

**Photonic
Universe**

P5000M User Manual

Portable Power Generator



Attention! Please read this manual carefully before using this product.

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P5000M Portable power generator

1 Introduction

1.1 Important safety instructions



Danger!

Danger to life due to high voltages in the unit!

All work must be carried out by a qualified electrician.

The appliance must not be used by children or individuals with reduced physical, sensory, or mental capabilities, or by those lacking experience and knowledge, unless they are supervised or instructed appropriately.



Caution!

Risk of burns due to hot enclosure parts!

During operation, the top of the enclosure and the enclosure body may become hot. Avoid touching the top of the case and the body of the unit during operation.



Caution!

Potential health risks due to radiation / electromagnetic exposure!

Do not stay closer than 20 cm (8 inches) to the unit for any extended period.



Note!

Grounding the PV generator.

Comply with the local requirements for grounding the PV modules and the PV generator.

Connect the generator frame and other electrically conductive surfaces to a grounding point to provide optimal protection for the system and individuals.



Warning!

Ensure the input DC voltage does not exceed the maximum input DC voltage of the unit.

Exceeding this limit may cause permanent damage to the inverter or other components of the unit. Such damage is not covered under the warranty.



Warning!

Authorized service personnel must disconnect both AC and DC power from unit before attempting any maintenance or cleaning or working on any circuits connected to unit.



WARNING !

Risk of electric shock!

- Prior to any use, application or settings, carefully read this user manual, including the current section, to ensure correct and safe operation. Keep the user manual in a secure place for future reference.
- Only use accessories included with the P5000M shipment. Using unauthorised accessories may result in a risk of fire, electric shock, or injury.
- Ensure that the existing wiring is in good condition and appropriately sized. Undersized wiring can pose safety risks.
- Do not disassemble any parts of the P5000M generator that are not specified in this user manual. Refer to the Warranty section for instructions on obtaining service. Attempting to service the P5000M yourself or by a non-authorized provider will void the warranty and may result in electric shock, or fire.
- Keep the unit away from flammable or explosive materials to prevent fire hazards.
- Ensure the unit is stored away from humidity, liquids or corrosive substances.
- Any personnel working with this equipment must use insulated tools and gloves for protection.
- PV modules used with this generator must comply with IEC 61730 Class A standard.
- Never touch either the positive or negative pole of the PV connector. Touching both simultaneously is strictly prohibited. Do not touch any other exposed terminals or contacts to avoid electric shock.
- The unit contains capacitors that may remain charged to potentially lethal voltages after disconnecting the mains, battery, and PV supply and turning the unit off. Hazardous voltage may be present for up to 5 minutes after the unit is disconnected and turned off. Never work on the mains cables, battery cables, PV cables, or PV generator while power is applied or within 5 minutes after turning the breakers off.
- If authorised for maintenance, when accessing the internal circuit of the unit, ensure you wait at least 5 minutes before working on the power circuit or removing the electrolytic capacitors inside the device. Do not open the device prematurely, as the capacitors require sufficient time to discharge.

1.2 Explanation of symbols

This section gives an explanation of all the symbols shown on P5000M, label and in this user manual.

Symbol	Explanation
	CE mark. The device complies with the requirements of the applicable CE guidelines.
	TUV certified.
	RCM remark.
	SAA certification.
	Beware of hot surface. The portable generator can become hot during operation. Avoid contact during operation.
	Danger of high voltages. Danger to life due to high voltages in the portable generator!
	Danger. Risk of electric shock!
	Observe enclosed documentation
	The device can not be disposed together with the household waste. Disposal information can be found in the enclosed documentation.
	Do not operate this device until it is isolated from battery, mains and PV modules.
	Danger to life due to high voltage. There is residual voltage in the portable generator after powering off, which requires 5 minutes to discharge. Wait 5 minutes before accessing the portable generator connections, sockets or cables.

1.3 Basic features

P5000M is a high-quality portable power generator that can function as a portable battery pack, portable solar generator, or as an off-grid solar power system. It provides up to 5,000W of portable power in remote locations, such as for building and construction, emergencies, backup power, off-grid and other applications. The unit can also be used as a quickly deployable, all-in-one household solar system. Finally, it can be used as an emergency power supply (EPS), providing power for emergency use during a power cut or other disruptions to mains power.

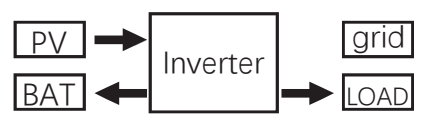
Charging:





1. For slow AC charging, turn the charging switch on the unit to “2kW” mode. Plug the mains AC cable into the 2kW AC input port of the unit, and connect it to a mains power socket. Turn the unit on. The mains power will then charge the generator’s battery with a maximum power of 2,000W.
2. For fast AC charging, turn the charging switch on the unit to “5kW” mode. Connect the 5kW AC input port of the unit to a dedicated mains wiring outlet rated for up to 5kW mains power draw (do not use a standard mains socket for this type of charging). Turn the unit on. The generator’s battery will then be charged with a maximum power of 5,000W. Ensure that all the wiring, connections, and testing work is carried out by an appropriately qualified person.
3. For solar charging, connect the solar panels to the PV input port of the unit. Turn the PV switch on. A single PV array can provide up to 3,500 W of charging power, while two PV arrays can provide up to 7,000W.

Supplying power to the load:

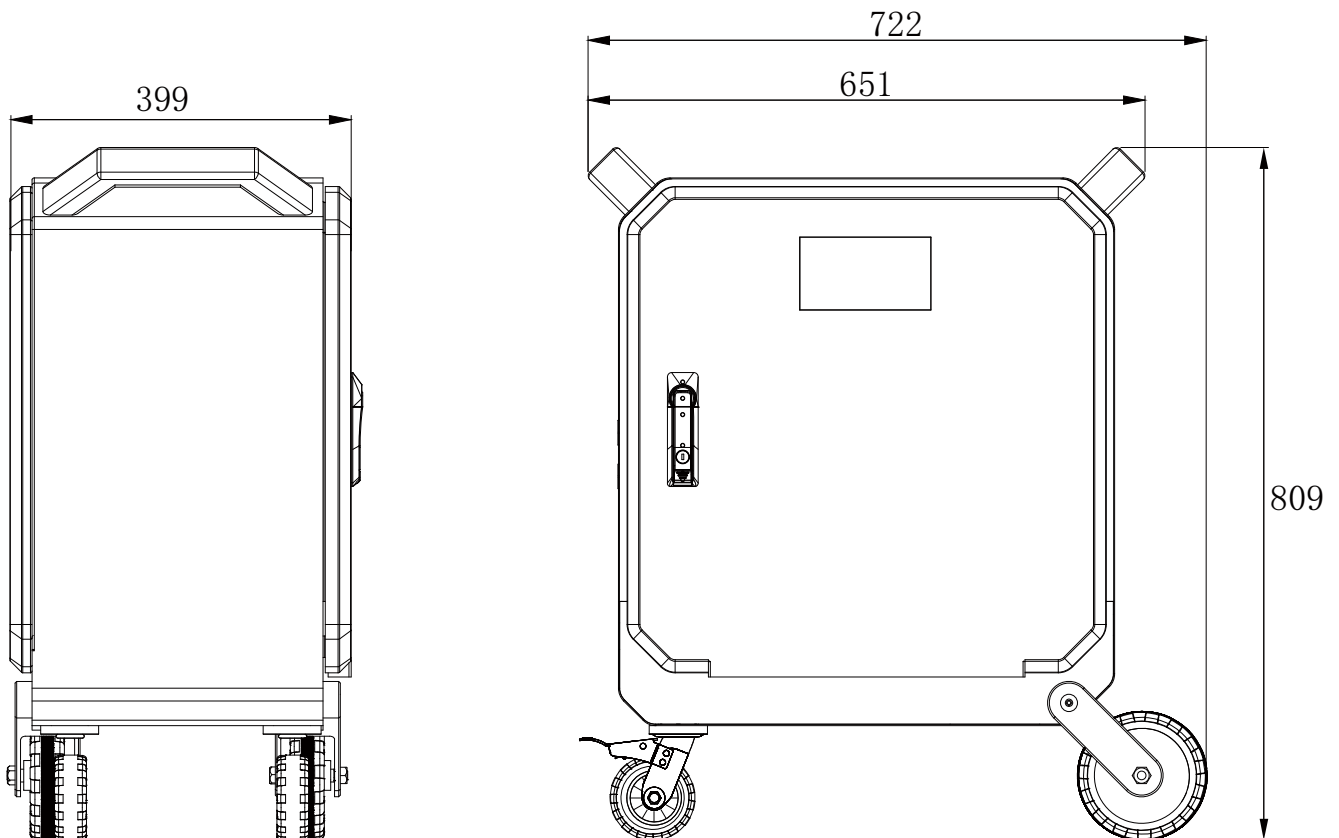
1. Use the AC output sockets to supply power to loads with up to 2,000W from a single socket, and up to 5,000W combined from all sockets. Do not use sockets for devices requiring more than 2kW.
2. To provide 5,000W power to a single appliance, use the 5kW AC output port (EPS port) with fixed wiring. Ensure that all installation work is carried out by an appropriately qualified person.

1.4 Working modes

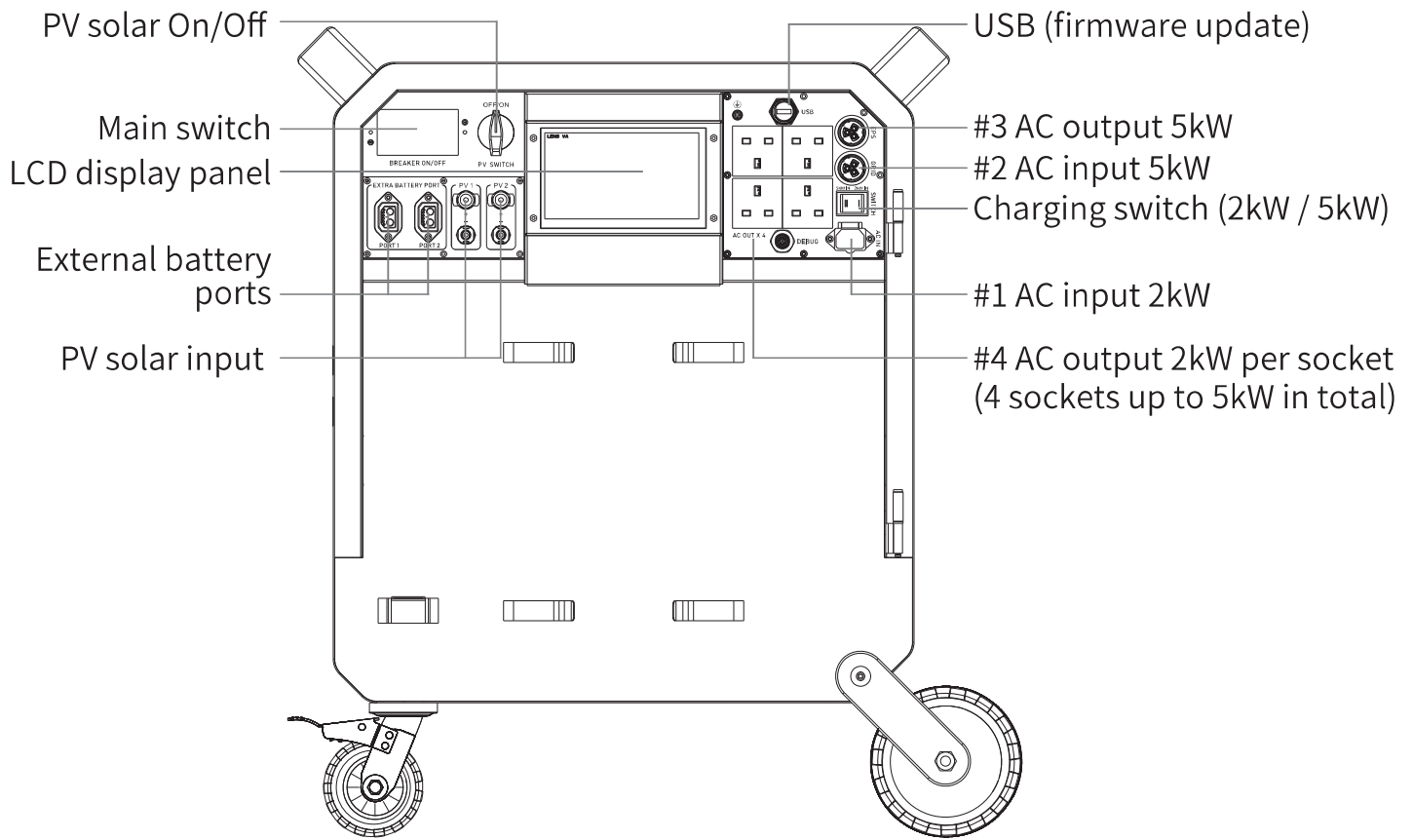
Working modes: Battery priority working modes	
When PV, grid, battery are available:	
 <pre>graph LR; PV --> Inverter; BAT --> Inverter; Inverter --> grid; Inverter --> LOAD;</pre>	A. Solar energy provides power to the loads as first priority, if solar energy is sufficient to power all connected loads, the excess of solar energy will charge the battery, and any additional power will not be fed to the grid.

	<p>B. Solar energy provides power to the loads as first priority, if solar energy is not sufficient to power all connected loads, battery energy will supply power to the loads at the same time.</p>
	<p>C. Solar energy provides power to the loads as first priority, if solar energy and battery are not sufficient to power all connected loads, utility energy (main grid) will supply power to the loads at the same time.</p>
<p>When PV, Battery is available (grid is disconnected):</p>	
	<p>A. Solar energy provides power to the loads as first priority, if solar energy is sufficient to power all connected loads, solar energy will charge the battery.</p>
	<p>B. Solar energy provides power to the loads as first priority, if solar energy is not sufficient to power all connected loads, battery energy and solar energy will supply power to the loads at the same time.</p>

1.5 Dimensions: (unit: mm, tolerance: $\pm 0.5\text{mm}$)



2 Interface definition and technical data



Model		P5000M
General	Capacity	5120Wh*N(N≤3),can connect 2 external battery packs
	Cell chemistry	LiFePO4
	Life cycle	6000+ Cycles to 80% Capacity
	Indication	APP/LCD Screen/Web
	Storage temperature	-25°C ~ 60°C
	Operating temperature	0°C ~ 50°C
	Materials	Metal
	Weight	93±1kg
	Dimension(with base)	722*399*809mm(L*W*H)
	Battery Management System	OVP,UVP,OCP,SCP,OTP,UTP,etc
	Solar Charge System	MPPT Charge Controller
Input	PV(MPPT Solar)	7000W max combined for 2 MPPT inputs, each input up to 500V/14A
	1(AC input)	2000W Max(220~240V@50Hz/60Hz)
	AC#2(Grid)	5000W Max(220~240V@50Hz/60Hz)

Output	AC output #3	5000W Max(230V@50Hz)
		Automatic Switch over Time < 20ms
	AC output #4	2000W Max for each(230V@50Hz), total 5000W for 4 sockets

2.1 Technical data

1	Enclosure protection	IP65 (Outdoor)
2	Cooling Strategy	Natural Convection
3	Standby Power	<30W (Work) / < 5mW (Sleep)
4	Altitude	≤2000m
5	Over Voltage Category	I II (MAINS), II (PV,Battery)
6	Pollution Degree	II
7	Noise level	< 40dB
8	Active anti-islanding method	Power variation
9	Protective Class	I
10	Communication interface	WIFI & BT
11	Certificate	IEC 62109/IEC 62040
12	EMC	EN61000-6-1/-2/-3/-4
13	Grid Regulation	AS4777.2/CEI0-21/G99/G100/NRS097/EN50549/PEA

2.2 Battery specification

1	Battery Voltage Range	44V~58.4V
2	Battery Type	LiFePO4
3	Number of cycles	>6000(25°C)
4	Single Module Capacity	5120Wh
5	DoD	90%

2.3 Performance and parameters

DC Input(PV)	Max. Input Power	7.0kW
	Max. Input Current	14A/14A
	Max. Voltage	550V
	Range/Nominal	125V ~ 500V/360V
	No. of trackers	2
	Strings per tracker	1
AC Output	Rated Power	5.0 kW
	Max. Output Current	21.7A
	Nominal Voltage/Range	230V/176V ~ 270V
	Frequency	50/60Hz
	Power Factor (PF)	0.99 Leading ~ 0.99 Lagging
	HDI	<3%
	AC Output Topology	L+N+PE
Conversion Efficiency	DC Max.Efficiency	97.6%
	Euro Efficiency	97%
	MPPT Efficiency	99.9%
EPS Output:	Rated Power	5.0 kW
	Rated Current	21.7A
	Rated Voltage	230Vac
	Rated Frequency	50Hz
	THDU	<2%
	Automatic switchover time	<20ms

2.4 TFT communication



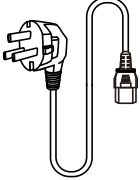

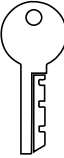


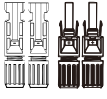

1	Size (inch)	7.0
2	Pixels resolution	1024*600
3	Colours	16.7M
4	Screen Type	IPS-TFT-LCD, Capacitive touch screen

2.5 Safety and protection

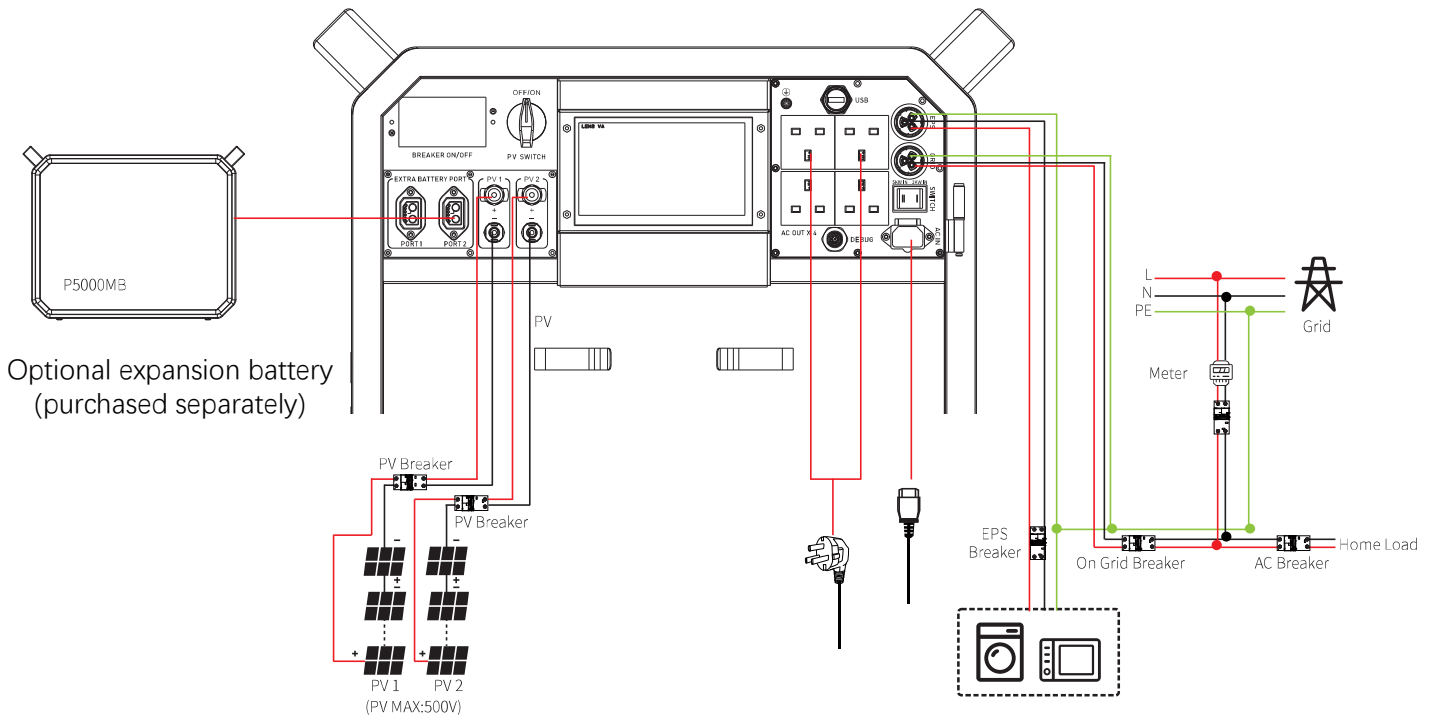
1	Over/under voltage protection	YES
2	DC isolation protection	YES
3	Monitoring ground fault protection	YES
4	Grid protection	YES
5	DC injection monitoring	YES
6	Back feed current monitoring	YES
7	Residual current detection	YES
8	Anti-islanding protection	YES
9	Over load protection	YES
10	Over temperature protection	YES
11	Max. output fault current	55A
12	Max. output over current	28.7A

2.6 Packing list

When you open the package and take out the product, please check the accessories first. The packing list is shown below.

								
Power station *1	Operating instructions *1	Mains cable *1	Key for PV connectors *1	Key for P5000M cabinet *2	Allen key *2	AC connectors *2	PV connectors *2	Pins for PV connectors *2

3 Electrical connection



3.1 Grid connection and EPS connection

Any installation, connections or commissioning of this equipment must be carried out by an appropriately qualified person. The work must be performed in full accordance with the local regulations. Personal protective equipment and insulated tools must be used in line with commonly accepted industry principles.

P5000M is designed for single phase grid. Voltage is 220/230/240V, frequency is 50/60Hz. Other technical parameters should comply with the requirement of the local public grid.

- Cable specification: 5 - 6mm² multi strand copper cable rated for AC voltage, current and the connection environment.
- Circuit breaker: 32A, must be installed between the inverter and the grid.

Step 1. Check the grid voltage and compare with the permissible voltage range of the portable power generator (refer to the technical data of the unit).

Step 2. If the grid port of the portable power generator has any cover or cap on it, remove it.

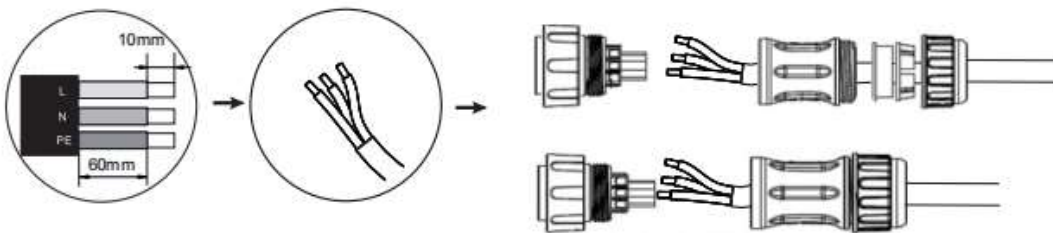
Step 3. Prepare the ends of the AC and EPS cables for attaching to the connectors. Ensure that all cables are completely disconnected and that all circuit breakers are switched off. Never touch or work on live cables.

3.1 Choose the appropriate wire.

3.2 Reserve about 60 mm of conductor material and strip 10 mm of insulation from the end of the wire.

3.3 Separate the screw cap and any removable parts of the AC connectors from the housing, feed the wire through them, insert the stripped ends into the terminals, and tighten the screws with a hex key.

3.4 Screw and tighten the removable parts and the cap onto the housing of the AC connectors.



Step 4. Connect the AC connector to the GRID port of the portable generator and tighten the connector nut. Connect the LOAD connector to the EPS port of the portable generator and tighten the connector nut.

3.2 PV connection

P5000M portable generator can be connected with 1 or 2 arrays of solar PV modules with up to 7kW in total. This connection is optional. If no solar charging is required, the unit can be charged from mains and used as a portable power pack.

If PV charging is required, either 1 or 2 strings of solar modules linked in series can be connected to P5000M. Ensure that each string meets these requirements at any temperature:

- Open-circuit voltage (V_{oc}) is less than 550V
- MPPT voltage (V_{mp}) is within the range 125V – 500V



Warning!

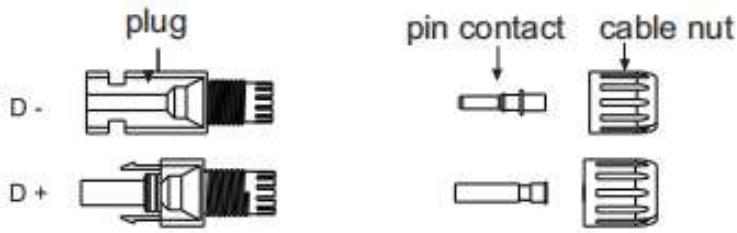
The high voltage in PV modules poses a danger. Ensure that the installation is carried out by an appropriately qualified person and complies with all electrical safety rules and regulations.

Do not ground either the positive or negative PV cables.

Connection steps:

Step 1. Check each string of PV modules to ensure the voltage is within the correct range. Turn off the breakers so that you are not working with the live cables. Double check the PV polarity.

Step 2. Disassemble the PV connectors.

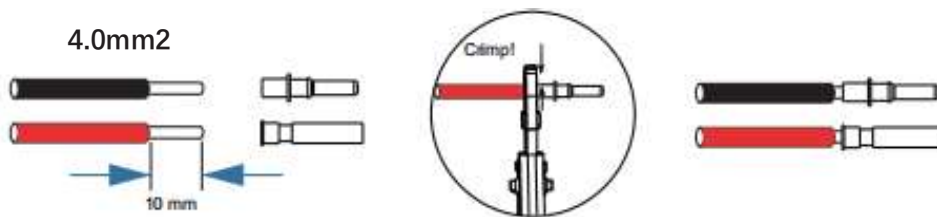


Step 3. Wiring

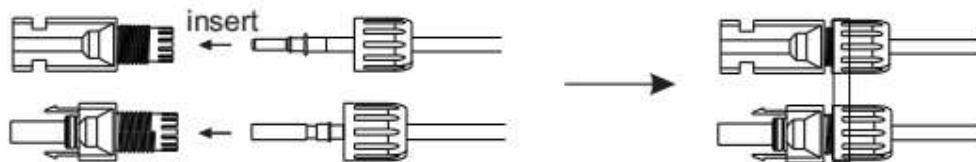
3.1 Choose solar PV cables with the cross-section of each core of 4mm² or higher.

3.2 Remove 10mm of insulation from the ends of the cables.

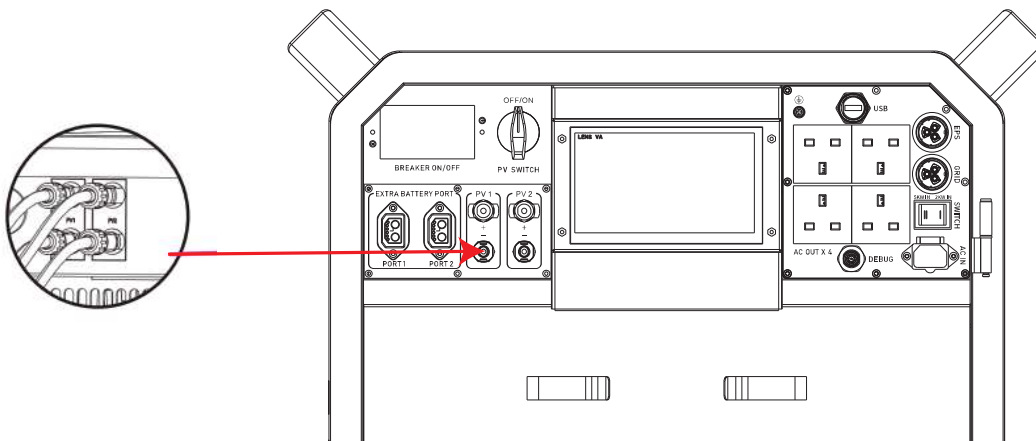
3.3 Insert the cable ends into pins and using a solar crimping tool, crimp the pins.



Step 4. Insert the cable ends with pins through the connector nuts and push them firmly into the housing of the PV connectors until you hear a click. Perform a pull test to ensure the pins are securely seated in the housing and properly grip the cable. Securely tighten the nuts.



Step 5. Plug the PV connectors into the corresponding PV sockets.



3.3 WiFi

P5000M comes with integrated WiFi communication. Users can select a WiFi network in settings.

3.4 Main switch and the PV switch

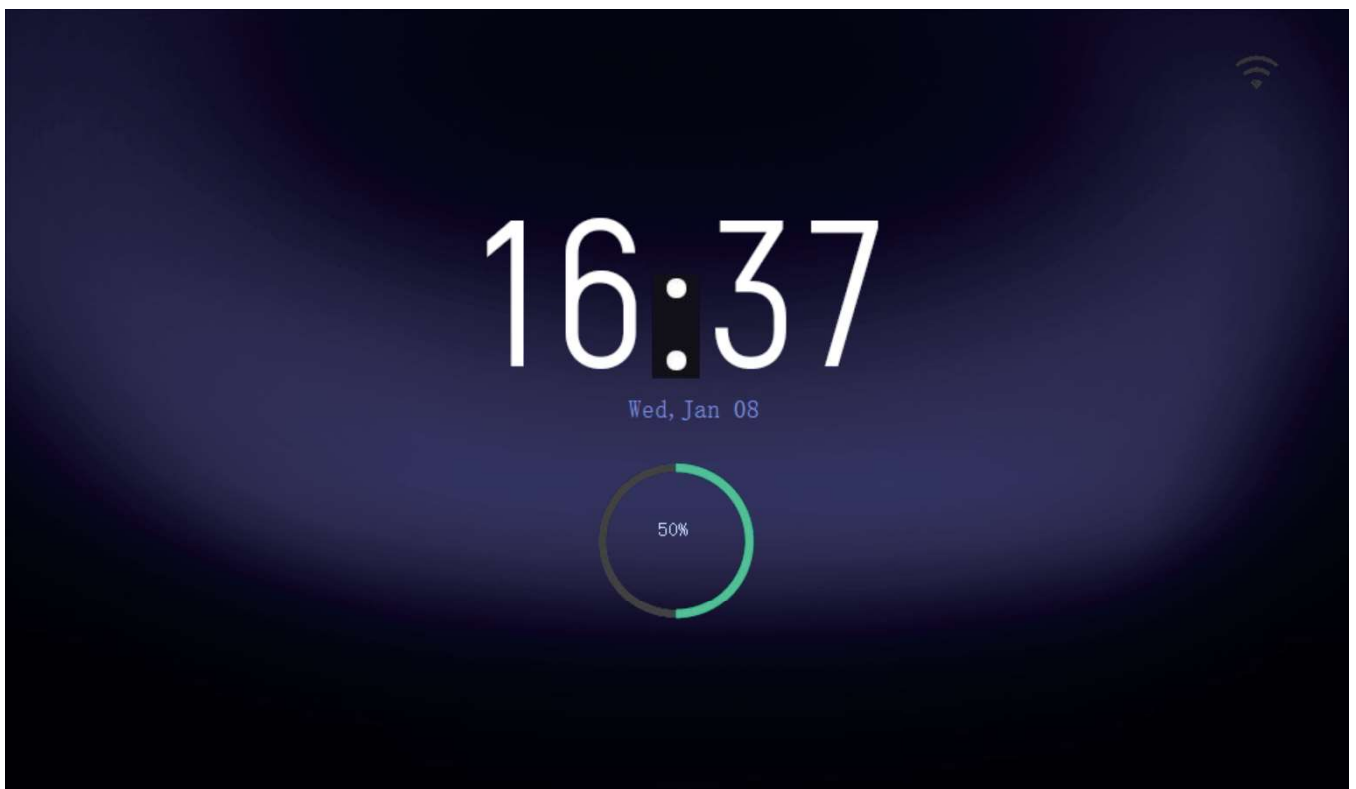
The main switch and the PV switch are located in the top-left corner of the unit behind the door. The main switch controls the battery's operation. If this switch is turned on, the display and the unit will turn on. The PV switch controls the PV connection and solar charging.

3.5 AC (EPS) output and AC (grid) input

There are four AC output sockets in the top-right corner of the unit behind the door, which can be used to power your devices. Each socket can provide up to 2000W of output (230V@50Hz), and all 4 sockets combined can provide up to 5000W of total output. The round GRID connector is used for charging from mains at up to 5000W. The lower-right AC input port AC IN is used for charging from mains at up to 2000W.

4 Display panel interface

If the main switch of the unit is turned on, the display will show the standby screen below.

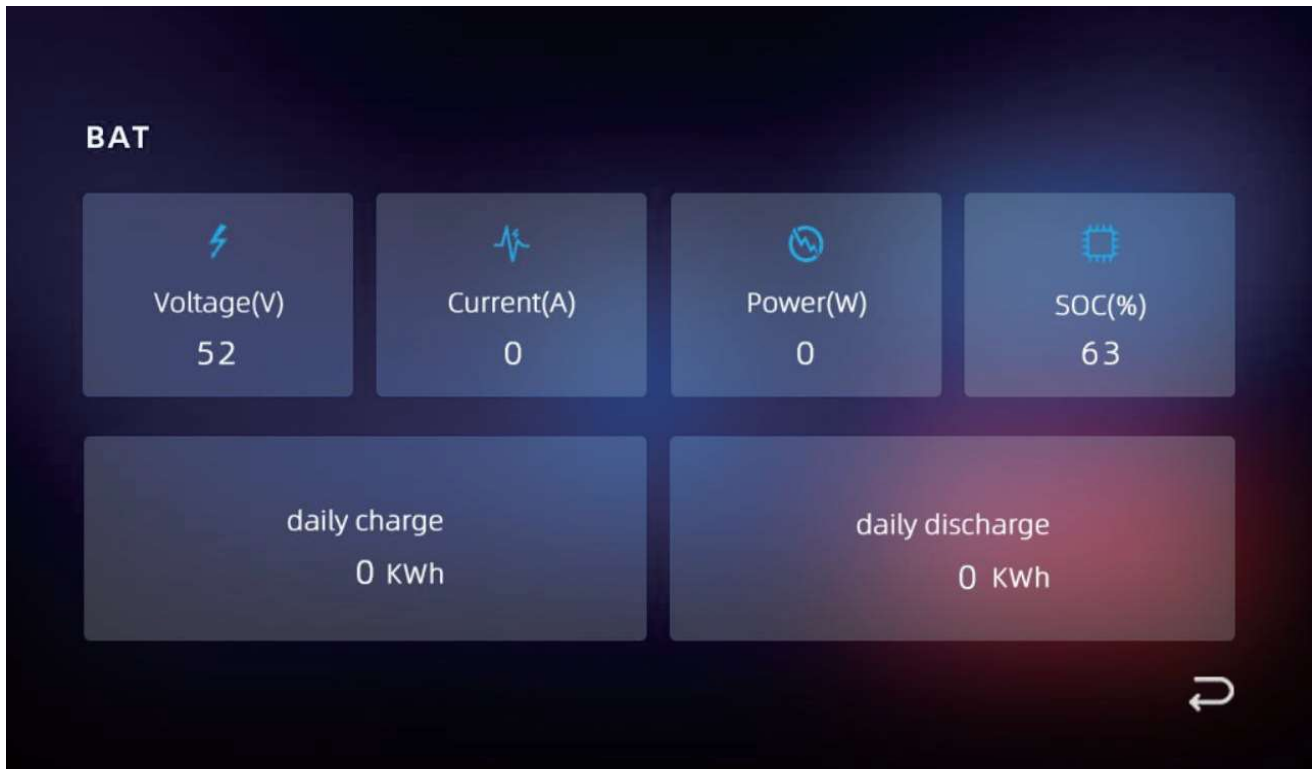


Touch any part of the screen to navigate to the homepage. On this page, all power data and the battery's state of charge can be monitored. WiFi connection settings can be configured in the Settings menu.



Section	Description
SOC Power	Battery state of charge and capacity information
Solar (PV)	Solar charging information when PV is working
AC IN	Grid information when the mains power is connected
AC OUT	Load information when the unit is working in the battery mode
Settings	Settings and WiFi configuration

SOC page for battery info.



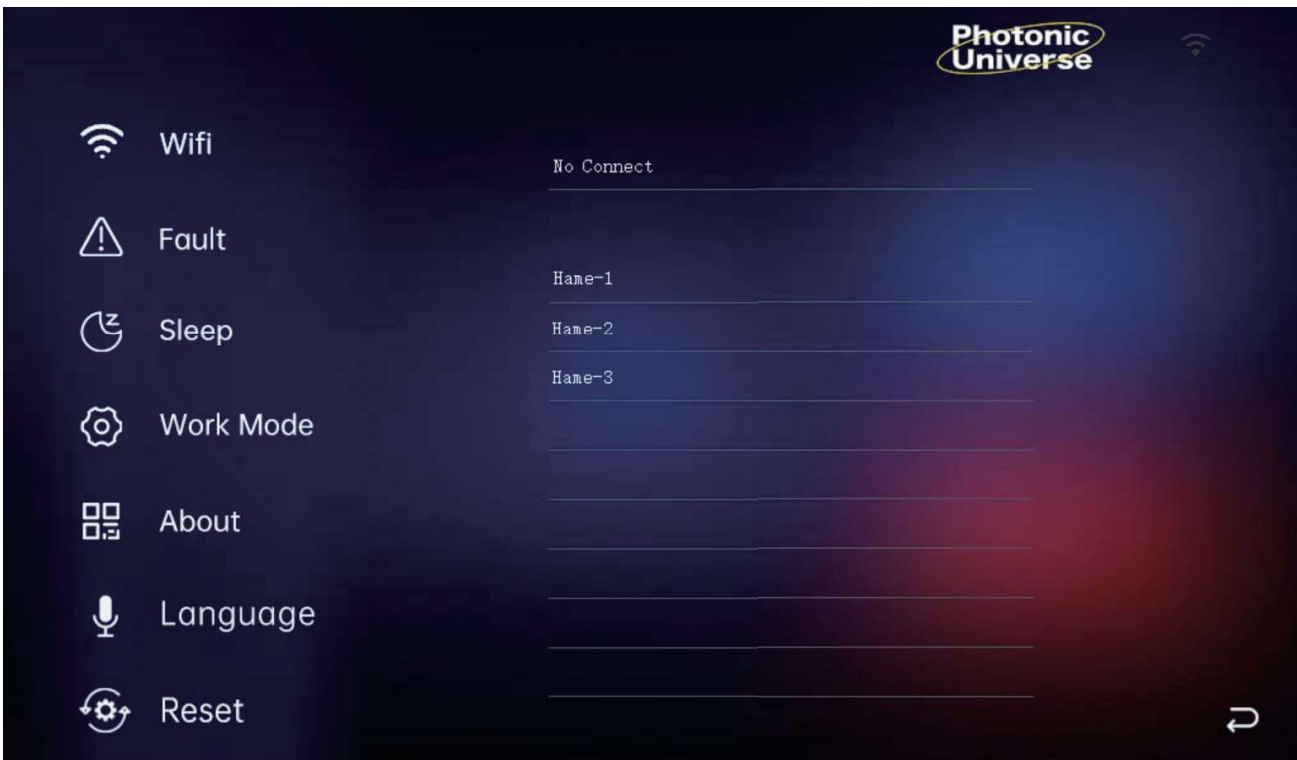
PV page for Solar info



Load page info



Touch settings menu to set Wifi.



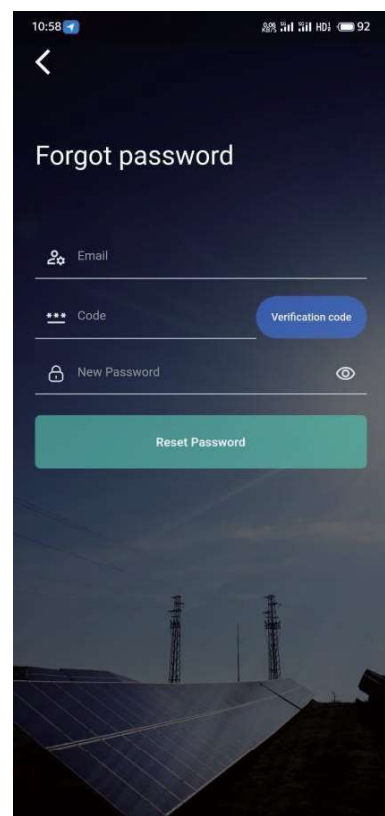
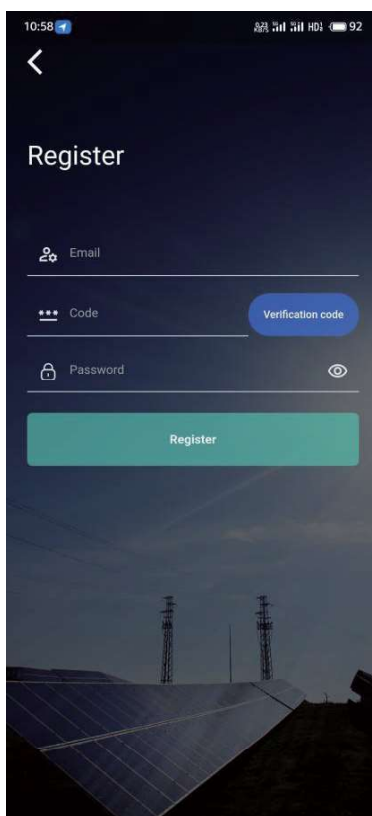
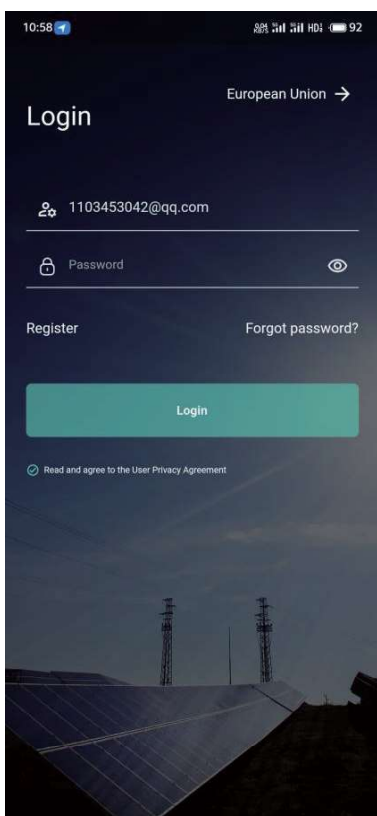
5 APP remote control by Power Zero

5.1 Download the app and register your account

Download the Power Zero app from Google Play or the App Store and install it on your smartphone or tablet. Tap "Register" to set up your account and enter your email address. You will then receive a security code to confirm your email. Enter the code in the app interface to verify your email and set your password.

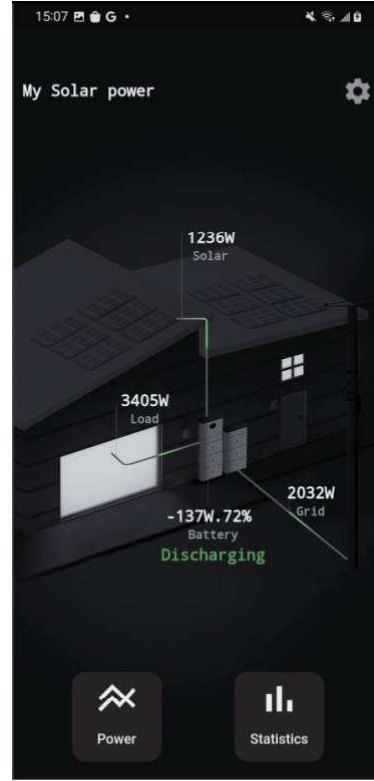
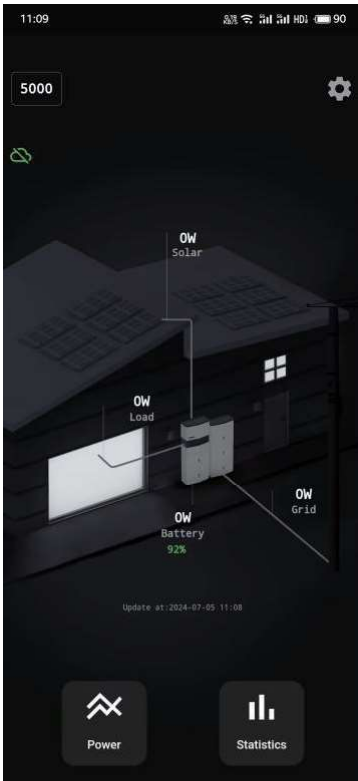
5.2 Log in to Power Zero

Input your email and password to log in. If you forget your password, tap "Forgot Password" and reset it by following the instructions.

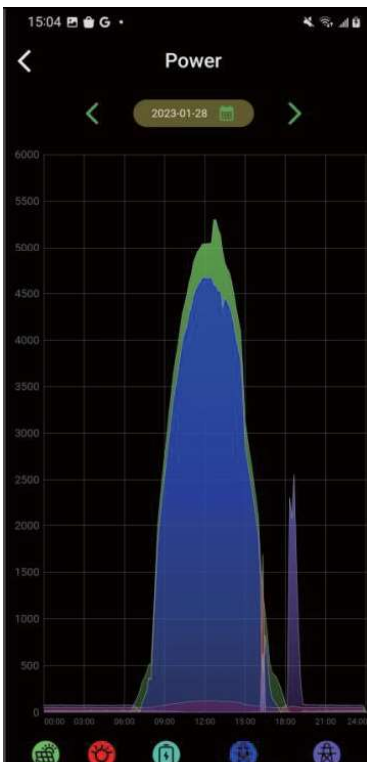


5.3 Remote control on Power Zero


After you log in successfully, tap "Add Device" to navigate to the Device Management page. Tap the "+" icon in the top-left corner to add a new device, and scan the QR code found in the "About" section of the Settings menu on the display of your P5000M portable power generator. Select a name for your device that you want to appear on the app homepage.

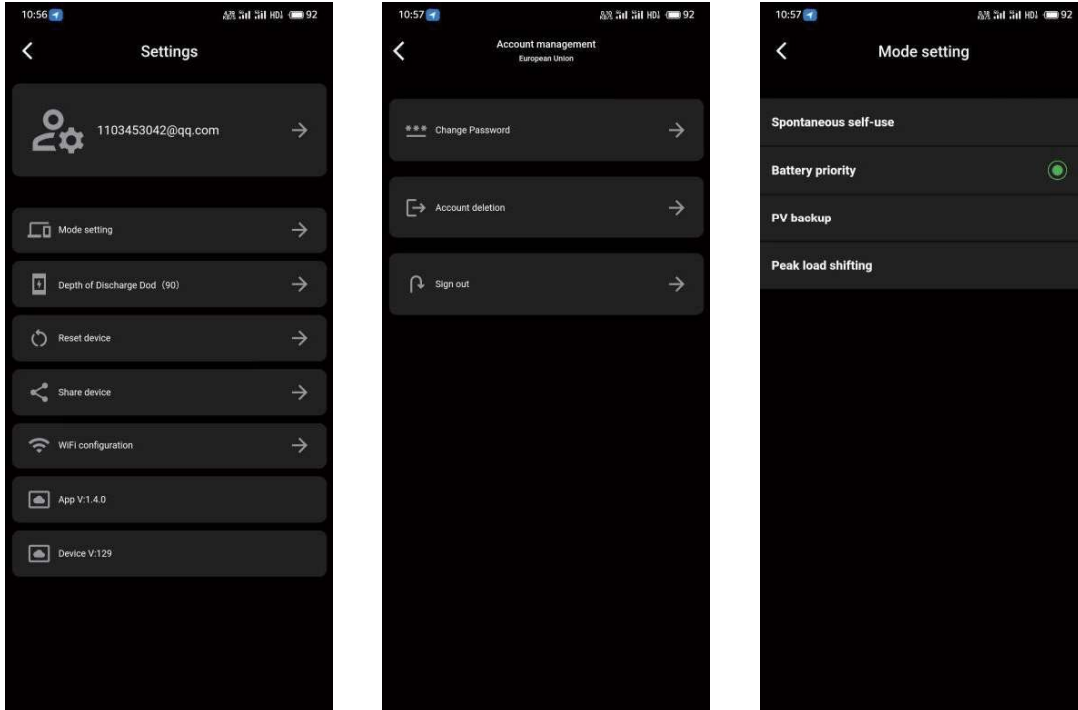


Tap the "Power" and "Statistics" buttons to view the current data and system status, or the historical data. The Statistics page displays data by month, year, or as cumulative totals.



5.4 Personal settings

Touch the Settings icon  in the top-right corner of the homepage to access the Settings menu. In this menu, you can update your password, choose the working mode, review the "About" page, check the app and device information, and more.



6 Fault diagnosis and solutions

If you encounter any of the following problems, refer to the solutions provided below, and contact your local distributor if the problem persists. The following table lists common issues that may occur during operation, along with their corresponding solutions.

Fault diagnosis table

Content	Cause	Solutions
Over Load	The load power exceeds the maximum limit of the power generator, or the output port has a short circuit.	(1) Check if the load complies with the unit's maximum power rating. (2) Turn off the power and shut down the unit; disconnect the load, and restart the unit. Then check if the unit still displays the Over Load fault (with the actual load disconnected), or if the fault has been resolved.

Bat Disconnect	The battery is disconnected from the internal inverter.	(1) Turn off and disconnect the PV input and the grid input. (2) Turn the main switch of the unit off, wait for 5 minutes and turn it on (with no PV or grid connected). Check if the error message has been cleared.
Bat Under Vol	The battery charge is too low, and the protection system is preventing further discharge.	Charge the battery as soon as possible from the grid or solar power. Do not leave the unit in this condition for an extended period to avoid damage or servicing (not covered under the warranty).
Bat Low vol	The battery voltage is lower than the normal working voltage.	Charge the battery as soon as possible from the grid or solar power. Do not leave the unit in this condition for an extended period to avoid damage or servicing (not covered under the warranty).
Bus over vol	(1) The PV input voltage exceeds the supported MPPT range (2) The load port (OUT) and the grid port (IN) have been connected in reverse, with load connected to the IN port and vice versa.	(1) Check whether PV input voltage is within the MPPT voltage range. (2) Power down the unit, disconnect the load and grid connectors, wait for 5 minutes and turn the unit on again to check if the error message has been cleared.
BMS comm.fail	Communication failure between the battery and the internal inverter.	(1) Turn off and disconnect the PV input and the grid input. (2) Turn the main switch of the unit off, wait for 5 minutes and turn it on (with no PV or grid connected). Check if the error message has been cleared.
Fan fault	Poor internal contact of the fan.	Turn off the unit, wait for 5 minutes and turn it on again.

Note: If an error occurs that is not included in this table, please contact your supplier or distributor.

7 Storage and maintenance

- Professionally trained personnel are required to install and maintain the equipment.
- Before operation, read the manual carefully to understand the correct use and maintenance methods. Retain it for future reference.
- Disconnect all electrical connections before installing or repairing the equipment.
- Do not open the device cover without authorisation. If you accidentally come into contact with the electrolyte, wash the affected area immediately with water and seek medical attention.
- The portable power generator must not be placed in or close to a fire or source of heat to avoid overheating, explosion and risks to personal safety.
- The connections, cables and plugs between the unit and other components can never be disconnected while they are live, due to the risk of electric shock. Dangerous voltage exists at various terminals. Ensure all power is turned off before disconnection. Measure the voltage prior to that if necessary.
- Portable power generators may pose a hazard of electric shock and high short-circuit currents. Remove watches, rings, and other metal accessories when handling the unit. Always use properly insulated tools for protection.
- Do not short any terminals to avoid sparks, fire or an explosion.
- Handle the portable generator unit gently to avoid physical damage.
- In case of fire, use a dry-powder fire extinguisher. Do not use a liquid fire extinguisher, as it carries a risk of electric shock.
- Keep all fireworks and flammable materials at least 3 meters away from the battery pack.
- If the product is not used for a long time, it should be recharged every three months. Before storing the product, discharge or recharge the battery to 50%, and store it in a cool, dry place. Check the charge level every three months, and if there is any reduction, recharge it to 50%. Never keep the product in long-term storage fully charged to 100%.
- The product should be stored in a dry, well-ventilated location at room temperature, away from sources of liquids, heat, direct sunlight, or electromagnetic exposure.

