

UPS (Uninterruptible Power Supply)

User Manual



Usage Notice

In order to protect your legitimate rights and interests, please be sure to read our operating procedures and safety instructions carefully before using this product, and please operate the product in accordance with the operating procedures and safety instructions provided in this manual.

Once you start using this product, you are considered to have read, understood, approved and accepted all the terms and contents of the operating procedures and safety instructions of this product, and the user promises to be responsible for his actions and all consequences arising therefrom. The user promises to use this product for legitimate purposes, and agrees to these terms and the relevant policies or guidelines of the country where they are located.

In the process of using this product, please be sure to strictly abide by and implement the requirements including but not limited to operating procedures and safety instructions. For all personal injuries, accidents, property losses, legal disputes, and other adverse events that cause conflicts of interest caused by violations of the use behaviors prompted by safety instructions or irresistible factors, the user shall bear the relevant responsibilities and losses, and the company will not assume any responsibility.

All rights reserved. Contents are subject to change without notice.

	Attention ! Failure to follow the warnings in this manual could result in personal injury.
	Risk of high voltage and electric shock !
	Ref operating instructions.
	Please perform the installation operation 5 minutes after the inverter is turned off and disconnected to ensure safety,otherwise there will be a risk of electric shock.
	Be careful of surface temperature to prevent burns!
	Protective grounding

Installation risk notice

 Warning	When carrying equipment by hand,wear protective gloves to prevent sharp objects from being cut.
 Attention	Before connecting the cables,verify that the cable labels are correct.
 Dangerous	Construction operations on high-voltage lines may cause fire or electric shock.The erection and routing of AC cables must comply with the local regulations and specifications.

Please carry out construction in accordance with relevant construction safety regulations and standards to avoid safety accidents.

The personnel responsible for the installation of this product must undergo strict training and master the correct installation method of the system and various safety precautions before performing various operations on the product.

The installation site should choose a well-ventilated location and should keep a safe distance from the surrounding fire and explosive facilities and underground pipelines. The installation location should be far away from open flames, high temperature, dust and corrosive environments. The protection level of the selected product shell should be compatible with the installation environment.

The cables, terminals and other components selected for installation should meet the current requirements. Before and after installation, ensure that all connections related to the charging equipment are fastened, well insulated, connected correctly, and free from wear and tear, or risk of extrusion damage, otherwise there is a risk of fire and electric shock; Before powering on, please make sure that the system is well grounded to avoid electric shock accidents.

If the parts are damaged during installation, they should be repaired and replaced in time to avoid using them with damages.

Operation and maintenance risk notification

 Dangerous	There are dangerous voltages in the equipment when the system is running, non-professionals must not operate and maintain.
 Dangerous	When performing maintenance such as system, cleaning electrical connection and grounding reliability, perform system power-off operations, otherwise there is a risk of electric shock or fire.

Equipment operation and maintenance must comply with electrical safety operating regulations, otherwise there is a risk of electric shock or fire;

The personnel responsible for the operation and maintenance of this product must have high-voltage, alternating current and other work qualifications, and must undergo strict training to master the correct operation method of the system and various safety precautions before performing various operations on the equipment, otherwise there may be a risk of electric shock.

It is forbidden to carry out operation and maintenance when the system is not powered off, otherwise electric shock may occur; it is strictly forbidden to wear conductive objects such as watches, bracelets, bracelets, and rings on the wrist during operation; it is not allowed to disassemble or modify the product and wiring without authorization, otherwise it may cause fire, electric shock accident.

There should be no flammable and combustible materials around the product, and the operation and maintenance personnel should clean it up in time, otherwise there will be a risk of fire.

Use risk notification

It is strictly forbidden to use the system under the condition of equipment failure, and do not operate without authorization when the system is abnormal;

Operate in strict accordance with the operating procedures and prompts in this manual, and must abide by industry safety regulations, otherwise there will be risks of electric shock and fire;

In case of accidents such as fire and water immersion, it is strictly forbidden to get close to the product, and contact the operation and maintenance personnel in time to deal with it.

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1. Overview

The Power Stream 8 integrated photovoltaic and energy storage system (hereinafter referred to as the PS integrated system) is a photovoltaic and energy storage product capable of achieving photovoltaic power generation, power storage, and AC terminal grid connection applications. This chapter will describe the composition, working principle, and working modes of the PS integrated system.

1.1 Model description

The PS series is a new type of photovoltaic energy storage integrated machine that combines photovoltaic energy storage, grid charging and storage lithium batteries, with AC sine wave output. It adopts DSP control and, through advanced control algorithms, features high response speed, reliability and industrial standards.

1.2 Optical storage module composition and working principle

The product consists of power unit (battery charge and discharge circuit, photovoltaic buck-boost circuit, inverter circuit, auxiliary power supply, filter circuit), control unit, monitoring unit, communication unit, connection components, lithium battery protection system, lithium iron phosphate battery, etc. Composition.

Products are usually used in photovoltaic energy storage systems. The system mainly includes photovoltaic arrays, batteries, photovoltaic energy storage converters, local loads, and power grids. Through energy management, photovoltaic array power generation is connected to the grid, and photovoltaic array power generation supplies power for local loads. Five core functions: battery charging, photovoltaic array + battery powering local loads, grid charging batteries, multi-dimensional, maximum guarantee of photovoltaic power generation efficiency, reliability of local load power supply, long battery life and other key indicators.

Typical photovoltaic energy storage schematic diagram is as follows:

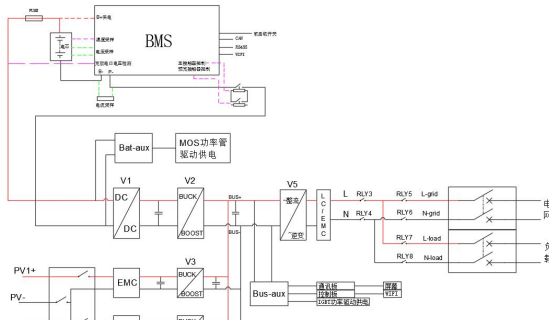


Figure 1-1 Optical storage module topology

2. Installation

This chapter describes the mechanical installation and electrical connection of the product.

2.1 Safety regulations

There is a danger of high voltage inside the product. In order to ensure personal safety, the following regulations should be observed:

Only operation and maintenance personnel who have received product training and have sufficient relevant knowledge are allowed to install this product. During the installation process, the safety precautions in this manual and local safety regulations should be followed;

It is not allowed to operate and maintain the product in thunderstorm weather or relatively humid conditions to avoid electric shock; if it is necessary to disassemble the product case, ensure that the system is completely powered off.

2.2 Installation Preparation

2.2.1 Unboxing inspection

After the goods arrive at the installation site, the packing box is allowed to be unpacked for inspection.

The inspection is carried out jointly by the user's representative and the supplier's representative. Unpack the package, take out the packing list, and check the packing accessories according to the list.

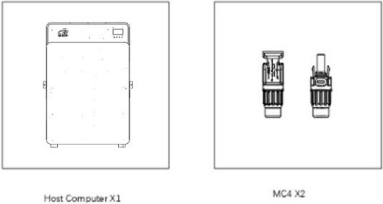


Figure 2-1

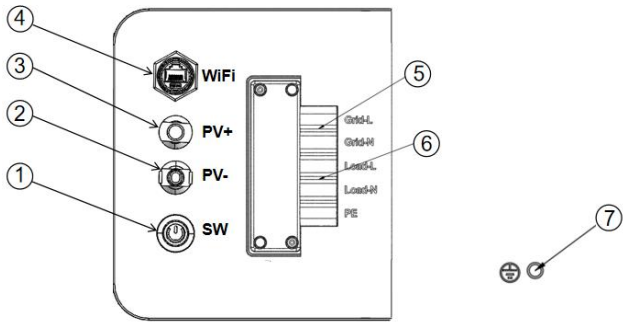


Figure 2-2 Interface definition of optical storage all-in-one system

①Equipment switch	②③Photovoltaic interface
④WiFi	⑤Power grid interface
⑥Load interface	⑦Grounding interface

2.2.2 Installation requirements

(1).Ground installation

- 1)Ensure that the installation ground has good flatness and slope < 10°;
- 2)Ensure that the installation ground is firm and meet the load-bearing requirements for installing this product (250kg);
- 3)Choose the installation location should avoid direct sunlight.

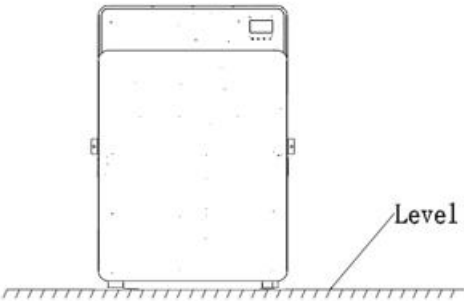


Figure 2-3 Ground level requirements

(2). Installation space requirements

For the installation position of the product, 300mm of maintenance and heat dissipation space are reserved on the left, right and front.

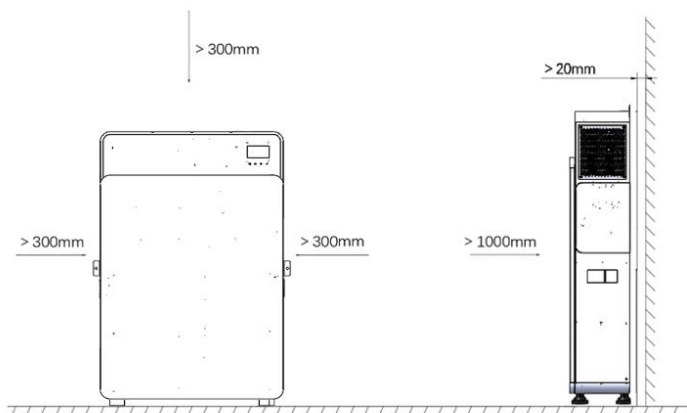


Figure 2-4 Installation distance requirements

2.3 Installation

2.3.1 Installation Guide

Step 1 :Lift the device with two hands to the wall where cables are connected, as shown in Figure 2-5.

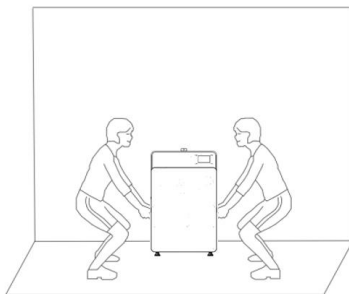


Figure 2-5

Step 2:Connect the external AC cables to the internal AC load cables of the home distribution box and route the cables through the cable collector to the cable outlet jacket of the all in one system.

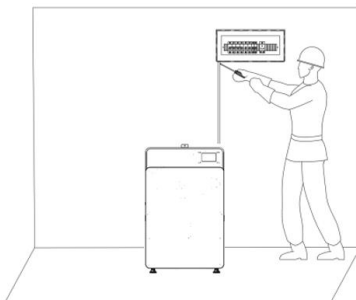


Figure 2-6

Step 3 :If the home distribution box does not have a ground cable, you can use an external ground cable hole to ensure the safety of electricity !

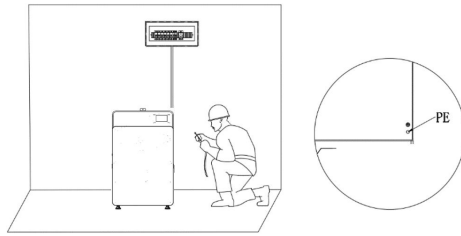


Figure 2-7

2.3.2 Electrical connection

Electrical connection diagram of optical storage module

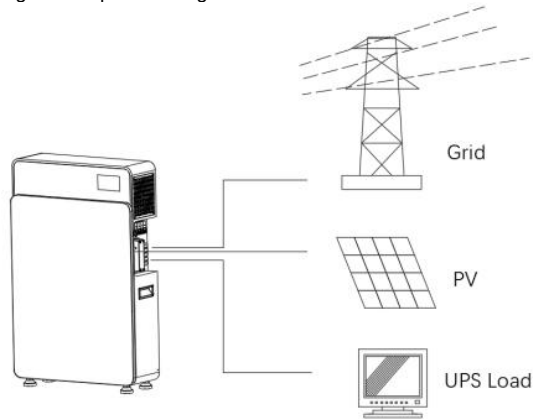


Figure 2-8



- 1) Place all switches in the off position before electrical connection;
- 2) Installation of AC and DC input cables can only be performed by professionals.

2.3.3 Connecting PV Cables



Do not reverse or mix the positive DC terminals (PV1+) and negative DC terminals (PV1-). Otherwise, the normal operation of the product may be affected, and even the product may be damaged. The length of the external cable between the PV side and the battery side is less than 30m.

The positive and negative terminals of the PV array cannot be connected to the ground. Ensure that the insulation impedance of the PV array is greater than 33.3k. If the insulation impedance is lower than this value, electric shock may occur.

Step 1: Use a multimeter to measure the PV side voltage and ensure that the polarity is correct and the open circuit voltage does not exceed 580V.

Step 2: Use a multimeter to measure battery side voltage and verify correct polarity, make sure open circuit voltage is less than 60V.



Figure 2-9 PV polarity check

Step 3: Connect the positive and negative terminals to the corresponding connectors.

Step 4: Arranging PV cables through the cable hole.

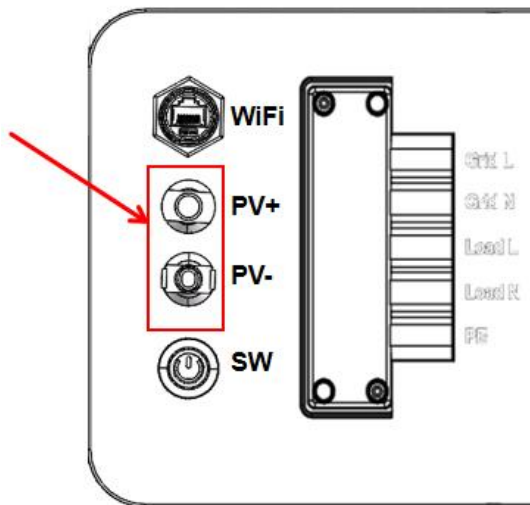


Figure 2-10 PV terminal connection

2.3.4 Connect other Cables



Caution

The PE line should be connected reliably, otherwise it will affect the normal operation of the product, or even cause serious consequences such as product damage; ground the PE grounding terminal in the AC connector and the chassis grounding point at the same time;

Do not connect the PV side terminal and battery side terminal, PV input cable and battery input cable reversely! Otherwise, it will affect the normal operation of the product;

Do not reverse the AC Load connector and AC Grid connector, AC Load cable and AC Grid cable! Otherwise it will affect the normal operation of the product.

Step 1: Measure the grid voltage with a multi-meter to ensure that the grid voltage is lower than the upper limit voltage required by all national grid standards.

Step 2: Tighten and connect the power grid, load, and positive/negative PE cables at the terminal block.

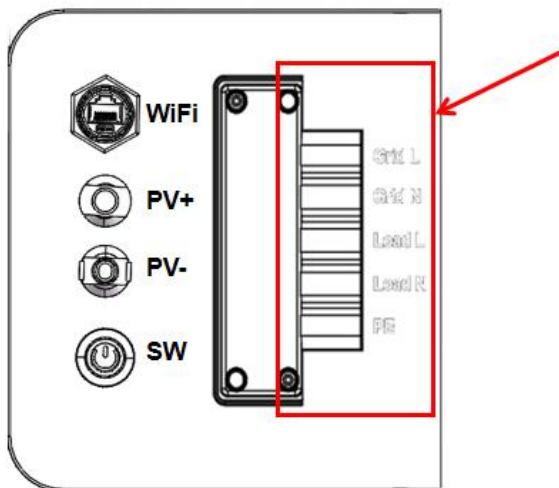


Figure 2-11 AC terminal block connection

Note: Do not connect load side connector and grid side connector in reverse.

Step 3: Grounding interface PE Installation

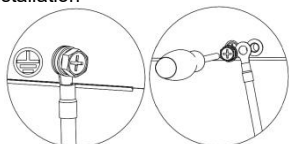


Figure 2-12 PE grounding connection

2.4 Installation inspection

After the product is installed, please be sure to check it according to the following table !

Table 2-1 Installation checklist

Inspect item	No	Check content
Installation	1	Check whether the product installation is vertical and stable
	2	Check whether all the screws are tightened(Especially pay attention to the electrical connection part),whether the flat washers and spray washers are aligned complete,whether it is reversed,etc
	3	Check whether the reserved distance under the product meets the requirement
	4	Check whether the accessories are complete and whether the cables are intact and undamaged
Electrical connections	1	Check whether the positive and negative poles of the PV side cables are correct
	2	Confirm that the switch of PV is in the "off" position

	3	Check whether the position of the load side connector and grid side connector is correct
	4	Check whether the chassis grounding is reliable
	5	Check all the connectors are securely connected
	6	Check whether the cable model and specification are correct
	7	Check that all cables are securely connected
	8	Check whether the color of the AC line is standardize and whether the safety signs are complete
	9	Check whether the cables are tidy and whether the binding conforms to the technical specifications

3. System debugging

This chapter describes the commissioning work after the photovoltaic energy storage system is installed. During debugging, the corresponding safety regulations must be observed.



During system commissioning, contact operation and maintenance personnel to complete system commissioning;

Please remove the ring, watch and other metal objects that may cause short circuit;

Pay attention to high voltage hazards during operation to avoid personal injury and property damage;

The system must be properly grounded, and the installation must be checked before commissioning;

Please strictly check before debugging according to Table 3-1

Table 3-1 Pre commissioning checklist

Inspection sequence	Inspection content	Inspection Standard	Note
1	Check that the DC circuit breaker is off	Switch off	PV 、BAT
2	Check whether the PV switch is in the off position	Switch off	PV
3	Use a multi-meter to measure the PV voltage at the PV switch to ensure that the voltage is not more than 600V		
4	Use a multi-meter to measure the BAT input switch voltage, ensure that the voltage is not more than 60V		
5	Check to ensure that the air switch at the AC terminal is disconnected	Switch off	Grid 、Load

7	Check that the battery communication connection is normal	Normal	Battery BMS
8	Check to make sure the grid/load are normal	Normal	Grid 、 Load

4. Product maintenance

This chapter describes routine maintenance and troubleshooting.



Danger

1. Safety regulations must be observed during product maintenance.
2. The operation must be carried out by trained professionals with electrical knowledge.
3. During maintenance of system cleaning, electrical connection, grounding reliability, etc., perform system power down operation and power down steps.
4. Disconnect the switches in sequence.
5. PV side switch.
6. battery side switch.
7. PV side switch of optical storage module.
8. AC side switch.
9. Load side switch.

4.1 Routine maintenance

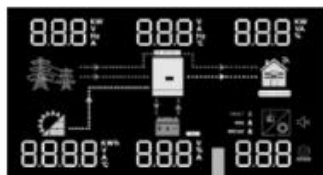
Table 4-1

Inspection content	Inspection method	Maintenance period
System cleaning	Regularly check whether the radiator is covered and dirty	Once every six months to one year
System operation status	1. Observe whether the inverter appearance is damaged or deformed. 2. Listen for abnormal sounds during the running of the inverter. 3. When the inverter is running, check whether all parameters of the inverter are set correctly.	Once every six months
Electrical connection	1. Check whether the cable connection is loose. 2. Check whether the cable is damaged, especially the cable. 3. Any signs of cuts on the epidermis in contact with the metal surface.	Half a year after the first commissioning, and then once every half a year to a year.
Grounding reliability	Check whether the ground cable is grounded reliably	Half a year after the first commissioning, and then once every half a year to a year.

4.2 Troubleshooting

Table 4-2 Troubleshooting

Fault name	Possible fault causes	processing method
PV Over voltage	The PV voltage is higher than the maximum DC voltage limit	Check PV configuration and reduce PV open circuit voltage
PV Under voltage	PV voltage below minimum DC voltage limit	Check PV configuration and increase PV open circuit voltage
Battery over voltage	The battery voltage is higher than the maximum DC voltage limit	Check the energy storage battery configuration and reduce the output voltage of the energy storage battery pack
Battery under voltage	The battery voltage is below the minimum DC voltage limit	Check the energy storage battery configuration and increase the output voltage of the energy storage battery pack
BMS communication abnormality	Communication failure between battery and optical storage module	Check whether the connection with the battery BMS is normal
High grid voltage	The grid voltage is higher than the upper limit of the allowable grid voltage range	Check the power grid, and restart after the grid voltage is restored to the allowable range
Low grid voltage	The grid voltage is lower than the lower limit of the allowable grid voltage range	Check the power grid, and restart after the grid voltage is restored to the allowable range
High grid frequency	The grid frequency is higher than the upper limit of the allowable grid frequency range	Check the power grid, and the power grid can be operated again after the frequency is restored to the allowable range
Low grid frequency	The grid frequency is lower than the lower limit of the allowable grid frequency range	Check the power grid, and the power grid can be operated again after the frequency is restored to the allowable range
Abnormal phase sequence of power grid	1.Wiring phase sequence error; 2.Abnormal power grid voltage phase.	1.Check the wiring phase sequence; 2.Check the power grid and restart after the phase sequence is normal.
Reverse connection of battery	The positive and negative electrodes of the battery are inversely connected	Check the wiring and run again after it is normal
Environmental over temperature	The internal temperature is higher than the allowable value	Check whether the product installation location is covered by foreign matters or whether the ambient temperature of the product installation location exceeds the upper limit of the product operating temperature.



Function keys

LCD display

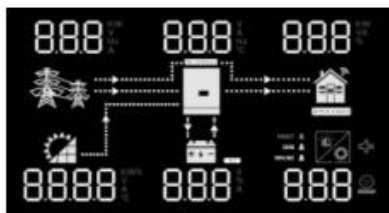
LED Indicator

LED Indicator			Messages
INV/AC	Green	Solid On	Output is powered by utility in Line mode.
		Flashing	Output is powered by battery or PV in battery mode.
CHG	Green	Solid On	Battery is fully charged.
		Flashing	Battery is charging.
FAULT	Red	Solid On	Fault occurs in the inverter.
		Flashing	Warning condition occurs in the inverter.

Function keys

Function key	Description
ESC	To exit setting mode
UP	To go to previous selection
DOWN	To go to next selection
ENTER	To confirm the selection in setting mode or enter setting mode

5.3 LCD Display Icons



Icon	Function description
Input source Information	
	Indicates the AC input.
	Indicates the PV input
	Indicate input voltage, input frequency, PV voltage, charger current, charger power, battery voltage.

Configuration Program and Fault Information	
	Indicates the setting programs.
	Indicates the warning and fault codes. Warning: 88B3 flashing with warning code. Fault: 888 lighting with fault code
Output Information	
	Indicate output voltage, output frequency, load percent, load in VA, load in Watt and discharging current.
Battery Information	
	
Load Information	
	Indicates overload.
Mode Operation Information	
	Indicates unit connects to the mains.
	Indicates unit connects to the PV panel.
	Indicates load is supplied by utility power.
	Indicates the utility charger circuit is working.
	Indicates the DC/AC inverter circuit is working.
Mute Operation	
	Indicates unit alarm is disabled.

6. Technical Parameter

Table 5-1 Technical parameter

Description	4 kW all-in-one hybrid power station with 8kWh LFP battery
AC Output	
Rated Output Power	4 kW, single – phase
Nominal Output Voltage	220 / 230 / 240 Vac
Output Voltage Range	220 / 230 / 240 Vac $\pm$ 5%
Output Frequency	50 / 60 Hz $\pm$ 0.1% (pure sine wave)
Nominal Output Current	17.4 A
Peak / Cverload Power	4.0 kVA (Unit shuts down under sustained overload to protect internal components.)
Transfer Time	<10ms (utility / inverter)
Total Harmonic Distortion (THD)	<3%
Max. Conversion Efficiency (Battery $\rightarrow$ AC)	98%
AC Lnpnt (Bypass / Charging)	
Input Sources	L + N + PE (single-phase 1-wire)
Rated Input Voltage	220 / 230 / 240Vac
Input Voltage Range	90 – 280 Vac $\pm$ 3 V (Appliance mode) / 170 – 280 Vac $\pm$ 3 V (UPS mode)
Input Frequency Range	50 / 60 Hz (auto adaptive)
Max. AC Charging Power	3,000 W (typical, AC charging)
PV Lnpnt (MPPT)	
PV Charging Mode	MPPT
Max. PV Input Power	6,200 W
Max. PV Input Voltage	500 Vdc
Max. PV Input Current	22 A
MPPT Tracking Range	60–450 Vdc
Battery	
Battery Type	LiFePO ₄ (LFP), built-in pack with smart BMS
Nominal Battery Voltage	25.6 Vdc
Nominal Capacity	314 Ah
Rated Energy	8.04 kWh
General	
Phase	1-phase in / 1-phase out
Installation	Floor – standing, wall – adjacent installation
Protection Degree	IP20, indoor use only
Discharge Operating Temperature	-10 to 70°C
Charge Operating Temperature	-20 to 70°C
Operating Humidity	0 – 95% RH (non-condensing)
Cooling	Forced air (internal fan)
Dimensions (W × D × H)	550 × 180 × 800 mm
Weight	82 kg
Design Cycle Life	8,000 cycles (@25 $\pm$ 2 °C, 0.5C / 0.5C, 80% DoD)
Warranty	3-year warranty (battery and inverter)
Communication Ports	RS-485 (upper computer / BMS), optional Wi-Fi module
Certificates	CE / RoHS / SAA / FCC / PSE

Notes 1: “ ” South African Grid Connection Standard 4600w

Notice2: This system has the function of self-locking diagnosis: when BMS detects the battery deviation from the baseline, it will carry out self-locking protection. After the system self-locking protection, the operator needs to check the maintenance manual or operation manual for manual physical intervention (including but not limited to repress Rest keys or manually intervene air switch and other devices for recovery).