

Lithium Battery Energy Storage System

BW48A0-51.2V 100Ah User manual

Lifepo4 battery 51.2v 100Ah





Note: Please strictly follow all the warnings and operating instructions in this manual. Keep this manual properly and read the following instructions carefully before installing the equipment. Do not operate this equipment until you carefully read all safety information and operating instructions.

1. Safety Instruction

- Before installing or using the battery, please read the user manual carefully. Any failure to comply with the operations, instructions, and warnings contained in this document may result in electric shock, serious injury, death, or may damage the battery and the entire system.
- Installation, commissioning and maintenance must be completed by professional personnel.
- Live operation is prohibited. Before installation, disassembly or maintenance, the battery must be physically disconnected from the inverter and the power grid, and insulation tools must be used.
- Do not place metal tools, wires, or other conductive objects near the battery terminals.
- Use the original supporting cable, do not replace the diameter or material
- No exposure to dangerous environments, stay away from flammable and explosive gases, corrosive chemicals, salt spray and dust environments.
- Avoid direct sunlight and prohibit installation in open or uncovered areas.
- Users should not remove the battery housing or modify the internal circuit by themselves.
- If the battery is not in use for a long time, the switch needs to be closed and charged every three to six months, the charge level (SOC) should not be less than 80%
- Batteries need to be avoided touching children or pets, and protective fences at the installation position if necessary.
- Charge as soon as possible after the battery is fully discharged.
- Do not leave the cable exposed.

2. Important Safety Warning

- Do not clean the battery with a cleaning solvent.
- Do not expose the battery to flammable or corrosive chemicals or vapors.
- Do not paint any part of the battery (including internal or external components).
- Do not connect the battery directly to the photovoltaic solar line.
- Do not insert any foreign body into any part of the battery.
- The direct or indirect damage caused by the above matters shall not be covered by the warranty.

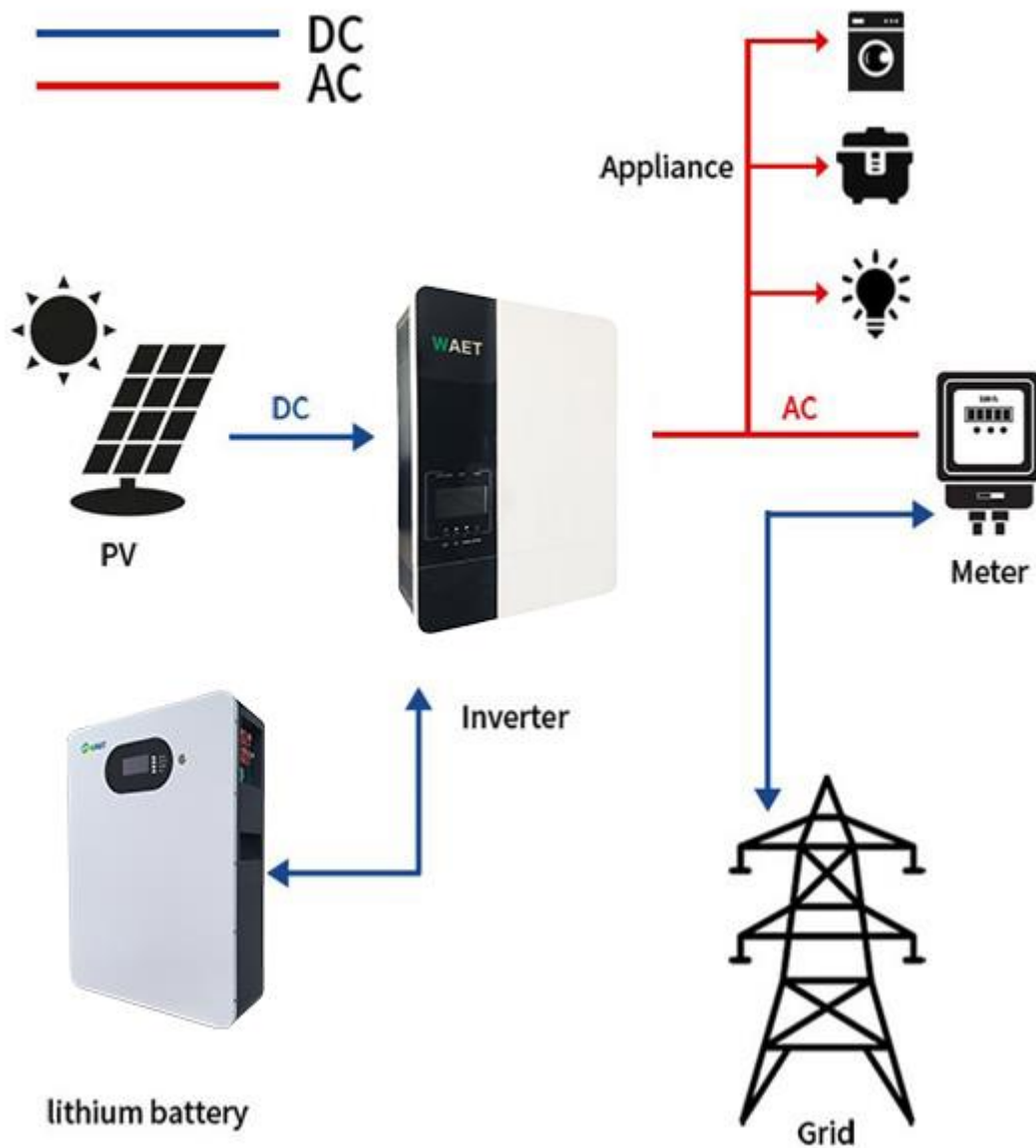
3. Introduction

A home energy storage battery is a device used for storing electrical energy, typically paired with solar photovoltaic systems or other renewable energy generation equipment. It can store excess energy during times of surplus power (such as during sunny days) and release it when power is insufficient or during outages (such as at night

or on cloudy days). This allows for flexible scheduling of household electricity use, thereby meeting the household's power needs. By optimizing energy utilization, home energy storage batteries not only reduce electricity costs but also increase the rate of self-sufficiency in energy, decreasing reliance on the grid. Additionally, they provide an emergency backup power function, offering more reliable power supply for homes. They are an essential tool in achieving a green, low-carbon lifestyle.

Product Usage Scenarios







Household energy storage battery application scenario schematic diagram



4. Before Connecting

4.1. Packing List

You will receive the following parts (Not a full set), sample as follow picture. For customized requirements, Please place an order with the manufacturer.

Battery pack	Inverter common cable(RJ45)	Power out positive cable
		
Power out Negative cable	Manual *1	Parallel common cable(RJ45)
		

4.2. Necessary installation Tools

Before installation, you must first prepare all the necessary installation tools, including a multimeter, electric screwdriver, screwdrivers, electrical tester, scissors, tape, power cables, communication cables, and so on.

The following image includes some of the essential tools.

			
Multimeter + Current clamp	Screw Driver Set	Allen Key Set	Drill + Hammer
			
Electrician Scissors	Wrench set	Lifting strap + mechanical lifter	RS 232/USB+screw terminal (insulated)

4.3. Personal protective equipment

You must use qualified personal protective equipment, including electrician's clothing, electrician's shoes, safety goggles, and electrician's boots.

The following figure shows some commonly used protective equipment.



4.4. More Detailed Safety Precautions

- 1) After opening the package, first inspect the battery for any visible damage, deformation, or leakage. Carefully check all accessories against the packing list to ensure completeness. If any damage is found or parts are missing, please contact the dealer or after-sales service immediately.
- 2) Before installation, always turn off the main battery switch and disconnect all power sources to ensure that work is carried out in a de-energized state, preventing electric shock or equipment damage.
- 3) Wiring must be performed by qualified personnel. All connections must be accurate and reliable. It is strictly prohibited to reverse or mix positive and negative cables. Ensure that there is no short circuit and that all connections to external equipment are secure and tight to prevent fire or equipment failure.
- 4) Do not connect the battery's positive and negative terminals directly to an AC power supply, as this may cause battery damage, overheating, or even explosion.
- 5) The Battery Management System (BMS) is specifically designed for a 51.2V DC system. Do not connect multiple batteries in series, as this may exceed the voltage range and trigger BMS protection or cause equipment failure.
- 6) Do not connect this battery with batteries of different types, models, capacities, or states of aging, as uneven charging and discharging may occur, leading to performance degradation or safety hazards.
- 7) When connecting two or more batteries in parallel, ensure that each battery's SOC (State of Charge) and voltage levels are approximately equal before connection. If not, charge them individually to the same level first to prevent circulating currents or battery damage.
- 8) Before connecting inverters or other electrical equipment, carefully verify that their electrical parameters (such as

voltage, current, and power rating) are compatible with the battery system's specifications to ensure stable system operation.

- 9) Store or install the batteries in a dry, well-ventilated area away from direct sunlight, fire sources, water sources, and flammable or explosive materials. Avoid exposing the batteries to high temperatures or humid environments, which can affect battery life and safety.

For any special requirements, please refer to the product manual or contact the manufacturer's technical support.

5. During operation

- 1) If the battery system needs to be moved or repaired, the power switch must first be placed off.
- 2) Do not connect the battery to different types of batteries.
- 3) Do not use the battery with a faulty or incompatible inverter.
- 4) In case of fire, only the dry powder fire extinguisher can be used, and the liquid fire extinguisher is prohibited. Do not open, repair, or remove the battery.
- 5) We shall not bear any consequences and related liabilities arising from the violation of the safe operation or the violation of the design, production and equipment safety standards.

6. Battery Information

6.1. Dangerous label

WARNING AVERTISSEMENT



1. Do not disassemble or alter the battery in any way.
Ne démontez ni modifiez la batterie en aucune façon.
2. Do not use the battery for purposes not described in its documentation.
N'utilisez pas la batterie à des fins non décrites dans sa documentation.
3. Do not drop, strike, puncture, or step on the battery.
Ne laissez pas tomber, ne heurtez pas, ne percez pas et ne marchez pas sur la batterie.
4. In case of electrolyte leakage, keep leaked electrolyte away from contact with eyes or skin, immediately clean with water and seek help from a doctor.
En cas de fuite d'électrolyte, évitez tout contact de l'électrolyte qui fuit avec les yeux ou la peau, nettoyez immédiatement avec de l'eau et demandez de l'aide à un médecin.
5. Do not put the battery into a fire. Do not use it or leave it in a place near fire, heaters, or high temperature sources.
Ne mettez pas la batterie au feu. Ne l'utilisez pas et ne la laissez pas à proximité de feux, de radiateurs, ou de sources de températures élevées.
6. Do not submerge the battery in water, or expose it to moisture.
Ne plongez pas la batterie dans l'eau et ne l'exposez pas à l'humidité.
7. Do not allow the terminals to contact exposed wire or metal.
Ne laissez pas les bornes entrer en contact avec du fil ou du métal exposé.
8. The battery is heavy and can cause injury if not handled safely.
La batterie est lourde et peut provoquer des blessures si elle n'est pas manipulée en toute sécurité.
9. Keep out of reach of children or animals. Tenir hors de portée des enfants ou des animaux.

6.2. Pack Specifications

Items	Specifications
Model No	BW48A0
Battery Chemistry	LiFePO4
Cell Specifications	100Ah * 3.2V
Capacity	5.12kWh

Nominal capacity	100Ah
Minimum capacity	98Ah
Nominal voltage	51.2V
Discharge cut-off voltage	40V
Charging mode (standard)	Constant Current / Constant Voltage
Standard charging current	100A
Maximum charge current	100A
Charging limiting voltage	58.4±0.40V
Discharge current (standard)	100A
Maximum discharge current	100A
Impedance	≤50mΩ
Factory capacity	50%~75%
Factory voltage	50~52V
Environmental temperature: standard charge	0°C~+45°C
Environmental temperature: discharge	-20°C~+60°C
Size	428 *590 *145±3mm
Weight	45±3Kg
Storage temperature	-30°C~+60°C
IP Rating of Enclosur	IP20
Cycle	≥6000
Certification	CE-EMC, UN38.3, MSDS

6.3. battery cell specifications

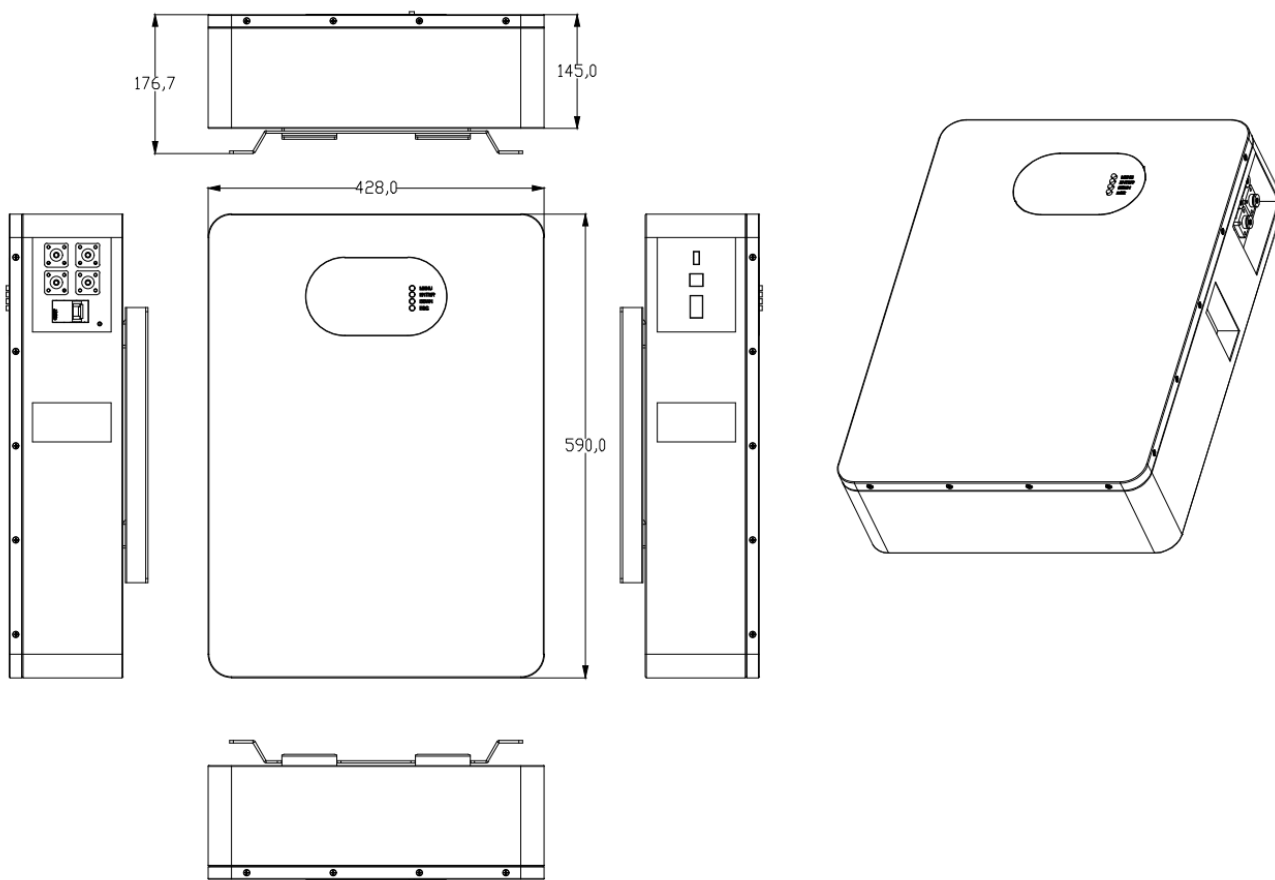
Item	specifications
Nominal capacity	100Ah (0.5C , 25±2°C)
Nominal voltage	3.2V
Charging limiting voltage	3.65V
Charging current	Standard charge: 0.2C
	Fast charging: 0.5C
Standard charging method	0.2C CC (constant flow) charging to 3.65V, and CV (constant voltage of 3.65V) charge until the charging current ≤ 0.02C
Discharge cut-off voltage	2.5V
Cell resistance	≤0.5mΩ
Working temperature	Charging: 0°C~+45°C; Discharging: -20°C~+60°C
Weight	2.0±0.1kg

6.4. Battery parameter settings on the inverter

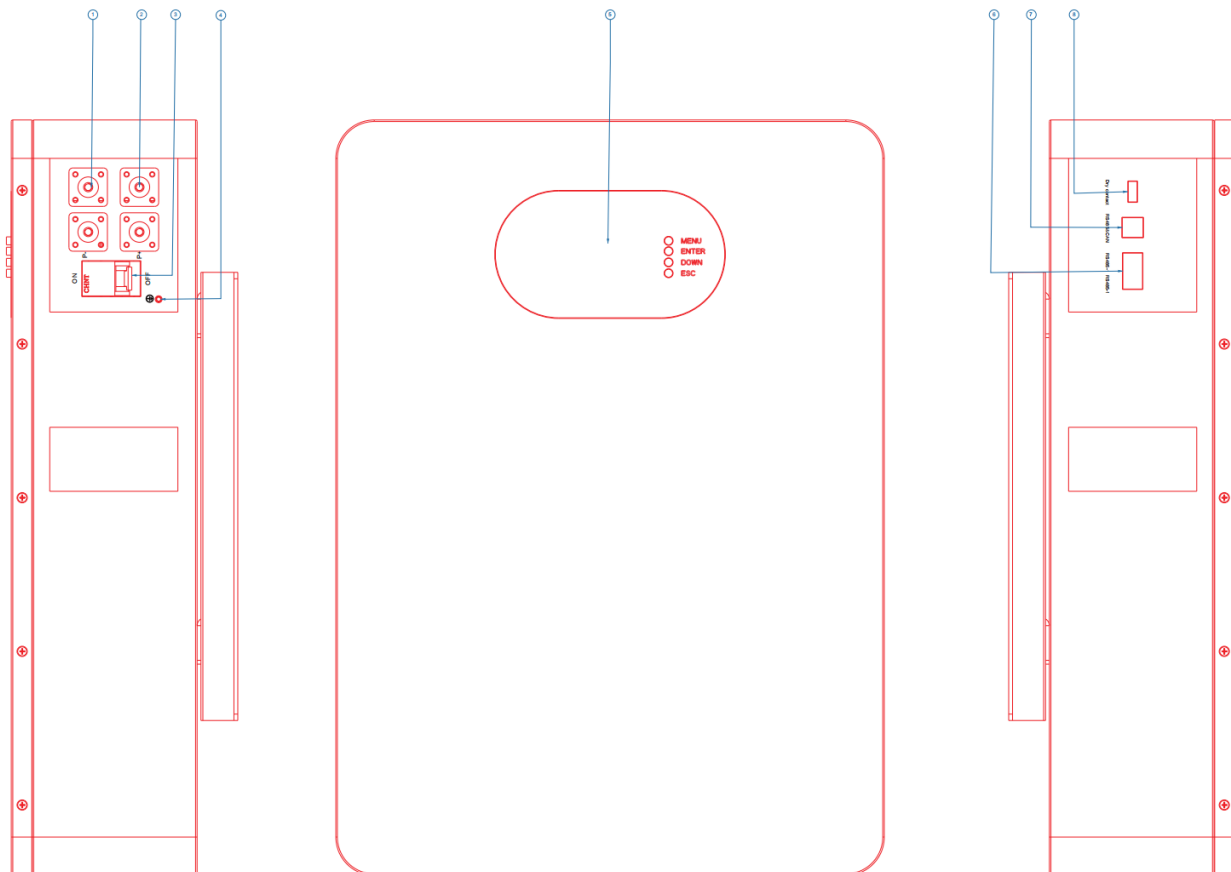
Max Charging (Bulk) Voltage	58.4V
Absorption Voltage	56.5V
Float Voltage	56V
Shut Down (cut off) Voltage	48V
Shut Down (cut off) SOC	10%
Restart Voltage	52V
Max Charge Current	100A

Max Discharge Current	100A
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6.5. Finished Battery Outline Diagram



6.6. Function interface description

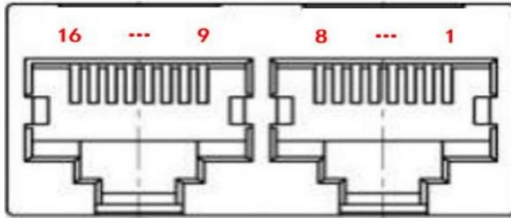


The panel markings correspond to the descriptions below

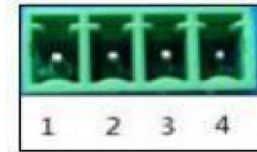
No.	Description	Silk-screen	Remark
1	Output terminal	P+	Output terminal
2	Output terminal	P-	Output terminal
3	Power Switch	ON/OFF	
3	LCD	Display Information	Display Pack Information
4	Earthing		The equipment is connected to the ground through a conductor.
6	RS485 port	RS485-1	RS485A and inverter connection port
7	RS485 port	RS485-2	RS485A and inverter connection port
8	Dry contact	Dry contact	

The definition of the switches is as follows

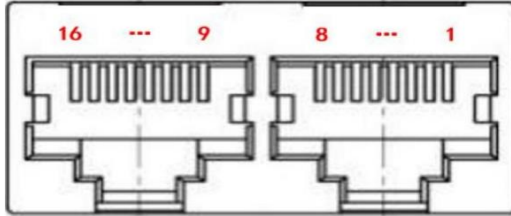
6.7. Communication Interface Description



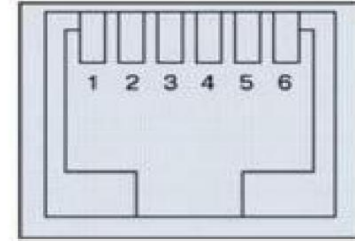
CAN & RS485



Dry Contact



RS485 Parallel Interface



RS232

RS232--Using a 6P6C Vertical RJ11 Socket	
RJ11 Pin	Note
1、2、6	NC
3	TX (Signal)
4	RX (Signal)
5	GND

CAN--Using a 8P8C Vertical RJ45 Socket		RS485--Using a 8P8C Vertical RJ45 Socket	
RJ45 Pin	Note	RJ45 Pin	Note
1、8	RS485-B1	9、16	RS485-B1
2、7	RS485-A1	10、15	RS485-A1
3、6	GND	11、14	GND
4	CANL	12	CANL
5	CANH	13	CANH

RS485--Using a 8P8C Vertical RJ45 Socket		RS485--Using a 8P8C Vertical RJ45 Socket	
RJ45 Pin	Note	RJ45 Pin	Note
1、8	RS485-B	9、16	RS485-B
2、7	RS485-A	10、15	RS485-A
3、6	GND	11、14、	GND
4	Automatic DIP Switch Input IN_DP+	12	Automatic DIP Switch Output ON_DP+
5	Automatic DIP Switch Input IN_DP-	13	Automatic DIP Switch Output ON_DP-

7. Pack Information Display

The various information of the battery can be viewed via the LCD screen on the PACK, including voltage, current, charging/discharging status, fault status, individual cell voltage, ambient temperature, cell temperature, remaining battery capacity (SOC), and the communication protocol settings between the PACK and the inverter.

When you turn on the PACK switch, the device displays the PACK's main information. Press the MENU button to access more detailed information.



Button Function:

- MENU: Display main information and enter the detailed menu.
- ENTER: Enter the selected menu item.
- DOWN: Select the next menu item or the next page of information.
- ESC: Return to the previous menu level.

You can view various information through button operations. The specific button operations are shown in the figure below.

The LCD can display the following information:

- Battery Voltage
- Operating Status
- Charge/Discharge Status
- Remaining Battery Capacity
- Battery Level
- Battery Health
- Battery Temperature
- Voltage of Each Battery Cell
- BMS Temperature
- Set Inverter Protocol

The system enters low-power mode under any of the following conditions:

- Single cell or overall overdischarge protection remains unresolved for 30 seconds.
- Pressing and releasing the button for 3 seconds.
- Lowest single cell voltage falls below the sleep voltage and remains for the sleep delay time (while simultaneously meeting no communication, no protection, no balancing, no current).
- Standby time exceeds 24 hours (no communication, no charging or discharging, no mains power).
- Forced shutdown via upper computer software.
- Disconnection of the low-voltage switch can control sleep mode.

Before entering sleep mode, ensure that no external voltage is applied to the input terminal; otherwise, lowpower mode cannot be entered.

8.2. Wake-up

When the system is in low-power mode, it exits low-power mode and enters normal operation mode under any of the following conditions:

- Connect the charger, and the charger output voltage must be greater than 48V.
- Press the button for 3 seconds and release it.
- Connect the communication cable and open the upper computer software (this method cannot wake up the protection board if it entered sleep mode due to overdischarge protection).

Note: After single cell or overall overdischarge protection enters low-power mode, the system wakes up every 4 hours, activating the charging and discharging MOSFETs. If charging is possible, it exits sleep mode and enters normal charging mode; if automatic wake-up fails to charge for 10 consecutive times, it will no longer automatically wake up.

When the system is defined as charging finished, if after standby for 2 days/48 hours (standby time setting) the recovery voltage is still not reached, it will be forced to resume charging until it reaches charging completion again.

8.Communication Description

9. Communication Description

9.1. RS232

BMS can communicate with the upper computer through the RS232 interface, allowing monitoring of various battery information such as battery voltage, current, temperature, status, SOC, SOH, and battery production information at the upper computer end. The default baud rate is 9600 bps.

9.2. RS485

It has two RS485 interfaces. One can be used for communication between the main pack and the secondary pack when the battery pack is in parallel. Through the RS485 interface of the main pack, all pack information can be viewed via RS232. The RS485 interface cannot be used for parameter setting or corresponding control operations.

The other RS485 interface can be connected to an upper computer or external device.

9.3. CAN

It has a CAN communication interface, which can be used for communication between battery packs when they are in parallel or connected to external devices. It enables the exchange of relevant information.