

User Manual for the Integrated Solar and Storage Outdoor Cabinet

50KW / 128KWh



2026 years

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1. General Rules

1.1 Preface

Energy storage effectively addresses the contradiction between the intermittent nature of renewable energy supply and the continuous demand for electricity from users, enabling peak shaving and frequency regulation in power systems, smoothing user demand, improving energy efficiency, and supporting the achievement of the "dual carbon" goals. With the gradual transformation of the new power system, the energy storage industry is entering a period of rapid development, spanning its three key components: generation, transmission and distribution, and consumption.

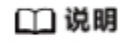
Energy storage applications in power systems address the lack of storage and discharge capabilities, serving as a critical component for enabling large-scale clean energy development and ensuring safe, economical grid operation. By altering the synchronous processes of electricity generation, transmission, and consumption, energy storage enhances the flexibility of rigid power systems capable of real-time balancing—particularly effective in mitigating fluctuations caused by the integration of large-scale renewable energy sources into the grid.

This document primarily outlines the packaging, transportation, installation, and electrical connections for the Photovoltaic Storage Commercial/Industrial Outdoor Cabinet (hereinafter referred to as "this product"). Before using the product, please carefully read this manual to understand safety information and familiarize yourself with its functions and features.

1-2 Symbols and Identifiers

To ensure users' personal and property safety when using this product and to facilitate its optimal use, the manual provides relevant information, which is highlighted with appropriate symbols.

The following lists the symbols and identifiers that may be used in this manual. Readers are advised to read them carefully.

Symbol	Description
	Indicates a hazard with a high level of risk which, if not avoided, will result in death or serious injury.
	Indicates a hazard with a medium level of risk which, if not avoided, could result in death or serious injury.
	Indicates a hazard with a low level of risk which, if not avoided, could result in minor or moderate injury.
	Used to convey equipment or environmental safety information. If not avoided, it may result in equipment damage, data loss, performance degradation, or other unpredictable consequences. "Notice" does not involve personal injury.
	Provides supplementary information on key points within the text. "Explanation" is not safety alert information and does not involve personal, equipment, or environmental hazards.
	This symbol indicates that the interior of the unit contains high voltage. Touching may result in electric shock hazard.
	This symbol indicates that the temperature here is higher than what the human body can tolerate. Do not touch arbitrarily to avoid personal injury.
	This symbol indicates that this is a protective earth (ground) terminal. It must be securely grounded to ensure operator safety.

Energy Storage System (ESS)
Energy Storage Converter PCS
Energy Management System (EMS)
Battery Management System (BMS)
Battery Cluster Management Unit (BCU)
Battery Management Unit (BMU)

2. Safety Notice

2.1 Personnel Requirements

Be thoroughly familiar with the composition and working principles of this product, as well as the relevant standards of the country/region where the project is located.

personnel responsible for the installation and maintenance of the company's equipment must undergo rigorous training to understand all safety precautions and master proper operating procedures. Only qualified professionals or trained personnel are permitted to install, operate, and maintain the equipment.

Only qualified professionals are permitted to remove safety facilities and inspect equipment.

Personnel operating equipment, including operators, trained personnel, and professionals, must possess the specialized operational qualifications required by local national regulations, such as qualifications for high-voltage operations, elevated work, or special equipment operation. Replacement of equipment or components (including software) must be performed by professionals or authorized personnel.

Professional Personnel: Individuals with experience in training or operating equipment, capable of clearly identifying various potential hazard sources and risk levels during equipment installation, operation, and maintenance.

Trained personnel: Individuals who have received appropriate technical training and possess the necessary experience, capable of recognizing potential hazards associated with specific operations and taking measures to minimize risks to themselves or others.

Operating personnel: Any individuals who may come into contact with the equipment, excluding trained staff and professionals.

2.2 General Safety

statement

Before installing, operating, or maintaining the equipment, please read this manual and follow all safety precautions indicated on the equipment and in the manual.

The "Notes," "Cautions," "Warnings," and "Hazards" sections in the manual do not represent all safety precautions to be observed, but rather serve as supplementary guidelines. The Company assumes no liability for any consequences resulting from violations of general safety operating procedures or breaches of design, production, and equipment usage safety standards.

This product must be used in an environment that complies with the specified design requirements; otherwise, equipment failure may occur. Any resulting equipment dysfunction, component damage, personal injury accidents, or property losses shall not be covered under the equipment's warranty.

When installing, operating, or maintaining the equipment, comply with local laws, regulations, and standards. The safety precautions outlined in the manual serve solely as a supplement to local laws, regulations, and standards.

The Company shall not be liable if the system is operated under any of the usage conditions specified in this manual.

The installation and usage environment exceeds the specifications stipulated in relevant international or national standards.

Do not disassemble, modify the product, or alter the software code without authorization.

Did not follow the operating instructions and safety warnings in the product and documentation.

Equipment damage caused by abnormal natural conditions (force majeure events such as earthquakes, fires, or storms).

Transport damage caused by the customer's failure to comply with transportation requirements.

Damage caused by storage conditions that do not meet the product documentation requirements.

Standard Requirement

It is strictly prohibited to install, use, or operate outdoor equipment and cables under adverse weather conditions such as lightning, rain, snow, or wind of level six (including but not limited to handling equipment, operating devices and cables, plugging and unplugging signal interfaces connected outdoors, high-altitude work, and outdoor installations).

During installation, operation, and maintenance, it is strictly prohibited to wear conductive objects such as watches, bracelets, anklets, rings, or necklaces to avoid electric shock injuries. Special protective equipment must be used during installation, operation, and maintenance, such as wearing insulating gloves, goggles, safety clothing, and personal protective gear (PPG).



Wear a full helmet and safety shoes, as shown in the figure below. Follow the step-by-step sequence.

Installation, operation, and maintenance must be carried out in accordance with the instruction manual.

Before contacting any conductor surface or terminal, measure the voltage at the contact point to ensure there is no risk of electric shock.

After equipment installation, all empty packaging materials in the equipment area—such as cardboard boxes, foam, plastics, and tie straps—must be removed. In the event of a fire, evacuate the building or equipment area immediately, activate the fire alarm, or call the fire department. Under no circumstances should re-entry into the burning building be permitted.

Do not disable the protection device.

Do not ignore the warnings, alerts, and preventive measures in the manual or on the equipment.

Replace hazardous signs that have become unclear due to long-term use in a timely manner.

Only personnel authorized to operate the equipment may approach it; other individuals are prohibited from approaching. Tool handles must be insulated, or insulated tools must be used. All cable entry openings must be sealed, and those with existing cables should be filled with fire-resistant sealant.

It is strictly prohibited to manually alter, damage, or obscure the markings and nameplates on the equipment.

When installing the equipment, use a torque wrench with the appropriate range to tighten the screws according to the torque specified in the instruction manual.

Under no circumstances should live-line operations be performed during the installation process.

Paint scratches occurring during equipment transportation and installation must be repaired promptly; prolonged exposure of scratched areas to outdoor environments is strictly prohibited.

Before operation, the equipment should be securely fixed to the floor or another stable surface.

Do not use water to clean the internal and external electrical components of the cabinet.

Do not alter the device's structure or installation sequence without authorization.

Before the fan is powered off and stops rotating, strictly avoid contact with the operating fan using fingers, components, screws, tools, or circuit boards to prevent hand injury or equipment damage.

The device software shall not be subjected to reverse engineering, decompilation, disassembly, modification, alteration, implantation, or any other derivative operations. It is strictly prohibited to investigate the internal implementation of the device, obtain its source code, infringe intellectual property rights, or disclose any results of performance testing for the device software.

personal security

During equipment operation, if any malfunction that may cause personal injury or equipment damage is detected, the operation must be immediately terminated, reported to the responsible person, and effective protective measures must be implemented.

Before using the tool, familiarize yourself with its correct operation to avoid injuring others or damaging equipment.

During operation, the casing temperature is high and poses a burn risk; do not touch it.

Do not power on the device if it is not fully installed or confirmed by a professional.

2.3 Electrical Safety

Grounding Requirements:

For equipment requiring grounding, the protective ground wire must be installed first during installation and removed last during dismantling. Damage to the grounding conductor is strictly prohibited.

Do not operate the equipment without installing a grounding conductor.

The equipment must be permanently connected to a protective ground. Before operating the equipment, inspect its electrical connections to ensure reliable grounding. Grounding requirements: $<4\Omega$ (conventional requirement).



Before performing electrical connections, ensure the equipment is undamaged; otherwise, it may cause electric shock or fire. All electrical connections must comply with the electrical standards of the respective country/region.

Permit from the local power authority is required before commencing grid-connected operations.

The cables provided by the user must comply with local laws and regulations.

When performing high-voltage operations, it is essential to use specialized insulated tools.

AC/DC operating requirements:



It is prohibited to install or remove power cords while they are energized. The moment the conductor core of a power cord makes contact with another conductor, an electric arc or spark may be generated, which can cause fires or personal injuries.

Before installing or removing power cords, always turn off the power switch first.

Before connecting the power cord, ensure the label is correctly labeled before proceeding.

If the device has multiple inputs, disconnect all inputs and wait until the device is completely powered off before operating it.

If a component is damaged, it must be replaced by a professional to avoid risks.

Cabling requirements:

The use of cables in high temperature environments may cause aging and damage to the insulation layer. The distance between the cable and the periphery of the heating device or heat source area should be at least **30 mm**.

No cables shall pass through the equipment's air inlets and outlets.

Flame-retardant cables should be selected, and their flame-retardant rating must comply with local legal requirements.

Cables of the same type should be bundled together, while cables of different types must be spaced at least 30 mm apart; mutual entanglement or cross-laying is strictly prohibited.

The cables used in this product must be securely connected, properly insulated, and meet the specified specifications.

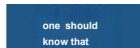
At excessively low temperatures, severe impacts or vibrations may cause brittle cracking of the cable's plastic sheath. To ensure construction safety, the following requirements must be adhered to:

All cables shall be installed at temperatures above 0°C. During handling, especially in low-temperature environments, cables must be handled with care.

If the storage temperature of cables is below 0°C, the cables must be stored at room temperature for at least 24 hours prior to installation. Non-standard operations such as directly pushing cables off vehicles are strictly prohibited.

The selection, installation, and routing of cables must comply with local laws, regulations, and standards.

electrostatic prevention



Static electricity generated by the human body can damage electrostatic-sensitive components on circuit boards, such as large-scale integrated circuits. Anti-static gloves must be worn before handling equipment or holding connectors.

When holding the handheld plugin, always grip the edge free of components; touching any components with your hands is strictly prohibited.

The removed plugins must be packaged with anti-static materials before storage or transportation.

2.4 Mechanical Safety

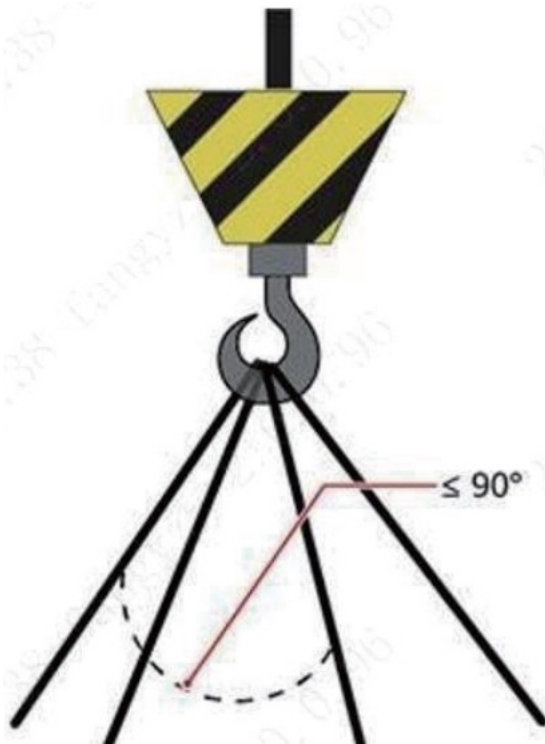
hoisting

When lifting heavy objects, it is strictly prohibited to move around beneath the crane boom or the lifted object.

Personnel performing lifting operations must undergo relevant training and obtain certification before commencing work.

Lifting tools must undergo inspection and can only be used when all required tools are present.

Before performing lifting operations, ensure that the lifting tools are securely fastened to a load-bearing support or wall. During lifting, maintain an angle between the two cables no greater than 90° , as shown in the figure below.



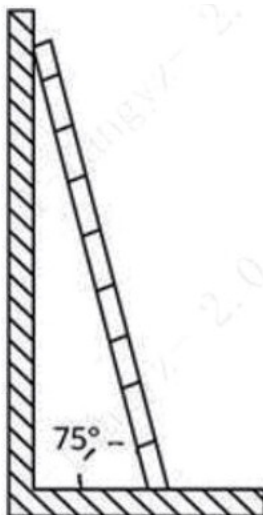
During lifting operations, it is prohibited to drag steel cables or lifting equipment, and hard objects must not be used for impact.

Ladder Usage

When performing high-altitude operations involving electrical hazards, use certified insulated ladders such as wooden or fiberglass ladders.

When using a A-frame ladder, the rope must be securely fastened, and someone must hold the ladder during operation.

Before using a ladder, ensure it is in good condition and capable of supporting the required weight; overloading is strictly prohibited. The ladder should be placed in a stable location. An inclination of 75° is ideal, which can be measured with a protractor as shown in the figure below. When using the ladder, position the wider rung downward or install protective measures at the base to prevent slipping.



When climbing stairs, please follow these precautions to reduce risks and ensure

Maintain body stability.

The maximum height at which workers can stand on their feet should not exceed the fourth step counting downward from the top of the ladder.

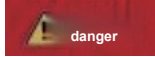
Ensure that the body's center of gravity does not deviate from the edge of the ladder frame.

drill

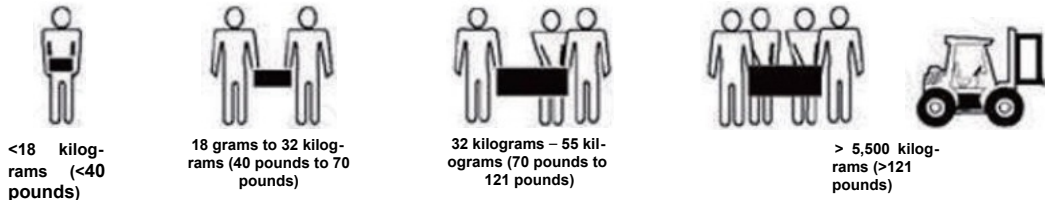
one should know that

Drilling holes in the equipment is strictly prohibited. Such drilling will compromise the equipment's electromagnetic shielding performance, internal components, and cables. The metal debris generated from drilling may enter the equipment, causing a short circuit.

Lifting heavy objects



When installing equipment or removing it from the cabinet, exercise caution with devices that may be unstable or heavy when mounted on the cabinet to avoid crushing or injury. When handling heavy objects, ensure adequate load-bearing capacity to prevent injuries such as crush injuries or sprains.



Hand transport

When handling the equipment, protective gloves should be worn to prevent injury. During transportation, avoid scratching the equipment surface or damaging components and cables.

When using a forklift for handling, the forks must be positioned in the central area to prevent tipping over. Before moving the equipment, secure it firmly to the forklift with ropes; during transportation, a designated person must supervise the process.

Handle the device with care to avoid damage from impacts or drops.

2.5 Product Safety

▲ danger

Do not immerse the product in water.

incorrect use and storage of the product pose risks of fire, explosion, and burns. Do not disassemble, crush, incinerate, or heat the product.

It is prohibited to place the product in a fire or expose it for extended periods to high-temperature environments exceeding the temperature conditions specified in this specification, as doing so may cause a fire. Under any normal operating conditions, the temperature of the cells within the module must not exceed

60°C: If the temperature exceeds 60°C, shut down the product and cease operation.

Keep the product out of reach of children. Do not remove the original packaging before use, and dispose of used products promptly in accordance with local recycling or waste regulations.

Do not disassemble, dismantle, or modify the product in any way without authorization.

Do not mix products of different specifications, brands, or batches.

If the product emits an unusual odor, becomes hot, deformed, changes color, or exhibits any other abnormal behavior, do not use it and move it to a safe location.

Short circuits between the positive and negative electrodes of the product are strictly prohibited; otherwise, high currents and elevated temperatures may cause personal injury or fires. Adequate safety measures must be implemented during battery system assembly and connection to prevent short circuits.

Connect the positive and negative terminals of the product strictly according to the markings and instructions; reverse or parallel charging is prohibited.

Overcharging or overdischarging of the product is prohibited, as it may cause cell overheating and fire incidents within the module. During installation and use, multiple safety protection mechanisms against overcharging and overdischarging must be implemented through both hardware and software.

During product charging, improper termination of charging may occur—for example, when charging is terminated due to exceeding the permitted charging time, excessively high charging voltage, or overly strong charging current. Such occurrences are defined as "improper termination of charging." When these phenomena happen, they may indicate electrical leakage in the battery system or malfunctioning components. Continuing to charge the product without identifying and thoroughly resolving the root cause could lead to cell overheating or fire within the module.

The customer should securely mount the product on a solid surface and properly secure the power cord in an appropriate position to prevent friction-induced arcs and sparks.

The use of plastic for electrical connections is strictly prohibited. Incorrect electrical connection methods may cause the product to overheat during operation.

In the event of electrolyte leakage, avoid contact with skin or eyes. If contact occurs, thoroughly rinse the affected areas with plenty of clean water and seek medical assistance immediately. No person or animal shall ingest any components of the product. During use, protective measures must be implemented to shield the product from mechanical vibrations, impacts, or pressure shocks; failure to do so may cause internal short circuits, resulting in high temperatures and fires. The product poses potential hazards, requiring appropriate safety precautions during operation and maintenance. Improper handling during safety performance testing experiments may trigger cell fires or explosions within the module; such tests must be conducted exclusively by qualified personnel wearing appropriate protective equipment in specialized laboratories. Failure to comply may lead to severe personal injury and property damage. Non-compliance with these warnings could result in various catastrophic consequences.

The customer is aware of the following potential hazards associated with product use and operation: Operators may sustain injuries from chemicals, electric shocks, or electrical arcs during operation; although the human body reacts differently to direct current (DC) and alternating current (AC), DC voltages exceeding 50V and AC currents cause equally severe harm. Therefore, customers must adopt a conservative posture during operation to avoid electric current injuries. When operating the product and selecting personal protective equipment (PPE),

Customers and their employees must consider the aforementioned potential risks to prevent accidental short circuits that could lead to electric arcs, explosions, or thermal runaway.

If the internal resistance of the operational product exceeds 200% of its initial value or its capacity falls below 70% of the rated capacity, the customer must cease using the product. Otherwise, Zhongzhu Technology shall not be liable for any resulting parameter deviations, quality issues, cell failures, or associated losses.

Industrial and commercial photovoltaic energy storage systems



Provide highly secure and reliable optical energy storage system solutions for industrial and commercial applications

The integrated system combines battery packs, PCS, EMS, MPPT, STS, control systems, fire protection systems, air-cooling systems, and monitoring systems. Through the control system, all components operate efficiently in coordination to absorb and release energy.

The entire system is plug-and-play, facilitating transportation, installation, and maintenance.

3. Product Design Introduction



●Main design specifications for the structure

The liquid-cooled cabinet is fabricated by welding sheet metal. The interior primarily houses battery clusters, an insulation system, a fire alarm system, a fire suppression system, a safety protection system, an emergency lighting system, a lightning protection system, a grounding system, and a liquid cooling system.

●Air-cooled system

The Black Shield Heat Pipe Air Conditioner is a integrated temperature control solution specifically designed for cabinets, suitable for various challenging indoor and outdoor environments. By combining the air conditioning unit with a heat exchanger (heat pipe), it effectively addresses cabinet heating issues. Based on seasonal changes, ambient temperature variations, and equipment operational requirements, intelligent management technology automatically activates either cooling or heat exchange functions—or both simultaneously—achieving energy efficiency optimization and efficiently resolving excessive energy consumption at communication sites.

●Lightning Protection Design

The liquid-cooled cabinet is equipped with a reliable, high-quality lightning protection system. In accordance with the GB51048-2014 Design Code for Electrochemical Energy Storage Power Stations, surge protection modules are installed on the power lines.

●Fire Protection System Design

Design the perfluorohexone gas automatic fire suppression system (using total immersion extinguishing method) and the automatic fire alarm system according to the requirements.

●Alarming System Design

The liquid-cooled cabinet is equipped with an alarm system. By installing an alarm light at designated locations, it provides clear visual alerts to external observers, serving as an early warning mechanism. Additionally, the battery management system transmits data via the LAN bus to a remote monitoring platform for real-time alarm detection and supervision.

●lighting system

The lighting fixtures employ explosion-proof lamps equipped with independent illumination control switches for turning the lights on and off. They can also be designed as an access control-linked system, where the lighting automatically activates upon door opening and automatically turns off upon door closure.

4. PACk Parameter



Order number	Project	Parameter	Remarks
1	Rated capacity	16kWh	1P16S (Chuneng lithium iron phosphate battery, 314 Ah)
2	Rated voltage	51.2V	
3	Working voltage range	44V~57.6V	Single cell: 2.75V to 3.60V
4	Charge-discharge conversion efficiency	≥97%	
5	Maximum charge and discharge current	100A	
6	Weight	Approximately 120 kg	
7	Battery operating ambient temperature	-25℃~45℃	
8	Heat management	Air-cooled system	
9	Levels of protection	IP20	
10	Size	440mm*720mm*220mm	Depth * Width * Height

5. Introduction to Air-cooled Unit-1.5 kW



Features and Value

- **Highly efficient and environmentally friendly**

The system combines air conditioning with heat pipe heat exchangers, utilizing high-efficiency compressors and DC variable-speed fans to extend the service life of the air conditioning unit while reducing power consumption.

If the temperature difference exceeds the set point, the heat exchanger activates; if it falls below the set point, the air conditioner operates.

- **Easy to install and operate**

A compact all-in-one device, plug-and-play for easy installation;

The flange design facilitates various installation methods;

A closed refrigeration cycle protects the equipment from harsh environmental conditions.

-Metal sheet with spray coating for rust and corrosion resistance.

- **Intelligent control**

Automatically switch cooling modes based on ambient temperature to maximize energy efficiency;

-Multi-functional alarm output, real-time system monitoring, and a user-friendly interface for simplified operation.

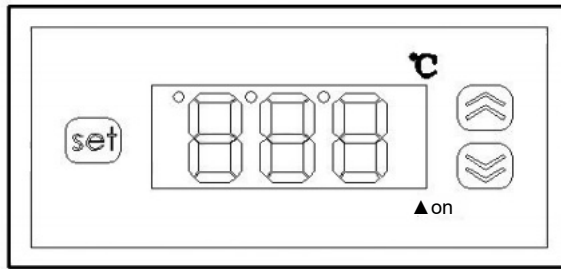
technical parameter

- Input voltage range and frequency: AC 187–253 V, 50 Hz (compressor) & DC –36 to –60 V (fan)
- Communication Interface: RS485
- **Protection rating: IP55**
- **Complies with CE and RoHS**

- **Operating temperature range: -40° C to +55°C**
- **Alarm output: Dry contact**
- Refrigerant: R134a

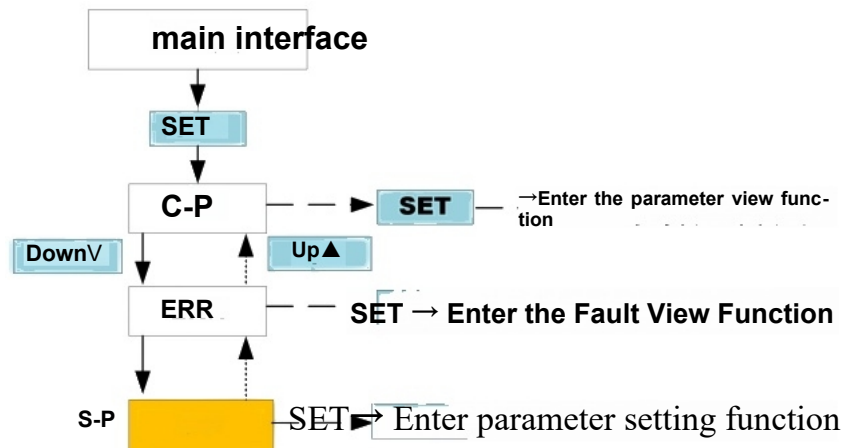
6. Guidelines for Air Conditioner Parameter Settings

Schematic diagram of the human-machine interface



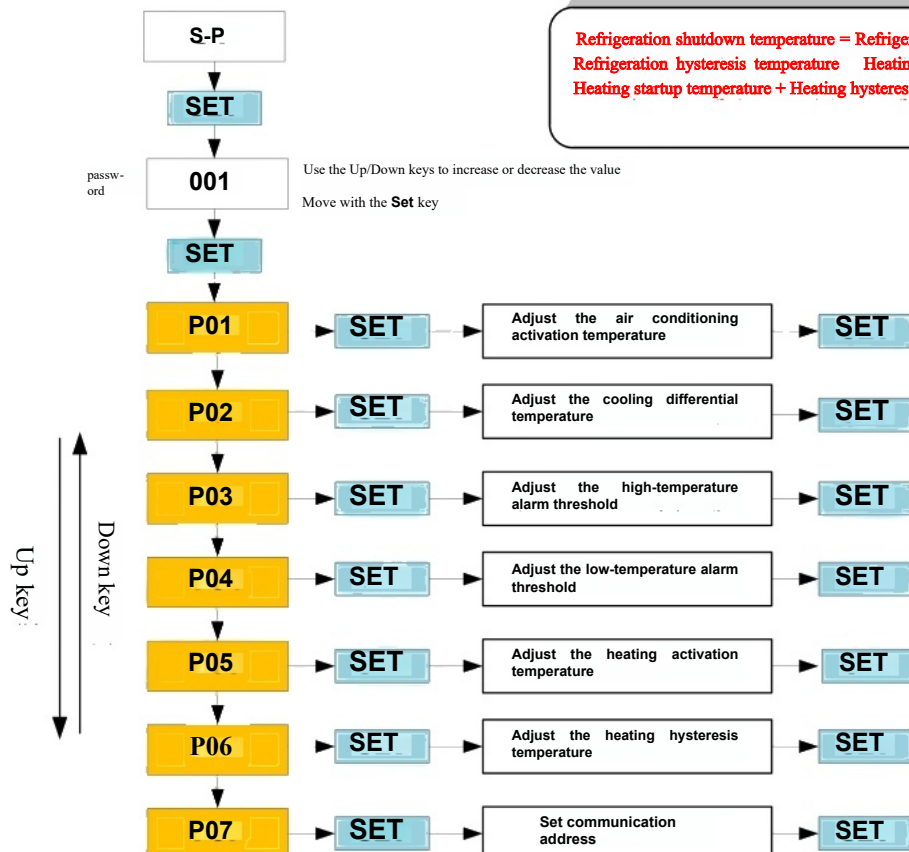
where is the Up key and is the Down key

Step 1: Select **S-P**, press the **SET** key to enter parameter setting mode. (If no operation is performed in 6S, it automatically returns to the main interface.)



Step 2: Enter the password **001** to access the parameter settings. After adjusting the parameters, press **SET** to confirm and save the changes; otherwise, the values will not be saved.

(6S: No action taken.) and automatically return to the main interface)



7. Introduction to Photovoltaic and Storage Hybrid Inverter--50KW



highly active

- Supports both AC and DC power supply, with black start capability
- Energy flows bidirectionally with seamless switching between forward and reverse directions, achieving full-load switching time of less than 100 ms.



safe

- Highly reliable protective performance, resistant to harsh environments including extreme temperatures, humidity, and salt spray. Wide operating temperature range: -20°C to 50°C.



convenient

- Modular design for easy maintenance and scalable configuration
- Three-phase system with 100% unbalanced load, supports connection of single-phase loads, and offers flexible load configuration.



intelligence

- Multi-dimensional intelligent fan adjustment function reduces power consumption and noise
- Supports integration with local EMS and intelligent management

PV Input Section: Multiple photovoltaic input terminals are connected via independent fuses and monitored by current sensors. A DC EMI filter is employed to suppress electromagnetic interference, ensuring stable operation and EMC compliance.

• DC switch and MPPT boost module

The system equips each photovoltaic input group with an independent DC switch, enabling safe maintenance and isolation.

The dual MPPT (Maximum Power Point Tracking) boost module dynamically optimizes the input performance of the photovoltaic system in response to varying sunlight conditions.

• Direct current surge protection and arc fault detection

The system-integrated DC surge protection device (DC SPD) effectively safeguards against lightning strikes and transient voltage surges.

The damage caused by surge currents to equipment. The AFCI (Arc Fault Circuit Interrupter) module can detect and interrupt hazardous arc faults in DC circuits.

• Battery input and bidirectional DC converter (BDC)

A single BDC module supports multiple battery packs. Each BDC handles bidirectional power flow charging and discharging, and connects to a shared DC bus.

All power input terminals of the centralized DC bus and inverter bridge converge onto the DC bus, which supplies power to the inverter circuit. The inverter converts DC to AC with high precision, supporting both grid-connected and off-grid operating modes.

• Exchange Output Processing

After inversion, the alternating current must pass through an AC filter and an EMI filter to reduce harmonics and electromagnetic interference. The AC relay provides isolation functionality and enables controlled switching between different operating modes.

Grid and Load Interface

The system supplies alternating current to the power grid (L1, L2, L3, N) and local loads. The device is equipped with an Emergency Power Supply (EPS) output port, providing backup power during grid failures.

• AC surge protection and output safety

The AC SPD is installed to protect the output side from surge events. Other AC relays manage disconnection or switching of the load side when required.

8. TPM-CT-E-EU three-phase smart meter

1 Summary

The SDM630MCTV2 is a milliampere-volt-current type energy meter specifically designed for 3P3W/3P4W power grid systems, capable of accurately measuring and displaying parameters such as voltage, current, power, frequency, active power, reactive power, positive energy, negative energy, and total harmonics. This device is an ideal solution for real-time power monitoring, offering extensive functionality and versatile application scenarios with high stability and long service life. Powered by external current transformers, it is suitable for both high-and low-voltage grid environments and features an RS485 communication interface supporting up to 38,400 baud/s baud rate for remote data transmission.

2. Technical Parameter

Rated voltage for general special symptoms	3×230/400 V AC,
Rated frequency	50/60 Hz; 100–
L-voltage range	276 V AC;
L-L voltage range	173–480 V AC
The auxiliary power supply voltage range is 85–275 volts AC or 120–380 volts DC.	
AC voltage withstand input current range	4 kV, lasting 1 minute at either 1 A or 5 A; maximum duration: 20 minutes; duration not exceeding 0.5 seconds; total energy consumption: 9,999,999.9 kWh.
Short Circuit-I: Maximum Overcurrent Reading	
accuracy	
Active power	0.5% of the maximum range
Reactive power	0.5% of the maximum range
environment	
Standard operating temperature range	
Annual average relative humidity within a limited operating temperature range: 25°C to +55°C; 40°C to +70°C; <90%.	

Installation Type

CAT II III complies with the RoHS standard

Pollution level communication

Communication baud rate pulse	Modbus RTU RS485 output port parameters: 9600 bps (default), 3200 impulses/kWh
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Overview of mechanical structure dimensions;

Guide rail dimensions; protection, etc.

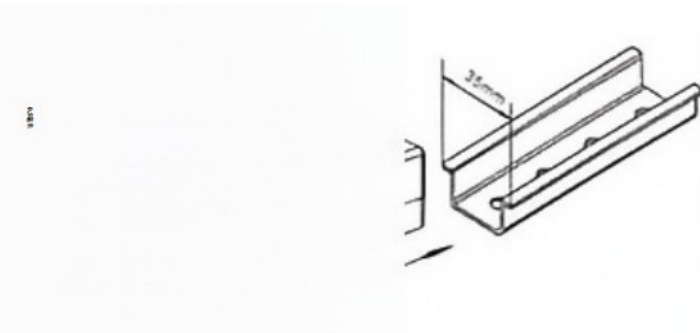
Level DIN rail, 35 mm, IP51 (indoor)

3. Open the Bag



project	Quantity	Description: Three-phase Meter Rapid Installation Guide
A		
B		RS485 cable (standard length: 15 meters)
D	3	current transformer

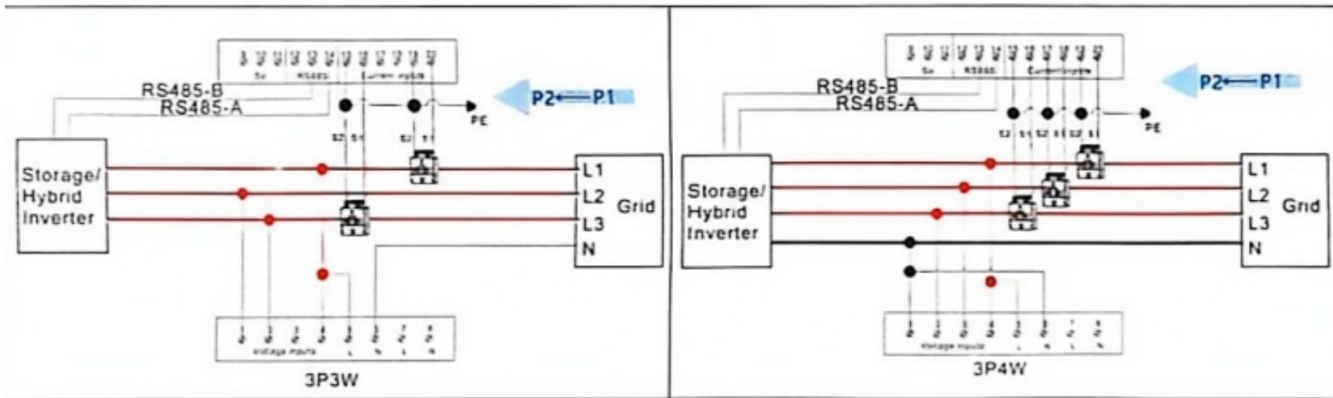
4. Size (unit: Mm)

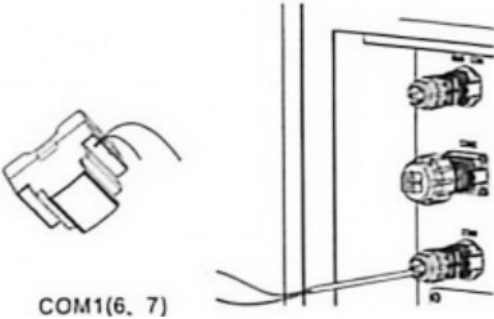
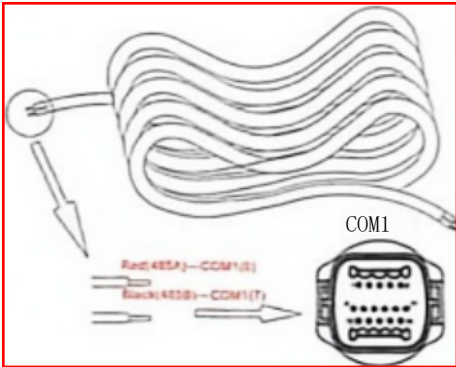
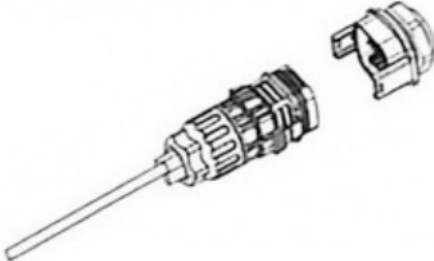
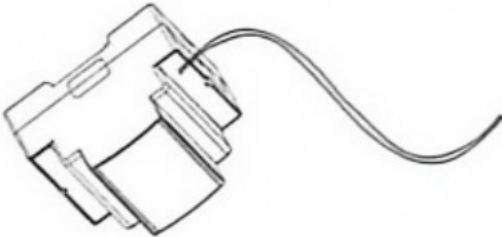


5. Install !

▲ li t

1. The Grivatt energy storage inverters and hybrid inverters are collectively referred to as "energy storage/hybrid inverters" hereinafter.
2. The grid is positioned on the right, with current flowing from P1 to P2 (i.e., from the grid to the load).



Voltage Sampling and Power Supply Wiring 3P3W Wiring method for the L1 voltage sampling line: corresponding to pin 4 of the instrument Wiring of the L2 voltage sampling circuit: corresponding ammeter pins L3 voltage sampling circuit wiring: corresponds to Meler Pin 2 B.Curront transformer wiring method Refer to the schematic diagram above. The grid is on the right, with current flowing from K to T (i.e., from the grid to the load). LI CT: The S1 line corresponds to the wiring of distance sensor pin 16; the S2 line corresponds to the motor pin 15. L3CT: The S1 line wiring corresponds to instrument pin 20; the S2 line wiring corresponds to instrument pin 19.	3P4W Wiring of the L1 voltage sampling circuit: corresponds to Metro pin 4 L2 volume sampling pipeline wiring: corresponds to flowmeter pin 3 The wiring of the L3 voltage sampling circuit corresponds to Pin 2 of the fuse. Wiring method for the N-voltage sampling line: corresponds to Pin 1 of the low-level measuring instrument The S1 wiring of L1CT corresponds to instrument pin 16; the S2 wiring corresponds to instrument pin 15. The S1 wiring of L2CT connects to meter pin 18, and the S2 wiring connects to meter pin 17. L3CT: The S1 wiring corresponds to instrument pin 20; the S2 wiring corresponds to instrument pin 19.
C. RS485 cable wiring Connect RS485A to Pin 14 and RS485B to Pin 13 (the network cables included with the inverter are labeled 485-A and 485-B; if using commercially purchased cables, be sure to distinguish between 485-A and 485-B.)	
D. Connect the electricity meter to the Growalt three-phase energy storage/hybrid inverter 	E. When connecting the smart meter to the inverter, connect one end of the cable to terminal 13 (485B) and terminal 14 (485A) of the smart meter, and the other end to pins 6 (485A) and 7 (485B) of the COM1 port. Note: In most cases, the red cable is used for 485A and the black cable for 485B. 
F. Disassemble the 16-pin connector included with the inverter, keeping the waterproof plug. Pass the cables through each component sequentially, then connect them to pins 6 and 7. Finally, plug the connector into the inverter's COM1 port. 	G. The standard RS485 cable is 15 meters long. For longer RS485 cables, use intact cables and ensure the length is less than 100 meters (the recommended length is under 25 meters). Mi) 。 

6.Button Description and Display

The panel features four touch buttons, arranged sequentially from top to bottom as:ESC(-)VIA. (A)MD/PHIHZ'.I (Shift)P". Input (-) E". These buttons support bidirectional operation: long press (held for more than two seconds) and short press within one second.

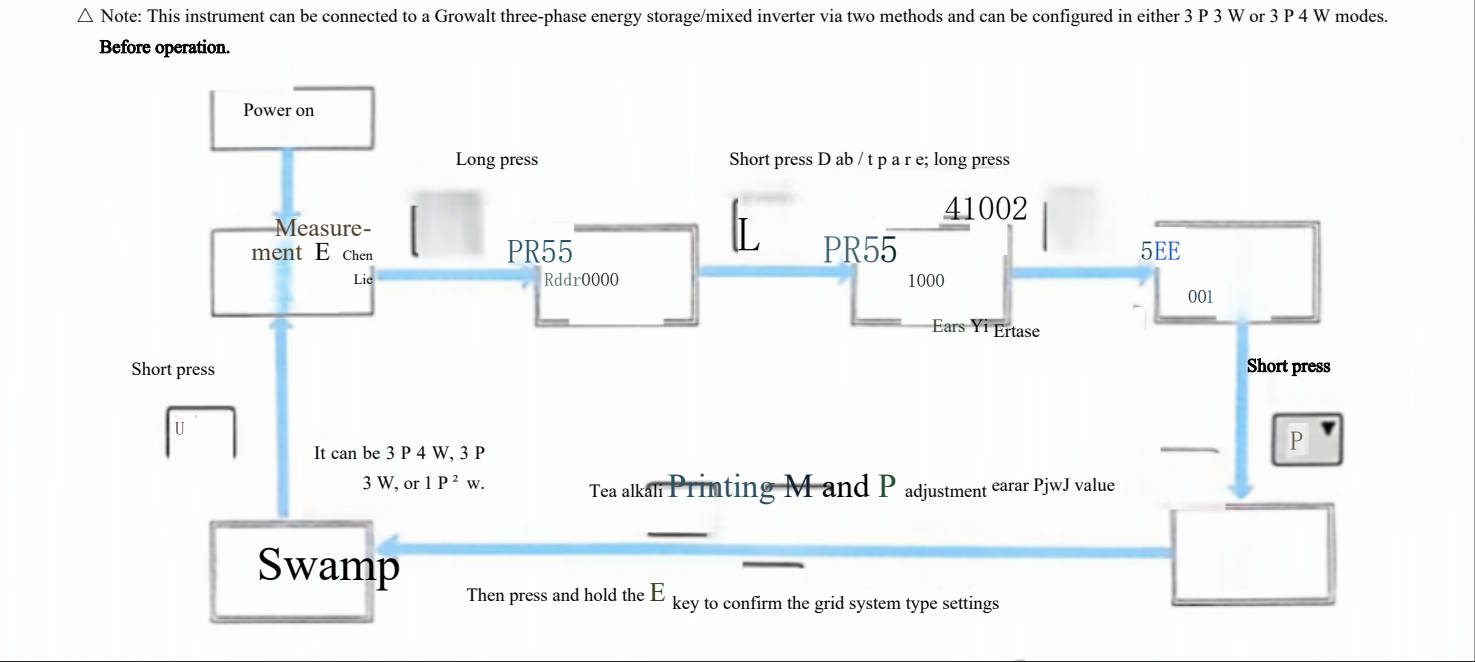
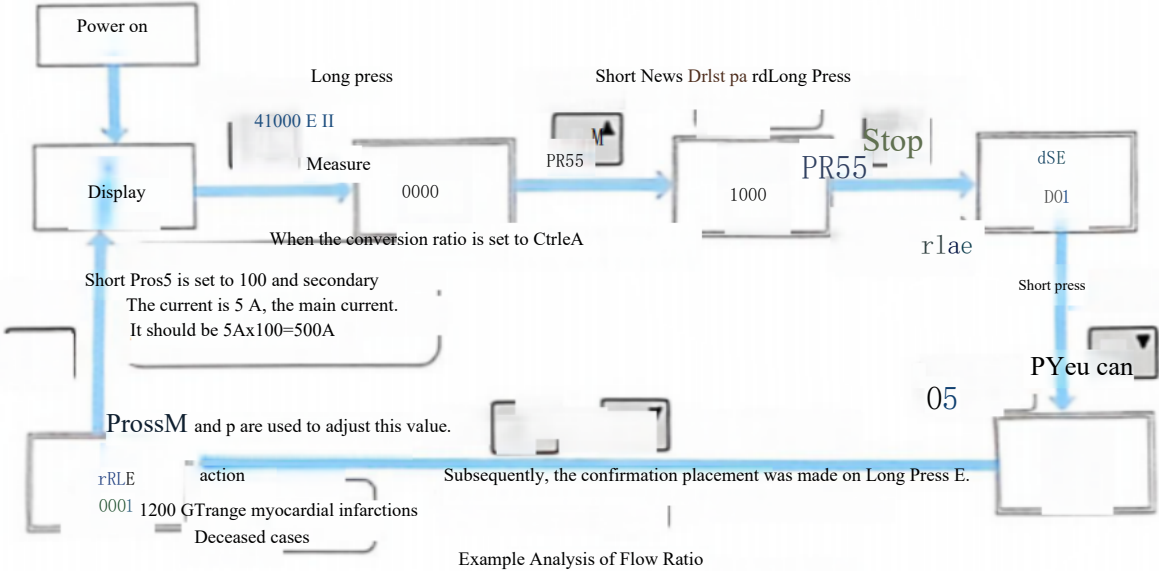
No	By button	Various faults	View content (long press)
1		Short Film 5: Displays voltage and current; Long press: ESC	Phase voltage, line voltage; phase current; neutral current; voltage harmonics; current harmonics
2		Short press to display power factor and frequency. 1 Long press S: Alternating	Phase (total) frequency. Total power factor. Maximum phase (total) current requirement
3		Short press: Show power status. Long press:Shift	Phase (Total) Active Power. Phase (Total) Reactive Power. Phase (Total) Apparent Power.
4		Short press. Display electrical energy. Long press one: Input	Total active power energy. Total reactive power energy. Positive active power energy. Reverse reactive power energy. Positive reactive power energy. Reverse reactive power energy.

The default communication address for the meter and Growatt three-phase energy storage/hybrid inverter is 02, with a default baud rate of 9600. The current ratios are 250A/5A, 600A/5A, and 1200A/5A, with specific values determined by the connected power source.

The flow transformer (CT) determines the setting. If no communication connection is established between the meter and the inverter, verify that the communication address and baud rate are correctly configured.

Long press to enter the download menu (the default password is 1000). Then use this password.

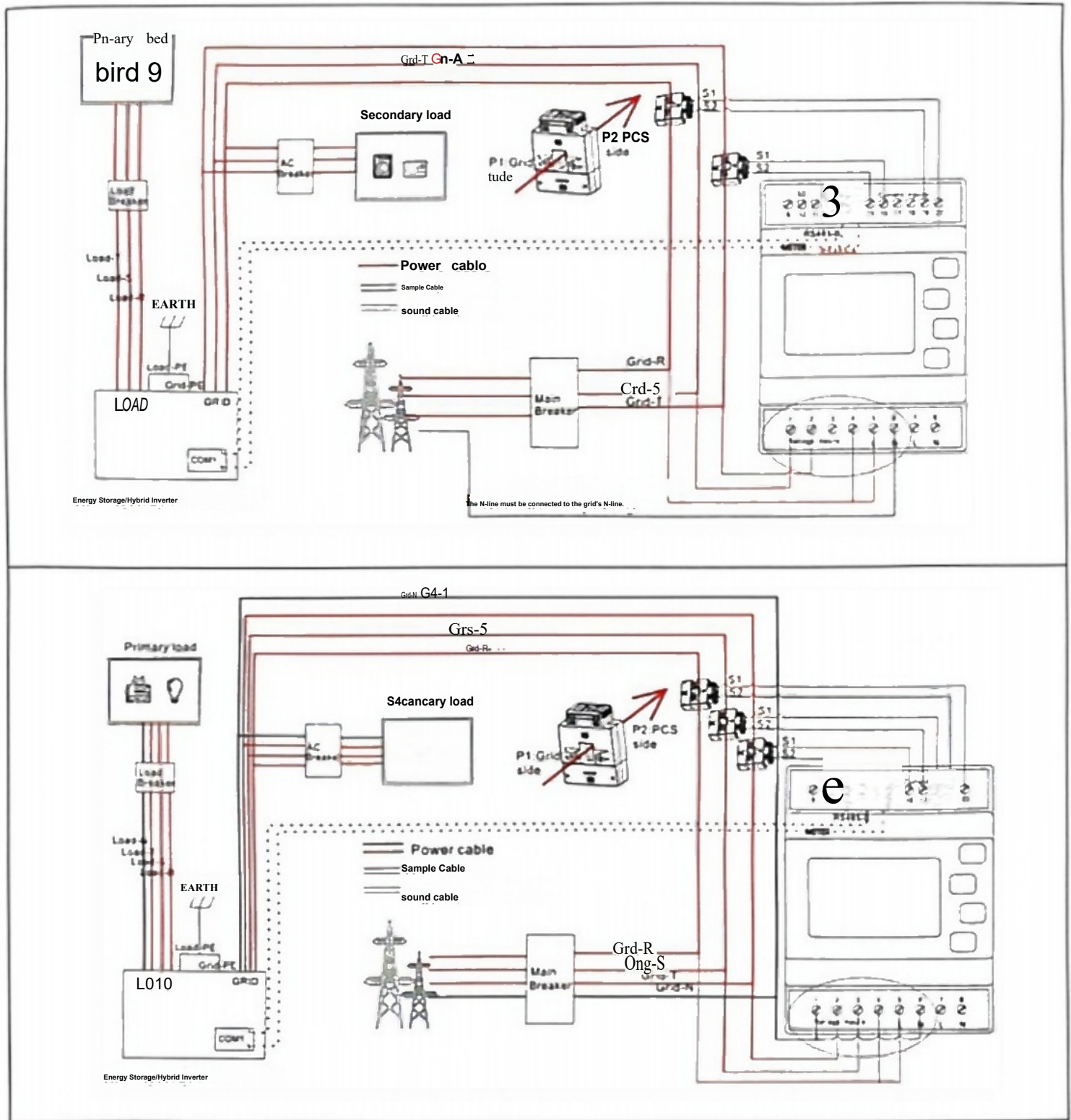
Payment. If the payment fails, you can configure the parameters by entering the selection routine. Then press and hold E2 to confirm the settings, then press



7 Troubleshooting

Fault phenomenon	Analysis of causes	Solution
Inaccurate measurement	1. Wiring error. Check whether the phase sequence of voltage and current is correct. 2. Check whether the output circuit of the current transformer is connected in reverse. 3. The transformer ratio is not set; the instrument displays secondary data.	1. Refer to the wiring diagram to inspect circuit 2. If the transformer ratio is incorrectly set, adjust the voltage and current ratios accordingly. 3. If the issue persists, contact your local supplier.
RS485 Communication Error (Inverter Error 401)	1. The RS485 communication cable exhibits disconnection, short circuit, or reverse connection. 2. The address, baud rate, data bits and parity bit of the instrument do not match those of the inverter.	1. If the communication cable is faulty, replace it. 2. Set the instrument's address, baud rate, data bits, and calibration bits via the button. 3. If the issue persists, contact your local supplier.

The complete system wiring diagram is shown below. If the meter is not functioning properly, refer to the relevant documentation to check the wiring and connect the meter to the inverter's RS485 port. The following explanation uses the WIT as an example.



8. Services and Con-tact

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9. system para-meter



Photovoltaic Parameters	
Maximum input power (W)	75.0KW
Maximum input voltage (V)	1000V
PPPT Work Scope (V)	180~850V
PTPT rated voltage (V)	180V-800V
Starting voltage (V)	500V
Maximum input current (A)	32A/32A
Maximum short-circuit current (A)	48A/48A
MPPT quantity	Route 4
Number of strings per MPPT input channel	4/4
Photovoltaic MPPT efficiency (%)	99%
AC AC parameters (grid-connected end)	
Rated output power (W)	50.0KW
Maximum output power (KW)	800KW
Maximum charging power (KW)	50. (KW
Combined output power (KW)	00kN
Rated voltage (Vac)	3. C/40UV, 3L/N/PE
Rated frequency (Hz)	50/60Hz
Maximum output current (A)	131A
Maximum three-phase unbalanced output	0-80%
Power factor range	~1 (0.8 lead to 0.8 lag adjustable)
Total current harmonic distortion (rated power) (%)	<3%
AC AC parameters (off-grid end)	
Set the output power (KW)	50.0KW
Rated output voltage (Vac)	380/400V, 3L/N/PE
Rated output frequency (Hz)	50/60 (Hz)
Maximum output single-phase apparent power (KW)	16KW
And off-grid switching time (ms)	10 (ms)
Transfer efficiency (%)	98.00%
Exchange parameters (diesel generator end)	
Rated voltage (Vac)	380/400V, 3L/N/PE
Rated frequency (Hz)	50/60 (Hz)
Rated input power (KW)	50.0KW

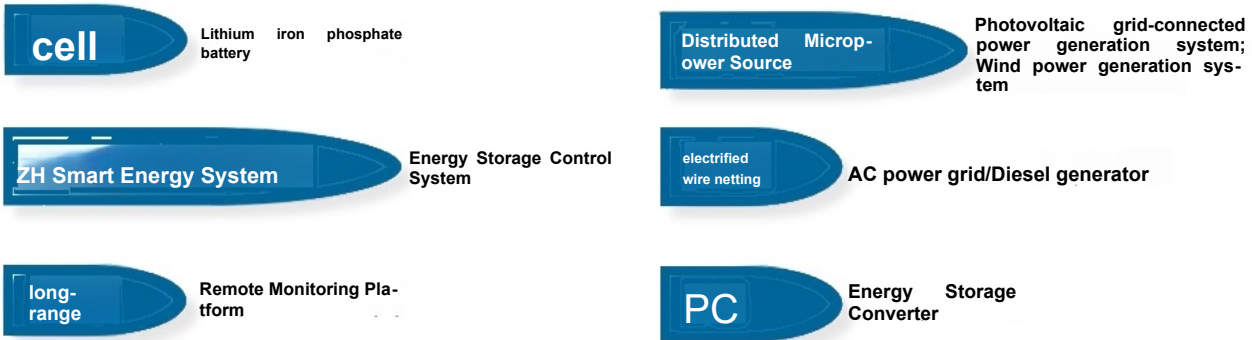
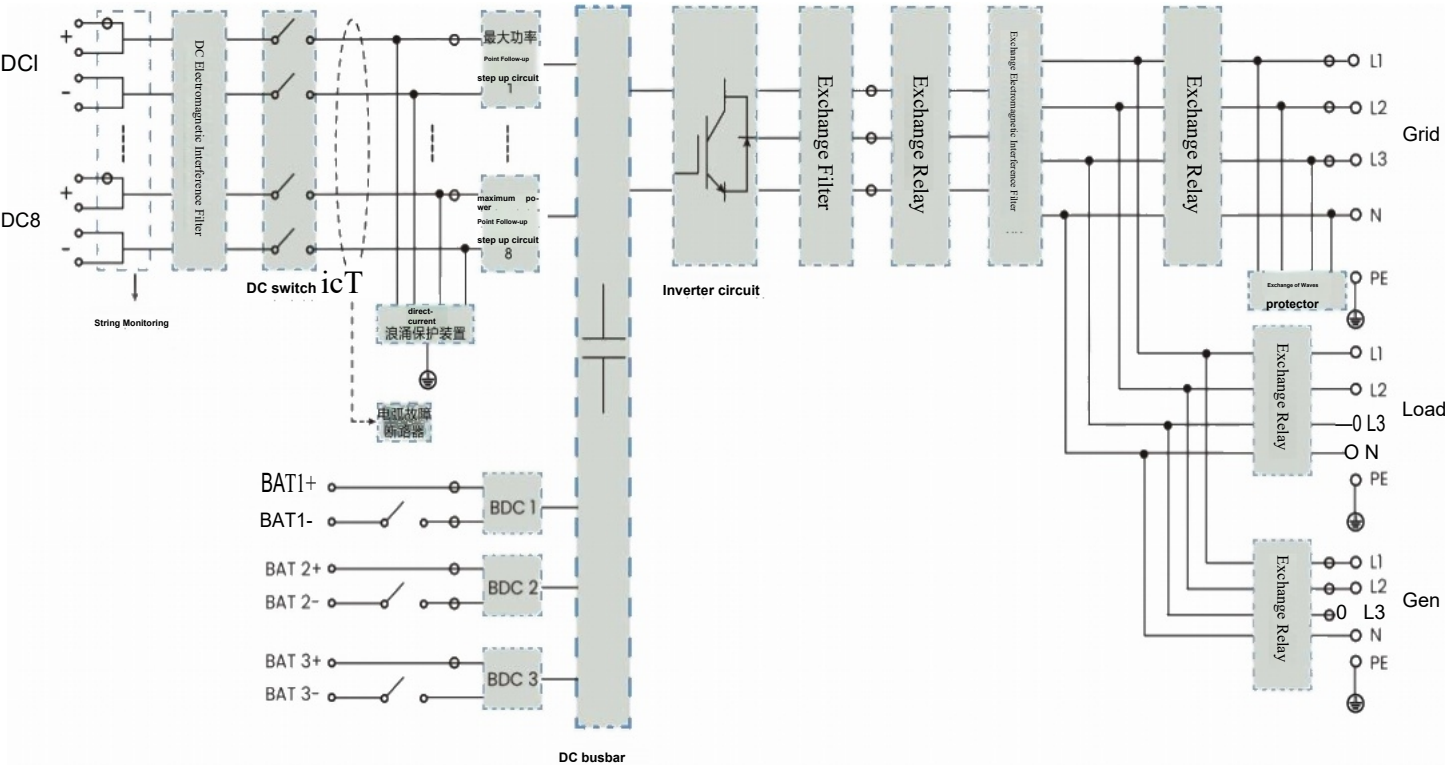
Battery Parameters	
Nominal voltage	409. 6. 0V
Working voltage range (V)	352V~460. 8V
Battery type	Lithium iron phosphate
Battery Model	SF-T314AH
Rated charging/discharging current (A)	200A/200A
Maximum charging power (KW)	50. 0KW
Battery Pack Package	8
Single-cell battery capacity (kWh)	16. 0KWH
Rated capacity (kWh)	128. 0KWH
Temperature controlling system	
Temperature controlling system	Automatic cooling/Air cooling
Fire extinguisher system	
Passive Fire Protection	Hot aerosol fire extinguishing/Perfluorohexane
Essential parameter	
Working temperature range (°C)	-25~60 (>45: reduction in quota)
Working altitude (m)	<4000
Noise emission (dB)	<30-60
Levels of protection	IP55
Relative humidity range (%)	0-95, no condensation
Size (W "H" D) (mm)	1400*1000*1900MM
Weight (KG)	1432KG
Human-Computer Interaction Methods	LCD/APP
Cloud Communication Method	Wi-Fi、GPRS、4G
Display Interface	Night crystal, LCD, RS485, CAN
Attestation	UN38. 3 NSDS CE
Safety and Safety Standards	IEC62109-1/-2
EMC standard	EN61000-6-1/-3, IEC61000
Well Network Standard	NRS97、G98/G99、EN50549-1、C10/C11、as 4777、VDE-AR-N4105、VDE0126、IEC62040

10. System Topology Diagram and Main Parameters

summary

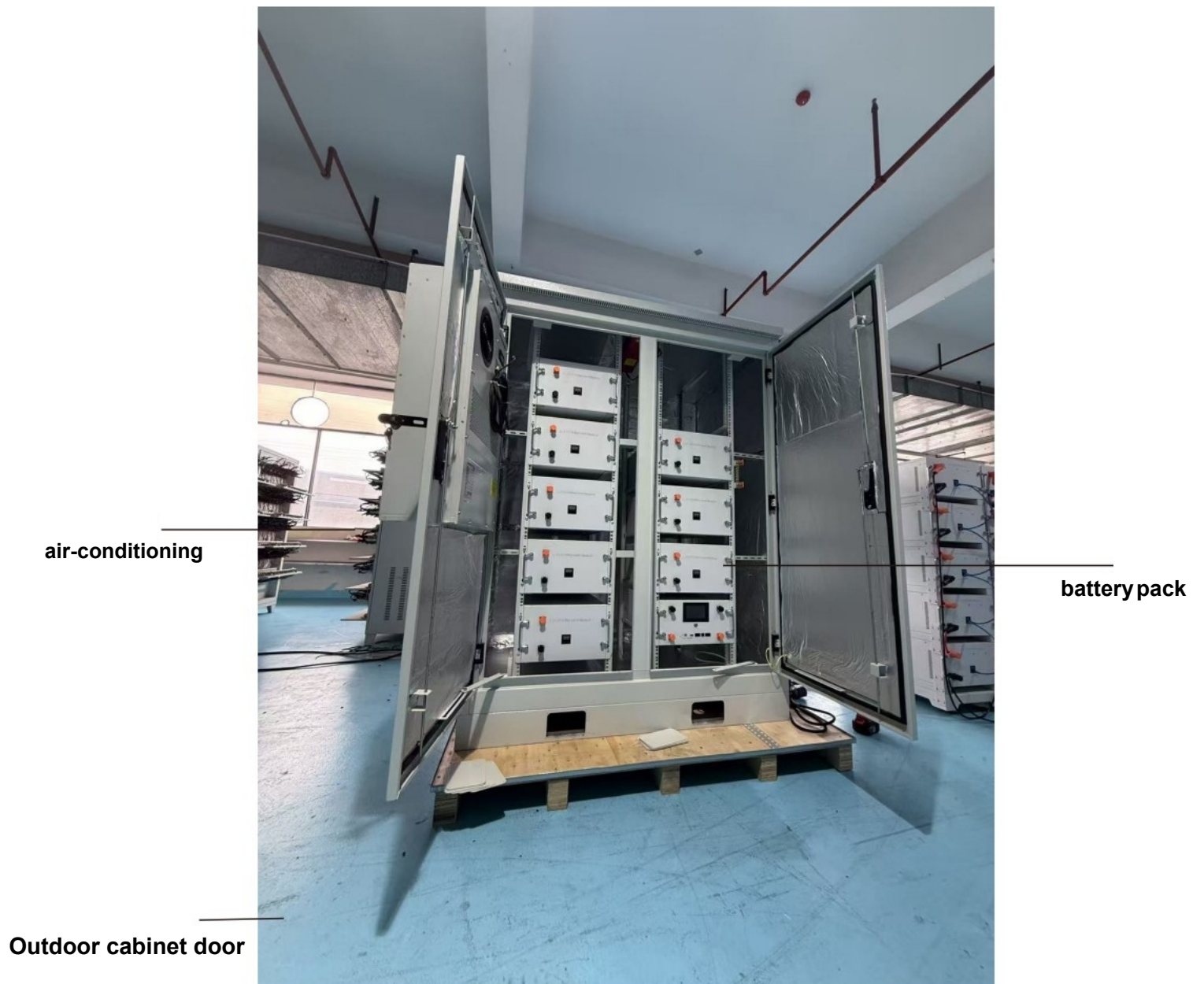
The system adopts an AC microgrid architecture, comprising PV EMS, STS, PCS, loads, the grid, and distributed energy sources.

The declining power source is connected to the AC bus and controlled by the intelligent energy storage control system. Depending on the specific application scenario of the system, appropriate control strategies are selected to ensure safe power supply to the load.





Schematic diagram of wiring on the inner side of the outdoor cabinet



Schematic diagram of the inner structure of an outdoor cabinet door

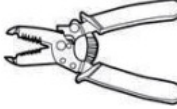
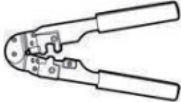
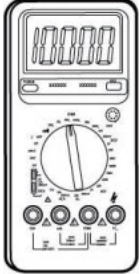
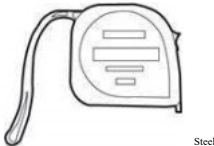
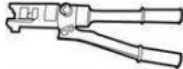
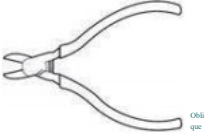
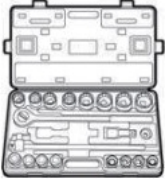
11. Product Installation and Linking

10.1 Tool and Equipment Preparation

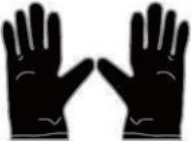
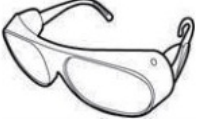
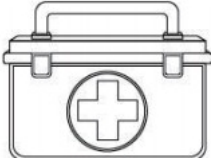
The tools and protective equipment required before installing the device are listed below. Installation Tools

pay attention to

The tools used, including socket wrenches, torque wrenches, screwdrivers, and similar handles, must be insulated or protected with insulating materials.

	 One-wire screwdriver head: 0.6mm×3.5mm		 Tool Knife
 Wire nipper	 Crystal head wire clamp	 Vacuum cleaner	 The multimeter's DC voltage range is $\geq$ 1500V DC
 Marker pen	 Ruler	 Digital or bubble ruler	 Hydraulic clamp
 Heat-shrinkable tubing	 Heat gun	 Stranding tape	 Insulation ladder
 Oral clamp	 Lifting rope	 socket wrench set	 Torque spanner

Personal Protective Equipment (PPE)

			
Safety gloves	Eye shield	Dust mask	Safety shoes
			
Reflective vest	Safety helmet	Medical Box	

10.2 Installation Environment

The external environment complies with the requirements of the "GB 51048-2014 Design Code for Electrochemical Energy Storage Power

Do not block ventilation openings or cooling systems while the equipment is operating to prevent fires caused by high temperatures.

The equipment shall be installed in a location away from liquids and should not be positioned directly beneath water pipes, air outlets, or other areas prone to condensation formation. It should also avoid placement directly below air conditioning vents, ventilation openings, or cable distribution windows in equipment rooms where leaks are likely, to prevent liquid ingress that may cause operational failures or short circuits.

If liquid is detected entering the equipment, immediately shut off the power supply and notify the on-site management personnel.

Do not place the equipment in environments with flammable, explosive gases or smoke; no operations shall be performed under such conditions. Installation of this product in salt-prone areas may cause corrosion and potentially lead to fires; therefore, energy storage systems must not be installed outdoors in these regions. Salt-prone areas refer to locations within 2 km of the coast or exposed to sea winds. The extent of sea wind influence varies depending on meteorological conditions (e.g., typhoons, monsoons) or topographical features (such as dams or hills).

height : ≤ 3000 m.

12. Packaging, Transportation, and Storage

Through UN38.3 (UN38.3: Section 38.3 of the Sixth Revised Edition of the United Nations Charter)

Recommendations for the transport of dangerous goods: Test manuals and standards

Certification in accordance with SN/T 0370.2-2009 "Inspection Regulations for Packaging of Exported Dangerous Goods-Part 2: Performance Testing" (this product falls under Category 9 hazardous materials).

The product can be delivered directly to the site and meets transportation requirements for vehicles, ships, etc. The transport packaging boxes must be sturdy, with their exteriors complying with national standards and bearing labels such as "handling with care" and "moisture-proof." Due to external environmental factors (e.g., temperature, transportation, storage), the product specifications shall be based on the factory date.

During transportation, direct exposure to rain or snow, immersion in water, dropping, mechanical impact, inversion, or tilting must be avoided. It is strictly prohibited to store the product together with corrosive substances such as acids and alkalis.

During storage, the product shall be kept in a dry, well-ventilated, clean, waterproof, anti-corrosive, dust-proof environment with relative humidity control.

stored under conditions of 5% RH to 80% RH, ambient temperature 0°C to 35°C, with a recommended storage temperature of 20°C to 30°C; avoid direct sunlight, maintain a distance of at least two meters from heat sources, and prevent contact with corrosive organic solvents, gases, or other substances. The product's State of Charge (SOC) should be maintained within the range of 20% to 50%. If customers plan to store the product for more than one month but no longer than six months, they should perform a full charge-discharge cycle in advance to adjust the SOC to 20%–50%.

50%. If the product's storage SOC exceeds the range of 20%–50%, or if storage is maintained without charge/discharge cycles for more than six months, it will result in capacity loss or other damage to the product.

13. An Emergency Measures

The energy storage system consists of multiple battery strings connected in series and parallel. The system design has accounted for potential hazards or failures; however, absolute safety cannot be guaranteed.

If internal product materials are leaked, users should follow the following recommendations.

If inhalation occurs, immediately leave the contaminated area and seek medical attention.

If contact with the eyes occurs, rinse the eyes with running water for 15 minutes and seek immediate medical attention.

In case of skin contact, thoroughly cleanse the affected area with soap and seek immediate medical attention.

In case of accidental ingestion, induce vomiting and seek medical attention.

If a battery fire is detected, first disconnect the circuit breaker in the power distribution section and shut off system connections under safe conditions.

Evacuate personnel immediately and contact the local fire department.

Note: To continuously improve customer satisfaction, our products and product manuals are under constant improvement and upgrading. Any discrepancies between the manual you have and the actual product may be due to version differences; please refer to the project technical documentation for accuracy. If you have further questions, please contact us.