产品规格书

Product specification

锂电池主动均衡保护板

Lithium battery active balancing protection board

JK-B2A32S-RP

版本：20.1.1

成都极空科技有限公司

Chengdu Jikong Technology Co., Ltd

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1. 产品概述(Product Overview)

1.1. BMS概述(BMS Overview)

锂电池智能保护板是为大容量串联锂电池组量身打造的管理系统，具备电压采集、大电流主动均衡、过充过放过流过温保护、库仑计、蓝牙通信、UART 远程等功能。可适用于磷酸铁锂、三元锂等电池种类。

Lithium battery intelligent protection board is a management system tailored for large capacity series lithium battery pack, with voltage acquisition, high current active balancing, overcharge over pass temperature protection, coulomb meter, Bluetooth communication, UART remote and other functions. Can be applied to lithium iron phosphate, ternary lithium battery type.

保护板依托具备自主知识产权的能量转移式主动均衡技术，可以实现最大持续2A 的均衡电流。大电流主动均衡技术可以最大程度的保证电池一致性、提高电池续航里程、延缓电池衰老。

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

保护板有配套的手机APP，支持 Android 和 IOS 操作系统。APP 可以通过手机蓝牙连接到保护板以查看电池工作状态、修改保护板的各项工作参数、控制充放电开关等等。保护板体积小、操作简单、功能全，可广泛应用于小型观光车、代步车、共享汽车、大功率储能、基站备用电源、太阳能电站等产品的电池 PACK。

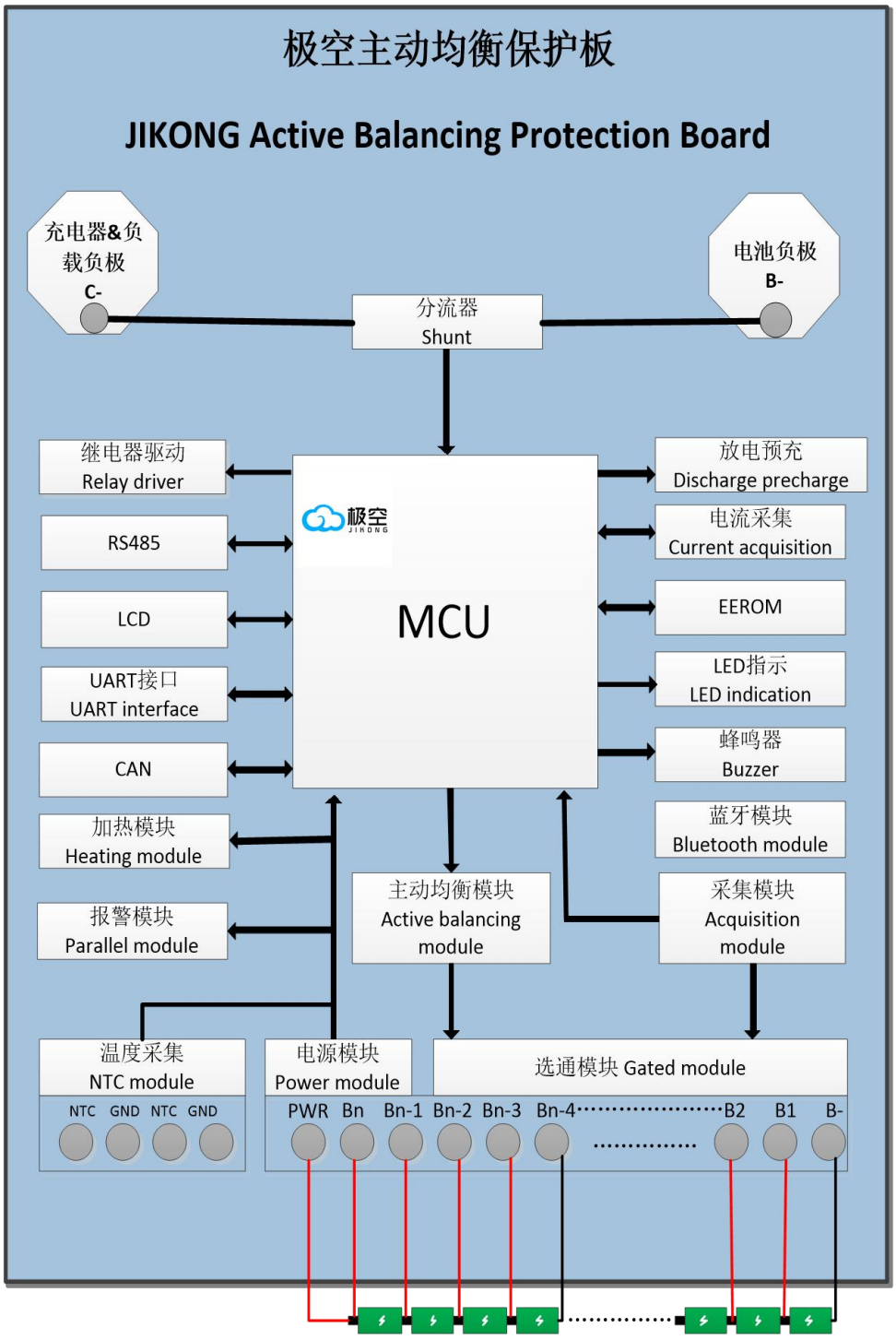
The protection board has a mobile APP supporting Android and IOS operating systems. The APP can be connected to the protection board through the Bluetooth of the mobile phone to check the working status of the battery, modify the working parameters of the protection board, control the charge and discharge switch, and so on. The protection board is small in size, simple in operation and full in function, and can be widely used in battery packs of small sightseeing vehicles, mobility scooters, shared cars, high-power energy storage, base station backup power supply, solar power stations and other products.

1.2. 功能特性(Functional characteristics)

●LED蓝牙状态指示
●APP蓝牙远程操作
●电池容量计算
●高精度电压采集(±3mV)
●高精度电流采集
●支持信息屏幕显示
●精准时间日志记录
●支持RS485
●支持CAN
●支持加热功能
●支持报警功能
●ACC检测功能
●放电预充功能
●支持UART通讯
●充电过流保护
●充电过压保护
●充电过温保护
●充电低温保护
●放电过流保护
●放电欠压保护
●放电过温保护

●LED Bluetooth status indicator
●APP Bluetooth remote operation
●Battery capacity calculation
●High precision voltage acquisition(±3mV)
●High precision current acquisition
●Support information screen display
●Accurate time logging
●Support RS485
●Support CAN
●Support heating function
●Support alarm function
●ACC detection function
● Discharge pre-charging function
●Support UART communication
●Charge overcurrent protection
●Charge overvoltage protection
●Charge over temperature protection
●Low temperature protection during charge
●Discharge overcurrent protection
●Discharge undervoltage protection
●Discharge over temperature protection

1.3. 结构框图(Structural block diagram)



JK-B2A32S-RP 结构框图
JK-B2A32S-RP structure block diagram

2. 产品选型指南(Product selection guide)

2.1. 产品功能配置表(Product function configuration table)

产品规格 (Product specification)	JK-B2A32S-RP	
序号 (Serial number)	功能 （Function）	配置 （Configuration）
1	主动均衡电流 (Active equalizing current)	2A
2	蓝牙功能 (Bluetooth function)	标配 (Standard option)
3	UART接口 (UART interface)	标配 (Standard option)
4	NTC数量 (NTC quantity)	1路内置，4路外置 (1 built-in,4 external)
5	RS485	标配 (Standard option)
6	CAN	标配 (Standard option)
7	显示屏接口 (Display interface)	标配 (Standard option)
8	加热功能 (Heating function)	标配 (Standard option)
9	报警功能 (Alarm function)	标配 (Standard option)
10	充电过压、过流保护 (Charging overvoltage, overcurrent protection)	标配 (Standard option)
11	放电预充功能 (Discharge precharge function)	标配 (Standard option)
12	放电欠压、过流保护 (Discharge under voltage, over currentprotection)	标配 (Standard option)

2.2. 产品适配指南(Product adaptation guide)

序号 (Serial number)	产品规格 （Product specification）	电池类型 （Battery type）	适配串数 （Number of adaptive battery strings）
1	JK-B2A32S-RP	三元锂电池 (Ternary lithium battery)	7～32
		铁锂电池 (Lithium iron battery)	8～32
		钛酸锂电池 (Lithium titanate battery)	14～32

3. 功能介绍及使用说明(Function introduction and usage instructions)

3.1. 主动均衡(Active equalization)

保护板采用主动均衡技术，均衡的原理是将高电压的电芯能量转移到低电压的电芯中，通过保护板这一媒介实现能量转移。用户在使用均衡功能之前需要设置电池基本参数，需要下载极空BMS-APP，下载之后在极空APP中参数设置页面设置电池类型，默认参数见第四章。设置完成电池类型后在常用设置中设置电池基本参数，包括单体数量、电池容量、触发均衡压差(可保持默认)、电压校准、电流校准等。

The protection board adopts active equalization technology, and the principle of equalization is to transfer the energy of the high-voltage cell to the low-voltage cell, and realize the energy transfer through the medium of the protection board. Before using the balancing function, users need to set the basic parameters of the battery and download the Jikong BMS-APP. After downloading, set the battery type on the parameter setting page of the Jikong APP. For default parameters, see Chapter 4.After setting the battery type, set basic battery parameters in common Settings, including the number of cells, battery capacity, trigger equalization differential pressure (the default value can be retained), voltage calibration, and current calibration.

用户可在APP的参数设置中自行设置均衡触发压差(mV)，均衡打开时，当电池包中任意两串电池压差大于设定值时均衡自动打开，压差小于设置值后关闭 。默认均衡电流为最大值2A。如无需均衡功能，可在APP的BMS控制页中将均衡开关设置为关闭状态。

Users can set the balance trigger pressure difference (mV) in the parameter setting of the APP. When the balance is turned on, the balance will be turned on automatically when the pressure difference of any two strings of batteries in the battery pack is greater than the set value, and the balance will be turned off when the pressure difference is less than the set value. The default balance current is 2A. Users can adjust the balance current according to their own battery capacity.If you do not need the balancing function, you can set the balancing switch to off in the BMS control page of the APP.

3.2. UART功能(UART function)

保护板标配UART接口，可以满足个人以及企业用户对于电池定位的需求。

The protection board has a UART interface, this can meet the battery positioning needs of both individual and enterprise users.

3.3. 显示屏功能(Display function)

保护板标配了显示屏接口，支持用户选配我司显示屏，方便查看电池信息。

The protection board comes standard with a display interface, supporting users to optionally configure our company's display screen. This allows for convenient viewing of battery information,。

3.4. 加热功能(Heating function)

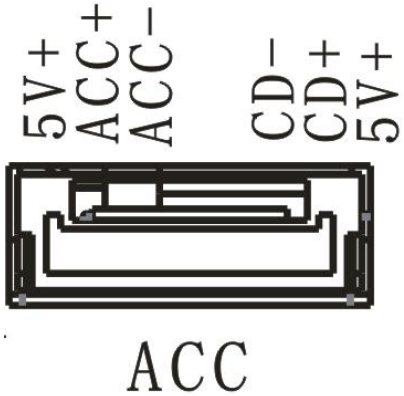
保护板标配加热功能，在低温条件下通过电阻加热器或加热膜来为电池加热，避免因低温导致的电池活性降低而无法充放电，设计加热电流为10A，建议加热线规格不低于16AWG。此功能用户可根据自己所处的的气温实际情况在极空APP中的BMS控制页进行开关操作。同时建议在加热回路中串联一个温控开关作为二级保护，防止极端情况出现热失控。建议选择45℃～65℃常闭型温控开关，当温度达到温控开关阈值后温控开关断开，切断加热回路防止继续加热。

The protection board supports the heating function. The resistance heater or heating film is used to heat the battery at low temperature to avoid the failure of charging and discharging due to the decrease of battery activity caused by low temperature. The designed heating current is 10A.， It is recommended that the heating wire should be no less than 16 AWG. This function allows users to switch operations in the BMS control page of the Jikong APP according to their actual temperature. At the same time, it is recommended to series a temperature control switch in the heating circuit as a secondary protection to prevent thermal runaway in extreme cases. You are advised to select a normally closed temperature switch of 45 ° C to 65 ° C. When the temperature reaches the threshold of the temperature switch, the temperature switch is turned off and the heating circuit is cut off to prevent further heating.

3.5. ACC/充电器检测功能(ACC/Charger detection function))

ACC接口采用GH1.25-7PIN的连接器连接方式,共6根信号线，最中间的针脚是空置的。

The ACC interface adopts the GH1.25-7PIN connector connection method, with a total of 6 signal lines, and the middle pin is vacant.

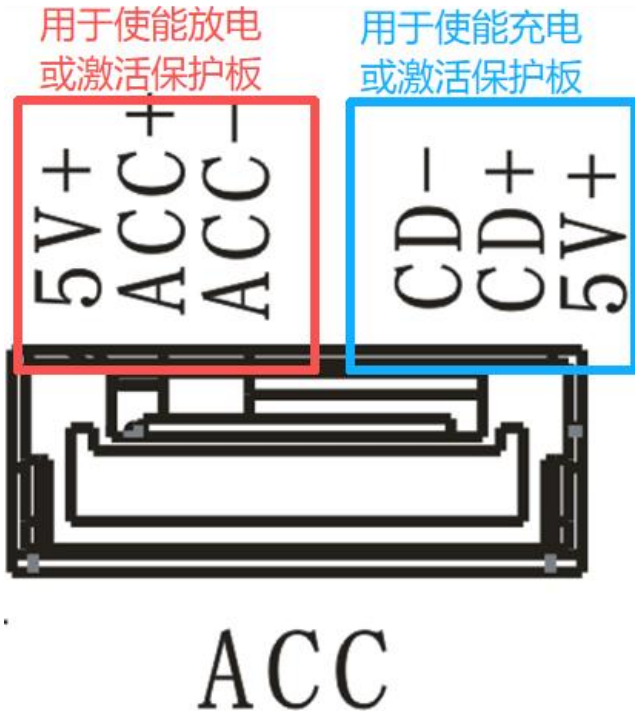


ACC连接器示意图
Schematic Diagram of the ACC Connector

信号定义表(Signal Definition Table)

信号名称 (Signal Name)	定义 (Definition)
5V+	内部隔离电源的5V+，只能用于打开ACC (5V+ of the internal isolated power supply, only used to turn on the ACC)

ACC+	ACC正极，配合5V+实现短接使能放电，配合ACC-实现外部输入电压使能放电或激活保护板 (ACC positive pole: cooperates with 5V+ to realize short-circuit enabled discharge; cooperates with ACC- to realize external input voltage enabled discharge or activate the protection board)
ACC-	ACC负极，配合ACC+实现外部输入电压使能放电或激活保护板 (ACC negative pole: cooperates with ACC+ to realize external input voltage enabled discharge or activate the protection board)
CD-	充电器检测输入负极，配合CD+实现外部输入电压使能充电或激活保护板 (Charger detection input negative pole: cooperates with CD+ to realize external input voltage enabled charging or activate the protection board)
CD+	充电器检测输入正极，配合5V+实现短接使能充电，配合CD-实现外部输入电压使能充电或激活保护板 (Charger detection input positive pole: cooperates with 5V+ to realize short-circuit enabled charging; cooperates with CD- to realize external input voltage enabled charging or activate the protection board)
5V+	内部隔离电源的5V+，只能用于检测充电器插入 (5V+ of the internal isolated power supply, only used to detect charger insertion)



ACC接口示意图
Schematic Diagram of the ACC Interface

如ACC接口示意图所示，ACC接口其实分为两部分功能，这两部分的接线方式相似。

As shown in the Schematic Diagram of the ACC Interface, the ACC interface actually consists of two functional parts, with similar wiring methods for both parts.

使能放电：首先明确，JK-B2A32S-RP标配ACC检测功能，必须在ACC打开并且蓝牙APP上面打开了放电开关的情况下（且无其他报警），才能打开放电MOS或继电器，所以ACC可以作为外部的弱电开关用来使能放电。打开ACC的方法有两种。

Discharge Enable: First, it should be clarified that the JK-B2A32S-RP comes standard with the ACC detection function. The discharge MOSFET or relay can only be turned on when ACC is activated, the discharge switch is enabled via the Bluetooth app, and no other alarms are present. Therefore, ACC can be used as an external low-voltage switch to enable discharge. There are two methods to activate ACC.

方法1：直接将5V+和ACC+短接在一起（ACC接线图左边黑色和黄色线），这是最简单的方式。

Method 1： Directly short-circuit 5V+ and ACC+ (the black and yellow wires on the left side of the ACC Wiring Diagram). This is the simplest method.

ACC接线图
ACC Wiring Diagram

方法2：从外部输入一个电压，电压范围默认是4.5~15V（改制过后也可以支持接B+电压），一般用12V。以12V外部电压为例，将12V+接到ACC+（ACC接线图左边黄色线），将12V-接到ACC-（ACC接线图左边绿色线）就可以打开ACC，这种外部输入电压的方式还可以激活保护板（特殊需求，默认不带激活功能）。

Method 2:Input an external voltage with a default range of 4.5~15V (supports B+ voltage connection after modification), and 12V is generally used. Taking 12V external voltage as an example, connect 12V+ to ACC+ (the yellow wire on the left

side of the ACC Wiring Diagram) and 12V- to ACC- (the green wire on the left side of the ACC Wiring Diagram) to activate the ACC. This external voltage input method can also activate the protection board (special requirement; the activation function is not included by default).

ACC打开后APP首页会显示ACC打开，如下图所示：

After the ACC is activated, the "ACC Activated" status will be displayed on the homepage of the Bluetooth APP, as shown in the following figure:

使能充电：JK-B2A32S-RP标配ACC检测功能，必选在充电器状态插入并且蓝牙APP上面打开了充电开关的情况下（且无其他报警），才能打开充电MOS或继电器，所以充电器检测可以作为外部的弱电开关用来使能充电。使能充电的方法有两种。

Charge Enable: The JK-B2A32S-RP is standard-equipped with the ACC detection function. The charging MOSFET or relay can only be turned on when the charger is connected, the charging switch is activated via the Bluetooth app, and no other alarms are present. Therefore, charger detection can be used as an external low-voltage switch to enable charging. There are two methods to enable charging.

方法1：直接将5V+和CD+短接在一起（ACC接线图右边黑色和黄色线），这是最简单的方式；

Method 1:Directly short-circuit 5V+ and CD+ (the black and yellow wires on the right side of the ACC Wiring

Diagram). This is the simplest method.

方法2：从外部输入一个电压，电压范围默认是4.5~15V，一般是用充电器输出的12V辅助电源。以外部12V电压为例，将12V+接到CD+（ACC接线图右边黄色线），将12V-接到CD-（ACC接线图右边绿色线）,保护板就会检测到充电器插入，这种外部输入电压的方式还可以激活保护板。

Method 2:Input an external voltage with a default range of 4.5~15V, typically using the 12V auxiliary power output from the charger. Taking an external 12V voltage as an example, connect 12V+ to CD+ (the yellow wire on the right side of the ACC Wiring Diagram) and 12V- to CD- (the green wire on the right side of the ACC Wiring Diagram). The protection board will then detect the charger connection. This external voltage input method can also activate the protection board.

检测到充电器状态插入后APP首页会显示充电器状态：插入，如下图所示：

After the charger connection is detected, the "Charger: Connected" status will be displayed on the homepage of the Bluetooth APP, as shown in the following figure:

3.6. 报警功能(Alarm function)

保护板支持报警功能，在BMS检测到电池出现过温、过充、过放等存在安全风险的时候是对外进行报警提示。

The protection board supports alarm function. When the BMS detects that there are security risks such as

overtemperature, overcharge, and overdischarge of the battery, the alarm is alerted to the outside.

3.7. 充电过压保护及恢复(Charge overvoltage protection and recovery)

保护板标配充电过压保护，用户可以在极空APP中的参数设置页中自行设置单体过充保护电压以及单体过充恢复电压，电池充电时当任意一串电池出现过压后保护板将关闭充电来保护电池，当所有单体电压均低于单体过充恢复电压之后保护板再次开启充电，以防止电池过充从而损坏电芯。

The protection board is equipped with charge overvoltage protection as standard. Users can set the single overcharge protection voltage and single overcharge recovery voltage in the parameter setting page of the Jikong APP. When any string of batteries is overvoltage during battery charging, the protection board will turn off the charging to protect the battery. To prevent the battery from overcharging and damaging the cell.

3.8. 放电欠压保护及恢复(Discharge undervoltage protection and recovery)

保护板标配放电欠压保护功能，用户可以根据自身电池类型在极空APP中的参数设置页设置电池欠压保护电压(V)、电池欠压恢复电压(V)、自动关机电压(V)。当保护板处于放电状态时，当任意一串电池的电压低于设置的欠压保护电压值，保护板触发欠压保护同时关闭放电来保护电芯，防止过放损坏电芯。当电池充电至所有单体电芯电压均高于欠压恢复电压时，欠压保护解除将再次打开放电。当电池任意一串电芯的电压低于自动关机电压时，保护板将自动关机来保护电芯。

The protection board is equipped with discharge undervoltage protection function as standard. Users can set battery undervoltage protection voltage (V), battery undervoltage recovery voltage (V) and automatic shutdown voltage (V) in the parameter setting page of the Jikong APP according to their own battery type. When the protection board is in the discharge state, when the voltage of any string of batteries is lower than the set undervoltage protection voltage value, the protection board triggers the undervoltage protection and closes the discharge at the same time to protect the battery cell and prevent overdischarge from damaging the battery cell. When the battery is charged until the voltage of all individual cells is higher than the undervoltage recovery voltage, the undervoltage protection release will turn on the discharge again. When the voltage of any string of batteries is lower than the automatic shutdown voltage, the protection board will automatically shut down to protect the battery.

3.9. 充电过流保护及恢复(Charge overcurrent protection and recovery)

保护板标配充电过流保护功能，用户可以根据自身电池容量以及充电器输出电流自行在极空APP中的参数设置页设置持续充电电流(A)、充电过流延时(S)、充电过流解除(S)。当充电电流大于设置的持续充电电流时，经过设置的充电过流延时时间后触发充电保护，保护板关闭充电，经过充电过流解除时间后保护板将再次打开充电。

The protection board is equipped with the charging overcurrent protection function as standard. Users can set the continuous charging current (A), charging overcurrent delay (S) and charging overcurrent release (S) in the parameter setting

page of the Jikong APP according to their own battery capacity and the output current of the charger. When the charging current is greater than the set continuous charging current, the charging protection will be triggered after the set charging overcurrent delay time, and the protection board will close the charging, and the protection board will open the charging again after the charging overcurrent release time.

3.10. 放电过流保护及恢复(Discharge overcurrent protection and recovery)

保护板标配放电过流保护功能，用户可以根据自身电池容量以及负载输出电流自行在极空APP中的参数设置页设置持续放电电流(A)、放电过流延时(S)、放电过流解除(S)。当放电电流大于设置的持续放电电流时，经过设置的放电过流延时时间后触发放电过流保护，保护板关闭放电，经过放电过流解除时间后保护板将再次打开放电。(注意：最大可设置持续放电电流不可超过设计值300A)

The protection board is equipped with the discharge overcurrent protection function as standard. Users can set the continuous discharge current (A), discharge overcurrent delay (S) and discharge overcurrent release (S) in the parameter setting page of the Jikong APP according to their own battery capacity and load output current. When the discharge current is greater than the set continuous discharge current, the discharge overcurrent protection is triggered after the set discharge overcurrent delay time, and the protection board closes the discharge. After the discharge overcurrent release time, the protection board starts the discharge again. (Note: The maximum continuous discharge current can not exceed the design value of 300A)

3.11. 过温保护及恢复(Over temperature protection and recovery)

保护板标配充放电过温保护功能，用户可以根据自身需求在极空APP中的参数设置页设置充电过温保护(℃)、充电过温恢复(℃)、放电过温保护(℃)、放电过温恢复(℃)。当保护板采集到的温度数据高于设置的设置的充电过温保护值时，保护板关闭充电，当温度恢复到低于设置的充电过温恢复值以下时再次打开充电，放电过温保护以及恢复同理。

The protection board is equipped with charge and discharge overtemperature protection function as standard. Users can set charge overtemperature protection (℃), charge overtemperature recovery (℃), discharge overtemperature protection (℃), and discharge overtemperature recovery (℃) on the parameter setting page of the APP according to their own needs. When the temperature data collected by the protection board is higher than the set charge overtemperature protection value, the protection board shuts down the charging, and turns on the charging again when the temperature is lower than the set charge overtemperature recovery value. The same applies to the discharge overtemperature protection and recovery.

3.12. 低温保护及恢复(Low temperature protection and recovery)

保护板标配充电低温保护功能，用户可以根据自身需求在极空APP中的参数设置页设置充电低温保护(℃)、充电低温恢复(℃)。当保护板采集到的温度数据低于设置的设置的充电低温保护值时，保护板关闭充电，当温度恢复到高于设置的充电低温恢复值时再次打开充电，建议冬天极寒地区的用户使用加热功能以便更好的保护

电芯。

The protection board is equipped with charging low temperature protection function as standard. Users can set charging low temperature protection (℃) and charging low temperature recovery (℃) in the parameter setting page of the APP according to their own needs. When the temperature data collected by the protection board is lower than the set charging low temperature protection value, the protection board closes the charging, and turns on the charging again when the temperature returns to higher than the set charging low temperature recovery value. It is recommended that users in extremely cold areas in winter choose the heating function to better protect the battery cell.

3.13. 放电预充功能(Discharge precharge function)

保护板标配放电预充功能，内置预充电阻和驱动电路，默认预充时间为5S，用户可以根据自身需求来设置预充时间，预充时间为0则为关闭预充功能，建议预充线的规格不低于16AWG。

The protection board comes with a standard discharge pre-charge function, with a built-in pre-charge resistor and drive circuit. The default pre-charge time is 5 seconds, and users can adjust the pre-charge duration according to their needs. Setting the pre-charge time to 0 will disable the pre-charge function， It is recommended that the pre-charge wire should be no less than 16 AWG.

3.14. 应急开关(Emergency switch)

保护板标配应急开关功能，当用户正常使用时如果出现过温、过放、过充、掉串等问题时，在极空APP中BMS控制页打开应急开关后，保护板将同时打开充放电30分钟，给予用户一个应急使用时间，在此过程中假如单体电芯电压已到达自动关机电压，保护板也将持续工作直至此次应急开关30分钟周期结束，避免出现在道路上抛锚等险情。

The protection board is equipped with the standard emergency switch function. When the user is in normal use, if there are problems such as over-temperature, over-discharge, over-charge, and drop string, the protection board will turn on the charge and discharge for 30 minutes at the same time after the emergency switch is opened on the BMS control page in the Jikong APP, giving the user an emergency use time. In this process, if the voltage of the single cell has reached the automatic shutdown voltage, the protection board will turn on the charge and discharge for 30 minutes at the same time. The protective plate will also continue to work until the end of the 30-minute emergency switch cycle to avoid dangerous situations such as breaking down on the road.

3.15. 智能休眠(Intelligent sleep)

保护板标配智能休眠功能，用户可根据自身需求在极空APP的BMS控制页选择打开或者关闭。此功能目的为在保护板处于待机状态时(连续26小时充放电电流小于1A)关闭保护板以减少保护板自身对于电池的能量消耗，当用户需要再次激活使用时可以使用按钮激活或者充电器激活即可。

The protection board is equipped with intelligent sleep function as standard, and users can choose to open or close the

BMS control page of the Jikong APP according to their own needs. The purpose of this function is to close the protection board when the protection board is in standby state (the charging and discharging current is less than 1A for 26 consecutive hours) to reduce the energy consumption of the protection board itself to the battery. When the user needs to activate it again, the button can be activated or the charger can be activated.

3.16. 通信功能(Communication function)

保护板标配CAN RS485功能，在使用保护板的通信功能时用户可以根据自身的使用需求以及场景自行设置保护板的地址以及通信协议，具体通信协议见极空保护板通信协议文档。

The protection board supports the CAN and RS485 function. When using the communication function of the protection board, you can set the address and communication protocol of the protection board according to your own requirements and scenarios. For specific communication protocols, see the communication protocol document of the Jikong Protection Board.

4. 主要参数 (Main parameter)

4.1. 基本参数(Basic parameter)

序号 (Serial number)	项目 (Project)	具体参数 (argument)	单位 (Unit)
1	供电电压(Supply voltage)	20-130	V
2	运行功耗(Operating power consumption)	≤1.2	W
3	工作温度(Operating temperature)	-30-70	℃
4	最大采集串数 (Maximum number of collection strings)	32	串 （String）
5	最大均衡电流(Maximum balancing current)	2	A
6	最大充电电流(Maximum charging current) （更换分流器可实现更大充电电流 Replacing the shunt resistor allows for a higher charging current.）	300	A
7	最大放电电流(Maximum discharge current) （更换分流器可实现更大放电电流 Replacing the shunt resistor allows for a higher discharging current.）	300	A
8	最大瞬时电流(Maximum instantaneous current)	600	A
9	保护板尺寸(Protective plate size)	234.6*157.5*30.5	mm
10	成品重量(Finished weight)	1280	g

4.2. 默认参数(Default parameters)

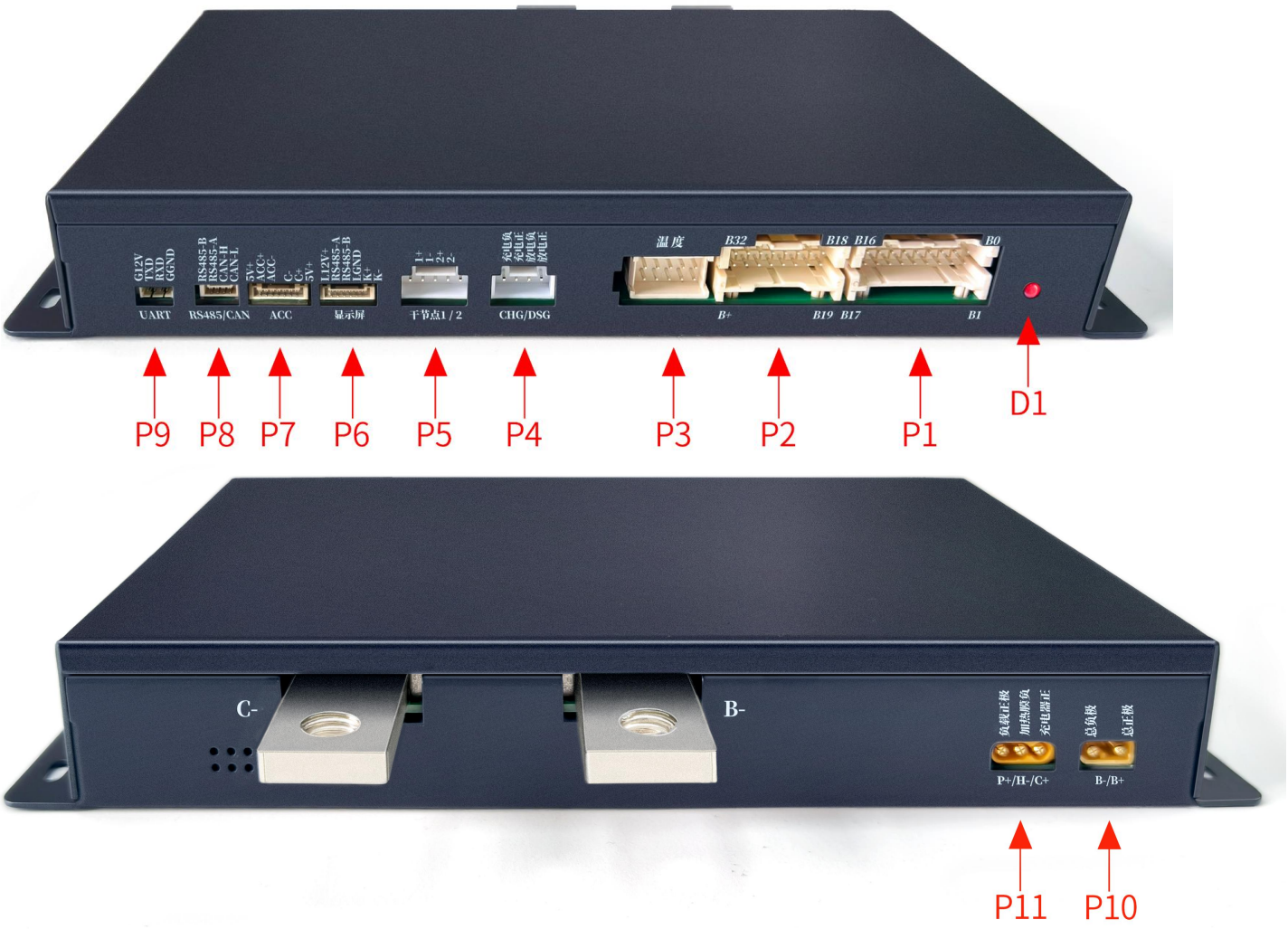
序号 NUM	参数 PARA	三元默认 LI-ION	铁锂默认 LIFEPO4	钛酸锂默认 LTO	单位 (unit)
1	均衡起始电压 (balancing initial voltage)	3	3	2	V
2	最大均衡电流 (Maximum balancing current)	2	2	2	A
3	单体过充电压 (Unit overcharge voltage)	4.2	3.6	2.7	V
4	单体过充保护恢复 (Single overcharge protection recovery)	4.18	3.55	2.65	V
5	单体欠压保护 (Monomer undervoltage protection)	2.82	2.6	1.8	V
6	单体欠压保护恢复 (Single undervoltage protection recovery)	2.85	2.65	1.85	V
7	自动关机电压 (Automatic shutdown voltage)	2.8	2.5	1.7	V
8	SOC-0%电压 (SOC-0% voltage)	2.9	2.6	1.85	V
9	SOC-100%电压 (SOC-100% voltage)	4.18	3.5	2.65	V
10	触发均衡压差 (Trigger balancing differential pressure)	0.01	0.01	0.01	V
11	充电过流保护延时 (Charging overcurrent protection delay)	30	30	30	秒 (S)
12	充电过流保护解除时间 (Charge overcurrent protection release time)	60	60	60	秒 (S)
13	放电过流保护延时 (Discharge overcurrent protection delay)	300	300	300	秒 (S)
14	放电过流保护解除时间 (Discharge overcurrent protection release time)	60	60	60	秒 (S)
15	充电过温保护温度 Charging overtemperature protection	70	70	70	℃

	temperature				
16	充电过温恢复温度 (Charge overtemperature restore temperature)	60	60	60	℃
17	放电过温保护温度 (Discharge overtemperature protection temperature)	70	70	70	℃
18	放电过温恢复温度 (Discharge overtemperature recovery temperature)	60	60	60	℃
19	充电低温保护温度 (Charging low temperature protection temperature)	-20	-20	-20	℃
20	充电低温恢复温度 (Charge low temperature to restore temperature)	-10	-10	-10	℃
21	设备地址 (Device address)	0	0	0	/
22	放电预充时间 (Discharge precharge time)	5	5	5	秒 (S)

5. 接口定义(Interface definition)

5.1. 产品外形(Product Appearance)

5.2. 产品连接器、LED 定义(Product connector, LED definition)



JK-B2A32S-RP 连接器示意图

Schematic diagram of the JK-B2A32S-RP connector

接口定义(Interface definition)

连接器(coupler)	连接器型号(Type of connector)	接口名称(Interface name)	管脚号(Pin number)	JK-B2A32S-RP	
				名称（Name）	定义(definition)
P1	A25005/XA-2*9AWD	均衡与采集接口(Balance with Acquisition interface)	1	B0	电池总负极(Total negative battery)
			2	B1	第 1 串电池正极(The first battery positives)
			3	B2	第 2 串电池正极(The second battery positive)
			4	B3	第 3 串电池正极(The third battery positive)
			5	B4	第 4 串电池正极(The fourth battery positive)
			6	B5	第 5 串电池正极(The fifth battery positive)
			7	B6	第 6 串电池正极(The sixth battery positive)
			8	B7	第 7 串电池正极(The seventh battery positive)
			9	B8	第 8 串电池正极(The eighth battery positive)
			10	B9	第9串电池正极(The ninth battery positive)
			11	B10	第10串电池正极(The tenth battery positive)
			12	B11	第11串电池正极(The eleventh battery positive)
			13	B12	第12串电池正极(The twelfth battery positive)
			14	B13	第13串电池正极(The thirteenth battery positive)
			15	B14	第14串电池正极(The fourteenth battery positive)
			16	B15	第15串电池正极(The fifteenth battery positive)
			17	B16	第16串电池正极(The sixteenth battery positive)
			18	B17	第17串电池正极(The seventeenth battery positive)
P2	A25005/XA-2*8AWD	均衡与采集接口(Balance with Acquisition interface)	1	B18	第18串电池正极(The eighteenth battery positive)
			2	B19	第19串电池正极(The nineteenth battery positive)
			3	B20	第20串电池正极(The twentieth battery positive)
			4	B21	第21串电池正极(The twenty-first battery positive)
			5	B22	第22串电池正极(The twenty-second battery positive)

			6	B23	第23串电池正极(The twenty-third battery positive)
			7	B24	第24串电池正极(The twenty-fourth battery positive)
			8	B25	第25串电池正极(The twenty-fifth battery positive)
			9	B26	第26串电池正极(The twenty-sixth battery positive)
			10	B27	第27串电池正极(The twenty-seventh battery positive)
			11	B28	第28串电池正极(The twenty-eighth battery positive)
			12	B29	第29串电池正极(The twenty-ninth battery positive)
			13	B30	第30串电池正极(The thirtieth battery positive)
			14	B31	第31串电池正极(The thirty-first battery positive)
			15	B32	第32串电池正极(The thirty-second battery positive)
			16	B+	不接线（Empty）
P3	A25012-2*5AW	温度接口 (Temperature interface)	1	T1A	第 1 个温度传感器 A 管脚 (First temperature sensor pin A)
			2	T1B	第 1 个温度传感器B 管脚 (First temperature sensor pin B)
			3	T2A	第 2 个温度传感器 A 管脚 (Second temperature sensor pin A)
			4	T2B	第 2 个温度传感器B 管脚 (Second temperature sensor pin B)
			5	T3A	第 3 个温度传感器 A 管脚 (third temperature sensor pin A)
			6	T4B	第 3 个温度传感器B 管脚 (third temperature sensor pin B)
			7	T5A	第 4 个温度传感器 A 管脚 (fourth temperature sensor pin A)
			8	T6B	第 4 个温度传感器B 管脚 (fourth temperature sensor pin B)
P4	XHB-2.54-4AW	继电器驱动接口 (Relay Driver interface)	1	CHG-	接充电继电器的线圈负极 (Connect to the charging relay coil (-))
			2	CHG+	接充电继电器的线圈正极 (Connect to the charging relay coil (+))
			3	DSG-	接放电继电器的线圈负极 (Connect to the discharging relay coil (-))
			4	DSG+	接放电继电器的线圈正极 (Connect to the discharging relay coil (+))
P5	XHB-2.54-5AW	干节点接口 (Dry Contact	1	1+	干接点1正极 (Positive Terminal of Dry Contact 1)

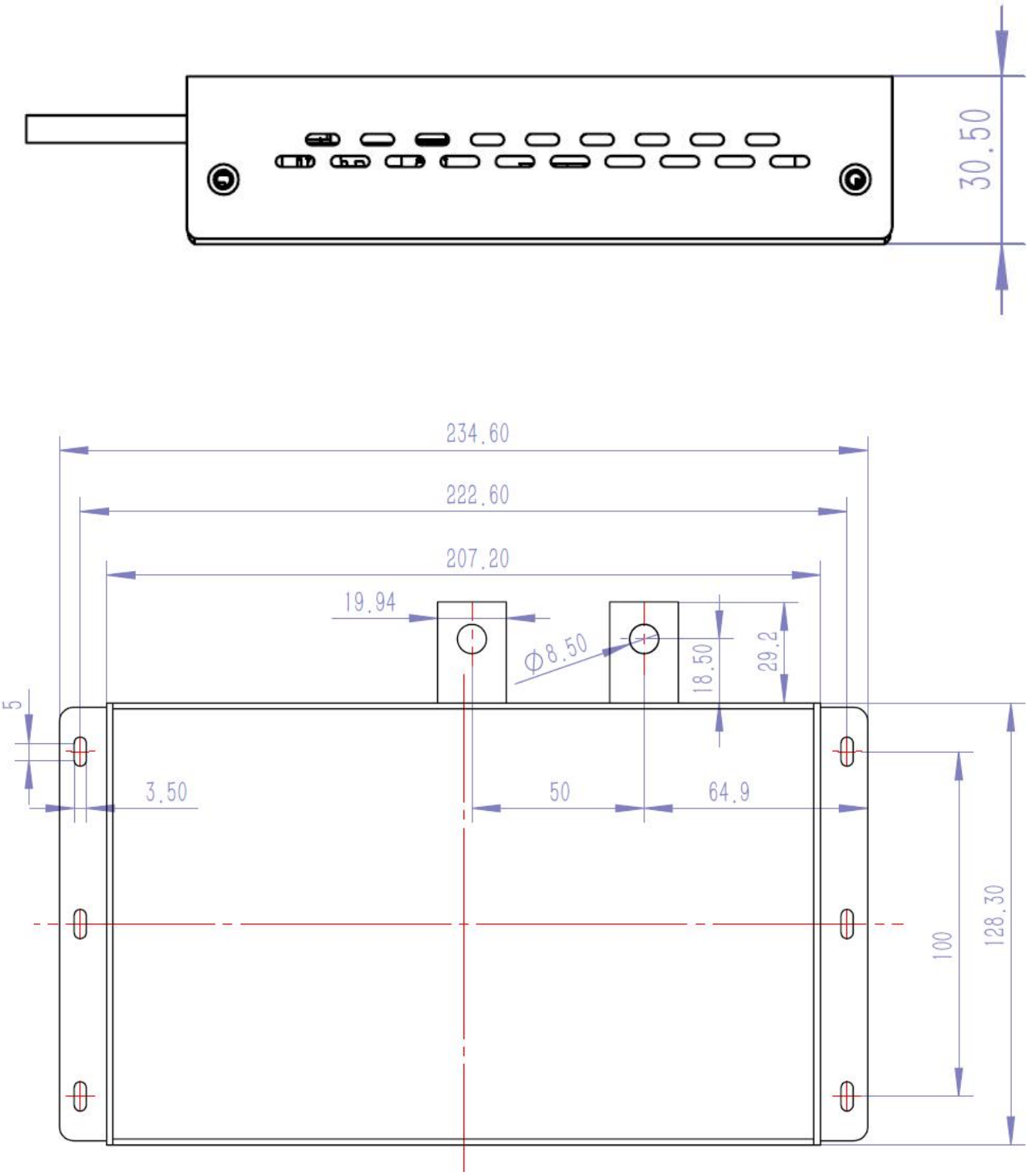
		Interface)	2	1-	干接点1负极 (Negative Terminal of Dry Contact 1)
			3	2+	干接点2正极 (Positive Terminal of Dry Contact 2)
			4	2-	干接点2负极 (Negative Terminal of Dry Contact 2)
P6	A1254WF-6A	显示屏接口 (LCD interface)	1	L12V+	显示屏电源输出 (Display power output)
			2	RS485-A	显示屏RS485信号正极 (The display RS485 signal is positive)
			3	RS485-B	显示屏RS485信号负极 (Display RS485 signal negative)
			4	LGND	电源负极 (Negative terminal)
			5	K+	激活信号正极 (Activate the positive signal)
			6	K-	激活信号负极 (Activation signal negative electrode)
P7	A1254WF-7A	ACC接口 （ACC interface）	1	5V+	内部5V电源正极 （Internal 5V (+)）
			2	ACC+	放电使能信号正极 （Positive Terminal of Discharge Enable Signal）
			3	ACC-	放电使能信号负极 （negative Terminal of Discharge Enable Signal）
			4	NULL	空（Null）
			5	CD-	充电使能信号负极 （negative Terminal of Charge Enable Signal）
			6	CD+	充电使能信号正极 （Positive Terminal of Charge Enable Signal）
			7	5V+	内部5V电源正极 （Internal 5V (+)）
P8	A1254WF-4A	通讯接口 （communication interface）	1	RS485-B	RS485信号负极(Negative terminal of RS485 signal)
			2	RS485-A	RS485信号正极(RS485 signal positive terminal)
			3	CAN-H	CAN信号正极(CAN signal positive terminal)
			4	CAN-L	CAN信号负极(CAN signal negative terminal)
P9	1.25T-4PWT	UART 接口 (UART interface)	1	G12V	输出12V电源正极 (Output 12V power supply positive terminal)
			2	TXD	UART_TX,3.3V
			3	RXD	UART_RX,3.3V
			4	GGND	电源/信号地 (Power/signal ground)

P10	TX30U-M-02	供电接口（Power supply interface）	1	B-	接电池总负极（Connect to the battery pack negative terminal）
			2	B+	接电池总正极（Connect to the battery pack positive terminal）
P11	MR30PW-M	加热接口（Heating interface）	1	P+	接负载的正极 (Connect to the load positive terminal)
			2	H-	接加热膜的负极，加热膜的正极接到充电器正极 (Connect to the heating film negative terminal; the heating film positive terminal connects to the charger positive terminal)
			3	C+	接充电器的正极 (Connect to the charger positive terminal)
D1	蓝牙连接指示灯，当蓝牙连接上保护板时指示灯常亮，断开连接时指示灯闪烁。(Bluetooth connection indicator: When the Bluetooth is connected to the protection board, the indicator is steady on, and when the connection is disconnected, the indicator is blinking.)				
C-	接外部负载或者充电器负极，配M10螺丝。(Connect to external load or negative terminal of charger,equipped with M10 screws.)				
B-	接电池负极，配M10螺丝。(Connect to the negative battery terminal,equipped with M10 screws.)				

5.3. 产品尺寸(Product size)

JK-B2A32S-RP系列保护板尺寸为 234.6mm×157.5mm×30.5mm如下图所示：

The size of JK-B2A32S-RP series protection board is 234.6mm×157.5mm×30.5mm as shown in the following figure：



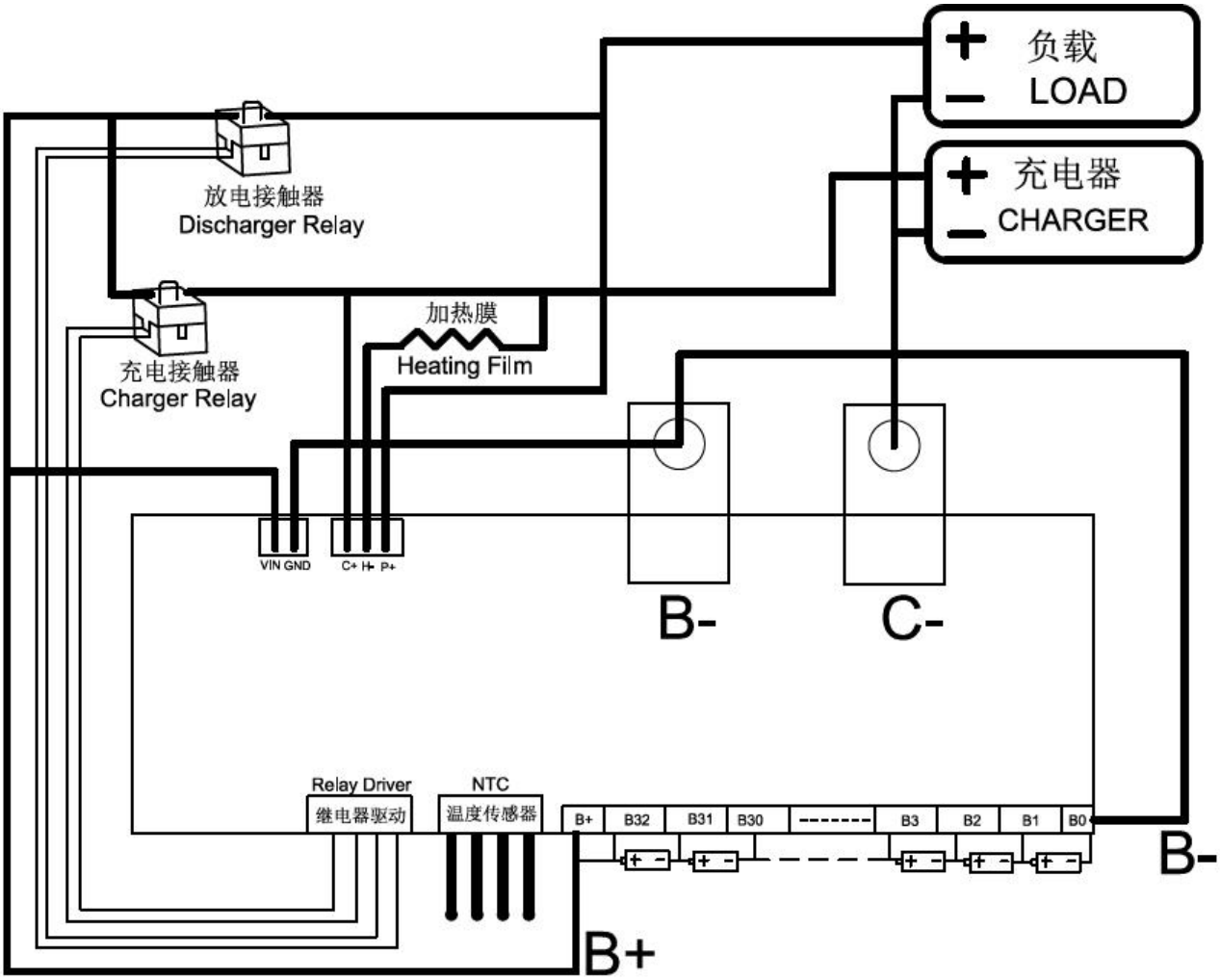
JK-B2A32S-RP 外形尺寸

Dimensions of JK-B2A32S-RP

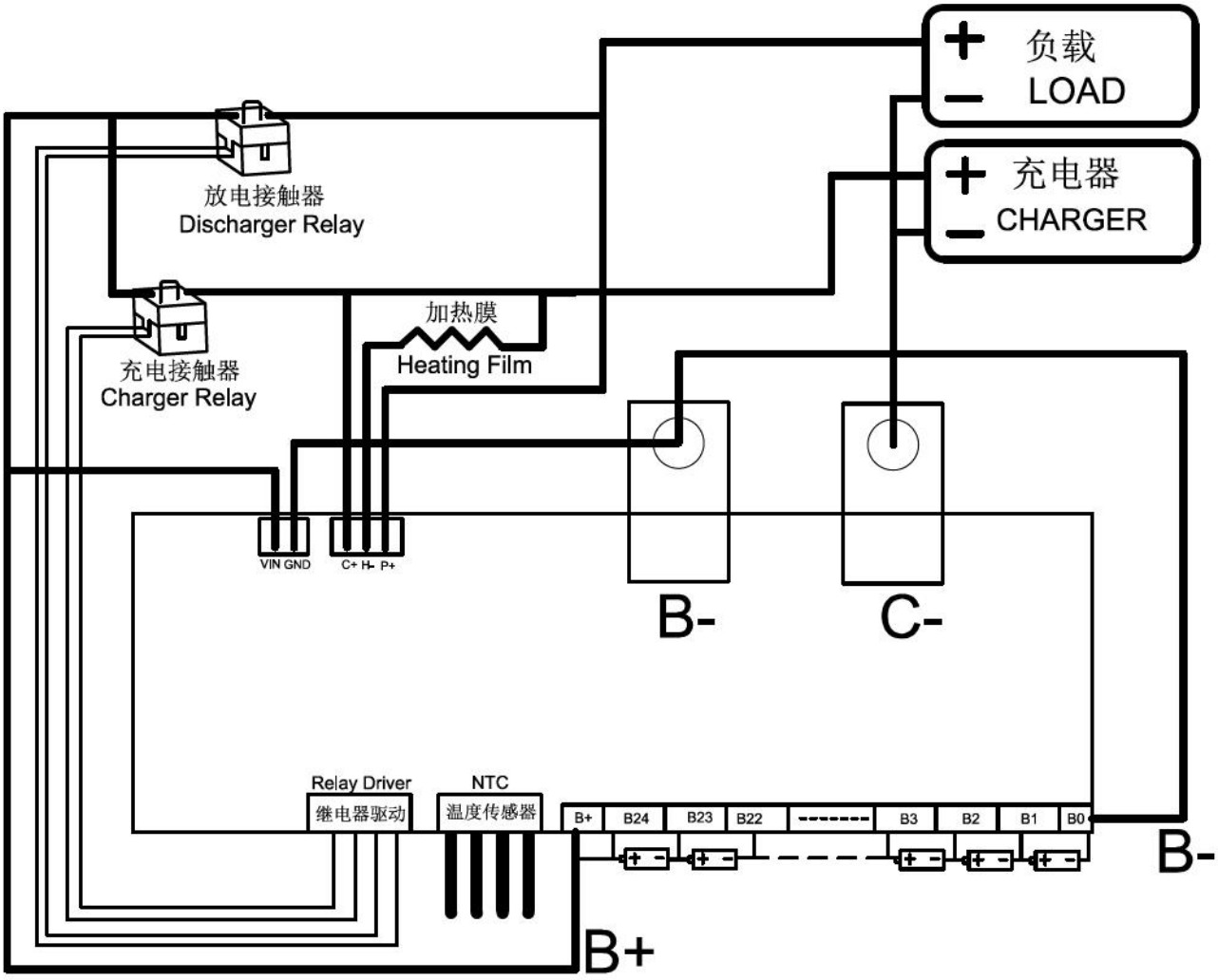
5.4. 安装方法 (Installation method)

JK-B2A32S-RP系列保护板适用于8-32串的的锂电池组，不同电芯数量的电池组接线方法不同，具体接线方式如下图所示。

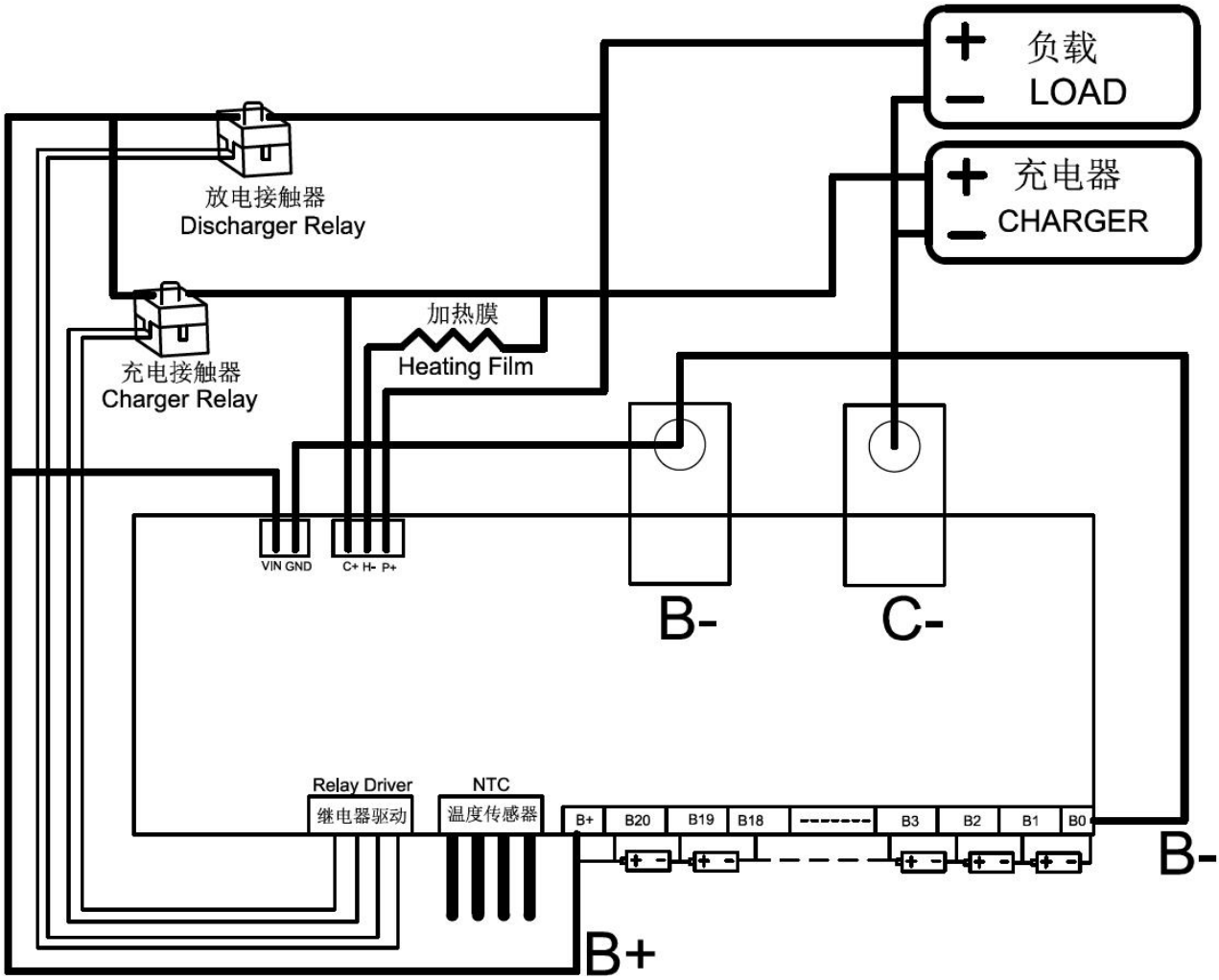
JK-B2A32S-RP series protection board is suitable for 8-32series of lithium battery pack, different cell number of battery pack wiring methods are different, the specific wiring method is shown in the following figure.



JK-B2A32S-RP-32S接线图
JK-B2A32S-RP-32S wiring diagram



JK-B2A32S-RP-24S接线图
JK-B2A32S-RP-24S wiring diagram



JK-B2A32S-RP-20S接线图
JK-B2A32S-RP-20S wiring diagram

6. 设备使用说明(APP operation Instructions)

6.1. APP 安装（APP installation）

通过扫描下图所示的二维码可以获取与产品配套的手机APP

Mobile APP matching the product can be obtained by scanning the QR code shown in Figure . Android Version 7 minimum is required for the Android APP.

手机APP 链接二维码
Mobile APP link QR code

6.2. 设备激活(Device activation)

确认接线无误后才可以给保护板上电。保护板标配激活开关，将激活开关接到显示屏接口，按一下开关按钮就可以激活保护板。使能充电和使能放电也可以激活保护板，具体操作方法参考“ACC和充电器检测功能”描述。

购买了显示屏的用户，将显示屏线缆接到保护板的显示屏接口，按一下显示屏上的按钮也可以激活保护板。

Once confirmed, you can power on the protection board. The board comes with a standard activation switch. Connect the activation switch to the display interface, and press the switch button to activate the board. Enabling charging or discharging can also activate the board. For detailed operation, please refer to the description under “ ACC and Charger Detection Function.”

For users who have an optional display, connect the display cable to the display interface of the protection board. Pressing the button on the display can also activate the board.

6.3. 参数设置(Parameter setting)

详见“保护板参数设置说明”。

Please refer to the "Instructions for Setting Protection Board Parameters" for details.