东莞市均衡宝技术有限公司

Dongguan Balanced Management Technology Co., Ltd

产品规格承认书

Product Specification

产品名称(Product Name)：	智能主动均衡保护板/Smart Active Balance BMS	
产品型号(Model Number)：	R24TK	
硬件版本(Hardware Version)：	V1.2	
客户名(Customer Name)：		
客户料号(Customer P/N)：		
送样日期： (Sample delivery date)：	版次 (Version)	文件编号 (Document No.)
	A7	
编制(Prepared by)	核准(Approved)	审核(Audit)
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客户确认栏 Customer Confirmation		
确认意见：Confirmation： 客户签章 Signature: 日期 Date:		

注意（Note）：

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After receiving the prototype confirmation, please sign back in time. If there is no sign back and problems feedback within 7 days, our company default customer test qualified.The pictures in the specification are general models, which may be different from the samples. Dongguan Balanced Management Technology Co.,Ltd retains this specification as the final right of interpretation.

2. 客户批量前，请在规格书中签字回传，并说明详细功能说明，我司才安排批量.

Before the batches, please sign the specification and return it, and explain the detailed function description, and our company will arrange in batch production.

修订记录

Revision record

日期 （Date）	版本号 (Version)	修订说明 （Note）	制表 （Tab）	核准 （Approve）
2023/11/20	A0	初版 First edition	杨伟滴	李天富
2023/11/29	A1	修改翻译内容、更新型号 Modify the translation content and update the model	杨伟滴	徐丹、邱泽飞
2023/12/05	A2	修改接线说明、尺寸图、操作说明 Modify wiring instructions, dimensions, and operation instructions	杨伟滴	曹用、张朗铭
2023/12/11	A3	修改部分参数值，新增 MOS 温度保护描述 Modified some parameter values and added the description of MOS temperature protection	杨伟滴	张朗铭、李天富
2024/1/5	A4	修改均衡电流范围值 Example Change the value of the balanced current range	杨伟滴	李天富
2024/4/13	A5	更新 V1.2 底板功能，双 DO，采集精度优化，修改充电电流，修改休眠功耗 Update to V1.2 baseboard functionality, featuring dual DO, optimized acquisition precision, modified charging current, and adjusted sleep mode power consumption.	杨伟滴	李天富
2024/5/6	A6	更新尺寸图，接口定义说明 Update dimension diagrams and interface definition specifications.	张洁	李天富
2024/6/8	A7	更新功耗及尺寸图 Update the power consumption and size diagram	张洁	李天富

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1、概述 Introduction

因电池的容量、内阻和电压等参数值不能完全一致，这种差异导致充电时容量最小的电池容易过充，过放，受损后最小的电池容量变得更小，进入恶性循环。单体电池性能的优劣直接影响到整组电池的充放电特性及电池组容量降低。没有均衡功能的 BMS 只是一个数据采集器，很难称得上是管理系统。本产品的主动均衡功能，可以实现最大持续 1A 的均衡电流。将单体能量高的转移到单体能量低的电池，或用整组能量补充到单体最低电池，在实施的过程中通过储能环节把能量重新进行分配，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。

Due to the battery capacity, internal resistance, voltage and other parameter values are not completely consistent, this difference causes the battery with the minimum capacity to be easily overcharged and discharged during charging, and the smallest battery capacity becomes smaller after damage, entering a vicious cycle. The performance of single cell directly affects the charge and discharge characteristics of the whole battery and the deduction of battery capacity. BMS lack of balance function is only a data collector, which is hardly a management system. The active equalization function can realize the maximum continuous 1A equalization current. Transfer the high-energy single cell to the low-energy cell, or use the whole group of energy to supplement the lowest single cell. During the implementation process, the energy is redistributed through the energy storage link, so as to ensure the battery consistency to the greatest extent, improve the battery mileage and extend the battery life.

2、产品特点 Product Features

- 集成第三代主动均衡功能；Integrate the third generation active balancing function;
- 智能集成兼串设计，兼容 4~24 串使用；Smart Integrated and string design, compatible with 4~24 strings;
- 集成蓝牙功能，可使用 APP 快速便捷查看及设置保护板的参数；Integrated Bluetooth function, can use the APP quickly and easily view and set the parameters of BMS;
- 采用低封装电阻、低寄生电感、低热阻的 TOLL 封装 MOS 管，满足大功率、大电流等场景；TOLL package MOS tube with low package resistance, low parasitic inductance and low thermal resistance is adopted to meet the application scenarios of high power and high current;
- 支持丰富的外设配件，满足多应用场景;Supports a variety of peripheral accessories to meet multiple application scenarios;
- 支持云平台远程电池管理，满足终端远程监控;Supports IOT cloud platforms and remote monitoring of terminals;
- 支持 PC 端上位机，快捷查看历史记录及批量设置参数;Support PC host, quick view of history and batch set parameters;

- 使用专业大电流走线设计及工艺，经受超大电流冲击;The use of professional high-current wiring design and technology, withstand the impact of large current;
- 支持过充保护、过放保护、过流保护、短路保护功能;Supports over charge protection, over discharge protection, over current protection, short circuit protection;
- 具有通讯功能，可通过 PC 上位机或 APP 对过流、过放、过流、充放电过流、均衡、过温、欠温、休眠、容量等参数进行设置;With communication function, you can set parameters such as over-current, over-discharge, over-current, charge and discharge over-current, equalization, over-temperature, under-temperature, hibernation and capacity through PC or APP;

3、电气特性 Electrical characteristics

3.1 基础规格 Basic specification

指标 Index	参数 Specification	备注 Remarks
电池组类型 Battery pack type	三元、铁锂、钛酸锂 NCM、LFP、LTO	
电池组串数 Number of battery strings	三元（NCM)、4~8S/8~17S/8~20S 铁锂(LFP)：4~8S/8~17S/8~24S 钛酸锂(LTO)：6~8S/8~17S/8~24S	
单体采样电压范围 Cell sampling voltage range	1.5V-4.9V	
工作电压范围 Operating voltage range	＞10V	
均衡方式 Balance method	主动均衡 Active Balance	
工作功耗 Working power consumption	≤1.25W	空载状态 Idle State
休眠功耗 Sleep current	4-8S≤25mW 8-17S≤35mW 8-24S≤45mW	空载状态 Idle State
工作温度 working temperature	-40℃ ~ 85℃	
工作指示灯 Working Light	绿色：正常工作 Green: works properly 红色：告警或保护 Red: Alarm or protection	
产品重量 Product weight	222±5g	
产品尺寸 Product size	167.5*65.5*14.5mm 长*宽*高 Length*width*height	

3.2 电流参数对应表 Current parameter correspondence table

产品型号 Model	支持串数 Compatible Strings	持续放电电流 Continous Discharge Current	放电保护电流 Discharge Protection current	持续充电电流 Continous Charge Current	充电保护电流 Charge Protection Current	短路保护电流 Short-Circuit Protection Current
R24TK1A-8S40A	4~8	40A	60A	40A	60A	120A (100-160A)
R24TK1A-8S60A	4~8	60A	90A	60A	90A	150A (100-200A)
R24TK1A-8S80A	4~8	80A	120A	80A	120A	240A (100-320A)
R24TK1A-8S100A	4~8	100A	150A	100A	150A	300A (100-400A)
R24TK1A-17S40A	8~17	40A	60A	40A	60A	120A (100-160A)
R24TK1A-17S60A	8~17	60A	90A	60A	90A	150A (100-200A)
R24TK1A-17S80A	8~17	80A	120A	80A	120A	240A (100-320A)
R24TK1A-17S100A	8~17	100A	150A	100A	150A	300A (100-400A)
R24TK1A-24S40A	8~24	40A	60A	40A	60A	120A (100-160A)
R24TK1A-24S60A	8~24	60A	90A	60A	90A	150A (100-200A)
R24TK1A-24S80A	8~24	80A	120A	80A	120A	240A (100-320A)
R24TK1A-24S100A	8~24	100A	150A	100A	150A	300A (100-400A)

3.3 工作参数 Working Parameters

序号 No	检测内容 Test content		出厂默认参数 Factory default parameters	单位 Unit	备注 Remark
1	主动均衡 Active balance	均衡开启电压 Balance ON voltage	3	V	默认值 Defaults
		均衡开启压差 BalanceONvoltage difference	10	mV	默认值 Defaults
		均衡开启条件 Balance ON conditions	1、达到设定开启电压 2、达到设定开启压差 (以上两个条件需同时满足，只要有一项不满足，就会关闭) 1. Reach the set opening voltage 2. Reach the set opening voltage difference (The above two conditions must be meet at the same time. if one of condition is not meet, balance will be closed)		
		均衡电流 Balance current	1100±200	mA	备注 Remark
2	单体过充保护 Single Cell over-charge protection	单体过充一级告警电压 Single cell overcharge level 1 alarm voltage	3.55	V	电池类型不同，保护参数则不同，详见 3.5 电池类型参数表 Different battery types with different setting parameters, please find the details in 3.5 Protection parameters
		单体过充一级告警解除电压 Single cell overcharge level 1 alarm release voltage	3.45	V	
		单体过充二级保护电压 Single cell overcharge level 2 protection voltage	3.6	V	
		单体过充保护延时 Single Cell over-charge protection delay	1±0.8	S	
		单体过充二级保护解除电压 Single Cell over-charge level 2 protection release voltage	3.55	V	
		单体过充二级保护解除延时 Single Cell over-charge level 2 protection release delay	1±0.8	S	
3	单体过放保护 Single Cell over-discharge protection	单体过放一级告警电压 Single cell over-discharge level 1 alarm voltage	2.65	V	电池类型不同，保护参数则不同，详见 3.5 电池类型参数表
		单体过放一级告警解除电压 Single cell over-discharge level 1 alarm release voltage	2.75	V	

		单体过放二级保护电压 Single cell over-discharge level 2 protection voltage	2.6	V	Different battery types with different setting parameters, please find the details in 3.5 Protection parameters
		单体过放保护延时 Single Cell over-discharge protection delay	1±0.8	S	
		单体过放二级保护解除电压 Single Cell over-discharge level 2 protection release voltage	2.65	V	
		单体过放保护解除延时 Single Cell over-discharge protection release delay	1±0.8	S	
7	充/放电过流保护 Charge/discharge over-current protection	过流 1 级告警电流 Discharge over-current level 1 alarm current	(持续电流 Current*1.2)±3%	A	
		过流 1 级告警延时 Discharge over-current level 1 alarm delay	1±0.8	S	
		过流 2 级保护电流 Discharge over-current level 2 protection current	(持续电流 Current*1.5)±3%	A	
		过流 2 级保护延时 Discharge over-current level 2 protection delay	1±0.8	S	
		放电过流保护解除条件 Release condition for Discharge over-current level 2 protection	移除负载解除 Remove the load to release		
		充电过流保护解除条件 Release condition for Charge over-current level 2 protection	移除充电器解除 Remove the charger to release		
8	短路保护 Short circuit protection	短路保护条件 Short circuit protection conditions	外部负载短路 External load short circuit		
		短路保护延时 Short circuit protection delay	50~200	us	实际以客户电池寄回我司测试为准 The actual test is subject to the customer's battery sent back to our company for testing.
		短路保护解除 Short circuit protection released	移除负载解除 remove the load to release		
	温度保护 Temperature protection	充电高温告警温度 Charging high temperature alarm temperature	55	℃	
		充电高温告警释放温度 Charging high temperature release	50	℃	

		temperature		
9		充电高温保护温度 Charging high temperature protection temperature	65	℃
		充电高温保护释放温度 Charging high temperature protection release temperature	60	℃
		充电高温保护延时 Charging high temperature protection delay	1±0.8	S
		充电低温告警温度 Charging low temperature alarm temperature	-10	℃
		充电低温告警释放温度 Charging low temperature alarm release temperature	-5	℃
		充电低温保护温度 Charging low temperature protection temperature	-20	℃
		充电低温释放温度 Charging low temperature release temperature	-15	℃
		充电低温保护延时 Charging low temperature protection delay	1±0.8	S
		放电高温告警温度 Discharge high temperature alarm temperature	65	℃
		放电高温告警释放温度 Discharge high temperature alarm release temperature	60	℃
		放电高温保护温度 Discharge high temperature protection temperature	70	℃
		放电高温释放温度 Discharge high temperature release temperature	65	℃
		放电高温保护延时 Discharge high-temperature protection delay	1±0.8	S
		放电低温告警温度 Discharge low temperature alarm temperature	-10	℃
		放电低温释放温度 Discharge at low temperature release temperature	-5	℃
		放电低温保护温度 Discharge low temperature protection	-20	℃

		temperature			
		放电低温释放温度 Discharge at low temperature release temperature	-15	℃	
		放电低温保护延时 Discharge low- temperature protection delay	1±0.8	S	
		温度保护解除条件 Temperature protection release conditions	达到恢复温度 The recovery temperature is reached		
		温度个数 Number of temperatures	2	PCS	可定制 4 个 4 can be customized
10	压差告警 Differential voltage alarm	压差一级告警 voltage difference level 1 alarm	0.5	V	
		压差二级告警 voltage difference level 2 alarm	0.8	V	
		压差大告警恢复 voltage difference alarm recovery	0.4	V	
11	内阻 Internal impedance	主回路导通内阻 Main circuit on-resistance	<20	mΩ	
12	MOS 温度	高温 1 级告警温度 High temperature level 1 alarm temperature	90	℃	可设置 Can be set up
		高温 1 级告警温度延时 High temperature level 1 alarm temperature delay	1±0.8	S	
		高温 2 级保护温度 High temperature level 2 protection temperature	100	℃	可设置 Can be set up
		高温 2 级保护温度延时 High temperature level 2 protection temperature delay	1±0.8	S	
		高温 1 级告警恢复温度 High temperature level 1 alarm release temperature	85	℃	
		高温 1 级告警恢复延时 High temperature level 1 alarm release delay	1±0.8	S	
		高温 2 级保护恢复温度 High temperature level 2 protection release temperature	95	℃	
		高温 2 级保护恢复延时 High temperature level 2 protection release delay	1±0.8	S	

13	消耗电流 Current consumption	工作时自耗电电流 Self-consumption current during operation	<1.25	W	不包含配件功耗 Not include other module
		休眠模式自耗电电流 Self-consumption current in sleep mode	4-8S≤25 8-17S≤35 8-24S≤45	mW	进入：无通讯、无电流、无钥匙信号 Status: no communication, no current, no key signal
		休眠时间 Sleep time	3600	S	可设置 Settable
14	通讯方式 Communication method	√UART √RS485 √CAN √蓝牙 Bluetooth √GPS √LCD √电量显示模块 SOC Indicator			
15	钥匙开关 Key switch	√有 Yes 无 No			
16	内置限流 Built-in Rate Limiting	内置恒功率 5W，最大电流 0.5A Built-in constant power of 5W, maximum current of 0.5A			

3.4 可靠性参数 Reliability parameters

序号	项 目	条 件
1	检测精度 （常温 25℃） Detection accuracy (Normal temperature 25℃)	电流检测精度(Current detection accuracy)：≤(±3%FSR) 电压检测精度(Voltage detection accuracy)：≤±5mV 温度检测精度(Temperature detection accuracy)：≤2℃ SOC 平均精度(SOC average accuracy)：≤10%
2	信息存储 （512Kb，符合印规需求） Information storage (512Kb, meets India AIS-156 requirement requirements)	最大存储大于 380 条履历信息，含单体过压欠压保护，当前总电压、电流、温度、SOC、mos 管状态、短路及运行状态等 Maximum storage of more than 380 pieces of history information, including single cell over-voltage and under-voltage protection, current total voltage, current, temperature, SOC, MOS tube status, short circuit and operating status, etc.
3	通讯接口 Communication interface	CAN 通讯波特率 250K,485/UART 波特率 9600bps 支持通讯端口升级程序 CAN communication baud rate 250K, 485/UART baud rate 9600bps ,supports communication port upgrade program
4	SOC 计量 measurement	采用电流积分 uses current integration
5	短路 Short circuit	电池包短路电流超过系统参数的短路电流，使用空气开关短路 5 次，且能正常恢复。短路回路线长不超过 1.2m，回路内阻低于 20mΩ The short-circuit current of the battery pack exceeds the short-circuit

		current of the system parameters. Use an air switch to short-circuit 5 times and recover normally. The length of the short-circuit loop should not exceed 1.2m, and the internal resistance of the loop should be lower than 20mΩ.

3.5电池类型参数表 Protection parameters

保护参数 Protection parameters	电池类型 Battery Type		
	三元 NCM	铁锂 LFP	钛酸锂 LTO
单体过压一级告警（V） Single cell over-voltage level 1 alarm (V)	4.1	3.55	2.65
单体过压一级告警恢复（V） Single cell over-voltage level 1 alarm recovery (V)	4	3.45	2.55
单体过压二级保护（V） Single cell over-voltage level 2 protection (V)	4.2	3.6	2.7
单体过压二级保护恢复（V） Single cell over-voltage level2 protection recovery (V)	4.15	3.55	2.65
单体欠压一级告警（V） Single cell under-voltage level 1 alarm (V)	2.85	2.65	1.85
单体欠压一级告警恢复（V） Single cell under-voltage level 1 alarm recovery (V)	2.95	2.75	1.95
单体欠压二级保护（V） Single cell under-voltage level2 protection (V)	2.82	2.6	1.8
单体欠压二级保护恢复（V） Single cell under-voltage level 2 protection recovery (V)	2.87	2.65	1.85
自动关机电压（V） Automatic shutdown voltage (V)	2.79	2.57	1.77
均衡起始电压（V） Balance ON voltage (V)	3	3	2

4、通信说明 Communication Description

4.1、UART 通讯：默认采用均衡宝 UART 通讯协议，通过专用通讯线与指定上位机进行通讯，波特率默认为 9600bps。
UART communication: Default 100balance UART communication protocol is used to communicate with the designated host PC through a dedicated communication line. The default baud rate is 9600bps.
4.2、RS485 通讯：默认采用均衡宝 RS485 通讯协议，通过专用通讯线与指定上位机进行通讯，波特率默认为 9600bps。
RS485 communication: Default 100balance RS485 communication protocol is used to communicate with the designated host PC through a dedicated communication line. The default baud rate is 9600bps.

4.3、CAN 通讯：默认采用均衡宝 CAN 通讯协议，通信速率为 250KB/S。

CAN communication: Default 100balance CAN communication protocol is adopted by default, and the communication rate is 250KB/S.

5、上位机说明 PC software Description

均衡宝上位机(JHB-PCmaster)功能主要分为六大部分：数据监控、参数设置、参数读取、工程模式、历史告警和 BMS 升级。

The functions of the PC host (JHB-PCmaster) are mainly divided into six parts: data monitoring, parameter setting, parameter reading, engineering mode, historical alarm and BMS upgrade.

- 解析各模块发送的数据信息，然后将电压、温度、配置值等显示出来；Analyze the data sent by each module, and then display the voltage, temperature, configuration value etc.;
- 通过上位机向各模块配置信息；Configure information to each module through the PC host ;
- 生产参数校准； Calibration of production parameters;
- BMS 升级。 BMS upgrade.

下载方式：可扫描产品说明书及外壳上面的二维码，进行网页下载。

Download method: Scan the QR code on the product manual and enclosure to get more information.

6、APP 说明 APP Description

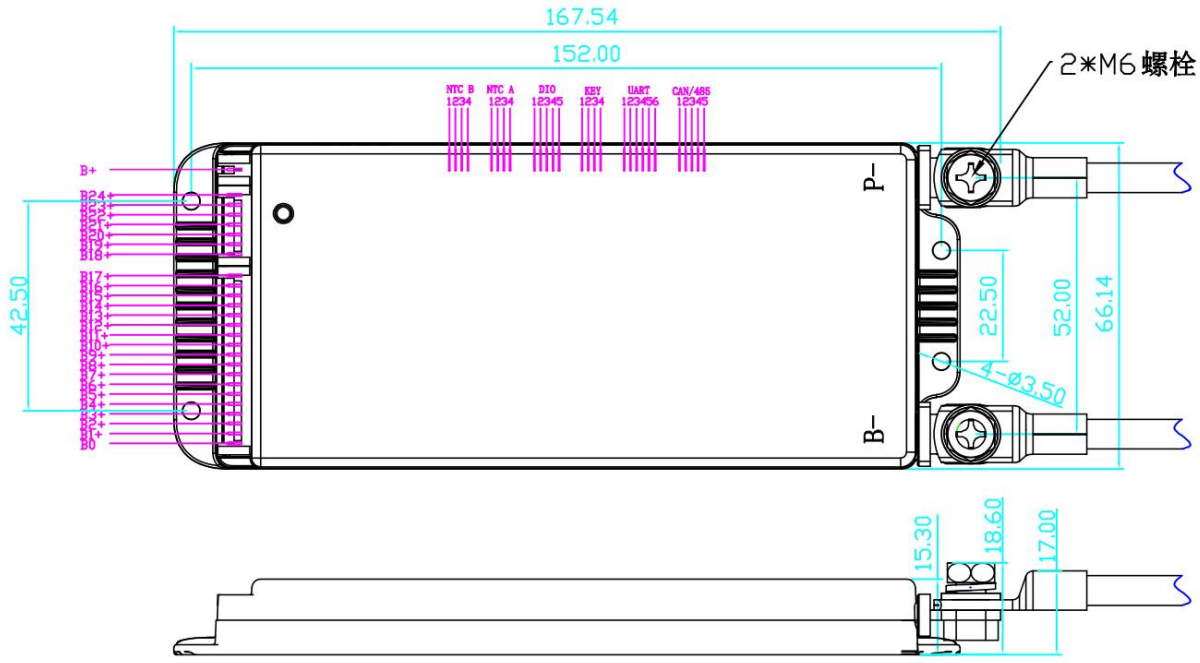
均衡宝 APP（BlanceBMS）功能：Balance BMS APP function

- 查看 SOC、剩余电量、总压、电流、MOS 开关状态、均衡开关状态；View SOC, remaining power, total voltage, current, MOS status, balance status;
- 电池单串电压、最高、最低位置、电池编号、软件版本号、SN 号；Battery single string voltage, highest and lowest position, battery number, software version number, SN number;
- 保护参数、电芯选型、一键设置参数；Protection parameters, cell selection, and one-click parameter setting;
- BMS 软件升级、查看 BMS 历史故障；BMS software upgrade, view BMS historical faults record
- 将历史故障上传云平台/发送至邮箱；Upload historical faults to the cloud platform/send to email
- 修改 BMS 密码；Change BMS password;

下载方式：可扫描产品说明书及外壳上面的二维码，进行网页下载。

Download method: Scan the QR code on the product manual and enclosure to get more information.

7、尺寸图（mm） Dimensional drawing（mm）



8、接口定义说明 Interface definition description

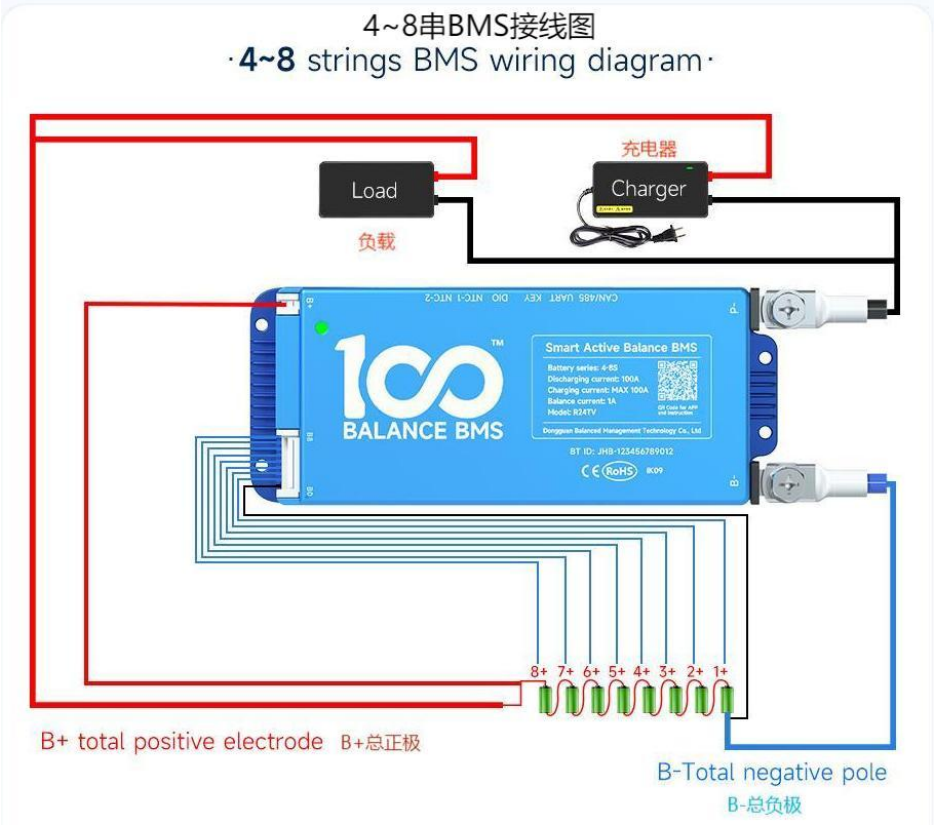
接口名称 Interface name	Pin 脚	标号 Label	定义说明 Definition description
B-接口 B-interface	/	B-	电池总负，接电池总负 Battery negative, connect to battery negative
P-接口 P-interface	/	P-	保护板充放电负极，接充放电负端 The charge and discharge negative terminal of the BMS is connected to the negative terminal of the charge and discharge
采样线接口 Sampling line interface PHB 2.0 带扣 PHB 2.0 with a buckle	1	B0	接第 1 节电池负级 Connect to the negative terminal of the first battery
	2	B1+	接第 1 节电池正级 Connect to the positive terminal of the first battery
	3	B2+	接第 2 节电池正级 Connect to the positive terminal of the second battery
	...	...	接最后 1 节电池正级 Connect the positive terminal of the last battery
	注：≤17 串为 1 个接口； >17 串为 2 个接口； Note: ≤17 strings are 1 interface; >17 strings are 2 interfaces;		
B+接口	1	B+	接最后 1 节电池正极 Connect the last positive battery terminal
NTC-A 接口 NTC-A interface GH1.25 4Pin	1	GND	地 GND
	2	NTC-1	1#温度线 1 # Temperature cable
	3	GND	地 GND
	4	NTC-2	2#温度线 2 # Temperature cable

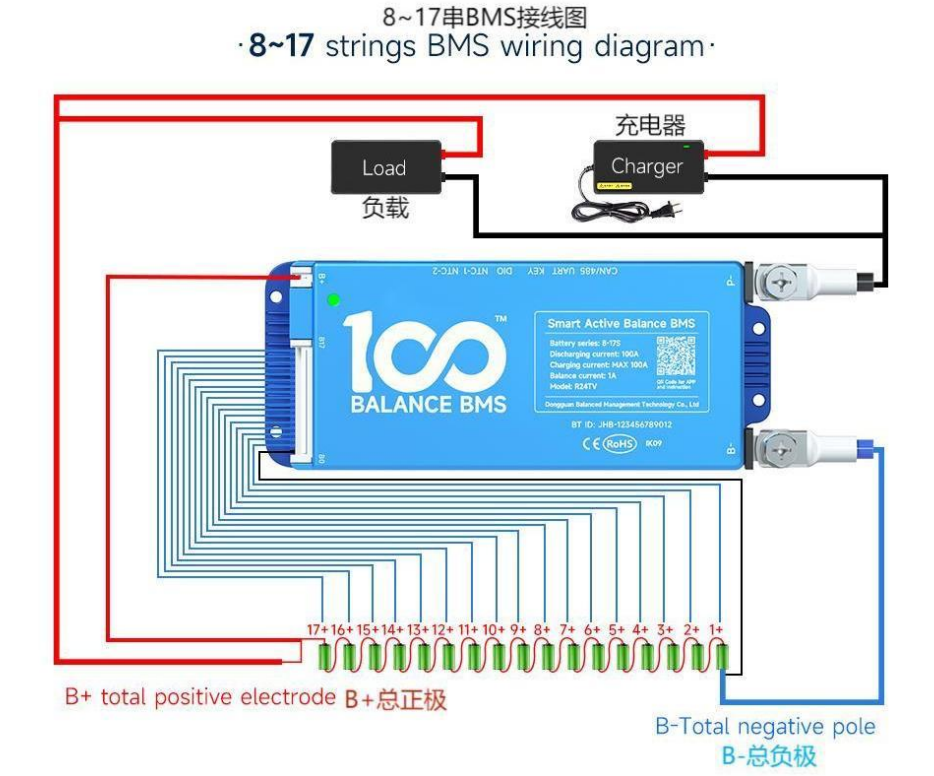
NTC-B 接口 NTC-B interface GH1.25 4Pin	1	GND	地 GND
	2	NTC-3	3#温度线 3 # Temperature cable
	3	GND	地 GND
	4	NTC-4	4#温度线 4 # Temperature cable
DIO 接口 DIO interface GH1.25 5Pin	1	DO	DO，12V（标配功能为蜂鸣器输出，可定制其他功能；The standard function is the buzzer output. Other functions can be customized）
	2	GND	地 GND
	3	DI1	DI（Input）
	4	GND	地 GND
	5	DO	DO，3.3V（标配功能为加热模块输出，可定制其他功能；The standard function is the output of the heating module. Other functions can be customized）
KEY 接口 KEY interface GH1.25 4Pin	1	KEY+	钥匙开关正 Key switch positive
	2	TBD	/
	3	TBD	/
	4	KEY-	钥匙开关负 Key switch negative
WIFI/GPS/UART/LCD/电量灯板接口 WIFI/GPS/UART/LCD /SOC display interface GH1.25 6Pin	1	GND	地 GND
	2	3.3V	供电电源 3.3V Power supply is 3.3V
	3	12V	供电电源 8-12V Power supply is 8- 12V
	4	S1	激活按键 Activate button
	5	RX	通讯发送端 Communication sending end
	6	TX	通讯接收端 Communication receiving end
RS485/CAN 接口（选配） RS485/CAN interface（Optional） GH1.25 5Pin	1	485_B	485 通讯接收端 485 communication receiver
	2	485_A	485 通讯发送端 485 communication sender
	3	ISO_GND	隔离地 Isolation ground GND
	4	CAN_H	CAN 通讯高 CAN communication high
	5	CAN_L	CAN 通讯低 CAN communication low

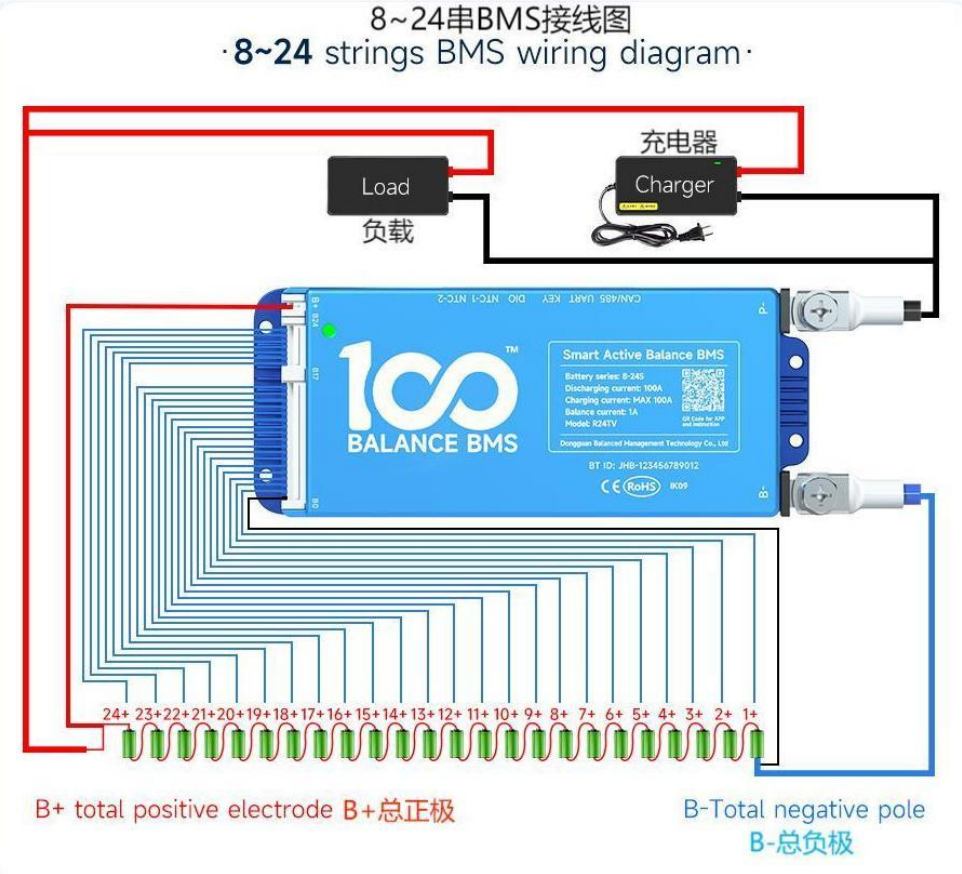
9、包装清单 Packing list

名称 Name	默认规格 Default specification	数量 Pcs
均衡保护板 Active Balance BMS	均衡保护板 Smart Active Balance BMS	1
采样线束 Sampling cable(可定制) (Support customized)	排插类型 Interface type：PHB2.0 线号 Cable number：24AWG 线长 Line length：450mm	1 or 2 (≤17 串为 1，＞17 串为 2) (≤17S is 1 lines, > 17S is 2 lines,)
说明书 Specification	双面彩色印刷 Double sided color printing	1
B+连接线 B+ connection cable	连接线_B+线_2Pin_PHB2.0_450mm_带扣 Cable _B+ cable _2Pin_PHB2.0_450mm_ With a buckle	1
P-连接线 P- Cable （选配） (Optional)	10AWG/7AWG（40-60A 为 10AWG，80-100A 为 7AWG）_100mm_黑色(P-)白色套管_两端带端子 SC16-6 10AWG/7AWG（40-60A is 10AWG，80-100A is 7AWG）100mm_Black (P-) White Bushing_With terminals SC16-6 on both ends	1
B-连接线 B- Cable （选配） (Optional)	10AWG/7AWG（40-60A 为 10AWG，80-100A 为 7AWG）_100mm_蓝色(B-)白色套管_两端带端子 SC16-6 10AWG/7AWG（40-60A is 10AWG，80-100A is 7AWG）100mm_Blue (B-) White Bushing_With terminals SC16-6 on both ends	1
螺丝 Screw	十字外六角三组合_M6×10mm_机牙_不锈钢 Cross outer hexagon three combination_M6×10mm_machine teeth_stainless steel	2
NTC 线 NTC cable	2 路_GH1.25_4Pin_3435_1%_28AWG_250mm 2 way_GH1.25_4Pin_3435_1%_28AWG_250mm	1
Uart 通讯线 （选配） Uart Cable (Optional)	USB 转 UART 数据线,6Pin 线长 1M USB to UART data cable,6Pin,Line length:1M	1
RS485 通讯线 （选配） RS485 Cable (Optional)	USB 转 RS485 数据线,5Pin 线长 1M USB to RS485 data cable,6Pin,Line length:1M	1

10、接线示意图 Wiring diagram







11、操作说明 Wiring Instructions

11.1、焊接保护板 Welding

(1)焊接采样排线：从细黑线连接电池 B-（总负极)开始，第 2 根线连接第 1 串电池正极， 后面依次连接每一串电池的正极；最后将 B+线也焊接在最后一串(总正极)上。(请参考说明书背面接线示意图)。

注:焊接采样线时不可插着保护板，请根据电池实际串数进行焊接，多出的采样线无需焊接(多出的采样线请做好绝缘处理)。

(2)检测电压：使用万能表或线序检测设备测量排线的针孔每串电压是否在正常范围内，如不正常请检查接线是否有错接、虚焊、假焊、漏焊等情况。

(3)焊接输出线：将 B-连接线(蓝色粗线) 、P-连接线(黑色粗线)用螺丝锁至保护板对应 B-、P-螺母上，建议扭矩为 10N.m (牛米);并把 B-线焊接电池总负极。

注:焊接 B-线时请把 P-线做好绝缘处理，最后接输出端时再解除。

(4)接入保护板配件：如温控、电量板、GPS、显示屏等，再把采样线插入保护板自动激活。

(1)Welding sampling cable:Start with the thin black wire connecting battery B-(total negative electrode),the second wire connects the positive electrode of the first string of batteries,and then connects the positive electrode of each string of batteries in turn;finally,weld the B+wire on the last string (total positive pole). (Please refer to the wiring diagram on the back of the manual.

Note:Do not insert the BMS when welding the sampling cable.Please weld according to the actual number of battery strings.The extra sampling cable do not need to be welded.Please insulate them.

(2)Detection voltage:Use a multimeter or line sequence detection equipment to measure whether the voltage of each string of pinholes in the cable is within the normal range.If not,please check whether there are misconnections,false soldering,missing soldering,etc.in the wiring.

(3)Welding P-&B-cable:Screw the B-cable (blue one)and P-cable (black one)to the corresponding B- and P- nuts of the BMS;recommended torque 10N-m.And weld the B-cable to the total negative terminal of the battery.

Note:Please insulate the P-cable when welding the B-cable,and then remove it when connecting the output terminal.

(4)Connect the BMS accessories such as temperature control,power board,GPS,LCD display,etc.,and then insert the sampling cable into the BMS to activate automatically.

11.2、下载蓝牙 APP 或 PC 端上位机 Download and Install APP method

可通过如下 4 种方式下载 APP:

1) 扫描保护板上的二维码;
2) iOS 和谷歌应用商店搜索"Balance BMS";
3) 登录均衡宝官网(https://www.100balancebms.com/download.asp);
4) 联系客服获取;

下载并安装成功后，打开蓝牙和手机位置信息,进入 APP 后会自动搜索蓝牙序列号，核对保护板上的序列号无误后点击序列号进入电池管理界面。

1) Scan the QR code on the BMS.
2) Search APP"BalanceBMS"in the iOS store or Google store.
3) Download APP from official website(https://www.100balancebms.com/download.asp) .
4) Contact with customer service of store.

Open the Bluetooth and mobile phone location information and enter the APP, the APP will automatically search for the Bluetooth serial number, check the sequence number on the protection board and click the serial number to enter the battery management interface.

11.3、设置参数 Set parameters

首次使用时，需在 APP 或电脑上位机设置电池类型及容量(出厂默认为铁锂参数),电池组的容量是需要按电池组的实际容量进行设置。首次使用时需充满 100%作为标定，其他保护参数可以根据自身需求进行设置，APP 修改参数的出厂默认密码为 123456,PC 上位机修改参数密码为 20211115。

注:在没有充放电的状态下，保护板默认 3600 秒后休眠，检测到充放电时会自动唤醒。也可通过 APP 或 PC 上位机修改休眠时间，如设置 65535 则代表不休眠。

When using BMS for the first time,the battery type and capacity need to be set in the APP or PC (the factory default is LFP parameters).The capacity of the battery pack needs to be set according to the actual capacity of the battery pack.The battery needs to be filled to 100% for calibration at the frist time use.Other protection parameters can be set according to your own needs.The factory default password for modifying parameters on the APP is 123456,and the password for modifying parameters on the PC host is 20211115.

Note:When there is no charging or discharging,the BMS will sleep after 3600 seconds by default,and will wake

up automatically when charging and discharging are detected.The sleep time can also be modified through the APP or PC.If set to 65535,it means no sleep.

12、保修 Warranty

本公司生产的所有锂电池保护板，质保一年，人为因素导致的损坏除外。
All BMS produced by our company has a one-year warranty,except for damage caused by human factors.

13、特别说明 Special instructions

(1)不同厂家的排线不通用，请确保使用我们公司配套排线；
(2)在测试、安装、接触和使用保护板时，要做好防静电措施；
(3)不要使保护板的散热面直接接触电芯，否则热量会传送到电芯，影响电池的安全；
(4)不可自行拆卸、更改保护板元器件；
(5)本公司保护板外壳仍会导电，组装作业中避免与电芯、镍带接触，因静电防护设计需要，外壳与主板共地，测量时有电压属正常现象；
(6)我司产品进行严格的出厂检验测试，但是因为客户使用的环境不同(特别是在高温、 超低温、太阳下、潮湿环境等)，难免会出现保护板故障，所以客户在选择和使用保护板时，需要在友好的环境下使用，及选择一定冗余量的保护板进行备用。
(1)Cables from different manufacturers are not universal,please make sure to use our company's sampling cables;
(2)When testing,installing,contacting and using the BMS,anti-static measures must be taken;
(3)Do not let the heat dissipation surface of the BMS directly contact the battery cell,Otherwise the heat wil be transmitted to the battery cell and affect the safety of the battery:
(4)Do not disassemble or change the components of the BMS by yourself;
(5)The enclosure of BMS will still conduct electricity.Pls avoid contact with the battery cell and nickel strip during assembly operations due to the need for electrostatic protection design.The enclosure and the motherboard share the same ground,and it is normal to appear voltage during measurement;
(6)All our products have undergone strict ex-factory inspection and testing to provide customers with the best quality products.Please make sure to use the BMS according to the parameter instructions,and avoid to use it in high temperature,ultra-low temperature environments (normal applicable temperature -40℃~85℃) to prevent the failure of BMS.