



51.2V Power Stacked Lithium Battery

USER INSTRUCTION

This power Stacked mode lifepo4 lithium battery belongs to one of the series of household energy storage products that are independently designed and developed. It has long cycle life, high safety standard BMS software protection and strong housing, exquisite looks, and easy installation, etc. It is widely used in energy storage system with off-grid inverters, on-off grid inverters and hybrid inverters.

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(Revision History)

Ver.No .	Date	Revised Content	Reasons for Change	Reviser	Approve
A0	2026.06.08	First Edition	First Draft	Xueqiang.Yang	

1. Symbol Description

	Do not place near open fire or flammable materials.
	A potential hazard exists when the equipment is working. Wear personal protective equipment during operation.
	Warning electric shock. Power off the equipment before any operation.
	Grounding: indicate PE cable connection position.
	Do not place in areas accessible to children.
	Keep the battery away from open fire or ignition sources.
	Read the product and operation manual before operating the battery system.
	Label for Waste Electrical and Electronic Equipment (WEEE) Directive (2012/19/EU.)
	The certificate label for CE.
	Recycle label.

2. Safety Precautions



Alert

- 1) It is important and necessary to read the user manual carefully (and attachment) before installing or using battery. Failure to do so or to follow any instruction or warning in this document can result in electrical shock, serious injury, and death, or damage battery, potentially rendering it unusable.
- 2) When battery is stored for a long time, it is required to charge once every 6 months, and the SOC should be no less than 50%.
- 3) After battery module cannot be discharged, it needs to be recharged within 12h.
- 4) Do not connect power terminal reversely.
- 5) All power supplies must be disconnected during maintenance.
- 6) Please contact the supplier within 24 hours if there is something abnormal.
- 7) Do not use any liquid to clean the battery.
- 8) Do not expose battery to flammable or irritating chemicals or vapor.
- 9) Do not paint any part of battery, including any internal or external components.
- 10) Do not connect battery with PV solar wiring directly.
- 11) Do not install or use this product beyond provisions of the manual.
- 12) Direct or indirect damages caused by the above reasons are not covered by warranty claim.



Warning

2.1 Before Connecting

- 1) Please check the external packaging condition before unpacking. If it is damaged, contact corresponding local retailer.
- 2) After unpacking, please check the products and spare parts according to spare parts list. If the product is damaged or missing, please contact your local retailer.
- 3) Connect to specified matching inverter.
- 4) Before installation, be sure to cut off the grid power and make sure battery switch is on OFF mode.
- 5) It is prohibited to connect the battery and AC power directly.
- 6) All electrical wiring must be connected in accordance with local regulations.
- 7) Please ensure that electrical performance of battery system is compatible with the equipment.
- 8) The installation onsite shall be equipped with fire-fighting facilities that meet relevant requirements, such as fire sand, dry powder fire extinguisher, etc.

2.2 In Using

- 1) If battery system needs to be moved or repaired, power must be cut off and battery is completely shut down.

- 2) It is prohibited to connect battery with different types of battery.
- 3) Do not connect battery to faulty inverter.
- 4) Except for personnel from The Company or other authorized personnel, batteries shall not be opened, repaired or disassembled. The company shall not bear any liability or responsibility caused by violation of any safety operation or design standard, production standard, equipment safety standards or any other standards or requirements.

3. Introduction

This power Stacked mode lifepo4 lithium battery is a new energy storage product developed and produced by The Company, which can provide reliable power supply for all kinds of equipment or systems.



Figure 3-1

3.1 Features

- 1) When multiple modules are paralleling connected, module addresses are set automatically.
- 2) Support for upgrading the battery module from the upper controller through 232 or 485 communication.
- 3) The module is non-toxic, non-polluting and environmentally friendly.
- 4) Cathode material is made from LiFePO₄ with safety performance and long cycle life.
- 5) Battery management system (BMS) has protection functions including over- discharge, over-charge, over-current and high/low temperature.
- 6) The system can automatically manage charge and discharge state and balance voltage of each cell.
- 7) Flexible configuration, multiple battery modules can be connected to expand capacity .
- 8) Adopted self-cooling mode rapidly reduced system entire noise.
- 9) The module has less self-discharge, up to 6 months without charging it on shelf, no memory effect, excellent performance of shallow charge and discharge.

Functions

Protection and Alarm	Management and monitor
Charge/Discharge End	Cell Balance
Over voltage Charging Protection	Intelligent Charge Model
Under Voltage Discharging Protection	Charge/Discharge Current Limit
Charge/Discharge Over current Protection	Capacity Retention Calculate
High/Low Temperature Protection	Short Circuit Protection
History Record	Adjustable parameter settings

3.2 Size

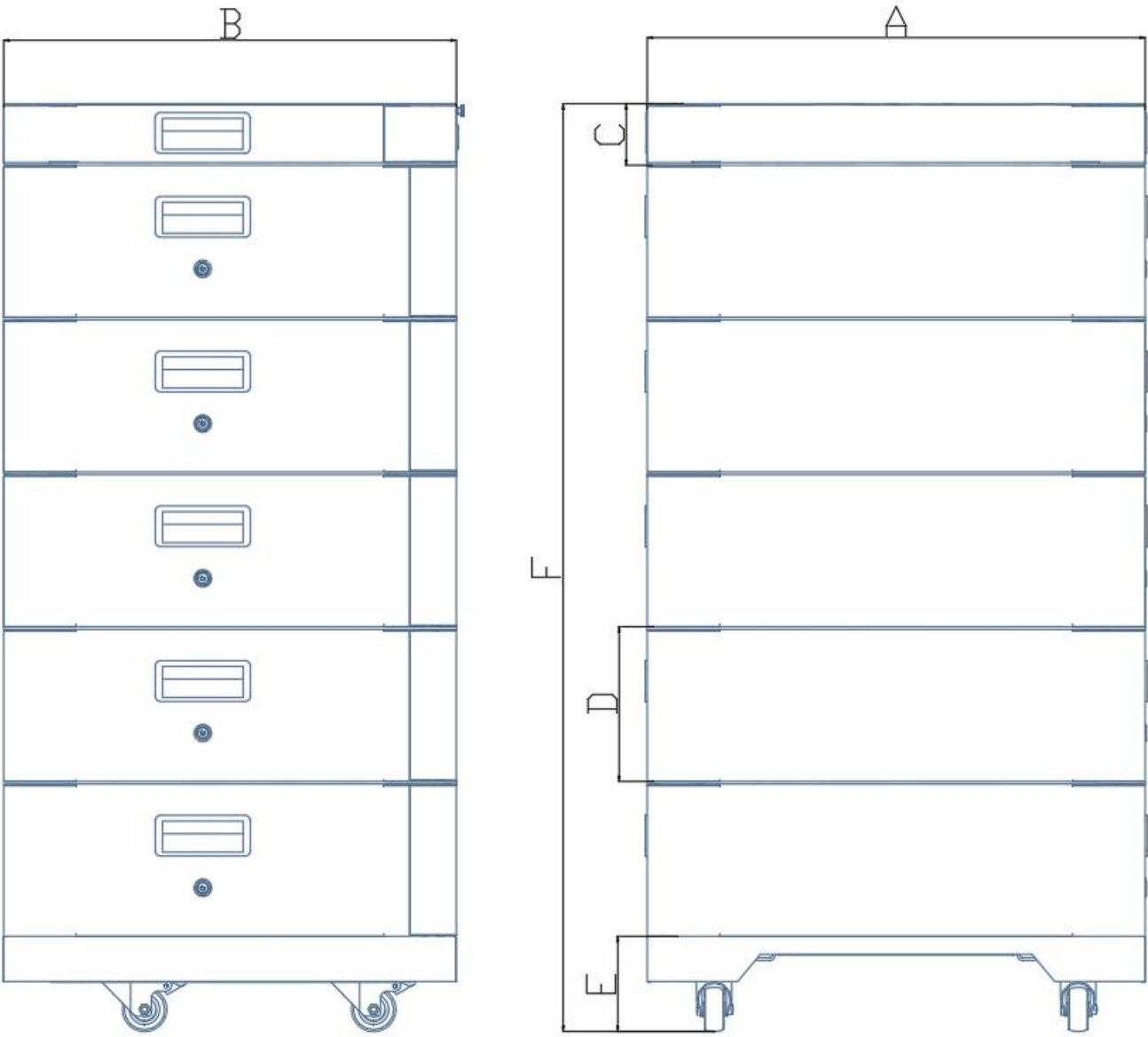


Figure 3-2

model Size					
A	B	C	D	E	F
550 mm	500 mm	68mm	171 mm	105 mm	1025mm

3.3 Specification Parameters

Appearance		
Basic Parameters	Battery layer×4	Battery layer×6
Product Size	550×500×854mm	550×500×1196mm
Product Weight	~ 202kg	~ 292kg
Battery parameters		
Nominal Voltage	51.2V	
Nominal Capacity	20.48kWh	30.72kWh
Standard Discharge Current	100A	
Standard Charge Current	50A	
Working Voltage	43.2-57.6V	
Overall parameters		
Communicate	RS485/ CAN	
Operation Temperature	Charge: 0℃~55℃ Discharge: -20℃~55℃	
Storage Temperature	- 20 ~ 5 5 ℃	
Ambient Humidity	≤85%（RH） No Condensation	
Working Altitude	≤2000m	
Cooling Method	Natural cooling	
Service Life	10 years+（25℃）	

Note: Our company will continuously update and upgrade our products. Please refer to the actual products received.

3.4 Equipment interface instruction

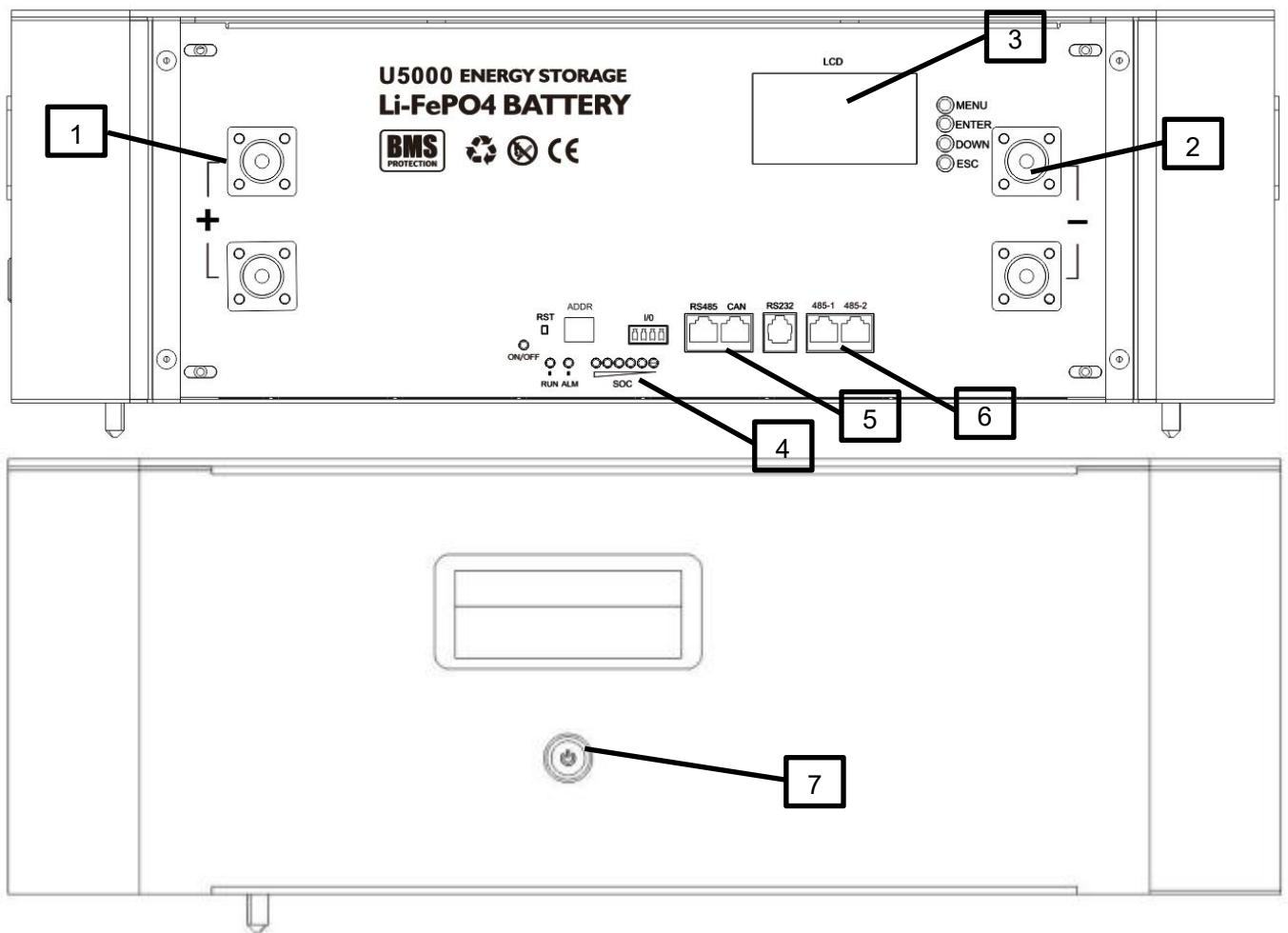


Figure 3-3

- ① **Positive terminal:** battery positive output--Connect 6AWG cable
- ② **Negative terminal:** battery negative output--Connect 6AWG cable
- ③ **LCD :** display,Function Keys
- ④ **SOC:** State indication
- ⑤ **Communication port:**Connect inverters via RJ45 8P8C
- ⑥ **Parallel connection:** Parallel interface between Battery
- ⑦ **Start:**System startup switch, press the button to activate the battery layer

4. Safe Handling of Lithium-iron ESS Batteries Guide

4.1 Solution Diagram

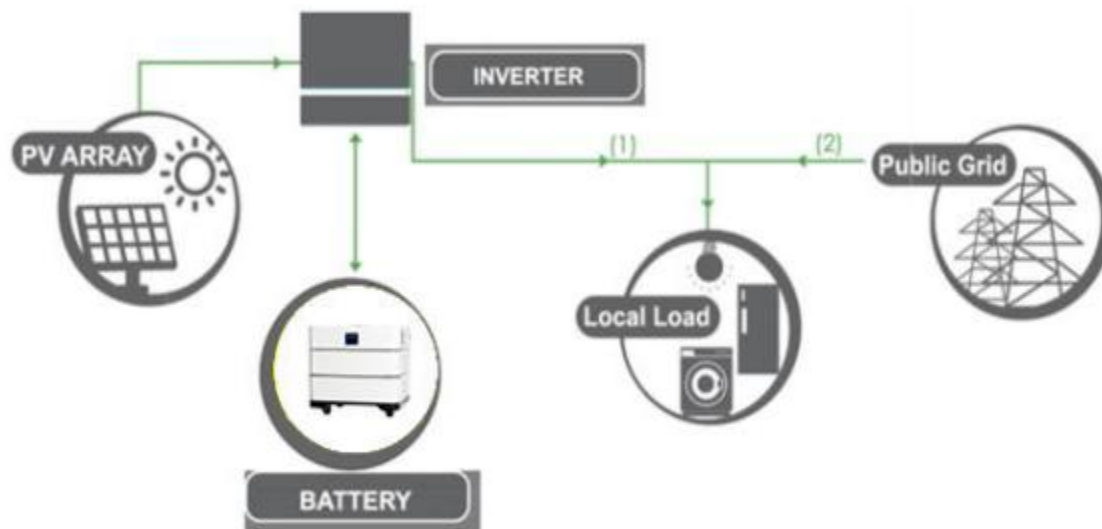


Figure 4-1

4.2 Danger Label



Figure 4-2

4.3 Tool



Wire Cutter



Modular Crimping Pliers



Screwdriver



Electric drill

Note :

Properly use insulated tools to prevent accidental electric shock or short circuits. If tools are not insulated, cover the entire exposed metal surfaces of available tools with electrical tape except their tips.

4.4 Safety Gear

It is recommended to wear the following safety gear when dealing with battery pack.



Insulated Gloves



Safety Goggles



Safety Shoes

5. Installation and operation

5.1 Installation Location

Make sure that installation location should meet the following condition:

- 1) The area should be completely water-proof.
- 2) The floor should be flat and level.
- 3) No flammable or explosive materials.
- 4) The ambient temperature is within the range from 0°C to 50°C.
- 5) The temperature and humidity are maintained at a constant level.
- 6) There is just a little dust and dirt in the area.
- 7) The distance from heat source should be more than 2 meters.
- 8) The distance from air outlet of inverter is more than 0.5 meters.
- 9) Installation areas should avoid direct sunlight.
- 10) No forced ventilation requirement for battery module, but please avoid installing in a closed area. Ventilation shall avoid high salinity $\leq 30\%$, humidity $\leq 85\%$ and ambient temperature of 0 ~ 45 °C.

5.2 Installation Steps



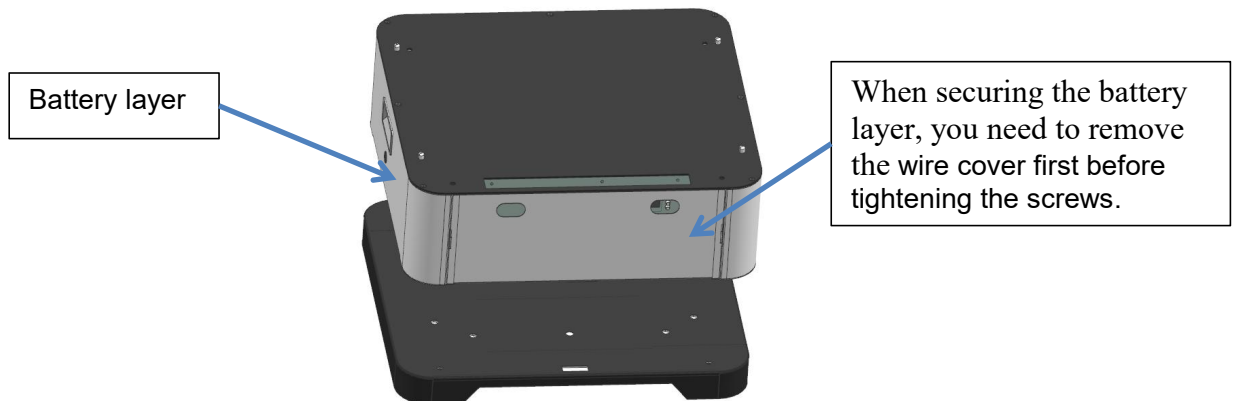
Warning

- 1) Follow local electrical safety and installation policies and use appropriate circuit breakers on the AC input, AC output, and photovoltaic input circuits of the inverter.
- 2) All installation and operation must follow local electric standard and requirements.
- 3) When battery modules are paralleled, the system should be powered off before installation operation.

5.3 Assembly steps



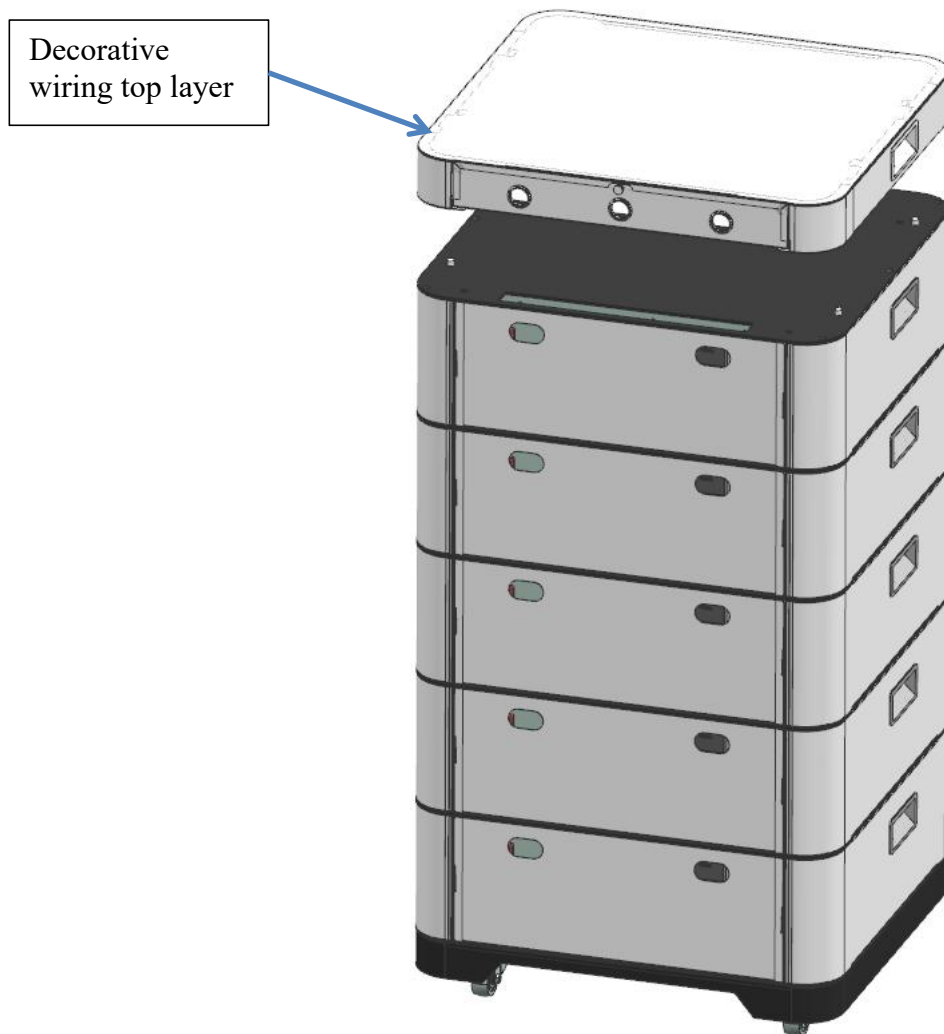
1. Adjust the four foot pads on the base layer to be level and stable with the ground. Place the base neatly against the wall (not shaking).



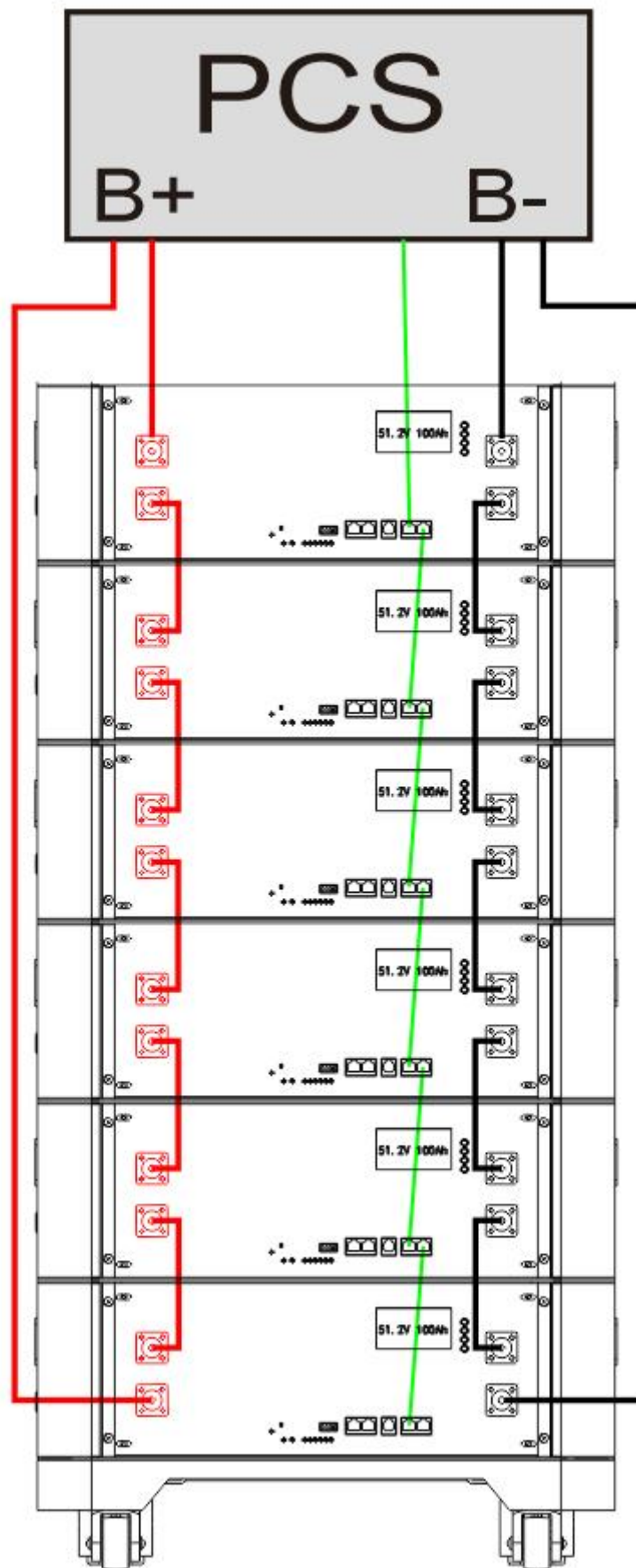
2. Align the direction, then insert the battery layer into the base (lower layer) and secure it with M6×10 screws.



3. After aligning the direction, insert the second battery layer into the first battery layer already placed on the base, and fix the module with M6×10 screws. (Multiple batteries can repeat step 3.)



4. Align the direction, insert the top layer downwards into the battery layer, and fix the module with M6 × 10 screws (After removing the top cover, tighten the screws).



5. Open the back panel of the battery and you can wire it here. (This wiring diagram is applicable to inverters up to and including 10KW)



6. After wiring is completed, cover the back panel.

5.4 System turns on

Warning: Double check all the power cables and communication cables. Check all the power switches are OFF.

System turns on step:

- 1) Check all cables are connected correctly. Check grounding is connected.
- 2) If necessary, turn on the switch at inverter's battery side or between inverter and battery. If possible, turn on AC or PV power source to wake up inverter.
- 3) Press the battery START button in turn, turn on the START metal button of the slave battery firstly, and finally turn on the START button of the master battery .
- 4) If no alarm ,the battery system will be ready for charging and discharge with PCS.

5.5 System turns off

When failure or before service, must turn the battery storage system off:

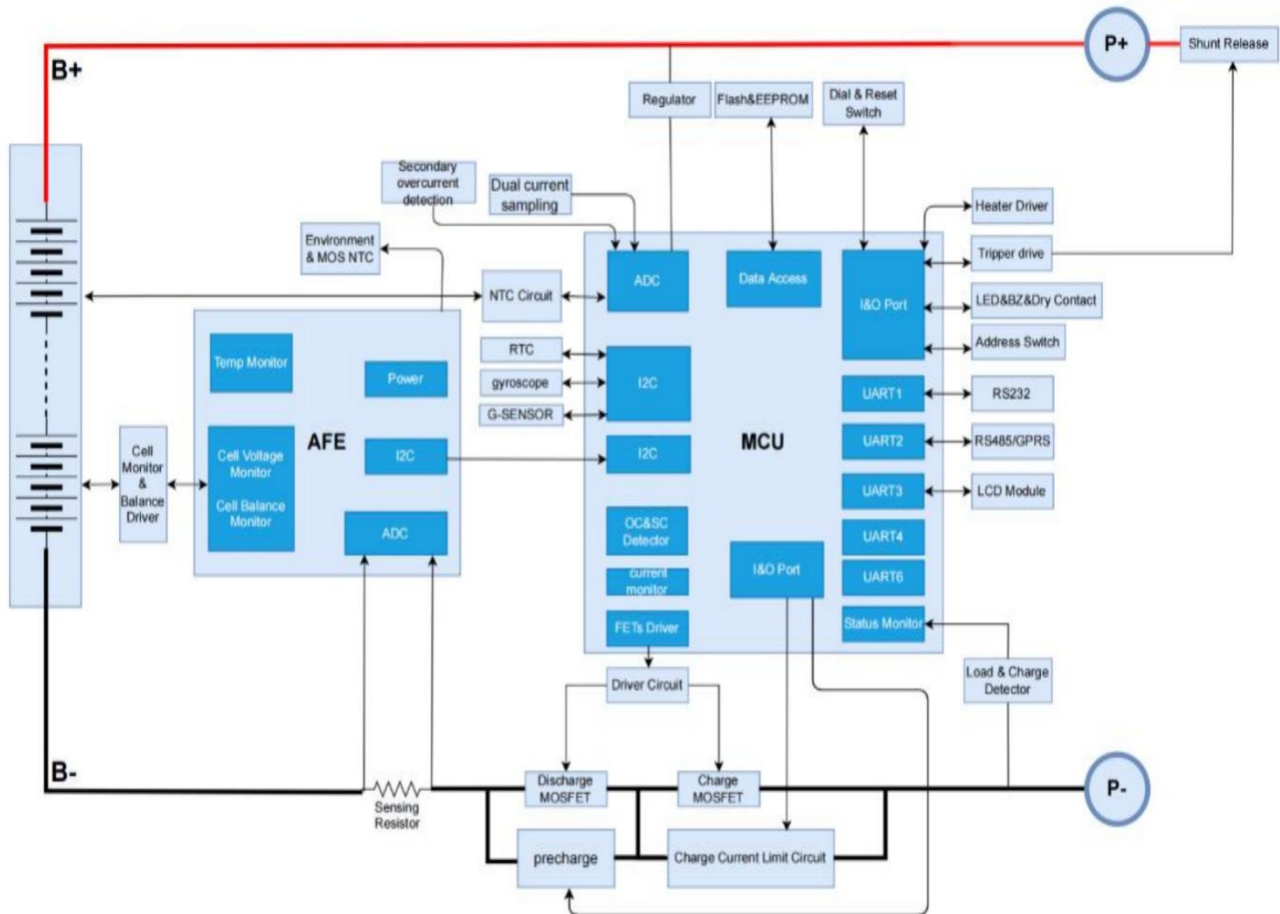
- 1) Turn off inverter or power supply on DC side.
- 2) Turn off the switch between PCS and battery system.
- 3) Switch the button switch to the off position. (First, turn off the slave battery, and finally turn off the master battery.)

Note:

- 1) One battery system shall just have one master, all the others are slaves. (The one on the extreme side connected to inverter is the master battery.)
- 2) It is forbidden to switch off the Isolating Switch during charging and discharging.

6. Battery layer

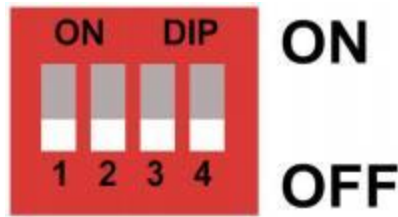
6.1 BMS System Schematic Diagram



6.2 BMS Parameter

No.	Item		51.2V 100Ah
1	Power Consumption	Low power consumption mode	$\leq 200\mu\text{A}$
2	Over charge Protection	Over charge detection voltage	3.65V
		Over charge release voltage	3.38V
3	Over discharge protection	Over discharge detection voltage	2.7V
		Over discharge release voltage	2.95V
4	Over current protection	Charging over current detection current (detection time)	110A (1S)
		Discharging over current detection current 1 (detection time)	110A (1S)
		Discharging over current Detection current2 (detection time)	$\geq 150\text{A}$ 100ms
5	Temp. Protection	Detection temperature	65°C
6	Balance	Balance voltage	3.5V

6.3 Dial Code Switch Settings (parallel connection needed)



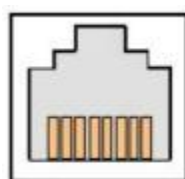
When the battery packs are connected in parallel, the dial code switch of each battery can be used to distinguish different Pack addresses. The hardware address can be set through the dial code switch on the board. (The automatic coding may encode the host to wake up the slave, after the host wakes up from the function to wake up automatically The definition of the dial code switch refer to the following table.

ADD	Dial switch position			
	# 1	#2	#3	#4
1	ON	OFF	OFF	OFF
2	OFF	ON	OFF	OFF
3	ON	ON	OFF	OFF
4	OFF	OFF	ON	OFF
5	ON	OFF	ON	OFF
6	OFF	ON	ON	OFF
7	ON	ON	ON	OFF
8	OFF	OFF	OFF	ON
9	ON	OFF	OFF	ON
10	OFF	ON	OFF	ON
11	ON	ON	OFF	ON
12	OFF	OFF	ON	ON
13	ON	OFF	ON	ON
14	OFF	ON	ON	ON
15	ON	ON	ON	ON

6.4 BMS Communication port

➤ RS485

The default baud rate is 9600bps, which is used for communication with the inverter. When this battery is the host, it can summarize slave data and communicate with the inverter.

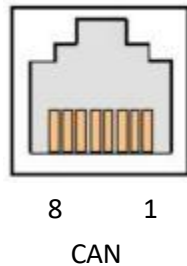


8 1
RS485

Pin	Definition
1、8	RS485-B
2、7	RS485-A
3、6	GND
4、5	NC

➤ CAN

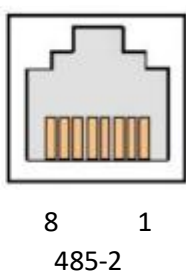
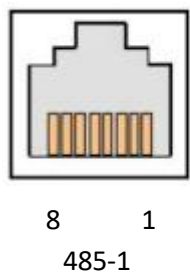
The default baud rate is 500K, and this interface is used for communication with the inverter. When this battery is the host, it can summarize slave data and communicate with the inverter.



Pin	Definition
1、3、6、7、8	NC
2	GND
4	CAN-H
5	CAN-L

➤ Parallel RS485

You can view the information of the PACK, with a default baud rate of 9600bps. To communicate with the monitoring device through RS485, the monitoring device serves as the host and sets the address range from 2 to 15 based on address polling data.



Pin	485-1 Definition
1、8	RS485-B
2、7	RS485-A
3、6	GND
4	GND
5	UP -IN

Pin	485-2 Definition
1、8	RS485-B
2、7	RS485-A
3、6	GND
4	GND
5	DN -OP+

The parallel machine has dual RS485 interfaces. The first battery that communicates with the inverter serves as the main unit, and the 485-2 of the main unit is connected to the 485-1 of the next slave unit. The communication interfaces of each battery are connected in this staggered order, so that the main battery can read the information of each battery.

6.5 State indication

State	Normal / Alarm / Protection	ON/OFF	RUN	ALM	SOC Indication LED						Instructions
		●	●	●	●	●	●	●	●	●	
Power Off	Sleep	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	All off
Standby	Normal	ON	flash1	OFF	Indication by SOC						Standby
	Alarm	ON	flash1	Flash3							Cell low voltage
Charge	Normal	ON	ON	OFF	Indication by SOC (The top SOC Led Flash 2)						Maximum power LED flash(flash 2),ALM does not flash for over-charge warning
	Alarm	ON	ON	Flash3							

	Over Charge Protection	ON	ON	OFF	ON	ON	ON	ON	ON	ON	If no mains supply, LED as standby
	Temperature. Over-current Fault Protection	ON	OFF	ON	OFF	OFF	OFF	OFF	OFF	OFF	Close charge
Discharge	Normal	ON	Flash3	OFF	Indication by SOC						
	Alarm	ON	Flash3	Flash3							
	Under Discharge Protection	ON	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	Close discharge
	Temperature. Over-current. Short Circuit Fault Protection	ON	OFF	ON	OFF	OFF	OFF	OFF	OFF	OFF	Close discharge
Fault		OFF	OFF	ON	OFF	OFF	OFF	OFF	OFF	OFF	Close charge Close discharge

6.6 Capacity indication

State		Charge						Discharge					
Capacity indicator light		L6 ●	L5 ●	L4 ●	L3 ●	L2 ●	L1 ●	L6 ●	L5 ●	L4 ●	L3 ●	L2 ●	L1 ●
electricity (%)	0 ~ 17%	OFF	OFF	OFF	OFF	OFF	flash 2	OFF	OFF	OFF	OFF	OFF	ON
	18 ~ 33%	OFF	OFF	OFF	OFF	flash 2	ON	OFF	OFF	OFF	OFF	ON	ON
	34 ~ 50%	OFF	OFF	OFF	flash 2	ON	ON	OFF	OFF	OFF	ON	ON	ON
	51 ~ 66%	OFF	OFF	flash 2	ON	ON	ON	OFF	OFF	ON	ON	ON	ON
	67 ~ 83%	OFF	flash 2	ON	ON	ON	ON	OFF	ON	ON	ON	ON	ON
	84 ~ 100%	flash 2	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON
Running light ●		ON						flash(flash 3)					

6.7 Light Blink explanation

Flash mode	ON	OFF
Flash 1	0.25S	3.75S
Flash 2	0.5S	0.5S
Flash 3	0.5S	1.5S

Note:

The LED indicator alarm can be enabled or disabled through the host computer. The factory default is enabled.

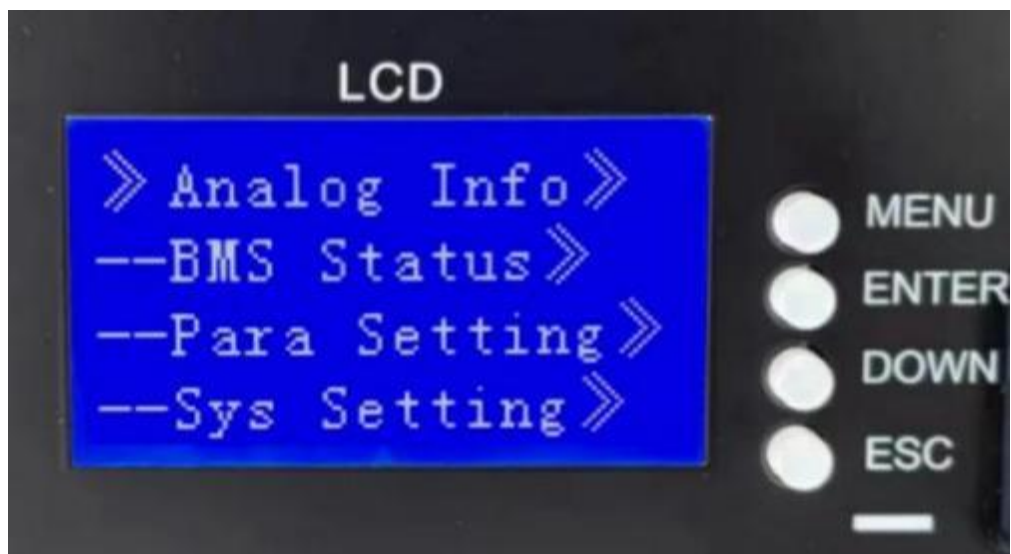
6.8 LCD introduction

➤ Display rendering



Main Menu Page

After power on/sleep activation, the welcome interface will be displayed, and press the MENU key to enter the main menu page. As shown in the following figure:



➤ Page definition not displayed

Single cell over voltage alarm	Cell OV
Single low voltage alarm	Cell UV
Total pressure over voltage alarm	Pack OV

Total pressure low pressure alarm	Pack UV
Charging over current alarm	CHG OC
Discharge over current alarm	DSG OC
Charging high temperature alarm	CHG OT
Discharge high temperature alarm	DSG OT

Low temperature charging alarm	CHG UT
Low temperature discharge alarm	DSG UT
Environmental high temperature alarm	ENV OT
Environmental low temperature alarm	ENV UT
MOS high temperature alarm	MOS OT
Low battery	SOC Low
Single cell over voltage protection	Cell OVP
Single cell over discharge protection	Cell UVP
Overall Over voltage Protection	Pack OVP
Overall Over discharge Protection	Pack UVP
Charging over current protection	CHG OCP
Discharge over current protection	DSG OCP
Short circuit protection	SCP
Charger high-voltage protection	Charger OVP
Charger reverse connection	Charger in versed
Charging over temperature protection	CHG OTP
Discharge over temperature protection	DSG OTP
Low temperature protection for charging	CHG UTP
Low temperature discharge protection	DSG UTP
MOS high-temperature protection	MOS OTP
Environmental high temperature protection	ENV OTP
Environmental low-temperature protection	ENV UTP
Full charge	Fully
Charging MOS fault	CHG MOS Fault
Discharge MOS Fault	DSG MOS Fault
NTC malfunction	NTC Fault

Battery failure	Cell Fault
Sampling fault	Sampling Fault
Fault in current limiting plate	CCB Fault
Heating film malfunction	Heater Fault

➤ Key Description

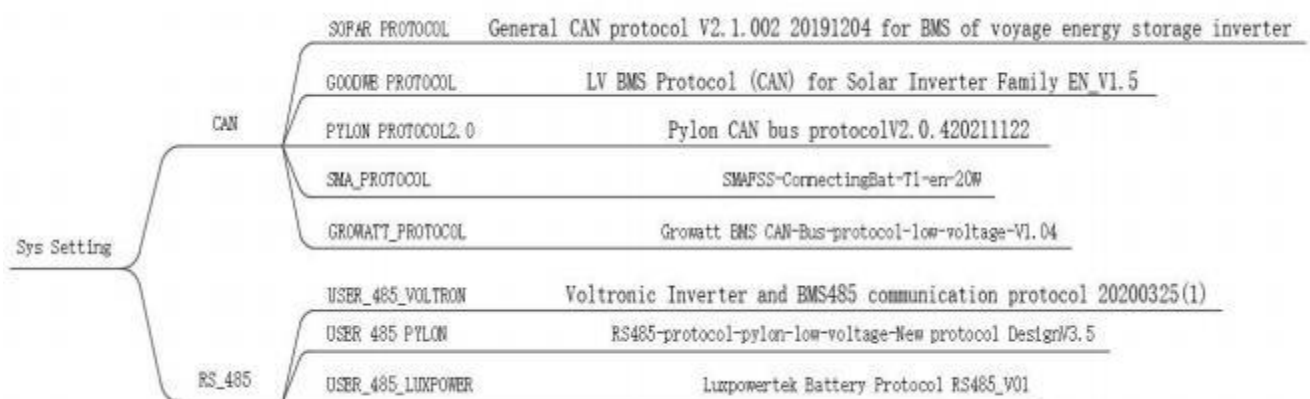
- 1) Each item starts with "» " or "--", where "» " represents the current position of the cursor, and pressing the DOWN key can, Move the cursor position downwards; A project that ends with "» " indicates that the project has content that is not displayed. Press the Enter key to enter the project The corresponding page.
- 2) Press ESC to return to the previous level directory; At any location, press the MENU key to return to the main menu page.
- 3) In sleep mode, press any button to activate the display screen.

➤ Screen selection protocol

The user selects the correct communication protocol version through buttons and passes the selected protocol version number back to the BMS motherboard Program to change the default communication protocol between BMS and the upper computer;

The selection menu for this function is placed in the system settings menu directory.

The menu structure is illustrated in the following figure:



➤ The protocol confirmation is shown below



6.9 Hibernate/shut down

In normal operating mode, after 1 minute of no button operation, the system will enter sleep/shutdown mode. In shutdown/sleep mode In this state, operating any button will activate the display screen.

6.10 Sleep Mode

The system enters a low-power mode when any of the following conditions is met:

- 1.The monomer or overall over release protection is not removed within 30 seconds.
- 2.Press the button (3~6S) and release the button.
3. The lowest unit voltage is lower than the dormancy voltage, and the duration reaches the dormancy delay time (at the same time, meet the no communication, no protection, no equilibrium, no current).
- 4.The standby time is more than 24 hours (no communication, no charge and discharge, no city power).
5. Force the shutdown through the upper computer software. Before entering hibernation, ensure that the input is not connected with external voltage, otherwise it cannot enter the low power mode.

6.11 Awake Mode

When the system is in the low power mode and meets any of the following conditions, the system will exit the low power mode and enter the normal operation mode:

- 1.Access to the charger, and the output voltage of the charger shall be greater than 48V.
- 2.Press the button (3~6S) and release the button.

7. Emergency Situations

7.1 Battery Leakage

If the battery pack leaks electrolyte, avoid contact with the leaking liquid or gas. If one is exposed to the leaked substance, immediately perform the actions described below.

- 1) Inhalation: Evacuate contaminated area and seek medical aid.
- 2) Contact with eyes: Rinse eyes with flowing water for 15 minutes and seek medical aid.
- 3) Contact with skin: Wash affected area thoroughly with soap water and seek medical aid.
- 4) Ingestion: Induce vomiting and seek medical aid.

7.2 On Fire



NO WATER!

Only dry powder fire or carbon dioxide extinguisher can be used; if possible, move the battery module to a safe area before it catches fire.

7.3 Wet Batteries

If the module is wet or submerged in water, do not let people access it, then contact us or an authorized dealer for technical support. Cut off all power switch on inverter side.

7.4 Damaged Batteries

Damaged batteries are dangerous and must be handled with utmost care. They are not fit for use and may pose a danger to people or property. If the module seems to be damaged, pack it in its original container, then return it to authorized dealer.



Warning

Damaged batteries may leak electrolyte or produce flammable gas.

8. Remarks

8.1 Recycle and Disposal

In case a battery (normal condition or damaged) needs disposal or needs recycling, it shall follow the local recycling regulation (Suggest Regulation (EC) N° 1013/2006 among European Union) to process, and using the best available techniques to achieve a relevant recycling efficiency.



8.2 Maintenance

Check installation environment such as dust, water, insect etc. Make sure it is suitable for IP20 battery system. Connection of power connector, grounding point, power cable and screw are suggested to be checked every year.

Parts List

Item	Part Name	Description	Unit	Quantity
1	Battery layer	Optional up to 6floors	PCS	2-6
2	Communication cable	RJ45network cable0.3m	PCS	Same as the number of batteries
3	Positive power line	220mm length red 6AWG	PCS	Same as the number of batteries
4	Negative power line	220mm length black 6AWG	PCS	Same as the number of batteries
5	Base		PCS	1
6	Hexagon screw	M6*10	PCS	Twice the number of modules
7				
8				

Maintenance Record

Dear user,thank you for selecting our product,Please fill in and keep the warranty card for better services.

Attn:_____Product No:_____

Tel:_____E-mail:_____

Purchase Date:_____

Address:_____

Maintenance Record			
Date of repair	Content	Maintenance Personnel	Note