

CONVERTS 12 VOLT DC TO 230/240 VOLT AC

# 120W INVERTER 'POWER-CAN' WITH USB CHARGER

IT'S LIKE HAVING A 240V SOCKET IN YOUR VEHICLE



## **WARNING**

- For use with negatively earthed vehicles & systems only.
- For indoor use only. Do not expose to rain.
- Hazardous voltages inside - do not attempt to open or repair.
- Do not use if damaged.
- Read operating manual before using or making any connections.
- Only connect 230/240VAC appliances that are in safe condition.
- It is recommended that a type 'A' portable residual current device (RCD) be used for added output protection.
- For independent use, do not connect to electrical wiring systems of buildings.
- Do not exceed the maximum input voltage of 15VDC.
- The Inverter 'Power-Can' should be used in a ventilated area.
- Take care if adjacent drinks holders contain or have contained liquids.
- Do not obstruct the vent at the bottom of the can.
- Ensure cables and leads connected to the Inverter 'Power-Can' do not interfere in the safe operation of the vehicle.
- Do not leave connected to 12VDC socket unattended.
- Remove from 12VDC socket when not in use as the unit will continue to draw 0.3 Amps in stand by current.
- Do not use the power lead to move or carry the Inverter 'Power-Can'.
- Do not use distracting accessories such as mobile phones and laptops whilst driving.

# FEATURES

## **Boost power technology**

Runs appliances with higher start-up loads exceeding 120W. The inverter can sustain 'boost power' for a short period of time which is sufficient to start many appliances.

## **Superior noise-free filtering**

Noise-free filtering reduces TV buzz & interference.

## **Heavy duty power lead with accessory plug**

The cigarette lighter plug is made from heat resistant plastic to withstand high temperatures that may be produced during operation. The plug also features a unique flat tip that provides high current transfer for optimum performance.

## **Auto shut down**

The Inverter 'Power-Can' will automatically shut down if the supply voltage is less than 10V or higher than 15.5V. At this point the green LED will go out. The inverter will automatically re-start when the voltage is between 10V & 15.5V.

## **Overload protection**

The Inverter 'Power-Can' will automatically shut down if the continued power draw exceeds the maximum rating. The Red LED and the warning buzzer will activate. Remove the appliance from the inverter before using again.

## **Temperature protection**

If the temperature of the internal heat sink reaches  $>65^{\circ}\text{C}$  the Inverter 'Power-Can' will shut down automatically and the Red LED and the warning buzzer will activate. Remove from power and allow the can to cool before using again.

## **USB charge socket**

The IM120 features a USB connection for recharging electronic devices including tablets, MP3's, mobile phones and other USB devices.

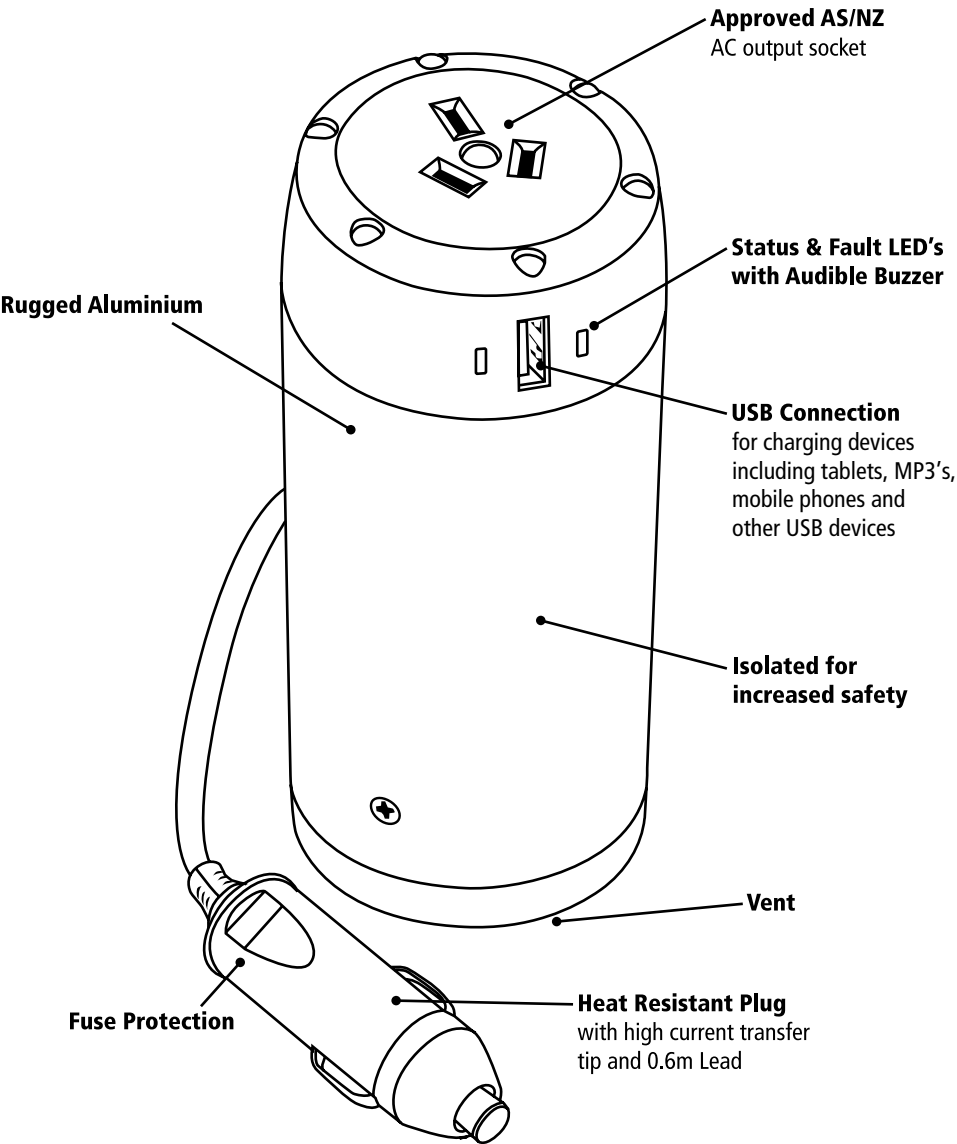
## **Status and warning lights with audible buzzer**

Green and Red LEDs are located on the side of the Inverter 'Power-Can'. The Green LED illuminates when the inverter is working correctly and the Red LED and buzzer will turn on to indicate when there is a fault.

## SPECIFICATIONS

Input	12V Battery/Vehicle (10-15.5DC)
Input current: (Max DC Amps)	20 Amps
Input standby Current ( $\pm 5\%$ )	0.3 Amps
Output	230V ( $\pm 10V$ ), 50 Hz (Modified Sine wave)
Continuous Output Power	120W
Peak Output Power	300W for 0.5 second
Efficiency	85%
Inverter Classification	Equipotentially Bonded Inverter (EPB)
USB Output Power	USB2, 5VDC, 2.0A
Low Battery Alarm & Shutdown	10.0VDC ( $\pm 0.5V$ )
High Battery Alarm & Shutdown	15.5VDC ( $\pm 0.5V$ )
Thermal Shutdown	65°C
Replacement fuse	20 Amp 3AG Glass Fuse
Fuse Location	Cigarette Plug tip
Connection cable	Cigarette Plug 600mm
Dimensions (mm) (D X H)	Ø 68 x 150 mm
Weight	0.4 Kg

# PRODUCT OVERVIEW



# OPERATING INSTRUCTIONS

- 1. Connect the cigarette lighter plug from the Inverter ‘Power-Can’ to the 12V cigarette lighter socket in the car or power pack.
- 2. Turn the car or power pack on. The alarm and Red LED will come on briefly prior to the Green status LED illuminating.
- 3. Plug the 240V appliance or USB device into the Inverter ‘Power-Can’.
- 4. To turn the inverter off, turn the car ignition switch to the off position or disconnect the cigarette lighter plug from the cigarette lighter socket.

## DETERMINING SUITABLE LOAD/APPLIANCES:

All appliances have a rating plate that shows the amount of power (Watts) used or the current (Amps) drawn under normal use. The Inverter ‘Power-Can’ is able to supply power to appliances that have a continuous power draw of 120Watts or 0.5 Amp AC.

Some appliances that use an electric motor or transformer may draw 2 to 9 times their rating when first turned on; this is called an inductive load and is the most difficult for the inverter to run. For these appliances it is often a matter of trial and error to see what size inverter they will run from; if in doubt always use a larger inverter. The following table lists typical appliances suitable for use with this IM120 Inverter ‘Power-Can’ and their approximate power rating (AC Watts).

## TYPICAL APPLIANCE

Appliance	Watts
Mobile phone charger	5W–10W
Video game console	39W–100W
Camcorder charger	3W–20W
Portable work light	8W–60W
Portable stereo	10W–40W
Laptop computer	60W–95W
Digital camera charger	4W–19W
19” Television	100W–160W
Printer	100W–200W
12” Fan	80W–140W

This product is rated for use with items running up to 120W or less.

# SUITABLE POWER SUPPLY

In order to operate the inverter and supply power to an appliance, a suitable 12VDC power supply is required. This can be a vehicle or caravan battery, portable power pack or an independent 12V lead acid battery. For most applications, a deep cycle battery is recommended for optimum performance. The size of the battery 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 (CCA).

Because 12V inverters are capable of drawing high currents the inverter should only be connected to a suitable sized battery. Connection to an undersized battery could damage the battery and will result in the inverter shutting down within a short period due to low battery voltage. The amount of power drawn from the battery is proportional to the inverter load.

Minimum recommended battery size	17Ah (100CCA)
Run time with maximum load and minimum battery size	40 min
Run time for a 100 Watt globe with minimum battery size	80 min
Ideal battery size	50-70Ah

# RESIDUAL CURRENT DEVICE (RCD)

For added safety it is recommended that a Type “A” Residual Current Device (RCD) be used for any appliance that is being operated by the inverter. These are sometimes called “Safety Switches” and are designed to be connected between an appliance and power source.

1. Connect the RCD to the inverter AC outlet socket
2. Connect the appliance to the other end of the RCD
3. Turn the power supply “ON”
4. Follow the manufacturer’s instructions to turn the RCD “ON” and “TEST” that it is functioning correctly.
5. Turn the appliance on.

NOTE: Some RCDs do not work properly with the inverter’s “Modified Wave” output. Check with the RCD manufacturer and always follow the manufacturer’s “TEST” procedure to check that the RCD is functioning correctly.

# USING THE INVERTER IN VEHICLES

The Inverter Power-Can’ is best used whilst the engine is running. This will minimise the risk of flattening the car’s starter battery even though the Inverter will shut down if the battery voltage falls below 10V (Note: 10V is not sufficient voltage to start a car). To use the Inverter for an extended period of time without the engine running, it is recommended to run it from a second battery or a dual battery system to avoid flattening the car’s starting battery.

## FREQUENTLY ASKED QUESTIONS

### Q.What is an inverter?

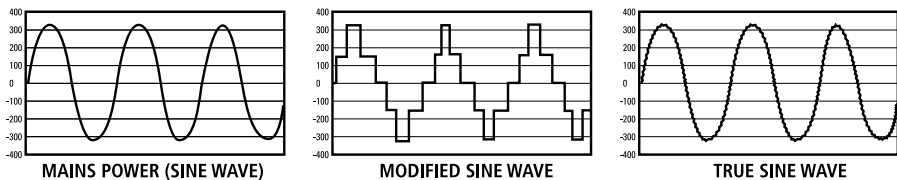
A. Inverters are designed for powering household appliances from a battery or vehicle. They are electronic devices that convert (12VDC) battery power to (230/240VAC) mains power.

Inverters are compact and often lightweight making them an ideal source of portable mains power. Thanks to their portability they are commonly used in cars, caravans, motor homes, boats, 4WD's and utility vehicles.

Using an inverter with standard household appliances is a much cheaper option than purchasing specialised 12V appliances for times when power is not available.

There are two different types of inverters, modified sine wave and true sine wave. The difference between the two is how close the output replicates mains power.

These graphs show the difference in output between mains power, modified sine wave and true sine wave inverters.



Logically it follows that the process used in a true sine wave inverter is more complex than a modified sine wave inverter and subsequently they are lot more expensive.

In reality most electric appliances operate unaffected on a modified sine wave and hence they are more common.

True sine wave inverters are reserved for use on medical equipment and sensitive electrical appliances.

Inverters are available with different power output levels to suit the type of appliances to be powered. Small inverters are designed for powering one small low power electrical or electronic appliance. Larger inverters can be used to power multiple small appliances or one larger appliance. Typically inverters are not an efficient method for running appliances with very high power requirements such as electric heaters, stoves, kettles and air conditioners. This is due to their high current draw and battery consumption.



### **Q.Why does the Inverter turn itself off?**

A.If the inverter makes a 'buzz' sound and the "RED" fault light illuminates this indicates that there is a problem, and the inverter will usually turn off. Most commonly this would be caused by an appliance that is drawing too much power (overloading), low battery voltage or voltage drop due to insufficient size cables or poor connections.

### **Q.The Inverter will not run my appliance even though the appliance draws less power (Watts) than the size of the inverter?**

A. Electrical appliances can be divided into three groups by the way they draw energy (current) from their power supply. These groups are "Resistive", "Inductive" and "Capacitive" appliances or also called "loads". Some appliances may draw all three types of power.

- **Resistive Loads** such as normal incandescent lights (wire filament) always draw a constant power (watts) from the power supply, that is a 100 Watt light will draw approximately 100 Watts from the power supply at all times. Resistive loads are the easiest appliances for an inverter to run.
- **Inductive Loads** such as a refrigerator (Electric Motor) require a large rush of power (surge current) to start and then usually draw a more constant power once running. Inductive loads contain coils of wire (motors, transformers, ballasts, solenoids). When the power is first turned on these coils of wire draw a large surge current which forms the magnetic flux (magnetic field) which allows these appliances to work. This magnetic flux is a kind of stored energy.
  - The most common inductive appliances are: bar fridges, air compressors, transformers/chargers, pumps, power tools and fluorescent lights. These appliances can draw 2 - 6 times their normal running power to start up, that is to run a 80 Watt fridge you may need a 600 or 1000 Watt inverter.
- **Capacitive Loads** such as many TV's or many electronic appliances require a large surge current to start only when they have not been used for a while. This is often due to large capacitors in the power supply that must be quickly charged when the appliance is turned on. If the appliance is not used for a few days these capacitors slowly go flat. Resetting the inverter a couple of times may allow these appliances to work.

**Q.Can I run fluorescent lighting from my inverter?**

A. Most portable fluorescent work lamps should operate fine on an inverter even though they may be slow to start.

- Fluorescent lights are an inductive & capacitive load and often draw at least twice as much power from the inverter than their normal rating to start.
- Normal household fluorescent lights should be avoided, because they contain power factor correction capacitors. Power factor correction is used in normal buildings to help smooth out the inductive effects of fluorescent light ballasts. If used with portable power inverters the power factor correction is effected by the harmonic distortion in the modified waveform, this causes a high load on the inverter that can overload and damage the unit. If normal household fluorescent lights must be used, you will need to have a qualified electrician remove the power factor correction capacitor. The light should then be marked "For Inverter Use only".

**Q.How do I check or change the fuse?**

A. The IM120 Inverter 'Power-Can' is fitted with a 20Amp 3AG glass fuse found in the cigarette lighter plug. If the unit does not function, disconnect the inverter from the DC power source and disconnect any AC appliances. Unscrew the tip of the plug, then remove the fuse and check if it is blown and replace if required.

THE DC SUPPLY MUST BE DISCONNECTED BEFORE ANY REPAIR.

**Q.Why does my Residual Current Device (RCD) trip each time I turn an appliance on?**

A. Some RCD's disconnect (trip) when they do not receive any power. These types of RCD's can be tripped by the inverter's Peak Power Technology which allows a gradual ramp up of power. Use a continuous RCD which does not trip out when the power is turned off, these only trip when there is a fault.

**Q.Can I run laptop computers?**

A. Most laptop/notebook computer AC power adaptors work perfectly with the inverter's modified sine wave. Some however are more sensitive and may not function properly. If your power adaptor does not function or causes a humming noise it is probably not compatible. The best way to operate a laptop/notebook from your vehicle is to use the Projecta 12V Laptop Power Adaptor P/No. DC3500 or P/No. DC6000. This is a much more convenient and efficient way to charge and operate the laptop direct from a 12V source.

**Q.Can I connect lights with dimmers to the inverter?**

A. Older light dimmers may function, but most newer light dimming circuits are designed for household sine wave AC power and these may not work properly with modified sine wave inverters.

# **WARRANTY STATEMENT**

## **Applicable only to product sold in Australia**

Brown & Watson International Pty Ltd of 1500 Ferntree Gully Road, Knoxfield, Vic., telephone (03) 9730 6000, fax (03) 9730 6050, warrants that all products described in its current catalogue (save and except for all bulbs and lenses whether made of glass or some other substance) will under normal use and service be free of failures in material and workmanship for a period of one (1) year (unless this period has been extended as indicated elsewhere) from the date of the original purchase by the consumer as marked on the invoice. This warranty does not cover ordinary wear and tear, abuse, alteration of products or damage caused by the consumer.

To make a warranty claim the consumer must deliver the product at their cost to the original place of purchase or to any other place which may be nominated by either BWI or the retailer from where the product was bought in order that a warranty assessment may be performed. The consumer must also deliver the original invoice evidencing the date and place of purchase together with an explanation in writing as to the nature of the claim.

In the event that the claim is determined to be for a minor failure of the product then BWI reserves the right to repair or replace it at its discretion. In the event that a major failure is determined the consumer will be entitled to a replacement or a refund as well as compensation for any other reasonably foreseeable loss or damage.

This warranty is in addition to any other rights or remedies that the consumer may have under State or Federal legislation.

## **IMPORTANT NOTE**

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 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.

## **Distributed by**

### **AUSTRALIA**

#### **Brown & Watson International Pty Ltd**

Knoxfield, Victoria 3180

Telephone (03) 9730 6000

Facsimile (03) 9730 6050

National Toll Free 1800 113 443

### **NEW ZEALAND**

#### **Narva New Zealand Ltd**

22–24 Olive Road

PO Box 12556 Penrose

Auckland, New Zealand

Telephone (09) 525 4575

Facsimile (09) 579 1192

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