SUNWODA ENERGY

User Manual

Rechargeable Li-ion Battery System

Model: CIESS series

Version: A0 Release Date: 2023-12-14

Shenzhen Sunwoda Energy Technology Co., Ltd.

Contents

1 Safety Instructions

1.1 Safety Notes

Before transportation, storage, installation, operation, use, or maintenance of equipment, please carefully read and properly store this manual and strictly follow the safety precautions required by the manual content for operation. The safety precautions mentioned in this manual are only a supplement to local safety regulations.

The "danger", "warning", "caution", and "instructions" in the manual do not represent all safety precautions that should be followed. You are also required to comply with relevant international, national, or regional standards, as well as industry practices. Our company does not assume any responsibility for violating safety operation requirements or violating safety standards for the design, production, and use of equipment.

The equipment shall be used in an environment that meets the requirements of the design specification; otherwise, equipment failure, equipment function abnormality, or component damage may be caused, which is not within the scope of equipment quality assurance. Otherwise, our company shall not be liable for compensation for potential personal injury, property damage, etc.

All operations, such as transportation, storage, installation, operation, use, and maintenance, should comply with applicable laws, regulations, standards,

and normative requirements. It is not allowed to study the internal implementation logic of the device in any way, obtain the source code of the device software, infringe intellectual property rights, or to disclose the results of any device software performance testing.

Our company shall not be liable for any of the following situations or their consequences:

● Equipment damage caused by earthquake, flood, volcanic eruption, debris flow, lightning strike, fire, war, armed conflict, typhoon, hurricane, tornado, extreme weather, force majeure,

● Not operating within the usage conditions specified in this manual,

● The installation and usage environment do not comply with relevant international, national, or regional standards,

● Failure to follow the operating instructions and safety warnings in the product and documentation;

● Unauthorized disassembly, modification of products, or modification of software codes;

● The materials and tools you provide do not meet the requirements of local laws, regulations, and relevant standards.

● Damage caused by negligence, intent, gross negligence, improper operation, or non-company reasons by you or a third party.

1.1.1 Personal safety

⚠Dangerous
Live operation is strictly prohibited during the installation process. It is prohibited to install or remove cables with electricity. When the cable core comes into contact with the conductor, it may generate electric arcs, sparks, or explosions, which can lead to fire or personal injury.
When the equipment is electrified, the non-standard and incorrect operation may cause fire, electric shock, or explosion, leading to personal injury or property damage.
It is strictly prohibited to wear easily conductive objects such as watches, bracelets, bangles, rings, necklaces, etc. during the operation to avoid being burned by electric shock.
During operation, special insulation tools must be used to avoid electric shock injuries or short circuit faults. The insulation's ability to withstand voltage levels must meet the requirements of local laws, regulations, standards, and specifications.
⚠Warning
Special protective equipment must be used during the operation process, such as wearing protective clothing, insulated shoes, goggles, safety helmets, insulated gloves, etc.

1.1.2 Electrical safety

⚠Dangerous
Before making electrical connections, please ensure that the equipment is not damaged; otherwise, it may cause an electric shock or fire.
Unstandardized and incorrect operations may cause accidents such as fires or electric shocks.

During the operation, it is necessary to prevent foreign objects from entering the interior of the equipment; otherwise, it may cause short circuit faults or damage to the equipment, load power reduction or power loss, and personal injury.
⚠Warning
When installing equipment that needs to be grounded, a protective ground wire must be installed first; When dismantling equipment, the protective ground wire must be removed last.

1.1.3 Environmental safety

⚠Dangerous
It is strictly prohibited to place the equipment in a flammable, explosive gas, or smoke environment, and any operation is prohibited in this environment.
It is strictly prohibited to store flammable and explosive materials in the equipment area.
It is strictly prohibited to place the equipment near a heat source or fire source, such as smoke, fire, a candle, a space heater, or other heating equipment. Heating of the equipment may cause equipment damage or fire.
During operation, special insulation tools must be used to avoid electric shock injuries or short circuit faults. The insulation's ability to withstand voltage levels must meet the requirements of local laws, regulations, standards, and specifications.
⚠Warning
The equipment should be installed in an area far away from liquids, and it is strictly prohibited to install it below water pipes, air vents, and other locations that are prone to condensation; It is also strictly prohibited to install

it below the air conditioning outlet, ventilation outlet, machine room outlet window, and other locations that are prone to water leakage, to prevent liquid from entering the equipment and causing equipment malfunction or short circuit.
When the equipment is running, do not block the ventilation openings, heat dissipation systems, or use other items to cover it to prevent high temperature damage to the equipment or ignition.

1.1.4 Mechanical safety

⚠ Dangerous
High-altitude operations must wear safety helmets, safety belts, or waist ropes tied to sturdy structural components. It is strictly prohibited to hang on moving unstable objects or metal with sharp edges to prevent hook slipping and falling accidents.
⚠ Warning
The tools must be fully prepared and inspected by a professional organization to be qualified. It is prohibited to use tools that have scars, fail the inspection, or exceed the inspection validity period, to ensure that the tools are firm and not overloaded.
Before installing the equipment into the cabinet, first make sure that the cabinet is fixed to avoid tilting and collapsing due to an unstable center of gravity, which may cause injuries to installation personnel and equipment damage.
When pulling equipment out of the cabinet, be careful to install equipment that may be unstable or heavy inside the cabinet to avoid being crushed or crushed.

It is strictly prohibited to drill holes in the equipment. Drilling holes can damage the sealing, electromagnetic shielding performance, internal components, and cables of the equipment, and the metal chips generated by drilling holes entering the equipment can cause circuit board short circuits.

1.1.5 Battery safety

⚠ Dangerous
It is strictly prohibited to short-circuit the positive and negative terminals of the battery; otherwise, it may cause a short circuit in the battery. The short circuit of the battery will generate a large current and release a large amount of energy in an instant, causing the battery to leak liquid, smoke, release combustible gas, thermal runaway, fire, or explosion. To avoid short circuits in the battery, live maintenance is not allowed.
Do not expose the battery to high-temperature environments or around heating equipment, such as high-temperature sunlight, a fire source, a transformer, a space heater, etc. Overheating of the battery may cause leakage, smoke, the release of combustible gas, thermal runaway, fire, or explosion.
It is strictly prohibited for the battery to be subjected to mechanical vibrations, falls, collisions, hard objects piercing, and pressure impacts; otherwise, it may cause battery damage or fire.
It is strictly prohibited to disassemble, modify, or damage the battery (such as by inserting foreign objects, squeezing by external force, immersion in water or other liquids), so as to avoid liquid leakage, smoke, release of combustible gas, thermal runaway, fire, or explosion of the battery.
It is strictly prohibited for battery terminals to come into contact with

other metal objects, as it may cause heating or electrolyte leakage.
⚠Warning
When installing and testing batteries, fire protection facilities such as fire sand and carbon dioxide fire extinguishers must be equipped in accordance with construction standards and specifications. Before putting into operation, it is necessary to ensure that fire-fighting facilities that comply with local laws, regulations, and regulatory requirements are in place.
The battery should be installed in an area far away from liquids, and it is strictly prohibited to install it below areas prone to water leakage such as air conditioning outlets, ventilation vents, machine room outlet windows, and water pipes, to prevent liquid from entering the equipment and causing equipment malfunction or short circuit.
After the battery is discharged, it should be charged in a timely manner; otherwise, it may cause damage to the battery due to over-discharge.

1.2 Interpretation of Symbols

Symbol	Interpretation	Symbol	Interpretation
	Caution! Hazards caused by failure to operate as required may result in moderate or minor personal injury, as well as damage to the product!		This equipment must not be discarded with other household waste and must be taken to an appropriate facility for recovery and recycling!
	Hazard: Caution for high voltage danger.		Recyclable!
	Fireworks are strictly prohibited		This faces upwards and must not be tilted

			upside down.
	No stepping on !		Read the manual carefully before use!
	The unit vents are hot, be careful of touching them!		Grounding protection!
	A 5-minute wait is required after power failure to ensure that the machine is fully discharged!		General identification of grounding!

2 System Introduction

2.1 System Overview

CIESS series of small-scale optical storage integrated outdoor cabinet energy storage system adopts modular design, featuring easy integration, easy deployment, easy expansion, etc., which guarantees the user's system security, and can be used for peak shaving and valley filling, self-generation and self-consumption, demand management, off-grid power backup, optical storage and charging and other application scenarios.

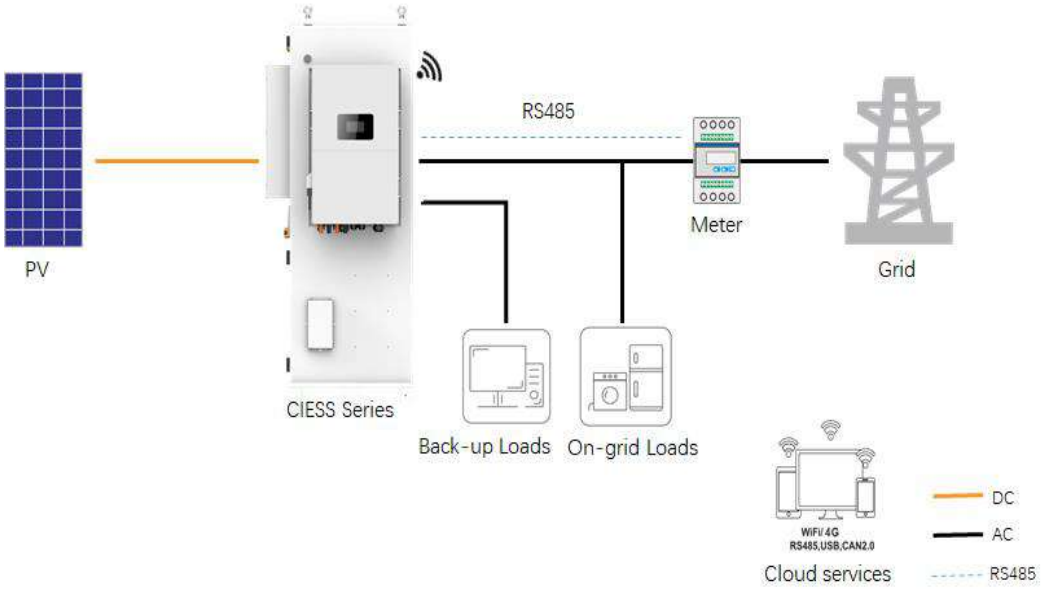


Figure 2-1 Application Scenario

This document mainly introduces the product information, installation, setup, maintenance and technical parameters of the CIESS series of small commercial and industrial energy storage battery systems. This energy storage battery system is mainly composed of battery module, main control module and battery cabinet and energy storage inverter (optional).

2.2 Structure Composition

CIESS energy storage system adopts a modular design framework, installing the battery module, main control module, power distribution components, and energy storage inverter (optional) in component form for easy replacement.

2.2.1 System configuration

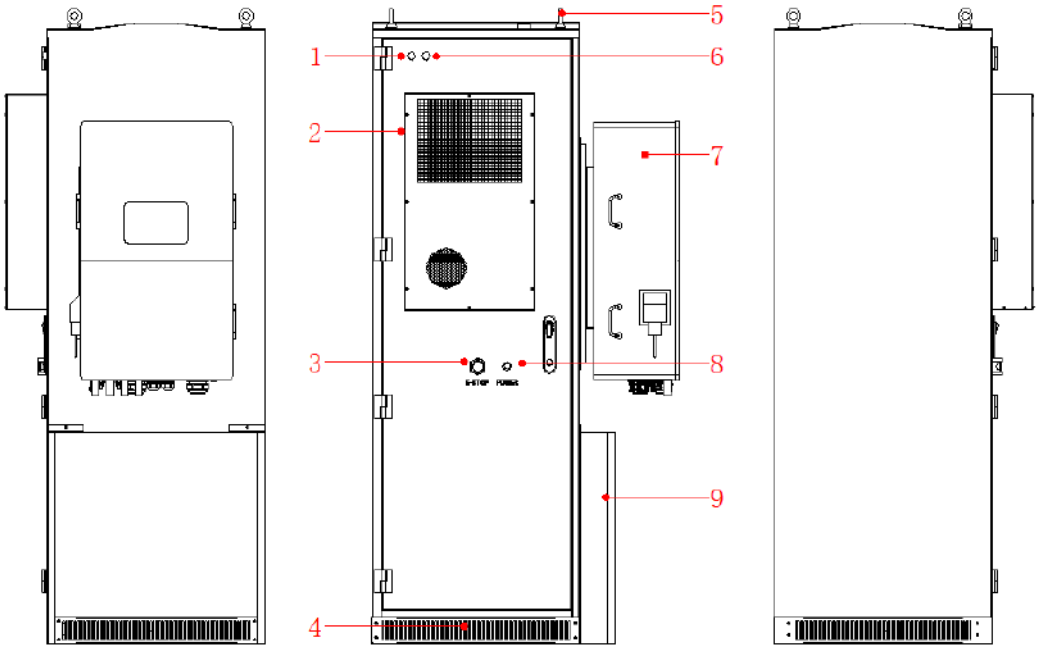


Figure 2-2 Diagram of System Appearance

(1) Operation Indicator Light; (2) Air Conditioner; (3) Emergency Stop Button; (4) Base; (5) Lifting Ring; (6) Alarm Indicator Light; (7) Energy Storage Inverter (Optional); (8) On/Off Button; (9) Cover Wire Plate

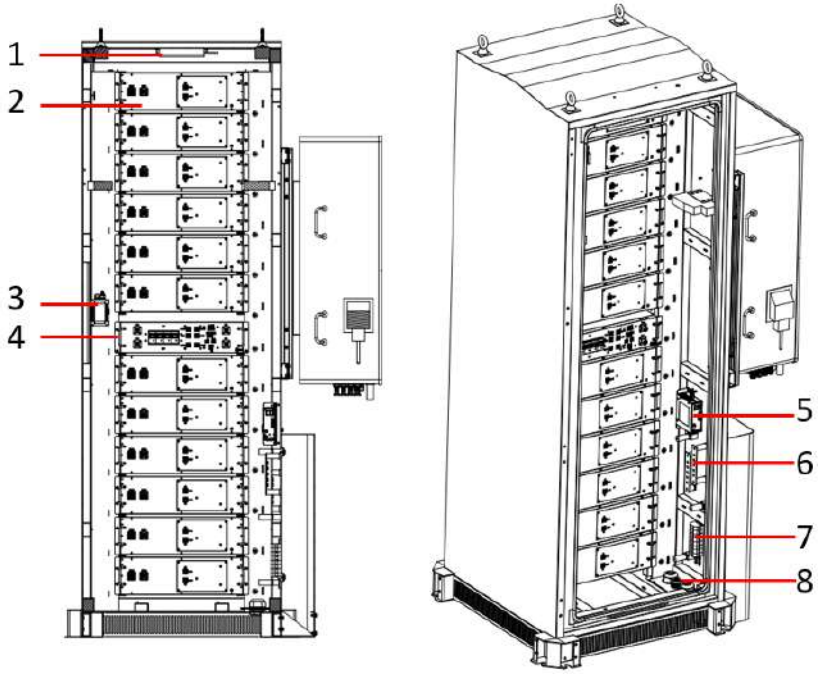


Figure 2-3 Diagram of system interior

(1) Smoke sensor; (2) Battery box; (3) Fire module; (4) Control box; (5) Data module; (6) Positive and negative copper rows; (7) Connector rows; (8) Outlet holes;

2.2.2 Inverter Composition

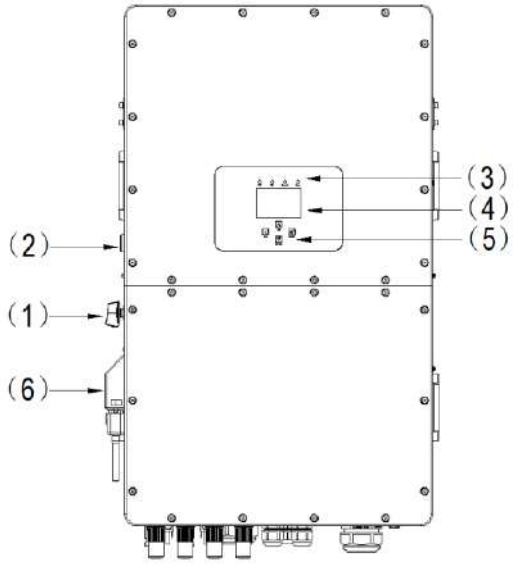


Figure 2-4 Exterior view of inverter

*Note: Please refer to the actual product

(1) DC Switch; (2) Power on/off button; (3) Inverter Indicators; (4) LCD display; (5) Function Buttons; (6) WiFi Interface;

2.2.3 Battery box composition

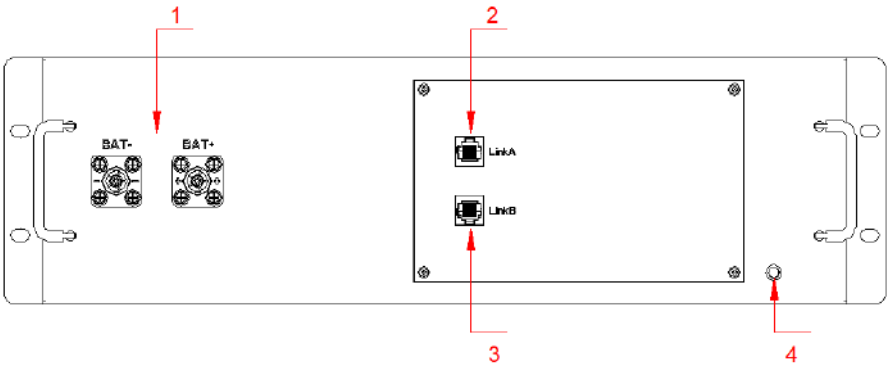


Figure 2-5 Exterior view of the battery module

(1) Positive and negative terminal; (2) Link A; (3) Link B; (4) Earth (electric connection)

No.	Name	Interpretation
1	Positive and negative terminals	Battery positive and negative outputs
2	Link A	Daisy Chain Port 1

3	Link B	Daisy Chain Port 2
4	Earth (electric connection)	Grounding point

2.2.4 Control box composition

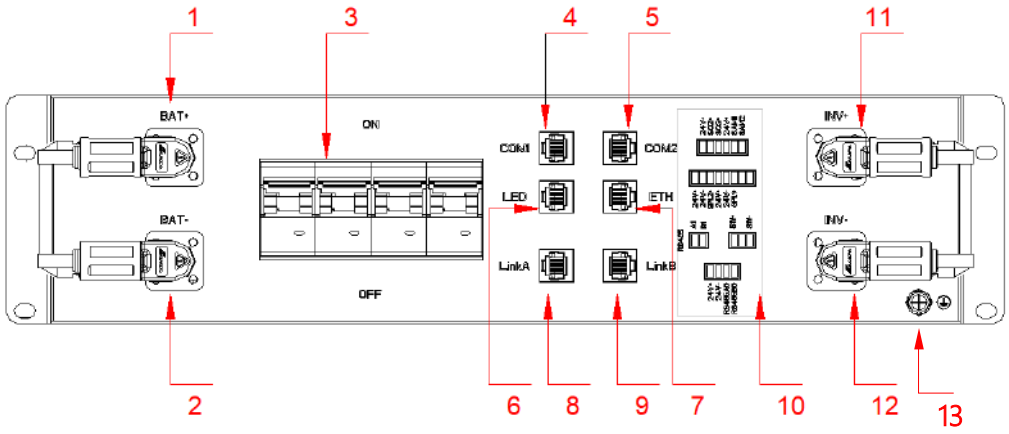


Figure 2-6 Appearance of the main control module

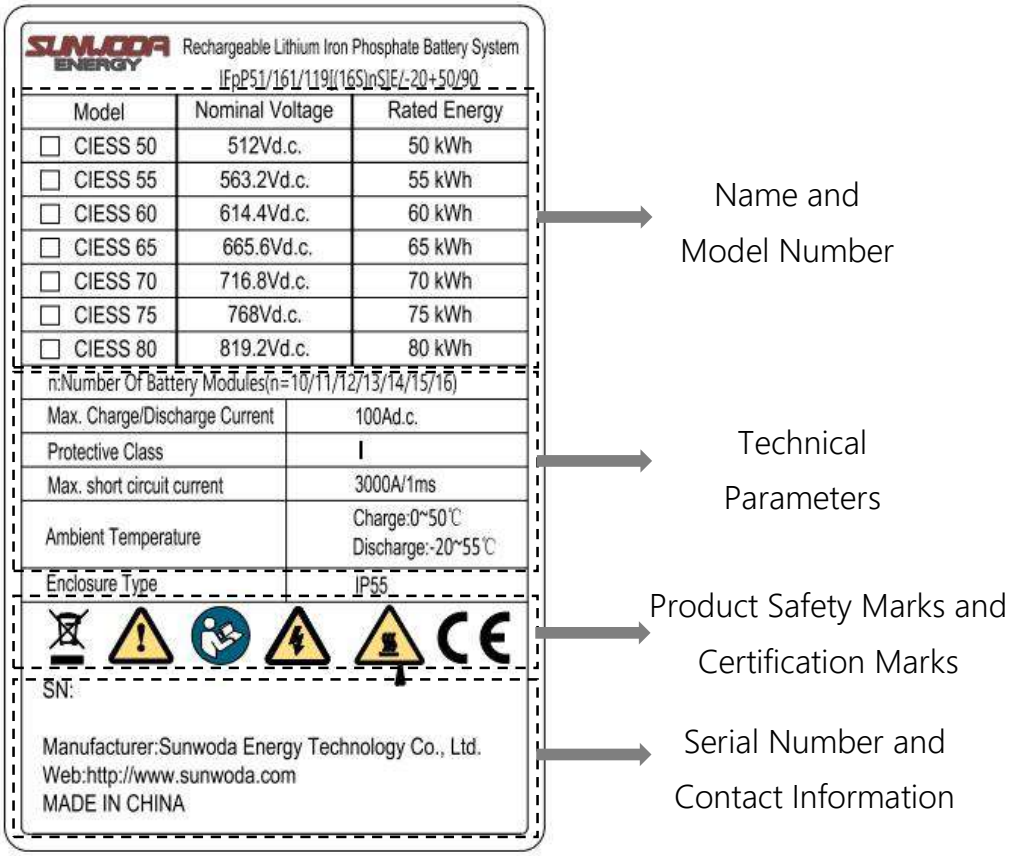
(1) BAT+ (2) BAT- (3) Air Switch (4) COM1 (5) COM2 (6) LED (7) ETH (8) Link A (9) Link B (10) Functional Interfaces (11) INV+ (12) INV- (13) Earth (electric connection)

No.	Name	Interpretation
1	BAT+	Positive input terminal
2	BAT-	Negative input terminal
3	Air Switch	On/Off switch for DC circuit
4	COM1	CAN and parallel communication line interface 1
5	COM2	CAN and parallel communication line interface 2
6	LED	Reserved wiring port for LED light panel
7	ETH	Ethernet interface
8	Link A	Daisy Chain Port 1
9	Link B	Daisy Chain Port 2
10	Functional interfaces	24V output, on button, air conditioning communication, data module power supply and communication, emergency stop detection, access control detection, smoke detection interfaces

11	INV+	Positive output (to inverter)
12	INV-	Negative output (to inverter)
13	Earth (electric connection)	Grounding point

2.2.5 Introduction to nameplate

The following nameplate is for reference only, please refer to the actual product for the details.



3 System Installation

3.1 Installation Notes

⚠Before starting the installation, please read the following instructions:

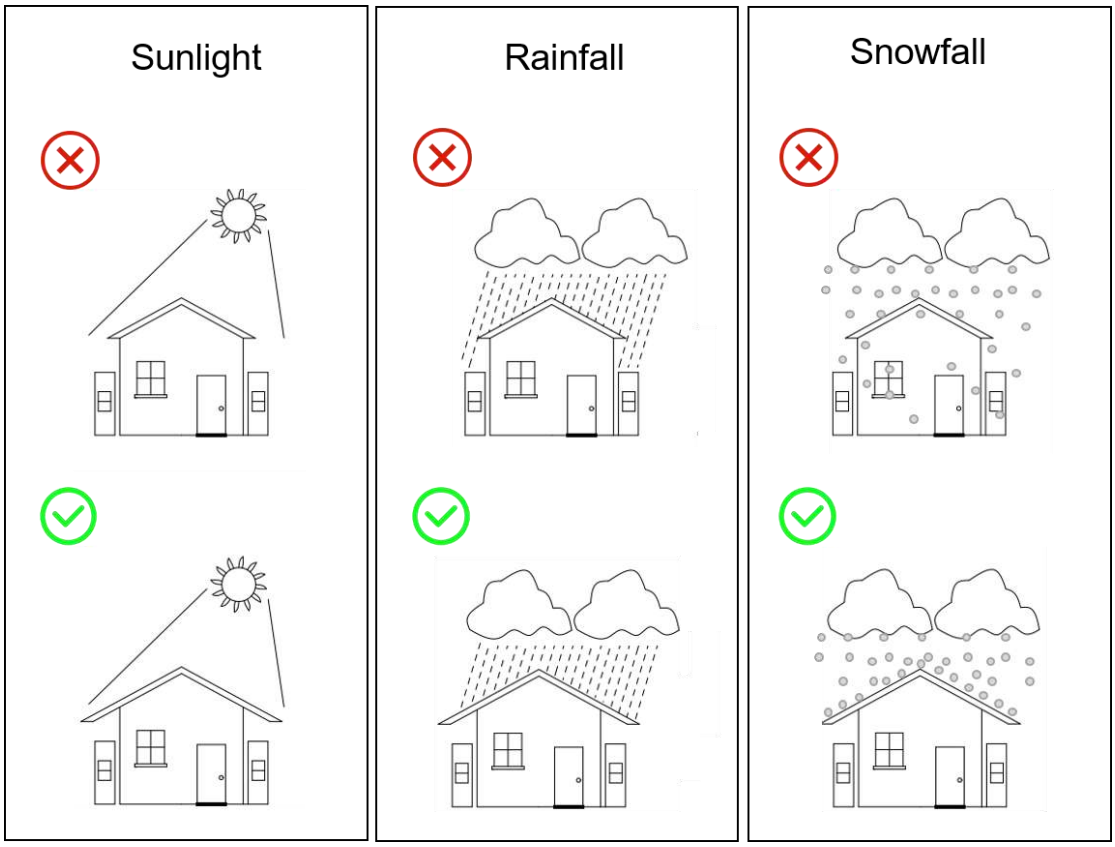
- Ensure that the ambient temperature of the installation site is within the specified range of -20°C to +55°C (0°C to 40°C recommended).
- The battery system needs to be installed on a ground with sufficient load-bearing capacity and levelness; if the ground does not have sufficient support and levelness, it needs to be ensured by other means (e.g., making a foundation, adding load-bearing plates, etc.).
- Avoid installing the equipment close to high-temperature heat sources or low-temperature cold source environments.
- Avoid installing the equipment in areas with extreme changes in ambient temperature.
- Avoid installing the equipment in a strong interference environment.
- Avoid installing equipment in sites accessible to children。
- Avoid installing the unit in areas prone to waterlogging.
- Make sure there is a carbon dioxide, Novac 1230 or FM-200 fire extinguisher near the equipment. To extinguish the fire, use an extinguisher of the recommended material, not water or ABC dry powder extinguishers; firefighters must wear protective clothing and self-contained breathing apparatus.
- The installation location should be well ventilated, away from flammable and explosive materials, and prohibit installation and operation in a smoky environment.
- Before installation, it is necessary to carry the battery system to the

installation location. To avoid injury to personnel or damage to equipment during transportation, please pay attention to the following matters:

① Please equip the corresponding personnel and tools according to the weight of the equipment, so as to avoid the equipment exceeding the range of weight that can be handled by the human body or smashing the personnel.

② Make sure the unit is balanced during handling and avoid dropping it.

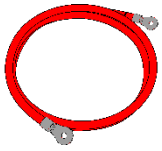
- Avoid sun, rain, snow, etc. as much as possible in the product installation location.
- The product must not be tilted or placed on its side。

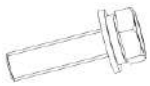
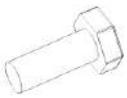
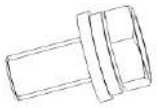
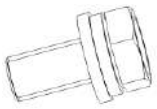


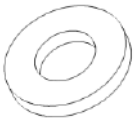
3.2 Pre-installation check

Before installation, check whether the appearance of the machine is intact

and check that the parts of the accessories package correspond to the list.

NO.	Diagram	Material Number	Name	Specification	QTY.
1		/	Energy storage system	CIESS Series	1pcs
2		5099000031331	Expansion bolts	M12X80, White zinc-plated carbon steel	4pcs
3		***	Parallel positive power cable / PCS positive power cable*	UL10269, 2.5m, orange colored	1 suit /1cabinet
4		***	Parallel negative power cable / PCS negative power cable*	UL10269, 2.5m, black colored	1 suit/ 1 cabinet
5		5619100061411	Parallel ground cable	UL1015, 8AWG,1.5m, yellowish green colored	1pcs/ 1 cabinet
6		5619100054511	Parallel communication cable /PCS communication cable	Cat5e, 4.2m	1pcs/ 1 cabinet
7		5619100062991	LAN communication cable	Cat5e,2m	1pcs/ 1 cabinet

8		5623000000051	Cable tie	YJ-120 2.5*0.12mm 尼龙白色	30pcs/ 1 cabinet
9		5099010030131	Cover wire plate	753.8X749.4X120.7mm, SGCC, T=1.2mm	1pcs/ 1 cabinet
10		/	Enclosure-1	L=718mm, SGCC, T=1.2mm	2pcs/ 1 cabinet
11		/	Enclosure-2	L=749mm, SGCC, T=1.2mm	2pcs/ 1 cabinet
12		/	Enclosure-3	L=700mm, SGCC, T=1.2mm	1pcs/ 1 cabinet
13		5099010030151	Tying the wire plate	600x30x10 mm，SGCC, T=1.2mm	2pcs/ 1 cabinet
14		5007010036281	Screw sets M4*16	/	8pcs/ 1 cabinet
15		5007010046191	Screws M10*25	/	4pcs/ 1 cabinet
16		5007010027261	Screw sets M6*14	/	30pcs/ 1 cabinet
17		5007010037321	Screw sets M8*20	/	4pcs/ 1 cabinet

18		50070200 00991	Spring pad M10	Use with M10 screws	4pcs/ 1 cabinet
19		50070300 01251	Flat washer M10	Use with M10 screws	4pcs/ 1 cabinet
20		56990100 55021	General Certificate of Conformity	/	1pcs/ 1 cabinet
21		55030000 26141	User Manual	/	1pcs/ 1 cabinet

*Indicates that the quantity and material number of this cable should refer to the packing list.

3.3 Installation Method

3.3.1 Preparation for installation

Installation requires the participation more than one person. Before installation, check the ground is flat and not inclined, make sure the battery cabinet is vertically close to the ground without the risk of tipping; use a forklift to carry the battery cabinet to the installation position and install the cabinet on the ground, the height of the installation base is more than 20 cm; keep both sides well ventilated, and the minimum clearance between the two sides and the top should not be less than Figure 3-1, 2.

Tips:

①When the AC side is parallel to the machine (in case of inverter installed

in the right side of each cabinet), the clearance between the two cabinets should be more than 1m （Figure 3-1）.

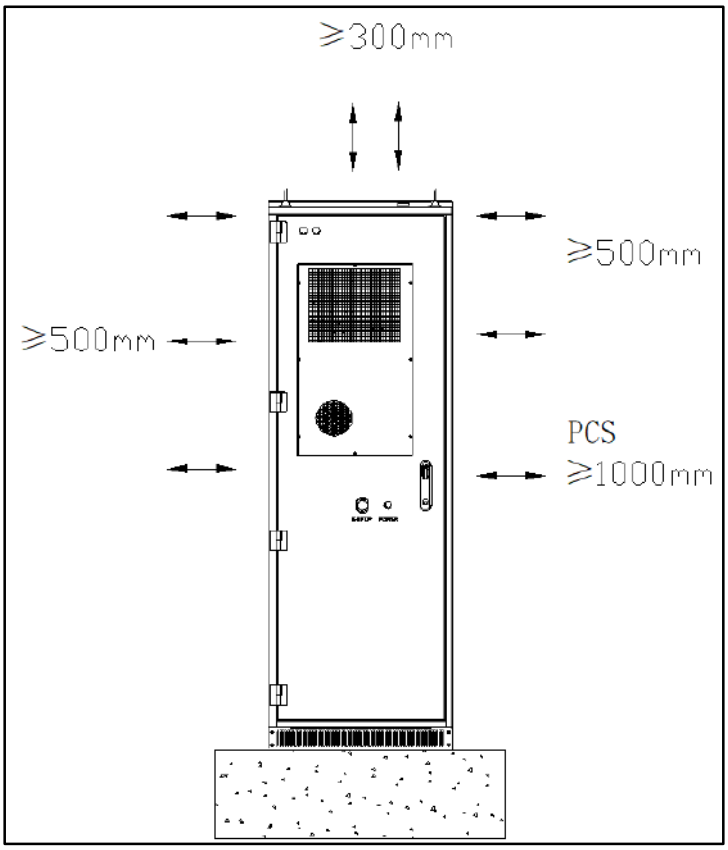


Figure 3-1 Installation diagram

② For DC side paralleling (multiple cabinets sharing one inverter), the recommended installation distance between two cabinets is 20cm （Figure 3-2）.

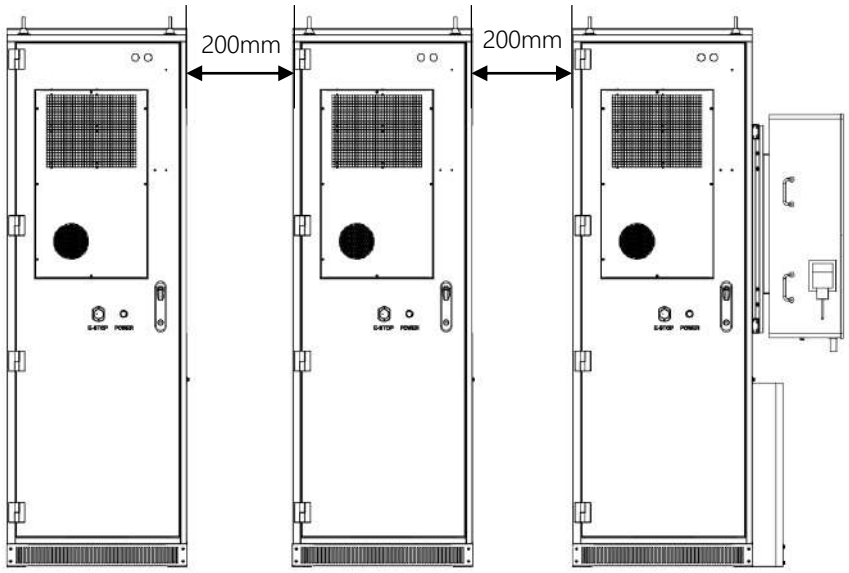


Figure 3-2 Parallel Installation Diagram for Multiple Cabinets

3.3.2 Installation guide

Step 1: Cabinet floor mounting, use expansion bolts to fix the cabinet on the base, the base load-bearing >2000KG.

The location of the base opening is shown in Figure 3-3:

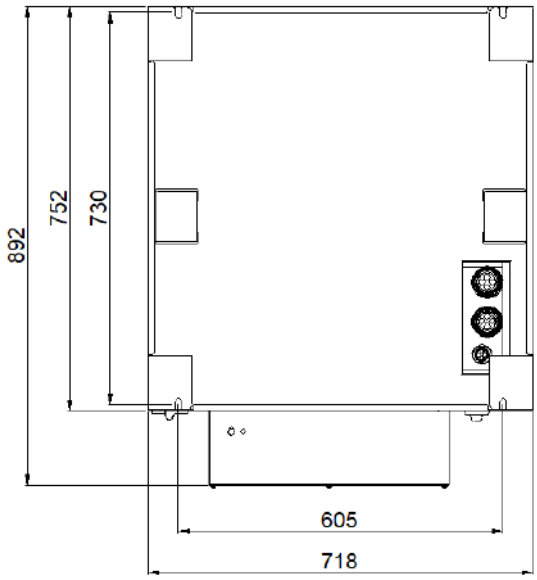


Figure 3-3 Location Diagram of Cabinet Base Openings

Step 2: According to the drawing of the base opening area, use an impact

drill to drill a hole at the opening location. The diameter of the hole is 14mm and the depth is about 80mm, tap the expansion bolts (5099000031331) with the nut removed into the holes.

Step 3: Use a forklift to move the cabinet, place the holes on the cabinet against the bottom bolts, fix the nuts of the expansion bolts to complete the fixed installation of the cabinet.

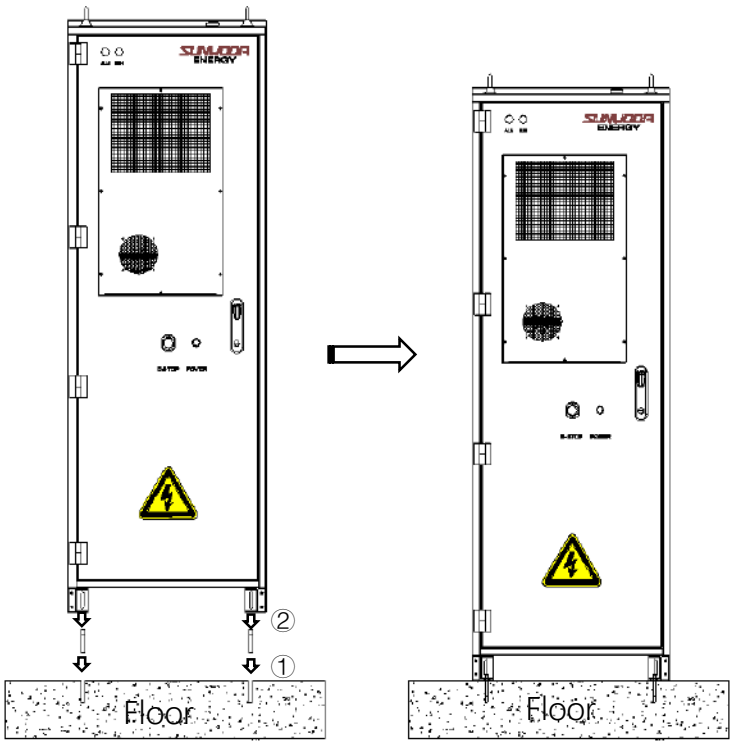


Figure 3-4 Cabinet Installation and Fixing Diagram

Step 4: Install the inverter.

Step 1: Adjust the position of the holes in the cabinet bracket where the inverter will be mounted.

Loosen the 4 M6x14 screws (5007010027261) on the slide bracket and set aside for subsequent re-use.

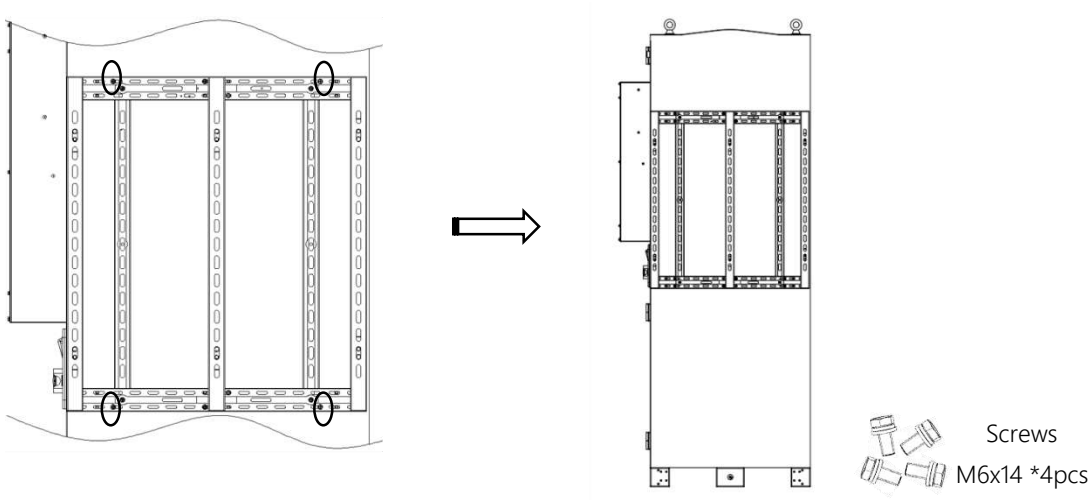


Figure 3-5

Step 2: Install the inverter bracket (comes with the inverter) to the cabinet bracket.

① Take the inverter mounting bracket out and move the nut plate mounting holes on the slide bracket horizontally and vertically against the inverter mounting bracket holes. Adjust the mounting holes and secure the slide bracket with the screws M6x14 removed in step one (Figure 3-6,7).

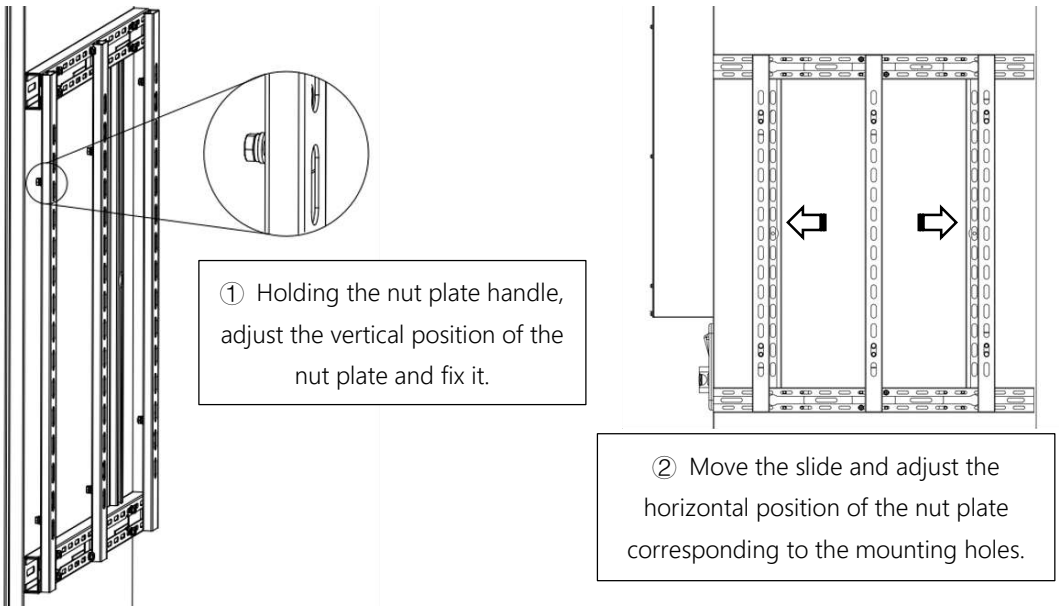


Figure 3-6 Adjusting the Slide Horizontal and Vertical Positions

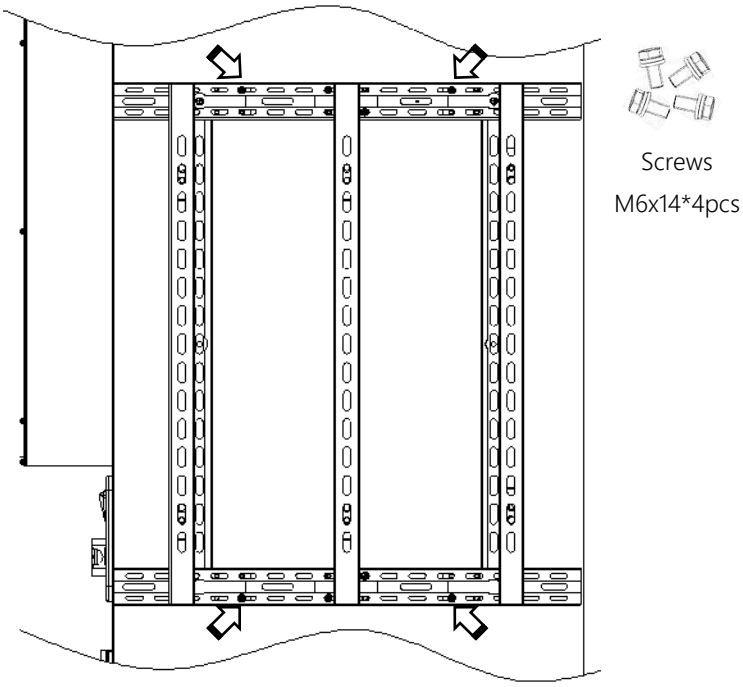


Figure 3-7 Secure the slide

② Remove the M8 (5007010037321) or M10 (5007010046191) bolts* to install the inverter bracket to the cabinet bracket (Figure 3-8) .

* Tip: Different inverters use different bolts, see packing list.

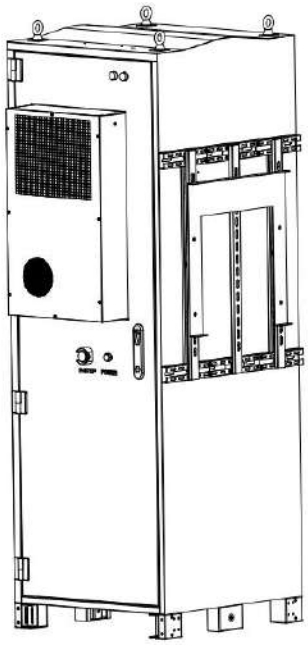


Figure 3-8 Install the Inverter Bracket to the Cabinet Bracket

Step 3: Install inverter.

Refer to the inverter's user manual to complete the installation of the cabinet inverter (Figures 3-8,9).

Tips:

a. Due to the limited length of power and communication cables from the cabinet to inverter, please keep the height distance from the inverter to the bottom of the cabinet between 0.81m and 0.95m.

b. If M10 bolts (5007010046191) are used for installation, use the M10 spring washers (5007020000991) and flat washers (5007030001251) in combination.

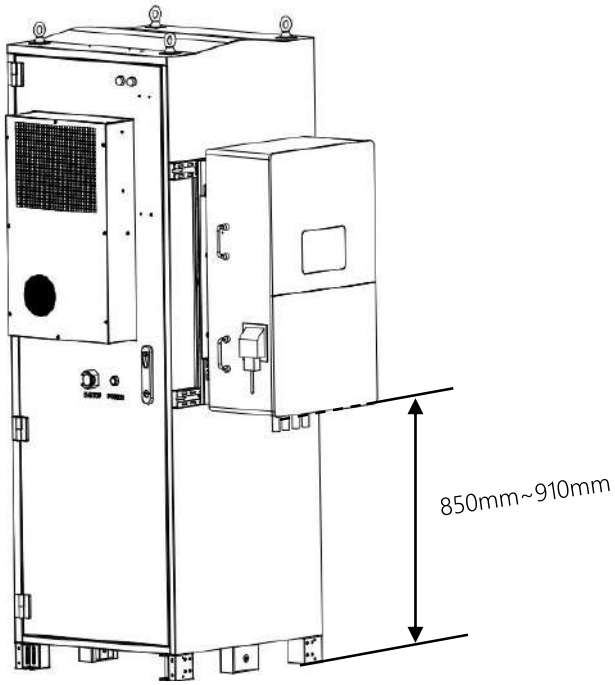


Figure 3-9 Inverter Installation Done

Step 5: Install the wire tying plate.

Secure the wire tying plate (5099010030151) to the cabinet with 6 screws M4x16 (5007010036281) (Figure 3-10), then follow the electrical connection guidelines to complete the wiring (Chapter 3.4).

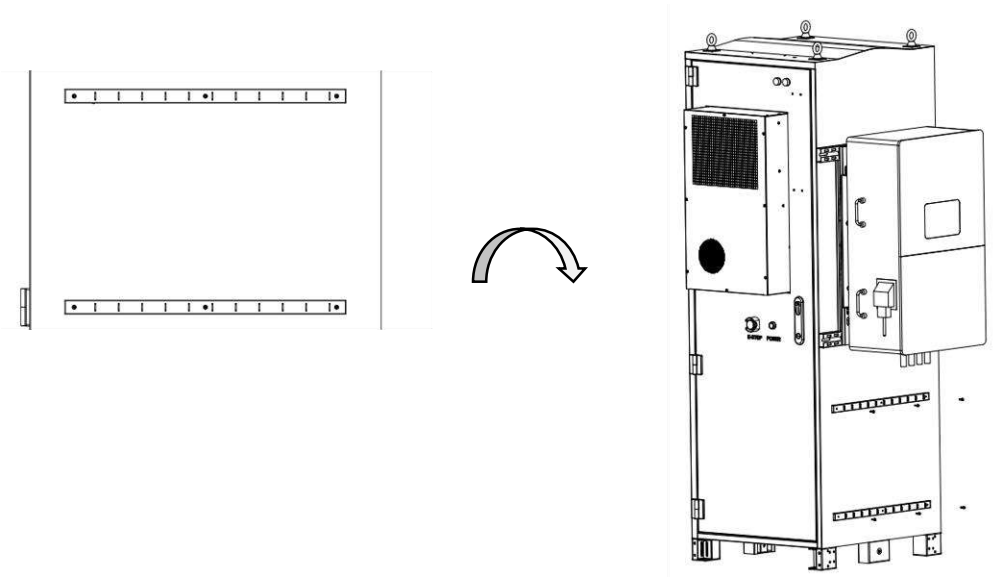


Figure 3-10 Install the cable tie plate to the cabinet

Step 5: Install the cover wire plate (after completing the Chapter4.3 Wiring section).

Step 1: After the cabinet is wired, take 6 M6x14 bolts (5007010027261) and refer to the following diagram to fix the cover wire plate (5099010030131).

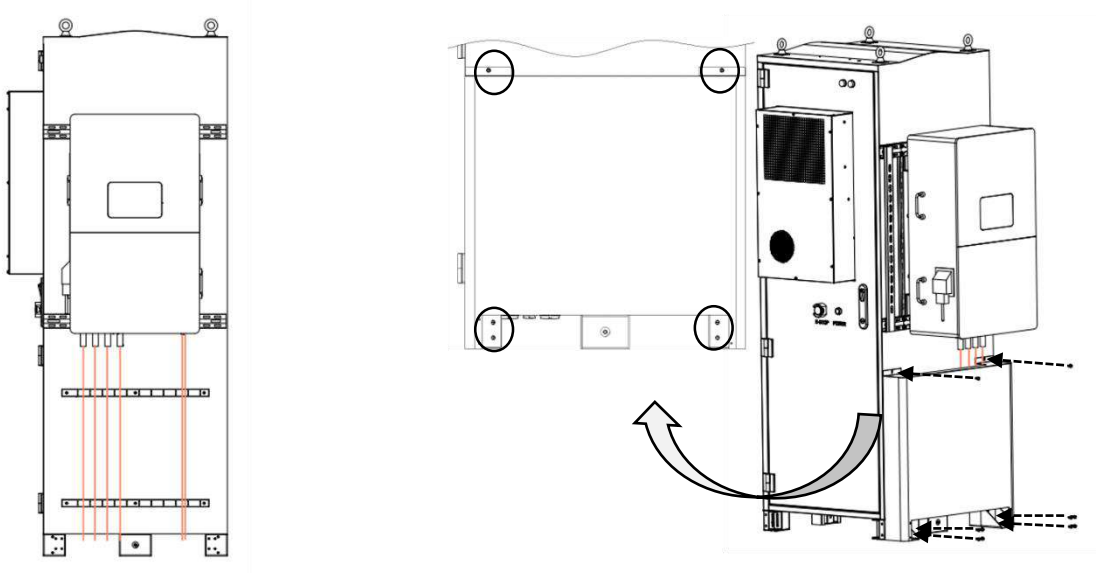


Figure 3-11 Fix Cover Wire Plate

Step 6: Install the cover plate around the base.

Step 1: Install enclosure 1 and enclosure 2 (Figure 3-12).

Note: For underground routing, the right side enclosure 2 needs to remain installed, but if ground routing is selected, the installation of the right side enclosure 2 may make the wiring obstructed and can be removed appropriately according to the situation.

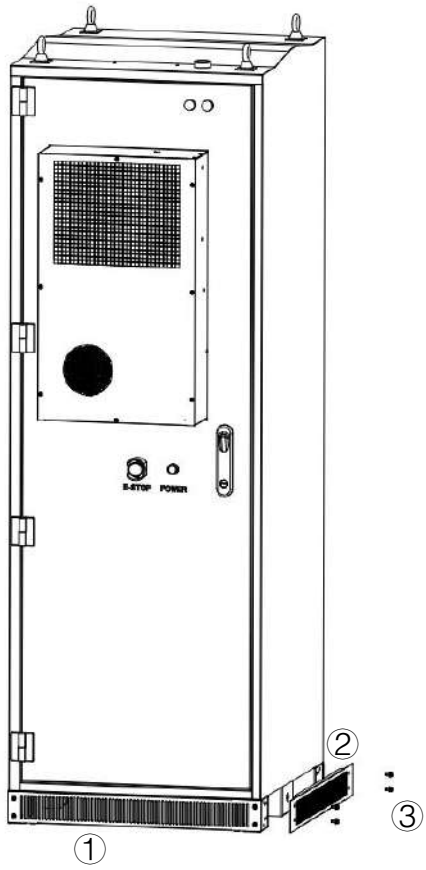


Figure 3-12 Fix enclosure 1 and enclosure 2

Table 3-1 Object Description

No	Name	Interpretation
①	Enclosure 1	L=718mm,SGCC,T=1.2mm
②	Enclosure 2	L=749mm,SGCC,T=1.2mm
③	Bolt M6x14 (5007010027261)	M6*14 assemblies of cross recessed hexagon head bolts, spring washers and flat washers

Step 2: Install the enclosure 3.

Take 4 screws M4x16 (5007010036281) to fix the enclosure 3.

Note: Make sure the wiring harness from the battery cabinet to the inverter is fully connected before installing enclosure 3.

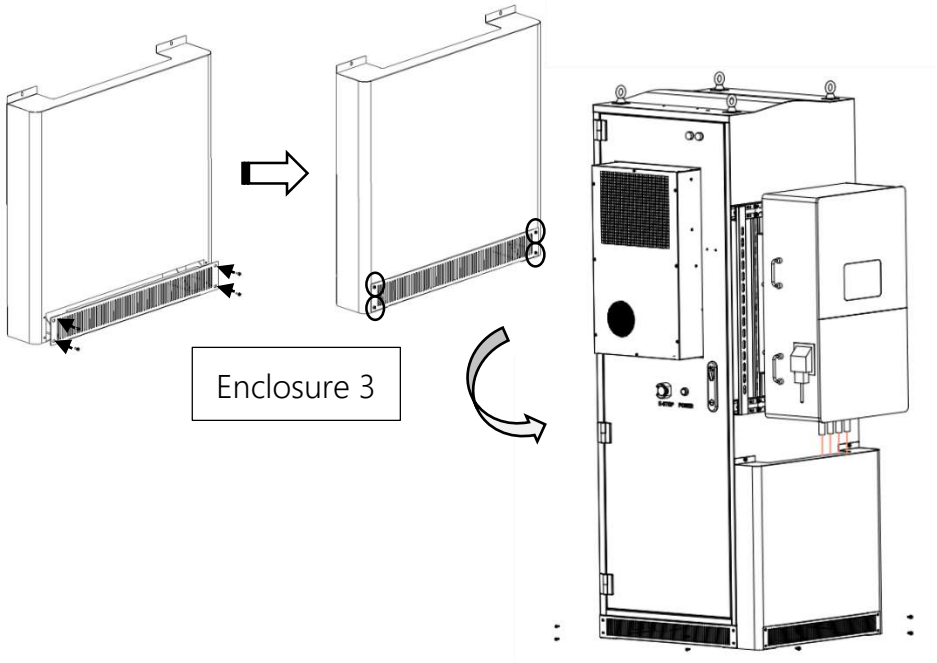


Figure 3-13 Enclosure 3 fixing

3.4 Electrical Cable Connections

⚠ Wiring Notes:

- Make sure that all switches on the main control box and higher level switches are disconnected before making electrical cable connections.
- Cables used in high temperature environments may cause the insulation to deteriorate and break, the distance between the cable and the periphery of the heat generating device or heat source area is at least 30mm.
- Before connecting the electrical cables, please check whether the cables between the battery and the main control box in the cabinet are well connected according to the following electrical connection diagram (Figure 3-14).

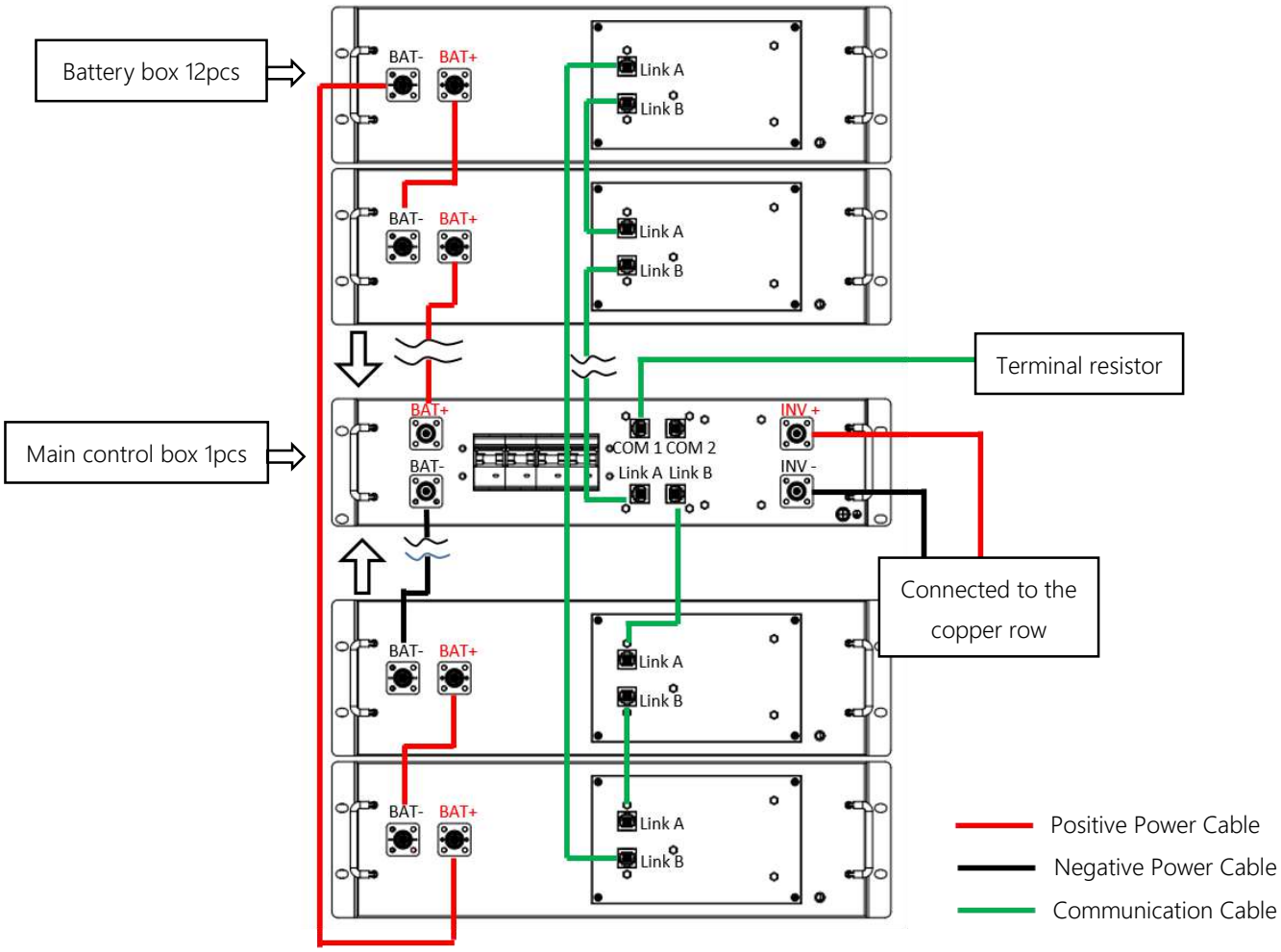


Figure 3-14

- When making electrical connections, the protective earth cable must be connected first; when removing equipment, the protective earth cable must be removed last.
- The parallel cabinet can be used with either an aboveground alignment or an underground alignment (Figure 3-15). When the parallel cabinet uses an aboveground alignment, pay attention to adding protective alignment grooves.

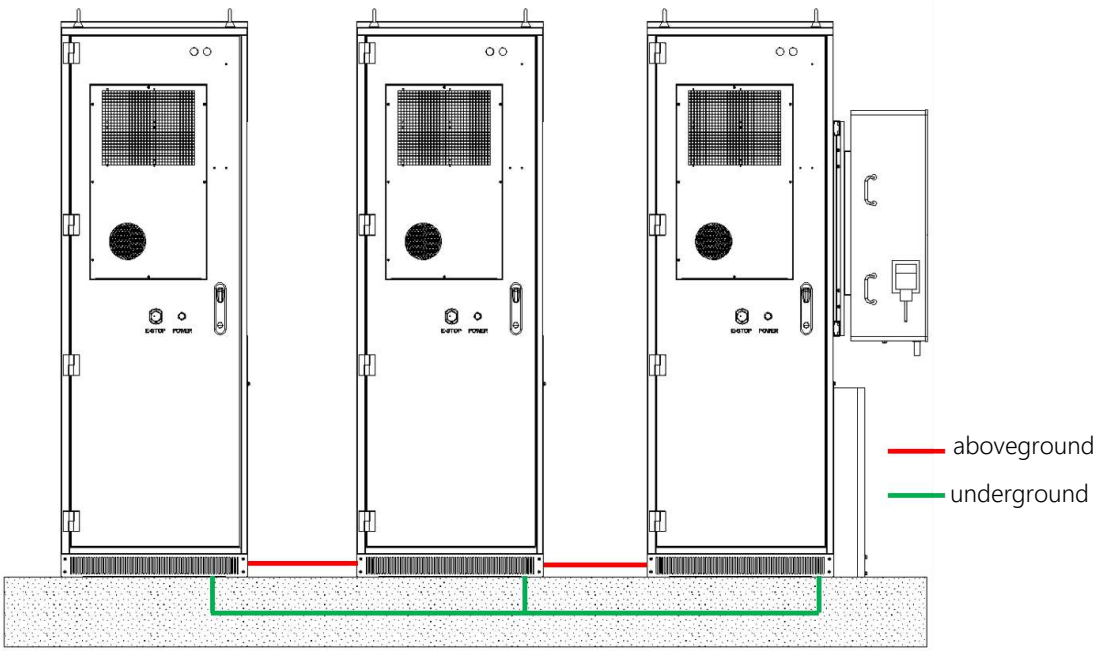


Figure 3-15

3.4.1 Ground connection

* The recommended wire sizes for equipment grounding cables are listed below (Table 3-2).

Table 3-2 Ground wire specification for connecting to an external ground strip

Model	Wire Size/Requirements	Cable(mm^2)
Outdoor Cabinet Battery System	8AWG, Yellow-green two-color cable, M6Ring terminal	10

Note: The above wiring harnesses are not included in the shipping list.

The grounding cable can be connected to the grid side after transferring to the inverter (Figure 3-16a, b), or directly to the grid side, depending on the actual situation. In either case, be sure to secure the system grounding to prevent electric shock.

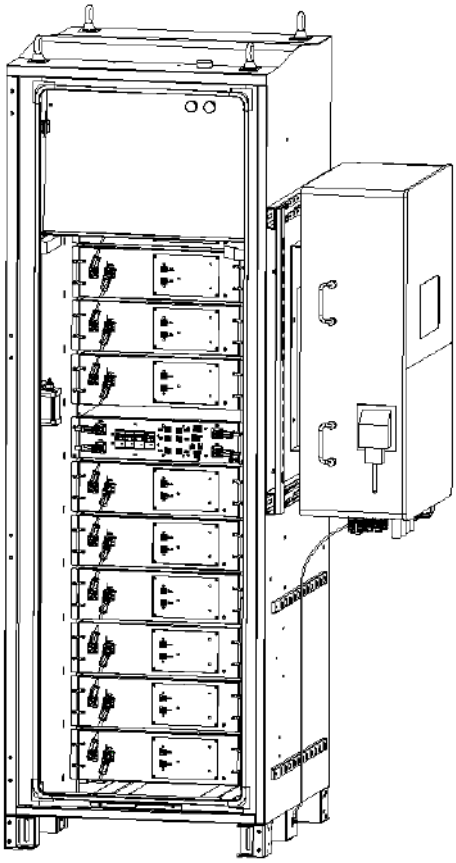
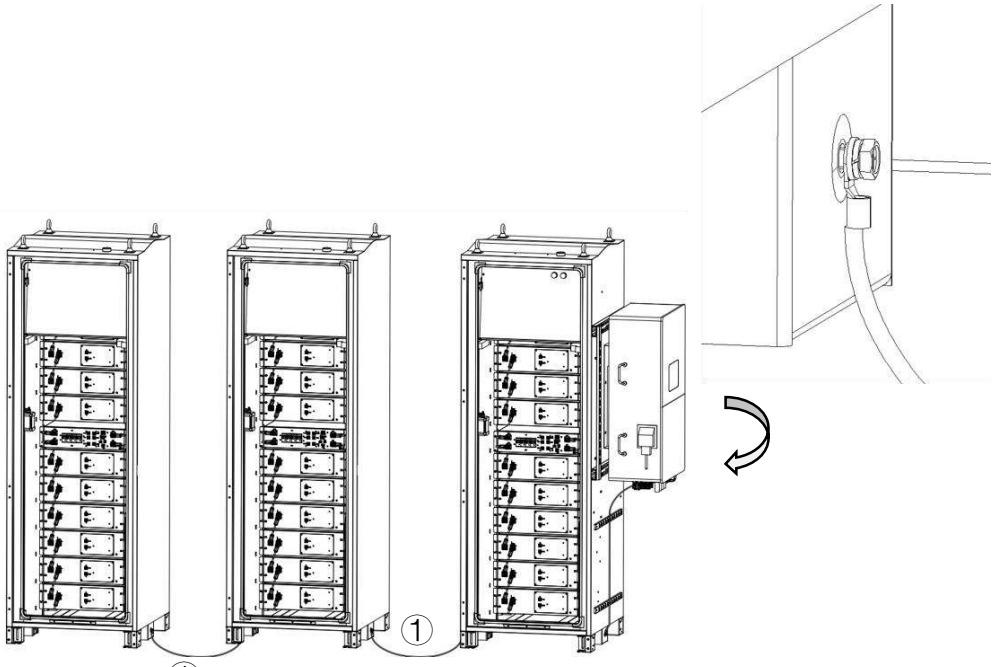


Figure 3-16a Ground connection for single machine use



①Figure 3-16b Parallel Ground Connections

Table 3-3 Object Description

No.	Name	Material number

①	Parallel Ground Cable	5619100061411

3.4.2 AC Cable Connection

⚠ *Please first ensure that you have connected the system to an external PE grounding point in accordance with local electrical codes (Figure 3-17).

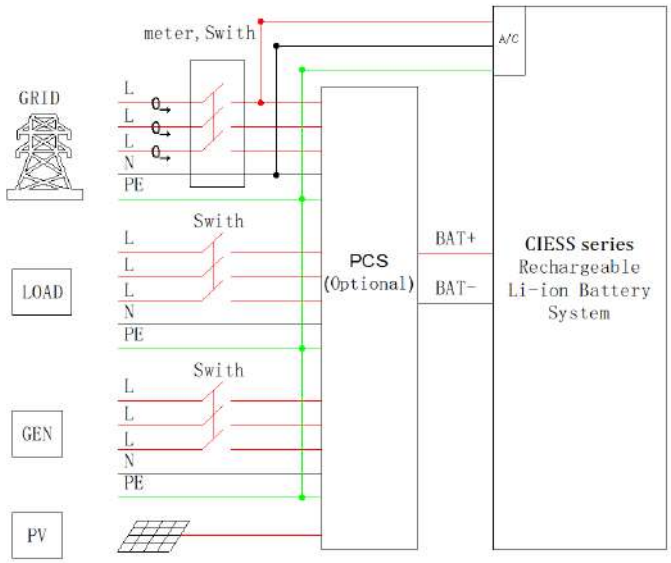


Figure 3-17 Overall Wiring Diagram for Battery Application Scenarios

⚠ * Before connecting the AC input/output harness, make sure the AC power is disconnected and the battery system is turned off.

* AC cable connections are primarily concerned with the connection of the air conditioning power supply harness for the cabinet. The recommended specifications for the wire harness are as follows (Table 3-4):

Table 3-4 Recommended AC Input/Output Cable Specifications

Model	Wire Size	Cable(mm2)
Air conditioning power supply cable	14AWG	2.5

Note: The above cable is not included in the shipping category.

Step 1: Remove the insulating protective cover from the inner wall of the

cabinet (Figure 3-18)

Remove the 3pcs screws and take off the insulation protection cover on the inner wall of the cabinet.

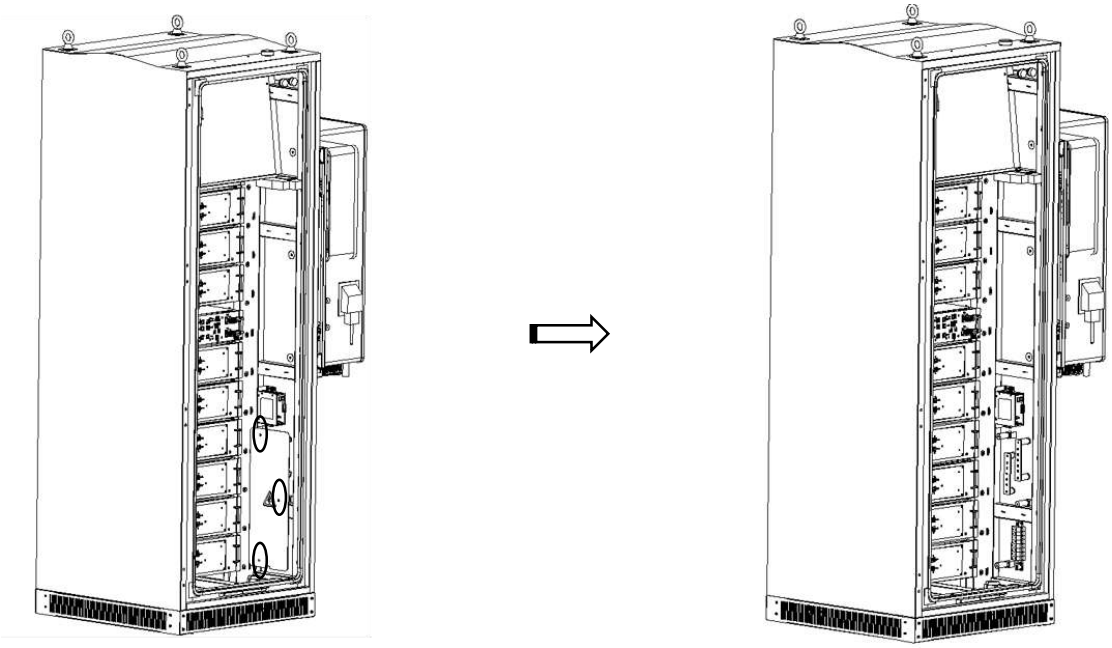
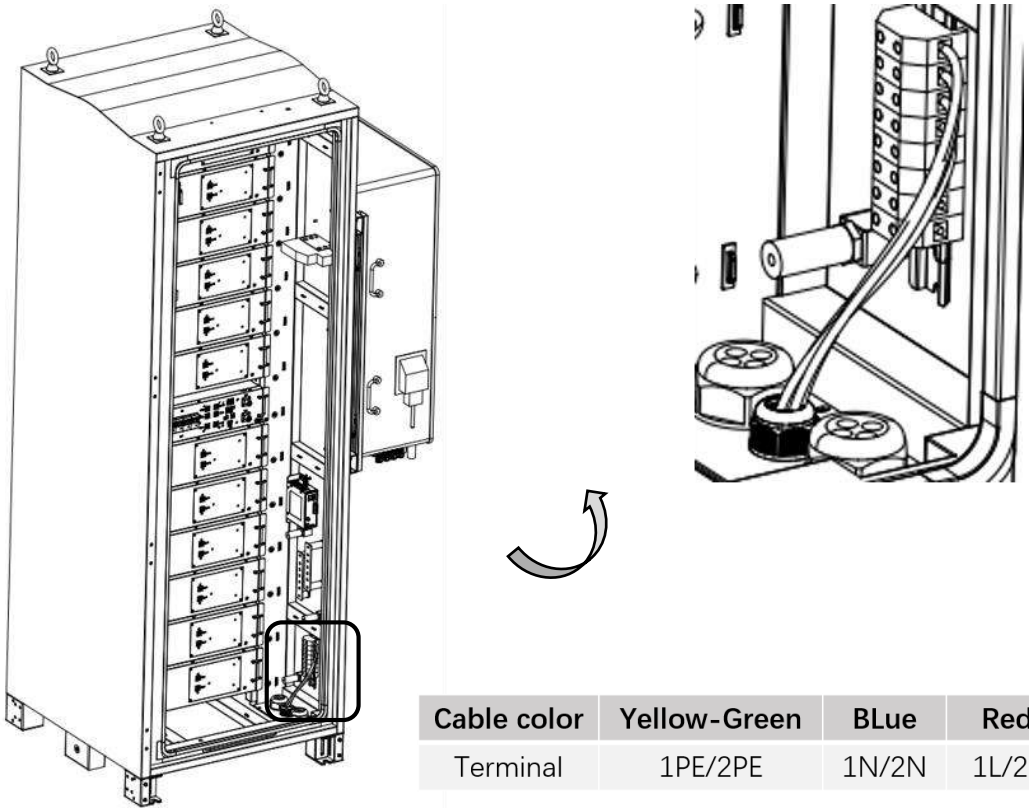


Figure 3-18 Remove Insulation Cover

Step 2: Connect the air conditioner power supply cable (Figure 3-19)

Strip 8mm off the cable to put on the tubular sheet, go through the waterproof plug at the bottom of the cabinet, fix it on the terminals inside the cabinet, and use crimping pliers to crimp it well.



Cable color	Yellow-Green	BLue	Red
Terminal	1PE/2PE	1N/2N	1L/2L

Figure 3-19 Connect the air conditioner power supply cable

3.4.3 DC Cable Connection

⚠ * Make sure the switch on the main control box is fully disconnected before connecting the DC power cable.

Step 1: Connect the cabinet and inverter together using the PCS power harness.

① Take out the PCS positive and negative power harnesses and connect them to the positive and negative copper rows inside the cabinet respectively, and then lead them out from the large round waterproof plug at the bottom of the outdoor cabinet near the inner side (Figure 3-20,21).

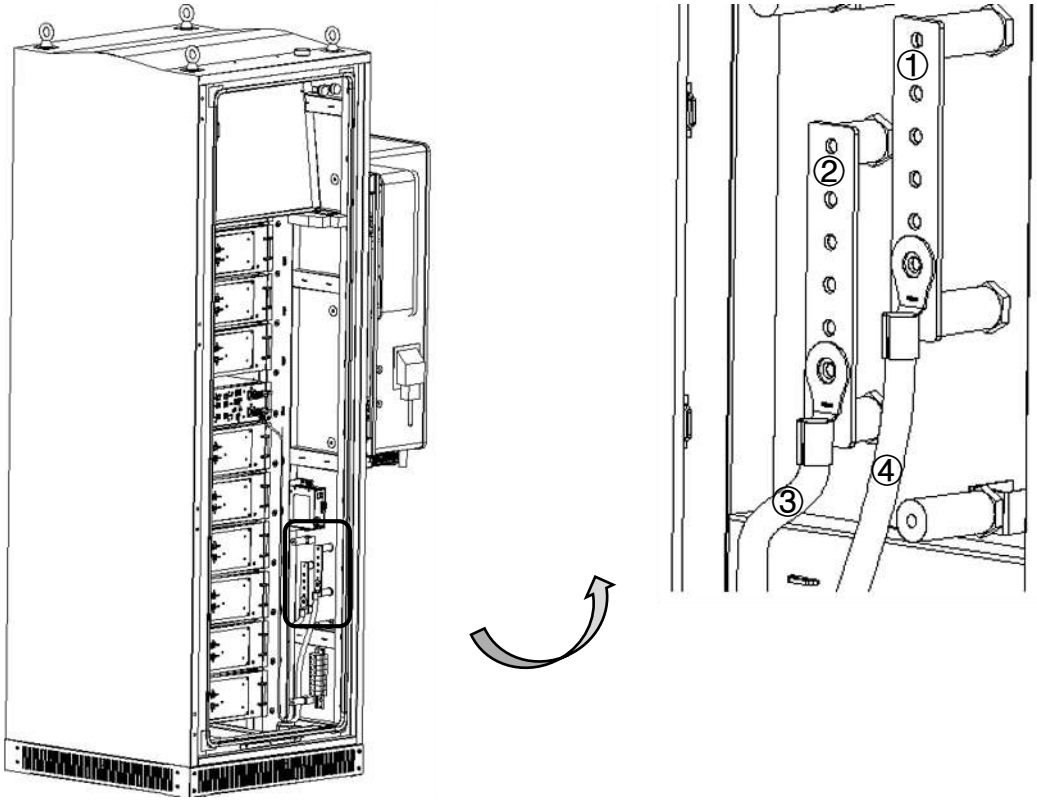


Figure 3-20 Power Harness Connecting the Cabinet to the PCS

Table 3-5 Object Descriptions

No.	Name
①	Positive copper row
②	Negative copper row
③	PCS Positive Power Cable *
④	PCS Negative Power Cable *

*Indicates that this harness will vary depending on the inverter used, see the packing list for details.

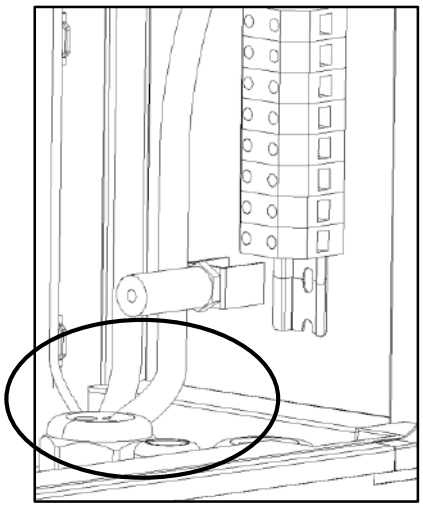


Figure 3-21 Lead Power Cables Over Waterproof Plugs

Step 2:Connect the power cable through the waterproof plug to the positive and negative terminals of the inverter (Figure 3-22).

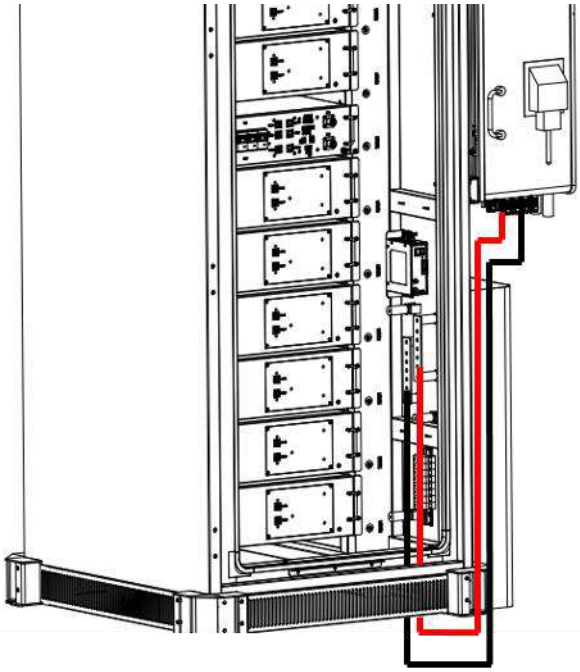


Figure 3-22 Complete power cable connection from cabinet to PCS
(Red is positive power harness; black is negative power harness)

Note: If using a DEYE inverter, the positive and negative power cables correspond to two each.

Step 2 (Optional): If there is a need for parallel operation, please follow the

following wiring diagram (Figure 3-23) to connect the DC power cables completely.

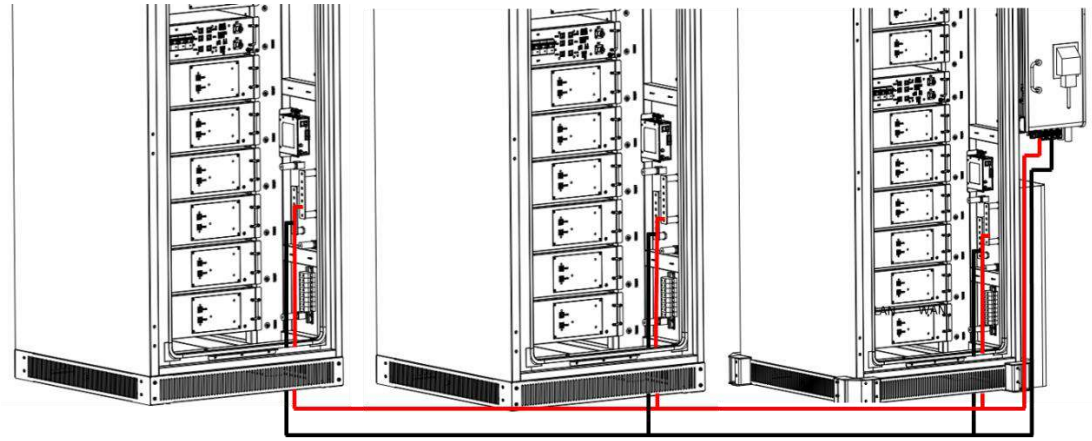


Figure 3-23 Parallel cable Connections

3.4.4 Connection for communication

Step 1: Connect the communication cable from COM2 of the main control box to inverter (Figure 3-24).

Use the PCS communication cable (5619100054511) to connect the wires from the COM2 port of the control box to the CAN communication port of the inverter, and lead the wires out from the small round plug on the outer side of the cabinet.

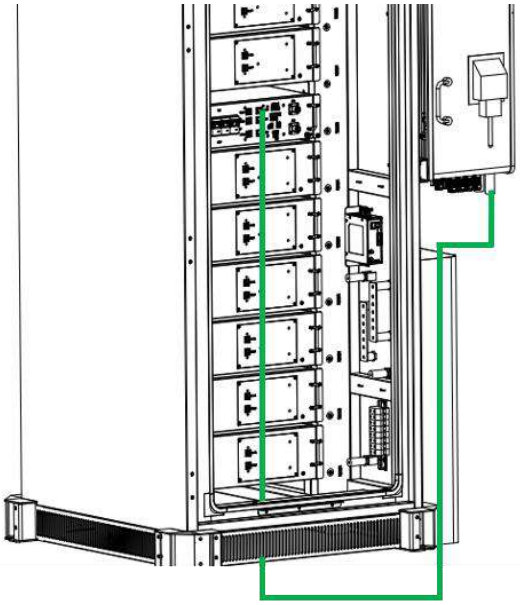


Figure 3-24 Connect the PCS Communication Cable

Step 2 (Optional): If there is a need for paralleling, please refer to the following diagram to connect the paralleling communication cables (5619100054511) between neighboring cabinets together (Figure 3-25). The termination resistor of the first cabinet should be kept intact and the extra termination resistor should be removed.

Figure 3-25

Step 3 (Optional): Connect the WAN port or LAN port communication harness of the data box module, and the corresponding positions of the data module and its Wan port and LAN port are shown in the figure (Figure 3-26).

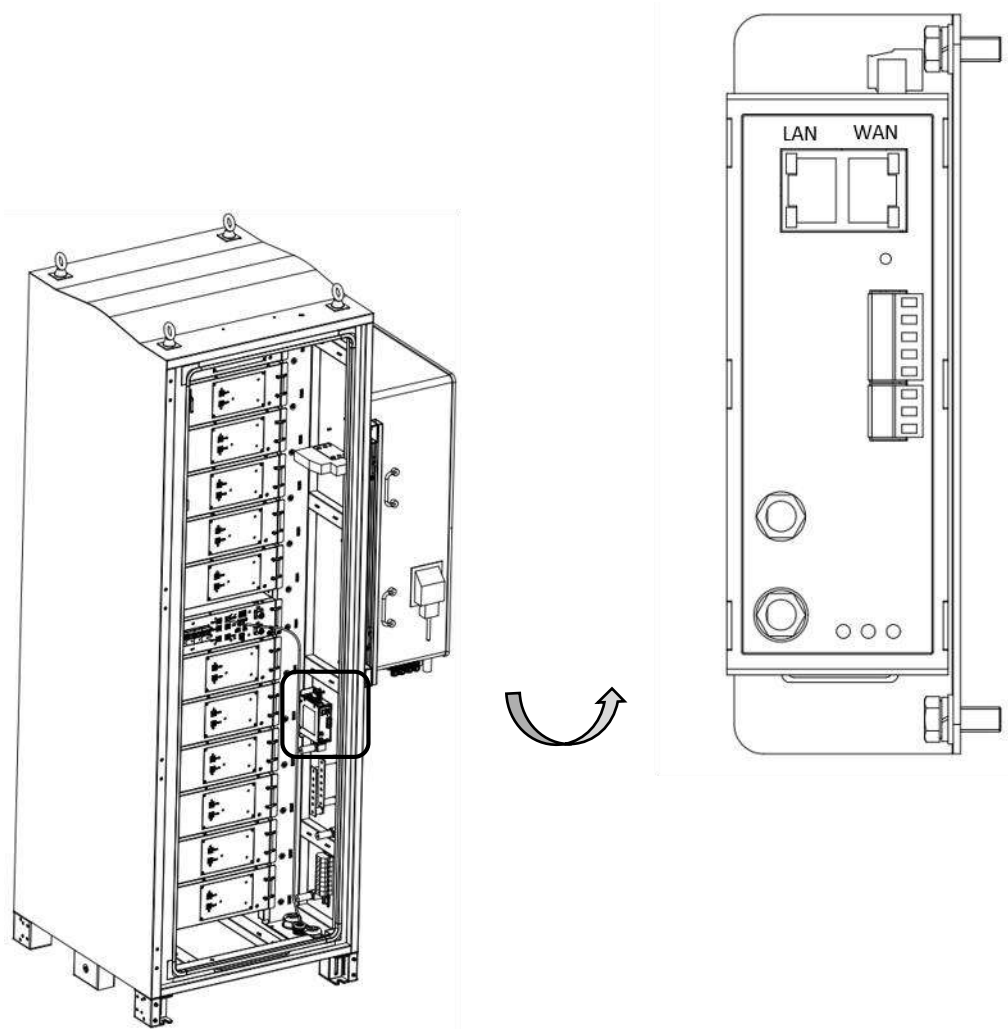


Figure 3-26 Diagram of the data module and its WAN and LAN ports

4 Operation Guidance

4.1 Pre-power-up check

- The equipment is firmly installed, the installation position is convenient for operation and maintenance, the installation

space is convenient for ventilation and heat dissipation, and the installation environment is clean and tidy.

- Ground cable, battery power cable, inverter power cable, communication cable, and AC power cable are connected correctly and securely.
- Cable ties meet alignment requirements, are well distributed, and are not damaged.
- Before powering up, all switches are in the disconnected state.

4.2 Indicator light Introduction

No.	Red Light	Green light	Instruction
1	Not Bright	Flash 1 time in 1s	Initialization state, Starting state, Stopping state
2	Not Bright	Bright	Running state
3	Bright	Not Bright	Fault state

4.3 System startup

Step 1: Open the front door and place the main control box air switch in the open position in the direction indicated by the arrow in the figure below (Figure 4-1).

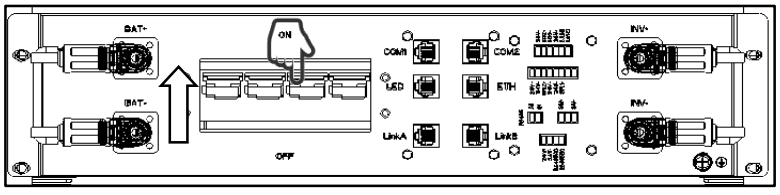


Figure 4-1

Step 2: Press the front door POWER button for 3S, the green indicator

light blinks steadily for 1s once to turn on the battery (Figure 4-2).

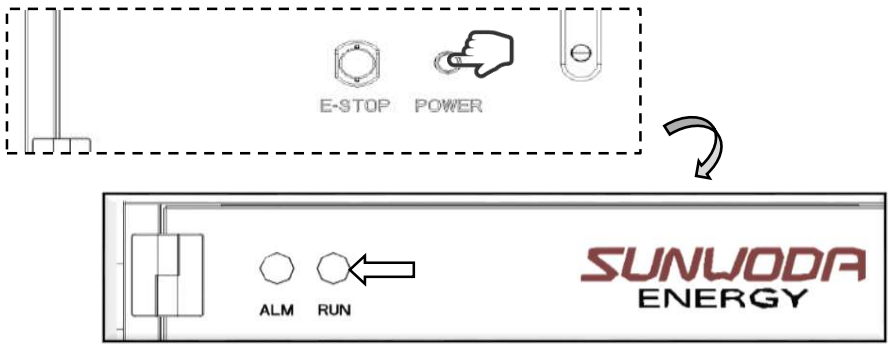


Figure 4-2

Step 3: After the cabinet door green light indicator is standing, press the inverter ON/OFF switch, the inverter LCD screen lights up to have inverter power on completed.

Step 4: Place the inverter DC switch "ON" (Figure 4-3).

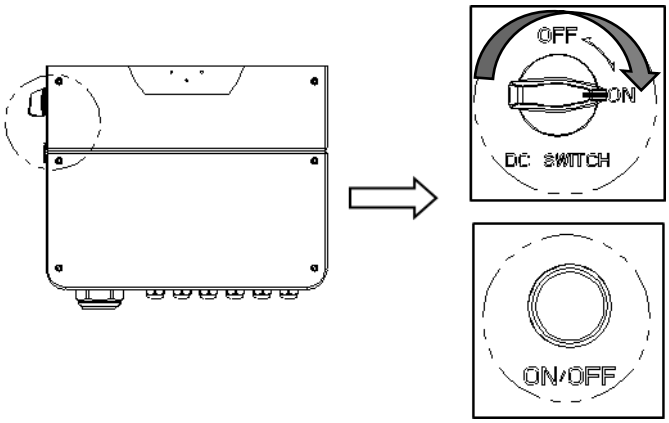


Figure 4-3

4.4 System monitoring setting

4.4.1 Guidelines for distribution network

4.4.1.1 Distribution network for master cabinet

Step1: On the PC, click the left mouse button along the path "Open Network and Internet Settings" > "Ethernet" > "Change Adapter Options", and

enter the Network Connection control panel (Figure 4-4,5).

Tip: The path to the page may be different for different computer systems.

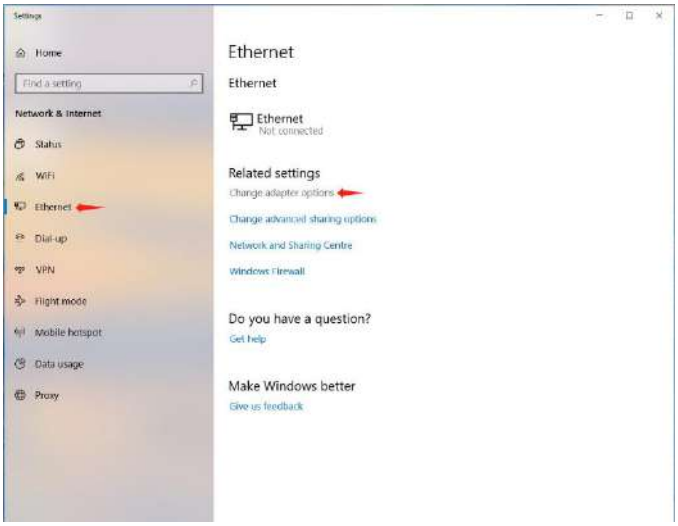


Figure 4-4

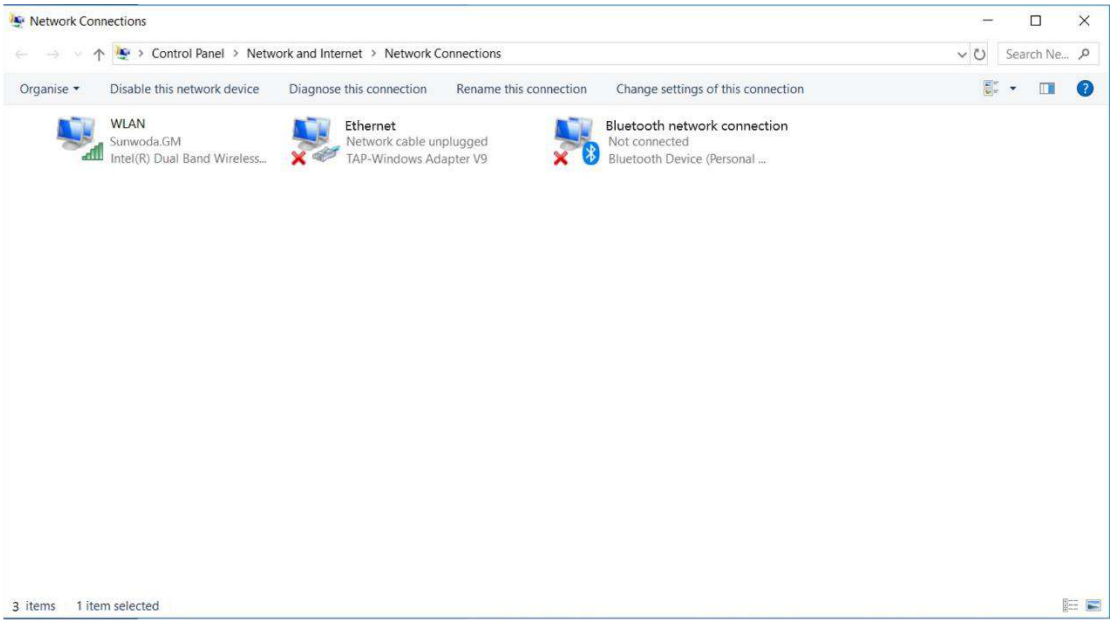


Figure 4-5

Step2: Right-click "Ethernet" and click "Properties" to enter the "Ethernet Properties " page (Figure 4-6).

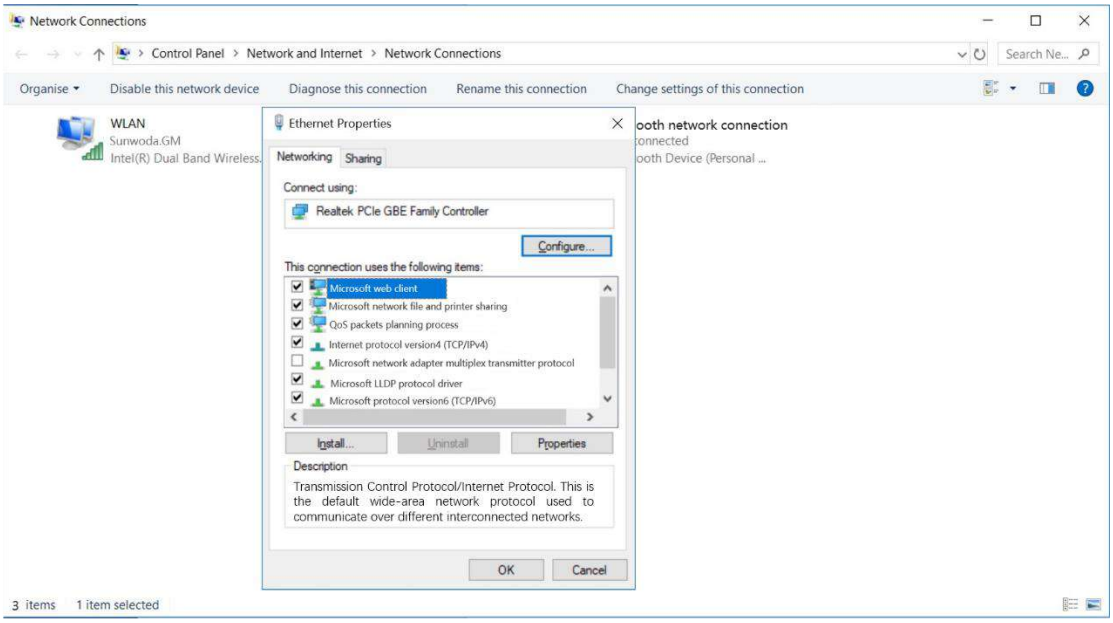


Figure 4-6

Step3：Double-click "Internet Protocol Version 4 (TCP/IPv4)", and change its corresponding General Properties to "Obtain an IP address automatically" (Figure 4-7).

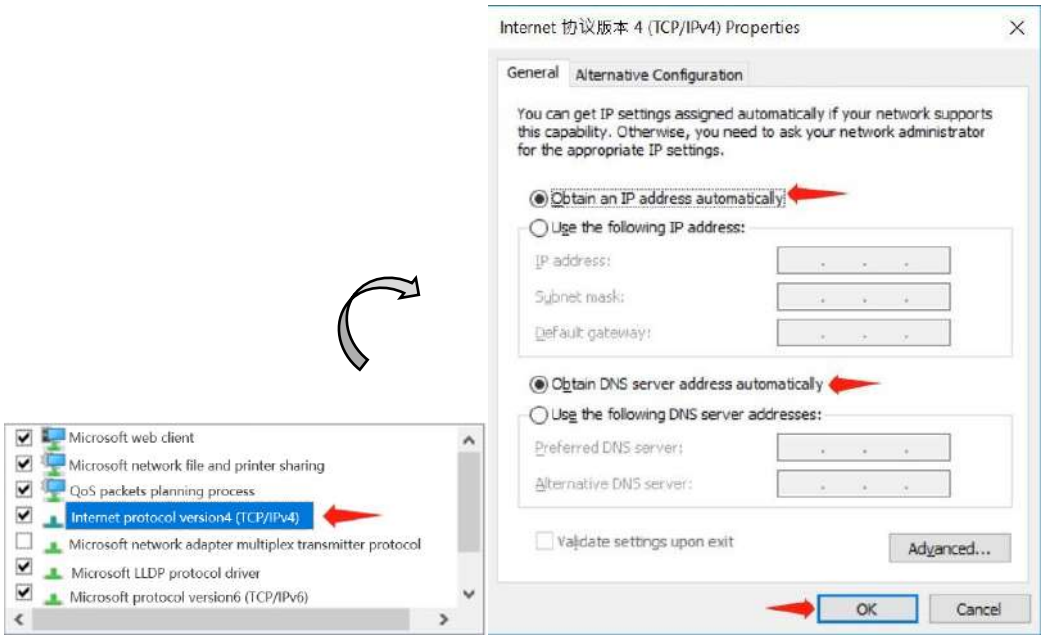


Figure 4-7

Step4: Click OK to complete the basic configuration settings for the PC.

Step5: Take the LAN communication cable (5619100062991) to connect the LAN port of the internal data box of the battery cabinet to the network cable interface of the PC, and then open Google Chrome (the latest version is required), search for the website 192.168.5.5, and then enter the account information:

User Name：user

Password：password

Click Login and enter the system homepage to set up the network configuration (Figure 4-8,9).

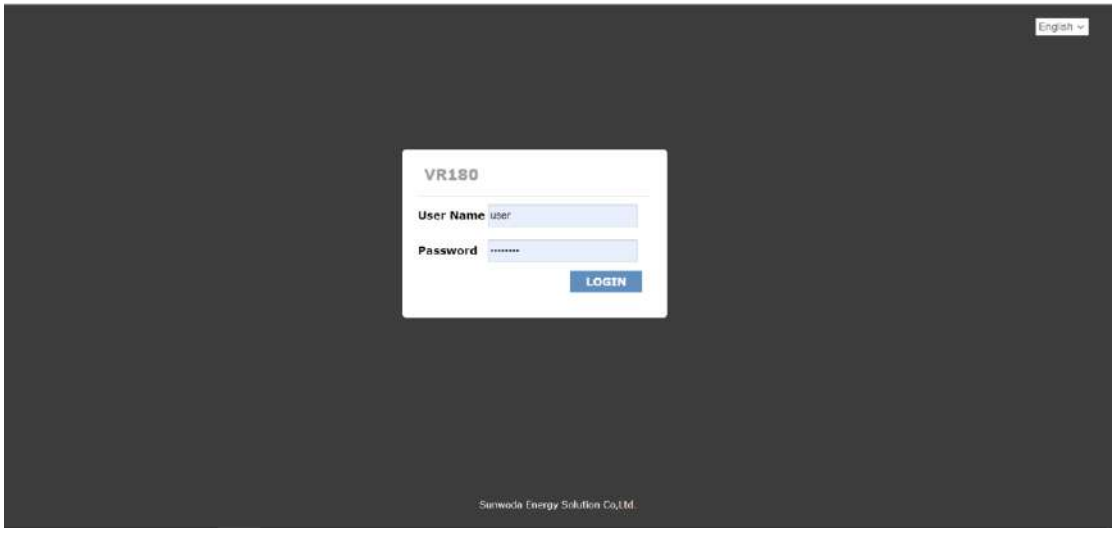


Figure 4-8 Landing page of the Website 192.168.5.5

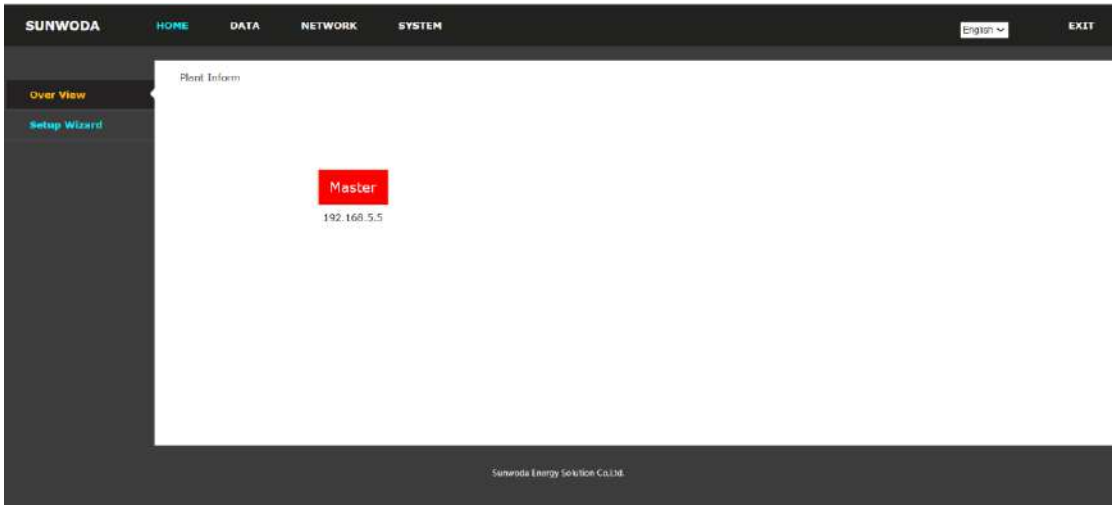


Figure 4-9 Home Page of the Web System 192.168.5.5

Step6: Click on "Setup Wizard" to setup the entry parameters (Figure 4-10):

Connection Mode: "Wireless Connection"

Router Role: "Master Battery Cabinet"

Basic Configuration>SSID: "Available WIFI name for cabinet networking"

Basic Configuration > Password: "Password for the available WIFI"

Click on "Setting" to complete the cabinet network.

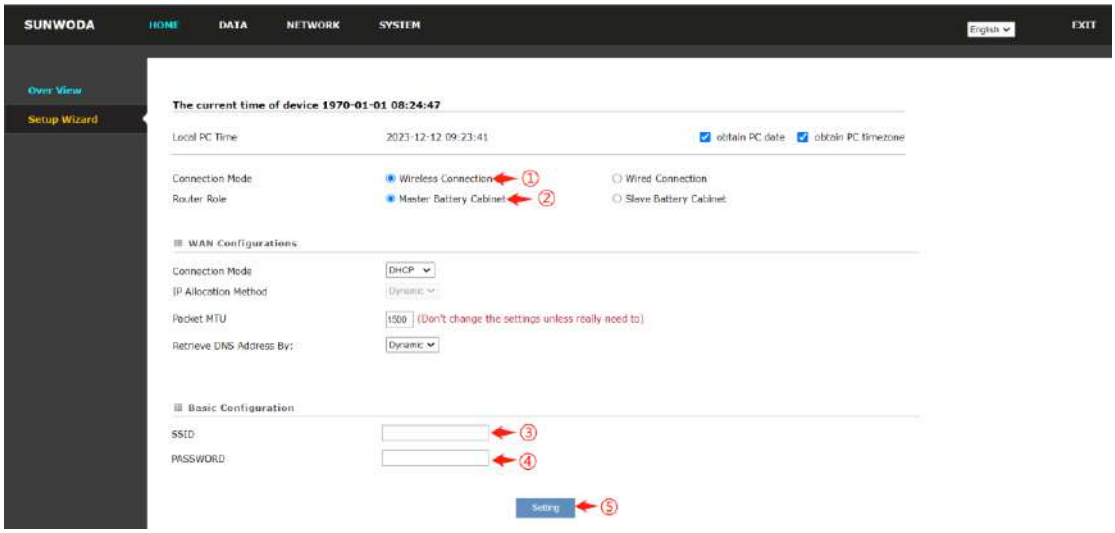


Figure 4-10

Tip: In addition to the wireless access to the network, you can also use the wired way to access the network of outdoor cabinets. The main method is: prepare the network cable, then connect the WAN port of the data box in the outdoor cabinet to the router.

Step7: Once the system network is configured, re-login to your personal account (usually automatically popped up) and perform the following (Figure 4-11):

① Click "Network" > "Network Settings" > "2.4G WIFI Setting", adjust

Operation Mode from "AP " to "Client ".

② Check that the section "Basic Configuration" has the correct information.

③ Slide the page to the bottom and click “Save” to complete all operations for the network entry of the main cabinet (Figure 4-12).

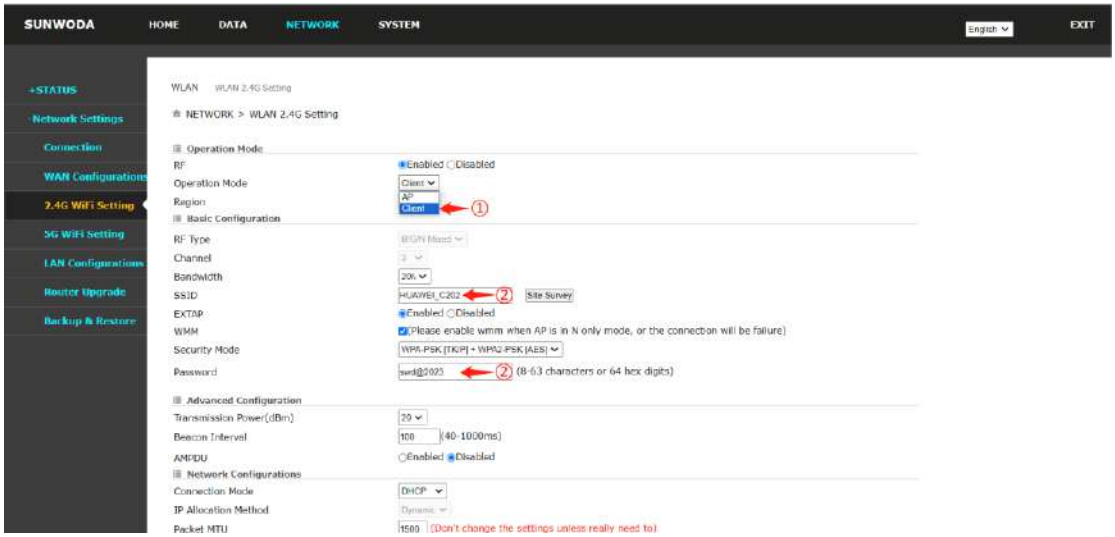


Figure 4-11

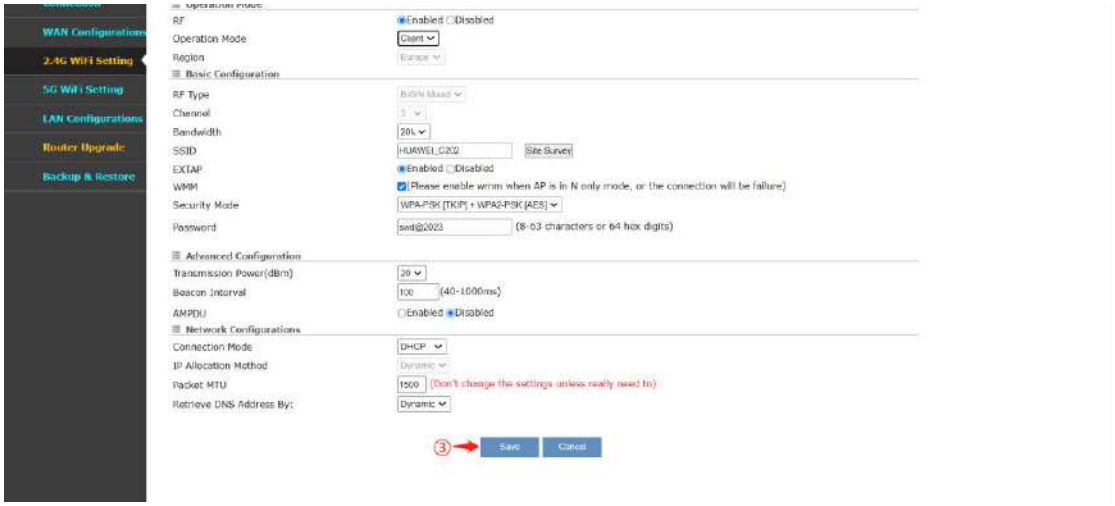


Figure 4-12

Tip:

For network access with wired connection, the "Operation Mode" should be kept as "AP".

In addition, after successful network access, you can check the related information at section "Network > Status > Network Status>Connection". At this time, the two green lights on the data box will also remain on (Figure 4-13,14).

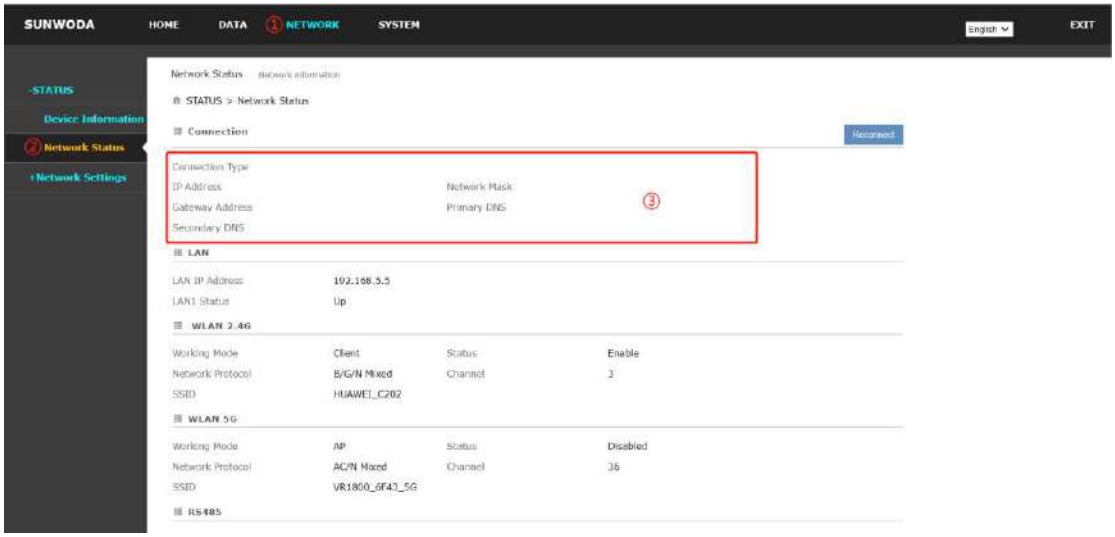


Figure 4-13

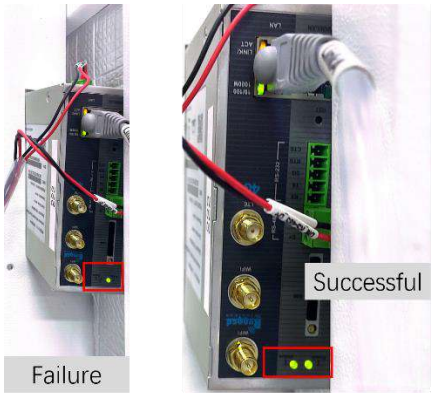


Figure 4-14

4.4.1.2 Distribution network and control box BCMU address assignment for slave cabinets (Optional)

For multiple cabinets in parallel, it is necessary to network the slave cabinets and reasonably assign their control box BCMU addresses. The details are as follows (taking three outdoor cabinets in parallel as an example):

Step1: After completing the master cabinet distribution, unplug the LAN communication cable (5619100062991) and connect it to the Data Module LAN port of slave cabinet 1, leaving the other end unchanged from the PC.

Step2: Open Google Chrome, search for the website 192.168.5.5, and enter the same account information:

User Name: user

Password: password

Click on Login.

Step3: At "Home > Setup Wizard > Basic Configuration" (Figure 4-15):

① Set the "Router Role" to "Slave Battery Cabinet";

② Fill in blanks with the WIFI information of the master cabinet's (4.4.1.1 Steps 6,7);

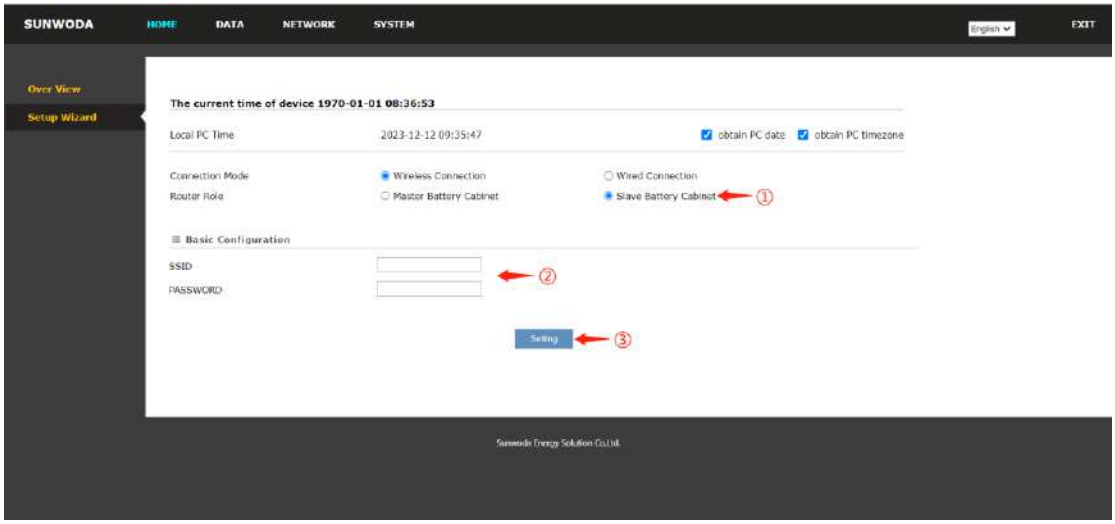


Figure 4-15

Step4: Click "Settings", the local interface restarts and automatically jumps to the IP address 192.168.6.5. Log in to your personal account again:

User Name: user

Password： password

Step5: Click "Data>Detailed Inform>Parameters Cfg.> BCMU Param. Cfg.> BCMU Address", change the BCMU address of slave cabinet 1 from "80" to "81" (the default BCMU address of all cabinets is "80", if not, please adjust it manually). Then click "Set" to complete network and control box BCMU address setting for slave cabinet 1.

Step6： Repeat the above operation to complete the setting of network and control box BCMU address of slave cabinet 2. The difference is that it is necessary to add “1” to the BCMU address number of slave cabinet 2 by changing it to "82" before clicking "Set" to complete the adjustment of BCMU address of control box of the slave cabinet 2 (Figure 4-16).

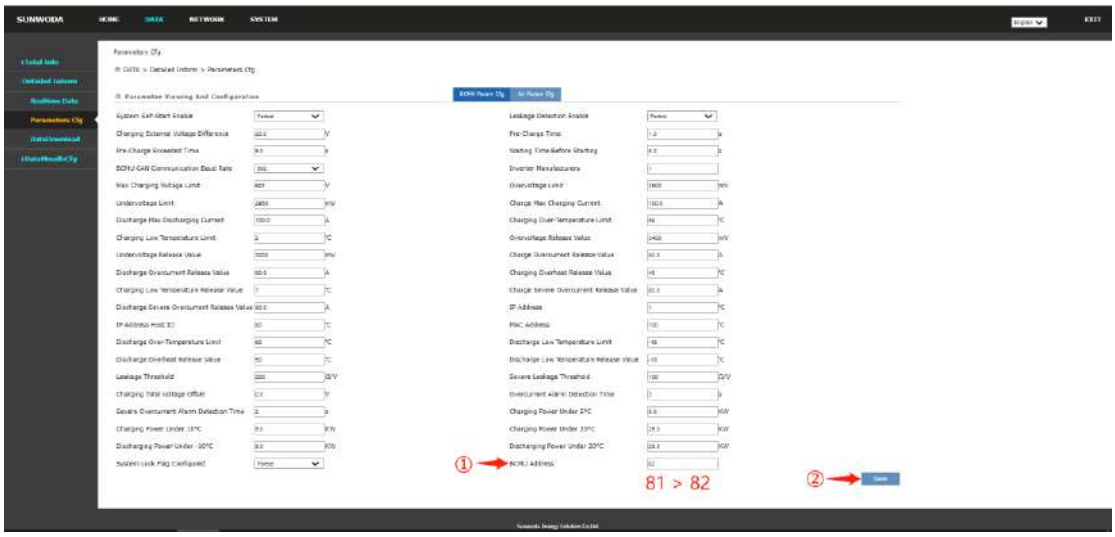


Figure 4-16 BCMU Address Setting for Control Box of the Slave Cabinet 2

Step7: At this point, the network capacity of the three cabinets have been set up separately, then you just need to connect the three cabinets in parallel through the website to achieve the unified management requirements. The

details are as follows:

① After connecting the relevant wiring cables of the three cabinets, turn on the power in turn.

② Use the LAN communication cable (5619100062991) to connect the LAN port of data module of the master cabinet (BCMU address 80) to the network port of the PC. Open Google Chrome (Latest version required), search for the website 192.168.5.5, and enter the account information:

User Name: user

Password: password

Click on "Login" to go to the website home page.

③ Click "Data>Data Module Cfg>System Control>Host Battery Cluster Enable", change the Battery Cluster Enable Command to "7" (or "3" for two parallel system), and click "Setting". At this point, the network connection and configuration of the three cabinets parallel system are all completed (Figure 4-17).

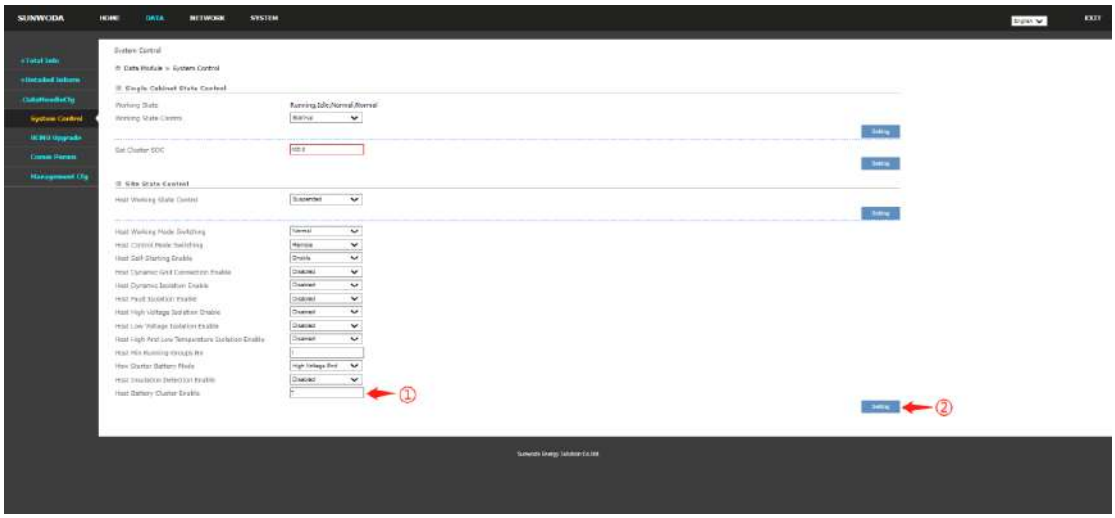


Figure 4-17

4.4.2 Guidelines for using the monitoring interface

4.4.2.1 Local Monitoring Interface

(1) Local Data View

Click "Data>Total Info>Plant Inform.", "Data>Detailed Inform.>Real-time Data ", etc. to view local data (Figure 4-18,19).

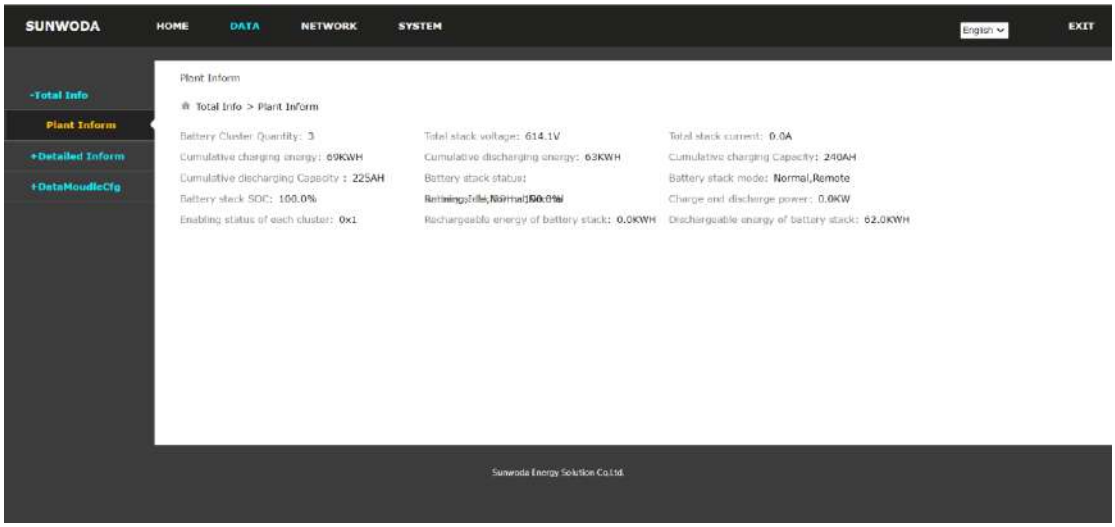


Figure 4-18 "Plant Inform." Interface

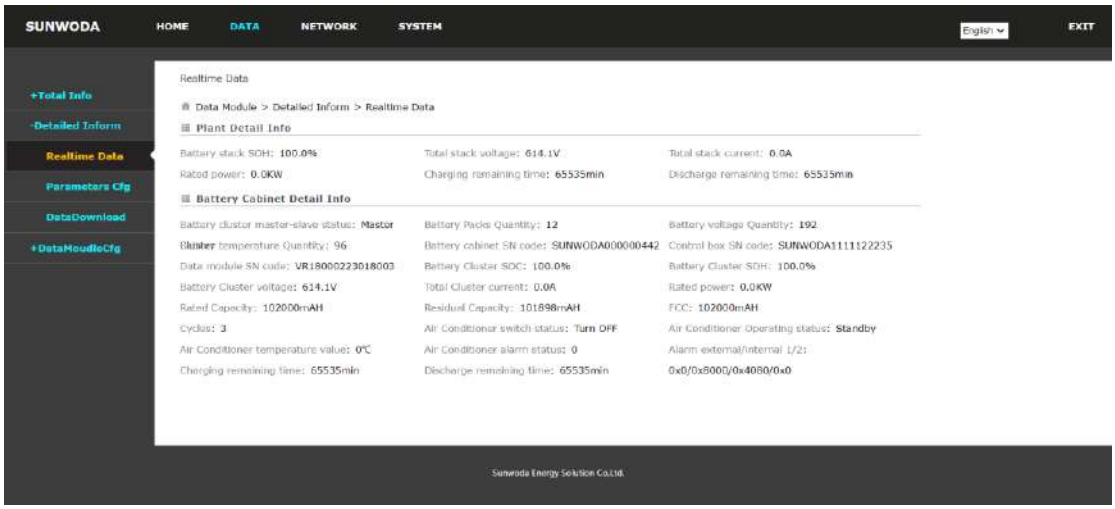


Figure 4-19 "Real-time data" Interface

(2) Local Data Download

Click "Data>Detailed Inform.>Data Download" to download the running data of the battery cabinet (Figure 4-20).

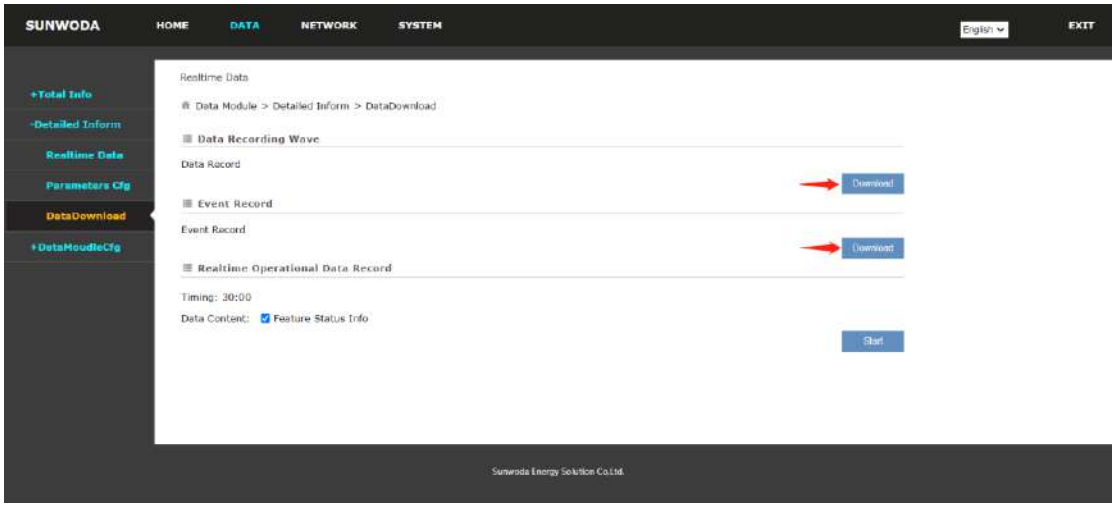


Figure 4-20 "Data Download" Interface

(3) BCMU on/off controls.

Click "Data>Data Module Cfg. >System Control>Working state control" to realize BCMU on/off (Figure 4-21).

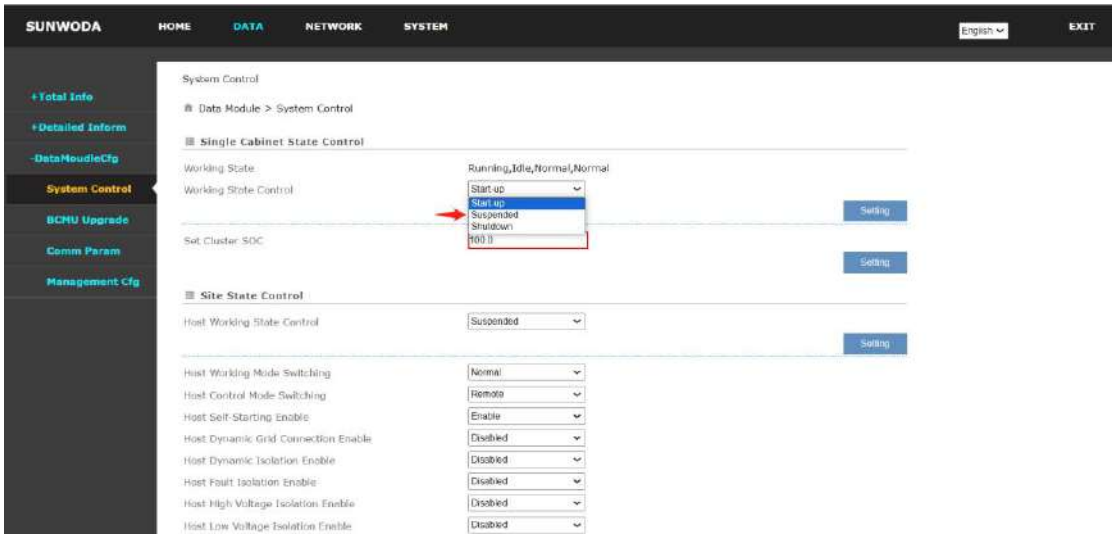


Figure 4-21

4.4.2.2 Remote Monitoring Interface

(1) Login to your personal account

Locate the web page https://sunwoda.vidagrid.com/, enter your personal account and click "Login" to access your home page (Figure 4-22).

Note: If there is no personal account, click "Account Registration" to

complete the registration information before logging into your personal system (Figure 4-23).

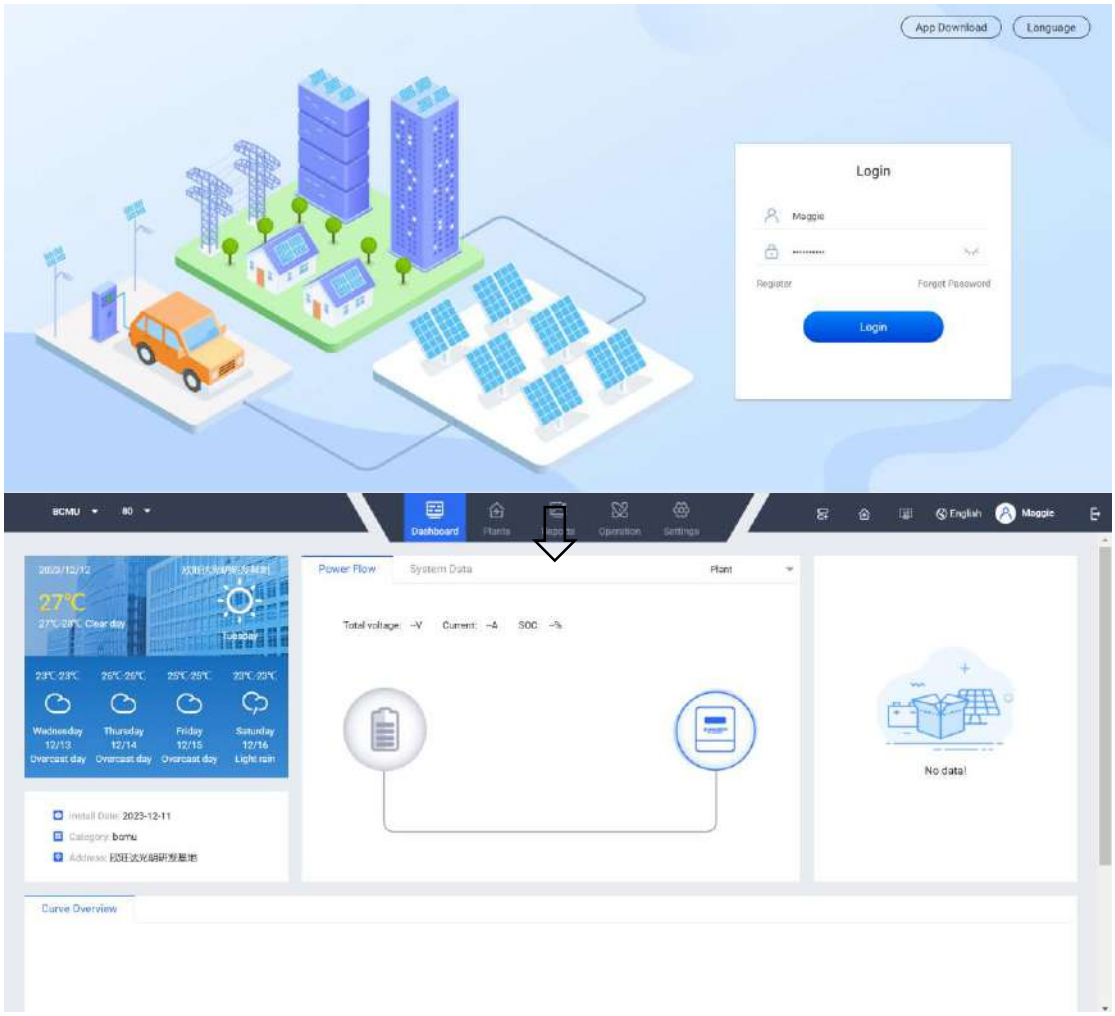


Figure 4-22

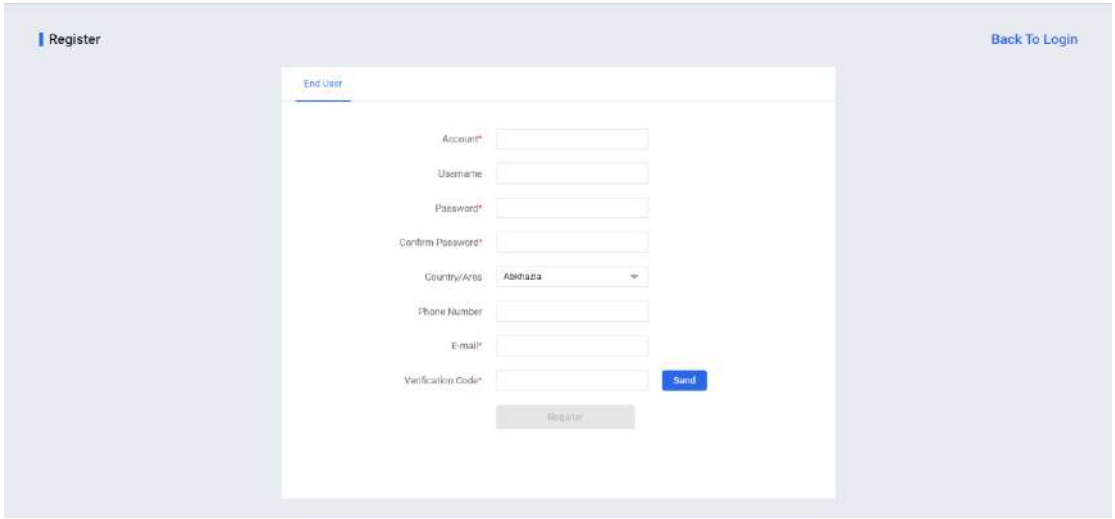


Figure 4-23

(* indicates fields required)

(2) Adding sites and equipment

Tip: The system WIFI configuration will affect the addition of equipment, please be sure to start this operation when the WIFI signal of the router and data module shows normal (Figure 4-14).

Step1: Click the position shown by the following arrow (Figure 4-24) to enter the BCMU site adding interface (Figure 4-25).

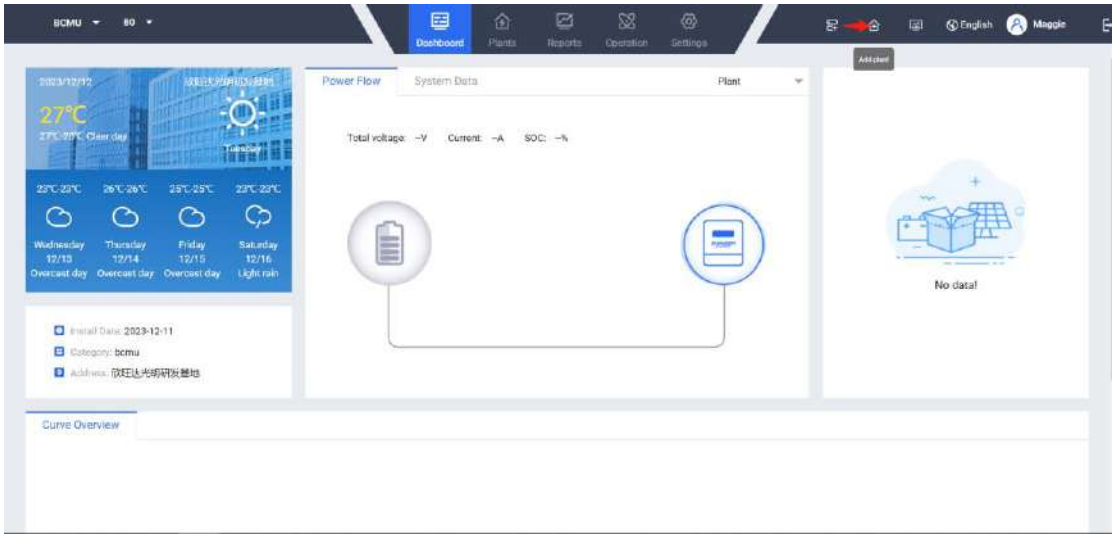


Figure 4-24

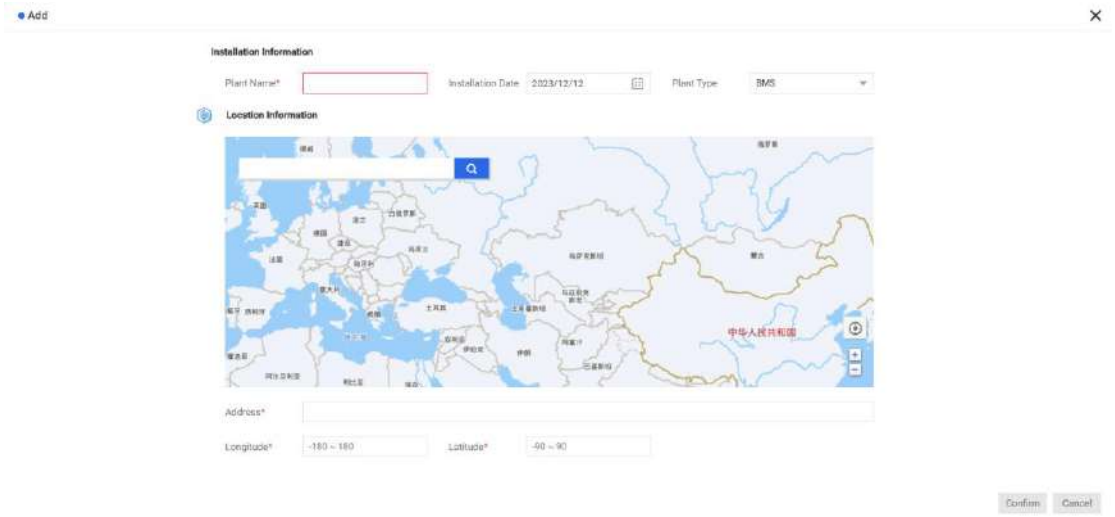


Figure 4-25 Plant adding interface

Step2: Enter the relevant information into the space marked with "*" and

adjust the Plant type "BMS" to "BCMU" (Figure 4-26).

Tips:

① The "Plant Name" can be named by yourself.

② Enter a specific address manually to the mark "③" in the figure, and click "Search" to automatically fill in the address, longitude and Latitude information below.

③ Optional: For parallel use, be sure to define the site information based on the master cabinet "80" (BCMU address), and then add the slave cabinets "81, and 82" (again, using the three-cluster parallel example).

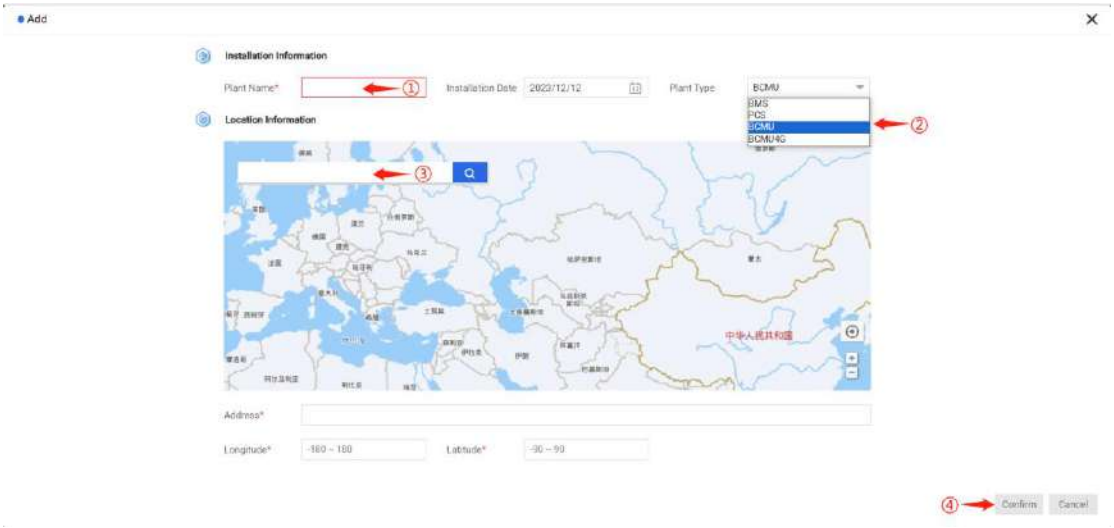


Figure 4-26

Step3: Click Confirm to enter the “Authorization Plant-Device Add” screen (Figure 4-27)

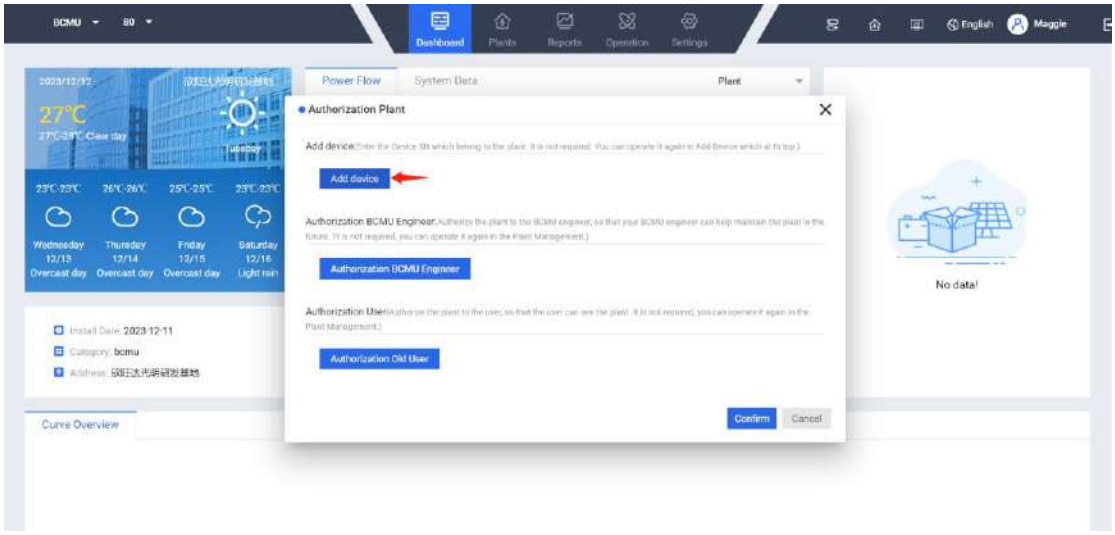


Figure 4-27 "Authorization Plant-Device Add" screen

Step4: Click Add Device, enter the SN code of the master cabinet, then click on "confirm" to finish the device adding (Figure 4-28).

Tip:

The SN code is obtained from the nameplate of the battery cabinet and is 17 digits long. Remove the first digit and retain the last 16 digits as the valid SN code and enter it here for binding. Please make sure that the network configuration session is completed before proceeding here.

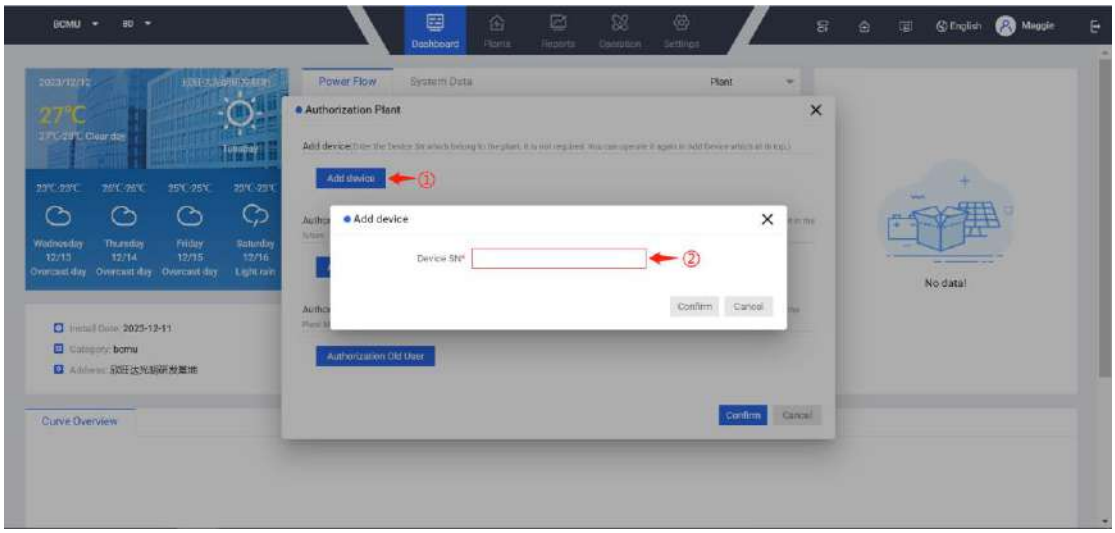


Figure 4-28 Complete the addition of the master cabinet

Step5 (Optional) : When used in parallel, it is also necessary to complete

the binding of the SN code of the slave cabinets sequentially through the current website (in the case of three clusters in parallel, the slave cabinets are the two outdoor cabinets whose BCMU addresses are defined as "81 and 82"). The details are as follows (Figure 4-29):

① Find the correct plant name at the mark ①;

② Click mark ② to add more devices to the site for monitoring and management;

③ Add the equipment SN code of the slave cabinet at mark ③. Similarly, remove the first digit and retain the last 16 characters as the valid SN code, and enter it into the website.

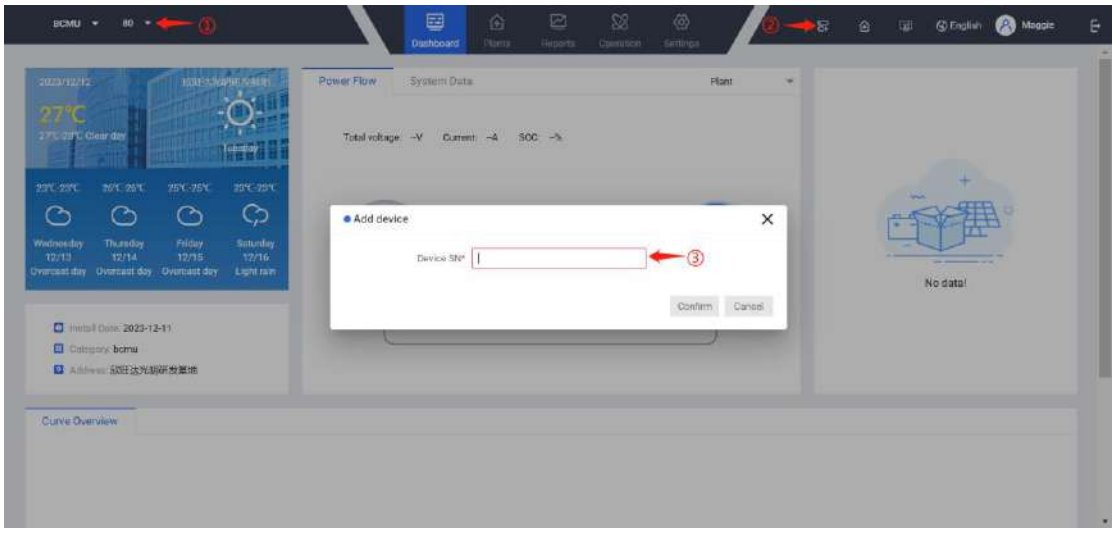


Figure 4-29

(3) Guidelines for Remote Data Monitoring

After adding the device, you can remotely view the device's running data through the homepage (Figure 4-30,31).

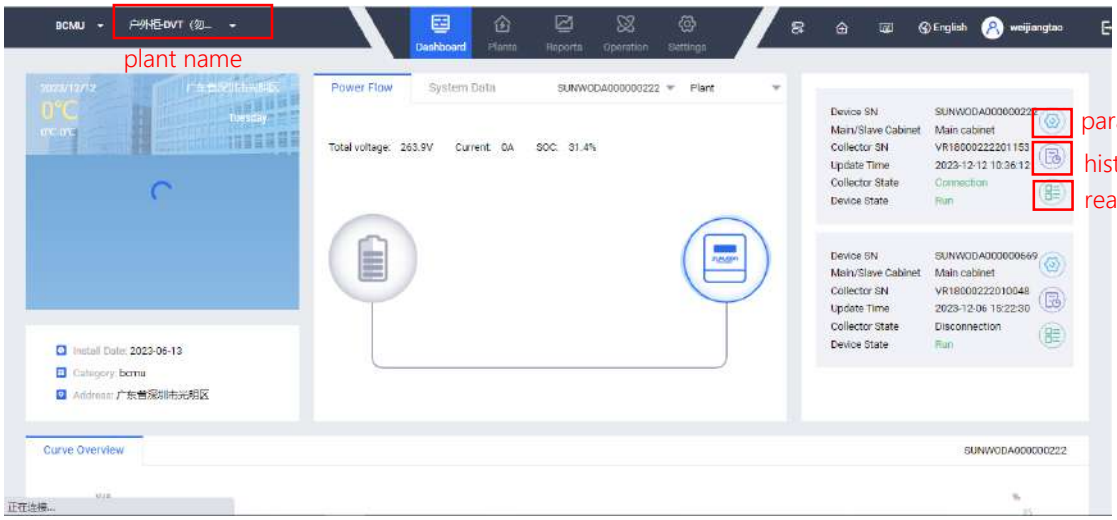


Figure 4-30 Homepage reading guidance

(4) Site and device management

You can view the information of added palnts and devices and manage them through the following page (Figure 4-31).

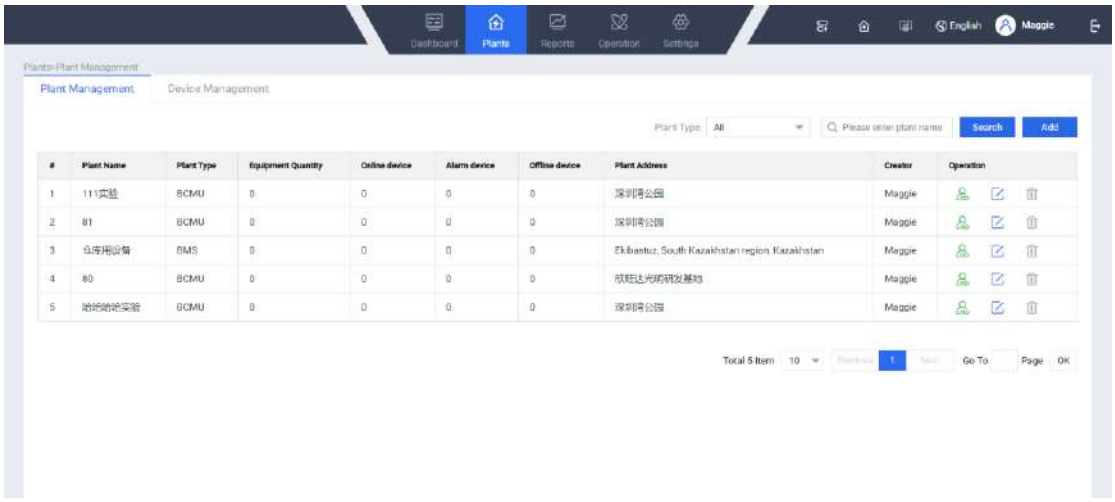


Figure 4-31

(5) Historical data viewing and exporting

The historical running data of devices in different plants can be viewed and exported through the following page (Figure 4-32)

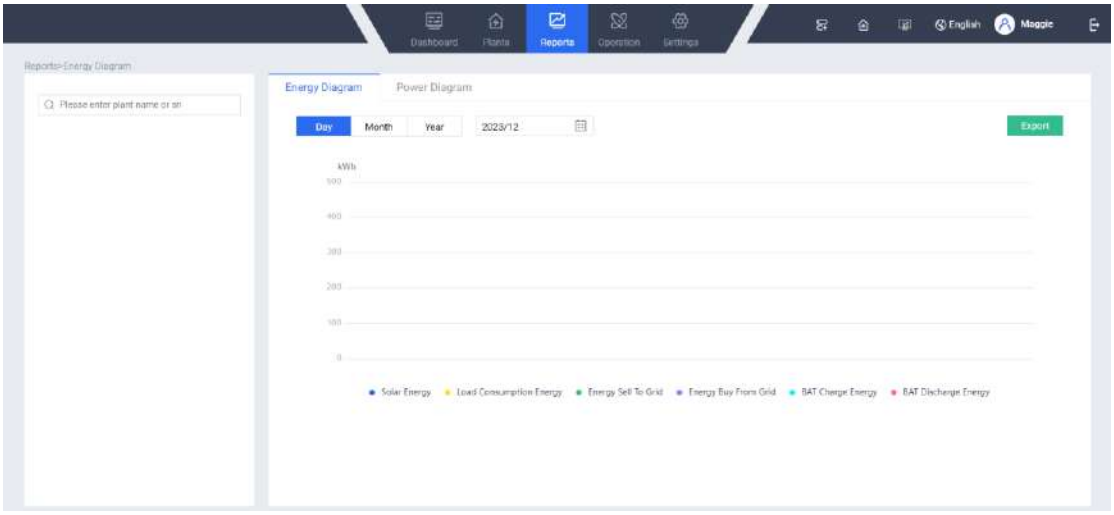


Figure 4-32

(6) Running Fault Troubleshooting

Historical information on device running failures can be retrieved and accessed through the following screen (Figure 4-33).

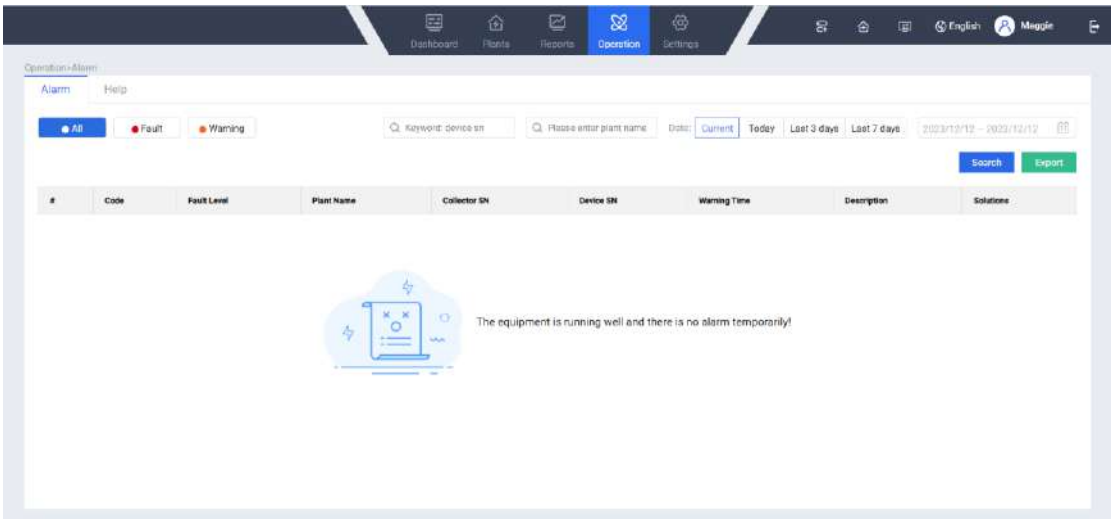


Figure 4-33

(7) Personal Information Setting

You can adjust your personal information, login password, etc. through the following screen (Figure 4-34).

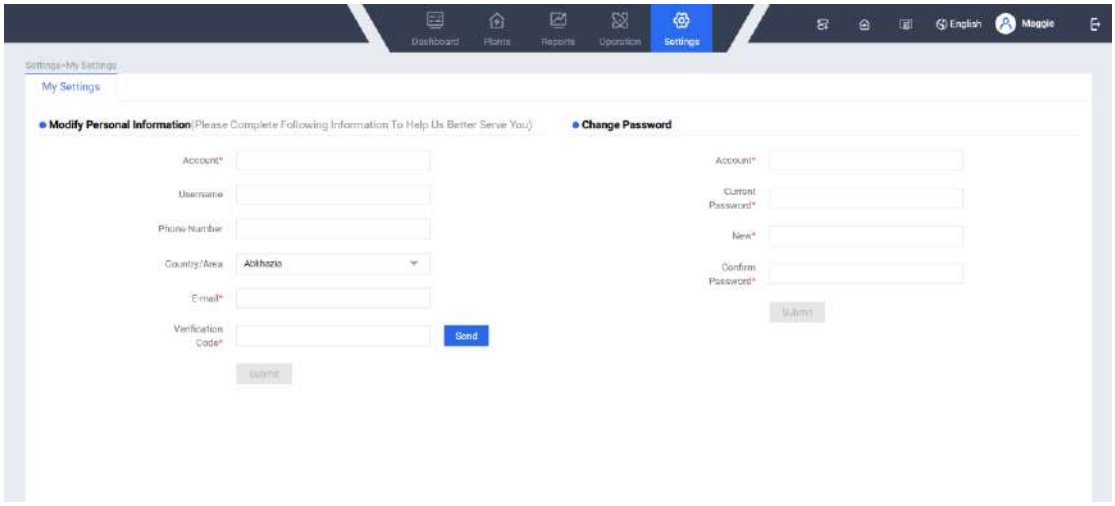


Figure 4-34

4.5 System Shutdown

Before powering down the battery system, make sure there is no load on the AC side of the inverter and that the circuit breaker between the battery system and the inverter is disconnected.

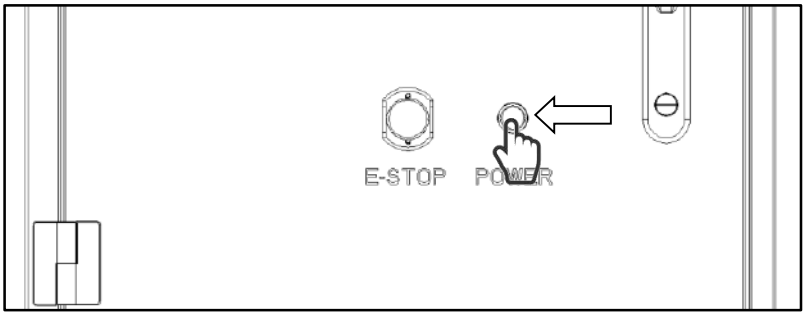
Step 1: Disconnect the inverter side "LOAD" switch.

Step 2: Disconnect the inverter side "GRID" switch.

Step 3: Disconnect the inverter side "GNE" switch.

Step 4: Disconnect the air condition power switch.

Step 5: Press the front door POWER button for 3 seconds, the running green indicator light will turn off, then put the air switch of the main control box in the off state, and the system will shut down (Figure 4-35).



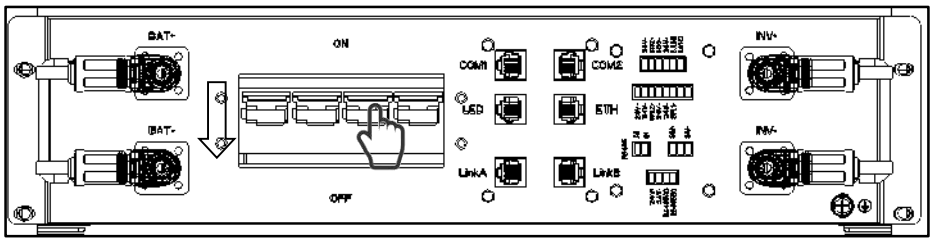


Figure 4-35

Step 6: Place the inverter DC switch to "OFF" and press the ON/OFF switch to turn off the system (Figure 4-36).

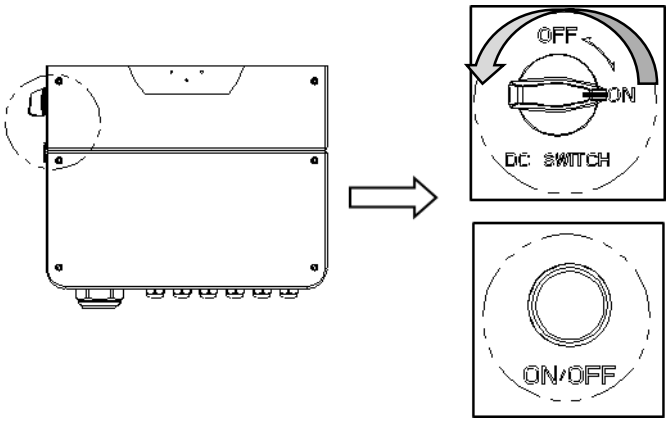


Figure 4-36

5 Maintenance and Common Troubleshooting

⚠Dangerous
When operating and maintaining the battery system, please remove the power from the system. Operating the equipment with power may cause damage to the battery system or pose a risk of electric shock.
⚠Warning
If any issues are found that may affect the battery system or energy storage inverter system, please contact after-sales personnel, and unauthorized disassembly is prohibited.
If the copper wire inside the conductive wire is found to be exposed, do not touch it; and there is a danger of high voltage. Please contact after-sales personnel, and unauthorized disassembly is prohibited.

If other unexpected situations occur, please contact after-sales personnel as soon as possible and operate under their guidance, or wait for on-site operation by after-sales personnel.

5.1 Daily maintenance

- It is recommended that the battery system needs to be recharged every 6 months from the factory.
- When the device is not in use for a long time, it is necessary to discharge the battery to a level between 45% and 55% and disconnect the battery output to avoid emptying the battery.
- During the storage period of the system, professional personnel should regularly inspect the system to check if the wiring is loose or detached, or clean the surface and interior of the system; If any defects are found, please contact the dealer promptly.

5.2 Battery Fault Handling

Phenomenon	Reason	Solution
POWER button does not respond	Button damaged or poorly wired	Replace button, check cable conduction status, or contact supplier
Short discharge time	Low battery level	Keep the product continuously charged for more than 2 hours to fully charge the battery storage system.
	Product overload	Check the load status and remove non-essential loads.
	Battery aging,	Replace the battery. Contact the

	reduced capacity	supplier for the battery and its components.
Unable to charge or discharge	Internal malfunction	Please contact the supplier.
	Battery reports charging or discharging Protection faults	Identify the corresponding cause of the malfunction according to the table of indicator function status of the battery.
	Battery Discharge to SOC protection level	① Modify the SOC lower limited value on the PCS side. ② Charge the battery to restore it.
	Battery overheating	Stand it at room temperature for more than 3 hours.
Communication abnormality of the battery	The connection of the communication cable is abnormal.	Check that the connections of the battery communication cables are tight.
Red light indication of malfunction	/	According to the fault information (function code) displayed on the PCS side, check the PCS function fault table to find out the corresponding fault cause.
Inverter cannot be started	Low battery voltage or PV offline	After starting the inverter through the grid, charge the battery.
Batteries cannot be charged from the grid	Inverter setup problems	See the user manual description of the inverter for details.
	Battery Fault Protection	According to the prompted fault information, check the table of indicator function status to find out the corresponding fault cause.

	Grid Fault	Check that the grid voltage is normal.

6 Transportation and storage

6.1 Transportation requirements

⚠ Dangerous
Rough loading and unloading, severe vibration, impact, or compression are prohibited to prevent exposure to sunlight and rain; otherwise, it may cause battery short circuit, damage (leakage, rupture, etc.), fire or explosion, etc.
⚠ Warning
Please ensure that the equipment is balanced during transportation to avoid falling.
It is prohibited to carry the battery through its terminals, bolts, or cables during transportation to avoid damage to the battery.
When handling, the battery should be carried in the required direction, and it is prohibited to invert, tilt, fall, mechanical impact, rain or snow, or fall into the water.
⚠ Attention
The battery has passed UN38.3 certification, and this product belongs to Class 9 dangerous goods.
Comply with international regulations for the transportation of dangerous goods and meet the regulatory requirements of the transportation regulatory authorities of the country of origin, destination, and destination.
When transporting, it is recommended to choose sea freight or

highways with good road conditions; and railway and air freight are not supported. During transportation, bumps and tilting should be minimized as much as possible.
Before transportation, the packaging of the battery must be checked for completeness and undamaged, and there must be no odor, leakage, smoke, fire, or other phenomena. Otherwise, transportation is prohibited.
When handling batteries, they should be handled with care; and it is strictly prohibited to touch the batteries, and personal safety should be taken into account.
The transportation packaging box must be firm, and care should be taken during loading, unloading, and transportation, with proper moisture-proof measures taken.
⚠ Notice
The handling of heavy objects must be balanced and stable with force; Move at a uniform and low speed. The positioning requirement is stable and slow to avoid any impact or drop that may scratch the surface of the equipment or damage the components and cables of the equipment.
When carrying heavy objects, special attention should be paid to workbenches, slopes, stairs, and other areas that are prone to slipping. When carrying heavy objects through the threshold, ensure that the width of the door is sufficient for the equipment to pass through, to prevent collisions or scratches on fingers.
When using a forklift for transportation, the forklift must be forked in the middle position to prevent tipping over. Before moving, please fasten the equipment to the forklift with ropes. When moving, a dedicated person is required to take care of it.
The inclination angle of the cabinet should meet the requirements

shown in the diagram, with a packaging inclination angle α≤ 15 °, and inclination angle after removing packaging α≤ 10 °.
When handling equipment by hand, safety protective equipment such as protective gloves and safety shoes should be worn to avoid injury.

6.2 Storage requirements

⚠Warning
The battery is stored indoors. No direct sunlight or rain, dry and well-ventilated, with a clean surrounding environment, free from a large amount of infrared and other radiation, no organic solvents or corrosive gases, no metal-conductive dust, etc., away from heat and ignition sources.
If the battery experiences bulging, deformation, damage, or leakage, it must be scrapped regardless of storage time.
When storing batteries, they should be placed correctly according to the packaging box markings. It is strictly prohibited to place them upside down, sideways, or tilted. When stacked, they should comply with the stacking requirements on the outer packaging.
The site must be equipped with fire protection facilities that meet the requirements, such as fire sand, fire extinguishers, etc.
⚠Attention
It is recommended to use batteries in a timely manner. For batteries that have been stored for a long time, please regularly recharge them; otherwise, it may cause battery damage.
The ambient air should not contain corrosive or flammable gases and should not be tilted or stored upside down.
⚠Notice
During storage, relevant certificates that meet the storage requirements of the product need to be saved, such as temperature and humidity log

data, storage environment photos, and inspection reports.
Store in a clean and dry place and prevent erosion by dust and moisture. It is prohibited to suffer from rainwater or surface water erosion.
Storage environment requirements: Recommended storage temperature: 20 ℃~30 ℃. Relative humidity: 5% RH to 80% RH. Dry, ventilated, and clean. Avoid contact with corrosive organic solvents, gases, and other substances. Avoid direct sunlight. The distance from the heat source must not be less than two meters.
From the date of shipment by the manufacturer, the battery needs to be maintained at a maximum interval of 6 months. The requirements for the recharge interval after the battery is emptied are as follows: If the ambient temperature is (30,40] ℃, power should be replenished within 15 days; if the ambient temperature is ≤ 30 ℃, power should be replenished within 30 days. It is recommended to store at a state of charge of 45% to 55% SOC.

Appendix: Parameter Specification Sheet

CIESS Parameters							
Model Type	**CIESS 50**	**CIESS 55**	**CIESS 60**	**CIESS 65**	**CIESS 70**	**CIESS75**	**CIESS 80**
System Parameter							
Battery number	10	11	12	13	14	15	16
Rated voltage (V)	512	563.2	614.4	665.6	716.8	768	819.2
Rated energy (KWh)	50	55	60	65	70	75	80
Voltage range(V)	448~576	492.8~633.6	537.6~691.2	582.4~748.8	627.2~806.4	672~864	716.8~921.6
Weight (kg)	740	790	840	1000	1050	1100	1150
Dimensions (L * W * H)	715*750*2140mm			1300*750*1700mm			
Expansion	Supports up to 3 battery cabinets in parallel						
Protection grade	IP55						
Temperature control	air-conditioning						
Charging ambient temperature	0℃~50℃						
Discharge ambient temperature	-20℃~55℃						
Working humidity	10%~95%RH(without condensation)						
Recommended storage temperature	20℃ ~ 30℃						
Communication	CAN/RS485						
Maximum charging current	100A						
Maximum discharge current	100A						
Maximum working altitude	2000m						
Cycle life	6000 次（25℃，0.5C/0.5C，90%DOD）						
Basic protection functions	Charging overvoltage, discharging under voltage, overcurrent, over temperature, short circuit protection, etc.						
Certification	IEC62619、CE、UN38.3						
Packaging, transportation, and installation							
Packaging	Wooden case packing for the whole machine						
Transportation	Sea and land transportation						
Installation	Lifting, floor mounting						

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