



User Manual

Integrated PV-Storage -Genset Hybrid System

BS07-265-ES-G

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1. Preface

This manual mainly introduces our company 's BS07-265-ES-G product. BS07-265-ES-G is an integrated lithium iron phosphate battery energy storage system . Please read this manual carefully before installing and using the product , understand the safety information and be familiar with the relevant information, and follow the instructions carefully during the installation process. If you have any confusion, please contact the supplier for advice and instructions.

1.1 Applicable Products

This document is applicable to the following products of our company :
BS07-265-ES-G

※In this manual, unless otherwise specified, whenever "system" or "energy storage system" is mentioned, it refers to this model product.

1.2 Applicable personnel

It is only suitable for professionals who are familiar with local regulations and electrical systems, have received professional training, and are familiar with the relevant knowledge of this product. Including but not limited to:

- Technical Support Engineer
- Installation Engineer
- Debugging Engineer
- Electrical Engineer
- Maintenance Engineer

1.3 Legal Notice

The copyright of this document belongs to our company . No part of this document may be extracted, copied, translated, annotated or reproduced in any form or by any means without the prior written authorization of our company .

All rights are reserved by our company.

Please note that in order to provide the best customer experience, the content of this manual may be updated and modified , so there may be some errors or slight discrepancies with the actual situation . If the information changes, no further notice will be given. Please obtain the latest manual from the sales channel.

1.4 Other Statements

Before transporting, storing, installing, operating, using and maintaining the equipment, please read this manual first, operate strictly in accordance with the contents of the manual, and follow the markings on the equipment and all safety precautions in the manual. In this manual, "equipment" refers to the products, software, components, spare parts and services related to this manual; "the company" refers to the manufacturer (producer), seller or service provider of the equipment; "you" refers to the entity that transports, stores, installs, operates, uses and maintains the equipment.

The "Danger", "Warning" and "Notice" items in the manual do not represent all the safety items that should be observed. You must also comply with relevant international, national or regional standards and industry practices. The company does not assume any responsibility for any violation of safety operation requirements or violation of safety standards for design, production and use of equipment.

This equipment should be used in an environment that meets the design specifications. Otherwise, the possible equipment failure, equipment malfunction or component damage is not within the scope of the equipment quality assurance. Otherwise, the company will not be liable for compensation for personal injury, property loss, etc.

All operations including transportation, storage, installation, operation, use and maintenance must comply with applicable laws, regulations, standards and specifications.

It is prohibited to reverse engineer, decompile, disassemble, adapt, implant, etc. the device, study the internal implementation logic of the device, obtain the source code of the device software, infringe intellectual property rights in any way, and disclose the results of any device software performance test.

The Company shall not be liable for any of the following circumstances or their consequences:

- Equipment damage caused by earthquake, flood, volcanic eruption, mudslide, lightning strike, fire, war, armed conflict, typhoon, hurricane, tornado, extreme weather, or force majeure;
- Not operated within the conditions of use described in this manual;
- The installation and use environment does not comply with relevant international, national or regional standards;
- Unqualified personnel installing and using the equipment;
- Failure to follow the operating instructions and safety warnings in the product and documentation;
- Unauthorized disassembly, modification of the product or modification of software code;
- Damage caused by transportation by you or a third party you entrust;
- Damage caused by storage conditions not meeting the requirements of product documentation;
- The materials and tools you bring with you do not meet the requirements of local laws, regulations and relevant standards;
- Damage caused by your or a third party's negligence, intent, gross negligence, improper operation or reasons not attributable to our company.

1.5 Revision History

The latest version in the revision log contains the updated contents of all previous document versions.

V1.0.0.20250722

- **First issue.**

V1.0.0.20250728

- **Model designation update.**

2. Safety precautions

2.1 Safety Tips

Read all safety instructions carefully before performing any work and follow them when handling batteries.

Incorrect operation may result in:

- Injury or death of the operator or third party
- Damage to system hardware

Skills required of qualified personnel :

- Training in electrical system installation and commissioning and hazard handling
- Understanding this manual and other related documents
- Know your local regulations and directives

may appear in this manual to highlight information . Their meanings are as follows:

	Indicates a hazardous situation which , if not avoided, will result in death or serious injury .
	Indicates a possible damage or injury. If not avoided, a low to medium risk situation could result in death, injury, or damage.
	Indicates potential equipment damage or environmental safety warnings. Failure to avoid may result in equipment damage, data loss, performance degradation, or other unpredictable consequences.

2.2 Personal safety



It is strictly forbidden to install, maintain, or overhaul the equipment when it is energized!
When maintaining or overhauling the equipment, at least two people must be on site.

2.2.1 Personnel requirements

- Only professional electricians or personnel with professional qualifications can perform various operations on this product.
- Operators should be fully familiar with the structure and working principle of the entire energy storage system.
- Operators should be fully familiar with this manual.
- Operators should be fully familiar with the relevant standards of the country/region where the project is located.

2.2.2 Safety warning operation

When installing, performing routine maintenance, or inspecting the battery pack, please follow the following warnings to prevent unrelated personnel from approaching and causing misoperation or accidents:

- Place clear markings on the front, back and switch of the battery pack to prevent accidental closing of the switch.
- Set up warning signs or safety warning tapes near the operating area.
- After maintenance or repair operations are completed, be sure to remove the cabinet door key and keep it properly.

2.3 Electricity safety



It is strictly forbidden to operate with power on during the installation process. It may cause fire or personal injury.

2.3.1 Electrical safety

- Never touch terminals or conductors connected to the mains circuit.
- Observe all instructions or safety documents regarding connection to the power grid and comply with warning signs on the product .
- Observe the safety precautions listed in this manual and other documentation related to this equipment.

- Perform a preliminary visual inspection of the equipment for damage or other hazards before operating .
- Check whether other external devices or circuit connections are secure.
- Make sure the equipment is in a safe state before operating it.

2.3.2 Static Electricity Safety

- Avoid unnecessary contact with the circuit board.
- Observe electrostatic protection regulations, such as wearing an anti-static wrist strap.

2.3.3 Battery Pack Notes

- There is a lethal high voltage between the positive and negative poles of the energy storage battery pack.
- Damaged equipment or system failure may cause electric shock or fire
- When maintaining the equipment, ensure that the connection between the energy storage inverter and the energy storage battery pack is completely disconnected.

2.4 Environmental safety



It is strictly forbidden to place the device in an inflammable, explosive or smoky environment, otherwise it may cause hazards such as fire or explosion.

2.4.1 Escape route requirements

To ensure that staff can evacuate the scene quickly in the event of an accident, please comply with the following:

- Do not place flammable or explosive items around the battery pack .
- It is strictly prohibited to pile up debris in the escape passage or occupy the escape passage in any form.

2.4.2 Moisture protection

- Do not use the product in an environment that is more humid than specified .

2.5 Machinery Safety



When working at heights, you must wear safety equipment such as a helmet and fasten yourself to solid structural parts to prevent falling accidents.

Before installing the equipment, make sure it is securely fixed to avoid problems such as tipping over and injuring people or damaging the equipment.

2.5.1 General requirements

- Scratches that occur during transportation and installation must be repaired in a timely manner, and it is strictly forbidden to expose the scratched parts for a long time.
- It is prohibited to perform welding, cutting and other operations on the equipment without permission.
- Proper use of work and the correct use of tools.
- When working at height, wooden ladders or insulated ladders should be used, and straight ladders are prohibited.
- When using a ladder, the ladder must be placed on a stable surface and someone must hold the ladder during operation.

2.5.2 Heavy object handling requirements

- When moving heavy objects, you should be prepared to bear the weight in advance.
- When multiple people are carrying the load, they should be distributed appropriately to ensure that the weight is evenly distributed.
- When carrying heavy objects, you should wear protective gloves, labor protection shoes and other safety gear.

2.5.3 Forklift and lifting requirements

- When using a forklift, make sure the forks are in the middle position before raising the fork arms to prevent tipping.
- Before moving, the equipment needs to be fastened to the forklift with ropes; during moving, it needs to be supervised by a dedicated person.
- Lifting operators need to undergo relevant training and pass the training before they can start work.
- Warning signs must be erected to isolate the lifting area.
- The lifting conditions must meet the operating requirements
- During lifting operations, serious personnel are walking under the operation.
- During hoisting, ensure that the angle of the hoisting cable is less than 90°.

2.6 Live test specifications



There is a fatal high voltage between the positive and negative poles of the energy storage battery pack.

Two people must be involved in the operation to ensure personal safety.

2.6.1 Live measurement

There is high voltage in the device. Accidental contact may result in fatal electric shock. Therefore, when measuring with power on, you should:

- Take protective measures (such as wearing insulating gloves, insulating shoes, etc.) .

2.6.2 Measuring equipment used

When performing electrical measurements, connections, or test runs on equipment:

- Select high-quality measuring equipment whose measuring range and usable conditions meet the on-site requirements .
- Ensure that the connection and use of measuring equipment are correct and standardized to avoid dangers such as arcing

2.7 Equipment Security



Protective measures such as fences and walls must be set up around the equipment, and safety warning signs must be erected for isolation to prevent unauthorized personnel from entering and misoperating the equipment during operation, which may cause personal injury or property loss.

■ The equipment installation layout must meet the installation protection requirements specified in local standards, including but not limited to GB 51048-2014 Design Code for Electrochemical Energy Storage Power Stations, NFPA 855 Standard for the Installation of Stationary Energy Storage Systems» specification requirements .

■ Before installing, operating, or maintaining the battery, please read the relevant instructions and follow the manufacturer's requirements.

■ Please use the battery within the specified ambient temperature range.

■ If the battery is accidentally exposed to water, do not continue to install it. Please transport it to a safe place and dispose of it promptly.

■ Before installing the battery, check that the battery pack casing is not damaged or deformed.

2.8 Product scrapping



When the product needs to be scrapped and discarded, it cannot be treated as regular waste.

- Our company has priority to recycle scrapped batteries
- For scrapped batteries that are not recycled by our company, please contact local authorized professional recycling agencies or manufacturers for scrap recycling.

Note: This manual cannot cover all possible situations during operation, maintenance, and repair. If you encounter a situation that is not explained in the manual, please give priority to following the relevant local regulations and standards and contact our company in a timely manner.

3. Product Overview

3.1 System Introduction

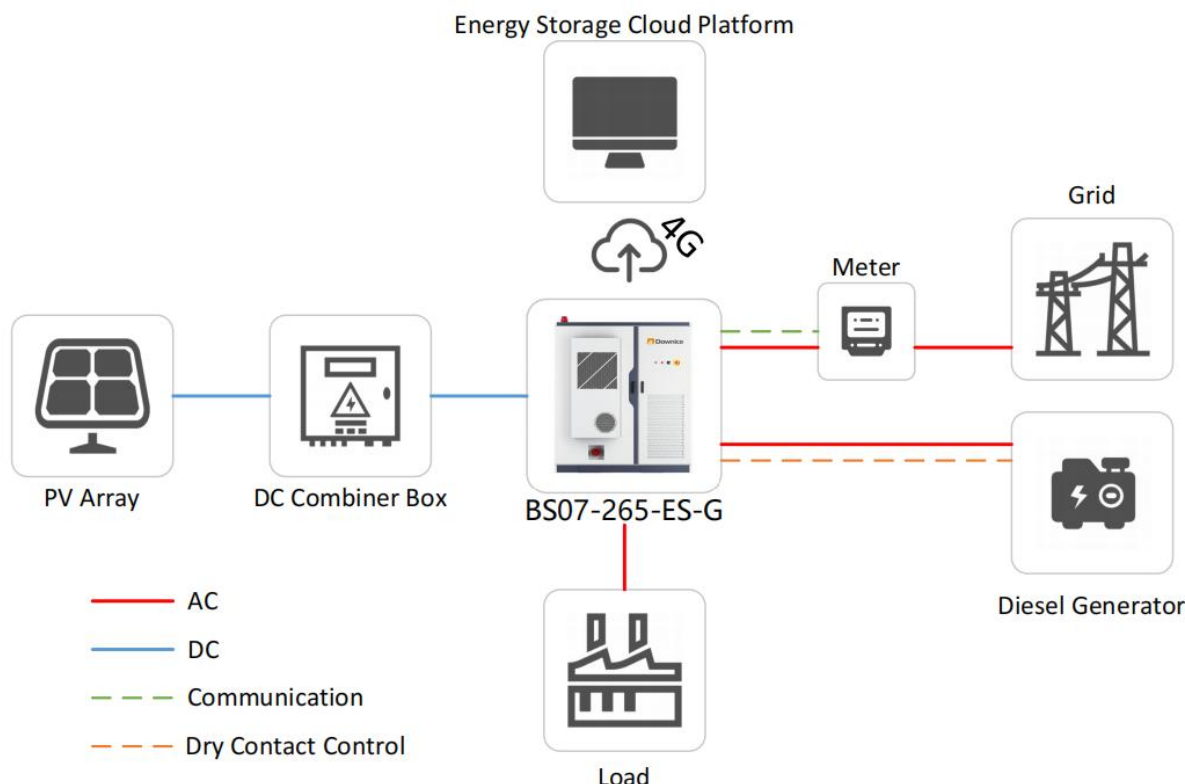


Figure 3.1 Solar-storage-diesel integrated system diagram

Table 3.1 Introduction to the photovoltaic-diesel integrated system

Equipment	Description
BS07-265-ES-G	BS07-265-ES-G is an integrated solar-storage-diesel energy storage system
Energy Storage Cloud Platform	Intelligent monitoring platform, controlled by 4G network connection, relevant personnel can view data at any time
Meter	By reading the meter data, the charging and discharging of the energy storage system is controlled to achieve intelligent energy management
Grid	Conventional power supply source, suitable for 400V/230V and 380V/220V power grids
Diesel generator	Equipment that uses fuel-fired power generation to supply electricity. It connects to the system through dry contacts to automatically start and stop the generator, thereby reducing unnecessary fuel consumption.
PV Array	Photovoltaic cells
DC combiner box	Photovoltaic string converging equipment
Load	Electricity-using buildings or equipment

3.2 Product Introduction

3.2.1 Functions and features

Function

The energy storage system includes a power conversion module, a photovoltaic power generation module, an on-grid and off-grid switching module, a generator access module, a black start module and a lithium battery module, which can store, convert and release energy according to the EMS energy management system.

Features

BS07-265-ES-G is composed of lithium iron phosphate battery cells with high energy density, low cost and high safety connected in series . The system includes power supply and distribution system, battery management system, energy management system, temperature control system, fire suppression system, etc. This product provides a systematic, efficient, safe and stable energy storage solution.

The system is equipped with multiple safety protection measures, including voltage, current, and temperature protection functions, and is equipped with a fire warning and suppression system that can promptly detect and suppress the occurrence and spread of fire.

EMS is equipped with a variety of energy storage control strategies and can adapt to a variety of operating scenarios to meet various usage requirements. It can be applied to situations involving the adaptive operation of multiple devices such as batteries, photovoltaics, power grids, and diesel generators to ensure the stable operation of electricity.

3.2.2 System appearance

Product size

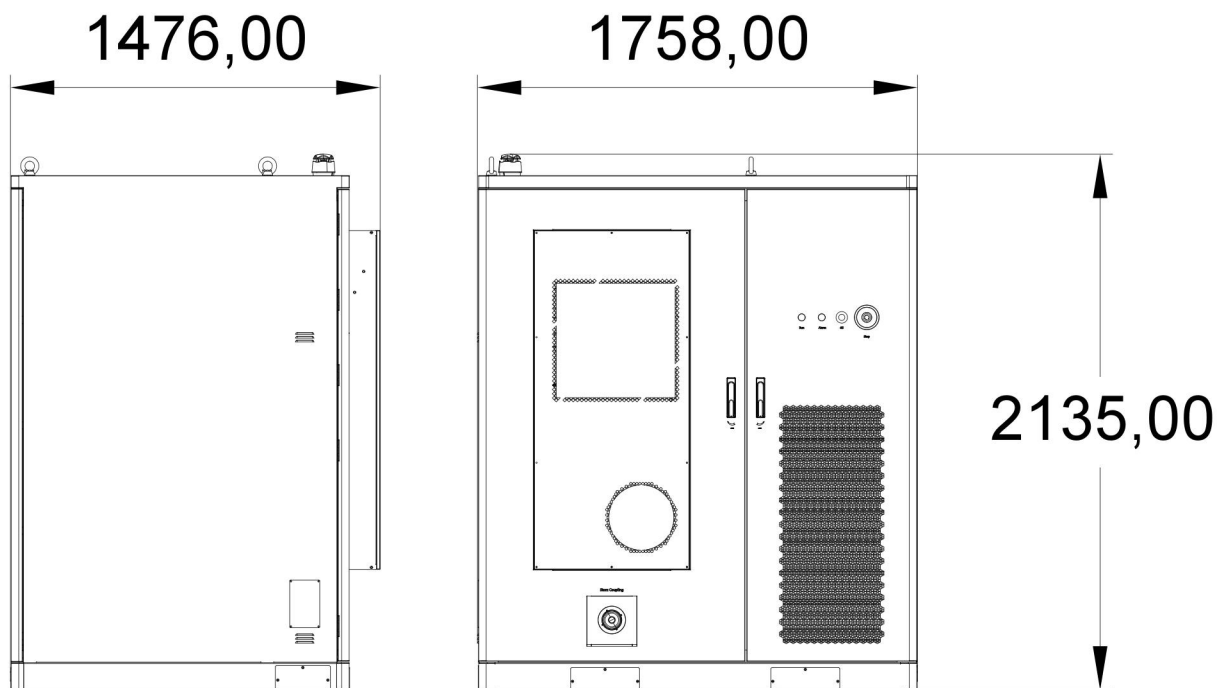


Figure 3.2.2 Dimensions of the integrated solar-energy-storage-diesel unit

3.2.3 Components Introduction

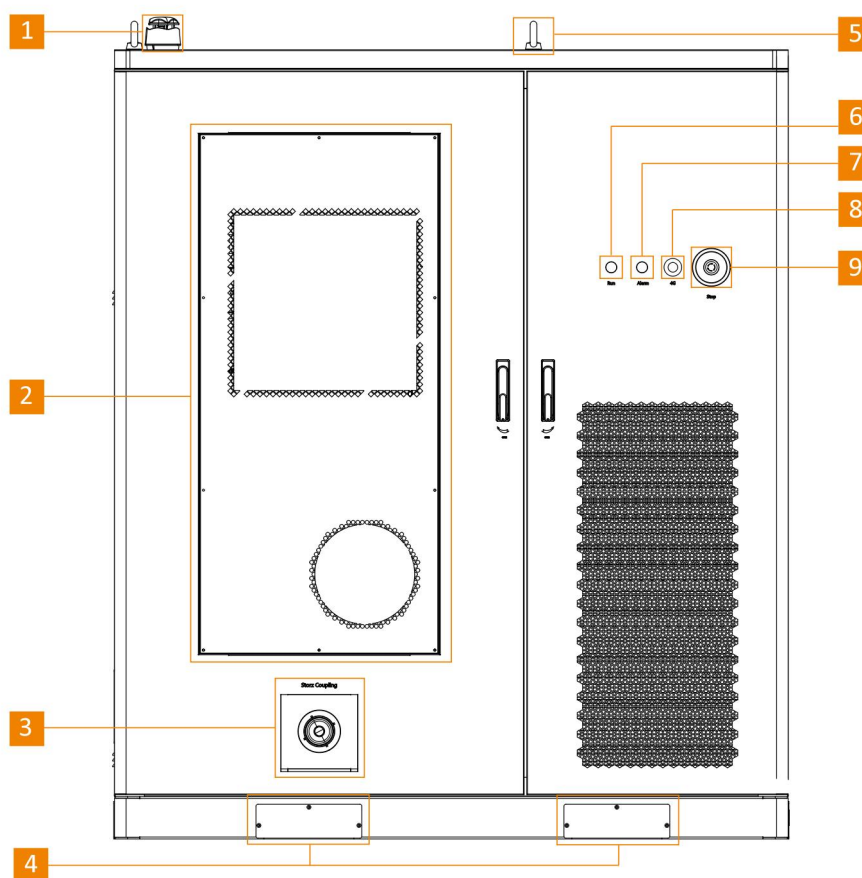


Figure 3.2.3 Introduction to the components of the solar-energy-storage-diesel integrated machine (closed)

Table 3.2.3 Introduction to the components of the integrated optical storage device (closed)

Serial number	Name	Description
1	Sound and light alarm	For fire alarm
2	Air conditioner	Energy storage system air conditioning
3	Water fire protection interface	For connecting to external fire water source
4	Forklift Port	Forklift handling
5	Rings	Used during hoisting
6	Running lights	Display system operation status
7	Fault light	Display system fault conditions
8	4G Antenna	Use in conjunction with EMS
9	Emergency stop switch	System emergency stop

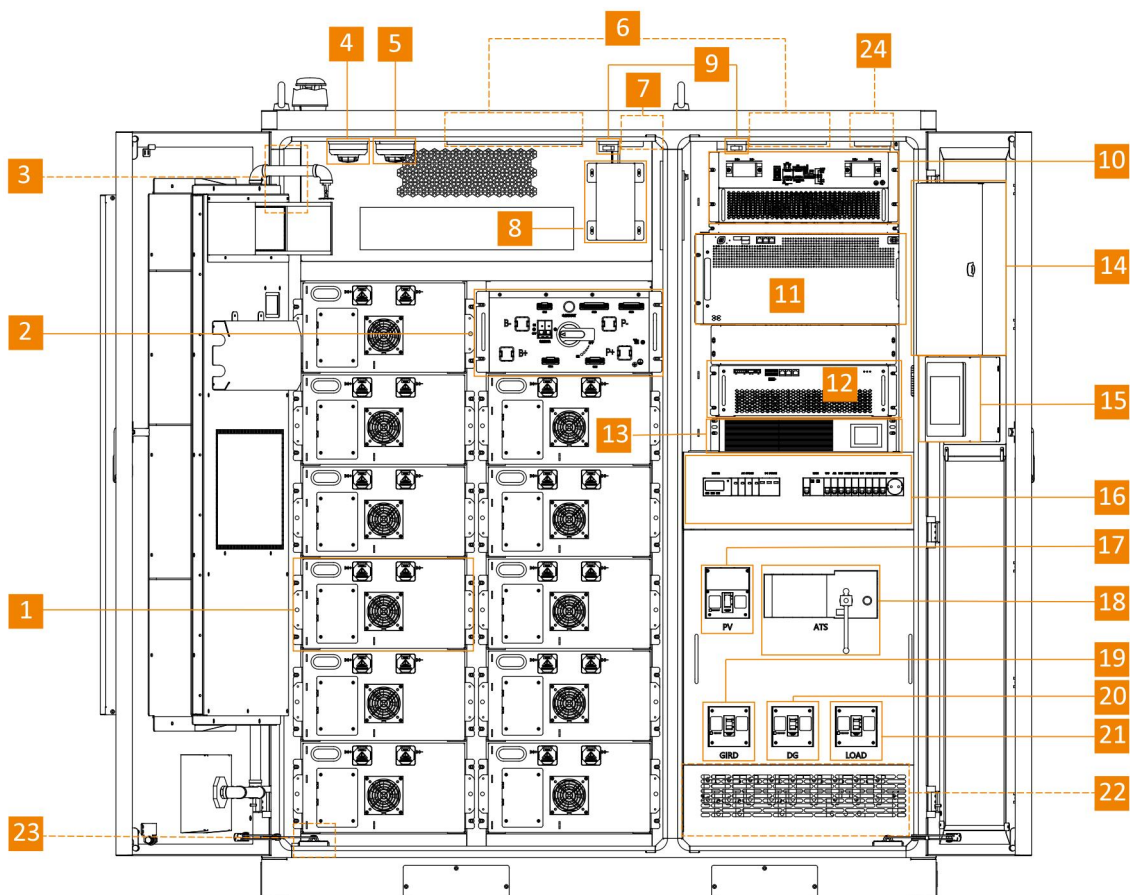


Figure 3.2.3 Introduction to the components of the solar-energy-storage-diesel integrated machine (open)

Table 3.2.3 Introduction to the components of the integrated optical storage device (open)

Serial number	Name	Description
1	Battery Pack	Energy storage medium
2	High voltage box	Collect information such as voltage, current, temperature, etc. of the battery cluster to control charging and discharging
3	Dehumidifier *	Humidity detection and control
4	Smoke collector	Smoke detection
5	Temperature collector	Over temperature detection
6	Lighting *	Cabinet lighting
7	Gas collector *	Toxic gas detection
8	Cluster Aerosol Suppressor	Aerosol fire suppressants
9	Door magnetic switch	Used to monitor the switch status of the cabinet door
10	MPPT	Photovoltaic power modules
11	PCS	Power Module
12	STS	On-grid and off-grid switching module
13	UPS	Off-grid start module
14	Control area	Including IO, EMS, etc.
15	HMI Display	System information display

16	Secondary power distribution	Power distribution in the cabinet
17	Photovoltaic circuit breaker	Photovoltaic input switch
18	ATS Switch	Generator transfer switch
19	Grid circuit breaker	Grid input switch
20	Diesel generator circuit breaker	Generator input switch
21	Load circuit breaker	Load output switch
22	Incoming area *	Cable connection area
23	Water sensor *	Check water accumulation in the cabinet
24	Temperature transmitter	Temperature acquisition equipment

3.3 DC side system

3.3.1 Battery Pack

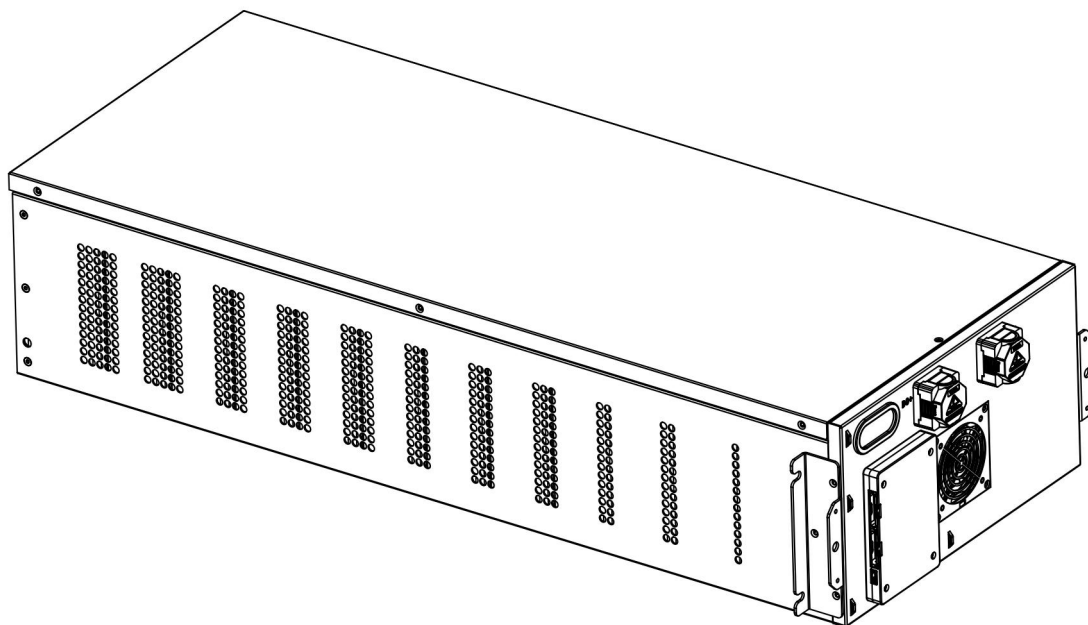


Figure 3.3.1 Appearance of battery pack

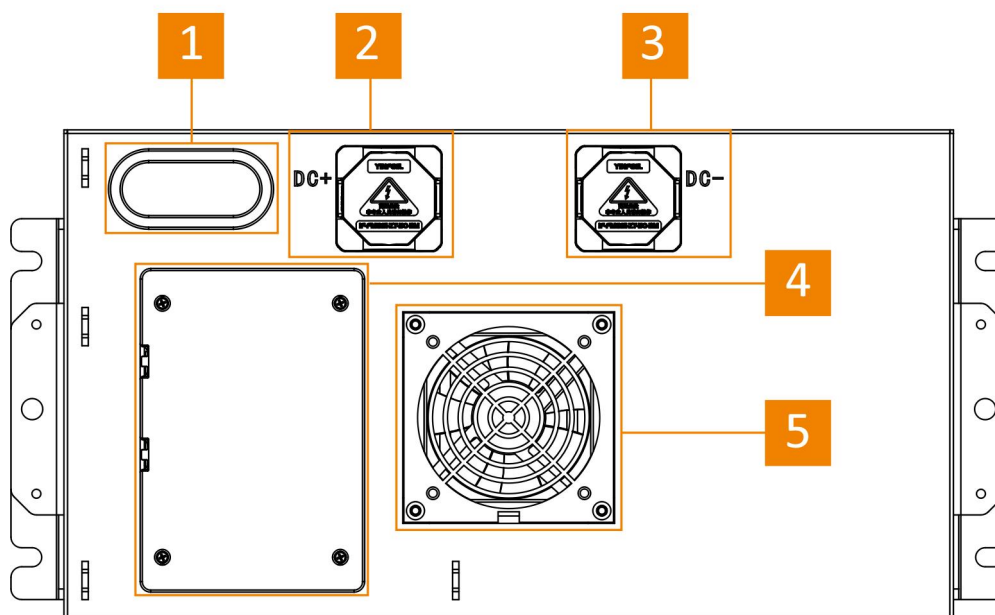


Figure 3.3.1 Battery pack panel introduction

Table 3.3.1 Battery Pack Panel Introduction

Serial number	Name	Description
1	Collection line port	Used to collect single cell information in the battery pack
2	Positive connector	Negative terminal for connecting high voltage box or battery pack
3	Negative connector	Positive terminal for connecting high voltage box or battery pack
4	BMU	Battery pack BMS (slave control)
5	Fan	For ventilation and heat dissipation

3.3.2 High voltage box

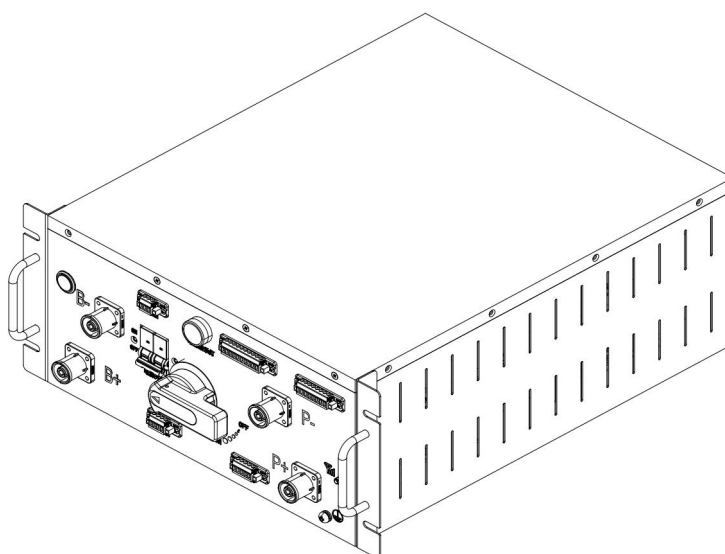


Figure 3.3.2 Appearance of high voltage box

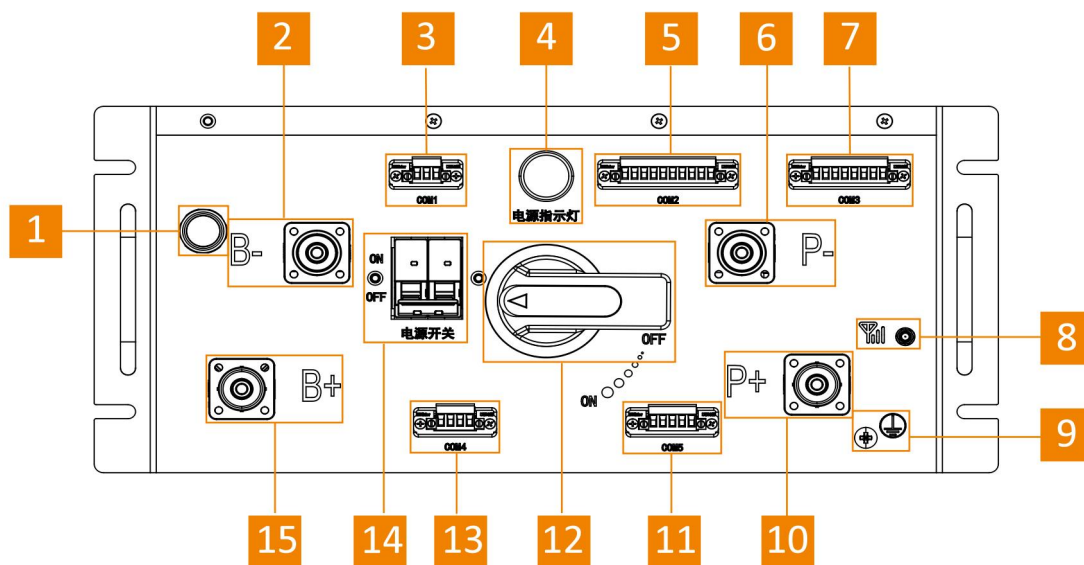


Figure 3.3.2 High voltage box panel introduction

Table 3.3.2 High voltage box panel introduction

Serial number	Name	Description
1	Wake-up switch	BMS wake-up switch
2	Battery cluster total negative connector	Battery pack total negative connection location
3	COM1	220V/50Hz power input
4	Power indicator	Battery cluster operation indicator
5	COM2	PCS equipment communication terminal
6	PCS main negative connector	Negative connection position of PCS DC side
7	COM3	Dry contact communication terminal
8	Antenna interface	WiFi/4G antenna connection interface
9	Grounding point	High voltage box grounding point
10	PCS main positive connector	PCS command process positive connection location
11	COM5	BMU communication terminal
12	Circuit breaker manual operation	DC side power segment switch
13	COM4	EMS equipment communication terminal
14	Power switch	220V power switch
15	Battery cluster main positive connector	Battery Pack Positive Connection Location

3.4 Photovoltaic power generation module

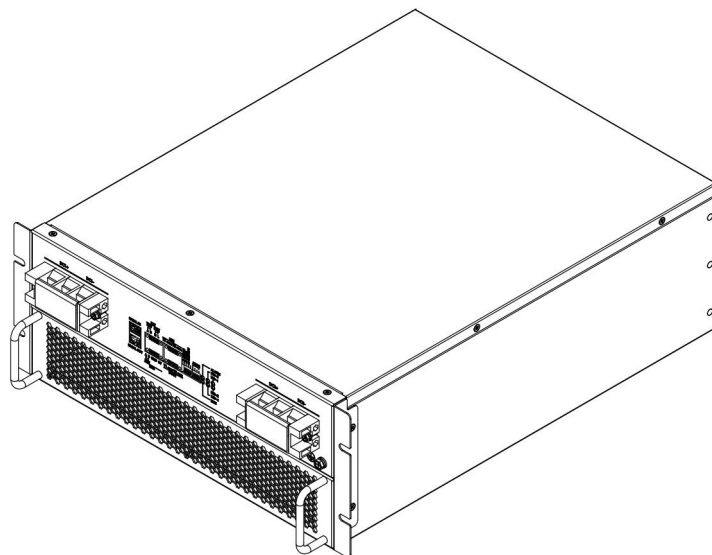


Figure 3.4 MPPT appearance

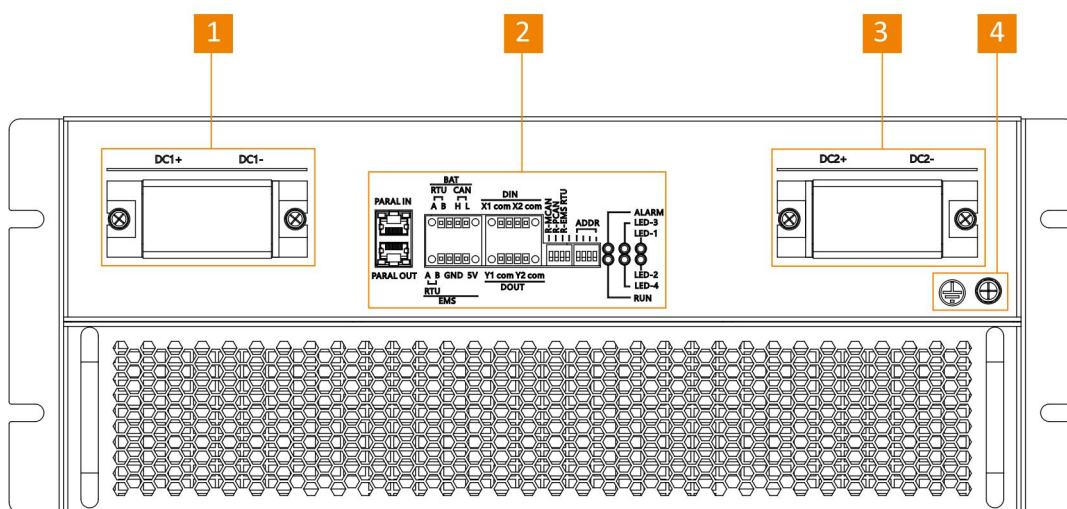


Figure 3.4 MPPT panel introduction

Table 3.4MPPT panel introduction

Serial number	Name	Description
1	Photovoltaic access port	Used to collect single cell information in the battery pack
2	Communication panel	Negative terminal for connecting high voltage box or battery pack
3	Battery access port	Positive terminal for connecting high voltage box or battery pack
4	Ground terminal	Battery pack BMS (slave control)

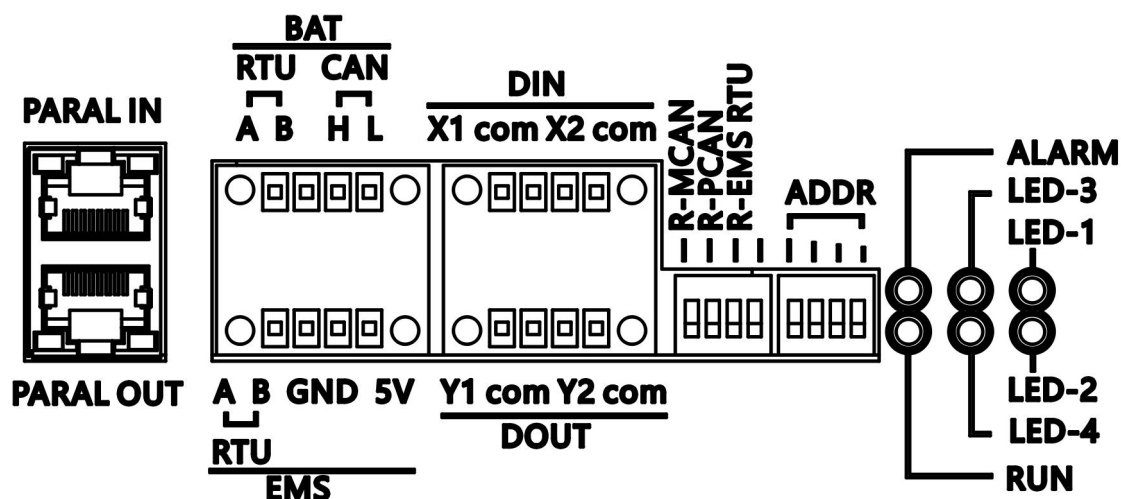


Figure 3.4 MPPT communication panel introduction

Figure 3.4 MPPT communication panel introduction

Name	Description
PARAL IN	Parallel line
PARAL OUT	Parallel line
BAT_RTU	BAT communication interface
BAT_CAN	
RTU(AB)	EMS communication interface
X1	EPO+
X1_com	EPO-
X2	Reserve
X2_com	Reserve
Y1	DOUT
com	
Y2	
com	
R-MCAN	Switch upward to ON, the 1st module and the last module are turned ON
R-PCAN	
R-EMS RTU	
ADDR	Switch upward to ON Module address 00001 is 1 Module address 00100 is 4
ALARM	/
RUN	/
LED-1	/
LED-2	/
LED-3	/
LED-4	/

3.5 Power conversion module

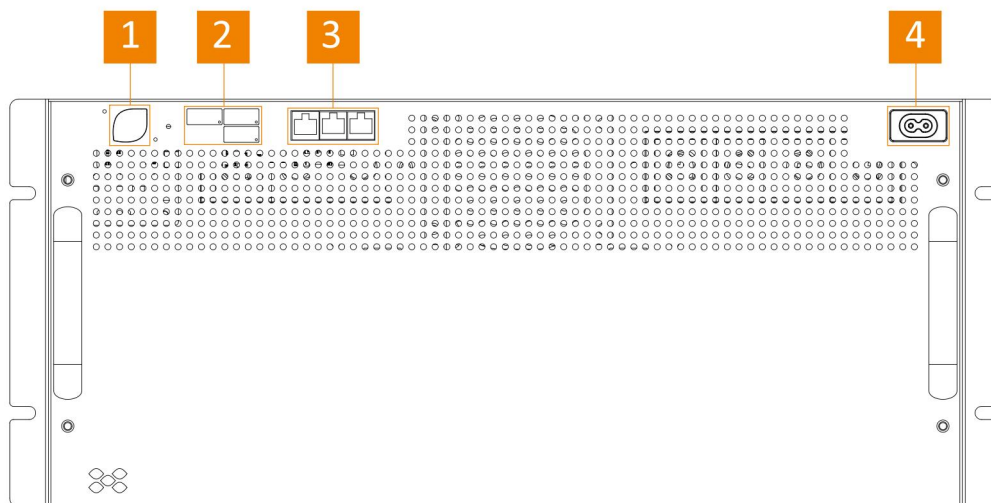


Figure 3.5 PCM panel introduction (front)

Table 3.5 PCM panel introduction (front)

Serial number	Name	Description
1	Indicator Lights	For operating status display
2	Interface	USB reserved interface ADDR address setting (binary) the 4th bit is the lowest bit (from right to left) 120Ω matching resistor
3	Network port	Reserve
4	Debug power supply	220V debugging power supply inlet (for debugging only)

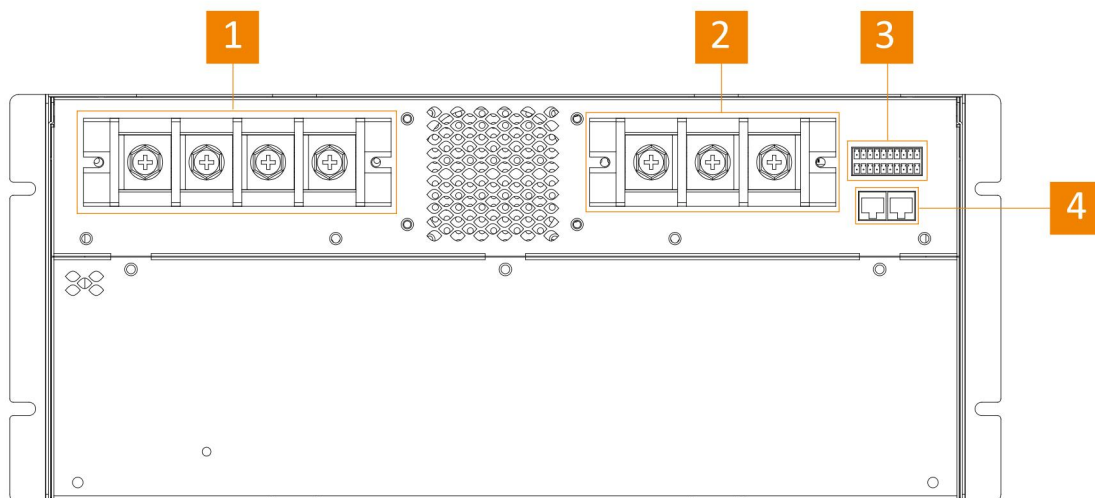


Figure 3.5 PCM panel introduction (back)

Table 3.5 PCM panel introduction (back side)

Serial number	Name	Description
1	AC power port	AC side connection port
2	DC power port	DC side connection port
3	Terminal Blocks	Communication Terminal Blocks
4	PARA	PCS and STS communication interface

3.6 On-grid and off-grid switching module

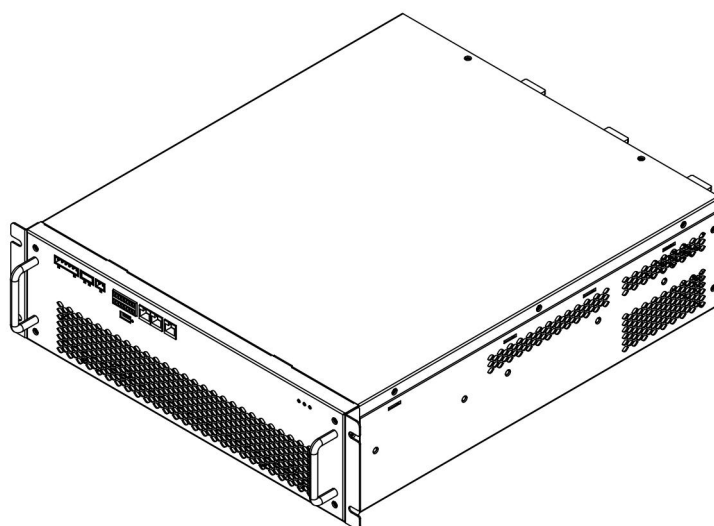


Figure 3.6 STS appearance

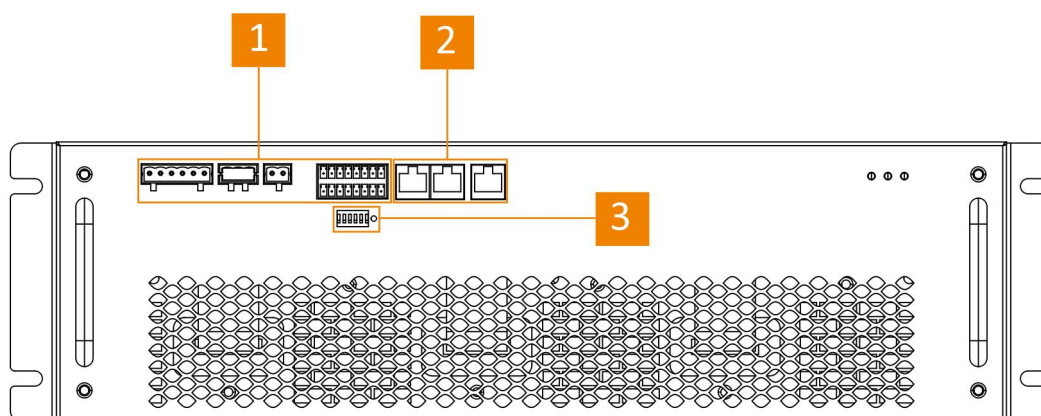


Figure 3.6 STS panel introduction (front)

Table 3.6 STS panel introduction (front)

Serial number	Name	Description
1	Communication Port	Current sampling/24V power supply/communication
2	PARA/TEST	PCS communication port/test communication port
3	Dip switch	Device address dip switch

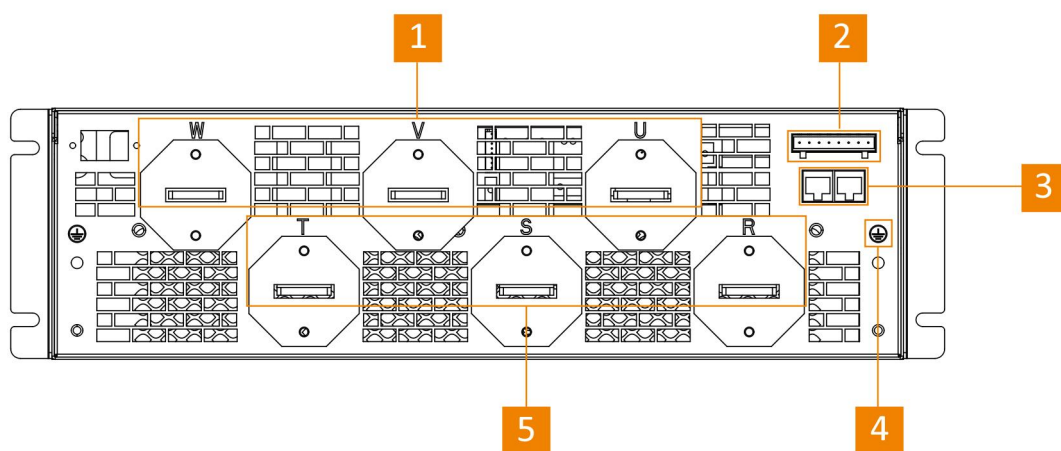


Figure 3.6 STS panel introduction (back side)

Table 3.6 STS panel introduction (back side)

Serial number	Name	Description
1	Power output terminal	Power terminal, connected to the load side
2	Communication terminal	EMS communication, PCS communication
3	PARA	PCS Communications
4	Grounding point	Equipment Grounding
5	Power input terminal	Power terminal, connected to the grid side

3.7 UPS Module

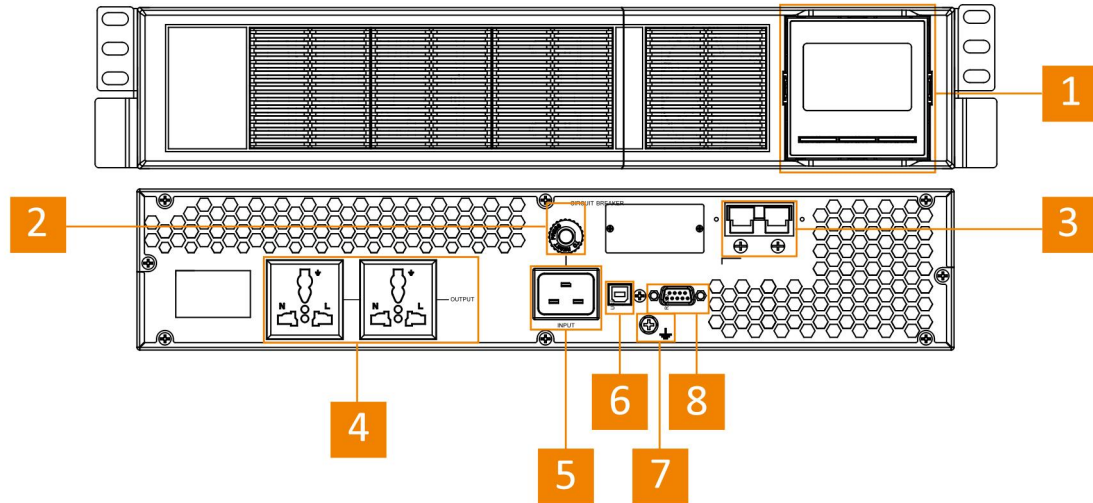


Figure 3.7 UPS panel introduction

Table 3.7 UPS panel introduction

Serial number	Name	Description
1	Control Panel	UPS operation setting panel
2	Input circuit breaker	Input circuit breaker
3	External battery connector	Battery expansion interface
4	Output socket	Power socket
5	Mains input	220V input interface
6	USB interface	Reserve
7	Protective grounding	Equipment grounding point
8	RS232 interface	Reserve

3.8 Environmental Management System

3.8.1 Energy storage air conditioning

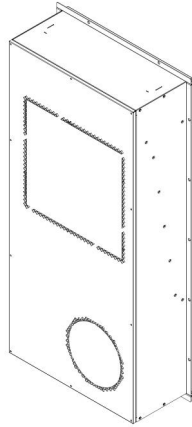


Figure 3.8.1 Appearance of energy storage air conditioner

3.8.2 Dehumidifier

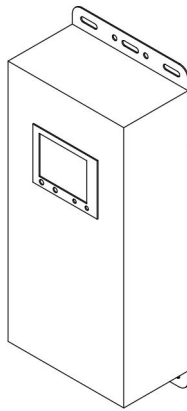


Figure 3.8.2 Appearance of dehumidifier

3.8.3 Water sensor



Figure 3.8.3 Appearance of water immersion sensor

3.8.4 Temperature transmitter

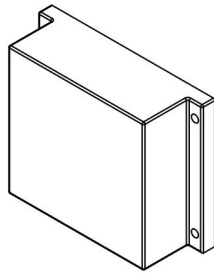


Figure 3.8.4 Appearance of temperature transmitter

3.8.5 I/O module

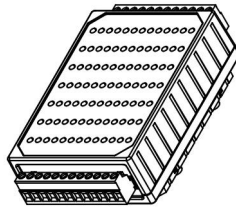


Figure 3.8.5 Appearance of I/O module

3.8.6 Threshold Sensor

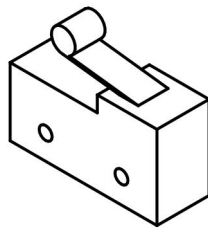


Figure 3.8.6 Appearance of threshold sensor

3.9 Fire protection system

3.9.1 Aerosol Suppressor

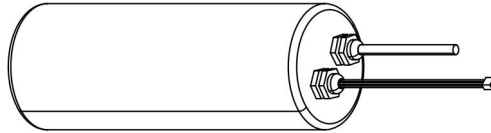


Figure 3.9.1 Appearance of aerosol fire suppressor

3.9.2 Temperature probe



Figure 3.9.2 Appearance of temperature detector

3.9.3 Smoke Detectors



Figure 3.9.3 Appearance of smoke detector

3.9.4 Gas Detectors

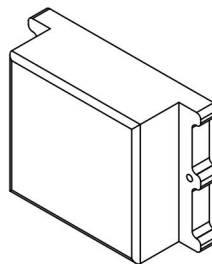


Figure 3.9.4 Gas detector appearance

3.9.5 Sound and light alarm

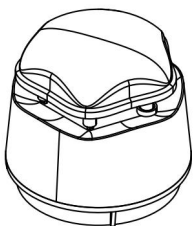


Figure 3.9.5 Appearance of the sound and light alarm

3.9.6 Water Fire Fighting

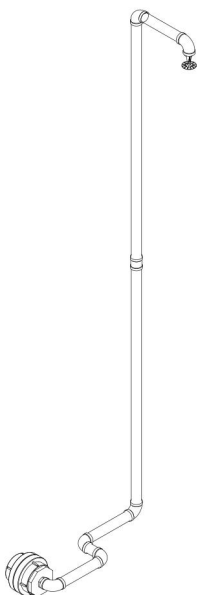


Figure 3.9.6 Appearance of water fire fighting pipeline

3.10 EMS Energy Management System

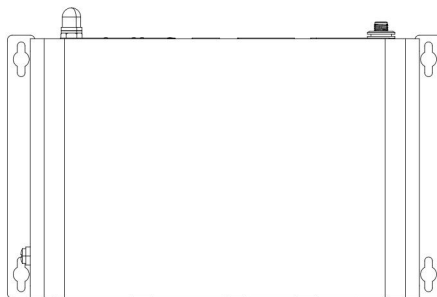


Figure 3.10 EMS appearance

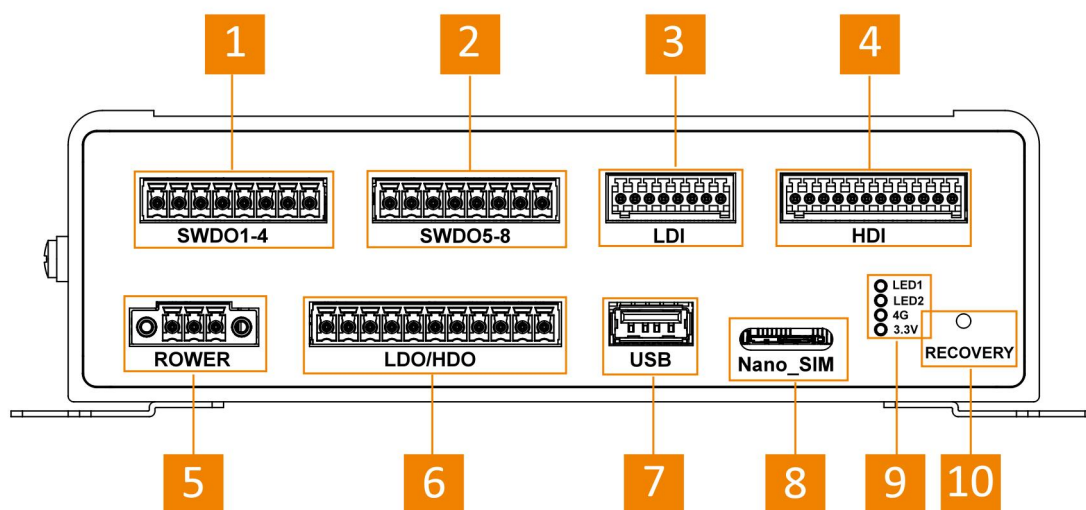


Figure 3.10 EMS panel introduction (front)

Table 3.10 EMS panel introduction (front)

Serial number	Name	Description
1	SWDO1-4	Mechanical relay/dry contact output
2	SWDO6-8	Solid state relay/dry contact output
3	LDI	Isolation, low level detection interface
4	HDI	Isolation, high level detection interface
5	POWER	Power supply input interface
6	LDO/HDO	High and low side driver output interface
7	USB	USB socket
8	Nano_SIM	SIM card slot
9	LED	Indicator Lights
10	RECOVERY	Touch button (hidden)

SIM card specifications

The nano_SIM specification should be selected

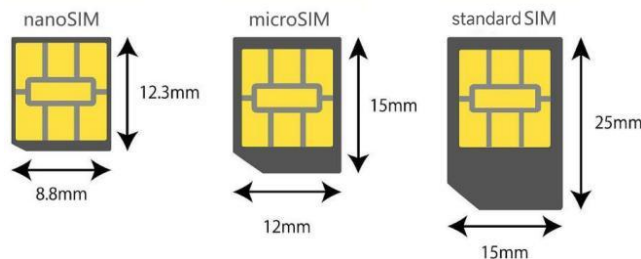


Figure 3.10 SIM card specifications

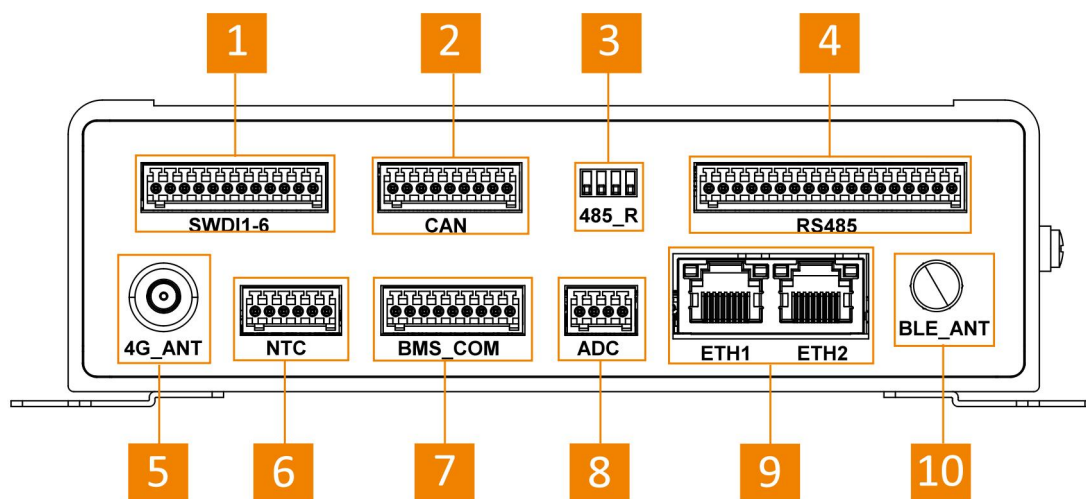


Figure 3.10 EMS panel introduction (back side)

Table 3.10 EMS panel introduction (back side)

Serial number	Name	Description
1	SWDI1-6	Isolation, dry contact signal detection interface
2	CAN	Isolation, CAN bus interface
3	485_R	485 bus matching resistor dip switch
4	RS485	Isolation, RS485 bus interface
5	4G_ANT	4G network antenna socket
6	NTC	4-channel temperature acquisition (NTC103)
7	BMS_COM	Communication interface with BMS
8	ADC	Isolation, analog acquisition interface
9	ETH	RJ45 100M Ethernet port
10	BLE_ANT	Bluetooth Antenna

4. Working Principle

4.1 Circuit Diagram

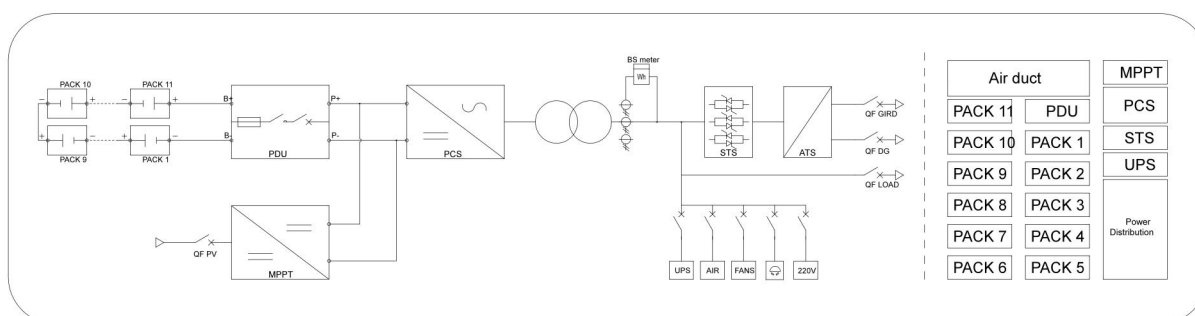


Figure 4.1 System circuit diagram



Description of the application environment of loads with different characteristics in off-grid mode:

- Pure resistive load power $\leq$ system rated power, supports 100% load capacity, and recommends matching load equipment at 80% load capacity.
- The power of pure inductive load is $\leq 15\% \sim 20\%$ of the rated power of the system. Such loads include direct-start motors, water pumps, electric drills, air conditioners (non-frequency conversion) and other impact load equipment.
- The load power of the inverter is $\leq 50\%$ of the rated power of the system. If it is a conventional load such as inverter air conditioner + lighting, it is recommended to configure it with a load rate $\leq 65\%$ of the rated power of the PCS.

4.2 Running status

The system has charging, discharging, and standby operating states, and the specific operating logic is executed according to the EMS settings.

Table 4.2 Operation status description table

Serial number	State	Description
1	Charge	The battery is charged and the current flowing into the photovoltaic or grid is stored in the battery
2	Discharge	The battery is discharged, and the power stored in the battery or the current generated by photovoltaic is supplied to the load or the grid.
3	Standby	The device is powered on and in standby mode, but has no power to operate.

5. Transportation Requirements

5.1 Handling requirements



During the transportation process, comprehensive personnel safety measures must be taken. The equipment must be handled with care and must not be dragged or thrown on rough surfaces.

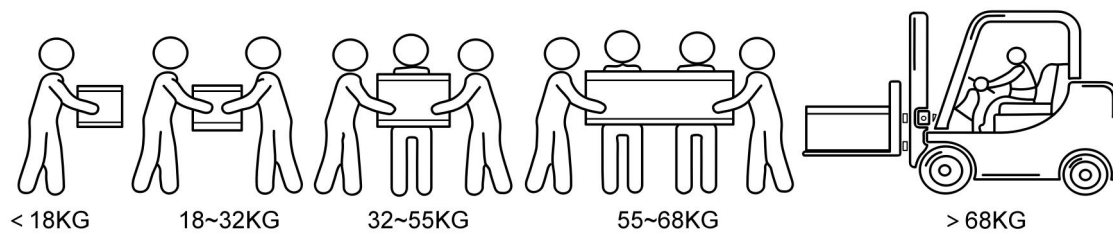


Figure 5.1 Handling weight requirements

- When carrying heavy objects, you should be prepared to bear the weight to avoid being crushed or sprained by the heavy objects.
- When two or more people are lifting heavy objects together, one person should be in charge and they should lift or lower the equipment at the same time and in unison.
- When moving equipment by hand, you should wear protective gloves, labor protection shoes and other safety protection equipment to avoid injury.
- When carrying equipment by hand, first get close to the object, squat down, and use the strength of your straight legs (not your back) to lift the object slowly and steadily. It is strictly forbidden to lift it suddenly or twist your torso.
- When moving or lifting the device, hold the device handle or support the bottom edge of the device instead of the handle of the installed module.
- Do not quickly lift heavy objects above waist height. Place the heavy object on a workbench at half waist height or in a suitable place first, adjust the position of your palms, and then lift it.
- When moving heavy objects, you must use balanced and steady force; the moving speed must be uniform and slow; positioning must be smooth and slow, and any impact or drop that may scratch the surface of the equipment or damage the components and cables of the equipment must be avoided.
- When carrying heavy objects, you should be especially careful on workbenches, slopes, stairs and places where it is easy to slip. When carrying heavy objects over thresholds, make sure the door is wide enough for the equipment to pass through to prevent bumps or scratches on your fingers.
- When transferring heavy objects, you should move your feet instead of twisting your waist. When you need to lift and transfer heavy objects at the same time, you should first point

your feet in the direction you want to move them, and then carry them.

- When using a forklift to transport the equipment, the forklift must be in the middle position to prevent it from tipping over. Before moving, please fasten the equipment to the forklift with ropes; during moving, special personnel are required to supervise.
- The placement tilt angle should meet the requirements, the tilt angle with packaging $\alpha \leq 15^\circ$, and the tilt angle after removing the packaging $\alpha \leq 10^\circ$.

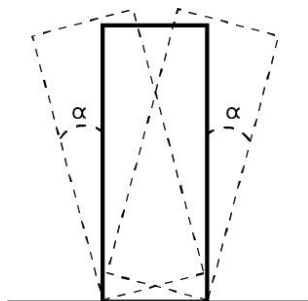


Figure 5.1 Tilt angle α requirement diagram

- During the process of moving and transporting the air conditioner, the air conditioner must be kept upright and it is prohibited to place it flat or upside down.

5.2 Transportation Requirements

- Rough loading and unloading is prohibited, otherwise it may cause battery short circuit, damage (leakage, rupture, etc.), fire or explosion, etc.
- The battery should be transported in the direction required. It is prohibited to invert, tilt, drop, mechanically impact, be exposed to rain or snow, or drop into water.
- Batteries must be transported separately. For cabinets with installed batteries, it is prohibited to transport them with batteries. If the cabinet needs to be transported or moved, the batteries must be removed first.
- The battery has passed the UN38.3 (UN38.3: Section 38.3 of the sixth Revised Edition of the Recommendations on the Transport of Dangerous Goods: Manual of Tests and Criteria) certification, and this product belongs to the ninth category of dangerous goods.
- Transport service providers must be qualified to transport dangerous goods, and the use of convertibles is strictly prohibited .
- The battery can be directly delivered on site to meet the transportation requirements of cars, ships, etc.
- Comply with international dangerous goods transportation regulations and meet the regulatory requirements of transportation regulatory authorities in the country of departure, transit and destination .
- When transporting, choose sea transportation or roads with good road conditions. Railway and air transportation are not supported. Bumps and tilts should be minimized during transportation .
- Sea transportation complies with the transportation requirements of the International Maritime Dangerous Goods Code .
- Before transportation, the battery packaging must be checked to ensure it is intact and free of odor, leakage, smoke, fire, etc. Otherwise, transportation is prohibited .
- The transport packaging box must be sturdy and should be handled with care and moisture-proof measures during loading, unloading and transportation .

6. Storage requirements



Due to the characteristics of lithium batteries, battery storage requirements should be followed when storing lithium batteries, otherwise permanent battery damage or performance degradation may occur.

- Battery packs or energy storage systems containing battery packs should not be stored for long periods of time. Long-term storage of lithium batteries will cause capacity loss. After lithium batteries are stored at the recommended storage temperature for 12 months, the general irreversible capacity loss is 3% to 10%.
- Store in a clean and dry place and avoid erosion by dust and water vapor. Do not expose to rain or ground water.
- The ambient air must not contain corrosive or flammable gases.
- Do not store tilted or upside down.
- When equipment other than battery packs is stored for two years or more, it must be inspected and tested by professionals before being put into use.

6.1 Energy storage system storage (excluding battery pack)

- During long-term storage, it is prohibited to remove the packaging.
- Stacking storage is prohibited.
- Storage (long term or temporary) on a flat surface.
- Keep cabinet doors closed.
- Storage environment temperature: $-40^{\circ}\text{C}\sim+60^{\circ}\text{C}$, relative humidity: 5% RH~90% RH.

6.2 Battery Pack Storage

- The battery should be stored indoors, out of direct sunlight or rain, in a dry and well-ventilated place, with a clean environment, free from a large amount of infrared radiation, organic solvents or corrosive gases, metal conductive dust, etc., and away from heat and fire sources.
- If the battery fails (carbonization, leakage, expansion, water ingress, etc.), it must be promptly transferred to a hazardous goods warehouse for separate storage, at least 3m away from surrounding combustible materials, and scrapped as soon as possible.
- When storing batteries, they should be placed correctly according to the packaging box labels. It is strictly prohibited to place them upside down, sideways, or tilted. When stacking, they must comply with the stacking requirements on the outer packaging.
- When storing batteries, please store them separately and avoid mixing them with other equipment or stacking them too high. Firefighting facilities that meet the requirements must be

available on site, such as fire sand, fire extinguishers, etc.

- After the battery is powered off, there is static power consumption of the battery internal module and self-discharge loss of the battery itself, which may cause the battery to be damaged due to over-discharge. Avoid storing the battery in a low-power state and recharge the battery in time. If the battery fails to be recharged beyond the expiration date and causes permanent failure, the company will not provide corresponding warranty services. Scenarios that trigger low-power storage of the battery include but are not limited to:

- The battery power cable or signal cable is not connected.
- After the energy storage system is discharged, the battery cannot enter the charging state due to system failure
- Improper configuration of the energy storage system results in the battery being unable to enter the charging state
- The battery cannot be charged due to long-term AC power failure
- The control system, PCS or main circuit components are not closed, causing the battery to be unable to enter the charging state

6.3 Storage environment requirements

- Ambient temperature: -30°C~+50°C (excluding battery pack)
- Ambient temperature: 0~30°C (battery pack); it is recommended that the battery pack be stored in a constant temperature environment of 25°C. Long-term storage beyond this temperature may affect the performance and service life of the battery.
- Relative humidity: 5% RH~90% RH (around 45% RH recommended).
- Dry, ventilated and clean.
- Avoid contact with corrosive organic solvents, gases and other substances.
- Avoid direct sunlight.
- The distance to the heat source must not be less than two meters.
- During storage, the battery must be disconnected from any external connections. If there is an indicator light on the battery pack panel, it should be off.
- If storage period is exceeded, it should be reported promptly.
- When batteries are shipped, the first-in-first-out principle should be followed.
- When transporting batteries, they must be handled with care and it is strictly forbidden to damage the batteries.

7. Installation site requirements

7.1 Site selection requirements

- This system is only suitable for outdoor scenes.
- The installation environment level should be higher than the historical highest water level in the area and at least 300mm above the horizontal ground. The installation location cannot be in a low-lying area.
- There should be no vegetation or flammable plants within 3m of the installation site of the energy storage system or energy storage power station and the surrounding area to prevent wildfires caused by high temperatures in summer from causing fires in the energy storage system.
- The safe distance between the energy storage system and the building should comply with local fire regulations or standards.
- The safe distance between the energy storage system and Class A production buildings is $\geq 12\text{m}$, the safe distance between the energy storage system and Class B production buildings is $\geq 10\text{m}$, the safe distance between the energy storage system and Class C, D, and E production buildings with fire resistance levels of one or two is $\geq 10\text{m}$, the safe distance between the energy storage system and fire resistance level three production buildings is $\geq 12\text{m}$, and the safe distance between the energy storage system and living buildings is $\geq 12\text{m}$. If the exterior walls of the adjacent buildings are non-combustible and have no doors, windows, or exposed burning eaves, the fire separation distance can be reduced by 25% based on the aforementioned safe distance.
- If the above safety distance cannot be met, a firewall must be installed between the battery equipment room, energy storage room or energy storage installation area and Class C, D, and E buildings. Firewalls with a fire resistance of no less than 3h should be installed for safety protection, and the length and height of the firewall should exceed the outer contour of the energy storage system by 1m each. At the same time, the space requirements for equipment transportation, installation, maintenance, etc. need to be considered.
- The energy storage system or energy storage power station must be set up in an environment without the risk of explosion.
- The site has convenient transportation conditions and reliable fire suppression system equipment.

Description 1

- The installation, commissioning and operation phases of the energy storage system should comply with the principle of fire protection first: ≥ 2 gas fire extinguishers should be installed near each unit, such as heptafluoropropane, perfluorohexanone, and carbon dioxide.
- Please reserve a water fire extinguishing system interface at the energy storage system site.
- The site area required in the near term should be sufficient, and room for expansion

should be left based on the needs of the entire life cycle .

- Choose a well-ventilated area
- Energy storage systems installed in salt-damaged or polluted areas will be corroded. Please do not install energy storage systems in salt-damaged or polluted areas. Energy storage systems can be used in the following or better environments:

- Outdoor environment more than 2000m from the coast. It is not recommended to use the energy storage system when the distance is 500m~2000m from the coast (if you need to use it, you must confirm with the dealer or our engineers). The energy storage system cannot be used when the distance is less than 500m from the coast.

- The distance from heavy pollution sources such as smelters, coal mines, thermal power plants, etc. is greater than 1500m to 3000m

- The distance from moderate pollution sources such as chemical industry, rubber, electroplating, etc. is more than 1000m to 2000m

- The distance to light pollution sources such as food, leather, heating boilers, slaughterhouses, centralized garbage dumps, and sewage treatment stations is greater than 500m to 1000m.

Description 2

When the safety distance of the selected site cannot meet the requirements of relevant national standards, it is recommended to re-select the site. The site selection should avoid scenarios that are not recommended by industry standards and regulations, including but not limited to the following areas, regions and places:

- Areas with strong vibration, strong noise sources and strong electromagnetic field interference.

- Places where dust, oil smoke, harmful gases, corrosive gases, etc. are generated or present.

- Places where corrosive, flammable, or explosive items are produced or stored.

- Locations with existing underground facilities.

- There are unfavorable geological conditions such as rubbery soil, soft soil layers, and the ground is prone to water accumulation and sinking.

- Below the water reservoir, water landscape, and water intake room.

Description 3

- If it is unavoidable to set it up in a place where water may accumulate, water retaining and drainage facilities or measures to raise the ground should be installed.

- Cable trenches should not be used as drainage channels, and openings for cable routing (such as holes where cables pass through partition walls and floor slabs) should be fire-blocked.

- Earthquake faults and seismic zones with a fortification intensity higher than nine degrees.

- Areas with direct hazards such as mud-rock flow, landslide, quicksand, and caves.

- Within the boundaries of the mining subsidence (dislocation) zone.

- Within the explosion hazard area.

- An area that may be flooded if a dam or dike fails.
- Important water supply source sanitary protection area.
- Historical and cultural relics protection area.
- Crowded places, high-rise buildings, and underground buildings.
- Intersections and busy traffic sections of urban main roads.

Site selection and flood control requirements:

- The design elevation of the station site of a large-scale electrochemical energy storage system (power $\geq 100\text{MW}$) should be higher than the flood water level with a frequency of 1% or the highest historical waterlogging water level.
- The design elevation of the station site for medium and small electrochemical energy storage systems (power $<100\text{MW}$) should be higher than the flood water level with a frequency of 2% or the highest historical waterlogging water level.
- When the design elevation of the station site cannot meet the above requirements, another site should be selected, or different flood and waterlogging prevention measures should be taken according to different situations.
- For energy storage power stations along rivers, lakes, seas and other places affected by wind and waves, the elevation of flood control facilities should take into account the wind and wave height with a frequency of 2% and a safety overheight of 0.5m.
- When a large amount of water flows into or passes through the base from the periphery of the base, it is advisable to set up side ditches or drainage (interception) ditches to carry out surface drainage in an organized manner.

Anti-intrusion fence:

It is recommended to use a solid wall or fence to isolate and protect the energy storage equipment area. The fence should have a door lock and the fence height should be greater than 2.2 meters. Firewalls can replace part or all of the walls, and the designer can make comprehensive considerations.

7.2 Foundation requirements

Foundation design requirements:

- The energy storage system must be installed on concrete or other non-combustible surfaces. The installation surface must be level, firm, flat, and have sufficient bearing capacity. No dents or tilts are allowed.
- The equipment foundation is calculated and configured based on the load-bearing capacity of a single piece of equipment of 3500kg. If the foundation load-bearing capacity is not met, it needs to be reviewed.
- The bottom of the foundation pit of the equipment foundation must be compacted and filled.
- It is strictly forbidden to disturb the foundation of the equipment by water after excavation. If it is disturbed by water, excavation should be continued and replacement should be carried out.

- The horizontal error between the equipment foundation and the contact surface of the cabinet is $\leq 3\text{mm}$.
- The foundation must be higher than the local historical highest water level and at least 300mm above the horizontal ground.
- Drainage facilities should be constructed in accordance with local geology and municipal drainage requirements to ensure that no water accumulates at the foundation of the equipment. The foundation construction should meet the drainage requirements of the local maximum historical rainfall, and the discharged water needs to be treated in accordance with local laws and regulations.
- When constructing the equipment foundation, it is necessary to consider the cable outlet of the energy storage system and reserve trenches or cable entry holes.
- The reserved holes in the equipment foundation and the cable inlet holes at the bottom of the equipment should be sealed.
- Users must verify the basic design parameters of the energy storage system based on the project site's installation environment, geology, and earthquake resistance requirements.

7.3 Forklift requirements

- It is prohibited to move the energy storage system after the battery pack wiring harness is installed.
- If a forklift is used to install the cabinet, the forklift's load-bearing capacity must be $\geq 5\text{t}$.
- If a forklift is used for battery pack installation and maintenance, the forklift's load-bearing capacity must be $\geq 1\text{t}$.
- Forklift lifting height requirements: when the foundation height is $\leq 0.3\text{m}$, the lifting height is $\geq 2\text{m}$; when the foundation height is $> 0.3\text{m}$, the lifting height is increased accordingly.

7.4 Lifting requirements

Personnel performing lifting operations must undergo relevant training and be qualified before they can take up their posts.

- Temporary warning signs or fences must be erected in the lifting area to isolate it.
- The foundation for lifting operations must meet the load-bearing requirements of the crane.
- Before lifting, ensure that the crane and lifting rope meet the load-bearing requirements.
- Before lifting, ensure that the lifting tools are firmly fixed to a fixed object or wall that meets the load-bearing standards.
- During hoisting, it is strictly forbidden to walk under the boom or the hoisted object.
- During lifting, it is prohibited to drag the wire rope or lifting equipment, and it is prohibited to use hard objects to hit.
- During the lifting process, ensure that the angle between the two cables is no greater than 90° .
- When installing or removing the hanging equipment, do not drag on the cabinet to avoid scratching the cabinet.
- It is prohibited to lift or move the energy storage system after installing the battery pack.

Hoisting precautions:

Before lifting:

- The crane's lifting capacity is $\geq 5t$ and its working radius is $\geq 2m$. If the on-site working conditions do not meet the requirements, a professional person should be consulted for evaluation.
- Personnel performing lifting operations must undergo relevant training and be qualified before they can take up their posts.
- Lifting tools must be inspected and complete before they can be used.
- Ensure that the lifting tools are firmly fixed to a load-bearing fixture or wall.
- When used outdoors, it is recommended to hoist the device in clear and windless weather.
- Confirm that the crane and steel cable meet the requirements before lifting.
- The doors of the equipment are all closed and locked.
- Ensure that the connection of the steel cable is safe and reliable.
- It is recommended to adopt the lifting order from left to right or from right to left to ensure smooth lifting.

When hoisting:

- It is strictly forbidden for unauthorized personnel to enter the lifting area, and it is strictly forbidden to stand under the boom.
- Ensure that the crane is in a suitable position and do not lift over long distances.
- Keep it stable, with the diagonal inclination of the cabinet $\leq 5^\circ$.
- Ensure that the angle between the two cables is $\leq 90^\circ$.
- Lifting equipment should be lifted and lowered gently, and the cabinet should be lowered slowly and steadily to avoid impact on internal equipment.
- When the cabinet is in contact with the base, remove the lifting cable after the base is evenly stressed.
- It is prohibited to drag wire ropes and slings, and equipment collision is prohibited.
- The subsequent cabinets can be hoisted only after the cabinet that is hoisted first is fixed.

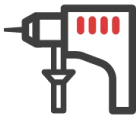
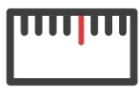
8. Equipment Installation

8.1 Pre-installation preparation

Preparing tools

- The tools shown in the pictures are for reference only. Please refer to the actual objects.
- Due to different on-site conditions, this tool list does not fully list the tools that may be used. On-site installers and users are requested to prepare unlisted tools based on actual conditions.

Installation Tools

			
Slotted insulated screwdriver	Phillips insulated screwdriver	Wire strippers	Diagonal pliers
			
Wire cutters	Utility knife	wrench	Rubber hammer
			
Hand drill	Impact drill	Cutting Machine	tape measure
			
Level	Vernier caliper	Steel Ruler	brush

 Cable Ties	 multimeter	 Heat Gun	 Vacuum cleaner
 Lifting cable	 Insulation ladder	 Forklift	 crane

Figure 8.1 Installation tools

Personal protection tools

 Insulating gloves	 Protective gloves	 Reflective vest	 seat belt
 Insulated shoes	 helmet	 Goggles	 Protective masks

Figure 8.1 Personal protective equipment

8.2 Product Installation

- Step 1: Open the cabinet door and take out the items and accessories inside the cabinet
- Step 2: Confirm that the moving parts in the cabinet are securely fixed
- Step 3: Close and lock the cabinet door
- Step 4: Remove the bottom access panel

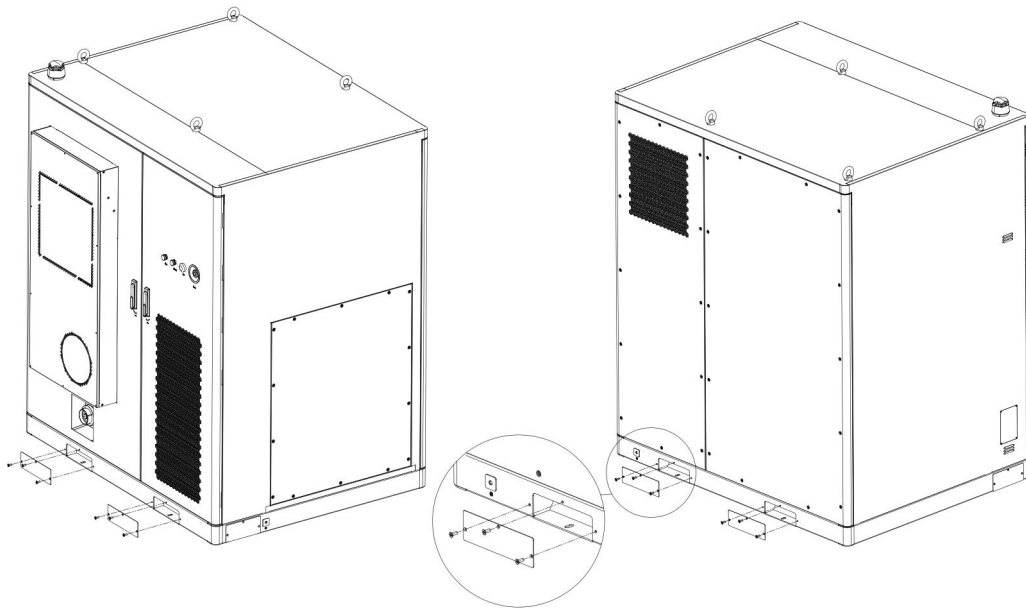


Figure Schematic diagram of bottom baffle disassembly and assembly

- Step 5: Use a forklift ^① (or hoist ^②) to move the battery cabinet

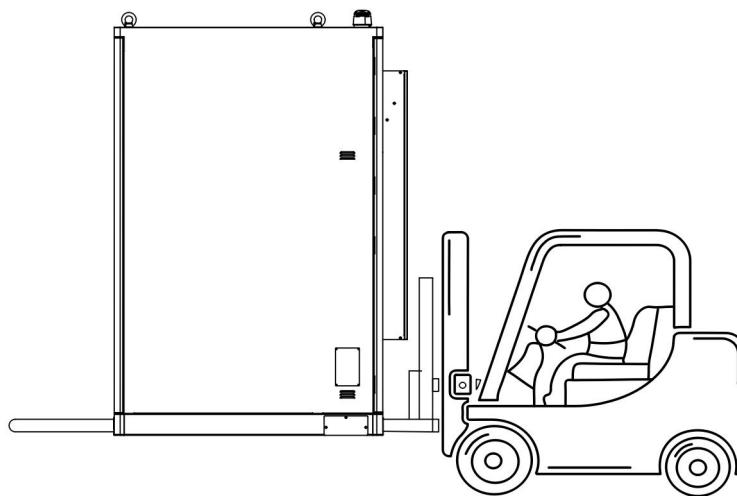


Figure Schematic diagram of forklift operation

Note ^① : When operating a forklift, it is only allowed to operate from the front and back. Lifting from the side may cause the center of gravity to shift and cause tipping, resulting in personal injury and equipment damage.

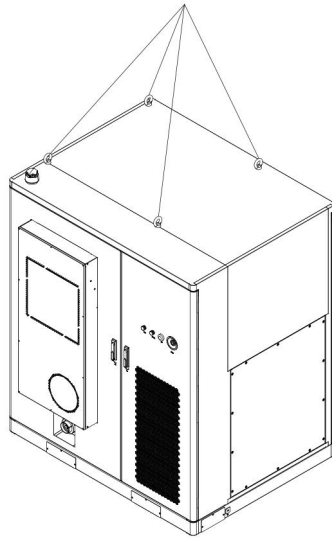


Figure 1. Schematic diagram of hoisting

Note ^② : During hoisting operations, ensure that the angle between every two cables is no greater than 90°, otherwise a hoisting accident may occur, causing personal injury and equipment damage.

➤ Step 6: Secure the battery cabinet with bolts

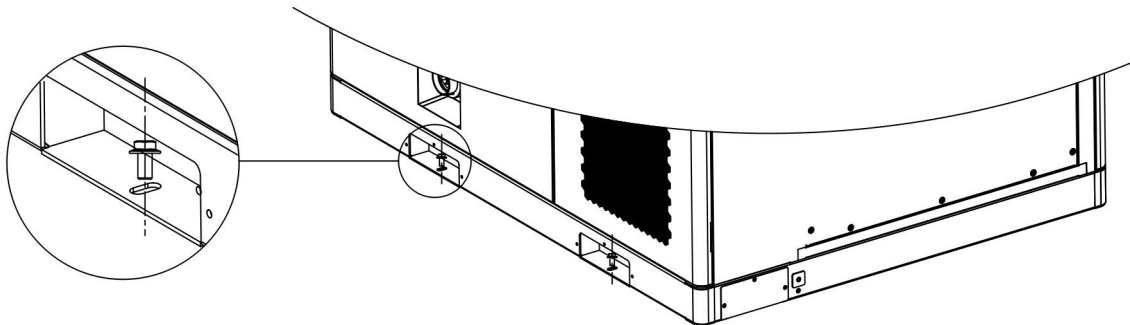


Figure fixed schematic diagram

--End

9. Appendix

Product Parameters

Model	BS07-265-ES-G
Battery Information	
Battery Type	LiFePO ₄
Combination	1P264S
Battery rated voltage	844.8VDC
Battery voltage range	739.2~950.4VDC
Battery rated energy	265.267 kWh
Maximum charge and discharge rate	0.5P
Battery cycle life	8000 cycles (@25 °C ,0.5P,90%DOD,70%EOL)
Photovoltaic input	
Input Power	120kW
Photovoltaic open circuit voltage	200~900V
MPPT voltage range	200~700V
Starting voltage	250V
Maximum current	200A
Short circuit current	240A
AC (on-grid)	
Rated Power	125kW
Output voltage	230/400VAC
Grid frequency	50/60Hz
Output Type	3W+N+PE
Power Factor	0.99
Power factor range	1 (leading) ~1 (lagging)
Current distortion rate	< 2% (rated power)
Parallel expansion	10 units
AC (off-grid)	
Rated Power	125kW
Output voltage	230/400VAC
Grid frequency	50/60Hz
AC voltage harmonics	<3% (linear load)
Parallel expansion	4 units
Isolation transformer	
Voltage	400VAC / 400VAC
Capacity	150kva
Maximum efficiency	≥ 97%
Short circuit impedance	4%

General parameters	
Dimensions (W*D*H)	1758 *1476 *2135mm
Weight	3500kg
Operating temperature	-30 °C ~55 °C (> 45 °C derating)
Relative humidity	< 90% (non-condensing)
Protection level	IP54
Noise	≤75dB
Corrosion resistance	C4
Altitude	≤ 2000m
Cooling method	Intelligent air cooling
Fire Fighting	Aerosol + water firefighting
Communication	MODBUS TCP/RTU



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※ The product information and parameters are subject to change without prior notice