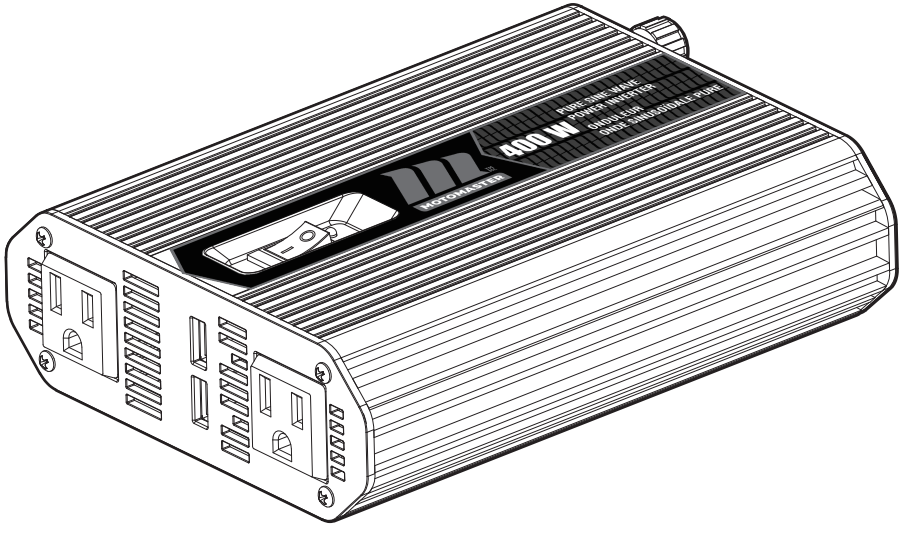
MOTOMASTER™

400 W PURE SINE WAVE INVERTER



Model no. 011-2113-4

IMPORTANT SAFETY INSTRUCTIONS.

SAVE THESE INSTRUCTIONS.

This manual contains important safety and operating instructions.

INSTRUCTION MANUAL

IF ANY PARTS ARE MISSING OR DAMAGED, OR IF YOU HAVE ANY QUESTIONS, PLEASE CALL OUR TOLL-FREE HELPLINE AT 1-888-942-6686.

Read and understand this instruction manual thoroughly before using the product. It contains important information for your safety as well as operating and maintenance advice.

Keep this instruction manual for future use. Should this product be passed on to a third party, this instruction manual must be included.

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This MotoMaster®product carries a one (1) year warrantyagainst defects in workmanship and materials. At its discretion, MotoMaster Canada agrees to have any defective part(s) repaired or replaced free of charge, within the stated warranty period, when returned by the original purchaser with proof of purchase. This product is not guaranteed against wear or breakage due to misuse and/or abuse.

TABLE OF CONTENTS

This manual contains information that relates to protecting personal safety and preventing equipment problems.
Carefully read and follow the guidelines in this manual and give special attention to the caution and warning statements.

ABBREVIATIONS AND ACRONYMS	
A	Amp (Ampere)
AC	Alternating current
cm	Centimetre
DC	Direct current
KW	Kilowatt
mm	Millimetre
V	Volts
W	Watts

SHOCK HAZARD

- Keep children away from the Power Inverter. Do not allow children to handle the Power Inverter.
- DO NOT expose the Power Inverter to rain, snow, spray, or bilge water.
- Make sure the inverter wiring is of proper size and rating and in good condition. Operating the inverter with damaged wiring may void the warranty.
- DO NOT use the inverter if it is dropped, hit, worn, broken, or damaged.
- DO NOT attempt to service or disassemble the inverter, as it does not have user-serviceable parts and the internal capacitors remain charged even if the power source is disconnected.
- Disconnect DC power source from the inverter, before attempting to service, clean, or operate on any circuits connected to inverter. Simply turning OFF the ON/OFF switch of the inverter will not disconnect the power, thereby creating risk of electric shock.
- NEVER connect the inverter to any power distribution systems or branch circuits.
- While servicing, never work on the AC wiring without physically disconnecting the DC connection.
- Use care when operating 110 V circuit. Incorrect operation of the inverter may cause personal injury.
- The Power Inverter is not designed to be waterproof. It functions in ambient temperatures of 32 to 104°F (0 to 40°C).

EXPLOSION AND FIRE HAZARD

- NEVER operate the inverter near flammable items or explosives, such as in the cabin of a gasoline-fuelled powerboat, or near propane/fuel tanks, in compartments containing batteries of flammable materials, locations that require ignition-protected equipment, or joints, fittings or any connections between fuel system components. This inverter contains components which tend to produce arcs or sparks.
- NEVER smoke while handling the inverter.

FIRE HAZARD

- **DO NOT** cover or obstruct the ventilated openings of the inverter, as doing so may cause overheating.
- Make sure there is minimum of 3" (7.5 cm) of unblocked air space around the entire surface of the inverter at all times. The inverter may become warm reaching a temperature of 140°F (60°C) under high power operation.
- **DO NOT** place any materials near the inverter that could be easily damaged by heat.

EQUIPMENT DAMAGE

- Do not connect the inverter to live AC power circuits or any AC device with the neutral conductor connected to ground, to avoid damage to the inverter even if it is switched OFF.
- Never install the inverter in a zero-clearance environment, as doing so may cause overheating of the inverter.

SAFETY PRECAUTIONS WHEN WORKING WITH BATTERIES

Follow all instructions mentioned by the manufacturer to avoid explosion of the battery.

EXPLOSION HAZARD

- **DO NOT** work near lead-acid batteries, as the batteries generate explosive gases during normal operation.
- **DO NOT** drop a metal tool on the battery, as doing so can create a spark or short circuit in the battery or other electrical parts, resulting in battery explosion.
- While removing the battery, make sure to remove the grounded terminal from the battery and disconnect other electrical connections.
- Make sure the area around the battery and engine is well ventilated and free from spark or flame.
- Do not operate the inverter in an enclosed area containing automotive type lead-acid batteries. These types of batteries emit explosive hydrogen gas that can be ignited by sparks.
- Have someone within the range of your voice or nearby for help when working with lead-acid batteries.

CHEMICAL HAZARD

- Remove all metal items such as rings, bracelets, and watches when working with lead-acid batteries. The batteries may produce a short circuit current that can weld metals, thereby causing severe burns on skin.
- Make sure there is plenty of fresh water, soap and baking soda near the work area. If a person's skin or clothing accidentally contacts battery acid, wash immediately with baking soda, soap and water. If acid enters the eyes, wash immediately with running cold water for at least twenty minutes and get medical attention immediately.
- Always wear complete eye and clothing protection. Avoid touching your eyes while working with the batteries.

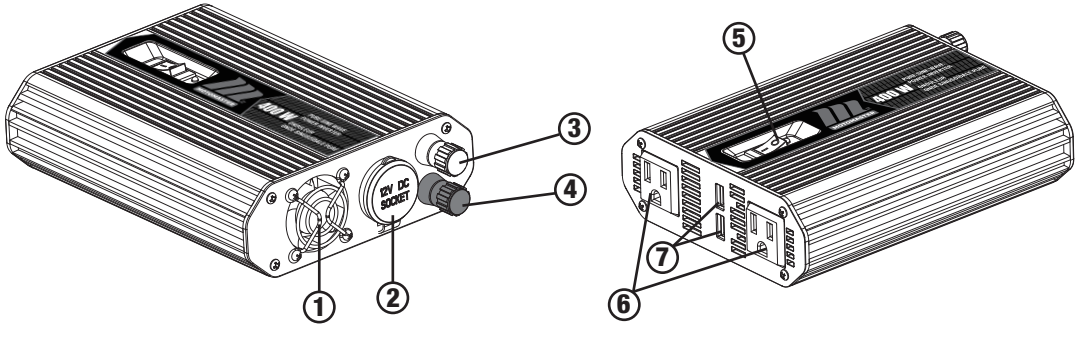
EQUIPMENT DAMAGE

- Connect the inverter to batteries with a normal output of 12 V DC only. The inverter will not operate if connected to a 6 V battery (voltage is too low) and 24 V battery (voltage is too high) will damage the unit.
- **DO NOT** insert any foreign objects into the outlets, vents, or fan openings of the inverter.
- **DO NOT** cover or obstruct the ventilation openings of the inverter.

SAFETY PRECAUTIONS WHEN USING RECHARGEABLE APPLIANCE

- Please connect 2 cables with all 2 DC terminals according to the installation instructions in this manual. Failure to do so may damage the inverter.
- **DO NOT** use this inverter to recharge battery operated appliances such as flashlights, razors, and night lights that can be plugged directly into an AC outlet.
- **DO NOT** use this inverter to recharge battery operated power tools that have a charger with a warning label indicating that dangerous voltages are present at the battery terminals.

KEY PARTS LIST



1. Cooling Fan
2. 12 V DC Socket
3. Positive DC terminal
4. Negative DC terminal
5. Power Switch
6. AC Outlets
7. USB Ports

GENERAL USE

The MotoMaster® 400 Watt Pure Sine Wave Inverter efficiently and reliably supplies 115 V/60 Hz AC power with 400 W continuous output power for small single loads, intermittent loads, or multiple smaller loads. The inverter is designed to meet UL standard and cETL certification. The high-quality and mid-range inverter is suitable for charging or powering electrical devices such as jacklight, TV set, audio/video system, and tools with power consumption less than 400 W. It is ideal for operating household appliances, cars, trucks, RVs and boats.

CHARACTERISTICS OF INVERTER

- The inverter is not waterproof.
- The inverter has high surge capability and functions in ambient temperatures of 32°F to 104°F (0°C to 40°C).
- The inverter's low standby power ensures less battery discharge, even if it is kept ON for a few days. (Stand by time is varied based on the capacity of battery connected.) It is not recommended to keep inverter always on when it is not in use.
- The inverter has a convenient USB port. It powers most modern electronic products.

SAFETY FEATURES

AC OUTPUT OVERLOAD OR SHORT CIRCUIT SHUTDOWN - This feature automatically turns OFF the inverter if a short circuit occurs or if the load attached to the inverter exceeds the operating limit. The LED indicator will light "green" or "red" to show working status and the audible alarm is also activated.

HIGH BATTERY VOLTAGE SHUTDOWN - This feature automatically shuts down the inverter if the input voltage exceeds 15.5 +/- 0.5 V. The LED indicator will light "red" and the audible alarm is also activated. The inverter recovers automatically when the battery voltage drops to a safe range.

LOW BATTERY VOLTAGE ALARM - The alarm produces an audible sound if the battery discharges to 11.0 +/- 0.3 V. The LED indicator will light "red".

LOW BATTERY VOLTAGE SHUTDOWN - This feature automatically shuts down the inverter if the battery voltage drops to 10.5 +/- 0.3 V. The LED indicator will light "red" and the audible alarm is also activated. The inverter recovers automatically when the battery voltage is 12 +/- 0.3 V DC.

OVER TEMPERATURE SHUTDOWN - This feature automatically turns OFF the inverter if the internal components temperature becomes too high. The audible alarm produces a beep when this happens. The LED light will be red. This may be caused by the ambient temperature being too high (over 104°F/40°C) or bad ventilation.

MAIN FEATURES OF AC PANEL

USB PORT - The port ③ powers and charges USB-enabled devices.

LED INDICATOR DISPLAY - This inverter has two indicators. One is a power indicator; when this inverter works normally, the green light will be on. Another is an error indicator: the red light will be on under error or alarm conditions.

AC OUTLET - The inverter is provided with two AC outlets ② into which a 115 V AC electrical appliance having a power consumption of 400 W or less can be plugged in.

MAIN FEATURES OF DC PANEL

POSITIVE DC TERMINAL - The terminal ⑥ accepts ring connectors of the positive cables connected to the battery.

NEGATIVE DC TERMINALS - The terminal ⑦ accepts ring connectors of the negative cables connected to the battery.

COOLING FAN AND VENTILATION OPENING - This feature ④ protects the inverter from overheating. The ventilation openings should be kept clear.

DC SOCKET - This 12 V DC socket can power 12 V accessories less than 10 A.

INVERTER LOADS

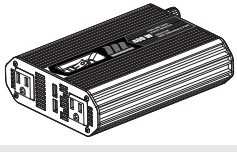
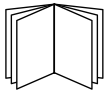
The inverter will operate AC loads within its power rating of 400 W. However, some appliances and equipment may be difficult to operate, and some appliances may be damaged while operating with this inverter.

INPUT VOLTAGE

The table below depicts the input voltage limits under various operating conditions.

OPERATING CONDITION	VOLTAGE RANGE	DESCRIPTION
Normal	11 V - 14 V	
Peak performance	13 V -14 V	
Low voltage alarm	11.0 ± 0.3 V	The audible low battery voltage alarm sounds. The red light will be on.
Low voltage shutdown	10.5 ± 0.3 V	The inverter shuts down to protect the battery from being over-discharged. The red light will be on.
High voltage shutdown	15.5 ± 0.5 V	The inverter shuts down to protect itself from excessive input voltage. The red light will be on. **NOTE:** Even though the inverter has over-voltage protection feature, it can be damaged if input voltage exceeds 16 V.
Inverter restarts after low voltage shutdown	12.0 ± 0.3 V	The inverter will not restart unless the battery voltage is suitable for operating the load.

PACKAGING CONTENTS

NO.	MATERIAL NAME	QUANTITY	ILLUSTRATION
1.	PS Power Inverter	1	
2.	Clamp cable	1	
3.	Owner's manual	1	

BEFORE INSTALLATION

Follow all instructions including safety guidelines mentioned in this manual.

DETERMINING BATTERY CAPACITY

- Determine the battery capacity based on the type and requirement of load. Please use with 12 V battery only.
- Battery type and size strongly affect the performance of the inverter.

DETERMINING CHARGING SYSTEM

- Choose an appropriate charging system. A well-designed charging system allows the battery to remain in optimal condition, thereby supplying power when needed.
- Inadequate charging and wrong charger type will affect the system performance and reduce battery life.

CHOOSING A LOCATION

The inverter contains components that tend to produce arcs or sparks. It is not recommended to use this device for marine applications.
The inverter should be operated only in locations that meet the following requirements:

CONDITION	DESCRIPTION
Dry	Avoid splashing of water or other liquids on the inverter.
Cool	Maintain the ambient air temperature between 32°F and 104°F (0°C and 40°C).
Ventilated	Leave at least 3" (7.5 cm) of space around the inverter for airflow. Ensure that the ventilation openings are not obstructed.
Safe	Do not install the inverter in a compartment containing batteries or flammable liquids like gasoline.
Close to battery	Do not use an excessively long DC cable, as it increases wire resistance and reduces input power.
Protection from battery gases	Do not mount the inverter in a place where it is exposed to gases produced by the batteries. Prolonged exposure to these gases will damage the inverter, as they are very corrosive.
Clean	Do not operate the inverter in an area that is prone to dirt, dust or debris.

WARNING!

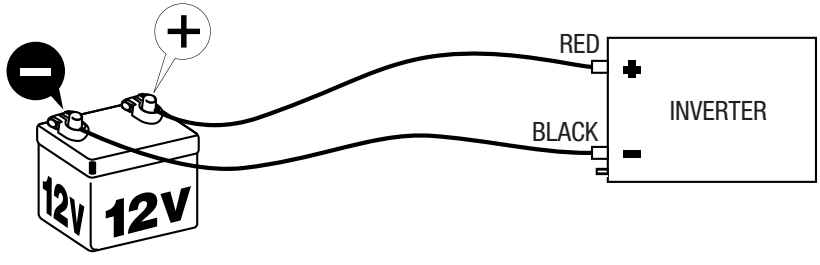
- To prevent fire or explosion, do not install the inverter in compartments containing batteries, flammable materials, or ignition-protected equipment.
- Do not cover or obstruct the ventilation openings of the inverter.
- Never install the inverter in a zero-clearance environment, as doing so may cause overheating of the inverter.

USING THE INVERTER WITH BATTERY CABLES

1. Make sure the inverter's ON/OFF switch is OFF and no flammable fumes are present.
2. Attach the ring type connector on the red wire to the red (+) positive terminal on the back of the inverter, and the ring connector on the black wire to the black (-) negative terminal.

CAUTION: AVOID REVERSE POLARITY - Reversing the polarity (red and black wire connections) will damage the inverter and void the warranty.

3. Tighten the nut on each DC terminal by hand until it is snug. Do not over-tighten.
4. Connect the black negative (-) end of the ring terminal to the negative (-) terminal of the battery.
5. Connect the red positive (+) end of the ring terminal to the positive (+) terminal of the battery.
6. Ensure that all electrical connections have been tightened and turn on the inverter with the ON/OFF switch.
7. Plug the AC product(s) you wish to operate into the AC outlet(s) and switch them on, one at a time. (See cautions below before turning on the AC products.)



NOTE

The Power Inverter uses low-voltage and high-current input, hence low-resistance wiring between the battery and the inverter is essential to deliver the maximum amount of usable energy to the load.

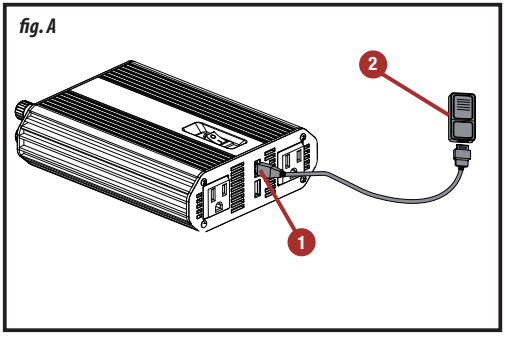
CAUTION! EQUIPMENT DAMAGE

- It is strongly recommended to contact a qualified professional.
- Do not perform the cable connection if the environment has any flammable fumes. Always ventilate the battery compartment before making this connection. If not explosion or fire may occur.
- Always make sure the cable connection is tight. Loose connections may cause excessive voltage drop, thereby leading to overheating and melting of cable insulation.

CHARGING USB LOAD

1. Use the USB port (1) for charging and powering USB-powered devices (2) such as a portable music (MP3) player, mobile phone, or video game player (fig A).
2. Make sure the USB device accepts 5 V and can be charged using a USB power source. Refer to technical specifications ➞ page 15.

fig. A



MAINTENANCE

The inverter will operate efficiently when maintained properly.

- Clean the exterior surface of the inverter with a damp cloth to prevent accumulation of dust and dirt.
- Ensure that the DC cables are secured and fasteners are tightened.
- Recharge the battery before it is discharged to 50%. This will extend the durability and efficiency of the battery.

CAUTION! EQUIPMENT DAMAGE

Do not charge portable GPS receivers and certain cameras using this inverter, as these devices may not be compatible and damage the inverter when plugged in.

TROUBLESHOOTING QUICK REFERENCE

Condition	Cause	Solution
No power and no indicator	Battery is defective.	Replace the battery.
	Blown fuse.	Check and replace fuse.
	Power switch is OFF.	Turn power switch to ON.
	Loose cable connection.	Check the connection and tighten as required.
Solid Red LED	AC products connected rated at more than the wattage load of the inverter: overload shutdown has occurred.	Reduce load. Use a product with starting surge power within the inverter's capability.
	AC products are less than the wattage load of the inverter, but high starting surge has caused overload shutdown.	Use a product with starting surge power within the inverter's capabilty.
	The voltage input from the DC power source is too low. Alarm is sounding.	Charge the power source battery.
	The voltage input from the DC power source is too high. Thermal shutdown has occurred.	Use 12 V DC power source ONLY. Allow the unit to cool down. Improve air circulation around the unit. Relocate unit to a cooler environment. Reduce load if continuous operation is required.
Water entered the unit.	Water entered the unit.	Disconnect the inverter and wipe immediately with a dry cloth, or permanent damage can occur.
Battery run time is less than expected.	AC product power consumption is higher than rated.	The total watts needed by the AC products should be no more than the inverter's watt rating.
	Battery is old or defective.	Replace the battery.
	Battery is not being properly charged.	Make sure battery is fully charged.
	Battery‘s Ah rating is low.	Use a battery with a higher Ah rating.

SPECIFICATIONS

Continuous AC output power	400 W
Maximum AC output surge power	800 W
AC output voltage range	104 V - 127 V AC
Output frequency (nominal)	60 ± 1 Hz
Output waveform	Pure sine wave
DC output	5 V DC, 3100 mA
DC input voltage range	11 V - 14 V DC
Low battery alarm	Audible, 11 ± 0.3 V DC
Low battery shutdown	10.5 ± 0.3 V DC
Low battery shutdown resume	12.0 ± 0.3 V
High battery shutdown	15.5 ± 0.5 V
Fuse (replaceable)	25 A fuse x 2

PHYSICAL SPECIFICATION

Ambient operating temperature range	32 - 104°F (0 - 40°C)
Dimension (L x W x H)	7 x 5 3/4 x 2'' (17.9 x 14.7 x 5.1 cm)
Weight	1 lb 9 oz (0.73 kg)

Made in China
Imported by MotoMaster Canada, Toronto
Canada M4S 2B8