Produce

Taste regulation grid Book

Product Name: MASON-280 (Ultra-empty version)
51.2V280AH Lithium IonSub-battery system

Project Name	Configuration
External switch function	have
Current limiting function	have
Display	have
Storage function	have
Pre-charge function	none
Communication Function	have
Secondary protection	have
Bluetooth	have

Update Record

Version	describe	date	state
A	First edition released	**2025.03.12**	controlled

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1. Basic Introduction

This battery system is suitable for household energy storage and small and medium-sized commercial storage battery systems. 3.2V 280 Ah lithium battery composition 1 and 16 Battery Module Group and Intelligence BMS composition 51.2V280Ah Lithium battery system. The system supports 16 The system is prohibited from being used in series and with other non Mix batteries of the same brand and model.

2. Function introduction and usage instructions

2.1 Active balancing

This product uses active balancing technology. The principle of balancing is to transfer the energy of high-voltage cells to low- voltage cells through the protection board. Before using the equalization function, users need to set the basic parameters of the battery and download the BMS - APP, download Later in the sky APP After setting the battery type, set the basic battery parameters in the common settings, including The number of monomers, Battery capacity, trigger equalization voltage difference (can keep default), voltage calibration, Current calibration, etc.

Users can APP Set the balanced trigger voltage difference (mV) in the parameter settings When the balancing is turned on, when the voltage difference between any two battery strings in the battery pack is The balance will automatically open when the pressure difference is greater than the set value, and close when the pressure difference is less than the set value The default balancing current is the maximum value. 1A/2A , users can It is recommended that the balancing current should not exceed the battery capacity (C) . 0.2C If the equalization function is not required , APP of BMS The control page will The equalization switch is set to off.

2.2 Charging overvoltage protection and recovery

This product is equipped with charging overvoltage protection as standard, and users can APP Set the single cell overcharge protection voltage and Single cell overcharge recovery voltage. When any battery string is over-voltage during battery charging, the protection board will shut down charging to protect the battery. After the voltage is lower than the single cell overcharge recovery voltage, the protection board starts charging again to prevent the battery from being overcharged and damaging the battery cell.

2.3 Discharge undervoltage protection and recovery

This product is equipped with discharge undervoltage protection function as standard. Users can APP Set the battery undervoltage on the parameter setting page in Protection

voltage (V), Battery undervoltage recovery voltage (V), Automatic shutdown voltage (V) When the protection board is in the discharge state, when the power of any battery string When the voltage is lower than the set undervoltage protection voltage value, the protection board triggers the undervoltage protection and shuts down the discharge to protect the battery cell and prevent overdischarge from damaging the battery cell. When the voltage of all cells is higher than the undervoltage recovery voltage, the undervoltage protection is released and the discharge will be turned on again. When the voltage is lower than the automatic shutdown voltage, the protection board will automatically shut down to protect the battery.

2.4 Charging overcurrent protection and recovery

This product is equipped with a charging overcurrent protection function as standard. Users can adjust the charging current according to their own battery capacity and charger output current. APP In Parameter setting page to set continuous charging current (A), Charge overcurrent delay (S)、Charge overcurrent release (S) When the charging current is greater than the set continuous charging current When charging, the charging protection is triggered after the set charging overcurrent delay time, and the protection board shuts down charging. After the charging overcurrent release time, the protection board Will again Turn on charging again.

2.5 Discharge overcurrent protection and recovery

This product is equipped with discharge overcurrent protection function as standard. Users can adjust the discharge current according to their own battery capacity and load output current. APP The reference Set the continuous discharge current (Aon the digitals etting page , Discharge overcurrent delay (S) discharge overcurrent release (SWhen thedisc harge current is greater than the set continuous discharge current When the discharge is on, the discharge overcurrent protection is triggered after the set discharge overcurrent delay time, the protection board turns off the discharge, and the protection board turns off the discharge after the discharge overcurrent release time. The shield will open again to discharge. (Note: The maximum continuous discharge current that can be set cannot exceed the design value 200A)

2.6 Over-temperature protection and recovery

standard . Users can APP Set the charging over-temperature protection on the parameter setting page Protection (℃)、Charge over-temperature recovery (℃), discharge over-temperature protection (℃)、Discharge over-temperature recovery (℃)
When the temperaturedata collected by the protection board is higher than the set When the over-temperature
protection value is reached, the protection board turns off charging. When the temperature returns to below the set over- temperature recovery value, charging is turned on again. The same applies to power, discharge over-temperature protection and recovery.

2.7 Low temperature protection and recovery

This product is equipped with a charging and low temperature protection function as standard. Users can APP Set the charging low temperature protection on the parameter setting page (℃)、Charge low temperature recovery (℃)When the temperature data collected by the protection board is lower than the set charging low temperature protection value, the protection board shuts down the charging When the temperature returns to a value higher than the set charging low temperature recovery value, charging will be turned on again.

2.8 Short circuit protection and recovery

This product is equipped with short-circuit protection function as standard. The user does not need to set the current that triggers the short-circuit protection . If necessary, the user can set the current that triggers the short-circuit protection. Own needs in the extreme space APP In the parameter setting page, set the short circuit protection delay (us) and short circuit protection recovery time (S) When a user connects to a charger for the first time When charging the appliance, after the external circuit is correctly connected, BMS If the charging short circuit protection is triggered after turning on charging in the control page, you can increase the short circuit protection Delay, The reason for the protection is that the peak current at the moment the charger is turned on is too large. At this time, the short-circuit protection is turned off after the short-circuit protection recovery time. Release, the protection board opens for charging. When the user connects the load for the first time and the discharge short

circuit protection appears, make sure that there is no short circuit in the external wiring. This can be solved by increasing the short-circuit protection delay, because some loads have large internal capacitance, resulting in a large instantaneous current when they are turned on, which may trigger the short circuit. After the short-circuit protection recovery time, the short-circuit protection is released and the protection board opens to discharge.

2.9 Charging current limiting function

The protection board is equipped with a charging current limiting function as standard. Users can set the charging current according to their own battery capacity and charging current . APP Set the continuous charge current in (A) , Charge overcurrent delay (S) 、Charge overcurrent release time (S) When the battery is overcharged , the current limiting function starts. Charge The current is constant at 10A left and right to protect the battery.

2.10 Emergency switch

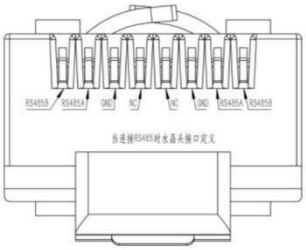
The protection board is equipped with an emergency switch function. If the user encounters problems such as over-temperature, over-discharge, over-charge, or string loss during normal use, the protection board can be turned on in the air. In APP BMS After the emergency switch is turned on on the control page, the protection board will start charging and discharging at the same time 30 minutes, giving users an emergency time. Procedure If the voltage of the single cell has reached the automatic shutdown voltage, the protection board will continue to work until the emergency switch is turned off. 30 The minute cycle ends, Avoid dangerous situations such as breaking down on the road.

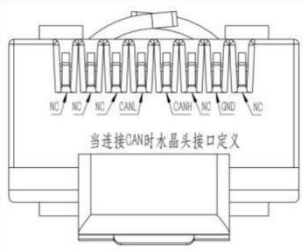
2.11 Smart sleep

protection board is equipped with intelligent sleep function, and users can APP of BMS The control page selects to open or close. Head When the protection board is in standby state (continuous 26 Hour charge and discharge current is less than 1A) Turn off the protection board to reduce the protection board's own impact on the battery Energy consumption is reduced. When the user needs to activate it again, he can use the button or charger to activate it.

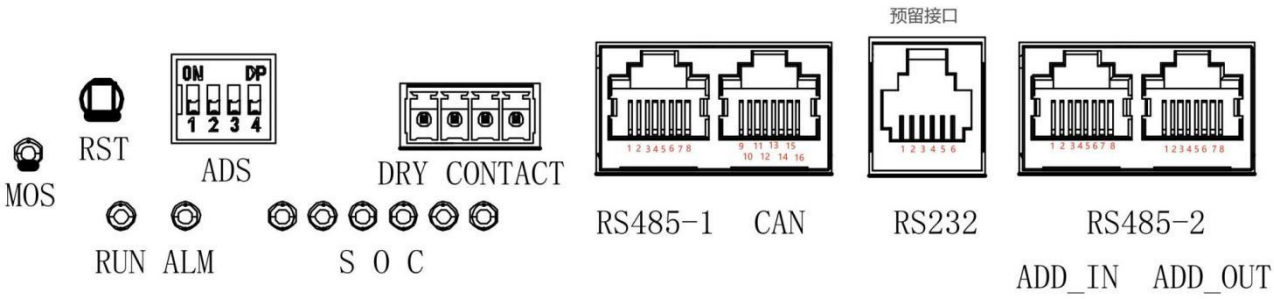
2.12 Communication Function

Protection plate standard CAN 、 RS 485 communication. CAN Default communication rate 250K , users can choose the inverter they are using. Brand and specific specifications in the extreme air APP Select the corresponding protocol. RS 45 Communication interface, where RS 485-1 For use with inverter Users can set up communication according to the inverter brand and specific specifications they use in the polar air APP Select the corresponding protocol. RS 485-2 Parallel output Two interfaces are used for parallel connection of battery packs and connecting to the host computer to view battery pack information. The default baud rate 115200. The protection board can The communication address can be set by setting the DIP switch, and the data of all battery packs can be queried through the host polling. The address setting range 0~ 15 .





Communication Description

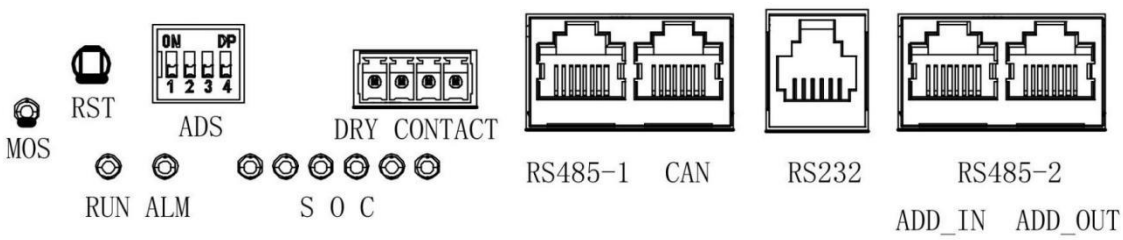


CAN and RS 485-1 catch mouth Certainly righteous (Interface definition ofCAN and RS 485-1 **)**		
Pin number (Pin number)	**Pin Definition (Pin definition)**	**Remark (remark)**
1 , 8	RS 485- B1	
2 , 7	RS 485-A1	
3 , 6	GND	
4 , 5	NC	
9 , 10 , 11 , 14 , 16	NC	
12	CANL	
13	CANH	
15	GND	
Pre Keep catch mouth Certainly righteous (Reserved interface definition)		
Pin number (Pin number)	**Pin Definition (Pin definition)**	**Remark (remark)**

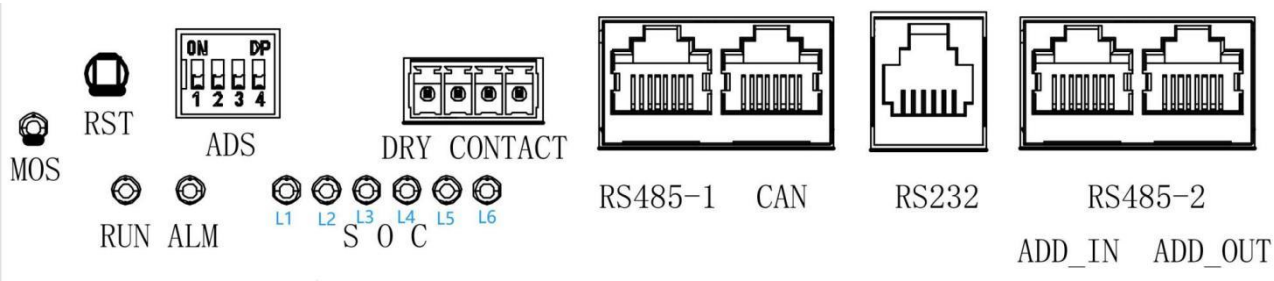
1-6	NC	Reserved interface, not used yet
RS 485-2 catch mouth Definition (Interface definition ofRS 485 -2)		
Pin number (Pin number)	**Pin Definition (Pin definition)**	**Remark (remark)**
1	RS 485- B2	
2	RS 485-A2	
3	GND	
4	NC	
5	NC	
6	GND	
7	RS 485-A2	
8	RS 485-B2	

2.13 Interface Board Function Introduction

The protection board is factory-equipped with an interface board for easy use by users led Indicator light, reset switch, DIP switch, dry contact, communication and other functions. The LED indicator light can help users judge the current BMS Working status, remaining battery power; reset button can be used by the user BMS When an abnormality occurs , press Down reset BMS ; DIP switches can be used when BMS Used for address setting in parallel use environment, support 0-15 Total 16 Address; dry connection Point user control of external devices such as alarms and fans; CAN and RS 485-1 Used for BMS Communication with inverter; RS 485-2 For battery pack The panel interface is shown in the figure below (see attachment for details).



2.14 led Indicator Light Description



state	Normal / Warning / Protection	ON/OFF instruct	RUN	ALM	L1	L2	L3	L4	L5	L6	illustrate
Shutdown	normal	OFF									
Balance	normal	ON	Flash	OFF	Display based on power level					OFF	
Charge	normal	ON	Flash	OFF	Display based on power level					OFF	
	Overcurrent \ overtemperature \ overvoltage \ Charging Failure	ON	Flash	Flash	Display based on power level					OFF	
Discharge	normal	ON	Flash	OFF	Display based on power level					OFF	
	Overcurrent \ overtemperature \ undervoltage \ Discharge failure	ON	Flash	Flash	Display based on power level					OFF	
Other warnings	Password not changed \ short Road \ Temperature Abnormal	ON	Flash	Flash	Display based on power level					OFF	

Remark: When the device address is set to 0 When hosting, the last one led lamp L6 flashing When set to other values, the slave will turn off, slave and master communication Flashes after success

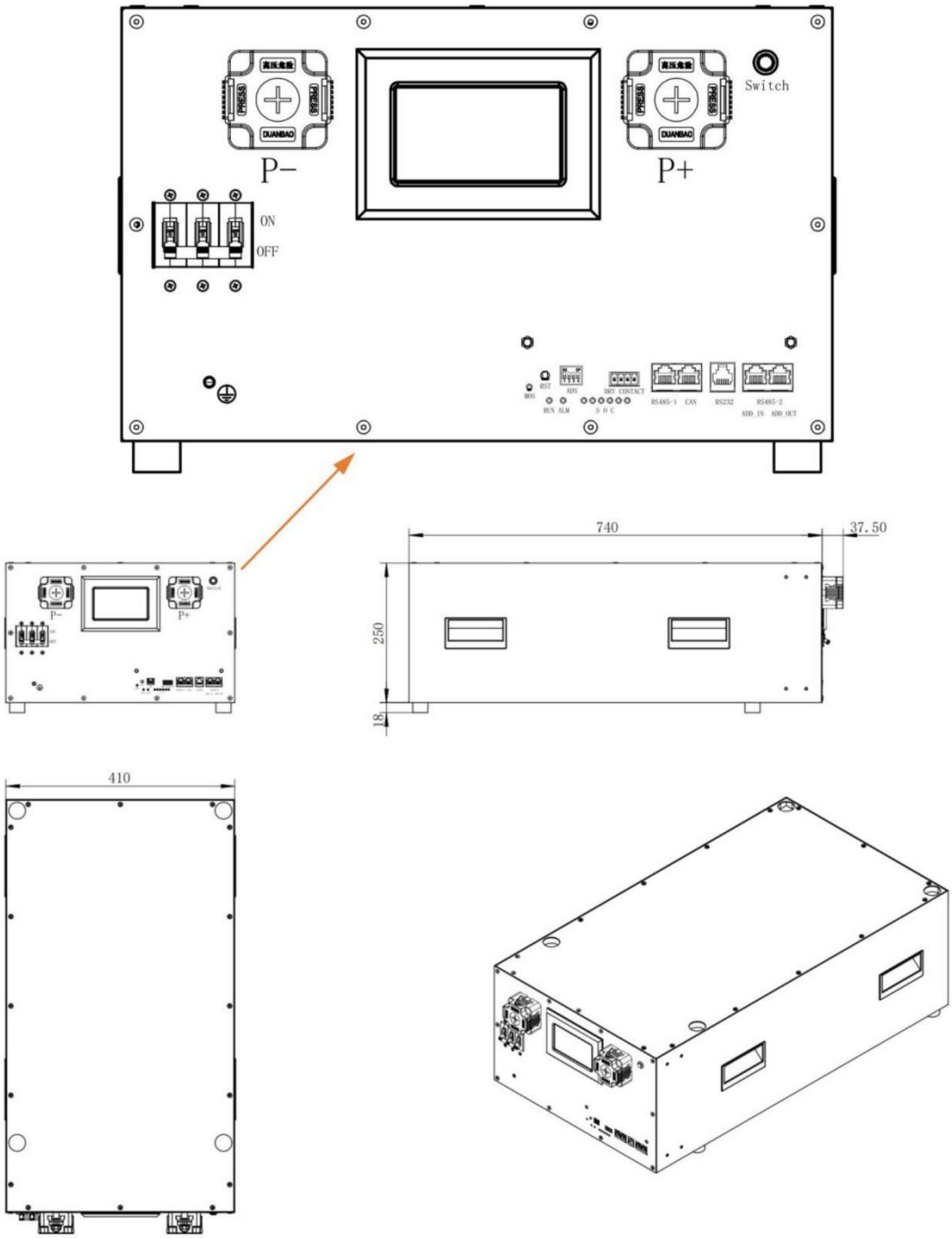
Remark: ON Representative LED Status is bright, OFF Representative LED The status is off.

state		Charge					put electricity				
Capacity indicator light		L5	L4	L3	L2	L1	L5	L4	L3	L2	L1
Battery %	0~20%	OFF	OFF	OFF	OFF	ON	OFF	OFF	OFF	OFF	ON
	20~40%	OFF	OFF	OFF	ON	ON	OFF	OFF	OFF	ON	ON
	40~60%	OFF	OFF	ON	ON	ON	OFF	OFF	ON	ON	ON
	60~80%	OFF	ON	ON	ON	ON	OFF	ON	ON	ON	ON
	80~ 100%	ON	ON	ON	ON	ON	ON	ON	ON	ON	ON

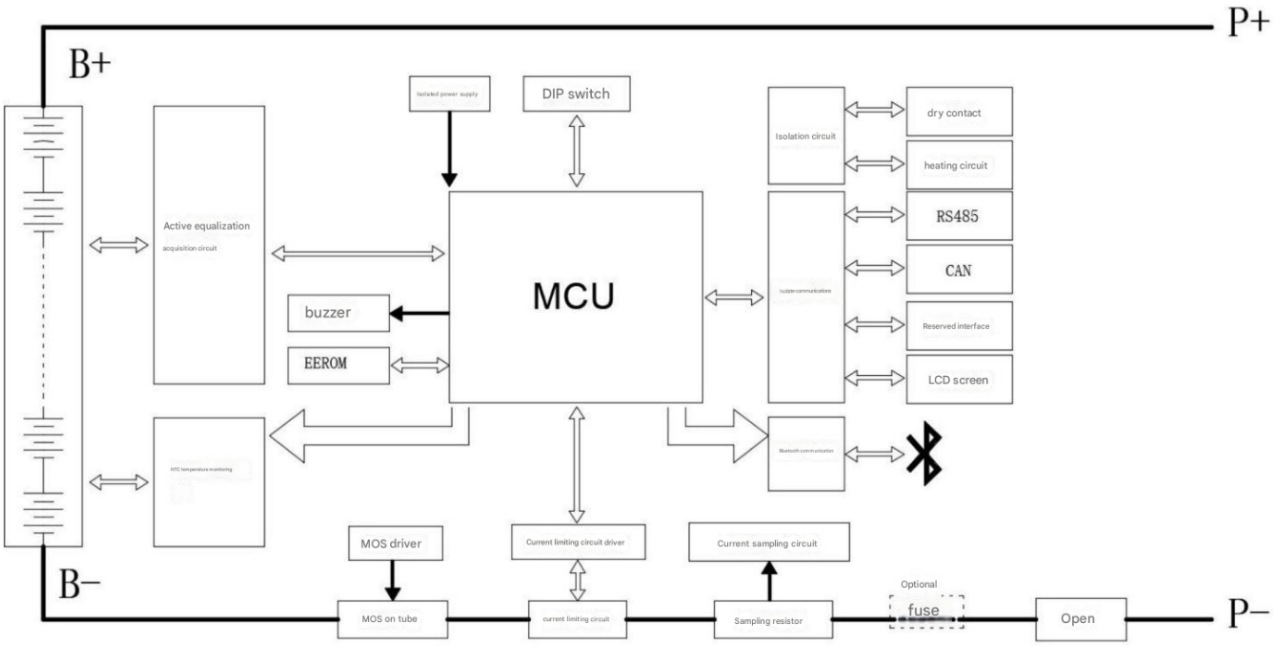
Remark: ON Representative LED Status is bright, OFF Representative LED Status is off Destroy

3. Product details

3.1 Dimensions and interface diagram



3.2 Electrical Schematics



3.3 Battery performance parameters

Serial number	project	Specification
1	Battery Configuration	1P16S
2	Rated voltage	51.2V
3	Operating voltage range	41.6V~57.6V
4	Rated capacity	280Ah
5	capacity	14.336KWh
6	Standard charge / discharge current	100A @25 ± 2 ℃
7	Maximum charging current	200A@25 ± 2 ℃
8	Maximum discharge current	200A @25 ± 2 ℃
9	Operating temperature	0 ～ 55 ℃ (Charge)
		-20 ～ 55 ℃ (Discharge)
10	Storage temperature and humidity	-10 ℃ ~35 ℃ (stored within one month) 25 ± 2 ℃ (storage within three months) 65%±20%RH
11	Dimensions (L x W x H)	(740)×(410)×(250)mm
12	weight	113Kg ± 3kg
13	Cycle life	8000 cycles @25 ℃ 100A Charge and discharge current 80% DOD
18	IP grade	IP 20
20	Altitude	0-3000m
twenty one	Humidity range	5~90%

3.4 Battery protection parameters

sequence Number **NUM**	parameter **PARA**	Iron lithium default **LIFEPO4**	unit **(unit)**
1	Equalization start voltage (balancing initial voltage)	3	V
2	Maximum balancing current (Maximum balancing current)	1	A
		2	A
3	Single cell overcharge voltage (Unit overcharge voltage)	3.6	V
4	Single cell overcharge protection recovery (Single overcharge protection recovery	3.55	V
5	Single cell undervoltage protection (Monomer undervoltage protection)	2.6	V
6	Single cell undervoltage protection recovery (Single undervoltage protection recovery	2.65	V
7	Automatic shutdown voltage (Automatic shutdown voltage)	2.5	V
8	SOC -0% voltage (SOC -0% voltage)	2.6	V
9	SOC -100% voltage (SOC -100% voltage)	3.5	V
10	Trigger equalization pressure difference (Trigger balancing differs pressure)	0.01	V

11	Charging overcurrent protection delay (Charging overcurrentprotection delay)	30	Seconds (S)
12	Charging overcurrent protection release time (Charge overcurrent protection release time)	60	Second (S)
13	Discharge overcurrent protection delay (Discharge overcurrentprotection delay)	300	Second (S)
14	Discharge overcurrent protection release time (Discharge overcurrent protection release time)	60	Second (S)
15	Short circuit protection delay (Short-circuit protection delay)	1500	Microseconds (uS)
16	Short circuit protection release time (Short circuit protection release time)	60	Second (S)
17	Charging over-temperature protection temperature Charging overtemperature protection temperature	70	℃
18	Charging over-temperature recovery temperature (Charge overtemperature restore temperature	60	℃
19	Discharge over-temperature protection temperature (Discharge overtemperature protection temperature	70	℃

20	Discharge over-temperature recovery temperature (Discharge overtemperature recovery temperature	60	℃
twenty one	Charging low temperature protection temperature (Charging low temperature protection temperature	-20	℃
twenty two	Charging low temperature recovery temperature (Charge low temperature store temperature	-10	℃
twenty three	MOS Over temperature protection temperature (MOS Overtemperature protection temperature)	100	℃
twenty four	MOS Over temperature protection recovery temperature (MOS Overtemperatureprotection recovery temperature	80	℃
25	Device Address (Device address)	0	/
26	Discharge pre-charge time (Discharge precharge time)	0	Second (S)

4. Install

4.1 Unpacking and Inspection

Handling:

It is forbidden to apply force on the terminal to prevent terminal damage and cracking of the sealing part;

Avoid turning the battery upside down, dropping it or causing it to impact;

Absolutely avoid using metal wires such as steel ropes to prevent battery short circuit.

Inspection: Packing box and battery appearance - no damage;

Point inspection: The number of batteries and accessories are complete;

Refer to: Instructions, Precautions.

4.2 Pre-installation precautions

After checking that there is no abnormality in the battery, install it in the designated location (e.g. battery room);

If the battery is placed in the battery room, it should be placed at the lowest point in the battery room as much as possible;

Avoid installing the battery near heat sources (such as transformers);

Because batteries may generate flammable gases when stored, avoid installing them near spark-generating devices (such as fuses);

Before connecting, polish the battery terminals to give them a shiny metallic look; be careful not to short-circuit the positive and negative battery terminals with conductive materials.

When using multiple batteries together, first make sure the batteries are connected correctly , then connect the battery to the charger or load. The positive terminal of the battery should be connected to the positive terminal of the charger or load, and the negative terminal should be connected to the negative terminal. If the battery and charger are not connected correctly, the charger will be damaged. Be careful not to connect incorrectly. Make sure to connect correctly.

When wiring, make sure the connection is firm, but do not use excessive force. To avoid damaging the terminals, see Table 1 for recommended tightening torque. Each connecting nut and bolt must be tightened to the required torque as shown in Table 1.

5. Equipment Instructions

5.1 APP Install

Scan the QR code below to get the mobile phone that matches the product. APP

cell phone APP Link QR code

5.2 Parameter settings

Press the button to activate the device. Mobile phone APP Connect product settings. Customers can set parameters according to their needs or according to the above 3.4 Set the battery parameters.

8. Package

Packed in a dry, dust and moisture proof box. Use plastic film / EPE Pack the product in cartons. Specifications: **L830 mm *W485 mm *H 350 mm**
Packing quantity **1** tower Weight: **118 kg**

9. Notes

●If the battery has obvious impacts and deformations, do not use it

●Do not install batteries in multiple layers or stacks.

●Pay attention to the polarity of the power supply and the access terminals.

●Ensure equipment insulation and use tools and instruments correctly.

●The battery installation site should be kept away from fire sources and flammable objects, and the installation site should be ventilated and dry.

●Absolutely prohibit plugging or unplugging plugins while the product is in operation.

●It is strictly forbidden for non-professional technicians of our company to open each functional module, and the consequences will be borne by themselves.

●Before using a new battery or a battery that has been used for a long time, please fully charge the battery with a special charger.

●Do not disassemble, open, squeeze, bend, deform, pierce or break the product.

●Do not modify the battery or insert any external objects. Do not immerse the product in or expose it to water, fresh water, seawater, drinks (such as coffee, juice, etc.) or other liquids. Keep it away from fire sources, explosive substances or other dangers.

●Do not short-circuit the battery, and do not allow metal or other conductors to contact the battery terminals.

●Do not drop the battery. If it does happen (especially on a hard surface), please contact the service center.

●In case of electrolyte leakage, do not let the battery come into contact with the skin or eyes. If it does happen, rinse the contact area with plenty of water or seek medical help.

●Under no circumstances should the cell battery be disassembled. This may cause internal short circuits and even lead to fires or other problems.

●Under no circumstances should the battery be burned or thrown into a fire. Otherwise, it may cause the battery to catch fire.