essis

User Manual

All-in-one ESS

ESS-100F

100kWh

Statement

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1 About This Manual

1.1 Foreword

Dear users, this manual mainly introduces the 100kWh industrial and commercial energy storage battery integrated cabinet product introduction, application scenarios, installation instructions, system maintenance and related technical data, before using this product, please be sure to read this manual carefully and operate the energy storage system according to the methods described in this manual, otherwise it may cause equipment damage or personal injury.

1.2 Applicable Personnel

This manual is intended for persons involved in the transportation, installation and other operations related to this product, who have a certain level of electrical knowledge, are familiar with electrical schematics and the characteristics of electronic components, have a certain level of ability to deal with emergencies, and are familiar with the terms of this manual.

This manual is intended for the following people：

- Sales engineers
- Systems Engineer
- Installation and after-sales engineer
- End Users

1.3 Use of Symbols

In order to ensure the safety of the user's person and property when using this product, and to improve the user's efficiency in using this product, this manual provides relevant information and reinforces explanations with appropriate symbols.

The following symbols may appear in this manual and are represented as follows:

Symbol	Explanation
	● Used to warn of an emergency situation that, if not avoided, will result in death or serious personal injury.
	● Used to warn of potentially hazardous situations that, if not avoided, could result in death or serious personal injury.
	● Used to warn of potentially hazardous situations that, if not avoided, could result in moderate or minor personal injury.
	● Used to transmit equipment or environmental safety warning messages. Failure to avoid it may result in equipment damage, loss of data, degradation of equipment performance, or other unpredictable results. “Caution” does not involve personal injury.
	● Indicates additional information in the manual that emphasizes and complements the content, or may provide tips or tricks for optimal use of the product that can help you solve a problem or save you time.
	● This symbol means that there is a high voltage hazard inside the product and that touching it may result in a risk of electric shock.
	● This symbol means that there is a danger of high temperatures in the product and that contact should be avoided to prevent injury.
	● This marking means that the product here for the protection of the ground (PE), need to be connected to the grounding wire, requires a solid and reliable connection to ensure the safety of the operator.

Label 1-1 Label Explanation

1.4 Instructions for Use of the Manual

Please read this manual carefully before using the product. Keep this manual and the information contained in other product components together for safekeeping and make sure it is easily accessible to the relevant personnel.

This manual is intended to help the user to quickly start up and use the battery. The information in this manual is subject to change without notice, and we reserve the right to explain the details of such change.

1.5 Document Version

V1.0 (February 10, 2025) was first officially released.

2 Safety Instructions

2.1 Handling Precautions

Statement

When installing, operating, and maintaining the equipment, you must first read this manual and follow the signs on the equipment and all safety precautions in the manual. When unpacking a new product for the first time, check the product and packing list, and contact your local dealer if the product is damaged or missing parts.

The “CAUTION”, “EXPLANATION”, “WARNING” and “DANGER” in this manual are only supplementary to all safety precautions. You are also required to comply with relevant international, national, or regional standards, as well as industry practices. We are not responsible for any violation of general safety practices or safety standards in the design, manufacture, or use of the equipment.

The equipment should be used in an environment that complies with the design specifications. Otherwise, it may lead to equipment malfunction, resulting in abnormal functioning of the equipment or damage to parts, personal safety accidents, property damage, etc., which is not covered by the equipment quality warranty.

All operations, such as transportation, installation, operation, use, and maintenance of the equipment, should comply with local laws, regulations, executive standards, and customer regulatory requirements. The safety precautions in this manual are intended only as a supplement to local laws, regulations and codes.

ESSIS is not responsible if one of the following occurs:

- Damage to the equipment caused by extreme environments (earthquakes, floods, typhoons, volcanic eruptions, etc.), force majeure, and other factors.

- Not operating under the conditions of use described in this manual.
- The installation and use environment violates relevant international, national or regional standards.
- Failure to comply with operating instructions and safety warnings in the product and documentation.
- Unauthorized disassembly, modification of the product or modification of the software code.
- Damage caused by transportation by the customer or by a third party commissioned by the customer.
- Damage caused by storage conditions that do not comply with product requirements.
- Damage caused by improper, customer or third party operation not caused by ESSIS.
- Beyond the life of the product.

2.1.1 Personal Safety

Danger	On-site operation is strictly prohibited during installation. Installation or removal of the cable is prohibited. When the cable core comes into contact with the conductor, arcing, sparking or explosion will occur, which may result in fire or personal injury.
Danger	When the equipment is energized, unregulated and improper operation may cause fire, electric shock or explosion, resulting in personal injury or property damage.
Danger	It is strictly prohibited to wear conductive items such as watches, bracelets, bangles, rings, necklaces, etc. during operation to avoid electric shock burns.
Danger	Special insulated tools must be used during operation to avoid electric shock injury or short circuit failure. The insulation voltage withstand level must meet the requirements of local laws, regulations, standards and codes.
Warming	Special protective equipment must be used during operation, such as wearing protective clothing, insulated shoes, goggles, helmets, insulated gloves, etc.

2.1.2 Electrical Safety

Danger	● Before making electrical connections, make sure the equipment is not damaged, otherwise it may cause electric shock or fire.
Danger	● Unregulated and incorrect operation may cause accidents such as fire or electric shock.
Danger	● Prevent foreign objects from getting inside the equipment during operation, otherwise it may result in short-circuit failure or damage to the equipment, load power supply derating or power loss, and personal injury.
Warming	● When installing equipment that requires grounding, the protective grounding wire must be installed first; when removing the equipment, the protective grounding wire must be removed last.
Caution	● No cables are allowed to be set up to pass through the air inlet or outlet of the equipment.

2.1.3 Battery Safety

Danger	● It is strictly prohibited to short-circuit the positive and negative terminals of the battery, as this may result in a short-circuit of the battery. A short circuit of the battery can immediately generate a high current and release a large amount of energy, resulting in battery leakage, smoke, release of flammable gases, thermal runaway, fire, and explosion. To avoid short-circuiting of the battery, maintenance with electricity is not allowed!
Danger	● Do not expose the battery to high temperature environments or heating devices, such as high temperature sunlight, fire sources, transformers, heaters, etc. Overheating of the battery may result in liquid leakage, fumes, release of flammable gases, thermal runaway, fire or explosion.
Danger	● Mechanical vibration, dropping, collision, piercing by hard objects, and pressure shocks are strictly prohibited, otherwise the battery may be damaged or fire may result.
Danger	● It is strictly prohibited to disassemble, modify or damage the battery to avoid liquid leakage, smoke, combustible gas release, thermal runaway, fire or explosion.

Danger

- Using or replacing an incorrect battery type creates a risk of fire and explosion. Use the specified battery type recommended by the manufacturer.

Danger

- Do not allow battery terminals to come into contact with other metal objects, which may cause heat generation or electrolyte leakage.

Danger

- Battery electrolyte is toxic and volatile. In case of electrolyte leakage or abnormal odor, avoid contact with the leaking liquid or gas.
  Non-professionals should not approach. Contact a professional immediately to handle the situation. Professionals should wear goggles, rubber gloves, gas masks, protective clothing, etc., promptly disconnect the equipment, dismantle the leaking battery, and contact a technical engineer for treatment.

Danger

- The battery is a closed system and no gases are released under normal operating conditions. If under extreme abuse, such as under fire, pinprick, extrusion, lightning strike, overcharging or other severe conditions that may lead to thermal runaway of the battery, which may lead to breakage of the battery or abnormal chemical reaction inside the battery, which may lead to leakage of the electrolyte or generation of gases such as CO, H2, etc., the site should ensure that the measures of flammable gas emission are normal, so as to avoid leading to combustion or corrosion of the equipment.

Danger

- Gases from burning batteries can irritate eyes, skin and throat. Attention should be paid to the protective measures taken.

Warming

- The battery should be installed in the area away from liquid, and it is strictly prohibited to install it under the water pipe, air outlet and other locations that are easy to produce condensation; it is strictly prohibited to install it under the air conditioning port, vent, machine room outlet window and other locations that are easy to leak water, in order to prevent the liquid from entering into the internal equipment and causing the equipment to malfunction or short-circuit.

Warming

- When the battery is installed and tuned, it shall be equipped with fire-fighting facilities, such as fire-fighting sand, carbon dioxide fire extinguishers, etc., in accordance with the requirements of construction standards and specifications. Before putting into operation, make sure that the fire fighting facilities are in accordance with local laws, regulations and codes.

Warming

- Before disassembling the packaging of the battery, during storage and transportation, it shall be ensured that the outer packaging box is intact and correctly placed according to the box marking. Inverted, sideways, vertical or diagonal placement is strictly prohibited. When stacking, it should comply with the stacking requirements on the outer packaging to avoid damage and scrapping of the battery.

Warming

- After unpacking the battery, it should be placed in the required direction. Inverted, sideways, vertical, tilted or stacked is strictly prohibited, so as not to cause damage to the battery by impact or fall and scrap.

Warming

- After discharging the battery, it should be recharged in time, otherwise the battery may be damaged due to over-discharge.

2.1.4 Energy Storage System Security

Danger

- Do not open the cabinet door while the system is running.

Danger

- Avoid standing at the cabinet door (including within the door hit) when the energy storage system fails.

Caution

- Emergency evacuation from the site should be done when the fire audible alarm is triggered.

2.1.5 Mechanical Safety

Danger

- Safety helmet, safety belt or waist rope should be worn for working at height, tied to firm and sturdy structural parts, and it is strictly prohibited to hang on moving unsound objects or metal with sharp edges and corners, so as to prevent hooks from slipping off and fall accidents.

Warming

- Tools need to be prepared and qualified by professional organizations, prohibit the use of scarred and unqualified or beyond the inspection of the validity of the tools to ensure that the tools are firm and can not be overloaded.

Warming

- Before installing the equipment into the cabinet, first make sure that the cabinet has been fixed well to avoid the cabinet being tilted and collapsed due to unstable center of gravity, resulting in the installer being smashed and the equipment being broken.

Warming

- When pulling the equipment out of the cabinet, be careful of equipment that may be unstable or heavy when installed in the cabinet to avoid being crushed or smashed.

Warming

- Drilling holes in the equipment is strictly prohibited. Drilling holes can damage the sealing, electromagnetic shielding performance, internal devices and cables of the equipment, and metal shavings from drilling holes into the equipment can lead to a short circuit of the circuit board.

2.1.6 Environmental Safety

Danger

- It is strictly prohibited to store flammable or explosive materials in the equipment area.

Danger

- It is strictly prohibited to place the equipment in an environment of flammable or explosive gases or fumes, and it is prohibited to carry out any operation in such an environment.

Danger

- It is strictly prohibited to place the equipment close to sources of heat or fire, such as fireworks, candles, heaters or other heat generating devices, as heat applied to the equipment may cause damage to the equipment or cause a fire.

Warming

- The equipment should be installed in an area away from liquids, and it is strictly prohibited to install it under water pipes, air vents and other locations that are prone to condensation; it is strictly prohibited to install it under air conditioning outlets, vents, server room outlet windows and other locations that are prone to leakage to prevent liquids from entering the interior of the equipment and causing equipment malfunctions or short circuits.

Warming

- When the equipment is in operation, please do not cover the vent, cooling system or use other items to cover to prevent high temperature damage to the equipment or fire.

2.2 Safety Instructions

2.2.1 General Requirement

Warning

- It is forbidden to disable the protective devices of the equipment and to ignore the warnings and precautions in the manuals and in the equipment.

Warning

- Do not open the equipment until it has been installed or confirmed by a qualified person.

Warning

- It is forbidden to touch directly, to touch other conductors through wet objects, or to touch the power supply equipment indirectly. Before touching any conductor surface or terminal, measure the voltage at the point of contact to confirm that there is no risk of electric shock.

Warning

- When the equipment is in operation, part of the inner casing is hot and there is a risk of burns, so do not touch it.

Warning

- Installation, operation and maintenance must be carried out in accordance with the procedures in the manual. No modifications, additions, or alterations to the equipment or changes to the installation sequence may be made without authorization.

Warning

- In order to connect to the power grid for operation, permission must be obtained from the national or regional power authority.

Warning

- When liquid is found to have entered the device, turn off the power immediately and prohibit further use.

Warning

- Before installing the cable, it is important to verify that the cable labeling is correctly identified and that the cable terminals are insulated and protected.

Warning

- Ensure that all electrical component protective casings, insulation sleeves and other devices are in place after installation to avoid the risk of electric shock.

Warning

- Paint scratches that occur during transportation and installation of the equipment must be repaired in a timely manner, and prolonged exposure of the scratched portion is strictly prohibited.

Warning

- When working in the space above the top of the equipment, protection should be added to the top of the equipment to avoid damage to the equipment.

Warning

- It is strictly prohibited to install, use and operate outdoor equipment and cables (including but not limited to carrying equipment, operating equipment and cables, plugging and unplugging signal interfaces connected to the outdoors, working at height, outdoor installation, opening doors, etc.) under severe weather such as lightning, rain, snow, wind of more than six degrees.

Warning

- Arc welding, cutting, and other operations on the equipment are prohibited without our evaluation.

Warning

- Use the battery within the specified temperature range. Charging is prohibited when the ambient temperature is below the lower limit of the operating temperature to avoid internal short circuit caused by low temperature charging.

Warning

- Before installing the battery pack, the battery should be checked for either of the following two conditions. If any one of them occurs, it is considered abnormal:

Warning

- (1):There is obvious deformation or damage to the battery pack case;

Warning

- (2):The voltage between the positive and negative terminals of the battery pack output is not within the normal range.

Warning

- Determine if the positive and negative battery terminals are accidentally grounded. If accidentally grounded, disconnect the battery terminals from the grounding point.

Warning

- Do not weld, grind, or perform similar work around the battery to avoid sparking, arcing, and fire hazards.

Warning

- It is prohibited to use equipment that does not meet the requirements of local laws, regulations and charging and discharging regulations.

Warning

- Battery circuits should remain disconnected during installation and maintenance.

Warning

- After power components of the energy storage system are replaced or wiring is changed, it is necessary to manually initiate wiring testing to avoid abnormal system operation.

Warning

- Battery damage (drops, collisions, expansion bulges or case dents, etc.) may result in leakage or release of flammable gases; do not use damaged batteries. When the battery is damaged by liquid leakage, structural deformation, etc., please contact the installer or professional operation and maintenance personnel immediately for removal and replacement. Do not store damaged batteries near other equipment or flammable materials, and keep non-professionals away from damaged batteries.

2.2.2 Personnel Requirements

Warning

- Personnel responsible for the installation of the equipment and maintenance of the equipment must first be rigorously trained in the correct methods of operation, be aware of the various safety precautions, and be aware of the relevant standards of the country/region in which the equipment is located.

Warning

- Only qualified professionals or trained personnel are allowed to install, operate and maintain the equipment.

Warning

- Personnel for special scenarios such as electrical operation, work at heights, and operation of special equipment must have special operating qualifications required by the local country/region.

Warning

- Only qualified professionals are allowed to remove safety devices and service equipment.

Warning

- Replacement of equipment or parts (including software) must be done by qualified or authorized personnel.

Warning

- Do not approach the equipment by persons other than those who will be operating it.

2.2.3 Environmental Requirements

Warning

- When installing the equipment, please make sure that the mounting surface is solid and meets the load-bearing requirements of the equipment.

Warning

- The installation and use environment must comply with local laws and regulations as well as relevant international and regional standards for lithium battery products. The person using this equipment is obliged to protect it from fire or other damage.

Warning

- In areas where natural disasters such as floods, mudslides, earthquakes, typhoons, etc. are frequent, appropriate precautions need to be taken.

Warning

- The temperature and humidity environment in which the equipment is stored should be suitable, stored in a clean, dry, well-ventilated area, and protected from dust and condensation.

Warning

- Installation environment ground is solid, no rubber soil, weak soil or easy to sink and other adverse geology, it is strictly prohibited to choose easy to accumulate water, easy to accumulate snow and other low-lying areas, the site level should be higher than the highest historical water level in the region. When installing, operating and maintaining the equipment, it is necessary to clean the top of the water, ice and snow or other debris before opening the door, so as to avoid debris falling into the interior of the equipment. When installing the equipment, make sure the mounting surface is solid and meets the equipment's load-bearing requirements.

Warning

- Do not place the equipment near sources of heat or fire, such as smoke, candles, heaters or other heating devices. Heating the equipment may cause damage to the equipment or cause a fire.

Warning

- It is strictly prohibited to store flammable or explosive materials in the equipment area.

Warning

- When the equipment is in operation, do not block vents, cooling systems, or use other items to cover the equipment to prevent heat damage to the equipment or ignition.

Warning

- Installation, use and operation of outdoor equipment and cables (including, but not limited to, handling equipment, operating equipment and cables, plugging and unplugging signal interfaces connected to the outdoors, overhead, etc.) are strictly prohibited in inclement weather such as lightning, rainfall, heavy snowfall, strong winds. work, outdoor installation, etc.).

Warning

- It is strictly prohibited to install the equipment in direct sunlight, dust,

fumes, volatile gases, corrosive gases, infrared radiation, high organic solvents or salts.

Warning

- Site selection should be in accordance with local laws, regulations and relevant standards.

Warning

- The equipment should be installed in an area away from liquids, and it is strictly prohibited to install it under water pipes, air outlets and other locations that are prone to condensation; it is strictly prohibited to install it under air conditioning outlets, vents, server room outlet windows and other locations that are prone to water leakage to prevent liquids from entering the interior of the equipment and causing equipment malfunctions or short circuits.

2.2.4 Grounding Requirements

Warning

- When installing equipment requiring grounding, the protective ground wire must be installed first; when removing equipment, the protective ground wire must be removed last.

Warning

- The equipment shall be permanently connected to the protective ground. Before operating the equipment, check the electrical connections of the equipment to ensure that it is properly grounded.

Warning

- It is prohibited to install a grounding conductor to operate the equipment.

Warning

- Damage to the grounding conductor is prohibited.

Warning

- In the case of high contact current equipment, the protective earth terminal of the equipment enclosure must be grounded before connecting the input power supply to prevent electric shocks to humans from the contact current of the equipment.

2.2.5 Wiring Requirements

Warning

- Cables must be selected, installed and laid in accordance with local laws and regulations.

Warning

- All cables must be securely connected, well insulated and have appropriate specifications.

Warning

- Use of cables in hot environments may cause deterioration and damage to the insulation. The distance between the cable and the periphery of the heating unit or heat source area should be at least 30mm.

Warning

- Cables of the same type should be tied together with a straight and neat appearance and without skin damage; cables of different types should be laid separately and entanglement or cross-laying is strictly prohibited.

Warning

- Cable grooves and over-wire holes should be free of sharp edges, and the location of cable penetration pipes or over-wire holes should be protected to avoid damage to cables by sharp edges and burrs.

Warning

- When wiring is completed or when leaving during the wiring process, sealing mud should be used immediately to seal the cable opening to avoid water vapor and small animals from entering.

Warning

- When holding the veneer or module with exposed circuit board, you must hold the veneer or module edges that do not contain components, and it is prohibited to touch the components with your hands.

Warning

- The disassembled veneer or module must be packaged with anti-static packaging material before storage or transportation.

2.2.6 Maintenance Requirements

Warning

- If the device has multiple inputs, disconnect all inputs to the device and wait until the device is completely powered down before operating the device.

Warning

- When installing and maintaining the battery, it is necessary to wrap the exposed cable terminals on the battery with insulating tape.

Warning

- When maintaining the power or distribution equipment at the back stage of the power supply equipment, it is necessary to disconnect the corresponding output switch of the power supply equipment.

Warning

- When maintaining the equipment, hang a “No Closing” sign on the upstream and downstream switches or circuit breakers, and post warning signs to prevent accidental connections. Troubleshooting must be completed before power is restored.

Warning

- When troubleshooting and diagnosing a problem, the following safety measures must be completed if a power outage is required: power outage > power test > installing grounding wire > hanging signs and installing shields.

Warning

- Please check the equipment connection terminal screws regularly to make sure they are tightened and not loose.

Warning

- Avoid foreign objects (e.g. conductive objects, screws, liquids, etc.) from entering inside the battery and causing a short circuit.

Warning

- If the cables are damaged, they must be replaced by a professional to avoid risks.

Warning

- It is strictly prohibited to artificially alter, damage or cover up the markings and nameplates on the equipment, and promptly replace markings that have become unclear due to long-term use.

Warning

- Solvents such as water, alcohol or oil are prohibited to clean the electrical parts inside and outside the equipment.

2.2.7 Recycling Requirements

Warning

- Please dispose of used batteries in accordance with local laws and regulations, and do not dispose of batteries as household waste.

Warning

- If the battery is leaking or bulging and cannot be used beyond its service life, please contact technical support or a battery recycling company for disposal.

Warning

- Faulty batteries are prohibited from secondary use and must be disposed of as soon as possible by contacting a battery recycling company to avoid environmental pollution.

Warning

- Avoid exposing the battery to high temperature or direct sunlight.

Warning

- Avoid exposing the battery to high humidity or corrosive environment.

3 Products

3.1 Product Description

The product introduced in this manual is the ESS 100F

No.	Acronym	Description
1	ESS	Abbreviation for ESSIS
2	100	Nominal energy 100kWh
3	F	Cooling is air-cooled

Table 3-1 Description of Product Name

A single 100kWh industrial and commercial energy storage battery cabinet is an energy storage unit with seven battery packs and a high-voltage box and a 50kw PCS, each battery pack consists of 16 battery cells connected in series with a rated capacity of 280Ah. The high-voltage box contains a battery cluster management unit and a number of protection, control and other electrical components, which are used for the management and protection of the entire battery cluster operation. The high-voltage box contains the battery cluster management unit and some protection, control and other electrical components for the management and protection of the whole battery cluster operation.

3.2 Overall Appearance

Figure 3-2 Exterior and Dimensional Drawings

3.3 Component Introduction

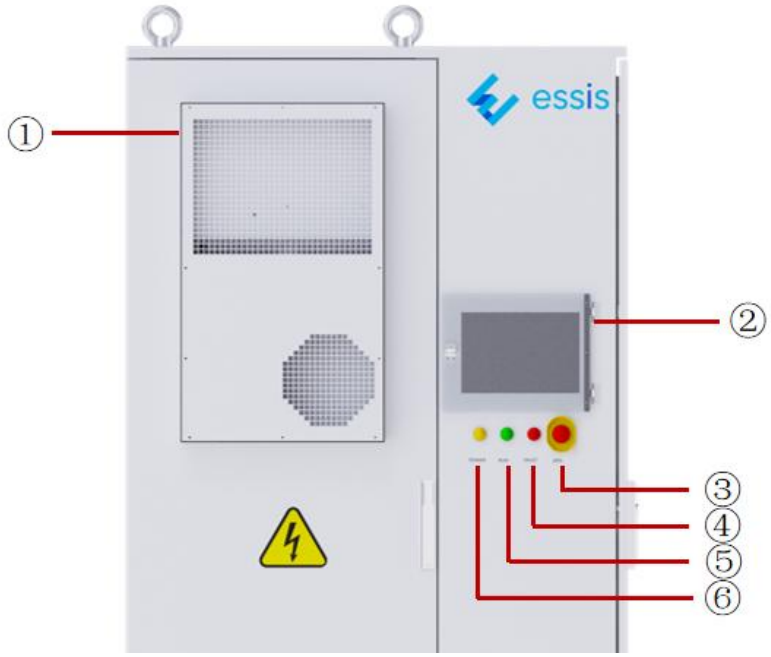

Figure 3-3 Component Introduction (Closed Door)

NO.	Model	Description
1	Air Conditioning Outside Unit	Air conditioning vent and duct inlet
2	Touch Screen Module	Easy handling of equipment with cranes
3	Emergency stop button	Emergency stop for energy storage system
4	Red Indicator Light	Power status indicator, after power on, the indicator light is on
5	Yellow Indicator Light	Fault indicator, when the equipment failure, the indicator light on
6	Green Indicator Light	Normal operation indicator, when the equipment is in normal operation, the indicator light is on

Table 3-4 Component Introduction (Closed)

Figure 3-5 Component Introduction (Open Door)

No.	Model	Description
1	Aerosol fire suppression device	When the aerosol fire suppression device senses high temperature, it will activate itself and spray fire extinguishing agent
2	Inner Circulation Air Outlet	Air conditioning cool air enters the battery through this port
3	Battery PACK	Battery pack is a battery assembly in which the battery cells are connected in series with a pair of positive and negative terminals for external input and output.
4	High Pressure Box	Containing BCU modules, fuses, contactors, disconnect switches and other components, used for the control center of the energy storage cabinet, short-circuit fault, insulation detection, leakage current detection and other functions.
5	Combined temperature and smoke detectors	Used to monitor smoke and fire
6	Display Screen	Ten-inch display showing the status of the energy storage system, with separate alarm indicator, power indicator and status indicator for the energy storage system

No.	Model	Description
7	Inverter PCS	Energy storage converter; when discharging, it is used to convert the DC voltage of the battery into the specified AC voltage output; when charging, it converts the AC voltage of the power grid into DC voltage for energy storage.
8	Air inlet and outlet	Auxiliary energy storage cabinet high temperature gas emission

Table 3-6 Component Introduction (Open Door)

3.3.1 Power Supply And Distribution Systems

3.3.1.1 System Introduction

Figure 3-7 Schematic diagram of the power supply and distribution system

No.	Model	Description
1	Battery PACK	Battery pack is a combination of battery cells connected in series with a pair of positive and negative terminals for external input and output.
2	High-voltage box HVDB	Containing BCU module, fuse, contactor, isolation switch and other components, used for the control center of the energy storage cabinet, short-circuit fault, insulation detection, leakage current detection and other functions
3	Inverter PCS	Energy storage converter; when discharging, it is used to convert the DC voltage of the battery into the specified AC voltage output; when charging, it converts the AC voltage of the power grid into DC voltage for energy storage.

Table 3.8 Names of distribution systems

3.3.1.2 Battery Pack

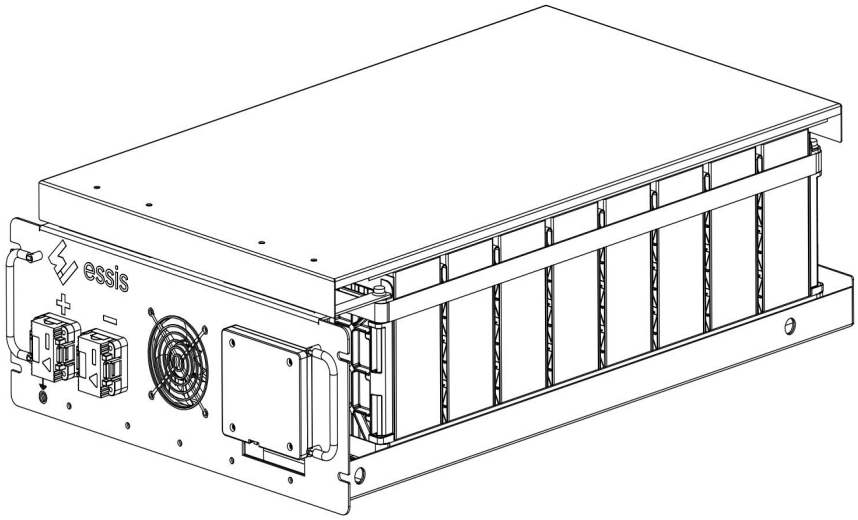

Figure 3-9 Exterior view of the battery pack

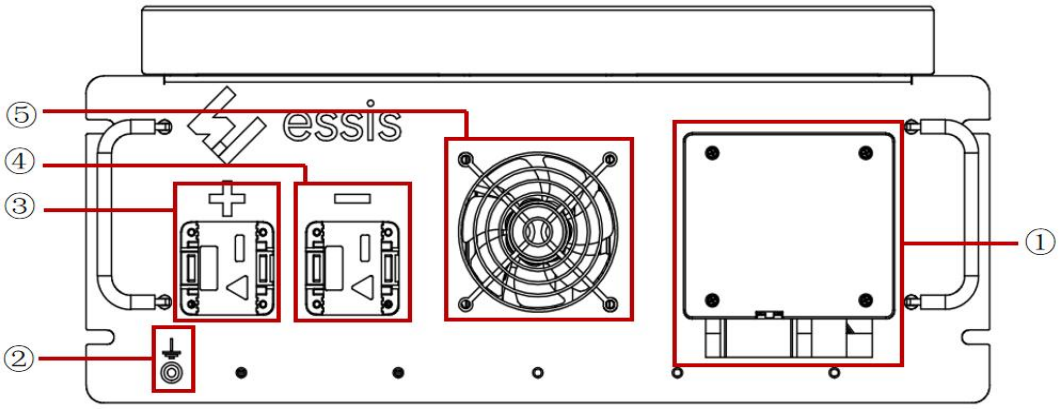

Figure 3-10 Battery front view

No.	Model	Description
1	Battery Slave Management Unit (BSU)	Through the acquisition of cell voltage and temperature voltage, it realizes the monitoring of Pack-level battery status and completes the sampling and equalization management of Pack-level battery.
2	Battery Ground Terminal	Ground wire terminal
3	Main power positive connector (BAT+)	PACK main power input interface, used for power connection between PACK and PACK, or power connection between PACK and high voltage box.
4	Main power negative connector (BAT-)	PACK main power output interface, used for power connection between PACK and PACK, or power connection between PACK and high voltage box.
5	Fan	Battery cooling air outlet

Table 3-11 Description of Battery Front Functions

Technical Indicators	CB71173204EB-280Ah
Capacity	3.2V/280Ah
Material	LiFePO4
Working Voltage	43.2-57.6V
Rated Voltage	51.2V
Charge/discharge power	≤0.5P
Nominal Capacity	14.3kWh
Heat Dissipation Method	air cooling
Protection Grade	IP55
Working Temperature	-35℃~+55℃
Storage ambient temperature	-35℃~+60℃
Transportation ambient temperature	-35℃~+60℃
Equalization method	Passive equalization between cells, active equalization between PACKs
Communication Interface	CAN

Table 3-12 Battery Specifications

3.3.1.3 Inverter PCS

Figure 3-13 PCS Appearance

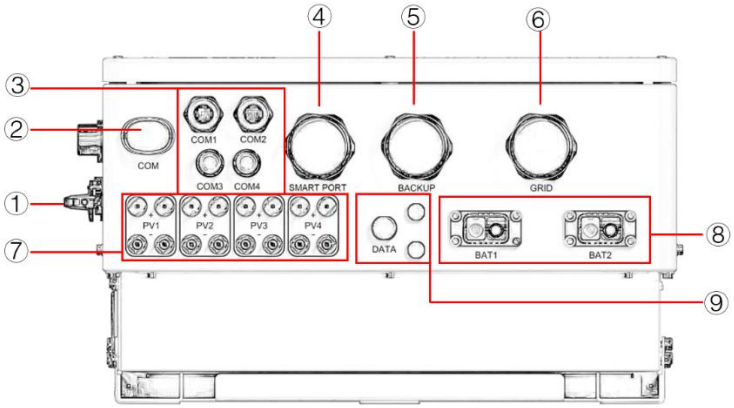

Figure 3-14 PCS Panel Diagram

No.	Model	Description
1	DC Switch	DC switch for PV
2	COM	Connection of Solis loggers
3	COM1/2　COM3/4	COM1/2 connection of RS485 and CAN communication cable and parallel cable
4	Smart Port	COM3/4 connection of communication cable to 14PIN terminal block
5	BACKUP	Connecting the AC lead to the generator
6	GRID	Connecting the AC leads to the load panel
7	PV	Connecting the AC lead to the main service panel
8	DATA	Connecting the PV conductor
9	BAT1、BAT2	Connecting battery conductors

Table 3-15 PCS Panel Descriptions

Technical Specification	S6-EH3P50K-H
Maximum DC voltage	1000V
DC working voltage range	150-850V
Maximum DC current	40A
AC Rated Working Voltage	600V
AC rated working frequency	50Hz/60Hz
AC Rated Working Current	76.0A/72.2A
AC Maximum Working Current	76.0A/72.2A
AC rated power	50kW
Power factor	0.8 ahead to 0.8 behind
Operating temperature range	-25℃～+60℃
Voltage Recognition Accuracy	2%
Protection class	IP66
Maximum AC power	50kWA

Table 3-16 PCS Technical Parameters

Technical Specification	S6-EH3P50K-H
Overvoltage category	Type II
AC lightning protection	Type II
Impedance insulation detection	Support
Anti-islanding protection	Support
Output overcurrent protection	Support
Residual current monitoring	Support
Input reverse connection protection	Support
Dimension (W*H*D)	530*880*390mm
Weight	73kg
Cooling Method	Intelligent Fan Cooling

Table 3-17 PCS Protection and General Parameters

3.3.1.4 High-voltage box HVDB

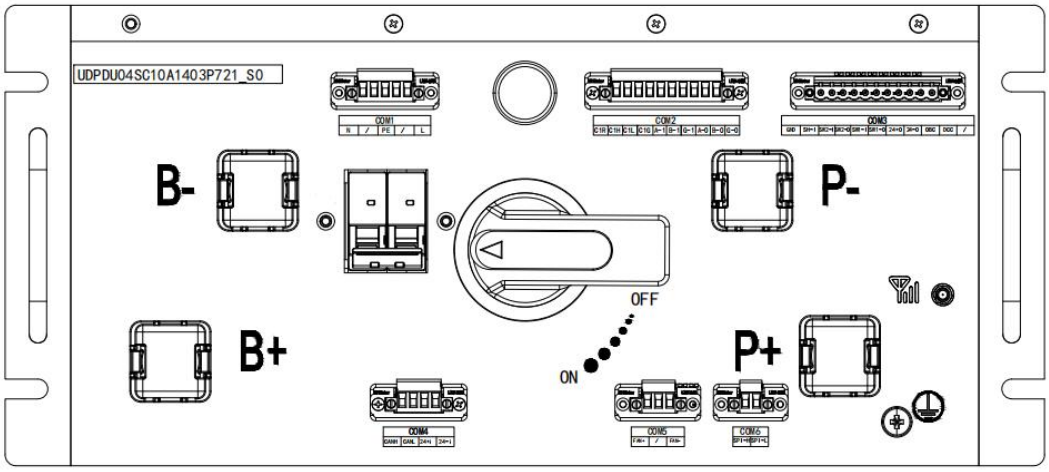

Figure 3-18 Front Panel Interface Display Diagram

NO.	Name		I/O	Functional Description
1	B+		-	Cluster Input Positive
2	B-		-	Cluster input negative
3	P+		-	PCS input positive
4	P-		-	PCS input negative
5	Manual Switches		-	DC control box start switch
6	Power switch		-	
7	Indicator light		-	
8	COM1(5P)	N	/	External AC 220V zero line
		/	/	/
		PE	/	External AC 220V ground
		/	/	/
		L	/	External AC 220V Fire
9	COM2(10P)	CAN1R	I/O	Terminal Resistance
		CAN1H	I/O	Isolated CAN (with PCS or external device)
		CAN1L	I/O	
		CAN1G	I/O	
		RS485-A1	I/O	Isolated 485 (to PCS or external

		RS485-B1	I/O	device)
		RS485-G1	I/O	
		RS485-A0	I/O	Non-isolated 485 (to display or external device)
		RS485-B0	I/O	
		RS485-G0	I/O	
10	COM3(11P)	GND	/	
		SH-I	I	Low Side Switching Output 3
		SW2-I	I	Dry contact 2 (0.1A)
		SW2-O	O	
		SW1-I	I	Dry contact 1 (1A)
		SW1-O	O	
		24+O	O	Input 24V+
		24-O	O	Input 24V-
		OBC	I/O	/
		DCC	I/O	/
		/	/	/
11	COM4(4P)	CANH	I/O	Debugging CANH
		CANL	I/O	Commissioning CANL
		24+i	I	Input 24V+
		24-i	I	Input 24V-
12	COM5(3P)	FAN+	I	Fan input
		/	/	/
		FAN-	O	Fan output
13	COM6(2P)	SPI-H	I/O	Slave CANL
		SPI-L	I/O	Slave CANH
14	Signal Interface		-	
15	Grounding		-	

Table 3-19High Pressure Box Front Panel Interface Descriptions

3.3.2 Firefighting And Other Accessories

3.3.2.1 Aerosol Fire Suppression Devices

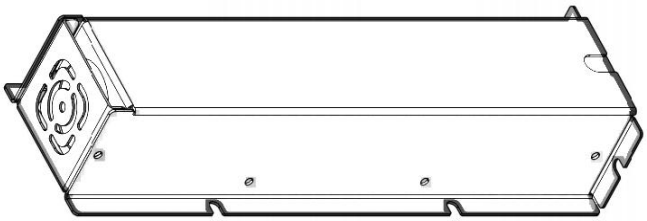

Figure 3-20Aerosol Fire Suppression Device Appearance

Working Principle: When the aerosol fire suppression device senses high temperatures, the device will activate itself and generate a large amount of aerosol dust, thus quickly realizing fire suppression.

Technical indicators	Aerosol Fire Suppression Devices
Pharmacy	Aerosol
Starting method	Temperature Sensitive Hot Start
Starting temperature	185±15℃

Table 3-21Aerosol Fire Suppressor Unit Specifications

3.3.2.2 Combined temperature and smoke detectors

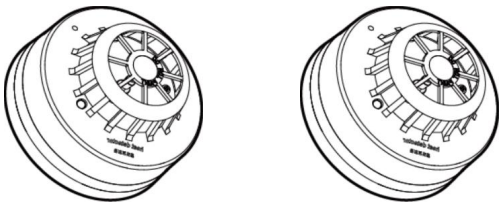

Figure 3-22Appearance of temperature and smoke sensing composite detector

Function: Temperature and smoke detectors are used to detect the temperature and smoke concentration of the current environment.

Technical Specification	Temperature and Smoke Sensing Combined Detector
Dimensions (Diameter * Height)	110*60mm
Installation method	Screw fixing

Table 3-23 Temperature and Smoke Sensing Composite Detector Parameters

Name	Color	state	Description
Indicator light	Red	Normal Bright	Detector in alarm
		flashing	Detector is monitoring

Table 3-24 Temperature and Smoke Sensing Composite Detector Indicator Description

3.3.2.3 Exhaust fan

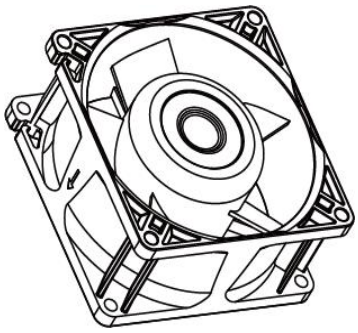

Figure 3-25 Exterior of Exhaust Fan

Role: The exhaust fan works with the air conditioner to assist in heat dissipation; when the battery opens the valve to release combustible gases, the exhaust fan increases the operating power to reduce the concentration of combustible gases in the battery compartment.

Technical Specification	Exhaust Fan
Working Voltage	8V~16V (DC)

Table 3-26 Exhaust Fan Specifications

3.4 Working Principle

3.4.1 Circuit Block Diagram

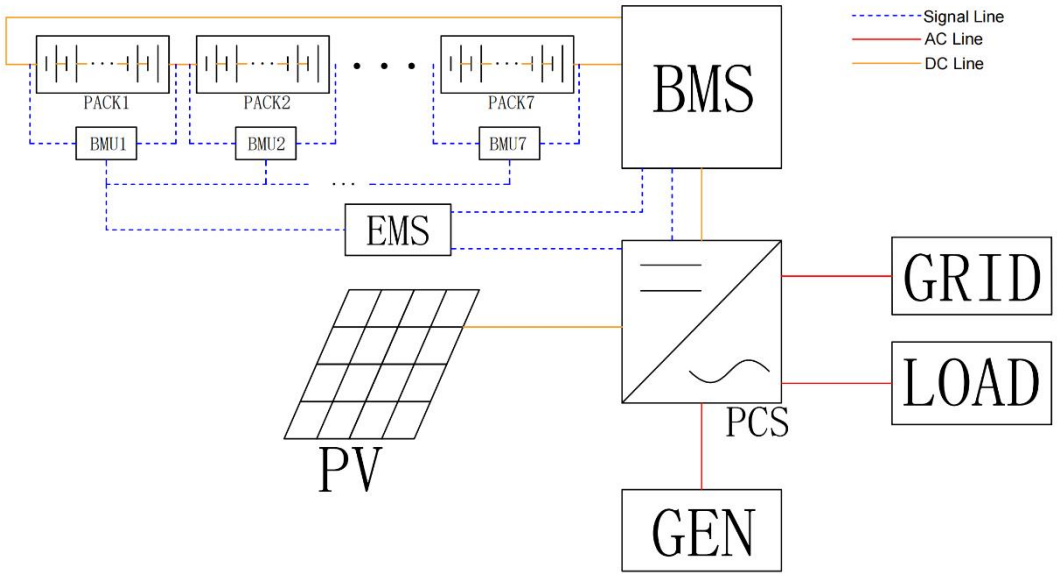

Figure 3-27 Circuit Block Diagram

3.4.2Device Status

The energy storage system has a variety of device states, namely: running, standby, and shutdown.

device status		clarification
run	Charge	Energy storage system is charging
	discharge	Energy storage system is discharging
pragmatic		Energy storage system initialization self-test process
turn off	Abnormal Shutdown	The energy storage system enters a shutdown state due to a fault
	Command Shutdown	The energy storage system receives a shutdown command and the energy storage system enters a shutdown state.

Table 3-28 Device Status Table

4 Site Preparation And Installation

Danger	● Violent loading and unloading is prohibited, otherwise it may lead to short circuit, damage (liquid leakage, rupture, etc.), fire or explosion of the battery.
Danger	● During battery installation, pay attention to the positive and negative terminals. It is strictly prohibited to short-circuit the positive and negative terminals of individual battery packs or batteries, otherwise it may lead to short-circuiting of the battery and cause fire hazard.
Warning	● During the battery installation process, it is strictly prohibited to place installation tools, metals and other conductive substances on the battery. After the battery installation is completed, clean the battery and surrounding items in time to prevent short circuit.
Warning	● It is forbidden to handle the battery through its terminals, bolts or cables to avoid damaging the battery.
Warning	● After unpacking the battery, it should be placed in the required direction. It is strictly prohibited to invert, incline, tilt or stack the battery to avoid collision or fall that may cause damage to the battery.
Warning	● In case of bad weather, such as heavy rain, fog, strong wind, etc., installation should be stopped.

4.1 Haulage

The cabinet and modules of the entire energy storage unit are transported as a whole, i.e. the battery module is fixed to the cabinet and then transported as a whole. When the energy storage cabinet is not conducive to the transportation of the whole unit, the cabinet body and the battery module can also be transported separately. When transporting and storing the cabinet, please pay attention to the markings on the box. The modular design of the energy storage unit makes it easy to position and transport the unit.

Each energy storage cabinet is rigorously inspected and tested before leaving the factory. Care must be taken during transportation and handling to avoid damage to the electrical components of the control system. Before unpacking, the cabinet should be transported as close as possible to the installation site. During transportation, the cabinet must be kept in an upright position.

4.2 Pre-installation Inspection

Before opening the Energy Storage System components, inspect the outer packaging for visible damage, such as holes, cracks, or other signs of possible internal damage, and check the model number. If you find any abnormalities in the packaging or a mismatch in the model number, do not open it and contact your dealer as soon as possible.

In addition to the exterior inspection, the following inspections should be performed

- Check that the product nameplate data is consistent with the ordering contract, e.g. product model, rated capacity, voltage class, etc;
- Check that the factory documentation and accessories are complete;
- The battery modules of the energy storage cabinet for deformation and looseness;
- The inverter cabinet for deformation, paint loss and looseness;

If you notice any of these problems, please contact your dealer and provide a report.

4.3 Installation Environment

Before installation, make sure that the installation environment meets the following requirements:

Category	Requirement
Installation Site Requirements	Good ventilation, large air volume, avoid direct sunlight, avoid strong magnetism, strong light, dust and other places.
	The air inlet and outlet must be professionally treated against rain, wind, sand and dust.
	Necessary fire, water and rodent-proof treatment
	Ground surface inclination ≤ 1 °, seismic capacity > 8 level
Foundation Requirements	The installation surface must be flat and dry, and the ground is strictly prohibited from stagnant water.
	The foundation pit base shall be compacted and filled.
	The foundation must be higher than the highest water level in local history and at least 300mm above the horizontal ground.
	It is strictly prohibited to disturb the equipment foundation after excavation by soaking water, if soaking water is disturbed, the excavation should be continued and refilled.
	The foundation design should take into account the installation and operation and maintenance scenarios, and reserve the access and space for forklift trucks.
	The leveling error between the equipment foundation and the cabinet contact surface is ≤3mm.
	Ensure that the ground level is not shaking and can carry the weight of the energy storage equipment.
Space Requirements	Enough space must be left in front, back, left, right and above the equipment for ventilation, maintenance and escape.
Temperature Requirements	-20～+50℃
Humidity	≤95%, condensationless
Altitude	≤2000m

Table 4-1 Installation Requirements

⚠ Caution

- Do not install the equipment in a place where it will interfere with the working and living environment, because the equipment generates noise during normal operation.

4.4 Preparation of Tools and Instruments

Phillips Insulated Screwdriver	Insulation torque wrench
Diagonal Nose Pliers	Wire Strippers
Wire Cutting Pliers	Art Knife
Insulation tape	Multimeter
Steel tape measure	Heat Shrink Tubing
Insulated ladder	Power forklift (load capacity >4T)
Insulated gloves	Safety helmet
Insulated shoes	Goggles

Table 4-2 Preparation of Installation Tools and Instruments

4.5 Space Requirements

Notice

- The installation space of the storage cabinet should be kept at an appropriate distance from the surrounding walls to ensure easy opening and closing of the door, smooth insertion and removal of modules, normal heat dissipation, and to leave enough space for users to operate.

The front and back of the energy storage cabinet should not be pressed against the wall. The front and back of the cabinet should be kept at a reasonable distance from the wall to ensure proper operation of the cabinet. The distance between the front door of the energy storage cabinet and an obstacle should be maintained at a minimum of 1500 mm to ensure that there is sufficient maintenance space to open the door for maintenance and removal of the battery modules. The distance between the front of the door on the back of the storage cabinet and the obstacle should be at least 1000 mm, which not only ensures the necessary space for maintenance, but also ensures the space for heat dissipation of the air-conditioner on the back.

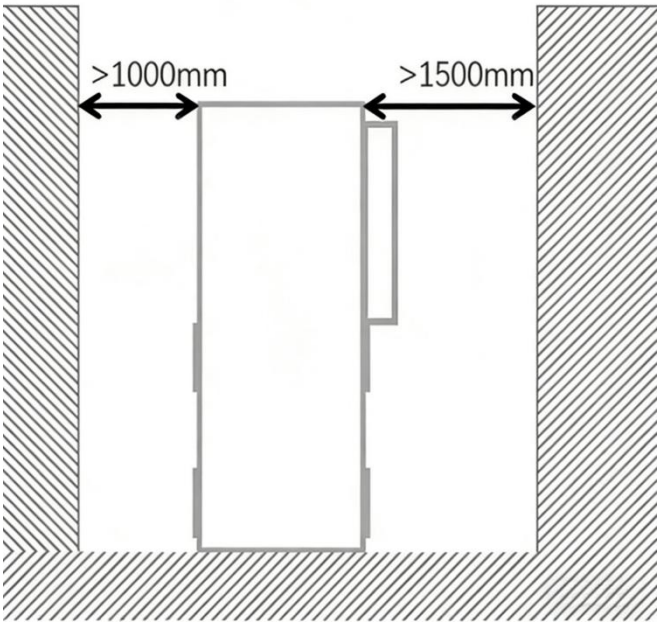

Figure 4-3 Storage Cabinet Space Requirements

4.6 Installation Of Energy Storage Cabinets

Step 1: Dismantle the outer packaging of the energy storage cabinet and remove the paper transportation guidelines pasted on the side of the cabinet;

Step 2: Take away accessories, information and other attachments and keep them in a safe place;

Step 3: Use the crane to lift the energy storage cabinet, transport the energy storage cabinet to the nearest location to the installation site, before lifting, please check whether the lifting ring on the top of the energy storage cabinet is stable;

Step 4: Remove the bottom forklift limit stop, keep the door closed and move the energy storage cabinet to the designated location.

Step 5: Use screws (supplied with the box) to fasten the ground adapter.

⚠ Warming	● Do not remove the forklift limit plates while suspended in the air. Make sure that the energy storage cabinet is placed on the ground before removing the forklift limit plates.
⚠ Warming	● Please make sure that the foot adapter is installed correctly and check whether the screws (supplied with the box) are tight to prevent the cabinet from being tipped over and damaged due to extreme conditions such as earthquakes.
⚠ Warming	● Ramps prohibit the use of a hand forklift to move the cabinet.
⚠ Warming	● Use only powered forklifts to transport cabinets on inclined surfaces. Power forklift trucks must have sufficient power and a stable center of gravity during inclined transport to ensure safe handling.
⚠ Warming	● Forklift arms must be positioned in the center of the energy storage cabinet and must extend out of the cabinet.
Notice	● Forklift limit stops are used for forklift arm limiting and preventing cuts to the energy storage cabinet, allowing for collision deformation and paint loss, and will be removed subsequently.
Notice	● When the energy storage system is not smooth, leveling shims (supplied

with the box) can be used for leveling before fixing.

4.7 Installation of Protective Earth Wires

Install the storage cabinet grounding cable and connect it to the customer side grounding grid.

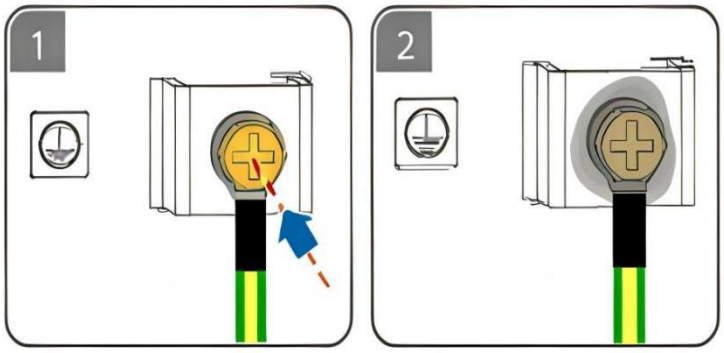

Figure 4-4 Grounding Cable Installation

5 Energy Storage System Power-up

5.1 Pre-power-up Check

No.	Inspection items	Standard
1	Cabinet	Appearance of the equipment is intact, no damage, no rust and no paint falling off. If there is any paint falling off, please
		carry out the operation of replacing paint.
		The label of the equipment is clearly visible, damaged labels should be replaced in time.
		The cabinet is level and the doors can be opened normally.
		The cabinet is properly grounded according to the requirements of the power distribution system.
		The number and location of accessories meet the design requirements.
2	Disconnect switch	Labeling is correct, clear and complete.
3	Cables	The disconnecting switch is in the tripping position.
4	Foreign objects	Cable mounting bolts have been tightened, and cable pulling is not loose.
5	Subcomponents	Remove all foreign objects in the cabinet, such as tools, installation residual materials, etc.
6	Touch Panel	There is no damage to the appearance of each subcomponent.

Table 5-1 Pre-Power-Up Checklist

5.2 Power-on Operation

Danger	● Please wear insulated gloves and use insulated tools to avoid electric shock injury or short circuit failure.
Warming	● During operation, it must be ensured that the positive and negative terminals are not overlapped, so as to prevent short circuits.
Caution	● Observe the power-up process at the same time, and immediately power down the energy storage system when abnormal phenomenon is found, and find out the reason and solve it before continuing to power up.
Caution	● If the battery is discharged or over-discharged during the installation and testing of the system, please replenish the battery in time, otherwise the battery may be damaged due to over-discharge.
Caution	● If the energy storage system has not been in operation for more than half a year after assembly, it should be inspected and tested by professional personnel before it is put into operation.
Notice	● Before the energy storage cabinet is powered up and operated for an extended period of time, remove the desiccant from the cabinet and dispose of it in accordance with the applicable waste disposal act for the location where it is installed. If the energy storage cabinet is powered up and then powered down for a short period of time, keep the desiccant inside the cabinet.

Step 1: Single Cluster Battery Connection

- Wear insulated gloves and prepare the corresponding torque wrench.
- Make sure the handle of the circuit breaker of the high-voltage box is in the “OFF” position, and use a multimeter to measure the voltage difference between the two ends of the circuit breaker (to avoid electrified operation).
- Connect the batteries of each cluster in turn with wires and tighten them with a torque wrench.

Step 2: Battery Cluster Connection

- Connect the total positive and total negative terminals of the battery cluster to the high

voltage box B+B-, and use a torque wrench to tighten them.

- Use a multimeter to measure whether the voltages at both ends of the high voltage box and battery connection meet the requirements, if not, check whether the wires are connected tightly.

Step 3: High voltage box connection

- Check whether the wires of the high-voltage box panel are connected tightly and whether there is any leakage.
- Use the wire to connect the P+P- end of the high voltage box, and connect the other end to the shunt terminal on the wiring board.

Step 4: PCS Connection

- In accordance with the PCS manual, connect the PCS to the high-voltage box, photovoltaic, power grid, three-phase switch on the drain board, and the diesel engine (if any).According to the manual of PCS, use the network cable to make PCS communicate with EMS, if there is a parallel case, it is also necessary to use the network cable to connect each energy storage cabinet, so that the parallel communication.

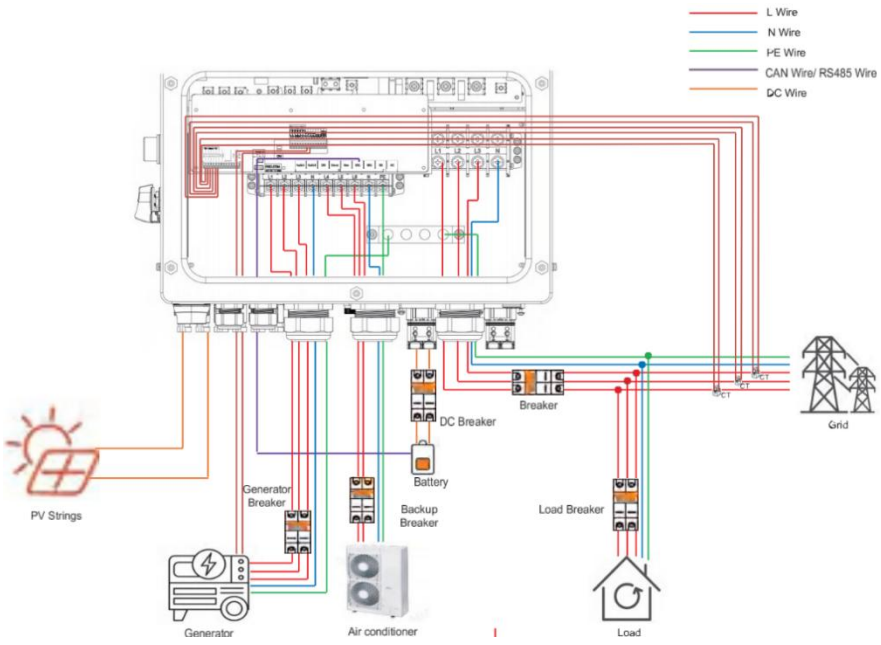

Figure 5-2 Single Inverter Wiring Diagram

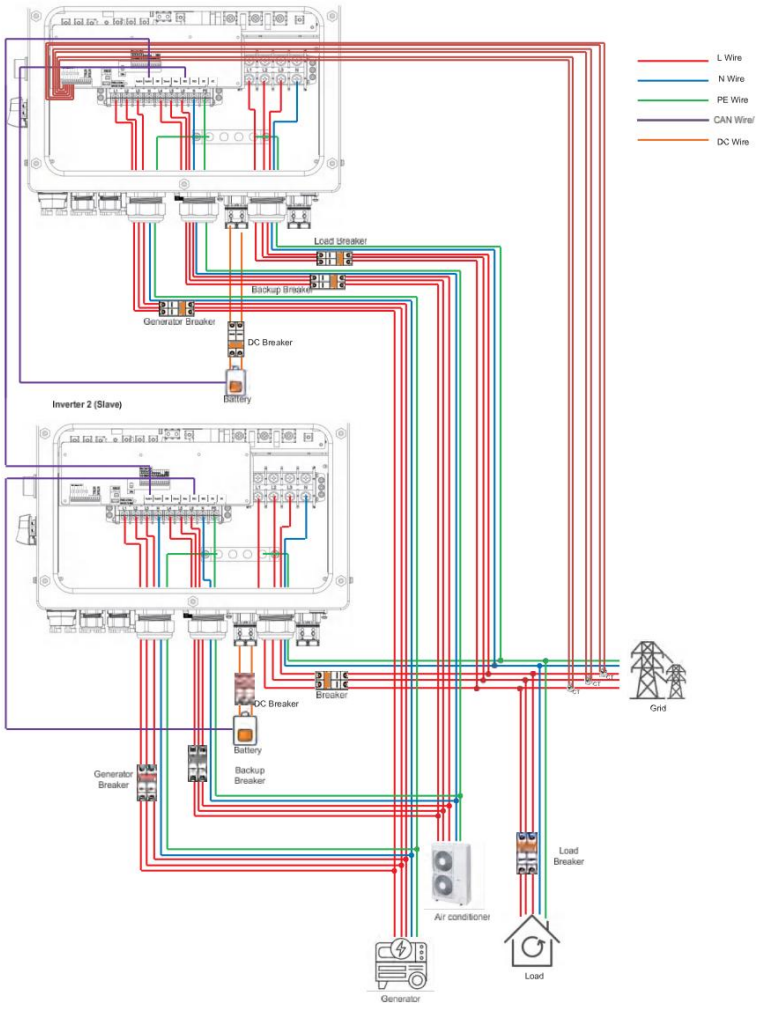

Figure 5-3 Multiple Inverter Wiring Diagram

Step 5: Platoon plate check

- Check whether the wiring board is connected tightly and whether there is any leakage, if there is any leakage, reconnect the wires according to the electrical schematic diagram.

Step 6: Energy storage cabinet startup

- Close the high-voltage box mechanical handle, observe whether the indicator light is green, if green, continue to close the power switch, if red, check the battery cluster links
- Before closing the row version of the battery switch, use a multimeter to measure whether there is a voltage difference between the two ends of the switch (to avoid electrified operation)
- Close the power switch, PCS start, after hearing the “click” sound, use a multimeter to measure whether there is a voltage difference between the two ends of the three-phase switch (to avoid electrified operation).

- Close the three-phase switch, open the air conditioner, fan, socket, lighting, 24V power supply and other switches, to observe whether the electrical parts work normally, the indicator state for the power indicator light is always on, fault indicator off, running indicator in the case of electrical parts work is always on; if it does not work normally, immediately disconnect the three-phase switch, check the line connection

Step 7: Grid, PV, Load Connection

This section requires that the operation is not electrically powered and that the previous section is de-energized during the operation of this section.

- Connecting to the power grid as per PCS manual
- Connect the PV wires according to the PCS manual.
- Connect the load switch with the wires as required
- After the connection is completed, follow all the steps to re-power up, at this time the PCS and the screen can display the working status of each component to prove that the power-up is successful.

Step 8: Strategy Verification

- Use CAN communication to verify the communication debugging software and read the BMS data.
- Adjust the PCS parameters according to the PCS instructions.
- Observe the working status of each component through the screen, and connect to the cloud platform, through the cloud platform can remotely monitor the data of the energy storage cabinet.

Step 9: Verification of protection function

- Manually trigger the emergency stop button to verify the system response:
- The DC contactor should be disconnected within ≤50ms, and the output power of PCS should be reduced to 0 within 100ms.
- BMS records the fault event (code “E101: emergency stop”).

5.3 Hazard Avoidance

In the event of an emergency, follow the steps below:

⚠ Caution	● Press the emergency stop switch on the outside of the cabinet door, the energy storage device automatically disconnects the AC and DC measurement switches, and the energy storage system stops running.
⚠ Caution	● If the energy storage device is in external power supply mode, it is necessary to disconnect all circuit breakers of the machine and external power supply.
⚠ Caution	● When the energy storage system is re-activated, it is necessary to ensure that the relevant faults of the energy storage equipment have been eliminated.

6 System Under Power

6.1 Confirmation before powering down

- View the list of BMS, PCS, EMS alarms and deal with all unmitigated faults (e.g. insulation faults, communication outages)

6.2 Power Down Operation Procedure

Step 1: Confirm standby status

- Disconnect photovoltaic switch, grid switch, diesel engine switch, load switch
- Disconnect the air conditioner switch, fan switch, outlet switch, and light switch on the wiring board.
- Confirm that the system is currently in “standby mode” (non-charging/discharging state) through the screen interface and disconnect the 24V switch.
- Check whether the PCS output power is 0kW and the battery SOC is in a reasonable range (30%~70% is recommended to prolong the life).

Step 2: Energy storage cabinet shutdown

- Disconnect the three-phase switch, at this time the energy storage cabinet electrical components off
- Disconnect the power switch, at this time the PCS shutdown
- Disconnect the power switch of the high-voltage box and disconnect the mechanical handle of the high-voltage box.
- If the equipment is shut down for a long time, remove the battery wires of each cluster.

6.3 Post power down safety verification

Use a multimeter to test all energized areas (DC bus, AC terminals, PCS internal capacitance)

- DC side total voltage <60V DC, AC side voltage to ground <5V AC
- Voltage between positive and negative poles of battery clusters＜5V (no residual energy in equalization circuit)
- After disconnecting all battery clusters, use 500V megohmmeter to measure the insulation resistance of DC bus to ground (≥10MΩ is qualified).

6.4 Physical isolation and labeling

- Hang a “No Operation, Occupied” warning sign on all disconnected circuit breakers.
- Lock battery and PCS cabinets

6.5 Emergency Power Down Plan

6.5.1 Sudden Failure To Power Down Quickly

Scenario 1: Fire/Smoke

Immediately tap the emergency stop button (E-stop) to trigger a system-wide hard power failure, start the gas fire extinguishing system, evacuate the people and alarm the police.

Scenario 2: Battery leakage

Wear acid-resistant clothing, treat leaking electrolyte with a neutralizing agent (e.g., sodium bicarbonate), disconnect faulty battery clusters, and isolate the contaminated area.

6.5.2 First Aid For Personnel

First aid for electrocution：

Remove the victim with an insulated hook and bar, perform CPR (cardiopulmonary resuscitation) immediately, and call the emergency services to specify “high-voltage electric shock accident” and ask for professional assistance.

7 System Maintenance Instructions

7.1 Caveat

Due to the effects of environment, temperature, dust and vibration, the equipment inside the energy storage system can age and wear out, which can lead to potential failures inside the energy storage system. Therefore, it is necessary to perform routine and periodic maintenance on the energy storage system to ensure its proper operation.

⚠ Caution	• Only qualified and authorized personnel may perform maintenance and other operations on the energy storage system.
⚠ Caution	• Do not leave screws, washers and other conductive materials inside the product during maintenance as this may damage the equipment.
⚠ Caution	• Wait at least 15 minutes after the energy storage system has stopped before carrying out maintenance and other operations.

During maintenance or overhaul of your energy storage system, follow these five safety rules to ensure the safety of your operators:

- Disconnect all external connections to the energy storage system.
- Ensure that the energy storage system is not accidentally charged.
- Use a multimeter to ensure that the energy storage system is fully discharged.
- Make the necessary grounding and short-circuit connections.
- Cover adjacent potentially energized parts of the operating components with insulation cloth.

7.2 Maintenance Cycle

Scope of Inspection	Inspection Items	Maintenance cycle
Fire protection	Is the fire extinguishing system complete	Annual Inspection
	Whether the fire extinguishing system is within the validity period	Annual Inspection
	Whether the cooling system is complete	Semi-Annual Inspection
	Whether the air duct of the cooling system is blocked	Semi-annual inspection
Cabinet and Structural Components	Whether the appearance of the integrated cabinet is deformed	Annual Inspection
	Whether the appearance of the cabinet is rusted and damaged	Annual Inspection
	Is there moisture inside the cabinet	Half-yearly Inspection
Wiring harness	Is the low voltage wire harness loose or broken	Quarterly Inspection
	Is the high-voltage wiring harness loose or damaged	Quarterly Inspection
	Is the wiring harness interfering with structural parts	Half-yearly Inspection
	Is the high voltage connection corroded	Monthly Inspection
Mechanical parts	Structural fixing bolts are loose or missing	Monthly Inspection
	Is the switch intact and securely mounted	Quarterly Inspection
	Air conditioning routes are not damaged	Semi-annual Inspection
Gas Inspection	Is there a bad odor inside the integrated cabinet	Daily Inspection
	Is there an irritating odor inside the integrated cabinet	Daily Inspection
	Is there a burnt odor in the high-voltage connection area	Daily Inspection
Electrical Parts	Is the main data complete?	Quarterly

Scope of Inspection	Inspection Items	Maintenance cycle
	Is the voltage data of the unit complete?	Quarterly
	Is the temperature data of single unit complete?	Quarterly
	Is there any abnormal alarm in the alarm bar?	daily censorship

Table 8-1 Maintenance cycle schedule

Attachment

A. Technical Data

Model	Technical Specification	parameters
System	Nominal output power	50KW
	AC Output Power and Voltage	50/60Hz;220/380,230/400Vac
	Wiring method	3L/N/PE
	Nominal energy	100.35kWh
	Dimension (W*D*H)	1108*1082*2200mm
	Weight	1500kg
	AC Output Rated Current	76A
	Rated Voltage	358.4V
	Battery operating voltage	313.6-403.2Vd.c.
	Protection level and corrosion protection level	IP55,C3-C5
	Heat Dissipation Method	Air cooling
	Storage Temperature	0℃-35℃
	Operating Temperature	-20℃-60℃
Inverter	Maximum PV Output Power (W)	96000
	Rated PV Output Voltage (V)	600
	MTTP Operating Voltage Range (V)	150-850
	Start-up voltage (V)	180
	Maximum PV Input Current (A)	40+40+40+40
	Maximum short circuit current (A)	60+60+60+60
	MPPT Number/Maximum Input String Number	4/8
	Power Factor	0.8leading-0.8lagging
	THD	＜3%

Model	Technical Specification	parameters
	Maximum Efficiency	97.80%
	MPPT Efficiency	99.90%
Battery Modules	Battery Type	LiFePO4
	Nominal Cluster Voltage	51.2V
	Cluster Capacity	3.2V/280Ah
	Cluster Energy	14.3kWh
	Cluster Communication Method	CAN&RS485
	Cycle Life	≥8000（25℃±2℃，0.5C，90%DOD,70%SOH）
	Cluster Certification	CE,IEC62619,UN38.3

B. Emergency Response

Notice

This product incorporates multiple safety strategies to prevent hazards caused by failures resulting from external factors.

Battery leakage

Warning

If the battery pack has electrolyte leakage, avoid contact with the leaked liquid or gas. Electrolyte is corrosive and contact may cause skin irritation and chemical burns. If you come into contact with the leaked substance, take the following actions immediately:

- **Inhalation:** Evacuate contaminated area and seek immediate medical attention.
- **Eye Contact:** Rinse eyes with running water for 15 minutes and seek immediate medical attention.
- **Skin Contact:** Thoroughly wash affected area with soap and water and seek immediate medical attention.
- **Ingestion:** Induce vomiting as soon as possible and seek immediate medical attention.

Fire

Warning

- In case of fire, ensure an ABC or carbon dioxide fire extinguisher is nearby. Do not use water to extinguish the fire.

Warning

- Firefighters must avoid contact with high-voltage components during firefighting operations, as this may pose an electric shock hazard.

Warning

- When temperatures exceed 130°C, the battery pack may ignite. If a fire

occurs where the battery is installed, perform the following actions:

Warning

- Extinguish the fire before the battery ignites.

Warning

- If the battery catches fire, do not attempt to extinguish it. Evacuate personnel immediately.

Warning

- If the battery catches fire, it will produce toxic gases. Do not approach.

Wet cell

Warning

- If the battery is wet or submerged in water, do not attempt to approach it. Contact your dealer for technical support.

Battery damage

Warning

- If the battery is damaged, contact your dealer immediately for assistance, as damaged batteries are hazardous and must be handled with extreme caution.

Caution

- Damaged batteries are not suitable for use and may pose a risk to personal safety or property. If the battery appears damaged, return it to your dealer.

Combined Heat and Smoke Detector Alarm

Warning

When the device alarm light flashes or sounds a buzzer:

- Do not approach
- Do not open doors
- Immediately move away
- Remotely disconnect the power supply while ensuring your own safety