

NPowerTM



1000W Pure Sine Inverter

Item Number# 31908

OWNER'S MANUAL



TO REDUCE THE RISK OF INJURY, USER MUST READ AND UNDERSTAND THIS INSTRUCTIONAL MANUAL. THIS MANUAL CONTAINS IMPORTANT INFORMATION REGARDING THE OPERATION AND WARRANTY OF THIS PRODUCT. PLEASE RETAIN FOR FUTURE REFERENCE.

About this Guide

Purpose

The purpose of this Owner's Guide is to provide explanations and procedures for operating, installing, maintaining, and troubleshooting the 1000W Pure Sine Inverter.

Scope

The guide provides safety guidelines, as well as information about operating, installing, and troubleshooting the inverter. It does not provide details about particular brands of batteries. You need to consult individual battery manufacturers for this information.

It is recommended that qualified installers such as licensed technicians and electricians should handle installation. Qualified installers 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.

Audience

The Guide is intended for users and operators of 1000W Pure Sine Inverter.

Conventions Used

The following conventions are used in this guide.

WARNING

Warnings identify conditions that could result in personal injury or loss of life.

CAUTION

Cautions identify conditions or practices that could result in damage to the unit or other equipment.

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

TABLE OF CONTENTS

| | |
|---------------------------------------|----|
| 1. IMPORTANT SAFETY INSTRUCTIONS..... | 2 |
| 2. INTRODUCTION..... | 4 |
| 3. FEATURES..... | 6 |
| 4. INSTALLATION..... | 9 |
| 5. OPERATION..... | 15 |
| 6. TROUBLESHOOTING..... | 20 |
| 7. SPECIFICATIONS..... | 22 |
| 8. WARRANTY..... | 23 |

1. IMPORTANT SAFETY INSTRUCTIONS

IMPORTANT: READ AND SAVE THIS OWNER'S MANUAL FOR FUTURE REFERENCE.

 **WARNING: Shock, fire, and heat hazard. Risk of injury to persons**

1. Do not expose the 1000W Pure Sine Inverter to rain, snow, spray, or bilge water. To reduce risk of fire hazard, do not cover or obstruct the ventilation openings. Overheating may result.
2. To avoid a risk of fire and electric shock, make sure that wiring is in good condition, adequately rated, and not undersized. Do not operate the 1000W Pure Sine Inverter with damaged or substandard wiring.
3. Do not operate the 1000W Pure Sine Inverter if it has received a sharp blow, been dropped, or otherwise damaged in any way. If the 1000W Pure Sine Inverter is damaged, see the Warranty section.
4. Do not disassemble the 1000W Pure Sine Inverter. It contains no user-serviceable parts. See Warranty for instructions on obtaining service. Attempting to service the 1000W Pure Sine Inverter yourself may result in a risk of electrical shock or fire. Internal capacitors remain charged after all power is disconnected.
5. To reduce the risk of electrical shock, disconnect DC power from the 1000W Pure Sine Inverter before attempting any maintenance or cleaning or working on any circuits connected to the unit. Turning off controls will not reduce this risk.

Precautions When Working with Batteries

WARNING: Explosion or fire hazard

1. Follow all instructions published by the battery manufacturer and the manufacturer of the equipment in which the battery is installed to reduce the risk of battery explosion.
2. Working in the vicinity of lead-acid batteries is dangerous. Batteries generate explosive gases during normal operation. Therefore, you must read this guide and follow the instructions exactly before installing or using your 1000W Pure Sine Inverter.
3. This equipment contains components which tend to produce arcs or sparks. To prevent fire or explosion, do not operate the 1000W Pure Sine Inverter in compartments containing batteries or flammable materials, or in locations that require ignition-protected equipment. This includes any space containing gasoline-powered machinery, fuel tanks, as well as joints, fittings, or other connections between components of the fuel system.
4. Make sure the area around the battery is well ventilated.
5. Never smoke or allow a spark or flame near the engine or batteries.
6. Use caution to reduce the risk of dropping a metal tool on the battery. It could spark or short circuit the battery or other electrical parts and could cause an explosion.
7. If you need to remove a battery, always remove the ground terminal from the battery first. Make sure all accessories are off so you don't cause a spark.

WARNING: Risk of personal injury due to burns or battery acid

8. Remove all metal items, such as rings, bracelets, and watches when working with lead-acid batteries. Lead-acid batteries produce a short circuit current high enough to weld metal to skin, causing a severe burn.
9. Have someone within range of your voice or close enough to come to your aid when you work near a lead-acid battery.
10. Have plenty of fresh water and soap nearby in case battery acid contacts skin, clothing, or eyes.
11. Wear complete eye and clothing protection. Avoid touching your eyes while working near batteries.
12. 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.

Failure to follow these safety guidelines will result in personal injury and/or the damage to the unit. It may also void the warranty.

2. INTRODUCTION

Thank you for purchasing the 1000W Pure Sine Inverter. As a high-quality, true sine wave output inverter, you can expect exceptional performance and years of dependable operation. The pure sine wave AC output from the inverter ensures all AC loads operating from the unit perform efficiently and correctly. Since these loads were designed to operate from true sine wave voltage, you can expect these loads to operate the same as if operating from grid/utility supplied power. In some cases, the true sine wave output from the inverter is even superior to the power supplied by your utility company. To get the most out of your 1000W Pure Sine Inverter, carefully read and follow the instructions in this guide.

Quality Power

The 1000W Pure Sine Inverter is a professional-quality, mid-range inverter designed to handle a variety of applications including compact microwaves, TVs, VCRs, coffee makers, lamps, and small power tools.

- The 1000W Pure Sine Inverter provides optimal continuous power (900 W), making it ideal for large single loads, intermittent loads, or multiple smaller loads.
- The inverter's high surge capability (up to 2000 W) lets you handle many hard-to-start loads, including large TVs, refrigerators, and freezers.
- The unit's low standby battery demand means you don't have to worry about excessive drain on your battery if you leave the inverter on for a few days. When the inverter is on but no power is being supplied to a load, the inverter draws less than 0.6 A from the battery.

Ease of Use

- Superior features and rugged durability have been combined with extreme ease of use:
- The unit is compact, lightweight, and easy to install.
- You can power loads directly from the AC receptacles on the front panel.
- Easy-to-read digital display on the front panel lets you monitor system performance at a glance.
- The optional remote ON/OFF switch lets you control the inverter from a convenient location—up to 20' (6 m) away—while the inverter itself is mounted out of sight and close to the batteries.

- A convenient USB port powers all modern electronic products.

Comprehensive Protection

The 1000W Pure Sine Inverter is equipped with numerous protection features to guarantee safe and trouble-free operation:

| | |
|-------------------------------|--|
| Low battery voltage alarm | Alerts you if the battery has become discharged to 11 V or lower. |
| Low battery voltage shutdown | Automatically shuts the inverter down if the battery voltage drops below 10.5 V. This feature protects the battery from being completely discharged. The unit recovers automatically once the battery voltage reaches above 11.6 V DC. |
| High battery voltage shutdown | Shuts the inverter down automatically if the input voltage rises to more than 15.5 V. The unit recovers automatically once the battery voltage falls below 15.5 V DC. |
| AC output overload shutdown | Shuts the unit down automatically if a short circuit occurs or if the loads attached to the inverter exceed the operating limits. |
| Over temperature shutdown | Turns the inverter off if its temperature rises above an acceptable level. |

3. FEATURES

The following information describes the main features of the 1000W Pure Sine Inverter. We recommend that you familiarize yourself with these features before installing and operating the unit.

Materials List

Your 1000W Pure Sine Inverter package includes these items:

- 1000W Pure Sine Inverter unit
- Owner's Manual
- Remote control panel mounting brackets
- The 1000W Pure Sine Inverter can also be installed with a remote ON/OFF switch that comes with a 20' (6 m) cable

If any of these materials are missing or are unsatisfactory in any way, please call the toll-free helpline: 1-800-222-5381.

Optional Accessory

Two battery cables with connectors

For ordering information, please call the toll-free helpline: 1-800-222-5381.

Please reference the part number above when ordering.

Front Panel Details



Figure 1: 1000W Pure Sine Inverter Front Panel

1. **Green LED**—Indicates DC input voltage.
2. **Yellow LED**—Indicates that the consumption of the loads of your device is over 1000 W. When AC output power exceeds 1050 W – 1400 W, the over load shutdown will act.
3. **Red LED**— It indicates that the consumption of the loads which the inverter receiving power to is under 1000 W.
4. **USB Port**— Powers and charges USB-enabled devices.
5. **Remote Switch Port**— Use to connect the optional remote ON/OFF switch via a communication cable.
6. **Digital Display**—Shows input voltage (in volts), output power (in kilowatts and watts), and error code information. The allowed power tolerance is 15% (with loads of over 200 W), and the allowed voltage tolerance is +/- 0.2 V (no load).
7. **Power Switch Button**— Turn the inverter ON or OFF.
8. **AC Outlets**— Equipped with three AC outlets. They allow you to plug in 115 V AC products with a total continuous of 1000 W or less.



Figure 2 1000W Pure Sine Inverter View Panel

- 9. Cooling Fan and Ventilation Openings**— The high speed cooling fan protects the inverter from over-heating. Ventilation openings should be kept clear!
- 10. Positive (+) DC terminal**— Accepts ring connectors appropriate to the cable size being used.
- 11. Negative (-) DC terminal**—Accepts ring connectors appropriate to the cable size being used.

4. INSTALLATION

Follow all instructions from this guide and instructions including safety guidelines from the battery manufacturer. Installing battery cables require some electrical knowledge and local electrical codes.

WARNING

If you do not have some electrical knowledge or awareness of local electrical codes or are not comfortable installing cables yourself, ask a qualified installer including a licensed technician and electrician. Qualified installers 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.

Basic Installation Steps

1. Determine battery capacity.
2. Determine a charging system.
3. Choose a location.
4. Mount the inverter.
5. Connect the battery cables.

Determine Battery Capacity

Battery type and battery size strongly affect the performance of the 1000W Pure Sine Inverter. Therefore, you need to identify the type of loads your inverter will be powering and how much you will be using them between charges. Once you know how much power you will be using, you can determine how much battery capacity you need. We recommend that you purchase as much battery capacity as possible.

CAUTION: Risk of inverter damage.

The 1000W Pure Sine Inverter must only be connected to a battery that has a nominal output of 12 V. The 1000W Pure Sine Inverter will:

- **Not operate** if connected to a 6 V battery
- **Be damaged** if connected to a 24 V battery.

Determine a Charging System

The charging system must be appropriate for your particular installation. A well-designed charging system will ensure that power is available when

you need it and that your batteries remain in top condition. Inadequate charging will degrade system performance and the wrong type of charger will reduce battery life.

For a list of Battery Chargers, please call the toll-free helpline:
1-800-222-5381.

Choose a Location

CAUTION: Risk of inverter damage.

The 1000W Pure Sine Inverter contains components that tend to produce arcs or sparks. To prevent fire or explosion, do not install the inverter in compartments containing batteries or flammable materials or in locations that require ignition-protected equipment.

CAUTION: Risk of inverter damage.

Do not install the 1000W Pure Sine Inverter in a wet environment or in any other environment where moisture can occur and enter the inverter interior through the ventilation openings. This unit is not intended for marine applications.

WARNING

To reduce the risk of fire, do not cover or obstruct the ventilation openings. Do not install the 1000W Pure Sine Inverter in a zero-clearance compartment. Overheating may result.

Installation

| | Description |
|------------------------------|--|
| Dry | Don't allow water or other liquids to drop or splash on the unit. |
| Cool | Ambient air temperature should be between -4°F and 104°F (-20°C - 40°C) (the cooler the better within this range). |
| Ventilated | Leave at least 2" (5 cm) of clearance around the unit for airflow. Ensure that the ventilation openings are not obstructed. |
| Safe | Do not operate the unit in the same compartment as batteries or in any compartment storing flammable liquids like gasoline. |
| Close to battery | Do not use excessive DC cable lengths: They increase wire resistance and reduce input power. |
| Protected from battery gases | Do not mount the inverter where it will be exposed to gases produced by the batteries. These gases are very corrosive and prolonged exposure will damage the inverter. |
| Clean | Do not operate the unit in an area that is prone to dirt, dust or debris. Especially important if used in a work environment. |

Mount the inverter

1. Select an appropriate mounting location and orientation. The unit can be oriented in any way, such as:

- Horizontally on a vertical surface or
- On or under a horizontal surface.

WARNING

DC connections should NOT point up or down.

2. Hold the inverter against the mounting surface and mark the positions using the mounting brackets as guide.
3. Pilot-drill the four mounting holes.
4. Fasten the inverter to the mounting surface using corrosion-resistant hardware.

Connect the Battery Cables

Important: Use of a qualified installer strongly recommended.

Because the 1000W Pure Sine Inverter has low-voltage, high-current input, low-resistance wiring between the battery and the inverter is essential to deliver the maximum amount of usable energy to your load.

To connect the battery cables:

1. Make sure the inverter is off and assemble the terminated cables (cables with connectors).
2. Line up the connectors that will join the cables to the battery.
3. Attach the connectors of the positive and negative cables into the cabling terminals of the inverter.

Note: Make a secure connection. Loose connectors cause excessive voltage drop and may cause overheated wires and melted insulation.

Note: The red terminal is positive (+) and the black terminal is negative (-).

Power connections to the 1000W Pure Sine Inverter must be positive to positive and negative to negative.

⚠ CAUTION: Risk of inverter damage due to reverse polarity.

A reverse polarity connection (positive to negative) will blow a fuse in the inverter and may permanently damage the unit. Damage caused by a reverse polarity connection is not covered by your warranty.

4. Attach the connector on the positive cable to the positive battery terminal.

⚠ WARNING: Risk of explosion or fire.

Do not complete the next step if flammable fumes are present. Explosion or fire may result. Thoroughly ventilate the battery compartment before making this connection.

5. Attach the connector on the negative cable to the negative battery terminal.
6. Note: This is the last cable connection. You may observe a spark when making this last connection.
7. Note: Make a secure connection. Loose connectors cause excessive voltage drop and may cause overheated wires and melted insulation.
8. Turn on the inverter.
9. Check the front panel of the inverter. The digital display should show 12–13 V, depending on the voltage of the battery. If it does not, check your battery and the connection to the inverter.

Note: This product does not include DC battery cables. DC battery cables sold separately.

5. OPERATION

Turning the Inverter On and Off

The power switch on the inverter's front panel turns the control circuit in the 1000W Pure Sine Inverter on and off.

To toggle the inverter on and off from its front panel:

1. Press the inverter's power switch button (for half a second) to turn on the inverter (from off).
2. Press the inverter's power switch button (for one second) to turn off the inverter (from on).

Note: When the inverter's power switch button is off, the inverter draws no current from the battery.

 **WARNING: Risk of electrical shock.**

When turned off, the unit's power switch does not disconnect power from the 1000W Pure Sine Inverter.

Operating Several Loads at Once

If you are going to operate several loads from the 1000W Pure Sine Inverter, turn them on separately after you have turned the inverter on. This will ensure that the inverter does not have to deliver the starting current for all the loads at once.

Turning the Inverter Off Between Charges

When the power switch is on but no power is being supplied to a load, the inverter draws less than 0.6 A from the battery. This is a low current draw. It would take a week to discharge a 100 Ah battery at this current, so you don't have to worry about excessive drain on your battery if you leave the

inverter switched on for a few days.

If you are not planning to recharge your battery within a week or so, switch the inverter off.

Reading the Front Panel Indicators

Indicator LEDs

- If the Green LED is on, it indicates that the unit is on. Under normal operating conditions, the AC outlets and USB port have power.
- If the Red LED is on, it indicates that the consumption of the loads which the inverter transmitting power to is under 1000 W.
- If the Yellow LED is on, it indicates that the consumption of the loads which the inverter transmitting power to is over 1000 W.

Digital Display

- Under normal operating conditions, the digital display shows the input voltage (in volts) and the output power (in kilowatts and watts).
- Under error or alarm conditions, the digital display shows an error code.

Description of LED and Digital Display Codes

| LED | Digital display | Description |
|--------|-----------------|---------------------------|
| Green | 13.5 | Example: 13.5 V |
| Yellow | 1.00 | Example: 1.00 Kw (1000 W) |
| Red | 500 | Example: 0.5 Kw (500 W) |
| | LUP | Low voltage alarm |
| | LUP | Under voltage shutdown |
| | OUP | Over voltage shutdown |
| | OLP | Over load shutdown |
| | OCP | Over temperature shutdown |
| | OPP | Short circuit |

Restarting After an AC Output Shutdown

1. Press the unit's power switch to turn it off.
2. Remove all AC loads or let the unit cool down for 15 minutes.
3. Press the unit's power switch to turn it on.

Operating Limits

The 1000W Pure Sine Inverter will deliver the following power continuously, depending on input voltage and ambient temperature.

The inverter will deliver more than 10% of its continuous power rating for approximately five minutes. The inverter must cool down for 15 minutes before it can resume operation above its continuous power rating.

| | | | | |
|----------------------------------|-------|---------|---------|---------------------|
| | Power | Current | Voltage | Temp. |
| 1000 Pure Sine Inverter | 900 W | 7.5 A | 13 V DC | Ambient 25°C (77°F) |

Input Voltage

The input voltage limits are shown in the following table.

| Operating condition | Voltage range | Comments |
|--|---------------------------|--|
| Normal | 11.0 V - 14.0 V | |
| Peak Performance | 13.0 V - 14.0 V | |
| Low voltage alarm | 11.0 ±0.3V | The audible low battery alarm sounds. |
| Low voltage shutdown | 10.5 ±0.3V | The unit shuts down to protect the battery from being over-discharged. |
| High voltage shutdown | Voltage is 15.5 V or more | The unit shuts down to protect itself from excessive input voltage. Note: Although the 1000W Pure Sine Inverter incorporates over-voltage protection, it can still be damaged if input voltage exceeds 16 V. |
| Unit restarts after low voltage shutdown | 11.6±0.3V | The unit will not restart unless the battery voltage is acceptable for running the load. |

Inverter Loads

The 1000W Pure Sine Inverter will operate many AC loads within its power rating. However, some appliances and equipment may be difficult to operate. Please see “Problem Loads” below carefully.

USB Loads

A lot of USB-powered devices such as portable music (MP3) players, mobile phones, and video game players can be charged and powered safely via the standard USB port. However, some devices such as portable GPS receivers and certain cameras may not work and may be damaged even if you use the USB cable that came with the product. Be sure that the device only accepts 5 V and can be charged or powered using other sources of power. See the device’s owner’s guide for specifications.

Problem Loads

Some induction motors used in freezers, pumps, and other motor operated equipment need high surge currents to start. The 1000W Pure Sine Inverter may not be able to start some of these motors even though their rated current draw is within the inverter’s limits. If a motor refuses to start, observe the VOLTS indicator while you are trying to start the motor. If the indicator drops below 11 V while the 1000W Pure Sine Inverter is trying to start the motor, this may explain why the motor won’t start. Make sure the length and connections are good and that the battery is fully charged. If the cables are sized correctly, the connections are good, and the battery is charged, but the voltage still drops below 11 V, you may need to use a larger battery.

Battery Charging Frequency

When possible, recharge your batteries when they are about 50% discharged or earlier. This gives them a much longer life cycle than recharging when they are almost completely discharged.

Routine Maintenance

Minimal maintenance is required to keep your 1000W Pure Sine Inverter operating properly. Periodically you should:

- Clean the exterior of the unit with a damp cloth to prevent the accumulation of dust and dirt.
- Tighten the screws on the DC input terminals.

6. TROUBLESHOOTING



WARNING: Electrical shock and burn hazard.

Do not dismantle the 1000W Pure Sine Inverter. It does not contain any user-serviceable parts. Attempting to service the unit yourself could result in an electrical shock or burn.

Troubleshooting Reference

| Problem | Possible Cause | Solution |
|---|---|--|
| LUP | Under-voltage (Low input shutdown) | Recharge the battery. Check if cables and connection are secure. |
| LUP | Poor DC wiring and/or poor battery condition) | Use proper cable and make secure connections. Charge the battery or install a new battery. |
| OUP | Over-voltage (high input) shutdown | Make sure the inverter is connected to a 12 V battery. |
| OLP | Overload shutdown | Reduce the load within the inverter's continuous power rating. |
| OCP | Over-temperature shutdown | Improve ventilation and make sure the inverter's ventilation openings are not obstructed. Reduce the ambient temperature, if possible. |
| OPP | Short circuit. | Check the AC wiring for a short circuit. |
| No output voltage; no voltage indication. | The unit is off. | Turn the inverter on. |
| | No power to the inverter. | Check wiring to the inverter. |
| | Inverter fuse is open. | Have a qualified service technician check and replace the fuse if necessary. |
| | Reverse DC polarity. | Have a qualified service technician check and replace the fuse, making sure to observe correct polarity. |

7. SPECIFICATIONS

Specifications are subject to change without prior notice.

AC Output

| | |
|----------------------------|------------------|
| Continuous power | 900 W |
| Peak power (5 minutes) | 1000 W |
| Surge power | 2000 W |
| AC output voltage range | 108 V – 125 V AC |
| Output frequency (nominal) | 60 ± 0.05 HZ |
| Output waveform | Pure sine wave |
| Efficiency | >85% |
| No load current draw | <0.6 A |

USB Output

| | |
|-----------|----------------|
| DC output | 5 V DC, 500 mA |
|-----------|----------------|

DC Input

| | |
|-----------------------------|------------------------------|
| DC input voltage range | 11.0 ±0.3V - 15.5 ± 0.5 V DC |
| Low battery alarm | Audible, 11 ± 0.3 V DC |
| Low battery shutdown | 10.5 ± 0.3 V DC |
| Low battery shutdown resume | 11.6 ± 0.3 V |
| High battery shutdown | 15.5 ± 0.5 V |
| Fuse | 25 A fuse ×5 |

Physical specifications

| | |
|-------------------------------------|---|
| Ambient operating temperature range | -4°F - 104°F -20°C - 40°C |
| Dimensions | 12 x 8 3/8 x 3 1/4" (30.5 x 21.3 x 8.3 cm) |
| Weight | 7 lb (3.2 kg) |

8.Warranty

The limited warranty program is the only one that applies to this unit, and it sets forth all the [NPower](#) responsibilities of . There is no other warranty, other than those described herein. Any implied warranty of merchant ability of fitness for a particular purpose on this unit is limited in duration to the duration of this warranty.

This unit is warranted, to the original purchaser only, to be free of defects in materials and workmanship for one year from the date of purchase without additional charge. The warranty does not extend to subsequent purchasers or users.

Manufacturer will not be responsible for any amount of damage in excess of the retail purchase price of the unit under any circumstances.

Incidental and consequential damages are specifically excluded from coverage under this warranty.

This unit is not intended for commercial use. This warranty does not apply to damage to units from misuse or incorrect installation/connection. Misuse includes wiring or connecting to improper polarity power sources.

RETURN/REPAIR POLICY:

If you are experiencing any problems with your unit, please contact our customer service department at 1-800-222-5381 before returning product to retail store. After speaking to a customer service representative, if

products are deemed non-working or malfunctioning, the product may be returned to the purchasing store with 30 days of original purchase. Any defective unit that is returned to manufacturer within 30 days of the date of purchase will be replaced free of charge. If such a unit is returned more than 30 days but less than one year from the purchase date, manufacturer will repair the unit or, at its option, replace it, free of charge. If the unit is repaired, new or reconditioned replacement parts may be used, at manufacturer's option. A unit may be replaced with a new or reconditioned unit of the same or comparable design. The repaired or replaced unit will then be warranted under the terms of the remainder of the warranty period. The customer is responsible for the shipping charges on all returned items.

LIMITATIONS:

This warranty does not cover accessories, such as adapters and batteries, damage or defects result from normal wear and tear (including chips, scratches, abrasions, discoloration or fading due to usage or exposure to sunlight), accidents, damage during shipping to our service facility, alterations, unauthorized use or repair, neglect, misuse, abuse, failure to follow instructions for care and maintenance, fire and flood.

If your problem is not covered by his warranty, call our Customer Service Department toll free at 1-800-222-5381 for general information if applicable.