

# WALL/FLOOR-MOUNTED BATTERY



## PRODUCT MANUAL

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## I.Preface

This product is a household lithium iron phosphate energy storage battery designed and developed specifically for the household storage market. With its design features of integration, miniaturization, lightweight, intelligence, and long cycle, this product has a simple and beautiful appearance, a safe and reliable quality, and is widely used in household energy storage markets in various regions around the world.

## II.Reference Standards and Specifications

GB/T 8897.4-2008 Primary batteries Part 4: Safety tips for lithium batteries

QB/T 2502-2000 General specification for lithium-ion batteries

GB T36276-2018 National standard of lithium-ion batteries for power energy storage

IEC 62619-2017 Safety requirements for lithium-ion batteries and lithium-ion battery packs containing alkaline or other non-acidic electrolytes and lithium-ion batteries and lithium-ion battery packs for industrial use.

GB/T 36276-2018 Lithium-ion batteries for electric energy storage

GB/T 34131-2023 Battery management system for electric energy storage

GB/T 16935.1-2008 Insulation coordination of equipment in low-voltage systems Part 1: Principles, requirements and tests

## III.Product Features

- (1)The battery uses lithium iron phosphate (LiFePO<sub>4</sub>) material, which has good safety performance and long cycle life;
- (2)The battery system uses a high-performance BMS battery management module, which has multiple protection functions such as overcharge, over-discharge, over-current, and temperature, and enables good communication between the battery system and the host;
- (3)Automatic charge and discharge management, the monitoring unit automatically measures the charge and discharge current of the battery and performs floating charge and cycling charge management on the battery;
- (4)Battery control technology is effectively combined with computers to monitor and control various parameters and status in real time;
- (5)Flexible configuration: multiple sets of battery modules connected in parallel can meet the requirement of high-power consumption;
- (6)Adopting self-cooling method, the whole system has low operation noise.

## IV. Product Parameters

Table 1 IV product parameters

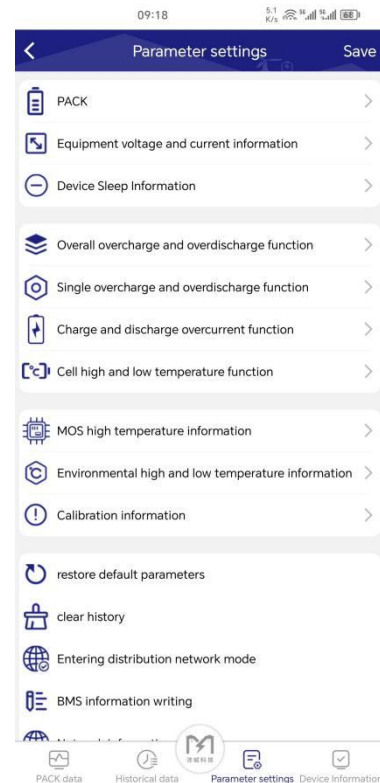
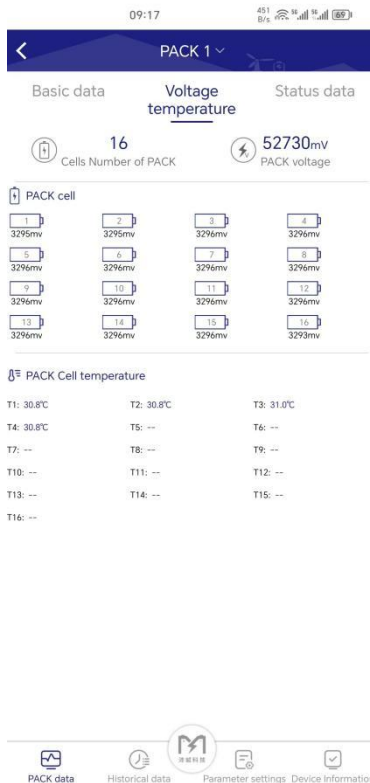
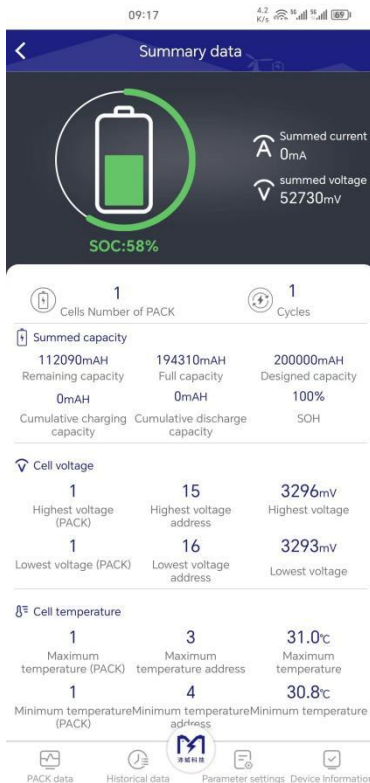
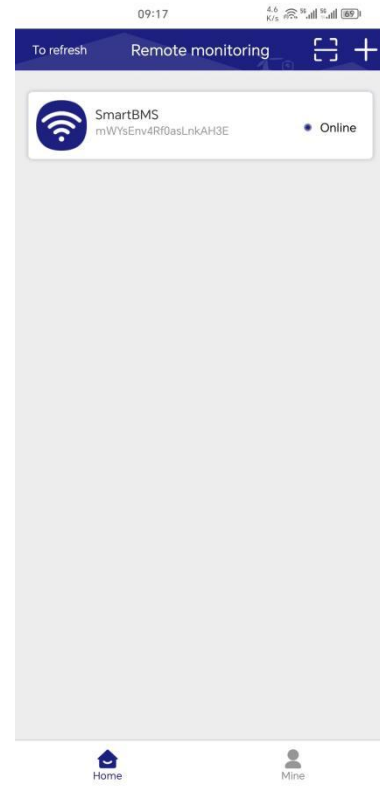
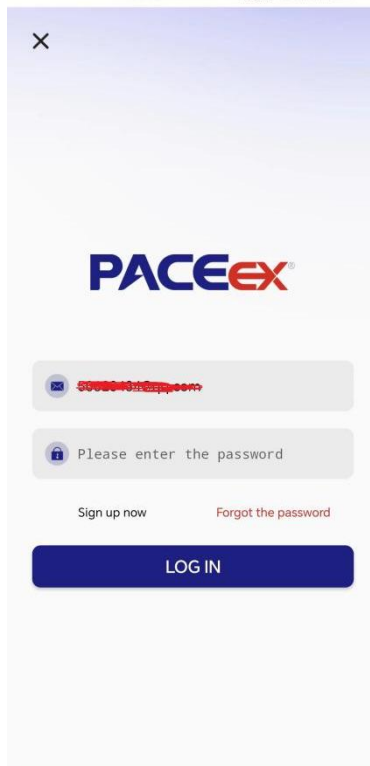
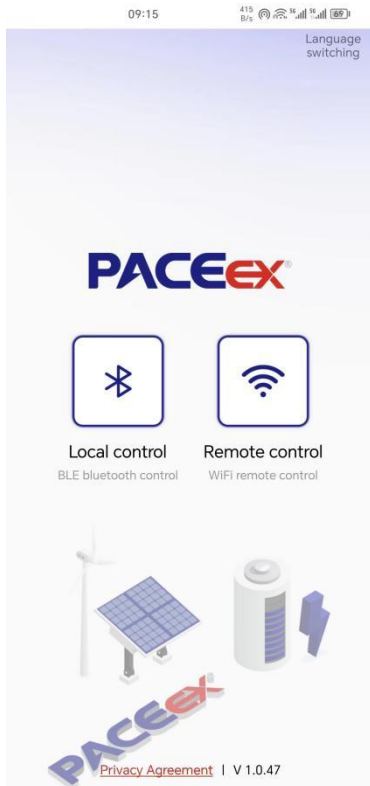
Specifications and models	NSFE100P10/DS	NSFE200PC5/DS	NSFG100P10/DS	NSFG200PC7/DS	NSFG280PC5/DS	FLCD-30048
Cell						
Capacity	100Ah	100Ah	100Ah	100Ah	280Ah	300Ah
Nominal voltage	3.2V	3.2V	3.2V	3.2V	3.2V	3.2V
Internal resistance standard	≥0.5mΩ	≥0.5mΩ	≥0.5mΩ	≥0.5mΩ	≥0.5mΩ	≥0.5mΩ
Combination method	8S1P	8S2P	16S1P	16S2P	16S1P	16S1P
Finished product parameters						
Nominal capacity	100AH	200AH	100AH	200AH	280AH	300AH
Minimum capacity	100AH	200AH	100AH	200AH	280AH	300AH
Rated voltage	25.6V	25.6V	51.2V	51.2V	51.2V	51.2V
Maximum charge voltage	28.15V	28.15V	56.15V	56.15V	56.15V	56.15V
End-of- discharge voltage	22.4V	22.4V	44.8V	44.8V	44.88V	44.88V
Charge current	50A	100A	50A	100A	100A	100A
Working current	100A	200A	100A	200A	200A	200A
Weight(KG)	24	46.5	46.5	93	140	141
Dimension (MM)	370*160*400	370*160*600	370*160*600	500*160*850	852*588*260	852*588*260
Suitable for charging						
Standard	50A	100A	50A	100A	100A	100A
Quickly	100A	200A	100A	200A	200A	200A
Operating temperature						
Charge	0℃~55℃	0℃~55℃	0℃~55℃	0℃~55℃	0℃~55℃	0℃~55℃
Discharge	-15℃~65℃	-15℃~65℃	-15℃~65℃	-15℃~65℃	-15℃~65℃	-15℃~65℃

## Wifi and Bluetooth

### Mobile Operation Interface

To operate the mobile phone, the mobile App need to be installed firstly. Following the indication after the installation is completed: Register-Select a country-Email registration. After the registration is completed, the interface of adding devices will be appeared. Clicking to add a device, the phone will display the batteries nearby. Choosing a battery randomly to bind it. Then the network configuration interface will be appeared. Selecting an available network, after the connection is done, the APP will return to the battery network selection interface, selecting the connected network, after entering the password, the mobile app will connect with the battery. After the connection is done, the APP will display the device. Here the device name can be modified and saved. After saving, the device name interface will be appeared. After

clicking the device and entering the APP, the battery information can be showed. The battery-related parameters in the parameter setting interface can be set and the battery BMS communication protocol in the device information interface can be selected.



**Note:** The battery needs to be turned on when connected to the distribution network. The Bluetooth and GPS functions of the mobile phone are turned on to ensure the WIFI is 2.4GHz. Other signal sources such as 5G will not be connected successfully!

## V. Product Description

Figure 1 the sketch of front interfac

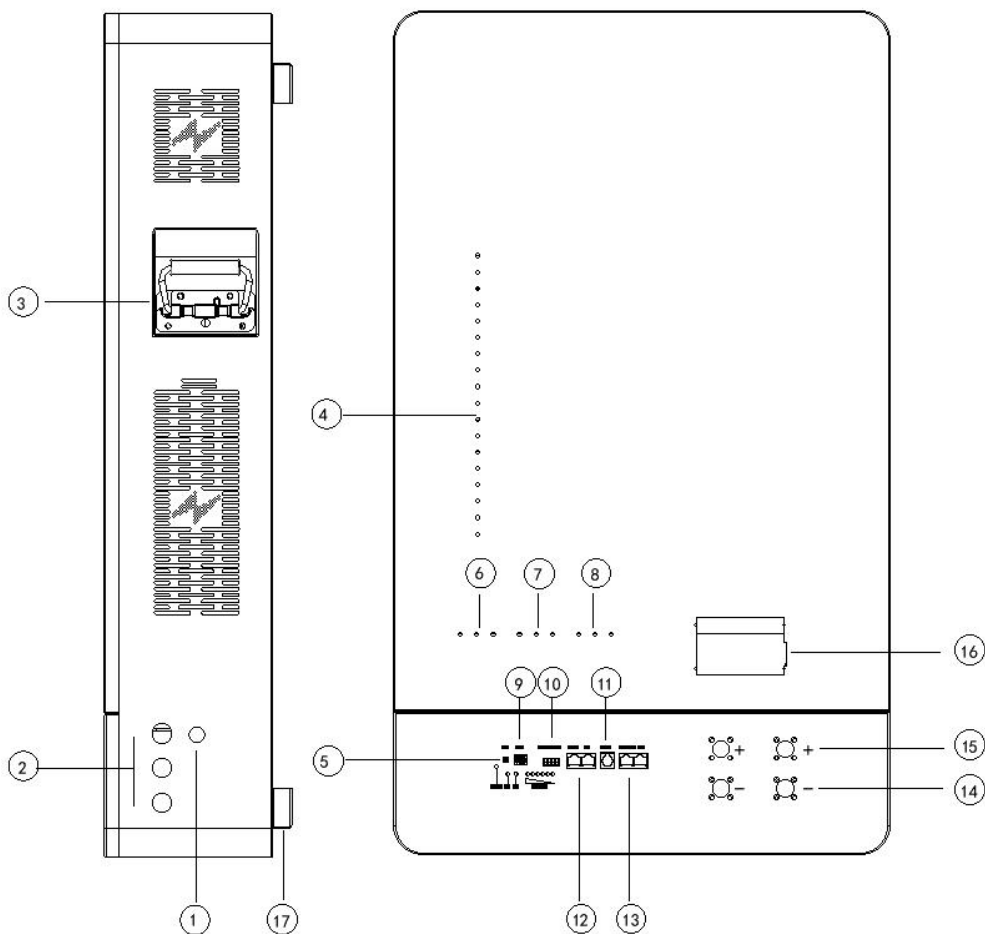


Figure 2 the sketch of left side and back side








1	Switch	10	Dry contact
2	Power output terminal	11	Port of 232:Host computer interface
3	Battery Handel	12	Port of RS485/CAN: connect with RS485/CAN port of inverter
4	Light of capacity	13	Port of parallel
5	Reset	14	Negative terminal outlet
6	Power indicator	15	Positive terminal outlet
7	Alarm Lights	16	Display
8	Running Lights	17	Battery bracket
9	DIP Switch		

Table 2 interface definition

## VI. Installation Preparation

### 1. Check if all accessories are included according to the packing list

Table 3 packing items

Battery*1		Terminal screws*4	
Expansion screws*6		Expansion screw spacer*6	
Battery bracket*1		Specification*1	
Communication cable*1			

This is the accessories of 25.6V100Ah. The quantity of expansion screws and spacers will be different for different models.

Communication cables maybe more depends on customer needs.








The above are accessories for 25.6V100AH

51.2V200AH accessories: expansion screws/gaskets\*6 sets

Communication cable according to customer requirements

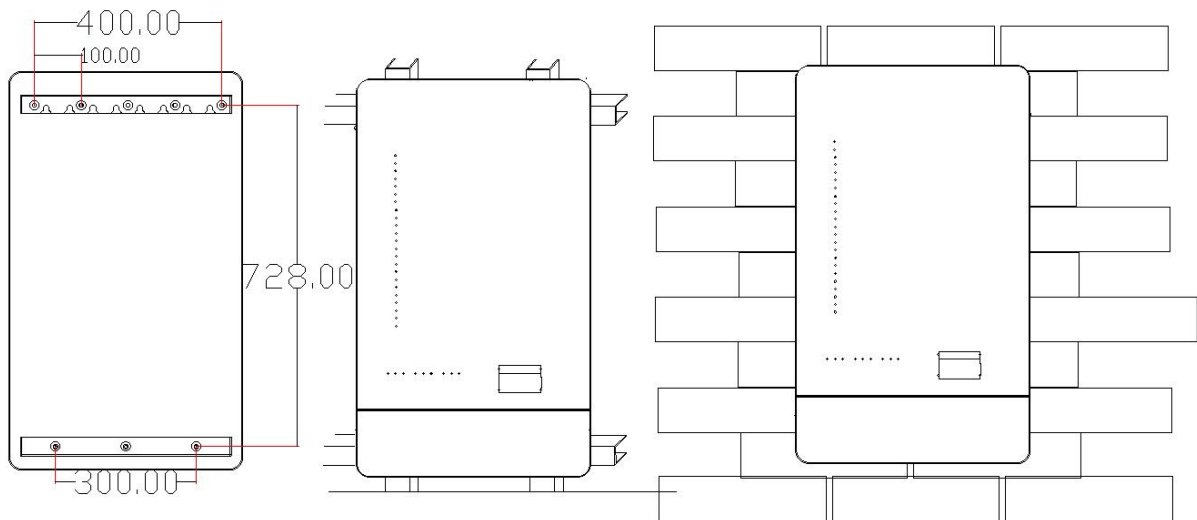
The battery and instructions are subject to the actual product.

2.Preparing tools before installation

			
Screw for removing battery cover	Screw for locking output terminal	Screw for Installing battery bracket	Drill holes for installing battery holder
			
Insulated gloves to prevent electric shock	Insulated shoes to prevent electric shock	Blinkers	

## VII. Installation and Operation

Figure 3 Wall installation



(Battery specifications are different. Before installing the bracket holes, measure the actual object and then drill holes!)

1. Select a solid load-bearing wall and mark the location, based on the distance of the battery bracket mounting holes;
2. Use a 10mm drill to drill a hole of about 75mm, insert the expansion screws, and tighten the expansion screw hooks;
3. Install the battery bracket to the backside of the battery, and note that all 6 screws need to be locked;
4. Lift the battery and hang it with the notch on the battery bracket on the back aligned with the expansion screw hook;
5. Battery and inverter connection
  - 1) Single battery connection method

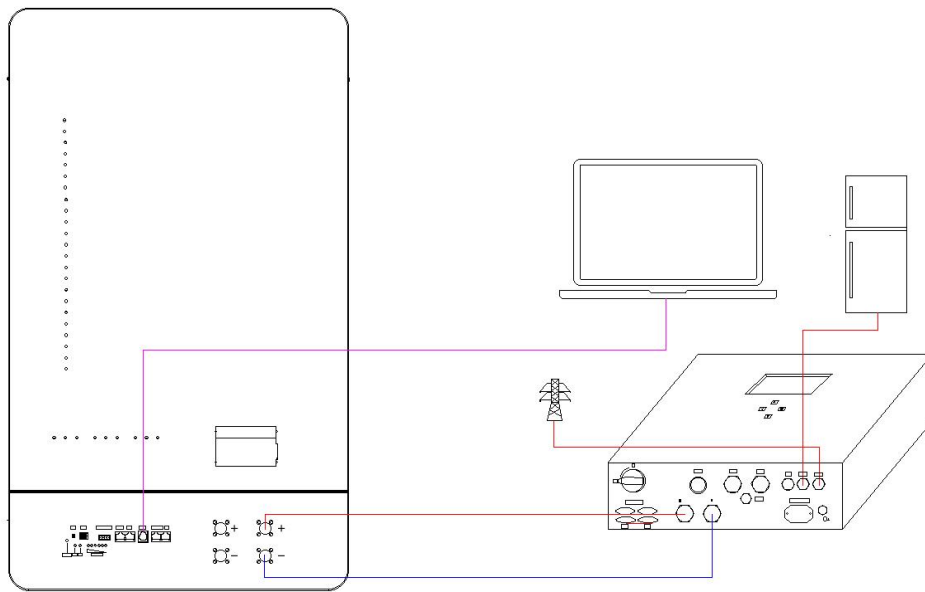
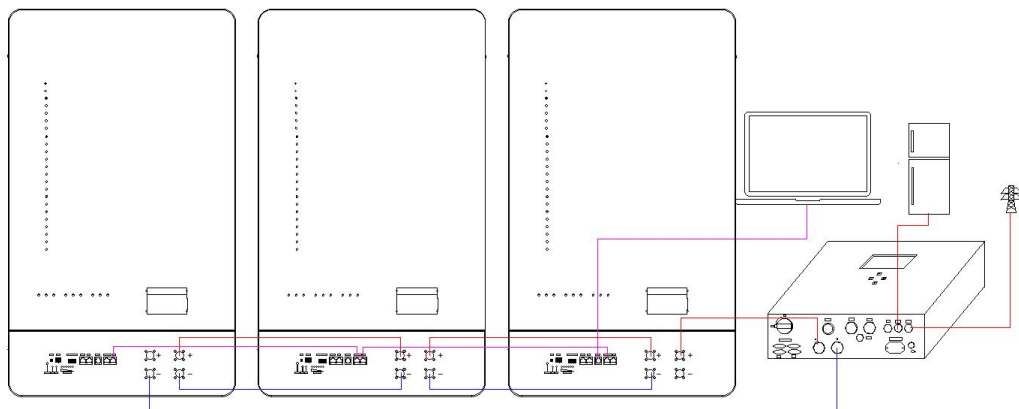


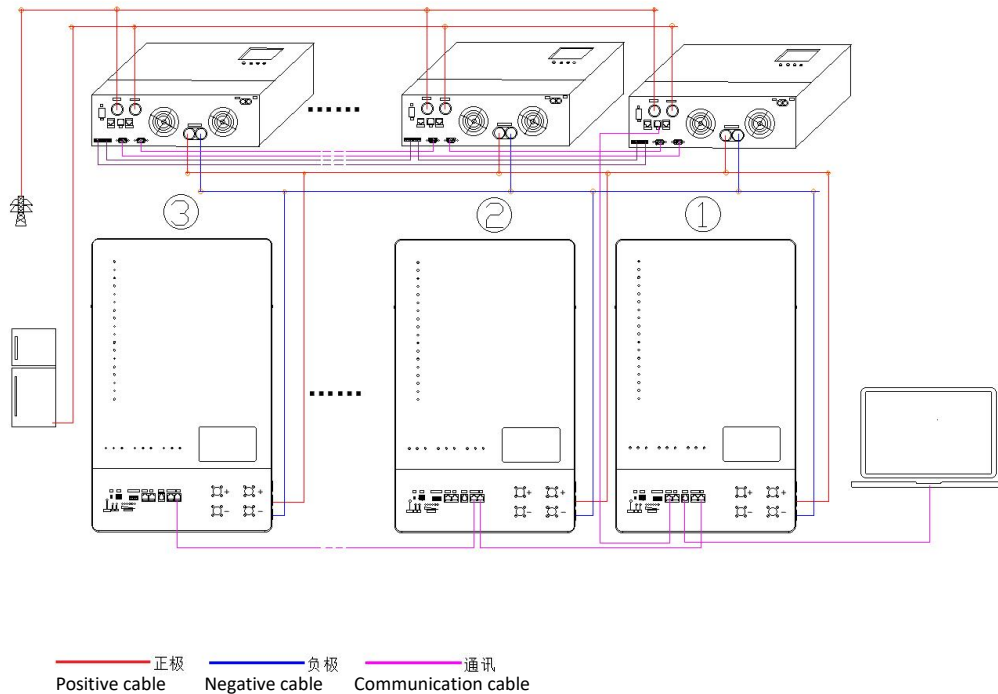
Figure 4 single battery connect with inverter

2) Parallel connection method for three groups or less (circular connection)

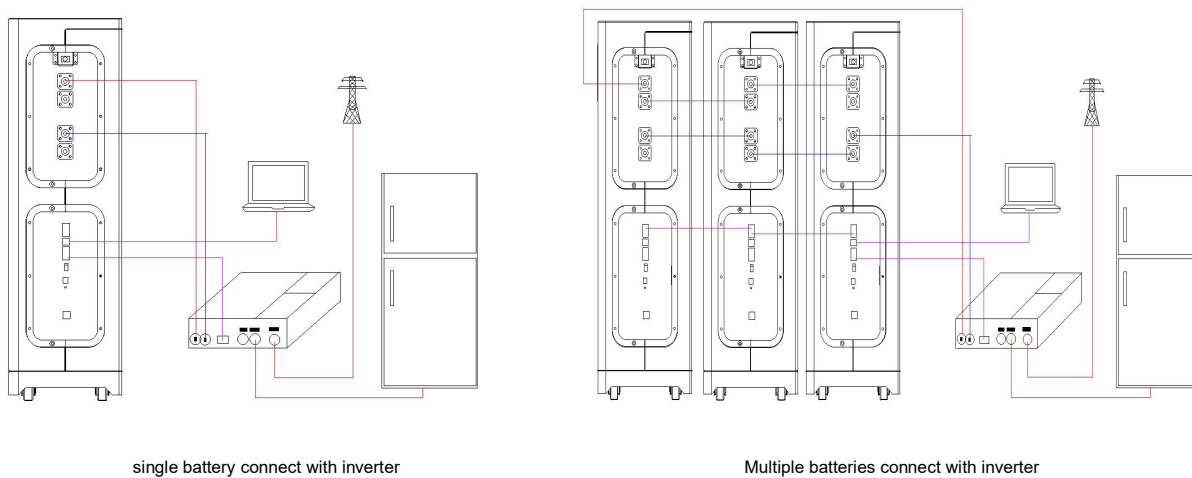


3) Multiple batteries connected in parallel (busbar connection)

3) Multiple sets of batteries are connected in parallel (busbar type). The picture below shows multiple batteries connected in parallel. The inverter is SREN. Other brands can be connected according to the inverter manual.



4) The connected way of Floor-Stand type batteries(the terminal connection, communication setting, and dialing code are same)



5) Parallel Connection Notes:

\*Before connecting the batteries in parallel, make sure that the voltage difference between each group of

battery pack is less than 0.5V;

\*Measure the internal resistance of each battery pack before paralleling, and the difference in internal resistance between the battery packs should be less than 3mΩ.

\*The length of the wires of all battery pack should be the same as far as possible to ensure the average shunt.

\*Selection of the connecting wires for parallel connection

Table 4 load power VS. Power cable diameter

load power	Power diameter	cable	load power	Power diameter	cable	load power	Power diameter	cable
3KW	25mm <sup>2</sup>		5KW	25mm <sup>2</sup>		8KW	50mm <sup>2</sup>	
10KW	50mm <sup>2</sup>		15KW	75mm <sup>2</sup>		20KW	95mm <sup>2</sup>	

Figure 6 communication cable connection between battery

packs

## 6. Battery communication instructions

### 1) Communication cable connection between battery packs

\*The connection cable is a regular network cable

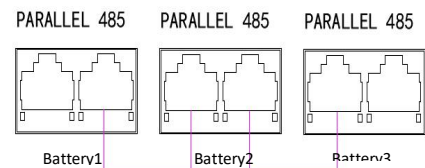
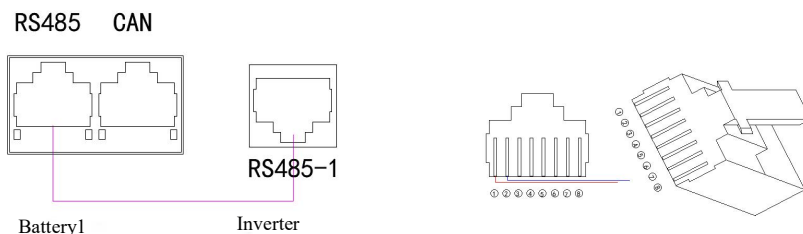


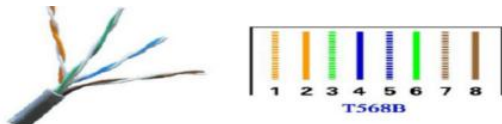
Table 5 a regular network cable

Serial No.	1	2	3	4	5	6	7	8
Colors	orange-white	orange	green-white	blue	blue-white	green	brown-white	brown

### 2) Communication connection between battery pack and inverter

Figure 7 communication cable connection between battery pack and inverter

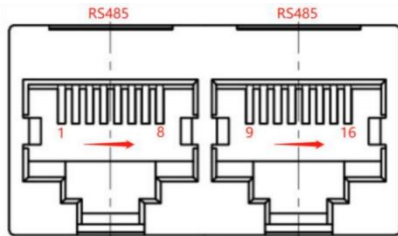




Number	1	2	3	4	5	6	7	8
Color	Orange White	Orange	Green White	Blue	Blue White	Green	Brown White	Brown

4

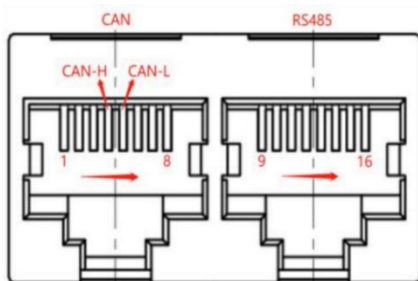
### 3) Battery side communication interface PIN description



parallel communication

#### RS485 - using 8P8C vertical RJ45 socket

RJ45 pin	Definition notes	RJ45 pin	Definition notes
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



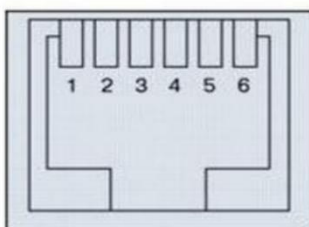
CAN and RS485 Interface

#### CAN - using 8P8C vertical RJ45 socket      RS485 - using 8P8C vertical RJ45 socket

RJ45 pin	Definition notes	RJ45 pin	Definition notes
1/2/3/6/8	NC	9、 16	RS485-B1
4	CAN-H	10、 15	RS485-A1
5	CAN-L	11、 14	GND

#### RS485 - using 8P8C vertical RJ45 socket

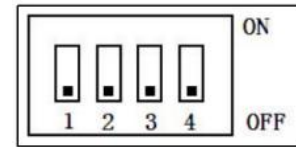
RJ45 pin	Definition notes	RJ45 pin	Definition notes
1、 8	RS485-B1	9、 16	RS485-B1
2、 7	RS485-A1	10、 15	RS485-A1
3、 6	GND	11、 14	GND
4、 5	NC	12、 13	NC



RS232 Communication

### 7. Battery parallel connection communication address description

After checking that the communication cable and power cable are connected normally, dial the code, when the batteries are used in parallel, the address can be set by the dip switch on the BMS to distinguish the



different batteries, and the address should be avoided to be set as the same, refer to the following table for the definition of the dip switch of the BMS, under the parallel mode, the default dialing address of 1 is the host computer.

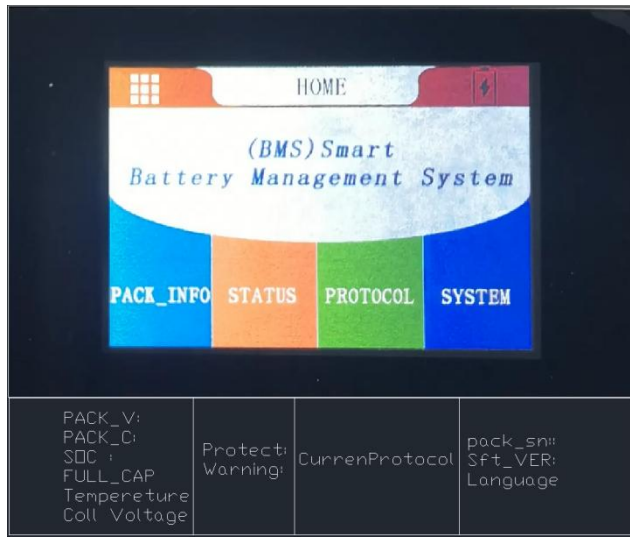
Address	dialing code setup			
	#1	#2	#3	#4
0	OFF	OFF	OFF	OFF
1	ON	OFF	OFF	OFF
2	OFF	ON	OFF	OFF
3	ON	ON	OFF	OFF
4	OFF	OFF	ON	OFF
5	ON	OFF	ON	OFF
6	OFF	ON	ON	OFF
7	ON	ON	ON	OFF
8	OFF	OFF	OFF	ON
9	ON	OFF	OFF	ON
10	OFF	ON	OFF	ON

### 8. Switching on and off

(1) Press the power button switch to energize the battery; when the machine is in parallel, the interval between the two batteries should be less than 30s;

2) Press the button switch to turn off the power, and the battery will be disconnected.

### 9. Interface display



10.LED working status indication

Mode	Normal/Alarm/Protection	ON/OFF	RUN	ALM	LED Power Indicator LED						Instruction
		●	●	●	●	●	●	●	●	●	
Turn off	Sleep	Off	Off	Off	Off	Off	Off	Off	Off	Off	All off
Stand by	Normal	Ever-bright	1Flash1	Off	Based on power indication						Standby mode
	Warning	Ever-bright	1Flash2	3Flash 3	Based on power indication						Module low voltage
Charge	Normal	Ever-bright	Ever-bright	Off	Based on power indication (power indication up to LED flash 2)						Maximum charge LED flashes
	Warning	Ever-bright	Ever-bright	3Ever-bright	Based on power indication						
	Overcharge protection	Ever-bright	Ever-bright	Off	Always on	Always on	Always on	Always on	Always on	Always on	If there is no utility power, the indicator light turns to standby mode
Discharge	Temperature	Ever-bright	Off	Ever-bright	Off	Off	Off	Off	Off	Off	Stop charging
	Normal	Ever-bright	3Flash 3	Off	Based on power indication						
	Warning	Ever-bright	3Flash 4	3Flash 5	Based on power indication						
	Overcharge protection	Ever-bright	Off	Off	Off	Off	Off	Off	Off	Off	Stop discharging
	Temperature	Ever-bright	Off	Ever-bright	Off	Off	Off	Off	Off	Off	Stop discharging
Run out		Off	Off	Ever-bright	Off	Off	Off	Off	Off	Off	Stop charging and discharging

Table 6: LED Working Status Indication

Flashing mode	On	Off
on1	0.25S	3.75S
on2	0.5S	0.5S

on3	0.5S	1.5S
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Table 7: LED Flashing Description

### 11. Buzzer action description

In case of fault, it will beep 0.25S every 1S;

In case of protection, it will beep 0.25S every 2S (except for over-voltage protection);

In case of alarm, it will beep 0.25S every 3S (except over-voltage alarm);

The buzzer function can be enabled or disabled by the host computer, and it is disabled by factory default.

### 12. Description of reset button

When BMS is in a sleep state, press the button (3~6S) and release it, the protection board will be activated, and the LED indicator will light up in turn from "RUN" for 0.5 seconds.

When BMS is active, press the button (3~6S) and release it, the protection board will be put to sleep, and the LED indicator will light up sequentially for 0.5 seconds starting from the lowest power lamp.

When BMS is active, press the button (6~10S) and release it, the protection board will be reset, and all LEDs will light up at the same time for 1.5 seconds.

After the BMS is reset, it still retains the parameters and functions set by the host computer. If you need to restore the initial parameters, you can do it by "Restore Default Values" of the host computer, but the related operation records and stored data remain unchanged (e.g., power consumption, cycle times, protection records, etc.).

### 13. Hibernation and Activate

#### \*Hibernate

When any of the following conditions are met, the system enters the low-power mode:

- 1) The single or overall over-discharge protection is not lifted within 30 minutes.
- 2) Press the key (3~6S) and release the key.
- 3) The lowest single unit voltage is lower than the hibernation voltage and the duration reaches the hibernation delay time (simultaneously satisfying no communication, no protection, no equalization, and no current).
- 4) Forced shutdown through the upper computer software.

Before entering hibernation, it is necessary to ensure that the input is not connected to an external voltage, otherwise it will not be able to enter the low-power mode.

\*Activate

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

- 1) Connect the charger, the output voltage of the charger should be more than 48V.
- 2) Press the key (3~6S), after releasing the key.
- 3) With RS232 activation.

Remarks: After single cell or whole battery pack over-discharge protection, enter into low-power mode, and wake up once every 4 hours to turn on the charging/discharging MOS. If it can be charged, it will exit from the hibernation state and enter into normal charging; if it can't be charged by 10 consecutive automatic activations, it will no longer be activated automatically.

When the system is defined as the end of charging, standby for 2 days (standby time setting value), and still has not reached the recovery voltage, forced to resume charging until the end of charging again.

## VIII. Alarms, troubleshooting

1	Cannot power on, fault indicator light on	Shut down, restart, and press the reset button to resume.
2	the screen does not light up	Check the battery run indicator and power indicator, if the battery works, the screen is burned out or the wiring is disconnected.
3	Battery not charging enough	Check that the inverter charge setting cutoff soc is set to 100%, check the voltage difference of battery cells, and if any single battery cell is fully charged.
4	Battery not fully discharged	Check if the inverter discharge setting cutoff soc is set to 0. Check the voltage difference of battery cells, and if any single battery cell discharge has been cut off.
5	Insufficient discharge time	Check on the display for excessive differential voltage
6	Can't turn off properly	Press the reset button to reset, if the reset is invalid and still cannot be reset after disconnecting the load, please contact us

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7	No output current	Check that the inverter mode setting is correct, and check that it is set to its input priority. Check that the battery is communicating properly with the inverter.
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## IX. Battery Maintenance

### 1. Notes before using the lithium battery:

- 1) Please read and keep this manual carefully.
- 2) Please pay attention to all the warning labels on the battery, do not tear or damage the warning labels.
- 3) Confirm that the battery model matches the inverter used before use, if the lithium battery and the inverter do not match may cause damage to the lithium battery and power-using equipment.
- 4) Check if the appearance of the lithium battery is intact, there is no obvious phenomenon such as breakage, liquid leakage, heat soak and smoke.

(5) To ensure the safety of transportation, lithium battery factory power is at about 30%, due to transportation and storage cycle processes due

the power consumption reasons, resulting in the first use of low or no power, this is a normal phenomenon, so do not worry about it, according to the charging instructions to replenish the power can be done.

(6) In the case of low temperature, the available capacity of lithium battery will have different degrees of attenuation, the specific reference degree is:

The specific reference level is as follows: -70% of the available capacity at 10°C, 85% at 0°C, and 100% at 25°C.

If the battery has an odor, abnormal heat, deformation and other abnormalities, please stop using it immediately, stay away from the battery and contact the after-sales department.



#### Warning:

The battery is not a user-serviceable part, if an abnormal phenomenon occurs, please contact the after-sales department for an overhaul.

Private disassembly of the battery will not enjoy the three warranty policy and may cause the battery to generate heat, smoke, fire, or explosion.

### 2. Charging environment:

- 1) Use charging equipment that matches the relevant parameters of the battery, do not use equipment with mismatched voltage for charging. Continuous charging current: 0.2 CA -0.5 CA is the best charging current.

- 2) Please charge the battery at ambient temperature 0°C ~ 45°C, make sure there is no flammable material in the surrounding area and well-ventilated.
- 3) Charging time instructions, the battery charging time is not more than 12 hours, overcharging will affect the battery life, and there are security risks.
- 4) The capacity of the battery rises fast during the primary charging, and rises slow at the end, this is a program set for charging safety and is a normal situation.
- 5) When charging in winter, and the outdoor temperature is lower than -20°C, the battery will stop charging, this is a normal phenomenon, please place the battery under the appropriate ambient temperature for charging to ensure the charging effect.
- 6) During the charging process, the surface of the battery pack chassis will have a temperature rise effect, which is a normal phenomenon, please rest assured that the used, pay attention to avoid children touching.

### 3. Storage environment:

- 1) Due to the internal resistance of lithium battery itself, there will be a certain self-consumption of battery power. Normally, there's power drop after placing for some time.
- 2) Please store the battery in an ambient temperature of -10 °C ~ 45 °C, do not store the battery in an environment higher than 50 °C, it may cause the battery overheating, fire or functional failure, life expectancy.
- 3) When the battery pack is not used for a long period of time, please do regular maintenance and charging, otherwise it may lead to a complete depletion of battery power and irreversible damage.
- 4) The most suitable storage capacity of the battery is 30%, if less than 10% or more than 50% of the capacity for long-term storage will lead to irreversible capacity degradation of the battery.
- 5) Lithium battery safe storage of self-depletion protection mode, the technical standards are as follows:
  - \* Long-term non-use, lithium batteries have a connection to the power equipment, and the safety period of up to 3 months, otherwise there may be a battery feed, can not be repaired problem.
  - \* Long-term non-use, the power is not less than 30%, stored separately, a safety period of a maximum of 6 months, otherwise there is a risk of battery feed, can not be repaired problems.
- 6) Avoid storing the battery in a place where there is a risk of falling, which may cause uncontrollable damage to the battery and may lead to battery leakage, heat, smoke, fire, or explosion.
- 7) Prohibit the use of strong static electricity and strong magnetic fields, otherwise, it is easy to destroy the battery safety protection device, bringing unsafe hidden danger.



#### Warning:

The above improper use of the battery caused by under voltage and abnormal feed is not within the responsibility of the manufacturer.

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### 4. Usage:

- 1) When wiring, be sure to confirm that the positive and negative poles of the lithium battery and the polarity of the connecting wires of the power-using equipment are connected correctly.

- 2) The first time you use the battery to replenish the battery first, because of transportation reasons the battery storage capacity is less than 30%.
- 3) During later use, please keep the battery capacity is not less than 10%, and timely charging, which can extend the battery cycle life.
- 4) In normal use, it is recommended to reduce long time and high rate discharge, following the battery specifications for use, which can extend the life of the battery.
- 5) The two ends of the battery connected to any conductor will cause an external short circuit, different types of batteries, short circuit may bring different degrees of severity of the consequences. Such as the battery can not be used, leakage, explosion, etc. Do not put the battery into a humid environment, and can not be mixed with the conductor, such as the pocket at the same time in the key, the battery, both may cause a short circuit.



Serious warning:

Avoid batteries in the rain or flushing, and soaking the battery in water. Internal short-circuit, lithium batteries have the risk of explosion and fire, and at the same time will lead to permanent failure of the battery.

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## **X.Cautions**

To prevent accidents such as leakage, abnormal heating, fire, degradation of performance, and explosion, please use the battery correctly according to the following specifications. The company is not responsible for any accidents caused by not operating according to the provisions of this manual.

- 1) Hold and place the battery gently to avoid violent vibration!
- 2) Do not immerse the battery and its accessories in water or other liquids, and pay attention to moisture!
- 3) Avoid short-circuiting the positive and negative outputs of the battery pack!
- 4) Prohibit the disassembly of the battery. Disassembling the battery may cause an internal short circuit, internal material decomposition, fire, explosion, etc. In addition, disassembling the battery may cause the electrolyte leaking; if the electrolyte splashes on the skin, eyes or other parts of the body, please flush with water immediately and see a doctor immediately!
- 5) It is forbidden to put the used battery into the fire, otherwise, it will cause explosions and other dangerous accidents!
- 6) If the battery is damaged, deformed, leaking electrolyte or smelling strange odor and other abnormal phenomena, do not use the battery again; please send it to the manufacturer's authorized office or the relevant agencies for proper disposal. In addition, the battery-leaking electrolyte should be kept away from fire sources to avoid causing an explosion!
- 7) Battery Replacement. Batteries should be replaced by the battery supplier and should not be replaced by the user without authorization!

- 8) Prohibit private disassembly. Users are not allowed to disassemble the battery pack and charger privately, otherwise, the company will not be responsible for any loss caused by this reason!
- 9) Prohibit the combination of different capacities, models, and varieties of batteries!
- 10) This product must be properly grounded before use to ensure your safety!