



Inverters and Battery to Battery Chargers Information and Install Guide v2

Specifications Subject To Change Without Notice

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IMPORTANT



Please read and understand this manual before installing and using this inverter.

High Voltages inside do not open inverter case.

Do not use equipment that exceed the inverter specifications as permanent damage may happen and will not be covered by the warranty.

Due to the nature of the product only qualified installers should install this inverter.

Specifications

PS2001 1000w Pure Sine Wave Inverter



WARNING:

Do not exceed the stated values for output power. Serious damage will be done to the inverter if power demand is exceeded and will not be covered by the warranty. Excess voltage can also damage an inverter.

The 1000w Inverter is rated as;

1000 Watts Continuous

1200W for 10 seconds

2000w for 1 second (Surge only)

Max Voltage Rating: 15V±0.5V Euro 5/6 Engines may cause issues

1000W Pure Sine Wave Power Inverter 200~240VAC output cable

Input Voltage: DC-12V

Output Voltage: 200~240VAC

Output Frequency: 50Hz±1%

Output Wave Form: Pure Sine Wave (THD < 3%)

Converting Max. Efficiency: 90% (Full Loading) / 95% (1/3 Loading)

No Load Consumption: < 0.5A

The USB Output: 5V 2A

Output Power: 1000W

Peak Power: 2000W

Max Constant Power Start : 1200W for 10 seconds

Efficiency: 90% (Full Loading) / 95% (1/3 Loading)

Low Voltage Alarm: DC 10.5V± 0.5V

Low Voltage Protection: DC 11.0V / 11.9V

Low Voltage Recovery: DC 11.0V / 11.9V

High Voltage Protection: DC 15V±0.5V

Short Circuit Shutdown: Reverse Polarity (External Fuse)

Over Temperature Protection: YES Temperature >75

Overload Shutdown: YES DC 15V±0.5V

Radiator Fan: YES, Temperature control

Remote Control: YES

Working temperature: -10C+50C

Working humidity: 20% - 90% RH Non-Condensing

Fitted Output Cable: Yes 2m With fitted UK/EURO Socket

Warranty: 2 Year Warranty

Specifications

PS2003-2K 2000w Pure Sine Wave Inverter



WARNING:

Do not exceed the stated values for output power. Serious damage will be done to the inverter if power demand is exceeded and will not be covered by the warranty. Excess voltage can also damage an inverter.

The 2000w Inverter is rated as;

2000 Watts Continuous

2400W for 10 seconds

4000w for 1 second (Surge only)

Max Voltage Rating: 15V±0.5V Euro 5/6 Engines may cause issues

2000W Pure Sine Wave Power Inverter 200~240VAC UK/Euro Socket

Input Voltage: DC-12V

Output Voltage: 200~240VAC

Output Frequency: 50Hz±1%

Output Wave Form: Pure Sine Wave (THD < 3%)

Converting Max. Efficiency: 90% (Full Loading) / 95% (1/3 Loading)

No Load Consumption: < 0.5A

The USB Output: 5V 2A

Output Power: 2000W

Peak Power: 4000W Surge

Max Constant Power Start : 2400W for 10 seconds

Efficiency: 90% (Full Loading) / 95% (1/3 Loading)

Low Voltage Alarm: DC 10.5V± 0.5V

Low Voltage Protection: DC 11.0V / 11.9V

Low Voltage Recovery: DC 11.0V / 11.9V

High Voltage Protection: DC 15V±0.5V

Short Circuit Shutdown: Reverse Polarity (External Fuse)

Over Temperature Protection: YES Temperature >75

Overload Shutdown: YES DC 15V±0.5V

Radiator Fan: YES, Temperature control

Remote Control: YES

Working temperature: -10C+50C

Working humidity: 20% - 90% RH Non-Condensing

Fitted Output Socket: Yes UK/EURO Socket

Warranty: 2 Year Warranty

Specifications

PS2004-3K 3000w Pure Sine Wave Inverter



WARNING:

Do not exceed the stated values for output power. Serious damage will be done to the inverter if power demand is exceeded and will not be covered by the warranty. Excess voltage can also damage an inverter.

The 3000w Inverter is rated as;

3000 Watts Continuous

3600W for 10 seconds

6000w for 1 second (Surge only)

Max Voltage Rating: 15V±0.5V Euro 5/6 Engines may cause issues

3000W Pure Sine Wave Power Inverter 200~240VAC UK/Euro Socket

Input Voltage: DC-12V

Output Voltage: 200~240VAC

Output Frequency: 50Hz±1%

Output Wave Form: Pure Sine Wave (THD < 3%)

Converting Max. Efficiency: 90% (Full Loading) / 95% (1/3 Loading)

No Load Consumption: < 0.5A

The USB Output: 5V 2A

Output Power: 3000W

Peak Power: 6000W Surge

Max Constant Power Start : 3600W for 10 seconds

Efficiency: 90% (Full Loading) / 95% (1/3 Loading)

Low Voltage Alarm: DC 10.5V± 0.5V

Low Voltage Protection: DC 11.0V / 11.9V

Low Voltage Recovery: DC 11.0V / 11.9V

High Voltage Protection: DC 15V±0.5V

Short Circuit Shutdown: Reverse Polarity (External Fuse)

Over Temperature Protection: YES Temperature >75

Overload Shutdown: YES DC 15V±0.5V

Radiator Fan: YES, Temperature control

Remote Control: YES

Working temperature: -10C+50C

Working humidity: 20% - 90% RH Non-Condensing

Fitted Output Socket: Yes UK/EURO Socket

Warranty: 2 Year Warranty

What does a power inverter do, and what can I use one for?

A power inverter changes direct current (DC) power from a 12v battery, into conventional mains alternating current (AC) power at 230V. This means that you can use one to operate all kinds of devices, electric lights, kitchen appliances, power tools, TVs, radios, computers, to name just a few.

Just connect the inverter to a battery, and plug your AC devices into the inverter and you've got portable power whenever and wherever you need it.

The inverter draws its power from a 12V battery (preferably deep-cycle), or several batteries wired in parallel. The battery will need to be recharged as the power is drawn out of it by the inverter. The battery can be recharged by running the car or lorry motor, or a generator, solar panels, or wind turbine. Or you can use a battery charger plugged into an AC outlet to recharge the battery.

Types of Inverter.



There are 2 types of inverters available for use in consumer applications. These are:

Pure Sine Wave Inverters:

The name pure sine wave inverters come from the wave form of its output. They have pure sine wave form output as show in above diagram. This is identical or replicate as close as possible to general mains. As most electronic products are designed to be powered by mains, pure sine wave inverters are suitable for all applications, especially motorised devices where it is proven that pure sine wave power will lengthen the product's lifetime and run much quieter.

Pure sine wave inverters are more expensive than modified sine wave inverters because they involve a much more sophisticated design in order to simulate the smooth output of standard mains power.

Modified Sine Wave Inverters.

Again modified sine wave inverters are named after their output waveform. The output of the modified sine wave inverter cycles through positive, ground and negative voltage as shown in the diagram above, to give a similar output waveform to pure sine wave.

Modified sine wave inverters are a much cheaper alternative to pure sine wave inverters as they don't require the complicated system needed to smooth and render the output waveform. The only down side with a modified sine wave is that it introduces harmonic distortion to inductive and audio equipment. This is caused by the harsh clipping in the on and off phase changing in voltage. However, modified sine wave inverters are suitable for heat element devices (kettle, heater, etc) and devices that have an external or built-in adaptor (laptop, TV, etc).

How do I choose between Modified Sine Wave or Pure Sine Wave Inverters?

1. Output voltage wave form is pure sine wave with very low harmonic distortion and clean power like utility-supplied electricity.
2. Inductive loads like microwave ovens and AC motors run faster, quieter, cooler and more efficient on pure sine wave.
3. Pure sine wave reduces audible and electrical noise in fans, fluorescent lights, audio amplifiers, TV, games consoles, fax machines, and answering machines.
4. Pure sine wave prevents crashes in computers, glitches and noise in monitors.
5. Pure sine wave reliably powers the following devices that normally won't work with modified sine wave inverters:

- Laser printers, photocopiers, magneto-optical hard drives.
- Some fluorescent lights with electric ballasts.
- Power tools running on AC motor and variable speed control.
- Sewing machines with speed/microprocessor control.
- Charger for rechargeable battery.

Modified sine wave works well for most devices, and is the most common type of inverter on the market, as well as the most economical.

If you mostly want to run lights (none ballast), TV, kettle, heater, etc, a modified sine wave inverter is suitable for your needs.

If you mostly want to run lights (none ballast), TV, kettle, heater, etc, a modified sine wave inverter is suitable for your needs.

Pure sine wave inverters (also known as true sine wave) are more suited for sensitive electrical devices such as laser printers, inductive devices (ballast, compressor, AC motor), variable speed control devices and audio equipment.

Using an Inverter for Emergency Home Backup Power.

A very simple way to use an inverter for emergency power (such as during a power outage), is to use a car battery (with the vehicle running), and an extension cord running into the house, where you can then plug in electrical appliances.

What output power inverter should I buy?

The output power you require depends on the power (Watts) of devices that you want to run. The power information of most devices can usually be found on a specification label on the product or packaging, if you have any uncertainty please contact the retailer or customer service department of the manufacturer. We recommend you choose an inverter with 20 to 50% extra of total power required and with minimum of twice the power of the largest device you will be using.

The reason for requiring twice the largest power device is that the power rating on any device is based on continuous power. When an electronic device is starting up, there is a surge of current. This power surge is normally two times, but can be up to seven times (such as ac motors), of the rated continuous power. Therefore choosing an inverter with a higher power output will reduce the risk of damaging your electrical items, power supply or the inverter itself.

Example:

You want to power a computer, some lights and a radio with power as below.

Computer:	300W
2 x 60W lights:	120W
Radio:	10W
Total Power Needed:	430W

For this application, an inverter with minimum power of 600W is recommended. As 600W is twice the power of the highest power device and the total power of 430W is still within the maximum power rating of the inverter. Of course it will be more ideal to move one step up and choose a 1000W inverter which would allow for additional devices to be powered or added on in the future.

Helpful formula:

Many specifications on the product only quote current (amps) instead of power, to convert current to power, below formula can be used:

To convert Amps to Watts:

Current (Amps) $\times$ 230 (AC voltage) = Power (Watts)

This formula yields a close approximation of the continuous load of the appliance.

To calculate approximate start-up load:

Power (Watts) $\times$ 2 = Start-up Load

This formula yields a close approximation of the starting load required by the appliance, although some appliances may require an even greater starting load.

Note: Induction motors such as air conditioners, refrigerators, freezers and pumps may have a start-up surge of up to seven times their continuous power rating.

Most often the start-up load of the appliance or power tool determines whether an inverter has the capability to power it.

For example, you have a freezer with a continuous load of 2 Amps, and a start-up load of 6 Amps:

2 Amps $\times$ 240 Volts = 480 Watts continuous

6 Amps $\times$ 240 Volts = 1440 Watts starting load

You would need an inverter with peak-surge rating greater than 1440W.

To work out current/battery capacity requirement (for 12V system):

Power (Watts) / 12V = Current hour (Ah)

This is the rough calculation for the size of a vehicle alternator you would need to keep up with a specific load, as an inverter's efficiency is only rated around 90%, the current requirement will need to be 10% higher; for example, to keep up with a continuous draw of 1000W, you would need:

$(1000 \div 12) \times 1.1 = 91.67\text{Ah}$

Therefore an alternator with minimum output current of 91.67A at 12V is required to run continuously. Alternatively a fully charged 12V battery with capacity of 91.67Ah can run continuously for around an hour.

How do I connect the Inverter?

Many small inverters come with crocodile clips which are attached to the positive and negative terminals of the battery.

Larger inverters must be hard-wired directly to a battery. The cable size depends on the distance between battery and inverter. See page 10.

When connecting the inverter to the battery use the thickest wire available, in the shortest length practical.

General recommendations: (cable sizes are expressed as AWG).

(See also page 10)

Cable size recommendations may vary among inverter brands and models; please check the Instruction manual for the model you have purchased before you buy the wire for it.

The maximum length generally recommended is 3m, and shorter runs are recommended to reduce resistance and heating effect of the cable and improve the efficiency. If longer distance is required from battery to the device, it is recommended to extend from the AC output rather than on the DC input side.

What type of battery should I use (automotive or deep cycle)?

Small Inverters (up to 500W).

Most leisure and marine batteries will provide an ample power supply for 30 to 60 minutes even when the engine is off. Actual time may vary depending on the age and condition of the battery, and the power demand being placed on it by the equipment being operated by the inverter. If you use the inverter while the engine is off, you should start the engine every hour and let it run for 10 minutes to recharge the battery.

Larger Inverters (500W and above).

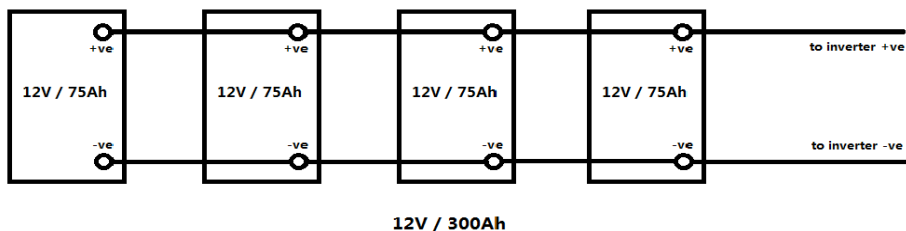
We recommend you use deep cycle batteries which will give you several hundred complete charge/discharge cycles. If you use the normal vehicle starting batteries they will wear out after about a dozen charge/discharge cycles. If you do not have a deep cycle battery, we recommend that you keep the engine of your vehicle running whilst using the power inverter.

When using the inverter with a deep cycle battery, start the engine every 30 to 60 minutes and let it run for 10 minutes to recharge the battery.

When powering appliances with high continuous load ratings for extensive periods, it is not advisable to power the inverter with normal car battery. If the car battery is used for an extended period, it is possible that the battery charge may be drained to the point where the battery has insufficient power to start the vehicle. In these cases, it's a good idea to have an extra deep cycle battery installed for the inverter (installed close to the inverter), cabled to the original battery/alternator. It is also recommended that a suitable battery isolator should be installed between the two batteries.

How do I connect two or more batteries?

It may be advisable to operate the inverter from an array of 12V batteries of the same type in a "parallel" configuration. Two such batteries will generate twice the Amps/hour of a single battery; three batteries will generate three times the Amps/hour, and so on. This will lengthen the time before your batteries will need to be recharged, giving you a longer time that you can run your appliances.



Operating a computer with a Modified Sine Wave Inverter?

With the exception of some laptops most computers will work fine, although some CRT monitors will experience some interference such as lines or a hum.

However, if you have any doubt about any appliance, tool or device, particularly laptop computers, we recommend that you check with the manufacturer to be sure it is compatible with a modified sine wave inverter. If it is not, choose one of our pure sine wave inverters instead. The difference between them is the pure sine wave inverter produces a better and cleaner current. However, they are also considerably more expensive due to the electronics inside.

Microwave Ovens & Power Inverters.

The power rating used with microwave ovens is the "cooking power" which refers to the power being "delivered" to the food being cooked. The actual operating power requirement rating is higher than the cooking power rating (for example, a microwave with "advertised" rating of 600W usually corresponds to almost 1200W - 1500W of power consumption). The actual power consumption is usually stated on a label located at the back of the microwave. If the operating power requirement cannot be found on the back of the microwave, check the instruction manual or contact the manufacturer.

None LED Camera Flashes & Power Inverters.

A none LED camera flash generally requires a pure sine wave inverter capable of surging to at least four times the Watt Sec rating of the strobe. For instance, a camera flash rated at 300W requires an inverter capable of 1200W or more.

Laser Printers & Power Inverters.

A laser printer generally requires a pure sine wave inverter capable of producing at least three times the continuous wattage rating of the printer. For instance, a laser printer rated at 500W requires an inverter rated at 1500W or higher.

An inkjet printer does not maintain the same requirements as a laser printer. Inkjet printers can be operated normally with a modified sine wave inverter rated to handle the printer's wattage requirements.

Television & Audio Suggestions.

Although most inverters are shielded and filtered to minimise signal interference, some interference with your television picture may be unavoidable, especially with weak signals. Here are some suggestions that may improve reception:

1. First make sure that the television antenna produces a clear signal under normal operating conditions (i.e., at home plugged into a standard mains wall outlet). Also ensure that the antenna cable is properly shielded and of good quality.
2. Change positions of the inverter, antenna cables and television power cord.
3. Isolate the television, its power cord and antenna cables from the 12V power source by running an extension cord from the inverter to the TV set. Ensure that any excess AC power cord is a distance away from the TV set.
4. Coil the television power cord and the input cables running from the 12V power source to the inverter.
5. Attach a "Ferrite Data Line Filter" to the television power cord. More than one filter may be required.

NOTE: Some inexpensive audio systems may experience a slight "buzzing" sound when operated with a modified sine wave inverter. This is caused by deficient filters in the audio system. Pure sine wave inverter can be used to reduce the buzzing noise.



Appliance Cautions:

DO NOT use an inverter to directly recharge nickel-cadmium batteries through appliances. Always use the charger provided with that appliance.

DO NOT plug in battery chargers for cordless power tools if the charger carries a warning that dangerous voltages are present at the battery terminals.

Some fluorescent lamps may not be fully compatible with an inverter. If the lamp appears to be too bright, flickering or fails to light up, do not use the lamp with an inverter.

Some fans with synchronous motors may slightly increase in speed (RPM) and increase in noise when powered by an inverter.



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

Certain chargers for small nickel-cadmium batteries can be damaged if plugged into a modified sine wave inverter. In particular, two types of appliances are susceptible to modified sine wave: •

- Small, battery-operated appliances such as flashlights, cordless razors and toothbrushes that can be plugged directly into an AC receptacle to recharge.
- Certain battery chargers for battery packs that are used in some cordless hand-tools. Chargers for these tools have a warning label stating that dangerous voltages are present at the battery terminals.
- Sensitive electrical or electronic items such as certain medical equipment

The majority of portable appliances do not have this problem. Most portable appliances use separate transformers or chargers that plug into AC receptacles to supply a low-voltage DC or AC output to the appliance. If the appliance label states that the charger or adaptor produces a low-voltage DC or AC output (30V or less), there should be no problem powering that charger or adaptor.



Safety Warning: 240V of electricity can be lethal. Improper use of a power inverter will result in property damage, personal injury, or loss of life. Please read and follow carefully the instructions in he instruction manual provided with every inverter for important safety considerations and recautions.



General Safety Precautions and Installation Tips:

- Place the inverter on a reasonably flat surface, either horizontally or vertically.
- The inverter should not be installed in the engine compartment, due to possible water/oil/acid contamination, and excessive heat under the bonnet, as well as potential danger from petrol fumes and the spark that an inverter can occasionally produce. It's best to run battery cables to a dry, cool mounting location.
- Keep the inverter dry. Do not expose it to rain or moisture. DO NOT operate the inverter if the inverter, the device being operated, or any other surfaces that may come in contact with any power source are wet. Water and many other liquids can conduct electricity which may lead to serious injury or death.
- Do not operate the inverter in dusty environments. Keep the fan clean.
- Avoid placing the inverter on or near heating vents, radiators or other sources of heat. Do not place the inverter in direct sunlight. Ideal operating temperature is between 10° and 30°C. Allow at least 2 inches (5cm) of air space on all sides of the inverter. During operation, keep away from materials that may be affected by high temperatures.
- In order to properly disperse heat generated while the inverter is in operation, keep it well ventilated. While in use, maintain several inches of clearance around the top and sides of the inverter.
- DO NOT use the inverter near flammable materials.
- DO NOT install inverters in unvented battery compartments.
- DO NOT expose the inverter to temperatures exceeding 40C
- DO NOT connect live AC power to the inverter's AC outlets. The inverter will be damaged even if it is switched OFF.

CAUTION! Any internal adjustment on the inverter is prohibited. Do not disassemble.

Battery Chargers - Battery to Battery Charging with Voltage Sensitive Relay (ECR140KIT).

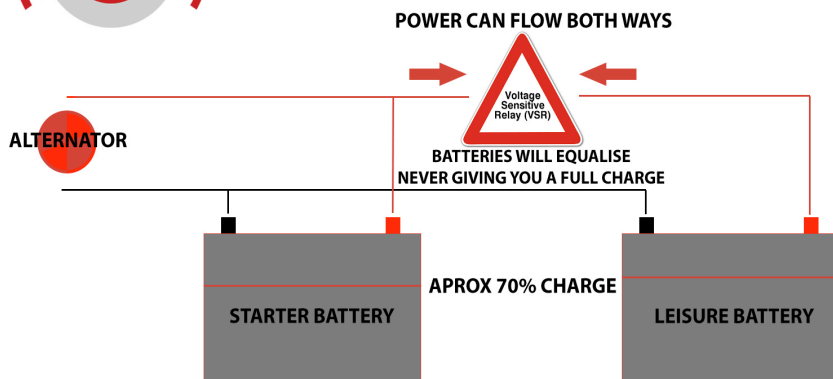
Voltage Sensitive relay charges are suitable for all vehicles apart from Euro 5 / 6 engines with smart alternator systems. If used on a Euro 5/6 engine the following issues may occur: Poor charging, battery damage and reduction in battery performance. We recommend that you use our battery to battery chargers PSEURO range.



ECR140KIT Voltage Sensitive Relay Kit



TYPICAL EURO 5 / 6 ENGINE CHARGING SYSTEM Voltage Sensitive Relay **NOT RECOMMENDED INSTALL METHOD**



SMART ALTERNATORS WILL TYPICALLY CHARGE TO BATTERY TO 70% ON A SMART ALTERNATOR SYSTEM AND THEN USE REGENERATIVE BRAKING TO DO THE REST. THE CHARGE WILL THEN VARY UP AND DOWN AS STOP START IS USED AT AROUND THE 70% MARK. YOUR LEISURE BATTERY NEVER GETS TO FULL CAPACITY REDUCING THE TIME YOU CAN RUN APPLIANCES.

Battery to Battery Charging with Voltage Sensitive Relay (PSEURO Series).

PSEURO15 - 15 Amp Charge to batteries, Provides a steady 15 Amp Charge ideal for small batteries and low battery use .

PSEURO30 - 30 Amp Charge to batteries, Provides a steady 30 Amp Charge ideal for medium sized batteries and with medium battery use.

PSEURO60 - 60 Amp Charge to batteries, Provides a steady 60 Amp Charge ideal for large sized batteries and with heavy battery use.



PSEURO Series Charger

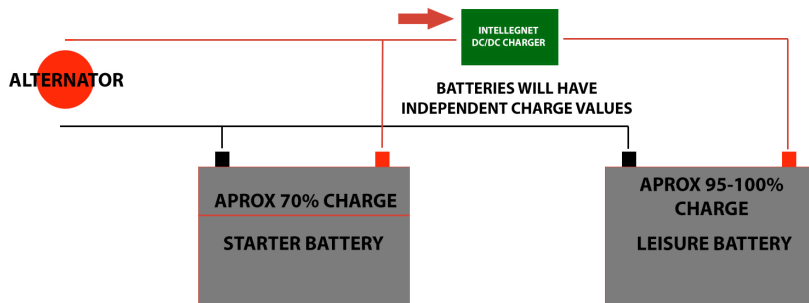


TYPICAL EURO 5 / 6 ENGINE CHARGING SYSTEM

Intelligent DC/DC Charger

RECOMMENDED INSTALL METHOD

POWER CAN ONLY FLOW ONE WAY



SMART ALTERNATORS WILL TYPICALLY CHARGE TO BATTERY TO 70% ON A SMART ALTERNATOR SYSTEM AND THEN USE REGENERATIVE BRAKING TO DO THE REST. THE CHARGE WILL THEN VARY UP AND DOWN AS STOP START IS USED AT AROUND THE 70% MARK. USING A INTELEGNET DC TO DC CHARGER WILL PROVIDE AN OPTIMUM CHARGE TO YOUR LEISURE BATTERY SO IT IS ALWAYS AT FULL CAPACITY WHEN YOU NEED IT.

PSEURO chargers are the ideal way to fully charge batteries in vehicles with Euro 5/6 engines. They provide 100% charge at the correct voltage and maintain the battery without allowing any high voltages to pass to the battery from the alternator and causing damage. They provide a continuous charge independent from the smart alternator.

Recommended Inverter Cable and Breaker or Fuse Sizes.

Use this table to decide what size Battery to Inverter Cables and Over current Devices (Fuses & Breakers) to use with your inverter. Remember the fuse and breaker are there to protect your cabling from overheating (and potentially catching fire). You can use smaller cables but only if you in turn use a corresponding smaller breaker or fuse to protect the cable. However, using smaller cables and breaker than what's suggested can cause problems with your off-grid inverter because the breaker will repeatedly "pop" every time you surge beyond its capacity rating.

Inverter Voltage:	Continuous Watts	Recommended Max. Inverter Input Amps (DC)	Recommended Fuse Size DC Amps	Recommended Circuit Breaker DC Amps	Recommended Wire Size (AWG)
12V	1000	134	150	175	4
	2000	320	250	200	2
	3000	400	250	250	2
24V	1000	67	80	100	4
	2000	160	200	175	2
	3000	200	250	200	2

Larger cables may used if the distance from your inverter and battery bank is more than 10 feet (~3m).

NOTE: These are general recommendations for inverters that utilise a single cable set (one positive and one negative cable) only and may not be correct for all inverters or applications. Additionally, some inverters require two or more cable sets and therefore may require a different cable size than listed.



User Instructions for Parksafe Inverters.

1. Before connecting your new inverter, you should make a visual inspection to ensure no visible damage has been caused by shipping. Then make sure the Main Power Switch of the inverter is off.
CAUTION. A reverse polarity connection (positive to negative) will damage the inverter.
Damage by a reverse polarity connection is not covered under Warranty
2. Mount the inverter in a secure location paying attention to the ventilation of fans . See page 7, General Safety Precautions and Installation Tips.
3. Conect the DC power cables and tighten the nut on each DC terminal by hand until it is snug. Do not over tighten.

Operation of Inverter.

1. The display will alternate between the battery voltage and % of maximum inverter load.
2. All inverters may be turned on and off using the main power switch, if a remote was included and you plan on using it, the inverter's Main Power Switch must be OFF for the remote to operate. You may leave the Main Switch OFF and control the inverter using the remote switch.
4. The fan is thermally controlled and will only turn on when needed.



Using the Inverter.

The inverter is capable of continuously powering most 220-240v AC products within the inverters rated continuous output power or less. Its AC output waveform is a pure sine wave.

When many AC products are first switched on, they initially consume more power than their power rating. For a loading such as a motor, there will be surge current when starting. Please note the starting current can't exceed the maximum rated current of the inverter. The starting current of motor may be 7-12 times the rated current.



CAUTION. The inverter can be damaged if the rated current exceeds the Inverters maximum rating and this not be covered by warranty.



Voltage Drops under Load.

It is normal that the Input and output voltage will drop when a heavy load is present. You must take action in case below conditions.

- When the battery DC voltage is reduced below 11.5/21/42 volts the solution is to increase the battery capacity or reduce the load on inverter.
- When output AC voltage drops below acceptable levels the solution is to increase the battery capacity or reduce the load on inverter.



Surge Power Overload.

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 by switching on the inverter with all AC products switched off then one by one switch each on, starting with the high surge product first.

Indicators and Controls.

The AC outlets are provided on one end of the inverter any combination of 220-240v AC products with a total continuous power consumption of the inverters rating or less may be plugged in.

- The ON/OFF switch enables output of AC power at the Outlets.
- The GREEN POWER light indicates AC power is present at the AC outlets and the inverter is operating normally.
- The RED FAULT light indicates inverter shutdown caused by low or high voltage, overload or excessive temperature.
- When the inverter senses that the voltage at its DC input has dropped to 10.9-11.5V an audible alarm sounds, this will allow time for computers or other sensitive devices to be shut down. After auto shut down the RED FAULT light illuminates.
- If an AC product rated higher than the rated continuous power or draws excessive surge power when connected the inverter will shut down and the RED FAULT light will turn on.
- If the inverter exceeds a safe operating temperature due to insufficient ventilation or a high a temperature environment it will automatically shut down the RED FAULT light will turn on and the audio warning will sound.
- Should a defective battery charging system cause the battery voltage to rise to a dangerously high level, the inverter will automatically shut down.

Troubleshooting.

Most faults are caused by poor wiring, low battery voltage, not enough battery capacity or using devices that are rated higher than the inverter rating (Including start up surge). Incorrect use can permanently damage an inverter and will not be covered by the warranty.

PROBLEM: AC product will not operate, no inverter lights are ON.

Possible cause: Battery is defective. Inverter has been connected with reverse DC input polarity. Loose cable connections.

Suggested Remedy: Check battery and replace if required. Check connection to battery. Probable inverter damage has occurred. Have unit inspected and repaired (User damage not covered by warranty). Check cables and connections.

PROBLEM: Inverter will run some small loads, but not larger ones.

Possible cause: Voltage drop across DC cables. Battery power low.

Suggested Remedy: Shorten cables or use heavier cables. Charge Batteries or increase battery capacity.

PROBLEM: Alarm is sounding.

Possible cause: Low voltage shutdown or thermal shutdown has occurred.

Suggested Remedy: Shorten cables or use heavier cables. Charge Batteries or increase battery capacity. Improve air circulation around unit. Locate unit to a cooler environment. Reduce Load. Allow to cool for at least 15 minutes.

PROBLEM: Battery run time is less than expected.

Possible cause: Battery is old or not fully charged. See also Euro 5/6 engines page 9.

Suggested Remedy: Charge Batteries or increase battery capacity.

PROBLEM: AC product will not operate, red FAULT light on.

Possible cause: AC product power consumption is higher than rated continuous output power and overload shutdown has occurred. Staring surge has caused overload shutdown. Inverter has overheated due to poor ventilation and has caused over temperature shutdown. Input voltage is greater than 15 volts DC

Suggested Remedy: Check devices plugged in are not rated higher than inverter, or have high start up surge. Check ventilation around inverter. Check Fansa are not blocked. Check DC input voltage in not greater than 15 volts DC.

Warranty.

- All inverters and chargers have a 1 year warranty.
- The warranty is non transferrable and only applies to the original purchaser.
- Should the product be found to be defective within the warranty period, the product or part will be replaced without charge.
- To obtain repairs or replacement under the provisions of the warranty, the product should be returned prepaid with proof of purchase to the address below with a completed copy of our warranty returns form. To obtain a returns form please contact Parksaf Automotive Limited.
- This warranty does not cover the removal or reinstallation costs nor does it cover damage through alteration, misuse, mishandling, neglect or accident.
- Any implied warranty is limited to the duration of this written warranty and Parksaf shall not be liable for any loss or damage, direct or consequential, arising from the use or inability to use this product.
- No person or representative is authorised, to alter or amend this warranty either verbally or in writing.
- This warranty does not affect your statutory rights.

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