paco®

CONVERTS 24 VOLT DC INTO HOUSEHOLD AC POWER

POWER INVERTER

POWERS HOUSEHOLD APPLIANCES FROM 24 VOLT BATTERY

CONVERTS 24 VOLT DC TO AC

INSTRUCTION MANUAL

Please read user manual before use.

CE

USEFUL APPLICATIONS
RUN NOTEBOOK COMPUTERS, RADIOS, TVS, VCRS, LAMPS, FANS, FAX, DRILL, ... ETC.

1. DESCRIPTION

FIG 1

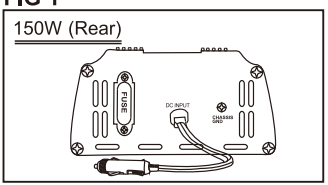


FIG 2

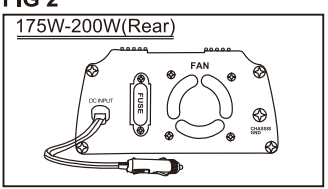


FIG 3

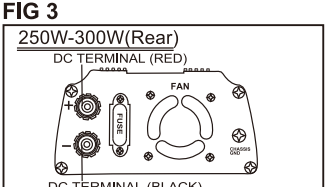
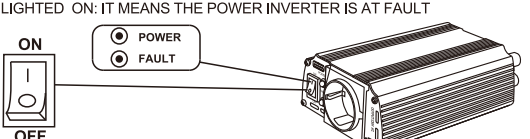


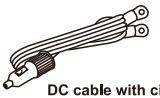
FIG 4

INDICATING SIGN

GREEN LIGHTED LED: POWER SWITCH "ON" , INVERTER STANDBY
GREEN UNLIGHTED LED: POWER SWITCH "OFF"
WHEN RED LIGHTED ON: IT MEANS THE POWER INVERTER IS AT FAULT



2. ACCESSORY



DC cable with cigarette lighter plug

DC cable clips

3. CONNECTION

Connect to lighter for appliances 0-200W or connect directly to battery (clips included) for appliances of 200-400W.

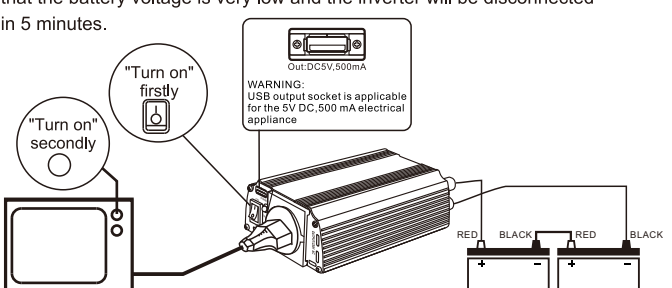
Please verify if you have chosen the right operating voltage for both input and output.

Connect the red cable from the "+" terminal (red terminal) of the battery to the + binding post (red connection) of the inverter and the black cable from the "-" terminal (black terminal) of the battery to the "-" binding post (black connection) of the inverter.

Be sure to right the screws in order to avoid loose connection.

4. OPERATION

A) When connected to an appliance, remember to turn on the inverter before turning on the appliance. If the buzzer sounds during operation, this indicates that the battery voltage is very low and the inverter will be disconnected in 5 minutes.



B) When connect the electrical appliance that with CRT,such as TV set, computer and so on to the Power Inverter which below 500W, the electrical appliance may be started for several times before it can work smoothly. Don't start the power inverter when it is with loaded, otherwise the power inverter will be damaged.

C) When connect the electrical appliance that with motor or compressor, such as drill, air-condition and so on to the power inverter, please make sure that the power rating of the power inverter is at least 3 times of the power rating of the electrical appliance, so that it can work smoothly, because the starting up power is much beyond of the power rating of the electrical appliance.

5. OUTPUT CAPACITY

The inverter will switch off automatically if the total wattage of the electrical appliances exceeds the inverter's output capacity. This will also happen if the temperature of the inverter exceeds 60°C due to prolonged use.

6. SPECIAL RECOMMENDATION

Unplug the AC inverter when not in use.

Unplug the AC inverter when starting the vehicle's motor.

If the AC inverter makes a beeping sound: switch off your appliance, unplug the inverter and restart your vehicle's the engine. The beeping sound is simply the low-battery warning which indicates that the voltage of your battery is getting low. Your inverter will shut down automatically if you do not restart your engine and continue the use of your inverter. This will leave your vehicle's battery at about 21VDC (42VDC when using 48V inverter), enabling you to start your engine and resume operation of the inverter. It also eliminates the possibility of being stranded with a dead battery.

To avoid over-discharging the battery, it is advisable to let your engine run for 10 to 20 minutes after every 2-3 hours of using the AC inverter. This allows your vehicle's battery to recharge.
Please remember to connect the "+" wire to the "+" terminal and the "-" wire to the "-" terminal if you choose to use an adapter in order to establish a direct connection between the AC inverter and the battery terminals. IF YOU CONNECT THE WIRES TO INCORRECT TERMINALS, THE POLARITY WILL BE REVERSED AND THIS WILL DAMAGE THE INVERTER. REVERSED POLARITY WILL INSTANTLY VOID YOUR INVERTER'S WARRANTY.

Please remember to disconnect the AC inverter before using the battery charger to replenish you battery's voltage. Failure to disconnect the inverter prior to connecting a charger may result in an input spike which will damage the inverter. CONNECTING THE INVERTER'S INPUT TO A BATTERY CHARGER WILL VOID THE WARRANTY AND MAY DAMAGE THE INVERTER

Make sure that the battery's voltage never exceeds 30VDC (60VDC when 48V version is used). CONNECTING THE INVERTER TO A DC POWER SOURCE GREATER THAN 30VDC (NO MORE THAN 60V WHEN YOU ARE USING 48V INVERTER). WILL VOID THE WARRANTY AND MAY DAMAGE THE INVERTER.

7. ADDING EXTENSION CORD

We recommend that the buyer refrain from using an extension cord between the DC power source and the inverter's DC input. Connecting an extension cord to the DC input will create a voltage drop, entailing reduced efficiency and output. Instead, we recommend the use of an extension cord between the AC output and the AC appilance. You may use up to 100ft (30m) of high quality extension cord. A longer cord may result in reduced power.

8. GROUNDING CONNECTION

WARNING: BEFORE USING THIS INVERTER YOU MUST PROVIDE A GROUND CONNECTION TO THE INVERTER.

- On the rear panel of the Inverter is a terminal fitted with a nut. This terminal is connected to the case of the Inverter and also to the earth terminal of the AC output socket. The use of this terminal will depend on your particular installation. In any installation, heavy duty, green-insulated wire should be used for this connection.
- In a stationary land based installation, the earth terminal should be connected to a metal earthing stake driven into the ground to a depth of 1.2m or more, If the battery system powering the Inverter does not have a connection to ground, one of the battery terminals (commonly the negative terminal) should also be connected to the earthing stake.
- In a vehicle where the Inverter is wired directly to the battery, the earth terminal is simply connected to the vehicle chassis. If the Inverter is to be used in a vehicle on a temporary basis and will be powered via the cigarette lighter socket in the vehicle,the earth terminal should be connected via a short link to either the negative or positive DC input terminal of the Inverter, depending on whether the vehicle has a negative or positive chassis connection. However when using the Inverter to power equipment used outside the vehicle, an earthing stake should also be used, as described above.

- In a boat, the grounding terminal should be connected to the existing grounding system, which may be the hull of the craft, or a network of ground wires.

NOTE: The grounding terminal of the AC outlet is connected to the neutral terminal. This is the same as a standard household power point where the neutral line is bonded to grounding and there is normally no voltage between them.

9. MEASURING AC VOLTAGE

The output wave of the AC inverter is a MODIFIED SINEWAVE. If you choose to measure the AC output voltage, you must use an AUTHENTIC RMS VOLT METER. Using any other type of voltage measuring device will result in an AC voltage reading that is up to 20 to 30 volts lower than the rated value. The reading will only be accurate when using an authentic RMS voltmeter.

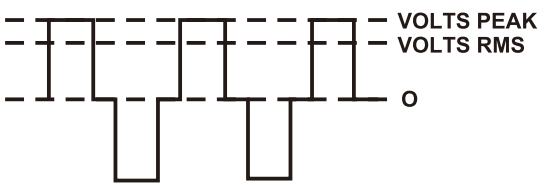
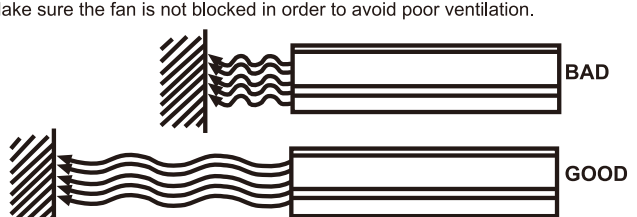


FIGURE 1: D/A INVERTER-MODIFIED SINEWAVE

10. VENTILATION

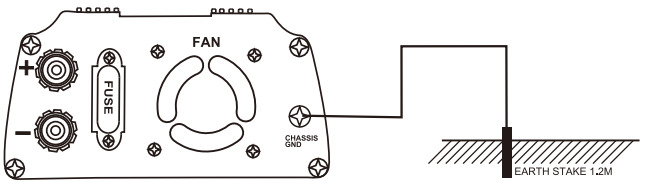
IMPORTANT! During operation, make sure the fan keeps revolving. Check the inverter for possible malfunctions if the fan does not work when this unit is being used.

Make sure the fan is not blocked in order to avoid poor ventilation.



11. CHASSIS EARTHING

The chassis earthing lug should be connected to an earthing point, which will very depending on where the power inverter is installed. In a vehicle, connect the chassis ground lug to the chassis of the vehicle. In a boat, connect to the boat's grounding systems. In a fixed location, connect to grounding



12. CAUTION

In case of trouble with the AC ouput, e.g.short-circuit, overload,etc... the protection circuit will automatically cut off the output.

In such cases: (A) switch off the power at once
(B) disconnect all units
(C) check the connected devices
(D) use the units again as soon as any problems concerning the connected devices have been solved

When in use for a prolonged period of time, the AC output may suddenly be cut off although the battery voltage is still very strong. This may be caused by excessive temperatures. If this happens. please proceed as follows:

(A)Switch off the inverter at once
(B) Disconnect some of the appliances or wait until the inverter cools off
(C) Switch the inverter back on

Always keep the inverter in an environment which is:
(A) Well-ventilated
(B) Not exposed to direct sunlight or any other heat source
(C) Inaccessible to children
(D) Safe from water/moisture, oil or grease
(E) Safe from any flammable substance

If the inverter is connected in the wrong way, this will void the warranty.

13. MAINTENANCE

Very little maintenance is required to keep your Inverter operating properly. You should clean the exterior of the unit periodically with a damp cloth to prevent accumulation of dust and dirt. At the same time, tighten the screws on the DC input terminals.

14. NOTE

All specifications typical at nominal line, half load, and 25°C unless otherwise noted. Specifications subject to change without notice.
WARNING: DO NOT DISASSEMBLY THE UNIT. HAZARDOUS VOLTAGE! DANGER!
PLEASE RETURN TO THE DEALER IF YOU FIND ANY PROBLEM WITH THE UNIT.

15.SUITABLE POWER SOURCE:

In order to operate the inverter and supply power to an appliance a suitable 24V DC power supply is required. This can be a vehicle or caravan batteries, portable power pack or 2 independent 12V batteries joined in series to produce 24V DC. For most applications, deep cycle batteries are recommended for best performance.

The size of the batteries used will determine how long the inverter will supply power to an appliance and how well the inverter will perform. Most batteries are marked with their size in Amp hours (AH) or Cold Cranking Amps.

Because 24 Volt inverters are capable of drawing high currents the inverter should only be connected to suitable size batteries, Connection to undersized batteries could damage the batteries and will result in the inverter shutting down within a short period due to low battery voltage.

The amount of power dawn from the battery is proportional to the inverter load.

P/No.	150W	200W	250W	300W	350W	400W
Minimum Recommended Battery Size	10Ah	14Ah	14Ah	14Ah	24Ah	24Ah
Run time with maximum load & minimum battery size	40min	53min	46min	40min	45min	40min
Run time for a 100 Watt globe with minimum battery size	80min	2 hours	2 hours	2 hours	4 hours	4 hours
Ideal battery size	24-40Ah	24-40Ah	24-40Ah	24-40Ah	24-55Ah	24-55Ah

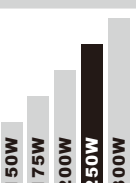
16. DETERMINING SUITABLE LOAD / APPLIANCES

The inverter is fitted with 1 to 2 approved EUROPEAN sockets (depending on model) either or both sockets can be used. As long as the combined load (Watts required to run appliance) does not exceed the inverter' continuous rating. All appliances have a rating plate that shows the amount of power (Watts) used or the current (Amp) drawn under normal use.
The following table shows the maximum combined AC Amp Watts or AC Amp which can be run by the inverter.

P/No.	IV150-24	IV175-24	IV200-24	IV250-24	IV300-24
AC combined max load (Watts)	150W	175W	200W	250W	300W
AC combined max load (Amps)	0.65A	0.76A	0.87A	1.09A	1.3A
Number of sockets	1	1	1	1	1

Some appliances that use an electric motor or transformer may draw 2 to 6 times their rating when first turned on. these are called inductive loads and are the most difficult tor the inverter to run.
For these appliances it is often a matter of trial and error to see what size inverter they will run on. if in doubt always use a larger inverter.
The following table is a guide to the appropriate AC Watt drawn by various appliances. The DC Amp column shows the approximate power drawn from the 24 Volt supply.

APPLICATION CHART Appliance		Approximate AC Watts	DC Amps
Small Power Tools/Fluorescent Light*		300	14
Juicer/Blender		250	11
Bar Fridge*/Large Stereo/PA Amplifier		200	9
Hand Mixer		175	8
Laptop Computer/Electric Knife		150	6
Portable Stereo/CD/DVD/VCR/Playstation		100	4
Charger/Mobile Phone/Camera/Camcorder		50	2



※ Appliance may require larger inverter.

17. HARD WIRED CONNECTION

When mounting the inverter in a vehicle, boat or cabin it may be preferable to use longer DC battery cables than those supplied, so that the inverter can be placed in a more convenient cooler or more protected location.

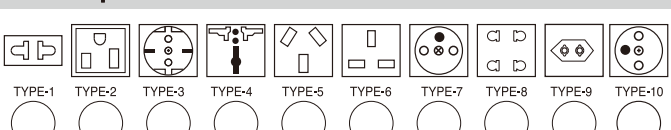
CONVERTS 24 VOLT DC TO AC

POWER INVERTER SPECIFICATION

Model / Ideal	IV150-24	IV175-24	IV200-24	IV250-24	IV300-24
Nominal Input Voltage (DC)	24V⎓, 6.8A	24V⎓, 8.0A	24V⎓, 9.1A	24V⎓, 11.4A	24V⎓, 13.7A
Nominal Input Voltage Range (DC)	24V⎓ (20-30V)				
Output Power (Continuous Watts)	150W, 0.65A	175W, 0.76A	200W, 0.87A	250W, 1.09A	300W, 1.3A
Output Power (Peak Watts)	300W	350W	400W	500W	600W
Standby Current	≤0.13A	≤0.13A	≤0.2A	≤0.2A	≤0.2A
Nominal Output Voltage (AC)	☐ 230V～ ☐ 220-240V～ ☐ 110V～				
USB Output Voltage (DC)	5.0V⎓, 500mA				
Frequency	☐ 50Hz ☐ 60Hz +/-5% Crystal Controlled				
Output Regulation	+/-5% Intelligent Pwm				
Output Waveform	Modified Sine Wave				
Low Battery-Voltage Alarm (Volts)	21+/-0.5V⎓				
Low Battery-Voltage Shutdown (Volts)	20+/-0.5V⎓				
Efficiency	85~90%				
Thermal Protection	65°C+/-5°C				
Overload	Shut Down & Alarm				
Battery Polarity Reverse	By Fuse				
Output Short	Output Short Circuit Protection				
With Cooling Fan	No	Yes	Yes	Yes	Yes
AC Outlets Socket	1	1	1	1	1
Replaceable Fuse	10A	10A	15A	15A	20A
Dimension (L×W×H) cm	15x10.8x5.1	15x10.8x5.1	15x10.8x5.1	15x10.8x5.1	15x10.8x5.1
Weight	0.55Kg	0.7Kg	0.7Kg	071Kg	0.71Kg

* DC input voltage must be +24 VDC

AC Output Socket:



WITH THIS "INVERTER" YOU WON'T HAVE TO WORRY ABOUT POWER OUTAGES OR BROWNOUTS!

WARNING:

To prevent fire or shock hazard do not expose this appliance to rain or moisture

"Please place the inverter used in the horizontal position"

CAUTION

ALWAYS PLACE THE INVERTER IN
AN ENVIRONMENT WHICH IS:

(A) WELL VENTILATED
(B) NOT EXPOSED TO DIRECT SUNLIGHT OR HEAT SOURCE
(C) OUT OF REACH FROM CHILDREN
(D) AWAY FROM WATER/MOISTURE, OIL OR GREASE
(E) AWAY FROM ANY FLAMMABLE SUBSTANCE
(F) SECURE AND NO RISK OF FALLING.