Charger Installation

Preparing for Installation

CAUTION

IMPROPER INSTALLATION BY AN UNQUALIFIED INSTALLER

The battery charger must be installed by a qualified installer in accordance with all applicable local or national installation codes. Examples of such codes are the US National Electrical Code (NFPA 70), the American Boat and Yacht Council standards E-11 and A-31, and the US Coast Guard Electrical Regulations (33CFR183).

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

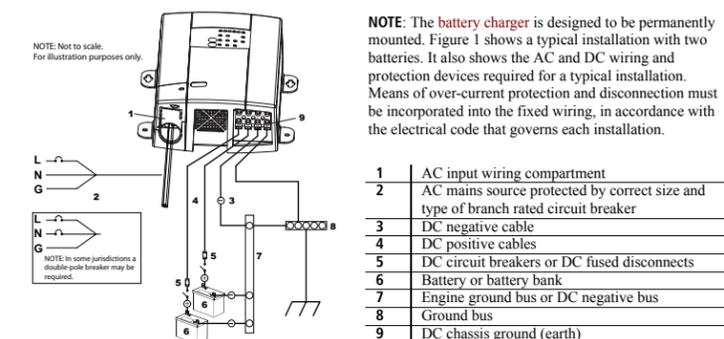


Figure 1 Configuration for Normal Loads

Tools and Materials

Tools needed are:

- flathead screwdriver for the DC terminals and ground connection,
- Phillips screwdriver for removing and re-securing the AC wiring compartment covers,
- power drill/screwdriver,
- drill bit set for pilot holes for mounting screws (if using #6 mounting screws, use 1/16 drill),
- wire stripper,
- manufacturer's recommended crimp tool for any crimp terminals that are being used.

Materials needed are:

- 3 conductor AC input wiring
- Use the information in "Install AC Wiring" and your local electrical codes to determine the correct wire and breaker or fuse.
- AC cable strain relief (if the one included is not compliant with your local electrical code requirements).
- appropriately sized DC cables for each battery, with suitable connectors at the battery end
- Use the information in "DC Wiring" and your local electrical codes to determine the correct wire and breaker or fuse.
- appropriately sized DC chassis ground (earth) cable with suitable connectors,
- DC fused disconnect or properly rated circuit breaker for each battery bank, and
- mounting screws, M3 or #6 marine grade, corrosion resistant (4 pieces) (Length dependent on mounting surface).

Wiring Requirements

⚠ DANGER

ELECTRICAL SHOCK AND FIRE HAZARD

Do not operate the battery charger with damaged or substandard wiring. Make sure that all wiring is in good condition and is not undersized. See notes below.

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

NOTES:

- Wiring and fuse sizes are governed by electrical codes and standards. Different requirements apply in different countries and to different types of installations, for example, boat, home or RV. It is the responsibility of the installer to ensure that each installation complies with all applicable codes and standards.
- Ensure that wires and fuses or breakered disconnects are correctly sized. Maximum continuous DC current available from the charger may be an additional 6–10% above the nominal current rating of the charger.

DC Wiring

The following table shows some typical wire sizes for various cable length runs, based on 3% voltage drop on DC cables, 75 °C (167 °F) rated wire with wiring being inside the engine compartment – assumed ambient of 50 °C (122 °F).

DC Wiring Examples Based on ABYC¹ E-11 20087 Table VI-A and Table IX

Wire Length (one way)	Wire Size (AWG, mm ²)
5 ft 1.5 m	No. 14, 2.1 mm ²
7.5 ft 2.25 m	No. 12, 3.3 mm ²
15 ft 4.5 m	No. 10, 5.3 mm ²

Over-current Protection Disconnect

Electrical codes require the DC circuit from each battery to the charger to be equipped with a disconnect and an over-current protection device, usually within 7 inches (17.8 cm) of each battery. The devices are usually DC-rated circuit breakers, fused disconnects, or a separate fuse and disconnect for each circuit. These devices must be rated for DC voltage and current and be rated to withstand the short circuit current available from the connected battery bank. Do not substitute devices rated only for AC voltage; they may not operate properly.

The current rating of the DC fuses must be correctly matched to the size of the DC wiring used, in accordance with the applicable codes. This helps to protect the installation against fire in case of any overcurrent or short circuit fault.

Fuse Sizes versus Wire Sizes Based on ABYC Regulations

AWG	Max. Fuse/Breaker
14	15 A
12	20 A
10	30 A

DC Chassis Ground

The DC chassis ground (earth) wire should also be sized correctly to provide proper protection. Refer to the local electrical codes for your specific installation to determine the correct gauge. The ABYC standards require this DC chassis ground wire to be the same size as the largest DC + and – conductors connected to the charger, or no more than one wire size smaller. See “Connect the DC Ground” for instructions.

AC Wiring

⚠ DANGER

FIRE HAZARD

Use only on circuits provided with 20 A maximum branch circuit protection in accordance with National Electrical Code, NFPA 70.

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

The AC wiring must be of sufficient size, and it must be protected by the appropriate size and type of input breaker, based on the jurisdiction and application. An example is given below.

The AC input wiring for the **battery charger** should be a three-conductor cable, providing a line, neutral, and ground conductor (or **L, N, GND**) in an outer jacket, rated a minimum of 75C, and sized based on the AC input current to the charger (see “AC Input Specifications”) and on the value of overcurrent protection provided.

- **For example:** in US NEC, you may use a 14 AWG wire with a 15 A breaker for up to 12 A continuous current (or 12 AWG for a 20 A breaker for up to 16 A continuous current).
- **NOTE:** Every jurisdiction will have different requirements as will each application, so research the regulations for your local jurisdiction to determine which wire size and type is correct based on the maximum AC input current marked on the charger and given in “AC Input Specifications”.

Other examples of AC wiring requirements:

For marine applications, the ABYC requires stranded wire, which is more robust than solid wire when exposed to vibration.

For RV applications, the United States National Electrical Code (NEC) allows solid wire in multi-conductor cable, however, stranded wire is also acceptable which will withstand vibration better.

The AC wiring supplying the **battery charger** must be protected by the correct size and type of branch-circuit rated fuse or breaker to meet the applicable installation codes. If a fuse is used instead of a breaker, a correctly rated disconnect switch is required ahead of the fuse so that power can be turned off, allowing fuse replacement and safe maintenance of other equipment on the mains circuit.

INSTALLING THE BATTERY CHARGER

To make charger installation quick and easy, Xantrex recommends that the installation tasks be performed in the following sequence:

1. Mount the charger in position.
2. Connect the DC ground.
3. Install DC wiring including installing required disconnects, fuses, or breakers.
4. Install AC wiring including earth grounds.
5. Power up the charger.

⚠ DANGER

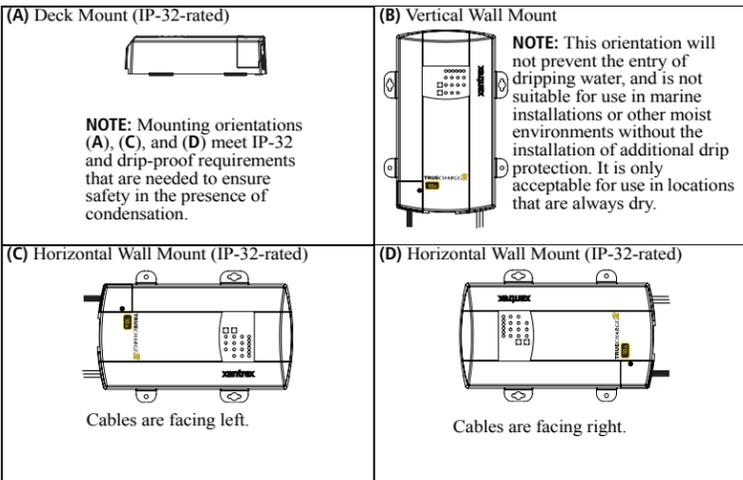
ELECTRICAL SHOCK HAZARD

Disconnect all AC and DC sources to the charger and wait five minutes for internal voltage and energy levels to reduce to safe levels.

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

Mount the Charger in Position

1. Choose a location for the **battery charger** that is dry, clean, cool, ventilated, safe, not directly above batteries, and close to an AC wall outlet.



2. Place the battery charger on a flat deck (A) or mount on a wall vertically (B) or horizontally (C or D) as shown above. When mounting on a wall, use the mounting flange holes as guides to pre-drill holes in the wall. Secure and permanently mount the unit on the wall.

Connect the DC Ground

⚠ DANGER

ELECTRICAL SHOCK HAZARD

Improper connection can result in electric shock. Have a qualified electrician install a properly grounded circuit if one is not available.

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

The Truecharge2 Battery Charger must be connected to a grounded, metal, permanent wiring system, or an equipment-grounding conductor should be run with the circuit conductors and connected to the equipment-grounding lead on the charger. Connections to the battery charger must comply with all local and application-specific codes and ordinances.

Xantrex recommends that you install a DC chassis ground (earth) wire from the ground terminal on the Truecharge2 Battery Charger to the engine bus or DC ground bus. The DC chassis ground (earth) wire should be sized correctly with the power conductors, and both must be sized for the battery fuses that are used to protect the DC wiring. Refer to your local electrical codes to verify the requirements in your jurisdiction for your application.

3. Locate the ground connection on the **battery charger**’s terminal block.
4. Connect the DC chassis ground (earth) from the ground terminal to the ground bus. **NOTE:** See “Configuration of Normal Loads” illustration.

Install DC Wiring

The procedure for installing the DC wiring applies to a single battery, as well as multiple batteries or battery banks.

⚠ WARNING

ACCIDENTAL SHORT OR SPARK HAZARD

Leave the DC disconnects or breakers in the Off position or DC fuses removed from their fuse holders until installation is complete.

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

5. Plan the route that the DC wires will follow, keeping it as short as possible. Measure and cut the required wire length, after allowing some extra length for connections and to provide slack in the wires for strain relief.
6. Identify the positive wires, by using color-coded wire, or by marking both ends of the wire with colored tape, or similar kind of marking. Repeat with a different color for the negative. Most installation codes recommend coloring the positive red and the negative black. **IMPORTANT:** You may find it helpful to label each cable, associating it with the battery bank it is connected to. For example, bank 1 (–), bank 1 (+), bank 2 (–), and so on.
7. Install a DC circuit breaker or fused disconnect in each positive cable that is as close to the battery positive terminal as possible. Consult your local electrical codes regarding the distance allowed between the battery and the fuse or breaker. For example, for most situations ABYC standard E-11 requires no more than 7 inches (17.8 cm). Be sure the breaker or fused disconnect is open.
8. Route the wiring to the batteries and to the Truecharge2 Battery Charger. Avoid routing wiring through an electrical distribution panel, battery isolator, or other device that will add voltage drops.

CAUTION

REVERSE POLARITY DAMAGE

Before proceeding to the next step, carefully check the wiring polarity. Do not reverse the connections. See note below.

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

NOTE: Make sure the positive terminals of the Truecharge2 Battery Charger will be connected to the correct terminals of the battery (fuses or breakers) and from there to the positive terminals of the battery. Make sure the negative terminal of the Truecharge2 Battery Charger will be connected to the battery negative terminal (or DC negative bus).

9. Connect the negative cable to the negative DC terminal on the charger. See Figure 1, “Configuration for Normal Loads”.
 - **For one battery or bank**
 - Connect the negative cable from the negative terminal on the battery to the negative DC terminal on the Truecharge2 Battery Charger.
 - **For more than one battery or bank**
 - Connect the negative cable from the negative terminal on the negative ground bar or bus to the negative DC terminal on the Truecharge2 Battery Charger.
10. Test that the wire is secure by tugging the wire gently and making sure it does not become loose.
11. Connect each positive cable to the correct positive DC terminal on the Truecharge2 Battery Charger and test that the wires are secure.
12. Connect the free end of each positive cable assembly to the correct positive terminal of the battery, using sufficient torque as recommended by your battery manufacturer.
13. Connect the free end of the negative cable to the negative terminal on the battery, using sufficient torque as recommended by your battery manufacturer.
 - **NOTE:** If you are using more than one battery, you will need to connect the negative cable from each of the batteries to the negative ground bar or bus. The negative ground bar or bus will then have a single negative cable connecting to the negative charger terminal.
14. Secure cables in place using tie-wraps or cable straps according to electrical codes.
15. Proceed to “Install AC Wiring”.

Install AC Wiring

Before connecting AC wiring, make sure the AC source circuit is protected by a breaker switch of the correct size and type, to comply with the electrical code for your location and application. The current rating of the input breaker should not be larger than 20 A for 120 VAC applications and 16 A for 230 VAC applications, but may be required to be lower depending on the wire size used.

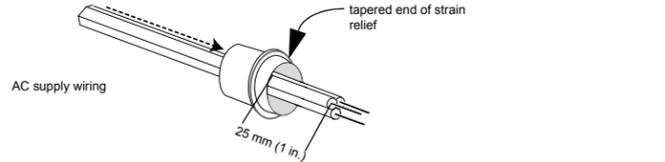
⚠ DANGER

ELECTRICAL SHOCK HAZARD

Disconnect the AC source by turning off the breaker feeding the circuit, unplugging from shore power and disconnecting any other power sources (such as a generator).

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

16. Plan the route that the AC supply wiring will follow from the source (usually an AC distribution panel) to the Truecharge2 Battery Charger.
17. Measure and cut the required length of three-conductor (**L, N, gnd**) cable allowing some extra length for connections and providing some slack.
18. Route the AC supply wiring from the charger (in its mounted position) to the source.
19. Unscrew the wiring compartment cover from the left rear of the Truecharge2 Battery Charger to expose the AC wiring access hole and charger’s AC pigtail leads.
20. Carefully remove 50 – 75 mm (2 – 3 in.) of the outer jacket from the AC supply wiring, being careful not to cut or nick the insulation on the individual conductors.
21. Extend the charger’s AC (**L, N, gnd**) pigtail leads (wires) from the AC wiring compartment of the charger.
22. Feed the AC supply wiring through the wider end of strain relief and out the tapered end.



23. Slide the strain relief on the jacket of the wiring (not on the individual conductors) approximately 25 mm (1 in.) from the end of the jacket.
24. Connect the AC supply wires to the Truecharge2 Battery Charger pigtail wires. **NOTE:** Connect the line conductor to the AC line, the neutral to the AC neutral, and the ground to the AC ground. The wires are color coded as follows:

Conductor	Charger Pigtail Color Code	AC Supply Wire Color Code
Line	Black	Black (or brown)
Neutral	White	White (or blue)
Ground	Green with yellow stripe	Green with yellow stripe

To connect AC wires with the provided crimp-on butt-splice connector:

- a) Make the connections using the provided crimp-on connectors or with other approved connectors required by your code, and suitable for your installation

For example, the ABYC Standards and Recommended Practices for Small Craft prohibit twist-on connectors for AC connections on a boat. For other types of installation, refer to your applicable code.

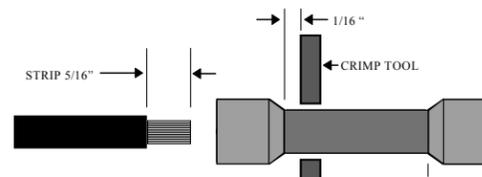
⚠ DANGER

FIRE HAZARD

Improperly connected wires may overheat. Exercise care when using any crimp connector, use the tool specified by the crimp connector manufacturer, and follow all crimping instructions.

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

- b) Using a wire stripper, carefully strip 8 mm (5/16 in.) from the ends of the two wires being connected.
- c) Insert one wire into one end of the butt-splice, until the insulation hits the internal metal crimp section, insert the butt-splice into the crimper, and crimp firmly. The proper location for the crimp is approximately 1.6 mm (1/16 in.) past where the butt-splice insulation tapers down as shown.



- d) Repeat Step c for the other end of the butt-splice.

25. When all connections are completed, push the wiring and connectors inside the AC wiring compartment.
26. Place the strain relief on the AC wiring access hole.
27. Install the wiring compartment cover to fasten the strain relief and tighten the screw on top to secure the cover. Do not over-tighten.
28. Connect the AC supply wiring from the charger to the AC panel feeding the charger.
29. Connect the line conductor to the breaker, the neutral to the neutral bus, and the ground to the ground bus.
30. Secure cables in place using tie-wraps or cable straps according to electrical codes.

Power Up the Charger

31. Make one last check that all connections are correct and secure.
32. The **battery charger** may now be powered up.
33. Close the DC disconnect switch or breaker.

⚠ DANGER

EXPLOSION AND/OR FIRE HAZARD

The final connection of the DC battery circuit will generate an arc. Ensure all areas of the system, including batteries and engine compartments, are well ventilated prior to making this connection.

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

34. Switch the AC power on at the source breaker. It is normal to see a 7 to10 second delay while the charger powers up. During this time, the indicator LEDs on the onboard display will illuminate for a second (power on test) before reporting charging and battery status information.

Battery Installation

Battery installation should always be treated like a brand new installation. This means, that all safety and precautionary guidelines that were followed prior and during the installation of the battery charger, must again be followed in order to avoid risks of electrical shock, injury, or death.

⚠ DANGER

ELECTRICAL SHOCK HAZARD

Disconnect both AC and DC power from the battery charger before replacing old and defective batteries and even before installing new batteries.

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

To replace an old battery:

- Turn off the AC source by opening the AC source disconnect.
- Switch off all devices operating from currently installed batteries.
- Disconnect the battery cables from the old battery.

NOTE: For Negative chassis systems, disconnect the negative cable first, then the positive cable.

For Positive chassis systems, disconnect the positive cable first, then the negative cable. Inspect all AC and DC cables for damage and repair, if necessary.

- Replace the old battery with the new battery.
- Reconnect the battery cables to the new battery.

NOTE: For Negative chassis systems, reconnect the positive cable first, then the negative cable.

For Positive chassis systems, reconnect the negative cable first, then the positive cable.

IMPORTANT: If the new battery is different from the old one in chemistry, temperature, or size, remember to re-configure the battery settings accordingly. See “Setting the Battery Temperature” and “Configuring the Battery Bank Type”.

Multi-Stage Charging

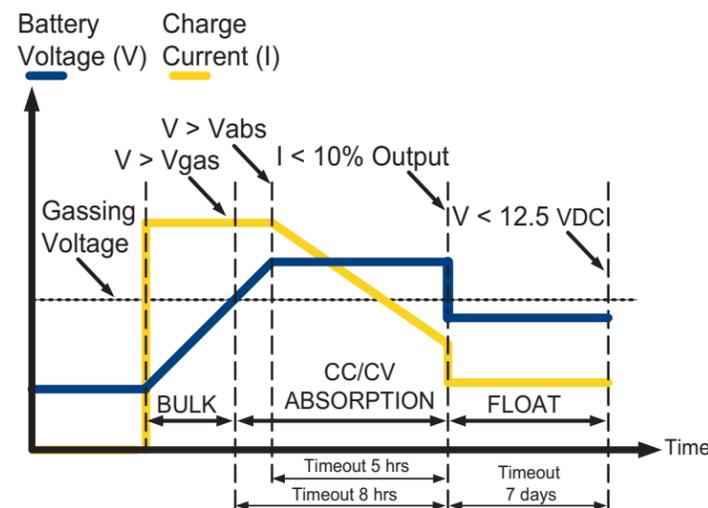
The Truecharge2 Battery Charger has two outputs that share the full rated current enabling it to charge two different batteries or battery banks that either have the same chemistry or can tolerate the same charge sequence and thresholds. The Truecharge2 Battery Charger performs sequential three-stage charging (Bulk, Absorption, and Float).

IMPORTANT: The battery banks are not galvanically isolated from each other. They share a common negative. The negative bus to chassis connection may not be suitable in some applications.

Three-Stage Charging

The three-stage charging mode employs the following sequence: *Bulk, Absorption, and Float*. During the Bulk stage the batteries are accepting a constant maximum current. In the Absorption stage, the battery voltage is held constant and the current declines. A battery will “gas” (produce hydrogen and oxygen) when its voltage exceeds the “gassing” voltage. Finally, in the Float stage, the charger continues to provide voltage at a lower level to maintain the battery in a fully charged state. If there is no load on the battery, it will typically draw very little current.

The charger will restart the charging cycle in the Bulk stage if lowest battery voltage of the two banks drops below 12.5 V for 15 minutes. After 7 days, the charger will automatically restart charging in order to refresh the batteries.



Charging Voltage Setpoints

The Truecharge2 Battery Charger charging process is designed to make the battery or battery banks reach the following voltage setpoints.

Charging Maximum Voltages

Battery Type	Absorption (Volts)	Float (Volts)
Flooded	14.4	13.5
GEL	14.2	13.8
AGM	14.3	13.4
Lead-Calcium	15.5	13.5

Battery Qualification

The Truecharge2 Battery Charger will perform a battery qualification on each application of AC, to determine if battery banks are present and healthy.

To force a battery detection sequence,

- Turn off AC.
- Wait approximately 20 seconds or until all lights on the charger have gone out.
- Turn on AC. The charger will then perform a battery detection.

The Truecharge2 Battery Charger charges all banks at the same time but the bank in most need of charging is the one that receives the most charge. For example, if Bank 1 and Bank 2 are both charged, but Bank 1 has a load and Bank 2 does not, then the charger may rarely charge Bank 2.

Operating DC Loads

When the **battery charger** is operating, DC loads such as fans and lights may vary in speed or intensity. This is normal. The Truecharge2 Battery Charger will not harm any load connected to it as long as the load can withstand the maximum voltage of 16.0 V.

Configuration

Once the charger is connected to a battery on bank 1 or to AC, it is live and it may be configured. The indicator LEDs on the onboard display will illuminate for a second (power on test) before reporting charging and battery status information.

Setting the Battery Temperature

CAUTION

RISK OF BATTERY DAMAGE

Do not set a battery temperature that is lower than the actual temperature as this may cause the battery to be overcharged. Similarly, do not set a battery temperature that is higher than the actual temperature as this may result in under-charging the battery.

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

NOTE: Always be aware of the temperature setting, observe the battery’s actual temperature and adjust the Battery Temperature setting accordingly. For varying conditions, use the Warm setting.

To configure the battery temperature:

- NOTE:** By default, the Battery Temp. is set to Warm.
- Press and hold the Battery Temp. Select button for three seconds to advance to the next setting.
 - Select the appropriate battery temperature setting. The LEDs will indicate which of the three types is being selected: Warm, Hot, or Cold. **NOTE:** Cold is for battery temperature below 5 °C (41 °F). Warm (default setting) is for battery temperature between 5 and 30 °C (41 and 86 °F). Hot is for battery temperature above 30 °C (86 °F). See table below to see how output voltage is offset by varying the temperature selection.

Temperature Selection	Recommended for battery temperature of:	Voltage added for temperature compensation offset from 25 °C	
Cold	below 5 °C (41 °F)	Flooded/Lead Calc./Gel	0.675
		AGM	0.500
Warm	between 5 and 30 °C (41 and 86 °F)	Flooded/Lead Calc./Gel	0
		AGM	0
Hot	above 30 °C (86 °F)	Flooded/Lead Calc./Gel	-0.27
		AGM	-0.20

Configuring the Battery Bank Type

NOTE: By default, the battery type is set to Flooded.

- Press and hold the Battery Type Select button for three seconds to advance to the next setting.
- Select the proper battery type. The LEDs will indicate which of the four types is being selected: Flooded (default), GEL, Lead Calc., and AGM.

Operation

CHARGING BATTERIES

NOTE: Please read sections “Precautions When Working With Batteries”, “Precautions When Preparing to Charge”, and “Precautions When Placing the Battery Charger” before proceeding.

- If possible, disconnect any heavy loads on the batteries being charged, by opening disconnect switches or by switching the loads off.
- Connect the batteries to the charger by closing the DC disconnect switches. **NOTE:** The onboard display LEDs will light up for a second.
- Ventilate the area around the battery thoroughly during charging. Review the charging instructions supplied by the manufacturer of your batteries and follow all safety precautions and the required steps.
- Apply AC power to the **battery charger** by:
 - closing the AC breaker or
 - turning the generator on.

All onboard display indicator LEDs will illuminate for one second (power on test) as the initialization sequence runs.

After initialization, the indicator LEDs will display present status and settings. At this point, changes in Battery Type and/or Battery Temperature can then be applied.

These settings are stored in memory (even when all power sources are disconnected) and need not be entered after every initialization. During charging, the Charging Output (%) LEDs will show the total current being delivered to the battery bank as well as any DC load applied. The charger fan may activate as well.

- After charging is completed, reconnect all loads to the battery.

The charger can be in one of five different situations which will be indicated on the onboard display in the Charger Status LEDs:

Mode	Charger Status LED—ON
Bulk	Charging
Absorption	Charging
Float	Ready
Fault	Fault ^a (solid light)
Warning	Fault ^a (flashing)

a.In combination with one or more flashing Charging Output % LEDs.

After charging is complete, the Truecharge2 Battery Charger enters Float mode. When the ready indicator LED illuminates, all batteries are fully charged and ready for use. The **battery charger** will continue to maintain the batteries’ charge. The **battery charger** will begin a new charging cycle seven days after the last completed cycle, or when the minimum battery terminal voltage drops below 12.5 V for 15 minutes.

TRANSITIONING THE CHARGER TO ON, STANDBY, OR DISABLED

To turn ON the Truecharge2 Battery Charger:

- Connect the batteries to the charger (i.e., charger is on standby) then connect AC power at the source. If the batteries are not fully charged then charging begins immediately. If the batteries are fully charged then charging will go to Float.

To put the Truecharge2 Battery Charger in Standby (see Danger warning below):

- Disconnect AC power at the source (i.e., only the batteries are connected).

⚠ DANGER

ELECTRICAL SHOCK HAZARD

- Do not disassemble the battery charger. Internal capacitors remain charged for five minutes after all power is disconnected.
- Disconnect both AC and DC power from the battery charger before attempting any maintenance or cleaning or working on any circuits connected to the battery charger. See note below.

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

To turn OFF (Disable) the Truecharge2 Battery Charger:

- Disconnect the AC power at the source and disconnect all DC batteries.

NOTE: This is the only state where the Truecharge2 Battery Charger is completely de-energized.

Accessing Charger Information

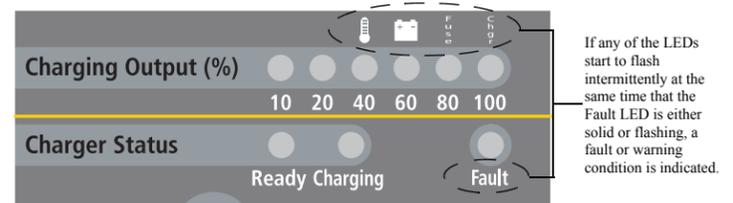
The Truecharge2 Battery Charger provides a lot of information about the status of the charger and the batteries. Notice that all indicator LEDs on the Onboard Display panel will illuminate for one second when AC or DC power is supplied to the Truecharge2 Battery Charger. This “power on” test indicates that the charger is now receiving AC power, and all LEDs are functioning.

Reporting While Charging or Equalizing

After configuring the charger and during charging, the onboard display panel will show the following information about the charger and the battery:

- Charging Output (%)** - charging output current expressed in percentage and
- Charger Status** - see description in table below.

NOTE: If there is a fault or warning related to one or both of the banks, the fault or warning information will display in the form of solid or flashing Fault indicator LEDs. Charging for one or both banks will stop and will only resume once the fault condition is cleared. However, charging will continue during warning conditions.



Charger Status LED Activity	Charger status
Ready LED illuminates solid	The charger is in float mode of three-stage charging. All batteries have been fully charged.
Charging LED illuminates solid	The charger is charging in bulk or absorption mode
Fault LED flashes	A warning condition. See next table.
Fault LED illuminates solid	A fault condition. See next table.

Fault or Warning Condition versus Charging Output

The Fault LED works in conjunction with the Charging Output (%) LEDs. The icons at the top row above the Charging Output (%) LEDs represent the various types of fault and warning conditions. For example, a temperature warning is represented by a thermometer icon - .

The Charging Output (%) LEDs will normally illuminate as a solid progress bar when they are indicating the amount of output charging current. If any of the LEDs start to flash intermittently at the same time that the Fault LED is either solid or flashing, a fault or warning condition is indicated.

IMPORTANT: A warning condition notifies the user of an impending problem and will not stop the charger from charging, while a fault condition will stop the charger from charging the battery.

Resolving Fault and Warning Conditions

The Truecharge2 Battery Charger will recover from fault conditions automatically when the cause of the fault or warning has disappeared. Under fault conditions, the charging process will be stopped, allowing either the charger or the battery or both to return within acceptable operating ranges. See “Specifications” for more information on normal operating ranges. To interrupt or cease the charging process, disconnect the AC power source from the charger.

Warning or Fault	LED Indicator	Solution
High Battery Voltage fault (>16.5 volts)	LED flashing Fault LED solid	Discontinue charging or disconnect AC power source from supplying power to the charger. Disconnect voltage sensitive DC loads from DC supply to prevent damage. If the DC bus voltage is still measuring high after AC power has been disconnected, call a qualified and certified electrician.
High Charger Temp. warning (>40°C)	LED flashing Fault LED flashing	Allow the Truecharge2 Battery Charger to cool while the AC is connected so the fan remains on.
High Charger Temp. fault (>65°C)	LED flashing Fault LED solid	Improve ventilation or install the Truecharge2 Battery Charger in a cooler location. If the temperature increases, the unit will display a fault and stop charging.
Reverse Polarity Fuse fault	LED flashing Fault LED solid	Check for reverse battery polarity (negative connected to negative, positive connected to positive is correct) at battery and charger output terminals. Disconnect AC and DC sources before replacing the fuse(s) on the charger. See “Replacing a Blown Fuse”.

Charger Maintenance

Maintaining the Battery Charger

⚠ DANGER
ELECTRICAL SHOCK HAZARD
Do not disassemble the battery charger. See note below.
Failure to follow these instructions will result in death or serious injury.

NOTE: The **battery charger** contains no user-serviceable parts with the exception of the DC output fuse which is user-replaceable. See “Replacing a Blown Fuse” for instructions. For obtaining service other than replacing the fuse, see “Warranty and Return Information” for guidance.

The Truecharge2 Battery Charger contains solid-state electronic components that require no maintenance. The best care you can give the charger is to protect it from contact with liquids, spray, or fumes which may cause corrosion and by keeping the air intake vent clean and free from any obstructions.

- Disconnect all AC and DC power and clean the outside of the case and wiring with a damp cloth. Wear protective gloves, if you suspect it has come in contact with battery fluid, salt water, gasoline or oil, or other corrosive material. Do not operate if the charger contains moisture of any kind.
- Periodically, disconnect all AC and DC sources and check all DC and AC wiring connections to be sure they have not loosened or deteriorated. Also check all cable clamps to ensure they are tightly fastened.

Loose battery terminals and lugs exposed to open air corrode rapidly. The corrosion appears as a white powder or granular foam on the terminals and any nearby exposed metal parts. If it contacts your skin, it will cause burns unless you rinse it off immediately.

- To clean battery terminals, follow the recommendations and procedures of the battery manufacturer.

Replacing a Blown Fuse

⚠ CAUTION
IMPROPER INSTALLATION BY AN UNQUALIFIED INSTALLER
Xantrex recommends that 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.
Failure to follow these instructions can damage the unit and/or damage other equipment.

⚠ DANGER
ELECTRICAL SHOCK HAZARD
Disconnect all AC and DC sources to the charger and wait five minutes for internal voltage and energy levels to reduce to safe levels.
Failure to follow these instructions will result in death or serious injury.

- Locate the fuse in the DC output compartment (see item 5 in “Features”).
- Pull out the blown out fuse, using long-nosed pliers or similar tool.
- Install a brand new fuse with the same type and rating as the old one such as Littelfuse® ATO/ATC 15A 32 V (blue).
- Fix the reverse polarity fault which caused the fuse to blow prior to reconnecting all AC and DC sources to the charger.
- Reconnect all AC and DC sources to the charger.

Troubleshooting

In the event that you have a problem with your Truecharge2 Battery Charger, the following tables will help you to identify the problem and offer possible solutions to the problem.

PROBLEM: The battery charger’s onboard display panel LEDs do not turn on.	
Possible cause	Remedy
There is no power at AC source.	Ensure that power is available at the AC source and it is within acceptable range.
Short circuit.	Remove all AC and DC connections. Remove the short circuit before reconnecting AC and DC connections.
Defective AC wiring or switches/breakers.	Wiring must be inspected and replaced by a qualified installer.

PROBLEM: Fault light is on.	
Possible cause	Remedy
High battery voltage	Discontinue charging or disconnect AC power source from supplying power to the charger. Disconnect voltage sensitive DC loads from DC supply to prevent damage. If the DC bus voltage is still measuring high after AC power has been disconnected, call a qualified and certified electrician.
High battery charger temperature	Allow the battery charger to cool while the AC is connected so the fan stays on. Improve ventilation or install the charger in a cooler location.
Reverse polarity - the battery cables were connected to the wrong terminals on the battery.	Remove the connection from the battery. Replace the blown out fuse before connecting the cables to the battery terminals again. See “ Transitioning the Charger to ON, Standby, or Disabled ” for instructions.

PROBLEM: The initial power up display test is not performed upon connection of battery or batteries.

Possible cause	Remedy
Truecharge2 Battery Charger does not detect battery for one of the following reasons: <ul style="list-style-type: none">poor connection reverse polarity connection (blown fuse) damaged wiring open DC breaker or external fuse battery voltage is below 9 volts	Check quality of battery connection and wires. Ensure correct polarity (negative connected to negative, positive connected to positive). In case there is an accompanying fault, check the type of fault.

PROBLEM: The battery charger completes a charging cycle but the battery voltage remains low.

Possible cause	Remedy
Battery has a shorted cell.	Disconnect AC from the charger and check the battery voltage approximately one hour later. NOTE: If the charger is functioning properly but the charge cycles fail to bring the resting voltage up above 10 volts, then this confirms the battery has a damaged or shorted cell.
	Replace battery. The battery has reached the end of its useful life and can no longer accept a charge.

PROBLEM: The battery charger appears to be taking too long to charge the battery.	
Possible cause	Remedy
Battery capacity is too high for the battery charger.	Use a higher capacity Truecharge2 battery charger. Visit www.xantrex.com for details on other Truecharge2 battery chargers.
Load connected to battery is draining charge current so that battery does not recharge.	Disconnect all loads or switch loads off.
Battery has a damaged cell or has reached the end of its useful life.	Replace battery.

PROBLEM: The **battery charger appears to have quickly charged the battery. Ready indicator LED illuminates sooner than expected.**

Possible cause	Remedy
Battery capacity is too low for the battery charger.	Use a lower capacity battery charger. Visit www.xantrex.com for details on other Truecharge2 battery chargers.
Battery has a damaged cell or has reached the end of its useful life.	Replace battery.

Specifications

NOTE: Specifications are subject to change without notice.

Operating temperature	0–50 °C (32–149 °F) (operation) −40–80 °C (−40–176 °F) (storage)
Humidity	5–95% RH non-condensing
AC input connections	Three colour-coded No. 14 AWG wires (L, N, GND) minimum 152 mm (6 in.) long in a separate wiring enclosure with 21.3 mm (0.84 in.) hole provision for connection of a 1/2 inch North American "trade size" strain relief (included).
AC input voltage	120 VAC (nominal) 90–265 ±4 VAC (full)
Maximum AC input current	at 104 VAC: 1.7 AAC at 230 VAC: 0.8 AAC
AC input frequency	47–63 Hz
AC input surge protection	Line-to-neutral surge protector rated at 300 VAC
AC peak efficiency	77% @ 120 VAC 80% @ 230 VAC
DC output and ground connections	DC terminal block (two positives, one common negative and one ground).
DC output voltage	12 VDC (nominal) 0–16.0 VDC (full)
DC voltage accuracy (no load)	14.4 ±0.3 VDC @ 25 °C (77 °F)
DC output current	10.3 ±0.3 ADC (max)
Battery charging	three-stage charging (bulk, absorption, float)
Number of battery bank outputs	2 isolated (separated) outputs
Minimum battery bank size	20 Ah
Absorption voltage	Flooded: 14.4 ±0.3 VDC @ 25 °C (77 °F) GEL: 14.2 ±0.3 VDC @ 25 °C (77 °F) AGM: 14.3 ±0.3 VDC @ 25 °C (77 °F) Lead-calcium: 15.5 ±0.3 VDC @ 25 °C (77 °F)
Float voltage	Flooded: 13.5 ±0.3 VDC @ 25 °C (77 °F) GEL: 13.8 ±0.3 VDC @ 25 °C (77 °F) AGM: 13.4 ±0.3 VDC @ 25 °C (77 °F) Lead-calcium: 13.5 ±0.3 VDC @ 25 °C (77 °F)
OFF state current draw	< 1.5 mA
Protection features	<ul style="list-style-type: none">Battery reverse polarity with user-replaceable Littelfuse® ATO/ATC 15A 32 V (blue). Output short circuit current limit of 12.5 ±0.3 AAC. Over-voltage limit of 16.5 ±0.3 VDC Charger over-temperature protection and automatic recovery. IP-32 drip protection rating.
Regulatory and safety compliance	ETL marked to CSA and UL standards, CE marked for the Low Voltage Directive 2006-95-EC, (complying with EN60335-2-29 Battery Chargers)
Standards	FCC Part 15 Class B, CE marked for the EMC Directive 2004-108-EC (complying with EN55014-1, EN55014-2, EN61000-3-2, and EN61000-3-3).
Dimensions (L×W×H)	224×138×70 mm (8 ⁷ / ₈ ×5 ⁷ / ₁₆ ×2 ³ / ₄ in.)
Weight	1.5 kg (3.3 lbs)

Warranty and Return Information

Warranty

What does this warranty cover? This Limited Warranty is provided by Xantrex Technology USA Inc. ("Xantrex") and covers defects in workmanship and materials in your Truecharge2 **12V 10A Battery Charger**. This warranty period lasts for **two years** 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: 1 408 987 6030 (direct telephone) or customerservice@xantrex.com (Email).

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 errorfree 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:

- 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;
- 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;
- the product if repairs have been done to it other than by Xantrex or its authorized service centers (hereafter "ASCs");
- the product if it is used as a component part of a product expressly warranted by another manufacturer;
- component parts or monitoring systems supplied by you or purchased by Xantrex at your direction for incorporation into the product;
- the product if its original identification (trade-mark, serial number) markings have been defaced, altered, or removed;
- the product if it is located outside of the country where it was purchased; and
- any consequential losses that are attributable to the product losing power whether by product malfunction, installation error or misuse.

Disclaimer

Product

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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.

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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

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 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.

Out of Warranty Service

If the warranty period for your Truecharge2 **12V 10A Battery 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 inverter may be serviced or replaced for a flat fee.

To return your Truecharge2 **12V 10A Battery 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” above.

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.

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