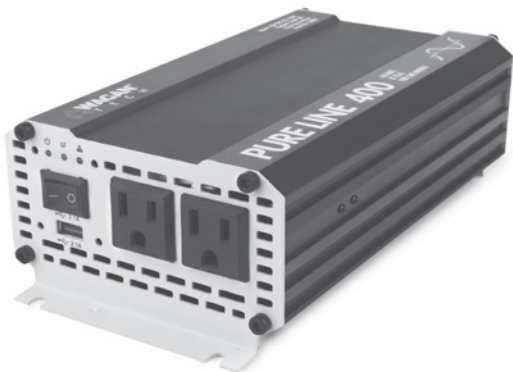


PURE LINE 400



User's Manual

INTRODUCTION

Thank you for purchasing the Wagan Tech® Pure Line 400 Pure Sine Wave DC to AC Power Inverter. Read and understand this manual before installing and operating this inverter. Keep this manual for future use.

It delivers a true AC sine wave identical to that of commercial power. Use this inverter to power AC appliances in your vehicle. Pure Sine Wave AC means that your sensitive electronics, such as audio/video systems, computers, and communications equipment will operate properly. Furthermore, appliances with motors operate cooler, quieter, and more efficiently when they are powered by pure sine wave AC.

The inverter is powered from 12 volt DC and it will continuously deliver 400 watts AC power at 115 volts, 60 Hz. Superior surge capability of 800 watts allows the inverter to start most difficult motorized appliances. Advanced microprocessor-controlled circuits run cooler and are more reliable than competing units. The Pure Line 400 operates at high efficiency (up to 90%), that results in long run time and extended battery life compared to other inverters with this level of power output. A 2.1A USB power port provides a convenient way to power USB devices, including tablets, e-readers, smartphones, and other mobile electronics.

The Pure Line 400 comes with a separate ground terminal typically found on higher capacity units. This terminal helps to reduce the noise caused by power conversion when using radio frequency devices.

The DC terminals have been designed with protective covers to minimize the risk of accidental shortage when handling the DC cables. This inverter bonds neutral to ground, just like utility power. The enclosure vents have been minimized to reduce the risk of pest intrusion in arid tropical climates.

This inverter has added safety features including ETL certification (UL458, CSA 22.2), conformal coating to protect circuits from dust and moisture, ground fault protection, and DC terminal protection.

The Wagan Pure Line 400 Pure Sine Wave Inverter is an indispensable addition to your compliment of mobile power equipment. With minimal care and proper treatment, it will provide years of reliable service.

SPECIFICATIONS

Output waveform	Pure sine wave
Input	12V DC
Output	115V AC
TrueRated Power™	400W (24-hour continuous)
Peak surge	800 watts
Maximum efficiency	90%
Frequency	60Hz
Total harmonic distortion (THD)	< 3%
No load current draw	< 0.6A
Battery low alarm	10.5V ± 0.5V DC
Battery low shutdown	10.0V ± 0.5V DC
Over voltage shutdown	16.5V ± 0.5V DC
Cooling fan	Thermally controlled
AC output sockets	2 North American standard
USB power port	2.1A, 5V
Power output control	AC On/Off Switch
Dimensions	9.3 × 4.7 × 2.8 in.
Net weight (approximate)	2.7 lb
Included DC cable with ring connectors	36 in., 11 AWG

* All specifications are typical at nominal line, half load, and 77 °F (25 °C) unless otherwise noted. Specifications are subject to change without notice.

WARNING

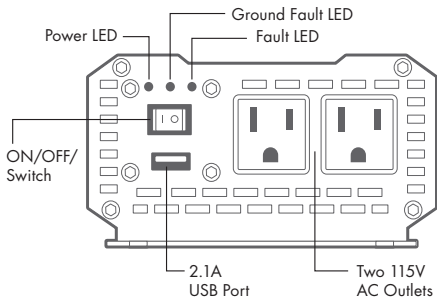
⚠ INVERTER OUTPUT CAN BE LETHAL. IMPROPER USE OF THIS INVERTER MAY RESULT IN PROPERTY DAMAGE, PERSONAL INJURY OR LOSS OF LIFE.

- Keep the inverter away from any direct heat source or combustible materials.
- Keep well ventilated—this device generates heat.
- Keep this inverter in a dry environment.
- Do not operate any equipment over 400 watts.
- This inverter is designed to operate from a 12 volt DC power source only.
- Do not attempt to connect the inverter to any other power source, including any AC power source.
- Incorrect battery polarity will damage the inverter and void the warranty.
- Do not open the inverter; there are no user serviceable parts inside.

DISPOSAL/RECYCLING OF INVERTER

Electronic products are known to contain materials that are toxic if improperly disposed. Contact local authorities for disposal and recycling information.

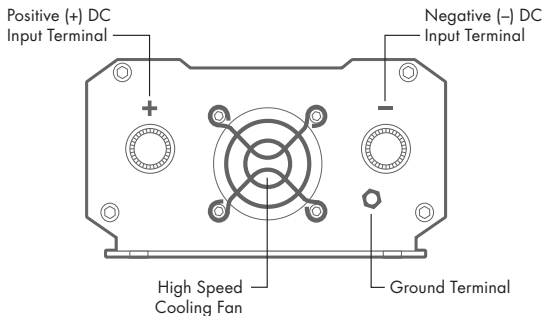
FRONT PANEL



- **ON/OFF Switch** — This switch controls AC output of the inverter.
- **Power LED (Green)** — When this green LED is lit, the inverter is operating normally.
- **Ground Fault LED (Yellow)** — When the yellow LED is lit, the ground fault circuit has been activated. Shut down the inverter and restart.
- **Fault LED (Red)** — The RED indicator turns on as the inverter shuts down due to overheating, overload, under voltage, or over voltage.
 - Immediately turn off all AC appliances if the FAULT LED is lit. Allow the inverter to cool before continuing. Make sure that the ventilation vents are not blocked.

- If an inverter shutdown was preceded by a buzzing sound, there may be an excessive load in combination with a low voltage or cable problem.
- Normal operating range is 11V to 15V DC.
- USB Power Port — This power port can supply 5 volts at 2.1A for charging or powering tablets, e-readers, smartphones, and other small electronic devices.
- Audible Alarm (internal to the inverter) — When the Audible Alarm makes a buzzing sound, the inverter senses a low battery condition. The user should reduce the AC load, charge the battery, and check the DC cable for excessive losses.

REAR PANEL



- Positive Terminal — Positive (+) DC Input (Red)
- Negative Terminal — Negative (-) DC Input (Black)
- Cooling Fan — High-speed and temperature controlled
- Ground Terminal — For attaching an insulated safety ground wire. This safety wire is for protecting personnel if there is an unlikely failure in either the cabling or enclosure insulation. Grounding the inverter enclosure ensures personnel safety should a DC cable problem occur. During the installation procedure, the Ground Terminal is connected either to a vehicle chassis or to the negative DC terminal of the battery. Do not directly connect this ground connection to the negative DC terminal of the inverter. Use an insulated 10 gauge wire to make the ground connection. If the inverter installation is located in fixed location, the safety wire can be connected to earth's ground.

LOAD CONSIDERATIONS

The startup load of an appliance is a major factor of whether this inverter can power it. This initial load is only momentary. With many appliances, it is approximately twice the continuous load, but some appliance startup loads can be as high as eight times the continuous load.

The inverter will automatically shut down in the event of an output overload so there is no danger of damaging either the inverter or the equipment. When the red LED indicator is lit, the inverter is signaling a fault.

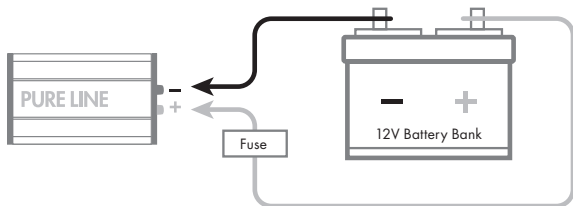
SETTING UP THE BATTERY BANK

Batteries that are used indoors or inside a vehicle or vessel, should be deep-cycle, sealed lead acid batteries.

NOTE: It is important that for any inverter installation to battery protection fuses. Battery fuses are added to the positive (+) battery cable as close as possible to the battery bank's positive terminal. The fuse amperage rating must be sized to allow simultaneous operation of all the AC appliances to be powered, plus 20 percent safety factor. Fuses are very important to protect equipment, batteries, and personnel. The fuses protect against battery explosion if the cables that connect to the inverter accidentally short.

BATTERY BANK DIAGRAM

The diagram below shows inverter connections to a battery bank with recommended fuse protection.



⚠ WARNING—EXPLODING BATTERIES!!

Exploding batteries can spray molten lead, hot sulfuric acid, and other metal, and plastic fragments. Batteries that are charging or under high discharge rates produce explosive hydrogen gas into the surrounding area. Be safe—fuse the battery bank and make sure the batteries are properly ventilated.

CONNECTING THE INVERTER



Installation procedure:

1. Mount the inverter in a secure location. If the inverter is to be mounted on a wall, mount it horizontally. Make sure that the front and rear of the inverter has free air flow.
2. Make sure the cables are the proper gauge and have the fuse holder as close to the battery bank's Positive (red) terminal.
3. Install the fuse in the Positive (red) cable.
4. Make sure the Power Switch located on the front panel of the inverter is in the Off position.
5. Locate the ground lug terminal on the inverter. Connect an insulated 10 gauge copper wire to the terminal. The other end of the ground wire is connected to a "proper" grounding point. Use the shortest practical length of wire. Connect this wire to the chassis of your vehicle or to the grounding system in your boat. In a city, the ground wire can connect to a metal cold water pipe that goes underground. In remote locations, the ground wire can be connected to an "earth ground". This can be an attachment to a foot long copper clad metal rod driven into the ground. In the unlikely event of a short circuit, operating the inverter without proper grounding can result in electrical shock. Do not directly connect this ground wire to the Negative (black) DC Terminal of the inverter. As an alternative grounding connection, use the Negative (black) terminal of the battery.

NOTE: Crimp-on ring terminals are required on all cable ends. The cable ends need to be stripped of insulation for 1/2 inch before crimping on ring terminals. Select a crimp terminal size to fit the gauge cable and inverter and battery terminal connectors. After crimping make sure that the cable connectors are secure on the cables so there are no loose connections.

6. Remove the terminal covers from the inverter. Slide the cable through the correct terminal cover.
7. Connect the Negative (black) cable end to the inverter terminal and battery Negative Terminal. Make sure you have good, secure connections.
8. Recheck and make sure the DC cable fuse is installed in the fuse holder.

CAUTION: Making an initial connection between the positive cable end and the inverter's positive terminal may cause a spark. This is a normal and is a result of capacitors in the inverter starting to charge. Because of the possibility of sparking, it is extremely important that both the inverter and the battery bank be positioned away from any source of flammable fumes or gases. Failure to heed this warning can result in fire or explosion. Do not make the positive terminal connection immediately after the batteries have been charging. Allow time for the battery gasses to vent to outside air.

9. Attach the positive cable to the Positive DC connector on the battery and then the inverter. Make sure the connections are tight and secure.
10. Turn on the inverter from the Front Panel Power Switch "I"
11. Make certain that the green Operating LED is lit and the FAULT LED indicator is not lit.
12. Turn Off "O" the inverter. The Fault LED may briefly "flash". This is normal. The audible alarm may also sound a short "chirp". This is also normal.
13. When you have confirmed that the appliance to be operated is turned off, plug the appliance into one of the two AC outlets on the front panel of the inverter.
14. Turn the inverter on.

15. Turn the appliance on. The appliance should begin working.

16. Observe the LED indicators for normal operation.

Note: If an extension cord is used from the inverter to the appliance, limit the extension cord length to 100 feet or less. Make sure that the cord is safety approved and AWG 14 or greater to carry the appliance load. Remember that extension cords are for temporary use.

⚠ WARNING: THERE IS DANGER OF EXPLOSION. DO NOT CONNECT OR DISCONNECT INVERTER CABLES DIRECTLY AFTER BATTERY DISCHARGE OR RECHARGE—MAKE SURE THAT THE BATTERY BANK AREA IS WELL VENTED BEFORE ATTACHING OR REMOVING CABLES.

OPERATING ISSUES: TELEVISION AND AUDIO EQUIPMENT SUGGESTIONS.

Although all inverters are shielded and filtered to minimize signal interference, some interference with your television picture may be unavoidable, especially with weak signals. However, here are some suggestions that may improve reception.

- Make sure that the television antenna produces a clear signal under normal operating conditions (i.e. plugged into a standard 110V/115V AC wall outlet). Also ensure that the antenna cable is of good quality and properly shielded.
- Sometimes vehicle alternators produce some electrical noise. There are filters available to mount on the alternator to reduce the noise.
- Change the positions of the inverter, antenna cables, and television power cord.
- Isolate the television, its power cord, and antenna cables from the 12 volt power source by running an extension cord from the inverter to the television.

TROUBLESHOOTING

PROBLEM: Low or No Output Voltage – Fault LED Lit

Reason	Solution
Poor contact with battery, inverter terminals.	Clean terminals thoroughly. Reinstall and tighten.

PROBLEM: Inverter Auto Shut Down – Fault LED Lit

Reason	Solution
Battery voltage is below 10.0 volts.	Charge or replace battery.
Inverter is too hot (thermal shut down mode).	<ul style="list-style-type: none"> • Allow inverter to cool. • Check for adequate ventilation. • Reduce the load on the inverter to the specified TrueRated™ power max output.

PROBLEM: Inverter Shut Down – Fault LED Lit

Reason	Solution
Equipment being operated draws too much power.	Do not use the equipment with this inverter; use a higher wattage inverter.

PROBLEM: No AC Output – Yellow Ground Fault LED Lit

Reason	Solution
Ground fault is unintended AC current that is flowing to ground. It can be caused by faulty wiring, bad insulation, very long wiring, and sparking appliances.	Turn inverter OFF (O) to reset it, then to ON (I). IF the inverter immediately shuts off, disconnect each appliance or wiring until the inverter will stay on after reset. Examine the wiring or appliance for unintended connections. Repair or replace as necessary.

Pure Line 400 by Wagan Tech®

PROBLEM: Continuous Buzzing Sound

Reason	Solution
Input voltage is below 10.5 volts.	Keep input voltage above 10.5 volts.
Poor or weak battery condition.	Recharge or replace battery.
Poor or loose cable connection.	Inspect terminals and tighten all connections.
Inadequate power being delivered to the inverter or excessive voltage drop.	Use heavier gauge DC cables. Keep cable length as short as possible.

Rely on premium batteries & power sources
by Wagan if you're looking for quality and efficiency.