群控能源
GROUP CONTROL ENERGY

5U 产品规格书

5U SPECIFICATION

产品名称：高压储能簇电池管理系统

Product Name：High-voltage Cluster BMS for Energy Storage

版本编号：VER1.0

Version：VER1.0

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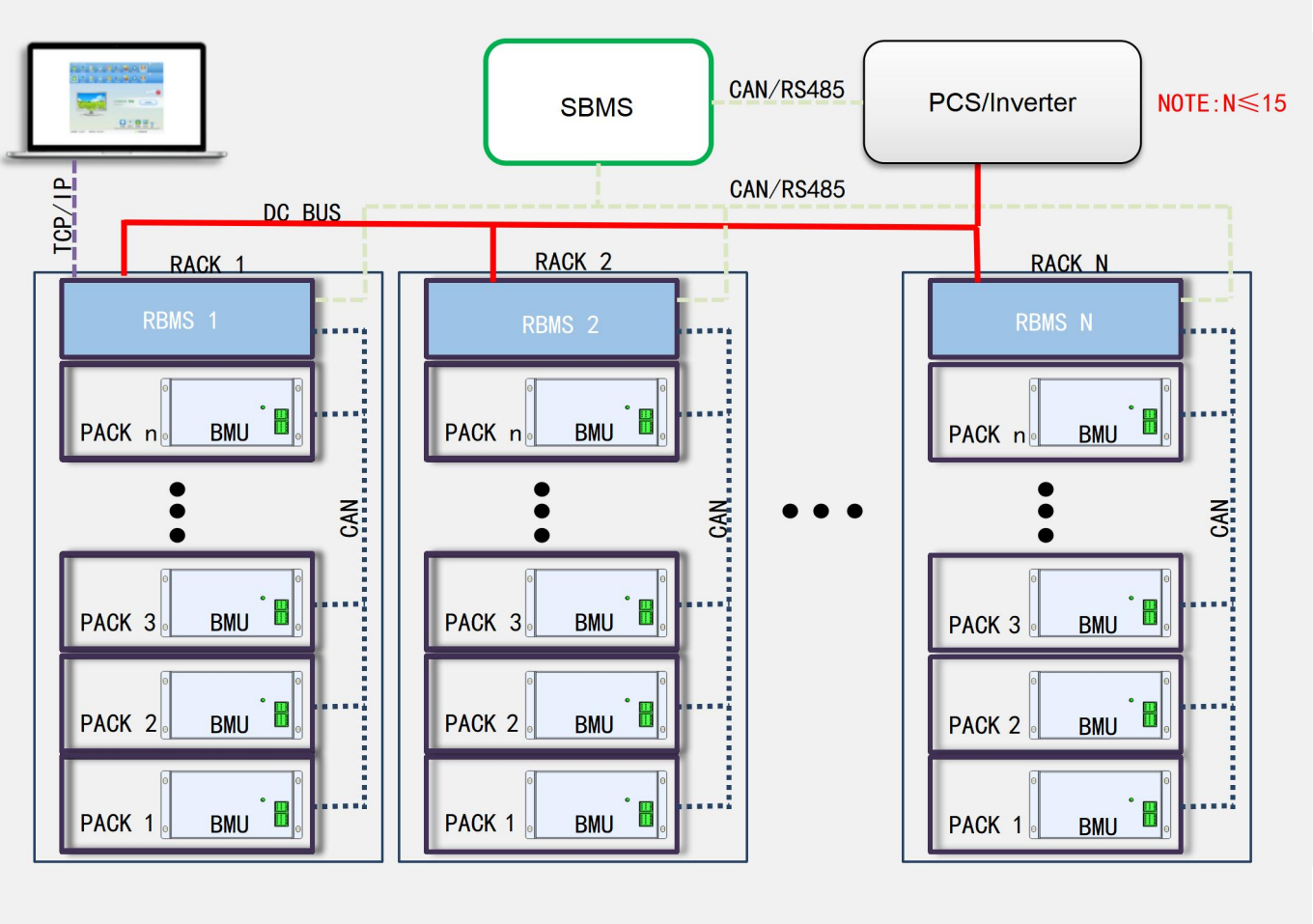
1. 应用场景 - Application

- 光伏电站储能
- 孤岛离网储能
- 工商业储能
- 微电网应用
- 电力系统电网侧储能

- PV power plant storage
- Island off-grid energy storage
- Industrial and commercial energy storage
- Micro-grid applications
- Energy storage on the grid side of the power system

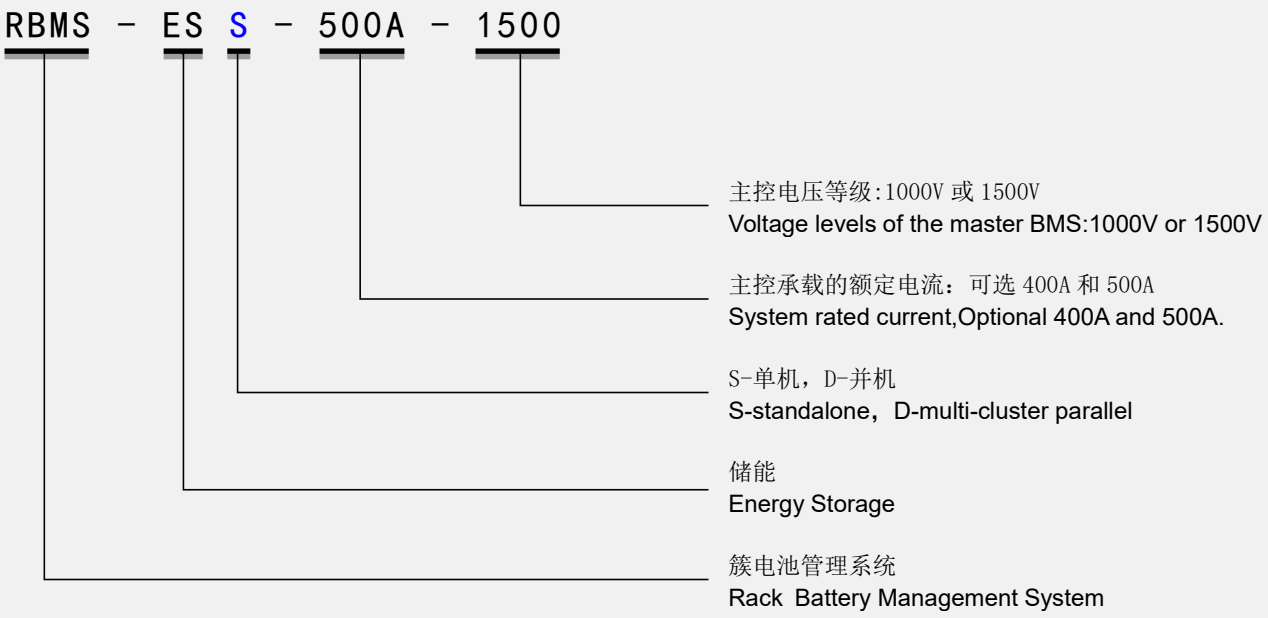
2. 三级架构拓扑图 - Topology of three-level architecture



注:单机模式为二级架构（BMU+RBMS）；并机模式为三级架构（BMU+RBMS+SBMS）。

Note: The standalone mode is a secondary architecture (BMU+RBMS); The multi-cluster parallel mode is a three-level architecture (BMU+RBMS+SBMS).

3. 命名规则 - Product Naming Rules



例：RBMS-ESD-400A-1500 代表高压系列 BMS 主控支持并机，主控电压等级为 1500V,支持额定电流 400A。

Example: RBMS-ESD-400A-1500 represents high voltage master BMS with parallel function ,the voltage level of master BMS is 1500V.It supports rated current 400A .

主控电压等级：1000 代表操作电压区间 260-1000VDC。
1500 代表操作电压区间 260-1500VDC

the voltage level of master BMS:1000 represents the operating voltage range of 260-1000VDC.1500 represents the operating voltage range of 260-1500VDC.

关于系统实际额定电压计算方法：

例如系统为10个16串磷酸铁锂电池模组串联组成（10S16S），按照单体标称3.2V计算额定电压即为10*16*3.2=512V；8个15串磷酸铁锂电池模组串联组成（8S15S），额定电压即为8*15*3.2=384V。

Calculation method of actual rated voltage of the system:Take the nominal 3.2V lithium iron phosphate battery as an example, when the system consists of 10 pcs of 16S battery modules in series (10S16S), the rated voltage will be 10*16*3.2=512V; when the system consists of 8 pcs of 15S battery modules connected in series (8S15S), and the rated voltage will be 8*15*3.2=384V.

4. 产品特性 - Product Features

图 **Figure 1** RBMS 外形图 - Dimensions of RBMS

- **高级电池管理系统** -- 高度集成化的电池管理系统可实现无缝监控;完善可靠的系统控制和保护策略，全面保障电池安全，为延长电池组的寿命保驾护航。
- **更高的功率密度** -- RBMS 高度 5U(220mm)，深度 500mm，标准 19 英寸机柜安装,小体积做到最大输出功率 750KW。
- **模块化设计，可配置，可扩展** -- 多个储能单元灵活组合可扩展为较大的储能系统，最大可支持 15 簇电池柜并联。
- **通信接口丰富** -- 多路 RS485、CAN、以太网、干接点输入输出等接口，支持与市面上绝大多数 PCS/Inverter、监控服务器通信。
- **通信接口协议灵活** -- 出厂自带本公司通信协议，也可根据客户需求来适配不同厂家的 PCS/ Inverter。
- **高精度电流检测** -- 采用高精度分流器电流检测方案，电流采样精度更高，SOC，电量计算更加准确。
- 自动环流控制及自动并机\脱机控制，可轻松实现电池组的并联。

- **Advanced battery management system** -- highly integrated battery management system can realize seamless monitoring；Perfect and reliable system control and protection strategies to fully ensure the safety of the battery and escort the extension of the service life of the battery pack.
- **Higher power density** - RBMS height 5U (220mm), depth 500mm, standard 19 inch cabinet installation, small size to achieve maximum output power of 750KW
- **Modular design, configurable and expandable** -- multiple energy storage units can be flexibly combined and expanded into a larger energy storage system,It supports up to 15 clusters of battery cabinets in parallel.
- **Rich communication interfaces** -- RS485, CAN, Ethernet, dry contact input and output interfaces, supporting communication with most PCS/Inverter and monitoring servers on the market.
- **Flexible communication interface protocol** -- the factory comes with the company's communication protocol, and PCS/Inverter of different manufacturers can also be adapted according to customer needs.
- **High-precision current detection** -- utilizing a shunt resistor current detection scheme, offering higher current sampling accuracy and more accurate SOC and energy calculations.
- Automatic circulation control and automatic parallel / offline control can easily realize the parallel connection of battery packs.

5. 主要技术参数 - BMS Main technical parameters

基本参数		Basic Parameters
额定电流	400A，500A（可选 Optional）	Rated Current
最高电压	1000V,1500V（可选 Optional）	Max voltage
功耗	≤15W	Power consumption
电流采样精度	0.1%FSR	Current sampling accuracy
绝缘耐压	3200VDC ,4200VDC ＜1mA 1min	Insulation withstand voltage
防护等级	IP20	Ingress protection
尺寸（W*H*D）	487*220*500（mm）	Size（W*H*D)
净重	～30Kg	Net Weight
通信接口		**Communication Port**
与 BMU 通信口	CAN	Communication port with BMU
与 PCS/Inverter 通信口	RS485/CAN	Communication port with PCS/Inverter
与 SBMS 通信口	RS485/CAN	Communication port with SBMS
与监控软件通信	以太网 Ethernet	Communication with monitoring software
基本功能		**Basic Function**
电池充放电管理	支持 Available	Battery charge&discharge Management
电池温度管理	支持 Available	Battery Temperature Management
IAP 升级	支持 Available	IAP Upgrade
系统保护参数设置	支持 Available	System protection parameter setting
短路保护	支持 Available（1500V 35KA @20ms）	Short circuit protection
预充功能	支持 Available	Pre-charge function
并机环流控制	支持 Available	Parallel circulation control
事件记录	支持 Available 5000	Event record
供电模式	AC 或者 DC 二选一供电模式（出厂默认 AC 供电） Main Control AC or DC Power Supply Mode (Default Standard AC Power Supply)	Power supply mode
其他参数		**Other**
外观颜色	RAL7035 灰白/RAL7035 Grey White	Appearance, Color
安装方式	适用于标准 19 英寸机柜安装-Suitable for installation in standard 19-inch racks	Installation method
散热方式	风冷散热（后进风前出风）Air cooling and heat dissipation (rear inlet and front outlet)	Heat dissipation method
进出线方式	前进前出 Front side in and front side out	Incoming and outgoing line mode
操作温度	-20℃～50℃（50℃以上降容使用，见图 2） For use with reduced capacity above 50°C(Figure 2)	Operating temperature
使用环境湿度	5%～75%RH	Operating ambient humidity
选配功能		**Functions Optional**
单机或并机功能	出厂前设置完成 Set up before leaving the factory	Stand-alone or parallel function

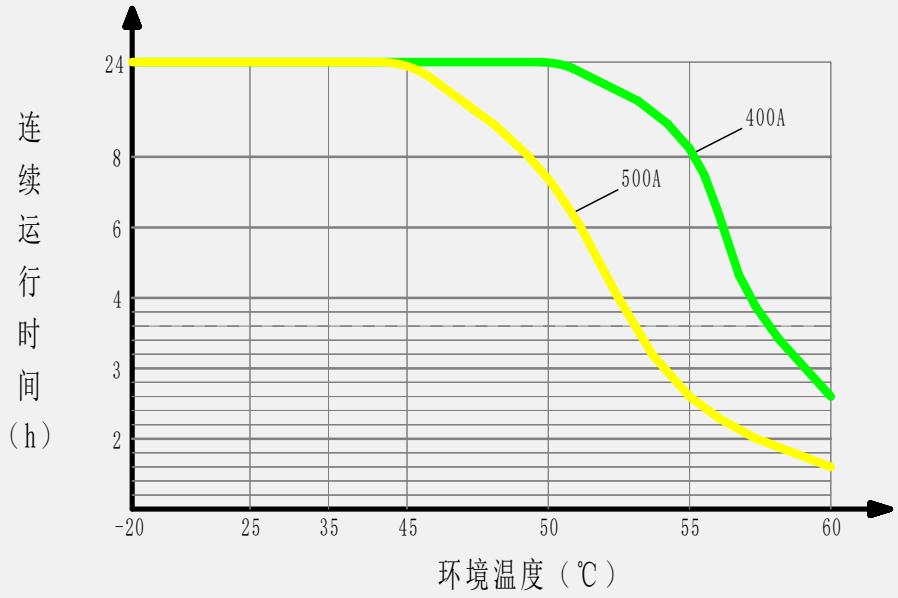
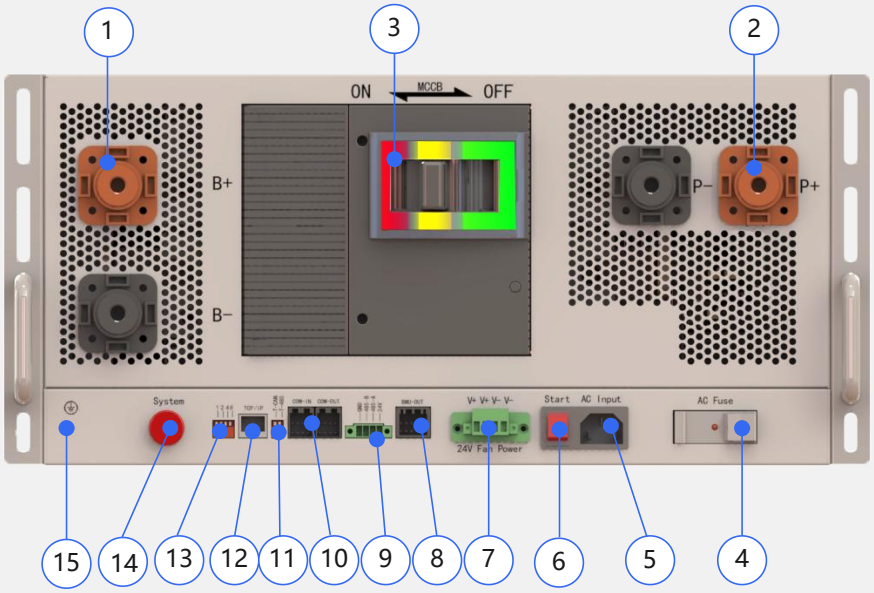


图 Figure 2 环温与连续运行时间曲线图 - Ambient Temperature and Continuous Operation Time Curve Chart

6. 接口说明 - Interface description

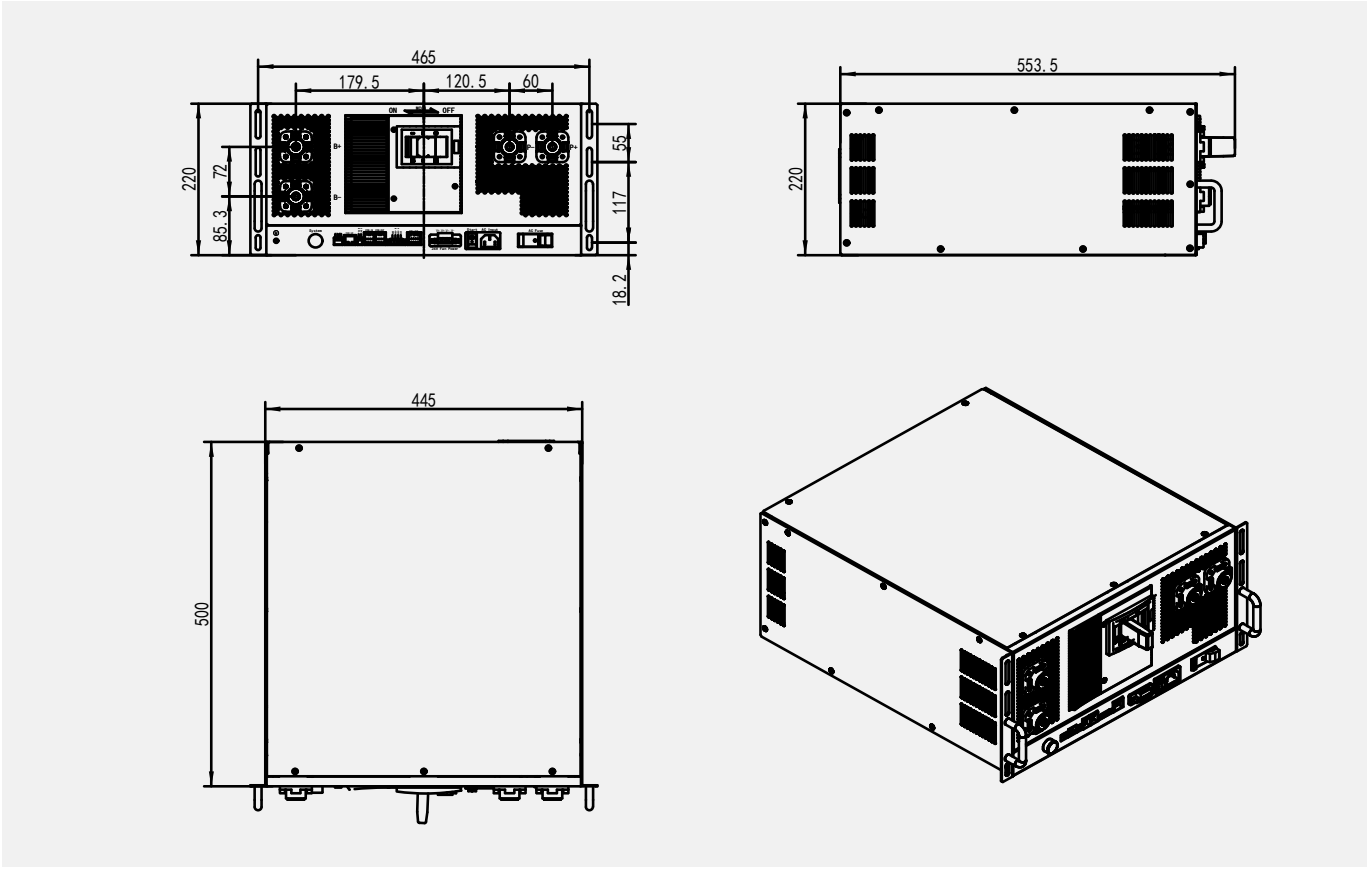


NO.	接口-Interface	接口说明	Interface description
1	B+ B-	与电池侧总正，总负连接的功率端口： 推荐连接螺栓 M10*20，扭力 12-20N.m 150mm²（ 300mcm AWG ）以上电缆	Power port connected to battery side total positive and total negative: Recommended connecting bolt M10*20, torque 12-20N.m；Use at least 150mm² （300mcm AWG） Copper cables of and above
2	P+ P-	与充电设备(PCS/Inverter)或直流母线连接的功率端口： 推荐连接螺栓 M10*16，扭力 12-20N m，	Power port connected to charging equipment (PCS/Inverter) or DC bus: Recommended connecting bolt M10*16, torque 12-20N

		150mm²（300mcm AWG）以上电缆	m；Use at least 150mm²（300mcm AWG） Copper cables of and above
3	ON OFF	ON:断路器闭合;OFF:断路器断开 当断路器手柄在中间位置为脱扣状态，需先拨到 OFF，才能再闭合	ON: The circuit breaker is ON. OFF: The circuit breaker is disconnected When the handle of the circuit breaker is in the trip state in the middle position, it needs to be turned OFF before it can be closed again
4	AC FUSE	AC 供电熔断器 220V ，4A	AC power supply fuse, 220V, 4A
5	AC Input	市电供电输入口，必须取自 PCS/ Inverter 输出侧： 180~264VAC 1A max 1.0mm²（18AWG） 电子线	The municipal power supply signal input port must be taken from the PCS/ Inverter output side： 180~264VAC 1A max 1.0mm²（18AWG） cables
6	Start	RBMS 系统开机启动开关 系统接入 AC220V，断路器合闸后按下待灯亮表示系统开机	RBMS system startup switch The system is connected to AC220V. After the circuit breaker is closed, press and wait for the light to turn on to indicate that the system is turned on
7	V+V+ V-V- 24V Fan Power	与电池模组风扇连接 主控控制并提供电池模组风扇电源（24V@13A max）	Connected to the battery module fan, the main controller controls and provides power to the battery module fan (24V@13A max)
8	BMU-OUT	与 BMU 通信接口 与 BMU 级联通讯	Communication interface with BMU Cascade communication with BMU
9	GND 485-B 485-A 24V	1. 接外挂显示屏用或对外通信用 2. 24V 和 GND 给 SBMS 供电用 接显示屏时请按照丝印线序接线	For external display screen connection or external communication. For SBMS power supplying connection Please connect the display screen according to the silk screen sequence
10	COM-IN COM-OUT	RBMS 外部通讯口： 并机应用时：与 SBMS 通信 单机应用时：与 PCS 外部设备通信 必须使用随机配置的双绞屏蔽线束，线序定义见线束上线标	RBMS external communication port: In parallel application: communicate with SBMS In stand-alone Application: communicate with PCS external equipment Must use randomly configured twisted pair shielded wire harness, the wire sequence definition see the wire mark on the wire harness
11	T-CAN T-485	CAN 和 485 通讯时终端匹配电阻设置 设置说明：（120Ω）,ON 为有效 并机应用时只需设置最后一台;单机应用时根据现场情况(干扰、通信距离等)灵活使用	Terminal matching Resistance setting during can and 485 communication Setting Description: (120Ω), on is valid For parallel application, only the last one needs to be set; In single machine application, it can be used flexibly according to the site conditions (interference, communication distance,etc.)

12	TCP/IP	可通过网线连接 PC 连接 RBMS 上位机系统软件 网线标准 CAT5 及以上，可用交叉线或者直连线,线序可按标准的 TIA-586A 或者 TIA-568B	RBMS upper computer system software can be connected to PC through network cable The network cable standard is CAT5 or above, and can be connected by cross line or straight line. The line sequence can be according to the standard TIA-586A or TIA-568B
13	1 2 4 8	ID 分配：多台 RBMS 并机使用时通过设置拨码开关分配 ID。必须从 1 开始。 拨码开关共 4 位，最多支持 15 台 RBMS 并机 1 ON: ID+1 2 ON: ID+2 3 ON: ID+4 4 ON: ID+8	ID allocation: when multiple RBMS are used in parallel, the ID is allocated by setting the dial switch. You must start with 1. The dial switch has 4 bits in total and supports up to 15 RBMS parallel machines 1 ON: ID+1 2 ON: ID+2 3 ON: ID+4 4 ON: ID+8
14	System	系统状态指示灯： 系统正常:绿灯常亮 系统告警:黄灯常亮 自检失败和保护状态:红灯常亮 充电:绿灯闪烁 放电:红灯闪烁 正在自检:红绿交替闪烁 正在预充:黄灯闪烁	System status indicator： System normal: Green light is always on Alarm: yellow light is always on Self test failure and protection status: red light is always on Charging: green light flashes Discharge: red light flashing Self checking: red and green flashing alternately Pre-charging: yellow flashing
15		RBMS 机箱接地点： 必须可靠接地，且接地电阻小于 1Ω	RBMS chassis ground： Must be grounded, and the grounding resistance is less than 1Ω

7. 外形尺寸 - RBMS Dimension



8. 安全注意事项 - Safety Accessory

1) 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，否则有触电的危险，同时失去保修权利。

2) 触发二级保护后断路器由 BMS 控制断开后，必须将系统下电排除故障，并至少间隔 1 分钟以后方可重新上电开机，否则可能会导致断路器分励线圈热量来不及散发而损坏。

1) There is a high voltage inside the energy storage system. It is strictly prohibited to open the chassis for disassembly and maintenance without authorization unless the company or the technicians authorized by the company, otherwise there is a risk of electric shock and the warranty right will be lost.

2) After triggering the secondary protection, the circuit breaker is controlled by BMS. After disconnection, the system must be powered off to eliminate the fault, and can be powered on and started again after an interval of at least 1 minute, otherwise it may cause damage to the shunt coil of the circuit breaker in time to dissipate heat.

3) If the PCS/Inverter needs to be cold started by the battery, the battery switch on the PCS/Inverter side must be closed before starting the battery. If the battery is started first and then the battery switch on the PCS/Inverter side is closed, the DC side of the PCS/Inverter side generally has a large capacitance, and the capacitance at the moment

3) 如需要由电池来冷启动 PCS/Inverter，必须先将 PCS/Inverter 侧的电池开关闭合后再启动电池。如果先启动电池，再闭合 PCS/Inverter 侧的电池开关，由于 PCS/Inverter 侧直流侧一般具有大电容，闭合瞬间电容相当于短路，此时电池给电容充电的电流会远高于 RBMS 机器内部的接触器额定值，极易造成接触器触点出现烧蚀、粘连，接触器触点接触电阻增大发热烧毁或者触点无法断开从而触发二级保护。

4) 安装及调试人员所使用的工具必须有绝缘防护。

5) 需要维护时，必须将 RBMS 的主断路器断开，切断电池组与 PCS 直流总线的连接。

6) 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。

7) 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。

8) 如长期不使用系统，请务必断开电池柜的主断路器。

9) 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、高烟雾场所

of closing is equivalent to a short circuit. At this time, the current charged by the battery to the capacitor will be much higher than the rated value of the contactor inside the RBMS machine, which is very easy to cause ablation and adhesion of the contactor contacts, The contact resistance of the contactor contact increases, heats and burns, or the contact cannot be disconnected, thus triggering the secondary protection.

4) The tools used by installation and commissioning personnel must be insulated.

5) When maintenance is required, the main circuit breaker of RBMS must be disconnected to disconnect the battery pack from PCs DC bus.

6) According to the different needs of the project, the charging and discharging current, charging and discharging voltage and other parameters of the battery management system have been set during the initial installation and commissioning. Do not change the parameters without authorization, otherwise the battery life may be shortened, and more serious may cause serious harm to the battery and safety accidents.

7) In case of fire around the energy storage cabinet, be sure to use dry powder fire extinguisher or fire sand to extinguish the fire. Electric shock may result if liquid fire extinguishing is used.

8) If the system is not used for a long time, be sure to disconnect the main circuit breaker of the battery cabinet.

9) Try to avoid long-term use in the following working environments:

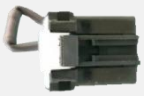
◎ Places exceeding the temperature or humidity range specified in the specification

◎ Places with strong vibration or vulnerable to impact

◎ Places with direct sunlight or close to heat source

◎ Places with dust, strong corrosive substances, inflammables and explosives and high salt fog

9. 外部配件 - Accessory list

图例 - legend	名称 - Name	规格 - Specifications	数量 - PCS
	功率端子护套 Power Terminal sheath	黑色 Black	2
	功率端子护套 Power Terminal sheath	红色 Red	2
	外部通信线 External Communication cable	6 芯屏蔽-2 米 6 core shield - 2m	1
	AC 插座（可接线） AC socket（wireable）	250V 10A	1
	干接点接线端子 Dry contact terminal	5.08-4Pin	1
	BMU 用终端匹配电阻 Terminating resistor	120Ω	1
	显示屏接线端子 Display terminal	3.81-4Pin	1
	断路器辅助操作手柄 Circuit breaker auxiliary operating handle	/	1

声明 - Statement：

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