

**CHICAGO POWER  
ELECTRIC® SYSTEMS**

***POWER INVERTER AND CHARGER  
500 WATT / 800 WATT PEAK***

**Model 93096**

**ASSEMBLY AND OPERATING INSTRUCTIONS**



3491 Mission Oaks Blvd., Camarillo, CA 93011

Visit our Web site at <http://www.harborfreight.com>

**TO PREVENT SERIOUS INJURY,  
READ AND UNDERSTAND ALL WARNINGS  
AND INSTRUCTIONS BEFORE USE.**

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## Specifications

ITEM	DESCRIPTION
Continuous Power	500 Watts
Peak Power	800 Watts
DC Voltage	12 Volts Nominal DC (11-15 Volts possible)
AC Voltage	120 Volts AC at 60 Hz
AC Receptacles	(2) Two 3-Prong, Polarized Outlets
Inverter Fuse	2 X 30 Amps
Charger Fuse	10 Amps, 250 Volt, Fast-acting
Dimensions	8 <sup>1</sup> / <sub>4</sub> " L x 9 <sup>3</sup> / <sub>8</sub> " W x 3 <sup>1</sup> / <sub>4</sub> " H
Weight	7.4 lbs
Indicators	Green LED = power on
Charging Rates	5/10 Amp
Operating Temperature	14-113° F
AC Power Cord	10'
Features	- Modified sine wave with overload protection - Low voltage alarm <sup>1</sup> and shutdown <sup>2</sup> <sup>1</sup> at 11 V; <sup>2</sup> at about 10 V

## Save This Manual

You will need the manual for the safety warnings and precautions, assembly instructions, operating and maintenance procedures, parts list and diagram. Keep your invoice with this manual. Write the invoice number on the inside of the front cover. Keep the manual and invoice in a safe and dry place for future reference.



## Safety Warnings and Precautions

**WARNING:** When using this device, basic safety precautions should always be followed to reduce the risk of personal injury and damage to equipment.

### Read all instructions before using this product!

1. **Do not plug a battery charger into the Inverter** if the charger has a warning that dangerous voltages are present at the battery terminals.
2. **Keep work area clean.** Cluttered areas invite injuries.
3. **Keep Inverter away from any direct heat source or combustible material.**
4. **Observe work area conditions.** Do not use machines or powered products in damp or wet locations. Don't expose to rain. Keep work area well lit. Do not use electrically powered products in the presence of flammable gases or liquids.

5. **Keep children away.** Children must never be allowed in the work area. Do not let them handle machines, equipment, or extension cords.
6. **Use the right inverter for the job.** Do not attempt to force a small inverter or attachment to do the work of a larger industrial inverter. There are certain applications for which this Inverter was designed. It will do the job better and more safely at the rate for which it was intended. Do not modify this Inverter and do not use this Inverter for a purpose for which it was not intended.
7. **Dress properly.** Do not wear loose clothing or jewelry as they can be caught in moving parts. Protective, electrically nonconductive clothes and nonskid footwear are recommended when working. Wear restrictive hair covering to contain long hair.
8. **Always wear eye protection.** When working around lead acid batteries, always wear ANSI approved safety impact eye goggles, full face shield and work gloves. When working under the vehicle's hood, always be careful of hot engine parts.
9. **Do not overreach.** Keep proper footing and balance at all times. Do not reach over or across running machines.
10. **Maintain inverters with care.** Keep inverters clean for better and safer performance. Follow instructions for changing accessories. Inspect inverter cords periodically and, if damaged, have them repaired by an authorized technician.
11. **Disconnect power.** Unplug inverter when not in use.
12. **Avoid unintentional starting.** Be sure the switch is in the Off position when not in use and before plugging in any appliance.
13. **Stay alert.** Watch what you are doing, use common sense. Do not operate any inverter when you are tired.
14. **Check for damaged parts.** Before using any inverter, any part that appears damaged should be carefully checked to determine that it will operate properly and perform its intended function. Check for alignment and binding of moving parts; any broken parts or mounting fixtures; and any other condition that may affect proper operation. Any part that is damaged should be properly repaired or replaced by a qualified technician. Do not use the inverter if any switch does not turn On and Off properly.
15. **Servicing.** This device should be serviced only by a qualified technician. Aside from the fuse, this item does not have any user-replaceable parts.
16. **Do not operate inverter if under the influence of alcohol or drugs.** Read warning labels on prescriptions to determine if your judgment or reflexes are impaired while taking drugs. If there is any doubt, do not operate the inverter.
17. **Read and adhere to all warnings and safety precautions in the owner's manual for the device or battery that this inverter is used to power.**

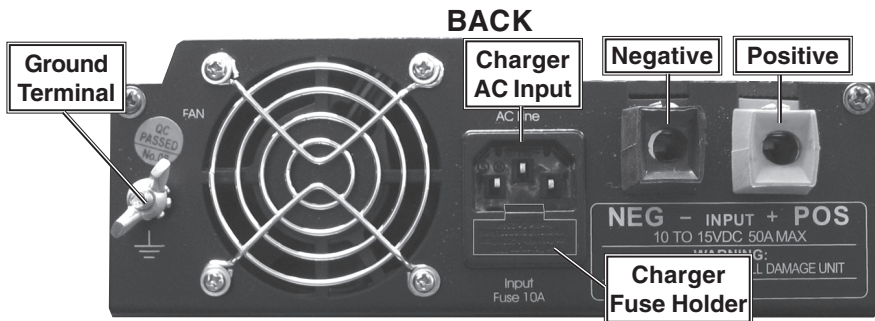
18.  **Guard against electric shock.**  
**Prevent body contact with grounded surfaces such as pipes, radiators, ranges, and refrigerator enclosures during installation.**  
**Connect all wires securely.**  
**Store metal objects away from the inverter.**
19. **People with pacemakers should consult their physician(s) before using this product.** Electromagnetic fields in close proximity to a heart pacemaker could cause interference to or failure of the pacemaker.
20. **Keep the Inverter well-ventilated.** Do not place any objects on top of or next to the Inverter or allow anything to cover the cooling fans; doing so can cause the Inverter to overheat, causing a potential fire hazard and/or damage to the Inverter. Leave adequate ventilation space underneath the Inverter as well; thick carpets or rugs can obstruct air flow, causing the Inverter to overheat.
21. **A vehicle's engine must never be used in any sealed structure. Carbon monoxide is produced during operation and is DEADLY in a closed environment.** Early signs of carbon monoxide poisoning resemble the flu, with headaches, dizziness, or nausea. If you have any of these signs, get fresh air immediately.
22.  **Risk of explosion!** Hydrogen gas is explosive. NEVER smoke when working with batteries. Lead acid batteries generate hydrogen during normal operation, and more is generated while the battery is charging.
23. **Proper Battery Care:** Battery leakage may occur under extreme usage or temperature conditions. If Battery fluid comes in contact with skin, wash with soap and water and rinse with lemon juice and vinegar. If the fluid comes into contact with the eyes, flush with water for several minutes and contact a doctor immediately. Never burn the Battery, as it can explode in a fire. Do not use the Battery Charger on a vehicle with a leaking Battery. Contact local solid waste authorities for instructions on correct disposal or recycling of the Battery.

**Note:** Performance of this unit may vary depending on the available battery power or appliance wattage.

**Warning:** The warnings, cautions, 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.

## Unpacking

When unpacking, check to make sure that the Inverter is in good condition and the AC Power Cord is included. If any parts are missing or broken, please call Harbor Freight Tools at the number on the cover of this manual as soon as possible.



**WARNING! Risk of Fire! The positive battery terminal connection must be the LAST connection and must be done with the inverter's switch off.**

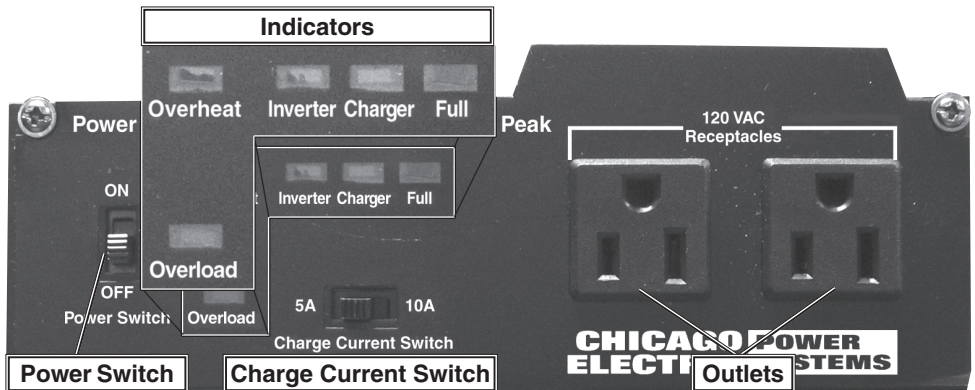
## Connection

For the power Inverter to work properly, your power source must provide 12 volts DC, and enough current (i.e., 32 amps to operate a load of 384 Watts or under).

**Warning:** This Inverter must only be connected to batteries with a nominal output voltage of 12 volts. More voltage could damage the Inverter or the device being powered. If more than one 12 volt battery is to be used, the batteries must be connected in a parallel circuit; batteries connected in a series circuit will produce too much voltage.

1. Place the Power Inverter on a flat surface. Make sure it has adequate ventilation and is not in direct sunlight. Fasten the Inverter securely to the surface, using screws or some other means. If holes are to be drilled, follow safe, proper installation techniques.
2. Strip the insulation off of the last  $\frac{3}{4}$ " of each Battery Cable (not included; #4-#0 AWG cable recommended). Insert the Cables into the (Positive) red and (Negative) black terminals on the back of the Inverter. Securely tighten the Screw on top of each connection. Connect the Ground Cable (not included; #6 AWG or larger cable recommended) lug to the Ground Terminal, see *BACK* above. Securely tighten.
3. The Power Inverter can be used either while the engine is running or off. Connect the Battery Cables to the (Negative) black and (Positive) red terminals of the battery.
4. Connect the Ground Cable to the appropriate location below:
  - a. **If this unit is mounted within a vehicle with a grounded metal chassis,** attach the Ground Cable to a nearby location on the chassis.
  - b. **If this unit is mounted in a boat or vehicle with an ungrounded chassis,** attach the Ground Cable to the vehicle's grounding system.
  - c. **ONLY if this unit is being used outside a vehicle,** attach the Ground Cable to the Negative Cable leading into the Inverter.

## FRONT



## Operation

### Powering AC Appliances

1. Plug the 115 VAC device(s) you wish to power into the 3-prong AC Receptacles. See *FRONT* above. The appliance(s) must not use more than 500 (total) watts during continuous operation, otherwise it may overload the Inverter.

**Warning: 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.**

2. Flip the Power Switch to the **ON** position. Do not use the appliance until the **Inverter** LED indicator is on.
3. Turn on appliance. If an alarm sound is heard or if either the **Overload** or the **Overheat** indicators light, turn off the appliance.

**Warning: It is recommended that the vehicle be started every hour 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. Due to the risk of carbon monoxide inhalation (see *Warning # 21* on page 4), do not run the vehicle's engine within an enclosed area.**

4. After use, disconnect appliances and flip the Power Switch to the **OFF** position.

### Charging the Vehicle's Battery

1. Make sure that no appliances are connected to the Inverter. Plug the AC Power Cord into the Charger AC Input (see *BACK*, page 5) and plug the other end into a fused, properly grounded, 3-prong 120VAC receptacle.
2. Select the desired charge rate with the **Charge Current Switch**. Flip the Power Switch to **ON**. The **Charger** LED indicator should illuminate.
3. Monitor the Inverter and turn the Power Switch to the **OFF** position once the **Full** LED indicator illuminates. Disconnect the AC Power Cord.

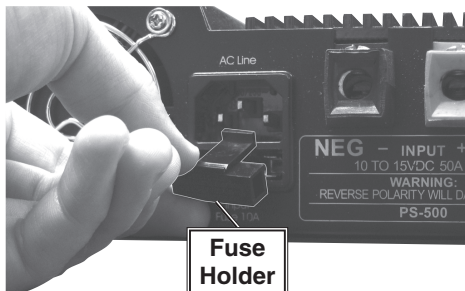
## Maintenance

1. Keep this unit clean and dry. Unplug before cleaning. Clean only the outside of this unit with a soft, dry cloth; never clean this unit with water or cleaners.
2. Aside from the fuse, this device does not contain any user replaceable parts. If it needs service, take it to a qualified technician.

**BEFORE INSPECTING THE FUSES, MAKE SURE THAT THE UNIT HAS HAD AMPLE TIME TO COOL WITH NO LOAD.**

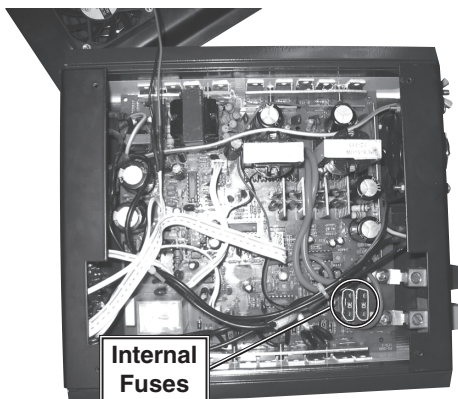
### 3. **Charger Fuse Replacement**

- a. If the Inverter stops functioning in Charger mode, the charging fuse may have blown.
- b. The Charger's fuse is underneath the AC Line Terminal.
- c. Disconnect the Inverter from both the battery and the AC input.
- d. Remove the fuse holder and inspect the fuse, see illustration. If the fuse is intact, check the internal fuses as noted below. Otherwise, replace the fuse **ONLY** with another F10A250V (Fast-acting, 10 Amp, 250 Volt) fuse of the same type.
- e. Replace the fuse holder and reconnect the Inverter. Check for proper operation.



### 4. **Internal Fuse Replacement**

- a. If the Inverter stops functioning, one of the internal fuses may have blown.
- b. Disconnect the Inverter from the battery, AC input, and all devices. Then, remove the Inverter from the vehicle.
- c. Turn the Inverter upside down and remove the four black screws holding the cover on. Carefully set the back cover aside. **DO NOT TOUCH INTERNAL PARTS.**
- d. Remove the fuses and inspect them; see illustration. If both fuses are intact and the unit still does not function, have the unit serviced by a qualified technician. Otherwise, replace damaged fuse(s) **ONLY** with 30 Amp fuse(s) of the same type.
- e. Carefully reassemble, reinstall, and reconnect the Inverter. Check for proper operation.



## Troubleshooting Tips

1. If the low battery alarm sounds, this means that the input voltage is below the necessary 11 V. The battery needs recharging. You should stop using the appliance and then recharge the battery. If this is not done, the Inverter will shut off automatically at around 10 V.
2. If you are unsure if the Inverter will have the proper amount of current to run the device, use this rough guideline: Take the power consumption of the load in watts and divide it by 12 (input voltage). The result will be the approximate number of amps needed to power your device.

Example: Load is rated at 312 watts.  $312 \text{ watts} / 12 \text{ V} = 26 \text{ amps}$  needed. You could use this device with the Inverter.

3. If your 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.
4. 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.
5. 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 its 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.
6. 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.
7. If you are getting a low output voltage, try reducing the load to minimize watts. You may have overloaded the Inverter. Reduce your load to 490 watts. Also, keep input voltage above 11 volts to maintain a constant flow of power.
8. If you are not getting any power output, turn the power switch Off and On again, until the green power light comes on. Your 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.



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