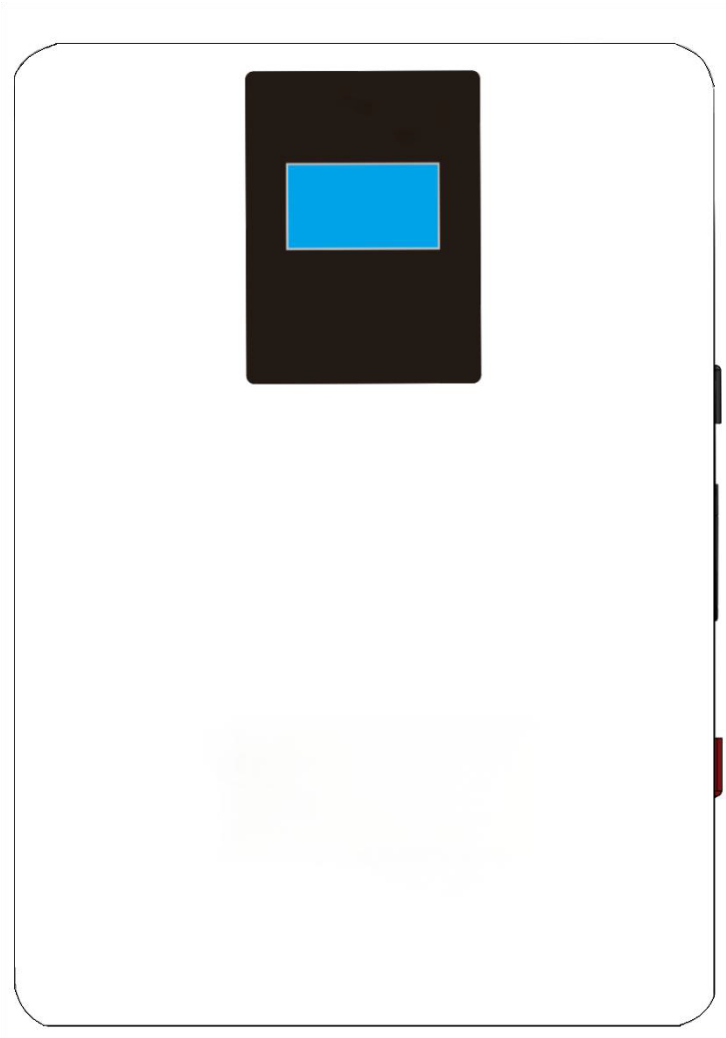
Inverters | Lithium Batteries

Home Energy Storage System

User Manual

51.2V

Lithium Ion Battery Pack



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1. Manual Function

1.1 Purpose

This manual provides information on the introduction,installation,operation and emergency handling of the battery bank.

Please read this manual carefully before installation and operation.

Keep it for future reference.

1.2 Scope

This manual includes safety and installation guidelines,as well as information on required tools and wiring.

1.3 Safety Instructions

WARNING: This chapter contains important safety and operating instructions.

Read and keep this manual for future reference.

1. Before using the unit, read all instructions and cautionary markings on the unit,the batteries,and all relevant sections of this manual.

2. **CAUTION!** To reduce the risk of injury or damage,please use the unit as described in this manual. Improper use may cause personal injury or equipment damage.

3. **Do not disassemble the battery.** Take it to a qualified service center for any service or repairs. Incorrect reassembly may result in a fire risk.

4. To reduce the risk of electric shock, disconnect all wiring before attempting any maintenance or cleaning. Turning off the unit will not eliminate this risk.

5. **CAUTION!** Only qualified personnel should install this device.

6. **For optimum operation, select the appropriate cable size as specified.**

7. Be cautious when working with metal tools around batteries. Dropping a tool could cause a spark or short circuit, potentially leading to an explosion or fire.

8. Follow the installation procedure strictly.

9. **GROUNDING INSTRUCTIONS** - Comply with local requirements.

10. NEVER short circuit the AC output and DC input. Do not connect to the mains when the DC input is short-circuited.

11. Warning! Only qualified service personnel should service this device.

12. Install the battery indoors, away from water, high temperatures, mechanical force, and flames.

2. Scope of application

This product is a 5.12kWh energy storage lithium iron phosphate battery pack.

2.1 Higher Energy Density: Smaller volume, ideal for household use

2.2 Parallel Connection Support: Allows for expansion

2.3 Designed for Photovoltaic Systems: Optimized for household solar power systems

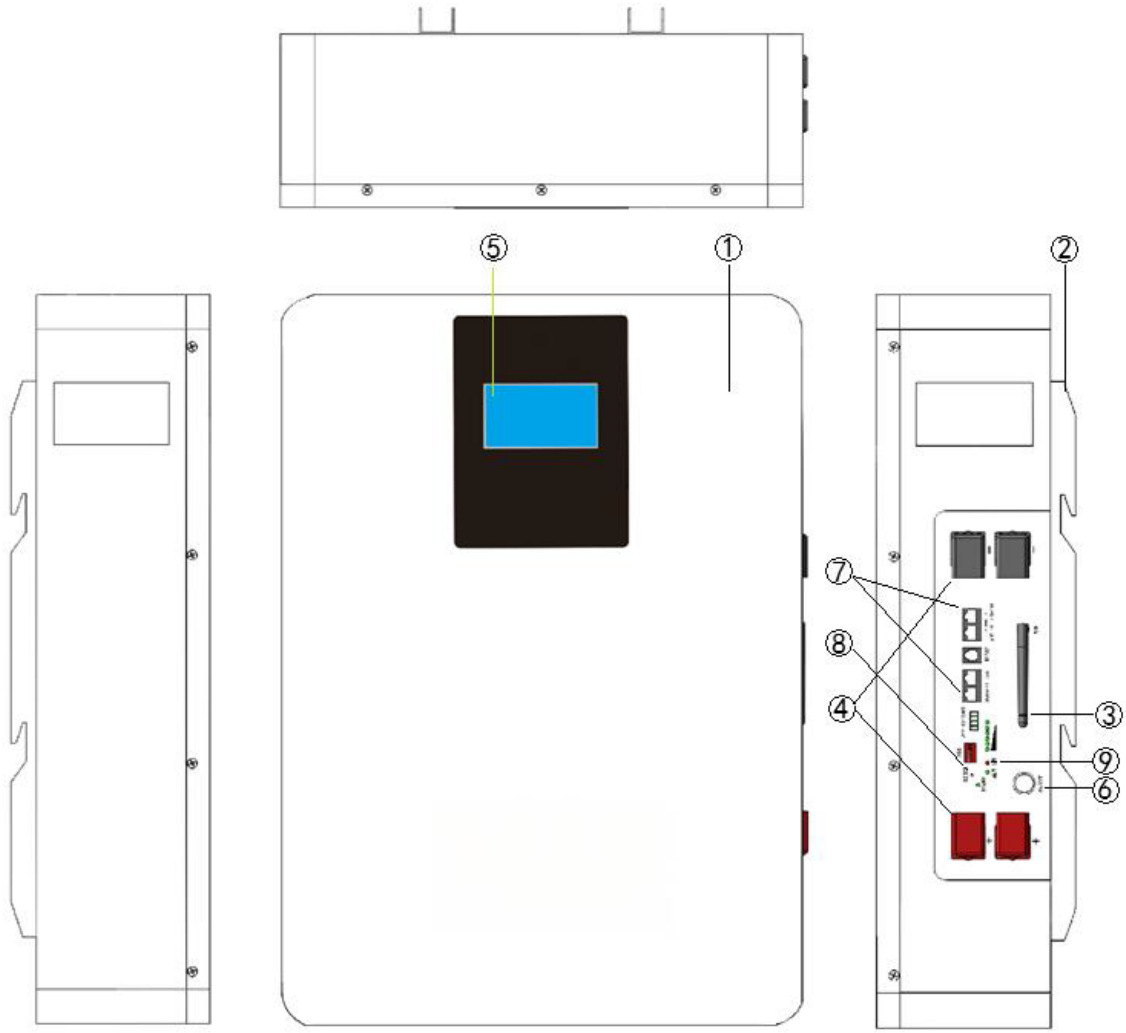
2.4 Battery Management System (BMS): Built-in BMS monitors operation and prevents the battery from operating outside design limitations

2.5 Expandability: Easily expandable by adding additional battery packs in parallel connection

3. Battery Specifications

Rated VOLTAGE	51.2V		
BATTERY CELL	LiFePO4	LiFePO4	LiFePO4
BATTERY ENERGY	5120WH	10240WH	14336WH
NOMINAL CAPACITY	100AH	200AH	280AH
DEPTH OF DISCHARGE	80%		
VOLTAGE RANGE	40V-58.4VDC		
MAXIMUM CHARGING CURRENT	100A	200A	200A
MAXIMUM DISCHARGING ICURRENT	100A	200A	200A
TEMPERATURE OF DISCHARG	-20℃~+60℃		
COMMUNICATION PORT	RS485, RS232, CAN ,WIFI		
OPERATION HUMIDITY	5%-95%		
CYCLELIFE	6000	8000	8000
CERTIFICATION	CE,IEC,UN38.3,MSDS		
DIMENSIONS	630*450*181.3MM	700*480*263.8MM	850*480*281.4MM
WEIGHT	48KG	92KG	130KG
INSTALLATION	WALL-MOUNTED/FLOOR STANDING		
PARALLEL UNITS	UP TO 15		
Adaptable inverter	485:PYLON,DEYE、GROWATT,VOLTRONIC,LTW,MUST, SRNE.BAYKEE.SMK.AFORE.VKING.BITTA.STONE.EPEVER. PACE CAN:PYLON,DEYE,GROWATT ,SOFAR,GOODWE,INVT,AFOR, SOLS,LUXPOWER.VICTRON,SOROTEC,SMA.DONNERGY, MUST,IMEON,SCHNEIDER,GENIXGREEN, INHENERGYSENERGY、LTW,SUNWAYS,STUDER,SOLAX		

4. Appearance description



① Cover
② Hanging Ear
③ WIFI
④ Output Terminal
⑤ Display Screen
⑥ Power Switch
⑦ Ccommunication Interface
⑧ Reset Switch
⑨ Led Lights

5. Communication Instructions

5.1.1 RS232 communication

BMS can communicate with the host computer through RS232, RS485,WIFI and CAN interfaces, so that it can monitor various battery information through the host computer, including battery voltage, current, temperature, status, and battery production information. The default baud rate is 9600bps.

5.1.2 CAN communication

The default communication rate is 500K.

5.1.3 RS485 communication

With RS485 interface, you can view PACK information. The default baud rate is 9600bps. If you need to communicate with the monitoring device through RS485, the monitoring device serves as the host and polls data according to the address. The address setting range is 2~15.

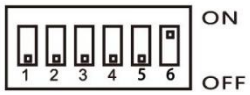
5.1.4 DIP switch setting

When PACK are used in parallel, different PACK can be distinguished by setting the address via the DIP switch on the BMS. It is necessary to avoid setting the same address. For the definition of the BMS DIP switch, refer to the table below.

1.After the battery system is installed, you need to connect the RS485/RJ45 network cable port of the BMS module with a communication network cable. Multiple BMS modules can be connected in cascade with a communication network cable (no connection is required when a single module is used).

2.Multiple When BMS modules are used in parallel, it is necessary to set the communication address (that is, the dial switch ADD). When a single BMS module is used, the communication address is 1, and the dial is "1". The original state is "0", which means "OFF", dial up to "1", which means "ON".

Note: Both RS485 network cable ports of BMS can communicate. Multi-level cascade starts from address #1(communication starts from #2) and dials according to the dial switch comparison table as shown below. Through the host computer software, set the master-slave BMS, usually the first one is the master BMS, and the others are set as the slave BMS, up to 16 units in parallel.

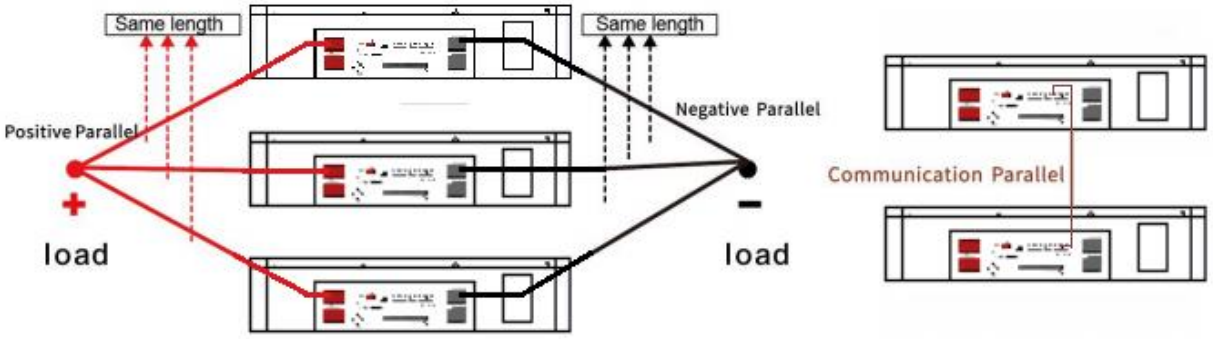


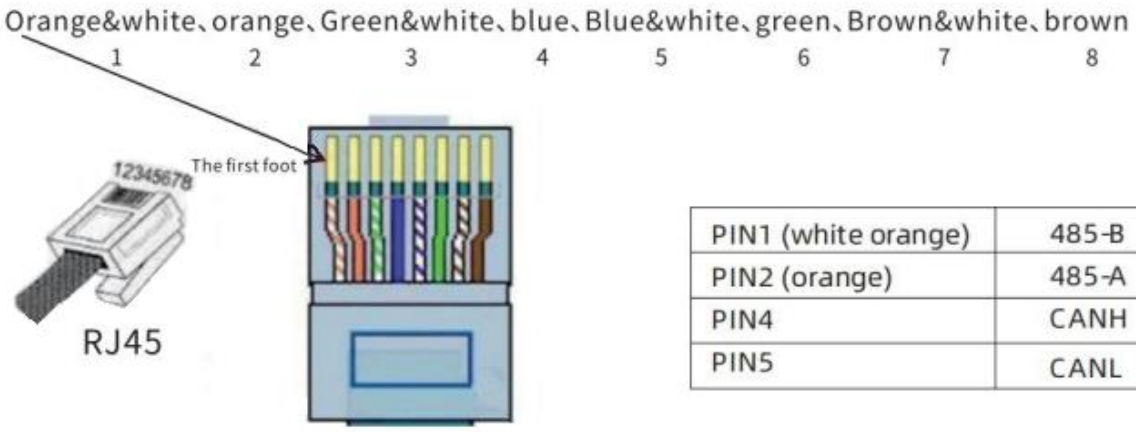
ADS	Dip switch						Instructions
	#1	#2	#3	#4	#5	#6	
0	OFF	OFF	OFF	OFF	OFF	OFF	(Host) Pack0
1	ON	OFF	OFF	OFF	OFF	OFF	(slave) Pack1
2	OFF	ON	OFF	OFF	OFF	OFF	(slave) Pack2
3	ON	ON	OFF	OFF	OFF	OFF	(slave) Pack3
4	OFF	OFF	ON	OFF	OFF	OFF	(slave) Pack4
5	ON	OFF	ON	OFF	OFF	OFF	(slave) Pack5
6	OFF	ON	ON	OFF	OFF	OFF	(slave) Pack6
7	ON	ON	ON	OFF	OFF	OFF	(slave) Pack7
8	OFF	OFF	OFF	ON	OFF	OFF	(slave) Pack8
9	ON	OFF	OFF	ON	OFF	OFF	(slave) Pack9
10	OFF	ON	OFF	ON	OFF	OFF	(slave) Pack10
11	ON	ON	OFF	ON	OFF	OFF	(slave) Pack11
12	OFF	OFF	ON	ON	OFF	OFF	(slave) Pack12
13	ON	OFF	ON	ON	OFF	OFF	(slave) Pack13
14	OFF	ON	ON	ON	OFF	OFF	(slave) Pack14
15	ON	ON	ON	ON	OFF	OFF	(slave) Pack15

5.1.5 Communication cascade between BMS modules

Lead out a communication network cable from the RS485 port of the BMS module, and connect it to the RS485 of the FSU device serial port of the dynamic loop monitoring system, The R 45 plug of the network cable 1 positive (white orange) connects to RS485A; 2 negative (Orange) Connect to RS485 B.

Note: The main battery and the slave battery are only connected in parallel with 1, 3B, and 7A. Now only 3 wires need to be connected. If other wires are connected, it will affect the CAN data and prevent communication with the inverter!





PIN1 (white orange)	485-B
PIN2 (orange)	485-A
PIN4	CANH
PIN5	CANL

5.2 Button description

When the system is in power off mode, close the self-locking switch, power on the protection board, and turn on the LED indicator for 0.5 seconds from the lowest battery light.

Turn off the self-locking switch when the system is running. Wait for 1S to 3S before the system enters the power failure state.

5.3 APP Function Introduction

3.1 Local connection

3.1.1 Local monitoring and device details interface

You can view the voltage of each cell, total battery voltage, current, SOC, SOH, cell temperature, battery status, battery warning and other information.

3.1.2 The operation guide for the distribution network is provided separately.

5.4 Hibernation

If the minimum single section voltage of the system is lower than the undervoltage protection voltage of -50mV for 60 seconds, or the undervoltage protection is triggered and does not recover for 1 hour, the protection board enters power failure mode, the power consumption level is uA, and enters hibernation state. You can exit hibernation mode by charging.

6. Test conditions

Unless otherwise noted, all tests are conducted under the following conditions (standard test conditions):

Environmental humidity: 30%~80%

Atmospheric pressure: 86kpa~106kpa group standard charge and discharge.

Standard charging: Charge the battery pack with a constant current and voltage of 10A to a cut-off voltage of 58.4V and a cut-off current of 0.2A (200mA).

Standard discharge: Discharge the battery pack at a constant current of 100A to a cut-off voltage of 44.8V.

7. Packaging method

Model	Product	Specification	Unit	Quantity
51.2V	Lithium battery pack	100Ah/200Ah/280Ah/314Ah	Set	1
	Mounting frame screw	M8*60mm	Pc	4
	Manual	User Manual	Set	1
	Cable	Positive and negative power cables	Set	1
	Communication line	1 meter with RJ45 connector	Pc	1

7.1 Before packaging, the host computer is set to power-off state;
7.2 After the battery has passed the visual inspection, it will be packed into boxes;
7.3 The material and hardness of the outer carton ensure the safety of turnover and transportation.
7.4 There must be shaped buffer packaging material inside; the packaging material should consider: space for terminal posts, placement of bagged screws, etc.

8. Product storage and transportation

8.1 When the product is stored for a long time and is not in use, please place it in a dry and ventilated place away from flammable and explosive items; inspect the battery pack regularly every three months.
Perform charging and maintenance to ensure the battery is in optimal performance.
8.2 The battery pack should be transported through external packaging. During transportation, it should be protected from severe shock, impact or extrusion, and should be protected from sunlight and rain.

9. Precautions for product use

9.1 Never put the battery into water or get it wet.

9.2 It is prohibited to charge and use the battery outside the temperature range specified by us; do not store, charge or use this product near fire or heat sources.

9.3 When the battery pack emits a peculiar smell or leaks, stop using or charging it immediately, move it to an open and ventilated place, away from fire sources, and contact us in time.

9.4 When using with a load, do not reverse the positive and negative poles.

9.5 Do not use metal conductors to short-circuit the positive and negative terminals of the battery pack.

9.6 It is strictly prohibited to perform artificial dissection of the battery pack, to pierce the battery pack with nails or sharp objects, to strike the battery pack with a hammer or other external force, and to step on or drop the battery pack.

9.7 Do not place the battery pack in a microwave oven or pressure vessel.

9.8 If any abnormality occurs during charging or use, please stop charging and using it immediately.

9.9 The optimal operating temperature of the product is 25±5℃. If the product is not within this temperature range during use, the discharge capacity will be low.

9.10 If any malfunction or abnormality occurs during use, please contact us and do not disassemble the battery pack without permission.

9.11 Do not turn the battery upside down when installing it on the cabinet.

9.12 The above tests are for new batteries that are no more than 1 month.

10. Installation Location

Make sure the installation location meets the following conditions:

10.1 The installation location must be suitable for the size and weight of the battery.

10.2 Must be installed on a solid surface to bear the weight of the battery.

10.3 The area is waterproof.

10.4 There are no flammable and explosive items nearby.

10.5 The ambient temperature is within the range of 0°C to 45°C.

10.6 Temperature and humidity are maintained at constant levels.

10.7 Minimum dust and dirt in this area.

10.8 It is recommended to wear the following safety equipment when handling battery packs: insulating gloves, safety goggles, safety shoes

10.9 Installation must be vertical or tilted backwards by a maximum of 15° - avoid forward or sideways stilts.

11. Standard installation instructions

11.1 Choose a suitable solid wall with a thickness greater than 80mm.

11.2 Use the mounting bracket as a template to mark the hole positions.

11.3 Drill 4 holes according to the hole positions, with a diameter of ø8 and a depth of 60mm.

11.4 Hammer the M8 screw into the above hole and tighten the nut. NOTE: Do not position the screws flush with the wall - leave 10 to 20 mm exposed.

11.5 Secure the mounting frame to the 4 screws.

11.6 Raise the battery slightly higher than the installation frame, while keeping the battery balanced, and hang the battery on the frame through hooks.

12.Common Problems and Solutions

Failure phenomenon	Possible Causes	
BMS cannot be activated	Whether the weak current switch of the BMS is turned on;Module serial connection connection error	Check the connection line and install it according to the method described in the installation manual
BMS red light is always on	Red light warning, existence failure	Locate the fault point according to the method described in the above table: 1.Voltage sensor failure/temperature sensor failure: Check whether the sampling line is connected correctly, you can replace the sampling line for troubleshooting;restart to observe whether it is restored. 2.Charging circuit failure,discharging circuit failure: contact the manufacturer for consultation. 3. Battery failure: check whether the connection of the sampling terminal is normal: check whether the voltage value of all modules is within the voltage range in the manual after turning off the BMS: observe whether it is cleared after restarting,otherwise contact the manufacturer. 4.Sampling IC signal failure: check whether the voltage sampling line is connected properly, you can replace the sampling line for troubleshooting: observe whether it is restored after restarting: contact the manufacturer if it is not
BMS cannot communicate with dynamic ring	1.The BMS aid code address is different from the address of the dynamic loop query 2.When multiple units are connected in parallel, they can not communicate normally 3.The communication serial port setting is incorrect 4.RS485 communication line sequence is incorrect 5.Abnormal physical connection	1.Detect and reset the RMS dialing address 2.When multiple units are connected in parallel, different addresses need to be set, and the dialing address of each product should be reset according to the address of the dynamic loop 3.Set the correct serial port configuration according to our communication protocol 4.Connect the communication line correctly as described in the installation manual 5.Check that the physical connection of the communication circuit is normal

13.LED operating status analysis

LED indicator definition of BMS module

Logo	Show Content	Colour	Description
Power	Charging and Discharging	Green 	Green light is always off 1.Short circuit, reverse connection, 2. Cell failure: cell voltage is less than 1.5V, or greater than 4. 1V 3. BMS failure (voltage sensor, temperature sensor failure, abnormal charging and discharging current)
Run	Running Lights	Green 	1. Idle: the green light flashes slowly 2.Charging: the green light is always on 3.Discharge: the green light flashes quickly 4. BMS failure (voltage sensor, temperature sensor failure, abnormal charging and discharging current) Green light is always off
Alm	Warning Indicator	Red 	1.Warning: Red light flashes quickly(cell voltage is too low, discharge current, temperature is too low, temperature is too high, capacity is low,Pack voltage is too high) 2. Protection: the Red light is always on (the battery voltage is too low, the battery cell voltage is too low, the charge and discharge are overcurrent, the temperature is too low, and the pack voltage is too high)
Soc	Battery Capacity Indicator	Green 	The capacity LED indicator light flashes slowly at 1HZ only when charging, and other lights are always on: when the capacity is 100%,All 4 lights are on: when the capacity is 99%-75%(inclusive), the fourth light from the top flashes slowly The bottom three lights are always on: when the capacity is 74%-50%(inclusive), the third light from the top flashes slowly and the bottom two lights are always on: when the capacity is 49%-25% (inclusive), The second light from the top flashes slowly and the bottom light is always on: when the capacity is 24%-0% (inclusive), the first light from the top flashes slowly

14.Safety and precautions

1. The battery module must be used in conjunction with BMS, and the mixed use of batteries from different manufacturers is strictly prohibited.
2. Check the battery module voltage for damage; if there is any abnormality, please stop using it.
3. It is strictly forbidden to stack the whole trailer battery with fork plate during transportation and storage, and it is forbidden to stack battery modules when installing and transporting batteries. There are positive and negative lead terminals or sampling line lead ends, and it is strictly forbidden to squeeze, stack and place them down.
4.Parallel matching requirements for battery modules: (Notes before picking and installation)
(1) Two identical models and same capacity, The battery modules of the same voltage are connected in parallel to 51.2V.
(2) Serial use is strictly prohibited.
5.Parallel wires are included in the battery module packing box, and the parallel wires correspond to the battery modules. Mixed insertion is strictly prohibited.
6.It is forbidden to use or leave the battery module near high temperature and high heat sources, away from fire and water sources.
7.It is forbidden to disassemble the battery module, knock, throw or step on the battery module, and dismantle the BMS and dismantle the yellow tamper-evident sticker without authorization.

8. Before installing the battery module, check whether the open circuit voltage of the battery is within the normal range. The "positive" and "negative" signs are printed on the module, and the electrical properties should be correctly determined. It is strictly forbidden to reverse or short-circuit the battery.

9.Insulation tools and gloves should be used during installation and transportation, and metal-containing conductors such as watches, bracelets (bracelets) and rings should be removed from the wrist to prevent electric shock and short-circuit the positive and negative electrodes. During installation, the battery module poles need to be insulated and protected. If the poles are close to the battery rack and other conductors, the battery poles or battery racks need to be insulated and protected.
10.The recommended transportation method is for two people to carry it at the same time. The transportation tool is a safety rope or a load-bearing net bag. The battery box must be carried to the site. Violent construction is strictly prohibited to damage the product.
11. Installation and maintenance requirements. After the battery module is installed on the wall, the poles and plug-ins are required to achieve frontal maintenance.
12. Battery rack compatibility: multiple groups of parallel type batteries, battery rack installation steps, battery module installation and cable connection, according to the different types of batteries to choose the corresponding installation diagram, installation without battery rack (such as outdoor integration Power cabinet) Refer to the schematic diagram of battery module installation and cable connection in battery rack mode.
13. Please read this installation manual carefully before installation. If you have any questions, please contact your supplizer.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