Energy Storage System User Manual

OHL-261 125KW/261kWh

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IMPORTANT NOTES

- This product contains battery type "Secondary" (rechargeable).
- Electrical and electronic equipment that has become waste is known as old equipment/device. Old devices must not be disposed of with other household waste.
- Owners of old devices at the end of its service life must return the device by taking them to the collection points set up by public waste disposal authorities or distributors. This return does not entail any costs for you.
- Owners of old devices have an obligation to remove accessible batteries / rechargeable batteries as well as non-destructively removable lamps from the old device prior to return. This does not apply if old devices are being prepared for reuse with the participation of a public law firm.
- Battery removal warning: The battery contained in this product must be removed only by professional personnel only. The battery must never be removed by the end user, if not removed correctly it could damage the battery which could cause fire.
- Batteries removed from an old electronic device should be disposed of separately. This return of battery does not entail any costs for you and the user is obliged to return the battery.
- Please make sure that this product is not powered on when removing the battery. Fire hazard! Avoid short-circuiting the contacts of a detached battery. Do not incinerate the battery. Please handle the battery with Caution!
- If electrical appliances or batteries are disposed of in landfills or dumps, hazardous substances can leak into the groundwater and get into the food chain, damaging your health and well-being.

- The symbol of "Crossed rubbish bins "indicates that this product should not be disposed of with other household wastes and must be collected separately from unsorted municipal waste at the end of its service life.

Label for Waste Electrical and Electronic Equipment (WEEE) Directive (2012/19/EU)

Warning electric shock.

1. Important information in the manual

1.1 Scope

Summaries

Thank you for choosing the energy storage system product!

This document gives a description of the energy storage system OHL-261 125kW/261kWh , including the features, performance, appearance, structure, working principles, installation, operation and maintenance. etc.

Please save the manual after reading, in order to consult in the future.

NOTE

The figures in this manual are just for illustration, details please take the actual product as standard.

Target Group

* User
* Technical support engineer
* Installation engineer
* Debugging engineer
* Maintenance engineer

Suitable Model

* OHL-261 125KW/261kWh

Symbol Conventions

The manual quotes the safety symbols, these symbols used to prompt users to comply with safety matters during installation, operation and maintenance. Safety symbol meaning as follows.

Symbol	Description
DANGER	Alerts you to a high risk hazard that will, if not avoided, result in serious injury or death.
WARNING	Alerts you to a medium low risk hazard that could, if not avoided, result in moderate or minor injury.
CAUTION	Alerts you to a low risk hazard that could, if not avoided, result in minor injury.
	Anti-static prompting.
	Be care electric shock prompting.
TIP	Provides a tip that may help you solve a problem or save time.
NOTE	Provides additional information to emphasize or supplement important points in the main text.

Change History

Record the content of each document update. The latest version contains the updates of all previous document versions.

Issue 01 (2025-08-29)

First issue.

1.2 Safety Description

This chapter mainly introduces the safety announcements. Prior to performing any work on the device, please read the user manual carefully, follow the operation and installation instructions and observe all danger, warning and safety information.

1.2.1 Safety Announcements

⚠ CAUTION

Before operation, please read the announcements and operation instructions in this section carefully to avoid accident.

The promptings in the user manual, such as "Danger", "Warning", "Caution", etc. don't include all safety announcements. They are just only the supplement ofsafety announcements when operation.

NOTE

Any device damage caused by violating the general safety operation requirements or safety standards of design, production, and usage will be out of Kehua's guarantee range.

1.2.1.1 Safety Announcements

⚠ DANGER

Damaged device or device fault may cause electric shock or fire!

* Before operation, please check if the device is damaged or has other danger.
* Check if the external device or circuit connection is safe.

⚠ DANGER

Don't touch terminals or conductors that connected with grid to avoid lethal risk!

⚠ WARNING

Please do not put finger or tool into the rotating fans to avoid human injury or device damage.

⚠ CAUTION

The product is grade A device. If the product is used in residential area, it may cause wireless interference. User should take actions to avoid the interference.

1.2.1.2 Symbol Illustration

WARNING

The warning labels on the energy storage system and in the cabinet include the important information related to the device safe operation. DO NOT tear them up.

The illustration for the labels of energy storage system is as shown inTable1-1.

Table1-1 Symbol illustration

Symbol	Illustration
	Observe the user manual.
	There is dangerous voltage which may endanger human safety, be care of electric shock.
	After powering down, please wait for 10min to make the device discharge completely.
	Do not dispose the device together with the household waste but in accordance with the disposal regulations for electronic waste applicable at the installation site.
	Pay attention to safety
	External grounding mark. It needs to be connected with grounding to keep the operator safe.
	Beware of hot surface. While operating, the temperature of air outlet maybe high, do not touch the air outlet louver to avoid scald.
	Take precautions against noise. Please wear the hearing protection equipment.

1.2.1.3 Battery Use Announcements

Lethal high voltage exists in the negative and positive of energy storage batteries, touching by accident will cause electric shock even endanger human safety.

When maintaining the device, make sure that the connection between the PCS and energy storage battery has been disconnected completely. And set warning mark in the disconnected position to avoid reconnecting by accident.

There is lethal high voltage between the positive and negative poles of batteries, DO NOT short circuit the positive and negative poles, once short circuit, the battery will generate large current and release a large number of energy, even cause battery thermal runaway, firing or explosion. To avoid battery circuit, DO NOT maintenance the battery with electricity.

DO NOT place the battery under the environment where with high temperature or heating device, such as resistance furnace, boiler etc. Battery over-temperature is easy to cause leakage, smoking, releasing flammable gas, thermal runaway, firing or explosion.

DO NOT dismantle, transform or damage the battery (such as impale the battery with sharp object, crush with dead weight or water logged, falling off, collision, etc.) to avoid causing electrolyte leakage, smoking, release flammable gas, thermal runaway, firing or explosion.

DO NOT use the battery modules with different type together.

The battery electrolyte is toxic and with volatility. When the electrolyte is spilled or with abnormal gas, please avoid touching the spilled electrolyte or gas. DO NOT approach unless professionals. Please contact the professionals immediately to deal with it.

DANGER

The gas generated from burning battery is harmful to eyes, skin and throat, please attention to the protection.

WARNING

Before installing the energy storage system, please configure the fire-fighting device according to the construction standards, such as fire-fighting sands, carbon dioxide extinguisher, etc. Before commissioning, ensure that the fire-fighting device has satisfied the requirements of local laws and regulations.

WARNING

Fasten the screws of copper bars and cables by specified moment of force, and check the screws' condition regularly. The false connection of the screws will cause the connection voltage drop to be too large, and even a large amount of heat will burn the battery when the current is large.

NOTE

When first startup, if the battery temperature is too low, SOC saltation may occur at the end of charge and discharge. The phenomenon is normal and not affect the normal operation. We suggest that keep the battery's temperature return to above 15℃ as far as possible and then start to discharge.

1.2.1.4 Grounding Requirements

WARNING

High leakage risk! Device must be grounded before performing electrical connection. The grounding terminal must be connected to ground.

* When installing, the device must be grounded first. When dismantling, the grounding wire must be removed at last.

* Don't damage the grounding conductor;

* The device should be connected to the protection earth permanently. Before operation, it should

check the electrical connection to ensure the device is grounded reliably.

DANGER

In the event of grounding fault in the energy storage system, some part that should not be charged may have lethal voltage, and touch by accident will cause serious damage. Before installation and operation, ensure that there is no system grounding fault and take appropriate protective measure.

1.2.1.5 Electrical Connection

The electrical connection must be performed strictly according to the description and wiring principle diagram in the user manual and labels on the energy storage system.

WARNING

The configuration and technical specifications (such as voltage, current, etc.) of energy storage batteries, must meet the technical requirements of the energy storage system.

Grid-tied operation should be allowed by the local power supply department and the related operation should be performed by professionals.

All electrical connection must meet the electrical standards of the country or local region where the project located.

1.2.1.6 Measurement Under Operation

CAUTION

There exists high voltage in the device. If touching device accidently, it may cause electric shock. So, when perform measurement under operation, operator must be accompanied by someone and take protection measure (such as wear insulated gloves, etc.).

The measuring device must meet the following requirements:

* The range and operation requirements of measuring device meets the site requirements;
* The connections for measuring device should be correct and standard to avoid arcing.

1.2.1.7 ESD Protection

CAUTION

The static produced by human body may cause the sensitive components on the PCB damage.

* Avoid unnecessary touch for PCB.
* Wear an anti-static wrist strap before touching sensitive components, and the other end should be well grounded.

1.2.1.8 APP Parameter Setting

CAUTION

Parameter setting is closely related to the operation of energy storage system, so the setting should be performed after estimating.

* Improper parameter setting may affect the function of energy storage system.

* Only qualified professional can perform the parameter setting.

1.2.1.9 Moisture-proof and Sand-proof Protection

CAUTION

Moisture or sand incursion may cause the energy storage system damage!

Observe the following items to ensure the energy storage system works normally.

* When the air humidity is more than 95% or under the circumstance of sandstorm, strong wind, hailstone, etc., don't open the door of the energy storage system.

* In the wet or damp weather, don't open the door of energy storage system to maintain or repair.

1.2.1.10 Safety Warning Mark Setting

CAUTION

In order to avoid accident for unwanted person getting close to inverter system or makes improper operation, it should observe the following requirements when perform installation, daily maintenance or repair.

* Set warning marks at the battery connection and grid connection of energy storage system to avoid switching on the breakers improperly.

* Set warning signs or safety warning belt in the operation area, which is to avoid unwanted person entering and cause human injury or device damage.

* After maintenance, ensure that pull out the key of energy storage system and save it properly.

1.2.2 Operator Requirements

CAUTION

The operation and wiring for energy storage system should be performed by qualified person, and ensure the electrical connection meets the related standards.

Before installing, operating and maintenance, the operator must understand the safety announcements, know correct operations and be trained strictly. The operator should meet the following requirements.

* With a certain knowledge of electrical connection, mechanical installation, and familiar with the electrical and mechanical principle.

* Be fully familiar with the constitution and operating principle of whole energy storage system.

* Be familiar with the structure and operating principle of connected device of energy storage system.

* Trained by professional electrical operation, installation and debugging.

* Can handle with the emergency conditions while installing, debugging.

* Be familiar with the related country and district standard.

* Be familiar with the illustrations in the user manual.

1.2.3 Others

* For the energy storage system are also installed far away from downtown, please prepare the emergency rescue facilities in advance.

* Take all possible auxiliary measures to ensure the safety of personnel and device.

2. Transport to the end customers

2.1 Provisions on Shipping of Battery Modules:

It is necessary to comply with the relevant regulations and provisions on roads for shipping lithium-ion products in the corresponding countries.

It is prohibited to smoke in the vehicle during transportation or in the vicinity during loading and unloading.

The dangerous goods transport vehicles shall meet relevant regulations concerning road transportation and shall be equipped with two tested CO2 fire extinguishers.

 It is forbidden for the freight forwarder to open the outer package of the battery module. Use only approved lifting equipment to move the battery cabinet system. Use only the hanging lug on the top of the battery cabinet as the connection point. When lifting, the angle of the sling must be at least 60° .

 Improper vehicle transportation can cause injury. Improper transportation or improper transportation locks may cause the load to slip or overturn, resulting in injury. The cabinet shall be placed vertically to prevent it from sliding in the vehicle, and a fixing belt shall be used.

 A tilting of the battery rack may cause injury. The maximum weight of a single battery rack of OHR-206 can reach 87.0 kg. When tilted, they may overturn, causing injury and damage.
Ensure that the battery cabinet is on a stable surface and that it does not tilt due to load or force.

 The battery energy storage system can be damaged, if not properly transported. The battery module can only be transported vertically. Note that these parts may be top-heavy.Failure to follow this instruction may result in damage to the part.

 During transportation, the battery storage rack may be damaged when it is installed with the battery module. The battery storage rack is not designed to be transported with the installed battery modules. Always transport the battery module and the battery rack separately. Once the battery module is installed, do not move the battery rack, and do not lift it by a lifting device.

 If possible, do not remove the transport packaging before arrival at the installation site. Before removing the transport protector, check if the transport packaging is damaged, and check the impact indicator on the outer packaging of the battery converter. If the impact indicator is triggered, the possibility of transport damage cannot be ruled out.

 Improper transportation of battery modules may cause injury. The single battery module weighs 120.0 kg. If it falls or slips, it may cause injury. Only use suitable transport and lifting equipment to ensure safe transport.

 Wear safety shoes to avoid the danger of injury. When transporting the battery rack and battery module, their parts may be crushed due to their heavy weight. Therefore, all persons involved in transportation must wear safety shoes with toe caps. Please observe the safety regulations for transportation at the end customer's site, especially during loading and unloading.

 During transportation and installation of unpacked battery storage cabinets, the risk of injury increases, especially on sharp metal panels. Therefore, all personnel involved in transportation and installation must wear protective gloves.

3.Overview

3.1 Product Intro

This product is a battery energy storage system with a system capacity of 100kWh. The energy storage battery, temperature control system and fire protection system form an integrated system. The output end is connected to an inverter, which combines photovoltaic and mains power to charge and discharge the battery, achieving energy storage and backup functions. It can be applied to small and medium-sized commercial places (stores, supermarkets, delis, hospitals, etc.), small and medium-sized factories and charging stations, etc.

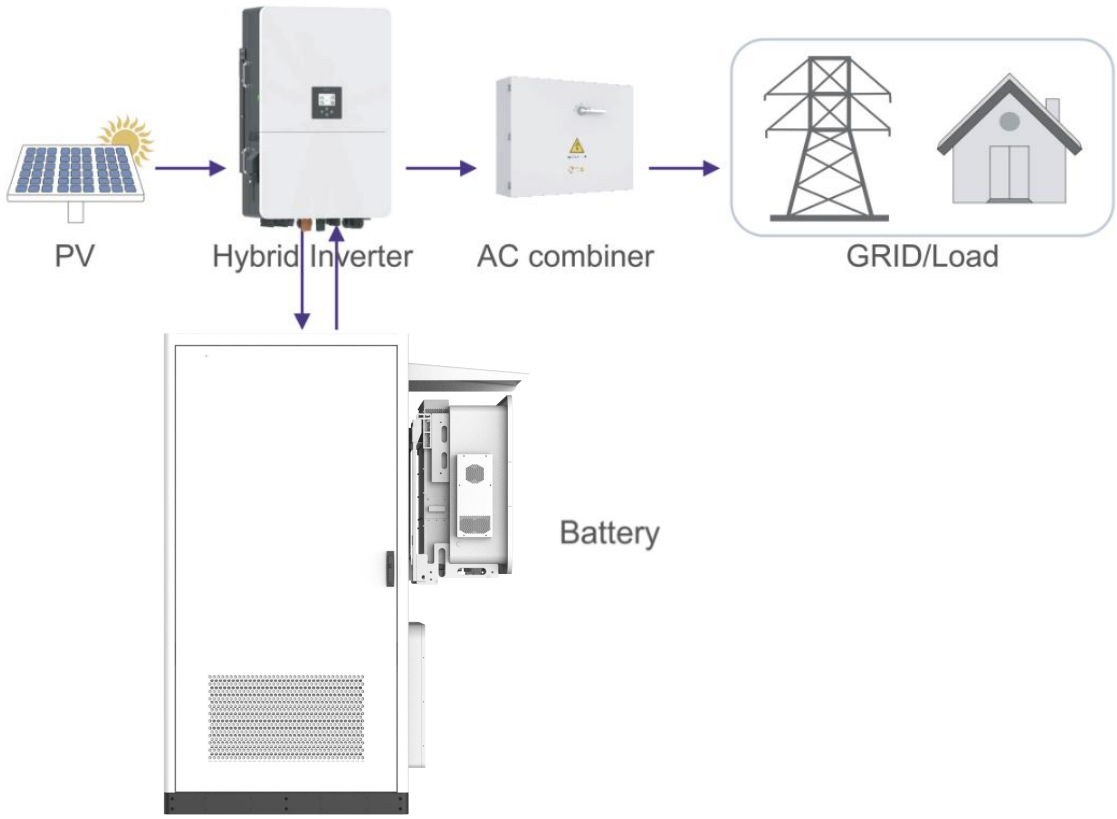

Figure2-1 Energy storage system constitution

⚠ CAUTION

Grid-tied operation of energy storage system needs to obtain the permission of local power supply department and performed by professionals.

3.1.1 Features

Innovative Structure Design

* With small volume, high power density, the footprint is small.
* The modules adopt front pull-out maintenance, easy to replace.

Safe and Reliable

* Double fire-fighting of Pack and system.

* Three-level explosion-proof of cell, pack and energy storage system.

* Two-level BMS safe redundancy management, ensure the battery operating safely.

Smart Management

* **Smart liquid-cooling**, perfect heat dissipation, effectively decrease the temperature different and enhance the battery use ratio.

* System adopts multi-level linkage design to achieve smart control and protection.

3.1.2 Technical data

Table2-1

Model	OHL-261 125KW/261kWh
Main Parameter	
Cell Chemistry	LiFePO4
Module Energy (kWh)	46.59
Module Nominal Voltage (V)	166.4
Module Capacity (Ah)	314Ah
Battery Module Qty In Series (Optional)	5
System Nominal Voltage (V)	832
System Operating Voltage (V)	728~936
System Energy (kWh)	261.24
System Usable Energy (kWh)	235.12
Recommend Charge/Discharge Current (A)	100
Max Charge/Discharge Current (A)	157
Dimension (W/D/H,mm)	1100*1400*2105 (Inverter not included)
Weight Approximate (kg)	~2590 (Inverter not included)
Installation Location	Floor-mounted
Cooling method	Intelligent Liquid Cooling
Communicaiton	CAN
Ingress Protection	IP55
Altitude	≤2000m
Cycle Life	25±2°C,0.5C/0.5C,EOL70%≥6000
Monitoring Parameters	System voltage,Current,cell voltage,cell temperature,module temperature
SOC	Intelligent algorithm
Working Temperature	0℃~55℃ Charge -20℃ ~55℃ Disharge
Storage Temperature	0~35℃

3.2 Appearance and Structure

3.2.1 Appearance

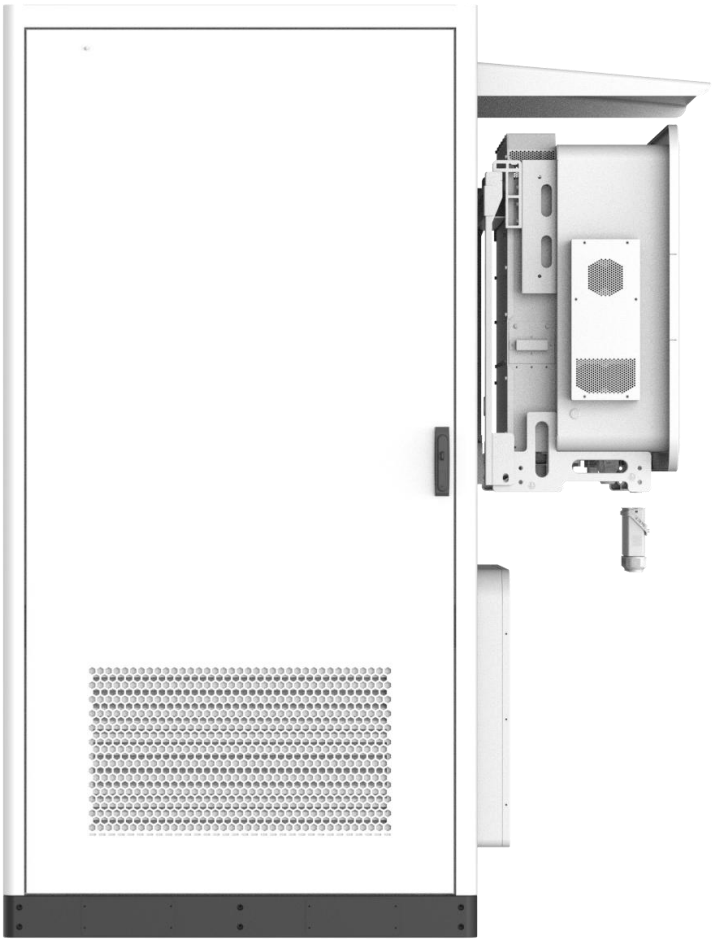

Figure2-2 Appearance

3.2.2 Structure Layout

The energy storage system adopts compartment design, the upper is battery cabin, the bottom is electric cabin. The fire extinguishing of cabinet adopts aerosol, and equips with smog sensor and leak detection controller. The structure layout is as shown in Figure2-3, corresponding component illustration is shown in Table2-2.

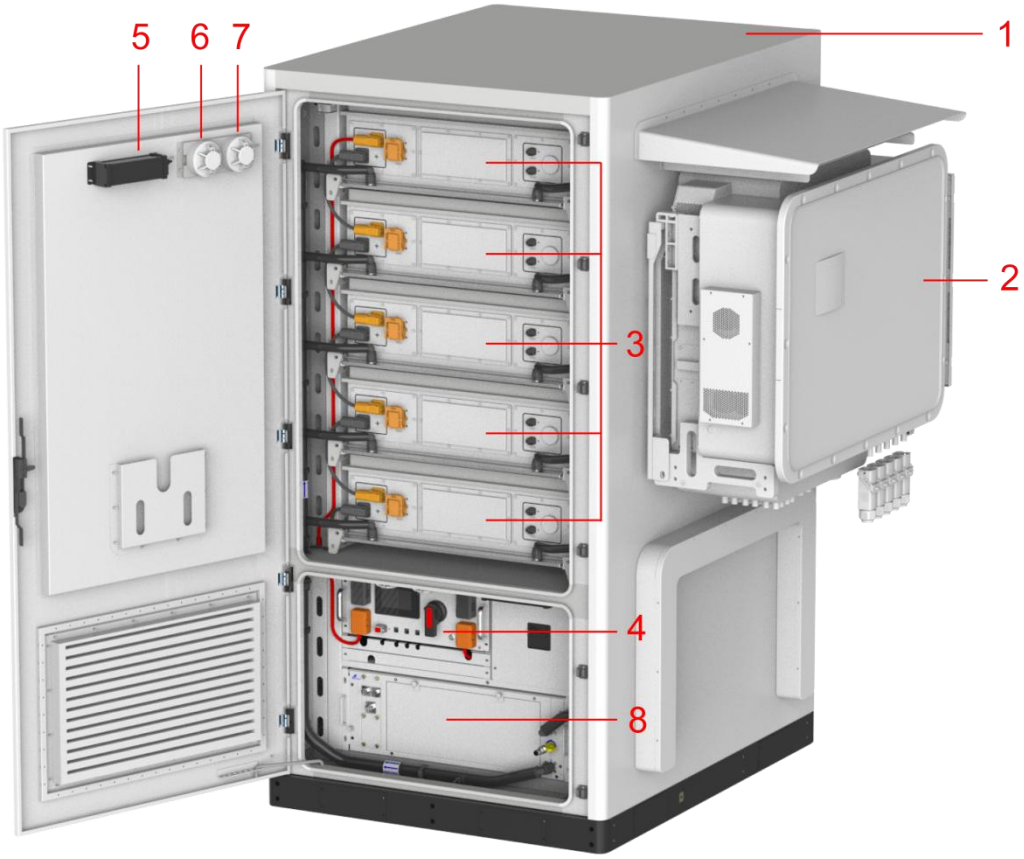

Figure2-3 Structure layout (open the front door)

Table2-2 Structure layout illustration

NO.	Name	Description.	Position
1	Energy Storage Integrated Cabinet	OHL-261 125KW/261kWh	Front
2	inverter	125KW	Front
3	battery pack	166.4V314Ah	
4	high-voltage box	1500V250A	
5	Aerosol firefighting	Used to protect battery clusters from combustion	Front
6	smoke detector	Used to detect battery compartment fire	Front
7	temperature detector	Used to detect whether the battery compartment has abnormal temperature	Front
8	Liquid cooling cabinet	5000W	Inside

Rechargeable Li-ion Battery Module

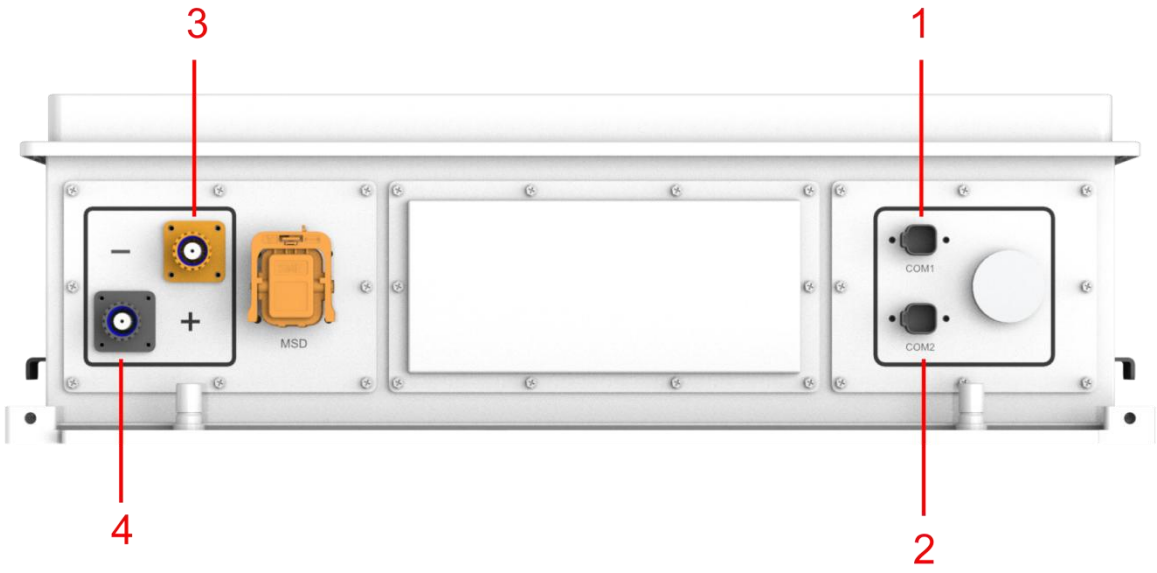

Figure2-4 Structure layout

Table2-3 Structure layout illustration

NO.	Name	Description.	Position
1	COM IN	Connection position of battery module communication supply input or output. Definition: 1:P-IN、2:IM-IN、3:FAN+、4:FAN+、5:FAN-、6:FAN-	Front
2	COM OUT	Connection position of battery module communicationand power supply input or output. Definition: 1:IP-OUT、2:IM-OUT、3:FAN+、4:FAN+、5:FAN-、6:FAN-	Front
3	B+	Battery module positive pole (orange)	Front
4	B-	Battery module negative pole (black).	Front
5	Earthing wire	Battery module grounding location	Front

High voltage battery cluster control box

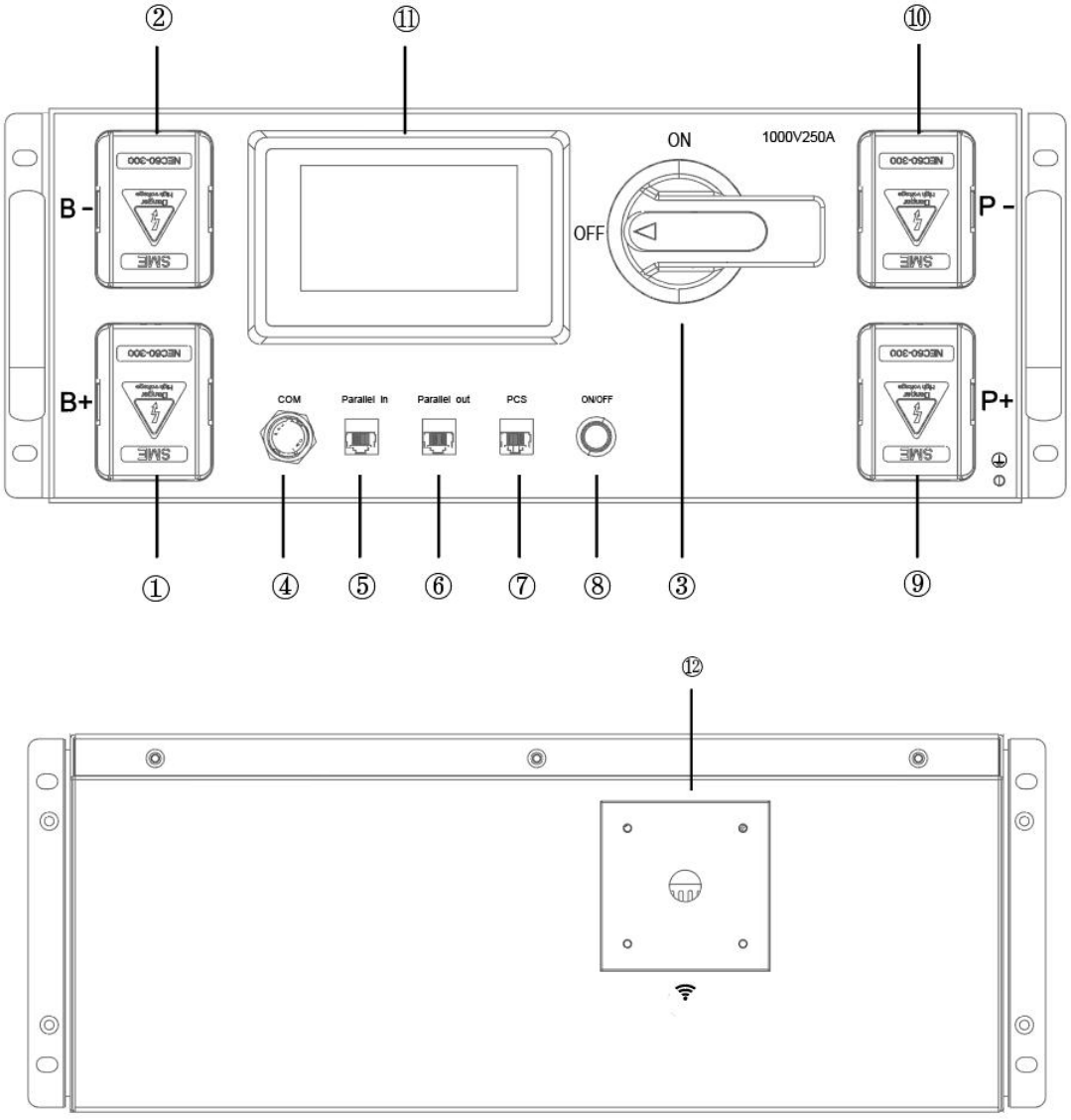

Figure2-6 Structure layout

Table2-4 Structure layout illustration

NO.	Name	Description.	Position
①	B+	High voltage box module positive pole (orange)	Front
②	B-	High voltage boxmodule negative pole (black).	Front
③	Air switch	Used to manually control the connection between the batteryrack and external devices.	Front
④	COM	Communication port between battery and high-voltage box	Front

		Definition: 1:ISOPSPI_H、2:ISOPSPI_L、3:FAN+、4:FAN+、5:FAN-、6:FAN-	
⑤	Parallel in	Parallel communication input port Definition: 1:GND、2:GND、3:CAN1G、4:CAN1H、5:CAN1L、6:DIG_IN2	Front
⑥	Parallel out	Parallel communication output port Definition: 1:GND、2:GND、3:CAN1G、4:CAN1H、5:CAN1L、6:HSS1	Front
⑦	PCS	Inverter communication port Definition: 1:RS485A_1、2:RS485B_1、3:CAN1G、4:CAN1H、5:CAN1L 、 6:RS485G_0 、 7:DEBUG CANH 、 8:DEBUG CANL	Front
⑧	ON/OFF	BMS start button and Green indicator light	Front
⑨	P+	Connect the high-voltage box to the positive pole of the inverter	Front
⑩	P-	Connect the high-voltage box to the negative pole of the inverter	Front
⑪	Human-machineinterface (HMI)	Display some important battery information.	Front
⑫	Wifi	High voltage box WiFi signal antenna	Rear

3.3 Working Principle

The energy storage system consists of a 100kWh energy storage system, a temperature control system and a fire protection system. The energy storage unit is composed of five liquid-cooled battery packs, each consisting of 16batteries with a cell capacity of 280Ah. Each energy storage system is 1P112S and has a nominal capacity of 100kWh. During discharge, the DC output power of the battery cluster is connected to the inverter through a DC circuit breaker, and then converted into AC power and output to the power grid or load through an AC circuit breaker. When charging, the power grid outputs alternating current to the inverter, which converts the alternating current into direct current to charge the battery, or the photovoltaic direct current is directly used to charge the battery through the inverter.

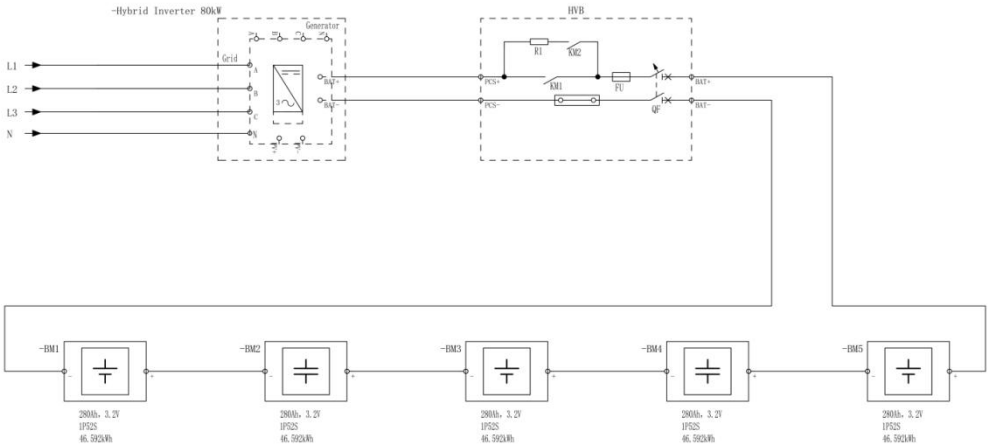

Figure2-13 Electrical schematic diagram

4.Installation

4.1 Installation Process

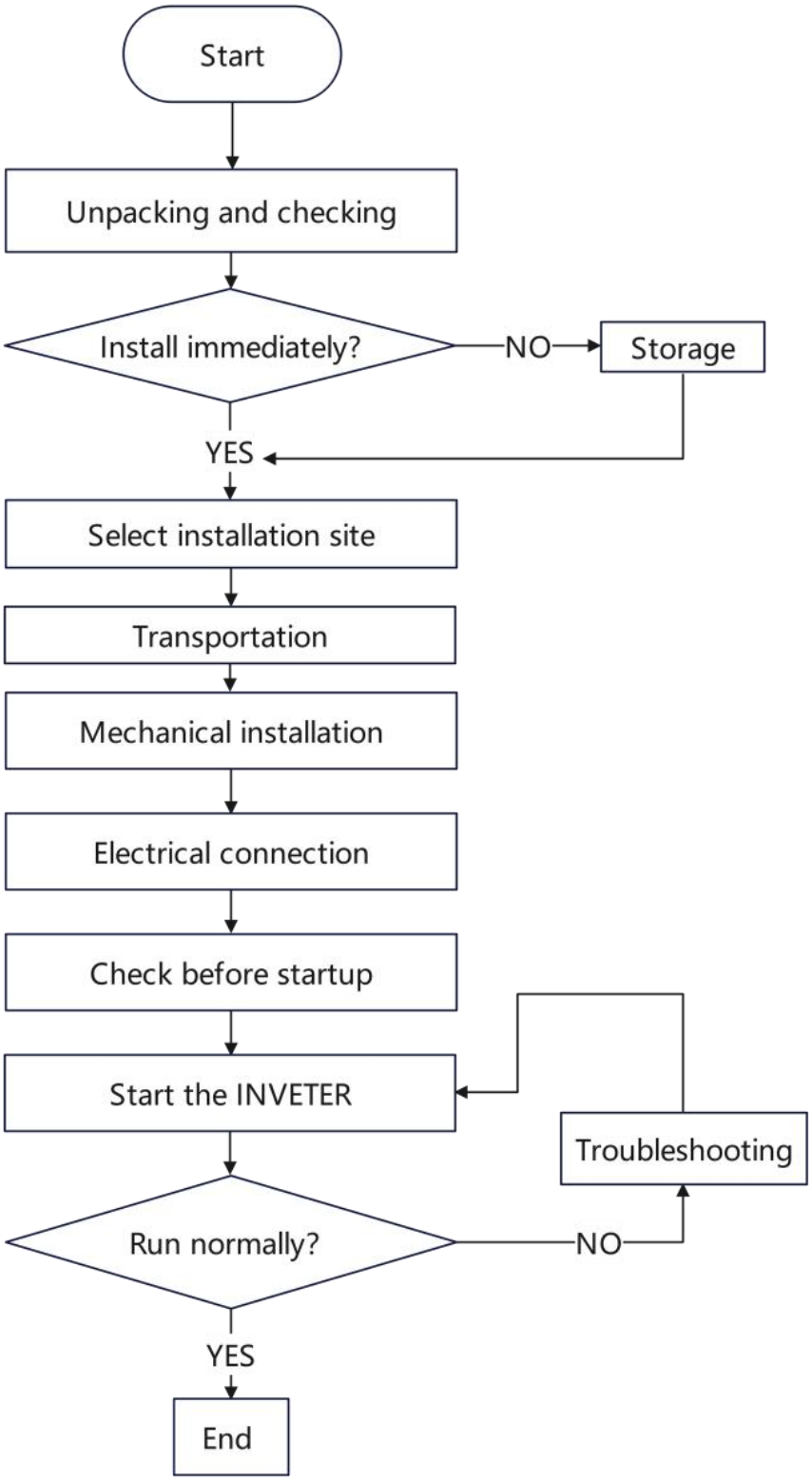

Figure3-1 Installation process

4.2 Unpacking and Checking

NOTE

Determine the unpacking site in advance. Generally, the unpacking site should be as close to the installation position as possible.

Check the External Package

The energy storage system has been completely tested and strictly inspected before leaving the factory, but damage may still occur during transporting, so a detailed inspection is required after arrival.

* Check the model, etc. of energy storage system (the delivering information can be find on the label at the side of the package, position as shown in Figure3-2), ensure that the model is in accordance with the ordered model.

* Inspect the package appearance for shipping damage, such as holes, cracks or other signs that could cause internal damage.

* Rainy days maybe encountered during transporting, please check whether the energy storage is flooded with rainwater.

NOTE

If any shipping damage is found, do not open the package and contact the manufacturer immediately.

Check the Deliverables

Unpack the package, check if the types of the accessories are complete and correct. If there is any discrepancy, take notes and contact the distributor immediately.

NOTE

The name and quantity of deliverables, please see the packing list.

After unpacking, if the energy storage system will not be used immediately, please store it according to following requirements.

CAUTION

Please store the energy storage system on the basis of storage requirements. If the damage caused by mismatch storage requirement, it will be out of warranty.

* Package the energy storage system by original package, keep the desiccator in the package plastic bag, seal the inner plastic bag.

* The energy storage system should be placed in the place where is clean and dry and avoid direct sunshine, rain or ponding, strong mechanical vibration, impact or strong electric field. No corrosive or inflammable or explosive gas or object in the storage environment.


Figure3-3 Storage environment requirements

* Storage temperature: -20~45℃ (for long term storage, the temperature should be within the range of 0~35℃, if the energy storage system is stored out of temperature range for long time, it will affect the performance and service life of battery.

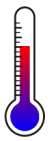 0℃~ 35℃ (long term)	 0%~ 95%, without condensation

Figure3-4 Storage temperature and humidity

* The placed direction of energy storage system should be accord with the marked direction on the package. The package should be padded 20cm from the floor and keep at least 50cm away from the wall, heat source, cold source, window or air inlet.

* When multi energy storage systems are stored, DO NOT stack them together.

* DO NOT tilt or invert the packed energy storage system.

* During storage, please check the energy storage regularly (we suggest checking it once every 3 months). If the package is damaged by insects or rats, please replace the package in time.

* Under the storage condition above, the storage period is 6 months. If the energy storage system is stored over 6 months, the energy storage system should be checked and tested by professionals, and then,it can be put into use.

⚠ CAUTION

From the date of delivery, every 6 months of storage, please recharge the energy storage system according to the specified requirements .

When the energy storage system has entered or passed through a humid environment, it is recommended to keep it in a dry and ventilated environment for more than 24 hours.

Before operation, perform an insulation impedance test. After the insulation impedance test is passed, perform a voltage withstand test. Only after all the tests have been passed can the energy storage system be operated.

If the insulation impedance test and voltage withstand test fail, continue to dry and ventilate the energy storage system.

Generally, the energy storage system can operate normally after drying and ventilating twice.

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* If the product needs to be transported again, please strictly pack it before loading it for transporting.

4.3 Battery side wiring

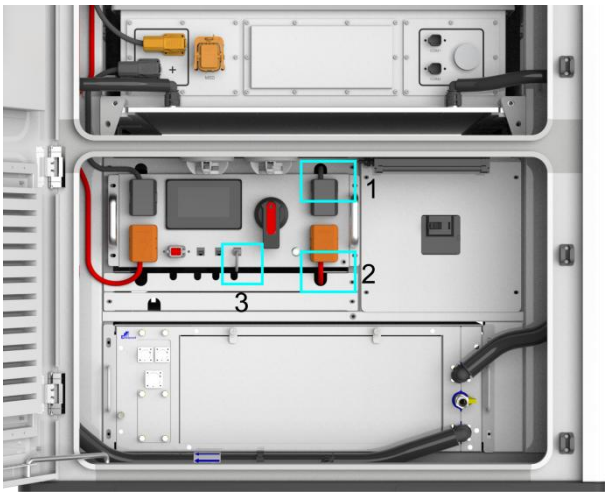


Figure3-2 1~3 To be wired

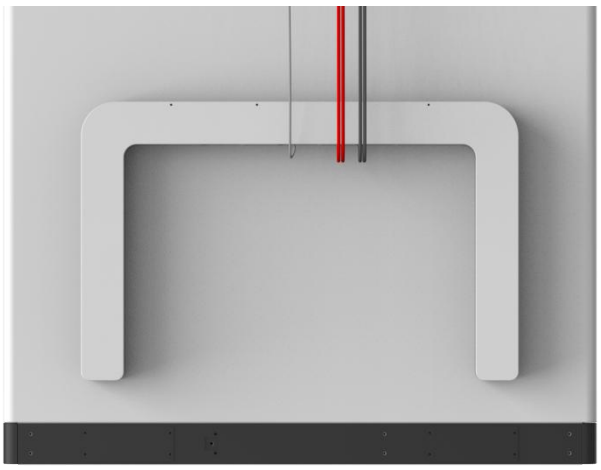


Figure3-3 The wire comes out of the cable tray and connects to the inverter.

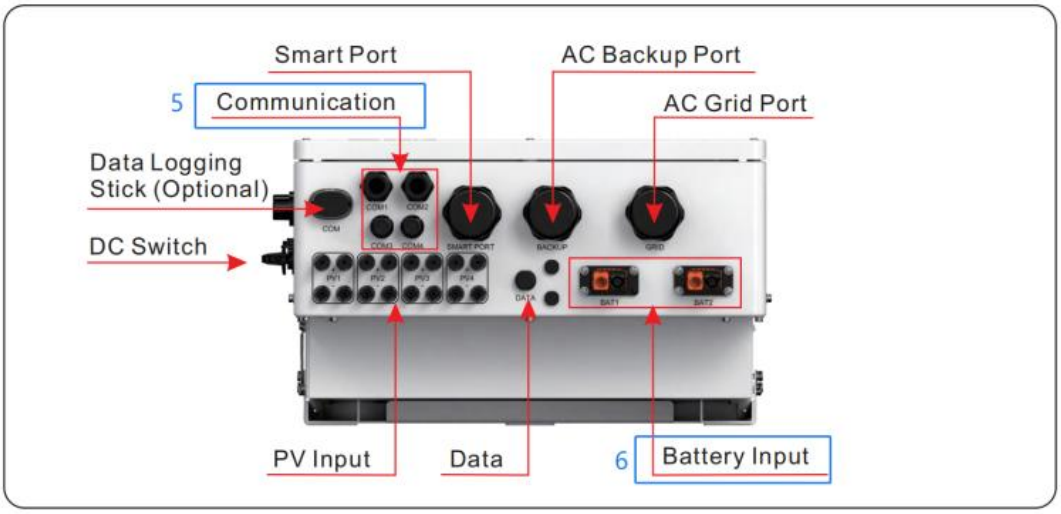


Figure3-4 Communication (5) and Battery Input(6) are the wiring positions on the inverter side ,The figure is for reference. Please refer to the actual inverter manual for specific usage.

4.4 System startup and shutdown

4.4.1 Startup procedure

① After connecting the battery cable, press the BMS start button and wait for the screen to light up..

②When the battery pack makes two clicks and the relay ON the display is closed, turn the circuit breaker to ON.

③ Complete the startup.

4.4.2 Shutdown procedure

①Stop load operation。

②Press the DC circuit breaker ON the high voltage control box and set "On" to "OFF" position 。

③Press the Start button again and wait for the screen to go off。

④Complete shutdown.

4.5 Inverter operation

Note: For inverter operation, please refer to the inverter user manual

5.OHL-261'S User Interface

5.1 Main Interface

NO.	Description	Function
1	SOC	Display real-time SOC value of energy storage system
2	Voltage	Display real-time voltage
3	Temperature	Displays the maximum and minimum battery temperatures
4	Voltage	Displays real-time maximum and minimum cell voltages
5	Current	Display battery real-time current
6	System status	Display battery fault name (For details, see Table 5-2)

5.2Alarm description and processing

When protection mode is activated or system failure occurred, the alarm signal will be given through the system status on the LCD. The network management can query the specific alarm categories.

If the fault such as single cell over voltage, charging over-current, under-voltage protection, high-temp protection and other abnormalities which affects the output, please deal with it according to Table 5-2.

Table 5-2 Main alarm and Protection

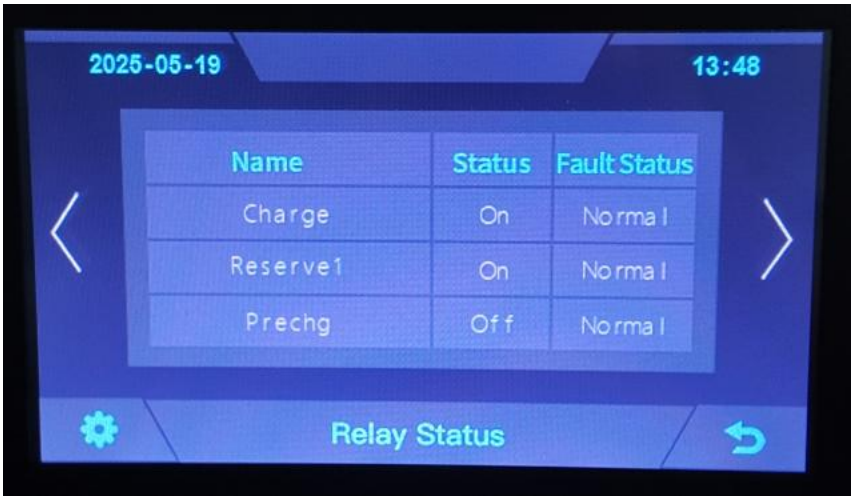
Statue	Alarm category	system status	Processing
Charge state	Over-current	Over-current during slow charging	Stop charging and find out the cause of the trouble
	Over-voltage	Cell voltage too high in charge	Stop charging
	High temp	Temperature too high in charge	Stop charging
	Low temp	Temperature too low in charge	Stop charging
Discharge state	Over-current	Continuous over-current	Stop discharging
	Low-voltage	Cell voltage too low in discharge	Stop discharging
	High temp	Temperature too high in discharge	Stop discharging
	Low temp	Temperature too low in discharge	Stop discharging

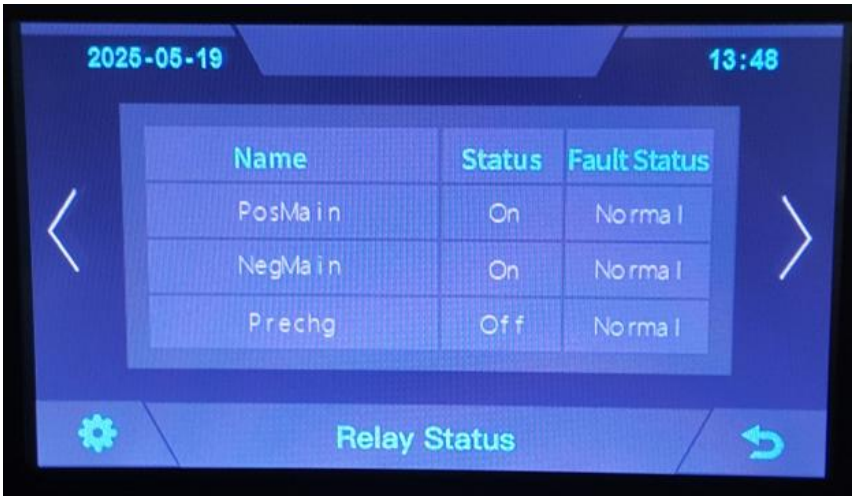
5.3 Cell Voltage

5.4 Cell Temperature

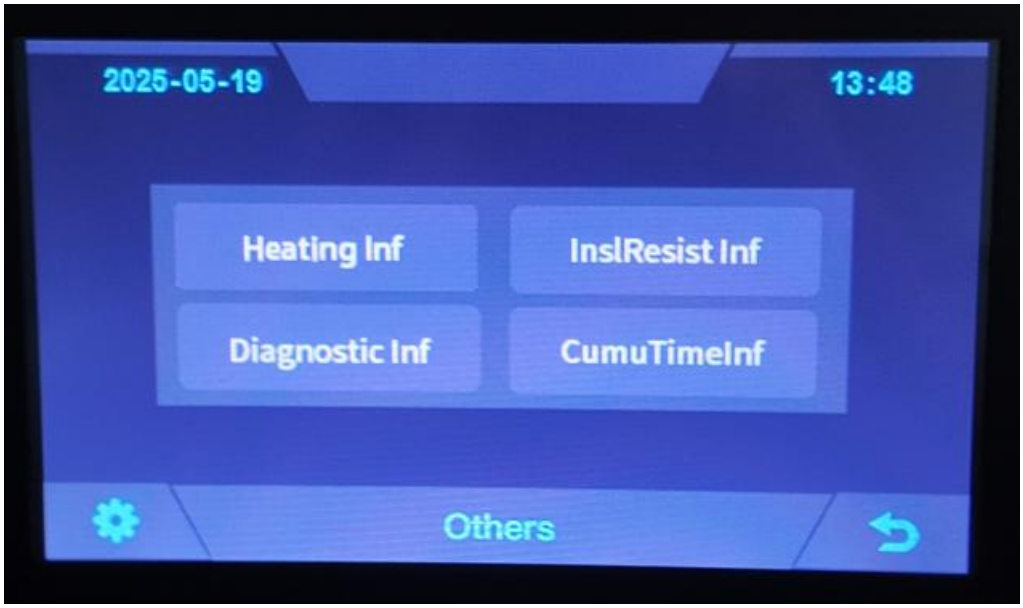
5.5 Heating Temperature

5.6 Relay Status

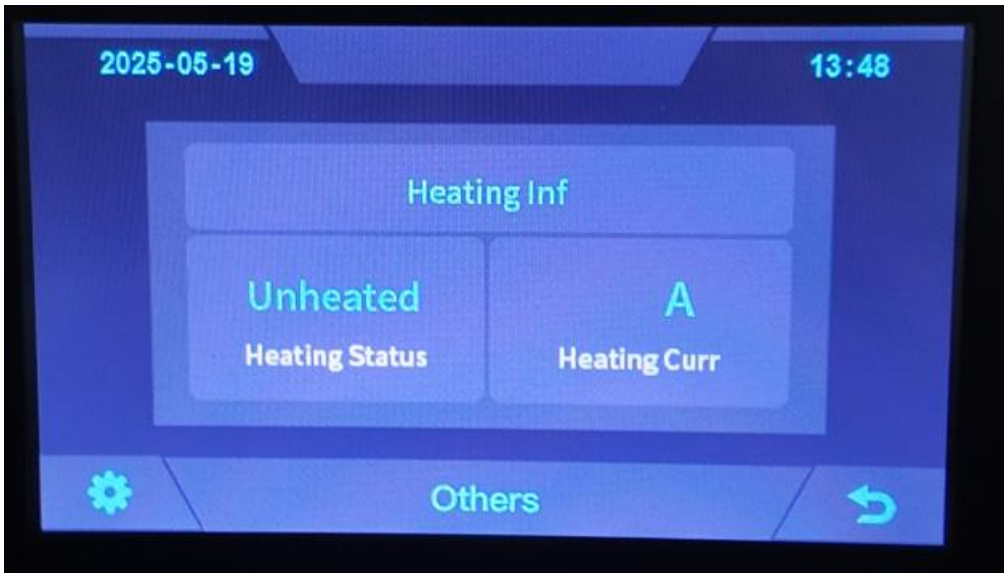




5.7 Other

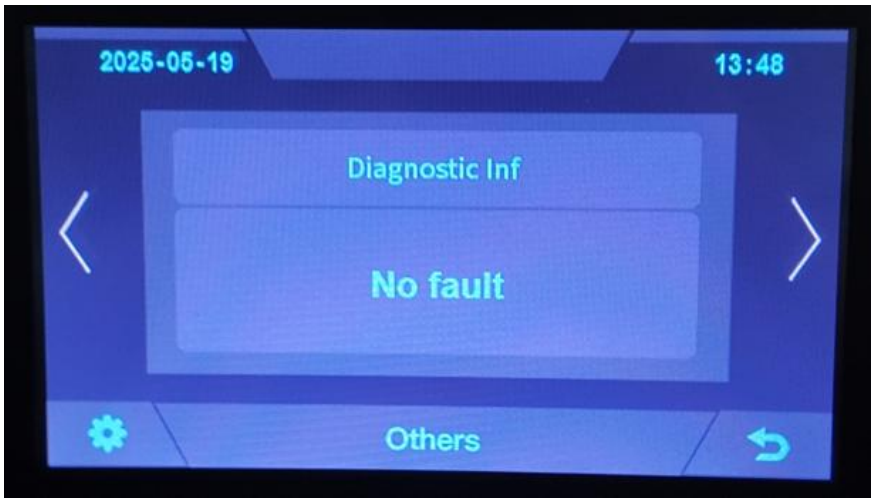


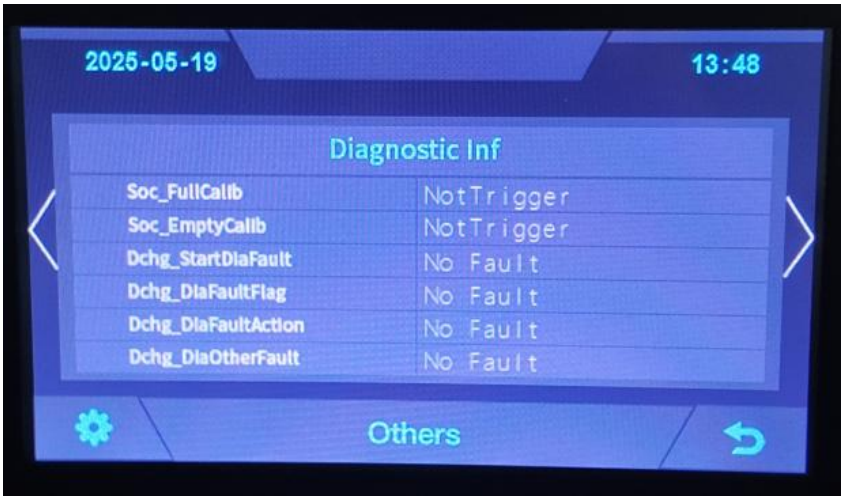
5.7.1 Heating Information

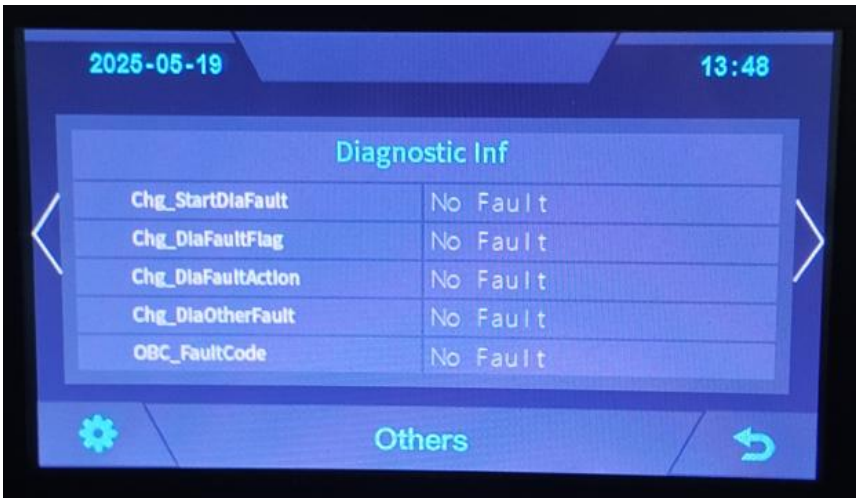


5.7.2 Insulation Resistense

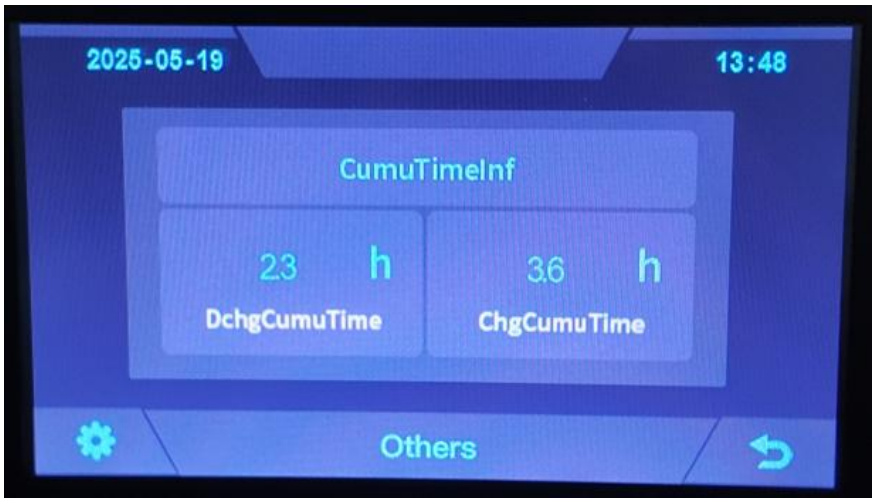
5.7.3 Diagnostic Information



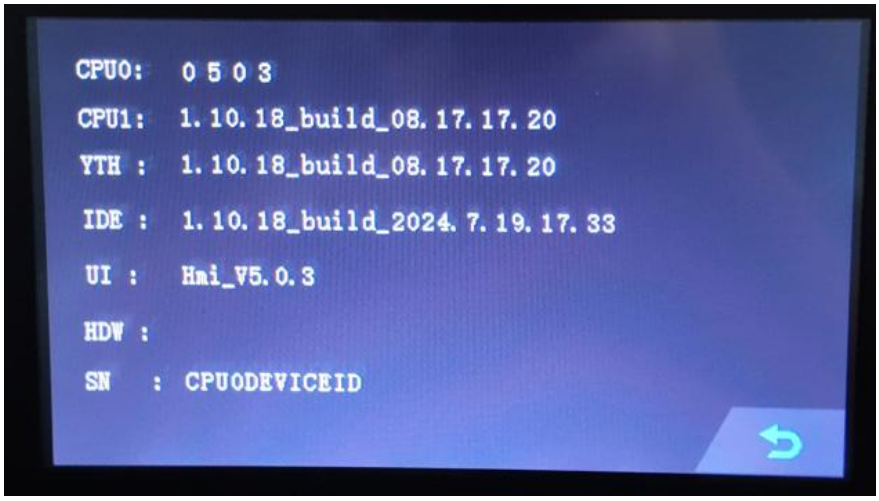




5.7.4 Cumulative Time Information



5.8 Set Up

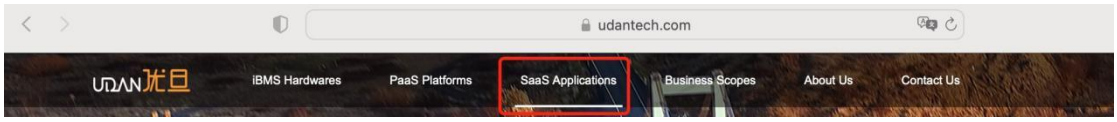


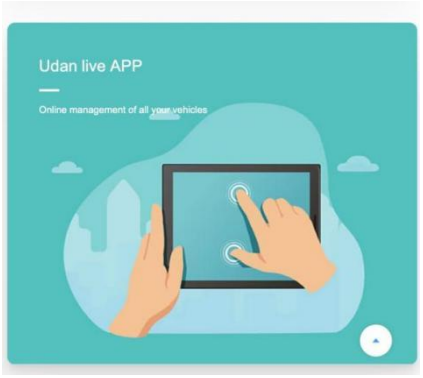
6.Xiaodan Energy Storage App

6.1 App download

6.1.1 Android version

1. Enter the official website of Youdan Technology https://www.udantech.com/#/ , click on the "SAAS Application" column in the top navigation bar, pull down to the mobile app application module, and you can see the mobile WeChat Mini Program and App application download.



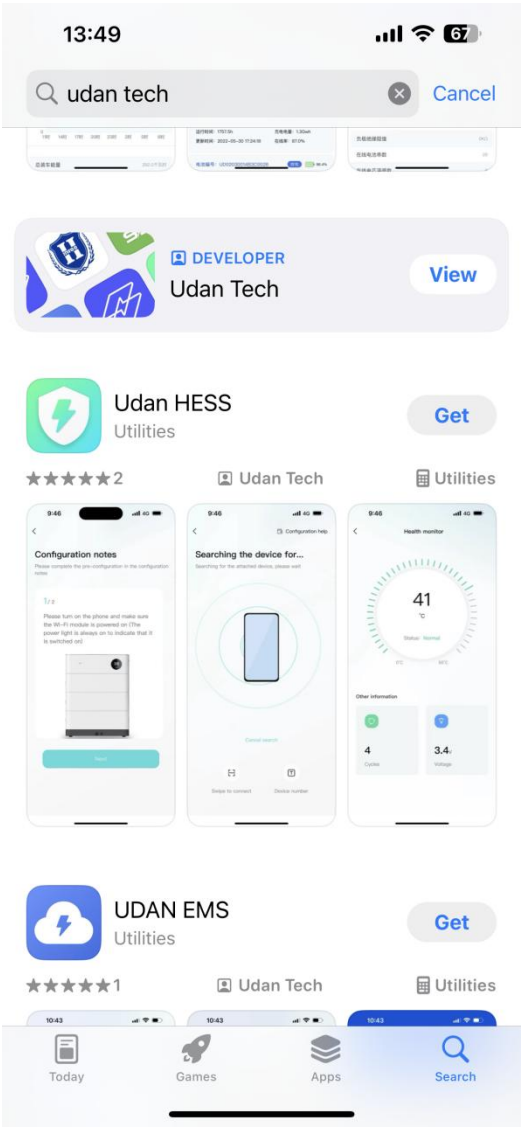


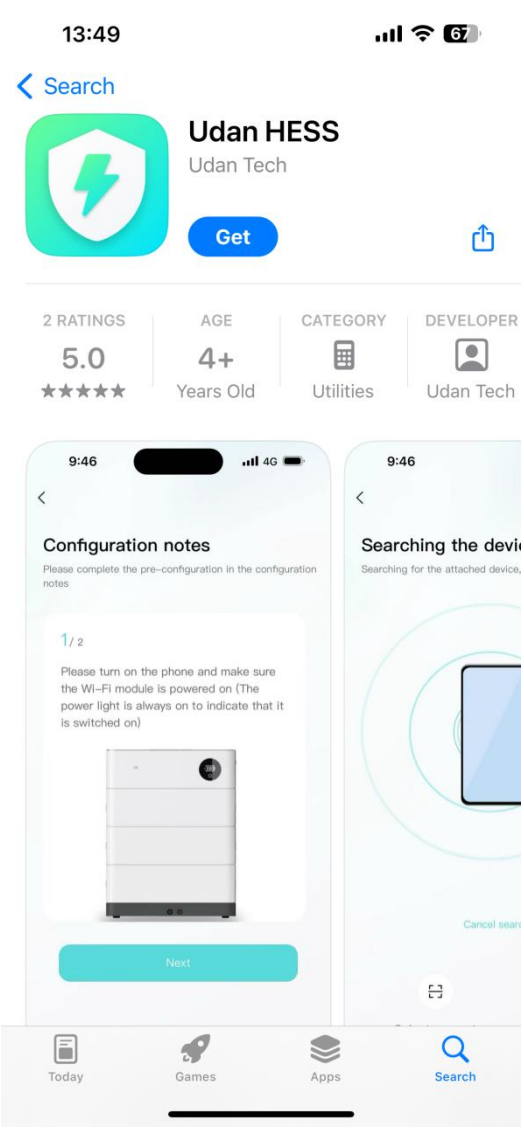
Wechat mini program scan code experience

APP download

6.1.2 iOS version

Enter the mobile App Store, search for "Xiaodan Energy Storage", and you can download and install it.

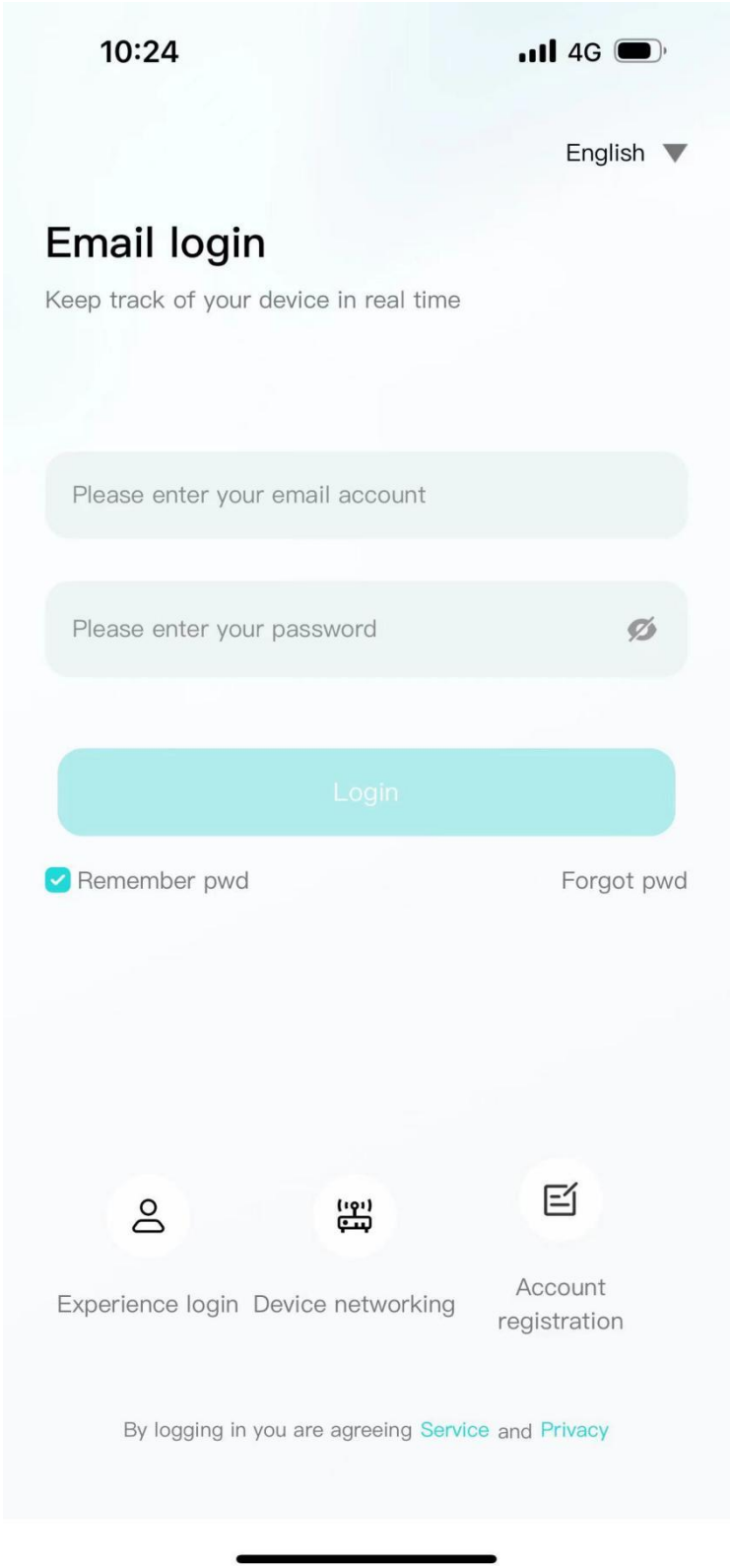




6.2. Log in and register

6.2.1 Log in

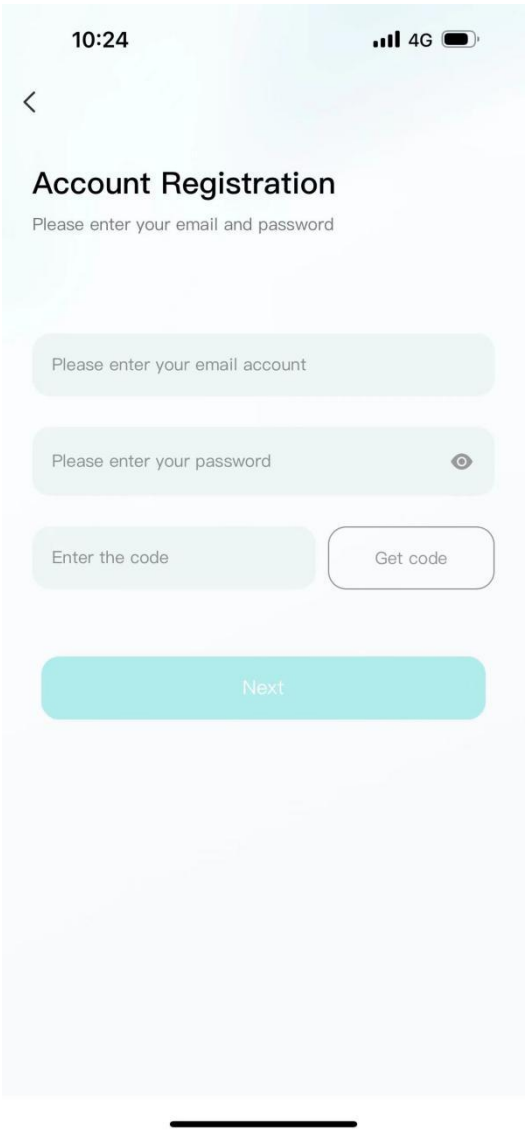
- After opening the APP, enter the login interface to log in with your account.
- Currently supports logging in through email accounts

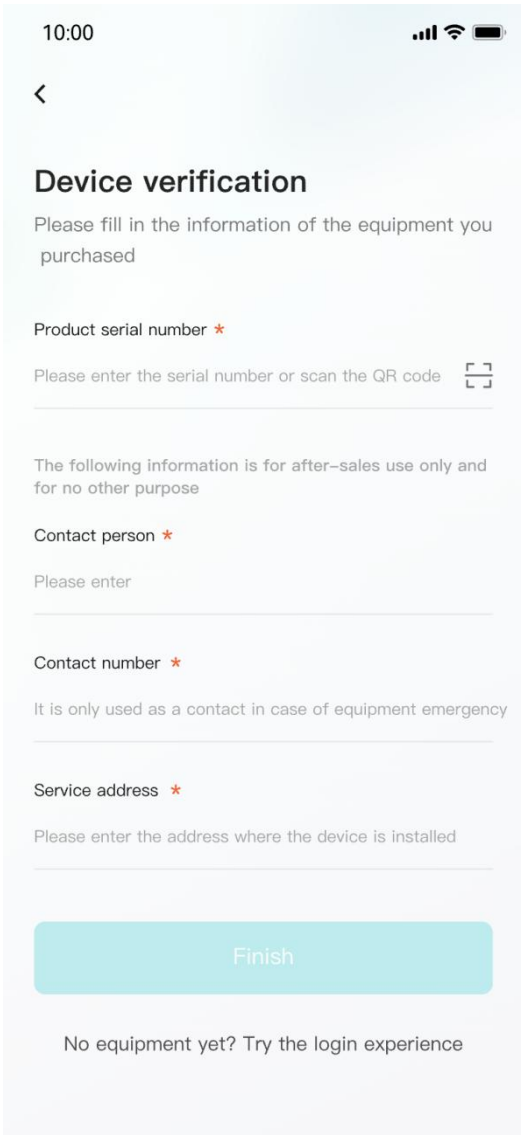


6.2.2 Register

• At the bottom of the login page, click the "Account Registration" button to enter the registration process.

• Currently, you can register with an email account. After registration, you need to go through the device verification process and enter the device SN code or device QR code for identification.





6.2.3 Experience login

• At the bottom of the login page, click the "Experience Login" button to experience the app function without registration as a tourist.

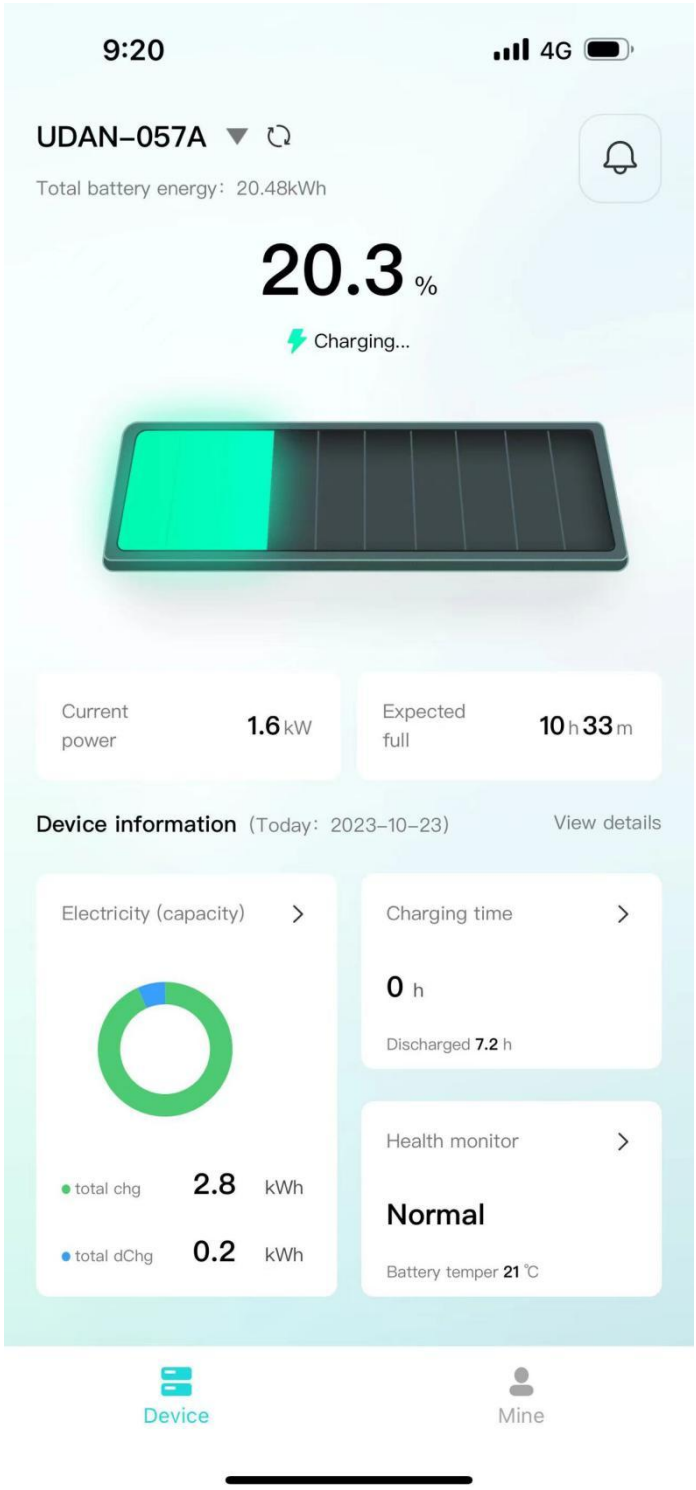
6.3. Equipment distribution network

The system adopts a **4G module** and there is no need to reconfigure the network.

6.4. App page

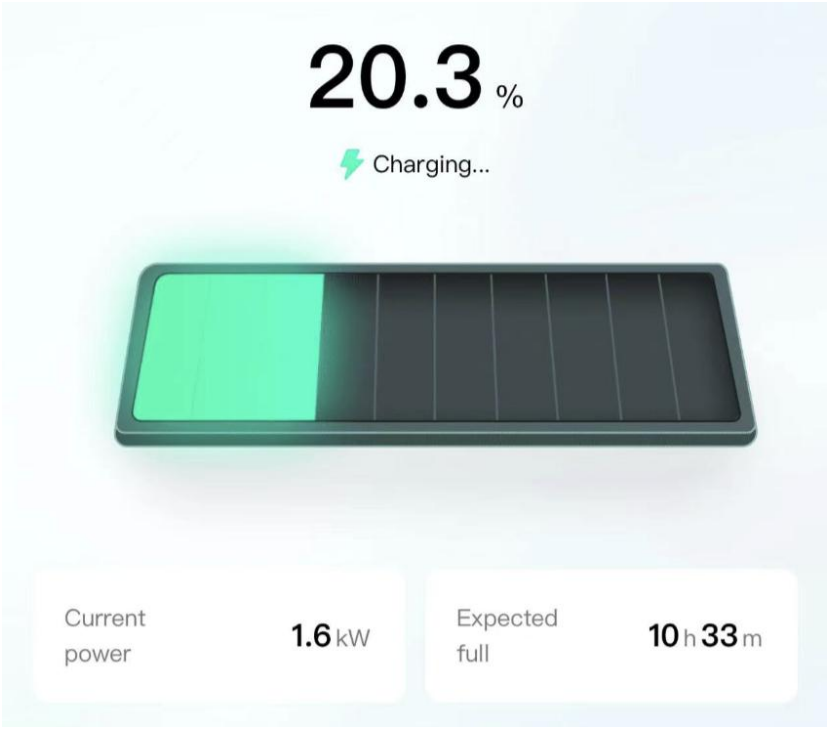
6.4.1 Equipment

The device homepage is used to display the currently managed device information.



- The top area displays the device name, battery energy, and message entry.

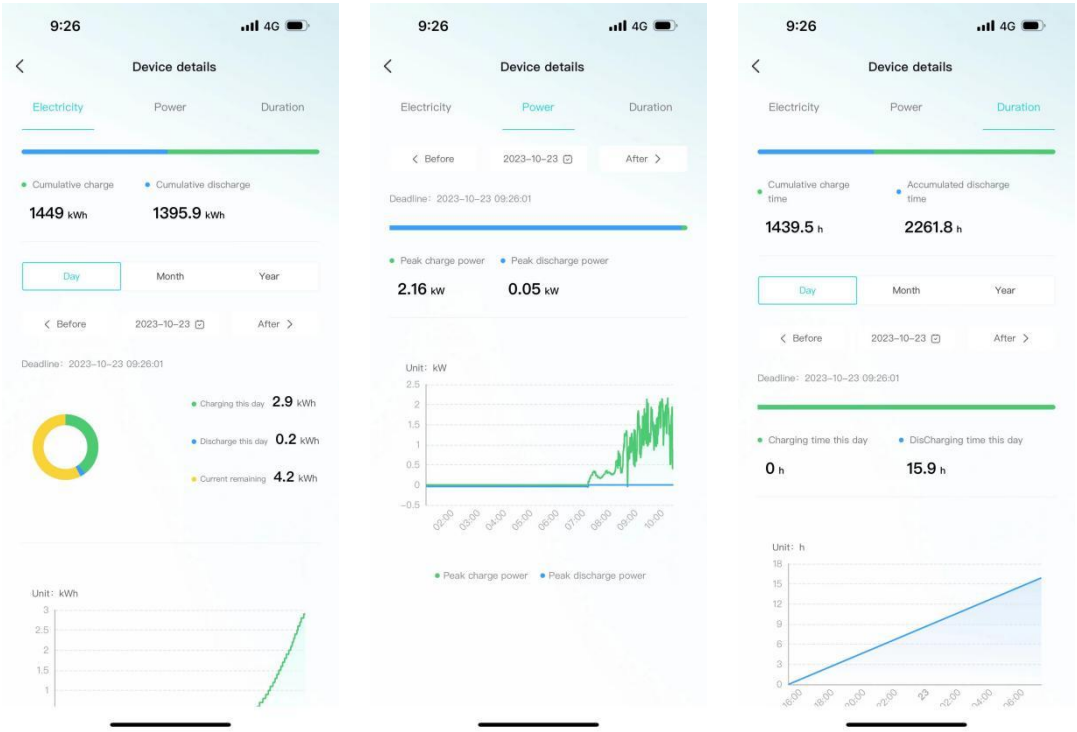
• Middle area: Displays the current battery charging and discharging status, battery percentage, current power, and estimated full time.



• The bottom area: Displays the device battery, charging time, and health check overview data of the day in the form of a card. You can click the corresponding card to view the details.

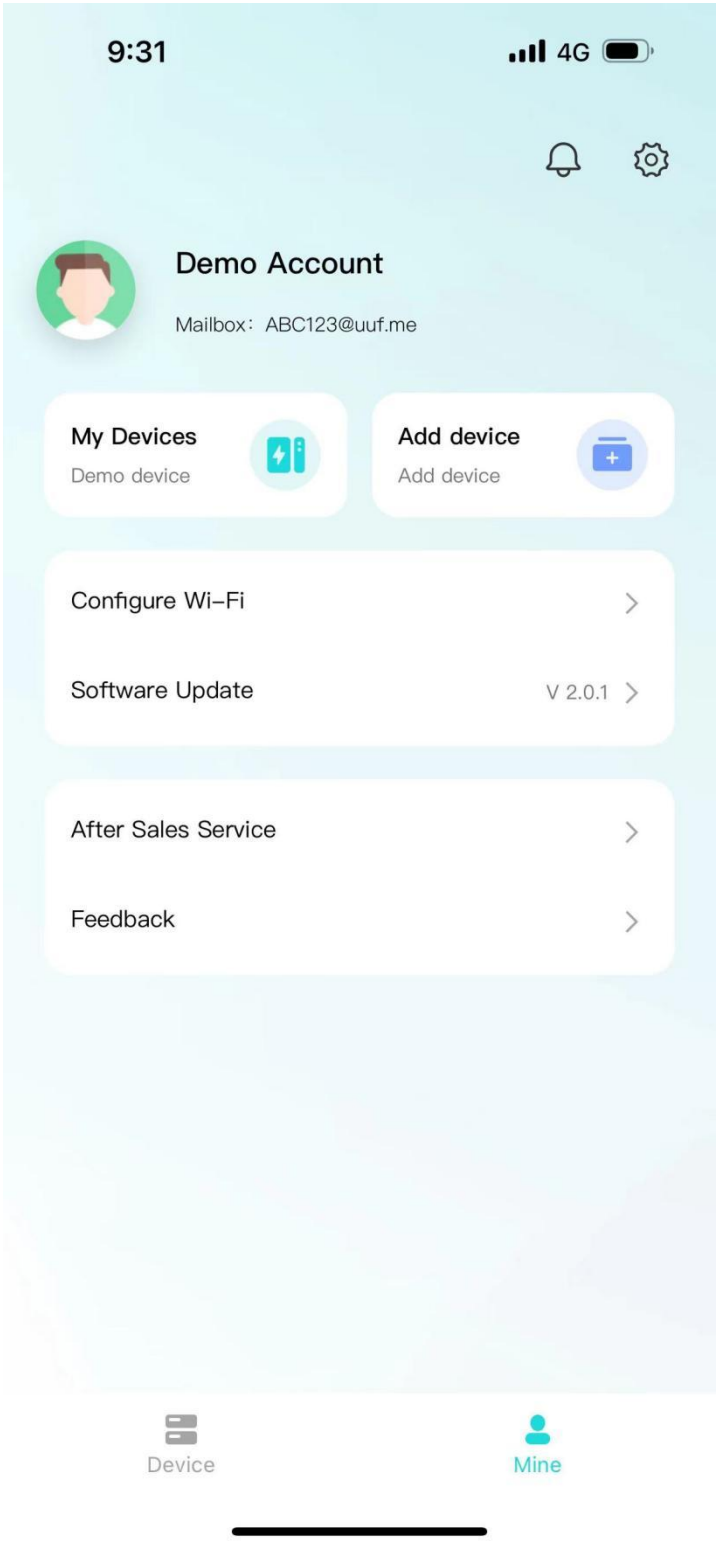
6.4.2 Data details

Display the data details of the current device, and view the battery, charging and discharging power, and charging and discharging time data separately, and support time filtering.

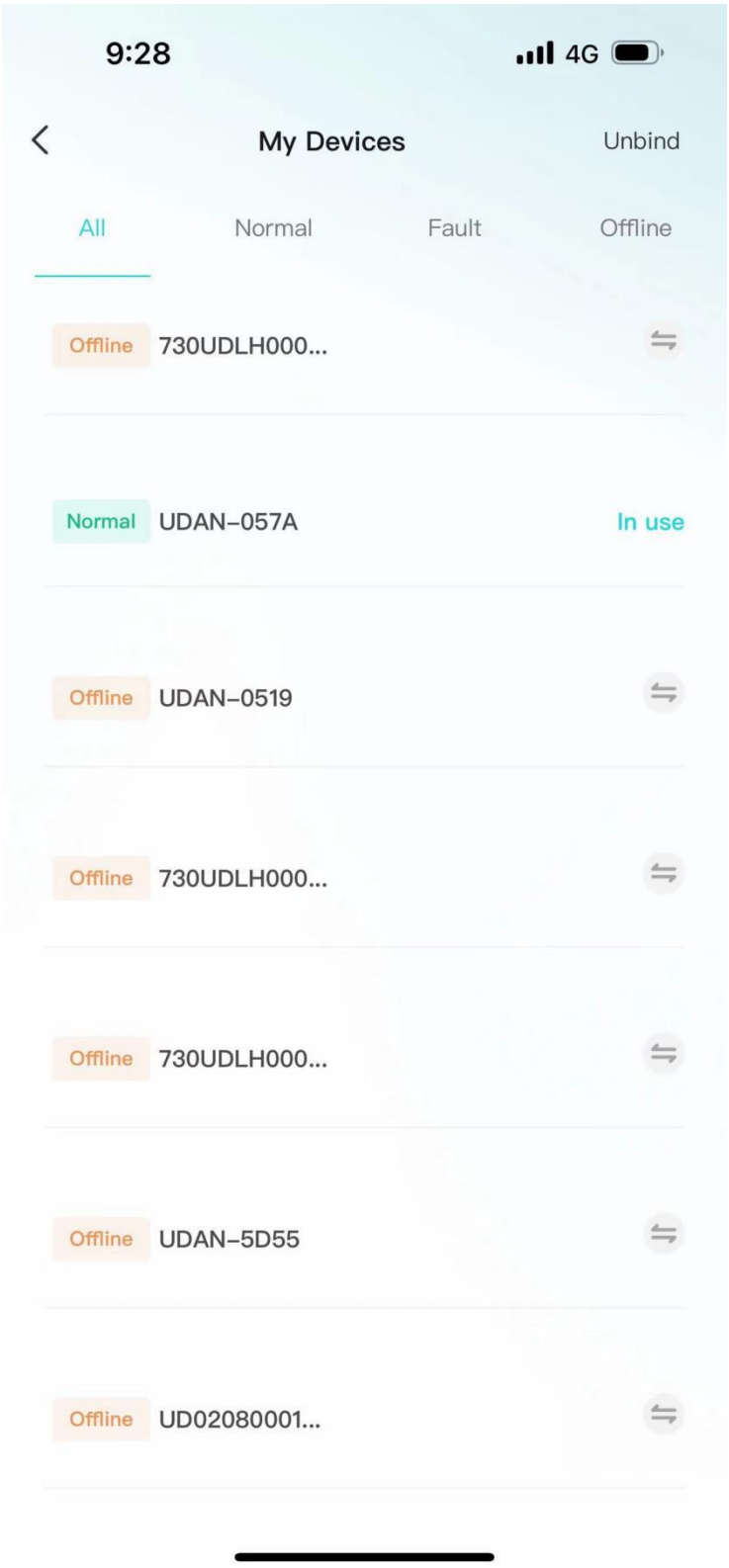


6.4.3 Mine

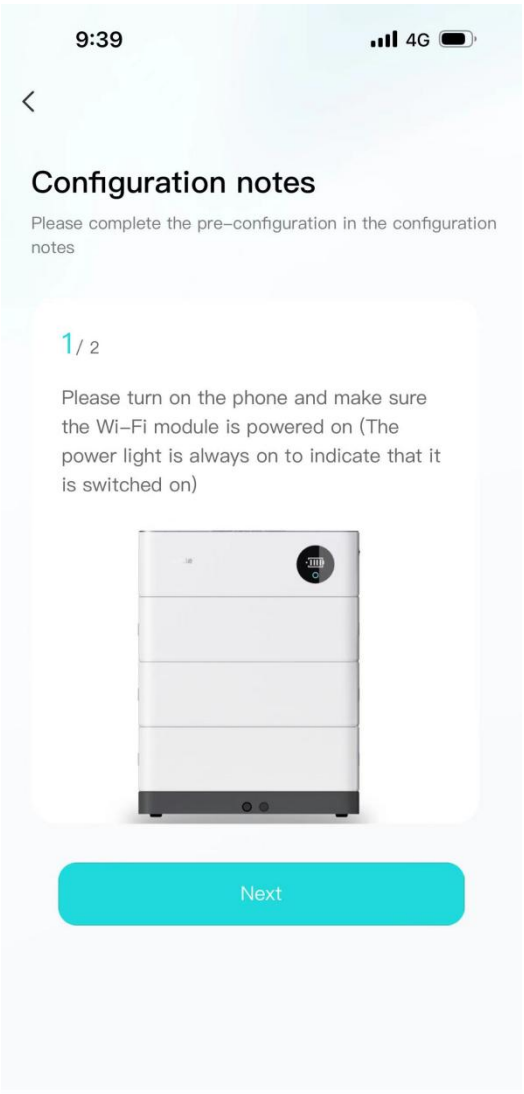
My page allows users to view **my devices, add devices, configure WiFi, software updates, after-sales services, problem feedback, app settings** .



• Click "My Devices" to enter Facility Management. You can view all devices managed under the current account, switch devices displayed on the homepage, unbind devices, and other operations.

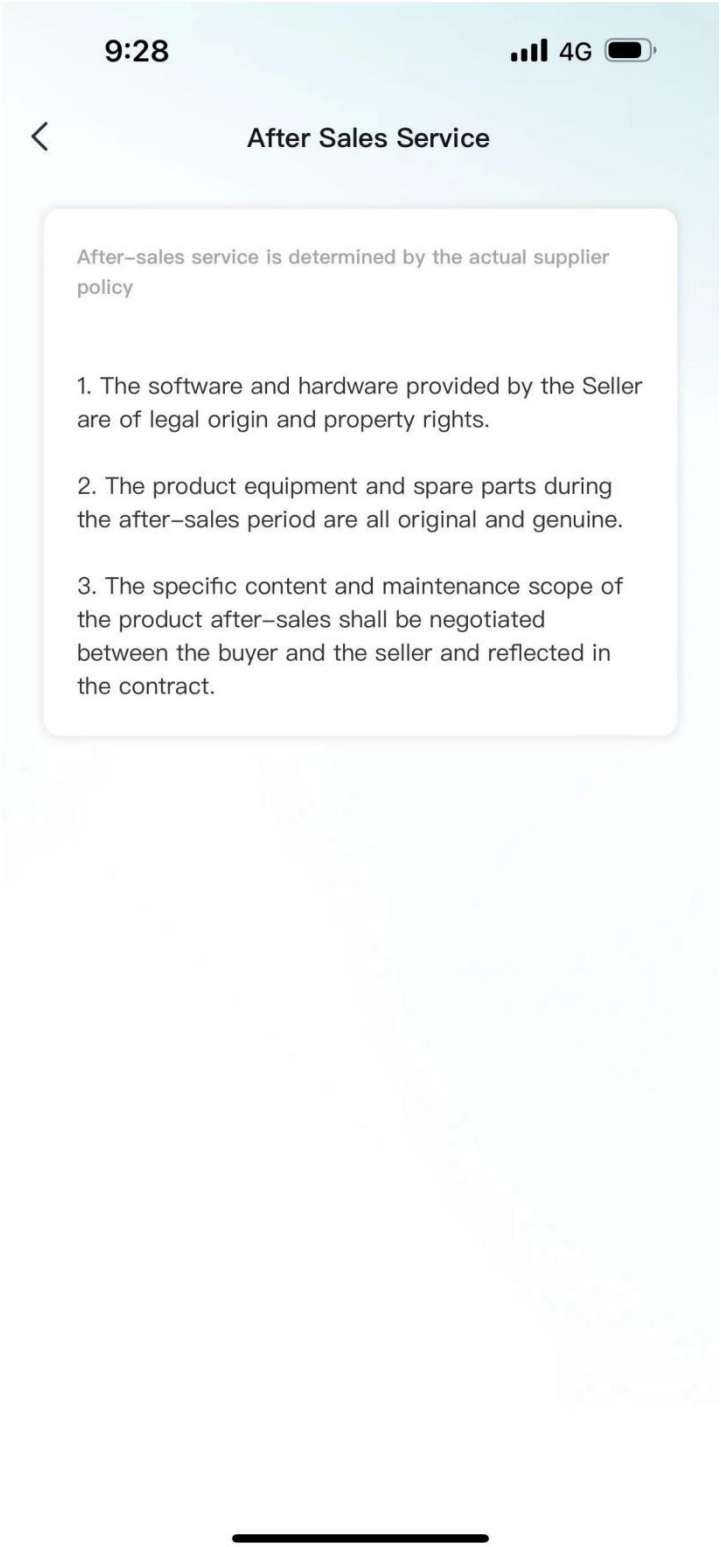


- Click "Add Device" to enter the code scanning page.
- Click "Equipment Distribution Network" to enter the equipment distribution network process.

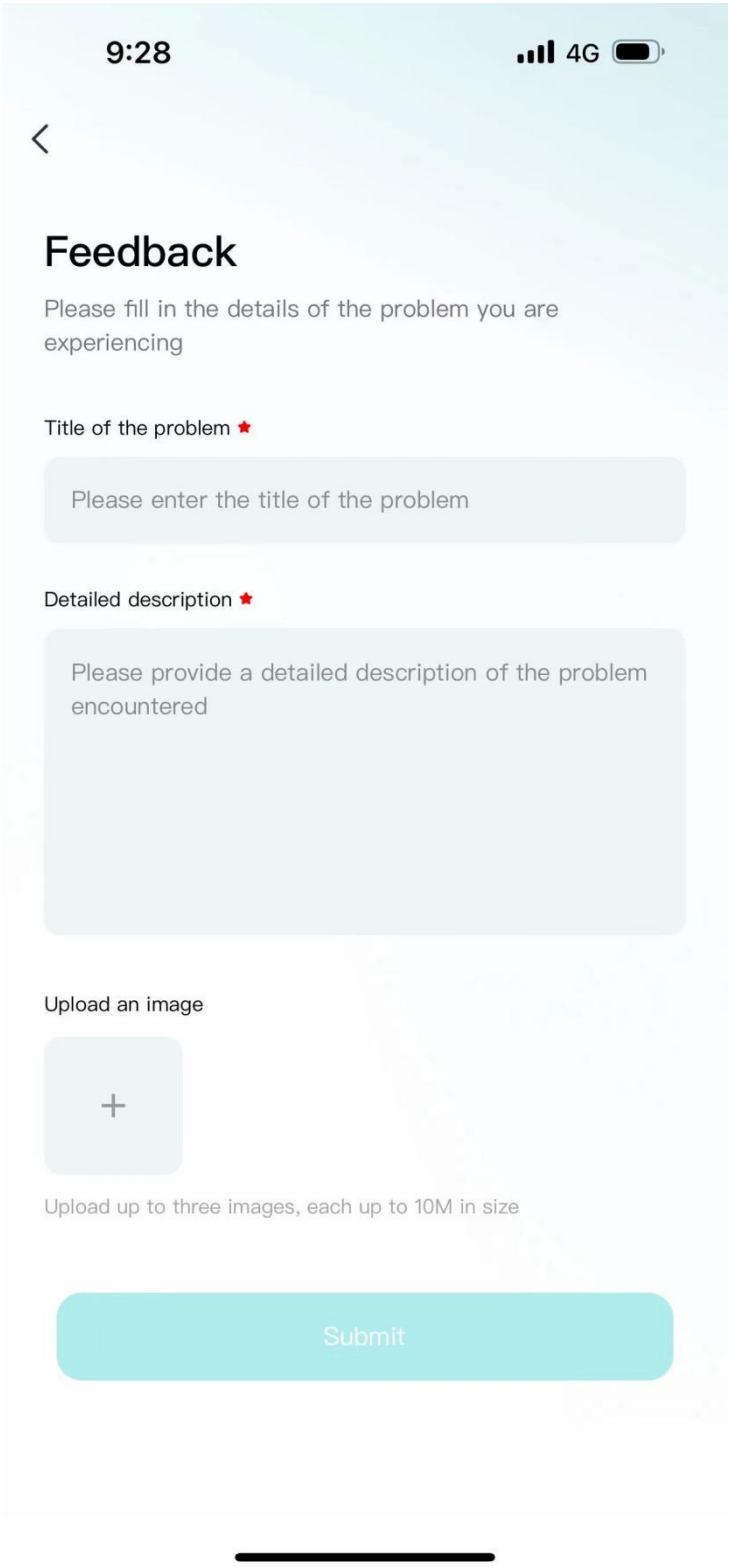


• After clicking "software update", it will enter the version detection. If there is a new version, it will be updated.

• Click "after-sales services" and enter the after-sales services page to display the after-sales services declaration of the current supplier.

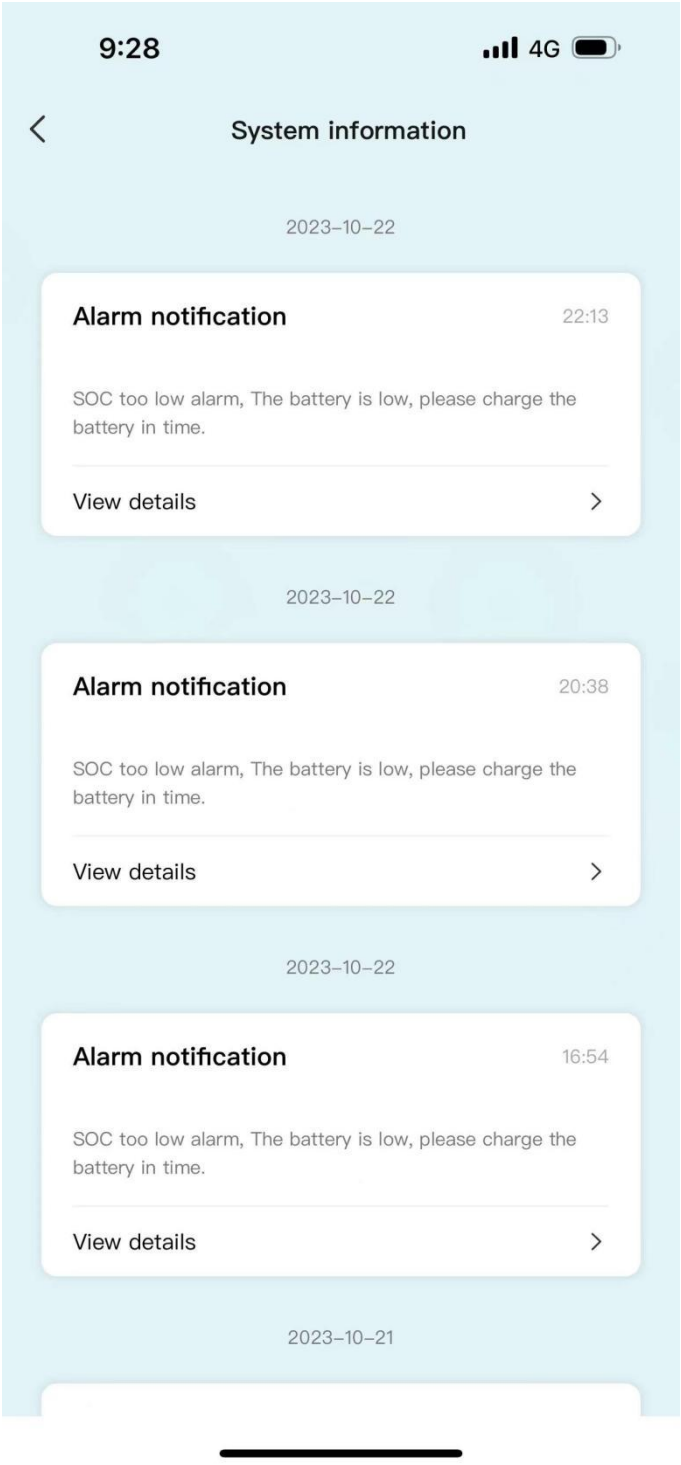


• Click "Feedback" to enter the feedback page. You can enter the current problem that needs feedback and submit it.



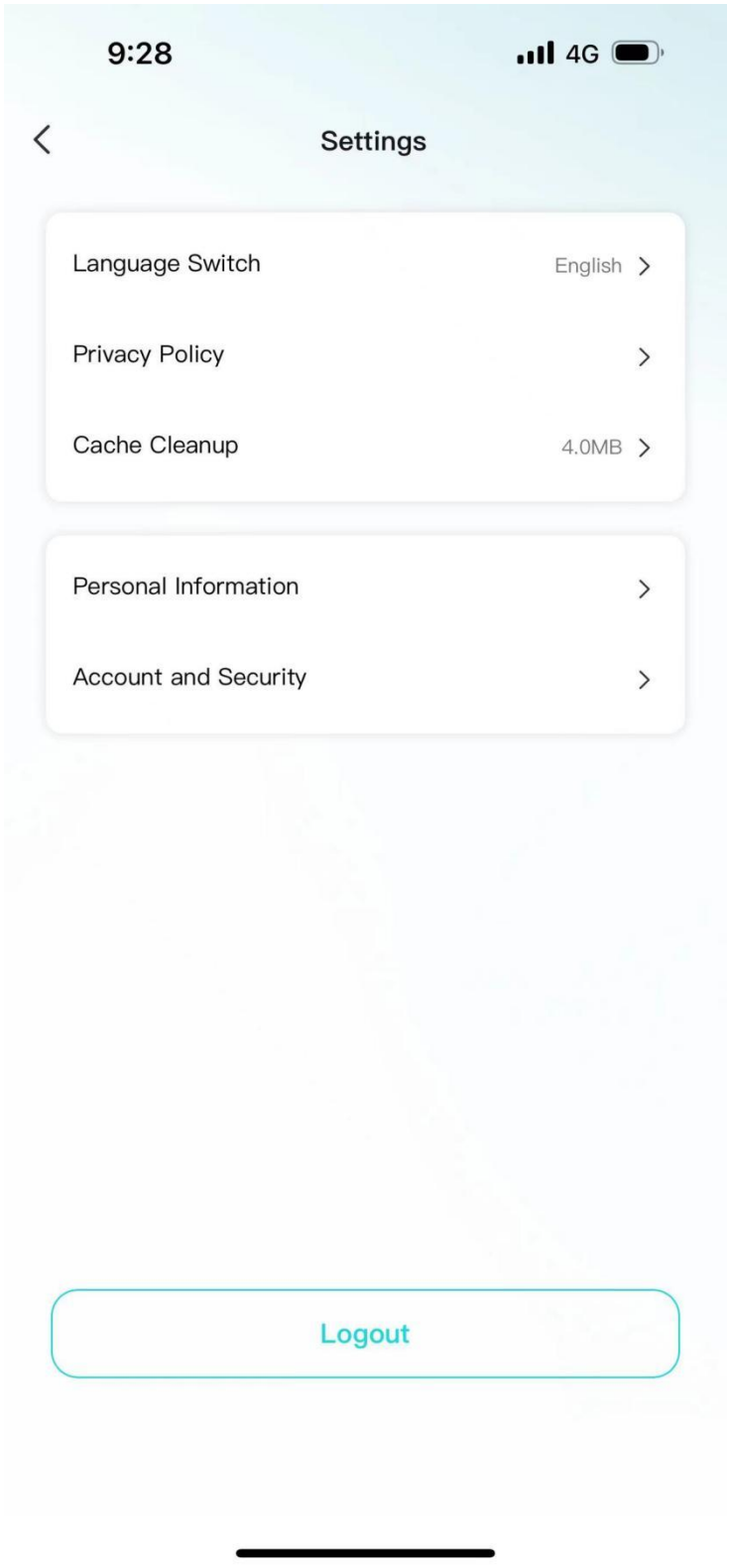
6.4.4 Message

Click on the device or my page, the message icon above, you can enter the inbox page to view the current notification or chat history.



6.4.5 App settings

- Click My Pages - Settings icon in the upper-right corner to enter the App Settings page.
- Settings page support: language switching, Privacy Policy, cache cleaning, personal information, account and security.


9:28
4G
Settings
Language Switch
English
Privacy Policy
Cache Cleanup
4.0MB
Personal Information
Account and Security
Logout

7.Maintenance

7.1 Maintenance Guide

Correct maintenance is the key to keep the energy storage system running in optimum condition and it will ensure a long service life for the energy storage system.

7.1.1Safety Precautions

DANGER

* Before checking or maintenance, if the DC and AC sides have just been disconnected, it is necessary to wait 10 minutes to ensure the device fully discharged. Measure with a voltmeter to ensure that the power supply is switched off and in a safe condition before maintenance.

* At least 2 persons must be present at the same time during maintenance or troubleshooting.

NOTE

When the cover plate of DC breaker or AC breaker needs to be removed, you can measure the voltage at the lower end of the DC breaker or the voltage at the upper end of AC breaker to judge the discharge condition. If the measured voltage is close to 0V, that means the energy storage system is completely discharged.

In order to perform the maintenance of the energy storage system safely and successfully, it is important to observe the relevant safety precautions, to use the necessary tools and test equipment, and to operate by qualified maintenance personnel. Always observe the following safety procedures:

* Ensure that the energy storage system will not be reconnected accidentally.

* When operating, DO NOT wear any easily conductive object, such as rings, watches, etc. when operating the energy storage system.

* When operating, cover the electrical components close to the operation area by insulating cloth.

* Inspection is required at the end of maintenance to ensure that the screws of maintained parts have been tightened and without tools left inside the energy storage system.

* Users do not need to operate the MSD under normal circumstances. When there is a possibility that the upper terminals or cable of DC breaker maybe touched, it is recommended to remove the MSD on the battery pack to ensure that the upper end of the DC breaker is disconnected from the power supply.

7.1.2 Safety Precautions

To improve the efficiency and reliability of the energy storage system, perform the following preventive maintenance operations periodically.

Before maintenance, first of all, it is necessary to shut down the energy storage system and disconnect the breaker of DC side and AC side. The external power supply should be operated in the following cases.

External Power Supply Requires to be Powered Down

Check item	Check method	Cycle
System cleaning	1. Check the cleanliness of the electric cabin and battery cabin of the energy storage system, and clean them in time. 2. Check the temperature of the heat sink as well as the surrounding dust. If necessary, clean the heat sink by dust collector to avoid affecting the normal operation of the heat sink.	Once every three months/half year/one year depending on the used environment.
Terminals and cables connection	1. Check whether the terminal of main circuit is in poor connection and whether the screws is overheating. 2. Check whether the screws of control end are loose, if so, tighten them with a screwdriver. 3. Check whether there is any color change of the wiring copper bar or screw. 4. Check whether there is scratch on the cable in contact withthe metal surface, if so, please maintain it in time. 5. Check whether the insulating wrapping tape of the cable terminals is off, if so, please tie it up in time. 6. Check whether the cable connection is loose, and tighten it again according to the specified torque.	Every three months once
Component maintenance	1. Check the corrosion condition of all metal components. 2. Annual inspection for contactors (auxiliary switches, breakers and micro breakers). Ensure them with good mechanical operation. 3. Check the operating parameters.	Every half to one year once

External Power Supply Without Power-down Requirement

Check item	Check method	Cycle
System cleaning	Check the filter mesh and filter cotton of each part and clean or replace it in time.	Once every three months/half year/one year depending on the used environment.
System operating condition and environment	1. Listen to the operation sound of the energy storage system to see if it is abnormal. 2. Check whether the operation parameters of the energy storage system are normal, for detailed operation, 3. Observe whether the air inlet and outlet are normal and whether there is any abnormal noise. 4. Check whether the heat generated by the cover of the energy storage system is normal and monitor the heat generated by the system, and the maximum temperature should not exceed the maximum use ambient temperature of the energy storage system. 5. Check whether filtration functions of all air inlet are normal. 6. Check whether the humidity and dust of the environment around the energy storage system are normal. 7. Check whether the temperature of the surrounding environment meets the operation of the energy storage system. Note: Ventilation of the air inlets must be checked. Otherwise, the module may not be cooled efficiently, and causing the energy storage system fault due to overheating.	Every half year once
Cabinet maintenance	Observe the energy storage system for damage or deformation. Check the warning signs and other device markings on the cabinet and replace them n time if they are blurred or damaged.	Every half year once
Safety Function	Simulate the halt operation and check whether the halt signal communication is normal.	Every half to one year once
Software maintenance	Check whether the parameter setting of each device on APP is normal and is the same as the initial setting.	Every half year once

Door lock maintenance	Check whether the door locks etc. of each door panel of the energy storage system are normal and in good condition. If necessary, lubricate the door lock holes appropriately.	Every half year once

NOTE

* The table above is only the recommended routine maintenance cycle, the actual product should be maintained based on the specific installation and use environment. The size of the power plant, the location, and the site environment and other factors will affect the product's routine maintenance cycle.

* If the energy storage system is installed in a harsh environment with heavy wind and sand or dense dust, please shorten the maintenance cycle and increase the frequency of maintenance.

7.2 Key Components Maintenance

CAUTION

Do not use any solvents, abrasives or corrosive materials to clean the energy storage system.

7.2.1 Battery Maintenance

Safety Precautions for Battery Maintenance

* The battery should be away from fire and all electrical equipment that is easy to cause sparks, so as not to cause explosion.

* Do not short circuit the battery terminals. Short-circuiting the battery will cause burning.

* Do not open the battery to prevent the electrolyte from harming the human body.

Battery Maintenance

Regular maintenance should be performed to ensure the service life of the battery.

Check item	Check method	Cycle
Battery cycle maintenance	The battery system should be fully charged and discharged periodically to ensure the battery performance.	Once every three months

Battery maintenance for long term storage	If the battery system is not used for more than 6 months, the battery must be replenished to 40%~50% of SOC to ensure the battery performance.	Once every six months
Maintenance in case of system failure or half	During the use of the system, if there is a halt for fault, and the halt time is more than 1 month, you need to confirm the SOC status of the battery system in advance. Ensure that the SOC is maintained at 40% ~ 50% state to avoid the battery in a low SOC state for long-term storage, and resulting in battery over-discharge.	Once every month
Maintenance for battery pack	1. Check the battery case and cover for bulging, liquid leakage and damage. 2. Check the connecting cables, terminals, etc. for corrosion and rust, and the fastening bolts and nuts for looseness. 3. Check the surface temperature of the battery terminals and battery case with thermal imager or other tools, which should be below 45℃ . 4. For the temporarily unused battery pack, regular recharge it within three months. 5. Batteries that have been in a charging status for a long time should be forcibly discharged once every month. 6. Battery packs equipped with BMS should pay special attention to whether the cell's voltage difference, cell temperature difference is too large, and whether the insulation resistance is normal. 7. Regularly check whether the battery temperature, voltage, current, SOC and other information are normal via APP.	Once every three to six months

NOTE

When the battery voltage or SOC is in the following conditions, it is necessary to charge the energy storage system in time according to the following recommended time, it is recommended to be charged to 40%~50% SOC, the capacity loss caused by not replenishing the battery within the recommended time is not covered by the warranty:

* 5%< battery SOC<10%: within 20 days .
* Battery SOC is 0 % or minimum cell voltage below 2.7V: within 5 days .
* The minimum cell voltage is less than 2.6V: within 2 days .

CAUTION

When the cell voltage is less than 2.5V, the recharge operation must be carried out by a professional with skillful training, please contact the manufacturer to carryout the operation in time.

Battery Replacement Announcements

* For battery replacement, please consult a professional engineer.

* The replaced battery must be with the same capacity, type and manufacturer of the energy storage system.

* The replaced old batteries should not be discarded at will, they should be disposed by professional recycling organization.

8.Maintenance

Warning! Improper decommissioning may cause damage to the equipment and/or battery inverter.

Before maintenance, ensure that OHL-261 125kW/261kWh is decommissioned according to relevant provisions.

Note: All maintenance work shall comply with local applicable regulations and standards.

The USB-CAN port of OHL-261 has the functions of upgrading firmware and recording battery data, which can be used as an auxiliary tool.

To ensure safe operation, all plug connections must be checked. If necessary, relevant operators shall press them back into place at least once a year.

The following inspection or maintenance must be carried out once a year:

• General visual inspection

• Check all tightened electrical connections. Check the tightening torque according to the values in the following table. Loose connections must be retightened to the specified torque.

Connection mode	Tightening torque
high-voltage BMS box grounding	4.5Nm
Fixing the lug of the high-voltage BMS box	1.2Nm
Fixing the lug of the battery module	1.2Nm

• Using the monitoring software, check whether the SoC, SoH, battery voltage and temperature of the battery module are abnormal.

• Shut down and restart OHL-261 125kW/261kWh once a year.

Note: If the system is installed in a polluted environment, maintenance and cleaning must be carried out at short intervals.

Note: Clean the battery rack with a dry-cleaning cloth. Ensure that no moisture comes into contact with the battery connections. Do not use solvents.

Attention:

1. Do not dispose of batteries and rechargeable batteries as domestic waste! You are legally obliged to return used batteries and rechargeable batteries.
2. Waste batteries may contain pollutants that can damage the environment or your health if improperly stored or handled.
3. Batteries also contain iron, lithium and other important raw materials, which can be recycled.

Do not dispose of batteries as household waste!