POWER INVERTER

USER MANUAL

○ Pure Sine Wave
○ Modified Sine Wave

CONTENTS

Thank you very much for selecting our power inverter. We hope our products can bring you the most satisfied service.

Please read this manual carefully before installing or using the power inverter and pay attention to all safety recommendation. Thank you!

1. Introduction

Thank you for purchasing the Power Inverter. The inverter with durable aluminum alloy housing is compact, well designed and highly portable power inverter. Which represents the new trend of high frequency inverter technologies. From the 12V/24V/DC outlet in your vehicle or boat, or directly from a dedicated 12V/24V DC battery, the inverter will efficiently and reliably power a wide variety of household AC products, such as TV, computers, air-conditioner etc. The inverter with perfect protection, super quality components, sufficient power, rational and safety design. When choosing an inverter, please check it is properly right for your appliance. And make sure that the total continuous power consumption of all your appliances is within the maximum power limit of the inverter.

2. Technical Parameters

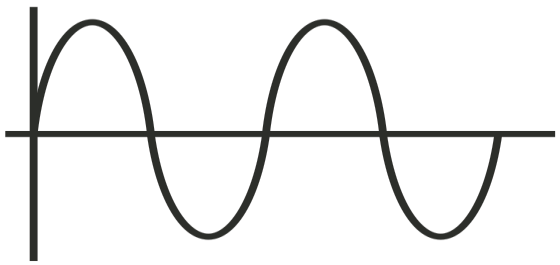
Item	300W, 500W, 600W, 800W, 1000W, 1200W, 1500W, 2000W, 2500W, 3000W, 3500W, 4000W, 5000W, 6000W
Continuous Power	300W, 500W, 600W, 800W, 1000W, 1200W, 1500W, 2000W, 2500W, 3000W, 3500W, 4000W, 5000W, 6000W
Surge Power	600W, 1KW, 1.2KW, 1.6KW, 2KW, 2.4KW, 3KW, 4KW, 5KW, 6KW, 7KW, 8KW, 10KW, 12KW
DC Input Voltage	DC12V, 24V, 48V or customized (Not automatically)
AC Output Voltage	AC220V/230V±10%, AC110V±10%(Not automatically)
Output Waveform	Pure Sine Wave or Modified Sine Wave
USB Output	QC3.0 Fast charging
Output Frequency	50Hz±0.5Hz or 60Hz±0.5Hz
Efficiency	88%-92%
Working Temperature	-20℃- +50℃

Output wave form:

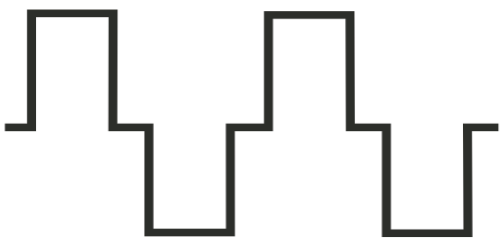
The inverter come in two types: pure sine wave and modified sine wave.

Pure sine wave is high quality output harmonically follows a smooth sine wave and electrical current similar to utility standards, less power consumption and clean power delivery. Pure sine wave support for more appliances, even the sensitive ones. You do not worry about the work of connected appliances.

Modified sine wave is more affordable. It apply to a limited list of devices such as light bulbs, kitchen appliances and other energy-consuming power tools.



Pure Sine Wave



Modified Sine Wave

3. Safety

Incorrect installation or misuse of the inverter may result in danger to the user or hazardous conditions. We urge you to pay special attention to all CAUTION and warning statements. Caution statements identify conditions that may result in personal injury or loss of life.

WARNING! Shock hazard. Keep away from children.

- The inverter generates the same potentially lethal AC power as a normal household wall outlet. Treat it with the same respect that you would any AC outlet.
- Do not insert foreign objects into the inverter's AC outlets, fan or vent openings.
- Do not expose the inverter to water, rain, snow or spray.
- Do not under any circumstances, connect the inverter to utility power AC distribution wiring.

WARNING! Heated surface.

The inverter's housing may become uncomfortably warm, reaching 50℃ under extended high power operation. Ensure at least 5cm of air space is maintained on all sides of the inverter. During operation, keep away from materials that may be affected by high temperatures.

WARNING! Explosion hazard.

- Do not use the inverter in the presence of flammable fumes or gases, such as in the bilge of a gasoline powered boat or near propane tanks. Do not use the inverter in an enclosure containing automotive-type, lead-acid batteries. These batteries, like sealed batteries, vent explosive hydrogen gas, which can be ignited by sparks from electrical connections.
- When working on electrical equipment always ensure someone is nearby to help you in an emergency.

CAUTION!

- Do not connect live AC power to the inverter's AC outlets. The inverter will be damaged even if it is switched off.
- Do not expose the inverter to temperature exceeding 40℃

CAUTION!

- Kindly Note DC voltage of battery should be similar to input DC voltage of power inverter. (For example DC12V of battery should be connected with input voltage 12V of the inverter.) Wrong DC input will not supply enough voltage or damage the inverter.

CAUTION! Do not use the inverter with the following equipment:

- Small battery operated products such as rechargeable flashlights, some rechargeable shavers, and night-lights that are plugged directly into an AC receptacle to recharge.
- Certain battery chargers for battery pack used in hand powered tools. These chargers will have warning labels stating that dangerous voltages are present at the charger's battery terminal.
- Connect inverter only to batteries with a 12V, 24V, 48V DC nominal output. Please connect with the same input DC voltage of your inverter.

CAUTION! Any internal adjustment on the inverter is prohibit!

4. Protective Functions

- **Overload protection**

  when overloading 125%, the inverter will send alarm sound (judge the alarm sound as a continuous alarm, BIBIBIBIBIBI...), the LED flashes RED and stop working after 20 seconds. When the Loads are reduces to accepted level, the inverter will resume working.

- **Short circuit protection**

  inverter is with short circuit protection, and without damaging the circuit.

- **Over–temperature protection**

  when the inside temperature of the inverter is 80℃ , alarm sound first (judge the alarm sound first, BIBIBI–BIBIBI–BIBIBI...), the temperature continues to rise, the LED flashes RED, and the inverter shuts down. Once the temperature drops to accepted level, the inverter will automatically resume working.

- **Low voltage protection**

  when the battery voltage is below the setting level, the inverter will send alarm by beeping. (judge the alarm sound as one, BI-BI-BI...), and the RED LED will lit. When the battery voltage keeps dropping to its shutting level, the inverter will stop working, when the battery voltage is increased to its restart level inverter will automatically resume working.

- **Over voltage protection**

  when the input voltage is higher than the setting level, the inverter will alarm first (judge alarm sound is two, BIBI-BIBI-BIBI...), the LED RED light flashes, the votlage continues to rise and the inverter will stop working, when the input is normal, it will automatically resume working.

- **Reverse connection protection**

  once there is reverse connection, the inverter built-in fuse will be burnt. In this case, please switch off the inverter, disconnect the power source, replace the new fuse by technician.

REVERSE CONNECT IS STRICTLY PROHIBITED.

- **LCD display**

  If you choose inverter with LCD display,smart LCD screen display the working status of inverter.

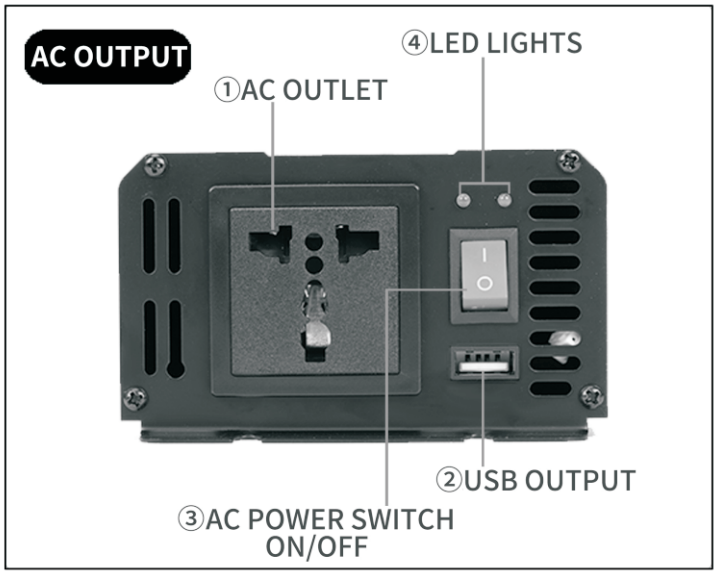
- **Cooling Fan**

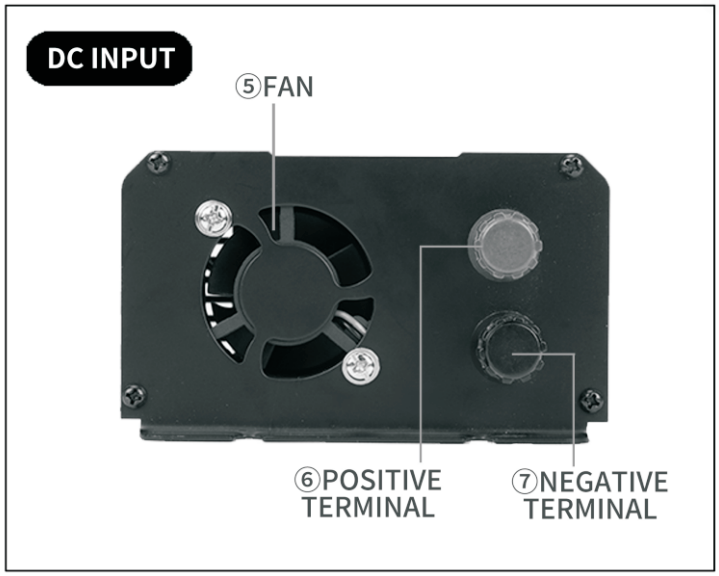
  it's intelligent fan and lower the temperature of inverter.

5. Product characteristic

Please make sure you have known the basic characteristic of this power inverter before use.

INVERTER 300W-600W





① AC OUTLET : please choose socket type when you purchase (Optional: Universal, Australia, British, Europe, French, American, South Africa etc., more style check with sales)

② USB OUTPUT : QC3.0 fast charging

③ AC POWER SWITCH : turn on/off the AC output power.

④ LED LIGHTS : Green color : indicates AC power is present at the AC outlets and the inverter is operating normally.
Red color : indicates inverter is in protection status

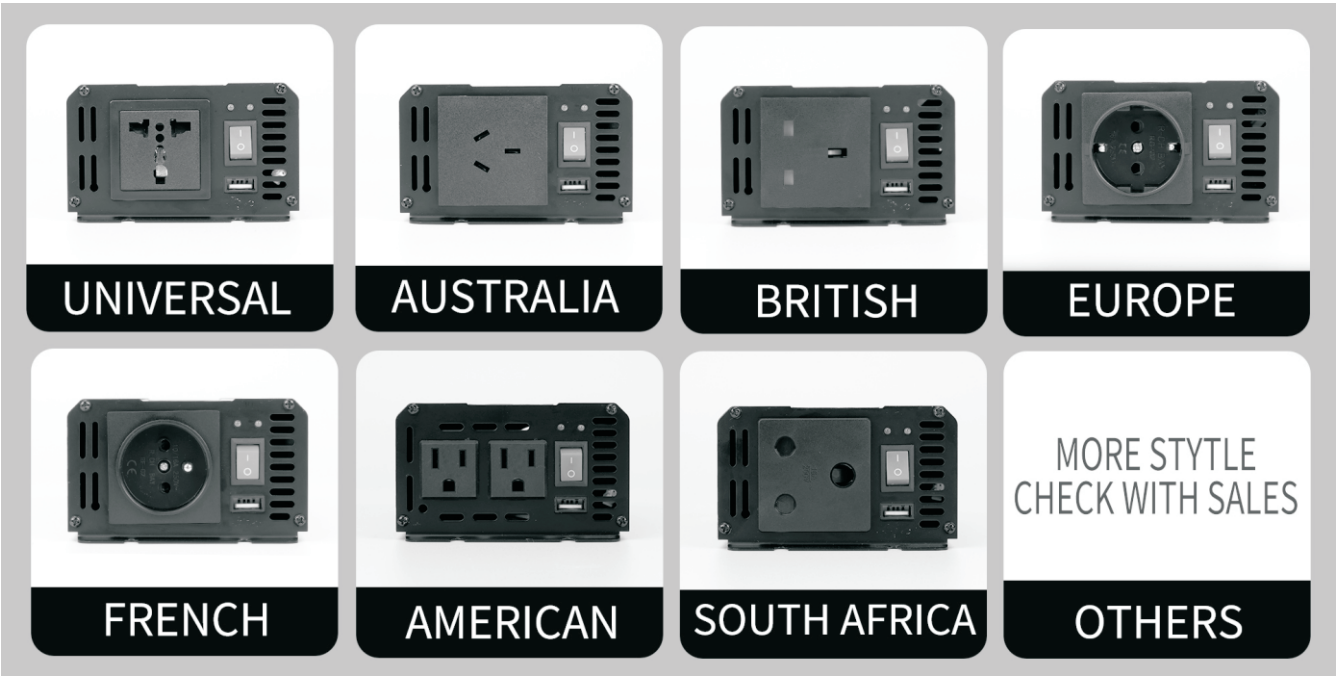
⑤ FAN : can lower the temperature of inverter. Should keep it clean during the inverter working.

⑥ POSITIVE TERMINAL : connect with the positive (+)side of the battery.

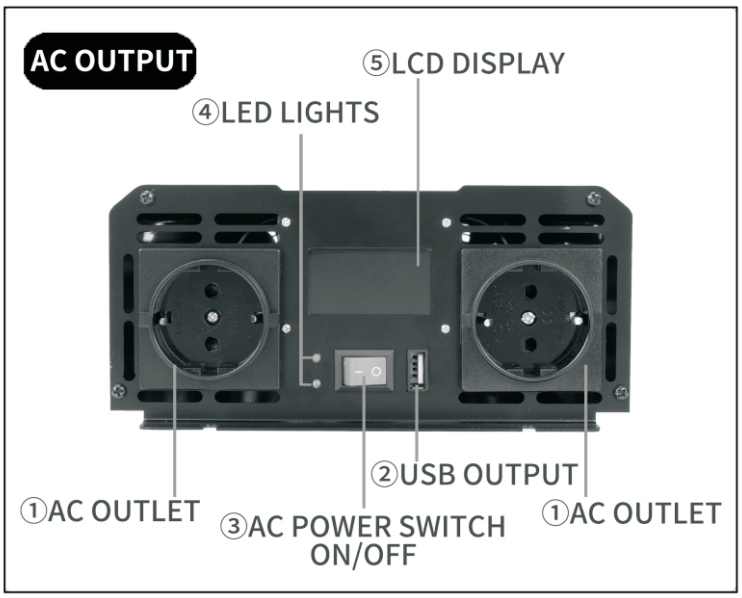
⑦ NEGATIVE TERMINAL : connect with the negative (–) side of the battery.

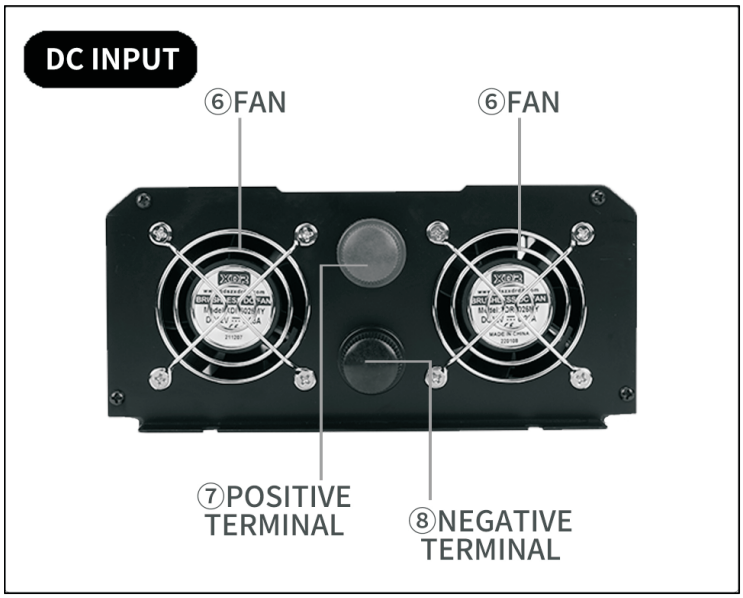
NOTE: Protection fuses are located inside the inverter cabinet.

Choose Sockets:



INVERTER 1000W-3000W





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④ LED LIGHTS : Green color : indicates AC power is present at the AC outlets and the inverter is operating normally.
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⑤ LCD DISPLAY : can display the working status of inverter.

⑥ FAN : can lower the temperature of inverter. Should keep it clean during the inverter working.

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NOTE: Protection fuses are located inside the inverter cabinet.

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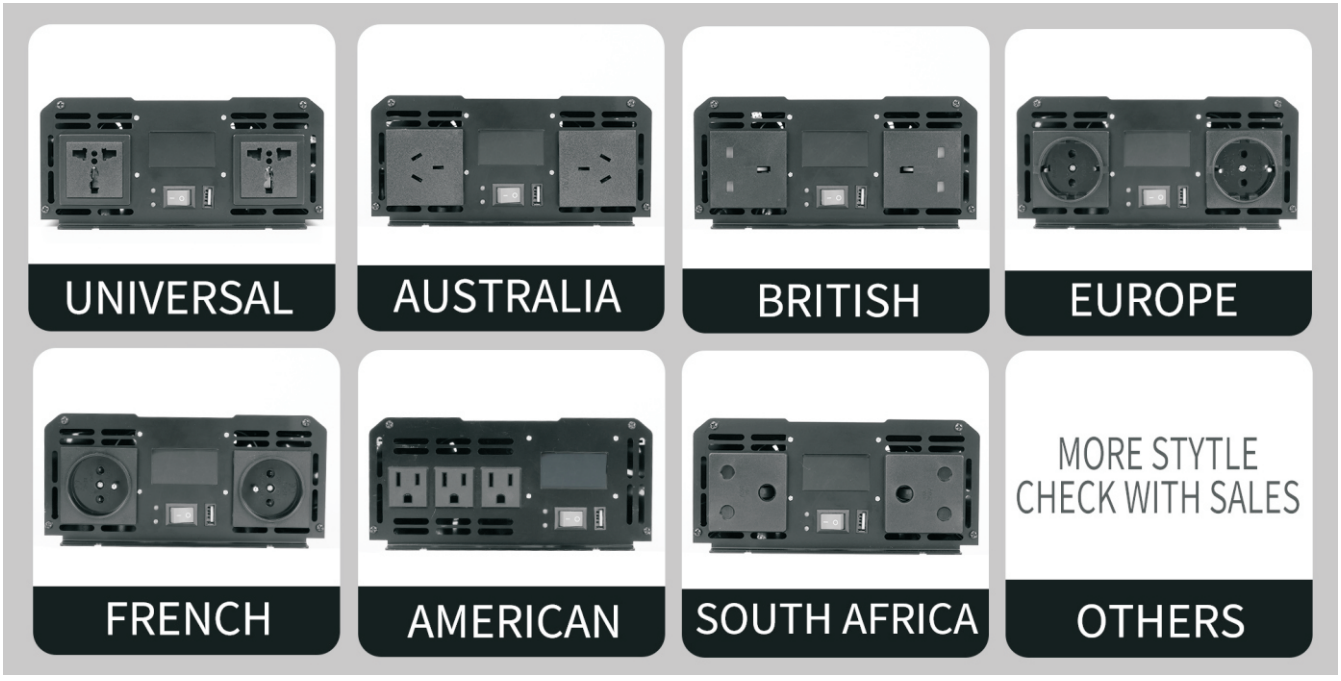
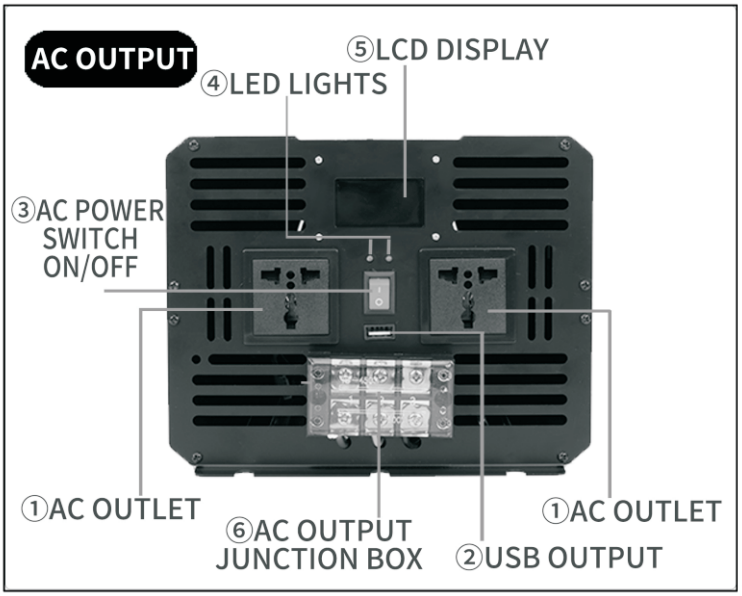
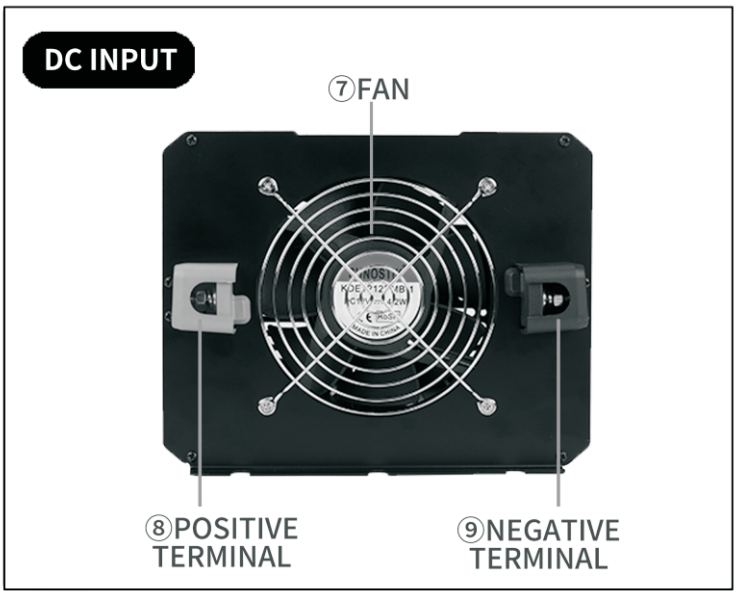


INVERTER 4000W-6000W





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② USB OUTPUT : QC3.0 fast charging

③ AC POWER SWITCH : turn on/off the AC output power.

④ LED LIGHTS : Green color : indicates AC power is present at the AC outlets and the inverter is operating normally.
Red color : indicates inverter is in protection status.

⑤ LCD DISPLAY : can display the working status of inverter.

⑥ AC OUTPUT JUNCTION BOX : can connect the high power appliances as request.

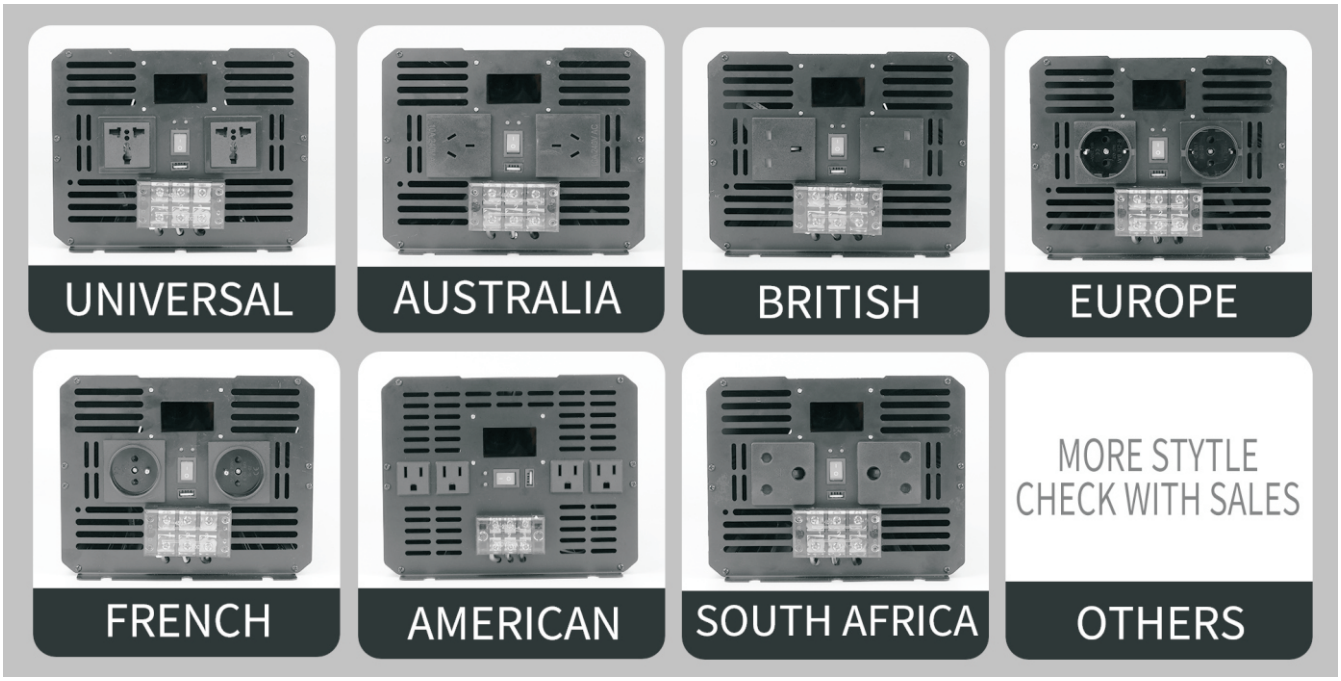
⑦ FAN : can lower the temperature of inverter. Should keep it clean during the inverter working.

⑧ POSITIVE TERMINAL : connect with the positive (+) side of the battery.

⑨ NEGATIVE TERMINAL : connect with the negative (–) side of the battery.

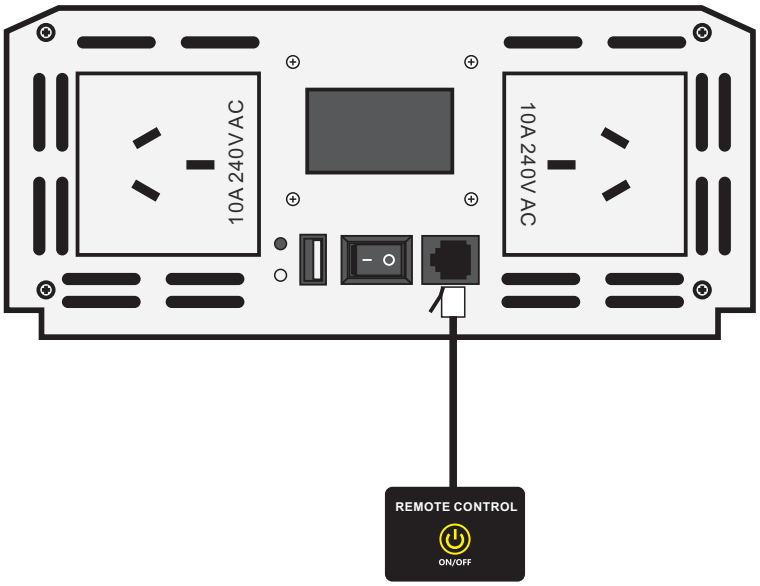
NOTE: Protection fuses are located inside the inverter cabinet.

Choose Sockets:

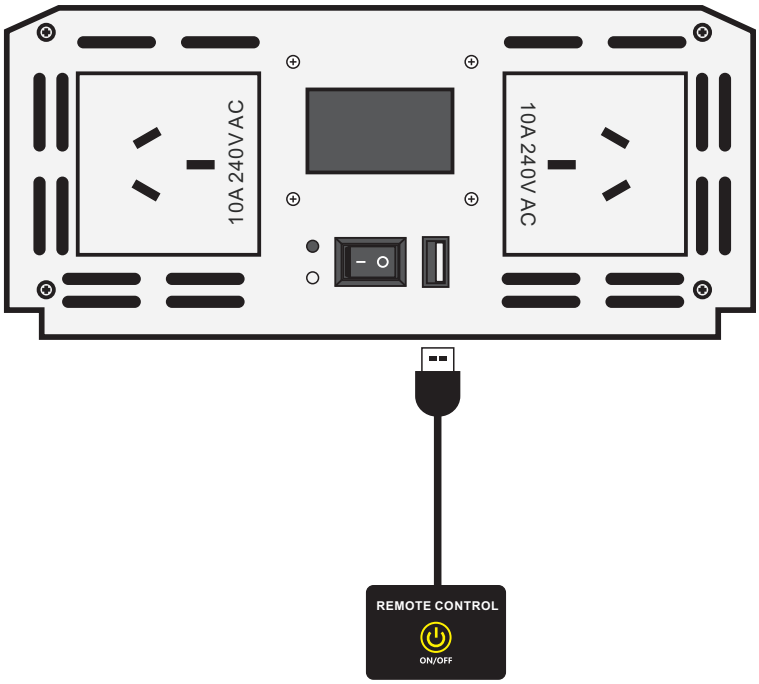


OPTIONAL: WIRED REMOTE CONTROL & WIRELESS REMOTE CONTROL

① WIRED REMOTE CONTROL



② WIRED REMOTE CONTROL



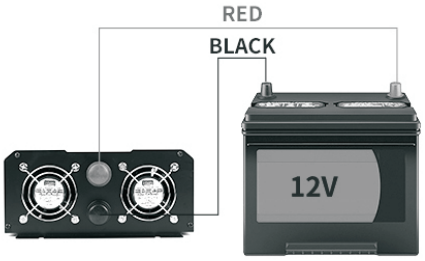
③ WIRELESS REMOTE CONTROL

④ WIRELESS REMOTE CONTROL

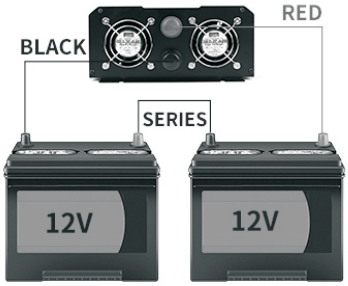
6. Inverter to Battery Connection

BLACK-NEGATIVE **RED-POSITIVE**

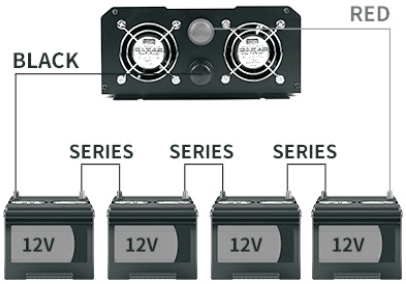
12V inverter connection



24V inverter connection



48V inverter connection



7. Installation Guidelines

Selecting a suitable location

For safe and optimum performance. Install the inverter in a location that is:

- **Dry.** Do not expose to water drip or spray.
- **Cool.** Better to be used in ambient temperatures between 32**°F(**0°C) and 104**°F(**40°C). Keep away from furnace heating vents or other heat producing equipment
- **Well ventilated.** Allow at least 5cm clearance above and on all sides of the unit for proper cooling.
- **Safe.** Do not install inverter in a compartment with non-sealed batteries or flammable liquids, such as gasoline, or explosive vapors.
- **Clean and free of dust and dirt.** This is especially important if the inverter is used in a work environment.

The function of inverter is to convert the DC12V, 24V, 48V voltage into AC110V, 120V, 220V, 230V, 240V.

For connecting the inverter with a battery, you need to:

1. Make a visual inspection to ensure no visible damage has been caused by shipping before connecting. Then make sure that the inverter is Switched Off.
2. When inverter connect to the battery, make sure that the battery voltage is consistent with the inverter reference voltage.
3. Connect the red cable of the inverter to the Positive pole (+) of battery, Connect the black cable of the inverter to the Negative pole (-) of battery. Do not connect the cable reversely, otherwise the inverter fuse will be burnt.

CAUTION! A reverse polarity connection (positive to negative) may damage the inverter. Damage caused by a reverse polarity connection is not covered under warranty.

4. Tighten the nut on each DC terminal by hand until it is snug. If DC terminal is big, please use tools to tight up the screw.
5. Turn on the inverter power switch, if green indicator light is on, indicating that the inverter is working properly.
6. Please connect the loads to the AC output of inverter, please do not overload. In the case of overloading, the inverter will send alarm and stop working. To restart the inverter, please firstly switch OFF the inverter for 5 seconds, reduce the load, then switch ON again.

8. Precautions

The inverters are designed, manufactured and tested as per safety standards. However, as an electrical and electric product, it must be installed, operated and maintained strictly according to the related safety intructions as follows:

1. Reverse connection between the inverter and battery is strictly prohibited, it will burn the fuse of the inverter.
2. Please double check if the voltage of the battery matches the inverter input DC voltage, mismatch connection between the inverter and battery can cause serious damage.
3. Double check if the connections are correct, make sure the connections are tight and firm.
4. Do not extend the inverter power cable.
5. When the inverter is not in use, please switch off and unplug it from the 12V/24V/48V DC outlet to prevent slight discharge of the battery.
6. Avoid contacting of any foreign objects or fluid. Do not touch the inverter with wet hand. Keep the product away from children. Avoid using it in damp, dusty, high temperature area. Do not use this product in flammable and combustible area.
7. Install the product in well ventilated place, avoid using this product on or nearby hot objects such as electrical heater etc. Do not cover the inverter, avoid direct sun shine, moisture and water.
8. This inverter can NOT be parallel connected.
9. It's strictly prohibited to connect this product to the city grid.
10. Do not try to repair the inverter, once the inverter is opened, warranty void.

We advise that please use deep cycle battery. If you hear the low voltage alarm, please stop the inverter immediately. When the battery is fully charged, the inverter can be used again.

9 Using the Inverter

Using the DC Cable Clips or Direct Connect Cables

By directly connecting the inverter to a DC12V 24V 48V battery with the DC Cable-Chips, you can operate products with power requirements up to the rated continuous output power.

The power, or 'wattage', rating of AC products is average power they use. When many AC products are first switched on, they initially consume more power than their power rating.

For loading such as motor rectifier, there is a surge current when starting. Please note the starting current can't exceed the maximum rated current. (The starting current of motor may be 7–12 times the rated current.)

CAUTION! Modified sine wave inverter can't take above mentioned load.

It's normal that the output voltage drops when a heavy load is present. You must take action in case of below condition.

When the battery DC voltage is reduced below

Solution:

- increase the battery capacity.
- reduce the load on inverter.

When output AC voltage drops below acceptable levels 210V AC (220V 230V 240V inverter), 105V AC (110V 120V inverter)

Solution:

- increase the battery capacity.
- reduce the load.

Although the inverter can supply momentary surge power, occasionally some products rated less than the rated continuous output power may exceed its surge capabilities and trigger its safety overload shut down feature. If this problem occurs when attempting to operate several AC products at the same time, try first switching on the inverter with all AC products switched off. Then one by one switch each on, starting with the high surge product first.

Inverter Operation

1. When correctly connected the inverter to battery, turning the ON/OFF (I /O) switch ON (I), will illuminate the green light and deliver AC power to the outlets.
2. Plug the AC product(s) you wish to operate into the AC outlet(s) and switch them on, one at a time.
3. As the battery is used up, battery voltage begins to fall. When the inverter senses that the voltage at its DC input has dropped to 10.5±0.5V (12V inverter) or 21±0.5V (24V inverter) or 42±1V (48V inverter) an audible alarm sounds. This allows time for computers or other sensitive devices to be shut down.
4. The inverter keep alarming and will automatically shut down when the battery voltage drops to 9.5±0.5V (12V inverter) or 19±0.5V (24V inverter) or 38±1V (48V inverter) . This prevents battery damage from excessive discharge. After auto shut down, the red FAULT light illuminates.

IMPORTANT: Vehicle batteries are designed to provide brief periods of very high current needed for engine starting. They are not intended for constant deep discharge. Regularly operating the inverter from a vehicle battery until the low voltage alarm sounds will shorten the life of the battery. Consider connecting the inverter to a separate deep discharge type battery if you will be frequently running electrical products for extended period of time.

5. If an AC product rated higher than the rated continuous power (or which draws excessive surge power) is connected, the inverter will shut down. The red FAULT light will turn on.
6. If the inverter exceeds a safe operating temperature, due to insufficient ventilation or a high temperature environment, it will automatically shutdown. The red led light will turn on and the audio warning will sound.
7. Should a defective battery charging system causes the battery voltage to rise to dangerously high levels, the inverter automatically shuts down.

CAUTION! Although the inverter incorporates protection against over-voltage, it may still be damaged if the input voltage exceeds 16.2 VDC (12V inverter) or 31V DC (24V inverter) or 63V DC (48V inverter).

8. The cooling fan is designed to operate only when the temperature is higher than 40℃.
9. In the event of an overload, low battery voltage or overheating, the inverter will automatically shut down.
10. The inverter will need to be manually reset when shut down by overload.

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.

When using a vehicle as a power source, it is strongly recommended to start the vehicle every hour or two to charge 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 may trigger the inverter's low voltage shutdown feature.

Because the inverter draws less than the no load current draw with the ON/OFF ("—"/"O") switch in ON ("—") position and with no AC products connected, it has minimal impact on battery operating times.

Interference with Electronic Equipment

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

Buzzing Sound in Audio Systems and Radios

Some inexpensive stereo systems, boom boxes, and AM–FM radios have inadequate internal power supply filtering and buzz slightly when powered by the inverter. Generally, the only solution is 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. The following should minimize or eliminate the problem:

- Use an extension cord to increase the distance between the inverter and the TV, antenna and cables.
- Adjust the orientation of the inverter, television, antenna and cables. Maximize TV signal strength by using a better antenna and use shielded antenna cable where possible.
- Try a different TV. Different models of televisions vary considerably in their susceptibility to interference.

10. Trouble shooting

If you have any problem with your inverter, the first thing you should do is to disconnect any load from it, switch the inverter off and disconnect it from the battery. The summary table below should help you to find the cause of the problem.

Possible Cause	Suggested Solution
PROBLEM: AC applicanes do not work, and the green power indicator does not ON.	
Battery is defective.	Check battery and replace if required.
Inverter has been connected with reverse DC input polarity.	Check connection to battery. Probable inverter damage has occurred, have unit repaired (not covered by warranty).
Loose cable connections	Check cables and connections. Tighten as required.
PROBLEM: Inverter will run some small loads, but not larger ones.	
Voltage drop across DC cables.	Reduce the cable and use bolder one
PROBLEM: Measured inverter output is too low.	
The range of reading of common ammeter is too small	Inverter's 'pure sine wave' or 'modified sine wave' with a real effective value multimeter to get the accurate data
Battery voltage is too low	Recharge battery or change battery
PROBLEM: Alarm is sounding.	
Low voltage alarm	Shorten cables or use heavier cables. Charge the battery.
Over temperature alarm	Allow unit to cool. Improve air circulation around unit. Locate unit to a cooler environment. Reduce load if continuous operation is required, restart.

AC appliances draws too much power	Use bigger power inverter
Poor connection	Check the connection and tighten it
PROBLEM: Battery run time is less than expected.	
AC product power consumption is higher than rated.	Use a large battery to make up for increased power requirement.
Battery is old or defective.	Replace battery.
Battery is not being properly charged.	Many simple chargers are unable to charge a battery fully. Replace charger with better charger. Use shorter/heavier DC cables.
PROBLEM: AC electric appliances does not work, and red FAULT light ON.	
Overload shut off due to rated power of appliances exceeding the inverter's rated power.	Use appliances have power below the inverter's rated continuous output power.
AC product is rated less than the rated continuous output power; high starting surge has caused overload shutdown.	Product exceeds inverter's surge capability. Use a product with starting surge power within the inverter's capability.
Battery is discharged (alarm is sounding).	Recharge battery.
Inverter has overheated due to poor ventilation and has caused over temperature shutdown.	Switch inverter OFF and allow to cool for 15 minutes. Clear blocked fan or remove objects covering unit. Locate unit to a cooler environment. Reduce load if continuous operation is required, restart.
Input voltage is greater than 16.0V/31V/61V DC.	Verify charging system is properly regulated and battery is 12V/24V DC nominal.