

## GENERAL SAFETY RULES

**WARNING:** Failure to read all instructions may result in serious personal injury.

- **Avoid wet environments.** Do not get the inverter wet.
- **Store the inverter in a safe place when not in use.** Keep out of reach of children.
- **Use the inverter for its intended purpose ONLY.** Do not overload the inverter. Trying to power an appliance that draws wattage larger than the inverter's capability will result in damage to the inverter.
- **Disconnect appliances.** Disconnect the appliance from inverter when not in use.
- **Proper cooling is essential when operating the inverter.** Do not place the unit near the vehicle's heat vent or in direct sunlight.
- **Use of accessories and attachments.** Do not use any accessories or attachments that are not recommended to use with your appliance. This could result in damage to the unit.

**WARNING: Keep away from WATER, FIRE, and SMOKE!**

The inverter will shut off if overheated, overloaded, or short circuited.

## IMPORTANT SAFETY INFORMATION

**WARNING:** To reduce the risk of electric shock:

- Do not connect to a household AC outlet or distribution panel.
- Do not connect the inverter to any ignition protected areas, such as 12V cigarette lighter type plugs.
- Do not let the inverter get wet.
- Do not insert foreign objects into the AC/110V outlet or the USB port.

**WARNING:** To reduce the risk of fire:

- Do not operate near flammable materials, fumes, or gases.
- Do not expose to extreme heat or flames.

**WARNING:** To reduce the risk of injury or property damage:

- Do not attempt to connect or set-up the unit or its components while operating your vehicle. Not paying attention to the road may result in a serious accident.
- Always use the inverter where there is adequate ventilation. Do not block ventilation areas.
- Always turn the inverter off before disconnecting the inverter from the vehicle battery.
- Make sure the nominal input voltage is 12V DC.
- Do not use with positive ground electrical systems\*. Reverse polarity connection will result in a blown fuse and may cause permanent damage to the inverter and will void warranty.  
\*The majority of modern automobiles, RVs and trucks are negative ground.
- This inverter is unable to power the appliances or equipment that produce heat, such as hair dryers, coffee makers, microwave, ovens, and toasters.
- **DO NOT OPEN THE INVERTER:** There are no user-serviceable parts inside.
- Do not use this inverter with medical devices. It is not tested for medical applications.
- Keep away from children. **This is not a toy!** Install and operate unit only as described in this instruction manual.
- This inverter is not qualified for marine applications.

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## FEATURES

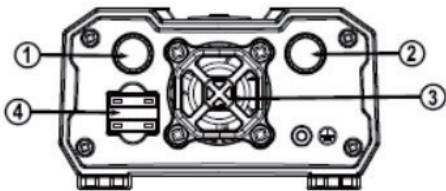
1. Positive DC terminal: Connect the red end of the DC power cord to it.
2. Negative DC terminal: Connect the black end of the DC power cord to it.
3. Cooling fan and ventilation openings: The high speed cooling fan protects the inverter from overheating.
4. Replaceable blade fuse
5. LED power & fault indicator
6. Inverter on/off switch
7. AC sockets
8. USB and USB-C® Ports
9. Ventilation holes
10. Control the backlighting via the red button on the front panel.
11. 12V DC plug with cable\*
12. Battery clamps\*

\*NOTE: Only one set of power cables should be connected at a time  
See diagram on page 5.

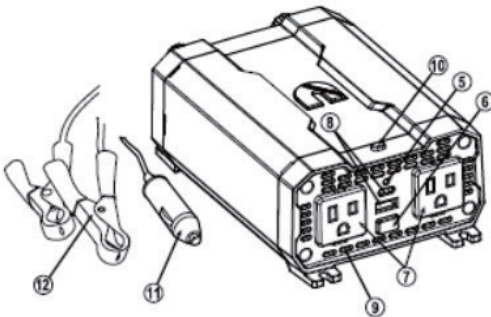
## OPERATING TIPS

The inverter should only be operated in locations that are:

- a. Dry:** Do not allow water or other liquids to come into contact with the inverter.
- b. Cool:** Keep the inverter away from direct sunlight, when possible.
- c. Well-Ventilated:** Keep the area surrounding the inverter clear to ensure free air circulation around the unit. Do not place items on or over the inverter during operation.



\*Only connect with cables or DC cables.  
Do not use the DC plug with cables at the same time.



\*Only use one set of cables at a time.

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The unit will shut down if the internal temperature gets too hot. The inverter will auto-reset after it cools down.

Please find the "continuous output" and "surge" power of your inverter as below.

**CMN400: Continuous output 400W/Surge power 800W with battery cable clamps**

## HELPFUL FORMULAS

**TO CONVERT AMPS TO WATTS: AMPS x VOLTS = WATTS**  
**TO CONVERT WATTS TO AMPS: WATTS ÷ VOLTS = AMPS**

When you turn on an appliance or a tool that operates using a motor, it requires an initial surge of power to start up. This surge of power is referred to as the "starting load" or "peak load". Once started, the tool or appliance requires less power to continue to operate. This is referred to as the "continuous load" in terms of power requirements. You will need to determine how much power your tool or appliance requires to start up and its continued running power requirements. We recommend that the equipment or appliance switch be in the "OFF" position prior to plugging into the AC receptacle of the inverter. The green LED light will confirm that AC power is on.

1. Attach the ring type connector marked with **red** to the **POSITIVE (+)** DC terminal on the power inverter, and attach the ring connector marked with **black** to the **NEGATIVE (-)** DC terminal.

**CAUTION:** Reverse polarity connection will result in a blown fuse and may cause permanent damage to the inverter and will void warranty.

**NOTE:** The fuse can be easily replaced with a new one, on the back of the inverter.

- Check unit periodically for wear and tear. Take to a qualified technician for replacement of worn or defective parts immediately.
- Do not connect the unit to any utility power distribution systems, or branch circuits.
- Do not use the inverter in temperatures over 104°F (40°C) or under 32°F (0°C).
- **Failure to follow these safety guidelines could result in personal injury and/or damage to the unit. It may also void the warranty.**
- Follow the instructions from the manufacturer of your vehicle battery and AC/110V appliance before connecting the inverter to battery. Please pay more attention to the cautionary marking on your vehicle battery.

2. Tighten the nut on each DC terminal by hand until it is snug. Do not over-tighten.

3. Attach the **NEGATIVE (black)** clip to the **NEGATIVE (-)** battery terminal.

4. Attach the **POSITIVE (red)** clip to the **POSITIVE (+)** battery terminal. Make sure both clips are securely connected to the battery terminals, as a loose connection will cause the voltage to drop and may cause the cables to overheat, resulting in equipment damage or fire.

5. Turn on the inverter.

6. When the power inverter is not in use, disconnect the DC cable clips from the battery to prevent slight discharge from the battery.

## OPERATING THE INVERTER

1. When properly connected to a 12V battery, turning on the inverter will illuminate the **green** LED light and deliver AC power to the outlet(s).
2. Plug the AC product(s) you wish to operate into the AC outlet(s) and switch them on, one at a time.

**CAUTION:** If there is more than one AC product connected to the inverter, turn on the higher powered product first.

Through its AC outlet, the inverter is capable of powering most 110V products at its rated power. The inverter will work under input voltage from 11V to 15V DC.

When in use, the battery voltage will drop. If the inverter senses that the voltage has dropped between 10.2 and 10.8V DC, the red LED indicator will turn on. This protects the battery.

Turn off any device that the inverter is powering. When input voltage rises to 11.7V to 12.3V DC, inverter restores to normal.

- Control the backlighting via the red button on the front panel.

**CAUTION:** Most vehicle batteries are designed to provide short periods of very high current for starting the engine.

They are not designed for a constant “**deep discharge**”. Constantly operating the unit from a vehicle battery until the low voltage shut off will affect the life of the battery. If you are going to power an appliance for a long time, please consider connecting the unit to a separate “**deep cycle**” battery.

Should a defective battery charging system cause the battery voltage to rise to the range of 15V to 16V DC, the inverter automatically shuts down and the red LED light will turn on.

**CAUTION:** Although the inverter incorporates protection against over-voltage, it may still be damaged if the input voltage exceeds 16V.

If the actual output is higher than the rated power of inverter, the inverter will shut down. The red LED light will turn on.

The unit will shut down automatically if the inverter exceeds a safe operating temperature due to insufficient ventilation or a high-temperature environment and the red LED indicator lights will turn on.

The cooling fan is designed to operate automatically when the inverter is turned on.

**ATTENTION:** Maximum wattage available depends on vehicle power port rating.

Amps x Volts = Watts

A 10 Amp outlet can supply 120 Watts.

A 15 Amp outlet can supply 180 Watts.

**ATTENTION:** Your inverter may have come with two different power cords depending on its watt rating.

The 12V power port cord can supply 120 Watts.

The battery clip cord can supply the full inverter rating power.

Only one set of power cables may be connected at a time.

## BATTERY OPERATING TIME

Operating time will vary depending on the charge level of the battery, its capacity, and the power level drawn by the particular AC load. With a typical vehicle battery load, an operating time of 1 hour or more can be expected.

When using a vehicle battery as a power source, it is strongly recommended to start the vehicle every hour to recharge the battery before its capacity drops too low. The inverter can operate while the engine is running, but the normal voltage drop that occurs during starting of the engine may trigger the inverter’s low voltage shutdown feature.

Because the power inverter draws less than 0.5A with it turned on and no AC product connected, it has minimal impact on battery operating times.

## INTERFERENCE WITH ELECTRONIC EQUIPMENT

Generally, AC products operate with the inverter just as they would with household 110V/AC power. Below is the information concerning two possible exceptions.

## BUZZING IN AUDIO SYSTEMS AND RADIOS

Some stereo systems and AM/FM radios have inadequate internal power supply filtering and “**buzz**” slightly when powered by the inverter. Generally, the only solution is an audio product with a higher quality filter.

## TELEVISION INTERFERENCE

The inverter is shielded to minimize its interference with TV signals. However, with weak TV signals interference may be visible in the form of lines scrolling across the screen.



## OWNER'S GUIDE CMN400

The following should minimize or eliminate the problem:

- Increase the distance between the inverter and the TV, antenna, and cables.
- Adjust the orientation of the inverter, TV, antenna, and cables.
- Maximize TV signal strength by using a better antenna and use shielded antenna cable where possible.

## SPECIFICATIONS

Model	CMN400
Input	11-15V DC
Output	115V AC
Output Frequency	58-62Hz
Output Waveform	Modified Sine Wave (MSW) with battery clamp power cables.
Continuous Power	400W
Surge Power	800W
Efficiency	85% Max
No Load Draw	<0.4A
Low Battery Shutdown	10.5±0.3V DC
USB Output Port	2.4A
USB-C® Output Port	3.0A (18W)
AC Output Sockets	2 standard North American sockets
Internal Fuse/ Replacement Fuse	1-15A fuse in the cigarette plug (replaceable) and 2-35A in end cap (replaceable)
Operating Temp	32°F-104°F
Power Cable Length	36"
Dimensions	7.5" x 4.88" x 2.76"
Net Weight	1.98 lbs.

## TROUBLESHOOTING

Problem	Cause	Solution
No power, no indicator.	Battery is defective.	Replace battery.
	Blown fuse.	Check and replace fuse.
	Loose cable connections.	Check the connection to the battery. Tighten as required.
The red LED indicator illuminates when unit is shut off.	The actual output is higher than rated power of inverter; overload protection has occurred.	Reduce load to have the actual output lower than rated power of inverter.
	The actual output is less than rated power, but high starting surge has caused overload shutdown.	Use a product with starting surge power within the inverter’s capability.
	The voltage input is too low.	Charge the battery.
Battery run time is less than expected.	Inverter is overheated due to poor ventilation and has shut down.	Disconnect the inverter from battery or DC socket and allow to cool for 15 minutes. Please ensure removal of objects covering the unit.

Problem	Cause	Solution
Inverter runs small loads but not large loads.	Low voltage battery.	Charge the battery.
	Inverter got wet.	Water entered the unit.
Measured inverter output is too low.		Standard “average-reading” AC voltmeter used to measure output voltage, resulting in an apparent reading 5V to 15V too low.
	Battery run time is less than expected.	Battery voltage is too low.
AC product power consumption is higher than rated.		Use a larger battery to make up for increased power requirement.
Battery is old or defective.		Replace battery.
Battery is not being charged.		Some chargers are not able to fully recharge a battery. Make sure you use a powerful charger.
	Power dissipation in DC cables.	Use shorter/heavier DC cables.

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**One-Year Limited Warranty**