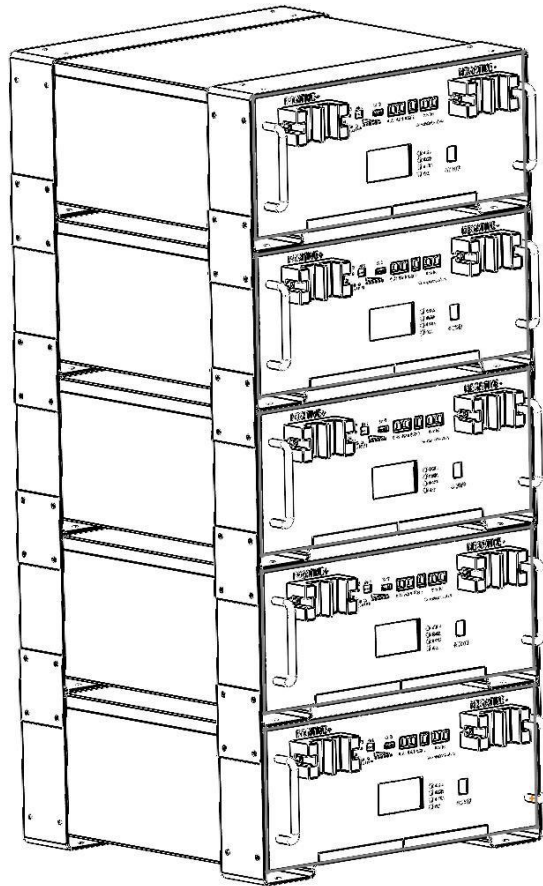


# Stackable Series

# AMPS

ADVANCED MOBILE POWER SYSTEMS

## Home energy storage battery



**RB48100**

## Rechargeable LiFePO4 battery User manual

This manual describes the RB48100 series. Please read this manual before installing the battery and follow the instructions carefully during the installation process. If you have any questions, contact the manufacturer immediately for help.



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# 1.Safety instructions



## WARNING

- 1) Before installing or using the battery, you must read the user manual (attached) carefully. Failure to do so or to comply with any instructions or warnings in this document may result in electric shock, serious injury or death, or may damage the battery and potentially render it inoperable.
- 2) If the battery is stored for a long time, it needs to be charged every six months, and the SOC should not be less than 90%.
- 3) The battery needs to be recharged within 12 hours of full discharge.
- 4) Do not install the product in an outdoor environment or in an environment beyond the operating temperature or humidity range listed in the manual.
- 5) Do not expose the cable to the outside.
- 6) Do not reverse connect the power terminal.
- 7) All battery terminals must be disconnected for maintenance.
- 8) If there is any abnormal situation, please contact the supplier within 24 hours.
- 9) Do not use detergent to clean the battery.
- 10) Do not expose the battery to flammable or harsh chemicals or vapors.
- 11) Do not paint any part of the battery, including any internal or external components.
- 12) Do not directly connect the battery to the photovoltaic solar line.
- 13) Warranty claims do not include claims for direct or indirect damages caused by the above items.
- 14) Do not insert any foreign object into any part of the battery.



## **WARNING**

### **1.1 Before Connection**

- 1) After unpacking, please check the product and packing list first, if the product is damaged or missing parts, please contact the local dealer.
- 2) Before installation, be sure to cut off the power grid and ensure that the battery is in off mode.
- 3) The wiring must be correct, do not confuse the positive and negative cables, and ensure that there is no short circuit with external devices.
- 4) Do not use AC power to connect the battery directly.
- 5) Battery embedded BMS design is 48VDC/51.2VDC, please do not series battery.
- 6) The battery must be grounded and the resistance must be less than 0.1 ohms.
- 7) Please ensure that the electrical parameters of the battery system are compatible with related equipment.
- 8) Keep the battery away from water and fire.

### **1.2 In Use**

- 1) If you need to move or repair the battery system, you must cut off the power and turn off the battery completely.
- 2) It is forbidden to connect batteries with different types of batteries.
- 3) Do not use faulty or incompatible inverters to connect the battery.
- 4) Do not disassemble the battery;
- 5) In case of fire, only dry powder fire extinguishers can be used, and liquid fire extinguishers are strictly prohibited.

6) Do not open, repair or remove the battery except by the manufacturer's staff or authorized by the manufacturer. We do not accept any consequences or liability arising from violations of safe operation, design, production and equipment safety standards.

## **2 Introduce**

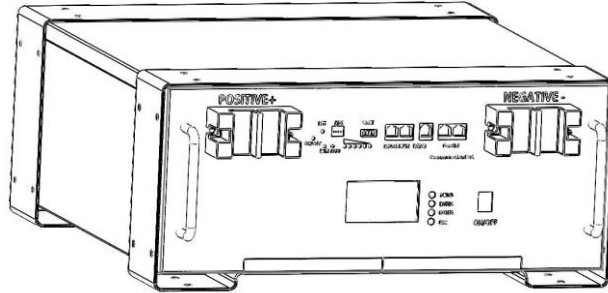
The LFP RB series lithium iron phosphate battery is a new energy storage product developed and produced by the AMPS team to provide reliable power support for a variety of devices and systems.

The LFP RB series has a built-in BMS battery management system, which can manage and monitor battery voltage, current, temperature and other information.

### **2.1 Product Features**

- 1) Built-in soft start function, when the inverter needs to start from the battery, can reduce the impact of current.
- 2) BMS dual active protection.
- 3) Supports up to 15 parallel groups.
- 4) Wake up is supported by the 5~12V signal of the RJ45 port.
- 5) The host controller CAN upgrade the battery module through CAN or RS485 communication.
- 6) Enable 95% discharge depth, which can be used for inverter operation in full compliance with the CAN protocol.
- 7) The module has non-toxic, pollution-free, environmental protection and other functions.
- 8) Lithium iron phosphate battery core, with good safety performance, long cycle life.
- 9) Battery management system (BMS) with over discharge, over charge, over current, high, low temperature and other protection functions.
- 10) The system can automatically manage the state of charge and discharge and balance the voltage of each battery.
- 11) Flexible configuration, multiple battery modules can be connected in parallel to expand capacity and power.
- 12) The method of natural cooling can reduce the overall noise of the system.
- 13) The module has less self-discharge and can be left on the shelf without charging for 6 months. There is no memory effect. Deep cycles are absolutely fine.

## 2.2 Product specification



### Product appearance and dimensions

TYPE:	RB48100
SIZE:	L500 W460 H210mm
Weight:	<51Kg

### 2.3 BMS Basic Function

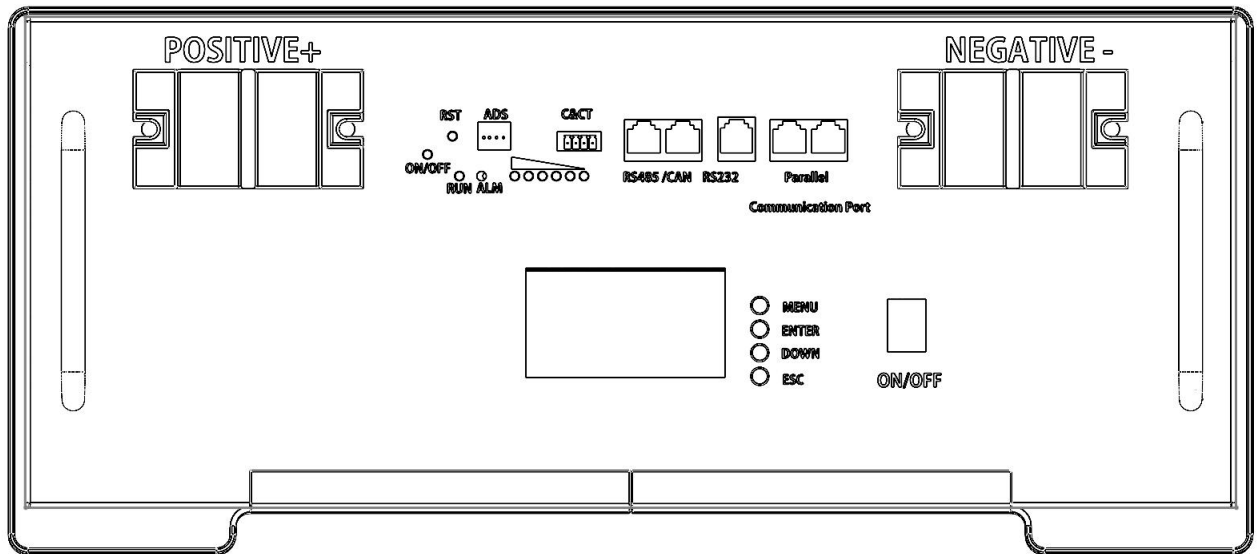
Protection and alarm	management and monitoring
Over discharge protect	Cell Balance
Charging overvoltage protection	intelligent charging model
Low voltage protection	charge/discharge current limit
Overcurrent protection	capacity retention calculation
High/low temperature protection	administrator monitoring
Short circuit protection	operation record
	Anti-reverse connection
	The inverter starts softly



### Battery Technical Specifications

Type	RB48100		
Nominal voltage	51.2V		
Nominal capacity	100Ah		
Power (Wh)	5.12Kwh		
Discharge cut-off voltage	40V		
Charge cut-off voltage	58.4V		
Recommended charging	<100A		
Maximum charging Current	100A		
Recommended discharge	<100A		
Maximum discharge current	100A		
Maximum load power	5KW		
Number of cells in series	16 pcs		
Communication	RS485/CAN		
Discharge depth	95%		
Operating temperature	Charge 0°C ~50°C		
	Discharge -10°C ~50°C		
Storage temperature	-20°C ~60°C		
Class of protection	I		
Humidness	5~95%(RH)		
Certificate	CE/UN38.3/MSDS		
Design life cycle	+10years (25°C/77°F)		
Cycles	>5000,25°C		

## 2.4 Device interface description



**POSITIVE** DC power positive pole

**NEGATIVE** DC power Negative pole

1) **Switch:** ON/OFF

a) ON: Start-Up

b) OFF: Power off during storage or transportation

2) **LCD screen: Battery information display**

(1) MENU

(2) ENTTER

(3) DOWN

(4) ESC

3) **Indicator light information**

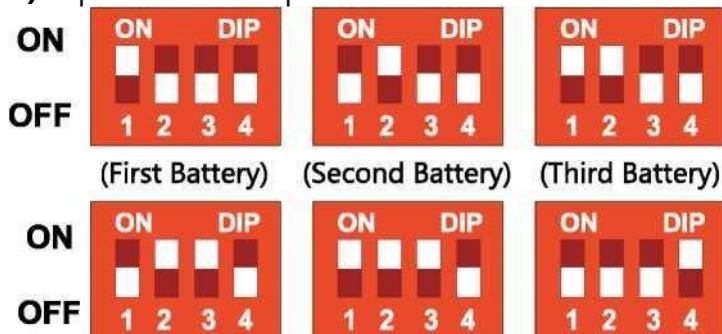
**ON/OFF::** The system is powered on

**RUN:** Green LED indicator shows the battery running status

**ALM:** Red LED Blinking indicates a battery alarm.;

 SOC: Power indicator

4) Dip switch description



The ADS dial code location corresponding address table is attached

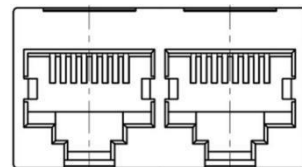
Address	DIP switch position			
	#1	#2	#3	#4
0	OFF	OFF	OFF	OFF
1	ON	OFF	OFF	OFF
2	OFF	ON	OFF	OFF
3	ON	ON	OFF	OFF
4	OFF	OFF	ON	OFF
5	ON	OFF	ON	OFF
6	OFF	ON	ON	OFF
7	ON	ON	ON	OFF
8	OFF	OFF	OFF	ON
9	ON	OFF	OFF	ON
10	OFF	ON	OFF	ON
11	ON	ON	OFF	ON
12	OFF	OFF	ON	ON
13	ON	OFF	ON	ON
14	OFF	ON	ON	ON
15	ON	ON	ON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

### 5) Dry contact output description

A) Dry contact 1-PIN1 to PIN2: normally open,  
Low battery



B) Dry contact 2-PIN3 to PIN4: normally open,  
Shutdown during fault protection

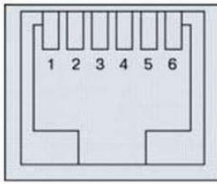


### 6) RS485/CAN

RS485--8P8C vertical RJ45 socket		CAN--8P8C vertical RJ45 socket	
RJ45 pin	Define the description	RJ45 pin	Define the description
1、 8	RS485-B1	9、 10、 11、 14、 16	NC
2、 7	RS485-A1	12	CANL
3、 6	GND	13	CANH
4、 5	NC	15	GND

## 7) RS232

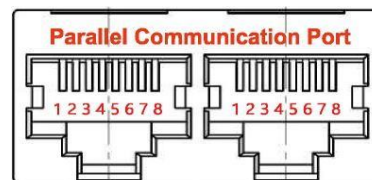
### RS232 Communication port difference



RS232 - with 6P6C vertical RJ11 socket	
RJ11 pin	Define the description
2	NC
3	TX ( Veneer)
4	RX (Veneer)
5	GND

RS232 connects the upper computer to the manufacturer or professional engineer.

## 8) Parallel communication port



### RS485 battery pack parallel function

a). In parallel mode, communication address 0001 is the primary battery string, and other communication locations are secondary batteries. The slave battery can communicate with the main battery pack through the RS485 port, and the main battery pack will collect all the slave battery data.

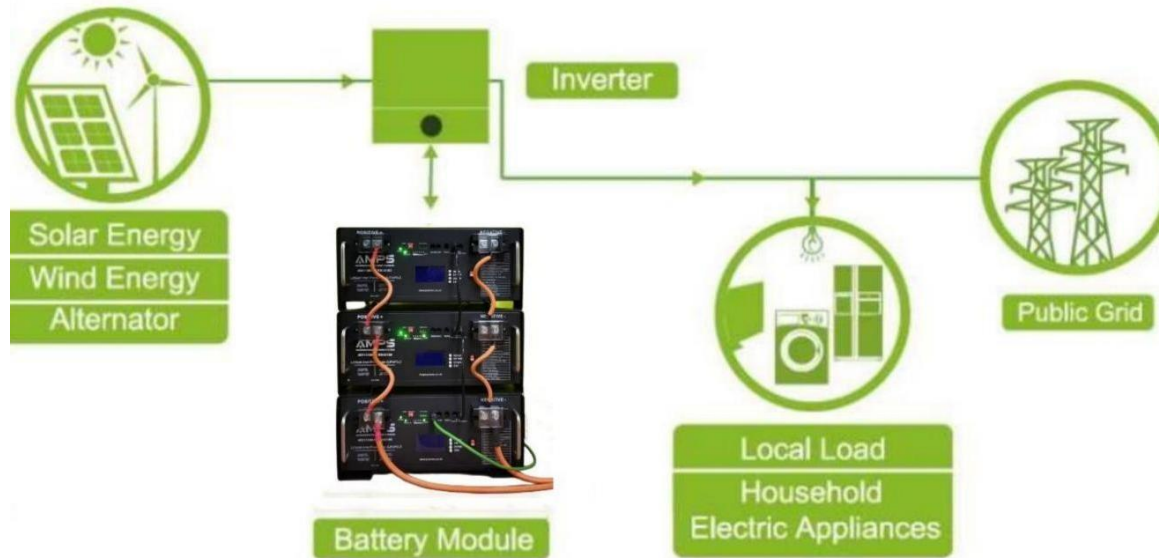
b). When in parallel state, only the main battery pack communicates with the PC host computer as a remote monitor, upload number, display status of all battery packs and

Using the RS485 parallel communication-8P8C vertical dual RJ 45 socket			
RJ45-A password	Definition specification	RJ45-B PIN	Definition specification
1、 8	RS485-B	1、 8	RS485-B
2、 7	RS485-A	2、 7	RS485-A
3、 6	GND	3、 6	GND
4、 5	NC	4、 5	NC

any other information.

### 3.Lithium battery installation guide

#### 3.1 Connection Scheme Diagram



#### 3.2 Before choosing an installation location, consider the following:

- Keep away from fire sources or inflammable and explosive materials.
- The ambient temperature should be somewhere in between 0°C and 45°C to ensure optimal operation.
- Make sure to keep a distance from the other objects shown in the picture on the right to ensure that there is enough heat dissipation and enough space to move and install the cable
- Use appropriate insulating tools to prevent accidental electric shock or short circuit. If no insulating tool is available, cover the entire exposed metal surface of the available tool with electronic tape.

### 4. Installation and operation

#### 4.1 Packing items (Open the packing and check the packing list)

- Battery pack \*1
- Two cables (1 \* black + orange; 1\* red + orange)  
1\*RS485 communication line
- Can be customized according to requirements: battery cable, communication cable, parallel cable, grounding cable, etc.
- User manual

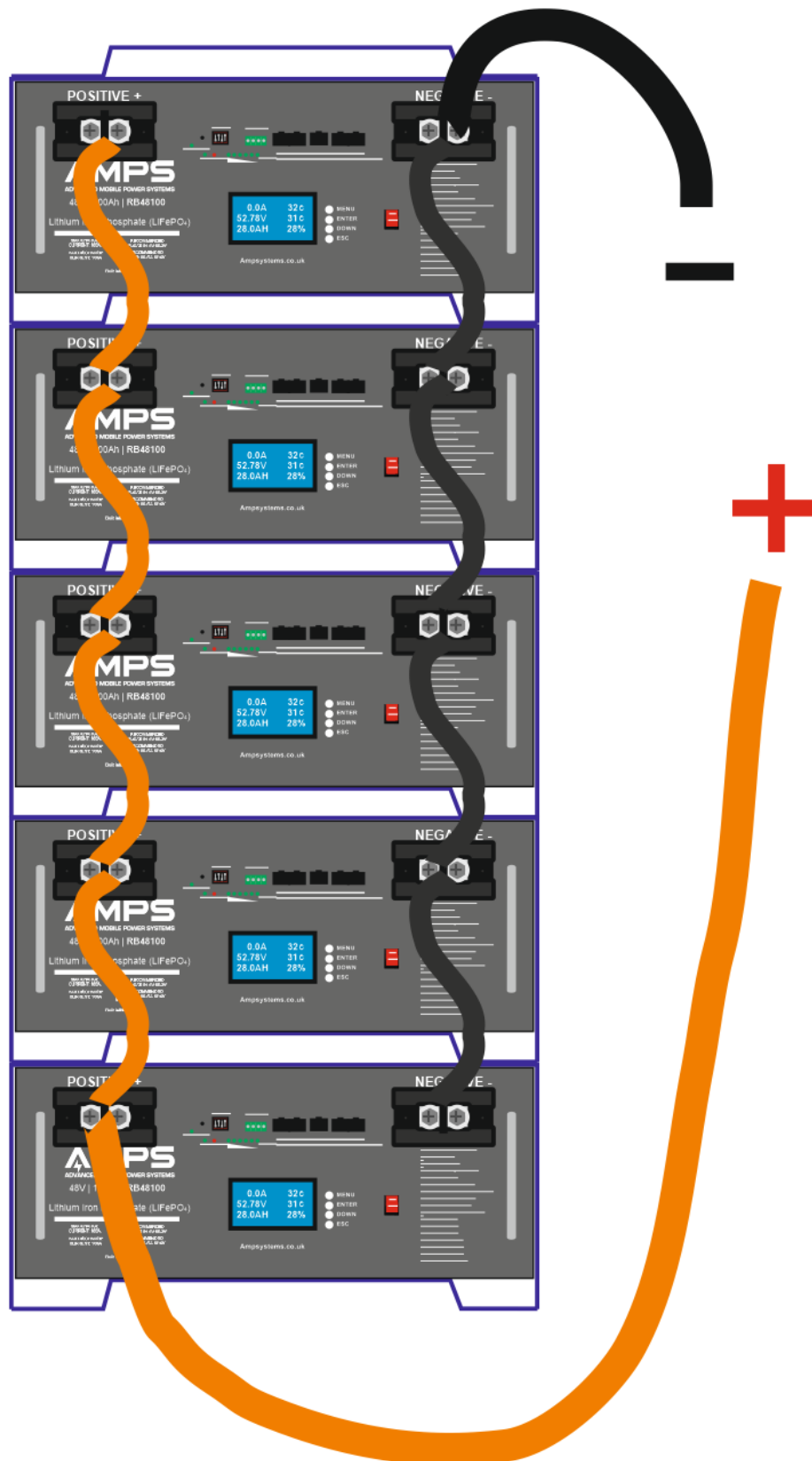


2 \* Parallel cable for battery parallel connection (black "-" / RED "+")

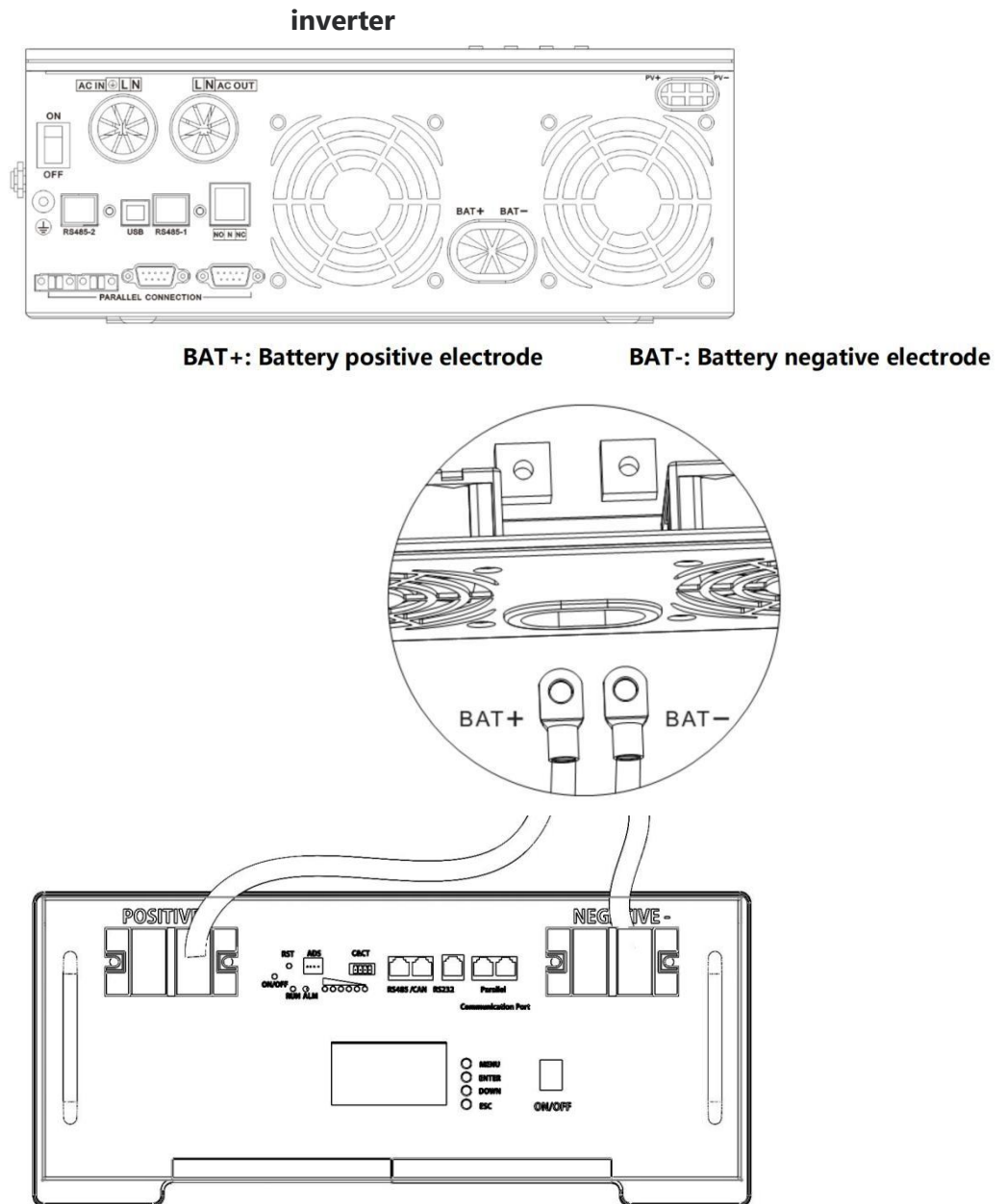


RS485/CAN communication link RJ45

## 4.2 Battery connection diagram



### 4.3 Connect the inverter



Connect the positive and negative cables of the battery to the positive and negative ports of the DC input of the inverter, and connect the communication line to the BMS/RS485 port on the inverter to complete the connection between the battery and the inverter.

### 5. On/Off Switch

a. Switching on: Press the on/off button to switch on the battery, and the battery will output after self-test.

B. Please refer to "2.3" of this manual for the description of the communication port and LED indication.

## 6. Troubleshooting

Problem-based determination

1. Whether the battery can be turned on.
2. If the battery is on, please check if the red light is off, flashing or on.
3. If the red light is off, check whether the battery can be charged and discharged.

### Possible conditions:

1. The battery won't turn on, turn on the switch, all lights are off or flickering.
  - 1.1. The capacity is too low, or the battery is over-discharged.
 

Solution: Use a charger or inverter to provide 57.6-58.4V.

    - A. If the battery can start, continue to charge the module and check the battery log with the monitoring tool.
    - B. If the battery terminal voltage is <40Vdc, please charge the module slowly with <0.05C so as not to affect the SOH.
    - C. If the battery terminal voltage is >40V DC, it can be charged with <0.5C.
    - D. If the battery does not start, please turn off the battery and repair it.
  - (2) The battery can be turned on, but the red light is on, and it cannot be charged or discharged. If the red light is on, it means that the system is abnormal, please check the following values.
    - 2.1 . Temperature: above 60°C or below 0°C, the battery cannot work.
 

Solution: Move the battery to the normal operating temperature range between 0°C and 50°C
    - 2.2. Current: If the current exceeds 250A, the battery protection will be turned on.
 

Solution: Check if the current is too high, if so, change the settings on the power supply side.
    - 2.3.High voltage: If the charging voltage exceeds 59.2V, the battery protection will be turned on.
 

Solution: Check if the voltage is too high, if so, change the setting on the power supply side discharge module.
    - 2.4. Low voltage: When the battery is discharged to 40V or lower, the battery protection will be turned on.
 

Solution: Charge the battery until the red light goes off.
    - 2.5. Unresolvable protection status: single-cell voltage is higher than 3.8 or lower than 2.0 or the temperature is higher than 80 degrees. Solution: Turn off the module and contact your local distributor for repair.
    - 2.6 . Broken Fuse
 

Solution: Turn off the module and contact your local distributor for repair.



### 3. Buzzer

#### 3.1. Cable Reverse Connection

Solution: Power off all batteries and inverters. Turn off the circuit breaker. Check the cable connections and disconnect all power cables. Check the power port for damage. Then try opening a single module without any cables connected. If there is no alarm, it is the reverse connection of the cable. Close the module and contact AMPS

#### 3.2 Buzzer Ringing

Solution: Power off all batteries and inverters. Turn off the circuit breaker. Check the cable connections and disconnect all power cables. Check the power port for damage. Then try opening a single module without any cables connected. If the buzzer still sounds. Close the module and contact your local distributor.

**Except for the above points, if the fault still cannot be determined, please turn off the battery and perform maintenance.**

## 7. Emergency Situation

### (1) Leaking battery

If the battery pack leaks electrolyte, avoid contact with the leaked liquid or gas. If anyone has been exposed to the spilled material, do the following immediately.

1.1 Inhalation: Evacuate contaminated area and seek medical attention.

1.2 Contact with eyes: Rinse eyes with running water for 15 minutes, then seek medical attention.

1.3 Skin Contact: Wash affected area thoroughly with soap and water and seek medical attention.

1.4 Ingestion: Cause vomiting and seek medical attention.

### (2) Fire

Use only dry chemical or carbon dioxide fire extinguishers; if possible, remove battery pack to a safe area before catching fire.

### (3) Wet the battery

If the battery pack gets wet or water gets in, contact your dealer for technical support. Turn off all power switches on the inverter side.

### (4) Battery Damage

Damaged batteries are dangerous and must be handled with great care. They are not suitable for use and may pose a danger to persons or property. If the battery pack appears to be damaged, return it to the dealer in its original container.

## **8. Remark:**

### **Recycling and Disposal**

If batteries (normal condition or damaged) require disposal or require recycling, they should be handled in accordance with local recycling regulations and use the best technology to achieve the relevant recycling efficiencies.

### **Maintenance**

1. Charge the battery at least once every 6 months, charge maintenance to ensure that the SOC charge is higher than 90%.
2. Every year after installation. It is recommended to check the connection of power connector, ground wire, power cable and screws. Make sure that the connection points are not loose, damaged or corroded. Check the installation environment for dust, water, insects, etc.
3. If the battery is stored for a long time, it needs to be charged every six months, and the SOC should be higher than 90%.