SR-Ket-A Series Energy Storage System

User Manual

V1.1

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1. Instructions

Thank you very much for choosing the SR-Ket-A series Industrial and commercial energy storage system developed and produced by our company. Please read and understand all contents of the Manual carefully before installing and using the product. If you have any suggestions during the use, please do not hesitate to give us feedback.

1.1 Range of Application

The installation and user manual of SR-Ket-A series is applicable to the installation and use of the following products:

No	Model	Rated energy	Rated Voltage	Composition
1	SR-Ket20A	20.5kWh	204.8V	SR-HOC05B * 4 + SR-PDU100 * 1
2	SR-Ket30A	30.7kWh	307.2V	SR-HOC05B * 6 + SR-PDU100 * 1
3	SR-Ket40A	41.0kWh	409.6V	SR-HOC05B * 8 + SR-PDU100 * 1
4	SR-Ket50A	51.2kWh	512.0V	SR-HOC05B * 10 + SR-PDU100 * 1
5	SR-Ket60A	61.4Kwh	614.4V	SR-HOC05B * 12 + SR-PDU100 * 1

The product should be used in compliance with local standards, laws and regulations, because any non-compliance with the use may lead to personal injuries and property loss.

The drawings provided in this Manual are used to explain the concepts related to the product, including product information, installation guide, electrical connection, system debugging, safety information, common problems and maintenance, etc.

The internal parameters of this product have been adjusted before delivery. No internal parameters can be changed without permission. Any unauthorized changes to the settings will invalidate the warranty, and the Company will not be liable for any loss resulting therefrom.

These Manual and other related documents are an integral part of the product and should be kept properly for onsite installation personnel and related technical personnel to consult.

1.2 Meaning of Abbreviations

AC	Alternating Current
DC	Direct Current
PV	Photovoltaic
BMS	Battery Management System
EMS	Energy Management System
BMU	Battery Management Unit
BCU	Battery Cluster Unit

BAU	Battery Array Unit
PDU	Power Distribution Unit
PCS	Power Conversion System
RJ45	Registered Jack 45
SOC	State Of Charge
C	Charge C-rate
RS485	RS485 Communication Interface
CAN	Controller Area Network
SOH	State Of Health
DOD	Depth Of Discharge

1.3 Symbol Stipulations

There may be following symbols herein, and their meanings are as follows.

Symbols	Description
	Indicate a hazard with a high level of risk which, if not avoided, will result in death or serious injuries.
	Indicate a hazard with a medium level of risk which, if not avoided, could result in death or serious injuries.
	Indicate a hazard with a low level of risk which, if not avoided, could result in minor or moderate injuries.
	Warning information about device or environment safety. If not avoided, equipment damage, data loss, performance degradation or other unanticipated results may be resulted in. The "NOTICE" does not involve any personal injuries.

2 Safety Precautions

2.1 Safety Symbols

This product contains the following symbols, please pay attention to identifying.

Symbols	Description
	Observe enclosed documentation
	Danger. Risk of electric shock!

	Danger of high voltages. Danger to life due to high voltages in the Energy storage system
	Hot surface
	CE certification
	Do not touch the product in 5mins after shutdown
	Comply with RoHS standard
	The Energy storage system should not be disposed together with the household waste.
	Flammability risk
	Electric shock hazard
	Keep the battery away from open flame or ignition sources
	Keep the battery away from electric sparks
	Recycling
	Rainproof and moisture-proof

2.2 General Safety

2.2.1 Important Notice

Before installing, operating, and maintaining the device, please read this Manual first and follow the symbols on the device and all the safety precautions in this Manual.

The matters indicated with "DANGER", "CAUTION", "ATTENTION" and "NOTICE" in this Manual do not represent all the safety matters to be observed but are only the supplements to all the safety precautions. The Company will not be liable for any violation of general safety operating requirements, or any violation of safety standards for the design, production, and use of the device. The device must be used in an environment that meets the requirements of the design specifications. Otherwise, the device may fail, and the abnormal device function or component damage, personal safety accident, and property loss arising from this are not covered within the quality assurance scope of the device. When installing, operating, and maintaining the device, the local laws, regulations, and codes shall be followed. The safety precautions in this Manual are only supplements to local laws, regulations, and codes. The Company shall not be liable for any of the following circumstances.

- The device is not run under the conditions of operating described in this Manual.
- The installation and operating environment is beyond the requirements of relevant international or national standards.
- The product is disassembled or changed, or the software code is modified without authorization.
- The operation instructions and safety warnings related with the product and in the documents are not followed.
- Damage of the device is caused by abnormal natural environment (force majeure, such as earthquake, fire, and storm).
- Transportation damage is caused during customer's own transportation.
- The storage condition does not meet the requirements of the product related documents and causes damage.

2.2.2 General Requirements

	Operating when the power is on is strictly prohibited during installation.
	It is strictly prohibited to install, use, and operate any outdoor equipment or cables (including but not limited to transporting equipment, operating equipment and cables, plugging and removing signal ports connected to the outdoor, working at altitude, and outdoor installation) in severe weather, such as thunder, rain, snow, and gale level 6.
	In case of any fire, evacuate the building or equipment area and press the fire alarm bell or dial the fire call. Under any circumstances, re-entry into a burning building is strictly prohibited.
	Under no circumstances should the structure and installation sequence of the device be changed without the manufacturer's permission.
	The battery terminal components shall not be affected during transportation. And, the battery terminal bolts shall not be lifted or transported.
	It is strictly prohibited to alter, damage or block the marks and nameplates on the device.
	The composition and working principle of the entire photovoltaic power generation system, as well as the relevant standards of the country/region where the project is located shall be known fully.
	After the device is installed, the empty packing materials, such as cartons, foam, plastics, and cable ties, shall be removed from the device area.

2.2.3 Personnel Safety

- When operating the device, appropriate personal protective equipment shall be worn. If any fault that may lead to personal injury or damage of the device is found, immediately terminate the operation, report to the responsible person, and take effective protective measures.
- Before using any tools, learn the correct method of using the tool to avoid injuries and damage of the device.
- When the device is running, the temperature of the case is high, which may cause burns. Therefore, do not touch the case.
- In order to ensure personal safety and normal use, reliable grounding should be carried out before use.
- Do not open or damage the battery. The electrolyte released is harmful to skin and eyes, so avoid touch it.
- Do not place irrelevant items on the top of the device or insert them into any part of the device.
- Do not place flammable items around the device.
- Never place the battery in the fire to avoid explosion and prevent the personal safety from being endangered.
- Do not place the battery module in water or other liquids.
- Do not short-circuit the battery terminals, because short-circuiting of the battery may cause combustion.
- The battery may pose a risk of causing electric shocks and large short-circuit currents. When using the battery, the following precautions should be paid attention to:

  a) The metal objects, such as watch and rings, shall be removed.

  b) Tools with insulated handles should be used.

  c) Rubber gloves and shoes should be worn.

  d) The charging power supply shall be disconnected before connecting or disconnecting terminals of the battery.

  e) Check whether the battery is accidentally grounded. If the battery is accidentally grounded, remove the power supply from the ground.
- Do not clean the internal and external electrical components of the cabinet with water or detergent.
- Do not stand, lean or sit on the device.
- Do not damage any modules of the device.

2.3 Personnel Requirements

- The personnel in charge of installation and maintenance must be strictly trained to understand all safety precautions and master proper operation methods.
- Only qualified professionals or trained personnel are allowed to install, operate and maintain the device.

- The personnel who operate the device, including the operators, trained personnel and professionals, must have special operation qualifications required by the local country, such as high voltage operation, working high above the ground, and special equipment operation qualification.
- The replacement of device or components (including software) must be carried out by professionals or authorized personnel.

2.4 Electrical Safety

2.4.1 General Requirements

Before carrying out electrical connections, ensure that the device is not damaged, or an electric shock or fire may occur.

Never install or remove any power cables when the power is on. The electric arcs or sparks may be generated at the moment when the power cable contacts with the conductor, which may cause fire or personal injuries.

- All the electrical connections must meet the electrical standards of the country/region where the project is located.
- The cables prepared by users themselves shall comply with local laws and regulations.
- Special insulating tools should be used in high-voltage operations.
- Before connecting the power cord, ensure that the label identification on the power cord is correct.
- Operations on the device are allowed only five minutes after the device is completely powered off.
- The insulation layer of the cable may be aged or damaged when the cable is used in a high temperature environment. Therefore, the distance between the cable and the heat source must be at least 30mm.
- Cables of the same type should be bundled together. Whereas the cables of different types should be routed at least 30mm apart, and shall not be wrapped together or crossed.

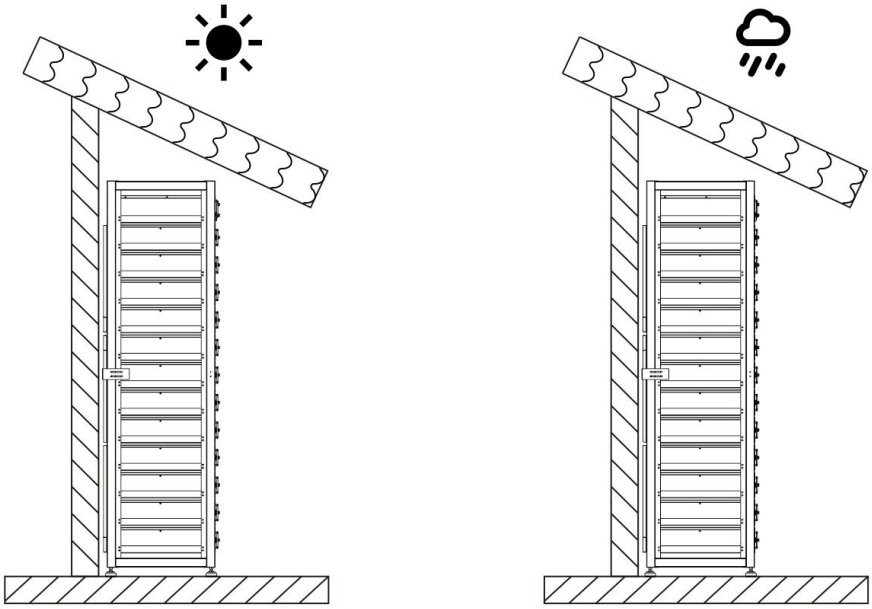
2.4.2 Grounding Requirements

- When installing the device to be grounded, the protective grounding wire must be installed first; when removing the device, the protective grounding wire must be removed at last.
- It is forbidden to destroy the grounding conductor.
- It is forbidden to operate the device without a grounding conductor installed.
- The device shall be permanently connected to the protective grounding wire. Before operating the device, electrical connection of the device shall be checked to ensure that the device is reliably grounded.

2.5 Installation Environment Requirements

- Do not install or use this product in an environment where the temperature is lower than -10 ℃ or higher than 50 ℃.

- It should be installed in a dry and well-ventilated environment to ensure good heat dissipation performance.
- The product can be installed at a maximum altitude of 3,000m.
- The installation position should be away from the fire source.
- The product should be installed and used away from children and animals.
- The installation position should be far away from water sources, such as faucets, sewer pipes, and sprinklers, to avoid entering of water.
- The device should be placed on a firm and flat supporting surface.
- Do not place any inflammable or explosive items around the device.
- When the device is running, do not block the ventilation vent or heat dissipation system to prevent fire caused by high temperature.



The operation and service life of the energy storage is related to the operating temperature. The energy storage should be installed at a temperature equal to or better than the ambient temperature.

3 Product Introduction

3.1 Battery System Specifications

Product model	SR-Ket20A	SR-Ket30A	SR-Ket40A	SR-Ket50A	SR-Ket60A
Battery Module Qty in series	4	6	8	10	12
Rated voltage	204.8V	307.2V	409.6V	512.0V	614.4V
System Operating Min.Voltage	179.2V	268.8V	358.4V	448.0V	537.6V
System Operating Max.Voltage	233.6V	350.4V	467.2V	584.0V	700.8V
System Energy	20.5kWh	30.7kWh	41.0kWh	51.2kWh	61.4kWh
Usable Energy	19.5kWh	29.2kWh	38.9kWh	48.6kWh	58.4kWh
Recommend Charge/Discharge Current	50A				
Max Charge/Discharge Current	70/100A				
Peak Discharge (3S,25℃)	80/120A				
Installation Location	Rack Mounting				
Recommend Depth of Discharge	≤95%				
Life cycle (25℃,0.5C/0.5C,EOL70%)	6000 Cycles				
Display Type	LED+Touch LCD				
Triple Protection	Positive Relay + Negative Relay + Breaker				
Number of Main Circuit Relays	3				
Heat Dissipation	Natural Cooling				
Working Temperature	Charge:0 ~ 55℃/Discharge:-20 ~ 55℃				
Storage time / temperature	6 months @25℃;3 months @35℃;1 months @45℃;				
Communication interfaces	CAN/RS485//WIFI				
Humidity	5%~80%RH				
Altitude	≤3000m				
Enclosure protection rating	IP20				
Operation Environment	Indoor				
Noise	< 30dB				
Max. number of parallel	2				
Dimensions (L*W)	776*552mm				
Dimensions (H)	976mm	1282mm	1588mm	1894mm	2200mm
Weight Approximate	209kg	305.7kg	402.4kg	499.1kg	595.8kg
Cover An Area	0.78*0.55 m*m				
Lithium Battery Standard	UN38.3, MSDS, EN55032, EN55024,				

3.2 Battery Pack Module Specifications

Battery Pack Module	SR-HOC05B
Cell chemistry	LiFePO4
Battery Energy	5.12kWh
Rated Voltage	51.2V
Rated Capacity	100AH
Recommend Charge/Discharge Current	50A
Max Charge/Discharge Current	70/100A
Peak Discharge(2 mins, 25℃)	80/120A
Installation Location	Rack Mounting
Recommend Depth of Discharge	≤95%
Life cycle (25℃,0.5C/0.5C,EOL70%)	6000 Cycles
Heat Dissipation	Natural Cooling
Working Temperature	Charge:0 ~ 55℃/Discharge:-20 ~ 55℃
Storage time / temperature	6 months @25℃;3 months @35℃;1 months @45℃;
Enclosure protection rating	IP20
Dimensions	603*485*140mm
Weight Approximate	43.6kg

3.3 PDU Module Specifications

PDU Module	SR-PDU100
Rated Voltage	850V
Rated Current	100A
Operating Voltage	100~850V
CAN Communication	2
Rely Control	3
LCD Screen	4.3 inch
Breaker	100A
Relay	150A
Fuse	160A
Precharge Relay	50A
Precharge Resistance	200W/100Ω
External DC input port	24V
Dimensions	577*485*150mm
Weight Approximate	15.6kg

3.4 Rack Module Specifications

Standard 19inch Rack	SR-Rack-13A
Dimensions	776*552*2200mm
Weight Approximate	57kg

Installable 12 pcs batteries and 1 pcs High Voltage Battery cluster control box

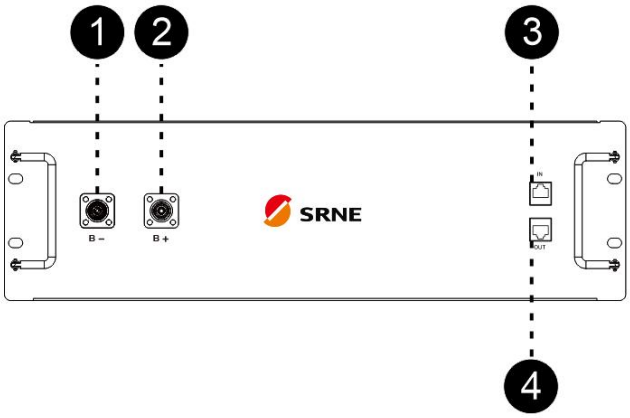
3.5 Appearance Description

3.5.1 Battery system introduction

Code	Name	Product Model
A	PDU Module	SR-PDU100
B	Battery Pack Module	SR-HOC05B
C	Rack	SR-Rack-13A

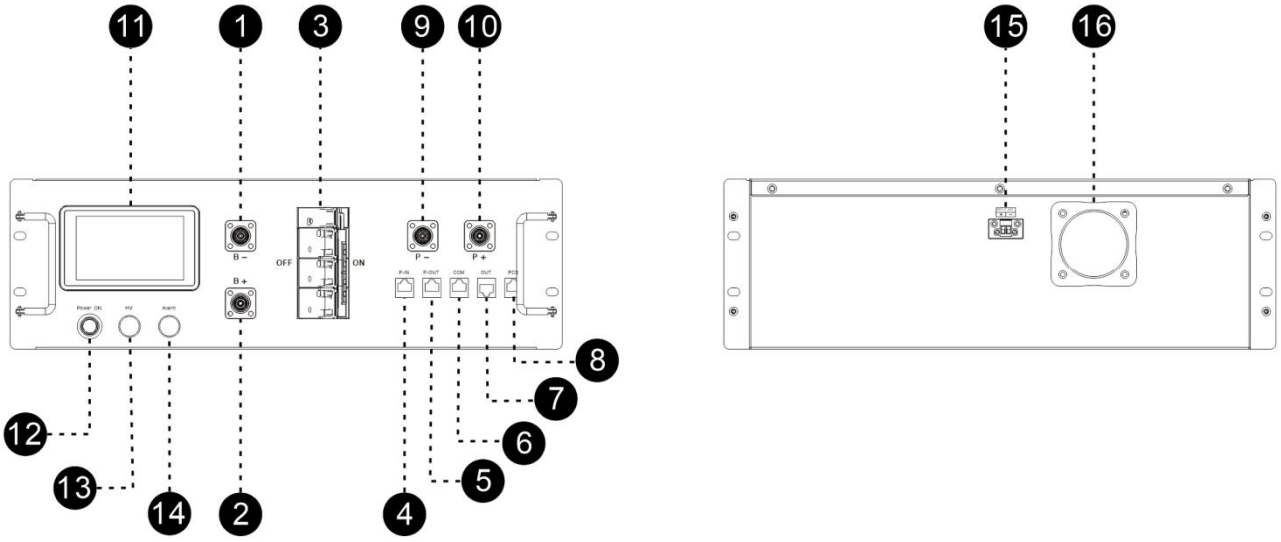
Built in 1 control module and UP to 12 battery modules.

3.5.2 Battery Pack Module introduction



No.	Name	Description
①	B-	Battery module negative pole (black)
②	B+	Battery module positive pole (orange)
③	BCOM IN	Connection position of battery module communication and power supply input
④	BCOM OUT	Connection position of battery module communication and power supply output

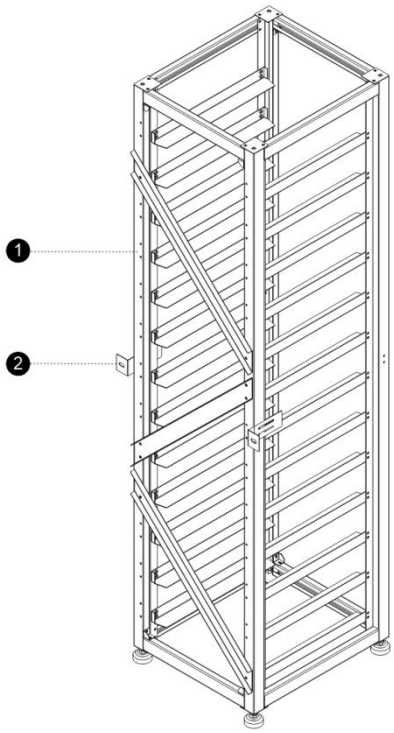
3.5.3 PDU Module introduction



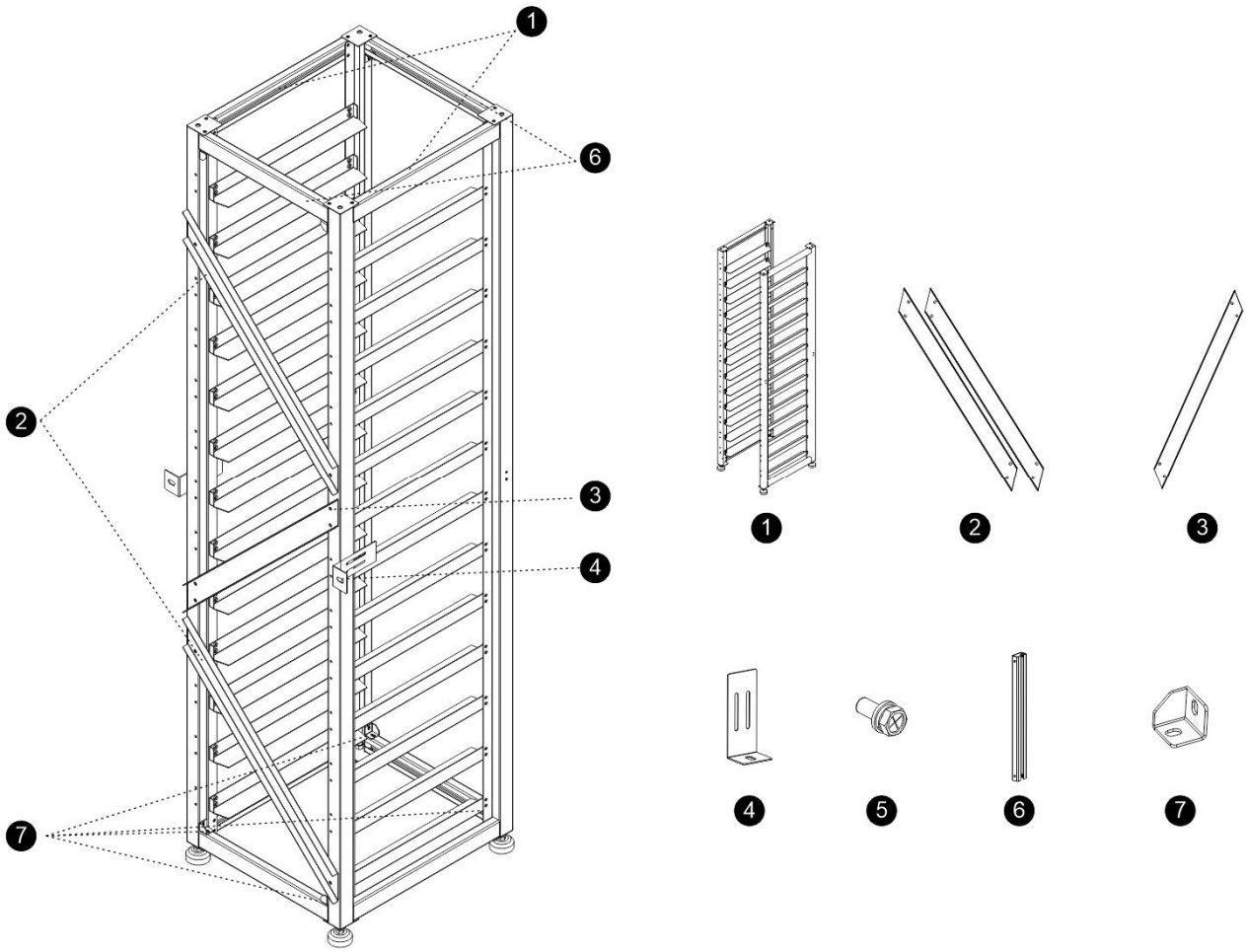
No.	Name	Description.	Position
①	B-	Connection position of the common negative pole of the battery (black).	Front
②	B+	Connection position of the common positive pole of the battery (orange).	Front
③	Air Switch	Used to manually control the connection between the battery rack and external devices.	Front

④	P-IN	Connection position with previous PDU communication.	Front
⑤	P-OUT	Connection position with next PDU communication.	Front
⑥	COM	BMS upgrade interface and connection PC interface.	Front
⑦	OUT	Communicative connection with the first battery module.	Front
⑧	PCS	PCS COM battery communication terminal: (RJ45 port) follow the CAN protocol (default baud rate: 500bps) and RS485 protocol (default baud rate:9.6bps), used to output battery information to the inverter.	Front
⑨	P-	Connection position of PCS negative pole (black).	Front
⑩	P+	Connection position of PCS positive pole (orange).	Front
⑪	HMI	Display some important battery information.	Front
⑫	POWER ON	A start switch of 24VDC power inside the PDU.	Front
⑬	HV	High-voltage hazard indicator (yellow).	Front
⑭	ALARM	Battery system fault alarm indicator (red).	Front
⑮	POWER	Connection position of external 24VDC power supply.	Rear
⑯	WiFi	Antenna	Rear

3.5.4 Rack Module introduction



Code	Name
①	Rack
②	Fixed trestle

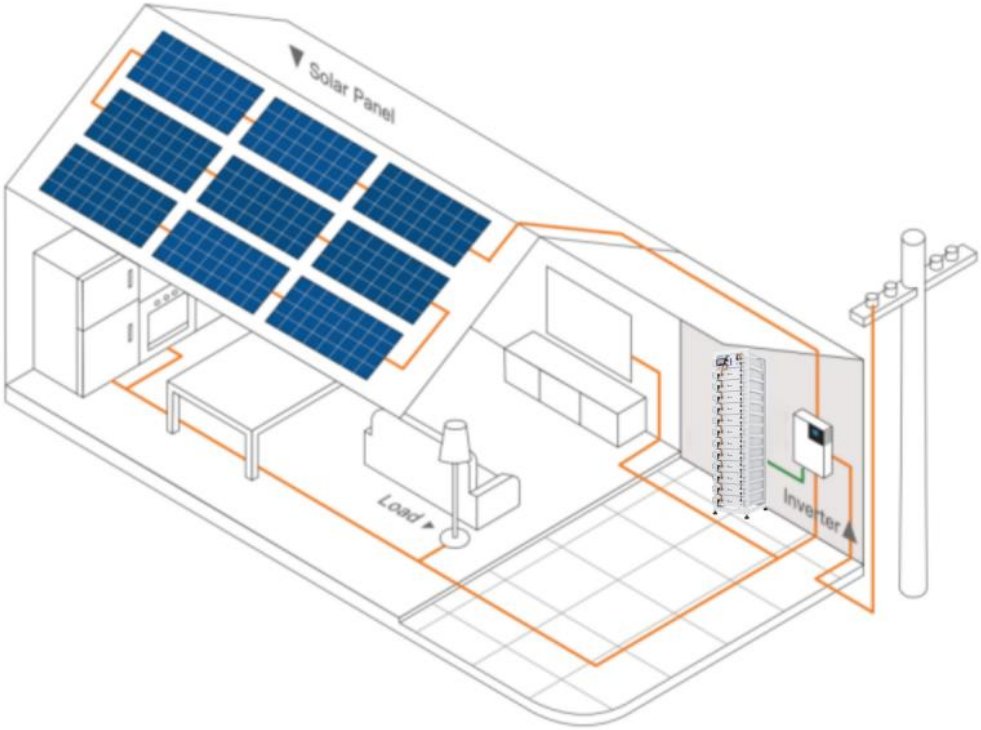


No.	Description.	PCS
①	Side beam	2
②	Right diagonal brace	2
③	Left diagonal brace	1
④	Rack fastener	2
⑤	M6*16screw	40
⑥	Beam	4
⑦	four-corner fixing fitting	8

4 Application Scenarios

The lithium iron phosphate batteries with high performance and long service life are used in the energy storage module. Meanwhile, the modular structure design is adopted. Each energy storage module is internally integrated with the intelligent BMS system, which can be easily expanded and can be combined into 120kWh battery pack at most,This product is very suitable for industrial and commercial energy storage applications.

The battery storage can be combined with SRNE brand inverter to form an off-grid or hybrid photovoltaic system, which can solve the problem of electricity consumption in areas without electricity.



5 System Installation

5.1 Inspections before Installation

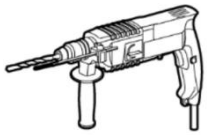
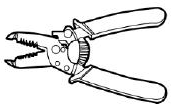
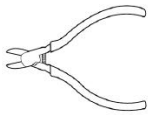
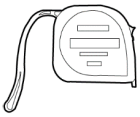
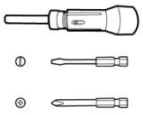
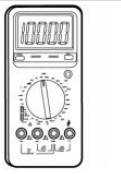
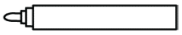
Inspection of outer package

Before opening outer package of the energy storage, check if there is any visible damage on the outer package, such as holes, cracks or other signs of possible internal damage, and check the type of energy storage. If there is any abnormality on the package or model of the energy storage is inconsistent, do not open it and contact us as soon as possible.

Inspection of deliverables

After opening outer package of the energy storage, check if the deliverable is complete and whether there is any visible external damage. If any items are missing or damaged, please contact us.

5.2 Preparation of Tools and Meters

Types	Tools and meters			
Installation tool				
				
				
Personal protective equipment				

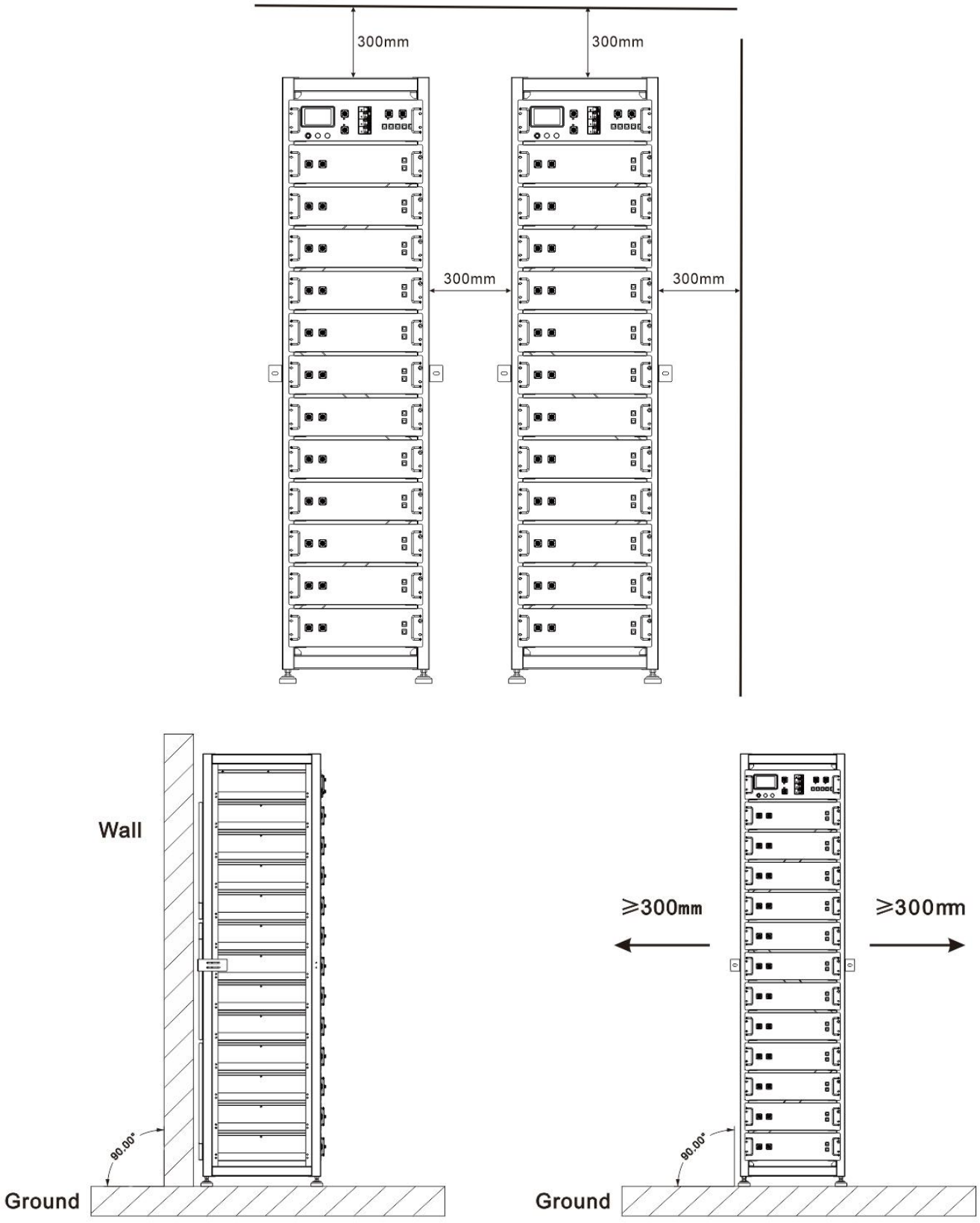
5.3 Selection of Installation Location

5.3.1 Basic Requirements

- When the energy storage is running, the temperature of the case and the radiator will be high. Therefore, do not install them in a place that is easy to touch.
- Do not install in areas where flammable and explosive materials are stored.
- If the energy storage is installed in areas with salt damage, it will be corroded and may cause fire. Therefore, do not install it outdoors in areas with salt damage. The areas with salt damage are defined as the areas which are not 500m away from shore or will be affected by sea breezes. The areas affected by the sea breezes vary depending on meteorological conditions (e.g. typhoons, monsoons) or topographical conditions (dams, hills).
- Do not install in the place where children can touch.
- The energy storage cannot be installed forwardly, horizontally, inversely, backwardly or sideways.
- When drilling holes on walls or ground, the goggles and protective gloves shall be worn.
- During drilling, the device should be shielded to prevent debris from falling into the device. After drilling, the debris shall be cleaned up in time.
- When handling any heavy objects, you should be prepared to bear loads to avoid being crushed or sprained.
- When handling the device by hand, wear protective gloves to avoid injury.

5.3.2 Installation Space Requirements

The battery system should be placed in the right position first, and the installation site should be smooth, and the wall should be solid, and the distance between the batteries should be greater than 200-350mm.

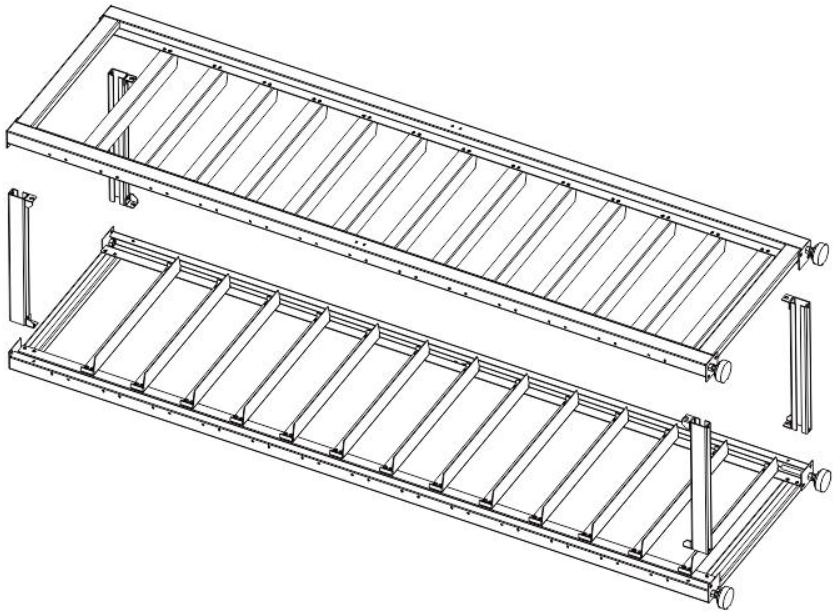


5.4 Device Installation

5.4.1 Installation of Rack

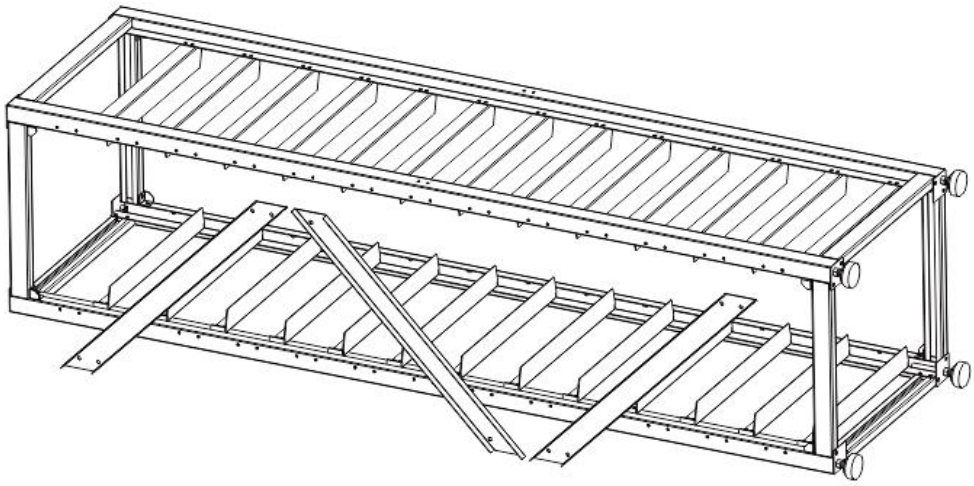
Step1:Frame Assembly

Use external hexagonal and internal cross combination screws and screwdrivers to connect the side beams with the top/bottom beams to form a rectangular frame. First assemble the top crossbeam, and then connect the bottom crossbeam, etc.



Step2:Diagonal Bracing Installation

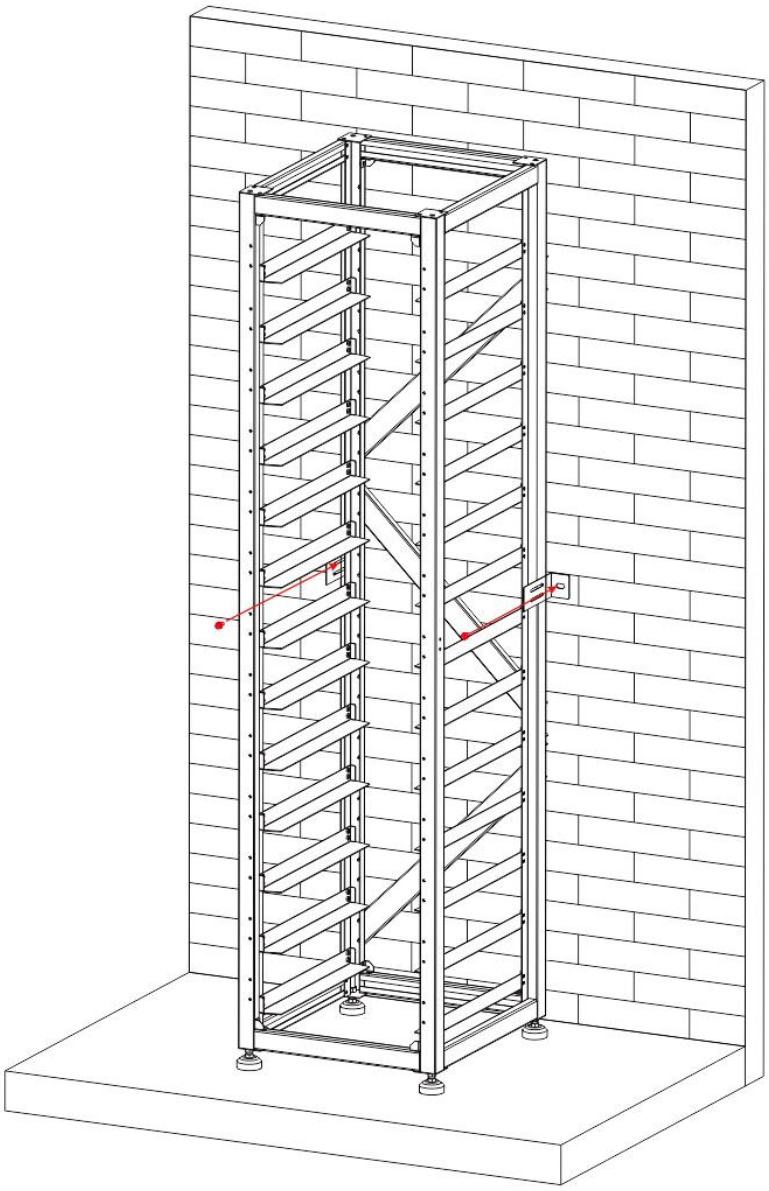
Secure left/right diagonal braces on both sides of the beam structure using the same hexagon socket screw system.



Step3:Rack Positioning

Erect the completed rack vertically after assembly.

Wall Mounting: Attach rack fasteners to upper socket screw holes and secure to the wall using hexagon combination screws.



DANGER!

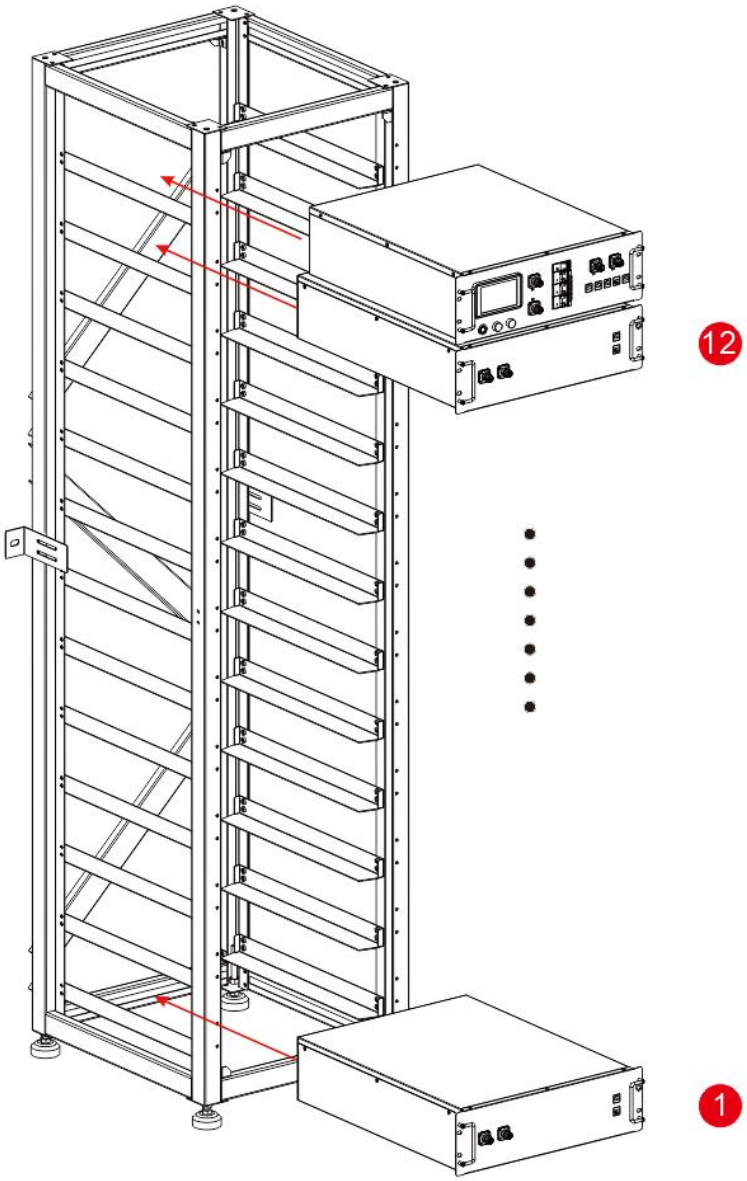
To avoid electrical shock or other injury, inspect existing electronic or plumbing installations before drilling holes.

CAUTION

Choose suitable firm wall with thickness greater than 80mm.

5.4.2 Installation of Battery and PDU

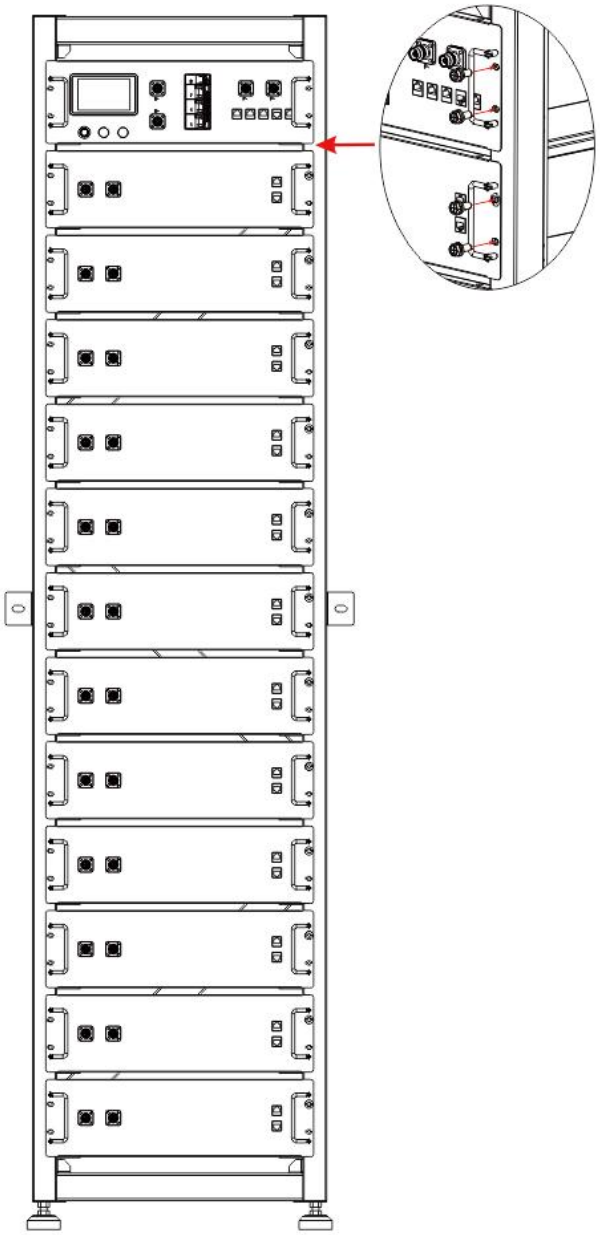
Install the battery from the bottom to the top, and make sure the battery is secured.When placing the battery, ensure that the battery is pushed to the bottom.



CAUTION

The battery pack is very heavy, which requires multiple people to install.

Fasten the battery with the accessory screws. Be careful that the battery falls down.



6 Electrical Connection

Before electrical connection, please ensure that the switches of the energy storage are in the "OFF" state. Otherwise, the high voltage of the device may cause electric shock.

The operations related to electrical connections must be carried out by professional electrical technicians. When carrying out electrical connections, the operator must wear personal protective articles.

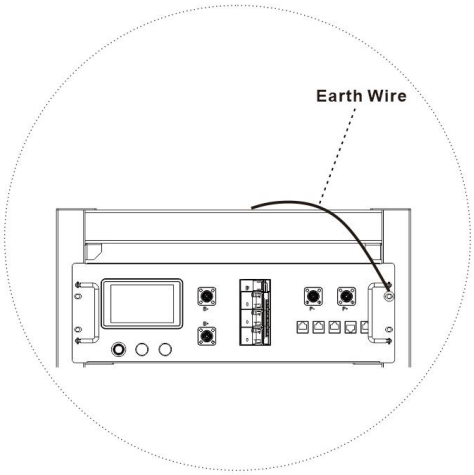
6.1 Preparation of Cables

No.	Cables	Description	Recommended specifications	Source
1	Battery Cable (red)	75mm Power cord of battery module		Battery Module
2	Battery Signal line	Signal cable between battery		Battery Module
3	PDU Cable (red)	65mm positive power cord of PUD		PDU Module
4	PDU Cable (black)	3.2m negative power cord of PUD		PDU Module
5	PCS Cable (red)	2m positive power cord to connect External PCS		PDU Module
6	PCS Cable (black)	2m negative power cord to connect External PCS		PDU Module
7	PCS Signal line	2m Connected to external inverter communication cable		PDU Module

6.2 Electrical Connection

6.2.1 Connecting Grounding Wire

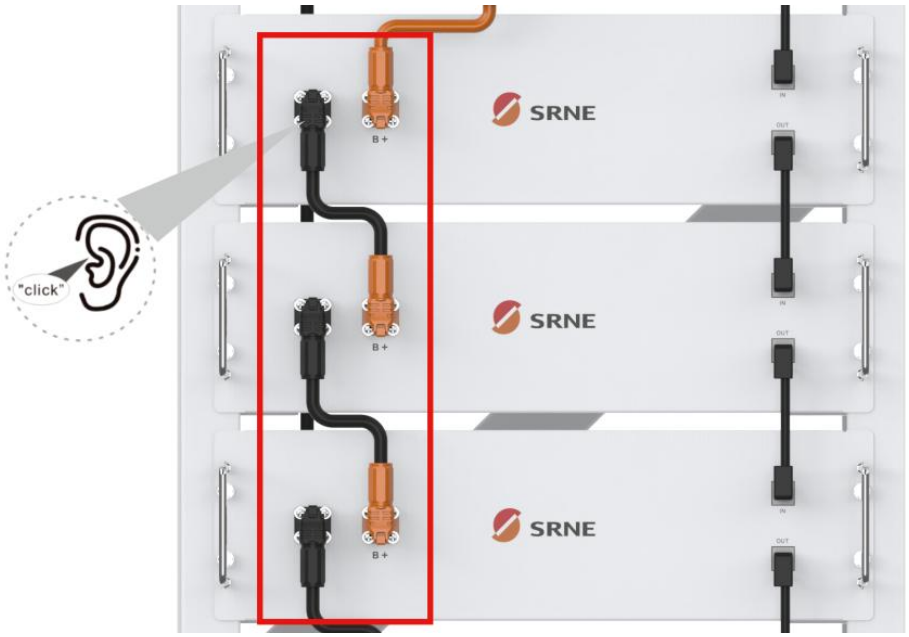
When installing equipment, the protective ground wire must be installed first;When removing the equipment, the protective ground wire must be removed finally.



6.2.2 Connecting Battery Power Cable

When connecting the battery wiring, please make sure that all switch is off and the indicator light is off. If the plug is connected properly, you will hear a "click" sound.

If you need to unplug the plug, you need to first turn off all devices and battery switches, and then wait for 5 minutes before proceeding,then press the self-locking clasp and unplug.

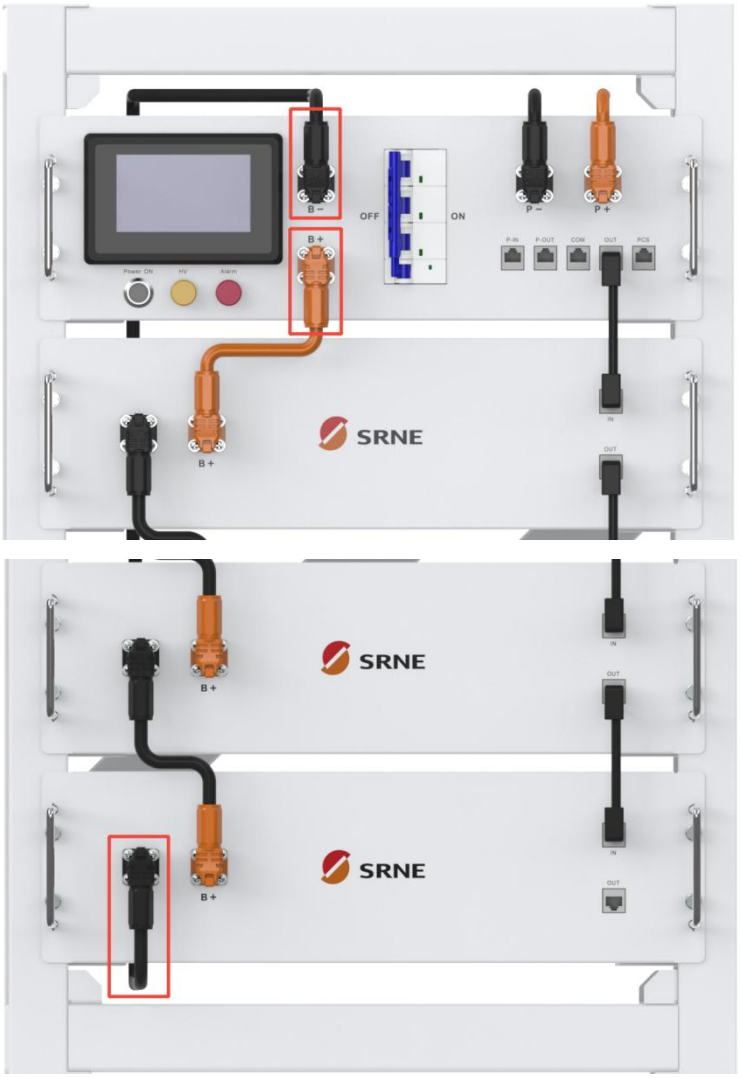


6.2.3 Connecting Battery Signal Line

The IN and OUT connections between battery packs use the battery communication cable.

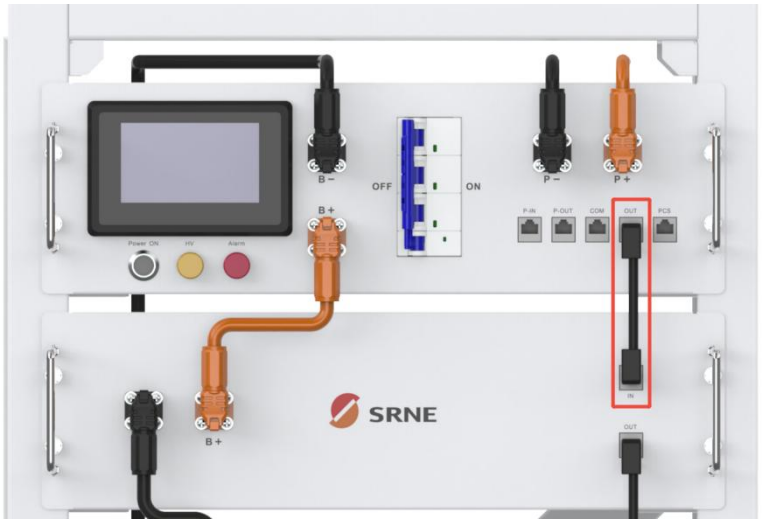
6.2.4 Connecting PDU Power Cable

Connect the positive of the topmost battery to the positive of the PDU, and connect the negative of the bottommost battery to the negative of the PDU.



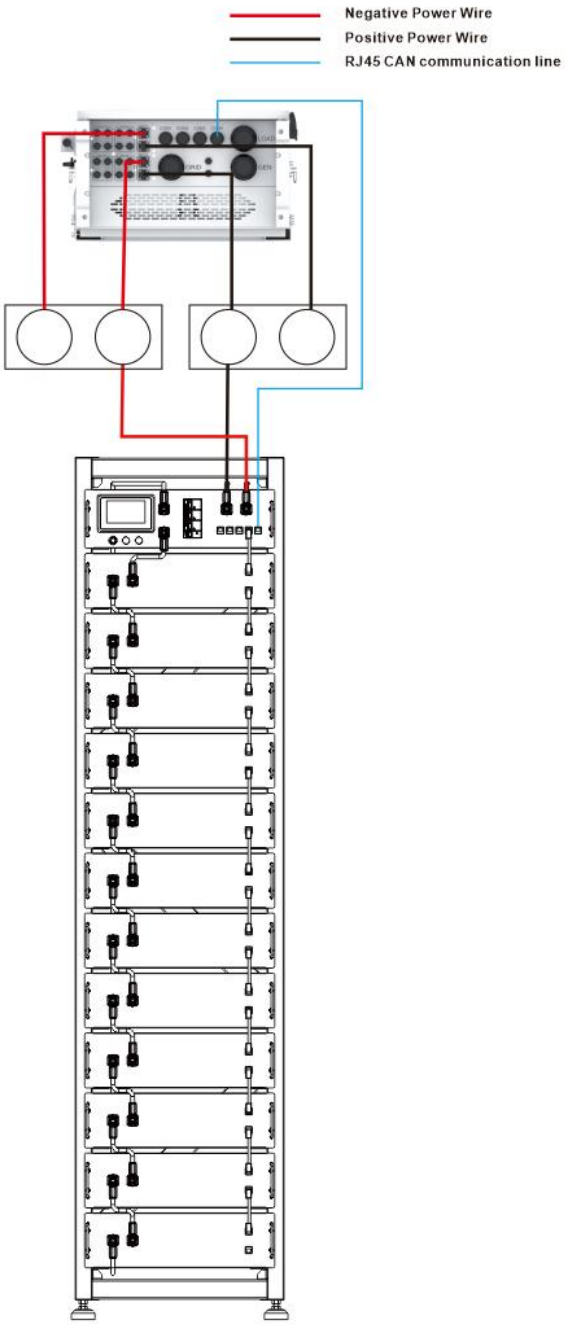
6.2.5 Connecting PDU Signal Line

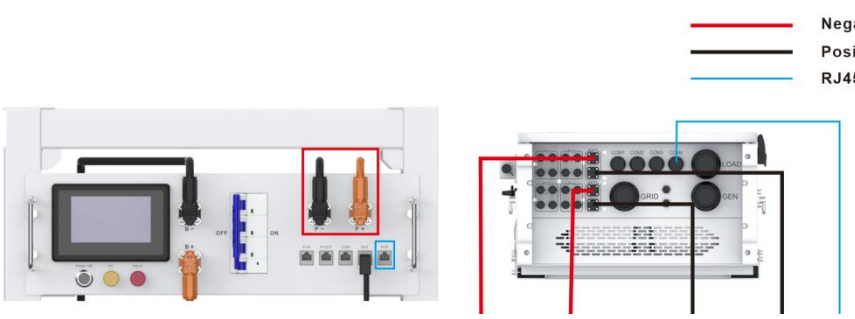
Connect the PUD “OUT” interface to the battery “IN” interface.



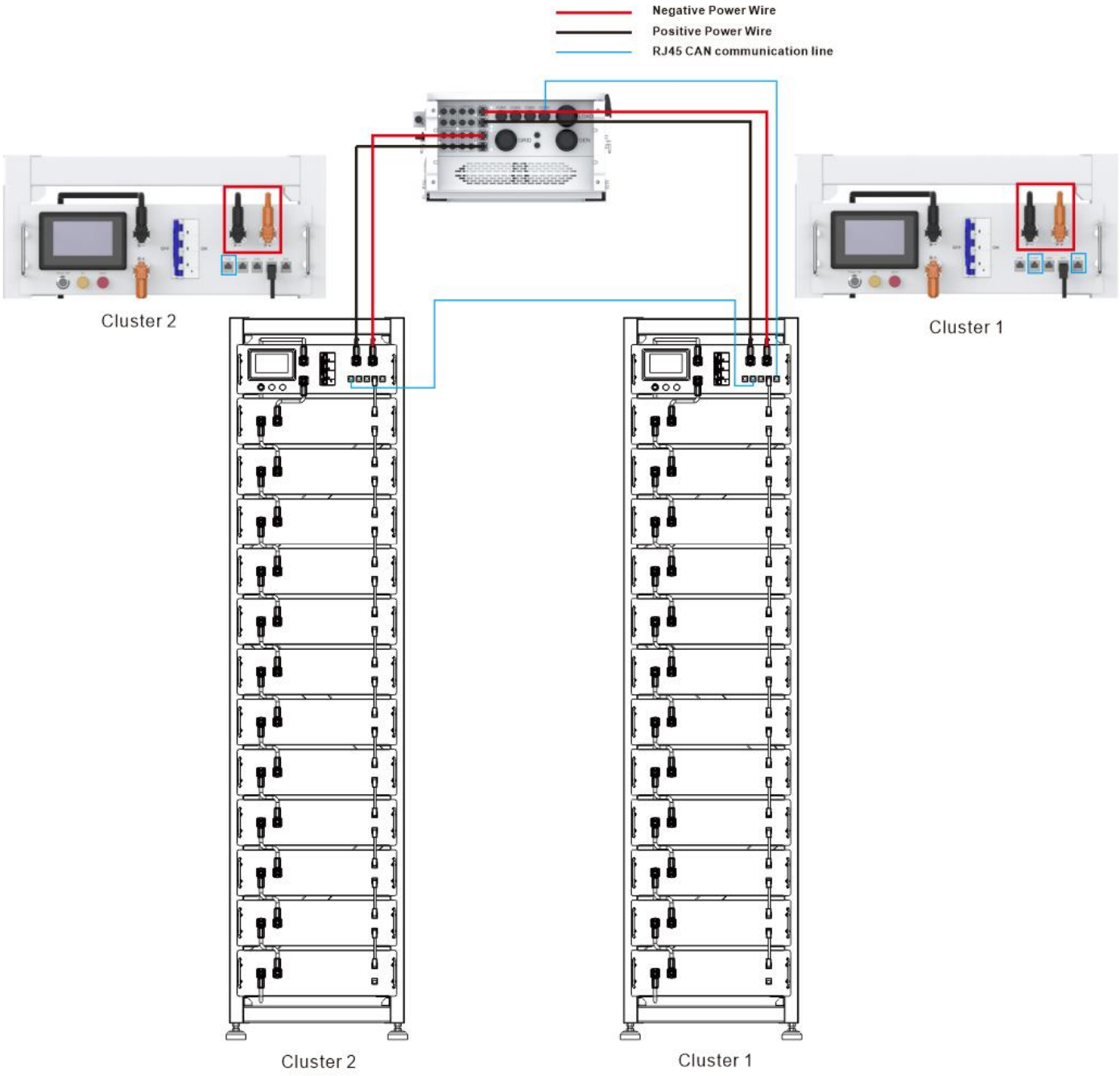
6.2.6 Connecting PCS

6.2.6.1 Single Battery Cluster Connected To Inverter





6.2.6.2 Two Battery Clusters Connected To Inverter



7 System Debugging

7.1 Inspections Before Power-On

No.	Inspection items	Acceptance criteria	Validation
1	The energy storage is installed in place	The installation is correct, secure and reliable.	□Yes □No
2	The installation environment meets requirements	The installation space is reasonable, and the environment is clean and tidy without any	□Yes □No
3	The power cord is correctly connected	The positive and negative terminals are connected correctly without any missing.	□Yes □No
4	The signal line is correctly connected	The signal line is connected reliably, and there is no wrong position	□Yes □No
5	The grounding is reliable	The grounding wire is correctly and reliably connected.	□Yes □No
6	The switch of the energy storage battery module is off	All switches connected to the energy storage are in the "OFF" state.	□Yes □No

7.2 Power-On of Battery System

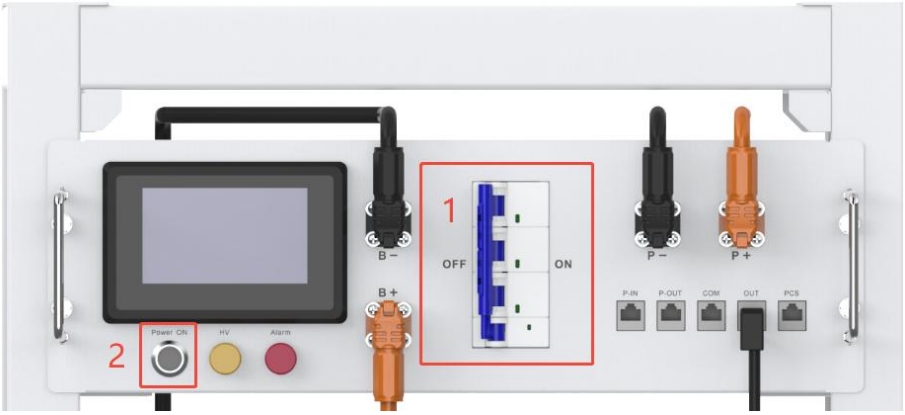
7.2.1 Power-up Sequence

After the battery is connected to the inverter, please power on in the following order.

Step1: Turn on DC Breaker

Step2: Press the Power on button and wait for the screen to light up.

Step3: Waiting for PDU self-test to complete, HV LED is turn on ,power on completed.



7.2.2 Shutdown Sequence

After disconnecting the inverter from the battery, please turn off the power in the following order.

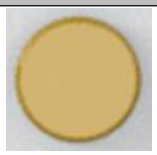
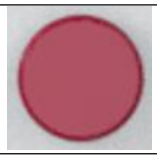
Step1: Press the Power on button again and wait for the screen to go off.

Step2: Turn off DC Breaker

Step3: Wait for 5 minutes, power off completed.

7.2.3 System Status Indication

After the battery switch button is turned on, the LED indicator will light up or flash. The meaning of the LED indicator is as follows.

LED	Colour	Appearance	Description
HV	yellow		The battery has started successfully and the high voltage output of the battery is normal
Alarm	red		System fault indication

7.2.4 LCD Touch Screen

7.2.4.1 Main Page

ID	Value
①	SOC

②	Battery voltage
③	Battery current
④	Battery power
⑤	Discharge remain time

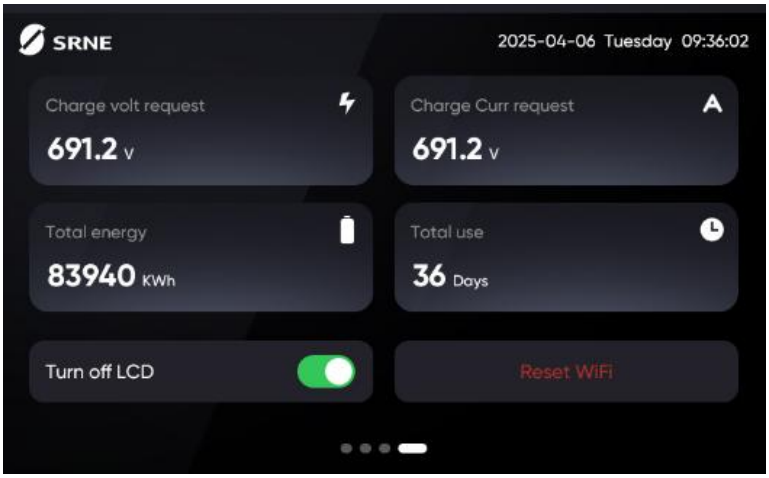
7.2.4.2 Warning Page

ID	Value
①	Cell Min and Max voltage
②	Cell Min and Max temperature
HV	Over voltage Warning
LV	Over discharge Voltage Warning
HT	Over Temperature Warning
LT	Low Temperature Warning
OC	Overcurrent Warning
ISO	Insulation failure, there is a risk of current leakage

7.2.4.3 Cell Voltage Page

ID	Value
①	Pack Number
②	Cell Voltage

7.2.4.4 Information Page



ID	Value
①	Request charging voltage
②	Request charging current
③	Total charging capacity
④	Total working days

⑤	LCD Turn off time
⑥	Reset WiFi

If you can't connect to the network or need to change the network environment, please reset the WIFI.

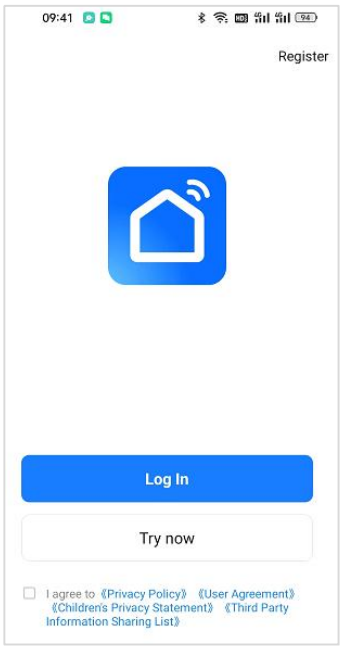
7.4 WIFI Function

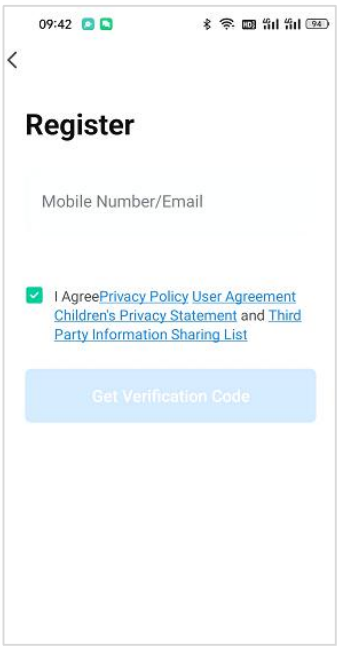
7.4.1 Download App

Scan the QR code to download the APP.

7.4.2 Register and Login

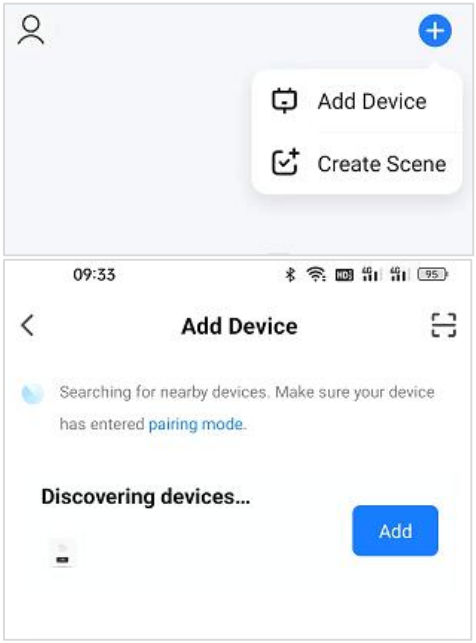
You need to register an account for the first time.





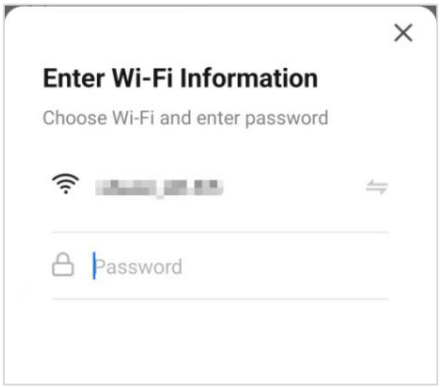
7.4.3 Add Device

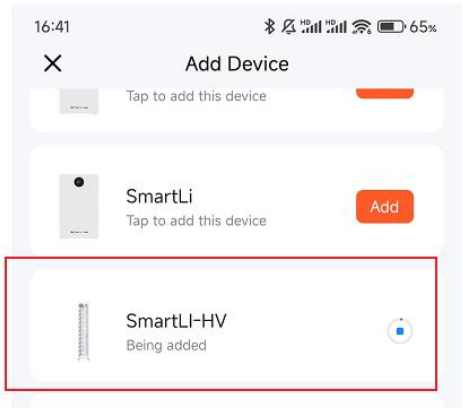
Connecting the device requires turning on Bluetooth, WIFI, and location permissions.



7.4.4 Connect Network

Choose WIFI and enter the password,the device starts connecting to the network.





7.4.5 Reset WIFI

If you can't connect to the network or need to change the network environment, please reset the WIFI.

Only supports 2.4G band's WiFi , not supports 5G band's WiFi , please make sure that the 2.4G band of the router is turned on.

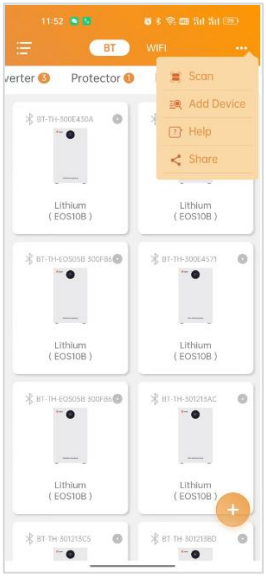
7.5 Bluetooth Function

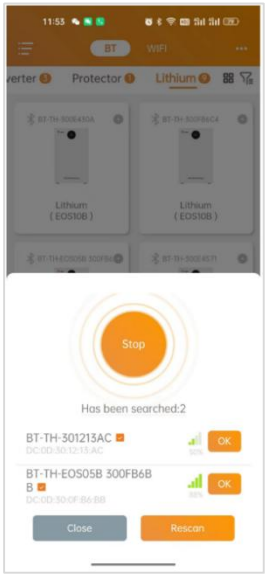
7.5.1 Download App

Scan the QR code to download the APP.

7.5.2 Add Device

Connecting the device requires turning on Bluetooth, and location permissions.





7.6 Sleep Mode

If the battery is neither charged nor discharged, it will automatically enter sleep mode after a period of time.After entering sleep mode, BMS will turn off LCD and WiFi module to save power.If you want to continue using it, please turn the power button on and off again.

8 System Maintenance

8.1 System Power-Off

After the system is powered off, the case still has residual power and heat, which may cause electric shocks or burns. Therefore, protective gloves should be worn before operating the energy storage 5 minutes after the system is powered off. Maintenance operations on energy storage should be performed only after ensuring that all indicator lights of the energy storage are off.

Power-off operation steps of the system:

Step 1 Turn off the breaker switch between the inverter and AC output (If installed).

Step 2 Turn off the breaker switch between the inverter unit and AC input(If installed).

Step 3 Turn off the breaker switch between the inverter unit and the PV string(If installed).

Step 4 Turn off the breaker switch between the inverter and battery.

Step 5 Turn off button on storage battery modules, the energy storage is powered off successfully.

8.2 Routine Maintenance

To ensure the long-term and good operation of the energy storage system, it is recommended to perform the routine maintenance as described in this section.

Items	Methods	Maintenance interval
System cleanliness	Check if the radiator is covered or dirt on a regular basis.	Once every six months to one year.
Running status of system	• Observe whether the energy storage appearance is damaged or deformed. • Listen to whether the energy storage has any abnormal sound during running. • When the energy storage is running, check whether the indicator of the energy storage battery is correct.	Once every six months.
Electrical connection	• Check if any cable connection is off or loose. • Check if any cable is damaged, and especially if there are cuts on the sheath where the cable contacts with the metal surface. • Check if the unused DC input terminals, energy storage terminals, COM ports, and covers are locked.	Half a year after first debugging and testing, and once every six months to one year thereafter.
Grounding reliability	Check if the grounding cable is grounded reliably.	Half a year after first debugging and testing, and once every six months to one year thereafter.

8.3 Common Faults and Handling Methods

Faults	Handling measures
The indicator light and LCD does not work	Check whether battery is sleeping mode.If the battery is neither charged nor discharged, it will automatically enter sleep mode after a period of time.
All indicators of the battery are off	If the battery power is low, you need to charge it before using it. If the battery is not used for a long time, it will automatically sleep, and it can be used normally after restarting.
Battery overcurrent protection fault	Check whether there is a short circuit in the battery wiring. Check whether the load power exceeds the maximum
The battery cannot be charged	Check if the battery is fully charged Check whether the ambient temperature is below -10 degrees.
Communication error with inverter	Check whether the communication interface is incorrectly plugged in and Whether the wiring is secure. Whether the battery address is set correctly. Whether the protocol is secure.
WIFI communication error	Check if the router settings are correct Check whether the routing network is normal Check whether the router's 2.4G frequency band is turned on

8.4 Battery Storage and Maintenance

8.4.1 Battery Storage Requirements

Do not put the battery into fire. The battery may explode.
Do not open or damage the battery. The electrolyte flowing out from the battery is harmful to the skin and eyes. The electrolyte may also be toxic;

1. When being stored, the batteries shall be placed correctly in accordance with the marks on the packing case. Do not put them upside down or on the side.

2. When stacking up the battery packing cases, the stacking requirements on the outer package shall be met.

3. The batteries should be handled with care, and damage to batteries should be strictly prohibited.

4. Requirements for the storage environment:

– Ambient temperature: -10℃ to 55 ℃, recommended storage temperature: 20℃ to 30℃.

– Relative humidity: 5%RH-80%RH.

– Dry, well ventilated, and clean.

– The corrosive organic solvents, gases and other substances shall be kept away.

– Exposing to direct sunlight shall be avoided.

– The distance from the heat source should not be less than two meters.

5. When being stored, the battery shall be disconnected from the external connection. If there is an indicator light on the battery panel, the indicator light shall be off.

6. When the stored batteries are going to be delivered, the first-in first-out principle should be followed.

7. After the battery is produced and tested, it shall be recharged to at least 50% SOC before being stored. If the device will not be used for a long period of time, discharge the battery to 45% to 60% of the battery capacity and disconnect the battery output to avoid the battery runs out;

8. Do not touch the battery pack with wet hands.☐

9. Do not squeeze, drop, or pierce the battery.

10. The battery should always be disposed in accordance with local safety regulations.☐

11. The battery should be stored and recharged in accordance with this User's Manual.

12. Do not reverse polarity of the battery when storing or transporting the batteries, the batteries shall not be stacked up without protective packaging, and the number of stacked packed batteries should not exceed the number specified on the packaging.

13. All operators of the energy storage system shall comply with the user manual, installation and service manual, and quality assurance requirements. Any damage to the device resulting from neglecting or misreading of the user's manual, installation and service manual, and the quality assurance requirements will invalidate the product warranty.

8.4.2 Requirements for Charging of Battery

The batteries to be stored for a long period of time (unused, for more than 3 months) must be kept in a dry and cool place. The storage voltage is 51V~53V. The batteries should be stored in a clean environment of 23± 2℃ and humidity of 45%~75%. If the battery will be shelved and not used for a long period of time, it should be recharged every 3 months to ensure that the battery voltage is within the above range.

As for batteries and long-term storage, routine maintenance is required. Please charge the battery to 40% SOC at a current of 0.2C according to the requirements in the table below.

Ambient temperature for storage	Relative humidity for storage environment	Storage Time	SOC
<-10℃	/	Prohibited	/
-10~25℃	5%~70%	≤12 months	30%≤SOC≤60%
25~35℃		≤6 months	
35~45℃		≤3 months	
>45℃	/	Prohibited	/

8.5 Device Cleaning

It is recommended to clean and maintain the product from time to time. When cleaning, the dust and stains on the product shall be removed with a piece of soft dry cloth or vacuum cleaner. The product shall not be cleaned with organic solvents, corrosive liquids and other cleaning products.

8.6 Fault threshold and its response mode

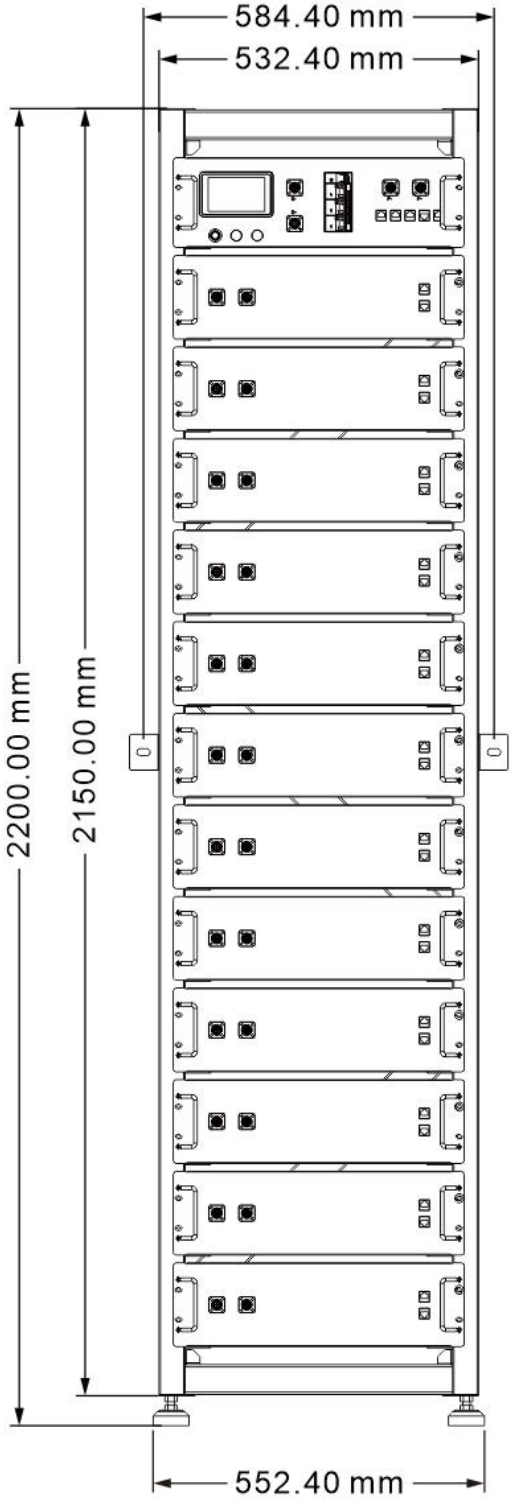
N0.	Fault name	Fault level	Trigger Value	delay	release value	delay	Discharge limiting	Discharge enable	Charge limiting	Charge enable	Action
1	Cell Low voltage	1	2.9V	2S	3.1V	2S	0%	DIS	100%	EN	SOC=0%
		2	2.7V	2S	2.9V	2S	0%	DIS	100%	EN	Discharge relay is off
		3	2.5V	2S	2.6V	2S	0%	DIS	100%	EN	All relay is off
		4	2.3V	4min	/	/	/	/	/	/	Breaker is off
2	Cell over voltage	1	3.6V	2S	3.34V	2S	100%	EN	0%	DIS	SOC=100%
		2	3.65V	2S	3.34V	2S	100%	EN	0%	DIS	Charge relay is off
		3	3.7V	2S	Manual	/	100%	EN	0%	DIS	All relay is off
		4	3.8V	1S	/	/	/	/	/	/	Breaker is off
3	Cell voltage difference	1	/	/	/	/	/	/	/	/	/
		2	500mV	2S	250mV	2S	50%	EN	50%	EN	/
		3	/	/	/	/	/	/	/	/	/
		4	/	/	/	/	/	/	/	/	/
4	Pack voltage difference	1	/	/	/	/	/	/	/	/	/
		2	/	/	/	/	/	/	/	/	/
		3	15V	10S	Manual	/	0%	DIS	0%	DIS	All relay is off
		4									
5	Cell over temperature	1	55℃	2S	50℃	2S	100%	EN	100%	EN	/
		2	61℃	2S	56℃	2S	0%	DIS	0%	DIS	/
		3	63℃	2S	40℃	2S	0%	DIS	0%	DIS	All relay is off

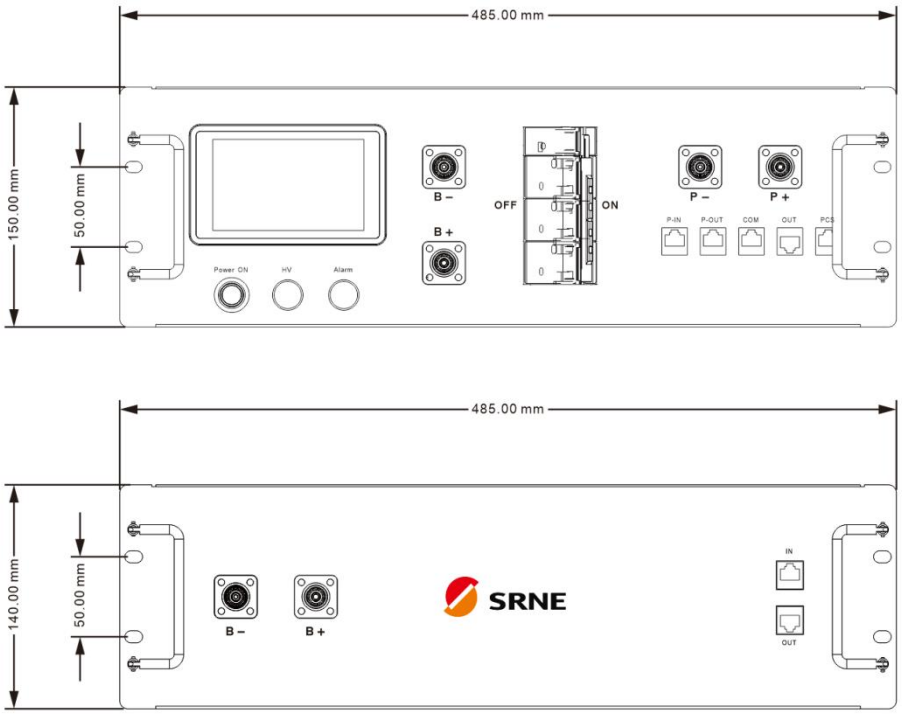
		4	/	/	/	/	/	/	/	/	/
6	Cell Low temperature	1	-11℃	2S	-5℃	2S	100%	EN	0%	DIS	/
		2	-21℃	2S	-10℃	2S	0%	DIS	0%	DIS	/
		3	-31℃	2S	-20℃	2S	0%	DIS	0%	DIS	All relay is off
		4	/	/	/	/	/	/	/	/	/
7	Temperature difference	1	15℃	2S	10℃	2S	50%	EN	50%	EN	/
		2	25℃	2S	20℃	2S	20%	EN	20%	EN	/
		3	/	/	/	/	/	/	/	/	/
		4	/	/	/	/	/	/	/	/	/
8	Over discharge current	1	60A	300S	50A	30S	100%	EN	100%	EN	/
		2	100A	180S	60A	30S	0%	DIS	100%	EN	/
		3	120A	60S	60A	30S	0%	DIS	100%	EN	All relay is off
		4	/	/	/	/	/	/	/	/	/
9	Over charge current	1	60A	60S	50A	30S	100%	EN	50%	EN	/
		2	70A	10S	60A	30S	100%	EN	0%	DIS	/
		3	80A	5S	60A	30S	100%	EN	0%	DIS	All relay is off
		4	/	/	/	/	/	/	/	/	/
10	Relay Fault	1	/	/	/	/	/	/	/	/	/
		2	/	/	/	/	/	/	/	/	/
		3	Relay adhesion fault	1S	/	/	0%	DIS	0%	DIS	All relay is off
		4	Relay open circuit fault	1S	/	/	0%	DIS	0%	DIS	All relay is off
11	Insulation leakage fault	1	500Ω/V	3S	1000Ω/V	3S	100%	EN	100%	EN	/
		2	300Ω/V	3S	500Ω/V	3S	100%	EN	100%	EN	/
		3	100Ω/V	3S	Manual	/	0%	DIS	0%	DIS	All relay is off
		4	/	/	/	/	/	/	/	/	/

9 Product Dimensions and Packaging

9.1 Product Dimensions

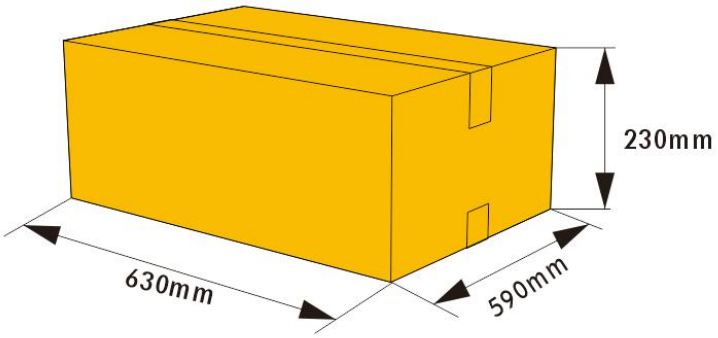
The external dimensions of the energy storage battery module ,



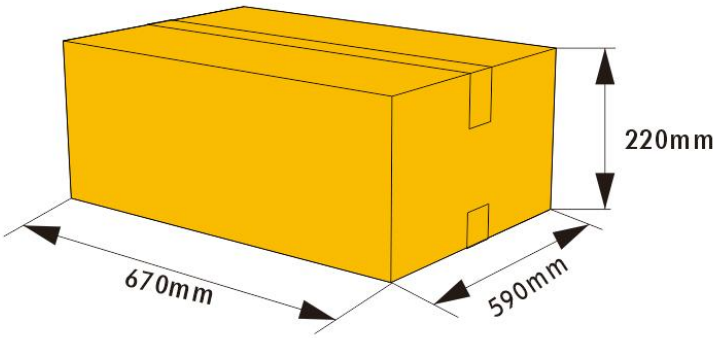


9.2 Package Dimensions

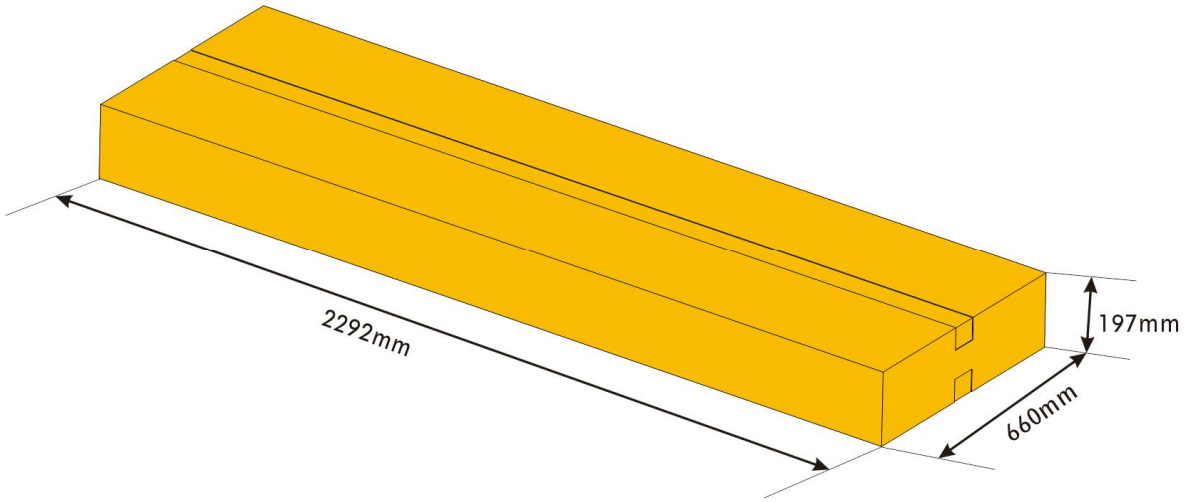
A、 PDU，The packaging size of SR-PDU100 is 630*590*230mm.



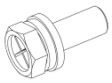
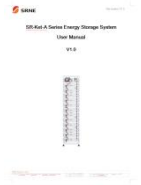
B、 single energy storage battery module，The packaging size of SR-HOC05B is 670*590*220mm.

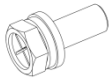


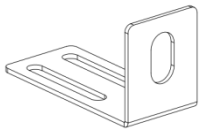
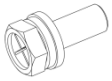
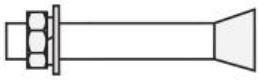
C、 Rack，The packaging size of SR-Rack-13A is 2292*660*197mm.



9.3 Accessories

SR-PDU100				
NO.	Picture	materials	Quantity	Remark
1		High-voltage control box 850V/100A	1	577*485*150mm
2		65mm positive power cord of PUD	1	65mm
3		3.2m negative power cord of PUD	1	3.2m
4		2m positive power cord to connect External PCS	1	2m
5		2m negative power cord to connect External PCS	1	2m
6		2m Connected to external inverter communication cable	1	2m
7		Screw/Wrie	4	M6*16
8		User Manual	1	Standard

SR-HOC05B				
NO.	Picture	materials	Quantity	Remark
1		Energy storage battery module 51.2V/50A	1	603*485*140mm
2		75mm Power cord of battery module	1	65mm
3		Signal cable between battery	1	3.2m
4		Screw/Wrie	4	M6*16

SR-Rack-13A				
NO.	Picture	materials	Quantity	Remark
1		Rack	1	776*552*2200mm
2		Side fastener	2	150*60*50mm
3		Screw/Wrie	40	M6*16
4		Mounting Frame Screw	2	M8*60 expansion bolt