

户用储能电池包规格书

Product Specification

Battery Pack for Residential ESS

RHV8.0-MB31-V1.0

版本 Version 1.0



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目 录 Contents

1. 概述 Product Overview	3
2. 产品特点 Product Features	5
3. 产品规格 Product Specification	8
4. 产品外观及结构 Product Appearance and Structure.....	12
5. 包装运输要求 Packaging and Transportation Requirements.....	16
6. 产品使用说明 Product Instructions	17
7. 产品维护保养 Product Maintenance.....	19
8. 附录 Appendix	20

1. 概述 Product Overview

产品型号定义规则参考以下说明。The definition of product model is shown as follows.

S R 048 - D - 314



该规格书描述了电池包设计结构、基本特性、测试方法和磷酸铁锂电池注意事项等，主要应用于户用储能应用场景。本产品的标准供货界面包括**电池包**、主控箱等。详细供货清单参考下表。

The purpose of this document is to outline the structural design, key performance parameters, and safety precautions for the battery pack, which is mainly applied in residential ESS. The supply scope of this product is **battery pack**, PDU, etc. The details are as follows.



表 1 标准供货清单

Table 1 Components of battery pack

序号 No.	组件 Component	型号 Model	数量 Quantity
1	电池包 Battery pack	RHV8.0-MB31-V1.0	可选 option
2	主控箱（带底座） PDU (with base)	RHV8.0-BOX-V1.0	1
3	正极动力输出线 Positive power output cable	/	1
4	负极动力输出线 Negative power output cable	/	1
5	输出通信线 Output communication cable	/	1
6	产品出厂检验报告 Test report	/	/
7	产品合格证 Product certificate	/	/

注：具体型号规格和数量以供货前确认为准。

Note: The specific model, specification and quantity are subject to confirmation before delivery.

2. 产品特点 Product Features

➤ 灵活配置 flexible configuration

- ◆ 模块化设计，可实现快速安装；

Modularization design enables rapid installation;

- ◆ 可调式高度站脚，减震防滑，高容错安装；

Height-adjustable feet with shock absorption and slip resistance, and a highly tolerant installation process;

- ◆ 支持新旧电池包混用，灵活扩容；

Supports mixed use of old pack and new pack units, enabling flexible expansion;

- ◆ 高扩容能力，单簇最大容量可达 48kWh，最大并联容量为 384kWh；

High expansion capacity, a maximum capacity of 48kWh per cluster and a maximum parallel capacity of 384kWh.

- ◆ 适配市场大多数主流逆变器，可进行自由搭配；

Compatible with most mainstream inverters in the market, allowing for free combination.

➤ 高安全性 high security:

1. 独立的电芯温度监测（1:1 电芯温度检测，实时监控电芯安全）

Independent Cell Temperature Monitoring (1:1 cell temperature detection for real-time cell safety monitoring)

2. 独立的输出排温度监测（配置 2 个独立 NTC 进行输出排温度检测）

Independent Output Busbar Temperature Monitoring (equipped with 2 independent NTCs for output busbar temperature detection)

3. 纳米级隔热材料（单芯过温失效，互不影响）

Nano-grade Thermal Insulation Material (single cell over-temperature failure does not affect adjacent cells)

4. PACK 级应急消防（内置带 V-Mark 标识的消防模块，通过 UL 认证要求，如遇火情，可在 15 秒内检测并完成灭火，第一时间切断风险）

PACK-level Emergency Fire Suppression (built-in V-Mark certified fire module meeting UL requirements; detects and extinguishes fire within 15 seconds to immediately eliminate risk)

5. 电气分舱，双舱运行（实现 BMS 与电池的物理隔离，隔热控温，防火防爆）

Electrical Compartmentalization, Dual-cabin Operation (physical isolation between BMS and battery pack for thermal control, fire and explosion protection)

6. BMS + 双向 DC/DC 主动智能电池管理（过流、过压、短路、反接多重功能保护，高隔离防护型变压器，多重电路开关）

BMS + Bidirectional DC/DC Active Intelligent Battery Management (multi-protection: over-current, over-voltage, short-circuit, reverse polarity; high-isolation transformer, multi-layer circuit switching)

➤ **高性能 PACK High-Performance PACK:**

1. EVE 高品质自研电芯（行业领先 LFP（磷酸铁锂）电芯，通过全方位严苛筛选检测，包括 1/8 生命周期循环测试与穿刺测试）

EVE High-quality Self-developed Cells (industry-leading LFP (Lithium Iron Phosphate) cells, rigorously screened and tested through comprehensive protocols including 1/8

lifecycle cycling test and nail penetration test)

2. 可靠运行, 快充快放 (独立模块管理, 额定功率达到 4kW, 最大支持 1.5 倍峰值功率带载 10s, 每簇储能系统最大充放功率可达 24kW, 性能突破, 带来效率提升)

Reliable Operation, Fast Charge & Discharge (independent module management with 4kW rated power, supporting up to 1.5x peak power load for 10 seconds; each battery cluster delivers up to 24kW max charge/discharge power for breakthrough performance and improved efficiency)

3. -20°C~50°C宽温域运行 (支持 -20°C环境稳定运行, 1h 内完成低温加热)

Wide Temperature Range Operation: -20°C to 50°C (stable operation at -20°C ambient temperature; low-temperature heating completed within 1 hour)

4. IP65 高防护性能 (超高级别防水防尘, 无惧户外复杂环境)

IP65 High Protection Rating (premium water and dust resistance, unaffected by harsh outdoor environments)

5. BMS + 双向 DC/DC 主动智能电池管理 (通过充放电电流精准调控技术, 可自动实现电池组内各电池包的能量动态均衡)

BMS + Bidirectional DC/DC Active Intelligent Battery Management (precision charge/discharge current control enables automatic dynamic energy balancing across all battery packs within the system)

6. 已通过 UN38.8、IEC61000、IEC62619、IEC62477 认证

Certified to UN38.8, IEC61000, IEC62619 and IEC62477 standards

3. 产品规格 Product Specification

3.1 电芯技术参数 Technical Parameters (Cell)

采用亿纬锂能自主研发和生产的 MB31(3.2V 314Ah)磷酸铁锂方形电芯，其具有高安全性、长循环、高一致性、优越的充放电性能和绿色无污染的特点，主要技术参数如下：

The prismatic LFP battery cell MB31 (3.2V 314Ah) which is independently developed and produced by EVE, exhibits high safety, long cycle life, high consistency, superior charge/discharge performance, and eco-friendly characteristics. The main technical parameters are as below:

表 2 电芯技术参数表
Table 2 Technical parameters (cell)

序号 No.	项目 Item	规格 Specification	备注 Remark
1	额定容量 Rated capacity	314Ah	
2	额定电压 Rated voltage	3.2V	
3	尺寸 T×W×H Dimension T×W×H	(71.7±0.8) * (173.7±0.5) * (207.2±0.5) mm	
4	重量 Weight	5.6±0.3kg	



图 1 电芯示意图

Figure 1 Battery cell: MB31

3.2 电池包技术参数 Technical Parameters of Battery Pack

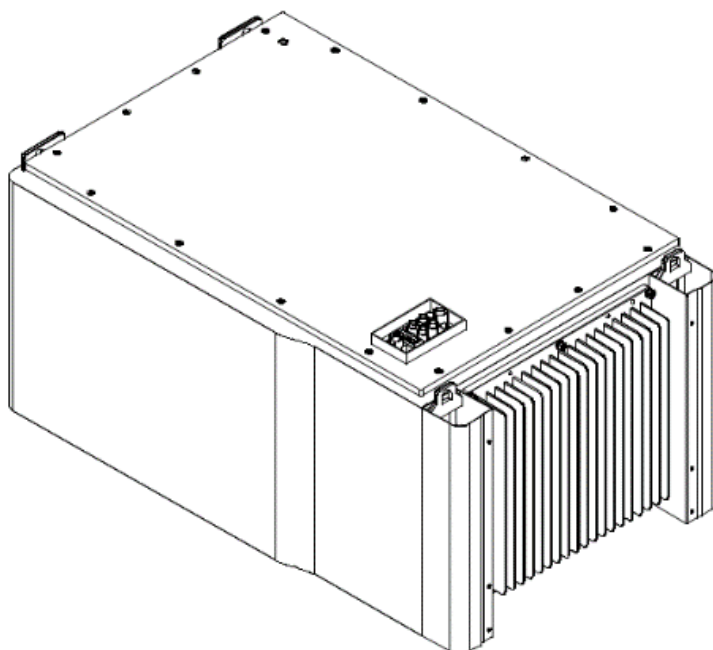


图 3 电池包外观图

Figure 3 The appearance of battery pack

表 3 电池包技术参数表

Table 3 Technical parameters (battery pack)

序号 No.	项目类型 Item	规格描述 Specification	备注 Remarks
1	额定容量 Rated Capacity	314Ah	
2	标称电池电压 Nominal Battery Voltage	25.6V	1P8S
3	额定输出电压 Rated Output Voltage	450-850V	
4	标称电量 Nominal Energy	8.0kWh	
5	额定功率 Rated Power	4kW	
6	最大峰值功率 Maximum Peak Power	6kW_10s	
7	电池内阻 Battery Internal Resistance	$\leq 15\text{m}\Omega$	25 $\pm$ 2°C, AC 1kHz

8	运行环境温度 Operating Ambient Temperature	-20℃~50℃	
9	工作湿度 Operating Humidity	5%~95%	No Condensation
10	尺寸 Dimensions	640*388*300mm	
11	重量 Weight	73±2kg	
12	IP 等级 IP Rating	IP65	系统层级 System Level
13	设计寿命 Design Life	10 years	
14	认证要求 Certification Requirements	UN38.8, IEC62619, IEC61000, IEC62477	

3.3 主控箱技术参数 Technical Parameters of Main Control Box

R HV 8.0-BOX-V1.0

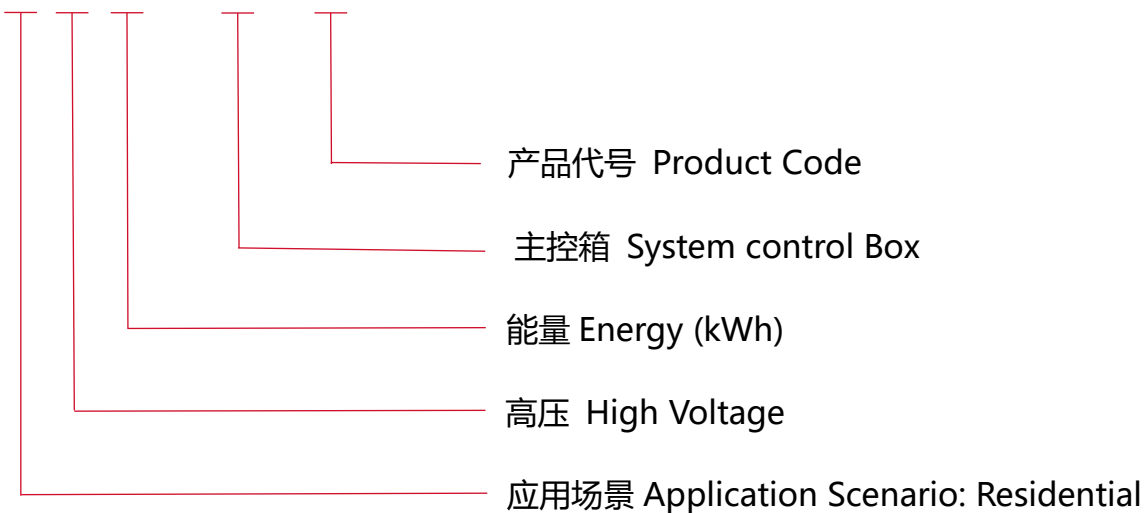




图 2 主控箱外观图
Figure 2 Main Control Box Diagram

表 4 主控箱技术参数表
Table 4 parameters of RHV8.0-BOX-V1.0

序号 No.	项目类型 Item	规格描述 Specification	备注 Remarks
1	电池模块类型 Battery Module Type	RHV8.0-MB31-V1.0	
2	电池模块匹配数量 Number of Battery Modules	1-6 pcs	电池连接方式 Battery Connection
3	电池模块电压范围 Battery Module Voltage Range	450-850V	
4	最大允许工作电流 Maximum Allowable Operating Current	80A	充放电 Charge and Discharge
5	运行环境温度 Operating Ambient Temperature	-20℃~50℃	
6	工作湿度 Operating Humidity	5%~95%	无冷凝 No Condensation
7	通信方式 Communication Interface	CAN/RS485	
8	尺寸 Dimensions	640*388*198mm	
9	重量 Weight	14±3kg	

	Weight		
10	IP 等级 IP Rating	IP65	系统层级 System Level
11	设计寿命 Design Life	10 years	

4. 产品外观及结构 Product Appearance and Structure

4.1 外形尺寸 Dimensions

电池包由 MB31 电芯通过 1P8S 成组而成，其外观及尺寸如下图所示。

The battery pack is consisted of MB31 cells configured in 1P8S, and its appearance and dimensions are presented as follows.

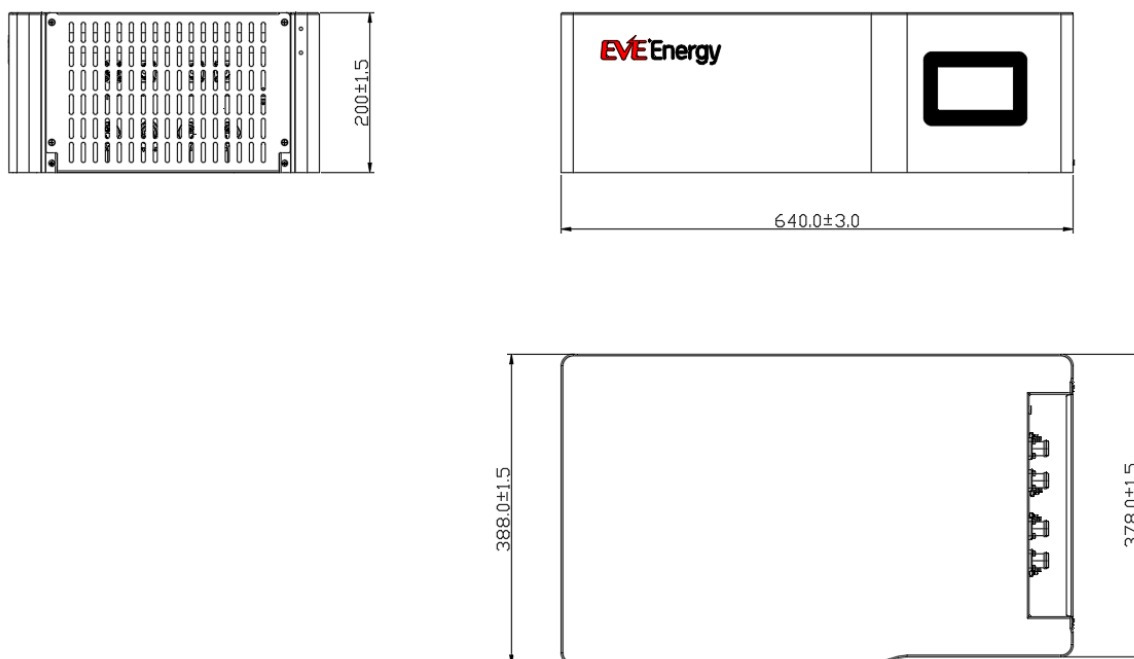


图 4 主控箱尺寸图

Figure 4 Main Control Box Dimension Diagram

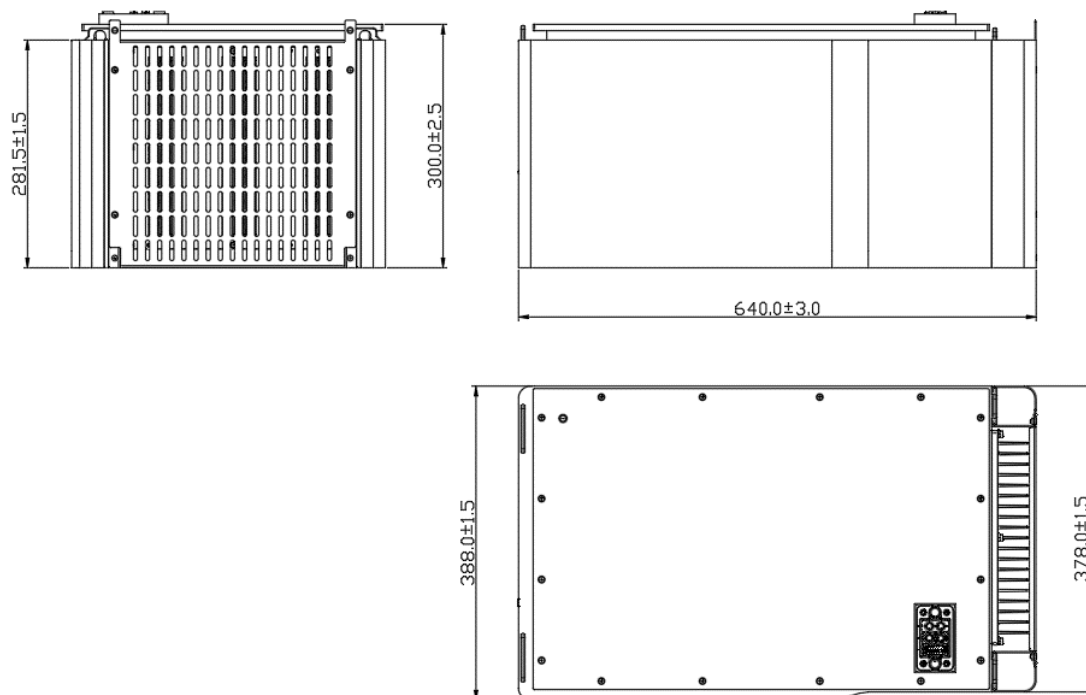


图 5 电池包尺寸图

Figure 5 The dimensions of battery pack

4.2 接口定义 Connection interface

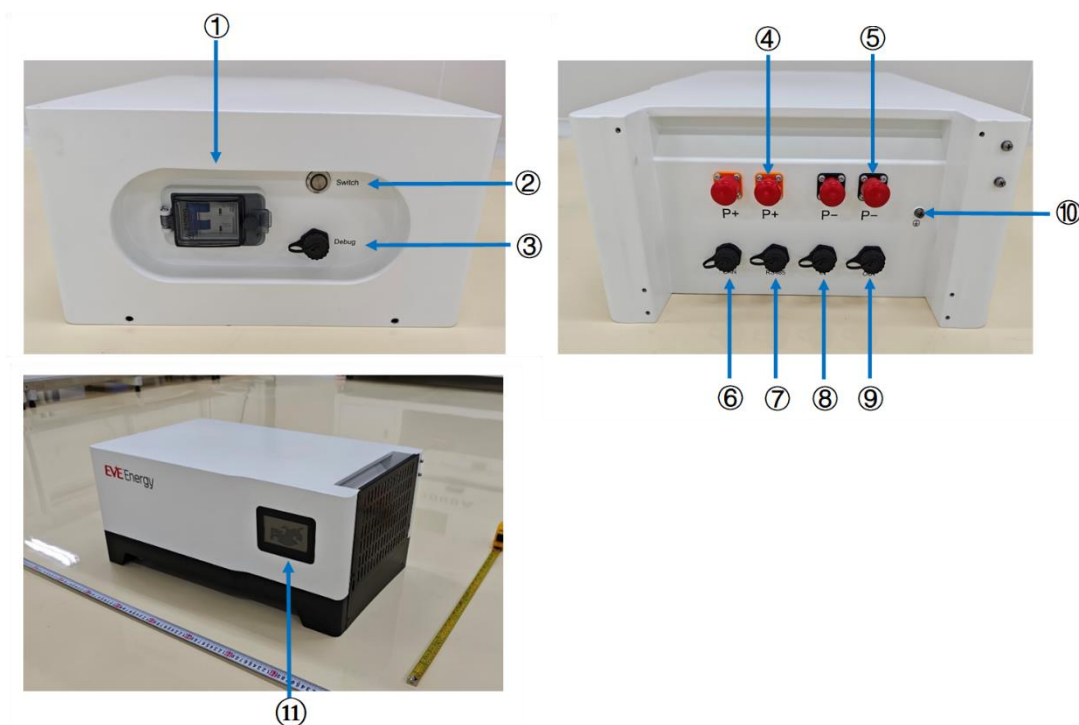


图 6 接口示意图

Figure 6 The diagram of connection terminals

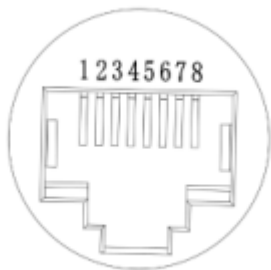
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表 5 主控箱接口定义表

Table 5 Main Control Box Interface Definition Table

序号 No.	名称 Name	物料描述 Material Description
1	Breaker	1000V 80A, high-voltage bus switch
2	Switch	Weak current switch, used to start BMS
3	Debug	Debug interface, used for connecting to the BMS host computer in special cases
4	P+	System Total Positive, Positive Output port
5	P-	System total negative, negative output port
6	CAN	CAN communication port, used for external CAN protocol communication
7	RS485	RS485 communication port, used for external Modbus protocol communication
8	IN	Parallel communication port, input terminal
9	OUT	Parallel communication port, output terminal
10	GND	Ground terminal
11	HMI	Human-machine interface, display screen



RJ45 引脚定义

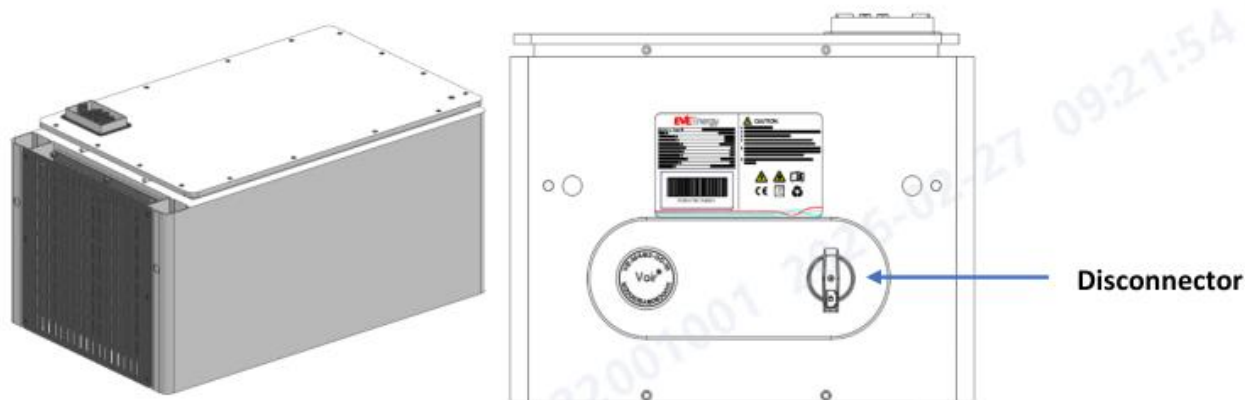
引脚 PIN	定义描述 Define description	接口功能 Interface function
4	BCANH	Debug interface
5	BCANL	

Schematic diagram of RJ45 Pins

注：具体接口型号及引脚定义以供货前确认为准。

引脚 PIN	定义描述 Define Description	接口功能 Interface Function	引脚 PIN	定义描述 Define description	接口功能 Interface function
1	NC	CAN Interface	1	RS485B	RS485 Interface
2	NC		2	RS485A	
3	SGND		3	SGND	
4	CANH		4	NC	
5	CANL		5	NC	
6	SGND		6	SGND	
7	NC		7	RS485A	
8	NC		8	RS485B	

Note: The specific interface model and pin definition are subject to confirmation before delivery.



PACK 直流开关示意图

Schematic Diagram of PACK DC Switch

注意：系统启动前，请将隔离开关开启到 ON 状态，系统运行过程中禁止手动开断隔离开关。

Note: Before starting the system, set the isolating switch to the ON position. Do not manually turn off the isolating switch while the system is running.

5. 包装运输要求 Packaging and Transportation Requirements

(1) 电池箱包装方式：每个电池箱采用单独的纸箱包装，纸箱内使用珍珠棉进行填充，保证电池箱在运输过程中不晃动、安全可靠。

Packaging of a single Pack: Every single pack is packed in a single carton, and the carton is filled with pearl cotton. The packaged pack does not shake, which is safe and reliable, during transportation.

(2) 批量产品的包装采用缠绕膜+护角纸+木卡板/木箱打包方式。

The packaging of a large number of battery packs requires the use of wooden pallets or crate with winding film, paper angle bead.

(3) 电池包应在小于 30%荷电状态下进行运输。在运输过程中应防止剧烈振动、冲击或挤压、防止日晒雨淋。以上要求适用于陆运、海运运输方式。

The battery packs should be transported at SOC less than 30%. During

transportation, measures should be taken to prevent severe vibration, impact, or compression, as well as exposure to sunlight and rain. The above requirements apply to land and sea transportation modes.

6. 产品使用说明 Product Instructions

(1) 请在使用前仔细阅读产品规格书，务必按照规定的充放电参数使用。

Please read the product instructions carefully before using the product, and be sure to use it according to the specified charge and discharge specifications.

(2) 禁止对电池包进行敲击、抛掷、踩踏。

Do not knock, throw or step on the battery pack.

(3) 禁止对电池包进行短路。

Do not short-circuit the battery pack.

(4) 电池包必须避免与腐蚀性物质接触，并远离火源及热源。禁止在阳光下存储或使用。

The battery pack must avoid contact with corrosive substances and be kept away from sources of fire and heat. Do not store or use it under the sun.

(5) 禁止将电池包投入水中。

Do not throw the battery pack into water.

(6) 禁止反向充电或放电。

Do not reversely charge or discharge the battery.

(7) 电池包必须在规定的环境条件下使用，过高或过低的环境温度都会影响电池的性能和安全。电池包必须在清洁、通风的环境条件下使用或存储。

The battery pack must be operated within the specified environment conditions, since too high or too low ambient temperature will affect the performance or safety of the battery. It must be used or stored in clean, dry and ventilated environmental conditions.

(8) 电池包首次使用时，若有腐蚀，难闻气体或不正常现象，禁止使用。

Do not use the battery pack if there is corrosion, unpleasant smell or any abnormality during the first usage.

(9) 电池包必须在规定的充电倍率或功率条件下使用，并且充电上限电压不得超过产品技术要求，防止电池过充电，以免影响电池的充放电性能、机械性能和安全性能。

The battery pack must be operated within the specified charge conditions. Over-charge will lead the electrical performance, mechanical performance and safety performance to be decreased.

(10) 电池包禁止在强静电和强磁场的地方使用和存储，以免产生安全隐患。

Do not use or store the battery pack in places with strong static electricity and strong magnetic fields to avoid potential safety hazards.

(11) 未经我司允许，不得私自拆卸、重组或改装本产品，否则质保终止，若产生安全事故，我司概不负责。

This product shall not be disassembled or reassembled or modified without the permission of EVE, otherwise the warranty will be terminated, and our company will not responsible for any safety accidents.

(12) 电池包必须按照设计状态正立安装或存放，严禁侧放或倒置。

The battery pack must be installed or stored upright in accordance with the design state, and it is strictly forbidden to put it on its side or upside down.

(13) 电池包的使用必须严格遵照以上要求，否则质保终止，造成产品的性能损坏以及安全事故，我司概不负责。

The usage of battery pack must strictly comply with the above requirements, otherwise the warranty will be terminated, and EVE will not be responsible for any product performance damages or safety accidents.

7. 产品维护保养 Product Maintenance

(1) 电池包长时间搁置或存放时，应保持在 $40\pm 5\%$ SOC 的状态下。

When the battery pack not in use for a long time, it is recommended to maintain the SOC at $40\pm 5\%$.

(2) 电池包长时间搁置或存放时，建议每 3 个月进行一次补充电，防止电池过放亏电，每半年应进行一次充放电循环。

When the battery pack is not in use for a long time, it shall be charged every 3 months regularly in case of the occurrence of over-discharge; And it is recommended to cyclically charge and discharge the battery pack every 6 months.

- ★ 免责声明：本设备应在产品规格书等规定的范围内使用。由于产品需求单位在安装、调试、维修、使用等过程中存在不当行为或用于产品规定的使用范围外等不按规定使用行为造成人员、动物或财产损失，生产厂家不负合同条款上和合同条款以外的责任。
- ★ Disclaimer: These mentioned products shall be used within the scope specified in product specifications. The manufacturer shall be free from liability for any damages to people, animals or property caused by the improper operations in the process of installation, commissioning, maintenance, use, etc., or uses not in accordance with the terms and conditions specified in product specifications.

8. 附录 Appendix

Item	Specification					
System Name	SR008D-314	SR016D-314	SR024D-314	SR032D-314	SR040D-314	SR048D-314
System Energy	8.0kWh	16.0kWh	24.0kWh	32.0kWh	40.0kWh	48.0kWh
Battery Module Qty (Optional)	1 (Min.)	2	3	4	5	6 (Max.)
Battery Voltage	25.6V					
Battery Voltage Range	21.6V~29.2V					
Rated Capacity	314Ah	628Ah	942Ah	1256Ah	1570Ah	1884Ah
Rated Output Voltage	450V~850V(Optional)					
Max. Continuous Charge/Discharge Power	4kW	8kW	12kW	16kW	20kW	24kW
Operating Humidity	5%~95%					
Depth of Discharge	95% DoD					
Operating Environment Temperature	-20°C~50°C					
Storage Temperature	0°C~35°C					
Dimension (D*W*H)	640*388*570.5 mm	640*388*850.5 mm	640*388*1130.5mm	640*388*1410.5 mm	640*388*1690.5mm	640*388*1970.5mm
System Weight	96kg	171kg	246kg	321kg	396kg	471kg
IP Rating	IP65 (System Level)					
Operating Altitude	3000m					
Certification	UN 38.3, IEC 62619, IEC 61000, IEC 62040, IEC 62477					