

POWERTECH PLUS

12V DC, 230V AC 200W, 400W Pure Sine Wave Inverter with built-in 2.1A USB output

MI5726 & MI5728 User Manual

MI5726



MI5728



Thank you for purchasing this inverter, please read this manual carefully before use to ensure your safety and optimal use of your product.

We recommend to keeping this manual for future reference.

INTRODUCTION

The PURE SINEWAVE INVERTERS are a member of the family of advanced mobile power inverters. Your PURE SINEWAVE INVERTER enables you to generate a pure sine wave 230V AC from a 12V DC battery wherever your travels take you. As a bonus we built-in a USB-Port for powering or charging e.g. your sat nav, cell phone, tablet or any other USB device. Because of the high quality pure sine wave voltage and the excellent overload capabilities, even sensitive electronics will work flawlessly.

We have taken numerous measures in quality control to ensure that your product arrives in top condition and will perform to your satisfaction.

Please carefully read and follow the safety and operating instructions. Not following these instructions may result in a serious accident, including damaged property, serious or even fatal injuries. If the device is passed on to another person, this manual must also be handed over with it.

IMPORTANT SAFETY INSTRUCTIONS

CAUTION: Please read this instruction manual carefully before installing and starting up the device. Do not operate the inverter unless you have fully read and understood all the provided information. If you are not confident working with 12V DC voltage or are unsure of what you are doing, consider seeking for help by a professional installation service or your vehicle's manufacturer. Failure to observe these instructions may cause an electrical shock, fatal or serious injury, material damage or impair the function of the inverter.



General

- Electrical devices are not toys. Keep the product away from children.
- Only use the product as intended and for purposes described in the manual.
- After opening the package, examine all parts for visible damage. If you have found any damage, please contact the company you purchased this unit from.
- Always disconnect the power supply (the connection to the battery) when working on the device.
- Use only approved accessories (especially all cables) or parts fully consistent with the requirements. The installer is responsible for ensuring that the correct cable and fuse sizes are used.
- The surface temperature can reach up to 65°C. Power-off and stop using the device immediately, if the unit is smoking or is showing any abnormal behavior.
- This appliance is not intended for use by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they are supervised or have been instructed on how to use the appliance by a person responsible for their safety. Children should be supervised to ensure that they do not play with the appliance.
- Installing the device, maintenance and repair work may only be carried out by qualified

personnel who are familiar with the risks involved, the relevant regulations and with the guidelines and safety precautions to be applied.

- Do not disassemble the inverter - the internal circuitry contains hazardous voltages.

Attempting to service the unit yourself may result in electric shock or fire and will void the unit warranty.

- Always keep metal objects or other materials that can short circuit the terminals of the battery or the inverter securely away. A resulting spark or short-circuit may not only damage the device, but also cause an explosion and potentially produce a current high enough to weld a ring or the like to metal.

Remove personal metal items such as rings, bracelets, necklaces, and watches when working on the device or the battery.

- Operate the inverter only, if all cables and the housing are undamaged and all connections are tight and clean. Loose or dirty connections could result in overheating, electrical sparks and fire.

- Do not connect AC output terminals of the inverter to an incoming AC source (or the grid).

- Do not connect DC input terminals of the inverter to an incoming AC source.

- Never use the inverter on vehicles where the positive terminal of the battery is connected to the chassis.

- Never connect cables in reverse polarity or short-circuit connected cables. This may blow internal fuses and may damage the inverter permanently.

- A fuse should be provided at a distance of max. 30cm from the battery's positive terminal.

Failure to do so, may cause damage to the cabling or battery if a fault (e.g. over-current or short circuit) occurs. Only use high quality copper cable and keep the cable length short.

- Do not operate appliances that may feed AC main power back into the inverter. This might damage the inverter.

- Ensure the device is standing firmly. The device must be set up and fastened in such a way that it cannot tip over or fall down.

- Never connect devices that have a higher power requirement than the peak output power of the inverter. Note that some devices may require more starting current than the type plate of the device indicates.

Environment

- Only use the product in environments from -20°C ~ 40°C.

- Do not operate the product in damp, wet or dusty environments: Never expose the inverter to rain or snow. Doing so may result in damage to the inverter or other equipment installed in the system or

result in electric shock or fire. Do not operate the unit in explosive atmospheres, such as in the presence of flammable liquids, gases or dust. Do not put batteries, or anything that should be protected from sparks around the inverter. Doing so may result in fire or explosion.

- To avoid heat accumulation, do not cover the device. To prevent overheating, ensure that air inlets and ventilation is not obstructed. Do not expose the device to a heat source (such as direct sunlight or heating). Avoid additional heating of the device in this way.

Electrical Cables

- If cables have to be fed through metal holes or other walls with sharp edges, use ducts or cable bushings to prevent damage.
- Do not lay cables which are loose or bent next to electrically conductive material (metal).
- Do not pull on the cables.
- Avoid to lay 230V mains cable and 12V DC cables in the same duct.
- Prevent all cables from being stepped on, tripped over, or being damaged by e.g. sharp edges or hot surfaces.

Working with Batteries

- Batteries can store large amounts of energy and improper handling can be dangerous. NEVER CONNECT to a battery with an unsuited voltage or other unsuitable or damaged batteries
- Keep children away from batteries and acid.
- Avoid getting electrolyte on your skin or clothes. It is acidic and can cause burns. If battery acid contacts skin or clothing, wash immediately with water. Baking soda neutralizes lead acid battery electrolyte. If electrolyte gets into your eyes, immediately flood your eyes with running cold water for at least 20 minutes and get medical attention immediately. Eye protection is therefore recommended.
- Always keep metal objects or other materials that can short circuit the terminals of the battery or the inverter securely away.
- Power-off the device before making or breaking the connections to the battery.
- Observe technical instructions of the seller or the manufacturer of your battery
- Check if all connections are tight and clean. Loose or dirty connections could result in overheating, electrical sparks and fire. Use terminal grease where required.
- Never smoke or allow a spark or flame in vicinity of the battery.
- Never try to charge a damaged or frozen battery.
- Do not place the device directly on top of the battery or vice versa or on a surface constructed from combustible material.
- Read your car's owner's manual. Some vehicle manufacturers may have special requirements before charging or discharging the vehicle's battery (e.g. fuses that have to be removed or certain security demands).

GENERAL INSTRUCTIONS

Intended use

The PURE SINE WAVE INVERTER converts a 12V direct current voltage (e.g. a battery or another 12V source that can deliver the required current) into 200-240V 50Hz AC pure sine wave voltage. The built-in USB-Port is intended to power or charge 5V USB devices (the maximum current delivery has to be kept in mind).

Maintenance

The unit itself is maintenance-free. From time to time, make sure all cable connections are clean and tight and fans are working correctly. If necessary, clean the unit with care, using a dry

cloth. Don't try to open the body casing. There are no user-serviceable parts inside. Damage due to improper use, modifications or attempted repairs lead to the exclusion of liability and the loss of warranty. If the unit is damaged, the appliance must be discarded. Cleaning and user maintenance shall not be made by children.

Packaging materials

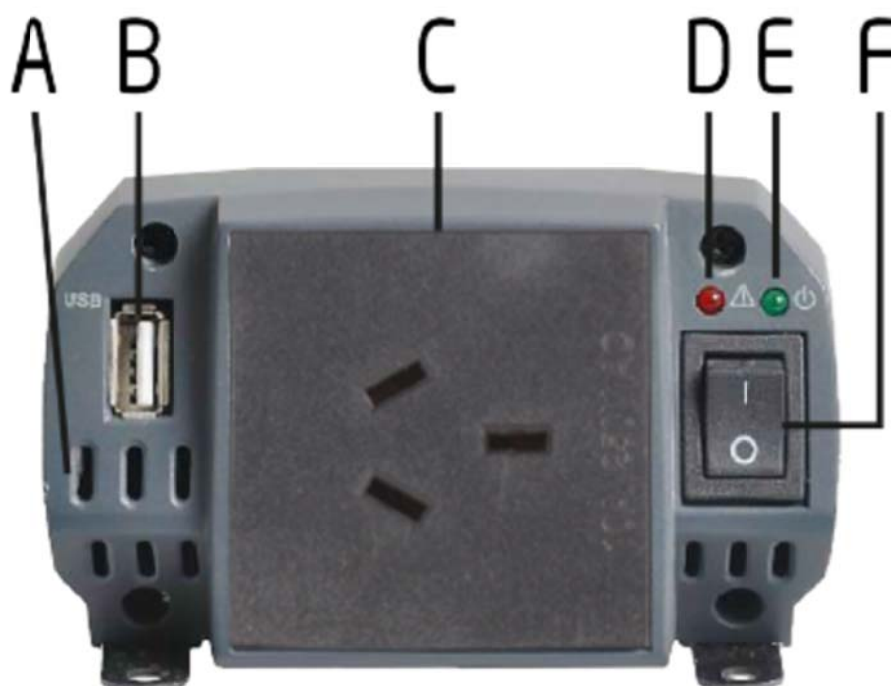
To avoid danger of suffocation, do not let children play with foils or other packaging materials. Remove all protective coverings before putting the device in operation.

Storage

When not in use, store the inverter in a dry environment. Store the device in a safe place out of the reach of children. Protect the unit from direct sunlight, heat and moisture.

TECHNICAL DESCRIPTION

Front panel of the inverter:



Item	Description
A	Air-Inlets: Do not cover !
B	USB power supply: delivers 2.1A of current to power or charge 5V DC USB devices If the battery voltage is lower than 10V, USB output is turned off.

230V socket: delivers a 230V 50Hz pure sine wave output (Switch-position I).

- The output can deliver up to 200W (MI5726) / 400W (MI5728) of continuous power.
- For a short period (max. 10 min) it can deliver an overload power of 230W-270W (MI5726) / 410W-450W (MI5728)

C

- Peak power is up to 400W (MI5726) / 800W (MI5728) for max. 1 sec.

If the battery's voltage is lower than 10.5V, undervoltage-protection is activated

NOTE: Use the outputs separately and never connect them to the grid.

Red LED: Signal-lamp that indicates errors and alarms

- LED flashes + 1x alarm beep:

battery voltage protection (battery voltage is <10.5V or >15.3V)

D

- LED flashes + 2x alarm beep:

temperature protection (the inverter overheated >75°C)

- LED flashes + 3x alarm beep:

overload protection (the requested power is higher than the maximum output power of the inverter)

E

Green LED: Signal-lamp that indicates readiness for operation

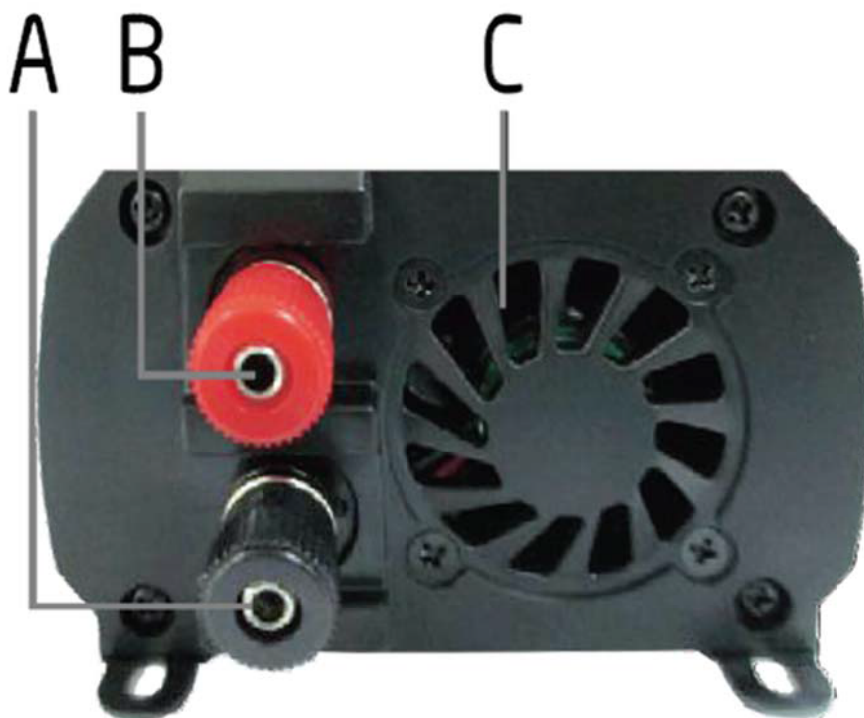
Main-Switch: Switches between the operation modes of the inverter: on/off

Switch-Position 0: Inverter-function is OFF (no output on the 230V socket), 5V USB-output is ON

F

Switch-Position I: Inverter-function is ON (230V is available on the socket), 5V USB-output is ON

Back panel of the inverter:



Item	Description
A	- Negative battery terminal (black) Connect the negative pole of the battery to this terminal
B	+ Positive battery terminal (red): Connect the positive pole of the battery to this terminal
C	Fan: Do not cover the vent holes !

INSTALLATION & OPERATION



WARNING: Please read this instruction manual carefully before installing and starting up the device. Do not operate the inverter unless you have fully read and understood all the provided information. If you are not confident working with 12V DC voltage or are unsure of what you are doing, consider seeking for help by a professional installation service or your vehicle's manufacturer. Failure to observe these instructions may cause an electrical shock, fatal or serious injury, material damage or impair the function of the inverter.



WARNING: Before installing the inverter, please ensure the main switch is set to position 0 = "OFF". Make sure the battery poles are clean when connecting the terminals. Tighten the nuts and bolts to a torque of 12-13 Nm. Loose or dirty connections may cause overheating.



Do not reverse the polarity. Reversing the polarity of the connections may cause a spark and melt internal fuses.



Observe the relevant regulations and directives of your country !
In some country there might be legal regulations that require RCD protection of AC output connections of installations (Residual-current device, also known as RCCB/GFCI).
RCDs may be fitted by a licensed electrician in installations.

Fastening the inverter

When selecting the installation location, observe the following instructions:

- The inverter can be mounted horizontally or vertically.

- The installation surface must be level and sufficiently sturdy.
- The inverter must be installed in a place that is protected from dirt, dust and moisture.
- The inverter may not be installed in the presence of flammable materials.
- The place of installation must be well-ventilated. A ventilation system must be present for installations in small, closed spaces.
- The minimum clearance around the inverter should be at least 25 cm.
- Do not block or cover the ventilation holes. Be sure to keep a distance (at least 1 inch) from surrounding objects.

Wiring & cables



A fuse should be provided at a distance of max. 30 cm from the battery's positive terminal. Failure to do so, may cause damage to the cabling or battery if a fault (e.g. over-current or short circuit) occurs.

Reverse polarity connection may blow the internal fuse and may damage the inverter permanently.

- Keep all load cables as short as possible. It is not recommended to use cables that exceed 4m in length.
- If cables get hot replace them with thicker cables.
- Always use cables of good quality.

Cable-cross-section

The cable-cross-section of all used cables should be at minimum: $0.1\text{mm}^2/\text{A}$

Example:

10A current will require minimum cable-cross-section of: $10\text{A} \times 0.1\text{mm}^2/\text{A} = 1.0\text{mm}^2$

The cable-cross-section is for 100% copper wire and does not include thickness of the cable sheath.

Device	Max. Input Current	Recommended min. cable cross section
MI5726	25A	3.3mm^2 (~AWG12)
MI5728	50A	5.3mm^2 (~AWG10)

Setting-up the inverter

To set up the inverter, use the appropriate cables to

- connect the positive pole (usually marked with + or colored in red) of the battery and the positive pole (M; colored in red) of the inverter and
 - connect the negative pole (usually marked with - or colored in black) of the battery and the negative pole (P; colored in black) of the inverter and
- Ensure to clamp all cables securely.

The Inverter is now ready to use: Set the position of the main switch to I to power on the device. Please notice the device functions described in chapter "TECHNICAL DESCRIPTION"
NOTE: You can operate the inverter with your vehicle's engine running or switched off. However, it is recommended to switch off the inverter while starting the engine.

USB port

Connect the USB external appliance to the USB port and switch it on. The USB port on the power inverter provides a power supply of 5V DC for external USB devices.



The USB port on the power inverter is not designed for transferring data. Do not connect memory sticks, MP3 player or similar data storage external appliances. Do not connect any data transfer cable to the USB port.

TROUBLESHOOTING



WARNING! Do not open or disassemble the Inverter. Attempting to service the unit yourself may cause the risk of electrical shock or fire. Please follow the safety instructions when working on the device.

With the help of the red LED and the alarm beep, you may identify which type of error has occurred

- LED flashes + 1x alarm beep: battery voltage protection (battery voltage is $<10.5V$ or $>15.3V$)
The battery voltage has exceeded or has fallen below the permissible range. This error occurs
 - When your battery is empty. Check the battery and recharge when required.
 - When the input voltage is too high. (Possibly the voltage regulator of your car's alternator is defect)
- LED flashes + 2x alarm beep:
temperature protection (the inverter overheated $>75^{\circ}C$)

Please check if vent holes are obstructed or a high power was demanded for an extended period.

Let the inverter cool down before putting it in operation again

- LED flashes + 3x alarm beep:
overload protection

The requested power is higher than the maximum output power of the inverter.

LED flashes + 1x alarm beep	<p>Battery Voltage Protection</p> <p>The battery voltage is lower than 10.5V or higher than 15.3V</p>	<p>The battery voltage has exceeded or has fallen below the permissible range. This error occurs</p> <ul style="list-style-type: none"> - when your battery is empty. Check the battery and recharge when required. - When the input voltage is too high. (possibly the voltage regulator of your car's alternator is defect)
LED flashes + 2x alarm beep	<p>Temperature Protection</p> <p>The inverter overheated >75°C</p>	<p>Please check if vent holes are obstructed or a high power was demanded for an extended period. Let the inverter cool down before putting it in operation again.</p>
LED flashes + 3x alarm beep	<p>Overload Protection</p>	<p>The requested power is higher than the maximum output power of the inverter. Check the power consumption of connected.</p>

If the device doesn't work at all, an internal fuse might be blown. This happens always for a reason.

Maybe there has been a short circuit, when connecting the inverter in wrong polarity. Don't try to replace internal fuses yourself. The inverter has to be checked by the manufacturer or by an authorized service.

TECHNICAL SPECIFICATIONS

Model	MI5726	MI5728
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DC input		
Battery voltage(VDC)	10.5~15.3	10.5~15.3
Battery capacity (AH)	≧ 26	≧ 26
Maximum input current (A)	≧ 25	≧ 50
Standby current(A)	≧ 0.75	≧ 0.75

AC output		
Voltage (VAC)	230	230
Frequency (Hz)	50	50
Power (W)	200	400
Peak power (W)	250	440
Surge peak power (W)	400	800
Voltage harmonics	≧ 5%	≧ 5%
Conversion efficiency	≧ 86%	≧ 86%

USB output		
Output voltage (VDC)	5	5
Maximum output current (A)	2.1	2.1

Mechanical dimensions		
Length x Width x Height (mm)	188x100x60	213x100x60
Weight (kg)	0.71	0.87

Other		
Operating ambient temperature (°C)	-20~40	-20~40
Cooling	Air cooling	Air cooling
Insulation class	CLASS II	CLASS II
Protection class	IP20	IP20

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