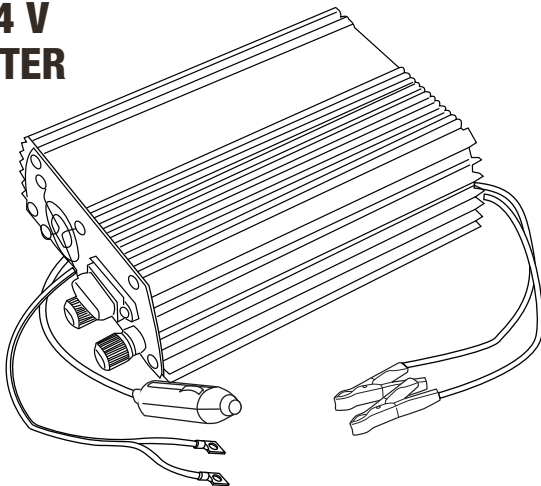




MOTOMASTER

400 W 12 V/24 V POWER INVERTER



model no. 011-2038-4

SAVE THESE INSTRUCTIONS!

This manual contains important safety and operating instructions.
Read all instructions and follow them with use of this product.
Questions? Call Customer Service Hotline: 1-877-466-8191

**INSTRUCTION
MANUAL**

TECHNICAL SPECIFICATIONS	3
SAFETY INFORMATION	4
KEY PARTS DIAGRAM	8
INTENDED USE	10
Options for connecting devices to the power inverter	10
OPERATION	11
Determining the maximum load of connected device	11
Wattage of commonly used devices	12
Before you start	15
Connecting the Power Inverter	16
Connecting the connector cables to the power inverter	16
Connecting the power inverter to a lighter socket (loads under 100 W)	18
Connecting the power inverter to a 24 V vehicle battery (loads up to 400 W)	19
Safety guidelines for handling batteries	19
Switching on / off	21
Using the USB port	22
Automatic safety features	23
MAINTENANCE	24
Fuse replacement	25
TROUBLESHOOTING	26
WARRANTY	31

AC POWER

AC output voltage (nominal)	115 V, 60 Hz
Input	12 / 24 V DC
Maximum AC output power	400 W
Continuous power	400 W
Maximum AC output surge power	800 W
Rated frequency	60 ± 1 Hz
AC output waveform	Modified sine wave

DC POWER

USB output	5 V / 3.1 A total
No load current draw (at 24 V)	< 0.35 A
Efficiency (maximum)	85%
Low-voltage shutdown	10-11 V / Input: DC 12 V
Low-voltage shutdown	20-22 V / Input: DC 24 V
High-voltage shutdown	15-16.3 V / Input: DC 12 V
High-voltage shutdown	30-32.6 V / Input: DC 24 V

PHYSICAL SPECIFICATIONS

Ambient operating temperature range	0–40°C (32–104°F)
Dimensions (L x W x H)	8 x 5 1/8 x 2" (20.3 x 13 x 5.1 cm)
Weight	2 lb 6 1/2 oz (1.2 kg)

This manual contains information that relates to PROTECTING PERSONAL SAFETY and PREVENTING EQUIPMENT PROBLEMS. It is very important to read this manual carefully and understand it thoroughly before using the product.

DANGER!

Potential hazard that will result in serious injury or loss of life.

WARNING!

Potential hazard that could result in serious injury or loss of life.

CAUTION!

Potential hazard that may result in moderate injury or damage to equipment.

IMPORTANT!

Installation, operation, or maintenance information that is important but not hazard related.

This power inverter can be used on 12 V Vehicles or 24 V Trucks, Boats, RVS. When firstly connected to a battery, the inverter will identify battery's voltage and record it, then it will perform under this voltage. For example, once it connect to Truck's battery-24 V, it will perform as low-voltage shutdown at 20–22 V and high-voltage shutdown at 30–32.6 V. If change to different voltage of battery, you need to power off the inverter firstly, Connect to a new battery with different voltage (for example 12 V), then power on the inverter, it will identify the voltage of new battery.

WARNING!

- **HEATED SURFACE.** The power inverter housing may become uncomfortably warm, and can reach up to 60°C (140°F) under extended high power operation.
- Do not use the power inverter in a truck in which the plus pole of the car battery is connected to the chassis! Before using the device, please determine how the battery is connected in the respective vehicle.
- Do not operate the power inverter if it has been dropped or damaged in any way.
- Always disconnect the device by pulling on the plug itself, not the power cable.
- The device must be fastened so that it does not cause a safety hazard in case of collision or hard braking.
- Route the power cable so that it does not interfere with the driver when plugged into the vehicle's 12 V outlet.
- Prevent the power supply cable from coming into contact with hot parts of the engine or from hanging over sharp edges and make sure it will not get caught on moving parts of the engine.
- When using truck batteries, always follow the advice from the manufacturer of the battery and in the truck instruction manual.
- Using improper voltage may result in damage to the device and possible injury to the user.
- The correct voltage is listed on the rating plate.
- Never leave the device unattended during operation.

CAUTION!

- Do not connect live AC power to the power inverter's AC outlets. The power inverter will be damaged even if it is switched off.
- Avoid placing the power inverter on or near heating vents, radiators or other sources of heat. Do not place the power inverter in direct sunlight (e.g. on the truck's dashboard) in order to prevent an overheat shutdown caused by high temperatures. Do not use the power inverter in temperatures over 40°C (104°F).

CAUTION!

- **DO NOT USE** the power inverter with the following equipment:



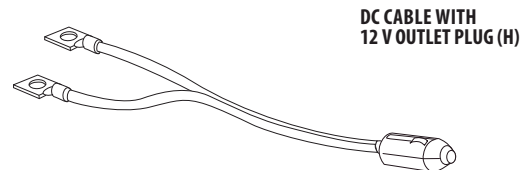
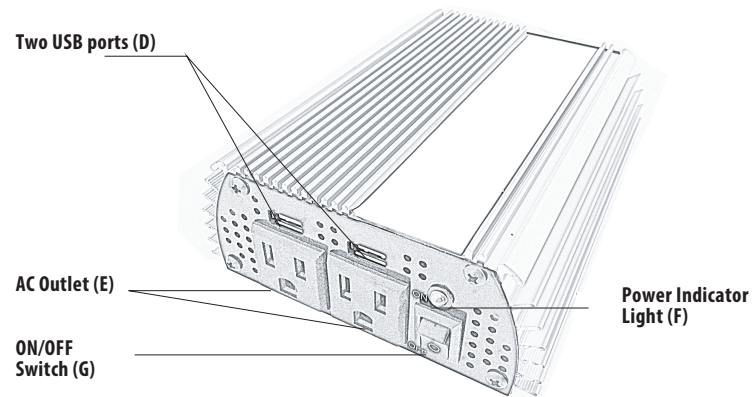
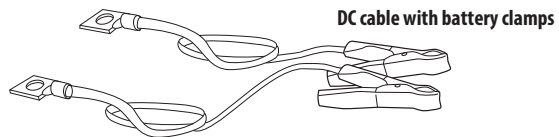
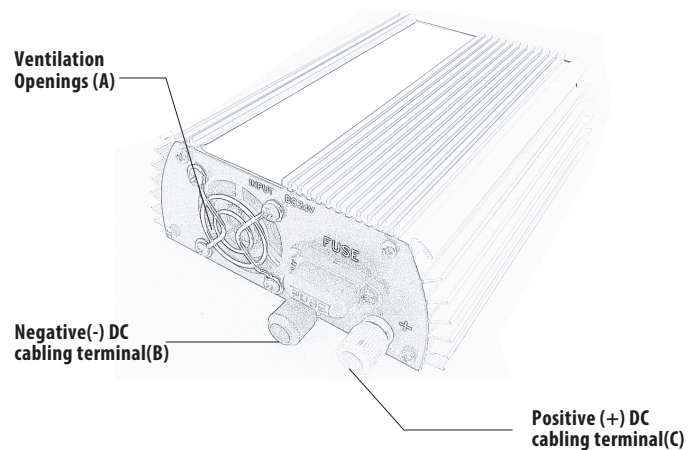
Small battery-operated devices such as rechargeable flashlights, some rechargeable shavers, and night lights that are plugged directly into an AC receptacle to recharge. The device can be damaged if connected to the power inverter. Always recharge batteries using a separate battery charger.



Battery chargers used in power tools. These chargers display a **WARNING LABEL** stating that there are dangerous voltages at the charger's battery terminals.

- Do not insert foreign objects into the power inverter or ventilation openings.

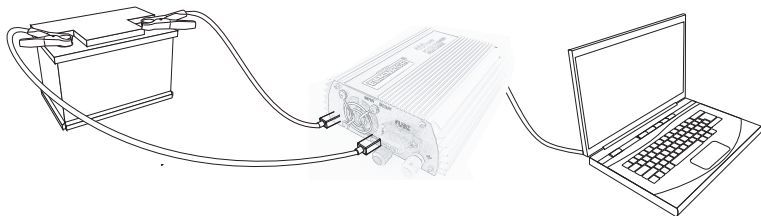
- **REVERSE POLARITY** Power connections from a **12 V or 24 V battery** to the power inverter must be positive to positive and negative to negative. A reverse polarity connection (positive to negative) will blow a fuse in the power inverter and might need to replace a new fuse. Damage caused by a reverse polarity connection is not covered by your warranty.
- Disconnect the power cable whenever the engine is switched off for extended periods of time. In some trucks, the power does not turn off after the engine has been switched off. If the plug is left connected, the truck battery might become discharged or damaged.
- Using the device for extended periods of time can completely discharge the truck battery.
- When using a power inverter continuously inside a vehicle that is not running, the engine should be started at least once an hour for 10-15 minutes to keep the battery from discharging. Do not start a truck in a closed garage, as the carbon monoxide in the exhaust is fatal.
- It is better to work with a battery that is in good condition and fully charged. A weak battery will be drained easily if demands are too high. This could leave you stranded so be sure to check the battery's condition before using a power inverter in a stationary truck.



The power inverter is an electronic device that converts the low-voltage 12 V or 24 V (direct current) from a battery, as can be found in trucks, or other similar power sources, to the conventional 115 V (alternating current) like you have in your home. Do not connect this power inverter to batteries below 12 V.

This conversion process thereby allows you to run standard household devices in all cars including 12 V Vehicles and 24 V Trucks, Boats, RVs anywhere else.

This power inverter uses a modified sine wave that delivers power consistent and efficient enough to run most devices adequately.



Determining the maximum load of connected devices

WARNING!

DO NOT overload your power inverter! Overloading the power inverter, even for a short time, could result in serious damage to the power inverter and/or to the connected device.

A few simple steps are necessary to avoid overloading the power inverter:

- Identify all devices that you would like to power.
- Add up the total wattage of devices that will be powered. The wattage can be found on the individual device's rating plate, as well as in the instruction manual.

IMPORTANT!

In some cases, the wattage might not be listed on the devices you want to connect to the power inverter. In that case, calculate the wattage using the following equation:

VOLTS x AMPERE = WATTS

Formula: 120 Volts x **X** Amperes = **XXXX** Watts

Example: 120 Volts x **2** Amperes = **240** Watts

CAUTION!

Understand the difference between **rated (running) wattage** and **surge (starting) wattage**.

The **RATED (RUNNING) WATTAGE** is the average amount of power that a device consumes continuously.

The **SURGE (STARTING) WATTAGE** is the amount of power that a device consumes at start-up for a limited period of time (2–3 seconds). Some devices (e.g. induction motors of drills and fans) may have a start-up surge of 3 to 7 times the rated wattage.

IMPORTANT!

The power inverter can supply momentary surge power that is higher (800 W) than its maximum power rating (400 W). Some products with a rated wattage lower than the maximum power rating for your power inverter may still exceed the power inverter's surge capability and trigger an overload shutdown.

Products rated with the following power and surge ratings or less can be connected to the power inverter.

POWER RATING	MAXIMUM WATTAGE
Continuous power rating (RATED WATTAGE)	400 W
Surge rating max. (SURGE WATTAGE)	800 W

Wattage of commonly used devices

IMPORTANT!

The wattages given on next page are estimates. The actual wattage required for your devices may differ from those listed. Be sure to check the specific wattage requirements on the rating label and in the operating instructions of devices to be used.

ELECTRONIC APPLIANCES	TYPICAL WATTS*
Portable music	10 W
MP3 player	10 W
Digital camera	10 W
Smartphone/Tablet	20–30 W
Laptop computer	60 W
13" television	100 W
Handheld gaming device	130 W
27" television	280 W
Food processor	350 W

*Actual wattage of different models may vary.

NOTE: Power requirements for product examples are estimates only. To calculate the wattage of a product, use the following equation: amperage x 115.

IMPORTANT!

Add up the total wattage of devices to be powered.

TAKE INTO CONSIDERATION THE SURGE WATTAGE REQUIRED BY ELECTRICAL MOTORS AS WELL AS THE RATED WATTAGE.

Example:

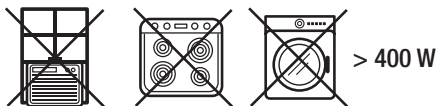
These devices can be operated simultaneously.

DEVICE	SURGE (STARTING) WATTAGE MAX. 480 W	RATED (RUNNING) WATTAGE MAX. 240 W
Light bulb	40	40
Table fan	400	200
Total wattage used	440	240

These devices usually **CAN** be connected to the power inverter:



These devices usually **CANNOT** be connected to the power inverter, as they might have a start-up surge or continuous rating that is too high.



IMPORTANT!

The device is not suitable for professional or industrial use.

Before you start

- Unpack the power inverter. Inspect the unit for damage. If the unit has been damaged, contact the retailer immediately.

The carton should contain:

- Power inverter
- DC cable with 12 V outlet plug (H)
- DC cable with battery clamps (I)
- Owner's manual
- Check the power inverter's identification label to ensure that you have purchased the intended model and that it has the required specifications for its intended use

Positioning of the power inverter:

Position the power inverter on a flat and stable surface in a location that is:

DRY	Do not expose to water, rain, moisture, snow or spray.
COOL	Operate the outlet in ambient temperatures between 0°C and 40°C (32°F and 104°F). Keep it away from heating vents and direct sunlight. We recommend using the outlet in environments not exceeding 25°C (77°F).
WELL-VENTILATED	For proper cooling, allow at least 2" (5 cm) of clearance around the power inverter.
CLEAN	Choose a location that is free of any debris that could get into the outlet.
SAFE	Do not install the power inverter in a compartment with batteries or flammable liquids, such as gasoline, or explosive vapours.

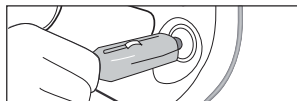
Connecting the power converter.

CAUTION!

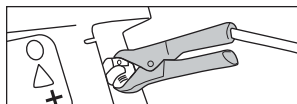
Prior to connecting to the power source:

Make sure that the total wattage of the devices you are planning to connect to the mobile power outlet does not exceed the maximum load of the respective power outlet.

LOAD CONNECTED (W)	CONNECTION WITH 12 V OUTLET PLUG	CONNECTION WITH VEHICLE BATTERY
Continuous load under 100 W	Yes	Yes
Continuous load between 100 and 400 W	No	Yes



< 100 W



< 400 W

Connecting the connector cables to the power inverter.

- Make sure that the power inverter is switched off by verifying that the on/off switch (H) is set on the "0" position.
- Choose the DC cable (I / H) suitable for connecting the AC products that you want to operate.

CAUTION!

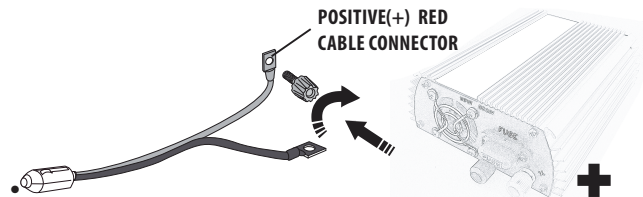
Only use the cables provided with your power inverter.

- Screw off the caps of the DC cabling terminals (B / C).
- Connect the cable with the DC cabling terminals (B / C).

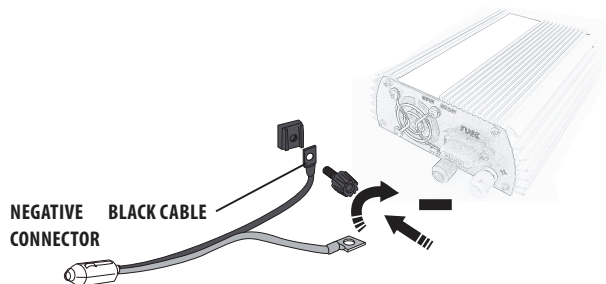
CAUTION!

Make sure to connect the **RED CABLE TO POSITIVE PORT (+)** and the **BLACK CABLE TO NEGATIVE PORT (-)**.

- Place the red cable connector on the positive DC cabling terminal (+ / red). Make sure that the respective holes are matching. Screw the red cap back on the cabling terminal until the cable connector is tightly fixed.

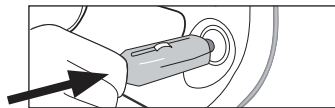


- Place the black cable connector on the negative DC cabling terminal (- / black). Make sure that the respective holes are matching. Screw the black cap back on the cabling terminal until the cable connector is tightly fixed.



Connecting the power inverter to a 12 V outlet (loads under 100 W)

- Follow the instructions in the previous section. Choose the DC cable with 12 V outlet plug (H) (See connecting the connector cables to the power inverter).



- Plug the 12 V outlet plug into the 12 V outlet of your vehicle. Make sure the plug is fully inserted.
- The power inverter is now ready for use.

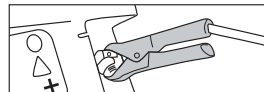
CAUTION!

Always disconnect the power cable from the vehicle's 12 V outlet when you are not using the device.

IMPORTANT!

The normal voltage drop that occurs when the truck engine is started may trigger the power inverter's low-voltage shutdown feature. We recommend having the power inverter disconnected from the vehicle's 12 V outlet when starting the engine.

Connecting the power inverter to a battery from 12 V Vehicles and 24 V Trucks, Boats, RVs



Safety guidelines for handling batteries

DANGER!

A spark may be visible when making the connection to a battery because a current will flow to charge the capacitors in the power inverter. Do not make this connection in the presence of flammable fumes. Explosion or fire may result.

Thoroughly ventilate the battery compartment before making this connection.

DANGER!

Take special care when working with truck batteries. Batteries contain corrosive materials and present an **ELECTRICAL SHOCK HAZARD**.

DANGER!

Do not use the truck battery in the proximity of open flames. Do not smoke when using a car battery.

WARNING!

Remove any jewellery (watch, ring, etc.). Be careful not to short-circuit the battery with any metallic object (wrench, etc.).

WARNING!

To prevent irritation and burns, wear protective eyewear and clothing when you install the power inverter or work with a vehicle battery. Should battery acid come into contact with skin or eyes, flush it with water and consult your physician.

CAUTION!

Power connections from a **12 V or 24 V** battery to the power inverter must be **POSITIVE (RED) TO POSITIVE AND NEGATIVE (BLACK) TO NEGATIVE**.

A reverse polarity connection (positive to negative) will blow a fuse in the power inverter and may permanently damage the unit. Damage caused by a reverse polarity connection is not covered by your warranty.

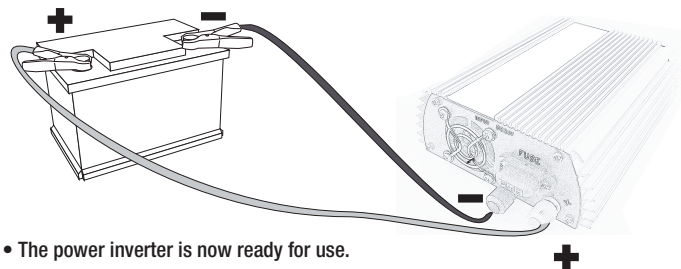
CAUTION!

Loose connectors result in an excessive voltage drop and may result in overheated wires and melted insulation.

CAUTION!

Do not start the vehicle engine during operation.

- Follow the instructions in the section (See connecting the connector cables to the power inverter) to connect the DC cable to the power inverter.
- If the battery can be switched off, switch it off.



- The power inverter is now ready for use.

CAUTION!

If you are going to disconnect the battery, switch the power inverter off first (See Switching on/off).

CAUTION!

Always disconnect the power cables from the battery when you are not using the device.

Switching on/off

- Be sure to have your power inverter properly placed and connected according to the wattage that is to be connected before attempting to switch it on.
- Switch the battery on in case it is switched off.
- Set the on/off switch (G) to the "I" position to switch on the power inverter.

The power indicator (F) lights up, indicating that the power inverter is operating normally and that the AC outlet and the USB port are powered.

- Plug in the devices that you want to operate to either the AC outlet or the USB port.

CAUTION!

After plugging in the devices, turn them on **ONE AT A TIME**. This will ensure that the power inverter does not have to deliver the surge currents required for all the loads at once.

- Set the on/off switch (G) to the "0" position to switch off the power inverter.

CAUTION!

Switch the power inverter off and disconnect it from the power source when it is not in

IMPORTANT!

When the power inverter is switched off, it draws no current from the battery. When the power inverter is switched on without any load connected to it the power inverter draws approx. 0.4 A from the battery. This low current draw will eventually discharge the battery.

Using the USB port

Plug the USB-powered device into the power inverter's USB port (D) and operate normally.

IMPORTANT!

This unit's USB charging port does not support data communication. It only provides (5 V/2.1 A) DC power to an external USB-powered device. Not all mobile phones are provided with a charging cable. Data cables are not supported by this device. Please check with your mobile phone dealer for the correct charging cable.

AUTOMATIC SAFETY FEATURES

The MotoMaster power inverter includes the following automatic safety features to ensure safe and trouble-free operation:

- Vehicle battery low-voltage automatic alarm and shutdown: automatic alarm activated when the battery voltage drops to 10.5-11 V/21-22 V, shutdown activated when the battery voltage drops to 10-11 V/20-22 V, the green indicator turns to red indicator. The unit will resume automatically.
- Vehicle battery high-voltage automatic shutdown: activated when the battery voltage rises to a dangerously high level 15-16.3 V/30-32.6 V due to a defective battery, the green indicator turns to red indicator. The unit will resume automatically.
- Overload protection with automatic shutdown: activated when a device rated more than 400 W is plugged into the power inverter, the green indicator turns to red indicator. Please restart the unit manually.
- Overheat protection with automatic alarm and shutdown: activated in case the power inverter overheats due to improper ventilation or a high ambient temperature, the green indicator turns to red indicator. The unit will resume automatically.
- Output short-circuit protection with automatic shutdown: activated in case of a short-circuit in the connected device, the green indicator turns to red indicator. Please restart the unit manually.
- Current leakage protection with automatic shutdown: activated in case of electric leakage in the connected device, the green indicator turns to red indicator. Please restart the unit manually.
- Built-in fan: activated when a significant amount of power increases the internal temperature and it exceeds its ambient operating temperature.
- Replaceable 8 A fuse: use for continued protection against a risk of fire or electric shock and should be replaced manually, if necessary.

WARNING!

Before cleaning, make sure the power inverter is switched off and disconnected from the power source.

- The exterior of the device should be cleaned periodically with a damp cloth or sponge and a mild soap solution.
- Be sure vents and fans are free of dust or debris.
- Never immerse the device in water or any other liquid.
- For cleaning, never use corrosive detergents, wire brushes, abrasive scourers, or metal or sharp objects.
- Store the device in a cool, dry, location that is protected from moisture and out of the reach of children.

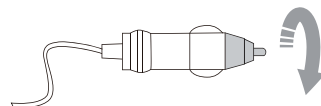
- While the engine is running, the power inverter can be connected to the vehicle's 12 V outlet again.
- Consider connecting the power inverter to a separate deep-discharge type of suitable battery if you will be frequently running electrical devices for extended periods of time.

FUSE REPLACEMENT

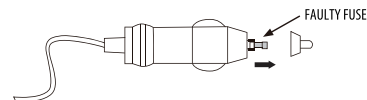
WARNING!

For continued protection against risk of fire or electric shock, replace only with a fuse of the same type and rating (125 V, 8 A).

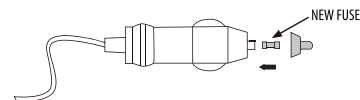
Follow the instructions to replace the fuse inside the 12 V outlet plug of your connector cable (H):



Screw off the upper cover of the 12 V outlet plug.



Remove the faulty fuse.



Insert a new fuse and screw the cover of the plug back on.

The power inverter is equipped with protective shutdown features and an acoustic signal. The details are listed in the following table:

Work with 24 V battery, such as Trucks, Boats, RVs

PROBLEM	POSSIBLE CAUSE	SOLUTION	ERROR SIGNAL
Low battery alarm and low-voltage shutdown	As the battery discharges, its voltage decreases. Voltage drops to 21.0–22.0 V 20.0–22.0 V	Shut down sensitive loads such as computers and then recharge the battery.	Audible alarm
	Voltage drops to 20.0–21.0 V This protects the battery from being over-discharged.	Recharge the battery.	Power indicator light (F) turns on (Green-Red)

A defective battery charging system can cause the battery voltage to rise to high levels (30.0–32.6 V). Although the power inverter has a protection against high voltage, it might still be damaged if the input voltage were to exceed 32 V.

High-Voltage shutdown

Disconnect the connected devices. Verify that the charging system is properly regulated and the battery is 24 V nominal.

Power indicator light (F) turns on (Green-Red)

Overload shutdown	If you connect a device that is rated too high or a load that draws excessive surge power, the power inverter shuts down.	Use a product with a power rating within the power inverter's continuous power rating (See operation).	Red indicator light (F) turns on (Green-Red)
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ALARM	POSSIBLE CAUSE	SOLUTION	ERROR SIGNAL
Overheat shutdown	The power inverter shuts down automatically if it exceeds its safe operating temperature.	<ul style="list-style-type: none"> Switch the power inverter off and disconnect it from the vehicle's 12 V outlet. Disconnect all connected devices and allow the power inverter to cool for at least 15 minutes. Use a brush to clear any blocked ventilation holes. Move the power inverter to a cooler place. Reduce the load if continuous operation is required. 	Power indicator light (F) turns on (Green-Red)

Work with 12 V battery, such as Trucks, Boats, RVs

PROBLEM	POSSIBLE CAUSE	SOLUTION	ERROR SIGNAL
Low battery alarm and low-voltage shutdown	As the battery discharges, its voltage decreases. Voltage drops to 21.0–22.0 V 20.0–22.0 V	Shut down sensitive loads such as computers and then recharge the battery.	Audible alarm
	Voltage drops to 20.0–21.0 V This protects the battery from being over-discharged.	Recharge the battery.	Power indicator light (F) turns on (Green-Red)

PROBLEM	POSSIBLE CAUSE	SOLUTION	ERROR SIGNAL
High- Voltage shutdown	A defective battery charging system can cause the battery voltage to rise to high levels (30.0-32.6 V). Although the power inverter has a protection against high voltage, H might still be damaged if the input voltage were to exceed 32 V.	Disconnect the connected devices. Verify that the charging system is properly regulated and the battery is 24 V nominal.	Power indicator light (F) turns on (Green-Red)
Overload shutdown	If you connect a device that is rated too high or a load that draws excessive surge power, the power inverter shuts down.	Use a product with a power rating within the power inverter's continuous power rating (See operation).	Red indicator light (F) turns on (Green-Red)
Overheat shutdown	The power inverter shuts down automatically if it exceeds its safe operating temperature.	<ul style="list-style-type: none"> Switch the power inverter off and disconnect it from the vehicle's 12 V outlet. Disconnect all connected devices and allow the power inverter to cool for at least 15 minutes. Use a brush to clear any blocked ventilation holes. Move the power inverter to a cooler place. Reduce the load if continuous operation is required. 	Power indicator light (F) turns on (Green-Red)

ALARM	POSSIBLE CAUSE	SOLUTION	ERROR SIGNAL
Overheat shutdown	The power inverter shuts down automatically if it exceeds its safe operating temperature.	<ul style="list-style-type: none"> Switch the power inverter off and disconnect it from the vehicle's 12 V outlet. Disconnect all connected devices and allow the power inverter to cool for at least 15 minutes. Use a brush to clear any blocked ventilation holes. Move the power inverter to a cooler place. Reduce the load if continuous operation is required. 	Power indicator light (F) turns on (Green-Red)
PROBLEM	POSSIBLE CAUSE	SOLUTION	
The connected device does not switch on.	The battery is defective.	Check the battery and replace it if required.	
	The power inverter is damaged and needs to be repaired.	Have the power inverter repaired by an authorized service centre.	
	Incorrect connections to the inverter.	Check all connections. Make sure the connection is correct and tight.	
The power inverter will run some small loads, but not larger ones.	The cables are either too long or not heavy enough.	Only use the cables provided with your power inverter.	

PROBLEM	POSSIBLE CAUSE	SOLUTION
Measured power inverter output is too low.	The battery voltage is too low.	Recharge the battery.
Battery run time is less than expected.	The AC product power consumption is higher than rated.	Use a larger battery to make up for the increase in power requirement.
	The battery is old or defective.	Replace the battery.
	The battery is not being charged properly.	Some chargers are not able to fully recharge a battery. Make sure that you use a powerful charger.
	Power dissipation in DC cables.	Only use the cables provided with your power inverter.
No power to power inverter	Blown fuse.	Replace fuse.
Television interference.	TV signals are weak.	<ul style="list-style-type: none"> Adjust the orientation of the power inverter, television, antenna and cables. Maximize TV signal strength by using a better antenna and use shielded antenna cable where possible. Try a different TV model.

This MotoMaster® product carries a one (1) year warranty against 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.

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