User Manual

Mobile Power Source

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Dear Customers：

It’s very grateful to you for trusting our company and selecting our products! Before using this product, please read carefully this user manual, including installation, using, failure investigation and other important information and suggestion, we also suggest you keep this manual well!

Contents

1. Product features

- Three programmable working modes prioritize different energy needs:
  1. Grid Power First (a.k.a. “Pass-Through AC Power”)
  2. Energy Saving (Inverter stays OFF unless load is detected)
  3. Battery Power First (Solar charges the battery but grid AC Power is only used if battery is almost empty).
- Dual-CPU Intelligent Control Technology manages energy input/output.
- Smart Fan Control keeps the unit cool, safe, and reliable.
- Low-frequency pure sine wave output is clean and reliable for any load.
- Wide input voltage range and consistent voltage output.
- LCD display shows real-time running statuses at-a-glance.
- Battery over-voltage and low-voltage protection, overload protection, short circuit protection, over-temperature and under-temperature protection.
- Intelligent MPPT solar controller features over-charge & over-discharge protection, current limiting charging, and multiple other safety protections.

2. Initial Inspection, Storage, Precautions

Initial Inspection

Ensure your box contains the following: MPS unit, AC Charging Cable, DC Car Charging Cable, Solar Negative Cable, Solar Positive Cable, AC output L5-30R receptacle, User Manual.

Make sure the equipment was not damaged during transit. If there is any damage, DO NOT POWER ON. Report to product dealer and carrier.

Installation, storage, precautions

Installation should be performed by a qualified technician.

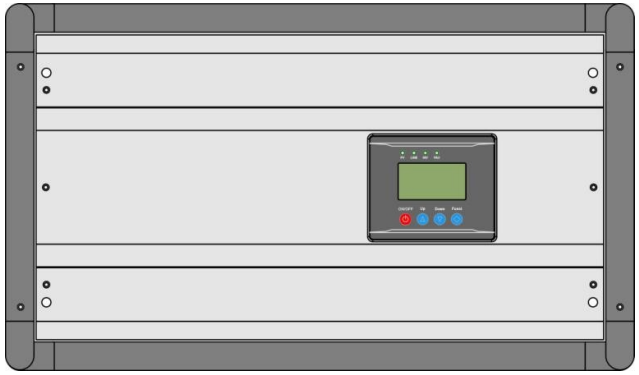
During transport, the unit may have warmed or cooled outside of its working temperature range. Moisture may have condensed on the unit. Ensure it is dry and within the proper temperature range (see Section 8) before using.

Do not use in a wet or dusty environment. Do not use near anything flammable or explosive. Do not cover or block the vents. Maintain 10cm of clear space around the unit in order to have good heat dissipation.

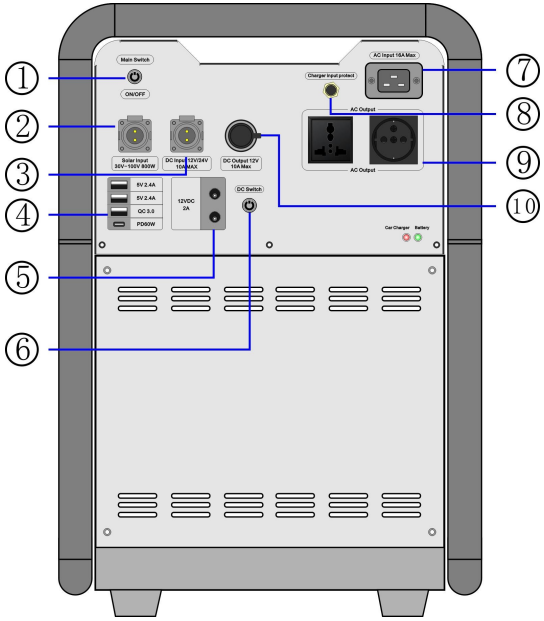
Before storage or other long periods of inactivity, turn off all breaker switches.

3. Unit diagram, operation instructions

3.1 Top



Front

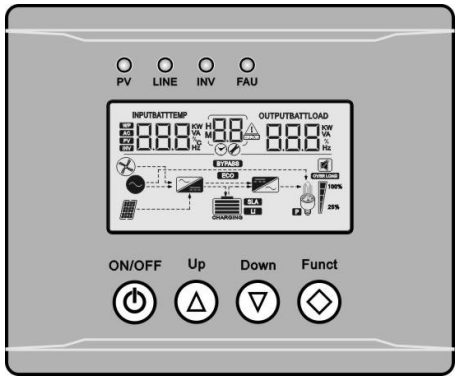


Guide

① Battery input breaker
② Solar Input connector (Solar Charger)
③ 12VDC Input connector (Car charger)
④ 5VDC Output (USB/Type-C sockets)
⑤ 12VDC 2A outlets
⑥ DC Output breaker
⑦ AC Input connector (AC charger)
⑧ Charger input protect
⑨ AC Outlets
⑩ 12VDC 10A outlet

Front panel instructions

The LCD display shows the real-time statuses of the unit, such as: Input / output voltages, AC current frequency, current working mode, inverter mode, battery level, charging current, and fault indicators. The buttons control the unit and allow you to change a variety of settings.



Button Descriptions

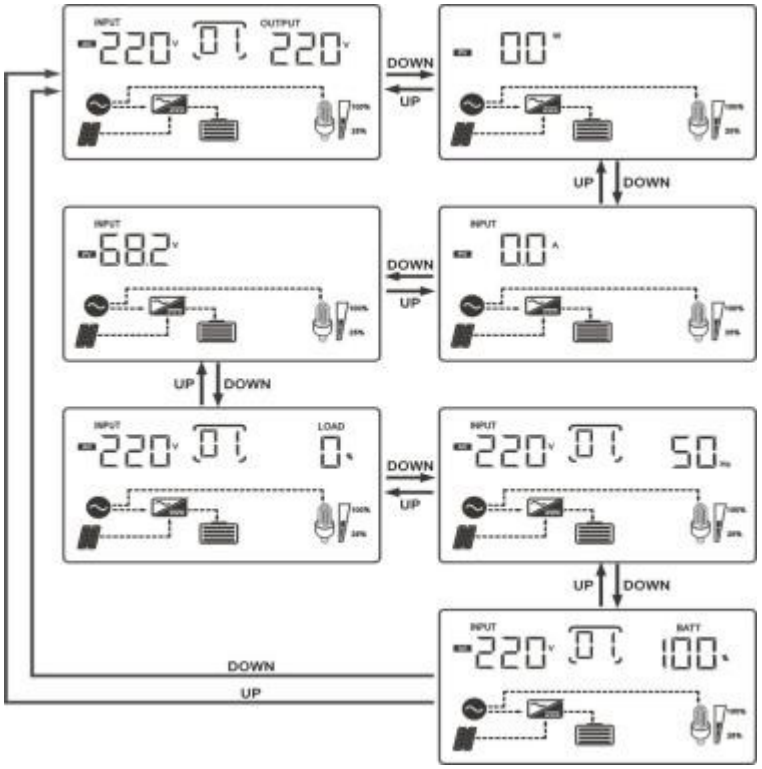
Button		Description
⏻	Power ON/ OFF	Long press for 2s to turn ON/OFF.
▲	Page up / Increase	In the “Status” screens, press to scroll up through the unit statuses. In the “Function” menu, press to increase values.
▼	Scroll down / Decrease	In the “Status” screens, press to scroll down through the unit statuses. In the “Function” menu, press to decrease values.
◇	Function	Long press for 5s to enter the Function menu. In the Function menu, short press to confirm the blinking parameter.

LED Lights Status Description

LED Lights			Description
PV	Green	ON	Solar charging.
		OFF	Solar disconnected or charging stopped.
LINE	Green	ON	The AC input is connected and is bypassing the battery to power AC output.
		OFF	The AC input is disconnected or the inverter is providing AC output; i.e. no AC pass-through.
INV	Yellow	ON	The inverter is providing AC output.
		OFF	The inverter is not providing AC output.
FAU	Red	ON	AC output overload or Inverter fault.
		OFF	The unit is working normally.
Car Charger	Red	ON	Car Charger is connected.
		OFF	Car Charger is disconnected.
Battery	Green	ON	Charging.
		Flash	Floating Charge. Battery is fully charged.

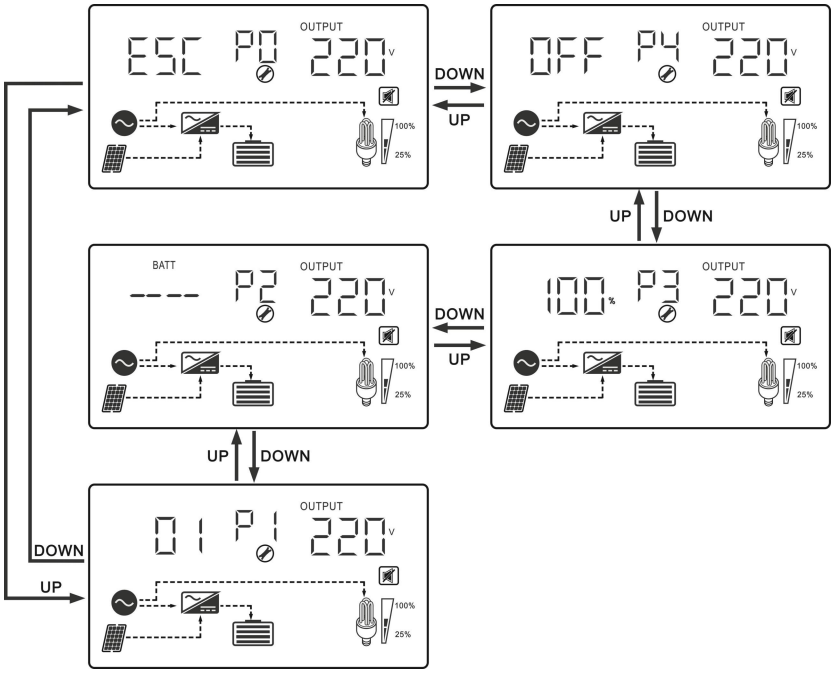
LCD display

View the unit statuses： The “Home” or “Default” screens are the Status screens. A Status screen first appears when you turn on the unit. Press DOWN or UP to scroll through the seven different Status screens. They display: AC Input/Output Voltage, PV Wattage, PV Voltage, PV Amperage, Inverter Load %, Inverter frequency, and Battery Level. Each page also visually indicates whether or not PV charging, AC charging, and Energy Outputs are currently active.



Function menu: From any Status screen, long press the Funct button for 5 seconds to enter the Function menu. Press DOWN or UP to scroll through the different parameters P0-P4. Then, after reaching the desired parameter P0-P4, short press Funct to highlight that parameter's setting (the setting will be blinking). Then press DOWN or UP to change the setting. After achieving the desired setting, press Funct so that the parameter P0-P4 is blinking, press DOWN or UP until "P0" is blinking, and then short press Funct to save the setting and exit the Function menu (you can change multiple parameter settings before exiting). The functions of P0-P4 are as follows:

Main Menu	Functions
P4	Buzzer mode
P3	Inverter charging current
P2	N/A (This parameter is intentionally left blank)
P1	Inverter operating mode
P0	Save & Exit

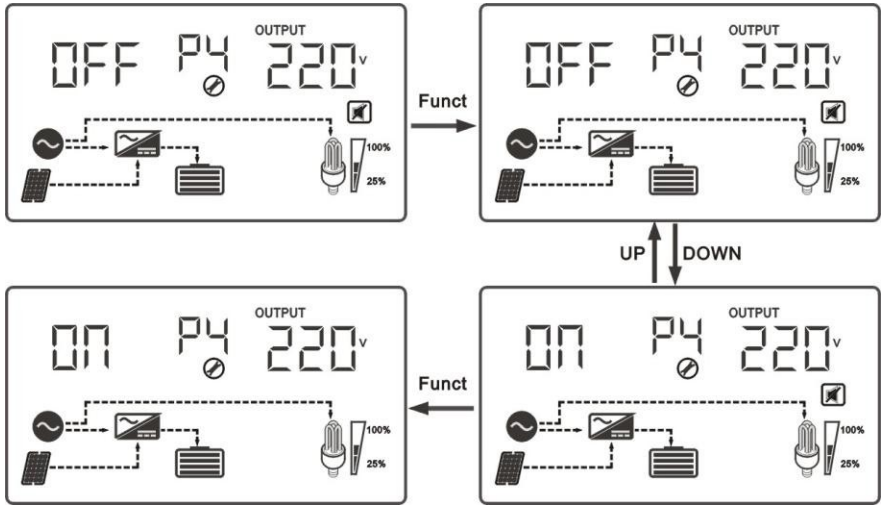


Parameter Settings

AC Input Alarm setting

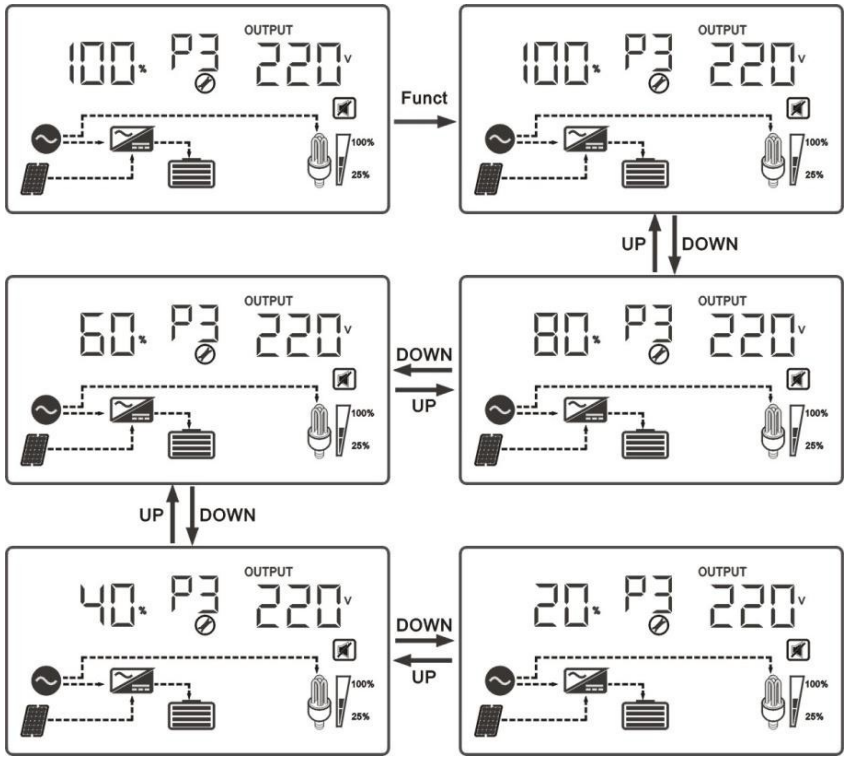
From any Status screen, long press the Funct button for 5 seconds to enter the Function menu. Press DOWN or UP until the Beeper noise parameter "P4" is blinking. Press the Funct button to highlight the setting ("OFF" or "ON" will be blinking). Turn On/Off the Alarm noise using the DOWN or UP button. Press the Funct button so that "P4" is blinking, press DOWN or UP until "P0" is blinking, and then press the Funct button to save and exit.

Explanation: When this setting is ON, an alarm sounds every 15-seconds if the inverter is running without AC input connected. When this setting is OFF, this particular alarm is disabled. All other operational/fault alarms remain enabled in either setting.



Inverter AC charging current setting

From any Status screen, long press the Funct button for 5 seconds to enter the Function menu. Press DOWN/UP until the Inverter charging current parameter “P3” is blinking. Press the Funct button to highlight the setting (the % value will be blinking). Press DOWN or UP to change the AC charging current of the unit (100%, 80%, 60%, 40%, or 20% of maximum capacity). Press the Funct button so that “P3” is blinking, press DOWN or UP until “P0” is blinking, and then press the Funct button to save and exit.



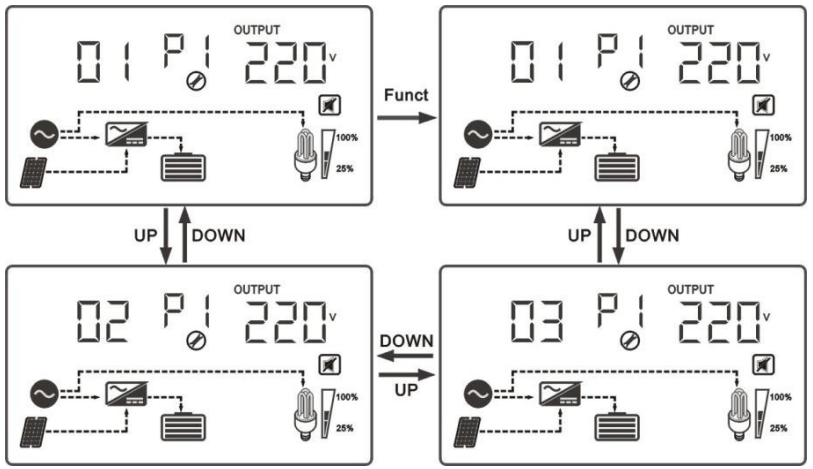
Error codes and solutions

Error code	Problem	Solution
E01	MOSFETS board over-current	Turn unit OFF and ON. If problem persists, contact support.
E02	Output short circuit	Inspect loads for signs of short circuit (e.g. bare wires, contact damage, etc.). Remove loads.
E03	Output overload	View Inverter Load % via Status screen. Remove unnecessary loads.
E04	Internal Temperature above Limit	Check cooling fan operation. Remove any dust. Maintain 10cm free space around unit.
E05	Battery over-voltage	Check external battery connection, configuration, and voltage (see section 4.4).
E06	Battery under-voltage	Make sure battery is fully charged. If problem persists, battery must be replaced. Contact support.
E07	Reversed connecting cables between transformer and heatsink on power board	Cables must be reconnected. Contact support.
E08	Start Protection from low output voltage	Turn unit OFF and ON. If problem persists, contact support.

Inverter working mode setting

From any Status screen, long press the Funct button for 5 seconds to enter the Function menu. Press DOWN or UP until the inverter working mode parameter “P1” is blinking. Press the Funct button to highlight the setting (the work mode number “01,” “02,” or “03” will be blinking). Choose the inverter work mode (01-02-03) using DOWN or UP buttons. Press the Funct button so that “P1” is blinking, press DOWN or UP until “P0” is blinking, and then press the Funct button to save and exit.

#	Working mode	Description
01	The grid priority mode **(Default)**	In working mode 01, the AC input directly powers the AC output (through a voltage stabilizer), bypassing the battery (a.k.a. “pass-through AC power”). When the grid’s AC power is over-voltage, low-voltage, distorted waveform, or cut off, the unit will draw from the battery power supply. When the grid power returns to normal, the unit will re-enable pass-through AC power.
02	Energy-saving mode	In working mode 02, the inverter only turns on when the unit detects load power greater than 15% of the inverter’s 3000W rated output. When it detects small or no, i.e. when the total load power is less than 15% of the inverter’s rated power, the inverter will remain off. This ensures the lowest power consumption of the battery bank by keeping the inverter shut off. Under this mode, the unit measures load power every 15 seconds.
03	Battery priority mode	In working mode 03, the AC input does not charge the battery or power the loads. The unit utilizes solar or DC (car) power only; solar and DC charge the batteries and supply power to the loads through the inverter. When the battery meets the low-voltage protection point, i.e. when the battery is 90% empty, the unit will enable pass-through AC power if the grid power is available. When the battery is fully charged again, the unit will again only use solar or DC power.



4. Wiring

Recommended wire thickness

For DC and AC input / output connecting wire, the thickness of the wire is very important. It is recommended to have 1 mm^2 cross-sectional area of copper wire for every 5A of current.

$$\textbf{Area of wire} = \frac{\text{Power rating(W)}}{\text{Rated battery voltage(V)}*5A/mm^2}$$

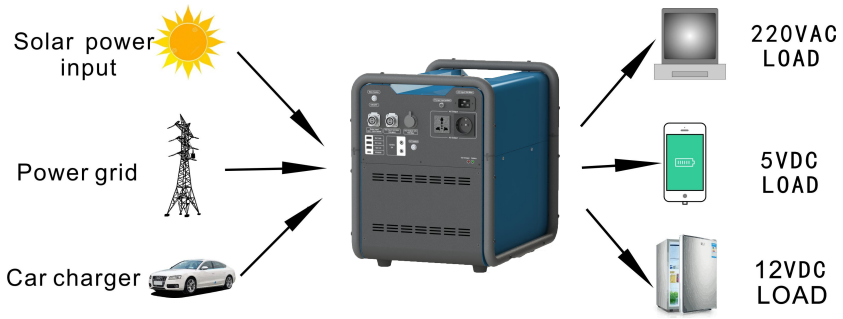
For example, the appropriate wire cross-sectional area for a 5000W/48VDC load is calculated as follows:

$$\textbf{Area of wire} = \frac{5000W}{48VDC*5A/mm^2} \approx 20(mm^2)$$

Diameter can then be derived from $A = \pi * r^2$

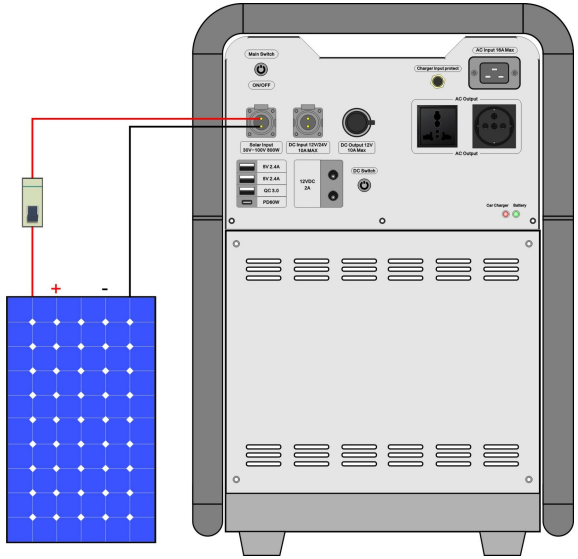
Consult a verified Wire Gauge and Current Limit table for guidelines. Failure to understand and adhere to these guidelines can result in wire and equipment damage and/or dangerously high temperatures.

.4.2 System working diagram



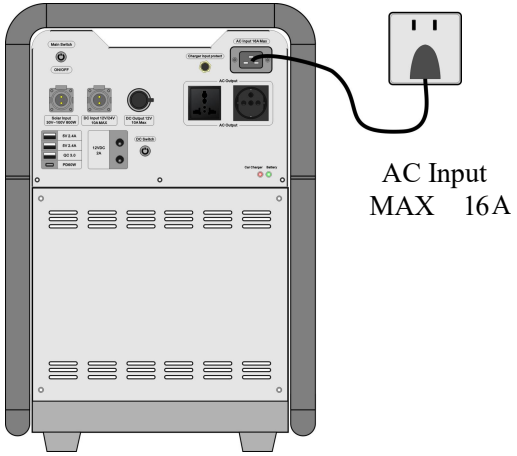
4.3 Instructions for connecting Solar Power

Use the correct size PV cable. Make sure the solar power voltage and wattage are within the allowed ranges (see section 8). Wire solar to the "② Solar Input connector"(see section 3). Make sure the positive (+) and negative (-) cables are wired correctly; incorrect wiring may damage the unit. Turn on the “Solar Input Breaker”.



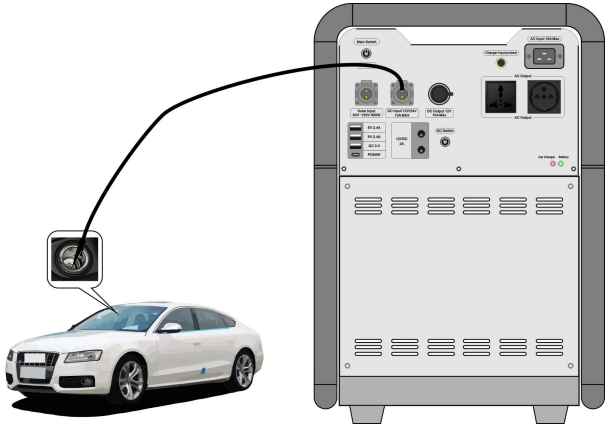
4.4 Instructions for AC input

Using the correct size of AC power cable, make sure the AC power voltage is in the allowed range. Wire AC power source to the “ ⑦ AC Input connector”.



Instructions for 12VDC input

You may charge the battery with a vehicle when the engine is running. Plug the car charger into “③ 12VDC Input connector” .



Outputs

AC outputs

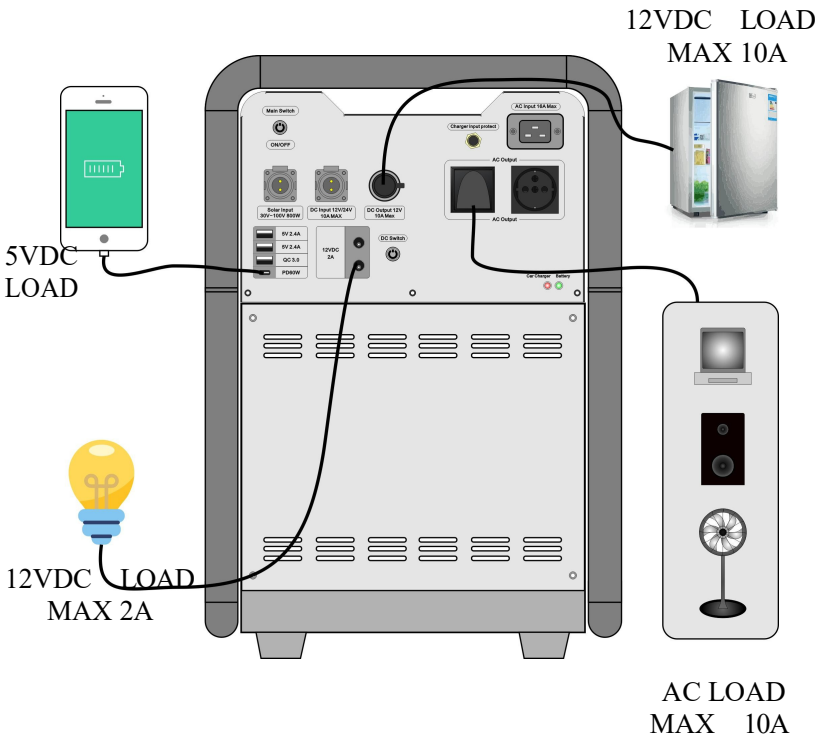
AC loads are connected to the “⑨ AC Outlets” outlets on the front panel. The total continuous power of all combined AC loads should be no more than the inverter’s rated continuous power.

DC outputs

5VDC loads are connected to the “④ 5VDC Output” (USB/Type-C sockets) on the front panel. The total 5VDC USB output current is 2A.

12VDC loads are connected to the “⑤ /⑩ 12VDC outlets” on the front panel. The cigarette lighter socket is rated for 12V10A. the 5mm socket is rated for 12V2A each.

Make sure the positive (+) and negative (-) cables of your DC loads are wired correctly before plugging in. DC output short circuit may damage the unit.



5. Power ON

Note: Make sure voltages and polarities of external battery and solar panels are correct (see section 8)

Inverter Power ON

Power On steps

Turn on the battery breaker. Then long press the "ON / OFF" button on the operation panel for 2 seconds; release it after the beeper sound. The "INV" indicator light will turn on, indicating that the inverter has started.

AC Input

Connect the “Line,” “Neutral,” and “Ground” AC cable ends to the corresponding “AC Input Terminals.” Turn on the “AC Input Breaker.” Plug the other end into a working power outlet. The "LINE" indicator light will turn on, indicating the AC Input power is passing through to the AC Output.

Solar Charge Controller

Make sure the solar power voltage and wattage are within the allowed ranges (see section 8). Wire solar panels via cables to the “Solar Input Terminals,” making sure the (+) and (-) are correct. Turn on the “Solar Input Breaker” (make sure the Battery Breaker is on first). When the solar panels are exposed to sunlight, the "PV" indicator light will turn on, indicating that the solar power is charging the batteries through the MPPT solar charge controller.

Shutdown

To properly shutdown: Turn off all loads and all energy inputs. Long press the "ON/OFF" button for 2 seconds, releasing after the internal relay action produces an audible “click.” The AC output will turn off and the LCD screen will turn off. Finally, turn off all the breakers in the proper order (see directly below).

BREAKER PRECAUTION: Turn on the Battery Breaker BEFORE turning on the Solar Breaker. Turn off the Battery Breaker AFTER turning off the Solar Breaker.

Caution: If the unit will be unused for a long time and neither solar power nor an AC charger will be connected, please turn off the battery breaker to avoid the battery deeply discharging.

Audio Alarms

Equipment running normally	"AC Input Alarm" OFF	The lack of AC Input does not sound an alarm.
	"AC Input Alarm" ON	When the inverter is on, an alarm sounds 4 times every 15 seconds if no AC input is detected.
Battery high-voltage alarm	Alarm beeps 4 times per second	
Battery low voltage alarm	Alarm beeps 2 times per second	
Over-temperature alarm	Alarm beeps for 2 seconds, then pauses for 1 second	

Connecting an Electric Generator:

When connecting an electric generator, make sure to follow these guidelines:

Make sure the generator output voltage is within the MPS unit's AC input range (see Section 8). To connect the generator, first turn off the AC Input and Output breakers. Wire the generator's output to the MPS unit's AC input terminals according to the instructions (see Section 4.5). Start the generator and make sure it is running stably. Make sure there are no loads connected to the MPS unit's AC or DC outputs. Finally, start up the MPS unit.

After the MPS unit is started, connect loads one-by-one to the MPS.

We suggest the electric generator's power output capacity be 2-3 times that of the MPS.

6. Maintenance

The MPS requires very little maintenance. The most important maintenance practice is to follow basic rules of battery charging. This will ensure good battery health.

Under normal operating conditions, the battery will work well for 3-5 years or longer. If operating conditions are subpar, the battery may need to be replaced earlier than 3-5 years. Battery replacement MUST be carried out by qualified personnel. Individual batteries within the battery pack must not be individually replaced. The entire battery pack must be replaced according to the battery supplier's instructions.

When in storage or during periods of inactivity, the battery should be kept at 50% charge. At least once every 4-6 months, the battery should be fully charged to 100% capacity and then fully depleted to 10% capacity. In a high temperature region (>100 degrees F or >38 degrees C), this charge/depletion operation should be done every 2 months.

Before replacing the battery, turn off the device, disconnect it from any power sources, and turn off the battery breaker. Remove any metal from your body (rings, watches, etc.). Use only tools with insulated handles. Do not put any tools or other metal objects on the battery pack.

When connecting the battery cable, it is normal for small sparks to appear. These sparks are harmless. Do not shorten any battery connections or reverse positive/negative polarity.

7. Simple Fault Diagnostics and Troubleshooting

WARNING: There is high voltage inside the unit! Do not open for any reason. High voltage may cause serious injury or death!

Failure phenomenon	Possible reason	Solution
The battery depletes more quickly than normal	The battery is not fully charged	Make sure that the battery is fully charged
	Outputs overloaded	Remove noncritical loads
	Aging battery, weak battery storage capability	Contact your customer service representative to obtain a battery replacement kit
Power on failure	The AC Input cable or the External Battery cable is poorly connected	Check and reconnect
Alarm sounds immediately after turning on unit	The battery is low	Make sure that the battery is fully charged
	Outputs overloaded	Remove of noncritical loads
Alarm sounds for 2 seconds, then silent for 1 second	The internal temperature is too high	Make sure the fans and cooling holes are not blocked by any objects or dust
The fan is spinning slowly	The fan automatically adjusts according to the temperature	The fan is operating correctly
The "PV" indicator does not light up when there is a sun-lit PV module	PV cable poorly connected	Check if the wiring of the PV array is correct and the contact is reliable

When you contact the service staff, please provide the following information: Type of machine / date of issue / complete description of the problem (including the relevant indicator display status, battery configuration, wired connections, and other information).

8. Technical data sheet

Model:		MPS2K-4100Wh
Rated AC Power		220VAC / 2,000 W Continuous (4,000 W Surge)
Battery Bank	Rated voltage	25.6VDC
	Battery capacity	4.100 Wh
	Battery Type	LiFePO4
Inverter voltage settings	High voltage protection	33.6 VDC
	High voltage recovery	32.0 VDC
	Low voltage alarm	23.0 VDC
	Low voltage protection	22.4 VDC
	Floating charge voltage	28.4 VDC
AC Input	AC Input Voltage	170VAC-275VAC
	Frequency	60 Hz or 50Hz
Charge	AC charger	MAX 10A
	Solar Charger	24V/30A MPPT (Max 750 watts, MPPT voltage range 30VDC-150VDC)
	Car Charger	Max. 12VDCx10A
AC Output	Voltage Range	220VAC ±5% (Inverter mode)
	Frequency	60Hz or 50Hz ±1%(Inverter mode)
	Output wave	Pure Sine Wave
	Transfer time	＜10ms (Typical load)
	Efficiency	＞85%（80% Resistive load）
DC Output	USB Plug	5VDC/2A
	Car Plug	12VDC/10A
	Low-voltage protection	22.4V
	Low-voltage recovery	26.8V
Protections		Battery over-voltage and low-voltage protection, overload protection, short circuit protection, over-temperature protection, under-temperature protection
Operating ambient temperature		-20℃ to +50℃
Storage ambient temperature		-25℃ to +55℃
Product size: L * W * H (mm)		503 x 362 x 471
Package size: L * W * H (mm)		595 x 440 x 535
Net Weight / Gross Weight		kg / kg

Note: We reserve the right to modify this user manual without any notification.