

DRAPER[®]

INSTRUCTIONS FOR 12V DC 230V 150W AC Inverter

Stock No.23244

Part No.IN150

IMPORTANT: PLEASE READ THESE INSTRUCTIONS CAREFULLY TO ENSURE THE SAFE AND EFFECTIVE USE OF THIS PRODUCT.



DRAPER[®]

GENERAL INFORMATION

These instructions accompanying the product are the original instructions. This document is part of the product, keep it for the life of the product passing it on to any subsequent holder of the product. Read all these instructions before assembling, operating or maintaining this product.

This manual has been compiled by Draper Tools describing the purpose for which the product has been designed, and contains all the necessary information to ensure its correct and safe use. By following all the general safety instructions contained in this manual, it will ensure both product and operator safety, together with longer life of the product itself.

All photographs and drawings in this manual are supplied by Draper Tools to help illustrate the operation of the product.

Whilst every effort has been made to ensure the accuracy of information contained in this manual, the Draper Tools policy of continuous improvement determines the right to make modifications without prior warning.

1. TITLE PAGE

1.1 INTRODUCTION:

USER MANUAL FOR:
12V DC 230V 150W AC INVERTER
Stock no. 23244
Part no. IN150

1.2 REVISIONS:

Date first published March 2012

As our user manuals are continually updated, users should make sure that they use the very latest version.

Downloads are available from: <http://www.drapertools.com/b2c/b2cmanuals.pgm>

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1.3 UNDERSTANDING THIS MANUALS SAFETY CONTENT:

- WARNING!** Information that draws attention to the risk of injury or death.
- CAUTION!** Information that draws attention to the risk of damage to the product or surroundings.

1.4 COPYRIGHT © NOTICE:

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3. GUARANTEE

3.1 GUARANTEE

Draper tools have been carefully tested and inspected before shipment and are guaranteed to be free from defective materials and workmanship.

Should the tool develop a fault, please return the complete tool to your nearest distributor or contact Draper Tools Limited, Chandler's Ford, Eastleigh, Hampshire, SO53 1YF. England.
Telephone: (023) 8026 6355.

A proof of purchase must be provided with the tool.

If upon inspection it is found that the fault occurring is due to defective materials or workmanship, repairs will be carried out free of charge. This guarantee period covering parts/labour is 12 months from the date of purchase. This guarantee does not apply to normal wear and tear, nor does it cover any damage caused by misuse, careless or unsafe handling, alterations, accidents, or repairs attempted or made by any personnel other than the authorised Draper warranty repair agent.

Note: If the tool is found not to be within the terms of warranty, repairs and carriage charges will be quoted and made accordingly.

This guarantee applies in lieu of any other guarantee expressed or implied and variations of its terms are not authorised.

Your Draper guarantee is not effective unless you can produce upon request a dated receipt or invoice to verify your proof of purchase within the guarantee period.

Please note that this guarantee is an additional benefit and does not affect your statutory rights.

Draper Tools Limited.

4. INTRODUCTION

4.1 SCOPE

Converts 12V DC to 230V AC using a 12V power outlet.
Ideal for use in cars, mobile homes and boats etc.

4.2 SPECIFICATION

Stock no.	23244
Part no.	IN150
Input voltage.....	12V $\overline{=}$, 13.7A
Input voltage range	12V $\overline{=}$ (10-15V)
Output power (Continuous Watts)	150W, 0.65A
Output power (Peak Watts)	300W
Standby current	\leq 0.21A
Nominal output voltage (AC)	230V
USB output voltage (DC)	5.0V $\overline{=}$, 500mA
Frequency	50Hz \pm 5% crystal controlled
Output waveform	Modified sine wave
Low battery-voltage alarm (volts)	10.5 \pm 0.5V $\overline{=}$
Low battery-voltage shutdown (volts)	10 \pm 0.5V $\overline{=}$
Efficiency	85-90%
Thermal protection	65°C \pm 5°C
Overload	Shut down and alarm
Battery polarity reverse	By fuse
Output short	Output short circuit protection
AC outlet socket	1
Replaceable fuse	20A
Dimensions (LxWxH)	Ø74 x 190cm
Weight	0.54kg

4.3 HANDLING & STORAGE

Although this machine is small in size, care must still be taken when handling and lifting. Dropping this machine will have an effect on the accuracy and may also result in personal injury. This machine is not a toy and must be respected.

The environment will have a negative result on its operation if you are not careful. If the air is damp, components will rust. If the machine is unprotected from dust and debris; components will become clogged: And if not cleaned and maintained correctly or regularly the machine will not perform at its best.

5. HEALTH & SAFETY INFORMATION

5.1 SPECIAL RECOMMENDATION

Unplug the AC inverter when not in use.

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

If the AC inverter makes a beeping sound: switch off your appliance, unplug the inverter and restart your vehicle's 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 to use your inverter.

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.

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 inverter before using a battery charger. 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 15V DC. **CONNECTING THE INVERTER TO A DC POWER SOURCE GREATER THAN 15V DC. WILL VOID THE WARRANTY AND MAY DAMAGE THE INVERTER.**

All specifications typical at nominal line, half load, and 25% unless otherwise noted.
Specifications subject to change without notice.

WARNING: DO NOT DISMANTLE THE UNIT. HAZARDOUS VOLTAGE!

DANGER!

PLEASE RETURN TO THE DEALER IF YOU FIND ANY PROBLEMS WITH THE UNIT.

5. HEALTH & SAFETY INFORMATION

5.2 CONNECTION TO THE POWER SOURCE

In order to operate the inverter and supply power to an appliance a suitable 12V DC power supply is required. This can be a vehicle or leisure battery, or anywhere with a 12V socket.

For most applications, a deep cycle battery is recommended for best 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.

Because 12 Volt inverters are capable of drawing high currents the inverter should only be connected to a suitable size battery.

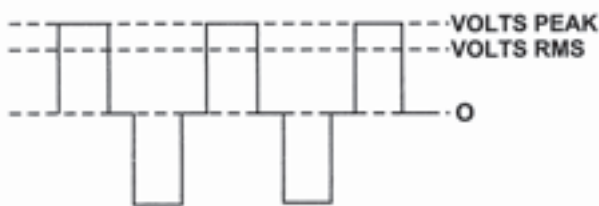
Connection to an undersized battery could damage the battery and will result in the inverter shutting down within a short period due to low battery voltage.

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

5.3 MEASURING AC VOLTAGE - FIG.1

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.

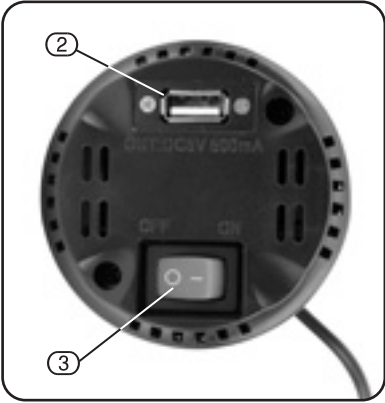
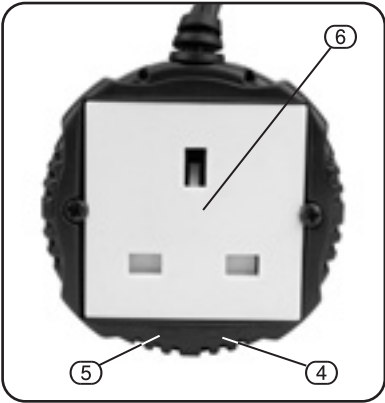
FIG.1



DIA INVERTER-MODIFIED SINEWAVE

6. TECHNICAL DESCRIPTION

6.1 IDENTIFICATION



- ① 12V DC socket connector.

② USB Output DC

③ On/Off switch

④ LED green power indicator
- ⑤ LED red fault indicator

⑥ 230V AC output socket

⑦ Chassis earthing lug

7. UNPACKING & CHECKING

7.1 PACKAGING

Carefully remove the inverter from the packaging and examine it for any signs of damage that may have happened during shipping. Lay the contents out and check them against the parts shown. If any part is damaged or missing; please contact the Draper Helpline (the telephone number appears on the Title page) and do not attempt to use the inverter.

The packaging material should be retained at least during the guarantee period: in case the machine needs to be returned for repair.

Warning! Some of the packaging materials used may be harmful to children. Do not leave any of these materials in the reach of children.

If any of the packaging is to be thrown away, make sure they are disposed of correctly; according to local regulations.

8. PREPARING THE INVERTER

8.1 DETERMINING SUITABLE LOAD / APPLIANCES

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 relationship between AC Watts and DC Amp which can be run by the inverter.

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 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 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 12 Volt supply.

Application Chart	Approximate	
Appliance	AC Watts	DC Amps
Laptop Computer	150	12
Portable Sterio/CD/DVD/Playstation	100	9
Charger/Mobile phone/Camera/MP3 Player	50	5

8. PREPARING THE INVERTER

8.2 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 appliance. You may use up to 15ft (3m) of high quality extension cord. A longer cord may result in reduced power.

8.3 GROUNDING CONNECTION FIG.2

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

On the casing of the Inverter is an earthing terminal. This earthing terminal is connected to the case of the Inverter and also to the earth terminal of the AC output socket. The use of this earthing terminal will depend on your particular installation. In any installation, heavy duty, green+yellow-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.

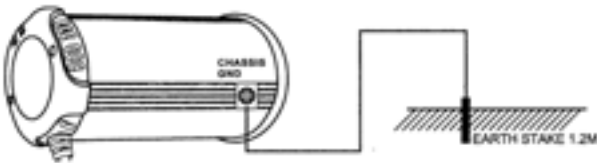
In a boat, the grounding terminal should be connected to the existing grounding system, which may be the hull of the craft, or a network of ground wires.

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.

8.4 CHASSIS EARTHING FIG.2

The chassis earthing lug should be connected to an earthing point, which will vary 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 system. In a fixed location, connect to grounding.

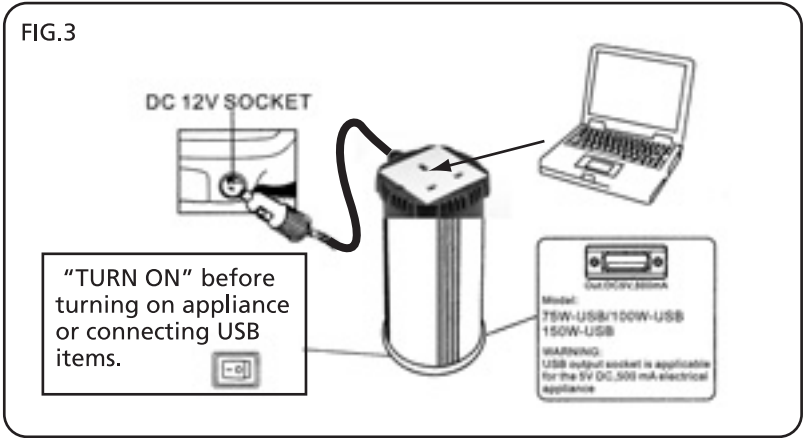
FIG.2



9. BASIC INVERTER OPERATIONS

9.1 OPERATION FIG.3

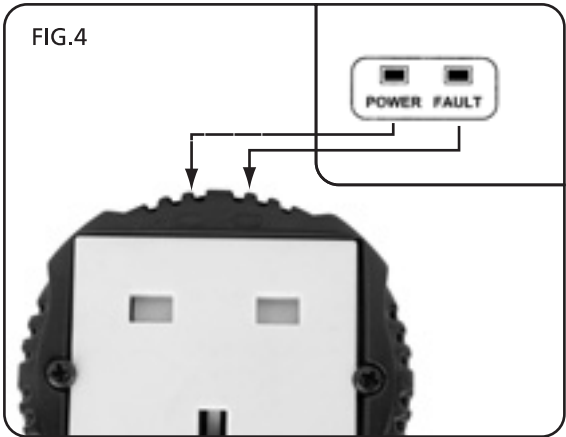
When connected to an appliance, remember to turn on the inverter before turning on the appliance. If the buzzer sounds during operation, this indicates that the battery voltage is very low and the inverter will disconnect in 5 minutes.



Ensure that the inverter is powerful enough to run the appliance connected BEFORE use.

9.2 INDICATING SIGN FIG.4

- GREEN LED ON:
Power switch “ON”, Inverter on standby and ready for use.
- GREEN LED OFF:
Power switch “OFF”.
- RED LED ON:
Power inverter is at fault or connection is incorrect. Check connections before attempting use.



9. BASIC INVERTER OPERATIONS

9.3 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.

10. TROUBLESHOOTING

10.1 CAUTION

In case of trouble with the AC output, 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.

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.

11. MAINTENANCE

11.1 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.

12. EXPLANATION OF SYMBOLS

12.1 EXPLANATION OF SYMBOLS



WEEE
Do not dispose of Waste Electrical
& Electronic Equipment in with
domestic rubbish

13. DISPOSAL

13.1 DISPOSAL

- At the end of the machine's working life, or when it can no longer be repaired, ensure that it is disposed of according to national regulations.
- Contact your local authority for details of collection schemes in your area.

In all circumstances:

- Do not dispose of power tools with domestic waste.
- Do not incinerate.
- Do not abandon in the environment.
- Do not dispose of WEEE* as unsorted municipal waste.



* Waste Electrical & Electronic Equipment.

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- **Service/Warranty Repair Agent**
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agent in your local area.

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