Home Energy Storage System Product Manual (Stacked Type)

Contents

Thank you very much for choosing the 51.2V 200Ah home energy storage battery box of our company. In order to make you better use and maintain this product, please read this user manual carefully before use, and understand the related safety operation matters. All installation, commissioning and maintenance shall be done by a professional.

Safety signs

The following safety marks are used in this manual.

"Danger"

It indicates a high potential danger and a failure to avoid it would result in death or serious injury.

"Warning"

It indicates a moderate potential hazard and failure to avoid conditions that may lead to moderate or serious injury to personnel.

"Attention"

It indicates a potential risk of failure to avoid situations that may cause the equipment to operate properly or cause property damage

"Instructions"

It is the additional information in the manual, emphasizes and complements the content, provides tips or tricks to optimize the use of the product, and will help you solve a problem or save your time.

Chapter 1 Product presentation

51.2V 200Ah home energy storage battery box mainly includes battery module, BMS module, output interface, etc., which can store and release electric energy according to the requirements of the AC-DC inverter system, and support the expansion of multi-module capacity. The household light storage system is formed with the photovoltaic and inverter. Under the control of the inverter, the excess photovoltaic power energy is stored in the battery, and when the photovoltaic energy is insufficient, the stored power is released to supply power to the load.

1.1 Product characteristics

Flexible configuration, convenient installation
Modular design, free configuration according to the requirements

Ultra-high protection, safe and carefree
IP65 protection level, calmly deal with the outdoor environment

Multi-mode seamless switching
All kinds of application modes intelligent switch, power grid outage seamless switch to off-grid mode

Remote monitoring, constant attention
Humanized design of the management platform, both mobile phones and computers can freely log in to check the real-time working status

Home energy intelligent management
Energy storage charging and discharging strategies are intelligently configured according to electricity consumption habits, peak and valley electricity prices and safety indicators, so as to maximize the comprehensive value

1.2 Product appearance

The overall dimensions of the product are shown in Figure 1-3:

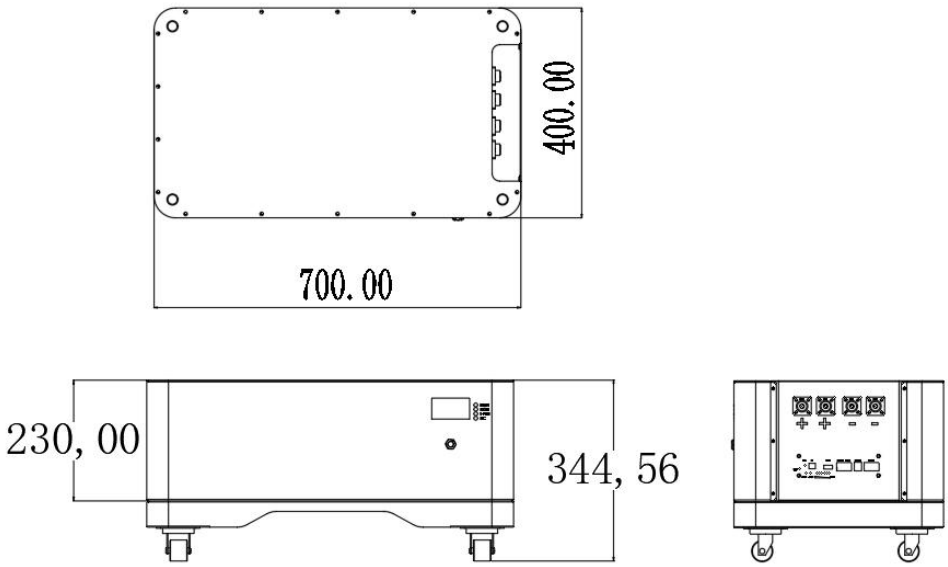


Figure 1-3 Overall size of the product

1.3 Interface definition

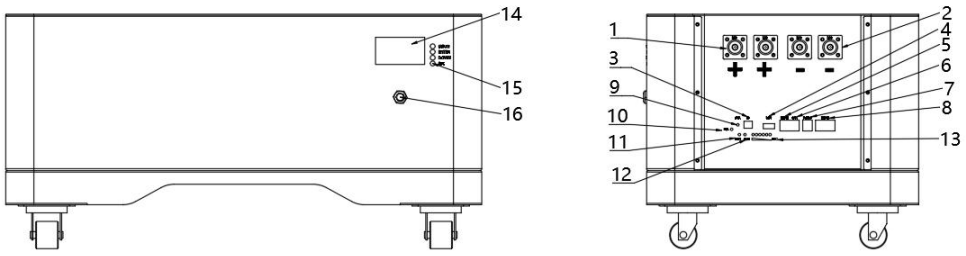


Table 1-4 Power supply and communication interface

Series Number	Name	Description
1	Total battery positive	Battery box positive port
2	Total battery negative	Battery box negative port
3	Address code	The code switch is used to set the IP address of each BMS protection board and supports expansion of multiple modules
4	Dry contact	Provides multiple dry contact signals. All dry contact signals are passive switches, regardless of polarity
5	External RS485 communication	Independent RS485 communication Used to communicate with external inverters and upload the corresponding summary battery information using the inverter protocol. The default baud rate is 9600bps.
6	External CAN communication	Independent CAN communication is provided to communicate with external inverters and upload corresponding summary battery information using the inverter protocol. The default baud rate of CAN communication is 500Kbps.
7	RS232 communication	With RS232 communication function for BMS internal testing and debugging, the default baud rate is 9600bps.
8	Parallel RS485 communication	Dual RS485 function for battery pack parallel, compatible with automatic and manual address Settings, default baud rate of
9	Reset Bottom	Reset system state
10	Status indicator	Displays the BMS switch status
11	Running indicator light	Displays the current battery status
12	Warning light	Displays the current battery status
13	Battery indicator light	Displays the current battery power

1.3.1 Indicator Description

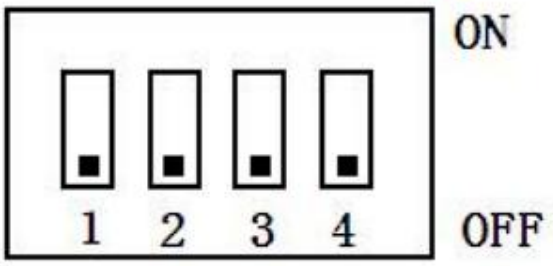
LED lights working status instruction

Status	Normal/ Alarm/ Protect	RUN	ALM	LED Lights Show Battery Electricity Status						Explanation
		●	●	●	●	●	●	●	●	
Power off	Dormant	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	All Off
Stand by	Normal	Flash one time	OFF	Show battery electricity status						Stand by
	Alarm	Flash one time	Flash three times							Under voltage
Charge	Normal	OFF	OFF	Show battery electricity status The LED which one indicate highest electricity that flash two times it means full charged						The LED light which one indicate highest electricity that flash two times it means full charged, alarm LED light is off
	Alarm	OFF	Flash three times							
	Over charging protect	ON	OFF	ON	ON	ON	ON	ON	ON	All LED lights are stand by if did not connect on grid
	Temperature, Large current and Error protect	OFF	ON	OFF	OFF	OFF	OFF	OFF	OFF	Stop charging
Discharge	Normal	Flash three times	OFF	Show battery electricity status						
	Alarm	Flash three times	Flash three times							Stop discharging
	Under voltage protect	OFF	ON	OFF	OFF	OFF	OFF	OFF	OFF	Stop discharging
	Temperature, Large current, Reverse connection and Error protect	OFF	ON	OFF	OFF	OFF	OFF	OFF	OFF	Stop discharging
Error		OFF	ON	OFF	OFF	OFF	OFF	OFF	OFF	Stop charge or discharging

Table 1-4 LED lights working status instruction

1.3.2 Setting DIP Switches

When battery strings are connected in parallel, the hardware address of each PACK is unique. The hardware address can be set by the DIP switch on the board. For the definition of the switch, see the following figure.



Adress	Code Switch Arrangement				Explanation
	#1	#2	#3	#4	
0	OFF	OFF	OFF	OFF	SINGLE USE
1	ON	OFF	OFF	OFF	SET TO PACK 1 (MAIN)
2	OFF	ON	OFF	OFF	SET TO PACK 2
3	ON	ON	OFF	OFF	SET TO PACK 3
4	OFF	OFF	ON	OFF	SET TO PACK 4
5	ON	OFF	ON	OFF	SET TO PACK 5
6	OFF	ON	ON	OFF	SET TO PACK 6
7	ON	ON	ON	OFF	SET TO PACK 7
8	OFF	OFF	OFF	ON	SET TO PACK 8
9	ON	OFF	OFF	ON	SET TO PACK 9
10	OFF	ON	OFF	ON	SET TO PACK 10
11	ON	ON	OFF	ON	SET TO PACK 11
12	OFF	OFF	ON	ON	SET TO PACK 12
13	ON	OFF	ON	ON	SET TO PACK 13
14	OFF	ON	ON	ON	SET TO PACK 14
15	ON	ON	ON	ON	SET TOPACK 15

Table 1-5 DIP switch address diagram

1.4 System introduction

1.4.1 Communication fuctions

51.2V200AH home energy storage battery box is equipped with communication interfaces such as RS485, CAN, and dry contact. The communication functions are as follows:

- RS232 communication:

  BMS can communicate with the host computer through RS232 interface, so that various information of the battery can be monitored through the host computer, including battery voltage, current, temperature, status and battery production information, etc. The default baud rate is 9600bps;

- CAN communication

  CAN communication. The default communication rate is 500K;

- RS485 communication

  With dual RS485 ports, you can view PACK information. The default baud rate is 9600bps. If you need to communicate with the monitoring device over the RS485 port, the monitoring device functions as a host and polls data based on the address;

- Setting DIP switches

  When used in parallel, you can use the DIP switch to set the addresses of different packs to distinguish them

1.4.2 Main functions

The functions of 51.2V200AH home energy storage battery box are as follows:

- With single voltage, overall voltage detection, overcharge, overdischarge alarm and protection functions;
- With temperature detection, high and low temperature alarm and protection functions;
- It has charge and discharge current detection, overcurrent alarm and protection functions; And has short circuit protection function;
- With LED power indicator, can display battery remaining capacity, working mode and alarm protection status;
- The protection parameters such as overcharge, overdischarge, overcurrent, overtemperature, and undertemperature can be set by the PC software.

- Supports 6-bit address encoding (4 bits by default).
- With RS485 communication interface, RS232 communication interface, dry contact function;
- With pre-charging function;
- With reverse protection function;

1.5 Main Product Parameters

Table 1-6 Main product parameters

Series number	Name	Parameters
1	Cell	LFP 3.2V/200Ah
2	Series and parallel mode of cell	16S1P
3	Rated Capacity	200Ah
4	Rated Voltage	51.2V
5	Rated Voltage	43.2-57.6V
6	Capacity	10.24kWh
7	Rated Charge and Discharge Current	200A
8	Cycle life	6000 cycles
9	Working Temperature	Charge：0℃～55℃;discharge：-10℃～55℃;
10	Weight (Kg)	83.5±2Kg

Chapter 2 Installation

This chapter introduces the installation of 51.2V200AH home energy storage battery boxes, including unpacking check, installation preparations, and installation procedures.

1. The disassembly and installation of the product must be carried out by a professional.

2. The front of the module packing case (labeled with labels) should face up, not upside down.

3. During product transportation and disassembly, strong impact or violent disassembly is strictly prohibited.

4. The number of stacked layers is 5 layers during transportation and storage, and more than 5 layers may cause extrusion damage to the product.

5. The product should be installed vertically.

2.1 Out of box audit

After the products of 51.2V200AH home energy storage battery box arrive, please check the following items:

1. Check the name, model and specification, carton number, carton number and packing of the product;

2. Check whether the delivered accessories are complete and correct against the list of shipped accessories (as shown in Figure 2-1).

3. Check the product packaging to see if there is any collision damage during transportation;

4. Open the outer package of each module and check the appearance of each module to see whether there is transportation damage;

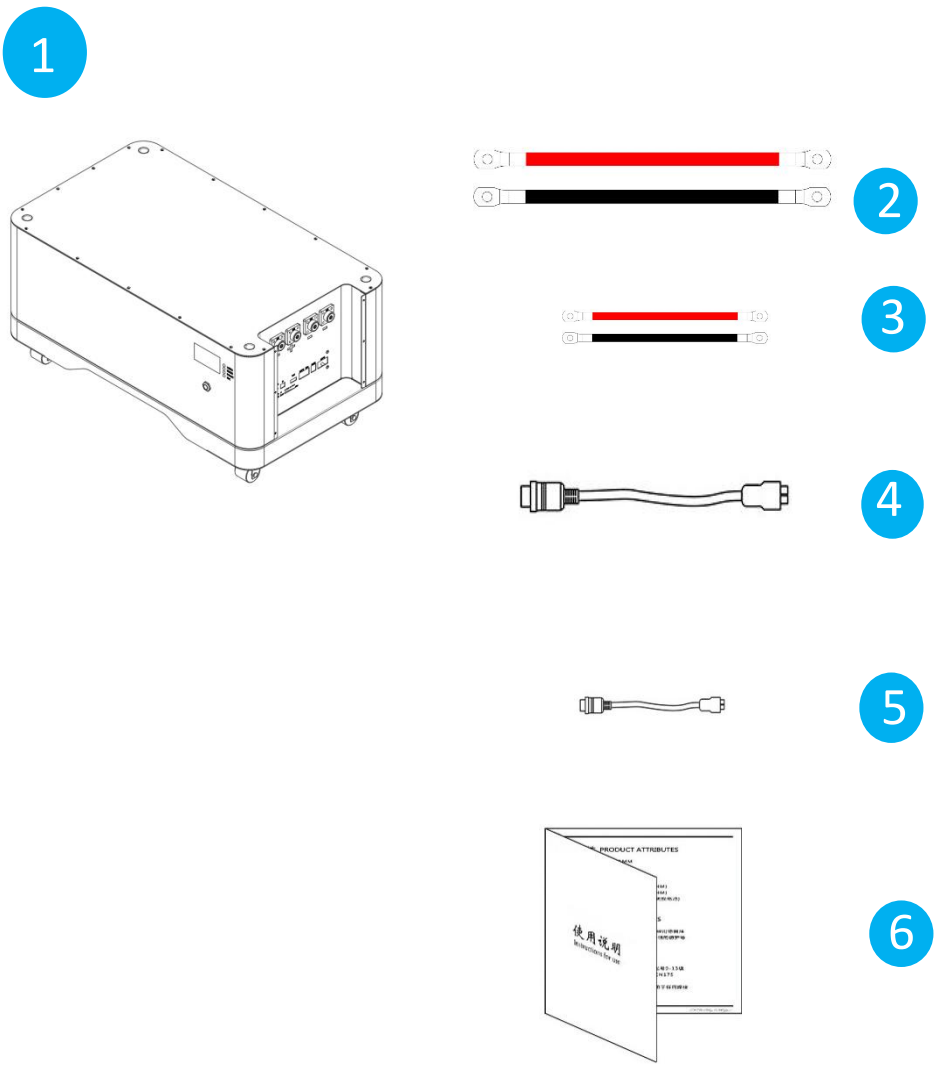


Figure 2-1 Schematic diagram of delivering components

Series Number	Name	Quantity	Notes
1	Battery Box	2 PCS	Two 51.2V 200Ah batteries and one pedestal
2	Power cable(long)	2 PCS	2 positive/2 nagative(connect the inverter)
3	Battery parallel connection cable cable(short)	2 PCS	1 positive/1 nagative(battery parallel connection)
4	Communication cable(long)	1 PCS	Connect the inverter
5	Battery paralle communication cable(short)	1 PCS	Battery paralle communication
6	Accessory bag	1 PCS	Contains user manual, screws, etc

2.2 Installation preparations

2.2.1Installation Environment

- The installation and use environment must comply with relevant local laws and regulations and relevant international, national and regional standards for lithium battery products.
- Installation position Do not touch children, as far as possible away from daily work and living areas;
- When outdoor installation, please select the installation point with shelter, or build an awning to avoid direct sunlight or rain;
- When installing the garage, keep it away from the direction of the vehicle. It is recommended to install the energy storage hanging wall higher than the bumper of the car body to avoid accidental collision.
- When installing the basement, keep ventilation and do not place inflammable or explosive materials around the equipment. It is recommended to hang the equipment on a wall to avoid water accumulation.
- Installation position The environment around the device is clean and away from fire and heat sources. Flammable and explosive materials are not placed around the device. Infrared radiation, organic solvents, and corrosive gases are not present.
- Installation position Keep away from water sources such as taps, sewer pipes, and sprinklers to avoid water infiltration.
- Energy storage may be corroded if installed in salt affected areas. Do not install it outdoors in salt affected areas.

2.2.2Installation Instruction

Please refer to the structure diagram of the split battery. The product includes a battery module and a fixing bracket. To use a single battery, you just need to connect it by placing the product on a flat surface of the inverter. For parallel use, the battery pack can be stacked up to 4 layers. The limit points are designed at the top and bottom of the battery bracket to enhance stability and practicality, thereby avoiding safety hazards such as unexpected displacement and

sideslip.

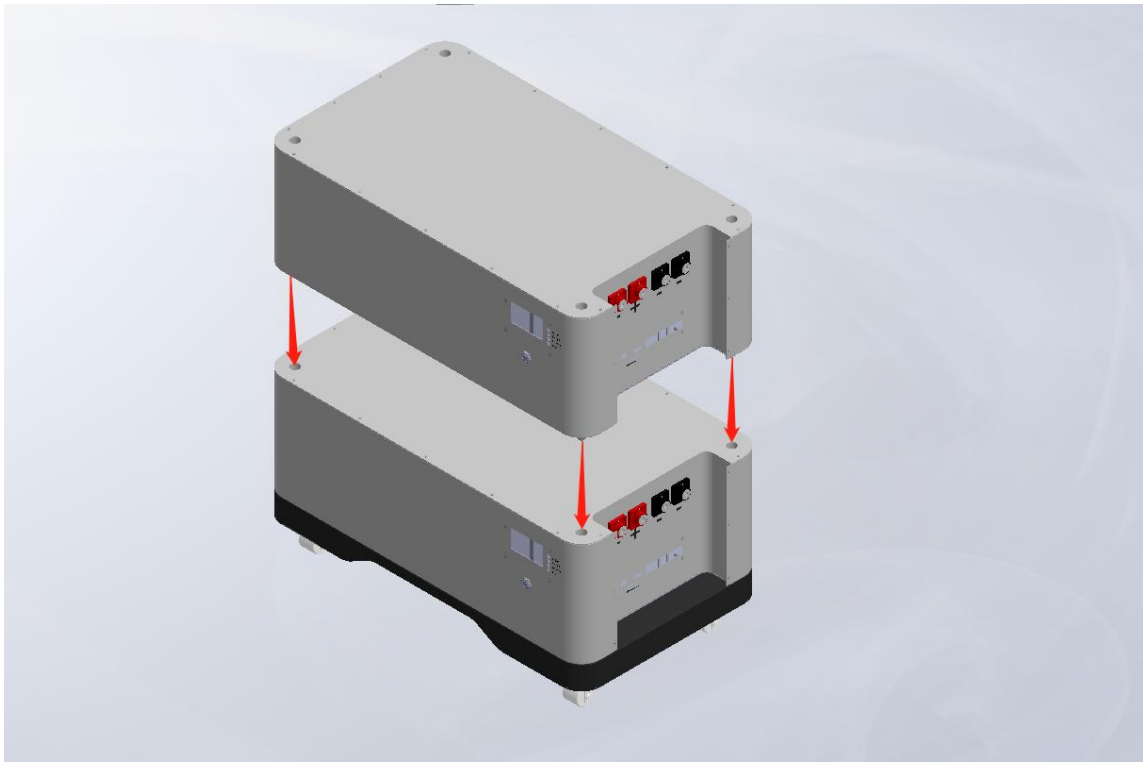


Figure 2-2-2-1Installation Diagram

2.3 Product installation

2.3.1 Handling of products

Please uninstall the product as required, and prevent the equipment from reaching the installation site when the sun and rain. Before unpacking, please check the total number of materials attached to the package in the "shipping list" and check that the package is properly packed. During unpacking, take care to lift and gently lower the protective surface coating. The installation personnel should read the technical documentation, check the list, and confirm that the parts are complete according to the Configuration Table and the Packing list.

First after opening the package. If the internal packaging is damaged, check it carefully and take a record. As shown in Figure 2-3-1:

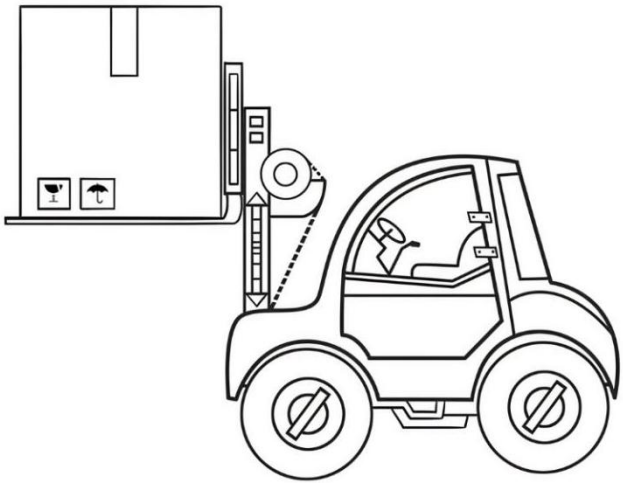
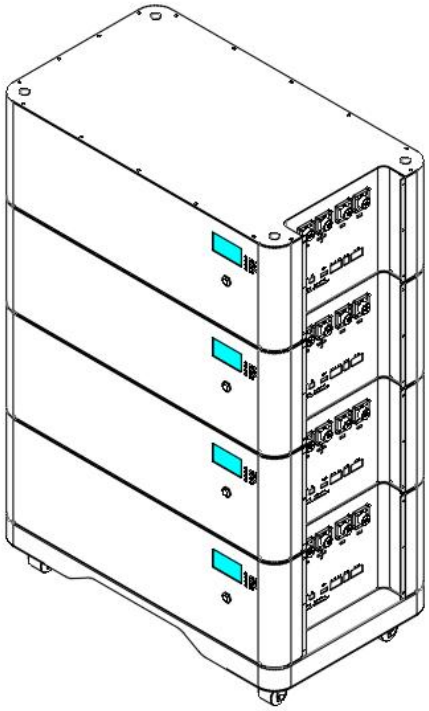


Figure 2-3-1Handling diagram



2.4 Cable connection

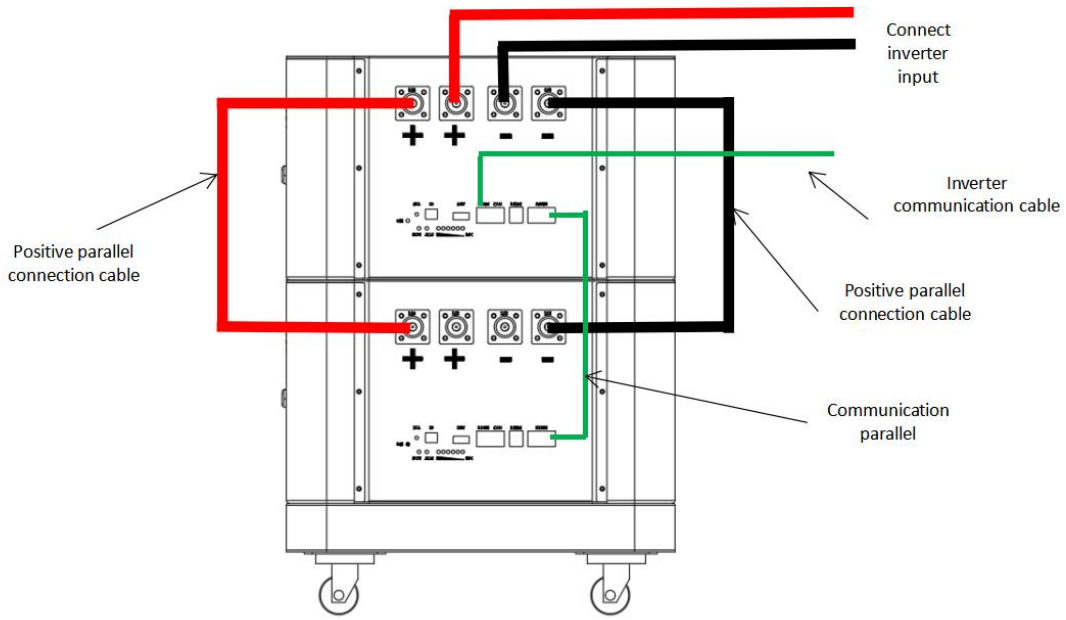
This chapter introduces the connection of DC cables and communication cables to 51.2V200AH home energy storage battery box. All cable connection procedures are described in relevant sections. The cable connection personnel must be professionally trained, read this manual and know the energy storage products in detail.

Before electrical connection, ensure that all switches of 51.2V200AH home energy storage battery box products are in the "OFF" state, otherwise the high voltage of the energy storage may cause a shock hazard.

1)Electrical connections should comply with the installation regulations of the country where the equipment is located;

2) The length of the DC input line and signal line between the energy storage battery box and the inverter is less than 10m;

3) The connector should use the socket and communication connector issued with the equipment;



2.4.1 DC cable connection

The cable colors in this document are for reference only. The cable colors must comply with local cable standards

2.4.2 Communication cable connection

51.2V200AH home energy storage battery box products have a variety of different communication interfaces, including RS232, RS485, dry contact, etc.

1) When laying out communications cables, separate them from DC cables and route them away from large interference sources. Otherwise, signal interference may affect communications;

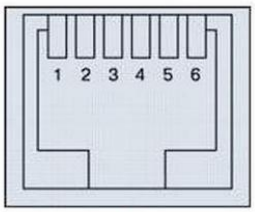
2) The protective layer of the communication wire is located in the connector, and the excess core wire flush protective layer is cut off. The wire core is fully entered into the wiring hole, without external leakage, and the cable connection is tight;

3)Use a plug to block the unused waterproof rubber ring through the cable hole, and tighten the locking cap;

4)If you need to connect multiple communication lines, please ensure that the outer diameter of the communication line is the same.

2.4.2.1 RS232 communication interface

51.2V200AH home energy storage battery box products are equipped with RS232 interfaces and can communicate with PC devices. Figure 2-4-2-1 shows the definition of RS232



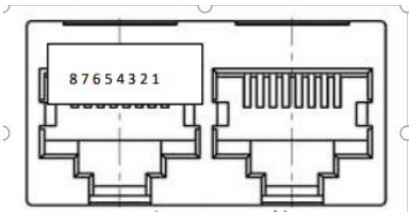
RS232 pins.

RS232 Communication interface	
RS232 with 6P6C vertical RJ11 socket	
RJ11 pin	Defined declaration
1, 2, 6, 3	NC TX(single board)
4	RX(single board
5	GND
NC-NC-TX-RX-GND-NC	

Table 2-4-2-1 RS232 Pin definition

2.4.2.2 RS485 communication interface

51.2V 200Ah home energy storage battery box is equipped with RS485 interface, which can communicate with PCS or EMS devices. Figure 2-4-2-2 shows the definition of the RS485 pins



CAN and RS485 interface

RS485 and RS232 Communication interface

RS485-User vertical RJ45 socket		RS485-User vertical RJ45 socket	
RJ45 pin	Defined declaration	RJ45 pin	Defined declaration
1,8	RS485-B1	9,16	RS485-B1
2,7	RS485-A1	10	RS485-A1
3,6		11,14,15	GND
4		12	CANL
5		13	CANH
RS485-B1,RS485-A1,GND,CANL, CANH,RS485-A1,RS485-B1		RS485-B1,RS485-A1,GND,CANL, CANH,GND,GND,RS485-B1	

Table 2-4-2-1 RS485 Pin definition

RS485 and inverter communication

Figure 2-4-2-1 RJ45 Network port pin sequence

2.5 Post-installation check

1. The installation position of the device is reasonable and meets the safety distance requirements;

2. The surrounding environment meets the installation and operation requirements of the device;

3. The cable connection is correct and reasonable, and the lower ground cable is well connected to the ground network. The construction unit is required to test the grounding resistance.

Chapter 3 Check the operation

This chapter describes 51.2V 200Ah home energy storage battery box inspection, system debugging, and use precautions.

3.1 On the electrical inspection

Check items and acceptance criteria are shown in the following table:

Series number	Project name	Project acceptance criteria
1	Energy storage installed in place	Install correctly and firmly.
2	Reasonable cable layout	The cable layout is reasonable and meets customer requirements.
3	Cable tie lashing beautiful	The cable tie should be even and cut without sharp corners.
4	Reliable ground	The ground cable is connected correctly and securely.
5	disconnect the switch	All switches connected to the energy storage are in the "OFF" state.
6	Cable connections in place	The output, input, and signal cables are connected correctly and securely.
7	Seal unused terminals and interfaces	Install waterproof covers on unused terminals and interfaces.
8	The installation environment meets requirements	The installation space is reasonable, the environment is clean and tidy, and there is no construction residue.

3.2 Product operation parameters

Battery charging and discharging operating parameters and ratings are shown in the following table:

Series number	Project name	Specifications
1	Norminal Voltage	51.2V
2	Charge cutoff voltage	57.6V
3	Discharge cutoff voltage	43.2V
4	Standard charge current	0.5C
5	Standard discharge current	0.5C
6	Maxium continuous discharge current	1C
7	Working temperature	Charge：0℃～55℃ ; Discharge：-10℃～55℃
8	Storage temperature	0℃～35℃
9	Relative humidity	5%-95%

3.3 BMS and functional parameters

Battery BMS parameters, functional parameters and ratings are shown in the following table:

No	Function	Specifications/description		Notes
1	Sleep function	Starting condition	BMS has manual and automatic sleep functions: 1.When the external voltage is off-line and there is no discharge, the BMS will automatically enter the sleep state after the duration reaches 24h; 2.Put the BMS to sleep by software instruction or manually; 3.When the BMS enters the over-discharge protection state, and keeps the duration, the BMS enters the sleep state;	Default can be set
		Condition subsequent	1. Charging activation; 2. Connect RS485 activation; 3. Press reset button for 1S to activate;	
2	Hardware switching function	Enter ibernation	Press and hold the reset button for 3S	
		Enter activation when dormant	Long press reset button 3-6S to activate charging and communication	
3	Self heating	Starting condition-10C°		Optional
4	Charge current limit	200A		Default can be set
5	Total charging voltage high voltage protection	Value of alarm	59.2V	Default can be set
		Value of PasswordLock	60.8V	Default can be set
		Value of recovery	54V	Default can be set
6	Charging cell voltage high voltage protection	Value of alarm	3.70V	Default can be set
		Value of PasswordLock	3.90V	Default can be set
		Value of recovery	3.40V	Default can be set
7	Total charging	Value of alarm	48.0V	Default can be set

		Value of	44.8V	Default can be set
		Value of recovery	50.4V	Default can be set
8	Discharging cell voltage high voltage protection	Value of alarm	3.00V	Default can be set
		Value of PasswordLock	2.80V	Default can be set
		Value of recovery	3.15V	Default can be set
9.	Discharge high temperature protection	Value of alarm	60℃	Default can be set
		Value of PasswordLock	75℃	Default can be set
		Value of recovery	50℃	Default can be set
10	Discharge low temperature protection	Value of alarm	-20℃	Default can be set
		Value of PasswordLock	-25℃	Default can be set
		Value of recovery	-10℃	Default can be set

11	Charge high temperature protection	Value of alarm	53℃	Default can be set
		Value of protection	60℃	Default can be set
		Value of recovery	45℃	Default can be set
12	Charge low temperature protection	Value of alarm	-3℃	Default can be set
		PasswordLock	-5℃	Default can be set
		Value of recovery	8℃	Default can be set
13	Level 1 overcurrent protection	Alarm	150A	Default can be set
		PasswordLock	210A	
		Time-delay	1S	
		Dissolve	Automatically dissolves after 1 minutes	
14	Secondary overcurrent protection	PasswordLock	200A	Default can be set
		Time-delay	500mS	
		Dissolve	Automatically dissolves after 15 minutes	

15	Short-circuit protection	Short-circuit current	280A	Default can be set
		Time-delay	300μs	Default can be set
		Dissolve	Automatically recharging or disconnecting the load	
16	BMS record function	Yes	Record warning information, battery voltage, capacity, temperature, etc	
17	BMS	Yes	≥500 records	
18	Cell capacity measurement function	SOC and SOH	≤5%	
19	BMS detection precision	Current	≤2%	
		Voltage	≤10mV	
		Capacity	≤5%	
		Temperature	≤2℃	
20	Quilibrium function	Equalization of charge	Equalization start voltage: 3.5V	
21	Remote monitoring function	Yes		
22	Remote alarm function	Yes		
23	Remote shutdown function	Yes		
24	ESD anti static electricity	Meet GB/T 17626.2-2006 requirements, can withstand 15KV (air discharge) 8KV (contact discharge) impact, components without damage, normal work		

Chapter 4 Maintenance guarantee

1. We promise, since the date of purchase, with the nameplate equipment serial number or product purchase and sales contract, to provide you with quality assurance, maintenance services.

2. In case of equipment failure, please call the customer service hotline and contact the distributor or directly with our company. During the product warranty period, the transportation costs caused by the product shall be borne by the user.

3. The following conditions are not covered by the warranty:

- Man made fault;
- Out of warranty;
- Name plate serial number changes, lost;
- Loss or damage caused by force majeure factors;
- Unauthorized tear down, modify secretly;
- In violation of the provisions of equipment operation, use;
- Equipment damage caused by failure to follow the documentation is not covered by the warranty.

4. The replacement of faulty products shall be handled by the company, and users shall properly store the faulty products; For the products that need to be repaired, the user should give reasonable and sufficient time. Please understand any inconvenience caused to your use.

5. This document is subject to update from time to time due to product version upgrade or other reasons. Unless otherwise agreed, this document is intended as a guide only. All statements, information and recommendations in this document do not constitute a warranty of any kind, express or implied

6. Devices operation and maintenance records

Appendix

Project name:		Project site:	
Installation time:		Equipment model:	
The number of devices:		Equipment serial number:	
App version:		Hardware version:	
Faule phenomenon:			
Handling result:			
Field operation introduction			
Oeration and maintainance record:			