

Owner's Manual

PowerVerter®

Ultra-Compact DC-to-AC Inverters

PV150, PV375, PV500 & PV600



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Congratulations! Your new PowerVerter Inverter will give you years of reliable, carefree service. Use it to convert DC (battery) power into 110-120V AC (household) power to run a variety of electronics: notebook computers, game systems, battery chargers, small TVs/VCRs and more! The Inverter's PWM (Pulse Width Modulated) sinusoidal wave is suitable for almost all loads.

Safety



Important Safety Instructions! Save These Instructions!

This manual contains important instructions and warnings that should be followed during the installation, operation and storage of all Tripp Lite Inverters.

Warning!

- Do not use a Tripp Lite PowerVerter Inverter in life support or healthcare applications where a malfunction or failure of a Tripp Lite PowerVerter Inverter could cause failure or significantly alter the performance of a life support device or medical equipment.
- Do not operate your Inverter near flammable materials, fumes or gases.

Feature Identification

- 1 Lighted ON/OFF Switch:** move to ON ("I") position to power connected equipment; switch will illuminate. Move to OFF ("O") position to stop powering connected equipment.
 - 2 AC Outlet(s):** accept 120V AC equipment you would normally plug into a wall outlet.
 - 3 DC Fuse(s)** (externally mounted on PV150 and PV375; internally mounted on PV500 and PV600): protect vehicle battery from damaging overload. If fuse blows, replace with standard automotive fuse of equal amperage. CAUTION: installing non-rated fuses could cause equipment damage and void your warranty.
 - 4 Vehicle Lighter/Accessory Plug (PV150 & PV375 only):** connects to a standard 12V DC vehicle lighter/accessory outlet.
 - 5 DC Power Terminals (PV500 & PV600 only):** directly connect to your battery terminals with user-supplied cables. Always loosely twist each pair of cables (one positive and one negative) together.
 - 6 Cooling Fan (PV375, PV500 & PV600 only):** maintains internal cooling.
 - 7 Ultra-Compact, Lightweight Metal Case**
 - 8 Mounting Flanges (PV500 & PV600 only):** provide fixed mounting, if desired. Install and tighten four user-supplied screws through mounting flanges and into a rigid horizontal surface. Mount Inverter before DC battery connection.
- Low Battery Alarm (internal, not shown):** detects low voltage and shuts down Inverter to preserve vehicle battery. If alarm sounds, turn Inverter OFF and run engine to recharge battery.
- Overload Alarm (internal, not shown):** detects wattage overload on Inverter outlets and shuts down Inverter as a protective measure. If alarm sounds, turn Inverter OFF and reduce wattage load (by unplugging high-wattage devices).

Caution!

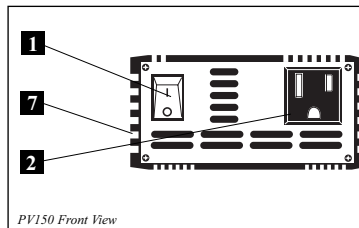
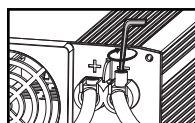
- Since the Inverter requires adequate ventilation during operation, do not block fan or cooling vents or cover the Inverter, and do not operate near vehicle heating vents or in direct sunlight. Keep the Inverter dry at all times and disconnect when not in use.
- Since the Inverter case will get hot (130° - 140° F) during continuous extended use, use care when handling it. Do not place it near surfaces or materials affected by this level of heat.
- Turn OFF connected equipment before starting your engine. DO NOT plug a surge suppressor, line conditioner or UPS system into the Inverter. If you attach AC extension cords, use the heaviest practical gauge.
- Before connecting a battery charger or adapter, check its manual to make sure that the Inverter's specifications (including output waveform) fall within its recommendations.

Operation

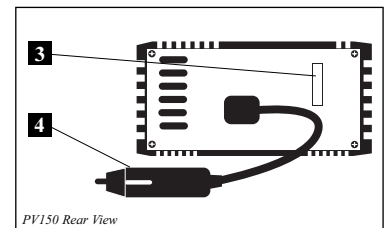
Step 1 (PV150 & PV375 models): Plug Inverter into vehicle lighter/accessory outlet.

Step 1 (PV500 & PV600 models): First mount inverter, if desired. With user-supplied cables,* connect the Inverter's negative DC terminal directly to your battery's negative terminal; connect the Inverter's positive DC terminal through a UL-listed fuse and fuse block** and directly to your battery's positive terminal. Always loosely twist each pair of cables (one positive and one negative) together. CAUTION! Observe proper polarity. Reversed polarity will blow the PV500's and PV600's internal fuses. To access internal fuses, disconnect equipment and battery from the PV500 or PV600. Then unscrew and remove end panels to access fuses. Replace blown fuses with an equal number of new fuses of the same type and amperage. Replace end panels and screws.

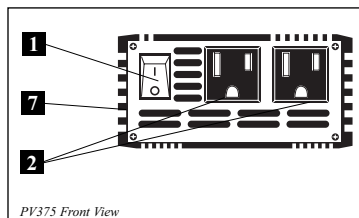
Tighten your Inverter's and battery's DC terminals to approximately 2.25 Newton-meters (1.85 foot lbs.) of torque to create an efficient connection and to prevent excessive heating at this connection. Insufficient tightening of the terminals could void your warranty. It is recommended that you solder cable ends and insulate the terminals at the battery. WARNING! Do not connect your



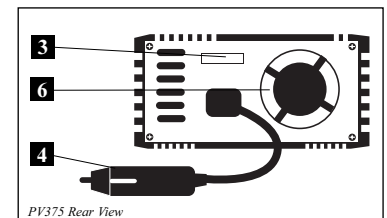
PV150 Front View



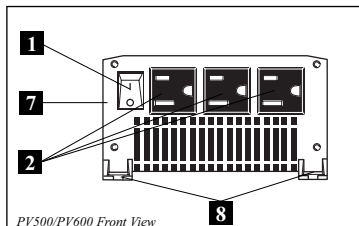
PV150 Rear View



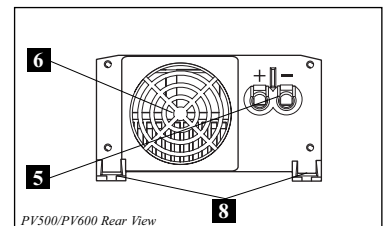
PV375 Front View



PV375 Rear View



PV500/PV600 Front View



PV500/PV600 Rear View

Inverter directly to output from an alternator rather than a battery or battery bank.

* The PV500's and PV600's output is limited by the length and gauge of user supplied cables. See cable sizing guide on back page. Shorter and heavier gauge cable maximizes output (especially important when operating heavy draw equipment). An excellent source of cables are battery jumper cables. ** Required by NEC article 551. Mount within 18 inches of the battery.

Step 2: Turn on Inverter.

Step 3: Plug equipment into the Inverter.

Determine your equipment's total wattage.* Do not connect more watts than your Inverter's Output Power (Maximum Continuous Watts) rating either 150, 375, 500 or 600, see *Specifications*. See back page for typical equipment runtimes. Also see back page for important note concerning the limitations of vehicle electrical systems.

* Wattage ratings are usually listed in equipment manuals or on nameplates. If your equipment is rated in amps, multiply that number times AC utility voltage to determine watts (Example: a ¼ in drill requires 2½ amps. 2½ amps × 120 volts = 300 watts)

Important! Alarms and automatic shutdown are normal safety functions of this inverter, indicating either outlet overload or low vehicle battery voltage.

If alarm sounds and/or the inverter has shut down and will not turn on . . .

- Check inverter connections
- Reduce wattage load
- Run engine to recharge battery
- Toggle ON/OFF switch on and off 3 to 4 times, ending in the on ("I") position

Maintenance & Service

Your Inverter requires no maintenance and contains no user-serviceable parts (except for replaceable DC fuses). If returning your Inverter to Tripp Lite, please pack it carefully using the ORIGINAL PACKING MATERIAL that came with the unit. Enclose a letter describing the problem. If the Inverter is within the warranty period, enclose a copy of your sales receipt. To obtain service you must obtain a Returned Material Authorization (RMA) number from Tripp Lite or an authorized Tripp Lite service center.

Limited Warranty

Tripp Lite warrants its Inverters to be free from defects in materials and workmanship for a period of 1 year (domestic) or 120 days (export) from the date of initial purchase. Tripp Lite's obligation under this warranty is limited to repairing or replacing (at its sole option) any such defective products. To obtain service under this warranty you must obtain a Returned Material Authorization (RMA) number from Tripp Lite or an authorized Tripp Lite service center. Products must be returned to Tripp Lite or an authorized Tripp Lite service center with transportation charges prepaid and must be accompanied by a brief description of the problem encountered and proof of date and place of purchase.

This warranty does not apply to equipment which has been damaged by accident, negligence or misapplication or has been altered or modified in any way, including opening of the unit's casing for any reason. This warranty applies only to the original purchaser who must have properly registered the product within 10 days of purchase.

EXCEPT AS PROVIDED HEREIN, TRIPP LITE MAKES NO WARRANTIES, EXPRESS OR IMPLIED, INCLUDING WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. Some states do not permit limitation or exclusion of implied warranties; therefore, the aforesaid limitation(s) or exclusion(s) may not apply to the purchaser.

EXCEPT AS PROVIDED ABOVE, IN NO EVENT WILL TRIPP LITE BE LIABLE FOR DIRECT, INDIRECT, SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES ARISING OUT OF THE USE OF THIS PRODUCT, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE. Specifically, Tripp Lite is not liable for any costs, such as lost profits or revenue, loss of equipment, loss of use of equipment, loss of software, loss of data, costs of substitutes, claims by third parties, or otherwise.

Tripp Lite has a policy of continuous improvement. Specifications are subject to change without notice.

Troubleshooting

Please check the following before sending the Inverter in for service:

| Symptom | Problem | Correction |
|---|--|--|
| Alarm sounds. | Low battery voltage (<10.5 V). | Turn Inverter OFF and run engine to recharge vehicle battery. |
| | Output overload. | Turn Inverter OFF and remove overload by unplugging high-wattage devices. Load should not exceed your Inverter's maximum continuous output power (see Specifications). |
| Inverter does not turn ON when power switch is turned ON. | Automatic Inverter shutdown due to low battery voltage (<10V). | Turn Inverter OFF and run engine to recharge vehicle battery. |
| | Automatic Inverter shutdown due to output overload. | Turn Inverter OFF and remove overload by unplugging high-wattage devices. Load should not exceed your Inverter's maximum continuous output power (see Specifications). |
| | Blown fuse. | Replace fuse with standard automotive fuse of identical amperage (see Specifications). |
| Inverter is unable to power connected equipment. | Battery running low. Low battery voltage reduces Inverter power output. | Turn Inverter OFF and run engine to recharge vehicle battery. |
| | Connected equipment load exceeds Inverter's maximum continuous output power. | Turn Inverter OFF and remove overload by unplugging high-wattage devices. Load should not exceed your Inverter's maximum continuous output power (see Specifications). |
| Connected equipment experiences audio/video distortion. | Loose connections. | Check and secure all connections. |
| | Audio/video interference. | Reposition equipment antennas and Inverter. |

Specifications

| Model: | PV150 | PV375 | PV500 | PV600 |
|---|------------------------|------------------------|-----------------------------|-----------------------------|
| Output Power (Maximum Continuous Watts):* | 150 | 375 | 500 | 600 |
| Output Power (Peak Watts):** | 300 | 600 | 1000 | 1000 |
| Input Voltage (DC): | 12V nominal (10-15V) | 12V nominal (10.5-15V) | 12V nominal (10-15V) | 12V nominal (10-15V) |
| Output Voltage (AC)/Frequency: | 120V / 60 Hz. nominal | 120V / 60 Hz. nominal | 120V / 60 Hz. nominal | 120V / 60 Hz. nominal |
| Output Waveform: | PWM Sine Wave | PWM Sine Wave | PWM Sine Wave | PWM Sine Wave |
| Low Battery Voltage Alarm (Volts): | 10.5V | 10.5V | 10.5V | 10.5V |
| Low Battery Voltage Shutdown (Volts): | 10V | 10V | 10V | 10V |
| AC Outlets: | 1 | 2 | 3 | 3 |
| Circuit Protection (DC Overload): | 20-amp fuse (external) | 40-amp fuse (external) | Two 40-amp fuses (internal) | Two 40-amp fuses (internal) |

* Maximum output power (continuous or peak) only available when vehicle battery is properly charged. Run vehicle engine often to maintain proper charge. ** Peak Output Power is instantaneous. The policy of Tripp Lite is one of continuous improvement. Specifications are subject to change without notice.

Typical Runtimes Before Battery Recharge

Although you can operate your Inverter with your vehicle engine off, best results are usually attained with the engine running. Since the Inverter converts electrical energy (and doesn't produce it), the Inverter's performance is relative to the condition of your vehicle's electrical system (battery, alternator and wiring). If other loads (air conditioner, heater, lights, etc.) are also using power, you may get less runtime.

| | With Typical Compact Vehicle (4 cylinder) Battery, Alternator & Wiring | With Typical Mid-Size Vehicle (6 cylinder) Battery, Alternator & Wiring | With Typical Full-Size Vehicle (8 cylinder) Battery, Alternator & Wiring |
|-----------------------------------|--|---|--|
| Model: PV150 | | | |
| 1/2 Load (engine on/engine off) | continuous/4-6 hours | continuous/6-8 hours | continuous/8-12 hours |
| Full Load (engine on/engine off) | continuous/2-3 hours | continuous/3-4 hours | continuous/4-6 hours |
| Model: PV375 | | | |
| 1/2 Load (engine on/engine off) | continuous/1-2 hours | continuous/2-3 hours | continuous/3-6 hours |
| Full Load* (engine on/engine off) | continuous/30 min-1 hour | continuous/1-2 hours | continuous/2-3 hours |
| Models: PV500 & PV600 | | | |
| 1/2 Load (engine on/engine off) | continuous/not recommended | continuous/1 hour | continuous/2 hours |
| Full Load (engine on/engine off) | 1-2 hours/not recommended | 2-4 hours/not recommended | continuous/1 hour |

* If vehicle wiring is adequate. See "Vehicle Electrical System Limitations" at right.

Minimum Recommended Cable Sizing Chart (PV500 & PV600 only)

Choose the correct wire gauge based on your equipment's wattage load. Always loosely twist each pair of cables (one positive and one negative) together.

| Watts | Wire Gauge | | | | |
|-------|-----------------|--------|------------|--------|---------|
| | 10 ga. | 8 ga. | Two 10 ga. | 6 ga. | 4 ga. |
| 100 | 24 ft. | 36 ft. | 48 ft. | 56 ft. | 100 ft. |
| 200 | 12 ft. | 18 ft. | 24 ft. | 28 ft. | 48 ft. |
| 300 | 8 ft. | 12 ft. | 16 ft. | 20 ft. | 30 ft. |
| 400 | 6 ft. | 10 ft. | 12 ft. | 14 ft. | 24 ft. |
| 500 | not recommended | 8 ft. | 10 ft. | 12 ft. | 18 ft. |
| 600 | not recommended | 6 ft. | 8 ft. | 10 ft. | 15 ft. |

Note: acceptable power is directly related to cable length (i.e.: the shorter the cable, the better the performance).

Vehicle Electrical System Limitations

NOTE: Due to the limitations of certain vehicles' 12V DC lighter/accessory outlet electrical systems, you may not be able to continuously run a full load (375 watts) from PV375 models. If you regularly blow fuses, it may indicate your vehicle is not adequately wired to support a PV375 as it is designed. In this case, consult vehicle manufacturer recommendations for rewiring from the fuse block or battery with appropriate wiring (10 - 12 gauge) and fusing (at least 40 amp). All standard vehicle accessory outlet electrical systems can support full loads for PV150 models without any modifications.