Battery Pack Product Specification Document

Battery Pack Model	51.2V628AH
Battery pack nominal voltage	51.2V
battery capacity	628Ah
Cell Type	lithium iron phosphate
date	

Specification Version Description

edition	Change Description	Author	date	remarks

catalogue

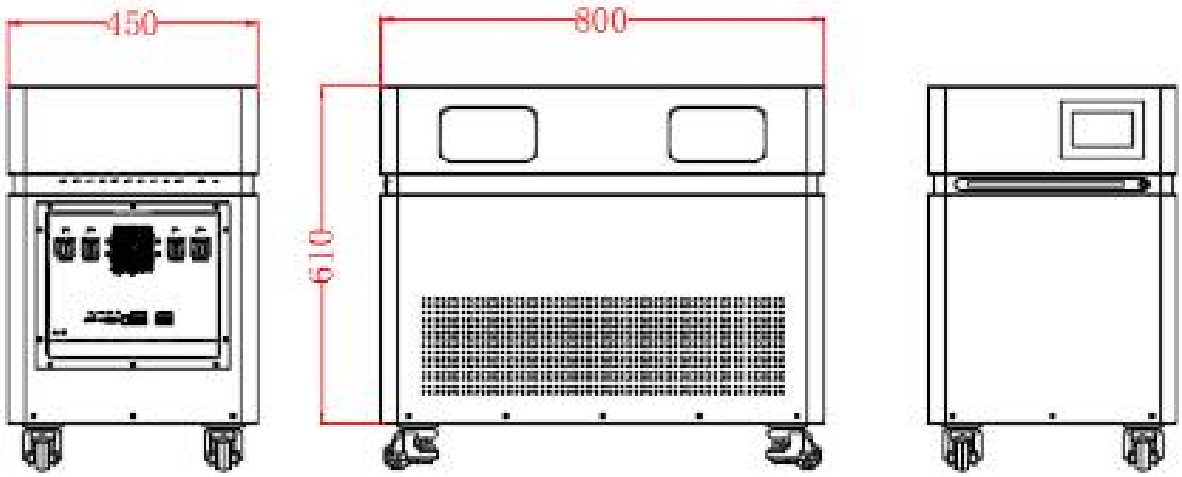
1. Product Overview

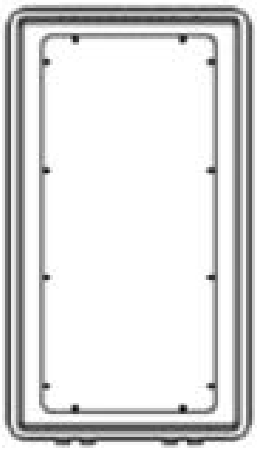
This product is a lithium iron phosphate battery pack (including BMS) composed of 16 cell strings, designed for loads operating within a current range of 200 A.

2. Product Technical Specifications

This product is a 48V 628Ah battery pack composed of 16S1P cells, with a maximum continuous charge/discharge current of 200A. It features Wi-Fi and Bluetooth connectivity, passive current limiting, dual RS485 communication ports, 500-cell storage capacity, and a white casing.

2.1 Product Structure Diagram of the Battery Pack





2.2 Technical Parameters of the Battery System

project		specifications	remarks
product model		**51.2V628Ah**	51.2V/628AH
nominal capacity		628AH	16 strings in parallel (16S1P)
nominal voltage		51.2V	3.2*16
Rated Energy (Wh) ±5%		32153	
display screen		5-inch touchscreen	
Charging Method		CC-CV (Constant Current, Constant Voltage)	
Discharge Method		constant-current discharge	
Charge/Discharge Port (Common or Dedicated)		Total Port	
communication port		RS485/CAN	
cooling-down method		natural cooling	
working temperature		-20℃~70℃	
Storage Humidity		10%~85%	
levels of protection		IP55	
Active Equilibrium		With active equalization function	
Battery Box Dimensions (Length * Width * Height) (mm)		800*610*450mm	
Battery weight tolerance: ±2 kg		236KG	
charge	Maximum Continuous Current	200A	CC&CV 200A
	cutoff voltage	58.4V	
	standard mode	Charging under ambient temperature (25±2) ℃ at a constant voltage of 58.4 V and a constant current of 100 A;	
discharge	Maximum Continuous Current	200A	

	overcurrent protection	205A	
	cutoff voltage	43.2V	
	standard mode	At ambient temperature (25 ± 2) °C, discharge the battery at a constant current of 100 A until the voltage reaches 2.7 V per cell (or 43.2 V total).	
Matching Inverter		CAN: Goodwe, Paine, Deye, Victron SMA, Pengcheng, Shouhang, Gurewatt, etc.	
		RS485: Sun Moon Yuan, Shuo Ri, Pylon, etc.	

3. Battery Management System (BMS)

3.1 Overview of BMS System Functions

3.1.1 Cell and Battery Voltage Testing.

3.1.2 Battery charge/discharge current detection.

3.1.3 Cell, Environmental, and Power Temperature Monitoring.

3.1.4 Battery Capacity Calculation and Cycle Count Function.

3.1.5 Charge/Discharge MOSFET Switching Function.

3.1.6 Battery Charging Balance Function.

3.1.7 Key Switch Function.

3.1.8 RS485 and CAN communication functions.

3.1.9 Host Computer Control Function.

3.1.10 Historical Data Storage Function.

3.1.11 Charging Current Limiting Function.

3.1.12 Secondary Protection Function.

3.1.13 Heating Function (Optional).

3.1.14 WiFi Function

3.2 BMS System Parameter Settings

project name	Key Indicators	standard figures
Monomer Overcharge Protection	Overcharge Protection Value	3.65±0.02V
	Overcharge Alert Value	3.55±0.02V
	Overcharge recovery value	3.45±0.02V
	Overcharge protection value	2.7±0.02V

Monomer Overcharge Protection	Set alarm value too high	2.9±0.02V
	Overcharge recovery value	3.0±0.02V
Battery pack overcharge protection	Overcharge Protection Value	58.4±0.02V
	Overcharge Alert Value	56.8±0.02V
	Overcharge recovery value	55.2±0.02V
Battery pack over-discharge protection	Overcharge protection value	43.2±0.02V
	Set alarm value too high	46.4±0.02V
	Overcharge recovery value	48±0.02V
Overcurrent Protection During Charging	Overcurrent Protection 1	220A±2A
	Overcurrent charging delay 1	10000mS
	Overcurrent Protection 2	240A±2A
	Overcurrent charging delay 2	500mS
Discharge Overcurrent Protection	Overcurrent Protection 1	220A±2A
	Discharge Overcurrent Delay 1	10000mS
	Overcurrent Protection 2	240A±2A
	Discharge overcurrent delay 2	500mS
short-circuit protection	Short-circuit protection current	400A±100A
	Short-circuit protection delay	450uS±100uS
	Short-circuit protection has been lifted.	1、Valid charging current detected 2、Re-test every minute and lock after three consecutive attempts
Temperature Protection	Heating Temperature Protection	55±3℃
	Recovery after high-temperature charging	50±3℃
	Charging Temperature Protection	-5±3℃
	Recovery of temperature protection during charging at low temperatures	0±3℃
	High-temperature protection during discharge	60±3℃
	High-temperature recovery during discharge	55±3℃
	Discharge Low-Temperature Protection	-20±3℃
	Recovery of low-temperature protection during discharge	-15±3℃
Equilibrium Function	Equalization Turn-on Voltage	2.8V
	Equalize Pressure Difference Activation	20mv

3.3 Description of the LED Indicator Light

There are 12 RGB three-color indicators: 10 battery remaining capacity indicators, 1 operation indicator, and 1 alarm protection status indicator.

3.3.1 Instructions (Definitions of scrolling displays and signal lights)

① Power-on self-check: The LED lights increase sequentially from RUN to SOC100, indicating entry into operating mode.

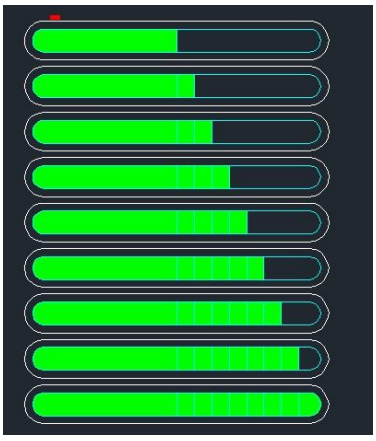
② RUN-LED Operation Status:

1. Normal state: Green, always on
2. Discharge State: Always On
3. Charging Status: Always On

③ Alarm LED BMS Alert/Protection/Failure Status:

1. Normal state: The display remains off when no alarm is triggered or protection mode is active;
2. Alarm status or low battery: Yellow flashing (overvoltage alarm not displayed; undervoltage alarm only shown when idle)
3. Protection status: Red flashing (no indication for overvoltage or undervoltage protection)
4. Failure: Red light remains on continuously

④ During charging: Increase charge according to SOC



⑤ During discharge, the process follows a decreasing SOC pattern.

⑥ When the battery is in standby mode (neither charging nor discharging), display the corresponding duration based on the actual SOC level (e.g., 50% as shown in the figure below).

3.4 Description of the Restoration Button

When the BMS is in sleep mode, press and hold button 1 for 1 second to activate the protection board; the LED indicator will light up sequentially from "RUN" for 0.5 seconds.

When the BMS is operational, press and hold the button for ≥6 seconds to reset the protection board; the LED indicator will display the current battery level.

When the BMS is operational, press buttons 3S−6S and release them to put the protection board into sleep mode; the LED indicator lights will then illuminate sequentially starting from the lowest power level.

Light for 0.5 seconds

3.5 Hibernation and Wake-Up Functions

3.5.1 Dormancy

The system enters sleep mode when the following conditions are met:

If neither the individual unit under-voltage protection nor the overall under-voltage protection has been resolved within 15 minutes

②Press the button for 3 seconds and then release it.

③ The minimum cell voltage falls below the sleep threshold voltage (default value: 3300 mV) and remains below it for the duration of the sleep delay period (default value: 1440 ms).
(Minutes) (must also satisfy no communication and no charging/discharging).

④ Force shutdown via the host computer software.

Before entering sleep mode, ensure the P-end is not connected to an external voltage; otherwise, low-power mode cannot be activated.

⑤ If the minimum cell voltage falls below the undervoltage protection threshold of-500 mV, the system will forcibly enter deep sleep mode after a delay of 10 minutes.

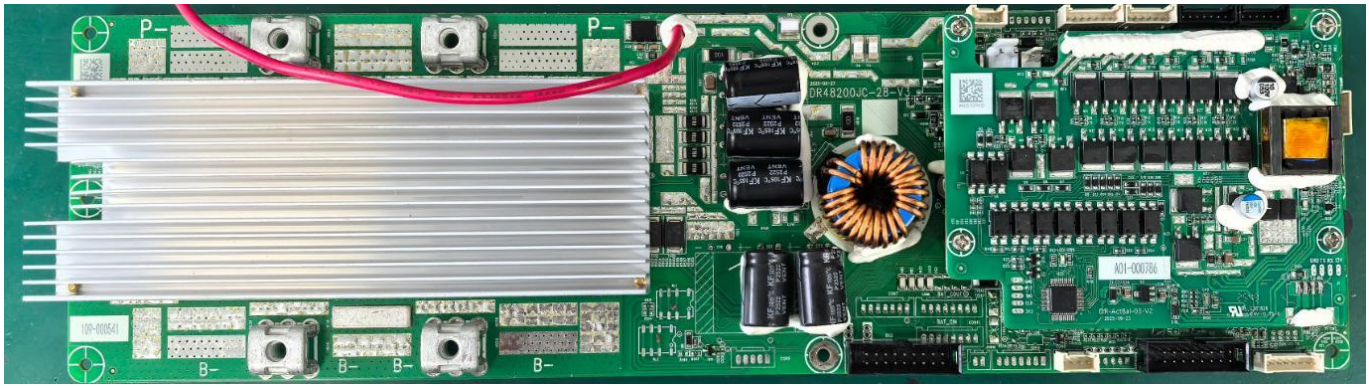
3.5.2 Awakening

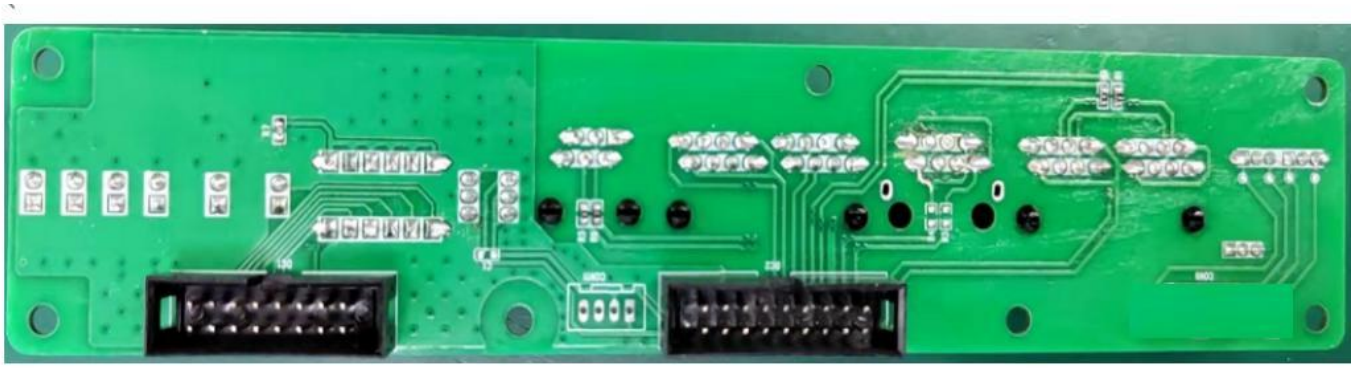
When the system is in low-power mode, it will exit low-power mode and enter normal operation mode if any of the following conditions is met:

① Connect to the charger; its output voltage must be ≥ 48 V.

②Press the button for 1 second, then release it.

3.6 Physical Diagram of Protection Plate Dimensions

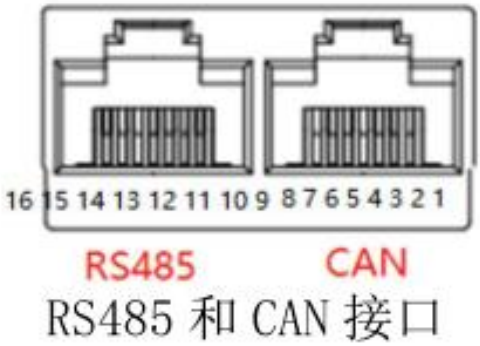




4. Communication

The BMS can communicate with the host computer via an RS485 communication interface, enabling parallel communication among multiple devices. It also features RS485 and CAN interfaces for communication with inverters or terminals.

4.1 Definition of Communication Interfaces



RS485 和 CAN 接口

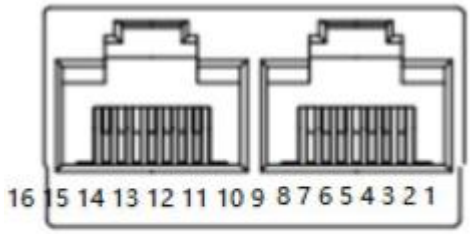
RS485—采用 8P8C 立式 RJ45 插座 RS485—Use 8P8C vertical RJ45 socket	
RJ45 引脚 RJ45 pin	定义说明 defined declaration
9、16	RS485A-B
10、15	RS485A-A
11、14	GND
12、13	NC

CAN—采用 8P8C 立式 RJ45 插座 CAN—Use 8P8C vertical RJ45 socket	
RJ45 引脚 RJ45 pin	定义说明 defined declaration
4	CANH
5	CANL
3、6	GND
1、2、7、8	NC

4.2 Parallel Interface

BMS battery packs communicate in parallel via the RS485 bus and can also interface with devices equipped with the RS485 bus, while the CAN interface enables communication with PCs or other devices.

It supports intelligent terminal communication and human-machine interaction via the RS485 bus, enabling data exchange from any battery pack connected in parallel; the multi-device parallel bus interface is illustrated below.



并机通信接口

并机通信端口（只用来并机） Parallel communication port (for parallel only)			
RS485-A—采用 8P8C 立式 RJ45 插座 RS485-A—Use 8P8C vertical RJ45 socket		RS485-B—采用 8P8C 立式 RJ45 插座 RS485-B—Use 8P8C vertical RJ45 socket	
RJ45 引脚 RJ45 pin	定义说明 defined declaration	RJ45 引脚 RJ45 pin	定义说明 defined declaration
9、16	RS485B-B	1、8	RS485B-B
10、15	RS485B-A	2、7	RS485B-A
11、14	GND	3、6	GND
12、13	NC	4、5	NC

4.3 Address Code Switch

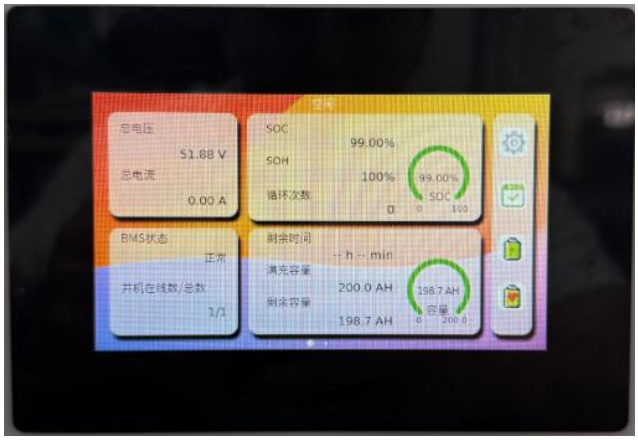
4.3.1 Code Assignment Settings

When multiple packs are used in parallel, distinct pack addresses are identified via hardware code assignment, with each pack having a unique address throughout the battery bank. The hardware addresses are configured using code switches as shown in the table below.

	#1	#2	#3	#4	#5	#6	
0	OFF	OFF	OFF	OFF	OFF	OFF	(主机) Pack1
1	ON	OFF	OFF	OFF	OFF	OFF	(从机) Pack2
2	OFF	ON	OFF	OFF	OFF	OFF	(从机) Pack3
3	ON	ON	OFF	OFF	OFF	OFF	(从机) Pack4
4	OFF	OFF	ON	OFF	OFF	OFF	(从机) Pack5
5	ON	OFF	ON	OFF	OFF	OFF	(从机) Pack6
6	OFF	ON	ON	OFF	OFF	OFF	(从机) Pack7
7	ON	ON	ON	OFF	OFF	OFF	(从机) Pack8
8	OFF	OFF	OFF	ON	OFF	OFF	(从机) Pack9
9	ON	OFF	OFF	ON	OFF	OFF	(从机) Pack10
10	OFF	ON	OFF	ON	OFF	OFF	(从机) Pack11
11	ON	ON	OFF	ON	OFF	OFF	(从机) Pack12
12	OFF	OFF	ON	ON	OFF	OFF	(从机) Pack13
13	ON	OFF	ON	ON	OFF	OFF	(从机) Pack14
14	OFF	ON	ON	ON	OFF	OFF	(从机) Pack15
15	ON	ON	ON	ON	OFF	OFF	(从机) Pack16
逆变器通信协议选择 CAN 通信(在主机模式下通过拨码 5 和 6 选择) Inverter communication protocol Select CAN communication (select by DIP 5 and 6 in host mode)							
1	OFF	OFF	OFF	OFF	OFF	OFF	**支持上位机/显示屏对逆变器协议选择 Supports host computer/display Select the inverter protocol**
17	OFF	OFF	OFF	OFF	ON	OFF	Victron
33	OFF	OFF	OFF	OFF	OFF	ON	泽能 Pylon
49	OFF	OFF	OFF	OFF	ON	ON	古瑞瓦特 Geowatt
逆变器通信协议选择 RS485 通信(在主机模式下通过拨码 5 和 6 选择) Inverter communication protocol RS485 communication (Select DIP 5 and 6 in host mode)							
1	OFF	OFF	OFF	OFF	OFF	OFF	**支持上位机/显示屏对逆变器协议选择 Supports host computer/display Select the inverter protocol**
17	OFF	OFF	OFF	OFF	ON	OFF	硕日 SRNE
33	OFF	OFF	OFF	OFF	OFF	ON	日月元 Voltronic
49	OFF	OFF	OFF	OFF	ON	ON	古瑞瓦特 Geowatt

备注：通过上位机或者显示屏进行选择协议拨码地址 5 和 6 必须为 OFF

5. The display screen itself



6. test condition

Except as otherwise specified, all test conditions shall comply with the standard test conditions:

Environmental temperature: 25 ± 5 °C; Environmental humidity: 40%–80% RH

"Standard charging" refers to the process conducted at an ambient temperature of 25°C ± 5°C: first charging at a constant current of 0.2C until reaching 58.4 V, then continuing under a constant voltage of 58.4 V.

The electric current is less than 0.02 C.

"Standard discharge" refers to the process of discharging at a constant current of 0.2C to 43.2 V under an ambient temperature of 25°C ± 5°C.

7. Electrical performance and safety performance testing

7. 1 Electrical Performance Testing

test item	testing standard	technical requirement
Discharge capacity at 25°C (room temperature)	Under standard testing conditions, the battery pack is first fully charged at a current of 0.2C, then discharged at the same current, and its discharge capacity is recorded.	≥ 100% of the rated capacity
Discharge capacity at-10°C	Under standard testing conditions, the battery pack is first fully charged at 0.2C current, then stored for 10 hours at-10 °C, and subsequently discharged at 0.2C current until reaching the termination voltage; the discharge capacity of the battery pack is recorded.	≥75% of the nominal capacity
Discharge capacity at a high temperature of 55°C	Under standard testing conditions, the battery pack is first fully charged at a current of 0.2C, then stored for 5 hours at 55 °C, and subsequently discharged at 0.2C until reaching	≥95% of the nominal capacity

	the termination voltage; the discharge capacity of the battery pack is recorded.	
Charge retention capability and capacity recovery capability	Under standard test conditions, the battery pack is first charged and discharged at a current of 0.2 C to record its initial capacity. It is then fully charged under the same conditions and stored at an ambient temperature of 25°C ± 5°C for 30 days. The capacity is measured by discharging at 0.2 C until reaching the termination voltage, followed by charging at 0.2 C and discharging again at 0.2 C—this cycle is repeated three times, with the third cycle serving as the recovery capacity test.	Charge retention rate ≥95%; Capacity recovery rate ≥ 95%
Cycle life at 25°C ambient temperature	The battery pack is first fully charged at a current of 0.2C under standard test conditions, then discharged at the same current rate. The charge-discharge cycle is performed continuously at an ambient temperature of 25°C ± 5°C until the discharge capacity falls to ≤80% of the initial capacity, marking the end of the cycle life test.	≥8000 times
Cycle life at a high temperature of 55°C	The battery pack is first fully charged at a current of 0.2C under standard test conditions, then discharged at the same current rate. Continuous charge-discharge testing is performed at an ambient temperature of 55°C ± 5°C until the discharge capacity falls to ≤80% of the initial capacity, at which point the cycle life test is terminated.	≥4000 times

7.2 Safety Performance Testing

test item	testing standard	technical requirement
External short-circuit test	The battery pack is charged under standard test conditions. The fully charged pack is placed in an explosion-proof box, and a wire with internal resistance less than 100 mΩ is used to short-circuit the external positive and negative terminals. During testing, the surface temperature of the batteries is recorded; the short-circuit duration is set at 10 minutes, marking the completion of the test.	Does not catch fire or explode.
Overcharge Test	After charging the battery pack under standard test conditions, apply a constant-current/costant-voltage charge	Does not catch fire or

	to a specific cell at a rate of 0.2C. Continue constant-current charging until the voltage reaches 5 V, then switch to constant-voltage charging until the cut-off current drops to 0 A; the test is completed.	explode.
Over-discharge Test	After charging the battery pack under standard test conditions, continuously discharge it at a rate of 0.5C using a load device until the voltage of any individual cell falls to 0–0.5 V; then terminate the test.	Does not catch fire or explode.

8. Product Packaging Requirements

8.1 The battery box shall maintain good appearance, free from paint peeling, scratches, deformation, damage, or other defects.

8.2 Before packaging, the battery must be in a powered-off sleep state.

8.3 The battery must pass visual inspection before being packed.

8.4 The outer packaging shall be in wooden boxes with clear labeling. The sides of the boxes shall be nailed to enhance their strength and rigidity, ensuring safety during transportation.

8.5 Protective packaging material must be added inside the wooden box to prevent scratches during transportation of the battery box.

8.6 An packing list is attached inside the wooden box.

9. Product Storage and Transportation

9.1 Product Storage

When the product is stored long-term without use, it should be kept in a dry, clean, and well-ventilated warehouse at 10°C to 35°C, away from flammable and explosive materials. The battery pack should undergo periodic charging maintenance every three months to ensure optimal performance.

9.2 Product Transportation

The battery pack shall be externally packaged before transportation. During transit, it must be protected from severe shaking, impact, compression, as well as exposure to sunlight and rain.

10. Warnings and Precautions During Battery Use

To prevent potential battery leakage, overheating, or explosion, follow these precautions

warn！

① It is strictly prohibited to immerse batteries in seawater or water. When not in use, they should be stored in a cool, dry environment.

② It is strictly prohibited to reverse the polarity of a battery;

③ Directly connecting metal parts to the battery's positive and negative terminals for short-circuiting is prohibited;

④ It is prohibited to transport or store batteries together with metals such as hair clips or necklaces.

⑤ It is prohibited to strike, throw, or step on batteries;

⑥ Direct welding of batteries and piercing them with nails or other sharp objects are prohibited;

pay attention to！

① It is prohibited to use or store batteries under high temperatures (such as intense sunlight or inside hot vehicles), as this may lead to battery overheating, fire, functional failure, or shortened lifespan. For long-term storage, the optimal temperature range is recommended to be 10–45°C.

② It is prohibited to dispose of batteries in fire sources or heaters to prevent fires, explosions, and environmental contamination; end-of-life batteries must be returned to suppliers or designated battery recycling centers for disposal.

③ Use is prohibited in areas with strong static electricity or strong magnetic fields, as this may damage the battery's safety protection devices and pose safety hazards.

④ In the event of battery leakage, if electrolyte enters the eyes, never rub the affected area; immediately rinse the eyes with clean water and seek medical attention promptly to prevent ocular injury. If the battery exhibits unusual odors, heat generation, discoloration, deformation, or any abnormalities during use, storage, or charging, immediately remove the battery from the device or charger and discontinue its use.

⑤ Do not directly insert the battery's positive and negative terminals into a power socket; use a charger specifically designed for lithium-ion batteries.

⑥ Before installation, check the battery voltage and connectors; only use after confirming everything is normal.

⑦ The battery stores energy at half capacity; if unused for three months, it requires a full charge.

⑧ If the electrode becomes contaminated, wipe it clean with a dry cloth before use; otherwise, poor contact or functional failure may occur.