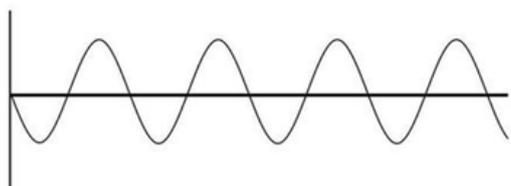




## **INSTRUCTIONAL MANUAL**



***PURE SINE WAVE***

## **POWER INVERTER**

- 1000 WATT**
- 1500 WATT**
- 2000 WATT**
- 2500 WATT**

**SOFT START TECHNOLOGY**

## Welcome

Please read this manual thoroughly before installing and operating your new Power Inverter. This manual contains information you need to obtain the performance required for your application. Keep this manual for future reference.

The Inverters convert low voltage, direct current (DC) to 110 volt or 230 volt pure sine wave (PSW) alternating current (AC). The inverter draws power from 12 volt or 24 volt, deep-cycle batteries such as those used for automobile, marine, and fork-lift or from other high current 12 or 24 volt sources.

## WARNINGS:

- *This is not a toy. Keep out of reach from children*
- *DO NOT install near flammable materials*
- *DO NOT use or make connections in mark or designated as IGNITION PROTECTED*
- *DO NOT expose to rain, snow, water, or any other liquids*
- *DO NOT use with positive ground electrical systems*
- *NEVER connect the inverter to AC distribution wiring*
- *DO NOT plug foreign objects into the receptacles*
- *DO NOT open, there are no user serviceable parts inside*



**CAUTION: SERIOUS SHOCK HAZARD.** The inverter should only be serviced by qualified personnel.

This pure sine wave power inverter converts

12V (10–15V)

24V (20–30V)

DC battery power into AC power of

110-120V /60Hz

220-240V /50Hz

You can use the inverter in your vehicle, boat or at home to operate almost any type of appliances that use AC power such as TVs, VCRs, computers, refrigerators, power tools and lights for emergency use, or camping use. Also, the pure sine wave power inverter can operate the higher-end equipments and is ideal for operating sensitive loads. The inverter can also be used as part of the Off-Grid solar system to generate AC power at home.

## Inverter operating equipments reference chart

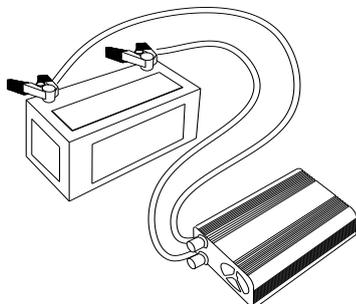
( Notes: for reference only! Starting up power may vary for different brand appliances!)

Audio / Video Equipment	Power	1000W	1500W	2000W	2500W
12 Inch color TV	16W	✓	✓	✓	✓
Satellite TV receiver	30W	✓	✓	✓	✓
CD changer / mini system	60W	✓	✓	✓	✓
27 Inch color TV	170W	✓	✓	✓	✓
240W RMS stereo amplifier	250W	✓	✓	✓	✓
Home theatre system	500W	✓	✓	✓	✓
Domestic Appliance	Power	1000W	1500W	2000W	2500W
halogen work light	100W	✓	✓	✓	✓
Clothes washer (horizontal)	250W	✓	✓	✓	✓
Blender	350W	✓	✓	✓	✓
Hair curler	750W	✓	✓	✓	✓
Microwave - 750W	900W	✓	✓	✓	✓
Vacuum cleaner	900W		✓	✓	✓
Coffee maker	1200W			✓	✓
Dishwasher - hot dry	1450W			✓	✓
Large Hob	2000W				✓
Home Office	Power	1000W	1500W	2000W	2500W
Inkjet printer	35W	✓	✓	✓	✓
satellite laptop computer	40W	✓	✓	✓	✓
Fax machine - printing	50W	✓	✓	✓	✓
Desktop computer	350W	✓	✓	✓	✓
Laser printer	900W		✓	✓	✓
Lighting	Power	1000W	1500W	2000W	3000W
100W incandescent light	100W	✓	✓	✓	✓
Twin work light	900W	✓	✓	✓	✓
Power tools	Power	1000W	1500W	2000W	3000W
Glue gun	20W	✓	✓	✓	✓
Buffer	77W	✓	✓	✓	✓
Rotary power tool	126W	✓	✓	✓	✓
5 Inch bench grinder	180W	✓	✓	✓	✓
industrial sander	220W	✓	✓	✓	✓
1/2 Inch reversible drill	620W	✓	✓	✓	✓
Grinder, 1/2hp	1080W		✓	✓	✓
14 Inch chain saw	1200W		✓	✓	✓

Note: You may not start up the same rated power appliance by the same rated power inverter as the appliance starting up power may exceed the inverter surge power. I.E compressor or motor driven appliances may need 3-10 times of starting up power. (100W refrigerator need 1000W power inverter to start it)

## **BASIC OPERATION**

- Use the right operating voltage for both input and output of the inverter.
- Powering devices by connecting **RED** terminal from inverter to + of battery terminal and connect **BLACK** terminal from inverter to – of battery terminal.



*(picture is just for your ref. real product may be different )*

- Insert the plug of your appliances into AC socket at the front of the inverter.
- Turn ON the power switch that is located at the front of the inverter, and the green LED light will light as indicator that the unit at work.

## **RECOMMENDATION**

- If the power inverter makes beeping sound, turn OFF the power inverter and disconnect all appliances from inverter and disconnect the inverter from the power supply. (The inverter Buzzer has different beeping sounds which mean different working conditions. See PROTECTION FEATURES)

## **NOTE:**

The audible alarm may make a momentary "chirp" when the inverter is turned OFF. This same alarm may also sound when the inverter is being connected to or disconnected from the battery bank.

- When you are not using the inverter, turn the switch to OFF and disconnect the inverter from the power supply.
- Disconnect the inverter when starting the vehicle's engine.

## **BATTERY USE**

TO avoid over-discharging your vehicle's battery, you should run your engine for 10-20 minutes to recharge the vehicle's battery after operating the inverter for some time. (The using time depends on your loaded power and your battery size. We recommend you to keep your car engine ON if your loaded power is more than 500W)

If you choose to connect the vehicle directly to your battery terminals, it is important to connect with right polarity (Connect RED from inverter to + of battery terminal and connect BLACK from inverter to – of battery terminal)

## **CAUTION:**

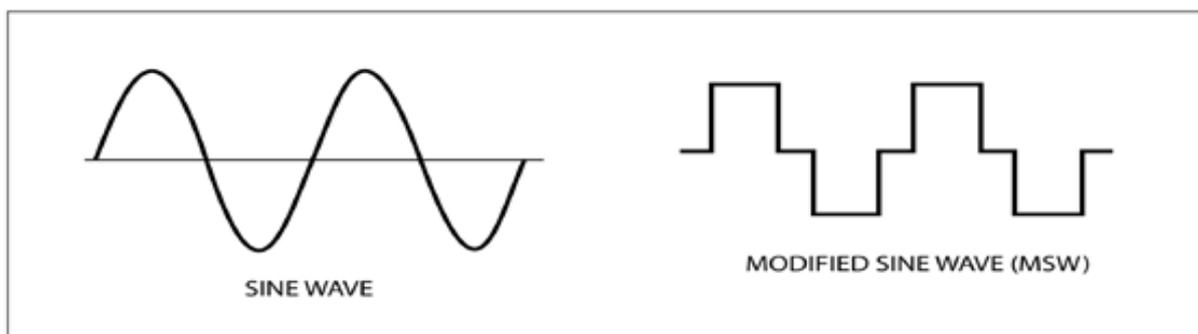
*The followings operation will damage the unit:*

- *Reverse polarity by connecting the wires to the incorrect terminals.*
- *Connecting the battery charger to replenish battery without disconnecting the inverter first.*
- *Operating the inverter and battery in or around water.*
- *Connecting 12V power inverter to a 24V battery.*
- *When use the inverter in solar system, connecting the power inverter DC input directly to solar controller DC LOAD terminals.*

## MEASURING THE AC VOLTAGE

If you plan to measure the true output R.M.S. voltage of the inverter, a meter such as FLUKE 87A, BACKMAN4410 or TRIPLETT 4200 must be used.

## Waveform comparison



**Normally on the market there are two kinds of power inverters:**

- \*Modified sine wave (waveform showed as above right picture)
- \*Pure sine wave (Waveform showed as above left picture)

**Most daily used appliances are belongs to 3 types of loads:**

- \*Resistive Load
- \*Capacitive Load
- \*Sensitive Load

For all appliances, you can use pure sine wave power inverter to run. For Resistive loads, there is no difference to run by modified sine wave or pure sine wave power inverters. For capacitive loads and Sensitive loads you better choose pure sine wave power inverters. You can use the modified sine wave inverters on certain capacitive loads and sensitive loads (low rated power appliances) but the working efficiency will not be as good as pure sine wave ones. Also, the reliability of modified sine wave is not as good as pure sine wave on the two types of loads. For all precise instruments or medical equipments, you **MUST** choose Pure Sine Wave inverters. For some compressor or motor driven appliances: coffee machine, refrigerator, air conditioner, you must need pure sine wave power inverters to run. Following are examples for appliances which belong to the three types of loads:

**Resistive Loads:** Incandescent light, Heater, Cooker, Oven.

**Capacitive Loads:** TV, computer, Projector, charger.

**Sensitive Loads:** Energy saving lamp, LED lamp, coffee machine, welding machine, air compressor, pump, refrigerator, cooling Fan, Air conditioner, Microwave, laser printer etc...

## SAFETY PRECAUTION

Do not open the case of the inverter. The high voltage inside the unit is the same type of power as our electrical outlets at home.

Do not let the cord of the inverter or any appliance's cord get wet.

Do not operate the inverter in or around water. The voltage of the unit makes electrical shock hazard if operated in wet conditions.

Do not connect the AC inverter directly to another AC power source.

## *Pure Sine Wave power inverter general manual for 1000W to 2500W*

Allow at least 1 inch of clearance around the inverter for airflow.

If you operate the inverter in a moving vehicle, you need to secure the inverter to prevent it from shifting around while the vehicle is moving.

If there is anything wrong with the inverter, disconnect all of the power.

### TROUBLE SHOOTING

TRouble/INDICATION	POSSIBLE CAUSE	SUGGESTED REMEDY
No AC output—the Red LED is ON	DC input below 10 Volts (DC12V Model) or 20 volts (DC24V Model) Excessive load	•Recharge or replace battery Reducing load
No AC output —inverter is cold	Poor connect with the battery.	•Disconnect load from inverter. Reconnect the unit to power source.
Motorized appliance will not start	Inadequate DC power supply Bad wiring or connection Appliance is excessive	Use battery of adequate size Use appropriate DC input cables Check all DC connection
Shut down after operating for a long time	•Over-temperature	•Disconnect the inverter and put aside for while to cool down the unit.
Shut down after operating short time, inverter is cold	Over-Load	Reduce the wattage of the inverter' s load

*Note: Check the PROTECTION FEATURES and you can also find some way of trouble shooting from the Buzzer sounds.*

### MAINTENANCE

Very little maintenance is required to keep the inverter operating properly.

### PROTECTION FEATURES

#### Low Battery alarm and shutdown

The inverter sounds an audible alarm then turns itself off if the source battery becomes too low. The Buzzer sounds “B (one sound)-3 seconds stop-B (one sound)-3 seconds stop-B (one sound)-3 seconds stop- ...” continuously. If you are using a small size battery to run a high power appliance, you may also encounter the battery low alarm and shutdown even the battery is fully charged. This is because the battery high current output draws the instant battery voltage down to battery low voltage.

#### Over voltage shutdown

The inverter will shutdown if the voltage is more than the input voltage range. See details on the Specification Chart. When the inverter is in over voltage condition, the Buzzer will sound like “B, B (two sounds)-1 second stop-B, B (two sounds)-1 second stop-B, B...” continuously.

#### Over-temperature protection

The inverter will shut down if the inverter inside circuit board is too hot. The Buzzer will sound as “B, B, B (3 sounds) -1 second stop-B, B, B (3 sounds) -1 second stop -B, B, B (3 sounds)-1 second stop-B, B, B...” continuously. This may happen if the working environmental temperature is too high or inverter is at fully loaded power for long time.

#### Overload Protection

The inverter will enter overload protection if the loaded power exceeds the inverter rated power.

The Buzzer will sound Beeping continuously 10 sounds then 1 second stop and repeatedly 3 times and then the Beeping sounds continuously ON.

#### Output Short Circuit Protection

The inverter automatically turns itself off if the connected load is shorts.

## Pure Sine Wave power inverter general manual for 1000W to 2500W

**Attention:** If the inverter is connected to the shorted load for long time, the inverter may get defective. If you find the inverter input and output are proper connected and your appliance is just not working, please turn OFF the inverter and check if the output wiring or appliance is shorted.

**Note:** When any beeping sound is ON, the inverter RED LED indicator will be ON or flashing.

### HEAT DISPERSAL

The inverter generates heat while it is working. This is not a malfunction. However, if the inverter gets too hot while working, it will turn off by itself.

Position the inverter where air flows freely around it to allow the heat to disperse.

The inverter's thermal protection prevents it from operating when its temperature exceeds 60+/-5 °C.

### SPECIFICATION

Name	Description
Output waveform	Pure Sine Wave
THD(Total Harmonic distortion)	less than 4%
Continuous power	1000W/1500W//2000W/2500W
Surge power	2000W/3000W/4000W/5000W
Best efficiency	Approx. 85%
Battery low shutdown	10+/-0.5VDC or 21+/-0.5VDC
Battery low alarm	10.5+/-0.5VDC or 22+/-0.5VDC
High voltage shutdown	15.5+/-0.5VDC or 29+/-0.5VDC
Thermal shutdown	140+/-9°F (60+/-5°C)
With DC 5V USB output	YES
With Wire Remote control	YES
AC output sockets	IP54 waterproof sockets- 2 outputs. Optional receptacles for US, UK, European or Australian market.

### Appended pictures for reference:



(Full view of the set)



**(Front view of the inverter)**



**(Rear View of the inverter)**