ASH-51280

16S1P-51.2V280Ah

Product Datasheet

Version: A1

Release Date: 2023-11-28

Contents

1. Scope of application

This specification describes the product performance of the rechargeable lithium-ion battery produced by **Guangdong Asgoft New Energy Co., LTD.** (hereinafter referred to as Asgoft).

2. Specification revision

If the raw materials, production process, production system or battery usage environment or other conditions change, the revising party must notify the other party of the changed information in writing and obtain the consent of both the supply and demand parties before revising.

3. Test conditions

It is recommended to use newly produced battery packs and new cells for relevant tests. Unless there are special requirements, the test needs to be conducted at a temperature of 20±5℃ and a relative humidity of 45~75%.

4. Dimensions
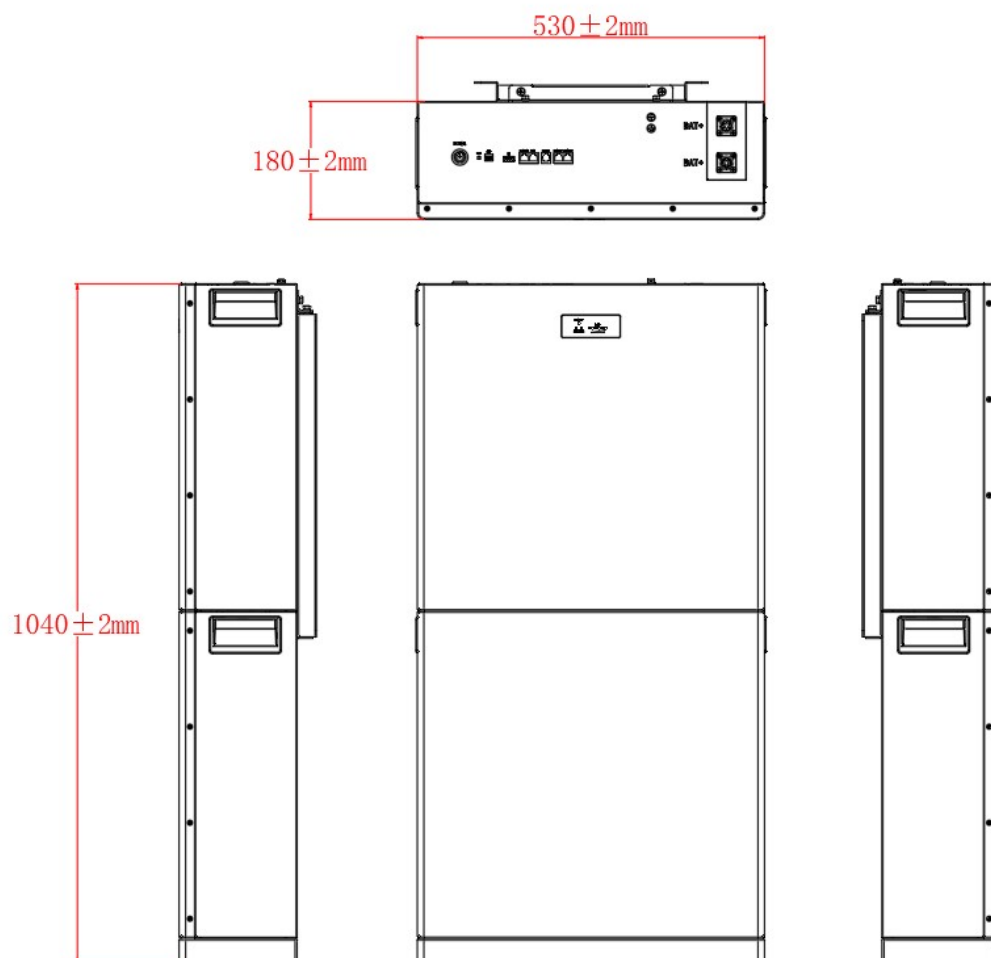
5. Definition of battery pack Panel Structure
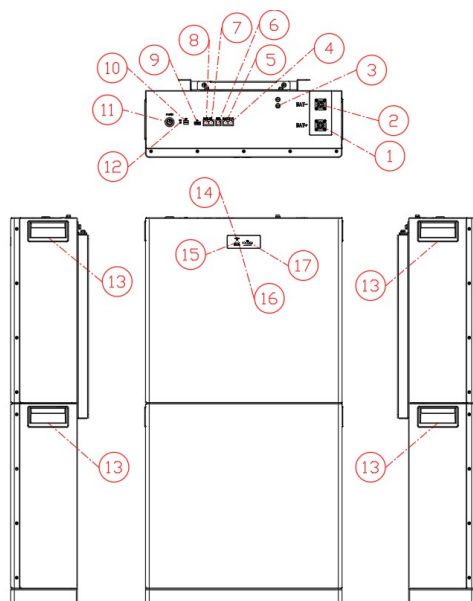

NO.	Content	Screen	Remark
1	Positive pole	BAT+	200A quick connection/orange
2	Negative pole	BAT-	200A quick connection/black
3	Restart	RST	
4	DIP switch	DIP	
5	Dry contact	DO	
6	RS485 communication, connect to PCS	RS485A	Connect inverter
7	CAN communication, connect to PCS	CAN	Connect inverter
8	RS232 Communication	RS232	Connect Upper-PC
9	RS485 Parallel communication	RS485B	Use for Parallel
10	RS485 Parallel communication	RS485B	Use for Parallel
11	Grounding	⏚	Recommend 6-10mm²cable
12	Power(on/off)	POWER	M22(Round Self-locking switch)
13	Handle	/	
14	Running-lights	RUN	Green-LED*1
15	Fault-lights	ALM	Red-LED*1
16	On/Off signal	ON/OFF	Green-LED*1
17	State of charge	SOC	Green-LED*6

6. Technical parameters

6.1 Cell parameters

Content	Standard	Remarks
Type of cell	Lithium iron phosphate (LFP)	EVE
Rated voltage	3.2V	EVE
Rated capacity	280Ah	0.5C 25±2℃ 2.5-3.65V
Rated Energy	896Wh	0.5C 25±2℃ 2.5-3.65V
Initial Resistance	≤0.25mΩ	AC 1kHz 40%SOC
limited charge voltage	3.65V	
limited discharge voltage	2.5V T >0℃ 2.0V T ≤0℃	
Rated charge current	140A	0.5C
Rated discharge current	140A	0.5C
Maximum Charging Current	280A	1C
Maximum Discharge Current	280A	1C
25℃ Cycle	8000	25℃ 2℃ 0.5P/0.5P，2.5~3.65V，energy retention≥80%
Internal Resistance	≤100mΩ	
Dimension	H：207.2±0.5mm	(Contains pole）
	L：173.7±0.5mm	
	T：71.7±0.8mm	
Weight	5490g±300g	Contains blue film and top patch
Range of working temperature	charge:0~60℃	Charge
	discharge: -30~60℃	Discharge

6.2 Battery parameters

Battery	Standard	Remarks
Power	14336Wh	0.5C 25±2℃ 2.5-3.65V
Cell Connection	16S1P	
Rated Capacity	280Ah	0.5C 25±2℃ 2.5-3.65V
Rated Voltage	51.2V	
Recommend Charge Current	140A	0.5C

Recommend Discharge Current	140A	0.5C
Maximum Charge Current	200A	
Maximum Discharge Current	200A	
Limited Voltage for charging	58.4V	
Limited Voltage for discharging	43.2V	
Internal Resistance	≤100mΩ	Measured using an AC internal resistance tester with a frequency of (1kHz) after full charging at an ambient temperature of 20±5℃
Dimension	530±2*180±2*1040±2	L*W*H（mm）
Net-Wight	122kg±5%	
Work temperature	Charge:0~55℃	Charge
	Discharge: -20~55℃	Charge

7. Communication port definition

7.1 Inverter communication（RS485A/CAN）

RS485A-using 8P8C vertical RJ45 socket		CAN-using 8P8Cvertical RJ45 socket	
RJ45 Pin	Definition		Definition
1、8	RS485-B1	1、8	RS485-B1
2、7	RS485-A1	2、7	RS485-A1
3、6	GND	3、6	GND
4、5	NC	4、5	NC
Default baud rate is 9600bps to communicate with the inverter		Baud rate 500K, communicate with the inverter	

7.2 Parallel communication （RS485B/RS485B）

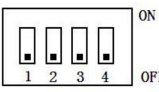| RS48B-using 8P8C vertical RJ45 socket		RS485B-using 8P8C vertical RJ45 socket	
RJ45 Pin	Define	RJ45 Pin	Define
1、8	RS485-B	1、8	RS485-B
2、7	RS485-A	2、7	RS485-A
3、6	GND	3、6	GND
4、5	NC	4、5	NC
It has dual RS485 interfaces for parallel communication between batteries. The communication address must be set with the DIP switch. The address setting range is 1~15.			

7.3 PC-side host computer communication （RS232)

RS232-using 6P6C vertical RJ11 socket	
RJ11 pin	Definition
2	NC
3	TX（single board）
4	RX（single board）
5	GND

It can communicate with the host computer through the RS232 interface, so that various information of the battery can be monitored through the host computer, including battery voltage, current, temperature, status and battery production information. The default baud rate is 9600bps.

8. DIP Switch： *Set communication address ID*

When batteries are used in parallel, different batteries can be distinguished by setting the address on the battery's DIP switch. It is necessary to avoid setting the same address. For the definition of the battery DIP switch, refer to the table below.

Address	DIP Switch			
	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

9. LED Signal Instruction

9.1 LED Flash model description

Flashing mode	On	Off
Flash once	0.25S	3.75S
Flash twice	0.5S	0.5S
Flash three times	0.5S	1.5S

9.2 LED Indicator for work state

| Status	Normal /Warning /Protection ●	ON/ OFF ●	RUN ●	ALM ●	Remaining capacity LED ●	●	●	●	●	●	Description
Power Off	Dormant	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	All LEDs OFF, system in sleep mode
Standby	Normal	ON	Flash once	OFF	Based on the SOC indicator						Standby
Standby	Alarm	ON	Flash once	Flash 3times	Based on the SOC indicator						Low Voltage of battery module
Charging	Working properly	ON	ON	OFF	Based on the SOC indicator (When the battery capacity is at its highest, the LED flashes twice)						Maximum charge LED blinks (blink 2), ALM does not blink in case of overcharge warning
Charging	Alarm	ON	ON	Flash 3times	Based on the SOC indicator (When the battery capacity is at its highest, the LED flashes twice)						Maximum charge LED blinks (blink 2), ALM does not blink in case of overcharge warning
Charging	Overcharge Protection	ON	ON	OFF	ON	ON	ON	ON	ON	ON	If there is no mains power, the indicator light turns to standby
Charging	Temperature, Over-current, failure	ON	OFF	ON	OFF	OFF	OFF	OFF	OFF	OFF	Stop Charging
Charging	Normal	ON	Flash 3times	OFF	Based on the SOC indicator						
Charging	Alarm	ON	Flash 3times	Flash 3times	Based on the SOC indicator						
Charging	Under-voltage Protection	ON	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	Stop Discharging
Charging	Temperature, Over-current, Short Circuit, Reverse	ON	OFF	ON	OFF	OFF	OFF	OFF	OFF	OFF	Stop Discharging
Failure		OFF	OFF	ON	OFF	OFF	OFF	OFF	OFF	OFF	Stop Charging and Discharging

14. Warning

⚠ The load may generate voltage and current, which will be added to the battery pack (including PCM). The voltage and current cannot exceed the reverse withstand voltage and current value of the protection board itself. Excessive voltage or current will damage the battery pack. protective board in.

⚠ To prevent possible leakage, heat generation, and fire in the battery pack, please pay attention to the following precautions.

⚠ The outer packaging film of the battery pack is easily damaged by sharp parts such as nickel flakes and sharp needles. It is prohibited to use sharp parts to damage the battery.

⚠ It is strictly prohibited to immerse the battery pack in sea water or water.

⚠ It is forbidden to combine the battery next to high heat sources, such as fires, heaters and other equipment.

⚠ Please use a special charger for lithium-ion batteries when charging.

⚠ It is prohibited to use the battery combination with the positive and negative poles reversed.

⚠ Do not throw the battery pack into fire or heater

⚠ It is prohibited to use metal to directly short-circuit the positive and negative poles of the battery pack.

⚠ It is prohibited to transport or store the battery pack together with metal, such as hairpins, necklaces, etc.

⚠ It is prohibited to knock or throw, step on the battery pack, etc.

⚠ It is prohibited to directly weld the battery pack or battery cell, and it is prohibited to pierce the battery pack or battery cell with nails or other sharp objects.

9.3 LED Indicator of SOC

Status		Charging						Discharging					
Capacity indicator light		L6●	L5●	L4●	L3●	L2●	L1●	L6●	L5●	L4●	L3●	L2●	L1●
Capacity(%)	0～16.6%	OFF	OFF	OFF	OFF	OFF	Flash Twice	OFF	OFF	OFF	OFF	OFF	ON
	16.6～33.2%	OFF	OFF	OFF	OFF	Flash Twice	ON	OFF	OFF	OFF	OFF	ON	ON
	33.2～49.8%	OFF	OFF	OFF	Flash Twice	ON	ON	OFF	OFF	OFF	ON	ON	ON
	49.8～66.4%	OFF	OFF	Flash Twice	ON	ON	ON	OFF	OFF	ON	ON	ON	ON
	66.4～83.0%	OFF	Flash Twice	ON	ON	ON	ON	OFF	ON	ON	ON	ON	ON
	83.0～100%	Flash Twice	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON
Running signal●		ON						Flash 3 times					

10. Product Topology Diagram
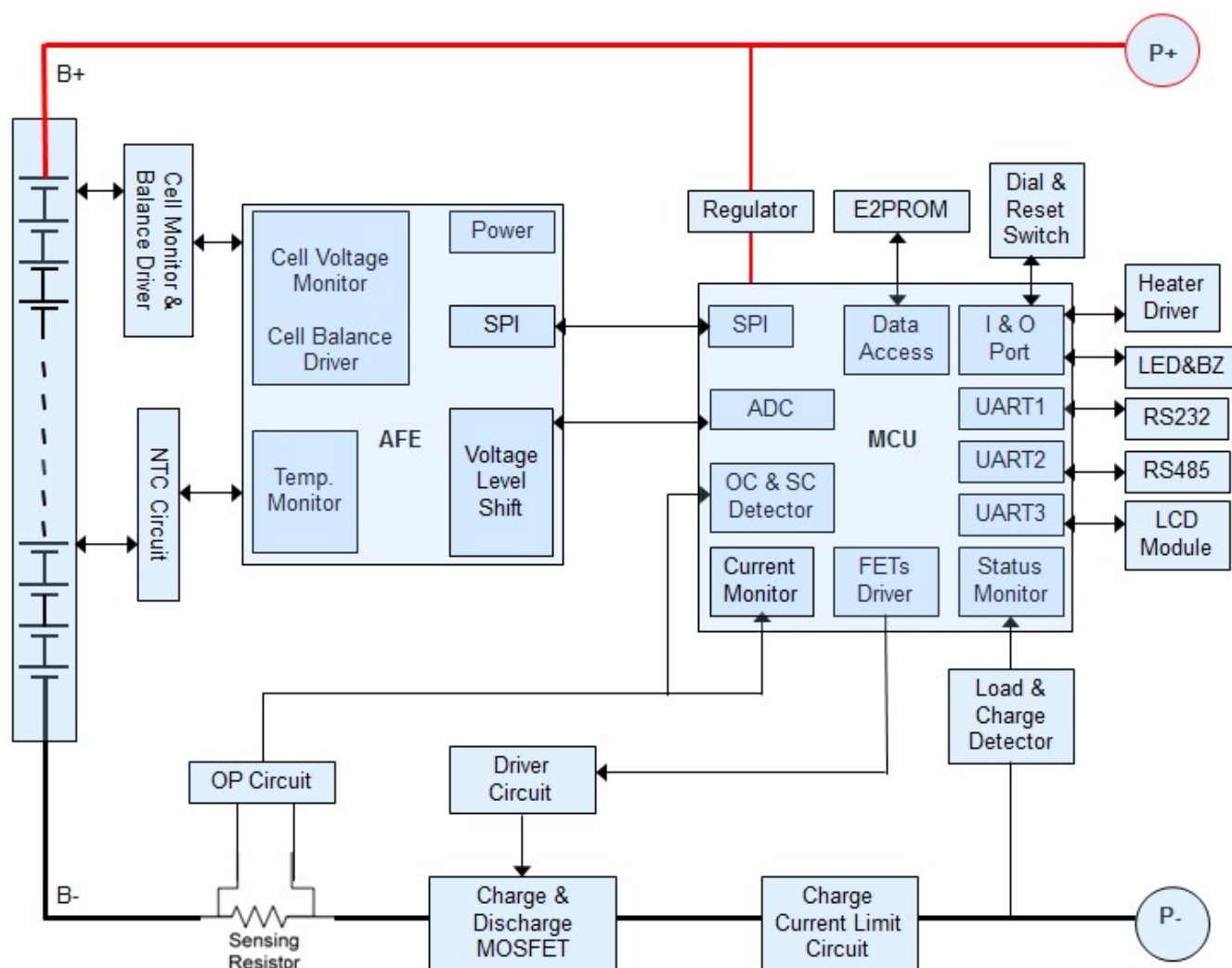
11. Battery Management System specifications

NO.	Content		Default parameters	Possible to set?	Remark
1	Battery cell overcharge protection	Battery cell overcharge alarm voltage	3600mv	yes	
		Battery cell overcharge protection voltage	3650mv	yes	
		Battery cell overcharge recovery delay	1s	yes	
	Battery cell overcharge recovery	Battery cell overcharge recovery voltage	3380mv	yes	
			SOC＜96%	yes	
		Discharge recovery	Discharge current＞1A		
2	Battery cell over-discharge protection	Battery cell over-discharge alarm voltage	2900mv	yes	
		Battery cell over-discharge protection voltage	2700mv	yes	
		Battery cell over-discharge protection delay	1.0s	yes	
	Battery cell over-discharge recovery	Battery cell over-discharge recovery voltage	2950mv	yes	
		Charge released	When connected to the charger, you can set as need		
3	Overall overcharge protection	Overall overcharge alarm voltage	57.6V	yes	
		Overall overcharge protection voltage	58.4V	yes	
		Overall overcharge protection delay	1.0S	yes	
	Overall overcharge recovery	Overall overcharge recovery voltage	54.0V	yes	
		Capacity recovery	SOC＜96%	yes	
		discharge recovery	Discharge current＞1A		
4	Overall over-discharge protection	Overall over-discharge alarm voltage	44.8V	yes	
		Overall over-discharge protection voltage	43.2V	yes	

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	Overall over-discharge protection recovery	Overall over-discharge protection delay	1.0S	yes	If over-discharge protection still cannot be restored after 30 seconds, the system enters low-power mode.
		Overall over-discharge recovery voltage	47.2V	yes	
		Charge recovery	Connect to the charger		
5	Charging overcurrent protection	Charging overcurrent alarm current	205A	yes	
		Charging overcurrent protection current	210A	yes	
		Charging overcurrent protection delay	1.0S	yes	
	Charging overcurrent recovery	Automatic recovery	Recovery after 1Min		
		discharge recovery	Discharge current＞1A		
6	Discharge overcurrent first-level protection	Discharge overcurrent "level 1" warning at	205A	yes	
		Discharge overcurrent "level 2" warning at	210A	yes	
		Discharge overcurrent "level 1" protection delay	6S	yes	
	Discharge overcurrent level one recovery	Automatic recovery	Restore after 1Min		
		Charge recovery	Charging current＞1A		
7	Discharge overcurrent "level 2" protection	Discharge overcurrent "level 2" protection current	≥250A	yes	
		Discharge overcurrent protection delay	100ms	yes	
	Discharge overcurrent secondary recovery	Automatic recovery	Restore after 1min		
		Charge recovery	Discharge current＞1A		
8	Short circuit protection	Short circuit protection	yes		
		Short circuit protection recovery	Charge recovery		
			load off recovery		

9	MOS high temperature protection	MOS over-temperature warning at	90℃	yes	
		MOS over-temperature protection at	115℃	yes	
		MOS over-temperature recovery at	85℃	yes	
10	Battery cell temperature protection	Charging low-temperature warning at	0℃	yes	
		Charging low-temperature protection at	-5℃	yes	
		Charging low-temperature recovery at	0℃	yes	
		Charging high-temperature warning at	55℃	yes	
		Charging high-temperature protection at	60℃	yes	
		Charging high-temperature recovery at	55℃	yes	
		Discharge low-temperature warning at	-15℃	yes	
		Discharge low-temperature protection at	-20℃	yes	
		Discharge low-temperature recovery at	-15℃	yes	
		Discharge high-temperature warning at	55℃	yes	
		Discharge high-temperature protection at	60℃	yes	
		Discharge high-temperature recovery at	55℃	yes	
10	Battery cell temperature protection	Ambient low-temperature warning at	-15℃	yes	
		Ambient low-temperature protection at	-20℃	yes	
		Ambient low-temperature recovery at	-15℃	yes	
		Ambient high-temperature warning at	60℃	yes	
		Ambient high-temperature protection at	65℃	yes	
		Ambient high-temperature recovery at	60℃	yes	

15. Others

● If customers need to use the battery for applications other than those specified in the documentation, or use the battery under usage conditions other than those specified in the documentation, they should contact ASGOFT in advance, as specific experimental tests are required to verify the performance of the battery under such usage conditions. and safety.

● ASGOFT is not responsible for any accidents caused by using the battery under conditions other than those specified in the documentation.

● If necessary, ASGOFT will notify customers in writing of improvement measures for correct battery operation. Any matters not mentioned in this manual must be confirmed through negotiation between both parties.

● Any matters that this specification does not cover should be conferred between the customer and ASGOFT .

12	Power consumption	Normal working mode	≤40mA		
		Low power consumption mode	≤200uA		
13	Equalization function	Balanced turn-on voltage	3500mv	yes	
		Open pressure difference	30mv	yes	
14	Low battery warning	Low battery warning	SOC＜5%	yes	No warning during charging
15	Sleep function	Sleep voltage	3150mv	yes	
		Delay	5Min	yes	
16	Battery cell failure protection	Battery cell voltage difference	voltage Difference＞1V	yes	
17	Current Restriction module		20A		Maximum current Restriction start 200A

12. Dormant and Wakeup

12.1 Dormant

The battery enters low power consumption mode when any of the following conditions are met:

1) Battery cell or overall over-discharge protection is not released within 30 seconds.

2) Press the button (3~6S) and release the button.

3) The lowest battery cell voltage is lower than the sleep voltage, and the duration reaches the sleep delay time (At the same time, it meets the requirements of no communication, no protection, no balancing, and no current.)

4) The standby time exceeds 24 hours (no communication, no charging and discharging, and no mains power).

5) Force shutdown through the host computer software.

Ps: Before entering sleep, make sure that the input terminal is not connected to external voltage, otherwise it will not be able to enter low-power mode.

12.2 Refresh

The battery enters low power consumption mode when any of the following conditions are met:

1) Connect to the charger, the charger output voltage must be greater than 48V.

2) Press the button (3~6S) and release the button.

3) With RS232 activation.

Ps: After battery cell or battery module over-discharge protection, it enters low-power mode, wakes up regularly every 4 hours, and turns on charging and discharging MOS. If it can be charged, it will exit the sleep state and enter normal charging; if it cannot be charged after automatic wake-up for 10 consecutive times, it will no longer wake up automatically. When the system defines the end of charging and the recovery voltage has not been reached after 2 days/48h of standby (standby time setting value), charging will be forced to resume until the end of charging again.

13.Notice

- It is prohibited to use or place the battery pack under high temperature (under direct sunlight or in a very hot car), otherwise it may cause the battery to overheat, catch fire or fail, thereby shortening the life of the battery pack.

- It is prohibited to use it in places with strong static electricity and strong magnetic fields, otherwise the safety protection device of the battery combination will be easily destroyed, causing potential safety hazards.

- If the battery leaks and the electrolyte enters the eyes, please do not rub it, rinse the eyes with clean water, and send to the hospital for treatment immediately, otherwise it will damage the eyes.

- If the battery combination emits an odor, generates heat, changes color, or deforms during use or storage, or if any abnormality occurs during charging, immediately remove the battery from the charger or device and stop using it.

- If the connection points of the battery combination are dirty, wipe them with a dry cloth before use, otherwise the performance may be affected due to poor contact.

- The electrodes of discarded batteries should be wrapped with insulating paper to prevent fire and smoke.

- The battery pack should be stored at room temperature and charged to 40% to 60% capacity. To prevent the battery from over-discharging, it is recommended to charge it every 3 months. If the storage time exceeds one year, it is recommended to charge and discharge it once a year to activate the battery.