



# Battery Module User Manual

Product Name: 2U Wall Mounted-Battery Module

POWER BOX A5120x2

(Certificate Model: YNJB16S100KX-L-2PD)

Version: P1.0

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This manual describes the instructions for using the 2U Wall Mount - Battery Module (POWER BOX A5120x2). Please read this manual before installing the battery and follow the instructions carefully during installation. In case of any confusion, contact the manufacturer immediately for advice and clarification.

## Catalogue

Chapter 1 Product Introduction .....	3
Chapter 2 Battery Module Safe Handling Guidelines .....	10
Chapter 3 Product Installation Instructions .....	11
Chapter 4 Safety Precautions .....	16
Chapter 5 Troubleshooting .....	17
Chapter 6 Emergency situation .....	17

## Chapter 1 Product Introduction

The 2U Wall Mounted - Battery Module (POWER BOX A5120x2) is one of the new energy storage products that can be used to support reliable power for a variety of devices and systems. It is especially suitable for application scenarios with high power, limited installation space, restricted load bearing and long cycle life. POWER BOX A5120X2 has a built-in BMS battery management system that manages and monitors battery information including voltage, current and temperature. In addition, the BMS can balance the charge and discharge of the battery to extend cycle life. Multiple batteries can be connected in parallel to expand capacity and power paralleling for greater capacity and longer power support time requirements.

### 1.1. Characteristics

- The battery module uses lithium iron phosphate cells, which reduces weight by 40% compared to lead-acid batteries of the same size;
- Appearance of wall-mounted structure, the module can be wall-mounted installation, maintenance is convenient, flexible and versatile;
- The battery module housing is made of insulated painted sheet metal;
- The power output input of the battery module adopts high-power quick-plug connector, supporting hot-swap;
- The battery module can support up to 7 groups in parallel, not in series;
- Low self-discharge of the battery module, no memory effect, shallow charging and discharging performance is more excellent;

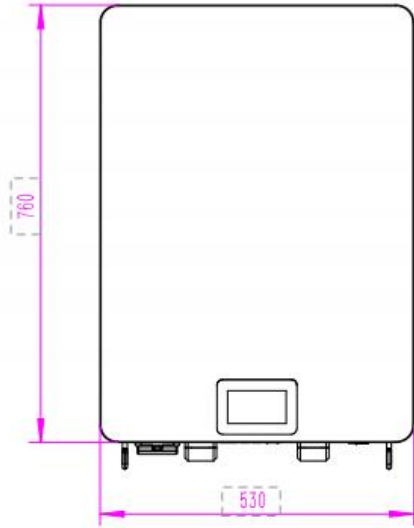
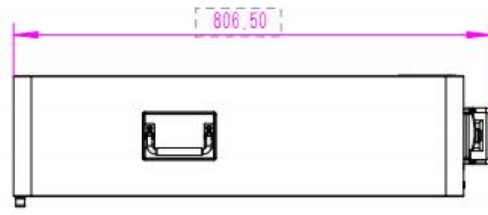
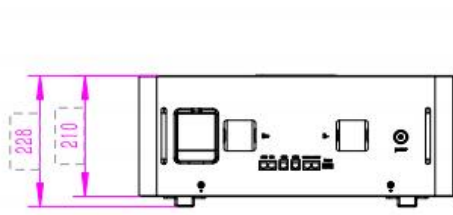
### 1.2. Function

- ✓ ARM low-power processor;
- ✓ Adopt professional battery management chip;
- ✓ Supports current-limited charging mode (up to 20A);
- ✓ Supports CAN/RS485 communication;
- ✓ Built-in 8-channel temperature acquisition;
- ✓ Supports high and low temperature overcharge and overdischarge protection;
- ✓ Supports battery equalization function;
- ✓ Supports SOC calculation and calibration;

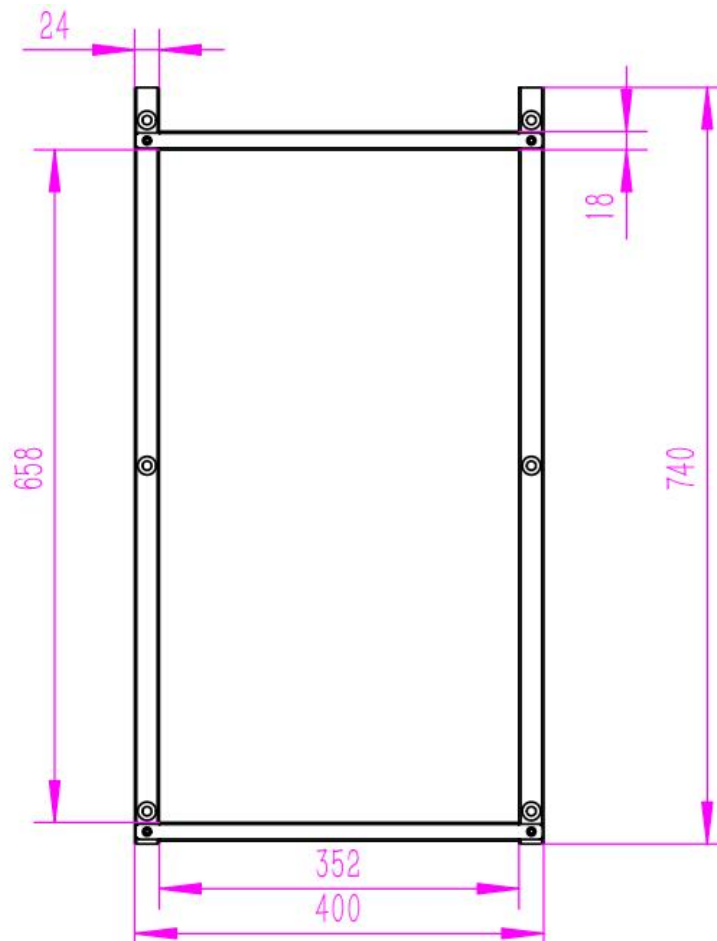
- ✓ Supports two levels of overcurrent protection;
- ✓ Supports output short circuit protection;
- ✓ Supports reverse polarity protection;
- ✓ Support for data storage;
- ✓ Multiple automatic fault detection (sampling, MOS, battery failure)

### 1.3. Specification





Battery Module Dimension

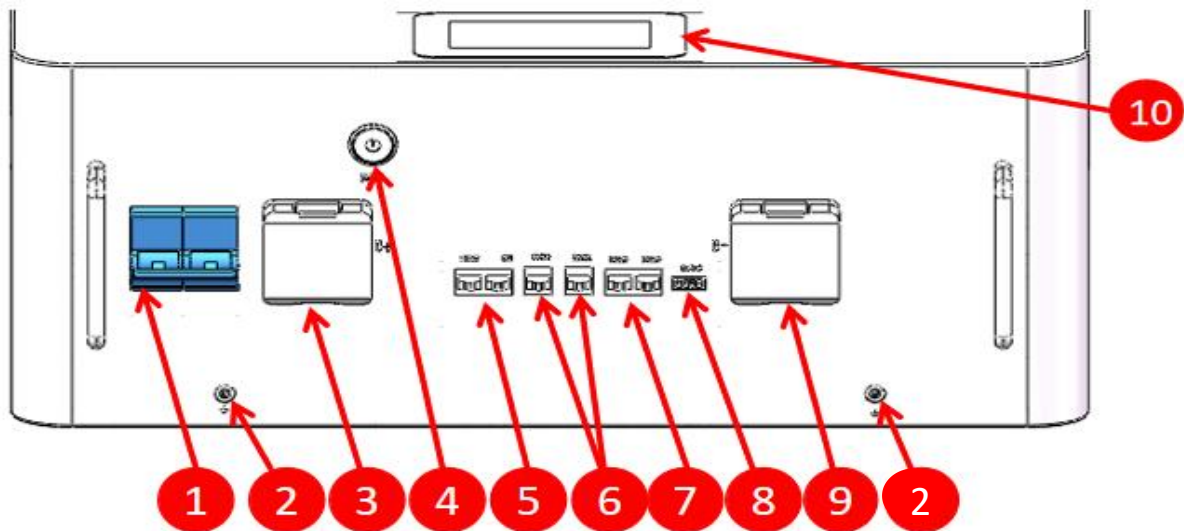


Drawing

Mounting Bracket Dimension Drawing

Product Model	POWER BOX A5120X2
Rated Battery Voltage	51.2V
Operating Voltage Range	44.8V to 57.6V
Float charging voltage support	55V±1V
battery capacity	200Ah
battery level	10240Wh
internal resistance	≤50mΩ
Rated discharge current/Maximum allowable discharge current	100A/200A
Rated charging current/maximum allowable charging current	100A/200A
Battery operating temperature range	Charging 0°C~+56°C Discharge -20°C~+56°C
Recommended operating temperature	+10°C~+30°C
Storage temperature specification	0-25°C/12 months
Battery module size (W*D*H mm)	Bare machine: 530*760*210mm (case)
weights	97±0.5KG
housings	Metal housing with insulating coating
Cooling method	natural cooling
Display mode	monitor
communication method	External: CAN/RS485 Internal: RS485 Upper PC: RS232

#### 1.4. interface definition



❶	Breaker	❸	232 interface
❷	ground connection	❹	Internal RS485 interface
❸	Load Positive	❺	dry contact
❹	power switch	❻	Load Negative
❺	External RS485/CAN interface	❼	monitor

**Breaker**

Circuit breaker: load isolation.

**ground connection**

Ground connection: equipment grounding.

**monitor**

Display: Displays the parameters of the battery module.

**power switch**

Power switch: turns on the battery pack status.

**Power terminals (B+/B-)**

Power terminals: Use two pairs of terminals with the same function using cold press terminals RNB22-8, one connected to the unit and the other connected in parallel to other battery modules for capacity increase. For each single module, each terminal can realize charging and discharging functions.

**Dry contact**

Dry contact: Dry Contact 1-PIN1 to PIN2: Normally open, low battery closed.

Dry contact 2-PIN3 to PIN4: Normally open, closed in case of fault, protection.

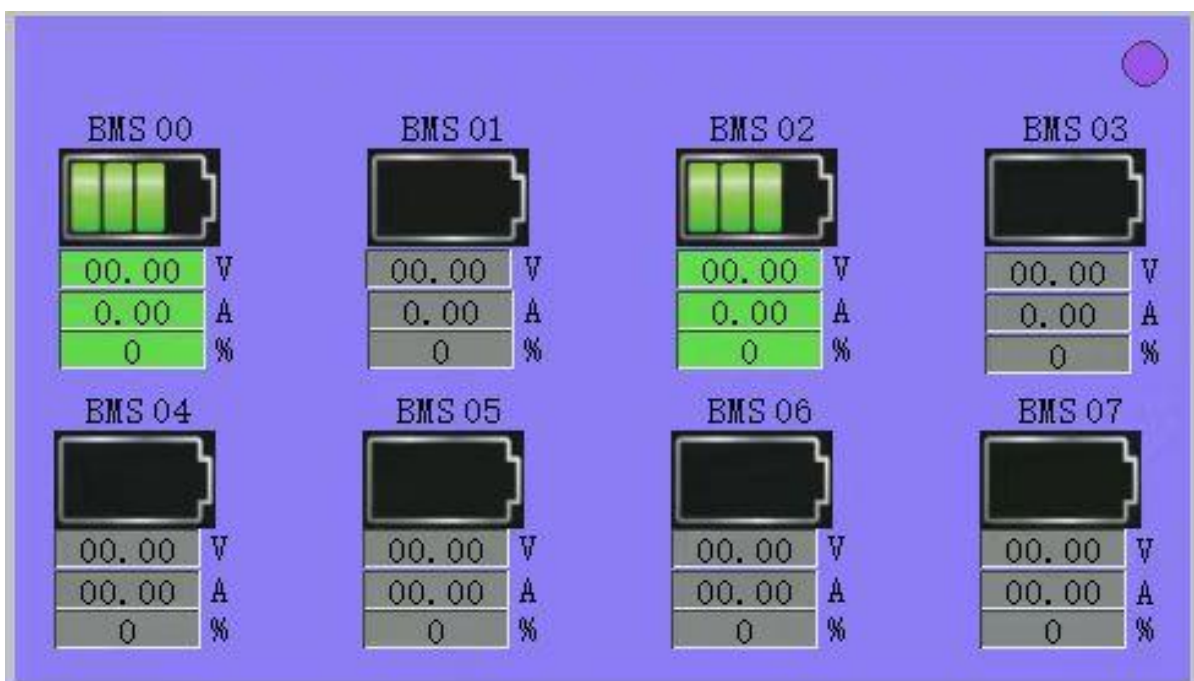
**monitor**

Display: Displays the parameters of the battery module.

(1) Main menu page

After power-up/sleep activation, the BMS internal data will be displayed as shown below:

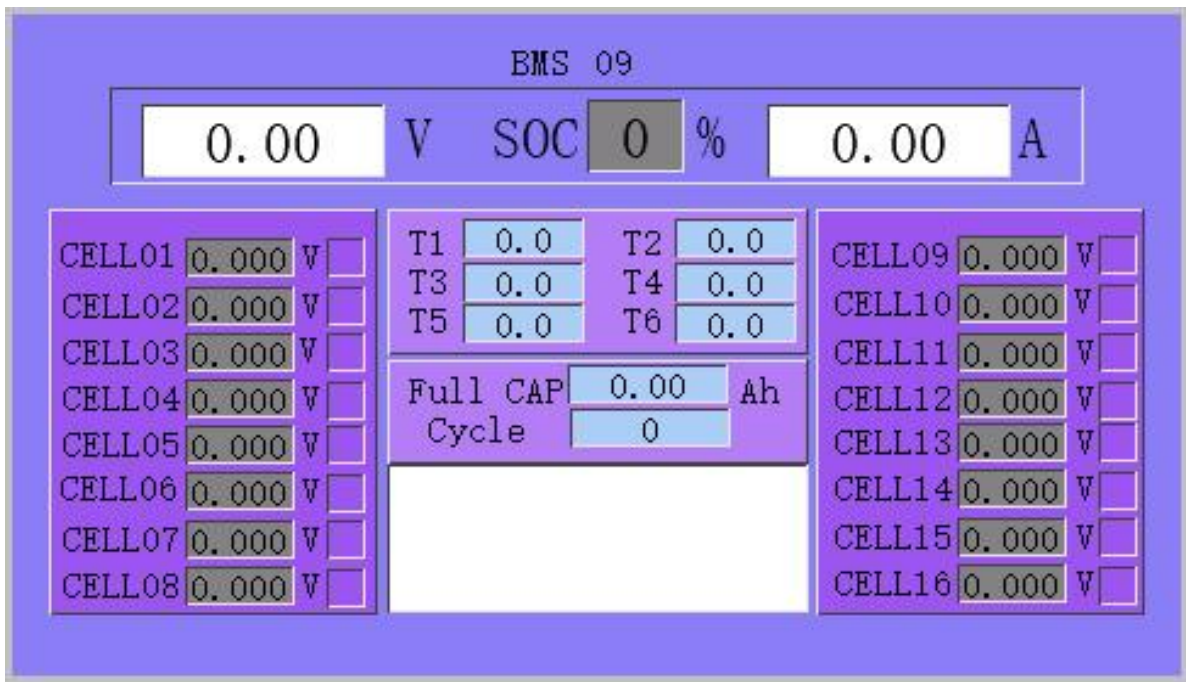
To skip to the next page click on the margins.



(2) Battery parameter acquisition page

After clicking BMS, you will enter the "Battery Parameter Acquisition" page, as shown in the following figure:

To go back press the blank space at the edge.

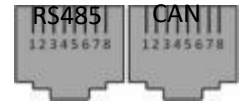




### RS485/CAN interface

RS485/CAN communication interface: (RJ45 port) Communication according to RS485/CAN protocol.

RS485 - using 8P8C vertical RJ45 socket		CAN - using 8P8C vertical RJ45 socket	
RJ45 Pin	Description of definitions	RJ45 Pin	Description of definitions
9, 16	RS485-B1	1, 2, 3, 6, 8	NC
10, 15	RS485-A1	4	CANH
11, 14	GND	5	CANL
12, 13	NC	7	GND



RS485/CAN interface definition

### RS232 interface

RS232 communication interface: (RJ11 port) Communicate according to RS232 protocol and can view the battery output information.

RS232 - using 6P4C vertical RJ11 socket	
RJ11 Pin	Description of definitions
2	NC
3	Send data
4	Acceptance of data
5	GND



RS232 Interface Definition

### RS485 interface

RS485 communication interface: (RJ45 port) communicate according to the RS485 protocol, read battery information, can also be used for multiple lithium batteries for parallel communication. RS485-F host RS485-F slave.

RS485-H adopts 8P8C vertical RJ45 socket		RS485-F adopts 8P8C vertical RJ45 socket	
RJ45 Pin	Description of definitions	RJ45 Pin	Description of definitions
1, 8	RS485-B1	9, 16	RS485-B1
2, 7	RS485-A1	10, 15	RS485-A1
3, 6	GND	11, 14	GND
4, 5	NC	12, 13	NC



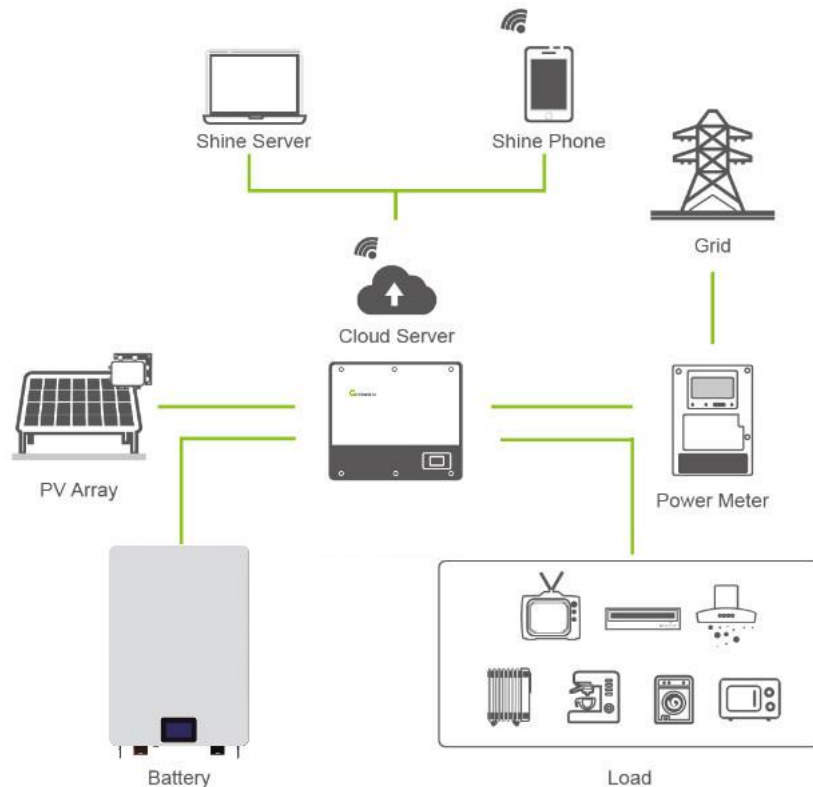
RS485 parallel communication interface definition

### BMS Functions

Protection and alarms	Management and monitoring
End of charge/discharge	Battery Balancing
Charging overvoltage	Smart Charging Mode
Charge/discharge overcurrent	Charge Current Limit
High/Low Temperature	Calculation of capacity reservation
shorts	Administrator Monitoring
Reversed power cord	Operation Record

## Chapter 2 Battery Module Safe Handling Guidelines

### 2.1. System Topology



### 2.2. markings

#### Lithium Battery Module

Model: YNJB16S100KX-L-2PD  
 Nominal Voltage: 51.2V  
 Charge Voltage: 57.6V  
 Cut Off Voltage: 44.8V  
 Nominal Capacity: 200Ah/10.24KWh



**⚠ DANGER**  
HIGH VOLTAGE INSIDE

	<p>*Do not disconnect, disassemble or repair by yourself.</p> <p>*Do not drop, deform, impact, cut or spearing with a sharp object.</p> <p>*Do not place near open flame or incinerate.</p> <p>*Do not sit or put heavy things on battery.</p> <p>*Keep away from moisture or liquid.</p> <p>*Keep out of reach of children, animals or insects.</p> <p><b>Emergency Situations</b></p> <p>*If leaking, fire, wet or damaged, switch off the breaker and go away from the battery.</p> <p>*Do not touch the leaking liquid. Do not use water. Sand or dry power extinguisher is usable.</p>
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### 2.3. tools

To install the battery pack, you may need these tools below:

name (of a thing)	
Screwdrivers (one, Phillips)	multimeter
torque wrench	clamp meter
tweezers	insulating tape
tweezers	thermometers
wiresnipers	Anti Static Hand Ring
wire stripper	zip ties
tape rule	drill

NOTE: Use properly insulated tools to prevent accidental electric shock or short

circuit. If insulated tools are not available, cover the entire exposed metal surface of the available tool, except its tip, with insulating tape.

## 2.4. safety protection

It is recommended that the following safety equipment be worn when handling battery packs



Insulated gloves



goggles



safety footwear

## 2.5. List of attachments

name (of a thing)	norm	quantities
expansion screw	M8*60mm	6
Connector screws	M8*10mm	2
ground screw	M5*10mm	2
carabiner pendant	N/A	2
pan head screw	M6*20	4
Wall mounted racks	400*740mm	1
User's Manual	POWER BOX A5120X2	1
Packing List	POWER BOX A5120X2	1
warranty card	POWER BOX A5120X2	1

# Chapter 3 Product Installation Instructions

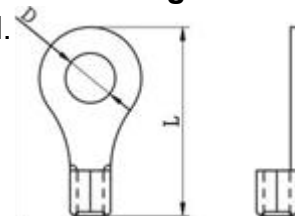
## 3.1. Connection Instructions

**NOTE:** For safe operation and regulatory compliance, a separate DC overcurrent protector or disconnect is required for battery installation. In some applications, a disconnect may not be required, but an overcurrent protection device is still required. Refer to the table below for typical amperage for the required fuse or circuit breaker size.

**Warning!** All wiring must be done by qualified personnel.

**Warning!** It is important for the safe and efficient operation of the system to use the proper cables to connect the battery. To minimize the risk of injury, use the appropriate recommended cable and terminal sizes listed below.

### Ring Terminal:



**Recommended battery cable and terminal sizes.**

battery capacity	Cable Size	ring terminal		
		Cable mm <sup>2</sup>	sizes	
			D (mm)	L(mm)
200Ah	2AWG	33	8.4	33.5

### 3.2. Installation conditions

Make sure that the installation location meets the following conditions:

- The area is completely waterproof.
- The flooring is flat.
- No flammable or explosive materials.
- Ambient temperature in the range of 0°C to 50°C.
- Temperature and humidity are maintained at a consistent level.
- There is very little dust and dirt in the area.

### 3.3. Installation Instructions

#### Caution

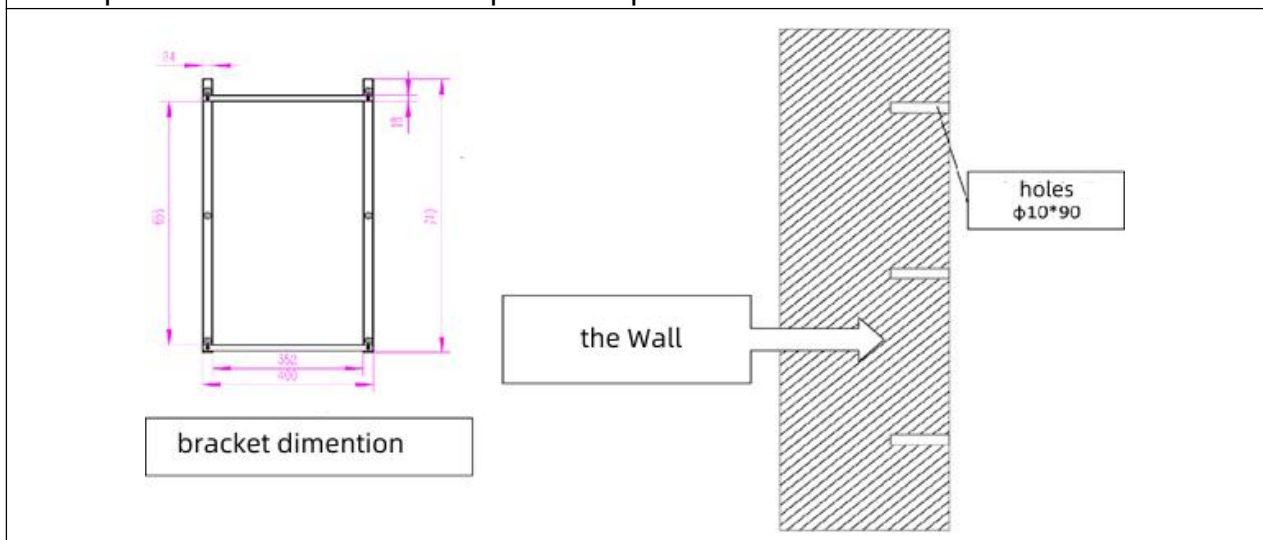


If the ambient temperature is outside the operating range, the battery pack will stop working to protect itself. The optimal temperature range for battery pack operation is 0°C to 50°C. Frequent exposure to harsh temperatures may degrade the performance and life of the battery pack.

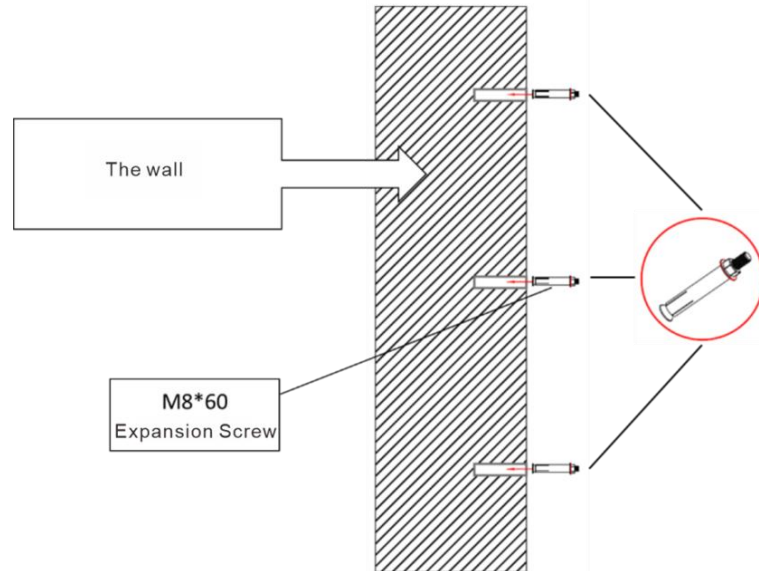
#### A. Wall mounting

1. Set 6 points on the wall and use  $\phi 10 \times 90$  impact drill to drill holes.
2. Put M8\*60 expansion screws into the drilled holes.
3. Place the wall-mounted rack on the M8\*60 expansion screws and fix it.
4. Hang the wall-mounted battery module with the snap hook on the wall-mounted battery module to fit the slot.
5. Connect the ground cable of the battery module
6. Communication cable to connect the battery module
7. Connect the cable to the inverter

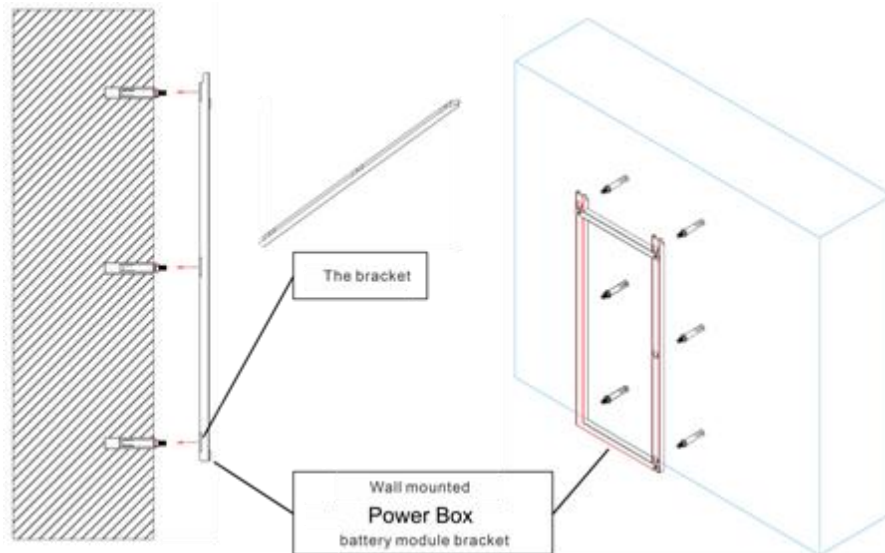
Set 6 points on the wall and use  $\phi 10 \times 90$  impact drill to drill holes.



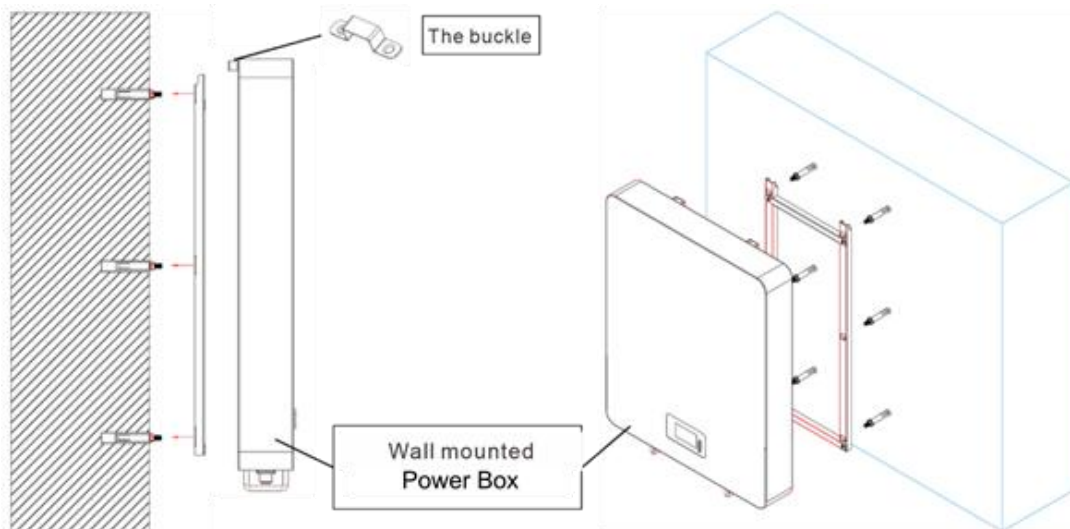
Put M8\*60 expansion screws into the drilled holes.



Place the wall-mounted rack on the M8\*60 expansion screws and fix it.

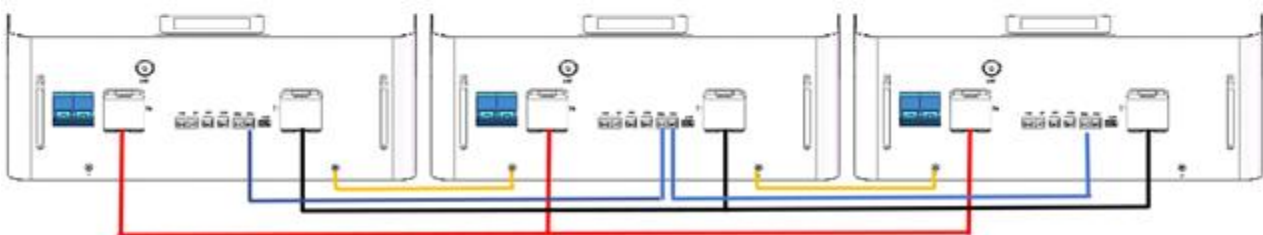


Simply attach the snap-on pendant on the wall-mounted battery module to the slot with the snap-on clip.



## B. Parallel installation

1. Set 6 points on the wall and use  $\phi 10 \times 90$  impact drill to drill holes.
2. Put M8\*60 expansion screws into the drilled holes.
3. Place the wall-mounted rack on the M8\*60 expansion screws and fix it.
4. Hang the wall-mounted battery module with the snap-on pendant and the slot with the snap-on can be
5. Connect the ground cable between the battery modules
6. Connect the communication cable between the battery modules
7. Connect the cables between the battery modules
8. Connect the cable to the inverter
9. Parallel communication as shown



### 3.4. Start-up instructions

(1) Turn on the power

Double-check all power cables and communication cables.

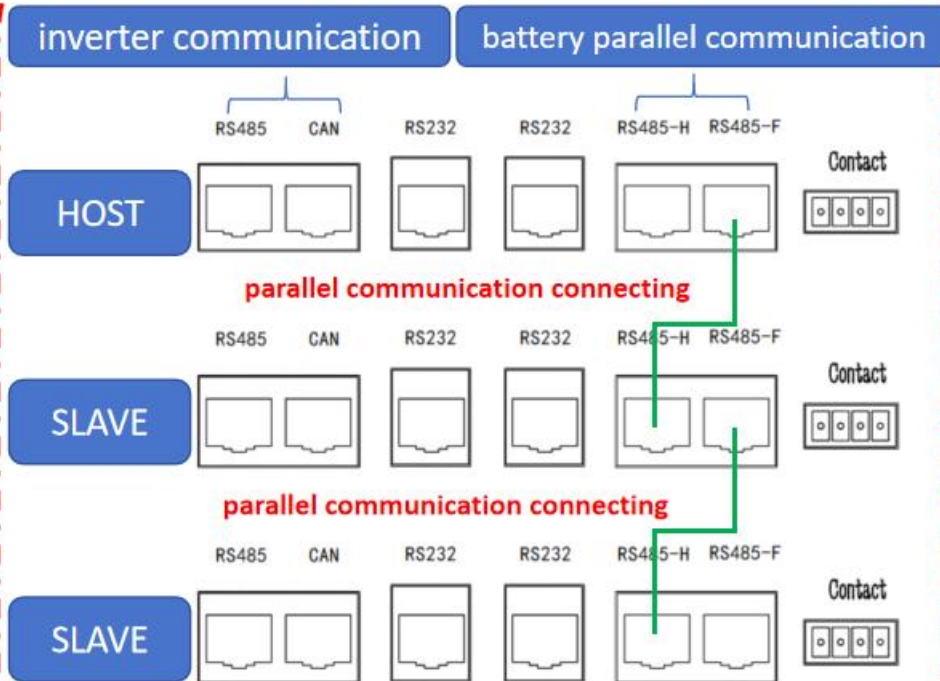
Turn on the slave battery module switch (POWER) first, then turn on the master battery module switch (POWER).

Turn on all battery modules, the display lights up, and finally turn on the breaker switch (Breaker) to turn on the inverter.

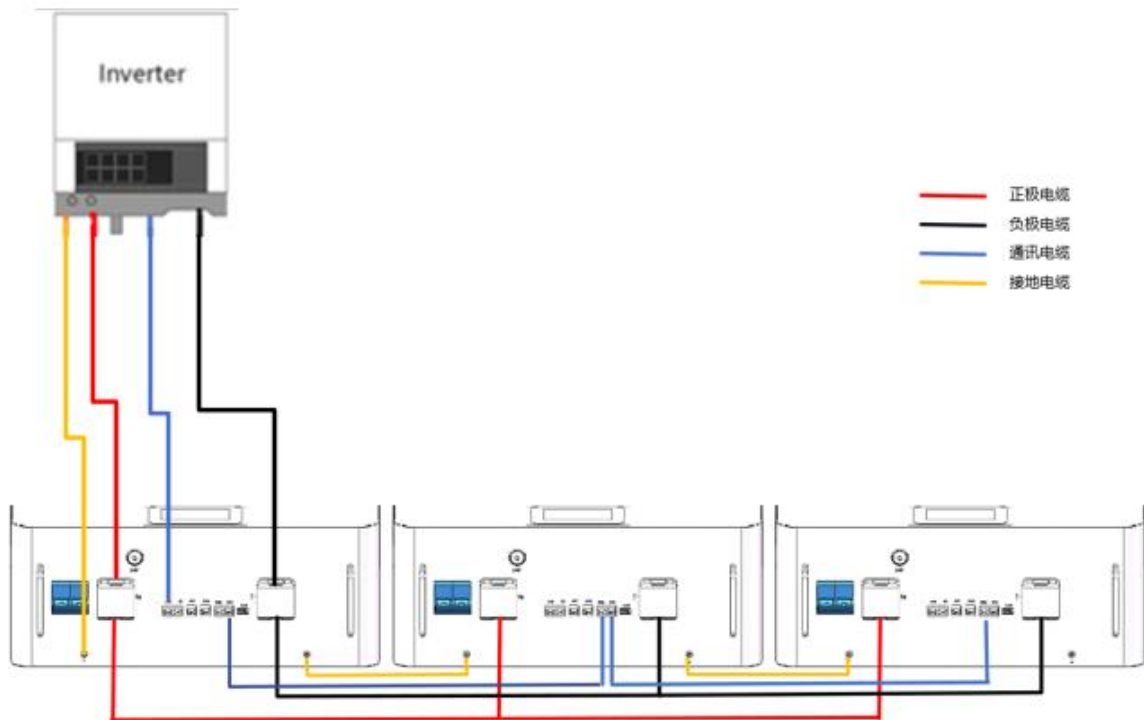
(2) Parallel mode connection

Normal parallel mode, as shown below

### Optimized product parallel setup instructions:



After optimizing the automatic addressing function, the product parallel communication lines must be connected as shown in the figure above and cannot be connected arbitrarily. The host is responsible for communicating with the inverter



**NOTE:** If all the displays are lit, this means the battery system is good and working properly.

## Chapter 4 Safety Precautions



### warnings

#### 4.1. Precautions before installation

- 1) After opening the box, please check the product and packing list first, if the product is damaged or missing parts, please contact your local retailer;
- 2) Before installation, be sure to disconnect the power from the grid and make sure the battery is off;
- 3) Wiring must be correct, do not mistake positive and negative cables, and ensure that there is no short circuit with external equipment;
- 4) It is prohibited to connect batteries and AC power directly;
- 5) The embedded BMS in the battery is designed for 48VDC, do not connect the batteries in series;
- 6) The battery system must be well grounded and its resistance must be less than 1Ω;
- 7) Make sure that the electrical parameters of the battery system are compatible with the relevant equipment;
- 8) Keep batteries away from water and fire.

#### 4.2. Precautions during use

- 1) If the battery system is to be moved or serviced, the power must be disconnected and the battery completely shut down;
- 2) It is strictly prohibited to connect the battery to a different type of battery.
- 3) It is strictly prohibited to operate the battery with a defective or incompatible inverter;
- 4) Battery disassembly is strictly prohibited (QC label removed or damaged);
- 5) In the event of a fire, only dry powder fire extinguishers may be used; liquid fire extinguishers are prohibited;
- 6) Do not open, repair or disassemble the battery except by staff authorized by the manufacturer or distributor. We are not responsible for any consequences or liabilities related to violations of safe operation or violations of design, production and equipment safety standards.



### reminders

- 1) Please read the user manual (in the attached file) carefully;
- 2) If the battery is stored for a long period of time, it needs to be charged every six months and the SOC should be no less than 80%;
- 3) Batteries need to be recharged within 12 hours after being fully discharged;
- 4) Do not leave cables exposed;
- 5) All battery terminals must be disconnected for maintenance;
- 6) Please contact the supplier within 24 hours in case of any abnormalities.
- 7) Direct or indirect damages caused by the above items are not covered by the warranty.



## Chapter 5 Troubleshooting

### 5.1. Troubleshooting Steps

- 1) Can the battery be turned on;
- 2) If the battery is on, check to see if the red light is off, blinking or on;
- 3) If the red light is off, check that the battery can be charged/discharged.

### 5.2. fault recognition

The battery won't turn on and none of the lights light up or flash when it is on.

If the battery external switch is on, the status light is blinking, the external supply voltage is 48V or more, and the battery still does not turn on, please contact your dealer.

The battery can be turned on, but the red light is on and cannot be charged or discharged. If the red light is on, the system is not normal, please check the following values:

Temperature: Batteries will not operate above 56°C or below -20°C.

Solution: Move the battery to a normal operating temperature range of -10°C to 50°C.

Current: If the current is greater than 200A, the battery protection will turn on.

Solution: Check if the current is too high, and if so, change the settings on the power supply side.

HIGH VOLTAGE: If the charging voltage exceeds 57.6V, battery protection will turn on.

Solution: Check if the voltage is too high, if so, change the setting on the power side.

LOW VOLTAGE: When the battery is discharged to 44.8V or lower, the battery protection will be turned on. Solution: Charge the battery for a period of time and the red light will turn off.

Apart from the above four points, if you still can't find the fault, turn off the battery and have it repaired.

### 5.3. Charging Troubleshooting

- 1) Cannot be charged:

Disconnect the power cord and measure the voltage on the power side, if the voltage is 53~54V, restart the battery, connect the power cord and try again, if it still doesn't work, turn off the battery and contact your dealer.

- 2) Cannot be discharged:

Disconnect the power cord and measure the voltage on the battery side, if it is lower than 44.8V, please charge the battery; if the voltage is higher than 48V and still cannot be discharged, please turn off the battery and contact your dealer.

## Chapter 6 emergency situation

### 6.1. Battery Leakage

If the battery pack leaks electrolyte, avoid contact with the leaking liquid or gas. If contact is made with the leaked material, the following measures should be taken immediately.

INHALATION: Evacuate contaminated area and seek medical attention.

CONTACT WITH EYES: Flush eyes with running water for 15 minutes and seek medical attention. Contact with skin: Wash affected area thoroughly with soap and water and seek medical attention.

Ingestion: Induce vomiting and seek medical attention.

**6.2. fire (that burns buildings etc)**

Do not use water! Use only a dry powder fire extinguisher; if possible, move the battery pack to a safe area before it catches fire.

**6.3. soak**

If the battery pack gets wet or is submerged in water, do not let anyone touch it and then contact the manufacturer or an authorized dealer for technical support.

**6.4. Battery damage**

Damaged batteries are dangerous and must be handled with the utmost care. They are unfit for use and may pose a danger to people or property. If the battery pack appears to be damaged, pack it in its original container and return it to the manufacturer or an authorized dealer.