

# Powerhouse Inverters

## Pure Sine Wave Inverter

### 1000 Watt (2000W Surge)

**M 8017A: 12V DC Input**

**M 8018A: 24V DC Input**



**Instruction Manual**

Congratulations on purchasing this Altronics Powerhouse inverter.

Inverters have high voltages and very high currents and are potentially very dangerous items to use if not used in accordance with the below instructions. Read this manual well before connecting and operating this appliance.

## Introduction

This inverter is classified as an 'Isolated Inverter' and can be used indoors for a wide range of applications and a variety of different location settings. It will operate most televisions, DVD players, set top boxes, most personal computers, and other small appliances.

Some more sensitive laptop computers may not function properly. If the power adaptor of the laptop provides no output, or causes a humming noise it is probably not compatible with this inverter.

## Features:

- High efficiency design
- Low battery alarm
- Low battery shutdown
- Over voltage protection
- Short circuit protection
- Over temperature shutdown
- Will provide 100% continuous power under normal conditions.
- Can be used to power most loads such as induction loads or equipment that comes with PFC (power factor correction) circuitry.
- Soft-start design enables easy start up of most appliances.

## Safety Warning:

- Hazardous voltage inside – do not attempt to open, repair or use if damaged.
- Only connect 230/240V AC appliances that are in safe electrical condition.
- This appliance is not intended for use by young children or infirm persons unless they have been adequately supervised by a responsible person to ensure that they can use the appliance safely.
- Young children should be supervised to ensure that they do not play with the appliance.
- It is recommended that a type 'A' portable residual current device (RCD) be used for added output protection.
- For independent standalone use only. Do not connect to household wiring, whether or not the building is connected to the electricity grid.
- Never operate the inverter without the DC negative input connected directly to the battery.

## Usage:

This isolated inverter is not suitable for use in the following circumstances:

- Medical instruments, sensitive timing machines, meters and calculating devices that draw graphs, variable speed household and industrial devices (e.g. power tools, food processors).
- The manufacturer advises care when using the device on boats and in other marine environments, on caravans and RVs. Appropriate grounding is essential in these situations. Since the inverter is intended for indoor use only, it must be placed in a dry, well ventilated, and secure location where it would experience minimal vibration.(See installation instructions for correct and appropriate set up)

## CAUTION:

**Appliances powered by the inverter should not have 'temporary high surfing' when loaded. This means that the power surge of the connected device when it is switched on should not exceed the maximum surge rating of the inverter concerned, which in this case is 2000W. So even if the normal continuous power is less than 1000W, if the start-up power surge is over 2000W, then it should not be plugged into this inverter.**

**M 8017A SPECIFICATIONS:**

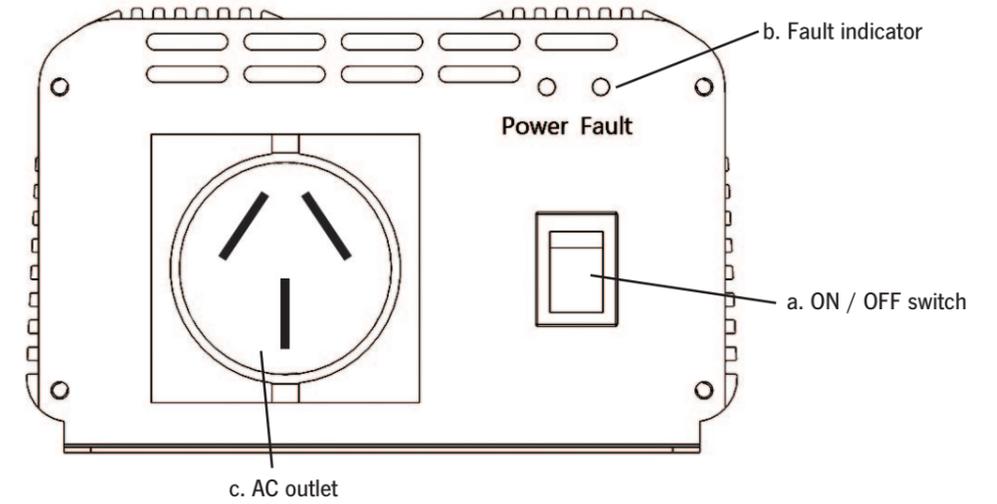
Output Power:	1000W
Output Power Surge:	2000W
AC Output Voltage:	240V
THD (max):	4%
Output Wave form:	Sine wave
DC Input Voltage:	11 - 15V
Frequency:	± 0.1% 60Hz / 55Hz / 50Hz
Efficiency (full load):	>80%
No Load Current Draw:	<1.5A
Protection:	Reverse polarity, overload (short circuit), high/low battery, high temperature
Operating Environment:	Temperature -20°C - 85°C (shut down above 85°C at full load)
Heat Dissipation:	Temperature controlled fan
Dimensions (L x W x H):	295 x 132 x 83mm
Net Weight:	2 kg

**M 8018A SPECIFICATIONS:**

Output Power:	1000W
Output Power Surge:	2000W
AC Output Voltage:	240V
THD (max):	4%
Output Wave form:	Sine wave
DC Input Voltage:	22 - 30V
Frequency:	± 0.1% 60Hz / 55Hz / 50Hz
Efficiency (full load):	>80%
No Load Current Draw:	<1A
Protection:	Reverse polarity, overload (short circuit), high/low battery, high temperature
Operating Environment:	Temperature -20°C - 85°C (shut down above 85°C at full load)
Heat Dissipation:	Temperature controlled fan
Dimensions (L x W x H):	295 x 132 x 83mm
Net Weight:	2 kg

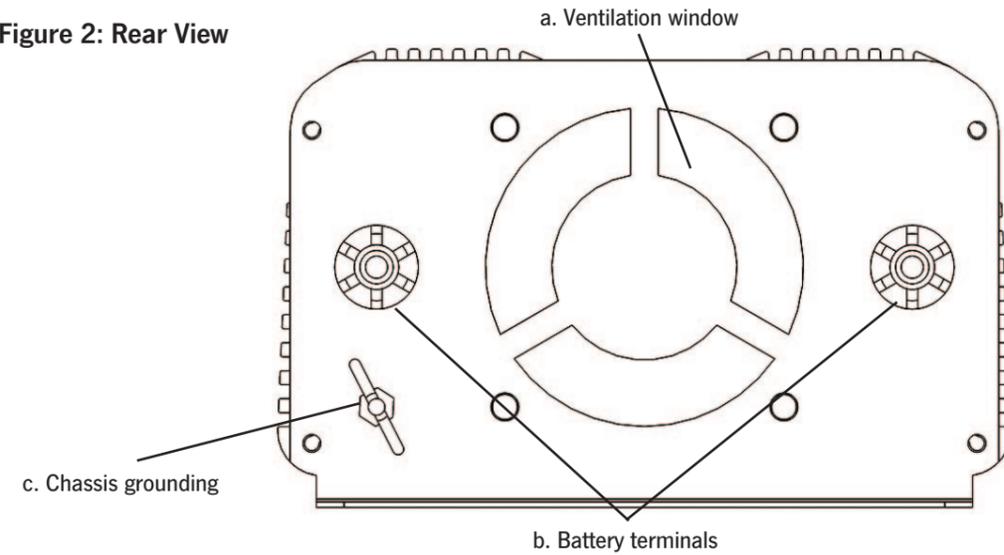
**1. Setting Up:**

Figure 1: Front View



- a. **ON / OFF switch:** Leave in the OFF position during installation.
- b. **Fault indicator:** Lights up when inverter protects itself against high/low battery condition, over temperature or overload conditions.
- c. **AC outlet.**

Figure 2: Rear View



- a. **Ventilation window:** Do not obstruct. Allow at least 25mm (1 inch) for air flow.
- b. **Battery terminals:** Connect to battery or other dc power source (ensure battery or power source voltage matches inverter voltage input, 12V for M 8017A, 24V for M 8018A). '+' is positive. '-' is negative. A reverse polarity connection will blow the internal fuse and may permanently damage the inverter.
- c. **Chassis ground lug:** Connect to earth ground or to vehicle chassis using #16 AWG wire.

**WARNING!** Operation of the inverter without a proper ground connection may result in an electrical safety hazard.

**Quick hook- up and testing:**

If you would like to quickly start up the power inverter and check its performance before installation, please follow these guidelines:

1. Unpack and inspect the power inverter. Make sure that the power switch is in the OFF position.
2. Connect the cables to the power input terminals on the rear panel of the power inverter. The red terminal is positive (+) and black terminal is negative (-). Connect the cables to the terminals and tighten the nuts to clamp the wires securely.

**Caution! Loose connections result in excessive voltage drop and may cause wires to overheat which might lead to the insulation melting.**

**Caution! Reverse polarity connection will blow a fuse in the inverter and may permanently damage the inverter. Damage caused by a reverse polarity connection is not covered by the warranty.**

**WARNING! You may observe a spark when you make this connection since current may flow to charge capacitors in the power inverter. Do not make this connection in the presence of flammable fumes, as an explosion or fire may result.**

3. Set the power switch to the ON position. Check indicators on the front panel of the inverter. The fault LED should be off, if fault LED is on, consult the troubleshooting section of this manual.
4. Set power inverter switch to the OFF position, the indicator lights may blink and the internal alarm may sound momentarily. This is normal. Plug the test load into the AC receptacle on the front panel of the inverter. Leave the test load switch off.
5. Set power inverter switch to the ON position and turn the test load on, the inverter should supply power to the load.

**2. Installation:**

**a. General Instructions:**

- The inverter must be placed in a dry, well ventilated and dust free location.
- Place the unit as close as possible to the battery in order to keep the battery cables as short as possible. Avoid cables longer than three meters between the battery and inverter.
- Do not place the unit in same compartment as the batteries.
- Ensure that neither water nor dust can enter the unit.
- Avoid mounting the device next to flammable materials.
- The ambient temperature should be between 0°C and 40°C. The cooler the better.
- Ventilation - Allow at least one inch (25mm) of clearance around the inverter for air flow. Ensure the ventilation is not obstructed on the rear and bottom of the unit. Ensure that the air flow from fan is not obstructed.

**b. Cabling requirements:**

The below applies to battery to inverter cable length ≤2m: For 2 – 3m length cables use a heavier gauge. We do not recommend the use of cable over 3m length.

DC to AC inverters convert high current / low voltage DC power to low current / high voltage AC power. To operate properly, connect inverter DC input terminals directly to the battery with heaviest wire available. See chart below:

Max. Watts Out	Approx. Current Req'd	Wire Gauge
100W	10A	# 18, 0.75mm <sup>2</sup>
150W	15A	# 14, 1.5mm <sup>2</sup>
200W	20A	# 12, 2.5mm <sup>2</sup>
300W	30A	# 10, 3.5mm <sup>2</sup>
400W	40A	# 8, 8.0mm <sup>2</sup>
600W	54A	# 6 or 2 x # 10, 13mm <sup>2</sup>
800W	72A	# 4 or 2 x # 8, 21mm <sup>2</sup>
1000W	85A	# 2 or 2 x # 6, 33mm <sup>2</sup>

**Warranty:**

**WARNING: Wrongly plugging AC power outlet LINE / NEUTRAL will void the warranty.**

Altronic Distributors warrants this product for 1 year from date of purchase from Altronics or its resellers to the consumer. If this item is part of an installation or another product, please contact the installer or supplier for your warranty.

During the warranty period, we undertake to repair or replace your product at no charge if found to be defective due to a manufacturing fault. The warranty excludes damage by misuse or incorrect installation (i.e. failure to install and operate device according to specifications in the supplied instruction manual), neglect, shipping accident, or no fault found, nor by use in a way or manner not intended by the supplier.

For repair or service please contact your PLACE OF PURCHASE.

If this item was purchased directly from Altronics please make a warranty claim by:

**FOR MAIL ORDER CUSTOMERS (includes school and trade orders), ringing us on 1300 797 007 and quoting your Tax invoice number.**

Upon contacting Altronics, we will issue an R.A. (Return Authorisation). As Altronics have a number of service agents throughout Australia, a copy of the R.A. will be emailed, faxed or mailed to you with full instructions of how and where to send the goods. The freight for shipping goods back to Altronics for all repairs is at the customers expense.

A copy of the R.A. form, (or at the very minimum, the R.A. number) must accompany the goods to effect the repair. Altronics will pay the return freight to the customer where the warranty claim has been accepted. Please quote the R.A. number in any correspondence to us.

**FOR OVER THE COUNTER PURCHASES;** to make a warranty claim, please return the goods to us in any of our stores, with a copy of your proof of purchase (tax invoice).

Upon leaving the goods at one of our stores, an R.A. (return authorisation) number will be issued to you. Once repaired, you will be contacted, advising that the goods are ready to be collected from the store.

It is at Altronics discretion as to whether the goods will be repaired or replaced (whilst under warranty); and as to whether identical goods will be used to replace the item due to changes of models / products.

**Note: Under no circumstances should you attempt to repair the device yourself or via a non-authorised Altronics service centre, as this will invalidate the warranty!**

Our goods come with guarantees that cannot be excluded under the Australian Consumer Law. You are entitled to a replacement or refund for a major failure and for compensation for any other reasonably foreseeable loss or damage. You are also entitled to have the goods repaired or replaced if the goods fail to be of acceptable quality and the failure does not amount to a major failure.

**TROUBLESHOOTING:**

**Television Interference:**

- Operation of the power inverter can interfere with television reception on some channels. If this situation occurs, the following steps may help to alleviate the problem:
- Make sure that the chassis ground lug on the back of the power inverter is solidly connected to the ground system of your vehicle or boat.
- Do not operate high voltage loads with the inverter while watching television.
- Make sure that the antenna feeding your television provides an adequate signal and you are using a good quality cable between the antenna and the television.
- Move the television as far away from the power inverter as possible.
- Keep the cables between the battery and the power inverter as short as possible and twist them together with about six twists per metre. This minimises radiated interference from the cables.

Problem and Symptom	Possible Cause	Solution
Low output voltage.	Overload	Reduce load
No output voltage.	Inverter switched off	Turn inverter on.
	No power to inverter	Check wiring to inverter.
	Internal fuse open	Have a qualified service technician check and replace fuse. OBSERVE CORRECT POLARITY
	Reverse DC polarity	OBSERVE CORRECT POLARITY
	High input voltage	Make sure the inverter is connected to a battery. Check regulation of charging system.
Low battery alarm on all the time.	Poor DC wiring, poor battery condition.	Use a correct sized cable for the load and make solid connections. Use new battery.
Low battery alarm on all the time.	Poor DC wiring, poor battery condition.	Use a correct sized cable for the load and make solid connections. Use new battery.
Fault indicator on. No output voltage. Load in excess.	Thermal shutdown	Allow inverter to cool down. Reduce load if continued operation required.
Fault indicator on. No output voltage. Load less than 1000W:(100A).	Thermal shutdown	Improve ventilation, make sure ventilation openings in inverter are not obstructed, reduce ambient temperature.
Fault indicator on. No output voltage.	Short circuit or wiring error.	Check AC wiring for short circuit or improper polarity (active and neutral reversed)
	Very high power load.	Remove load.

**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.

**3. Grounding:**

**WARNING! Electric Shock Hazard - Do not operate the power inverter without connecting it to ground. Do not connect the inverter chassis ground lug to the common ground on the household mains board. (See Fig 7.)**

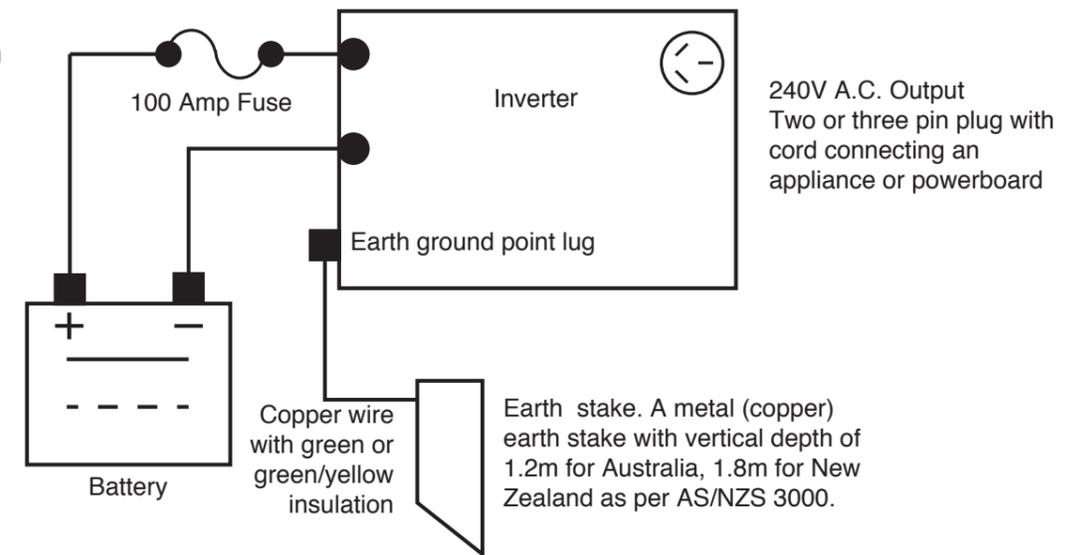
**This inverter is designed for negative ground d.c. systems**

**Important: Grounding and all other wiring must comply with local codes and rules.**

The power inverter has a lug on the rear panel marked "Earth Ground". This is to connect the chassis of the power inverter to the ground. The ground terminals in the A.C. outlets on the front panel of the inverter are internally connected to the ground lug. The chassis ground lug must be connected to a grounding point, which will vary depending on where the power inverter is installed.

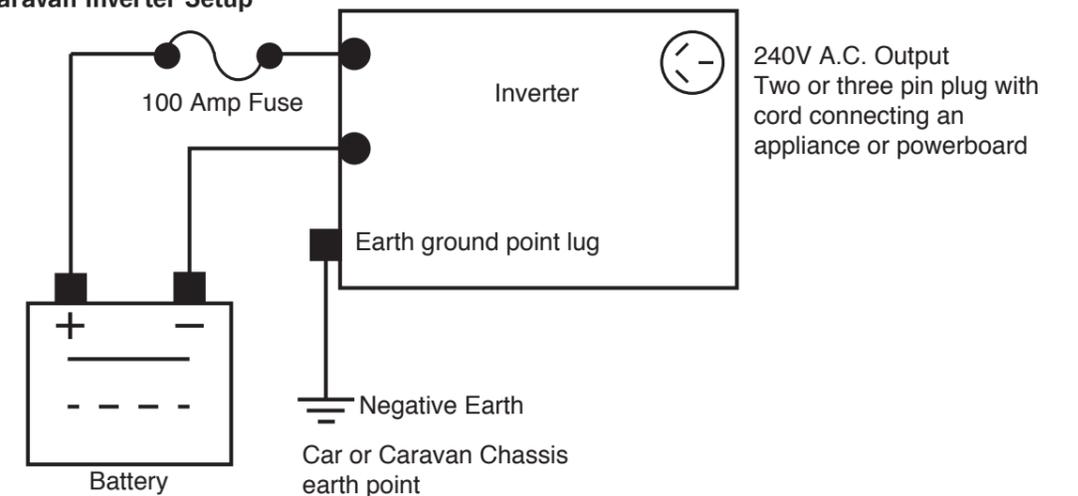
In a vehicle, connect the chassis ground to the chassis of the vehicle. In a boat, connect to the boat's grounding system. In a fixed location, connect the chassis ground lug to an earth stake. Even if a connected electrical appliance fails for some reason, there is no risk of electric shock when you connect the inverter's earth lug to a suitable ground point. The same is true if the inverter has an electrical fault. The in-built electronic protection circuitry will activate and a properly grounded inverter will pose no threat for electric shock.

**Figure 4:**  
**Typical Connection Setup**



**Figure 4: Connect an earth wire (preferably solid green or green with yellow stripe) from the external earth connection (Chassis GND) on the rear of the inverter to a metal stake as above.**

**Figure 5: Car or Caravan Inverter Setup**



**Figure 5: Connect an earth wire (preferably solid green or green with yellow stripe) from the external earth connection (Chassis GND) on the rear of the inverter to the chassis of the vehicle (car, truck, caravan).**

Figure 6: Marine Environment Inverter Setup

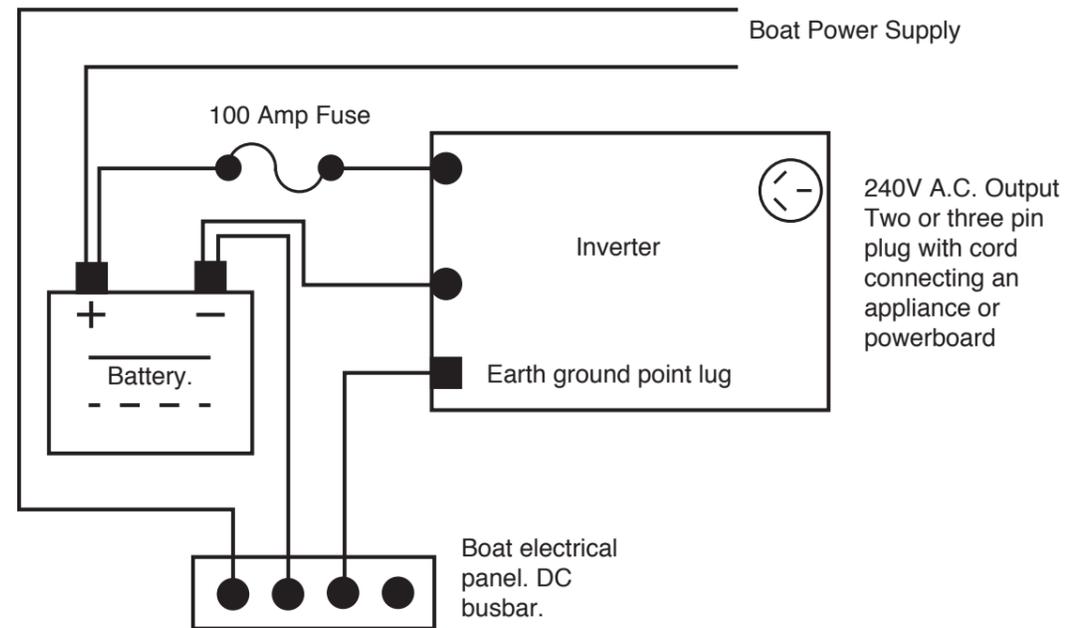


Figure 6: Note: For marine applications, special installation codes may apply.

Figure 7: Inverter Wired Into House Mains Power

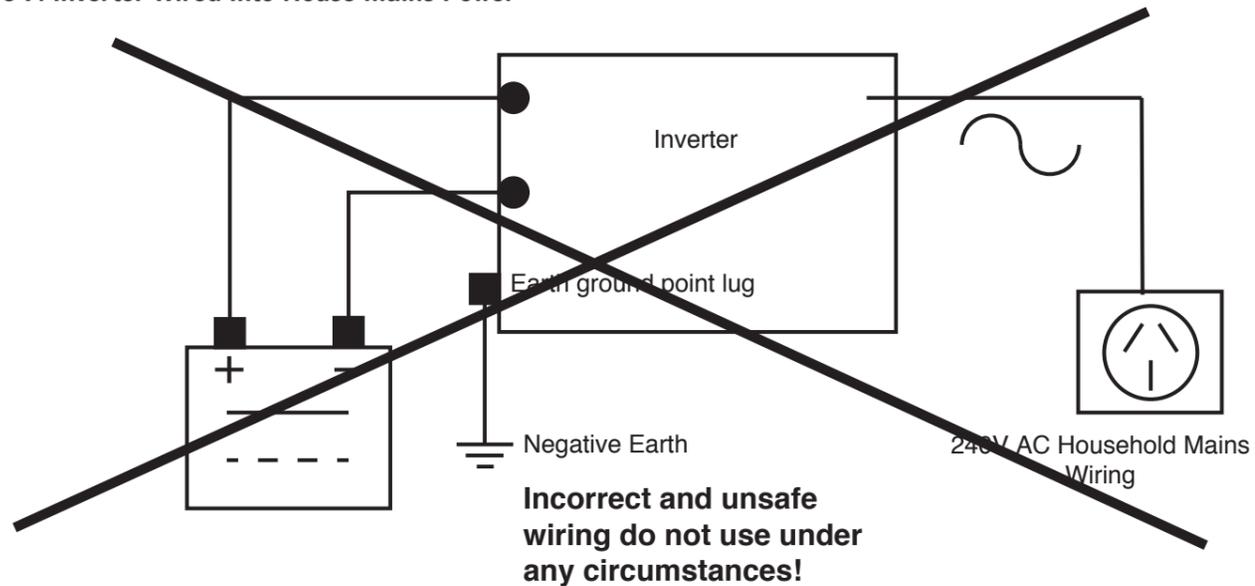


Figure 7: This device is NOT suited for connecting to any household wiring.

Operation:

To operate the power inverter, turn it on using the ON / OFF switch on the front panel. The power inverter is now ready to deliver AC power to your loads. If you are operating several loads from the power inverter, turn them on separately after the inverter has been turned on. This will ensure that the power inverter does not have to deliver the starting currents for all the loads at once.

1. Controls and Indicators:

The ON/ OFF switch turns the control circuit in the power inverter on and off. It does not disconnect the power from the power inverter. When the switch is in the OFF position, the power inverter draws no current from battery. When the switch is in the ON position, with no load, the power inverter draws <40W.

2. Fault Indicator:

The Fault indicator shows that the power inverter has a fault condition. This can be due to the following reasons:

**Overheating:** Inverter shut itself down because it has overheated. The power inverter may overheat because it has been operated at power levels above its rating, or because it has been installed in a location which does not allow it to dissipate heat properly.

**Overloading:** Inverter has shut itself down because its output circuit has been short circuited or drastically overloaded. Switch the ON / OFF switch to OFF, correct the fault condition, and then flip the ON / OFF switch back to ON.

**Low input voltage:** Battery input voltage may be too low for operation. Battery must be recharged.

**High input voltage:** Battery input voltage may be too high for operation. Ensure battery voltage is between 11 and 15 Volts (M 8017A) or 20 and 30 Volts (M 8018A).

**Reverse polarity (blown fuse):** Protection from reverse polarity is provided by a fuse. If inverter has been connected to a dc power source with the wrong polarity, this fuse will blow preventing damage to the inverter.

Operating Limits:

1. Power Output

Some induction motors used in refrigerators, freezers, pumps, and other motor operated equipment require very high surge currents to start. The power inverter may not be able to start some of these motors even though their rated current draw is within the rating of the power inverter. If the motor refuses to start, observe the battery voltage indicator while trying to start the motor. If the battery voltage indicator drops below 11V (M 8017A) or 22V (M 8018A) while the inverter is attempting to start the motor, this may be why the motor will not start. Make sure that the battery connections are good and the battery is fully charged. If the connections are good and the battery is charged, but the voltage still drops below 11V (M 8017A) or 22V (M 8018A), you may need to use a larger or better battery or inverter.

2. Input voltage

The power inverter will operate from an input voltage range shown in the specifications. If the voltage drops too low, an audible low battery warning will sound. The power inverter will also shut down if the input voltage drops outside the range shown in the specifications. This protects your battery from being over discharged. The power inverter will also shut down if the input voltage is too high. This protects the inverter against excessive input voltage. Although the power inverter incorporates protection against overvoltage, it may still be damaged if the input voltage is allowed to exceed 20V (M 8017A) or 30V (M 8018A).

3. Locations

This inverter is ideally suited for use in indoor locations, preferably fixed with the chassis ground lug connected by an insulated copper wire (green or green / yellow colour) to an earth stake. Correct grounding is paramount for effective and safe operation. If it is being used in a mobile home or vehicle or marine environment, it is imperative that the unit be well secured in a setting that is always dry, experiences minimal vibration, and will not be subject to excessively high temperatures. It would be best used only when a vehicle or boat is not moving.

4. If an appliance that is connected to the inverter fails or has an electrical fault, the inverter's protection electronics will engage and keep the system safe. If the inverter fails due to an electrical fault, then the connected appliance will be protected by the same circuitry.