

# abax<sup>®</sup>

*Pure sine wave - Modified sine wave Inverter*



User Manual



Version 1-2-3

# *Preface*

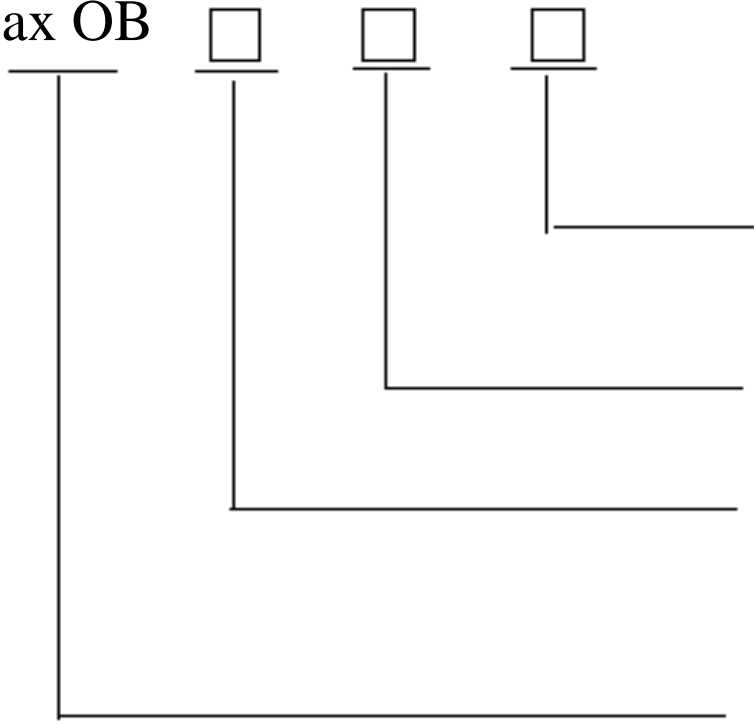
Thank you for purchasing our Pure Sine Wave Inverter. It is a compact and highly portable power inverter which has an excellent track record in the field of high frequency inverter. From the 12V/24V DC outlet in your vehicle or boat, or directly from a dedicated 12V/24V DC battery, this inverter can efficiently and reliably power a wide variety of household AC products, such as TV, Computers, Air-conditioner etc. Please read this guide before installing or using the inverter and save it for future reference. Due to our continuous work to upgrade and improve our products, we may change or revise the contents of this manual instructions or any part of it without giving any further notice.

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# Models and Denotations

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abax OB



300W, 600W, 1000W,  
1500W, 2000W, 3000W

12V, 24V

M: Modified sine wave Inverter

S: Pure sine wave Inverter

Model Name

## **Safety First**

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### **WARNING! Shock hazard. Keep away from children.**

- 1-1. The inverter generate the same potentially lethal AC power as a normal household wall outlet. Treat it as if you are using any other AC outlet.
- 1-2. Do not insert foreign objects into the inverter's AC outlet, fan or vent openings.
- 1-3. Do not expose the inverter to water, rain, snow or spray.
- 1-4. Do not under any circumstance, connect the inverter to AC power.

### **WARNING! Heated surface.**

- 1-5. The inverter housing may become uncomfortably warm, reaching 140F(60°C) under extended high power operation. Ensure at least 4 inches (10cm) of air space is maintained on all sides of the inverter. During operation, keep away from materials that may be affected by high temperature.

**WARNING! Explosion hazard.**

- 1-6. Do not use the inverter in the presence of flammable flumes or gases, such as in the bilge of a gasoline powered boat, or near a propane tanks. Do not use the inverter in an enclosure containing automotive-type, lead-acid batteries. These batteries, unlike sealed batteries, emit explosive hydrogen gas which can be ignited by sparks from electrical connection.
- 1-7. Do not connect live AC power to the inverter's AC outlets. The inverter will be damaged even if it is switched OFF.
- 1-8. Do not expose the inverter to temperatures exceeding 104F (40 °).

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

- 1-9. Small battery operated products such as rechargeable flashlights, some rechargeable shavers, and nightlights that are plugged directly into an AC receptacle to recharge.
- 1-10. Certain battery chargers for battery packs used in hand powered tools. These chargers will have warning labels stating that dangerous voltages are present at the charger's battery terminals.
- 1-11. 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).

## **Product Features and Applications**

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### ***Product Features***

- Pure sine wave or modified sine wave
- Soft start
  - PWM(Pulse Width Modulation)
- Microprocessor based design
  - With power ON/OFF switch and LED indicator
- Overload protection / Over voltage protection / Short Circuit protection / Over temperature protection / Reverse polarity protection (by fuses)

### ***Product Applications Power tools series:***

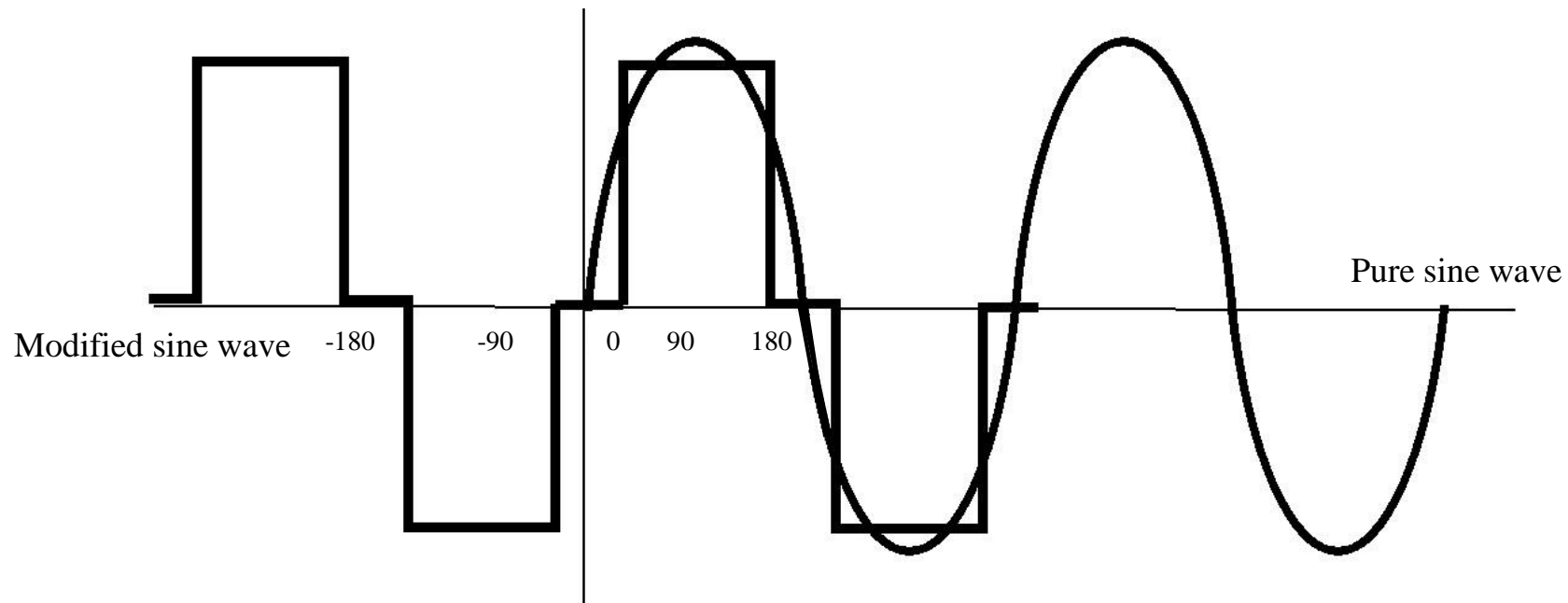
Electric Saw, Drilling Machine, Grinder, Sandblast Machine, Punching Machine, Weeding Machine, Air Compressor; Office series: Computer, Printer, LCD Monitor, Scanning Machine etc. Household Appliance series: Dust Collector, Fan, Lamp or LED, Sewing Machine etc, Kitchen Appliance series: Microwave Oven, Fridge, Freezer, Coffemaker,

## Pure sine wave and modified sine wave inverters

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The inverter come in two types; pure sine wave power type and modified sine wave type. In the pure sine wave power inverter, the 230V AC output harmonically follows a smooth sine wave and is almost identical to normal mains electricity. As a result, the pure sine wave output would be better for most appliances than the modified sine wave output.

*A Graphic Comparison of Modified Sine Wave and Pure Sine Wave is shown below:*





# Guidelines

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## *Installation Conditions*

For safe and optimum performance, install the inverter in a location that is:

3-1-1. Dry - Do not expose to water drips or spray.

3-1-2. Cool - Operate only in ambient temperatures between 32F (0°C) and 104F (40°C). Keep away from heating vents or other heat producing equipment.

3-1-3. Safe - Do not install inverter in a compartment with batteries or flammable liquids, such as gasoline or explosive vapors.

3-1-4. Wellryulbtark Allow at least 4 inches (10cm) clearance above and on all sides of the unit for proper cooling.

3-1-5. Clean and free of dust and dirt - This is especially important if the inverter is used in a dusty working environment. Select a Suitable Location.

# Guidelines

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## *Working Principle*

The inverter works in two stages. During the first stage, the DC to DC converter increases the DC input voltage from the power source (eg. A 12V battery) to 300V DC. In the second stage, the high voltage DC is converted to the watts you need (AC) using advanced power MOSFET transistors or IGBT technology in a full bridge configuration. The result is excellent overload capability and the capacity to operate difficult reactive loads.

## *Connection Method*

3-2-1. Attach the ring type connector marked with red to the positive (+) DC terminal on the inverter and attach the ring connector marked with black to the negative (-) DC terminal.

**CAUTION! A reverse polarity connection (positive to negative) may damage the inverter (Fuse). Damage caused by a reverse polarity connection would probably invalidate your warranty**

**WARNING: Sparking may occur when connecting the unit to the battery, make sure no flammable fumes are present before making any connections.**

3-2-2. Tighten the nut on each DC terminal by hand until it is snug. If the power more than 1800W, please use tools to tight up the screw.

3-2-3. When the inverter is not in use , unplug it from the 12V/24V DC outlet to avoid the battery's discharge.

**CAUTION: Before using, the inverter, please provide a ground connection wire. On the rear panel of the inverter is a terminal fitted with a nut for connecting to the inverter and to the earth terminal of the AC output socket. Please choose heavy duty, insulated green/yellow wire. Drive into the ground to a depth of 1-2m or more. In a vehicle, connect the inverter to the chassis of the vehicle. In a boat, connect to the boat`s grounding system.**

## ***Battery`s Charge***

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. If you use the inverter in a car, then it would be necessary to run the engine of your car after each time you use the inverter. You can run the engine for 10 minutes or so to recharge the battery.

## ***Inverter's Working Status***

3-3-1. When a 12V/24V DC outlet or battery properly connected to the inverter, turn on the ON/OFF, the green Power indicator will light, and it deliver AC power to the outlets.

3-3-2. Plug the AC appliances you wish to operated into the AC outlet(s) and switch your appliances on, switch one at a time.

**NOTICE: When connect to the appliances, remember to turn on the inverter before turn on the appliance.**

3-3-3. If the audible alarm be ignored the inverter may be automatically shut down when the battery voltage drops to 9.8-10.2V / 19.6-20.4V, in order to prevent damage to the battery from excessive discharge.

3-3-4. If a defective battery charge system has caused the battery voltage to rise to a dangerously high level, the inverter automatically shut down.

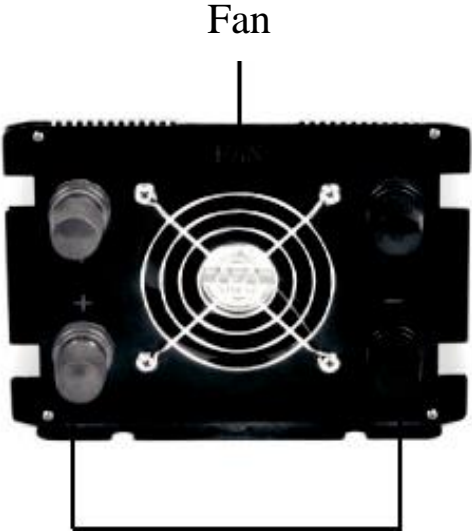
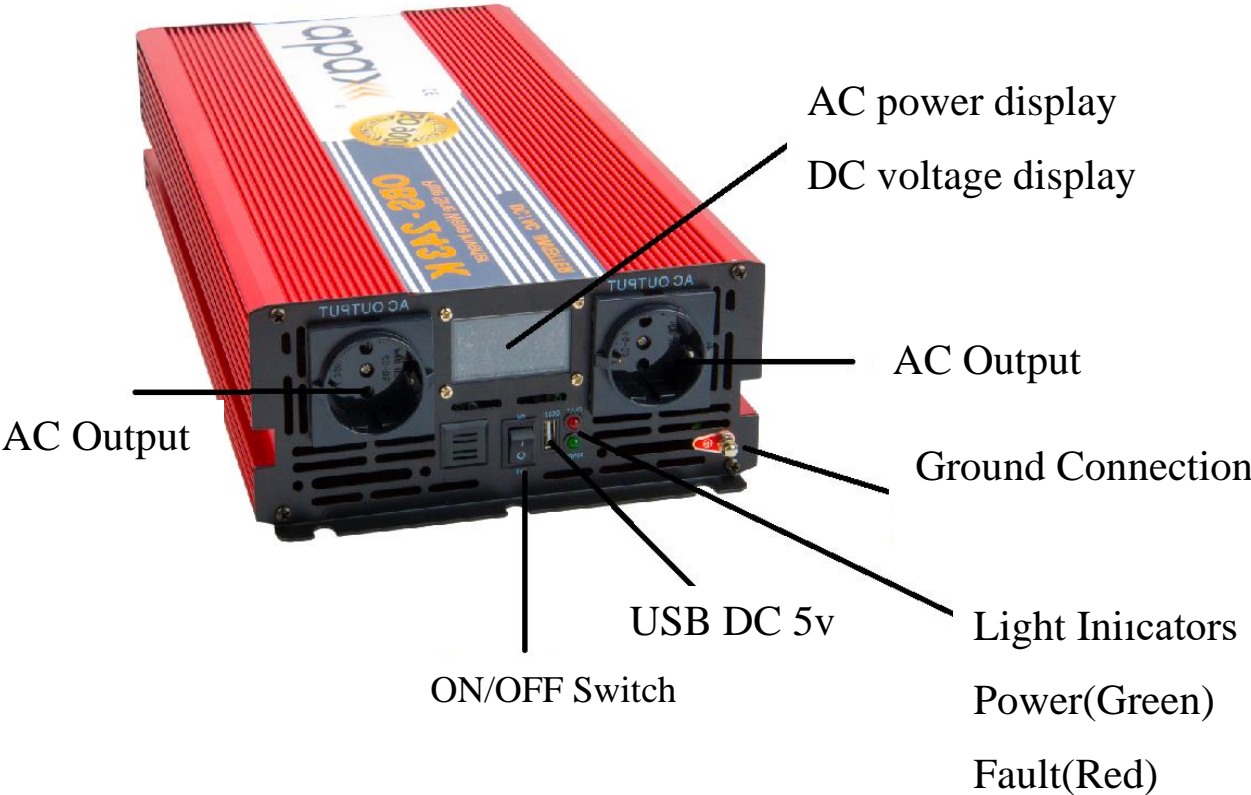
3-3-5. The cooling fan is designed to operate only when the temperature goes up or when the loads are applied.

**CAUTION! Although the inverter incorporates the protection function against over-voltage, there would be still the possibility of getting the unit damaged, if the input voltage exceeds 16V/32V.**

# The Sketch of Inverter

Pure Sine wave Inverter 3000W

OBS-243K

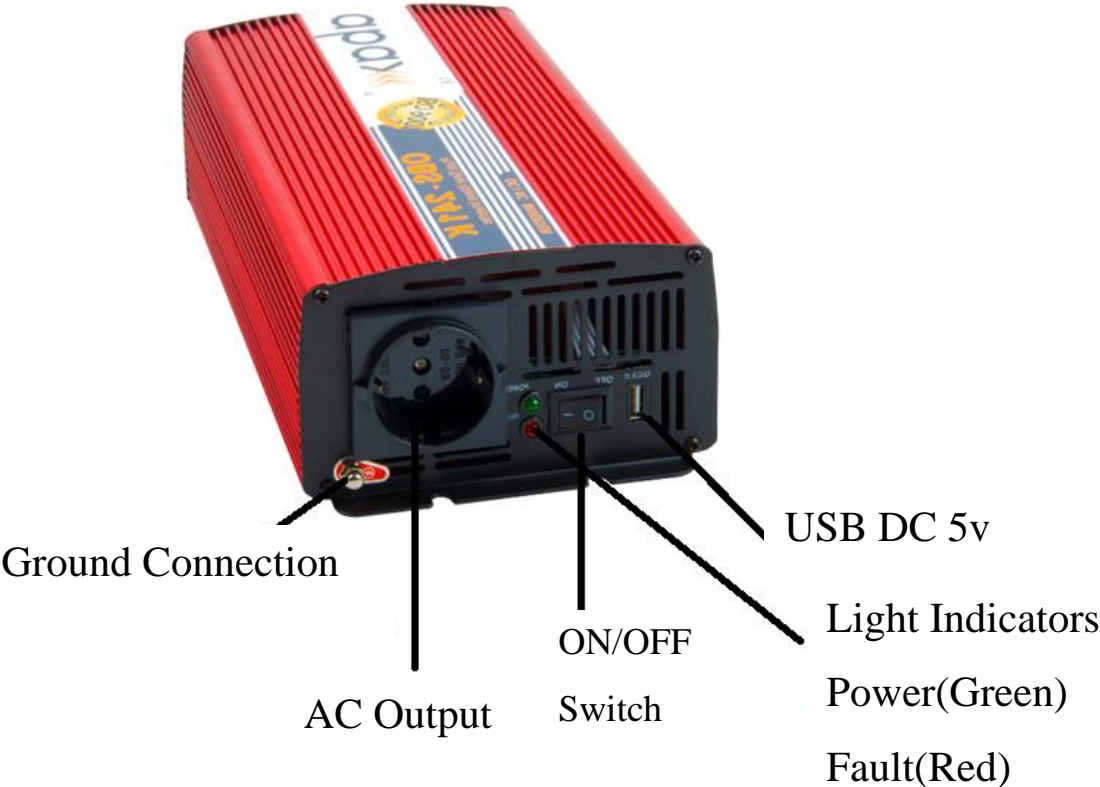


# The Sketch of Inverter

Pure Sine wave - Modified sine wave Inverter 1000W

OBS-121K – OBS-241K    OBM-121K – OBM-241K

Fan

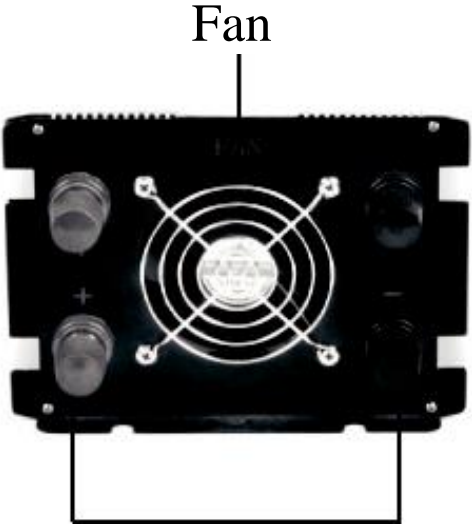
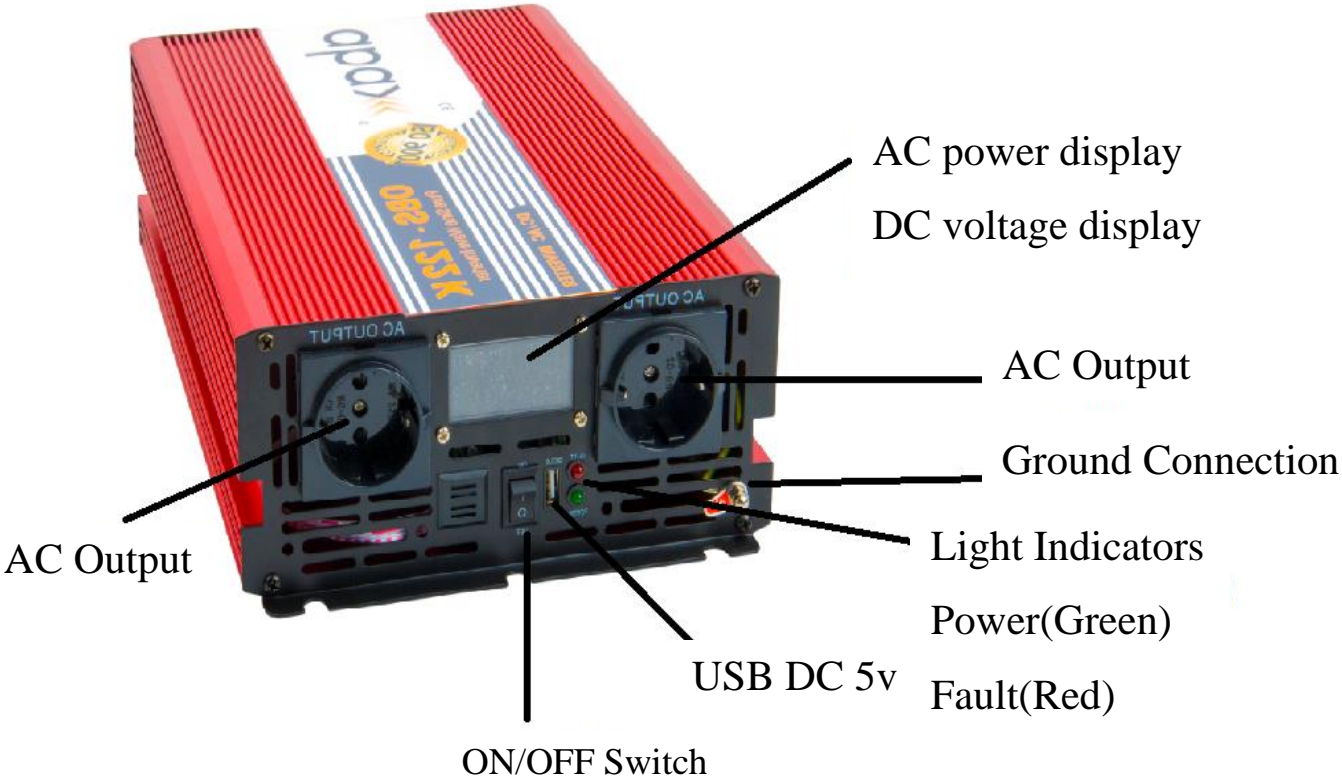


Battery Connecting Lines

# The Sketch of Inverter

Pure Sine wave Inverter 2000W

OBS-122K – OBS-242K

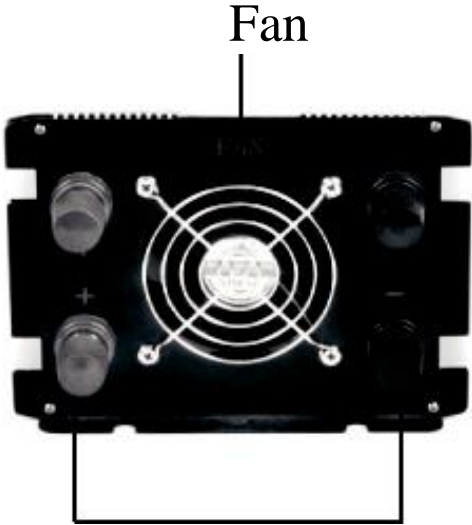
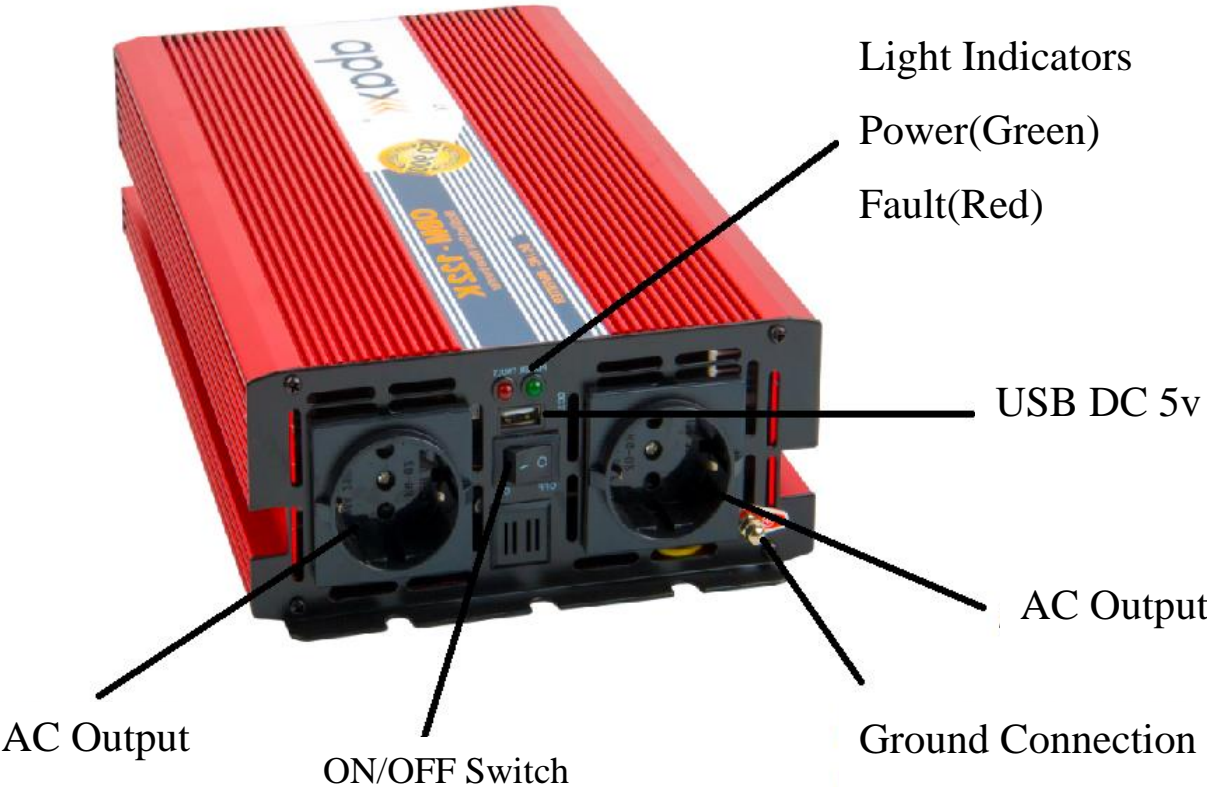




# The Sketch of Inverter

Modified Sine wave Inverter 2000W

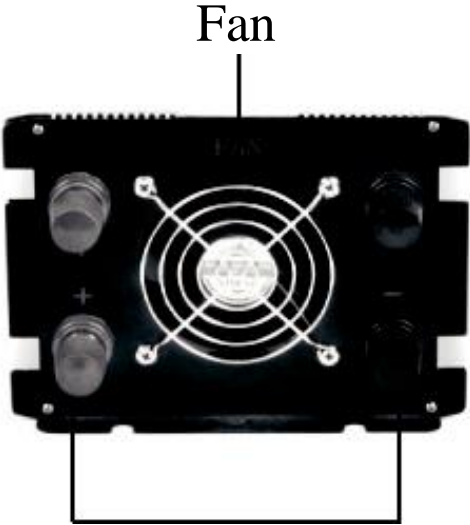
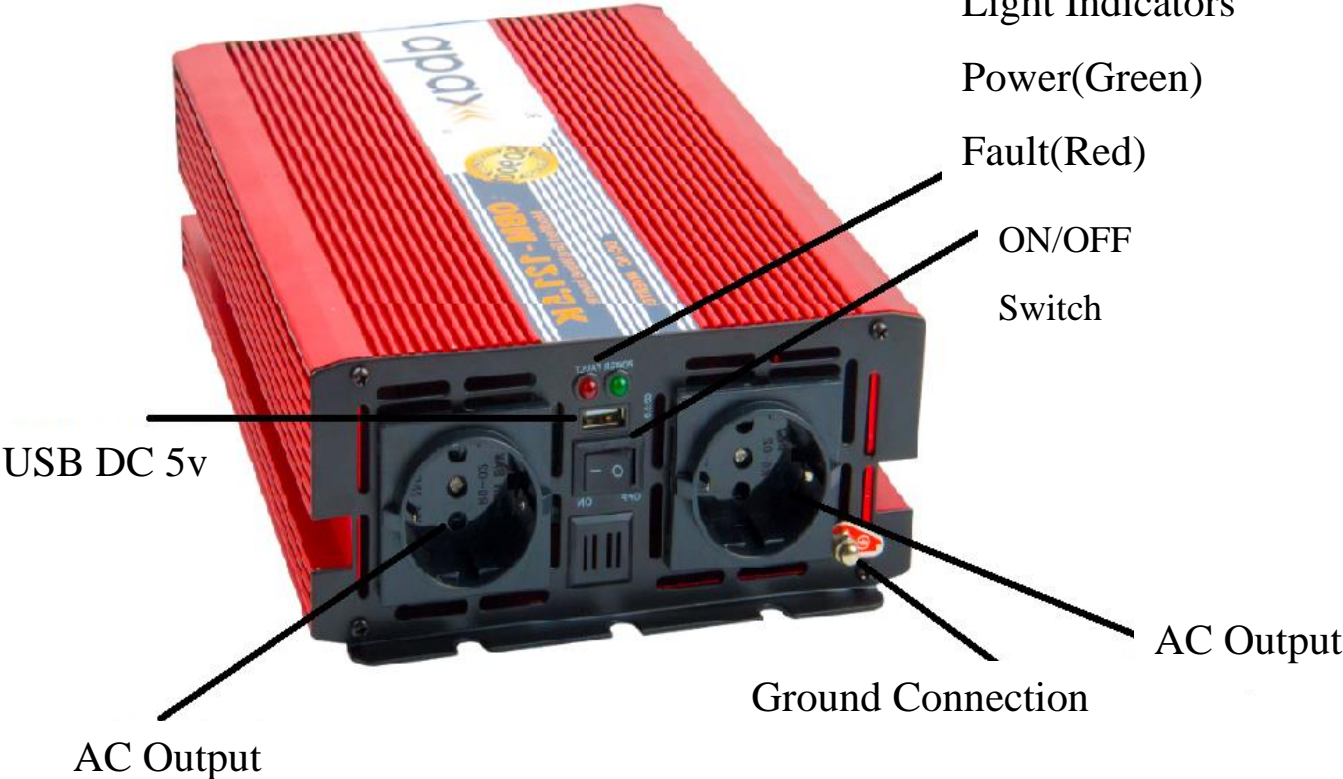
OBM-122K – OBM-242K



# The Sketch of Inverter

Pure Sine wave - Modified Sine wave Inverter 1500W

OBS-121.5K – OBM-121.5K



Battery Connecting Lines

# The Sketch of Inverter

Pure Sine wave - Modified Sine wave Inverter 600W

OBS-1206 – OBM-1206

Light Indicators  
Power(Green)  
Fault(Red)



AC Output

Ground Connection

USB DC 5v

Fan



Battery Connecting Lines

# The Sketch of Inverter

Pure Sine wave - Modified Sine wave Inverter 300W

OBM-1203

Light Indicators  
Power(Green)  
Fault(Red)

ON/OFF  
Switch

USB DC 5v



AC Output

Ground Connection

Fan

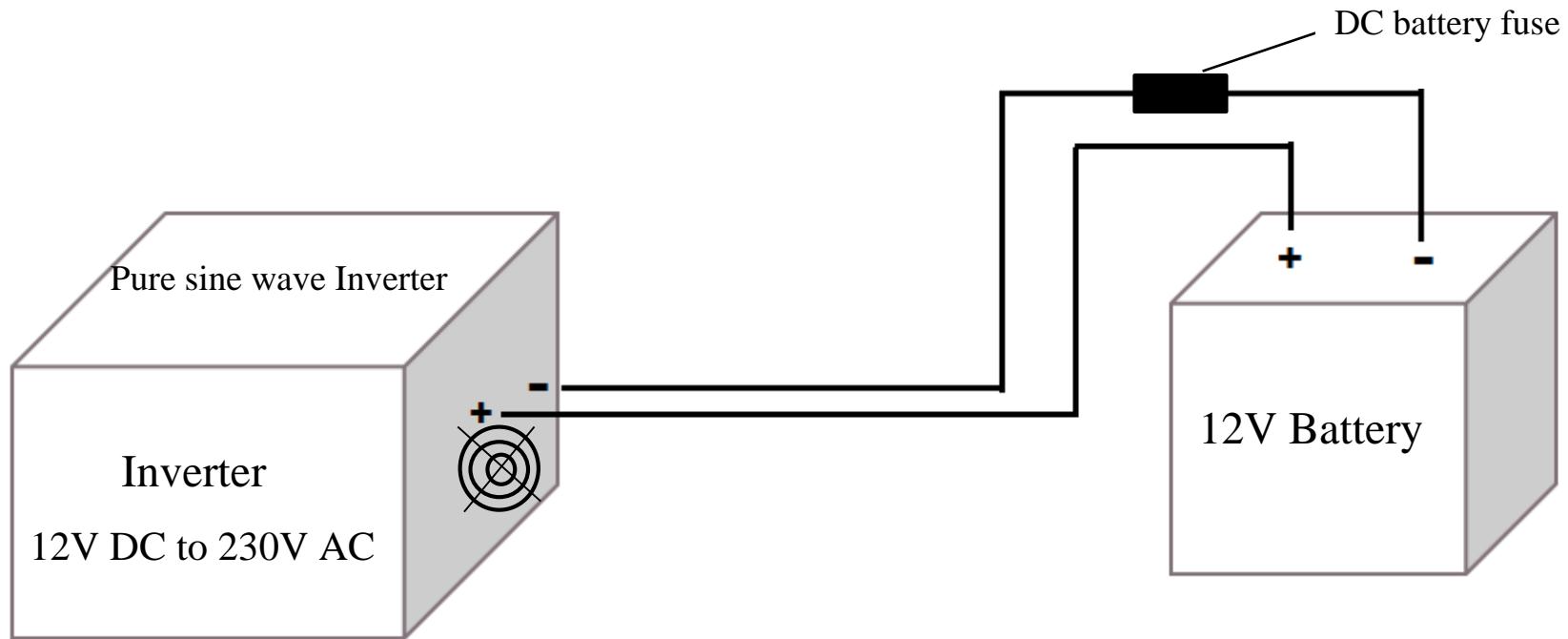


Battery Connecting Lines

# Inverter to Battery Connections Details

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*Example:* Connection of Power Inverter 2000W to Battery



## Trouble Shooting

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AC appliances do not work, and the green power indicator does not light.

<i>CAUSES</i>	<i>SOLUTION</i>
Bad battery	Check the battery replace it if necessary
Revers connection of negative and positive poles	Correct the connection to battery, the inverter may be damaged. Replace the fuse inside inverter (outside warranty cover)
Untight connection of cables	Check the cables and the connection

## Trouble Shooting

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The electric appliances does not work and the red FAUL indicator of the inverter lights.

<i>CAUSES</i>	<i>SOLUTION</i>
Overload shut off due to rates power of appliances exceeding the inverters rated power	Use appliances having power below the inverter rated power
Overload shut off due to overhigh peak power despite of power of electric appliances lower than the inverters rated power	Since the peak power of the electric appliances exceeds the peak power of the inverter, use an appliance with a peak power consistant with the inverter

## Trouble Shooting

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<i>CAUSES</i>	<i>SOLUTION</i>
The battery is over discharged (inverter gives an alarm)	Replace the battery or use battery charger to charge your battery
Over temperature shut off due to bad ventilation	Swith off the inverter and let it cool for 15 minutes. Clear objects around the fan and the inverter. Place the inverter at the cool place. Reduce load according to requirements. Restart
Too large input current	Check the working state of the charging system. Make sure the output voltage of the battery is within the proper voltage



## Trouble Shooting

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The measured output current of the inverter is too low

<i>CAUSES</i>	<i>SOLUTION</i>
The range of reading of common ammeter is too small	Measure modified sine wave with a real effective value multimeter to get the accurate data
Too low current of the inverter	Charge the battery or change the battery

## Trouble Shooting

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The inverter gives our alarm sound.

<i>CAUSES</i>	<i>SOLUTION</i>
Low voltage alarm	Shorten the wire or use wider cable. Charge the battery
Over temperature protection	Make the inverter get cooler. Improve ventilation around the inverter. Place the inverter at a cool place. Feed the load according to requirements.
AC appliances draw too much power	Use bigger power inverter
Poor connection	Check the connection and tighten it.

# Specifications

<b>ITEMS</b>	300	600	1000	1500	2000	3000
<b>Rated Power</b>	300W	600W	1000W	1500W	2000W	3000W
<b>Surge Power</b>	600W	1200W	2000W	3000W	4000W	6000W
<b>Output Voltage</b>	230V					
<b>Input Voltage</b>	12/24V	12/24V	12/24V	12/24V	12/24V	12/24V
<b>Output Waveform</b>	<i>Pure sine wave or Modified sine wave</i>					

# Warranty

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Our factory(dealer) warranty for the product.

Limited product warranty and exclusions:

We provide a limited warranty that covers defects of the products you ordered caused by material or manufacturing faults. The warranty period is for 12 months and begins on the date of purchase by the original end user.

This limited warranty is made only to the original purchaser of the unit, and is not transferable to any subsequent owner.

We will, at its option, repair or replace the defective component(s) free of charge, Provide that our factory is notified of the defect during the warranty period and a dated proof of purchase is furnished. We reserve the right to inspect the faulty component(s) and determine if the defect is due to material or manufacturing flaws. We also reserve the right to charge for service time expended if the defect is not due to material or manufacturing flaws or is not for some other reason subject to this limited warranty.

We are not warrant unit from any and all defects or damage caused by:

## Warranty

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a. Material or workmanship not provided by us

b. Shipping or transportation damages

c. Improper use or installation

d. Exposed to unsuitable environmental conditions (including but not limited to damage due to lightning strikes)

e. Unauthorized or abnormal use or operation

f. Negligence or accidents

g. This warranty does not cover costs related to removal, installation, or troubleshooting of your electrical systems. We will, at its option, use new and / or reconditioned parts in performing warranty repair and in building replacement products.

We reserve the right to use parts or products of original or improved design in the repair or replacement. If we repair or replace a product, its warranty continues for the remaining portion of the original warranty period. All replaced products and all parts removed from repaired products become the property of us. We cover both parts and labor necessary to repair the product and return shipment to the customer, via our selected non-expedited freight carrier within installation, removal or reinstallation of the unit.

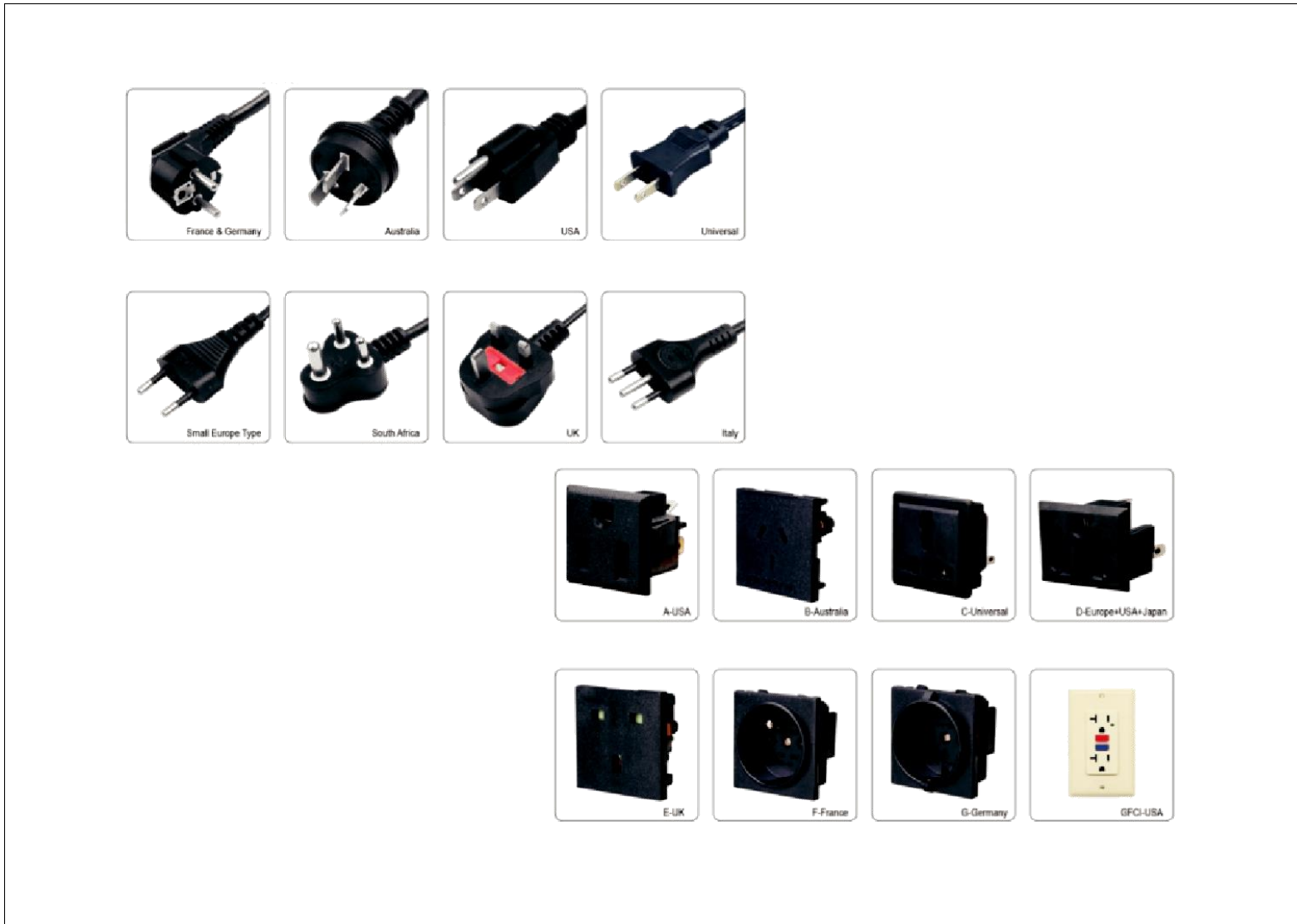


Fig 1: Different types of plugs and sockets used in different countries

**Statement:** There are some differences between the image and the real objects, please subject to real objects; Products are being updated constantly, if you need to learn more, please contact us.

