DOCAN PANDA 48KWH

Battery pack product specification document

Battery pack model	**51.2V942AH**
Nominal voltage of the battery pack	**51.2V**
battery capacity	**942Ah**
Cell type	**lithium iron phosphate**
date	**2025-11-05**

Catalogue

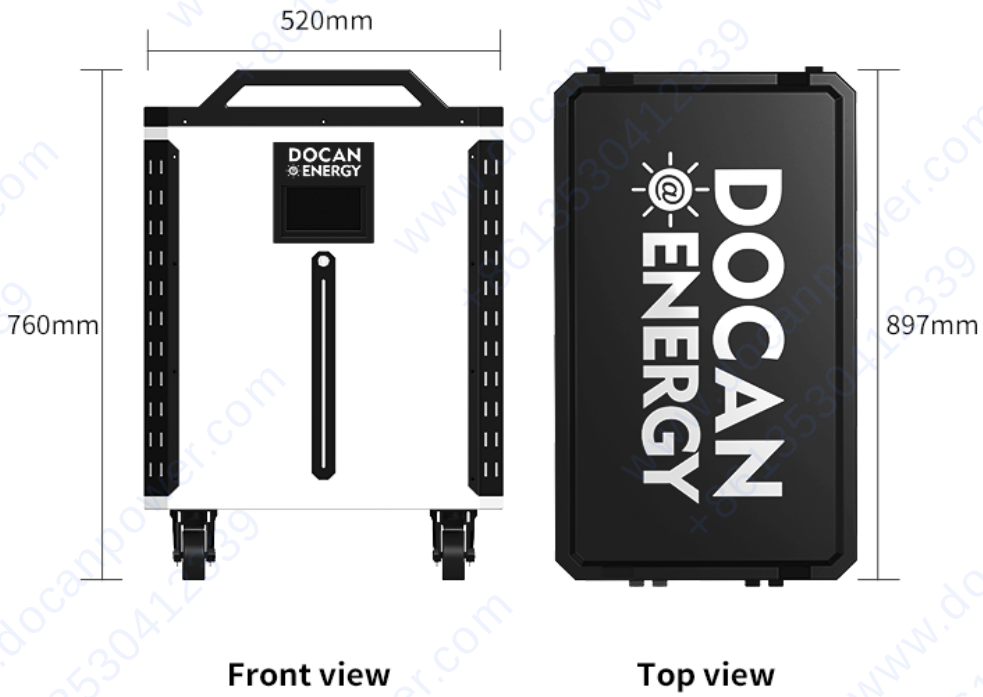
1. Product Overview

This product is a lithium iron phosphate battery pack (with BMS) consisting of 16 strings of 3P cells, designed for loads with operating currents up to 300A.

2. Product Technical Specifications

The model of this product is 51.2V942Ah battery pack, composed of 16S3P cells, with a maximum continuous charge and discharge current of 300A, with WIFI and Bluetooth functions, passive current limiting function, communication function (double RS485), storage function, and white chassis color.

2.1 Battery pack product structure diagram



2.2 Technical parameters of the battery system

project		specifications	remarks
product model		**51.2V942Ah**	51.2V/942AH
nominal capacity		942AH	16 strings 3 parallel (16S3P)
nominal voltage		51.2V	3.2*16
Rated energy (Wh) ±5%		50033	
display screen		5-inch touch screen	
charging mode		CC-CV (Constant Current and Constant Voltage)	
discharge mode		constant-current discharge	
Charge and discharge port (shared or split)		common mouth	
communication port		RS485/CAN	
cooling-down method		natural cooling	
charge temperature		0℃~55℃	
discharge temperature		-20℃~60℃	
storage temperature		-20℃~60℃	
storage humidity		25%~70%	
levels of protection		IP55	
active equilibrium		with active equalization	
Battery box dimensions (length*width*height) (mm)		897*520*760mm	
Battery weight tolerance: ±2kg		360KG	
charge	Maximum continuous current	300A	CC&CV 300A
	cutoff voltage	58.4V	
	standard mode	Charging constant voltage 58.4V and constant current 150A under the condition of ambient temperature (25±2) ℃;	

discharge	maximum sustained current	300A	
	overcurrent protection	315A	
	cutoff voltage	40V	
	standard mode	The battery was discharged at a constant current of 150A to a voltage of 2.5V (or 40V) at ambient temperature (25±2)℃.	
matched inverter		Pylon, Goodwe, Solis, Sungrow, Chnt Power, Eneigy, Sofar, Answei, Growatt,SMA, Victron, Lux Power/EG4, Sol-Ark, TBB, Deye, Sunsynk, Sorotec, Megarevo, Sacolar, MUST, INVT, RENAC, SRNE, SMK Solar, Voltronic, Easun, MPP,Solar, EPEVER, Techfine, Solax, SAJ, Sumry	

3. Battery Management System (BMS)

3.1 Overview of BMS System Functions

3.1.1 Voltage detection of cells and batteries.

3.1.2 Battery charge and discharge current detection.

3.1.3 Cell, environment and power temperature monitoring.

3.1.4 Battery capacity calculation and cycle count functionality.

3.1.5 MOSFET Switching Function for Charging and Discharging.

3.1.6 Battery charging balance function.

3.1.7 Key switch functionality.

3.1.8 RS485 and CAN communication functions.

3.1.9 The upper computer control function.

3.1.10 Historical data storage function.

3.1.11 Charging current limiting function.

3.1.12 Secondary protection functions.

3.1.13 Heating function (optional).

3.2 BMS System Parameter Settings

project name	Indicator items	standard figures
single charge protection	overcharge protection value	3.65±0.05V
	overcharge alarm value	3.6±0.05V
	overcharge recovery value	3.38±0.05V

monomer over-discharge protection	over discharge protection value	2.5±0.05V
	over discharge alarm value	2.7±0.05V
	over discharge recovery value	3.0±0.05V
Battery pack overcharge protection	overcharge protection value	58.4±0.05V
	overcharge alarm value	57±0.05V
	overcharge recovery value	54.4±0.05V
Battery pack over-discharge protection	over discharge protection value	40±0.05V
	over discharge alarm value	44±0.05V
	over discharge recovery value	48±0.05V
overcurrent protection	Overcurrent 1 protection	315A
	Overcharge delay 1	3000mS
	Overcurrent 2 protection	350A
	overcharge delay 2	500mS
overcurrent protection	Overcurrent protection 1	315A
	Discharge overcurrent delay 1	3000mS
	Overcurrent protection 2	350A
	2-second delay for discharge overcurrent	500mS
short-circuit protection	short circuit protection current	480A
	short circuit protection delay	300uS
	short circuit protection is removed	Short-circuit protection is disabled during charging
		The load will be removed automatically after removal.
temperature protection	high temperature protection during charging	55±3 ℃
	recovery of charging temperature	50±3 ℃
	cooling low temperature protection	-5±3 ℃
	Charging low-temperature protection and recovery	5±3 ℃
	Discharge high-temperature protection	60±3 ℃
	high temperature recovery of discharge	53±3 ℃
	discharge low temperature protection	-20±3 ℃
	Recovery of low-temperature protection during discharge	-15±3 ℃
equilibrium function	balanced turn-on voltage	3.45V±0.02V
	balanced differential pressure opening	65mA

3.3 LED Indicator Description

RGB lights: 16-channel dual-color lights, red and green

3.3.1 Instructions and Notes (Definitions of scrolling text and signal lights)

① Power-on self-test: The green light runs from low to high, illuminating from light 1 to light 16 at 300mS. After completion, the display returns to normal.

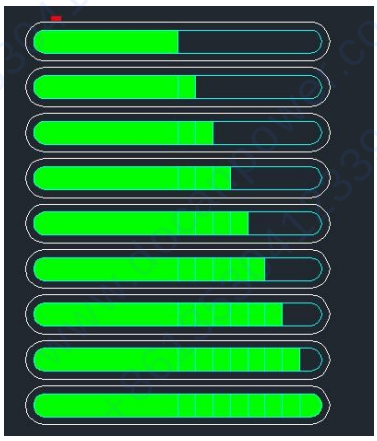
form 。

② If the communication between BMS and the light board is interrupted for 30 seconds, the yellow light will flash (on for 1 second, off for 1 second).

③ The red light remains on during faults or protection, and flashes (0.5 seconds) during alarms. It turns off completely for undervoltage protection, and illuminates for overvoltage alarms or overvoltage protection.

Lights should not flash or remain on continuously.

④ During charging, the green light flashes in a cycle (for example, when the SOC is 50%, lights 1 and 8 remain on, while light 6 runs a 300mS race).



⑤ Discharge according to the decreasing SOC

⑥ Overprotection, the system enters sleep mode, all extinguished

⑦ When the battery is in standby mode (neither charging nor discharging), the display shows the corresponding duration based on the actual SOC level (e.g., 50% as shown in the figure below).

3.4 Explanation of the Reset Button

When the BMS is in sleep mode, press and hold the button for 1 second to activate the protection board. The LED indicator lights will then flash sequentially from 'L4' for 0.5 seconds.

When the BMS is activated, press and hold button 3S to put the protection board into sleep mode. The LED indicator lights will then sequentially illuminate for 0.5 seconds from 'RUN'.

3.5 Hibernation and Wake-up Functions

3.5.1 Hibernation

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

①If the monomer under-voltage protection or the overall under-voltage protection is not released within 30 minutes.

②Press the button for 3 seconds before releasing it.

③ The minimum single-cell voltage falls below the default sleep threshold (3350mV) and remains below it for the default sleep delay duration (1440
minutes) (with no communication and no charge/discharge).

④Force shutdown via the host computer software.

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

⑤If the minimum unit voltage drops below the undervoltage protection threshold (-500mV), the system will enter deep sleep mode after a 10-minute delay.

3.5.2 Wake Up

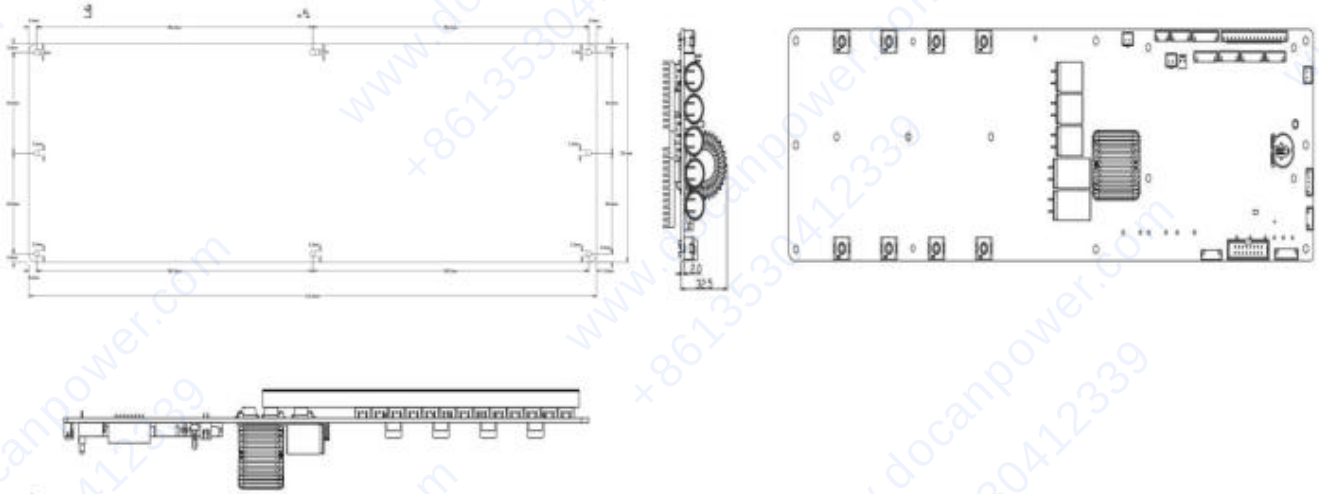
When the system is in low-power mode, it will exit low-power mode and enter normal operation mode if any of the following conditions is met:

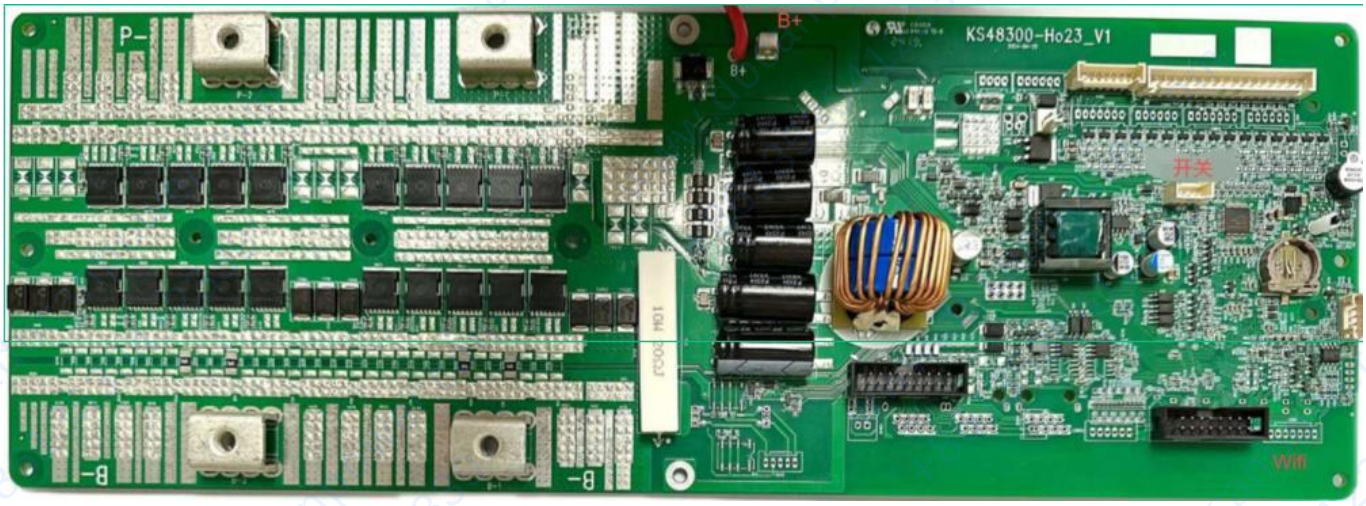
① Connect to the charger, which must have an output voltage of at least 48V.

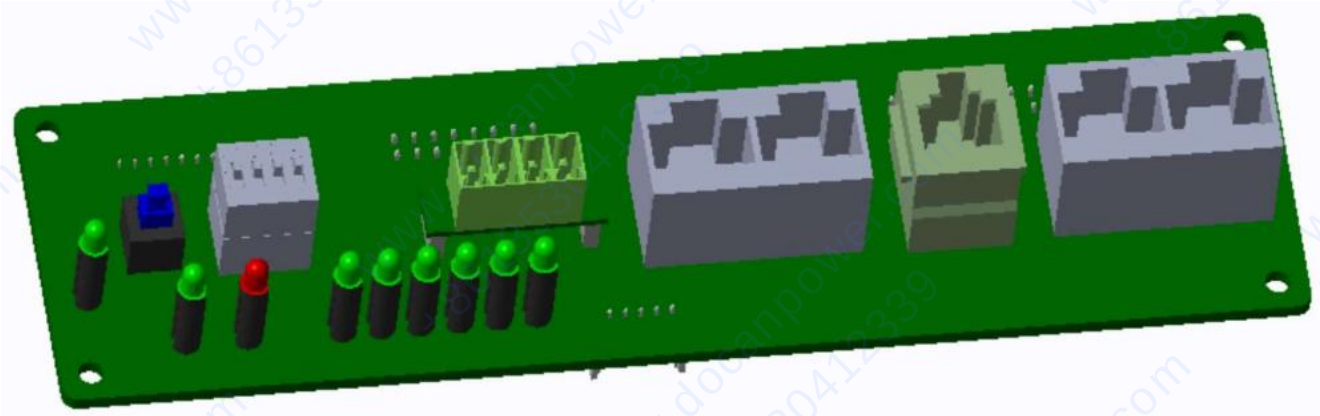
②Press the button for 1 second, then release it.

③ Connect the RS485 communication line and launch the host computer software.

3.6 Physical image of the protective board dimensions



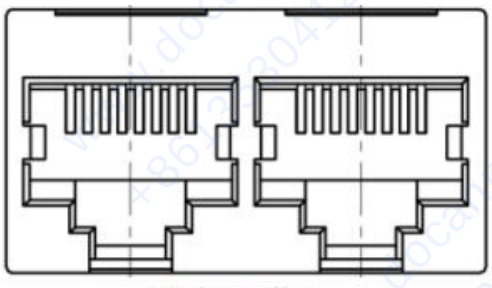




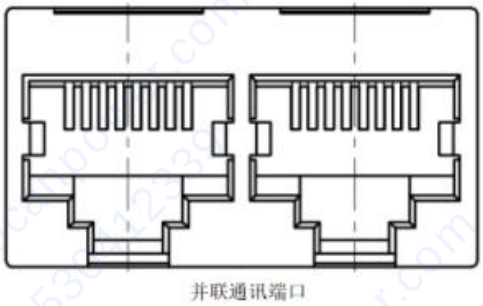
4. Communication

The BMS communicates with the host computer via an RS485 communication interface, enabling multi-unit parallel communication. It also features RS485 and CAN interfaces for interfacing with inverters or terminals.

4.1 Definition of Communication Interfaces


CAN 和 RS485 接口

RS485-1 接口（与上位机或逆变器通讯） 支持硕日、日月元、Pylon 协议--通过上位机切换协议		CAN-1 通信接口（逆变器通讯） 支持 Victron、Pylon、古瑞瓦特协议——通过上位机切换协议	
RS485—采用 8P8C 立式 RJ45 插座		CAN—采用 8P8C 立式 RJ45 插座	
RJ45 引脚	定义说明	RJ45 引脚	定义说明
1、8	RS485A-B	4	CAN1-H
2、7	RS485A-A	5	CAN1-L
6	GND	6	GND

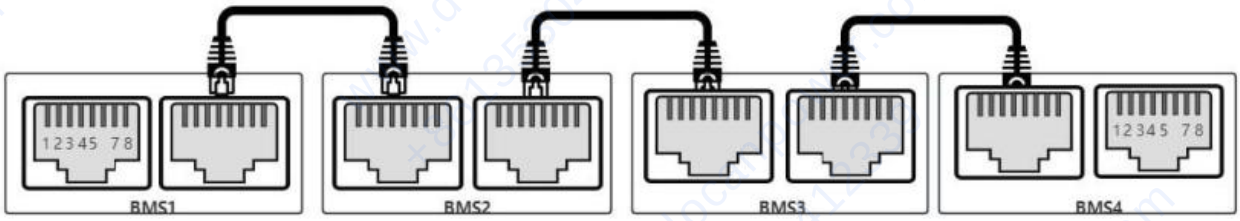

并联通讯端口

并机通讯端口（只用来并机）			
RS485-2—采用立式 RJ45 插座		RS485-2—采用 8P8C 立式 RJ45 插座	
RJ45 引脚	定义说明	RJ45 引脚	定义说明
1	RS485C-B	1	RS485C-B
2	RS485C-A	2	RS485C-A
6	GND	6	GND
7	RS485B-A(并机)	7	RS485B-A(并机)
8	RS485B-B(并机)	8	RS485B-B(并机)

4.2 Parallel Interface

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

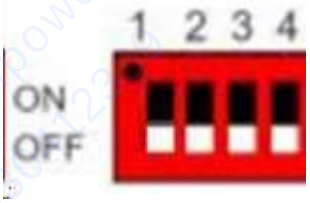
The intelligent terminal communicates via RS485 bus for human-machine interaction, with any battery pack information connected in parallel. The multi-device parallel bus interface is shown in the figure below.



4.3 Address Dialing Switch

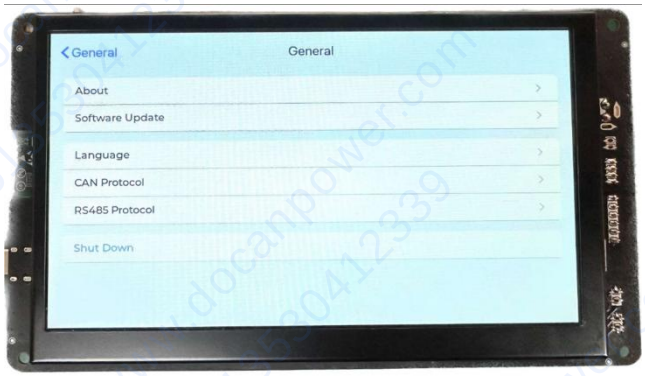
4.3.1 Dial Code Settings

When multiple PACKs are used in parallel, hardware dialing addresses are used to distinguish each PACK. Each PACK in the battery pack has a unique address. The hardware addresses are configured via the dialing switch, as shown in the table below.



地址	拨码开关位置			
	#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. Display screen



6. test condition

All test conditions shall be subject to standard test conditions, except in special circumstances:

Environmental temperature: 25±5℃; environmental humidity: 40%-80%RH

"Standard charging" means charging at a constant current of 0.2C to 58.4V and then charging at a constant voltage of 58.4V at ambient temperature of 25°C±5°C

The current of the electrode was less than 0.02C.

The standard discharge is defined as discharging to 40V at a constant current of 0.2C under an ambient temperature of 25°C±5°C.

7. electrical performance and safety performance test

7.1 Electrical performance testing

test item	testing standard	technical requirement
Discharge capacity at 25°C room temperature	The battery pack is first fully charged at 0.2C current under standard test conditions, then discharged at the same rate, with its discharge capacity recorded.	≥100% of the nominal capacity
Discharge capacity at-10°C	The battery pack is first fully charged at 0.2C current under standard test conditions, then stored at-10°C for 10 hours. It is subsequently discharged at 0.2C current until the termination voltage, with the discharge capacity recorded.	≥75% of the nominal capacity
Discharge capacity at 55°C	The battery pack is first fully charged at 0.2C current under standard test conditions, then stored at 55°C for 5 hours before being discharged at 0.2C current until the end voltage, with the discharge capacity recorded.	≥95% nominal capacity
charge retention and capacity recovery	The battery pack undergoes initial capacity measurement after 0.2C current charge-discharge cycles under standard conditions. It is then fully charged under the same conditions, stored at 25°C ±5°C for 30 days, and subjected to 0.2C current discharge until the termination voltage to assess retention capacity. The cycle repeats with 0.2C current charging and discharging three times, with the third cycle serving as recovery capacity testing.	charge retention rate≥95% Capacity recovery rate ≥95%
25°C ambient temperature cycle life	The battery pack was first charged at 0.2C current under standard test conditions, then discharged at 0.2C current. The charge-discharge cycle was continuously tested at an ambient temperature of 25°C±5°C. The cycle life test was terminated when the discharge capacity reached or fell below 80% of the initial capacity.	≥8000 times

55°C high temperature cycle life	The battery pack was first charged at 0.2C current under standard test conditions, then discharged at the same rate. The charge-discharge cycle was performed continuously at an ambient temperature of 55°C ± 5°C. The cycle life test was terminated when the discharge capacity dropped to ≤ 80% of the initial capacity.	≥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 battery pack is placed in an explosion-proof box, and a wire with internal resistance less than 100mΩ is used to short-circuit the positive and negative terminals on the outside of the battery pack. During the test, the surface temperature of the battery is recorded. The short-circuit lasts for 10 minutes, and the test is completed.	No fire, no explosion
overcharge test	After charging the battery pack under standard test conditions, a constant current and constant voltage source was used to charge a single cell of the battery pack at 0.2C. The constant current charging was continued until the voltage reached 5V, then it switched to constant voltage charging until the cutoff current dropped to 0A, and the test was finished.	No fire, no explosion
over discharge test	After charging the battery pack under standard test conditions, the battery pack is continuously discharged by the load device at 0.5C until the voltage of a single battery reaches 0~0.5V, and the test is ended.	No fire, no explosion

8. Product packaging requirements

8.1 The battery box must maintain a clean appearance, free from paint peeling, scratches, deformation, or damage.

8.2 The battery must be in a powered-off and sleep mode before packaging.

8.3 The battery must pass the appearance inspection before it can be packed.

8.4 The outer packaging shall be wooden crates with clearly marked information. Nails shall be nailed around the crates to enhance their strength and rigidity, ensuring safe transportation.

8.5 Protective wrapping should be added inside the wooden box to prevent scratches during transportation.

8.6 The wooden box contains an packing list inside.

9. Product storage and transportation

9.1 Product Storage

The battery pack should be stored in a dry, clean and well-ventilated warehouse at 10℃～35℃, avoiding flammable and explosive materials.

9.2 Product Transportation

The battery pack must be externally packaged before transportation. During transit, avoid violent shaking, impacts, or compression, and protect it from sun exposure and rain.

10. Battery Usage Warnings and Precautions

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

warn！

① Do not immerse batteries in seawater or water. When not in use, store them in a cool, dry place.

② It is strictly prohibited to reverse the polarity of batteries;

③ It is forbidden to use metal to directly connect the positive and negative terminals of the battery to short circuit;

④ Do not transport or store batteries with metal objects such as hair clips or necklaces.

⑤ It is forbidden to strike, throw, or trample on batteries;

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

pay attention to！

① Avoid using or storing batteries in high temperatures (e.g. under direct sunlight or in a hot car), as this may cause overheating, fire, or reduced lifespan. For long-term storage, the recommended temperature range is 10-45°C.

② Do not throw batteries into fire or heater to prevent fire, explosion and pollution of environment.

③ It is forbidden to use in the place of strong static electricity and strong magnetic field, otherwise it is easy to damage the battery safety protection device and bring hidden danger.

④ If the battery leaks and the electrolyte enters your eyes, do not rub it. Immediately rinse the eyes with clean water and seek medical attention to prevent eye damage. If the battery emits an unusual odor, overheats, changes color, deforms, or shows any abnormalities during use, storage, or charging, remove it from the device or charger and stop using it immediately.

⑤ Direct insertion of battery terminals into power sockets is prohibited; a lithium-ion battery-specific charger must be used.

⑥ Before installation, check the battery voltage and connectors. Only use after confirming all components are functioning properly.

⑦ Battery half-charge storage: If the battery has not been used for three months, it should be recharged once.

⑧ If the electrode is dirty, wipe it with a dry cloth before use, otherwise it may cause poor contact and failure of function.