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48V 50AH 2U Lithium Battery Pack
48V 50AH 2U Litium Batteri
48V 50AH 2U литиевая батарея

Product No. **产 品 型 号**	48V50Ah
File Name **文 件 名 称**	Specification of PR011-15S16P-48V50Ah
File Version **文 件 版 别**	V1.0
File No. **文 件 编 号**	
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Customer Approval 客户回签		

1 Product Description 产品概述

High-voltage DC energy storage system is the system using the design of battery modules in series. Through the reliable BMS system and high-performance equalization technology, the whole system has the flexible configuration and high reliability. Products are widely used in high-voltage application, such as distributed energy, power storage, photovoltaic energy storage, data room and etc.

高压直流储能系统是采用电池组模块串联设计的储能系统。通过可靠的 BMS 系统和高性能均衡技术，整个系统具备配置灵活，可靠性高等特点。产品广泛应用于分布式能源、电网储能、光伏储能、数据机房等需要高电压平台电池的应用场景

2 Application 应用场景

Widely used in microgrid energy storage, photovoltaic energy storage, computer data room stand-by power, UPS and etc.

可广泛应用于微网储能、光伏储能、数据机房备电、大型 UPS 配套等场景。

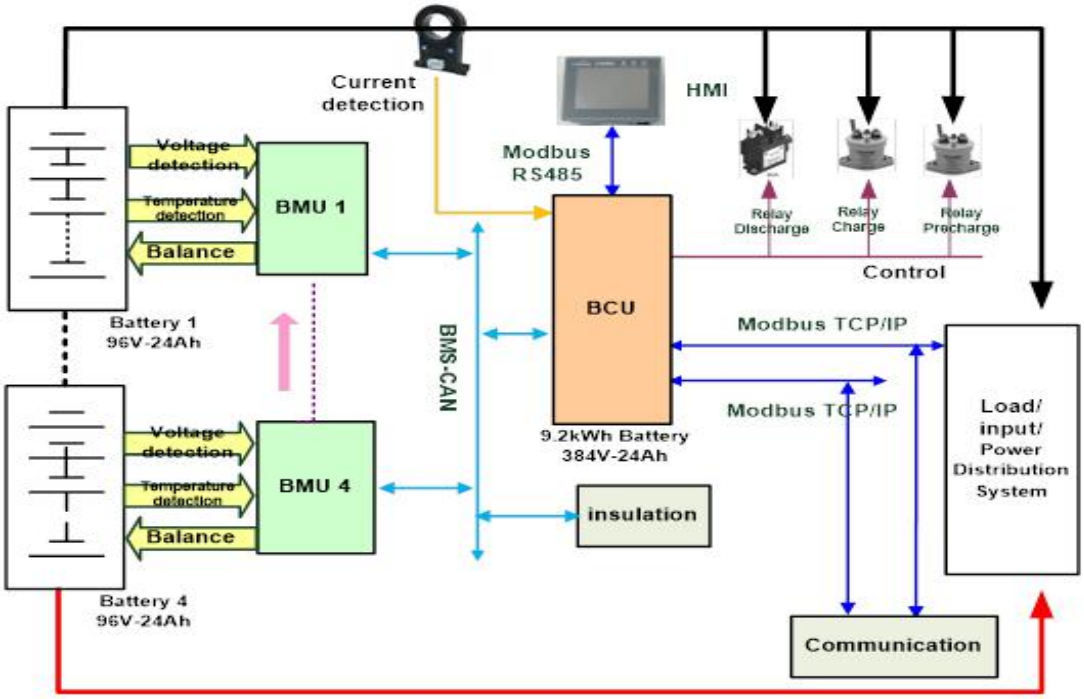
3 Solution Description 方案应用概述

The whole high voltage DC battery system is made of BCU (Battery Central Unit) and BMU (Battery Management Unit), which could apply to Residential Energy Storage or Computer Data Room stand-by power. At the same time, this system supports to expand capacity in the same voltage platform through multiple cabinets in parallel, applied to microgrid energy storage, photovoltaic energy storage.

由主控模块和电池模块组成高电直流电池系统，可直接应用于家庭储能或数据机房备电。同时此系统支持在同一个电压平台上扩展容量，通过多个机柜并联，应用于微网储能、光伏储能。

Customized battery management system (BMS) adopts real-time data acquisition, real-time data analysis. It have the monitoring and controlling functions, such as detection, early warning, alarm, automotive power-off function and etc., as to ensure the safe and reliable operation of the system, detection, early warning, alarm and automatic power-off function monitoring and control to ensure safe and reliable operation of the system.

定制化电池管理系统（BMS），实时进行数据采集、数据实时分析、具有检测，预警，报警以及自动断电功能等状态监控及控制，保证系统安全可靠运行。



4 Specification 系统参数介绍

4.1 Battery Module Figure 模组外观

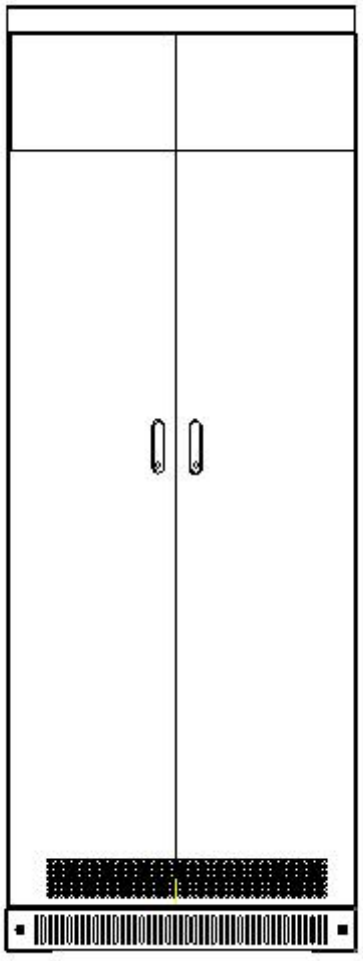
4.2 Battery Module Specification 模组参数

No.	Item 项目	Unit 单位	Value 特征值	Note 备注
1	Cell Type 电芯型号	-	26650-3.2V/3.2AH	LFP(LiFePo4) 磷酸铁锂
2	Configuration 组合方式	-	15S16P	
3	Nominal Capacity 标称容量	Ah	48	0.2C
4	Min Capacity 最小容量	Ah	48	0.2C
5	Rate Voltage 额定电压	V	48	
6	Charge Cut-off Voltage 充电截止电压	V	54	
7	Discharge Cut-off Voltage 放电截止电压	V	37.5	
8	Standard Charge Current 标准充电电流	A	9.6	0.2C
9	Max Charge Current 最大充电电流	A	48	1C
10	Standard Discharge Current 标准放电电流	A	24	0.5C
11	Max Continuous Discharge Current 最大持续放电电流	A	96	2C
12	Casing 外壳类型	-	Metal 金属壳	
13	Dimension 尺寸	mm	≤450*150*650 mm	
14	Weight 重量	kg	≤35kg	
15	Temperature	℃	0~+45℃	Charge 充电

	工作温度		-20℃~55℃	Discharge 放电
16	BMS Structure BMS 管理架构	-	2-Tier 两层管理架构	
17	MCU 主控 BMU 数量	PCS	1	
18	BMU 采集均衡模块数量	PCS	1	
19	MCU Power Consumption 主控 BMU 功耗	w	≤2.8w	
20	BMU Power Consumption 采集均衡模块功耗	w	≤1w	
21	电压采集范围 Voltage Range	V	0~4.5V	
22	Voltage Accuracy 电压采集精度	FS	±（0.3%RD+0.2%FS）	
23	Current Range 电流采集范围	A	-100A～100A	
24	Current Accuracy 电流采集精度	A	≤±1%	
25	SOC Accuracy SOC 估算误差	-	≤5%	
26	Temperature Range 温度采集范围	℃	－40℃ ～ 80℃	-
27	Temperature Accuracy 温度采集精度	℃	≤±0.1℃	
28	Current Equalization 均衡电流	mA	50 ± 5	Passive Equalization 被动均衡

29	Charge Control 充电控制方式	-	CAN, RS485/RS232, Relay CAN 通信，RS485/RS232，继电器	
30	Discharge Control 放电控制方式	-	Communication, Relay 通信，继电器	

4.3 Usage of High DC Battery Rack 高压电池系统组合使用



4.4 Battery Bank Cabinet Screen Display 屏显示参数

Battery Bank Voltage 总电池电压信息	Cabinet Temperature 机柜温度显示	Working Status 工作指示
Electric Current 电流信息	Charge/Discharge Status 充放电显示信息	Alarm Log 报警信息

Unit Battery Module Voltage 模块电压信息	Battery Bank Output 模块输出信息	Unit Battery Module Default 模块故障信息
Load Status 负载信息	Charging Status 充电信息	Info Log 查询功能

4.5 Battery Bank Specification 电池参数

No	Item 项目	Parameter 参数
1	High Voltage DC Battery Bank 高压直流电池组	Distributed microgrid energy storage system 分布式微网储能系统
2	Battery Bank Capacity 电池组容量	Ah
3	Battery Layout 电池组布局图	As per “Electric Circuit” 电气原理图
4	Temperature Sensor Qty 温度采样点数	6/BMU
5	Cooling Fan 是/否需控制风机功能	Optional 选配项
6	Heating Controller 是/否需要加热控制	Optional 选配项
7	Relay Controller Qty 控制继电器个数	3
8	IP Grade 电池箱防护等级	IP53
9	BMS Supply Voltage BMS 供电电压	24V/12V
10	Current Sensor Type 电流传感器类型	Hall Sensor/Diverte 霍尔传感器/分流器
11	Temperature Sensor Type 温度传感器类型	NTC(M8 connector/port) NTC(带 M8 端子)
12	Temperature Senor Layout 温度传感器布局	Evenly Layout 均匀布置
13	Protocol Version	Backlog item

	协义版本	待定项
14	Protocol Type 协议方式	RS485/RS232/CAN

4.6 Electronics Performance 电性能参数

No	Item 项目	Parameter 参数		Note 备注
1	Nominal Voltage 标称电压	V		
2	Nominal Capacity 标称容量	typical：Ah 典型：Ah		After full charged,discharge at 0.2C till cut-off voltage capacity 完全充电后用 0.2C 放电至截止电压的容量。
3	Charging Cut-off Voltage 充电截止电压	V±1V		
5	Charging Current 充电电流	standard charging 0.2C 标准充电 0.2C		
		0.5C fast charging 0.5C 快速充电		
6	Charging Time 充电时间	Standard Charging 标准充电	6Hours	
		Fast Charging 快速充电	3Hours	
7	Discharging Cut-off voltage 放电截止电压	V		
8	Discharging Current 放电电流	Standard Discharging 0.2C 标准放电 0.2C		
		Max. Discharging 2C 最大放电 2C		
9	Capacity Retention 容量保持率	94%		
13	Working Temperature 工作温度	Charging 充电	0~45℃	
		Discharging 放电	-20~55℃	

14	Storage Temperature 贮存温度	-5℃-35℃ (recommended 25±5℃)	Battery shall remain 40-50% capacity when store the battery 贮存时应充电至容量的40%~50%
16	Cycle Life 循环寿命	2000	

4.7 BMS 参数 BMS specification

Item **项目**	**Fault Grade** **故障等级**	**Threshold Value** **阀值**	**Duration time (S)** **持续时间(S)**	**Solution** **处理方式**	**Recovery Condition** **恢复条件**
System Over Voltage **总压过压**	First grade fault 一级故障				
	Second grade fault 二级故障				
System Under Voltage **总压欠压**	First grade fault 一级故障				
	Second grade fault 二级故障				
Cell Over Voltage **单体过压**	First grade fault 一级故障	3.65V	5	Alarm 告警	/
	Second grade fault 二级故障	3.7V	5	BMS cut discharging contactor	cell voltage＜3.6 最低单体＜3.6V

				BMS 切断充电接触器	
Cell Under Voltage **单体欠压**	First grade fault 一级故障	2.7V	5	Alarm 告警	/
	Second grade fault 二级故障	2.5V	5	BMS cut discharging contactor BMS 切断放电接触器	Cell Voltage>2.7V 最低单体>2.7V
Voltage Uneven **电压不均**	First grade Fault 一级故障	300mV	3	Alarm 告警	
	Second grade fault 二级故障	400mV	5	BMS cut discharging contactor BMS 切断充放电接触器	Cell Voltage＜300mV 单体压差<300mV
Low Temp. **温度过低**	First grade fault 一级故障	0℃	5	Alarm 告警	
	Second grade fault 二级故障	＜-5℃	5	warning,reduce charging curren 报警，降低充电电流 t	Lowest Temp. > 0℃ 最低温度 ＞0℃
High Discharge Temp. **放电温度过高**	First grade fault 一级故障	50°C	5	Alarm 告警	/
	Second grade fault 二级故障	>55°C	5	BMS cut discharging contactor	Highest Temp. < 45℃, 最高温度 ＜45℃,

				BMS 切断充放电接触器	
Temp. Uneven 温度不均衡	First grade fault 一级故障	15℃	3	Alarm 告警	/
	Second grade fault 二级故障	18℃	3	BMS cut discharging contactor BMS 切断充放电接触器	In Case Temp. Different＜15℃ 箱间温差＜15℃
Dicharge Over Current 放电过流	First grade fault 一级故障				
	Second grade fault 二级故障				
Charge Over Current 充电过流	First grade fault 一级故障				
	Second grade fault 二级故障				
High SOC SOC 过高	First grade fault 一级故障	100%	3	Alarm 告警	SOC<100%
Low SOC SOC 过低	First grade fault 一级故障	＜15%	3	Alarm 告警	SOC>20%,
	Second grade fault 二级故障	＜5%	3	Alarm 告警	SOC>10%,

Insulation Fault **绝缘故障**	First grade fault 一级故障	＜500Ω/V	1	Alarm, controller reduces discharge power, BMS reduces charge power 报警，控制器控制放电降功率，BMS 控制充电降功率	Insulation resistance >500Ω/V 绝缘电阻>500 欧/V
	Second grade fault 二级故障	＜100Ω/V	1	Alarm, controller cuts off discharge relay 报警，控制器控制切断放电继电器，禁止充放电	

4.8 Protocol Standard 协议标准

TBD

5 Storage and Shipment Requirement 存储及运输要求

Item **项目**		**Criteria** **标准**
Storage temperature 存储温度	Short period (less than 1 month) 短期 (少于 1 个月)	-20℃~55℃
	Medium period (less than 3 month） 中期 (少于 3 月)	-20℃~45℃
	Long period (more than 3 month) 长期 (超过 3 个月)	0℃~30℃
Relative Humidity 相对湿度		≤75% RH
State of Charge 荷电状态		40%~60%

Battery pack must be charged every three months when long term storage, please charge the battery pack with standard charging current to keep 40%~60% state of charge.

电池组在长时间存储时应每三个月充电一次确保电池组保持 40%~60%电量。

6 Contact information 联系方式

If you have any questions regarding the cell, please contact the following address:

如有疑问，请按以下地址联系：

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