产 品 规 格 书

Data-sheet & Specification Confirmation

高压储能 High Voltage Energy Storage		
客户名称 Customer	深圳市沛城电子科技股份有限公司 Shenzhen PACE Electronic Technology Co., Ltd	
客户型号 Customer Model		
客户料号 Customer part number		
产品型号 Product Model	HVB-3U-1012D1-PC	
版本 Version	1.0	
日期 Date	2023-08-31	
沛城 BMS PACE BMS	制作/write by:	
	核准/Approved by:	
客户确认 Customer confirmation	审查/Checked by:	
	核准/Approved by:	

文件修订摘要

Summary of File Changes

日期 Date	版本号 Version	修订说明 Revision Description	制定人 Prepared by	核准人 Checked by
2023-08-31	V1.0	初版发行 Initial release	李花凤	张振国

目录 Catalog

1. 适用范围 Scope of application

本文件适用于沛城公司生产的高压锂电池管理系统。

This document is applicable to the high-voltage lithium battery management system produced by PACE Company.

2. 产品系统概述 Products Overview

本产品适用于支持最高 270 串锂电池组，可对锂电池组提供完备的过充保护、过放保护、过流保护、过温保护、低温保护及多级告警机制，可与总控进行实时通信上传电池的相关数据，具有电池状态和数据存储功能。具有 RS485、CAN 隔离通信功能。可外接 6 个继电器以适应工商业储能、UPS 供电系统及其他应用。

This product is suitable for supporting up to 270 series of lithium battery packs, and can provide complete overcharge protection, over discharge protection, over current protection, over temperature protection, low temperature protection, and multi-level alarm mechanism for lithium battery packs. It can communicate with the main control in real-time to upload battery related data, and has battery status and data storage functions. Equipped with RS485 and CAN isolated communication functions. It can connect 6 relays externally to adapt to industrial and commercial energy storage, UPS power supply systems, and other applications.

3. 产品介绍 Product Introduction

3.1. 系统拓扑图 System topology diagram

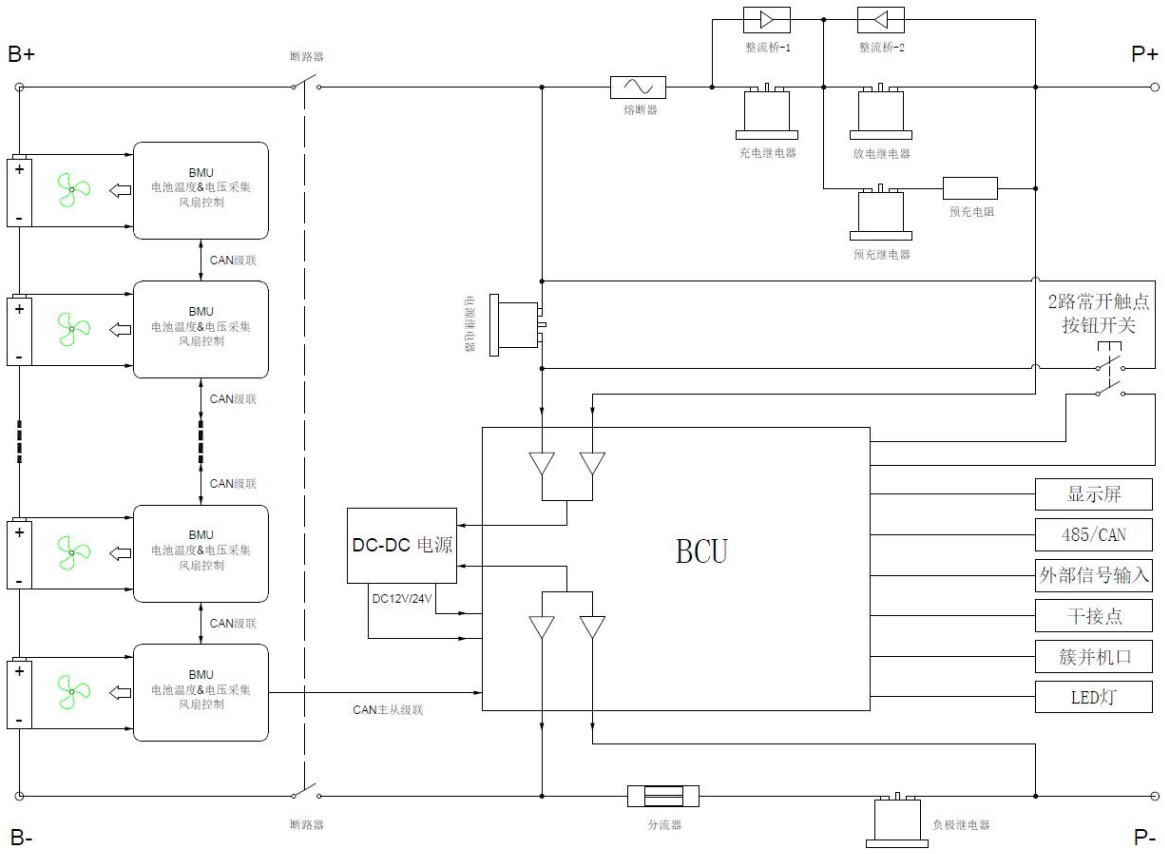


图 3.1 典型 2 级管理系统拓扑图

Figure 3.1 Typical Level 2 Management System Topology Diagram

3.2. 功能配置 functional configuration

功能 Function	存储 memory	☐无 NO ☐ 400 ☐ 5000
	电芯类型 Cell type	☑磷酸铁锂 LiFePO4 ☐锰酸锂 LiMn2O4 ☐钛酸锂 $LiTiO_3$ ☐三元电池 NMC
	电芯容量 Cell Capacity	☐50AH ☑100AH ☐150AH ☐200AH ☐280AH
	显示屏 Display	☐无 NO ☐工控屏 Industrial control display（7 寸/inch） ☑ 工控屏 Industrial control display（4.3 寸/inch：SK-043FE-1501B）
	LED 灯 Led Lamp	☑无 NO ☐ ALM ☐ RUN ☐ SOC_____
	干接点 Dry contact	☐无 NO ☑默认逻辑 Default logic ☐定制逻辑/Customized logic
		定义：干接点 1:正常时常开，充电保护时闭合（三级单/总体高压、充电过流、充电高/低温、环境高/低温、正/负极绝缘漏电保护）； 干接点 2:正常时常开，放电保护时闭合（三级单/总体低压、放电过流、放电高/低温、环境高/低温、正/负极绝缘漏电保护）。 Definition: Dry contact 1: Normally open, closed during charging protection (three-level single/overall high voltage, charging overcurrent, charging high/low temperature, environmental high/low temperature, positive/negative insulation leakage protection); Dry contact 2:Normally open, closed during discharge protection (three-level single/overall low voltage, discharge overcurrent, discharge high/low temperature, environmental high/low temperature, positive/negative insulation leakage protection).
	继电器 Relay	☑默认带 4 个继电器功能(充电、放电、预充及负极继电器) Default with 4 relay functions (charging, discharging, pre charging, and negative relay) ☐其他 Other：
		☑常闭触点 （默认）Normally closed contact (default) ☐常开触点 Normally open contact
	脱扣器 Release	☐无 NO ☑默认逻辑 Default logic ☐定制逻辑/Customized logic
		定义：正常时脱扣器闭合；当满足充放电、预充、负极、加热膜等继电器粘连/失效，单体低压<2.5V ，单体高压>3.8V，下电后金属开关正常关机，上电 10 分钟后金属开关未开的任一条件时脱扣器断开。 Definition: When the release is closed normally; When the adhesion/failure of relays such as charging and discharging, pre charging, negative electrode, and heating film is met, and the

		low voltage of the individual is less than 2.5V and the high voltage of the individual is greater than 3.8V, the metal switch will shut down normally after being powered off, and the release will open when the metal switch is not opened 10 minutes after being powered on.
	加热膜 Heater	☐无 NO ☑默认逻辑 Default logic ☐定制逻辑 Customized logic
		定义 Definition：
	BCU 底板号 BCU PCB No.	☑ 30019-1.4
	电流检测 Current detection	☑分流器 Diverter 200A/75mV （默认 default) ☐其他 Other
	总串数 Total serial number	☐自由搭配 Free to match ☐有 Yes_____串 serial
	BMU 底板 BMUPCB	_____
	BMU 总包串数 Total serial number of BMU	_____串 serial
	BMU_NTC 数量 BMU_NTC Qty	电芯温度（Cells NTC）_____个, 端子温度（Terminal NTC）_____个
	供电方式 Power supply	☐AC/DC 电源模块 power module ☑DC/DC 电源模块 power module：24V（DC/DC 接总压 BAT+） 24V (DC/DC connected to total voltage BAT+) ☐其他 Other：
	采样插座 Sampling socket	☐立式 Vertical ☑卧式 Horizontal
	条码 Barcode	☐一维码 One-dimensional code ☑二维码 QR code
	拨码开关 DIP switch	☑自动编码 Automatic encoding ☐手动编码（人为触发）Manual encoding (triggered manually)
通信 communication	通信接口 communication interface	☑ 独立三 Independent three RS485 ☑ 独立三 Independent three CAN
	升级方式 Upgrade	☑ RS485-1 ☐ CAN-2（默认 485-1 升级，CAN-2 不并机可做升级 Default 485-1 upgrade, CAN-2 can be upgraded without integration）
特殊需求 Special	1	
	2	

3.3. 高压箱模块 High voltage box module

3.3.1. 高压箱外观与结构尺寸图 Appearance and structural dimension diagram of HVB

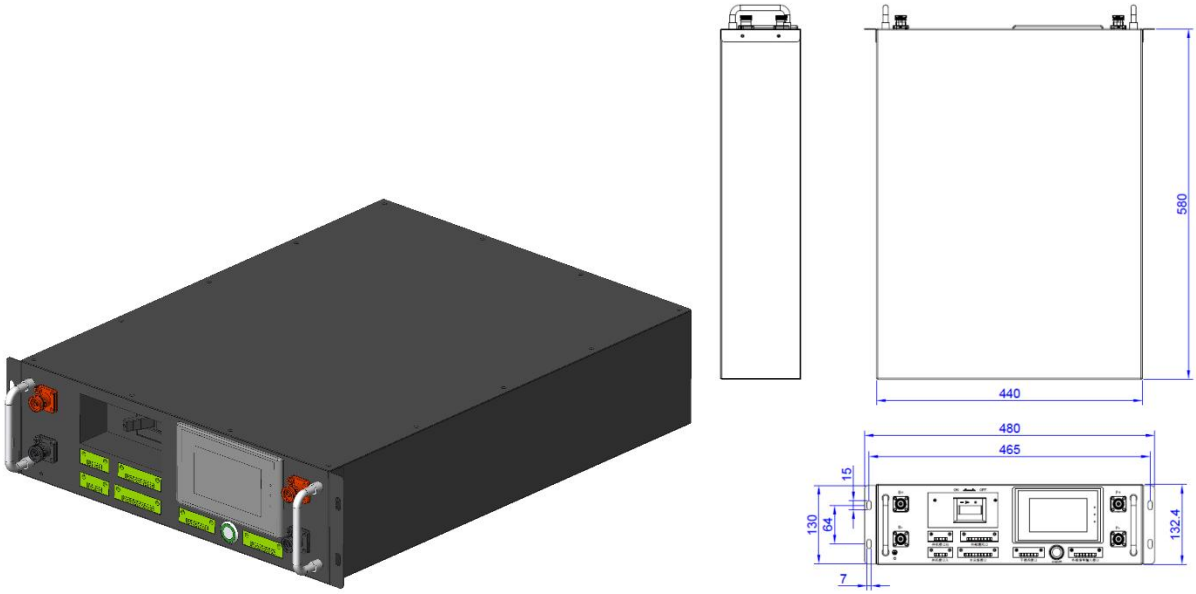


图 4.3.1 高压箱外观尺寸图

Figure 3.3.1 External dimension diagram of HVB

3.3.2. 接口定义 Interface definition

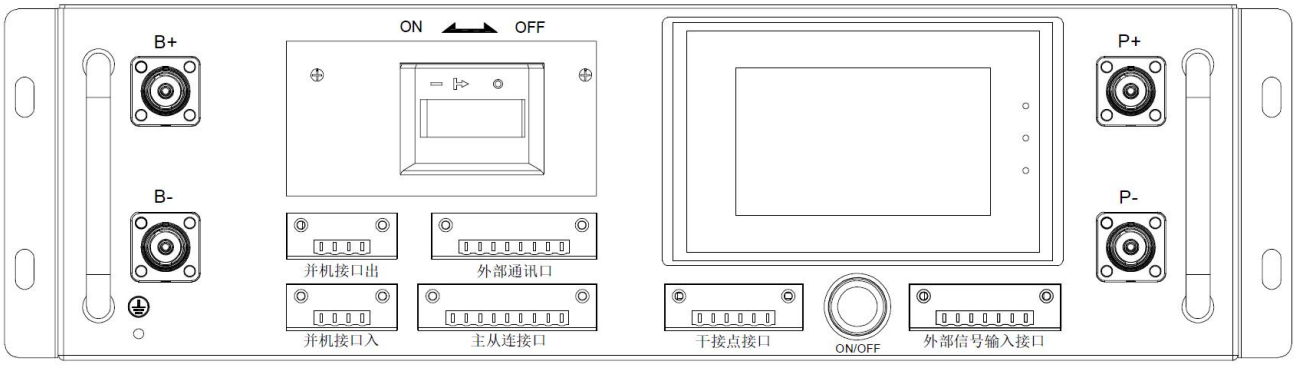


图 4.3.2 面板接口图

Figure 3.3.2 Panel Interface Diagram

干接点接口（按图 3.2.2 PIN 脚定义从左到右） Dry contact interface (defined from left to right according to PIN pin definition in Figure 3.2.2)					
脚序 PIN	PIN 脚定义 PIN Definition	说明 Description	脚序 PIN	PIN 脚定义 PIN Definition	说明 Description
1	RLY-OUT1+	干接点 1 输出正端 Dry contact 1 output positive terminal	4	RLY-OUT2-	干接点 2 输出负端 Dry contact 2 output negative terminal
2	RLY-OUT1-	干接点 1 输出负端 Dry contact 1 output negative terminal	5	NC	空置 vacancy
3	RLY-OUT2+	干接点 2 输出正端 Dry contact 2 output positive terminal	6	NC	空置 vacancy

外部信号输入接口（按图 3.2.2 PIN 脚定义从左到右） External signal input interface (defined from left to right according to PIN pin definition in Figure 3.2.2)					
脚序 PIN	PIN 脚定义 PIN Definition	说明 Description	脚序 PIN	PIN 脚定义 PIN Definition	说明 Description
1	5VO	输出 DC5V/1A Output DC5V/1A	5	SIN1-	输入检测 1 Input detection 1
2	5V_GND	输出 DC5V/1A Output DC5V/1A	6	SIN2+	输入检测 2 Input detection 2+
3	DOPWM	输出 PWM Output PWM	7	SIN2-	输入检测 2 Input detection 2-
4	SIN1+	输入检测 1 Input detection 1+			

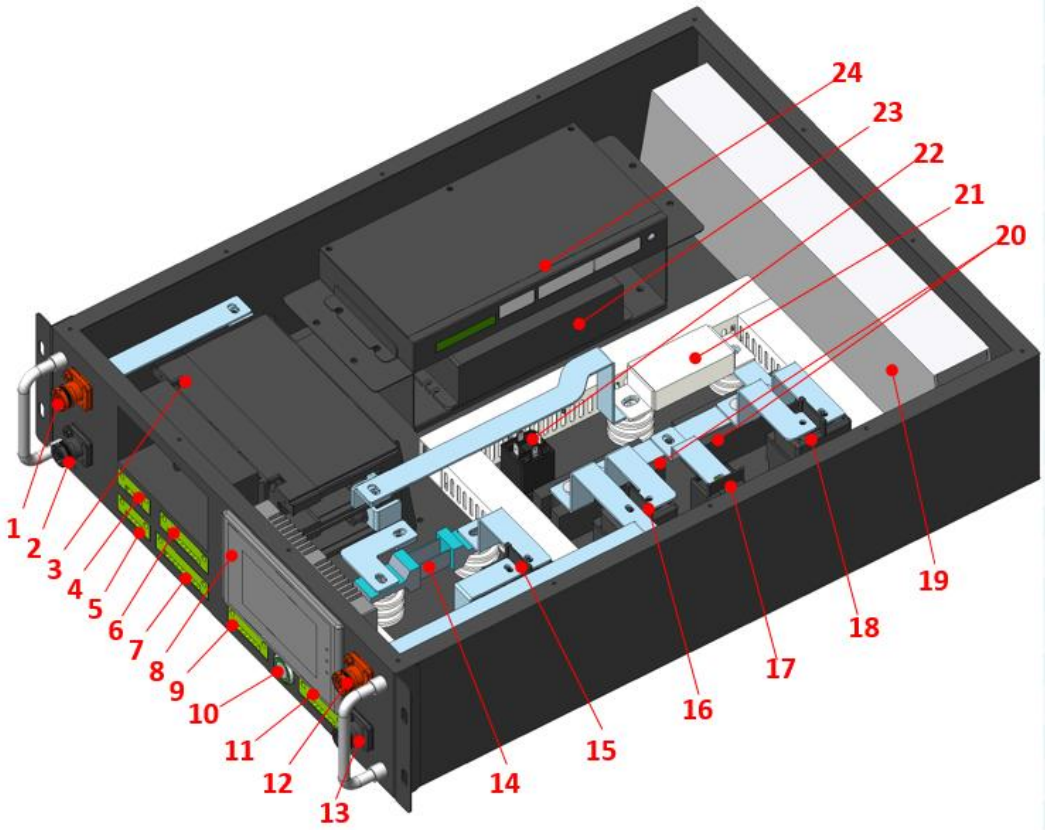
并机输出接口（按图 3.2.2 PIN 脚定义从左到右） Parallel output interface (defined from left to right according to PIN pin definition in Figure 3.2.2)					
脚序 PIN	PIN 脚定义 PIN Definition	说明 Description	脚序 PIN	PIN 脚定义 PIN Definition	说明 Description
1	ADDr_out	本机 CAN 编码输出 Local CAN coding output	3	CAN-H2	本机 CAN 通信 Local communication CAN-H2
2	CAN-L2	本机 CAN 通信 Local communication CAN-L2	4	CAN-GND	CAN 通信接地 CAN GND

外部通讯接口 External communication interface					
脚序 PIN	PIN 脚定义 PIN Definition	说明 Description	脚序 PIN	PIN 脚定义 PIN Definition	说明 Description
1	RS485-A1	本机 485 通信 Local communication 485-A1	5	RS485-A3	预留 485 通信 Reserve communication 485
2	RS485-B1	本机 485 通信 Local communication 485	6	RS485-B3	预留 485 通信 Reserve communication 485
3	GND_A1	485_A1 通信地 Local communication 485-A1 GND	7	CAN-L3	与 PCS 通信 Communicate with PCS
4	GND_A3	预留 485_A3 通信地 Reserve communication 485	8	CAN-H3	与 PCS 通信 Communicate with PCS

主从连接口（按图 3.2.2 PIN 脚定义从左到右） **Master slave connection port (defined from left to right according to PIN pin definition in Figure 3.2.2)**					
脚序 PIN	PIN 脚定义 PIN Definition	说明 Description	脚序 PIN	PIN 脚定义 PIN Definition	说明 Description
1	VO	从控供电输出正 Slave power supply output positive (BMU)	6	DC24V+	24V 电源输入正极 24V power input positive
2	CAN-L1	从控 CAN 通信 Slave Communicate CAN（BMU）	7	DC24V-	24V 电源输入负极 24V power input negative
3	CAN-H1	从控 CAN 通信 Slave Communicate CAN（BMU）	8	DC24V+	24V 电源输入正极 24V power input positive
4	PGND	从控供电输出负极 Slave power supply output negative (BMU)	9	DC24V-	24V 电源输入负极 24V power input negative
5	DN-OP	从控编码输出 Slave coding output			

并机输入接口（按图 3.2.2 PIN 脚定义从左到右） **Parallel input interface (defined from left to right according to PIN pin definition in Figure 3.2.2)**					
脚序 PIN	PIN 脚定义 PIN Definition	说明 Description	脚序 PIN	PIN 脚定义 PIN Definition	说明 Description
1	ADDr_IN	本机 CAN 编码输入 Local CAN coding **input**	3	CAN-H2	本机 CAN 通信 Local communication CAN-H2
2	CAN-L2	本机 CAN 通信 Local communication CAN-L2	4	CAN-GND	CAN 通信接地 CAN GND

3.4. 主要配件清单 List of Main Accessories



序号	名 称
1	B+端子
2	B-端子
3	断 路 器
4	并机接口出
5	并机接口入
6	外部通讯口
7	主从连接口
8	工控显示屏
9	干接点接口
10	按钮开关
11	外部信号输入接口
12	P+端子
13	P-端子
14	分 流 器
15	负极继电器
16	放电继电器
17	预充继电器
18	充电继电器
19	预充电阻
20	整 流 桥
21	熔 断 器
22	供电继电器
23	电源模块
24	BCU模块

图 4-1 器件布局图

Figure 4-1 Device Layout

120A 高压机箱-主要配件（DC1000V 以下） 120A high-voltage chassis - main accessories (below DC1000V)				
序号 No.	名称 Name	型号 Model	数量 Qty	备注 Remarks
1	工控屏 Industrial control display	SK-043FE-1501B	1	
2	直流电源 DC power supply	LM100-23B24R2	1	
3	整流桥 Rectifier bridge	MD200A	2	
4	分流器 Diverter	FL-2 200A/75mV	1	
5	直流断路器 DC circuit breaker	NDM3Z-250VM-2P 配 DC24V 脱扣器	1	

6	熔断器 Fuses	FWX-1000-200C	1	
7	预充继电器 Precharge relay	EVRBBA50CI-A-1_800V_50A	1	
8	供电继电器 Power supply relay Charge	EVRBB10UG-A_10A_1000V	1	
9	充放电/负极继电器 discharge/negative relay	EVRBCA150CI-A_150A_1000V	3	
10	预充电阻 Pre-charge resistor	RXLG-1000W80RJ	1	
11	复位开关 Reset switch	XKB22-H2W-G	1	
12	高压绝缘子 High voltage insulators	30*30*M6	4	

4. BCU 主控模块 BCU main control module

4.1. BCU 主要技术参数 Main technical parameters of BCU

适用平台 Applicable platforms	1000V 以下 Below 1000V	
供电电压 Power supply voltage	12-30V	
功耗 Power dissipation	额定功耗 Rated power consumption	<3W
	静态功耗 Static power consumption	0
总压采样 Total pressure sampling	采样范围 Sampling range	50~1650V
	采样精度 Sampling accuracy	±0.3%FSR
电流采样 Current sampling	采样范围 Sampling range	300A 以内（默认分流器）/300A 以上（霍尔） Within 300A (default Diverter)/Above 300A (Hall)
	采样精度 Sampling accuracy	0.5%
	采样周期 Sampling period	20ms
温度采样	采样范围	-40~125℃

Temperature sampling	Sampling range		
	采样精度 Sampling accuracy	±2℃	
	采样周期 Sampling period	200ms	
	采样路数 Sampling Qty	5 路 5 serial	
绝缘检测 Insulation testing	范围 Range	> 1MΩ/kV	
	精度 Accuracy	100K 以上 10%、100K 以下 15%、最小 10K,2MΩ以下视为故障 10% above 100K, 15% below 100K, minimum 10K, and below 2M Ω are considered faults	
状态估算 State estimation	SOC	≤5%	
	SOH	≤10%	
通信接口 communication interface	CAN-1	从控级连（125k～1000kbps），默认波特率：250K Slave level connection (125k~1000kbps), default baud rate: 250K	
	CAN-2	簇并机（125k～1000kbps），默认波特率：500K Cluster parallel machine (125k~1000kbps), default baud rate: 500K	
	CAN-3	连接 PCS，波特率根据客户提供的协议 Connect PCS, baud rate according to the protocol provided by the customer	
	RS485-1	上位机（9600~115200bps），默认波特率：57600 Upper computer (9600-115200bps), default baud rate: 57600	
	RS485-2	显示屏（9600~115200bps），默认波特率：9600 Display screen (9600-115200bps), default baud rate: 9600	
	RS485-3	预留 reserve	
继电器粘连检测 Relay adhesion detection	故障判断 Fault diagnosis	CAN 匹配电阻 CAN matching resistor	外部 External
DOH	-	自动编码 Automatic encoding	支持/带编码线 Supported/with encoding line
DOL	6	数据存储 data storage	128M
DO 输出范围 DO output range	随供电电压 With power supply voltage	工作温度范围 Working temperature range	-40~85℃
DO 输出电流 DO output current	-	工作湿度范围 Working humidity range	5~90%
干接点 Dry contact	2 个	DI 检测（12V 耐压） DI testing (12V withstand voltage)	2 路 DI，外部干节点信号 （高压互锁、急停） 2-way DI, 3-external dry node signal (High voltage interlock, emergency stop)
干接点 最大承受功率 Maximum withstand power of dry contact	最大承受功率 60W Maximum withstand power 60W	安装方式 Installation	壁挂 Wall mounted

4.2. BCU 外观与尺寸图 BCU Appearance and Dimensional Drawing

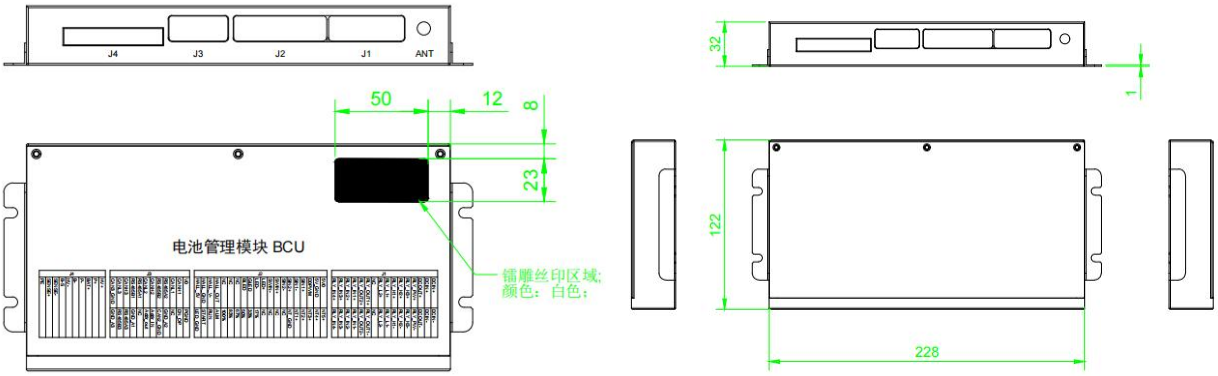


图 4.2. BCU 外观尺寸图

Figure 4.2. BCU Appearance Dimensional Diagram

4.3. 接口定义 Interface Definition

J1 接口 J1 Interface					
脚序 PIN	PIN 脚定义 PIN Definition	说明 Description	脚序 PIN	PIN 脚定义 PIN Definition	说明 Description
1	DCIN+	12-24V 电源输入正极（给 BCU 供电） 12-24V power input positive pole (supplying power to BCU)	17	DCIN-	12-24V 电源输入负极（给 BCU 供电） 12-24V power input negative pole (supplying power to BCU)
2	DCIN+	12-24V 电源输入正极（给 BCU 供电） 12-24V power input positive pole (supplying power to BCU)	18	DCIN-	12-24V 电源输入负极（给 BCU 供电） 12-24V power input negative pole (supplying power to BCU)
3	DCOUT+	显示屏供电 12-24V 电源输出正极 Display screen power supply 12-24V power output positive pole	19	DCOUT-	显示屏供电 12-24V 电源输出负极 Display screen power supply 12-24V power output negative pole
4	RLY_PW+	断路脱扣器正端 Positive end of circuit breaker release	20	RLY_PW-	断路脱扣器负端 Negative terminal of circuit breaker release
5	RLY_H3+	负极继电器控制线正端 Negative relay control wire positive end	21	RLY_H3-	负极继电器控制线负端 Negative terminal of negative relay control line
6	RLY_H2+	放电继电器控制线正端 Positive end of discharge relay control	22	RLY_H2-	放电继电器控制线负端 Negative terminal of discharge relay control line

		line			
7	RLY_H1+	充电继电器控制线正端 Positive end of charging relay control line	23	RLY_H1-	充电继电器控制线负端 Negative terminal of charging relay control line
8	RLY_L1+	预充继电器控制线正端 Pre charge relay control line positive end	24	RLY_L1-	预充继电器控制线负端 Pre charge relay control line negative terminal
9	RLY_L2+	供电继电器控制线正端	25	RLY_L2-	供电继电器控制线负端 Negative terminal of power supply relay control line
10	NC	空置 vacancy	26	NC	空置 vacancy
11	RLY_OUT1+	干接点 1 输出正端 Dry contact 1 output positive terminal	27	RLY_OUT1-	干接点 1 输出负端 Dry contact 1 output Negative terminal
12	RLY_OUT2+	干接点 2 输出正端 Dry contact 2 output positive terminal	28	RLY_OUT2-	干接点 2 输出负端 Dry contact 2 output Negative terminal
13	RLY_IN1+	充电继电器触点线正端 Positive end of charging relay contact wire	29	RLY_IN1-	充电继电器触点线负端 Negative end of charging relay contact wire
14	RLY_IN2+	放电继电器触点线正端 Positive end of discharge relay contact wire	30	RLY_IN2-	放电继电器触点线负端 Negative end of discharge relay contact wire
15	RLY_IN3+	负极继电器触点线正端 Negative relay contact wire positive end	31	RLY_IN3-	负极继电器触点线负端 Negative relay contact wire Negative end
16	RLY_IN4+	预充继电器触点正端 Pre charge relay contact positive terminal	32	RLY_IN4-	预充继电器触点负端 Pre charge relay contact Negative terminal
备注：J1 接口标红色字体，线材至少选用 22AWG Note: J1 interface should be marked in red font, and the wire should be at least 22AWG					

<table>
<tr><th colspan="6">J2 接口
J2 Interface</th></tr>
<tr><td>脚序
PIN</td><td>PIN 脚定义
PIN Definition</td><td>说明
Description</td><td>脚序
PIN</td><td>PIN 脚定义
PIN Definition</td><td>说明
Description</td></tr>
<tr><td>1</td><td>5V_VO</td><td>输出 DC5V/1A
Output DC5V/1A</td><td>21</td><td>NT5+</td><td>B+端子温度
Terminal temperature B+</td></tr>
<tr><td>2</td><td>5V_GND</td><td>输出 DC5V/1A
Output DC5V/1A</td><td>22</td><td>NT4+</td><td>B-端子温度
Terminal temperature B-</td></tr>
<tr><td>3</td><td>DOPWM</td><td>输出 PWM
Output PWM</td><td>23</td><td>NT3+</td><td>P+端子温度
Terminal temperature P+</td></tr>
<tr><td>4</td><td>SIN1+</td><td>输入检测 1
Input 1 detection</td><td>24</td><td>NT2+</td><td>P-端子温度
Terminal temperature P-</td></tr>
<tr><td>5</td><td>SIN1-</td><td>输入检测 1
Input 1 detection</td><td>25</td><td>NT1+</td><td>外部环境温度
External ambient temperature</td></tr>
<tr><td>6</td><td>SIN2+</td><td>输入检测 2
Input 2 detection</td><td>26</td><td>NT-GND</td><td>SIN1、2、3、4、5-输入检测地
Input detection Grounding</td></tr>
<tr><td>7</td><td>SIN2-</td><td>输入检测 2
Input 2 detection</td><td>27</td><td>NC</td><td rowspan="7">空置
vacancy</td></tr>
<tr><td>8</td><td>SWIN+</td><td rowspan="2">外部自复位按键
External self reset button</td><td>28</td><td>NC</td></tr>
<tr><td>9</td><td>SWIN-</td><td>29</td><td>NC</td></tr>
<tr><td>10</td><td>LED+</td><td rowspan="2">按键灯
KEY LED</td><td>30</td><td>NC</td></tr>
<tr><td>11</td><td>LED-</td><td>31</td><td>NC</td></tr>
<tr><td>12</td><td>GLED</td><td rowspan="2">开漏输出
Open drain output</td><td>32</td><td>NC</td></tr>
<tr><td>13</td><td>BLED</td><td>33</td><td>NC</td></tr>
<tr><td>14</td><td>NC</td><td rowspan="3">空置
vacancy</td><td>34</td><td>25%</td><td rowspan="4">LED 灯电量指示
SOC LEDs</td></tr>
<tr><td>15</td><td>NC</td><td>35</td><td>50%</td></tr>
<tr><td>16</td><td>NC</td><td>36</td><td>75%</td></tr>
<tr><td>17</td><td>HALL_OUT</td><td>霍尔输出
Hall output</td><td>37</td><td>100%</td></tr>
<tr><td>18</td><td>HALL_V-</td><td>霍尔参考
Hall reference</td><td>38</td><td>ALM</td><td>LED 灯告警指示
Alarm LED</td></tr>
<tr><td>19</td><td>HALL_GND</td><td>霍尔供电负极
Hall power Negative</td><td>39</td><td>RUN</td><td>LED 灯运行指示
Run LED</td></tr>
<tr><td>20</td><td>HALL_V+</td><td>霍尔供电正
Hall power positive (5V)</td><td>40</td><td>LED_GND</td><td>GND LED 灯
GND LED</td></tr>
<tr><td colspan="6">备注：NTC 线和 NTC 线头需绝缘耐压 2000VDC 以上，另外 NTC 头需加 M6 螺丝套头以方便安装在端子上
Note: NTC wires and NTC wire heads need to be insulated and withstand voltage of 2000VDC or above. In addition, the NTC head needs to be equipped with M6 screw inserts for easy installation on the terminals</td></tr>
</table>

J3 接口 J3 interface					
脚序 PIN	PIN 脚定义 PIN Definition	说明 Description	脚序 PIN	PIN 脚定义 PIN Definition	说明 Description
1	VO	供电输出 Power Output	13	PGND	从控供电 Slave power supply
2	CANH1	从控 CAN 通信 Slave CAN H1	14	DN_OP	从控编码输出 Slave coding output
3	CANL1	从控 CAN 通信 Slave CAN L1	15	NC	空置 vacancy
4	RS485A2	显示屏 485 通信 485 communication of Display。	16	GND_A2	485_A2 通信地 485_A2 communication ground
5	RS485B2	显示屏 485 通信 485 communication of Display。	17	CAN2_GND	CAN2 通信地 CAN2 communication ground
6	CANH2	本机 CAN 通信 Local CAN communication	18	Addr_IN	主板编码输入 Master coding input
7	CANL2		19	Addr_out	主板编码输出 Master coding input
8	RS485A1	上位机 485 通信 Upper computer 485 communication	20	NC	空置 vacancy
9	RS485B1		21	GND_A1	485_A1 通信地 485 A1 communication ground
10	CANH3	与 PCS 通信 Communicate with PCS	22	RS485A3	预留 485 通信 Reserve 485 communication
11	CANL3		23	RS485B3	
12	CAN3_GND	CAN3 通信地 CAN3 communication ground	24	GND_A3	

J4 接口 J4 interface					
脚序 PIN	PIN 脚定义 PIN Definition	说明 Description	脚序 PIN	PIN 脚定义 PIN Definition	说明 Description
1	PE	外壳地 Shell ground	6	B-	电池总负端 Battery total negative terminal
2	SENSE+	分流器 P-端 Diverter P-end	7	P-	负载总负端 Battery total positive terminal
3	SENSE-	分流器 B-端 Diverter B-end	8	BAT+	供电继电器主触点负端 Negative terminal of the main contact of the power supply relay
4	B-S	分流器 B-端（采样参考地） Diverter B-end (sampling reference ground)	9	P+	负载总正端 Total positive end of load
5	HV-	外部 DCDC 隔离电源负端 External DCDC isolation power supply negative terminal	10	HV+	外部 DCDC 隔离电源正端 External DCDC isolation power supply positive terminal
备注：J4 接口线需全部选用耐高压 2000VDC 以上 Note: All J4 interface cables must be selected for high voltage resistance of 2000VDC or above					

4.4. 产品基本设置参数 Basic product settings parameters

(注：以下参数除特殊注明以外，25℃环温下测试)

(Note: Unless otherwise specified, the following parameters are tested at an ambient temperature of 25 ℃.)

序号 No.	指标项目 Project			出厂默认参数 default parameters	是否可设 Setability	备注 Remarks
1	单体高压保护 Individual high voltage protection (IHVP)	一级 Level1	告警电压 alarm voltage	3600mV	可设 Settable	一级，二级只做告警，不切断充电，三级切断充电 Level 1 and Level 2 only provide alarms without cutting off charging, Level 3 cuts off charging
			告警延时 alarm delay	3.0S	可设 Settable	
			告警恢复电压 alarm release voltage	3500mV	可设 Settable	
			告警恢复延时 alarm release delay	2.0S	可设 Settable	
		二级 Level2	告警电压 alarm voltage	3650mV	可设 Settable	
			告警延时 alarm delay	2.0S	可设 Settable	
			告警恢复电压 alarm release voltage	3550mV	可设 Settable	
			告警恢复延时 alarm release delay	2.0S	可设 Settable	

		三级 Level3	保护电压 Protection voltage	3700mV	可设 Settable	
			保护延时 Protection delay	3.0S	可设 Settable	
			保护恢复电压 Protection release voltage	3380mV	可设 Settable	
			保护恢复延时 Protection release delay	3.0S	可设 Settable	
	单体高压保护解除 IHVP protection released		放电解除 discharge release	放电电流 >5.0A Discharge Current >5.0A	持续时间>3S Duration > 3 seconds	
2	单体低压保护 Individual low voltage protection (ILVP)	一级 Level1	告警电压 alarm voltage	3000mV	可设 Settable	
			告警延时 alarm delay	3.0S	可设 Settable	
			告警恢复电压 alarm release voltage	3100mV	可设 Settable	
			告警恢复延时 alarm release delay	2.0S	可设 Settable	
		二级 Level2	告警电压 alarm voltage	2900mV	可设 Settable	
			告警延时 alarm delay	2.0S	可设 Settable	
			告警恢复电压 alarm release voltage	3000mV	可设 Settable	
			告警恢复延时 alarm release delay	2.0S	可设 Settable	
		三级 Level3	保护电压 Protection voltage	2800mV	可设 Settable	
			保护延时 Protection delay	3.0S	可设 Settable	
			保护恢复电压 Protection release voltage	3000mV	可设 Settable	
			保护恢复延时 Protection release delay	3.0S	可设 Settable	
	单体低压保护解除 ILVP protection release		充电时解除 charging release	充电电流 >5.0A Charging current >5.0A	持续时间>3S Duration > 3 seconds	
3	总体高压保护 Total high voltage protection (THVP)	一级 Level1	告警电压 alarm voltage	(3.6*N) V	可设 Settable：(3.6*N)V	
			告警延时 alarm delay	3.0S	可设 Settable	
			告警恢复电压 alarm release voltage	(3.5*N) V	可设 Settable：(3.5*N)V	

			告警恢复延时 alarm release delay	2.0S	可设 Settable	
		二级 Level2	告警电压 alarm voltage	(3.65*N) V	可设 Settable：(3.65*N)V	
			告警延时 alarm delay	2.0S	可设 Settable	
			告警恢复电压 alarm release voltage	(3.55*N) V	可设 Settable：(3.55*N)V	
			告警恢复延时 alarm release delay	2.0S	可设 Settable	
		三级 Level3	保护电压 Protection voltage	(3.7*N) V	可设 Settable：(3.7*N) V	
			保护延时 Protection delay	3.0S	可设 Settable	
			保护恢复电压 Protection release voltage	(3.38*N) V	可设 Settable：(3.38*N) V	
			保护恢复延时 Protection release delay	3.0S	可设 Settable	
	总体过压保护解除 THVP release		放电时解除 Discharging release	放电电流 >5.0A Discharging current >5.0A	持续时间>3S Duration > 3 seconds	
4	总体低压保护 Total low voltage protection （TLVP）	一级 Level1	告警电压 alarm voltage	(3*N) V	可设 Settable：(3*N) V	
			告警延时 alarm delay	3.0S	可设 Settable	
			告警恢复电压 alarm release voltage	（3.1*N） V	可设 Settable：（3.1*N） V	
			告警恢复延时 alarm release delay	2.0S	可设 Settable	
		二级 Level2	告警电压 alarm voltage	(2.9*N) V	可设 Settable：(2.9*N) V	
			告警延时 alarm delay	2.0S	可设 Settable	
			告警恢复电压 alarm release voltage	（3*N） V	可设 Settable：（3*N） V	
			告警恢复延时 alarm release delay	2.0S	可设 Settable	

		三级 Level3	保护电压 Protection voltage	(2.8*N) V	可设 Settable：(2.8*N) V	
			保护延时 Protection delay	3.0S	可设 Settable	
			保护恢复电压 Protection release voltage	（3*N） V	可设 Settable：（3*N） V	
			保护恢复延时 Protection release delay	3.0S	可设 Settable	
	总体过放保护解除 Protection recovery of TLVP		有充电时解除 Charging release	放电电流 >5.0A Charging current >5.0A	持续时间>3S Duration > 3 seconds	
5	充电过流保护 Charging over current protection	一级 Level1	保护电流 Protection current	125A	可设 Settable	1、连续出现 10 次将锁定该状态，不再自动解除 10 consecutive occurrences will lock the state and no longer automatically release it
			保护延时 Protection delay	2.0S	可设 Settable	
			保护恢复电流 Protection release current	120A	可设 Settable	
			保护恢复延时 Protection release delay	2.0S	可设 Settable	
		二级 Level2	保护电流 Protection current	150A	可设 Settable	
			保护延时 Protection delay	2.0S	可设 Settable	
		三级 Level3	保护电流 Protection current	170A	可设 Settable	
			保护延时 Protection delay	1.0S	可设 Settable	
		自动解除 Automatic release		1min 后自动解除 Automatic release after 1min	可设 Settable	
	充电过流保护解除 Charging overcurrent protection release	放电解除 discharge release		放电电流 >5.0A Charging current >5.0A	持续时间大于 3S	
6	放电过流保护 Discharging overcurrent protection	一级 Level1	保护电流 Protection current	-125A	可设 Settable	连续出现 10 次将锁定该状态，不再自动解除 10 consecutive occurrences
			保护延时 Protection delay	2.0S	可设 Settable	
			保护恢复电流 Protection release current	-120A	可设 Settable	
			保护恢复延时 Protection release delay	2.0S	可设 Settable	

		二级 Level2	保护电流 Protection current	-150A	可设 Settable	will lock the state and no longer automatically release it
			保护延时 Protection delay	2.0S	可设 Settable	
		三级 Level3	保护电流 Protection current	-170A	可设 Settable	
			保护延时 Protection delay	1.0S	可设 Settable	
	放电过流保护解除 Discharging overcurrent protection release	自动解除 Automatic release		1min 后自动解除 Automatic release after 1min	可设 Settable	
		充电解除 charging release		充电电流 >5.0A Charging current >5.0A	持续时间大于 3S	
7	充电高温电芯温度保护 Temperature protection for charging high-temperature battery cells	一级 Level1	告警温度 alarm Temperature	40℃	可设 Settable	
			告警延时 alarm delay	3.0S	可设 Settable	
			告警恢复温度 alarm release Temperature	37℃	可设 Settable	
			告警恢复延时 alarm release delay	3.0S	可设 Settable	
		二级 Level2	告警温度 alarm Temperature	45℃	可设 Settable	
			告警延时 alarm delay	2.0S	可设 Settable	
			告警恢复温度 alarm release Temperature	42℃	可设 Settable	
			告警恢复延时 alarm release delay	2.0S	可设 Settable	
		三级 Level3	保护温度 protection Temperature	50℃	可设 Settable	
			保护延时 protection delay	3.0S	可设 Settable	
			保护恢复温度 protection release Temperature	47℃	可设 Settable	
			保护恢复延时 protection release delay	3.0S	可设 Settable	
	放电高温电芯温度保护 Temperature protection of high-	一级 Level1	告警温度 alarm Temperature	45℃	可设 Settable	
			告警延时 alarm delay	3.0S	可设 Settable	

	temperature discharge battery cells		告警恢复温度 alarm release Temperature	42℃	可设 Settable	
			告警恢复延时 alarm release delay	3.0S	可设 Settable	
		二级 Level2	告警温度 alarm Temperature	50℃	可设 Settable	
			告警延时 alarm delay	2.0S	可设 Settable	
			告警恢复温度 alarm release Temperature	47℃	可设 Settable	
			告警恢复延时 alarm release delay	2.0S	可设 Settable	
		三级 Level3	保护温度 protection Temperature	55℃	可设 Settable	
			保护延时 protection delay	3.0S	可设 Settable	
			保护恢复温度 protection release Temperature	52℃	可设 Settable	
			保护恢复延时 protection release delay	3.0S	可设 Settable	
	充电低温电芯温度保护 Charging low-temperature battery cell temperature protection	一级 Level1	告警温度 alarm Temperature	5℃	可设 Settable	
			告警延时 alarm delay	3.0S	可设 Settable	
			告警恢复温度 alarm release Temperature	8℃	可设 Settable	
			告警恢复延时 alarm release delay	3.0S	可设 Settable	
		二级 Level2	告警温度 alarm Temperature	2℃	可设 Settable	
			告警延时 alarm delay	2.0S	可设 Settable	
			告警恢复温度 alarm release Temperature	5℃	可设 Settable	
			告警恢复延时 alarm release delay	2.0S	可设 Settable	
		三级 Level3	保护温度 protection Temperature	0℃	可设 Settable	
			保护延时 protection delay	3.0S	可设 Settable	
			保护恢复温度 protection release	3℃	可设 Settable	

			Temperature			
			保护恢复延时 protection release delay	3.0S	可设 Settable	
	放电低温电芯温度保护 Discharge low-temperature battery cell temperature protection	一级 Level1	告警温度 alarm Temperature	-5℃	可设 Settable	
			告警延时 alarm delay	3.0S	可设 Settable	
			告警恢复温度 alarm release Temperature	-2℃	可设 Settable	
			告警恢复延时 alarm release delay	3.0S	可设 Settable	
		二级 Level2	告警温度 alarm Temperature	-10℃	可设 Settable	
			告警延时 alarm delay	2.0S	可设 Settable	
			告警恢复温度 alarm release Temperature	-7℃	可设 Settable	
			告警恢复延时 alarm release delay	2.0S	可设 Settable	
		三级 Level3	保护温度 protection Temperature	-15℃	可设 Settable	
			保护延时 protection delay	3.0S	可设 Settable	
			保护恢复温度 protection release Temperature	-5℃	可设 Settable	
			保护恢复延时 protection release delay	3.0S	可设 Settable	
8	环境高温温度告警 Environmental high temperature alarm	一级 Level1	告警温度 alarm Temperature	55℃	可设 Settable	
			告警延时 alarm delay	3.0S	可设 Settable	
			告警恢复温度 alarm release Temperature	52℃	可设 Settable	
			告警恢复延时 alarm release delay	3.0S	可设 Settable	
		二级 Level2	告警温度 alarm Temperature	60℃	可设 Settable	
			告警延时 alarm delay	2.0S	可设 Settable	
			告警恢复温度 alarm release Temperature	57℃	可设 Settable	
			告警恢复延时	2.0S	可设	

			alarm release delay		Settable	
		三级 Level3	保护温度 protection Temperature	65℃	可设 Settable	
			保护延时 protection delay	3.0S	可设 Settable	
			保护恢复温度 protection release Temperature	55℃	可设 Settable	
			保护恢复延时 protection release delay	3.0S	可设 Settable	
	环境低温温度告警 Environmental low temperature alarm	一级 Level1	告警温度 alarm Temperature	-10℃	可设 Settable	
			告警延时 alarm delay	3.0S	可设 Settable	
			告警恢复温度 alarm release Temperature	-7℃	可设 Settable	
			告警恢复延时 alarm release delay	3.0S	可设 Settable	
		二级 Level2	告警温度 alarm Temperature	-15℃	可设 Settable	
			告警延时 alarm delay	2.0S	可设 Settable	
			告警恢复温度 alarm release Temperature	-12℃	可设 Settable	
			告警恢复延时 alarm release delay	2.0S	可设 Settable	
		三级 Level3	保护温度 protection Temperature	-20℃	可设 Settable	
			保护延时 protection delay	3.0S	可设 Settable	
			保护恢复温度 protection release Temperature	-10℃	可设 Settable	
			保护恢复延时 protection release delay	3.0S	可设 Settable	
9	端子温度保护 Terminal temperature protection	一级 Level1	告警温度 alarm Temperature	100℃	可设 Settable	
			告警延时 alarm delay	3.0S	可设 Settable	
			告警恢复温度 alarm release Temperature	95℃	可设 Settable	
			告警恢复延时 alarm release delay	3.0S	可设 Settable	
		二级	告警温度	105℃	可设	

		Level2	alarm Temperature		Settable	
			告警延时 alarm delay	2.0S	可设 Settable	
			告警恢复温度 alarm release Temperature	100℃	可设 Settable	
			告警恢复延时 alarm release delay	2.0S	可设 Settable	
		三级 Level3	保护温度 protection Temperature	110℃	可设 Settable	
			保护延时 protection delay	3.0S	可设 Settable	
			保护恢复温度 protection release Temperature	105℃	可设 Settable	
			保护恢复延时 protection release delay	1.0S	可设 Settable	
10	SOC 高保护 SOC high protection	一级 Level1	告警 alarm Temperature	90%	可设 Settable	BMS 本身不以 SOC 做为保护依据，SOC 上传给 EMS 做调度 BMS itself does not use SOC as a protection basis, SOC is uploaded to EMS for scheduling
			告警延时 alarm delay	3.0S	可设 Settable	
			告警恢复 alarm release Temperature	88%	可设 Settable	
			告警恢复延时 alarm release delay	3.0S	可设 Settable	
		二级 Level2	告警 alarm Temperature	95%	可设 Settable	
			告警延时 alarm delay	2.0S	可设 Settable	
			告警恢复 alarm release Temperature	93%	可设 Settable	
			告警恢复延时 alarm release delay	2.0S	可设 Settable	
		三级 Level3	保护 protection Temperature	100%	可设 Settable	
			保护延时 protection delay	3.0S	可设 Settable	
			保护恢复 protection release Temperature	95%	可设 Settable	
			保护恢复延时 protection release delay	3.0S	可设 Settable	
	SOC 高保护解除	放电解除 discharge release		放电电流 >5.0A Charging current >5.0A	持续电流 3S Continuous current for 3	

					seconds	
11	SOC 低保护 SOC low protection	一级 Level1	告警 alarm Temperature	10%	可设 Settable	BMS 本身不以 SOC 做为保护依据，SOC 上传给 EMS 做调度 BMS itself does not use SOC as a protection basis, SOC is uploaded to EMS for scheduling
			告警延时 alarm delay	3.0S	可设 Settable	
			告警恢复 alarm release Temperature	12%	可设 Settable	
			告警恢复延时 alarm release delay	3.0S	可设 Settable	
		二级 Level2	告警 alarm Temperature	6%	可设 Settable	
			告警延时 alarm delay	2.0S	可设 Settable	
			告警恢复 alarm release Temperature	8%	可设 Settable	
			告警恢复延时 alarm release delay	2.0S	可设 Settable	
		三级 Level3	保护 protection Temperature	2%	可设 Settable	
			保护延时 protection delay	3.0S	可设 Settable	
			保护恢复 protection release Temperature	7%	可设 Settable	
			保护恢复延时 protection release delay	3.0S	可设 Settable	
	SOC 高保护解除 SOC low protection release	充电解除 charging release		充电电流 >5.0A Charging current >5.0A	持续电流 3S Continuous current for 3 seconds	
12	正极绝缘故障 Positive pole insulation fault	一级 Level1	告警 alarm Temperature	1000Ω/V	可设 Settable	
			告警延时 alarm delay	3.0S	可设 Settable	
			告警恢复 alarm release Temperature	1200Ω/V	可设 Settable	
			告警恢复延时 alarm release delay	3.0S	可设 Settable	
		二级 Level2	告警 alarm Temperature	600Ω/V	可设 Settable	
			告警延时 alarm delay	2.0S	可设 Settable	
			告警恢复 alarm release	800Ω/V	可设	

			Temperature		Settable	
			告警恢复延时 alarm release delay	2.0S	可设 Settable	
		三级 Level3	保护 protection Temperature	200Ω/V	可设 Settable	
			保护延时 protection delay	3.0S	可设 Settable	
			保护恢复 protection release Temperature	700Ω/V	可设 Settable	
			保护恢复延时 protection release delay	3.0S	可设 Settable	
	负极绝缘故障 Negative insulation fault	一级 Level1	告警 alarm Temperature	1000Ω/V	可设 Settable	
			告警延时 alarm delay	3.0S	可设 Settable	
			告警恢复 alarm release Temperature	1200Ω/V	可设 Settable	
			告警恢复延时 alarm release delay	3.0S	可设 Settable	
		二级 Level2	告警 alarm Temperature	600Ω/V	可设 Settable	
			告警延时 alarm delay	2.0S	可设 Settable	
			告警恢复 alarm release Temperature	800Ω/V	可设 Settable	
			告警恢复延时 alarm release delay	2.0S	可设 Settable	
		三级 Level3	保护 protection Temperature	200Ω/V	可设 Settable	
			保护延时 protection delay	3.0S	可设 Settable	
			保护恢复 protection release Temperature	700Ω/V	可设 Settable	
			保护恢复延时	3.0S	可设	

			protection release delay		Settable	
13	充电电芯压差保护 Differential voltage protection for charging cells	一级 Level1	告警 alarm	80mV	可设 Settable	
			告警延时 alarm delay	3.0S	可设 Settable	
			告警恢复 alarm release	50mV	可设 Settable	
			告警恢复延时 alarm release delay	3.0S	可设 Settable	
		二级 Level2	告警 alarm	120mV	可设 Settable	
			告警延时 alarm delay	2.0S	可设 Settable	
			告警恢复 alarm release	100mV	可设 Settable	
			告警恢复延时 alarm release delay	2.0S	可设 Settable	
		三级 Level3	保护 protection	150mV	可设 Settable	
			保护延时 protection delay	3.0S	可设 Settable	
			保护恢复 protection release	100mV	可设 Settable	
			保护恢复延时 protection release delay	3.0S	可设 Settable	
	充电电芯压差保护解除 DVPC release		放电解除 discharge release	放电电流 >5.0A Charging current >5.0A	持续电流 3S Continuous current for 3 seconds	
14	放电电芯压差保护 Differential voltage protection for discharging cells	一级 Level1	告警压差 alarm	100mV	可设 Settable	
			告警延时 alarm delay	3.0S	可设 Settable	
			告警恢复压差 alarm release	70mV	可设 Settable	
			告警恢复延时	3.0S	可设	

			alarm release delay		Settable	
		二级 Level2	告警压差 alarm	150mV	可设 Settable	
			告警延时 alarm delay	2.0S	可设 Settable	
			告警恢复压差 alarm release	120mV	可设 Settable	
			告警恢复延时 alarm release delay	2.0S	可设 Settable	
		三级 Level3	保护压差 Protection	180mV	可设 Settable	
			保护延时 Protection delay	3.0S	可设 Settable	
			保护恢复压差 Protection release	130mV	可设 Settable	
			保护恢复延时 Protection release delay	3.0S	可设 Settable	
	放电电芯压差保护解除 DVPD release		充电解除 charging release	充电电流 >5.0A Charging current >5.0A	持续电流 3S Continuous current for 3 seconds	
15	充电电芯温差保护 Temperature difference protection for charging cells	一级 Level1	告警温度 alarm	5℃	可设 Settable	
			告警延时 alarm delay	3.0S	可设 Settable	
			告警恢复温度 alarm release	3℃	可设 Settable	
			告警恢复延时 alarm release delay	3.0S	可设 Settable	
		二级 Level2	告警温度 alarm	8℃	可设 Settable	
			告警延时 alarm delay	2.0S	可设 Settable	
			告警恢复温度 alarm release	6℃	可设 Settable	
			告警恢复延时	2.0S	可设	

			alarm release delay		Settable	
		三级 Level3	保护 Protection	10℃	可设 Settable	
			保护延时 Protection delay	3.0S	可设 Settable	
			保护恢复 Protection release	5℃	可设 Settable	
			保护恢复延时 Protection release delay	3.0S	可设 Settable	
16	放电电芯温差保护 Temperature difference protection for discharging cells	一级 Level1	告警温度 alarm	5℃	可设 Settable	
			告警延时 alarm delay	3.0S	可设 Settable	
			告警恢复温度 alarm release	3℃	可设 Settable	
			告警恢复延时 alarm release delay	3.0S	可设 Settable	
		二级 Level2	告警温度 alarm	8℃	可设 Settable	
			告警延时 alarm delay	2.0S	可设 Settable	
			告警恢复温度 alarm release	6℃	可设 Settable	
			告警恢复延时 alarm release delay	2.0S	可设 Settable	
		三级 Level3	保护 Protection	10℃	可设 Settable	
			保护延时 Protection delay	3.0S	可设 Settable	
			保护恢复 Protection release	5℃	可设 Settable	
			保护恢复延时 Protection release delay	3.0S	可设 Settable	
17	电芯温升保护 Cell temperature	一级	告警 alarm	4℃/S	可设 Settable	

	rise protection	Level1	告警延时 alarm delay	3.0S	可设 Settable	
			告警恢复 alarm release	1℃/S	可设 Settable	
			告警恢复延时 alarm release delay	3.0S	可设 Settable	
		二级 Level2	告警 alarm	6℃/S	可设 Settable	
			告警延时 alarm delay	2.0S	可设 Settable	
			告警恢复 alarm release	1℃/S	可设 Settable	
			告警恢复延时 alarm release delay	2.0S	可设 Settable	
		三级 Level3	保护 Protection	8℃/S	可设 Settable	
			保护延时 Protection delay	3.0S	可设 Settable	
			保护恢复 Protection release	6℃/S	可设 Settable	
			保护恢复延时 Protection release delay	3.0S	可设 Settable	
18	电芯采样异常 Abnormal sampling of battery cells	一级 Level1	延时 relay	10.0S	可设 Settable	
			恢复延时 release delay	3.0S	可设 Settable	
		二级 Level2	延时 relay	20.0S	可设 Settable	
			恢复延时 release delay	3.0S	可设 Settable	
		三级 Level3	延时 relay	30.0S	可设 Settable	
			恢复延时 release delay	65.5S	可设 Settable	

19	NTC 采样异常 NTC sampling anomaly	一级 Level1	延时 relay	1.0S	可设 Settable	
			恢复延时 release delay	10.0S	可设 Settable	
		二级 Level2	延时 relay	3.0S	可设 Settable	
			恢复延时 release delay	30.0S	可设 Settable	
		三级 Level3	延时 relay	5.0S	可设 Settable	
			恢复延时 release delay	30.0S	可设 Settable	
20	从控风扇控制 Slave fan control	开启条件 Opening conditions		电芯温度>50℃或端子温度 > 85℃ Cell temperature >50℃ or terminal temperature > 85 ℃	可设 Settable	
		关闭条件 Closing conditions		电芯温度小于35℃或端子温度 < 75 ℃ Cell temperature < 35 ℃ or terminal temperature <75 ℃	可设 Settable	
21	电芯故障压差 Differential voltage due to cell failure	压差 voltage difference		1000mV	可设 Settable	
		延时 Delay		5.0S	可设 Settable	
		恢复压差 release voltage difference		500mV	可设 Settable	
		恢复延时 release delay		1.0S	可设 Settable	
22	继电器故障	继电器粘连 Relay adhesion		系统全下电 System fully		断脱扣器 Breaker

	Relay malfunction		powered down		release
23	均衡功能 Balance function	均衡开启电压 Balanced opening voltage	3400mV	可设 Settable	
		开启压差 Open differential voltage	30mV	可设 Settable	
24	满充判断 Full charge judgment	满充电压（单包和实际二选一） Full charge voltage (either single pack or actual)	总压>单包电压 56.1V Total voltage>Single pack voltage 56.1V	可设 Settable（单体 3.51V*BMU 串数*BMU 个数）	同时满足后停止充电，并更新 SOC 为 100% Stop charging when both conditions are met and update SOC to 100%
		截止电流 Cut-off current	< 2A	可设 Settable	
25	消耗电流 Consumption current	工作时自耗电 Self consumption during operation		≤3W（不包含继电器驱动电流）	
		关机模式电流 Shutdown mode current		≤0.3W	
26	严重低压保护 Severe low-voltage protection	单体 < 2500mV Single cell < 2500mV	静止状态持续 20 分钟，放电持续 20S Static state lasts for 20 minutes, discharge lasts for 20 seconds	断脱扣器，系统下电 Disconnect the release and power down the system	
		单体 < 2000mV Single cell < 2000mV	4S		
27	严重高压保护 Severe high voltage protection	单体 > 3800mV Single cell < 3800mV	4S		

5. 使用注意事项 Precautions for use

锂电池储能系统往往由几百甚至更多节电池串并联而成，电压往往有几百至上千伏，在安装调试和使用期间，必须按相关安全规定做好安全防护措施，避免安全事故的发生。

Lithium ion battery energy storage systems are often composed of hundreds or even more batteries in series and parallel, with voltages ranging from hundreds to thousands of volts. During installation, debugging, and use, safety measures must be taken in accordance with relevant safety regulations to avoid safety accidents.

严禁事项 Prohibited items	储能系统内部有高压，非本公司或本公司授权的技术人员，严禁擅自打开机箱进行拆卸和维护，否则有触电的可能，同时失去保修权利。 There is high voltage inside the energy storage system. Non authorized technical personnel of our company or our company are strictly prohibited from opening the chassis for disassembly and

	maintenance without authorization, otherwise there is a possibility of electric shock and loss of warranty rights.
	严禁 BMS 中任何线头或者接插件搭接在电池正负极，否则可能会有短路的危险并损坏电路板。 It is strictly prohibited for any wire or connector in the BMS to overlap between the positive and negative terminals of the battery, otherwise there may be a risk of short circuit and damage to the circuit board.
	严禁在主控 BCU 上电的情况下连接从控 BMU，避免可能损坏 BMS。 It is strictly prohibited to connect the slave BMU while the main BCU is powered on to avoid potential damage to the BMS.
	严禁靠近水源或火源，以免电池因短路或过热起火。 It is strictly prohibited to approach water or fire sources to prevent the battery from catching fire due to short circuits or overheating.
安全注意事项 Safety precautions	安装及调试人员所使用的工具须有绝缘防护。 The tools used by installation and debugging personnel must have insulation protection. 在安装调试及维护时必须戴绝缘橡胶手套，视情况穿戴护目镜、绝缘橡胶靴，尽可能避免安全事故的发生。 Insulated rubber gloves must be worn during installation, debugging, and maintenance. Depending on the situation, protective goggles and insulated rubber boots must be worn to avoid safety accidents as much as possible. 安装调试及维护过程中产生的线头金属等如掉入电池间，请务必使用绝缘工具取出，不能将杂物留置。 If any wire or metal drops into the battery compartment during installation, debugging, and maintenance, please use insulated tools to remove them and do not leave any debris behind.
	需要维护时，必须将主断路器断开，切断电池组与 PCS 直流总线的连接。 When maintenance is required, the main circuit breaker must be disconnected to disconnect the battery pack from the PCS DC bus.
	根据项目需求的不同，电池管理系统的充放电电流和充放电电压等参数在初次安装调试时已设定，不得擅自更改参数，否则可能会缩短电池寿命， 更严重的可能会对电池造成严重危害产生安全事故。 According to the different project requirements, the charging and discharging current and voltage parameters of the battery management system have been set during the initial installation and debugging, and cannot be changed without authorization. Otherwise, it may shorten the battery life, and more seriously, it may cause serious harm to the battery and cause safety accidents.
	如遇储能柜周围起火，请务必使用干粉灭火器或者消防沙进行灭火。若使用液体灭火可能导致电击。如长期不使用系统，请务必断开电池柜的主断路器。 If there is a fire around the energy storage cabinet, be sure to use a dry powder fire extinguisher or fire sand to extinguish the fire. If liquid extinguishing is used, it may cause electric shock. If the system is not used for a long time, please be sure to disconnect the main circuit breaker of the battery cabinet.
	尽量避免长期在下列工作环境中使用： ● 超过规格书规定的温度或湿度范围的场所。 ● 有强烈震动或易受撞击的场所。 ● 阳光直射或靠近热源的场所。 ● 有粉尘、强腐蚀性物质、易燃易爆物、高盐雾场所。 Try to avoid long-term use in the following work environments: ● Places that exceed the temperature or humidity range specified in the specifications. ● Places with strong vibrations or susceptible to impact. ● Places with direct sunlight or close to heat sources. ● Places with dust, highly corrosive substances, flammable and explosive materials, and high salt spray.

6. 免责声明 Disclaimer

本公司对此产品规格书拥有最终解释权，并有权对此规格书进行修订。产品规格如有变更，恕不另行通知。

Our company has the final right to interpret and revise this product specification. The product specifications are subject to change without prior notice.