
Star-Q 50kW_109kWh

一体式储能柜

产品规格书

版本：V1.0

Star-Q 50kW_109kWh

Product Specification

For All-in-one Energy Storage Cabinet

Version: V1.0

修订历史 Revision History

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V 1.0	首次发布 First Release	2024-10-22

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1. 产品描述 Product Description

产品型号：SCF-0050K-0109H-L-IN

Product model: SCF-0050K-0109H-L-IN

产品类型：一体式储能柜

Product type: All-in-one energy storage cabinet

1.1. 供货范围 Scope of Supply

本文档的目的是明确 一体式储能柜的规格，向客户提供指定产品的使用信息。本产品的供应范围：电箱、控制箱、消防系统、冷却系统、混合逆变器、控制系统、配电系统、一次二次连接。

This document is intended to specify the specifications of all-in-one energy storage cabinet and provide instructions on the use of the specified product.

The scope of supply of this product includes battery pack, control box, fire suppression system, cooling system, Hybrid Inverter, control system, power distribution system, and primary and secondary circuit connections.

表 1 一体化储能柜组成

Table 1 Components of all-in-one energy storage cabinet

组件 Configuration	数量 Quantity	备注 Note
电箱 Battery pack	7 个 7 pcs	440mm(W)*830mm(D)*247mm(H)
控制箱 Control box	1 个 1 pcs	包含 BMS Including BMS
消防系统 Fire suppression system	1 套 1 set	
冷却系统 Cooling system	1 套 1 set	空调 Air conditioner
混合逆变器 Hybrid Inverter	1 台 1 pcs	混合逆变器 Hybrid Inverter
控制系统 Control system	1 套 1 set	

配电系统 Power distribution system	1 套 1 set	包含配电开关 Including power distribution switch
一次、二次连接 Primary and secondary circuit connections	1 套 1 set	包括机架内的电缆、连接器等 Including cables, connectors in rack frame, etc.

2. 产品规格 Specifications

2.1. 外观及尺寸 Appearance and Dimension

一体式储能柜的外观如图 1 所示，产品主要设备见图 2，性能参数参见表 2。

The appearance of all-in-one energy storage cabinet is given in Figure 1, key components is given in Figure 2 and performance parameters are shown in Table 2.



图 1 外观图

Figure 1 Appearance drawing

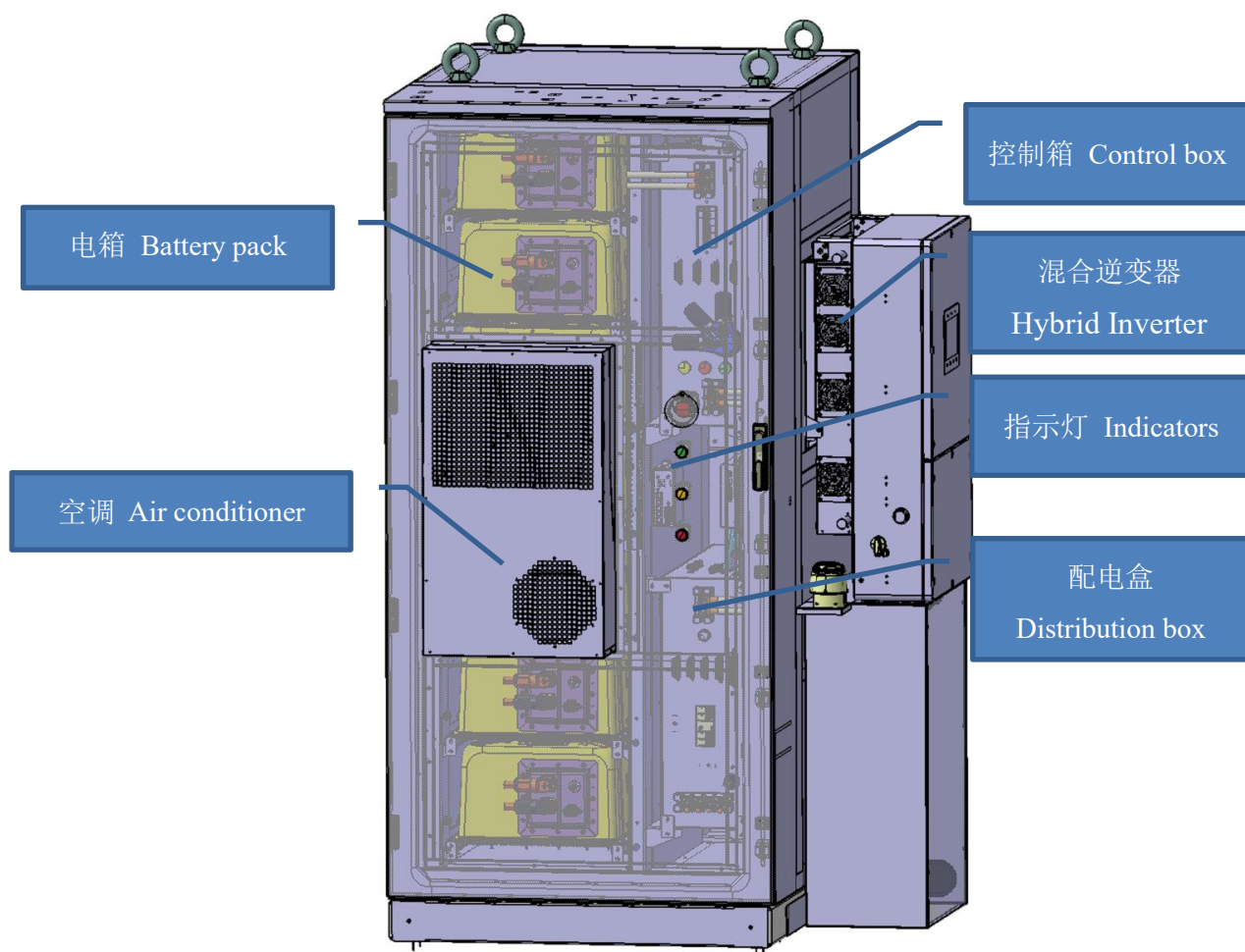


图 2 主要设备

Figure 2 Key components

2.2. 主要性能参数表 Parameters

表 2 储能柜主要参数

Table 2 Parameters of all-in-one energy storage cabinet

项 No.	名称 Item	规格 Specifications	备注 Note
1	电柜组成 Configuration	1P16S7S	
2	标称能量 Rated energy	109.67kWh	
3	直流电压范围	313.6~403.2Vdc	

	DC voltage range			
4	交流侧额定电压 AC side rated voltage		400Vac	
5	交流侧额定频率 AC side rated frequency		50Hz/60Hz	
6	混合逆变器额定功率 Hybrid Inverter rated power		50kW	
7	接线方式 Connection method		电网端：3 相 4 线 Grid:3P4W 柴发端：3 相 4 线 Diesel generator port: 3P4W 负载端：3 相 4 线 Critical load:3P4W 光伏端：单相直流 PV port:direct current	
8	充电功率 Charging power	标称 Rated	0.5P	电池功率 Power of battery
9		最大 Maximum	0.5P	
10	放电功率 Discharging power	标称 Rated	0.5P	
11		最大 Maximum	0.5P	
12	工作温度 Operating temperature		-25~55℃	
13	最佳工作温度 Optimum Operating temperature		20±3℃, 平均 20℃ (20±3℃, mean temperature 20℃)	
14	应用高度 Altitude		2000m	
15		尺寸	A.950(W)*1200(D)*2050(H)mm (不含吊	以具体产品为准

	综合参数 General parameters	Dimension	环及泄爆板，空调及逆变器) B.1270(W) (含逆变器) *1340(D) (含空调) *2094(H)mm (含泄爆板) A.950(W)*1200(D)*2050(H)mm(exclude ring, deflagration panel, air conditioner,hybrid inverter) B.1270(W)(include hybrid inverter)*1340(D)(include air conditioner)*2094(H)mm (include deflagration panel)	Specific dimension is subject to physical product
16		重量 Weight	约 1.8 T About 1.8T	以具体产品为准 Specific dimension is subject to physical product
17		保护等级 Ingress protection	系统: IP54 Equipment cabinet: IP54 电箱: IP67 Battery Pack: IP67	
18		冷却模式 Cooling mode	风冷 (电池) 风冷 (混合逆变器) Air-cooling (Battery) Air-cooling (Hybrid Inverter)	
19		防腐等级 Anti-corrosion	C4、C5 (选配) C4,C5(optional)	
20		消防 Fire suppression	气溶胶，烟感、温感，水消防接口，泄压阀，可燃气体传感器 (选配)，泄爆板 (选配)，声光报警器 (选配) Aerosol, Smoke detector, Heat detector, Dry pipe system, Relief valve, Flammable	

			gas detector (optional), Deflagration panel (optional), Audible and visual alarm (optional)	
21		辅助用电功率 Aux. Power supply power	~1.5kW	
22		通信 Communication	Modbus TCP	
23		认证 Certification	IEC62619, IEC 63056, IEC 62477, IEC 60730, IEC 61000, UN38.3, UN3480	
24		对外通讯方式 External communication method	4G 路由器（选配） 4G Router (optional)	

3. 产品介绍 Introduction

储能柜由 7 个电箱、1 个控制箱、1 个空调、1 个混合逆变器、1 个配电盒组成。

All-in-one energy storage cabinet is composed of 7 battery packs, 1 control box, 1 Air conditioner, 1 Hybrid Inverter and 1 distribution box.

3.1. 电箱 Battery Pack

电箱由 306Ah 电芯 1P16S 成组和一个 CSC 组成。CSC 可以监控单体电芯的电压、温度等数据，并将数据上传给 SBMU。

Battery pack is composed of 306Ah 1P16S battery cell and one CSC. CSC can monitor the voltage, temperature and other data, and upload to SBMU.

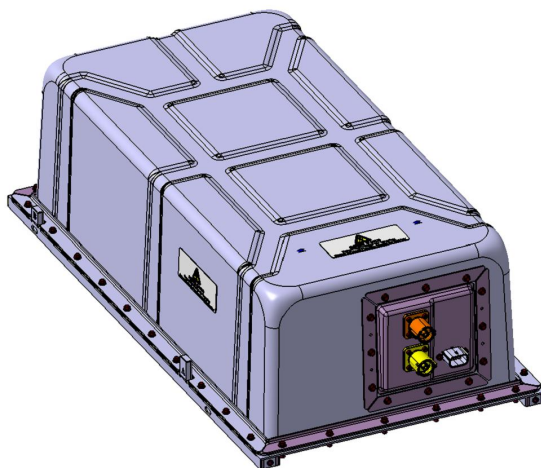


图 3 电箱

Figure 3 Battery pack

3.2. 控制箱 Control Box

控制箱由测量装置、保护装置和 SBMU 组成。可采集电池簇总电流、总电压等数据数据，可在电池状态异常时断开高压回路，并将数据上传给 EMS 系统。指示灯会指示电池系统状态。

Control box is composed of measurement device, protection device and a SBMU. It can collect total current, total voltage and other data of battery packs, and can cut-off HV when system has fault, and upload data to EMS. It has indicators to show the system statues.

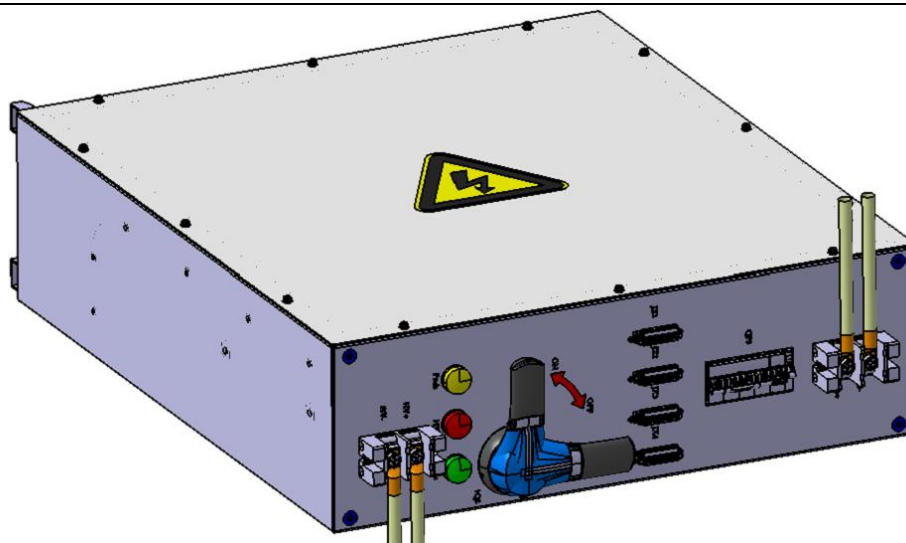


图 4 控制箱

Figure 4 Control box

表 3 指示灯定义

Table 3 Definition of indicators

名称 Name	定义 Definition
电源 Power	电池辅助供电正常，电源灯亮绿色 Aux. Power supply is power on, Power light in green
高压 HV	电池处于高压状态，高压灯亮红色 Battery HV is power on, HV light in red
故障 Fault	电池处于故障状态，故障灯亮黄色 Battery is in fault statue, Fault light in yellow

3.3. 空调 Air Conditioner

空调是一种作为储能柜控温的设备，其包含制冷功能、加热功能等功能。能有效控制电芯温度在最佳运行温度范围，使电池长期保持最佳温度工作，保证电芯正常运行，延长电池循环使用寿命。

Air conditioner is a device used as an energy storage cabinet for temperature control. It includes cooling function, heating function, etc. It can effectively control the temperature of the battery in the best operating temperature range, so that the battery can maintain the best temperature for a long time, ensure

the normal operation of the battery cell, and extend the cycle life of the battery.

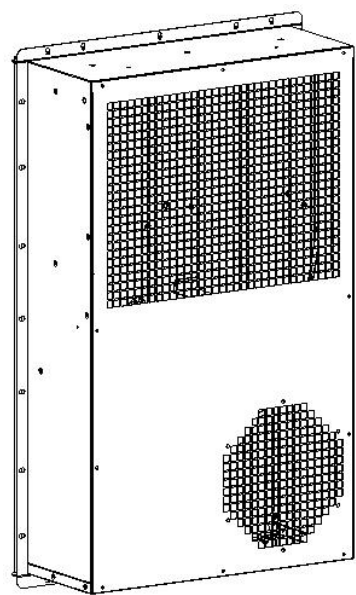


图 5 空调

Figure 5 Air Conditioner

表 4 空调参数

Table 4 Parameters of Air Conditioner

风量 Air Flow	600m ³ /h
制冷剂 Refrigerant	R134a
制冷量 Refrigerating capacity	2kW （L35/L35）
制热量 Heating capacity	1kW
工作电压范围 Operating voltage range	220V±15%,
工作频率 Operating frequency	50Hz

注：若电源频率为 60Hz，空调的最高工作温度需要降低至 50℃。

Note:If the Operating frequency is 60Hz,the maximum Operating temperature of the air conditioner needs to be reduced to 50℃。

会根据储能柜具体使用环境调整空调参数，发挥热管理最佳使用效果。

will adjust the parameters of Air Conditioner in accordance with the specified environmental condition of all-in-one energy storage cabinet so as to make best use of thermal management.

3.4. 混合逆变器 Hybrid Inverter

1、混合逆变器集成逆变器、MPPT、离并网转换开关以及柴发干接点，光伏、市电、柴发、负载轻松接入，实现即插即用。内置多种运行策略，支持自发自用、柴发控制、离网备电等多场景应用

Hybrid inverter integrated inverter, MPPT, switch device;reserve ports of PV,grid,diesel generator and load,plug and play. Preinstall multiple operation strategy, self-use, diesel generator control, off-grid mode,etc



图 6 混合逆变器

Figure 6 Hybrid Inverter

表 5 混合逆变器参数表

Table 5 Parameters of Hybrid Inverter

项目 Item	参数 Specification parameters	备注 Remark
PV 输入 PV input		
推荐最大 PV 功率 Recommended max. PV array size	96kW	
MPPT 电压范围 MPPT Voltage Range [V]	150-850V	

额定电压 Rated voltage[V]	600V	
MPPT 路数 No. of MPPT Tracker	4	
单路 MPPT 输入组串数量 No. of Input Strings per Tracker	2	
最大输入电流 Max. PV Input Current [A]	40/40/40/40	
并网输出 AC Output(On-grid)		
额定输出功率 Rated AC Output Power [kW]	50	
额定输出电压 Rated AC Voltage [V]	380V/400V 3L+N+PE	
额定频率 Rated Frequency [Hz]	50/60Hz	
离网输出 AC Output (Off-grid)		
额定输出功率 Rated AC Output Power [kW]	50	
额定输出电压 Rated AC Voltage [V]	380V/400V 3L+N+PE	
额定频率 Rated Frequency [Hz]	50/60Hz	
基本参数 General Data		
并离网切换时间 On-grid/off-grid switching time	< 20 ms	
最大并联数量 Max.number of system in parallel	6	
工作温度范围 Operation Temperature Range [°C]	-25 ~ 55	
工作高度	≤ 2000 no derating	

Operation Altitude [m]		
工作湿度 Operation humidity	≤95%, no condensing	
冷却方式 Cooling mode	风冷 air cooling	
混合逆变器认证 Hybrid Inverter Certification	EN 50549-1、EN50549-10、 VDE-AR-N 4105、 NRS 097-2-1、IEC 61000、IEC 62477、IEC62109	

3.5. 配电舱 Distribution cabinet

配电舱主要包含开关电源、控制单元、各设备空开等电气件。用于给电池、空调和内部电气件提供辅助用电电源。

Distribution cabinet is consists of power supply, control units, breakers and other devices. It can provide aux. power supply for battery, air conditioner and other components.

系统对外接口包含交流动力线（含电网端，客户负载端，柴发端）、直流动力线（含光伏组件输入线束）和通讯线，接口位置如图 8 所示，接口定义见表 6。

The external cable includes AC power cable (grid port, load port, diesel generator port), DC power cable (PV panel) and communication cable. The location is shown in figure 8 and definition is shown in table 6.

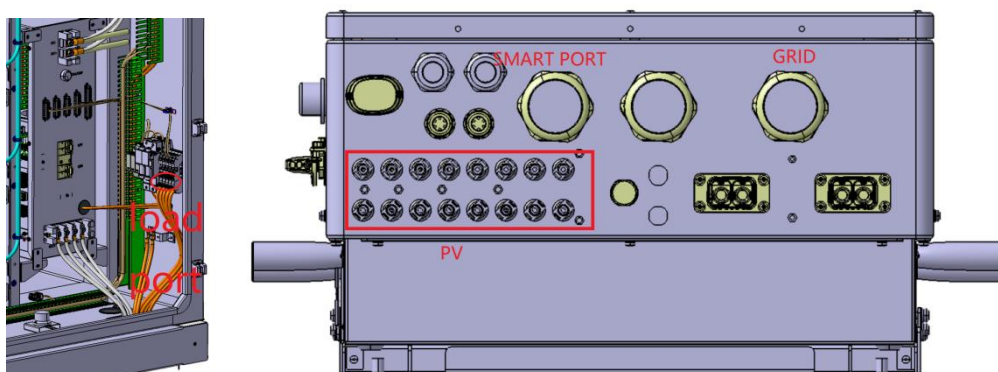


图 7 接口位置

Figure 7 Connector location

表 6 接口定义

Figure 6 Connector definition

类型 Type	端口 Connector	定义 Definition	位置 location
光伏接线 (PV)	第 1 组 光伏组件输入 Group 1 PV Panel input	PV1+	接入混合逆变器底部 On the bottom of the hybrid inverter
		PV1-	
	第 2 组 光伏组件输入 Group 2 PV Panel input	PV2+	
		PV2-	
	第 3 组 光伏组件输入 Group 3 PV Panel input	PV3+	
		PV3-	
	第 4 组 光伏组件输入 Group 4 PV Panel input	PV4+	
		PV4-	
市电端接线 (GRID)	A	交流 A 相 Phase A	接入混合逆变器内部 (Inside the hybrid inverter)
	B	交流 B 相 Phase B	
	C	交流 C 相 Phase C	
	N	N 线 Neutra line	
柴发端接线 (SMART PORT)	A	交流 A 相 Phase A	接入混合逆变器内部 (Inside the hybrid inverter)
	B	交流 B 相 Phase B	
	C	交流 C 相 Phase C	
	N	N 线 Neutra line	
负载端接线(load port)	A	交流 A 相 Phase A	接入储能柜内部 Inside all-in-one energy storage cabinet
	B	交流 B 相 Phase B	
	C	交流 C 相 Phase C	

	N	N 线 Neutra line	
通讯接口 (communication port)	Ethernet 1	EMS 通讯接口 (Communication port of EMS)	接入储能柜内部 Inside all-in-one energy storage cabinet

3.6. 消防 Fire suppression

消防系统由水消防、气溶胶、烟感探测器、温感探测器、泄压阀，可燃气体探测器（选配），泄爆板（选配），声光报警器（选配）组成，通过干接点或通讯的方式反馈给控制中心。当任一探测器检测到火灾信号时，会输出报警信号上传到控制中心执行对应的策略。当舱内温度持续升高并达到气溶胶触发的温度阈值时，气溶胶会启动，同时将信号反馈给控制中心，执行对应策略。

The fire suppression system consists of dry pipe ,aerosol, smoke detector, temperature detector, relief valve,flammable gas detector (optional), deflagration panel (optional),audible and visual alarm (optional) ,which are communicating with the control center through dry contacts or communication. When any detector detects a fire signal, it will output an alarm signal and upload it to the control center to execute the corresponding strategy. When the temperature inside the cabin continues to rise and reaches the temperature threshold triggered by aerosols, aerosols will be activated, and the signal will be fed back to the control center to execute the corresponding strategy.

4. 热管理系统 Thermal Management System

热管理系统空调及控制模块。电池系统的环境和自温将直接影响系统正常运行、电芯循环寿命、充放电、输出功率、可用容量、安全可靠性等性能。为了使电池的性能和寿命达到最佳，需要对电池系统的温度进行具体的控制，通过热管理控制在较好环境下运作。

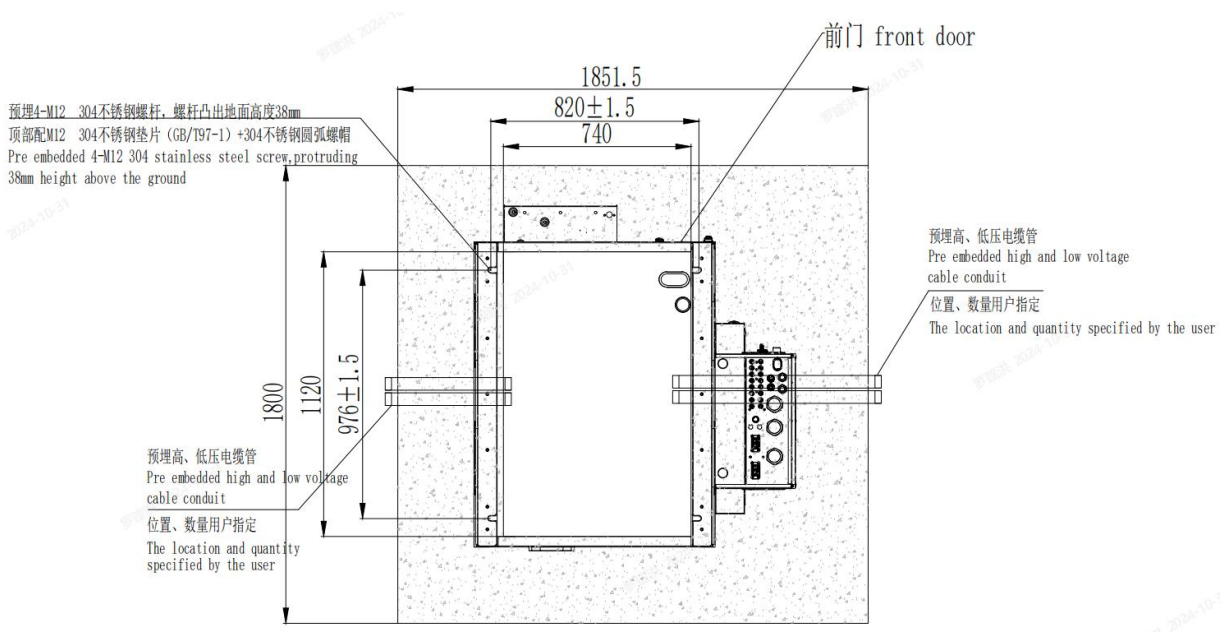
The thermal management system consists of control module and air conditioner. The environment and self-temperature of the battery system will directly affect its performance, including normal operation, cycle life, charge & discharge, output power, available capacity, safety and reliability. In order to achieve the optimum performance and longevity of the battery

system, it is necessary to conduct a control over the temperature of the battery system in specific range. Therefore,the battery system could be controlled to operate in a better environment through thermal management.

5. 安装及使用说明 Instructions for Installation and Use

5.1. 地脚尺寸 Bottom Foot

确保设备摆放整齐、平稳，然后用相对应的螺丝固定牢固。
Make sure the equipment is placed neatly and stably, and then fasten it with corresponding screws.



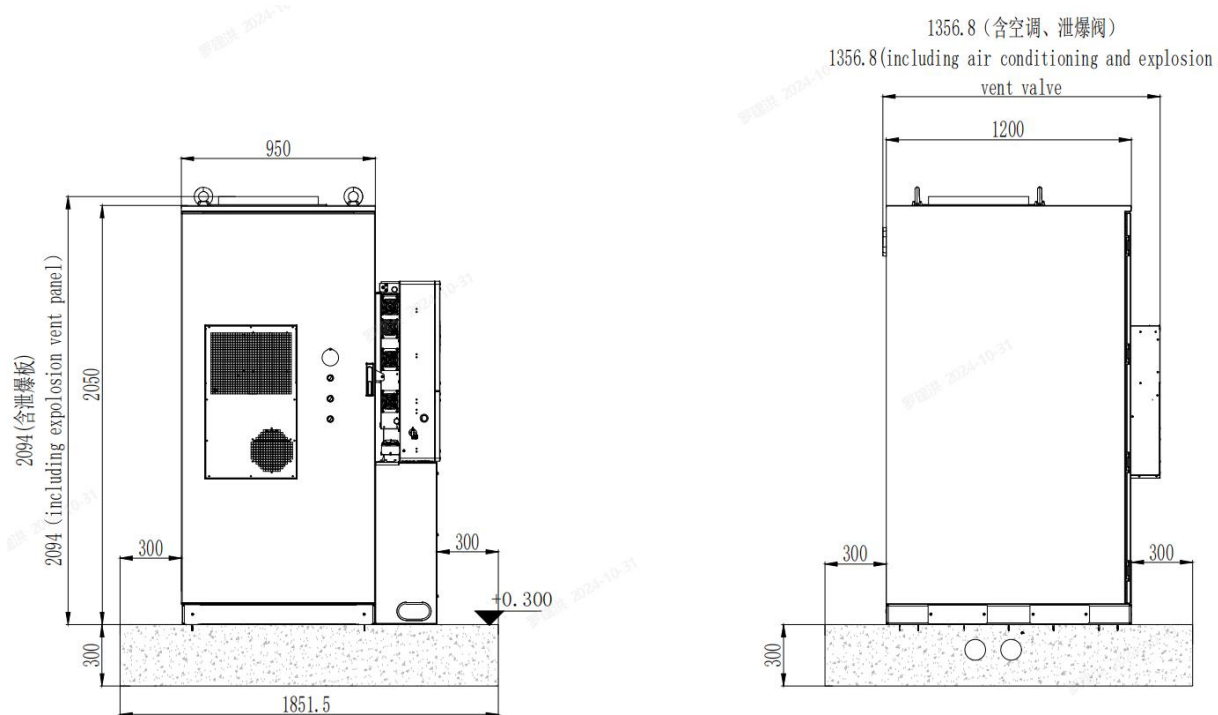


图 10 地脚尺寸

Figure 10 Dimensions of bottom foot

5.2. 一体柜布局 Layout of the all-in-one energy storage cabinet

不同一体柜布局方式如下图所示

Varied layouts of the all-in-one are presented in the figures below:

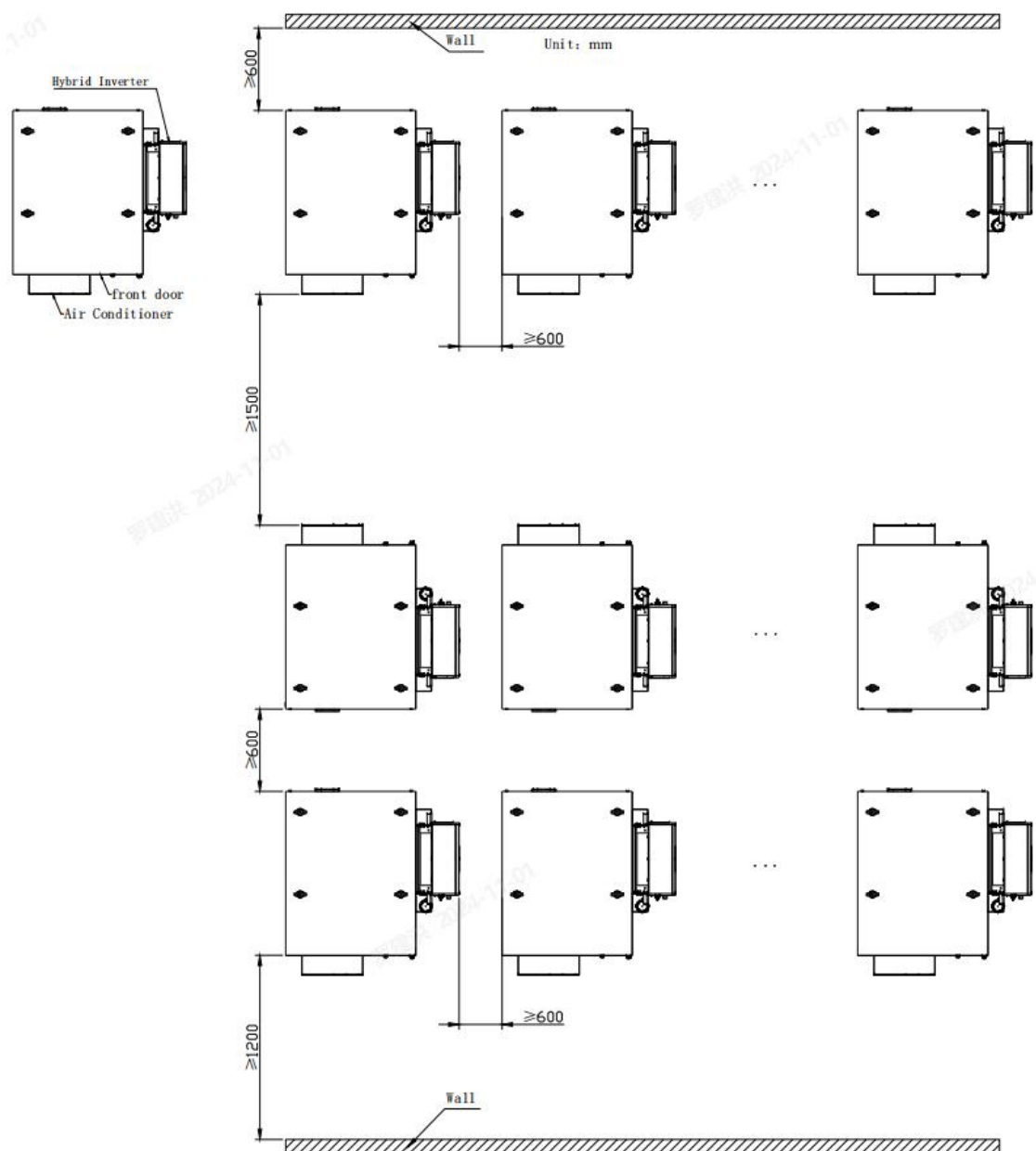


图 11 柜体间距离（俯视图）

Figure 11 Back-to-back arrangement (Top view)

背靠背最小间隙为 600mm，面对面推荐距离 ≥ 1500 mm。

For back-to-back arrangement, the minimum clearance between equipment is 600mm, and the recommended clearance between the front side of the two rack is more than 1500mm.

柜体背面与墙体最小间隙为 600mm，柜体正面与墙体推荐的最小间隙为 1200mm。

For back-to-enclosure arrangement, the minimum clearance between the back side of equipment and the enclosure is 600mm, and the recommended clearance between the front side of equipment and the enclosure is 1200mm. (For installation and maintenance).

左右距离安装时建议最小间隙为 600mm，考虑安装时地基的不平整度和制造偏差。

It is recommended to have a minimum gap of 600mm when installing from left to right, taking into account the unevenness of the foundation and manufacturing deviations during installation.

6. 使用注意事项 Precautions of Use

储能系统属于危险品，非专业人士及不当的操作与使用可能引起触电、燃烧、爆炸等严重的后果。储能系统的安装、维护必须是专业技术人员操作，使用必须严格遵守相关的安全规定。严禁非专业人员安装、维修储能系统以及超范围滥用。

Because energy storage system is regarded as dangerous goods, improper operation and be used by non-professionals may cause electric shock, combustion, explosion and other serious consequences. The installation and maintenance of energy storage system must be carried out by professional technicians, and the relevant safety regulations must be observed during use. It is strictly forbidden for non-professionals to conduct installation, maintenance and over-range misuse on energy storage system.

6.1. 环境要求 Requirement for environment

设备安装环境应通风良好，远离水源、热源和易燃易爆物品，避免将设备安装在有粉尘、挥发性气体、腐蚀性物质和盐分过高的环境中。

The equipment shall be installed in an environment with good ventilation and away from water, heat, and flammable and explosive materials. Do not install the equipment in an environment with dust, VOCs, corrosive substances or high salt content.

6.2. 注意事项 Precautions

(1) 定期清洁设备，特别是注意清洁进风口和出风口，必要时使用吸尘器进行清理，确保空气能够在柜内自由流通。

(1) Clean the equipment regularly, especially the air inlet and outlet. Ensure free circulation of air in the equipment cabinet by using vacuum cleaner if necessary.

(2) 确保设备内无任何杂物，设备周边无杂物妨碍维护人员对设备进行保养和维护。

(2) Make sure that there are no sundries inside or around the equipment that may hinder the operator from performing maintenance on the equipment.

(3) 定期检查线缆连接端子是否有松动，端子表面是否有严重生锈或氧化，接触是否良好。

(3) Check regularly whether the connection terminal of cable is loose, whether the surface of the terminal is rusted or oxidized, and whether the contact is good.

-
- (4) 定期检查线缆是否有老化、破损，绝缘是否良好。
- (4) Check regularly whether the cable is aged or worn, and whether the insulation is good.
- (5) 定期检查系统状态指示灯及报警指示灯是否完好，功能是否正常。
- (5) Check regularly whether status indicator lights and alarm indicator lights of the system are intact and can function to work normally.
- (6) 定期检查系统急停开关是否有效，确保紧急情况能快速停止系统。
- (6) Check regularly whether the emergency stop switch of the system can stop the system instantly in case of an emergency.
- (7) 定期检查消防灭火装置，状态是否正常，性能是否良好。
- (7) Check regularly whether fire extinguisher devices are in normal status and good in performance.
- (8) 长期静置不用：当电池系统长时间静置不用时，应该每隔 3 个月对系统进行一次充电，使得 SOC 达到 60%以上。
- (8) Long-time non-use: the battery system shall be charged to 60% SOC every three months when it is not be used for a long time.

6.3. 定期维护 Regular maintenance

定期维护保养根据不同的设备制定定期维护保养计划，并且填写定期维护保养记录表：
Conduct regular maintenance and implement corresponding plans with respect to different equipment. Complete the record list for regular maintenance.

表 7 系统定期维护保养计划

Table 7 Regular maintenance plan for the system

项目 Items	频率(推荐) Frequency (recommended)	备 注 Note
保存系统运行数据 Save system operating data.	每 1 个月 Every one month	
检查混合逆变器、配电开关等关键元器件的清洁情况，如	每半年	

有必要，进行清洁。 Check cleaning condition of key components such as Hybrid Inverter and power distribution switch, and clean them if necessary.	Every half a year	
混合逆变器、风机清理或者更换空气过滤网，增大进风口的风量。 Clean Hybrid Inverter and fan or replace air filter screen to increase the air volume of air inlet.	每半年 Every half a year	
检查各接线点螺栓处是否有老化、烧焦的痕迹，并用手晃动，确认处于拧紧的状态；Check whether there is a sign of aging and burning on bolts of each connection. Shaking the bolts to confirm that they are tightly fastened.	每半年 Every half a year	
检查功率电缆、控制电缆有无破皮痕迹，若出现需增加相应的绝缘措施或更换线缆； Check whether there is a sign of breakage on power cables and control cables. Take corresponding insulation measures or replace cables if the situation occurs.	每半年 Every half a year	
检查电池继电器是否能正常吸合。 Check whether the relay can perform normal pick-up.	每 1 个月 Every one month	
检查防雷器是否失效；防雷器指示窗变为红色时，表示防雷器失效，需及时更换，若为绿色，说明防雷器正常。 Check whether the SPD fails; if the indicator window of the SPD turns red, it indicates that the SPD fails and thus needs to be replaced, and if the indicator window is green, it indicates that the SPD is normal.	每 1 个月以及每次雷雨后检测一次 Every one month and once after every thunderstorm	
连接器检查是否有松动，端子表面是否有严重生锈或氧化，接触是否良好。 Check whether the connector is loose, whether the surface of the terminal is rusted or oxidized, and whether the contact is good.	每半年 Every half a year	
绝缘阻抗检测(高压回路)是否大于 $2M\Omega$ (DC 1000V)	每 4 年	

Detecting whether the insulation resistance (HV circuit) exceeds 2 MΩ (DC 1000V).	Every four years	
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