

# Owner's Manual & Safety Instructions

Save This Manual Keep this manual for the safety warnings and precautions, assembly, operating, inspection, maintenance and cleaning procedures. Write the product's serial number in the back of the manual near the assembly diagram (or month and year of purchase if product has no number). Keep this manual and the receipt in a safe and dry place for future reference.

201

# CEN-TECH®

## 400 WATT CONTINUOUS/800 WATT PEAK POWER INVERTER



Visit our website at: <http://www.harborfreight.com>  
Email our technical support at: [productsupport@harborfreight.com](mailto:productsupport@harborfreight.com)

66814





When unpacking, make sure that the product is intact and undamaged. If any parts are missing or broken, please call 1-888-866-5797 as soon as possible.

### **⚠ WARNING**

Read this material before using this product. Failure to do so can result in serious injury. SAVE THIS MANUAL.

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No portion of this manual or any artwork contained herein may be reproduced in any shape or form without the express written consent of Harbor Freight Tools. Diagrams within this manual may not be drawn proportionally. Due to continuing improvements, actual product may differ slightly from the product described herein. Tools required for assembly and service may not be included.

## WARNING SYMBOLS AND DEFINITIONS

	This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.
 <b>DANGER</b>	Indicates a hazardous situation which, if not avoided, will result in death or serious injury.
 <b>WARNING</b>	Indicates a hazardous situation which, if not avoided, could result in death or serious injury.
 <b>CAUTION</b>	Indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.
<b>NOTICE</b> <b>CAUTION</b>	Addresses practices not related to personal injury.

# CEN-TECH®

## IMPORTANT SAFETY INFORMATION

### **WARNING**

**Read all safety warnings and instructions.**

*Failure to follow the warnings and instructions may result in electric shock, fire and/or serious injury. Save all warnings and instructions for future reference.*

### General Precautions

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1. People with pacemakers should consult their physician(s) before use. Electromagnetic fields in close proximity to heart pacemaker could cause pacemaker interference or pacemaker failure.
2. The warnings, precautions, and instructions discussed in this instruction manual cannot cover all possible conditions and situations that may occur. It must be understood by the operator that common sense and caution are factors which cannot be built into this product, but must be supplied by the operator.

## Installation Precautions

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- DO NOT INSTALL THIS INVERTER INTO A BUILDING'S ELECTRICAL SYSTEM. This inverter is a vehicular accessory. It is not designed to be safely used in a building's electrical system and has not been evaluated to meet building wiring codes. Improper application may create a fire or electric shock hazard.**
- To allow proper cooling, install in indoor well-ventilated area and do not cover ventilation openings or cooling fins. Do not install in engine compartment. **Especially avoid placing the Inverter on carpets and rugs; they are not only flammable, but they also obstruct vents underneath it.**
- Keep combustible materials and gasses away from the inverter. The inverter produces sparks and heat during operation and can start a fire.
- Connect to 12 VDC power supply only. A power supply with lower voltage will not operate the Inverter correctly, and higher voltage could damage the unit.
- Connect input polarity properly. Incorrect connection will damage inverter and void warranty.
- Do not use in a marine application.** This inverter is not intended to withstand the highly corrosive conditions in marine applications and would quickly be rendered inoperable or unsafe.
- Keep inverter dry and clean. Do not expose to rain, snow, spray, bilge water or dust.
- Install as close to DC source as possible, but not in a closed area with vented lead-acid batteries. Vented lead-acid batteries release explosive hydrogen gas that can be ignited by the inverter.
- Mount inverter horizontally.
- Verify that installation surface has no hidden utility lines before drilling or driving screws.
- This product is not a toy. Keep it away from children.
- Do not use with positive ground electrical systems. (Most automobiles, trucks, and RV's have negative ground systems.)
- The positive (+) battery on the Inverter must be the last connection made, and must be connected before the Inverter is turned on. There may be a small spark during the final connection. This is normal.
- Properly ground the inverter's case as explained in this manual.

## Battery Precautions

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1. **Wear splash-resistant ANSI-approved safety goggles and electrically insulated gloves while working near batteries.**
2. Charge, store, and maintain batteries according to supplier's instructions.
3. Locate batteries in a clean, well-ventilated area, away from ignition sources and flammable materials. Vented lead-acid batteries release explosive hydrogen gas while charging.
4. Only connect similar batteries together. Do not connect old and new batteries together, wet and gel cells together, or batteries of different capacities together.
5. **Use only 12 V batteries with this item.**
6. **Connect batteries in parallel ONLY (negative terminals together to one cable; positive terminals together to the other cable).**
7. **Install a properly rated fuse on the positive output of the battery bank.**

## Operation Precautions

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1. Multiple outlet power strips with switches and circuit breakers only interrupt power to the "hot" receptacle terminals. The "neutral" terminals remain powered with respect to the "ground" terminals. So strip switch may be off, but part of appliance may still be powered.
2. Inspect supply connections before use to ensure they are tight and that insulation is not damaged.
3. Do not use this inverter to power sensitive devices such as medical devices or computers. However, it may be used to charge a computer battery. Do not use in ignition protected areas.
4. Some rechargeable tools and appliances can damage the Inverter. Check the temperature of the device several times when it is charging. If the device becomes extremely hot; turn the power off, remove the device, and do not use with the Inverter again.
5. Check for breakage of parts and any other condition that may affect the Inverter's operation. If damaged, have it repaired before use.
6. Do not attempt to power a device, or combination of devices, that will require more than the rated output of this inverter. This may damage the inverter or the attached devices.
7. Appliances such as microwave ovens will normally draw more than their rated current. For example: A typical 600 watt microwave oven will draw approximately 1,000 watts.
8. Do not attach a battery charger if the charger carries a warning that dangerous voltages are present at the battery terminals.
9. Some fluorescent lamps may not operate properly with this type of inverter. If the bulb appears to be too bright, or fails to light, do not use the lamp with this inverter.
10. Some fans with synchronous motors may slightly increase in speed when powered by the inverter. This is not harmful to the fan or to the inverter.
11. Inverter will consume some power while on, even without loads attached. Turn inverter off after use.





## Service Precautions

-  Do not open housing. Contains no user-serviceable parts. Internal parts may be electrified, even with unit off and power disconnected.
- Maintain labels and nameplates on the Inverter. These carry important safety information. If unreadable or missing, contact Harbor Freight Tools for a replacement.
- Have your Inverter serviced by a qualified repair person using only identical replacement parts. This will ensure that the safety of the Inverter is maintained.**
- Fuses must be replaced with fuses of the same type and rating only.**



**SAVE THESE INSTRUCTIONS.**

## Symbology

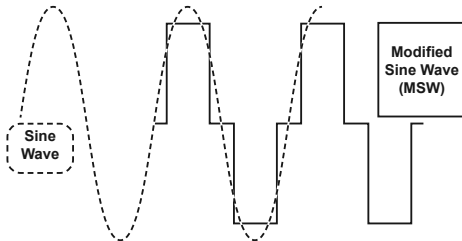
	Double Insulated		Direct Current Supply
<b>VAC</b>	Volts Alternating Current	<b>A</b>	Amperes
	Alternating Current Supply		Equipment Grounding Conductor

**CEN-TECH®**

## Specifications

Input Voltage	12 VDC (nominal)
Output Voltage	115 VAC / 60 Hz
Continuous Power	400 W
Surge Power	800 W
Operating Conditions	32° - 104° F
Receptacles	Two 3-prong grounded polarized AC outlets One 5 VDC 500mA USB outlet
Fuse Type	Two 25 Amp Internal Blade-type Fuses (professional replacement only)
Cables	Ø5mm x 23"

## Output Waveform



1. This inverter's output is a Modified Sine Wave. Power from most electric utilities is a Sine Wave.

**Note:** Only multimeters identified as "TRUE RMS" will read Modified Sine Wave voltage accurately.

2. **Modified Sine Wave (MSW)** power is suitable for most AC devices and power supplies used in electronic equipment, transformers, and motors. Do not use to power sensitive devices such as medical equipment or computers. Some audio equipment may perform poorly if run on Modified Sine Wave power.
3. **Sine Wave** inverters provide power that is identical to, or even better than, the power supplied by your power company. Motors start easier and run cooler under Sine Wave power. Certain devices, such as laser printers, variable speed motors and digital clocks, require sine wave power to operate properly. Sine wave inverters are typically more expensive for their capacity than other inverters.

# Installation



Read the **ENTIRE IMPORTANT SAFETY INFORMATION** section at the beginning of this manual including all text under subheadings therein before set up or use of this product.



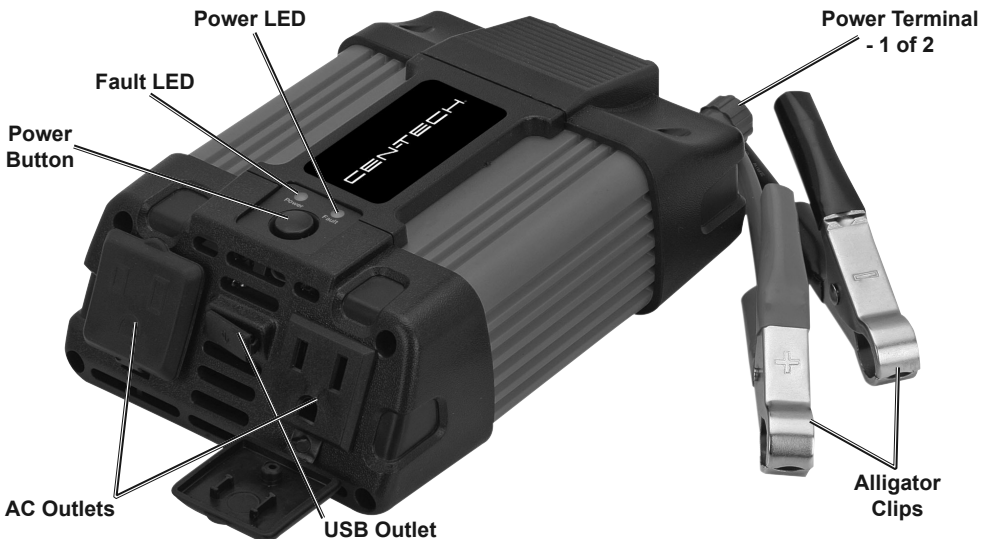
**CAUTION!** This Inverter must only be connected to batteries with an output voltage of 12 volts DC. Lower voltage will not operate the Inverter properly, and more voltage could damage the Inverter or the device being powered. Do not use this Inverter with positive ground electrical systems.

**The Inverter is configured to have a number of shut-down points, for the safety of the operator, the unit, and the devices being used with it.**

- If the DC input voltage drops too low, the alarm on the Inverter will sound. Should the input voltage drop further, the Inverter will shut down automatically to prevent permanent battery damage. Recharge the battery soon.
- If the DC input voltage exceeds 15.3V the Inverter will shut down automatically.
- If the output load power rises higher than the rating power of the Inverter; the unit may shut down automatically.
- The Inverter may automatically shut down if its internal temperature gets too high.

**Note:** Even though this inverter has built-in mechanisms to minimize damage, the above situations should be avoided because they can still damage the inverter, battery, and/or attached device(s).

## Functions



# Operating Instructions



Read the **ENTIRE IMPORTANT SAFETY INFORMATION** section at the beginning of this manual including all text under subheadings therein before set up or use of this product.

1. Place the Power Inverter on a flat surface that has adequate ventilation and is not in direct sunlight. Locate the Inverter close enough to the car battery so that the Cables can easily reach the Inverter and the car battery. Position the Inverter so that the Outlets are easily and safely accessible.
2. To connect the Cable Ring Terminals to the (Positive) red and (Negative) black Power Terminals on the back of the Inverter:
  - a. Make sure the Inverter's Power Button is in the OFF position.
  - b. Unthread the knobs covering the Power Terminals.
  - c. Slide the red Cable's Ring Terminal over the post of the red Power Terminal and the black Cable's Ring Terminal over the post of the black Power Terminal.
  - d. Replace the knobs and tighten securely.
3. Apply the parking brake to the vehicle connected to the battery. Place the transmission in "Park" for an automatic transmission, or in "Neutral" for a manual transmission. Start the car engine.
4. Attach the black Cable's Alligator Clip to a clean unpainted metal part of the chassis. If connecting to a battery not installed in a vehicle, connect to the Negative (black) terminal.
5. Attach the red Cable's Alligator Clip to the Positive (red) terminal on the battery.
6. The red Fault LED will light up momentarily and the alarm will sound as the Inverter draws power. Then the alarm and red LED will turn off.

**Note:** If the alarm continues and red Fault LED stays lit, check the Troubleshooting Tips section near the end of this manual to correct the issue before continuing.
7. Press the Power Button to turn on the inverter.
8. To power each device or appliance:
  - a. With the device or appliance switched off, plug it into one of the Power Outlets or the USB Outlet on the Power Inverter.
  - b. Turn on the device and/or appliance.
9. After use, turn all connected devices or appliances off, unplug them, then turn off the car engine if it is running. Keep the inverter turned on and remove the alligator clips from the battery posts, removing the Negative (black) clip first, then the Positive (red) clip. The alarm and red LED light will turn on as the Inverter powers down. Turn off the Inverter Power Button.

**WARNING!** Use only the included cables or 4 AWG cables up to 10 feet long. Thinner/longer cables may cause overheating and damage the inverter and/or connected devices.



## Operating Tips

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The total wattage of all items plugged into the Power Inverter must not use more than 400 watts during continuous operation, otherwise the Inverter may overload.

If an alarm sound is heard, turn off the appliances and check the Troubleshooting Tips section to correct the issue before continuing.

**NOTICE:** Some rechargeable appliances may damage the Power Inverter or the appliance. When first using a rechargeable device, check the inverter's temperature for the first 10 minutes. If it becomes abnormally hot, do not use this device with the Inverter.

**NOTICE:** It is recommended that the vehicle be running when you first connect the Power Inverter. Thereafter the engine can be on or off. If using the Power Inverter with the engine off start and run the engine every hour for at least 10 minutes to recharge the battery. Doing this will help prevent any unexpected shutdown of the equipment. This will also help ensure that there will be enough battery power to start the vehicle.

**WARNING!** To prevent serious injury and death from carbon monoxide inhalation, do not run the vehicle's engine within an enclosed area.

Do not use car battery to power the Inverter for extended periods of time with appliances requiring high continuous load levels. The battery may become drained to the point that it will not be able to start your car.

Deep cycle (marine and RV) batteries can be charged more times than a car battery, and are a better choice for repeated use of the Power Inverter.

Do not discharge your car battery more than 10% of its total capacity, and deep cycle batteries more than a 50% discharged state.

## Typical Appliance Power Consumption

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Product	Running Watts	Additional Start-up Watts
Stereo	400	0
Table Fan	400	400
TV-VCR	250	0
Small Refrigerator	350	700
Hand Drill - 1/2"	600	600
Light Bulb - 100 W	100	0
Microwave - 1000 W	1500	400
AC (5,000 BTU)	700	700

**Note:** This chart is intended as a general guideline only, actual appliance wattage requirements will vary. Some appliances listed above may require a pure sine wave inverter instead for proper operation.

## Troubleshooting Tips

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- If the alarm sounds, this means that the input voltage is at or below 10.8 V. Stop using the Power Inverter and recharge the battery. If this is not done, the Inverter will shut off automatically at 10.5 V.
- If you are unsure if the inverter will have the proper amount of current to run your devices, add up the total of the continuous wattage for the items. If this figure is under 400 watts, then the Inverter will be able to run the items at the same time.
- If your product, such as a television will not start, it is important to keep in mind that some appliances (including many televisions) may require two to six times their wattage to start up.
- If your audio system buzzes while using this inverter, it is because some sound systems can not filter out the modified sine wave produced by the inverter. Use a sound system that incorporates a higher quality power supply.
- This inverter is made to minimize the interference with TV signals. However, especially with weak TV signals, some interference may still be visible. To correct this, place the inverter as far away as possible from the television antenna and it's cables. Next, adjust the orientation of the inverter to the antenna cables and TV power cord to minimize the interference. Also use a shielded antenna cable.
- If the low battery alarm is on all the time, try these corrective measures: Recharge battery if in poor condition. Next, check the battery connection. You may need to clean the connectors.
- If you are getting a low output voltage, try reducing the load to minimize watts. You may have overloaded the inverter. Reduce the number of watts you are powering. Also, keep input voltage above 11 volts to maintain a constant flow of power.
- If you are not getting any power output, turn the power switch Off and On again. The devices may draw too much power to operate them. The inverter may be in thermal shutdown. Let it cool down and make sure there is adequate ventilation around the unit.

# Maintenance and Servicing



Procedures not specifically explained in this manual must be performed only by a qualified technician.

## **WARNING**

### **TO PREVENT SERIOUS INJURY FROM ACCIDENTAL OPERATION:**

Make sure that all loads are disconnected from the Inverter, the Power Button is in the off-position and the cables are disconnected from power source before performing any procedure in this section.

### **TO PREVENT SERIOUS INJURY FROM TOOL FAILURE:**

Do not use damaged equipment. If abnormal noise or vibration occurs, have the problem corrected before further use.

- BEFORE EACH USE**, inspect the general condition of the tool. Check for:
  - loose hardware,
  - misalignment or binding of moving parts,
  - damaged cord/electrical wiring,
  - cracked or broken parts, and
  - any other condition that may affect its safe operation.
- AFTER USE**, wipe external surfaces of the tool with clean cloth.
- Maintain batteries according to manufacturer's instructions. Check electrolyte level on all batteries after charging and refill as needed. **Charge batteries according to manufacturer's recommendations ONLY**; incorrect charging may cause battery damage or explosion.
- Internal electronic components must be disposed of properly or recycled.



**WARNING! TO PREVENT SERIOUS INJURY AND DEATH FROM ELECTRIC SHOCK: DO NOT OPEN HOUSING!**

Contains no user-serviceable parts. **Internal parts may be electrified, even with unit off and power disconnected.**

**Record Product's Serial Number Here:** \_\_\_\_\_

**Note:** If product has no serial number, record month and year of purchase instead.

**Note:** Some parts are listed and shown for illustration purposes only, and are not available individually as replacement parts. Parts may not be interchangeable. Specify UPC 792363668149 when ordering parts.

## Limited 90 Day Warranty

Harbor Freight Tools Co. makes every effort to assure that its products meet high quality and durability standards, and warrants to the original purchaser that this product is free from defects in materials and workmanship for the period of 90 days from the date of purchase. This warranty does not apply to damage due directly or indirectly, to misuse, abuse, negligence or accidents, repairs or alterations outside our facilities, criminal activity, improper installation, normal wear and tear, or to lack of maintenance. We shall in no event be liable for death, injuries to persons or property, or for incidental, contingent, special or consequential damages arising from the use of our product. Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation of exclusion may not apply to you. THIS WARRANTY IS EXPRESSLY IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING THE WARRANTIES OF MERCHANTABILITY AND FITNESS.

To take advantage of this warranty, the product or part must be returned to us with transportation charges prepaid. Proof of purchase date and an explanation of the complaint must accompany the merchandise. If our inspection verifies the defect, we will either repair or replace the product at our election or we may elect to refund the purchase price if we cannot readily and quickly provide you with a replacement. We will return repaired products at our expense, but if we determine there is no defect, or that the defect resulted from causes not within the scope of our warranty, then you must bear the cost of returning the product.

This warranty gives you specific legal rights and you may also have other rights which vary from state to state.

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