On Board Solutions
A ProMariner Company

Here are just a few:

ProMar1 Series - Recreational Grade Waterproof Marine Battery Chargers

ProSport Series - Heavy Duty Recreational Grade Marine Battery Chargers

ProTournament Series - Professional Grade Tournament Grade Marine Battery Chargers

ProNauticP Series - Sailing and Cruising Marine Battery Chargers

ProIsoCharge Series - Digitally Controlled Zero Loss Charging Isolators

Digital Mobile Charge In-Transit Chargers

ProSport 1.5 Amp Multi-Use Battery Maintainer

AC Plug Holders

Battery Isolators

Galvanic Isolators and Monitored Systems

Corrosion Control Products

Waterproof Marine Binoculars

A Complete Line of Hand Held Test Meters

Online Technical Support and Service Support

Intertek 5005649

On Board Solutions
A ProMariner Company

Marine / Mobile / Industrial

TruePower Series PLUS

Built-in AC Transfer Switch

Heavy Duty Marine, Mobile and Industrial Grade Inverters

ProMar Digital *Performance Technology Inside*

2 Year Warranty

Owner's Manual and Installation

Model	Part No.	Wattage	DC Input	AC Input	AC Transfer	AC Waveform
TruePower Plus 1200MS	06120	1200 W	12 VDC Input	115 VAC	30 Amps	Modified Sine Wave
TruePower Plus 1500MS	06150	1500 W	12 VDC Input	115 VAC	30 Amps	Modified Sine Wave
TruePower Plus 2000MS	06200	2000 W	12 VDC Input	115 VAC	30 Amps	Modified Sine Wave
TruePower Plus 1000PS	07100	1000 W	12 VDC Input	115 VAC	30 Amps	Pure Sine Wave
TruePower Plus 2000PS	07200	2000 W	12 VDC Input	115 VAC	30 Amps	Pure Sine Wave

IMPORTANT NOTICE - SAVE THESE INSTRUCTIONS

Please save and read all safety, operating and installation instructions before installing or applying DC or AC power to your TruePower Plus Inverter.

Your Satisfaction is Important to Us!

Do not return this product to a retailer or dealer for any service or warranty requirements.

PLEASE RECORD YOUR:

Model Number:_____ Serial Number: _____ Date of Purchase: _____

Important Notice:

Please read this manual and all warnings including those provide by the battery manufacturer. This manual is written to assist in the safe installation of the TruePower Plus Inverter. Installation must comply to the applicable electrical codes and when installed on a boat the American Boat and Yacht Council (ABYC) E-11 standards.

⚠ **WARNING TO OWNER AND INSTALLER:**

Read to avoid risk of injury or fire. INSTALL BY A CERTIFIED ELECTRICAL TECHNICIAN. INSTALLATION MUST COMPLY WITHTHE FOLLOWING GUIDELINES:

To prevent risk of fire damage: All DC stud and cable hardware must be securely tightened. Fasten DC input cables with proper strain relief within 6" of inverter.

Attaching battery cables to DC studs: Use two appropriately sized wrenches for each connection 7/16" or 1/2" wrench required (model specific). Tighten until lock washers compress.

Installing DC safety fuse: Install fuse in positive (+) cable within 7" of battery. See page 17 for recommended fuse sizes.

DC Input Cables: Cable size must be specified per length and DC input amperage of installed TruePower Plus Inverter. See page 17.

⚠ **WARNING:** Risk of Fire. Do not replace any fuse with a rating higher than recommended by the manufacturer. Ensure that the dedicated electrical system fuse can supply this product without causing the fuse to open. On no account should fuses be bypassed as this can cause serious damage, fire or risk of death.

⚠ **WARNING: This device is not ignition protected, risk of fire or explosion.**
This equipment contains components that could produce arcs or sparks. To reduce the risk of fire or explosion, do not install this equipment in compartments containing batteries, flammable materials or fumes, or in a location containing gasoline-powered machinery, or joints, fittings, or other connections between components of the fuel system.

⚠ **WARNING:** Low voltage - electrical burn and spark hazard. Disconnect battery power before servicing.

⚠ **WARNING:** ELECTRICAL SHOCK HAZARD
Do not disassemble the TruePower Plus Inverter. It does not contain serviceable parts and attempting to service the unit could result in an electrical shock or burn.

CAUTION: Polarity and wire color must be observed when making the installation connection to a 12 volt battery.
Red DC input bar = + (positive) red cable battery connection only.
Black DC input bar = - (negative) black cable battery connection only.
NOTE: REVERSE POLARITY CONNECTION WILL DAMAGE UNIT AND VOID WARRANTY.

Contents

UNPACKING AND INSPECTION

Thoroughly inspect your TruePower Plus unit. The package should contain the following:

1) TruePower Plus unit

2) Parts package including:

a. + (red) and - (black) DC terminal cover.

b. Remote package including panel, cable and mounting screws

c. Owners/installation manual

Introduction

Thank you from all of us at On Board Solutions and congratulations on your recent purchase of a TruePower Plus Inverter.

TruePower Plus Inverters have been taken to the next level of design using the latest in digitally controlled and software based power conversion technology.

TruePower Plus Inverters address the trend of having the convenience of household power on board for electric grills, entertainment systems, refrigeration and more.

TruePower Plus not only converts 12 VDC to 110 VAC household power but will seamlessly pass through AC station power with its built in 30 amp AC transfer switch.

Unique in design, the TruePower Plus Series offers an intuitive dual color user interface consisting of:

- LCD display, AC power output and DC input power gauges.
- LED indicators are used for power input type and service notification.
- During normal operation display and gauges are blue and green.
- Anytime there are adverse conditions the LCD display and gauges will turn red based on the
- condition and the LCD display will provide a full fault message versus traditional error codes that must be deciphered.
- This innovative design takes the stress and mystery out of using an on-board inverter for RV's, boats and specialty vehicles.

Installation time is significantly reduced with our innovative, concealed and integrated AC cable strain relief with front screw connection AC terminal blocks. This eliminates the need of punching holes and using conduit style strain relief and ring terminals for AC power connections.

Designed with 2x surge capability for demanding loads and convenient GFCI protected outlets and a USB charging port. Shock resistant and internal conformal coated electronics for protection in harsh environments.

Household power that is ready when you are!

Heavy Duty Marine, Mobile and Industrial Grade Inverters

TruePower Plus Inverters are available in both Modified Sine Wave (MS) 1200, 1500 and 2000 watts and Pure Sine Wave (PS) models in 1000 and 2000 watt models.

Standard Features:

Intuitive dual color digital LCD message center

Dual color gauges for AC power output and battery DC input

Internal 30 amp AC transfer switch will automatically pass through AC inlet power when present

Integrated AC power cable strain relief for ease of installation

USB power port and GFCI convenience outlets

Compact and lightweight design

Soft start noise filtered technology with 2x surge capability

On/Off remote with 9 foot cable and DC cable covers included

Built-in safety with overload, over temperature, short circuit and reverse polarity protection

Audible alarm and shut down for low and high DC voltage, overload and over temperature conditions

Shock resistant construction with internal conformal coated electronics

2 year warranty

Transfer Switch

The TruePower Plus includes an internal, automatic 30 amp AC transfer switch that senses the presence of AC shore/station power. Upon disconnection from shore power/shore station source, the inverter will switch to provide AC power via the DC battery source automatically. This switch, in compliance with A-31, disconnects the neutral AC lead from the AC ground when in shore/station power mode.

TruePower Plus Inverters are Protected by a Variety of Features Including:

- Convenience Outlet Safety Protected
- Input Polarity Protection
- Low Battery Alarm
- Low Battery Shutdown
- Overload Protection
- Output Short Circuit Protection
- Thermal Protection
- Over Voltage (15 VDC) Protection

TruePower Plus Remote

On/Off control
Input power source LED indicators
Check fault LED indicator
Remote mounting screws and 9 ft. cable included

Intuitive Dual Color Display and LCD Message Center

Integrated AC Power Strain Relief with Front Screws

DC Cable Covers
Black (-) and red (+)

General Safety Instructions

IMPORTANT SAFETY INSTRUCTIONS: READ AND SAVE THESE INSTRUCTIONS!

This owner's manual contains important safety instructions for the TruePower Plus Series Inverters that must be adhered to during installation, operation and troubleshooting. Read and save this owner's manual for future reference.

Read these instructions carefully and become visually familiar with the equipment before installation, operation, servicing, or maintenance. The following precautionary messages may appear throughout this manual or equipment to warn of potential hazards or to call attention to information that clarifies or simplifies a procedure.

Before installing and using your new inverter, read all appropriate sections of this guide and any cautionary markings on the inverter, batteries and on your appliances.

CAUTION

⚠ Do not expose this unit to rain or snow

⚠ Use of attachments not recommended or sold by On Board Solutions will void warranty and may result in the risk of fire, electrical shock or personal injury.

⚠ To reduce the risk of electrical shock, remove connection to AC shore power and DC connections prior to maintenance or cleaning. Turning off controls WILL NOT reduce this risk.

⚠ HELP - Someone should be within the range of your voice or close enough to come to your aid when working with a lead-acid battery.

1. **CAUTION:** Do not operate the inverter if the carton or unit has significant damage from being dropped or crushed, received a direct hit of force or is otherwise damaged.
2. **CAUTION:** Do not dismantle the inverter. Call the factory directly when service or repair is required. Incorrect assembly may result in risk of electrical shock or fire. No user serviceable parts.
3. **CAUTION:** As a precaution - **Keep children away from the inverter and its components!** The same potentially hazardous or lethal AC power that is found in a normal household 115 AC power outlet can be found in the TruePower Plus Inverter.
4. **CAUTION:** For an ABYC E-11 compliant installation, this Inverter must be installed with an inline fuse in the positive (+) cable on the DC side of the inverter (between the battery and the inverter) at a distance of seven inches (7") from the battery connection (Please see Specifications table in this manual for correct sizing).

Battery Precautions

1) To reduce risk of battery explosion, follow these instructions and those published by battery manufacturer and manufacturer of any unit you intend to use in vicinity of battery. Review cautionary marking on these products and on engine.

⚠ SPARK - Be very cautious about dropping metal objects such as screwdrivers and wrenches onto a battery. This could short-circuit the battery and immediately cause a spark that may result in a fire or explosion.

DC Connection Precautions

1) Connect and disconnect DC output connections only after setting any inverter switches to off and removing AC cord from electric power.

Personal Safety Precautions

1. WORKING IN VICINITY OF A LEAD-ACID BATTERY IS DANGEROUS. BATTERIES GENERATE EXPLOSIVE GASES DURING NORMAL BATTERY OPERATION. FOR THIS REASON, IT IS OF UTMOST IMPORTANCE THAT EACH TIME BEFORE SERVICING THE UNIT IN THE VICINITY OF THE BATTERY, YOU READ THIS MANUAL AND FOLLOW THE INSTRUCTIONS EXACTLY.
2. Never charge or invert power from a frozen battery.
3. If necessary to remove a battery from a vehicle or vessel, always remove grounded terminal from battery first. Make sure all accessories are off, as not to cause an arc.
4. Be sure area around battery is well ventilated.
5. Clean battery terminals. Be careful to keep corrosion from coming in contact with eyes.
6. Study all battery manufacturer's specific precautions such as removing or not removing cell caps while charging and recommended rates of charge.

WEAR - Complete eye protection and protective clothing. Avoid touching eyes while working near battery(s).

NEVER - Smoke or allow a spark or flame within the vicinity of the battery work area.

REMOVE - All personal metal items such as rings, watches, bracelets, etc. when working near a battery. A battery can produce a short circuit current high enough to weld a ring or any other metal causing serious burns.

⚠ **WARNING:** Restrictions on Use- The TruePower Plus Inverter shall not be used in connection with life support systems or other medical equipment devices.

DANGER
HIGH VOLTAGE
AVOID SERIOUS INJURY OR DEATH FROM ELECTRICAL SHOCK.
BEFORE PERFORMING ANY ELECTRICAL WORK TURN OFF AC POWER SUPPLY

DANGER
EXPLOSION HAZARD
AVOID SERIOUS INJURY OR DEATH
MAKE CONNECTIONS IN AN ATMOSPHERE FREE OF EXPLOSIVE FUMES

WARNING
LOW VOLTAGE
AVOID SERIOUS INJURY FROM ELECTRICAL BURNS AND SPARKS.
BEFORE PERFORMING ANY ELECTRICAL WORK DISCONNECT ANY DC POWER SUPPLY FROM UNIT

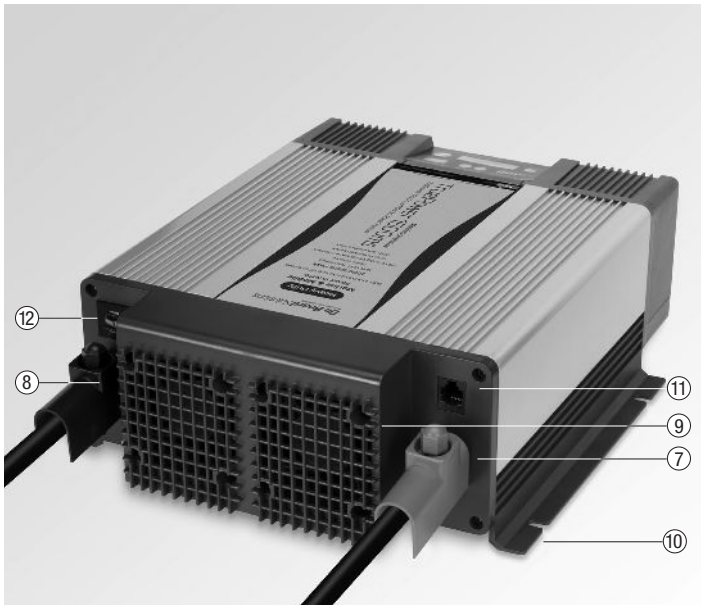
CAUTION
HOT SURFACES – TO REDUCE RISK OF BURNS DO NOT TOUCH WHILE IN SERVICE

TruePower Plus Overview

The above picture outlines the front of the TruePower Plus Inverter.
Please Reference Table below for features:

1. **USB Charge Port**
2. **AC Output**
3. **AC Input**
4. **Two 15A GFCI Protected AC Outlets** to power connected appliances.
5. **Ventilation Openings** provide air circulation for peak performance
6. **Ground Stud**

TruePower Plus Overview



The above picture outlines the back of the TruePower Plus Inverter.
The table below references the above numbered features of the back panel

7. **DC Input Cable** (Positive +)
8. **DC Input Cable** (Negative -)
9. **Fan Housings** keep clear 16 inches
10. **Mounting flanges** (Side)
11. **Remote Port** for simple remote with on / off switch and power and fault LED
12. **GFCI Breaker**

TruePower Plus Inverter Modes

The TruePower Plus Inverter has 3 distinct modes which allow you to tailor the inverter behavior to your specific needs:

Pass-through Mode (LCD display is off):

Pass-through mode is indicated by only AC being lit on the display panel. All other LEDs are off.

- In pass-through mode up to 30A of shore power can be passed through the inverter.
- In this mode if the shore power is interrupted the inverter will not convert DC to AC to keep the loads on.
- DC draw from the batteries is lowest in this mode (<5 ma); which makes this ideal for long term storage.

Stand-by Mode (LCD display is on)(Output supplied by station power, fast transfer to inverting when needed):

Stand-by mode is indicated by both AC and the LCD display being illuminated on the display panel.

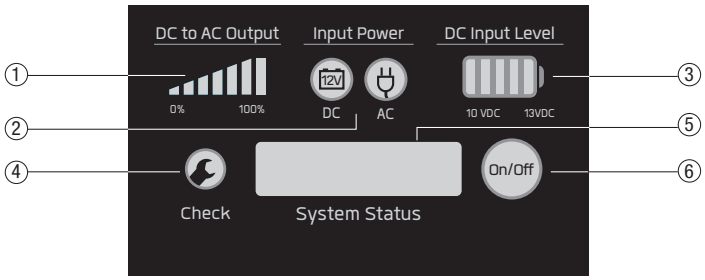
- Power for the loads connected to the inverter comes from shore power.
- In the event of power interruption the inverter will switch automatically to inverting mode to keep the loads on. This is ideal for loads like computers where a power dropout could cause lost data.
- DC draw from the batteries is <1A in this mode; which may discharge batteries if they do not have an external source of charge.

Inverting Mode:

Inverting mode is indicated by 12V DC and LCD display being illuminated on the display panel.

- Power for the loads is supplied by the attached batteries.
- The unit will automatically switch back to standby mode if AC power becomes present.

TruePower Plus Display Overview



		Inverter Mode		
		Inverting Output generated from DC	Standby Output supplied by shore (fast transfer to batteries if needed)	Pass-through
1.	DC to AC Output	The LED graph shows the percentage of the inverters total DC to AC conversion capability (0 to 100%). The final LED turns red when the unit is overloaded.	Off	Off
2.	Input Power	12V DC	AC	AC
3.	DC Input Level	When the input DC voltage is below 11 VDC, the first LED is lit red. From 11 to 13 VDC, the LEDs are lit green and incrementally indicate the battery level.		Off
4.	Wrench Symbol	The wrench symbol illuminates red when the inverter is in fault condition.		Off
5.	System Status	The System Status LCD screen shows the status of the inverter. When the inverter is running normal, the LCD indicates “SYSTEM NORMAL”. If a fault condition occurs, the LCD screen turns red and display an error message.		Off
6.	On / Off button	Pushing the button will change to pass-through mode		Pushing the button will change to Standby/Inverting mode

System Status Fault Modes

All faults conditions are accompanied by a 2 second on / off tone.

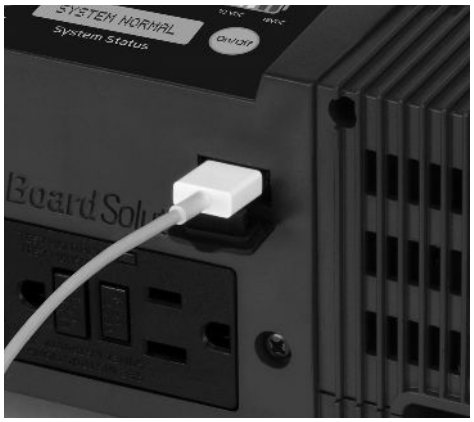
Fault Name	Explanation
LOW DC ALARM	Illuminates red when the DC Input level is below 10.5 VDC
LOW DC SHUTOFF	Illuminates red when the DC Input level is below 10.0 VDC
HI DC SHUTOFF	Illuminates red when the DC Input level is above 15.5 VDC
HI TEMP SHUTOFF	Illuminates red when the internal temperature is above 65 degrees Celsius
OVERLOAD SHUTOFF	Illuminates red when the output power is > 105%

TruePower Plus Remote

The remote allows the user to remotely view inverter status. The blue AC plug symbol indicates when the inverter is running from AC shore power. The green 12V battery symbol indicates when the inverter is running from DC power. The wrench symbol illuminates red when the inverter is in fault condition. The button toggles between pass-through and Standby/Inverting modes.

USB Charge Port

The USB port on the front panel provides power (5 VDC, 2.1 ADC) to USB connected devices. The port can provide power when the inverter is running from DC power or AC shore power. When the port is not in use, be sure the rubber dust cover is sealed over the port.



Preparing for Installation

⚠ **WARNING:** This device is not ignition protected, risk of fire or explosion

This equipment contains components that could produce arcs or sparks. To reduce the risk of fire or explosion, do not install this equipment in compartments containing batteries, flammable materials or fumes, or in a location containing gasoline-powered machinery, or joints, fittings, or other connections between components of the fuel system.

⚠ **WARNING:** Do not mount the inverter above or below your batteries.

⚠ **WARNING:** Electrical shock and fire hazards

On Board Solutions recommends all wiring be done by qualified personnel. Disconnect all AC and DC power sources to prevent accidental shock. Disable and secure all AC and DC disconnect devices and automatic generator starting devices. It is the installer's responsibility to ensure compliance with all the applicable installation codes and regulations.

⚠ **WARNING:** Installation precaution

The TruePower Plus Inverter should be mounted on a flat horizontal surface or a vertical surface. In no case should the front or rear end caps be facing in an upward or downward position. This allows proper ventilation and product safety of the unit as intended by design.

⚠ **WARNING:** Fire hazard

Do not cover or obstruct the ventilation openings. Do not install this equipment in a compartment with limited airflow; Overheating may result.

⚠ **WARNING:** Risk of fire or explosion

⚠ **WARNING:** Low voltage - electrical burn and spark hazard.

Disconnect battery power before servicing.

NOTE: This unit requires a large amperage draw from a DC battery when in inverter mode. Care must be taken during installation to provide properly sized cables from the battery to the inverter. Cable runs must be as short as possible and of the appropriate size and type. See the Installation section for more details.

Installation Recommendations and Requirements Include the Following:

American Boat and Yacht Council (ABYC)

The Canadian Electrical Code (CEC)

Canadian Standards Association (CSA)

The U.S. National Electrical Code (NEC)

RV Industry Association (RVIA)

Required Tools and Materials

You will need the following to install the inverter unit:

- Two 7/16" box wrenches (1000-1500 watt models)
- Two 1/2" box wrenches (2000 watt models)
- Wire strippers
- Phillips-head screwdriver
- Flat-head screwdriver
- Properly sized DC cabling
- Mounting hardware

Inverter Unit Location

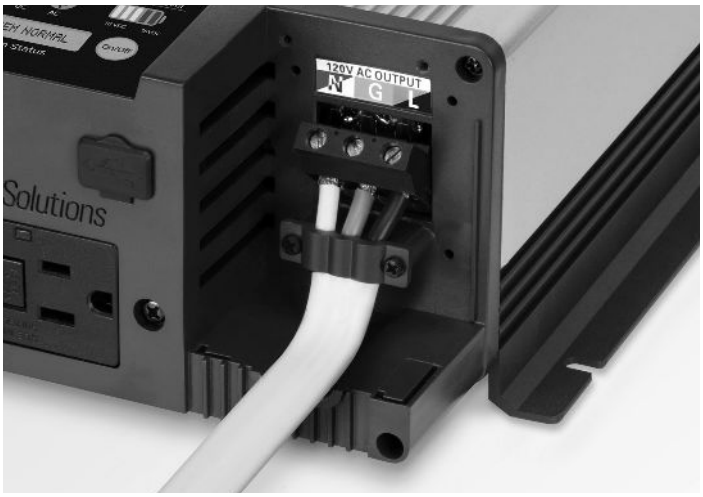
NOTE: On Board Solutions highly recommends that this unit be installed by a Certified Electrical Technician. Guidance from ABYC E-11 AC & DC Electrical Systems and ABYC A-31 Battery Chargers & Inverters is offered throughout this manual to ensure a safe, trouble free installation. Please re-read the PERSONAL PRECAUTIONS section of this manual prior to installation.

This unit must be located in a cool, dry, well ventilated area, free from unsecured hardware. Temperature is also a serious consideration. Do not mount this unit in an engine compartment or areas where temperatures will exceed 40° C (104° F).

In addition, the following should be considered when choosing a location:

1) Locate inverter unit away from battery in a separate, well ventilated compartment.
2) Placement of the remote status panel - A length of communications cable is provided for remote-location of the status/on/off panel. Ensure the cable is long enough to reach the desired location (generally in proximity to the main panel board) and avoid any area where it can be damaged.
3) Service - Remember, there are items on this unit that should be routinely checked (connections, LED Status Center) to ensure that there is ample room to address these issues. Also consider space to adequately swing a standard wrench.
4) Cable Routing - Large DC cables and over current protection (fuses/circuit breakers) will be located in proximity to this unit. Choose a location as CLOSE AS POSSIBLE to the DC battery bank serving the unit. This will provide optimum performance for the unit and keep cable sizes smaller. Location of the AC power is less critical than the DC supply. More information on cable sizing follows.

MOUNTING - This unit must be mounted securely to an appropriate surface (e.g. plywood bulkhead, cored fiberglass hull structure) and through-bolted if possible.



AC Wiring Options

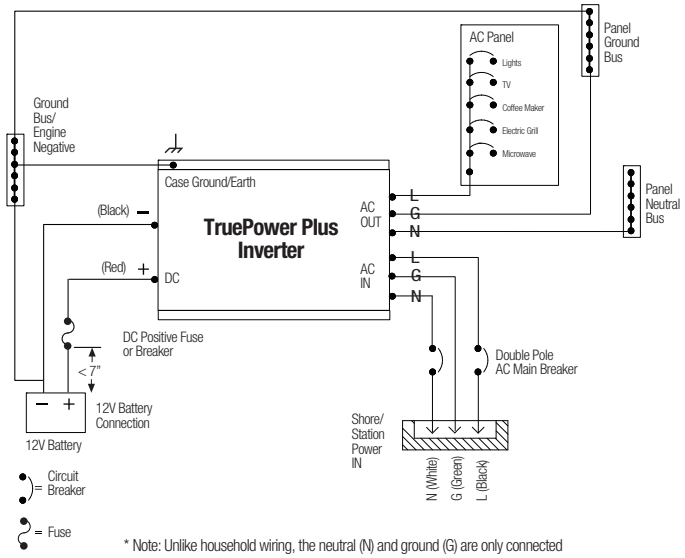
Installation Diagrams

WARNING - AC Installations have the potential to cause serious injury or death. Installations should be performed by an ABYC Certified Electrical Technician to ensure a safe and trouble free installation.

Depending on the appliances and loads that are intended to be powered by the TruePower Plus Inverter, there are essentially 2 installation options:

1) TRANSFER TO ALL LOADS – This scenario allows the entire AC panel board to be powered by the TruePower Plus Inverter. This is the simplest installation for an existing AC panel board. This scenario enables the user to choose what will be powered by the TruePower Plus Inverter. Energizing the entire panel may overload the unit depending on the size and the load requested. The diagram below provided from ABYC found in A-31 battery chargers and inverters

Advantages - Multiple loads from the existing panel board can be chosen, the user is not locked into set loads. This may require more trial and error to determine which loads the TruePower Plus Inverter can run.

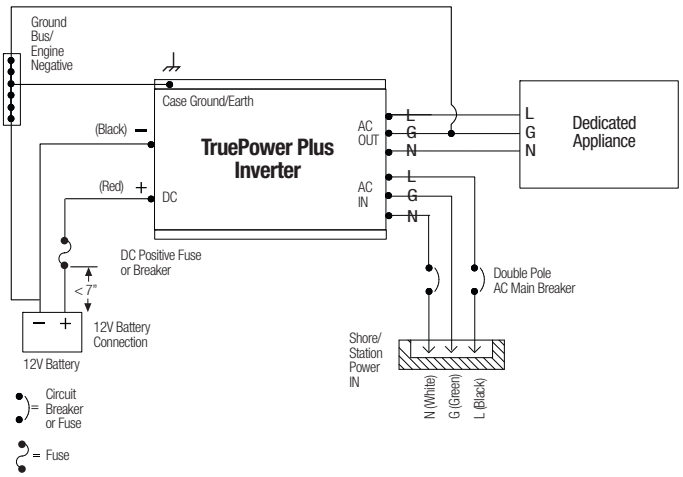


* Note: Unlike household wiring, the neutral (N) and ground (G) are only connected together at the SOURCE of power, either inverter or shore/station power. The TruePower Plus transfer switch maintains this wiring scheme automatically.

AC Wiring Options (Continued)

2) DEDICATED APPLIANCE - This scenario is becoming popular with items like air conditioning units and refrigerators where the load of the appliance and the rating of the inverter are matched. With this type of installation, the inverter is dedicated to only one load, whether in invert or pass-through mode.

Advantages - With this installation type there is never an issue with overloading of the inverter capacity.



* Note: Unlike household wiring, the neutral (N) and ground (G) are only connected together at the SOURCE of power, either inverter or shore/station power. The TruePower Plus transfer switch maintains this wiring scheme automatically.

Installation

STOP!

BEFORE INSTALLING YOUR INVERTER READ AND FOLLOW THE BELOW CHECKLIST:

✓ Begin with the power switch and main shore/station power breaker in the off position.

✓ Ensure that all overcurrent protection (e.g. fuses and/or circuit breakers) are ready for use, not blown or tripped. Use great care to ensure the polarity of the DC connections are correct or damage will result to your inverter.

✓ Verify all connections are tight, corrosion free and of good integrity.

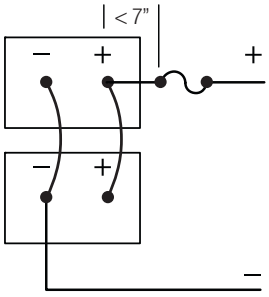
⚠ DO NOT OPERATE THIS UNIT WITHOUT THE EARTH CONNECTION ATTACHED.

The earth conductor is permitted to be 1 common size smaller than the DC positive (+) conductor (Example: DC += 2 AWG, Earth = 4 AWG)

12 Volt DC Battery Source- On Board Solutions minimum recommended battery or battery bank is 200 Ahr. Batteries can be a single battery or multiple batteries in parallel. Batteries connected in parallel boost amp hours while maintaining voltage.

Tapping each battery as shown balances the load of the battery.

Parallel batteries illustrated:



Parallel Batteries (12V) for a 12V Bank
(Increases the Amp/Hr Capacity)

Installation (Continued)

INSTALLATION MATERIALS – CABLING

⚠ Use great care to ensure the polarity of the DC connections are correct or damage will result to your inverter.

1) DC Cables - The DC portion of the TruePower Plus Inverter requires a large amount of amperage in Inverter mode. Cable size and length is of extreme importance and should be well thought out and planned per this manual before beginning installation. Items to consider are as follows:

a. Cable Size - Size is based on amperage draw of the unit compared to the maximum amperage a cable can carry based on ABYC E-11.On Board Solutions recommends NO MORE THAN a 10% drop in voltage from source (battery) to the TruePower Plus unit or a cable run not longer than 5 feet.

The following table outlines the cable size based on a 5' out and 5' back (10' round trip cable run).

Recommended cable sizes (Based on UL 1426 105° C jacket temperature rating & a class T fuse)

Wattage	12 VDC Amp Draw	5' Length Cable Size (AWG) 12V*	Recommended Fuse	DC Stud Size
1000	100A	4	150A	1/4"
1200	120A	2	175A	1/4"
1500	150A	1	200A	1/4"
2000	200A	00	250A	3/8"

b. Termination - Larger DC cables require specialty tools to ensure proper termination with ring terminals. Pre-terminated cable kits can be purchased through On Board Solutions or your local marine supply store. Cable type is as important as size. Cables must be acceptable under ABYC E-11 AC & DC Electrical Systems on Board Boats (types such as UL 1426 Boat Cable and SAE J1127 Battery Cable are common and marked as such)

c. Connection - The ring terminal must be directly on the battery terminal surface of the DC studs on the TruePower Plus Inverter, followed by the washer and nut with a torque of **10-15 foot-pounds**. The use of a dielectric or anti-oxidant paste is recommended once the cables have been connected.

d. Strain Relief- Install proper strain relief within 6" of inverter to prevent weight and vibration of large cables from damaging the inverter.

e. Installing DC Safety Fuse: Install fuse in positive (+) cable within 7" of battery. See above table for recommended fuse

⚠ DO NOT ATTEMPT CABLE TERMINATION BY MEANS OTHER THAN PROPER CRIMPING, WITH A PROPERLY CALIBRATED TOOL. SOLDER AND AUTOMOTIVE REPAIR TYPE BATTERY TERMINALS ARE NOT ACCEPTABLE. USE OF ANY OF THESE TYPES OF TERMINATIONS WILL RESULT IN PREMATURE, UNWARRANTIED FAILURE OF THE TRUEPOWER UNIT.

2) AC Cables – AC Cables should be UL 1426 Boat Cable, per ABYC E-11. This type of cable is readily available in both 2 and 3 conductor. Size is based on the maximum amperage to be passed through the cable and unlike DC does not take into account the length of the cable run and voltage drop. The table below indicates the proper size for AC Cables.

a. AC Connections - Screw terminal blocks have been provided to connect the input and output AC cables.

Shore/station power Service	Cable Size (AWG) 105° C Insulation
30 amp	10

Operation

Inverter Power On and Off

When AC shore power is provided to the AC input of the inverter, the unit operates in pass-through mode. When AC shore power is not present, the unit will switch over to inverter mode. In this mode, the AC output can turned on or off by pressing the ON/OFF button on the display panel. With the remote feature, the inverter can be turned on or off remotely as well. See page 7 for a detailed explanation of the modes.

GFCI Testing

To test the GFCI, start by plugging a load such as a lamp into the outlet. Press the TEST button to shut power off to the load. If the load turns off, then this part of the test is a pass. Next, press the RESET button. If power is restored to the load, then this test is a pass and verifies the functionality of the GFCI.

Operating the Inverter within the Load Range

Load Type Precautions

Resistive Loads – Be careful with resistive loads that generate heat (toasters, electric stoves, etc.). Due to the high current drawn by these loads, a typical battery bank would be drained very quickly. Therefore, it would impractical to run the inverter with these types of loads for an extended period of time.

Motor Loads – Use caution with the type of motor that you connect the inverter. Induction motors require a much higher startup current than their running current. Since motors vary in their characteristics, it is best to test the motor load on the inverter. If the motor does not start or loses power, the inverter should be turned off and the motor removed. If the motor startup current is too high, the inverter will turn itself off.

Important Notice: FCC Class B Part 15 Notification

NOTE: 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 when the equipment is operated in a commercial environment. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at their own expense. If in a residential setting you are encountering interference with TV and Radio reception while NOT in inverter mode, then: simply disconnect AC power from the TruePower Plus Inverter to confirm if this unit is causing the interference, if so explore the following options to minimize interference:

1) Make sure your AC connections include a proper ground connection
2) Reposition your receiving antenna
3) Purchase a separate AC line filter
4) Relocate the affected appliance so it is further separated from the TruePower Plus Inverter

This equipment has been designed to comply with:

- American Boat & Yacht Council A-31 Battery Chargers and Inverters
- FCC Class B
- Underwriters Laboratories: Standard 458 Power Converter/Inverter Systems for Land Vehicles and Marine Crafts
- Certified to CSA STD. C22.2 No. 107.2

Maintenance

Battery Maintenance

Periodically, check the batteries to make sure they are good condition. Check the terminals for corrosion and clean them with a wire brush if necessary. If the batteries are flooded lead-acid, check the electrolyte levels every month and top off with distilled water if needed. Finally, check the battery voltage in accordance with the manufacturer's specifications.

Inverter Maintenance

Little maintenance is needed to keep the TruePower Plus Series inverter running properly. To keep the unit running optimally, you should:

- Wipe the unit's exterior with a damp cloth to clean off dust buildup.
- Check that the DC cables are securely connected and the fasteners are tight.
- Clear the ventilation holes of dust buildup.
- The GFCI outlet must be tested monthly. See page 18 for proper GFCI testing procedure.

Troubleshooting

WARNING
ELECTRICAL SHOCK HAZARD
Do not disassemble the TruePower inverter. It does not contain any serviceable parts and attempting to service the unit could result in an electrical shock or burn.

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

How to Troubleshoot Common Fault Conditions

This section details how to troubleshoot the TruePower Plus Series Inverter. Follow the process below to narrow down the cause of unit fault conditions. Go through this process before contacting customer service.

1. Check for any fault messages on the unit display screen. If a fault message is displayed, note it down before proceeding further.
2. Note the conditions around the time the fault condition occurred. Record the following details:
   - Battery voltage at the time of failure
   - How many watts the inverter was putting out
   - Extreme environmental factors (ambient temperature, vibrations, moisture, etc.)
3. If no fault messages are displayed, check the installation:
   - Is inverter properly mounted and located in a clean, dry, adequately ventilated environment?
   - Is the battery in good condition?
   - Are the DC and AC cables properly sized, in good condition, and have clean and tight connections?
   - Have any circuit breakers tripped?
   - Have any fuses blown?
4. When steps 1 through 3 have been completed, contact customer service for further troubleshooting. Be prepared to provide information surrounding the unit failure as well the unit model and serial number.

Fault Message	Condition	Action
LOW DC ALARM	Battery voltage has fallen below 10.5 V +/- 0.5 V	- Check battery voltage and recharge if needed - Check for proper DC cable sizing - Check for loose connections and tighten if needed - Charge batteries to clear fault
LOW DC SHUTOFF	Battery voltage has fallen below 10.0 V +/- 0.5 V and inverter output is shutoff	- Check battery voltage and recharge if needed - Check for proper DC cable sizing - Check for loose connections and tighten if needed - Charge batteries to clear fault
HI DC SHUTOFF	Battery voltage is above 15.5 V +/- 0.5 V and inverter output is shutoff	- Check for other DC inputs, such as an over voltage alternator, and disconnect if needed - Decrease input voltage to clear fault
HI TEMP SHUTOFF	Inverter internal temperature is above > 65 C and inverter output is shutoff	- Reduce the loads connected to the unit AC output. - Check for proper ventilation to the unit and remove any obstructions - Check the ambient temperature and move the unit to a cooler location if possible - Push button twice to clear fault
OVERLOAD SHUTOFF	Inverter output is greater than 105% and is shutoff	- Reduce the loads connected unit AC output - Check for loads that have a high surge & remove if needed - Push button twice to clear fault

Specifications

TruePower Plus Model	1000	1200	1500	2000	2000
Continuous Output Power	1000 Watts	1200 Watts	1500 Watts	2000 Watts	2000 Watts
Surge Rating	2000 Watts	2400 Watts	3000 Watts	4000 Watts	4000 Watts
Output Waveform	Pure Sine	Modified Sine	Modified Sine	Modified Sine	Pure Sine
Dimensions	12.4" x 9.9" x 4"	11.5" x 9.9" x 4"	12.4" x 9.9" x 4"	14.2" x 10.7" x 4.4"	15.5" x 10.7" x 4.4"
Weight	8 lbs	7 lbs	7 lbs	11 lbs	11lbs
DC Input					
Operational Voltage Range	11.0 - 15.0 VDC				
Nominal Voltage	12.5 VDC +/- 0.5 V				
High Voltage Shutdown	15.5 VDC +/- 0.5 V				
Low Voltage Shutdown	10.0 VDC +/- 0.5 V				
Low Voltage Alarm	10.5 VDC +/- 0.5 V				
Low Voltage Recovery	12.0 VDC +/- 0.5 V				
Reverse Polarity Protection	Via internal fuse (not end user serviceable)				
System Off/LCD Off Drain	< 5 ma				
System Standby/LCD On	< 1 Amp				
AC Output					
Output Voltage	115 VAC +/- 10 V				
Output Frequency	60 Hz +/- 3 Hz				
Pass-through Voltage Range	100 – 130 VAC				
Pass-through Current	30 A RMS				
Transfer Time	< 30 mS				
Efficiency	> 90 %				
Integrated GFCI Duplex Outlet	15 A Circuit Breaker Overload /				
Over Temperature Manual	AC re-power to recover Recovery				
Short Circuit Recovery	Shutoff output voltage, auto recover when short is removed				
USB Output					
Voltage	5 VDC +/- 5%				
Current	2.1 ADC				
Environmental Specifications					
Operating Temperature	0 - 40 C				
Storage Temperature	-20 to 60 C				
Operating Humidity	10 - 90% non-condensing				
Storage Humidity	10 - 95% non-condensing				

TRUEPOWER PLUS - TWO YEAR LIMITED FACTORY WARRANTY

Each product is guaranteed against defects in material and workmanship to the original consumer in normal use for two full years from the date of purchase. On Board Solutions at its discretion will repair or replace free of charge any defects in material or workmanship.

The following conditions apply:

- Warranty is calculated from date of manufacture if not registered within two weeks of sale.
- Water intrusion will damage unit and void warranty.
- Reverse polarity connection will damage unit and void warranty
- Warranty void if damage occurs due to negligent repairs.
- Customer is responsible for returning the product to On Board Solutions. Inbound shipping costs must be prepaid.
- This warranty does not cover blemishes due to normal wear and tear or damages caused by accidents, abuse alterations or misuse.

Purchase or other acceptance of the product shall be on the condition and agreement that On Board Solutions SHALL NOT BE LIABLE FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES OF ANY KIND. (Some states do not allow the exclusion or limitation of consequential damages, so the above limitations may not apply to you.) This warranty is made in lieu of all other obligations or liabilities on the part of Onboard Solutions. Additionally, On Board Solutions neither assumes nor authorizes any person for any obligation or liability in connection with the sale of this product.

This warranty provides to you specific legal rights and you may also have other rights, which vary from state to state. This warranty is in lieu of all other, expressed or implied.