ID：JK/J.JK-B1A24S-15P.09
Ver：1.3

The lithium battery smart protection board

JK-BD6A17S6P/JK-BD6A20S6P/JK-BD6A24S6P
JK-BD6A17S8P/JK-BD6A20S8P/JK-BD6A24S8P
JK-BD6A20S10P/JK-BD6A24S10P
JK-B1A20S15P/JK- B1A24S15P
JK-B2A24S15P/JK-B2A24S20P/ JK-B2A8S20P

Specification and operation manual

Product warranty clause

Name：The lithium battery smart protection board

Warranty period：One Year

First of all, thank you for purchasing the Battery Active-Balancer from Chengdu Jikong technology co., LTD.

Chengdu Jikong technology co., LTD. Provides quality warranty for the hardware products and accessories sold by our company. The warranty period is as shown above.During the warranty period, the company shall have the right to choose to repair or replace the whole set of products after receiving the notice of the product failure and verification.The whole set of replacement products may be new or close to new.

1. Chengdu jikong technology co., ltd. guarantees that the products are fully tested.
2. Chengdu jikong technology co., LTD does not guarantee that the products can be used without interruption during the product repair process.However, the company shall ensure that faulty products are repaired within a reasonable time.
3. The warranty period starts from the date of product delivery or the date of installation by Chengdu jikong technology co., LTD.If the company's products are not installed within 30 days after the date of shipment due to the user's schedule or delay, the warranty period of the products shall be calculated from the 31st day after the date of shipment.
4. Chengdu Jikong Technology Co., Ltd. does not provide free warranty for product failure and damage caused by any of the following situations: (a) improper use or improper maintenance; (b) software, accessories, components or other items not provided by chengdu jikong technology co., LTD.;(c) unauthorized disassembly, modification and misuse;(d) use in excess of the scope specified in the technical specifications of the product;(e) improper transport, handling and storage;(f) failure or damage caused by other non-mass causes (e.g. earthquake, war, traffic accident, etc.).

To the extent permitted by law, the above warranty is the only express warranty and there are no other warranties, whether written or oral.Expressly disclaims any implied warranty or commercial terms.

Copyright statement

Contents

1 Overview

The lithium battery intelligent protection board is a management system tailored for large-capacity series lithium battery packs. It has functions such as voltage acquisition, high current active balance, overcharge, over discharge, over current and over temperature protection, coulomb counter, Bluetooth communication, GPS remote and other functions. Suitable for battery types such as lithium iron phosphate, the ternary lithium and so on.

The protection board relies on the energy transfer active balance technology with independent intellectual property rights, which can achieve a maximum continuous current of 2A. High-current active balance technology can ensure battery consistency, increase battery range, and delay battery aging to the greatest extent.

The protection board has a matching mobile APP, which supports Android and IOS operating systems. The APP can connect to the protection board via mobile phone Bluetooth to view the battery working status, modify various working parameters of the protection board, control the charge and discharge switch, and so on. The protection board is small in size, simple in operation and full of functions, and can be widely used in battery packs for small sightseeing cars, scooters, shared cars, high-power energy storage, base station backup power, solar power stations and other products.

2 Main technical parameters

2.1 Main technical indicators

The main technical indicators of the protection board are shown in Table 1.

Table 1. Main technical indicators of protection board

JiKong BMS

Technical Index	Product Specifications							
	17S 0.6A 60A	20S 0.6A 60A	24S 0.6A 60A	17S 0.6A 80A	20S 0.6A 80A	24S 0.6A 80A	20S 0.6A 100A	24S 0.6A 100A
	BD6A17S6P	BD6A20S6P	BD6A24S6P	BD6A17S8P	BD6A20S8P	BD6A24S8P	BD6A20S10P	BD6A24S10P
Number of Battery Strings(Li-ion)	7~17S	7~20S	7~24S	7~17S	7~20S	7~24S	7~20S	7~24S
Number of Battery Strings(Lifepo4)	8~17S	8~20S	8~24S	8~17S	8~20S	8~24S	8~20S	8~24S
Number of Battery Strings(LTO)	12~17S	12~20S	12~24S	12~17S	12~20S	12~24S	12~20S	12~24S
Balance Method	Active Balance							
Balance Current	0.6A	0.6A	0.6A	0.6A	0.6A	0.6A	0.6A	0.6A
Conductive Resistance in Main Circuit	1.3mΩ	1.3mΩ	1.3mΩ	1.3mΩ	1.3mΩ	1.3mΩ	0.8mΩ	0.8mΩ
Continuous Discharge Current	60A	60A	100A	80A	80A	80A	100A	100A
Maximum Discharge Current	100A	100A	100A	150A	150A	150A	200A	200A
Over Charge Protection Current(ADJ)	10~60A	10~60A	10~60A	10~80A	10~80A	10~80A	10~100A	10~100A
Other Interfaces (Customized)	RS485	RS485	RS485	RS485	RS485	RS485	RS485 CAN	RS485 CAN
Size	133*81*18mm						162*102*20mm	

Technical Index	Product Specifications							
	20S 1A 150A	24S 1A 150A	24S 2A 150A	24S 2A 200A		8S 2A 200A	25S 2A 600A	25S 5A 600A
	BD6A20S15P	B1A24S15P	B2A24S15P	B2A24S20P		B2A8S20P	B2A25S60P	B5A25S60P
Number of Battery Strings(Li-ion)	7~20S	7~24S	7~24S	7~24S		8S	8~25S	8~25S
Number of Battery Strings(Lifepo4)	8~20S	8~24S	8~24S	8~24S		8S	8~25S	8~25S
Number of Battery Strings(LTO)	12~20S	12~24S	12~24S	12~24S		/	12~25S	12~25S
Balance Method	Active Balance							
Balance Current	1A	1A	2A	2A		2A	2A	5A
Conductive Resistance in Main Circuit	0.5mΩ	0.5mΩ	0.5mΩ	0.3mΩ		0.3mΩ	0.3mΩ	0.3mΩ
Continuous Discharge Current	150A	150A	150A	200A		200A	600A	600A
Maximum Discharge Current	300A	300A	300A	350A		350A	350A	350A
Over Charge Protection Current(ADJ)	10~150A	10~150A	10~150A	10~200A		10~200A	10~600A	10~600A
Other Interfaces (Customized)	RS485 CAN	RS485 CAN	RS485 CAN	RS485 CAN		RS485	RS485 CAN	RS485 CAN
Size	162*102*20mm					152*107*20mm	234*144*32mm	
Wiring Output	Common Port							
Single Cell Voltage Range	1-5V							
Voltage Acquistion Accuracy	±5mV							
Over Charge Protection Voltage	1.2-4.35V Adjustable							
Over Charge Relese Voltage	1.2-4.35V Adjustable							
Over Current Detect Delay	2~120S Adjustable							
Over Discharge Protection Voltage	1.2-4.35V Adjustable							
Over Discharge Relese Voltage	1.2-4.35V Adjustable							
Quantity of Temperature Detection	3Pcs							
Temp Protection	Yes							
Short Circuit protection	Yes							
Coulomb Counter	Yes							
Bluetooth Function	Support for Android/IOS phone							

2.2 Environmental conditions

a) Operating temperature range: -20 ℃ ～ 70 ℃

b) Power requirements: 20 ~ 100V

c) Power consumption: 10mA @ 100V in balanced state, 6mA @ 100V in unbalanced state

3 Connector and interface description

3.1 Connector, LED light position description

The position of the connector and LED light is shown in Figure 1.

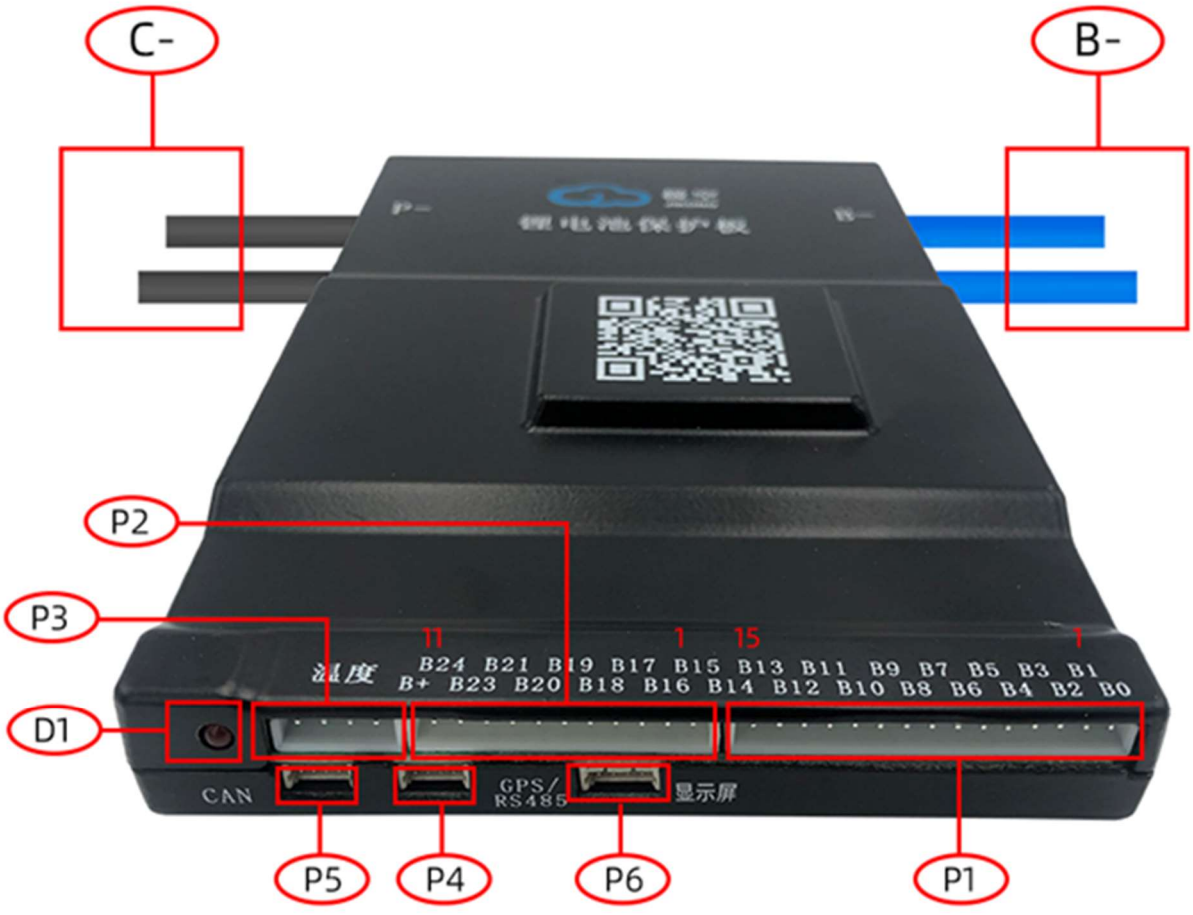
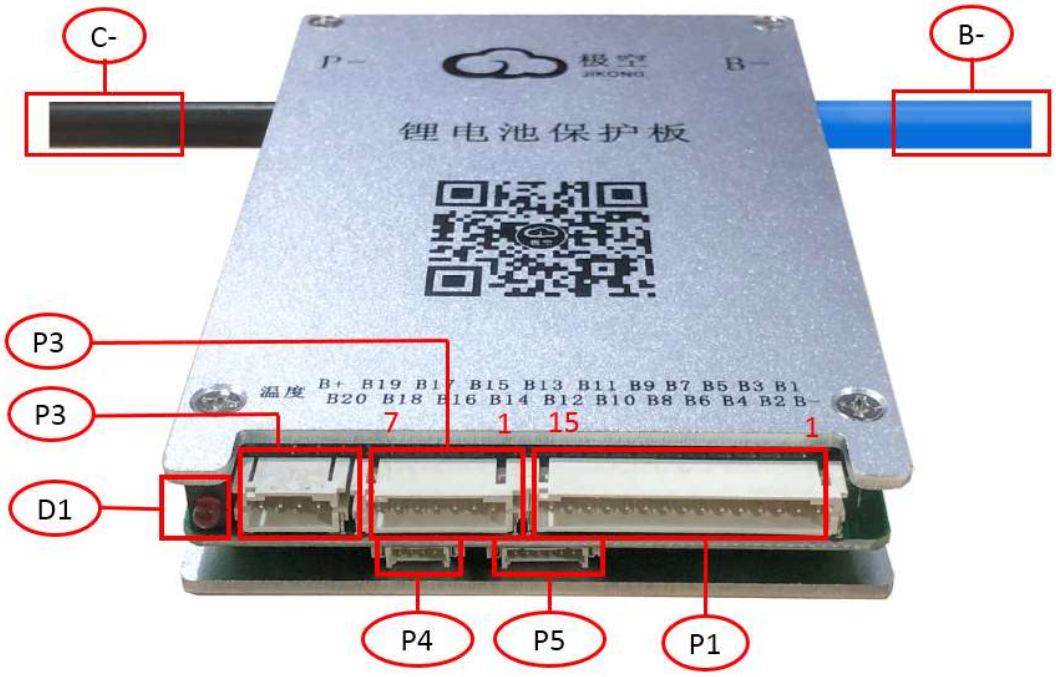


Figure 1. JK-BD6A20S10P/JK-BD6A24S10P/JK-B1A20S15P/JK- B1A24S15P JK-B2A24S15P/JK-B2A24S20P Connector diagram



JK-BD6A17S6P/JK-BD6A20S6P/JK-BD6A24S6P/JK-BD6A17S8P/JK-BD6A20S8P/
JK-BD6A24S8P Connector diagram

3.2 Connector, LED definition description

Table 2 for connector definition and LED light definition.

Table 2. Connector definition

connector	Pin	JK-BD6A/8A-17S/20S/24S-6P/8P		JK-BD6A/1A/2A-20S/24S-10P/15P/20P	
		name	Definition	name	Definition
P1	1	B-	Total negative electrode of battery	B-	Total negative electrode of battery
	2	B1	1 st cell +	B1	1 st cell +
	3	B2	2 nd cell +	B2	2 nd cell +
	4	B3	3 rd cell +	B3	3 rd cell +
	5	B4	4 th cell +	B4	4 th cell +
	6	B5	5 th cell +	B5	5 th cell +
	7	B6	6 th cell +	B6	6 th cell +
	8	B7	7 th cell +	B7	7 th cell +
	9	B8	8 th cell +	B8	8 th cell +
	10	B9	9 th cell +	B9	9 th cell +
	11	B10	10 th cell +	B10	10 th cell +
	12	B11	11 th cell +	B11	11 th cell +
	13	B12	12 th cell +	B12	12 th cell +

connector	Pin	JK-BD6A/8A-17S/20S/24S-6P/8P		JK-BD6A/1A/2A-20S/24S-10P/15P/20P	
		name	Definition	name	Definition
	14	B13	13 th cell +	B13	13 th cell +
	15	B14	14 th cell +	B14	14 th cell +
P2	1	B15	15 th cell +	B15	15 th cell +
	2	B16	16 th cell +	B16	16 th cell +
	3	B17	17 th cell +(17s)	B17	17 th cell +
	4	B18	18 th cell +	B18	18 th cell +
	5	B19	19 th cell +	B19	19 th cell +
	6	B20	20 th cell +(20s)	B20	20 th cell +(20s)
	7	B21	21 th cell +	B21	21 th cell +
	8	B22	22 th cell +	B22	22 th cell +
	9	B23	23 th cell +	B23	23 th cell +
	10	B24	24 th cell +(24s)	B24	24 th cell +(24s)
	11	B+	Protection board power	B+	Protection board power
P3	1	T1A	1st temperature sensor A pin		
	2	T1B	1st temperature sensor B pin		
	3	T2A	2nd temperature sensor A pin		
	4	T2B	2nd temperature sensor B pin		
P4	External GPS interface or external RS485 converter interface				
P5	External LCD display interface			External CAN converter interface	
P6	/			External LCD display interface	
D1	Bluetooth connection indicator. When the protection board is connected to Bluetooth, the indicator is always on. When disconnected, the indicator blinks.				
C-	Connect external load or charger negative.				
B-	Connected to battery negative.				

3.3 Product appearance

The appearance of the product is shown in Figure 2.

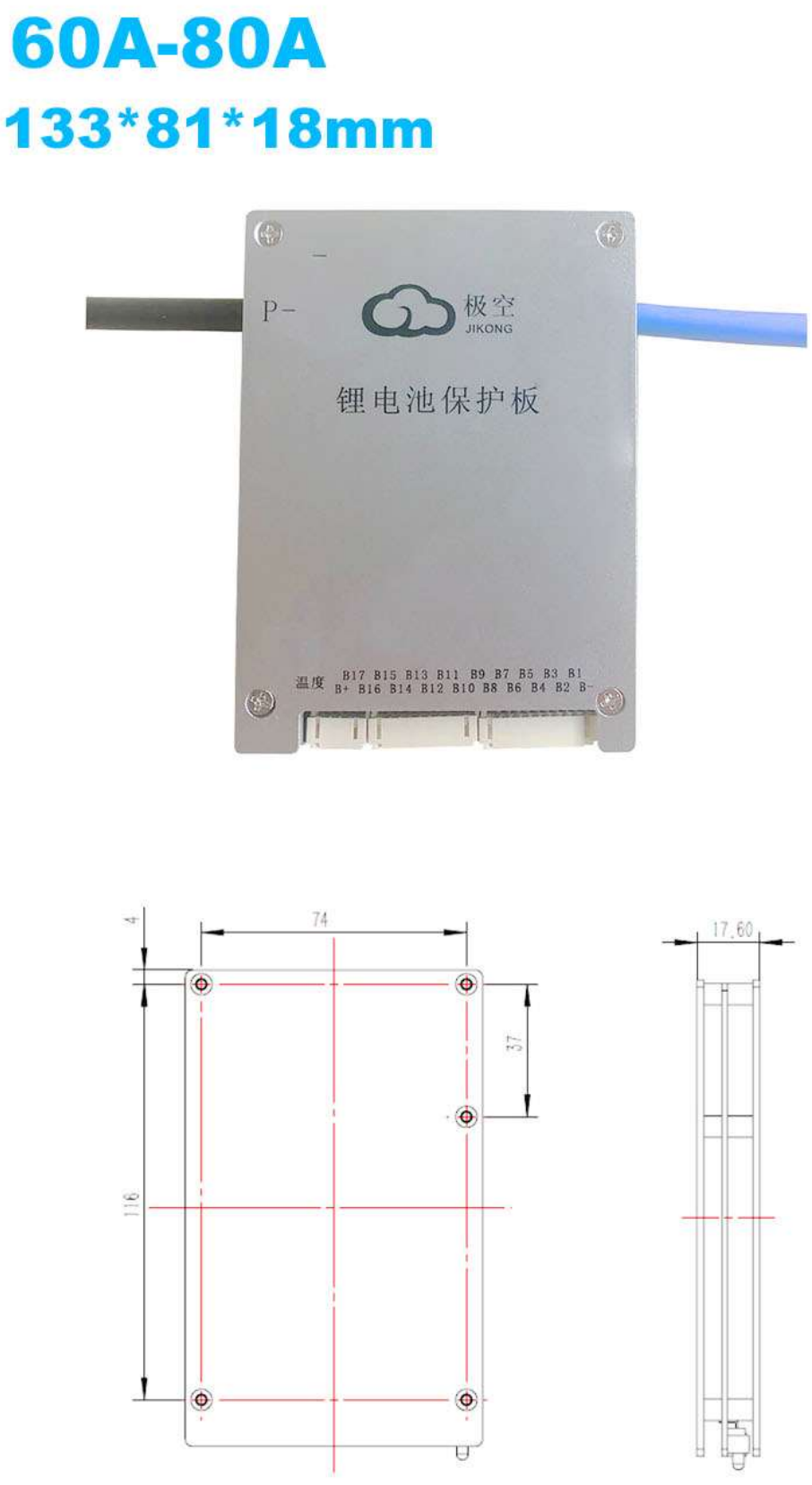
JK-BD6A17S6P/JK-BD6A20S6P/JK-BD6A24S6P
JK-BD6A17S8P/JK-BD6A20S8P/JK-BD6A24S8P

JK-B2A8S20P

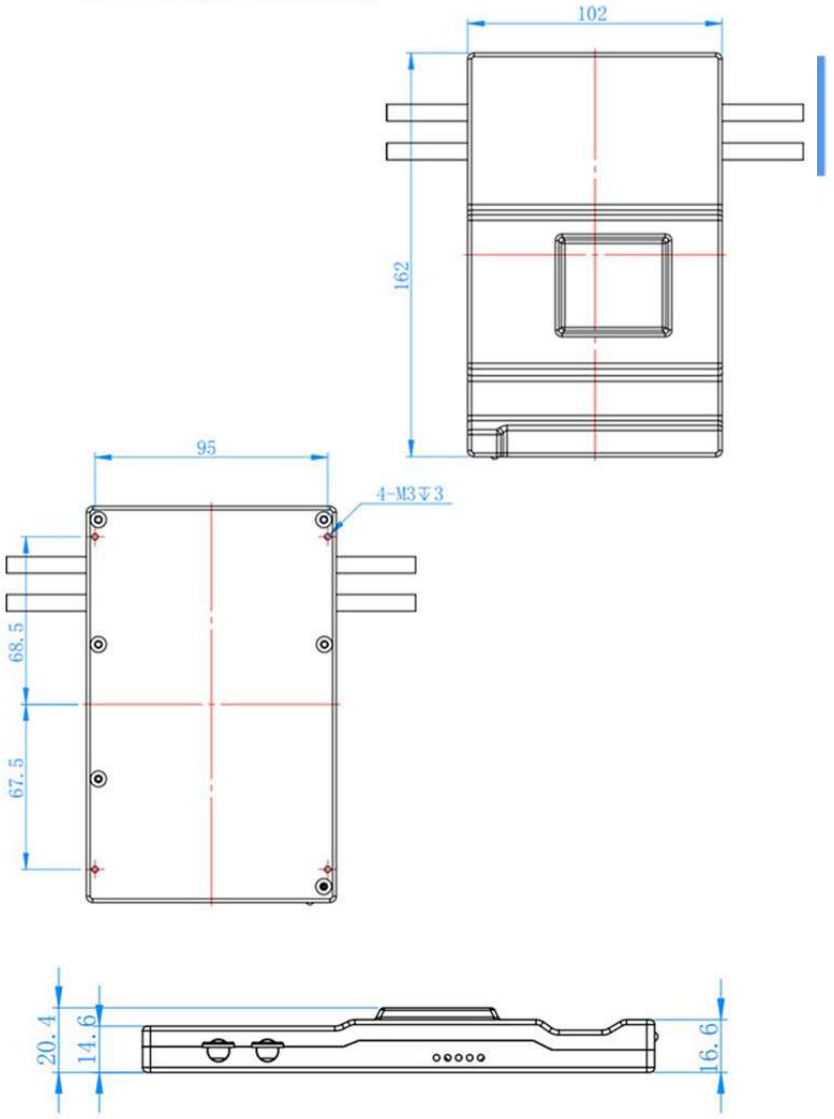
JK-BD6A20S10P/JK-BD6A24S10P/JK-B1A20S15P
JK-B1A24S15P/JK-B2A24S15P/JK-B2A24S20P

Figure 2. Protective board renderings.

3.4 Size


60A-80A
133*81*18mm
P-
极空
JIKONG
锂电池保护板
温度
B17 B15 B13 B11 B9 B7 B5 B3 B1
B+ B16 B14 B12 B10 B8 B6 B4 B2 B-
74
4
37
116
17.60

100A-200A
162*102*20mm



3.5 Weight

JK-BD6A17S6P/JK-BD6A20S6P/JK-BD6A24S6P/JK-BD6A17S8P/JK-BD6A20S8P/JK-BD6A24S8P weight is around 400g.
JK-BD6A20S10P/JK-BD6A24S10P/JK-B1A20S15P/JK-B1A24S15P/JK-B2A24S15P/JK-B2A24S20P/ JK-B2A8S20P weight is around 550g.

4 Installation method and precautions

4.1 Unpacking inspection and precautions.

Unpacking inspection and precautions are as follows:

a) Handle the packaging box, protective plate, etc. gently, and try not to invert it;

b) Before opening the box, pay attention to whether the packaging is intact, if there are any impact marks, whether there is damage, etc.;

4.2 Wiring diagram.

The intelligent lithium battery protection board is suitable for lithium battery packs with 8-24 strings of cells. The wiring method of battery packs with different numbers of cells is different. For a battery pack with 24 strings of cells in series, the installation and wiring method is shown in Figure 5.

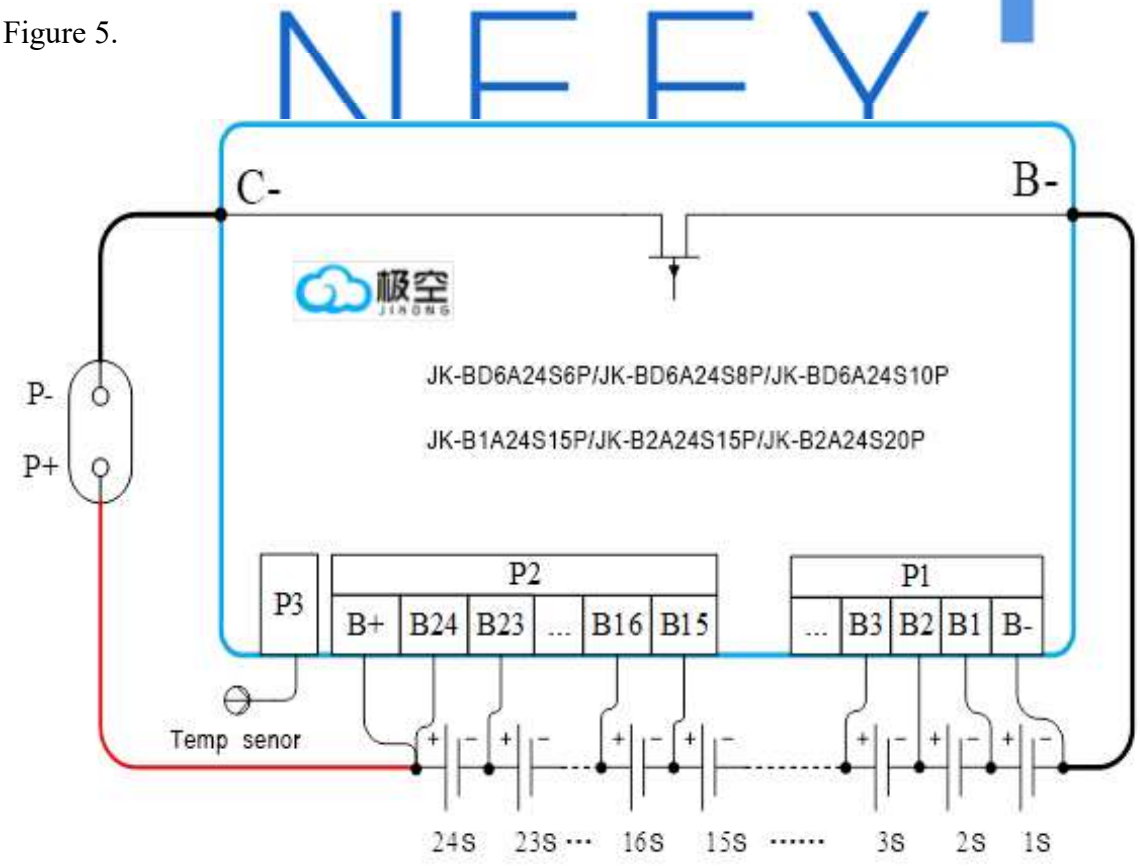


Figure 5. 24 series battery wiring diagram.

For a battery pack with 23 strings of cells in series, the installation and wiring method is shown in Figure 6.

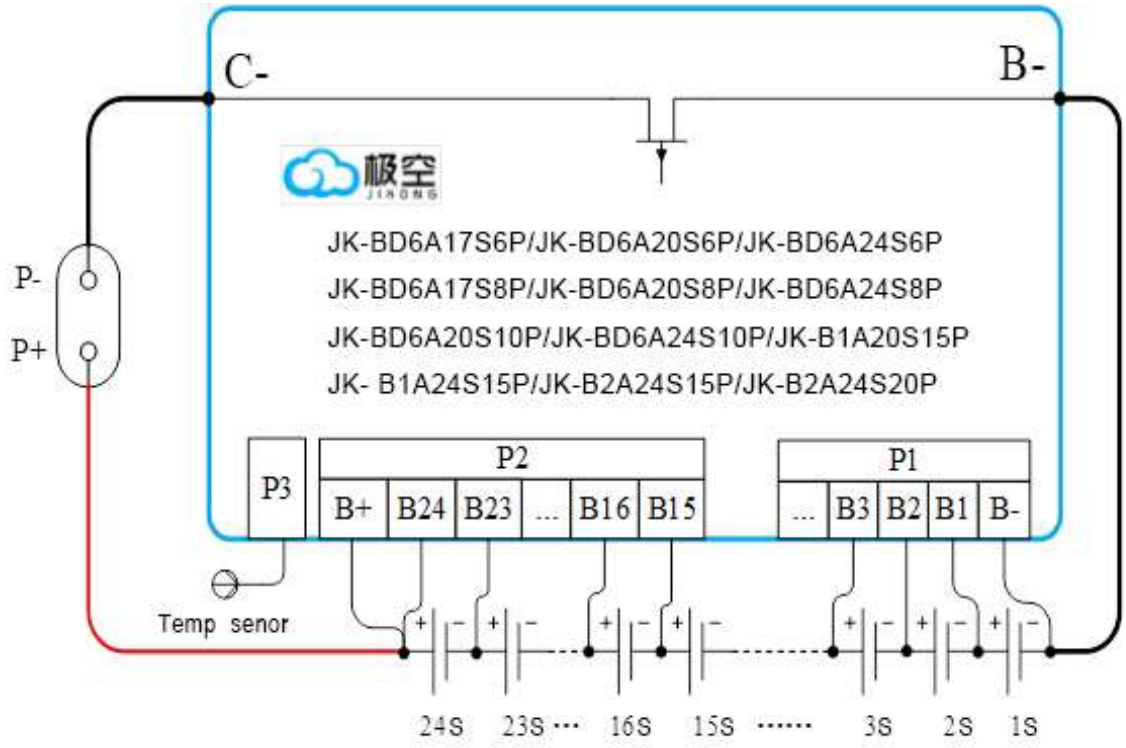


Figure 6. 23 series battery wiring diagram.

For a battery pack with 22 strings of cells in series, the installation and wiring method is shown in Figure 7.

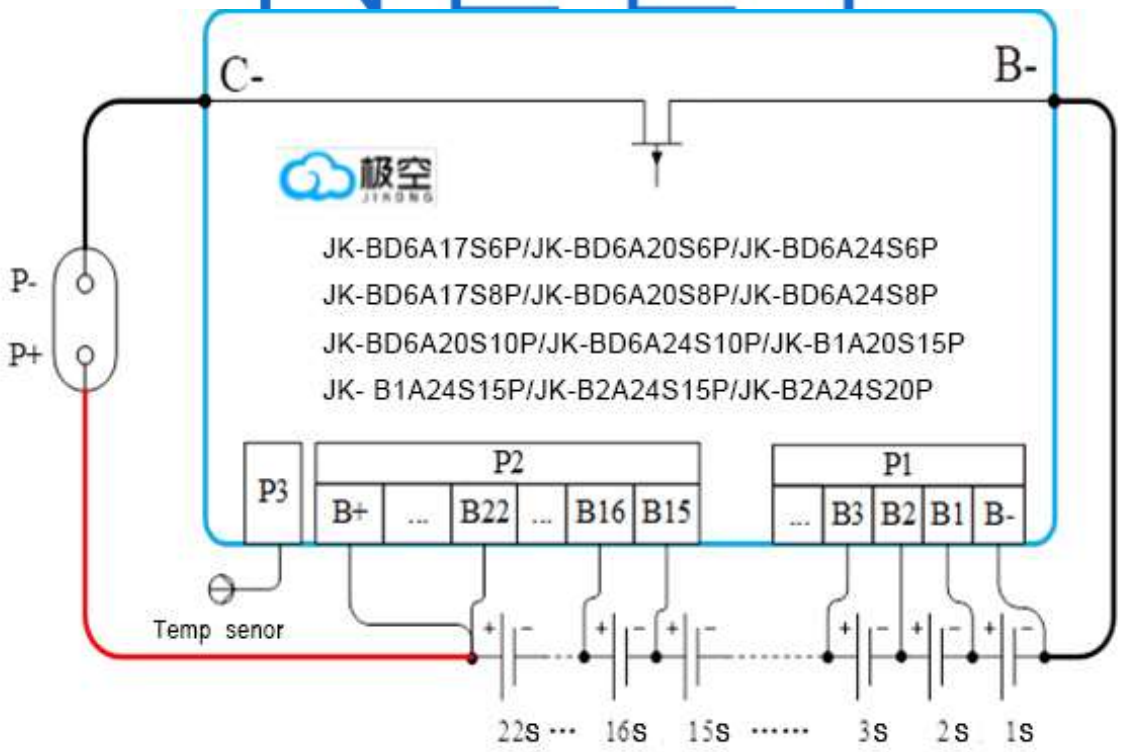


Figure 7. 22 series battery wiring diagram

For a battery pack with 20 strings of cells in series, the installation and wiring method is shown in Figure 8.

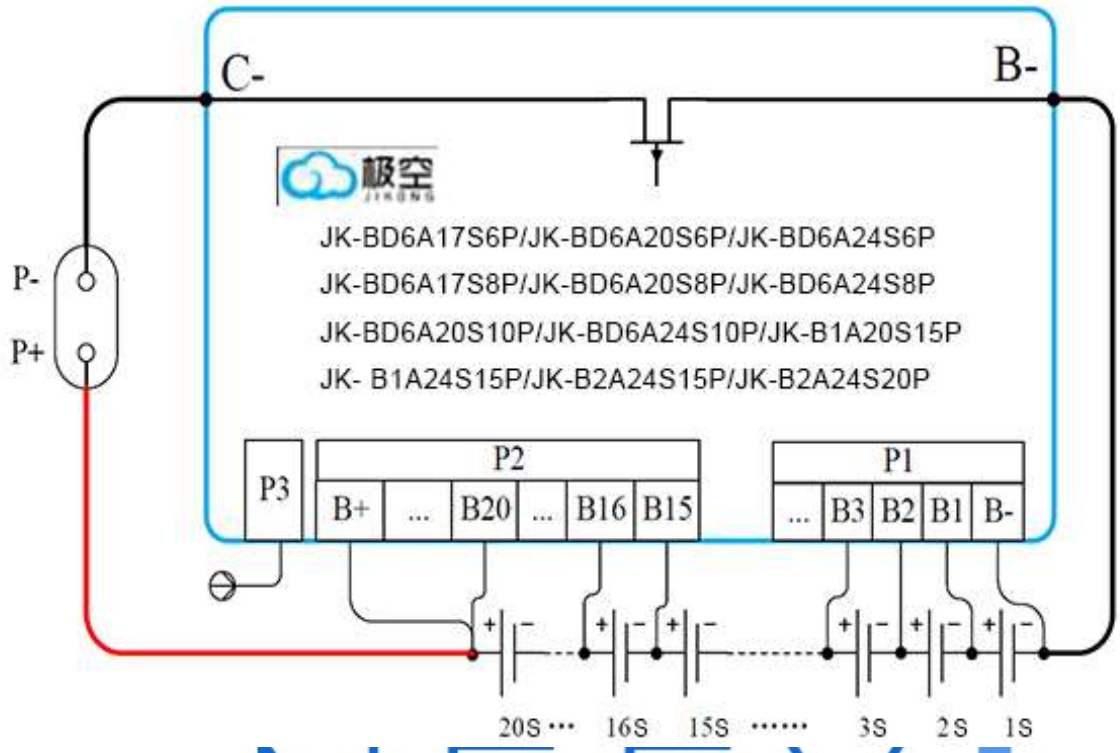


Figure 8. 20 series battery wiring diagram

For a battery pack with 17 strings of cells in series, the installation and wiring method is shown in Figure 9.

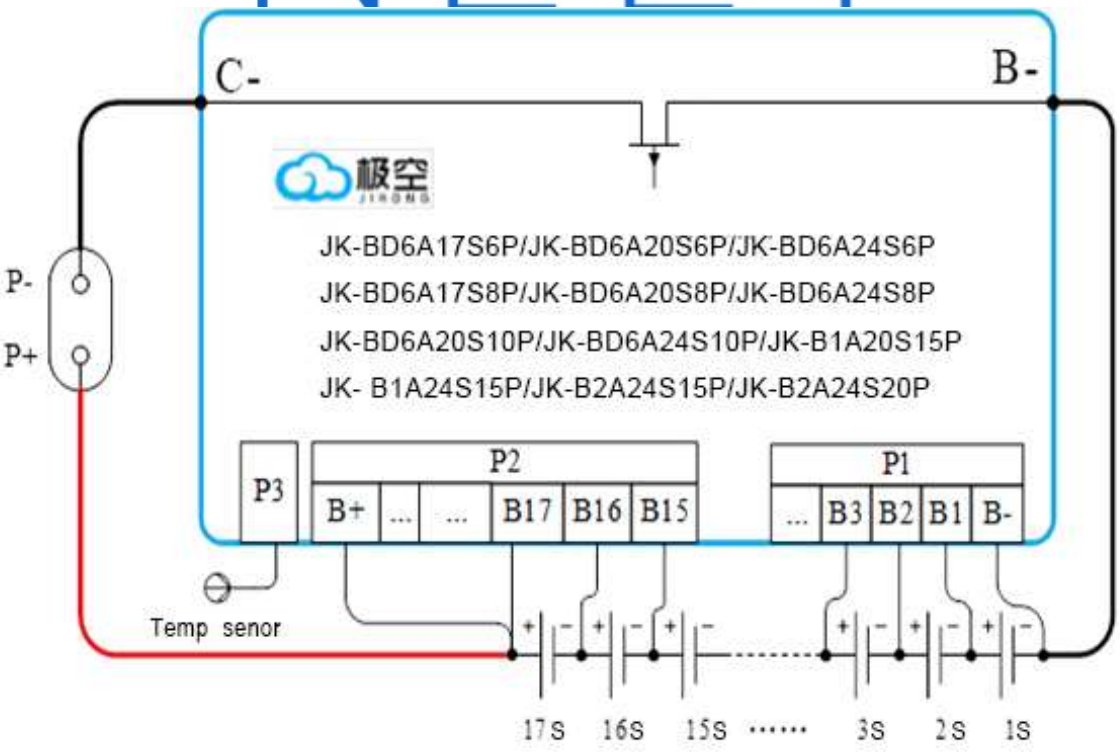


Figure 9. 17 series battery wiring diagram

For a battery pack with 16 strings of cells in series, the installation and wiring method is shown in Figure 10.

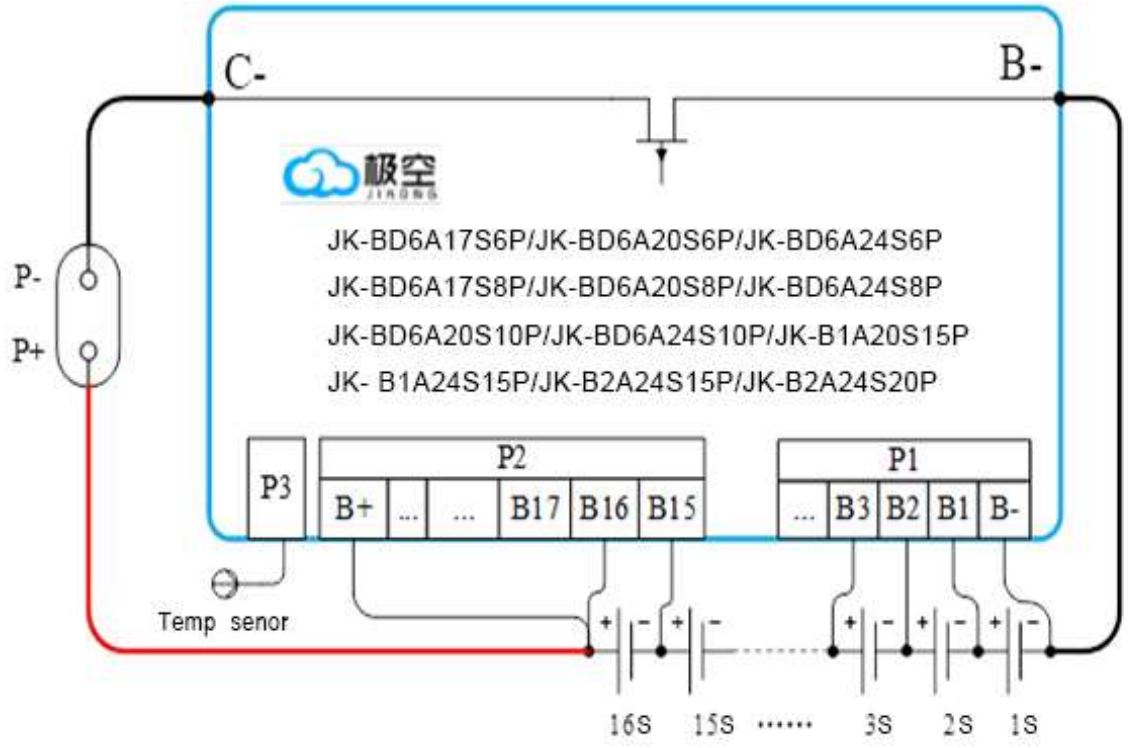


Figure 10. 16 series battery wiring diagram

For a battery pack with 8 strings of cells in series, the installation and wiring method is shown in Figure 11.

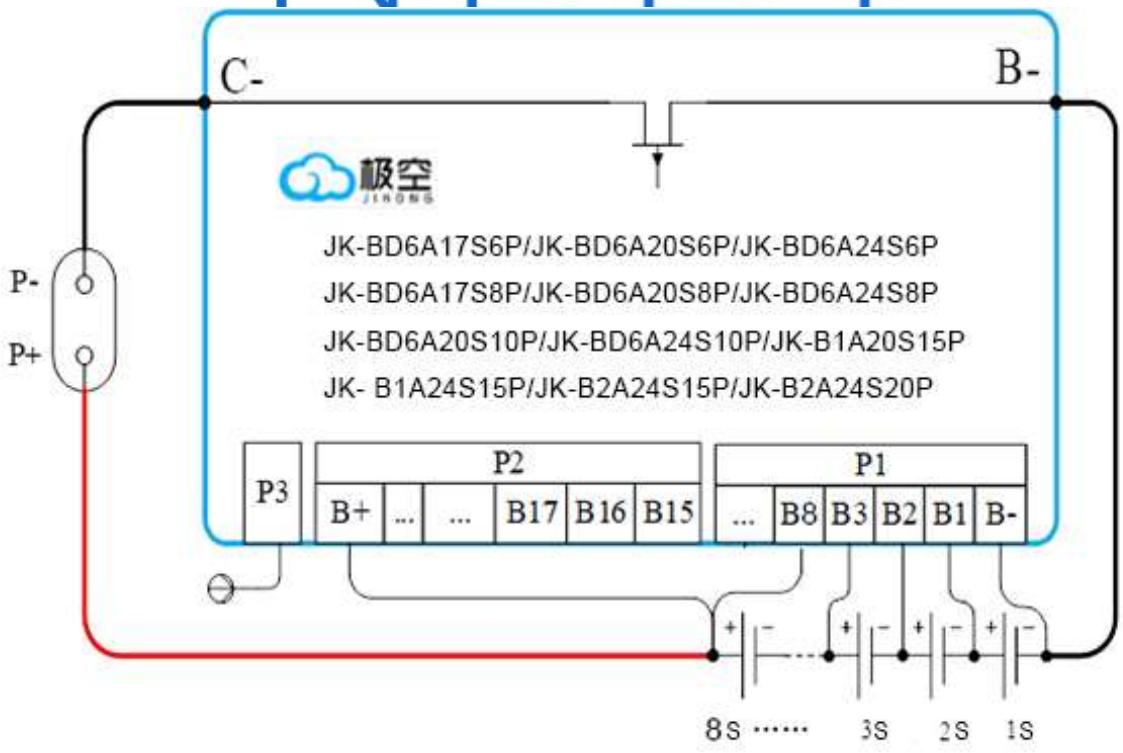
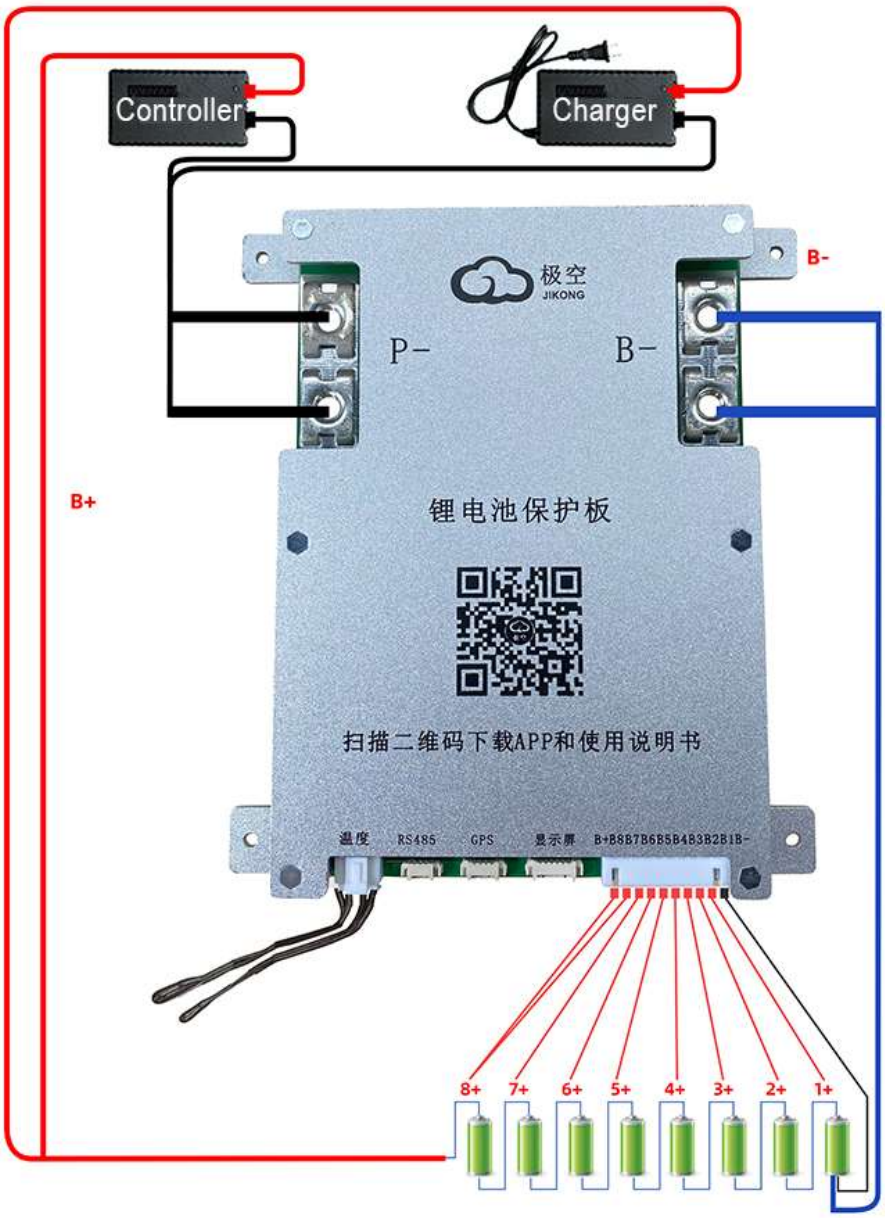


Figure 11. 8 series battery wiring diagram

For JK-2A8S20P , the installation and wiring method is shown in Below.



4.3 APP install.

By scanning the two-dimensional code shown in Figure 12, you can obtain the mobile APP that matches the product.

Figure 12. Mobile APP link QR code

5 Use and operation.

5.1 Preparation and inspection before use.

Before turning on the protection board, please confirm whether the balance wire is connected normally and whether "C-" and "B-" are connected correctly. Check whether the protection board is securely fixed to the battery core, and then you can switch on the protection board after confirming that it is correct. Otherwise, it may cause serious consequences such as abnormal operation and even burnout.

5.2 The protection board works

After confirming that the above operations are correct, you can power on the protection board. The protection board does not have a power-on control switch, and it is designed as a charging activation mode, that is, after the battery is assembled, a charger needs to be connected to make the protection board work.

5.3 App operation instructions.

5.3.1 Equipment operation

a) Device connection

First turn on the mobile phone's Bluetooth, and then turn on the APP, as shown in Figure 13.

Click the icon in the upper left corner to scan the device. After the scan is completed, click the name of the device to be connected, such as "JK-B1A24S15P". The APP will prompt for a password when connecting for the first time. The default password of the device is "1234". The APP will automatically record the password after the device is connected. There is no need to enter the password for the next connection. It will automatically connect after opening the APP. The password input interface is shown in Figure 14.

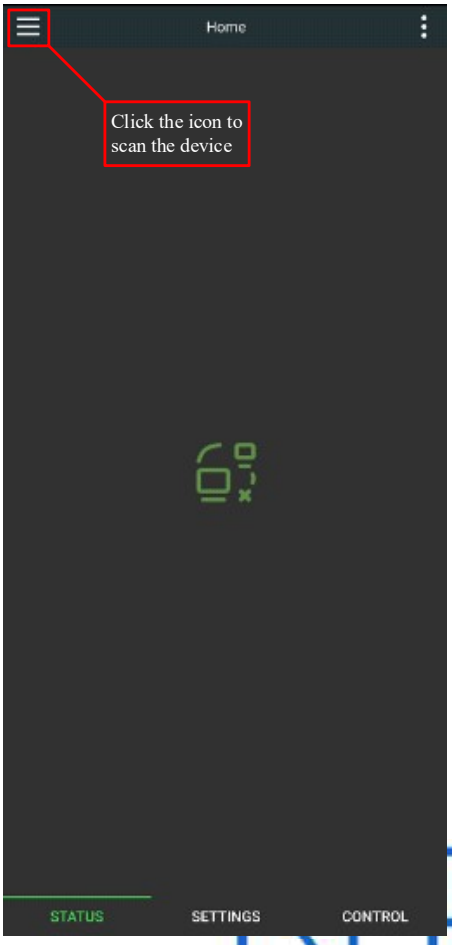


Figure 13. Scan the device

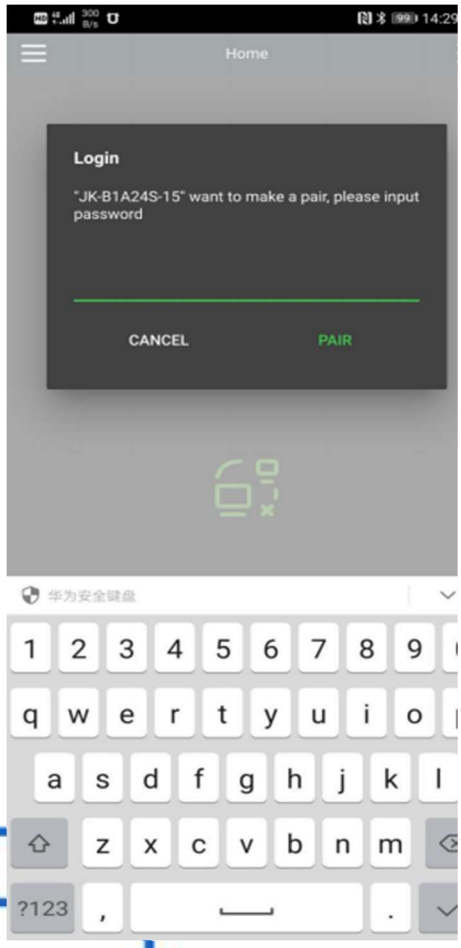


Figure 14. Password input

b) Change password and name

After the device is connected, click the "pen" icon on the right side of the device list to modify the device name and password.

The interface for modifying the device name is shown in Figure 15. Note that the device name only supports English or numbers, not Chinese names and Chinese characters.

The password modification interface is shown in Figure 16. To modify the device password, you must first enter the device's old password. Only when the current password is correct, can you enter the new password input option. After entering the new password twice, click "OK" to complete the device password modification.

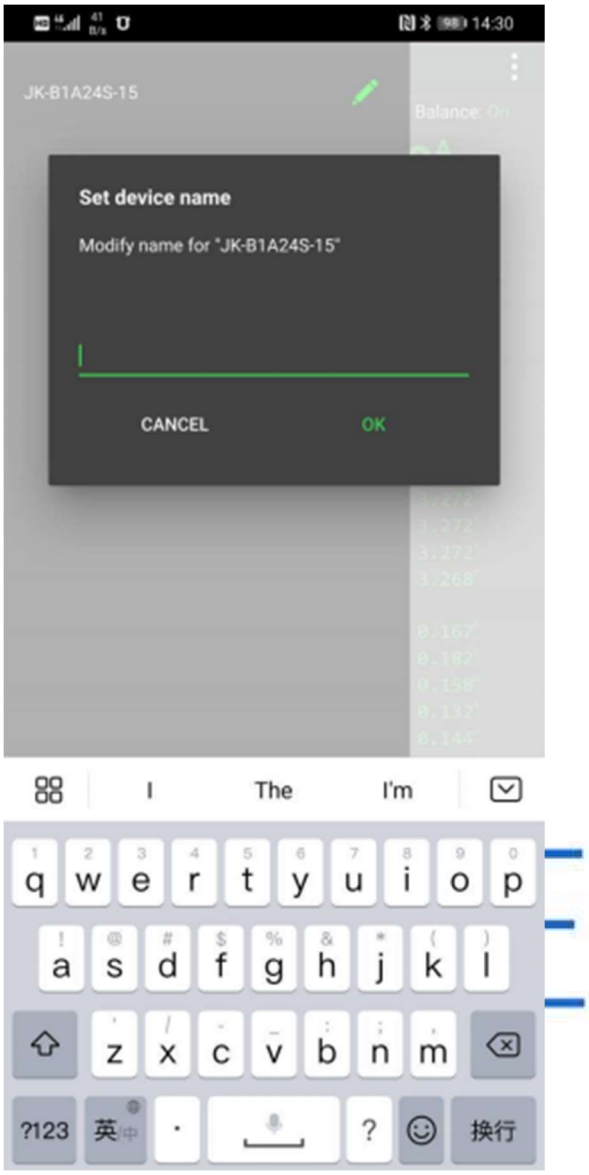


Figure 15. Name modification

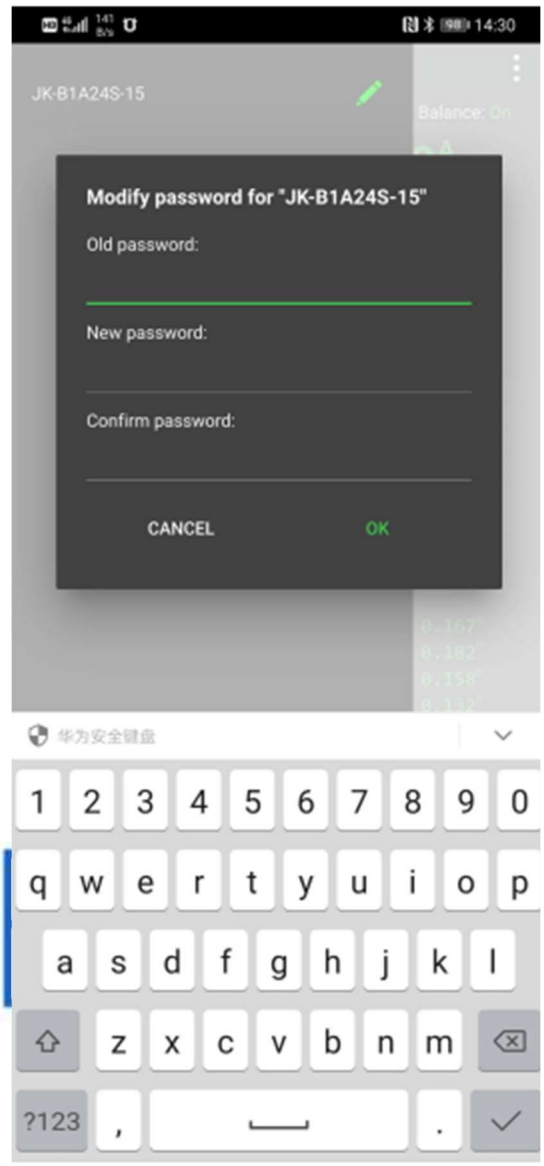


Figure 16. Password modification

5.3.2 Status view.

The real-time status interface is shown in Figure 17.

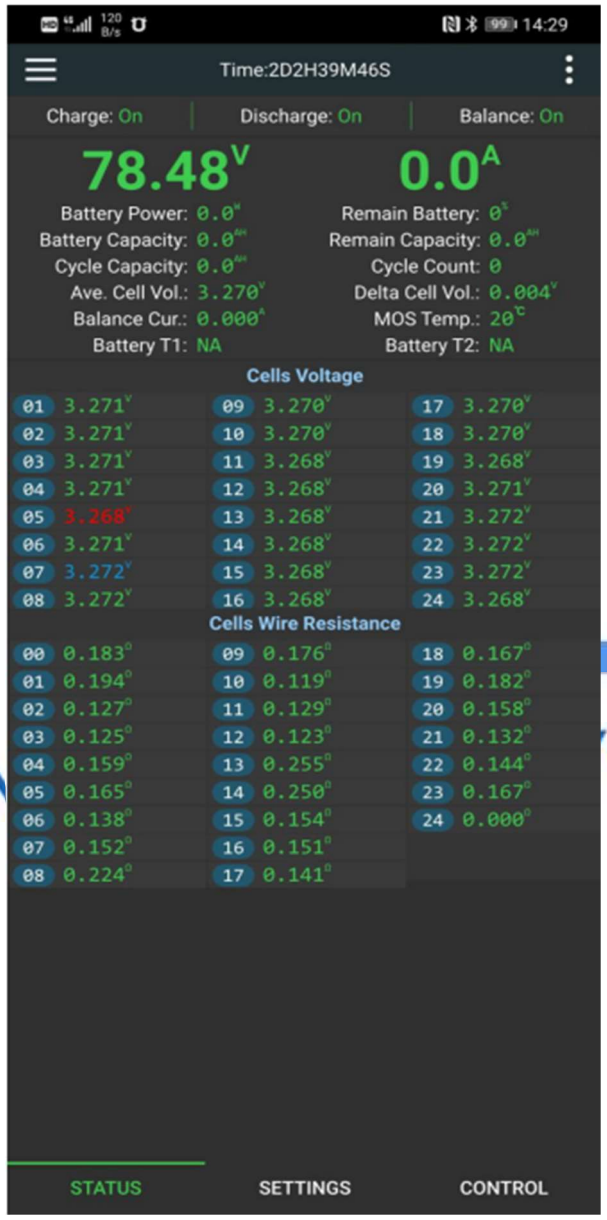


Figure 17. Real-time status display

The real-time status page is divided into 3 areas.

The area 1 in the figure is the comprehensive battery information column. The parameters are explained as follows：

a) Operation hours

Running time represents the total running time from the time the protection board was turned on.

b) Charge

Indicates the current on state of the charging MOS of the protection board. When it displays "on", it means that the current protection board charging MOS is on and the battery is allowed to

charge; when it displays "off", it means the current protection board charging MOS is off and the battery is not allowed to charge.

c) Discharge

Indicates the current on state of the protection board discharge MOS. When "ON" is displayed, it means that the current protection board discharge MOS is on, and the battery is allowed to discharge; when "OFF" is displayed, it means that the current protection board discharge MOS is off, and the battery is not allowed to discharge.

d) Balance

Indicates the current state of the protection board balance switch. When“On”is displayed, the protection board will automatically balance when the balance starting conditions are met; when “Off” is displayed, it means that the balance is off, and the protection board will not balance the battery.

e) Voltage

The voltage area displays the current total voltage of the battery in real time, and the total voltage is the sum of all cell voltages.

f) current

The current area displays the total current of the current battery in real time. When the battery is charging, the current is positive, and when the battery is discharging, the current is negative.

g) Battery power

Represents the total power output or input of the current battery, and its value is the product of the current battery voltage and the absolute value of the battery current.

h) Remaining battery

Represents the percentage of current battery power remaining.

i) Battery capacity

Represents the actual battery capacity calculated by the current protection board based on the high-precision SOC. The unit is AH.（**This value needs to be updated after a complete discharge and charge cycle of the battery**）.

j) Remaining capacity

Remaining capacity indicates the remaining capacity of the current battery, unit: AH.

k) Cycle capacity

The cycle capacity indicates the cumulative discharge capacity of the battery, and the unit is AH.

l) Number of cycles

The number of cycles indicates the number of times that the current battery is fully charged, and the unit is: times.

m) Monomer average

Indicates the average voltage of the current battery cell, unit: V.

n) Maximum voltage difference

The maximum voltage difference represents the difference between the highest battery voltage and the lowest battery voltage of the entire battery. The unit is V.

o) Balance current

When the protection board turns on the balance function and reaches the balance condition, it displays the balance current in real time. Unit: A.

When the balance is performed, the status display area of the real-time status, blue represents a discharged battery, and red represents a charged battery. Balanced current negative current indicates that the battery is discharging, and blue flashes at this time, and balanced current positive current indicates that the battery is charging, and red flashes.

The protection board uses active balance technology. The principle of balance is to take power from high-voltage cells, store them on the protection board, and then put them on low-voltage cells.

p) MOS temperature

Real-time display the current temperature of the protection board power MOS, unit: ℃.

q) Battery temperature 1

When the temperature sensor 1 is not installed, "NA" is displayed. When the temperature sensor is installed, the temperature of the temperature sensor 1 is displayed in real time, and the unit is ° C.

r) Battery temperature 2

When the temperature sensor 2 is not installed, "NA" is displayed. When the temperature sensor is installed, the temperature of the temperature sensor 2 is displayed in real time, and the unit is ° C.

Area 2 in the figure is a single-voltage area. The voltage data of each cell in the battery pack is displayed in real time, where red indicates the lowest voltage cell and blue indicates the highest voltage cell.

Area 3 in the figure is the resistance area of the balanceline. This balanced line resistance is the balanced line resistance obtained by the self-test of the protection board. This value is only an initial calculation. The purpose is to prevent misconnection or poor contact. When the balanced line resistance exceeds a certain value, it is displayed in yellow. Cannot turn on balance.

5.3.3 Parameter setting

The parameter setting page is shown in Figure 18.

Various working parameters of the protection board can be modified on the parameter setting page. The definition of each parameter is as follows.

a) One click lithium iron

Function this button can modify all the working parameters of the protection board to iron-

lithium battery parameters. The default values of the parameters are shown in Appendix 1.

b) One click to Li-ion

Function this button can modify all the working parameters of the protection board to the iron-lithium battery parameters. The default values of the parameters are shown in Appendix 2.

c) Number of monomers

The number of cells indicates the number of cells of the current battery. Please set this value accurately before use, otherwise the protection board will not work normally.

d) Battery capacity

This value is the design capacity of the battery.

e) Trigger equalizing pressure difference

The trigger equalization pressure difference is the only parameter that controls the equalization. When the equalization switch is turned on, when the maximum pressure difference of the battery pack exceeds this value, the equalization starts and ends when the pressure difference falls below this value. For example, set the equalization trigger voltage difference to 0.01V, when the battery pack voltage difference is greater than 0.01V, the equalization will begin, and the equalization will end when the voltage drop is below 0.01V. (It is recommended that the balance trigger voltage difference of the battery above 50AH is 0.005V, and the balance trigger voltage difference of the battery below 50AH is 0.01V).

f) Voltage calibration

The voltage calibration function can be used to calibrate the accuracy of the equalizer voltage acquisition.

When it is found that there is an error between the total voltage collected by the protection board and the total voltage of the battery, you can use the voltage calibration function to calibrate the protection board. The method of calibration is to fill in the total battery voltage currently measured, and then click on the "small plane" behind the voltage calibration to complete the calibration.

Figure 18. Parameter settings

g) "Single undervoltage protection", "Single undervoltage recovery"

"Single undervoltage protection" refers to the cut-off voltage of the cell. As long as the voltage of any cell in the battery pack is lower than this value, a "cell undervoltage alarm" is generated, and the protection board turns off the discharge MOS. At this time, the battery cannot Discharge, only charge. When the alarm is generated, only after the voltage values of all cells exceed the value of "cell voltage recovery", the protection board releases the "cell undervoltage alarm" and turns on the discharge MOS at the same time.

h) "Single overcharge voltage", "Single overcharge recovery"

"Single overcharge voltage" refers to the saturation voltage of the battery cell. As long as the voltage of any single cell in the battery pack exceeds this value, a 'single overcharge alarm' is generated, and the protection board turns off the charging MOS, and the battery cannot be charged at this time. Can only be discharged. When the alarm occurs, only after the voltage value of all the cells is lower than the value of “cell overcharge recovery”, the protection board releases the “cell

overcharge alarm" and turns on the charging MOS at the same time.

i) Automatic shutdown voltage

The automatic shutdown voltage indicates the minimum voltage at which the protection board works. When the voltage of the highest cell in the battery pack is lower than this value, the protection board closes. This value must be lower than the "cell undervoltage protection".

j) "Maximum charging current", "Charging overcurrent delay", "Charging overcurrent release"

When charging the battery pack, when the current exceeds the "maximum charging current" and the duration exceeds the "charge overcurrent delay" time, the protection board generates a 'charging overcurrent alarm' and turns off the charging MOS at the same time. After the alarm occurs, after the "charge overcurrent release" time elapses, the protection board releases the charge overcurrent alarm and restarts the charging MOS. Example: Set "Maximum Charging Current" to 10A, "Charge Overcurrent Delay" to 10 seconds, and "Charge Overcurrent Release" to 50 seconds. During the charging process, the charging current exceeds 10A for 10 seconds. The protection board will generate a 'charging overcurrent alarm' and turn off the charging MOS at the same time. 50 seconds after the alarm is generated, the 'charging overcurrent alarm' will be cancelled and the protection board will turn on the charging MOS again.

k) "Maximum discharge current", "Discharge overcurrent delay", "Discharge overcurrent release"

When discharging the battery pack, if the current exceeds the "maximum discharge current" and the duration exceeds the "discharge overcurrent delay" time, the protection board will generate a "discharge overcurrent alarm" and turn off the discharge MOS. After the alarm is generated, after the "discharge overcurrent release" time, the protection board releases the "discharge overcurrent alarm" and restarts the discharge MOS.

Example: Set "Maximum discharge current" to 100A, "Discharge overcurrent delay" to 10 seconds, and "Discharge overcurrent release" to 50 seconds. During the discharge process, if the discharge current exceeds 100A for 10 seconds, the protection board will generate a 'discharge overcurrent alarm' and turn off the discharge MOS. 50 seconds after the alarm is generated, the 'discharge overcurrent alarm' will be released and the protection board will restart the discharge MOS.

l) Short circuit protection released

When the short-circuit protection occurs, the short-circuit protection is released after the time set by 'short-circuit protection release'.

m) Maximum balance current

The equalization current represents the continuous current of high-voltage battery discharge and low-voltage battery charging in the process of energy transfer.

The maximum balance current represents the maximum current in the energy transfer process, and the maximum balance current should not exceed 0.1C. For example: 20AH battery does not

exceed 20*0.1=2A.

n) "Charging over temperature protection", "Charging over temperature recovery"

During the charging process, when the battery temperature exceeds the value of "charging over-temperature protection", the protection board will generate a warning of "charging over-temperature protection" and the protection board will turn off the charging MOS. After the alarm is generated, when the temperature is lower than the "charging over temperature recovery", the protection board will release the "charging over temperature protection" warning, and at the same time restart the charging MOS.

o) "Charging low temperature protection", "Charging low temperature recovery"

During the charging process, when the battery temperature is lower than the value of "charging low temperature protection", the protection board will generate a "charging low temperature protection" warning, and the protection board will close the charging MOS. After the alarm is generated, when the temperature is higher than the "charging low temperature recovery", the protection board releases the "charging low temperature protection" warning, and at the same time restarts the charging MOS.

p) "MOS over-temperature protection", "MOS over-temperature recovery"

When the MOS temperature exceeds the value of "MOS over temperature protection", the protection board generates a "MOS over temperature alarm" and closes the charge and discharge MOS, and the battery cannot be charged or discharged. After the alarm is generated, after the MOS temperature is lower than the value of "MOS over temperature recovery", the protection board will release the "MOS over temperature alarm", and at the same time turn on the charge and discharge MOS **(MOS over temperature protection value is 75℃, MOS over temperature recovery value 65° C, these two values are factory default values and cannot be modified).**

Note:

For any parameter modification, please refer to the manual. Inappropriate parameters may cause the protection board to not work properly or even burn the protection board.

After any parameter is modified, you need to click the "little plane" behind the parameter to complete the parameter delivery. After the equalizer successfully receives the parameter, it will make a beep.

5.3.4 BMS control

The BMS control page is shown in the figure 19. Through BMS control, the charging function, discharging function, and equalizing function of the protection board can be switched, and the power supply of the protection board can be turned off, and the factory settings can be restored.

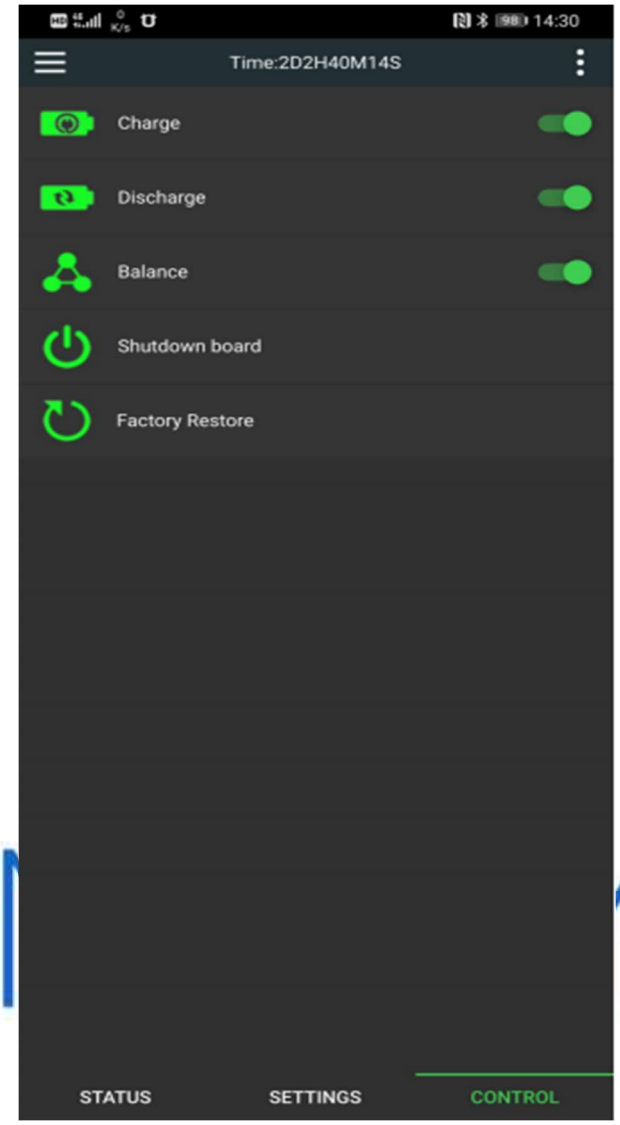


Figure 19. BMS Control page

6 Safety protection measures and precautions

There is no high voltage in the protection board itself, which will not cause electric shock to the body.

Please read the instruction manual carefully before use, and connect the wires according to the correct wiring diagram with different numbers of strings. Connect from the negative pole to the positive pole. After the equalization line is connected, use a multimeter to confirm again, and then insert the protection board after confirming that it is correct.

It is not allowed to modify the power line of the protection board without authorization. Modifying the power line without authorization will cause uneven overcurrent of the protection board and burn the protection board.

7 Transportation and storage

7.1 Transport

The packed products are not directly affected by rain and snow, and can be transported by usual means of transportation. It is not allowed to put it together with corrosive substances such as acid and alkali during transportation.

7.2 Storage

The packaged products should be stored in a permanent warehouse. The temperature of the warehouse is 0℃～35℃, the relative humidity is not more than 80%. There should be no acid, alkali, corrosive gas, strong mechanism vibration and impact, and no strong magnetic field Role.

Appendix Default parameters of "One-click Lithium Iron", "One-click Ternary" and "One-click Lithium Titanate"

No.	Parameter	Ternary default	Lithium iron default	Lithium titanate default	Unit
1	Single undervoltage protection	2.9	2.6	1.8	V
2	Monomer undervoltage protection recovery	3.2	3.0	2.0	V
3	Single overcharge voltage	4.2	3.6	2.7	V
4	Monomer overcharge protection recovery	4.1	3.4	2.4	V
5	Trigger equalizing pressure difference	0.01	0.01	0.01	V
6	Automatic shutdown voltage	2.8	2.5	1.7	V
7	Charge overcurrent protection delay	30	30	30	S
8	Charge overcurrent protection release time	60	60	60	S
9	Discharge overcurrent protection delay	30	30	30	S
10	Discharge overcurrent protection release time	60	60	60	S
11	Short circuit protection release time	60	60	60	S
12	Charging over temperature protection temperature	60	60	60	℃
13	Charging over temperature recovery temperature	55	55	55	℃
14	Discharge over temperature protection temperature	60	60	60	℃
15	Discharge over temperature recovery temperature	55	55	55	℃
16	Charging low temperature protection temperature	-20	-20	-20	℃
17	Charging low temperature recovery temperature	-10	-10	-10	℃
18	MOS over temperature protection temperature	75	75	75	℃
19	MOS over temperature protection recovery temperature	70	70	70	℃