

# USER MANUAL

Model: SAS51200/280/314-HV



**Stackable Type HV LiFePO4 Battery System**

**Version: 1.0**

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# 1. Important information in the manual

## 1.1. Scope

The installation and operation manual applies to the modular battery energy storage system. Please carefully read this installation and operation manual to ensure the safe installation, preliminary debugging, and maintenance of SAS51200/280/314-HV Installation, preliminary debugging, and maintenance must be carried out by qualified and authorized personnel. Please keep this installation and operation manual and other applicable documents near the battery energy storage system, so that all personnel involved in installation or maintenance can access this installation and operation manual at any time. This installation and operation manual only applies to countries meeting the certification requirements. Please observe the applicable local laws, regulations, and standards. Standards and legal provisions of other countries may be inconsistent with the provisions and specifications in this manual.

## 1.2. Description of High Voltage Battery System



## 1.3. Meaning of Symbols

This manual contains the following types of warnings:

**STOP** **WARNING!**

If the instructions are not observed, a loss may occur.

The following types of warning, prohibition, and mandatory symbols are also used on the equipment.

**ATTENTION! The risk of chemical burns**

If the battery is damaged or fails, it may lead to electrolyte leakage, which in turn causes the formation of a small amount of hydrofluoric acid, among other effects. Contact with these liquids can cause chemical burns.

- Do not subject the battery module to severe impact.
- Do not open, disassemble or mechanically change the battery module.
- In case of contact with an electrolyte, wash the affected area with clean water immediately and seek medical advice promptly

**ATTENTION! The risk of explosion**

Incorrect operation or fire may cause the lithium-ion battery unit to ignite or explode, leading to serious injury.

- Do not install or operate the battery module in explosive or high-humidity areas.
- Store the battery module in a dry place within the temperature range specified in the data sheet.
- Do not open, drill through or drop the battery cell or module.
- Do not expose the battery cell or module to high temperatures.
- Do not throw the battery cell or module into the fire.
- When the lithium battery catches fire after being plugged in with AC power, unplug the power supply first to prevent electric shock during fire fighting.
- If there is an open flame, use carbon dioxide or ABC dry powder fire extinguisher to put out the fire, and then cool down by using the nearby fire hydrant or pouring water until no white smoke appears and the battery is completely cooled down. After extinguishing the fire, continue to monitor the battery for at least 1 hour to prevent re-ignition.
- If there is no open flame but a large amount of white smoke comes out of the battery, it is recommended to use a 6L portable water-based fire extinguisher (if any), and then cool down by using the nearby fire hydrant or pouring water until no white smoke appears and the battery is completely cooled down. After extinguishing the fire, continue to monitor the battery for at least 1 hour to prevent re-ignition.
- Do not use defective or damaged battery modules.

**No open fire!**

It is prohibited to handle open flames and ignition sources near the energy storage system.

**Wear safety goggles!**

Wear safety goggles when working on the equipment.

## 1.4. General Safety Information

### **Danger!**

Failure to comply with the safety information can lead to

1. Improper use can cause death. Operators of SAS51200/280/314-HV must read this manual and observe all safety information.
2. Operators of SAS51200/280/314-HV must comply with the specifications in this manual.
3. This manual cannot describe all conceivable situations. For this reason, applicable standards and relevant occupational health and safety regulations are always given priority.
4. In addition, the installation may involve residual hazards in the following circumstances:
  - Incorrect installation.
  - The installation is carried out by personnel who did not receive relevant training or guidance.
  - Failure to observe the warnings and safety information in this manual.

**If there are any questions, please contact Greensun after service.**

## 1.5. Disclaimer

Shall not be liable for personal injury, property loss, product damage and subsequent losses under the following circumstances.

- Failure to comply with the provisions of this manual.
- Incorrect use of this product.
- Unauthorized or unqualified personnel repair the product, disassembly the rack and perform other operations.
- Use of unapproved spare parts.
- Unauthorized modifications or technical changes to the product

## 1.6. Installation environment

- The battery energy storage system can only be installed and operated in an enclosed space. The working environment temperature range of SAS51200/280/314-HV is  $-20^{\circ}\text{C} \sim 55^{\circ}\text{C}$ , and the maximum humidity is 85%. The battery module shall not be exposed to the sun or placed directly beside the heat source.
- The battery module shall not be exposed to a corrosive environment.
- When installing the battery energy storage system, ensure that it stands on a sufficiently dry and flat surface with sufficient bearing capacity. Without the manufacturer's written approval, the installation site's altitude shall not be higher than 3,000 meters. The output power of the battery decreases with the altitude.
- In areas where flooding may occur, care must be taken to ensure that the battery module is installed at a suitable height and to prevent its contact with water.
- The battery energy storage system must be installed in a fireproof room. This room must have no fire source and must be equipped with an independent fire alarm device, which complies with local applicable regulations and standards. According to local applicable regulations and standards, the room must be separated by the T60 fire door. Similar fire-proof requirements apply to other openings in the room (such as windows).

### **Minimum product installation distance**

The minimum distance to the surrounding building when the battery is installed is 100mm, and the minimum distance between the two products is 100mm.

## 1.7. Requirements for Installation Personnel

All work shall comply with local applicable regulations and standards. The installation of SAS51200/280/314-HV can only be completed by electricians with the following qualifications:

- Trained in dealing with hazards and risks associated with the installation and operation of electrical equipment, systems, and batteries.
- Trained on installation and debugging of electrical equipment.
- Understanding and complying with the technical connection conditions, standards, guidelines, regulations, and laws applicable.
- Knowledge of handling lithium-ion batteries (transportation, storage, disposal, hazard source).
- Understanding and complying with this document and other applicable documents.

## 2. Safety

### 2.1. Safety rules

To avoid property damage and personal injury, the following rules shall be followed when working on the hazardous live parts of the battery energy storage system:

- It is available for use.
- Ensure that it will not restart.
- Make sure there is no voltage.
- Grounding protection and short circuit protection
- Cover or shield adjacent live parts.

### 2.2. Safety information

Part damage or short circuit may cause electric shock and death. A short circuit can be caused by connecting battery terminals, resulting in current flow. This type of short circuit shall be avoided under any circumstances.

For this reason, follow these instructions:

- Use insulated tools and gloves.
- Do not put any tools or metal parts on the battery module or high-voltage control box.
- When operating the battery, be sure to remove watches, rings, and other metal objects.
- Do not install or operate this system in explosive or high-humidity areas.
- When working on battery, and ensure that they are not turned on again.



**WARNING!** Improper use can cause damage to the battery cell.

- Do not expose the battery module to rain or soak it in liquid.
- Do not expose the battery module to a corrosive environment (such as ammonia and salt).
- The battery energy storage system shall be debugged no later than six months after delivery.

## 3. Transport to the end customers

### 3.1. 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.



The dangerous goods transport vehicles shall meet relevant regulations concerning road transportation and shall be equipped with two tested CO<sub>2</sub> 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 battery rack (15 battery modules in series) can reach 1455kg( 200AH ), 1800 kg(280AH ) and 1890kg( 314AH ). 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.



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.

**Check whether the delivery is complete.**

### **3.2. Storage Position of the battery packaging module**

The battery module can only be transported in an upright position. Please note that the battery rack may be very top-heavy.

## 4. Description and Installation of our battery

### 4.1. Installation Precautions



**WARNING!** Possible damage to the building due to static overload

1. Each battery modul is heavy Ensure that the installation site has sufficient bearing capacity.
2. When selecting the installation site, consider the transportation route and necessary site cleanup.

### 4.2. Product Description

SAS51200/280/314-HV is high-voltage lithium-ion battery system.

It is characterized by high integration, good reliability, long service life, wide working temperature range, etc.

The battery energy storage system is modular.

It can support up to 15 battery modules in series.

### 4.3. Technical Data

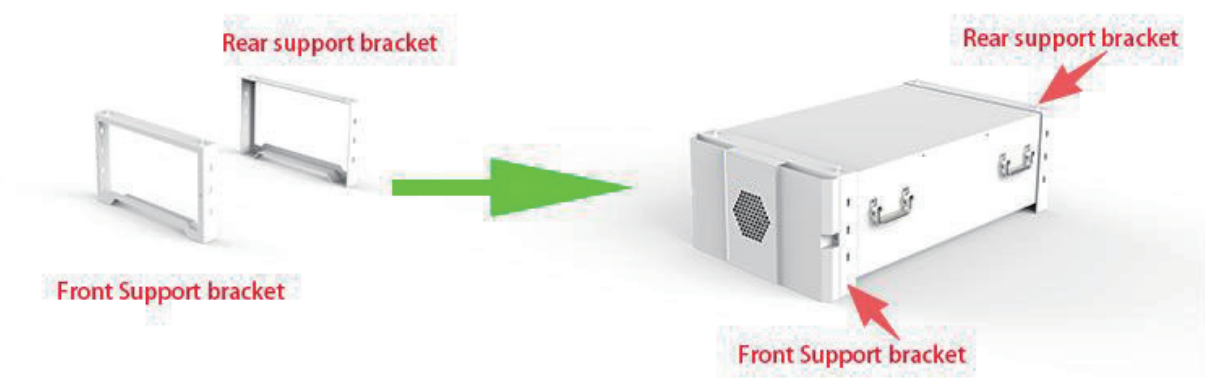
**please contact our sales team to get specifications.**

### 4.4. Preparation

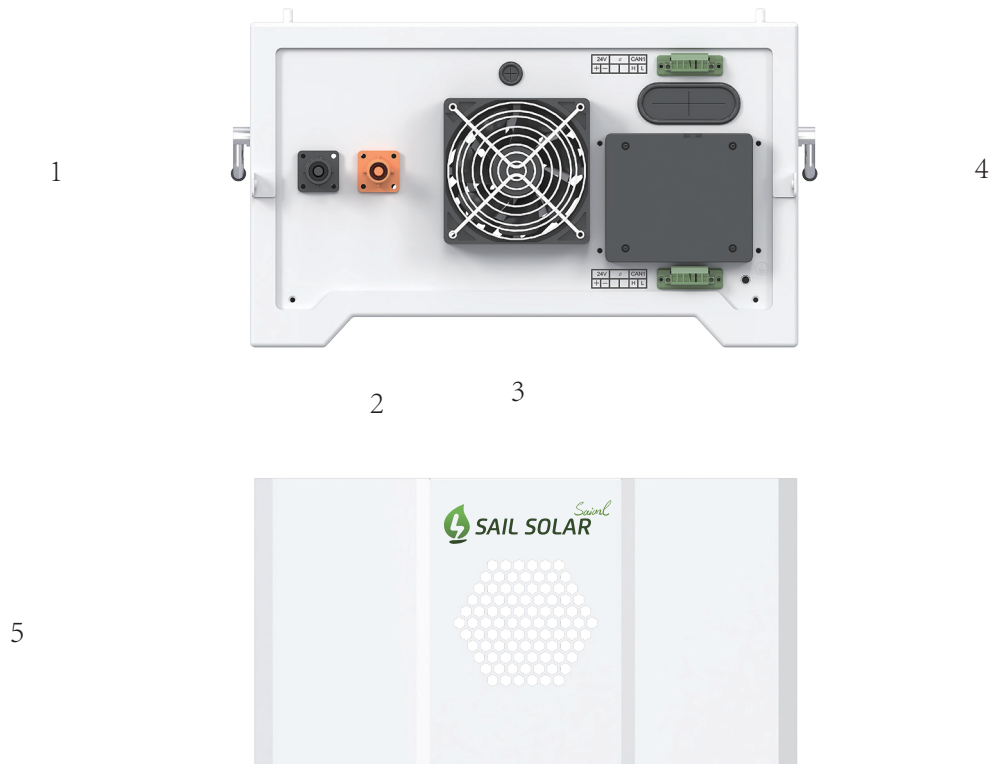
#### 4.4.1. Tools required

Please prepare 4mm and 5mm Hexagon socket, and No. 14 socket and cutting pliers for fastening screws on the side of the cluster holder to lock the power line.

### 4.5. Description of Rack



## 4.6. Description of Battery Module



1 B-  
Battery module negative pole (black)

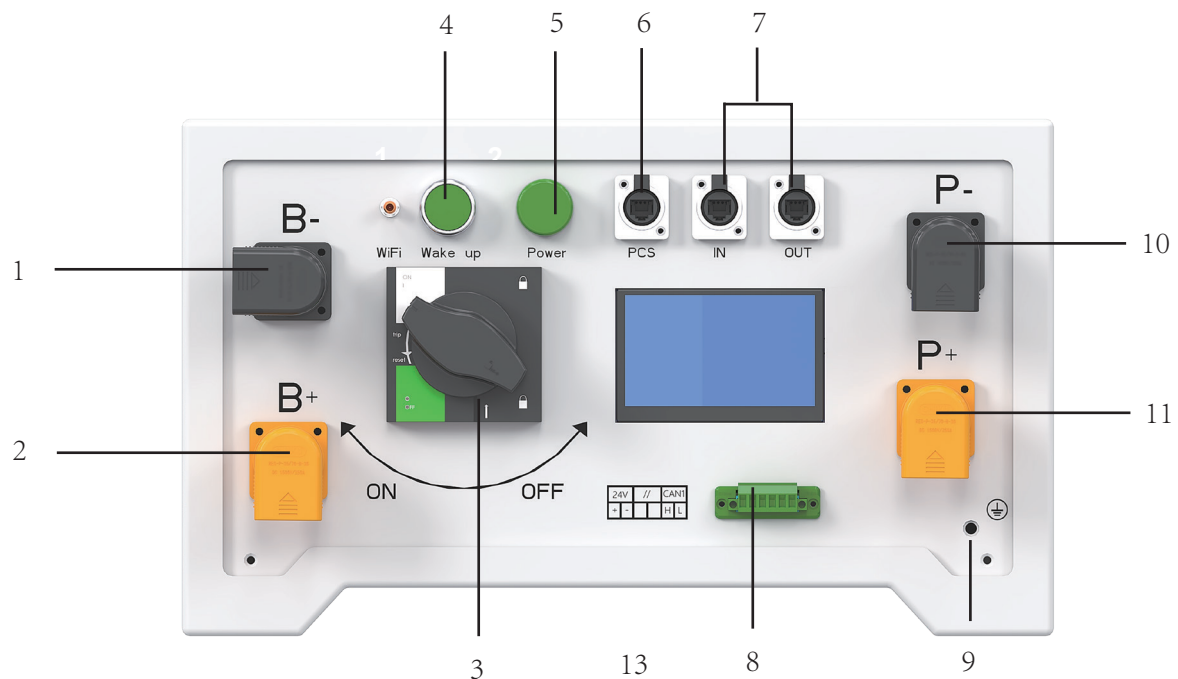
3 Fan  
Ventilation and heat dissipation.

2 B+  
Battery module positive pole (orange)

4 COMM port  
Battery module communication and fan cooling power supply

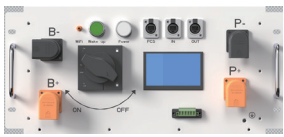









5 Dust guard  
Dust guard

## 4.7. Description of High-Voltage Control Box



- 1 B-: Battery common negative connection position (black)
- 2 B+: Battery common positive connection position (orange)
- 3 On/Off Switch
- 4 Wake-up switch
- 5 Power Indicator
- 6 PCS communication port: connect with PCS/Inverter
- 7 High-voltage cabinet parallel communication interface
- 8 High-voltage box communication and fan power supply interface with the battery pack
- 9 Connection to the battery rack and the ground point
- 10 Connection position of PCS negative pole (black)
- 11 Connection position of PCS positive pole (orange)
- 12 Battery Screen: Display battery SOC, Voltage, Current and Temperature, Time, Fault code

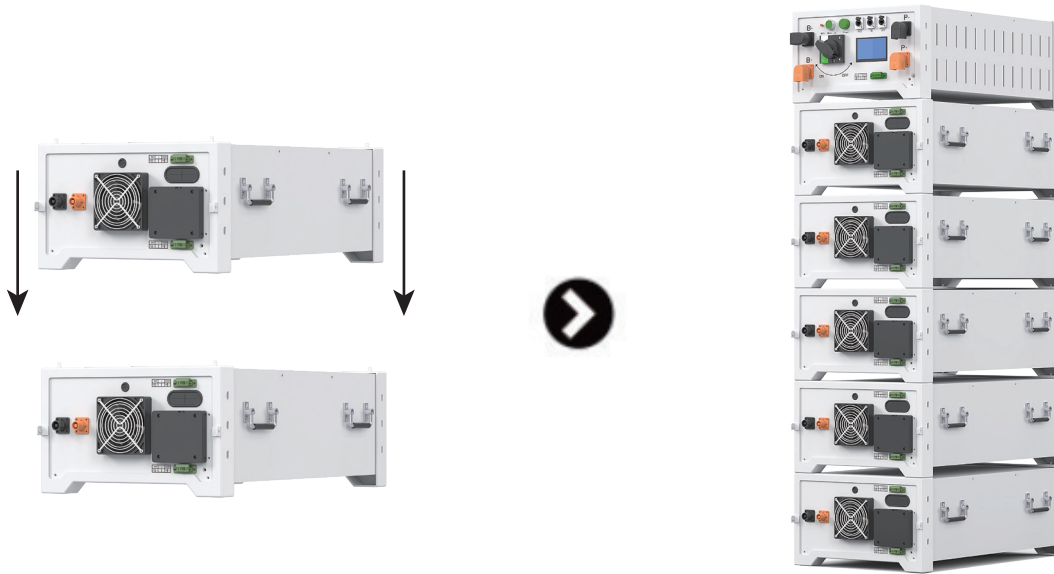
## 4.8. Description of Battery set

1		High-voltage Control Box
2		Battery module
3		Power cable (from the first battery to high voltage control box): Red color
4		Power cable(from the last battery to High Voltage Control Box: Black color
5		Dust guarddust guard
6		Power cable between 2 battery packs
7		One pair of Power cable: Connect battery with inverter: 1 Orange 1 Black
8		Communication cable( connect High-voltage Control Box to PCS/Inverter
9		Ground cable
10		Communication cable

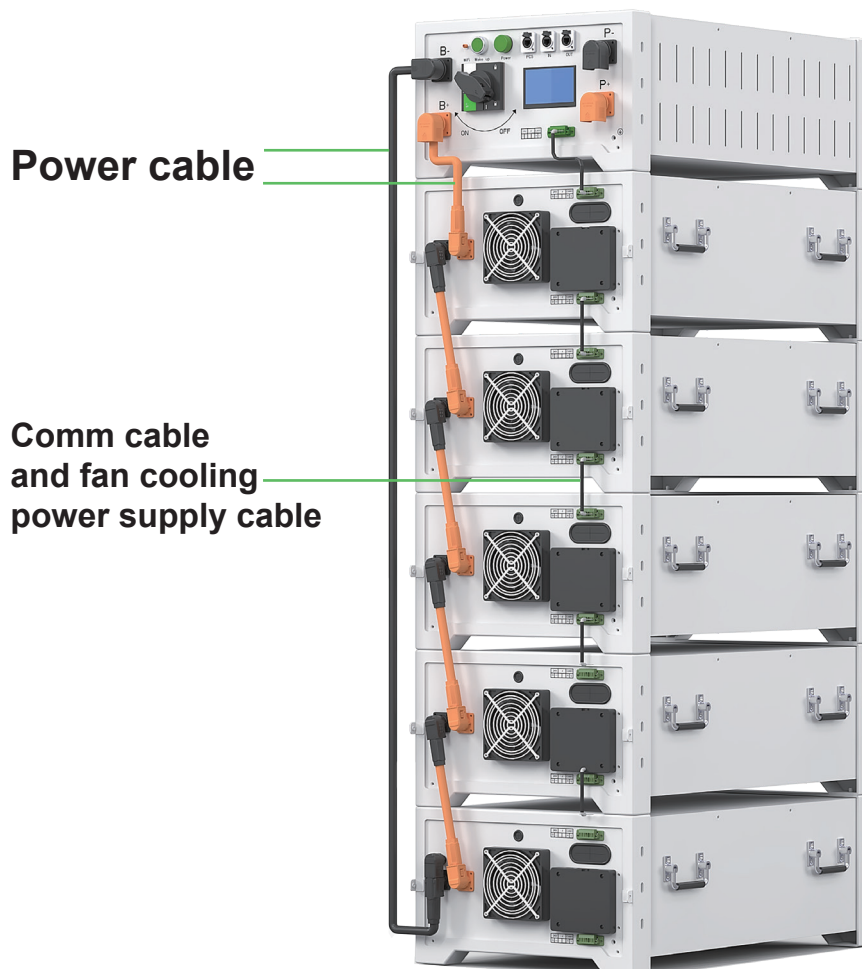
## 4.9. Installation of the Battery set

First step: Take the battery out of the packaging and install it as shown in the diagram.

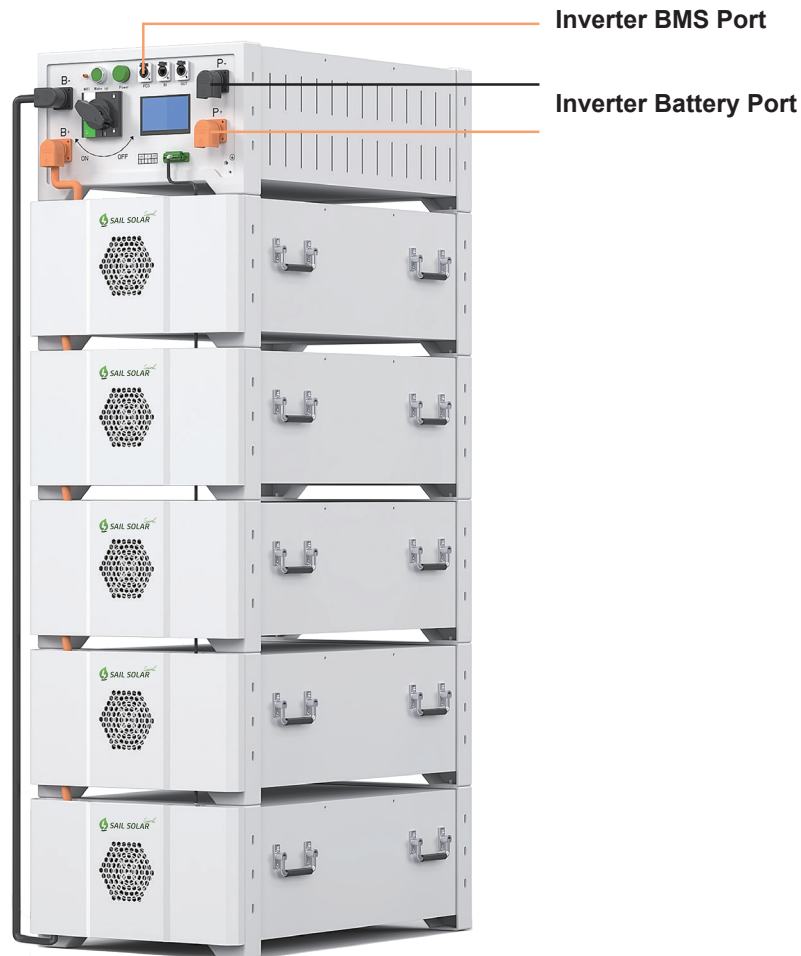
Second step: Stack the batteries together and then stack the HV controller box on top of the battery cluster



Third step: connect the power cable of each battery and to the HV controller box( B- B+); connect the COMM cable and Fan cooling power supply cable of each battery moduel and to the HV controller box(COMM 1 port)



Last step: install the cover, and use power cable connect HV controller box (P+ P-) to inverter battery port; use Comm cable to connect HV controller box( PCS port) to the inverter BMS port.



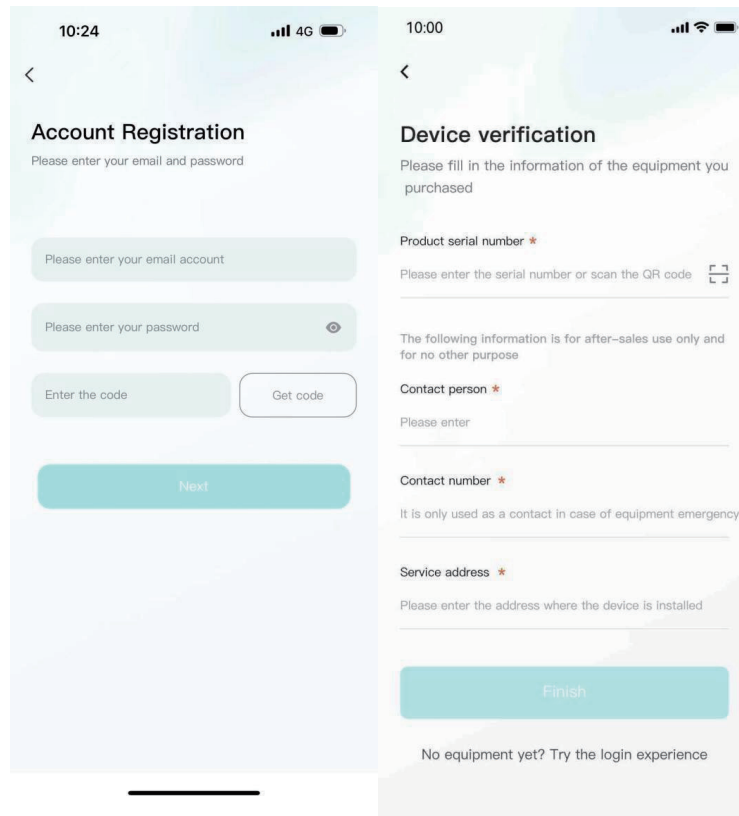
## 5. How to use remote control with our series battery

Scan QR code Or search “ Udan ESS” on app store and download the Wifi APP. After downloading the APP, please follow the steps below to complete the operation.



### Step1: Register Account

- 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.



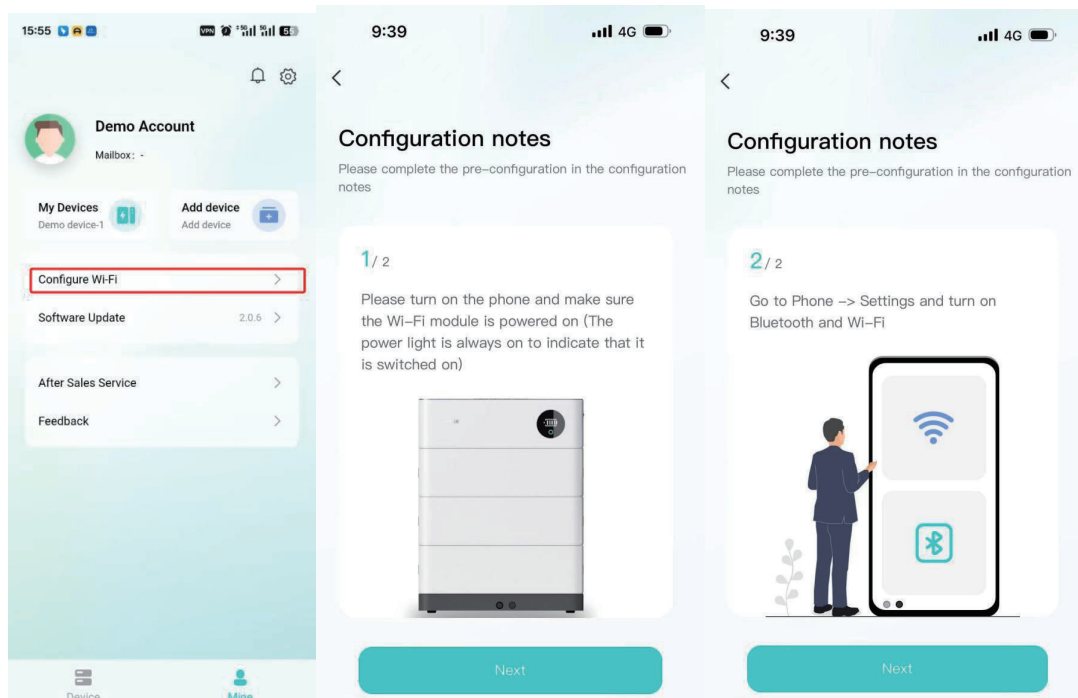
## Step2: Equipment distribution network

- **Overview**

Device distribution network refers to connecting devices to the Cloud Computing Platform to help users obtain real-time device data information.

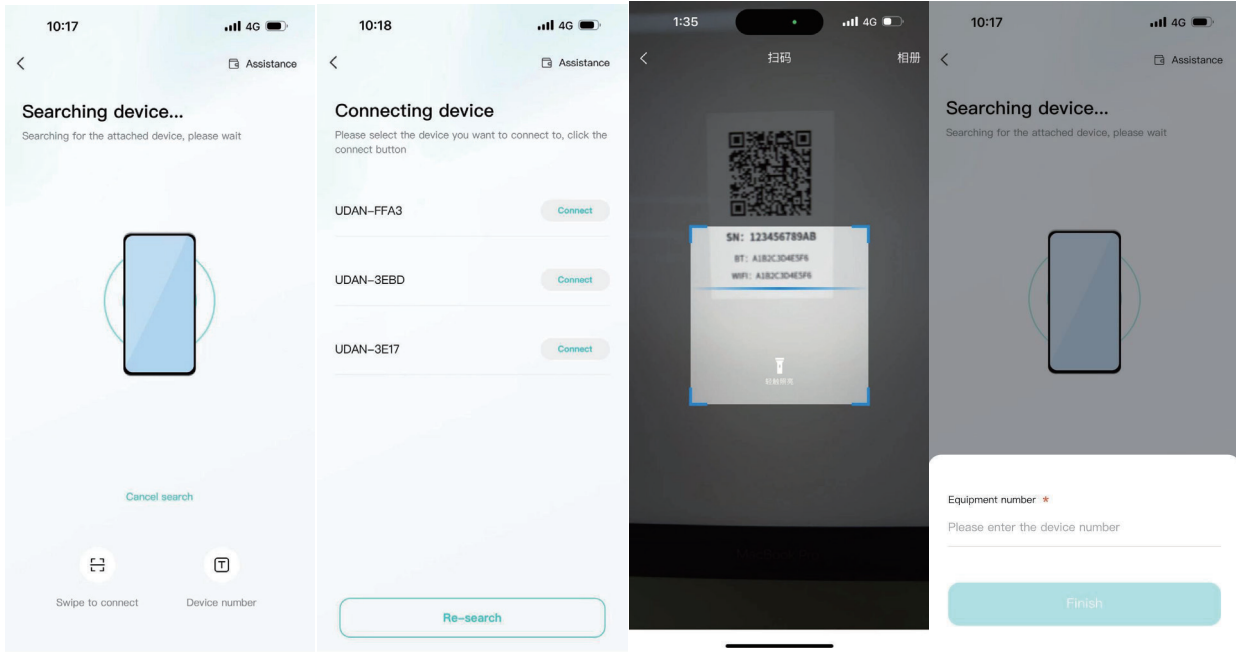
- **Distribution process**

Preparation before distribution: Ensure that the device is on , turn on the mobile phone Bluetooth and wireless LAN functions.



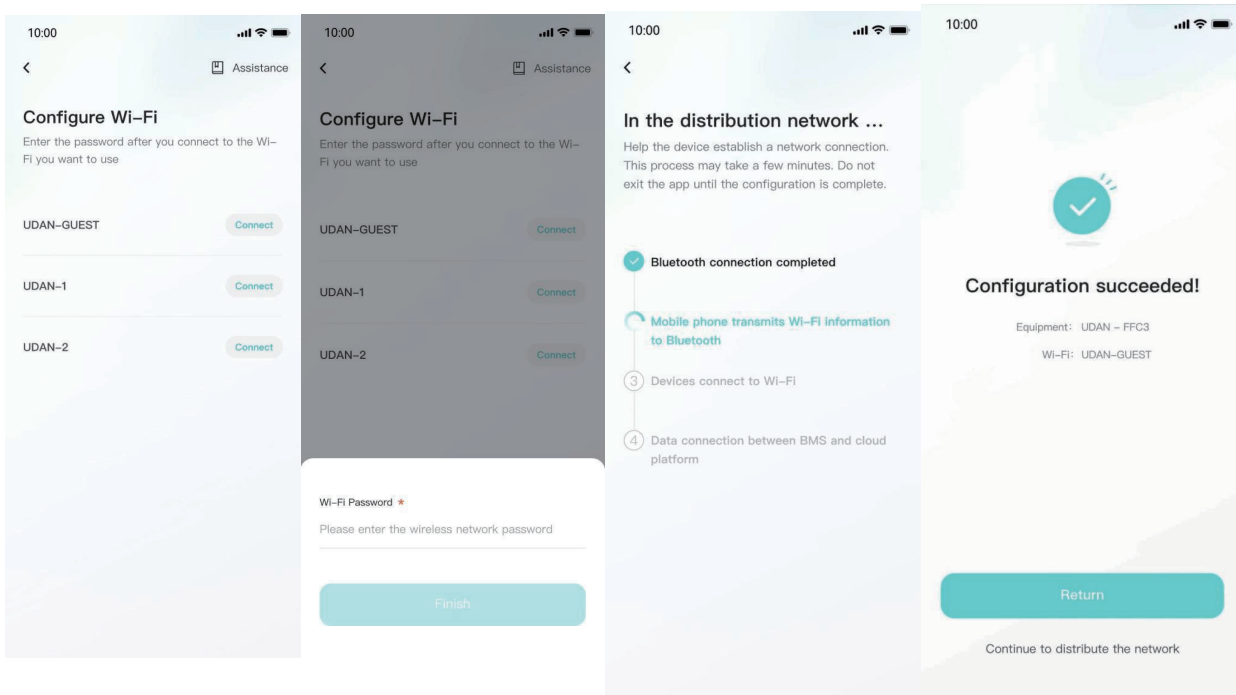
- **Connected devices**

The current App supports Bluetooth search, device scanning, and manual input of SN code.



● **Connect to WiFi**

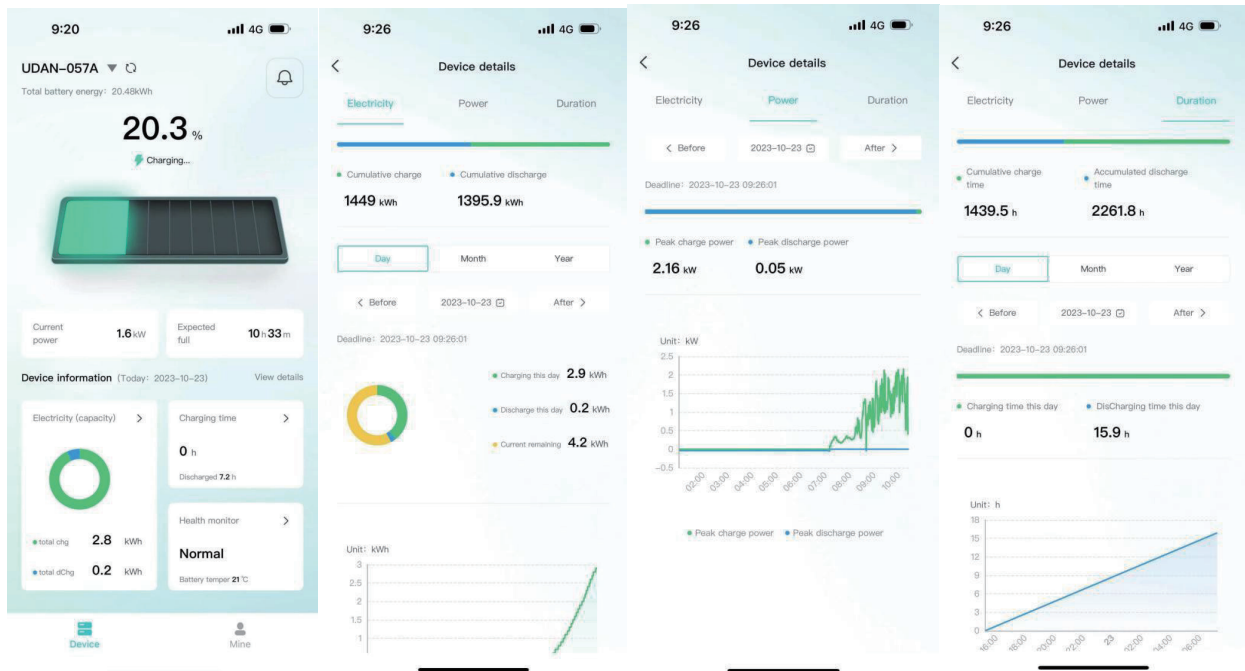
After the device is connected, enter the WiFi connection process. Select the WiFi you want to use and click the "Connect" button. Enter the WiFi password and click the "Finish" button to distribute the network.



### Step3: App page

- **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.



- **Mine Page**

- 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.



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