

# 硬件主动均衡 规格书

Hardware active equalization specification

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1.概述

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。BMS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。

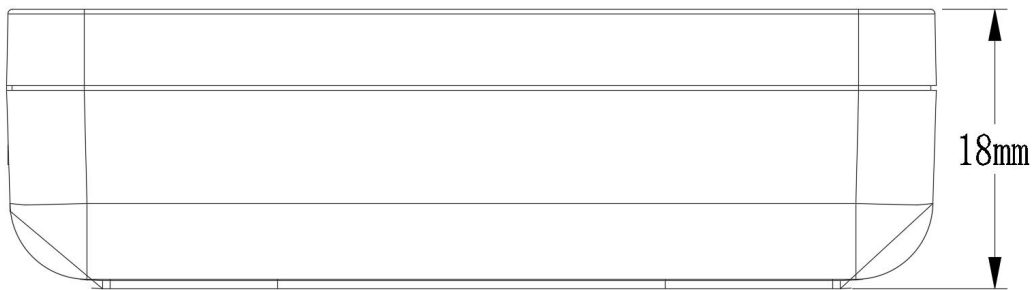
Because the battery capacity, internal resistance, voltage and other parameter values are not completely consistent, this difference causes the battery with the smallest capacity to be easily overcharged and discharged during charging, and the smallest battery capacity becomes smaller after damage, entering a vicious cycle. The performance of single battery directly affects the charge and discharge characteristics of the whole battery and the reduction of battery capacity. BMS without balance function is just a data collector, which is hardly a management system. BMS active equalization function can realize the maximum continuous 1A equalization current. Transfer the high-energy single battery to the low-energy single battery, or use the whole group of energy to supplement the lowest single battery. 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 life mileage and delay the battery aging.

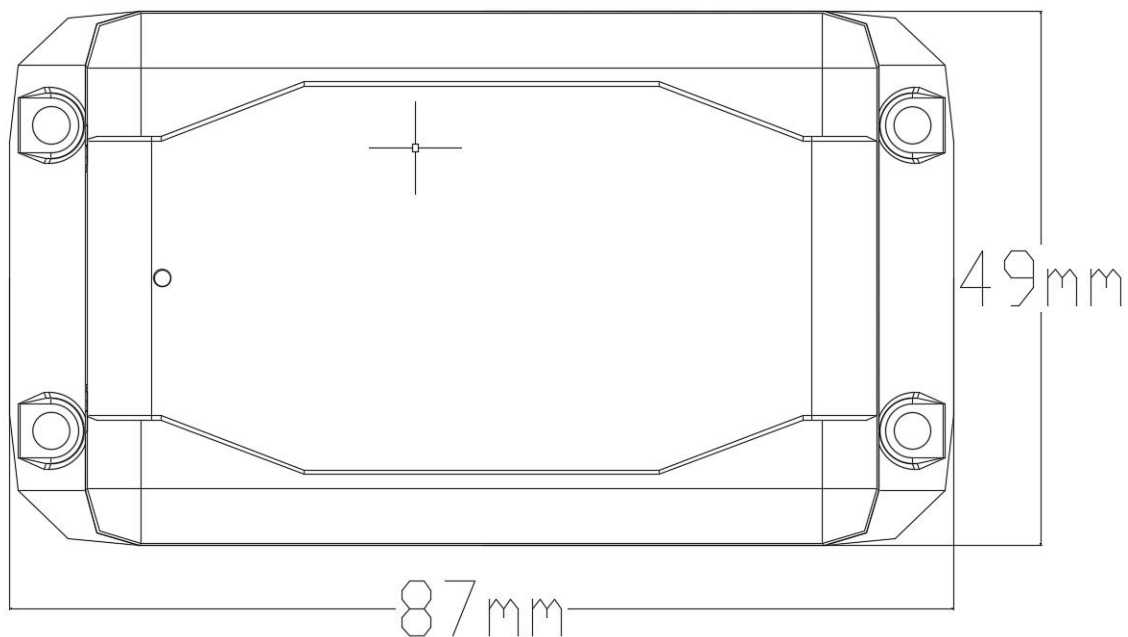
2.主要参数技术指标Technical indicators of the main parameters

| 技术指标<br>qualification                   | 数据说明<br>data specification | 备注<br>remarks |
|-----------------------------------------|----------------------------|---------------|
| 电池组类型<br>Battery pack type              | 三元、铁锂                      |               |
| 电池组串数<br>Number of battery pack strings | 10串                        |               |
| 均衡电流<br>Balance current                 | ≤1A                        |               |
| 均衡方式<br>Balance mode                    | 主动均衡Active equilibrium     |               |
| 均衡开启条件<br>Balance on                    | 开开启：第一串单串电压≥3.1±0.1V 关闭：第一 |               |

|                                   |                                                                                                                                                       |  |
|-----------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------|--|
| condition                         | 串单串电压 $\leq 3.0 \pm 0.1V$<br><br>On: First single string voltage $\geq 3.1 \pm 0.1V$<br><br>Off: Flat first single string voltage $\leq 3.0 \pm 0.1V$ |  |
| 工作功耗<br>Working power consumption | $< 1mA$                                                                                                                                               |  |
| 休眠电流<br>Sleep current             | $< 5\mu A$                                                                                                                                            |  |
| 工作温度<br>working temperature       | $-20^{\circ}C \sim 60^{\circ}C$                                                                                                                       |  |
| 尺寸size                            | 87*49*18mm                                                                                                                                            |  |
| 线束Harness                         | 与BMS兼容                                                                                                                                                |  |
| 均衡指示灯<br>Balance Indicator Light  | 亮：均衡开启 灭：未开启均衡/故障<br>Bright: BALANCE ON/OFF: BALANCE/FAULT NOT ON                                                                                     |  |

3.尺寸图dimensional drawing





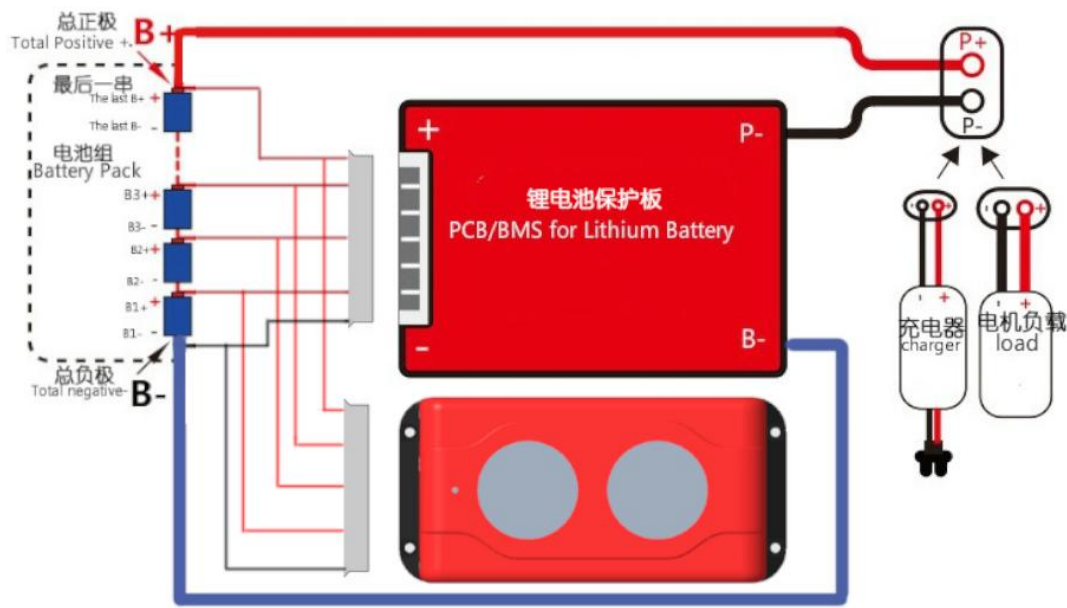
#### 4. 接口定义说明Interface definition description

| 保护板<br>Interface<br>name                                            | 主动均衡<br>Active<br>equilibrium | Pin脚 | 标号  | 定义说明<br>Description of definition                  |
|---------------------------------------------------------------------|-------------------------------|------|-----|----------------------------------------------------|
| 共用<br>采样线接口Connecting wire<br>(标配) Standard Parts<br>PHB 2.0 5Pin带扣 |                               | 1    | B0  | 接第1节电池负级Connect Section 1 Battery negative grade   |
|                                                                     |                               | 2    | B1+ | 接第1节电池正级Connect section 1 battery level            |
|                                                                     |                               | 3    | B2+ | 接第2节电池正级Connect section 2battery level             |
|                                                                     |                               | ...  | ... | 接最后1节电池正级Connect the last 1 positive battery level |

#### 5.主要线材说明Main wire description

| 线材名称Line name      | 默认规格Default specification  |
|--------------------|----------------------------|
| 采集线Collecting line | 1007 24AWG L=450mm (11PIN) |

#### 6.接线说明Terminal description



## 7. 操作说明 operation notice :

主动均衡需匹配相同串数的BMS,不同串数的不可混用,

1.BMS组装完成后焊接好所有的连接线

2.插上BMS排插

3.插上主动均衡排插

BMS排插和主动均衡排插相互可用不用区分，在保护板开机之前，请确认均衡线连接是否正常，检查保护板是否已经稳妥的与电芯固定，确认无误后才可以接通给保护板上电，否则可能造成工作异常、甚至烧毁等严重后果。

Active equalization must match the same series number of BMS, different series number can not be mixed, 1. BMS Assembly completed after welding all the connections 2. INSERT BMS INSERT 3. Before the Protection Board is turned on, please make sure the connection of the balance cable is normal, and check whether the protection board has been securely fixed with the battery, after confirming that no error can be connected to the protection board power, otherwise may cause abnormal work, or even burn and other serious consequences.

## 8. 保修Warranty

本公司生产的所有锂电池保护板配件，质保一年；人为因素导致损坏的，有偿维修  
All lithium battery protection board accessories produced by the company are guaranteed for one year; If the damage is caused by human factors, it shall be repaired with compensation