Low Voltage Household Energy Storage - EBox16 Pro

User Manual



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Ruidian Green Energy Technology Co., Ltd.

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1 Preface

Overview

This document primarily introduces the installation, electrical connections, debugging, and troubleshooting methods for the WX-16.0-LPB Pro household energy storage system. Before installing or using the energy storage product, please read this manual carefully to understand safety information and familiarize yourself with the functions and features of the energy storage system.

Target Audience

The following symbols may appear in this document, with their respective meanings as described:

Symbol Explanation

The following symbols may appear in this document, with their respective meanings as described:

Symbol	Explanation
	Indicates a high-risk hazard that may cause death or severe injury if not avoided.
	Indicates a medium-risk hazard that may cause death or severe injury if not avoided.
	Indicates a low-risk hazard that may cause minor or moderate injury if not avoided.
	Conveys safety warnings about equipment or the environment. Failure to avoid may lead to equipment damage, data loss, performance degradation, or other unforeseen consequences. Does not involve personal injury.
	Highlights important/critical information, best practices, and tips. Not a safety warning; does not involve personal, equipment, or environmental hazards.

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Revision History

The revision history summarizes updates made in each document version. The latest version includes all updates from previous versions.

Serial	Version	Content	Date	Remarks
1	V1.0	First release	20250604	
2	V1.1	Second release	20260509	Update Fault Codes，Add Communication Wiring Connection Schematic Diagram

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2 Safety Precautions

2.1 General Safety

Declaration

Before installing, operating, or maintaining the equipment, read this manual carefully and follow all safety instructions on the equipment and in the manual.

The "Notes," "Cautions," "Warnings," and "Dangers" in this manual do not cover all safety requirements but serve as supplements. The company shall not be liable for any damages caused by violations of general safety operations, design/production/usage standards, or local laws and regulations.

This equipment must be used in environments that meet design specifications; otherwise, equipment failure may occur, and the company shall not be liable for resulting functional abnormalities, component damage, personal injury, or property loss.

Comply with local laws, regulations, and standards during installation, operation, and maintenance. The safety notes in this manual are supplementary to local requirements.

The company shall not be liable in any of the following cases:

- The installation and use environment exceed relevant international, national, or regional standards.
- The equipment operates outside the conditions specified in this manual.
- Unauthorized disassembly, modification, or software code alteration.
- Failure to follow operational instructions and safety warnings in the product documentation.
- Equipment damage caused by abnormal natural environments (force majeure), such as earthquakes, fires, storms, floods, or mudslides.
- Damage caused by the customer’s non-compliance with transportation and installation requirements.
- Damage due to storage conditions not meeting product documentation requirements.
- Damage to equipment hardware or data due to customer negligence, improper operation, or intentional damage.
- System damage caused by third parties or the customer, including improper relocation, installation, or modification of identification marks contrary to this manual.
- Defects, failures, or damages caused by events beyond the seller’s control, such as power outages, electrical failures, theft, war, riots, terrorism, or malicious damage.

General requirements



The equipment involves high voltage. Improper operation may cause electric shock or fire, leading to death, severe injury, or property damage. Follow these guidelines:

- Adhere to the operational sequences and safety instructions in this manual and related

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documents.

- Respect warning labels, signs, and protective measures on the equipment.
- Use correct tools and ensure proper tool handling.
- Restrict access to authorized personnel only. Install temporary warning signs or barriers during operations.
- Ensure warning labels and protective measures are visible; do not deface, damage, or obscure them. Replace them immediately if they become unclear.
- Never perform installation, wiring, maintenance, or replacement with the power on.
- Do not clean internal electrical components with water.
- Inspect the equipment for damage (e.g., holes, dents) or loose cable connections.
- Check that internal components are not displaced; unauthorized changes to the equipment's structure or installation sequence are prohibited.
- Do not power on the equipment until installation is complete and verified by a professional.
- Measure the voltage at contact points before touching any conductive surfaces or terminals, and ensure the protective ground wire is reliably grounded to eliminate electric shock hazards.
- Do not open the casing while the system is running.



- Avoid arc welding, drilling, or cutting on the equipment, as these may damage the casing's sealing, electromagnetic shielding, internal components, or cables. Metal debris from such operations may cause electrical short circuits, affecting equipment functionality or causing damage.
- The casing may become hot during operation; do not touch it to prevent burns.
- Immediately terminate operations and report to a supervisor if faults risking personal injury or equipment damage are detected.
- Power off and secure the casing if leaving the work area temporarily during maintenance.



- Comply with local laws, regulations, and standards for transportation, installation, and maintenance.
- Ensure self-provided materials and tools meet local requirements.
- Obtain local power authority approval for grid connection.
- Clean water, ice, or debris from the casing top before opening the door to prevent foreign objects from entering.

Explanation

- Reverse engineering, decompilation, disassembly, or other derivative operations on the equipment software are prohibited. Do not attempt to study the internal structure, obtain source code, or disclose software performance test results by any means.

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● Users are advised to use a camera to record detailed installation, operation, and maintenance processes.

2.2Personnel Requirements

● Only qualified personnel may operate the equipment (including transportation, installation, wiring, and maintenance), and they must wear safety gear compliant with local requirements.

● Operators must carefully review installation manuals and possess basic knowledge of energy storage systems.

🕮 Explanation

Specific qualification requirements shall comply with local regulations and industry standards.

Protective Gear Instructions



● Avoid wearing conductive items (e.g., watches, bracelets, rings, necklaces) during installation and maintenance to prevent electric shock.

● Comply with local laws, regulations, and standards for all operations.

● Familiarize yourself with the system’s composition and working principles and follow the manual’s descriptions for operations.

2.3 Storage and Installation Environment Requirements

General Requirements

🕮Explanation

● Retain records (e.g., temperature/humidity logs, storage environment photos, inspection reports) confirming compliance with product storage requirements.

● Long-term storage of the energy storage system is not recommended, as it may cause capacity loss (3% – 10% irreversible loss after 12 months at recommended storage temperatures). Operate the system at least once every 3 months.

● Store in a clean, dry place protected from dust, moisture, and corrosive or flammable gases. Do not expose to rain or standing water.

● Do not store the equipment tilted or inverted.

Energy Storage System Storage Requirements

● Do not remove packaging for long-term storage.

● Avoid arbitrary stacking; ensure the storage surface is flat.

● Do not open the equipment casing during storage.

● Storage temperature: -20°C to +50°C; humidity: 5%RH to 95%RH.

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Battery Pack Storage Requirements

1.Store battery packs indoors in a dry, ventilated area away from direct sunlight, rain, fire, and corrosive gases or radioactive radiation.
2.Total storage and transportation time shall not exceed 6 months from shipment. If exceeded, recharge and calibrate the SOC (minimum 45% SOC). Failure to do so may affect battery performance and service life.
3.Store battery packs according to packaging labels; do not place them upside down or sideways.
4.When packing and stacking battery packs, they should comply with the stacking requirements on the outer packaging.
5.Storage environment requirements:

- Recommended temperature: 15°C – 35°C.
- Relative humidity: ≤95%.
- Dry, ventilated, and clean environment.
- Avoid contact with corrosive substances or organic solvents (including gas exposure).
- Keep away from direct sunlight.
- Maintain at least 2 meters from heat sources (e.g., heating equipment).

Warehouse managers shall inspect storage conditions monthly and arrange recharging for overdue battery packs. Follow the "first-in-first-out" principle for inventory.

Battery Pack Overdue Storage Criteria

In principle, battery packs are not recommended for long-term storage and should be used promptly.

Storage Temperature Range	Actual Temperature（T）	Recharge Cycle	Remarks
-10～40℃	0℃≤T≤30℃	6months	● No action needed during the cycle; use as soon as possible. ● Recharge when the cycle is reached. ● Total storage shall not exceed the warranty period.
	30℃＜T≤40℃	4months	

🕮Explanation

Storage time is calculated from the last charging date marked on the battery pack’s outer packaging. Refresh the charging date after recharging and label the next required recharging date

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(last charge date + 4 months for T>30°C or +6 months for T≤30°C). Total storage shall not exceed the warranty period.

Installation Environment Requirements

Additional installation requirements include:

- The energy storage system's layout must meet local fire distance or firewall standards, including but not limited to GB 51048-2014 Design Code for Electrochemical Energy Storage Stations and NFPA 855 Standard for the Installation of Stationary Energy Storage Systems.
- Do not install the equipment in environments with flammable/explosive gases or fumes, and prohibit any operations in such environments.
- Avoid outdoor installation or operation during thunderstorms, rain, snow, or winds above Beaufort scale 6 (including equipment handling, cabling, signal interface plugging/unplugging, and high-altitude work).
- Maintain a 30mm ventilation space between the radiator and walls to prevent overheating.
- Install the equipment away from water sources (e.g., pipes, air conditioning outlets) to avoid water ingress into the equipment, which may cause malfunctions or short circuits.
- Keep the installation location away from fire sources and flammable/explosive materials.

High-Altitude Work Requirements

- Wear a safety helmet, safety belt, and waist rope, secured to stable structural components. Avoid attaching them to movable or sharp-edged metal objects to prevent falls.
- Mark danger zones at high-altitude work sites with clear signage and restrict unauthorized access.
- Do not stack scaffolding, planks, or other debris on the ground below high-altitude work areas. Ground personnel must not stay or pass directly below.
- Prohibit throwing objects from high altitudes or throwing objects upward from the ground. Use ropes, baskets, or lifting equipment for material handling.
- Inspect scaffolding, planks, and work platforms for safety and structural integrity before use; do not overload them.
- Stop high-altitude work during rainy or other risky conditions. Resume only after safety inspections by the company's safety officer and technicians.
- Install guardrails and signs at openings and edges to prevent falls.
- Secure tools to prevent them from falling.
- Supervisors and safety officers shall immediately correct non-compliant operations and ensure adherence to work standards before allowing continued work.

2.4Handling and Transportation Requirements

DANGER

Batteries must be handled in accordance with local laws and industry standards. Rough handling may cause battery pack short circuits, damage, electrolyte leakage, fire, or explosion.

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This product complies with UN38.3 (Section 38.3 of the Recommendations on the Transport of Dangerous Goods: Manual of Tests and Criteria) and is classified as Class 9 hazardous goods.

Shipping Conditions

- Do not ship if the battery pack has been collided, dropped, or shows signs of smoking/fire. Follow emergency procedures instead.
- Inspect the energy storage system before shipping: the casing must be intact, the door closed and locked, and no abnormal odors or smoke present. Reject shipments failing these checks.

Handling and Transportation Guidelines

- Handle with care and protect from moisture. Product specifications are subject to factory dates due to environmental factors (e.g., temperature, storage).
- Transportation Restrictions:
  - No rail or air transport.
  - Sea transport follows IMDG CODE and International Maritime Dangerous Goods Regulations.
  - Road transport follows ADR requirements.
  - Comply with regulations of the origin, transit, and destination countries.
- Ensure full transportation monitoring.
- Land vehicle load capacity: Single energy storage system weight ≤124kg.
- Speed limits: 80 km/h on flat roads, 60 km/h on rough roads (local traffic laws take precedence).
- Stacking is prohibited during port and ship transportation.

Prohibited Actions During Transportation

- Do not drop, hit, invert, or submerge the equipment in water.

Follow emergency procedures if any of the above occur.

2.5 Mechanical Safety

Ladder Safety

- Single-step ladders are prohibited.
- Inspect ladders for integrity and load capacity before use; do not exceed load limits.
- Use wooden or fiberglass ladders for electrical work.
- Priority should be given to using platform ladders with protective barriers for high-altitude operations. During the operation, all four feet must be fixed and the ladder must be supported by someone.
- If a zigzag ladder is used, the rope must be secure and someone must hold the ladder during operation. When packing and stacking battery packs, they should comply with the stacking requirements on the outer packaging.
- Climbing Precautions

Maintain balance and avoid standing above the fourth rung from the top.

Keep the center of gravity within the ladder’s frame.

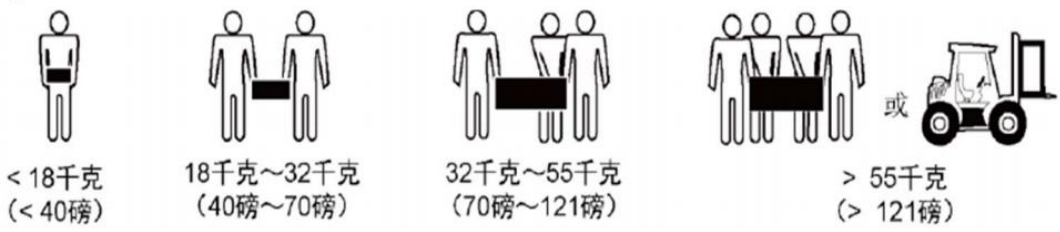
Drilling Safety (Outside Equipment)

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- Choose drilling locations carefully to avoid short circuits.
- Wear goggles and protective gloves; shield the equipment to prevent debris from entering.
- Clean up debris immediately after drilling.

Heavy Lifting Safety

- Use the recommended number of personnel for lifting and ensure proper load-bearing preparation.（Kg/Pound）



- Wear protective gloves and anti-smash shoes when handling equipment.
- Avoid scratching the casing or damaging internal components or cables during transportation.
- When using a forklift for transportation, the forklift must be positioned in the middle to prevent tipping over. Before moving, please fasten the equipment to the forklift with ropes; When moving, a dedicated person is needed to take care of it.
- Move the equipment slowly to prevent collisions or falls.

2.6 Electrical Safety

Wiring Requirements

- Prohibit improper operations like dropping cables from vehicles.
- Keep cables away from the equipment’s air inlets/outlets.
- Bundle similar cables together and separate different cable types by at least 30mm to avoid tangling or crossing.
- Seal cable openings with fireproof mud if leaving the work area temporarily to prevent small animals from entering.
- Maintain at least 30mm distance between cables and heat sources to avoid insulation aging or damage.
- Use cables compliant with local laws and regulations.
- Ensure cable trays and holes have no sharp edges; apply protective covers.
- Protect cables from sharp edges or burrs where they pass through pipes or holes.
- Cables used in the energy storage system must be securely connected, well-insulated, and of appropriate specifications.
- After wiring, secure cables with brackets and clamps. In backfilled soil areas, ensure cables are tightly attached to the ground to prevent deformation from soil pressure.
- For low-temperature construction (below 0°C):
  - Install cables at ≥0°C and handle them gently to avoid sheath cracking.
  - If cables are stored below 0°C, condition them at room temperature for at least 24 hours before installation.

Grounding Requirements

- Do not damage grounding conductors.

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- Install protective ground wires first during installation and remove them last during disassembly.
- The equipment’s main grounding body must be permanently connected to the protection grounding grid. Verify proper grounding before operation.
- Equipment grounding impedance must meet GB 50054 and local electrical standards.

AC/DC Operation Requirements

- Power off the system before installing or removing power cables.
- Confirm power cable label correctness before connection.
- For multi-input equipment, disconnect all inputs and fully power off the system before operations.

Maintenance and Inspection Safety

1.Disconnect the protection switch for the relevant circuit before connecting or removing cables.
2.Place "Do Not Close" signs on disconnected switches.
3.Use a voltage tester of appropriate rating to confirm the equipment is fully powered off.
4.Shield nearby live components with insulated panels or tape.
5.Ground the circuit to be serviced before maintenance.



- Reconfirm cable label correctness before connection.
- Fully power off multi-input equipment before operations.
- Remove grounding wires from the serviced circuit after maintenance.



Static electricity from the human body may damage static-sensitive components (e.g., LSI chips) on circuit boards.

- Wear anti-static gloves before touching the equipment, circuit boards, or PSU modules.
- Hold circuit boards or PSU modules by their edges, avoiding direct contact with components.
- Store removed boards or modules in anti-static packaging.

2.7 Battery Safety

Declaration

The company shall not be liable for battery pack damage caused by:

- Customer neglect in recharging, leading to overdue storage and capacity loss or irreversible damage.
- Improper handling (e.g., dropping, mechanical damage, leakage, or rupture due to incorrect connections).
- Over-discharging caused by delayed power-on after on-site installation.
- Customer delays in acceptance leading to battery pack damage.
- Incorrect setting of battery pack operation parameters by the customer.
- Unauthorized changes to battery pack usage scenarios (e.g., connecting extra loads or mixing with other brands/models).
- Direct damage from unsuitable operating environments (e.g., extreme temperatures) or external power parameters.

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- Frequent over-discharging due to poor maintenance, on-site capacity expansions, or long-term failure to fully charge.
- Failure to follow supporting equipment manuals for maintenance (e.g., not tightening battery pack terminal screws).
- Theft of battery packs.
- Battery packs beyond the warranty period.

Basic Requirements

- Do not expose battery packs to high-temperature environments or heat-generating equipment, such as direct sunlight, open flames, transformers, or heaters. Overheating of battery packs may cause fire or explosion.
- Disassembling, modifying, or damaging battery packs (e.g., inserting foreign objects, immersing in water or other liquids) is strictly prohibited, as it may lead to leakage, overheating, fire, or explosion.
- Lithium-ion/sodium-ion battery energy storage systems pose high fire risks. Consider the following safety hazards before any battery-related operations:

Battery pack electrolytes are flammable, toxic, and volatile.
Thermal runaway of battery packs can generate flammable gases (e.g., CO, HF) and pose explosion risks due to gas accumulation.

- If a battery pack is accidentally waterlogged, immediately stop installation, relocate it to a safe isolation point, and request a replacement spare part promptly.
- Store battery packs in a dry, well-ventilated area free from direct sunlight, rain, infrared radiation, organic solvents, or corrosive gases.
- Battery packs must be stored in a separate warehouse within their original packaging, avoiding mixing with other materials, outdoor exposure, or excessive stacking. Ensure appropriate fire-fighting facilities (e.g., fire sand, fire extinguishers) are available on-site.
- Conduct regular fire safety inspections for energy storage systems at least once a month.

Do not remove battery pack packaging under normal circumstances. If recharging is necessary, have qualified personnel perform it and repack the battery pack afterward.
For outdoor systems, power on within 24 hours after unpacking. If delayed, store the battery pack indoors in a dry, non-corrosive environment.

- Place battery packs according to anti-inversion labels on the packaging to prevent electrode leakage from long-term inverted storage.
- Avoid impacting the energy storage system.
- Transport the system in the specified direction; do not invert or tilt it.
- Use the energy storage system within the temperature ranges specified in this manual.
- Charging is prohibited below the minimum working temperature to avoid internal short circuits caused by low-temperature charging crystallization.
- Dispose of waste energy storage systems in accordance with local laws and regulations. Do not treat battery packs as household waste to prevent environmental pollution.
- Do not use damaged battery packs (e.g., dents or other shell damage). Damaged battery packs may release flammable gases and should not be stored near undamaged products.

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- Store damaged energy storage systems in areas free from flammable materials and keep unauthorized personnel away.
- Monitor damaged battery packs during storage to ensure no signs of smoke, fire, electrolyte leakage, or overheating.

Recharging Requirements

- If the energy storage system has not been charged for more than 6 months, recharge the battery pack. Failure to do so may affect battery pack performance and service life.

Battery Pack Short Circuit Prevention

DANGER

- Short circuits in battery packs can generate instantaneous high currents and release large amounts of energy, potentially causing personal injury or property damage.
- When installing or maintaining battery packs, wrap exposed cable terminals with insulating tape.
- Prevent foreign objects (e.g., conductive materials, screws, liquids) from entering the battery pack and causing short circuits.

Hazard and Toxicity Instructions

DANGER

- Contact between battery pack terminals and other metals may cause overheating or electrolyte leakage. If leakage occurs, immediately move the battery pack away from 火源 (fire sources).
- Vapors generated by burning battery packs may irritate the eyes, skin, and throat.

Abnormal Battery Pack Handling Procedures

DANGER

In case of electrolyte leakage or unusual odors, avoid contact with the leaked liquid or gas. Keep unauthorized personnel away and contact professional personnel immediately. Professionals should wear protective gear (e.g., goggles, rubber gloves, gas masks, protective clothing) to prevent hazards from electrolyte spills.

Electrolytes are corrosive and may cause skin irritation or chemical burns. If contact occurs:

- **Inhalation**: Evacuate the contaminated area, breathe fresh air, and seek medical help immediately.
- **Eye Contact**: Flush eyes with large amounts of clean water for at least 15 minutes without rubbing, then seek medical help immediately.

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•**Skin Contact**: Wash the affected area with soap and water thoroughly and seek medical help immediately.

•**Ingestion**: Seek medical help immediately.

Battery Pack Drop Procedures

If a battery pack drops (with or without packaging) but shows no obvious deformation, damage, or unusual odors/smoke/fire:

•**Warehouse**: Evacuate personnel, use mechanical tools to transfer the battery pack to a safe, open area, contact our service engineer, and wait 1 hour while monitoring the battery pack temperature (within ±10°C of room temperature) before further action.

•**On-Site**: Evacuate personnel, close the energy storage system door, transfer the battery pack to a safe, open area using mechanical tools, contact our service engineer, and wait 1 hour before further action.

If a dropped battery pack shows obvious odors, damage, smoke, or fire:

•Evacuate personnel immediately, contact professionals, and call emergency services. Have professionals use fire-fighting equipment to extinguish the fire safely.

Do not reuse a dropped battery pack; contact our service engineer for evaluation.

2.8 Maintenance and Replacement



Before removing components from the cabinet, ensure other parts of the casing are secure.
Always have at least two personnel present during energy storage system maintenance.
Cover nearby live components with insulating materials during maintenance.
Do not open the cabinet door during rain, snow, thunderstorms, dust storms, or fog.
Do not touch running fans (e.g., with fingers, components, or tools) until they stop and power is disconnected.
Do not power on the equipment until faults are resolved.
When inspecting live systems, pay attention to hazard labels and avoid standing near the cabinet door.
Wait 15 minutes after powering off (except for battery packs) to ensure the equipment is completely de-energized before operation.
Place "Do Not Close" warning labels on switches disconnected for maintenance.
After replacing power components or changing wiring, manually trigger wiring detection and topology recognition to avoid system anomalies.
After maintenance or replacement, reinstall and secure all casing components promptly.

2.9 Emergency Procedures

In case of hazards including but not limited to fire or smoke, prioritize personnel safety and contact our service engineer immediately.

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When the equipment smokes or catches fire:

Evacuate immediately.

Do not approach.

Do not disassemble.

Cut off power supply.

DANGER

Recommendations for on-site operators:

1. In case of fire, evacuate the building/equipment area, sound the fire alarm, and call emergency services immediately, providing product information (e.g., battery pack type, system capacity, battery pack location).
2. Under no circumstances re-enter the burning area or open the energy storage system door. Isolate the site and prevent unauthorized access.
3. After calling emergency services, remotely power off the system (e.g., via the equipment power plug or main household switch) if safe to do so.
4. Provide product information (e.g., battery pack type, system capacity, user manual) to arriving firefighters.
5. After firefighters confirm the fire is extinguished, have professionals handle further procedures in accordance with local regulations. Do not open the system casing privately.
6. Contact our service engineer for post-disaster maintenance evaluation.

Recommendations for firefighters:

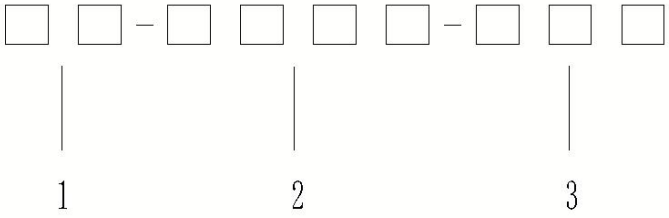
1. Refer to product information provided by on-site operators (e.g., battery pack type, system capacity, user manual).
2. Do not open the energy storage casing until internal safety is confirmed.
3. Follow local fire-fighting regulations for extinguishing operations.

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3. Product Introduction

3.1.Model Explanation

WX-16.0-LPB Pro



1. **Product Series Code**: WX represents wall-mounted energy storage battery systems.
2. **Battery Capacity**: 16.0 kWh (kilowatt-hour).
3. **Product Attribute**: LPB stands for low-voltage battery.
   Example: WX-16.0-LPB Pro is a household energy storage system with a capacity of 16.0 kWh and low-voltage battery design.

3.2.System Overview

The product consists of 3 main components: the battery system, battery management control system, and backend cloud service system. Combined with a hybrid inverter, it meets diverse user needs such as photovoltaic self-consumption, power selling, and emergency backup.

Modular Design: With an IP65 proof rating, the system supports long-term outdoor operation.

Capacity Expansion: Parallel expansion via a bus box allows connecting up to 15 battery packs, scaling capacity to 240 kWh.

Smart Monitoring: Remote monitoring, real-time control, and OTA (Over-The-Air) upgrades via Wi-Fi connectivity.

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3.3.Product Appearance



3.4.Basic Parameters

Item	WX-16.0-LPB Pro
Battery Type & Capacity	Lithium Iron Phosphate ($LiFePO_4$), 314Ah
Nominal Energy	16.0768 kWh
Usable Energy	14.4 kWh (90% DOD)
Voltage Range	44.8~57.6V
Charging Current	Rated: 157A, Max: 200A
Discharging Current	Rated: 157A, Max: 200A
Indication	Display Screen (SOC and operational status)
Operating Temperature	Charge: 0－55°C (-20~55℃ with heating function)/ Discharge: -20－55℃)
Recommended Temperature	15－35°C
Cycle Life	⩾8,000 cycles @ (25°C±2°C, 157A charge/discharge, 90% DOD, 70% EOL)
Circuit Breaker Type	2P125A
Cloud Platform Connection	Bluetooth/Wi-Fi
Parallel Mode	Via inverter or parallel connection box
Max Parallel Units	16
Dimensions	465*240*960mm

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Weight	120Kg
Communication	CAN2.0 (PCS); RS485 (parallel connection)
Address Coding	Automatic
Installation	Floor-Standing
proof Rating	IP65

3.5. Component Introduction

3.5.1. Cell Parameters

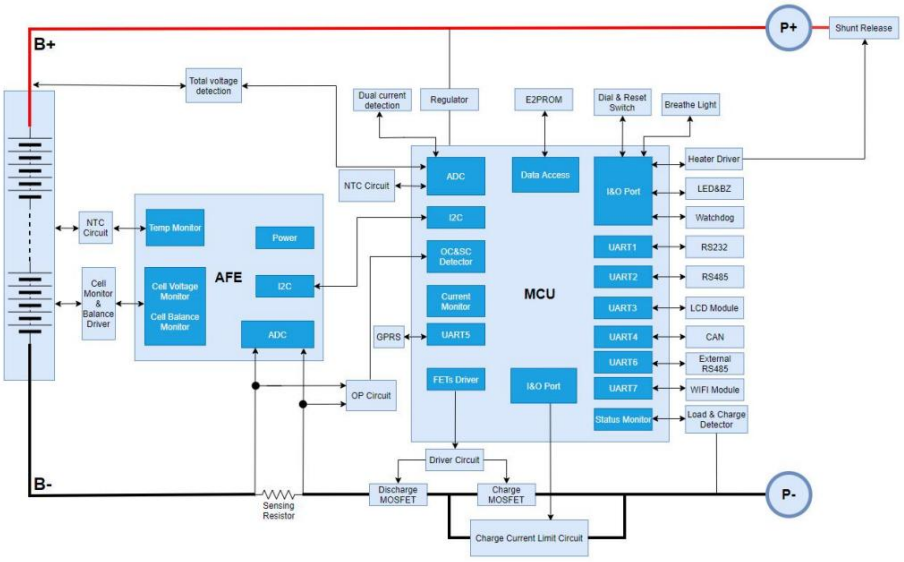
	Serial No.	Item	Normal Parameters	Remarks
Cell	1	Rated Capacity	314Ah	At 25±2℃, 0.5P/0.5P discharge rate
	2	Rated Voltage	3.2V	–
	3	Operating Voltage Range	2.5V—3.65V	When T > 0℃
	4		2.0V—3.65V	When T ≤ 0℃
	5	Internal Resistance	0.17±0.05mΩ	At 40% SOC
	6	Dimensions	Thickness: 71.7±0.8mm Width: 174.0±0.8mm Height: 204.4±0.8mm	Initial dimensions
	7	Weight	5.78±0.2kg	–
	8	Standard Charge	Constant current 0.5P, constant voltage 3.65V	At 25±2℃
	9	Standard Discharge	Constant current 0.5P	At 25±2℃
	10	Operating Temperature Range	Charge: 0—55℃ Discharge: -20—60℃	–
	11	Storage Temperature Range	Recommended: -10—40℃ Maximum: -30—60℃	humidity 60±25% RH, ≤3 months

3.5.2. BMS (Battery Management System)

Provide protection and recovery functions for the battery pack against overvoltage, undervoltage, overcurrent, high temperature, low temperature, short circuit, etc. Achieve accurate SOC measurement and SOH health status statistics during charging and discharging processes. Implement voltage balancing during the charging process. Through human-machine interaction with upper computer software, display and set alarm and protection parameters such as voltage, current, and temperature, and store and display real-time and historical data of the battery's operating status. It has multiple sleep and wake-up modes. Conduct parallel communication via RS485. Communicate data with the PC via RS485 and CAN, and perform

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parameter configuration and data monitoring via upper computer software or APP.



BMS Performance Parameters:

1. Equipped with multi-channel cell voltage and total voltage detection functions, while supporting overcharge, over-discharge alarm and protection; static voltage sampling accuracy at room temperature ≤ 10mV.

2. Equipped with charge and discharge current detection functions, supporting charge and discharge overcurrent alarm and protection; charging current is displayed as positive value, discharge current as negative value, current sampling accuracy at room temperature ≤2%@FS.

3. Reserved charge and discharge current detection interfaces, which can be expanded with charge and discharge overcurrent alarm and protection functions; after expansion, charging current is displayed as positive value, discharge current as negative value, current sampling accuracy at room temperature ≤ 2%@FS.

4. Equipped with multi-channel cell temperature detection function, supporting cell high temperature, low temperature alarm and protection; temperature sampling accuracy at room temperature ≤2℃.

5. Equipped with short-circuit protection function.

6. Equipped with charge balancing function.

7. Supports cell capacity estimation function: The full charge capacity, current capacity and design capacity of the battery pack can be set through the upper computer, and the capacity can be automatically updated after completing a full charge-discharge cycle.

8. Supports upper computer software control function: Protection parameters such as overcharge, over-discharge, charge-discharge overcurrent, over-temperature and under-temperature, as well as operating parameters such as capacity, sleep and balancing can be conveniently set through the upper computer software.

9. Equipped with three communication interfaces: RS232, RS485 and CAN.

10. Equipped with multiple sleep and wake-up modes.

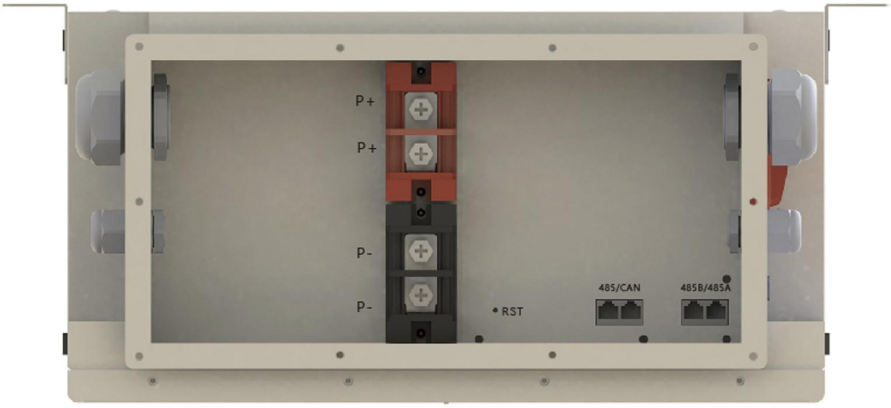
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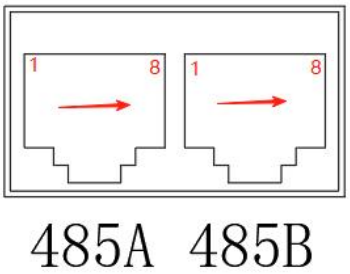
11. Equipped with auxiliary functions such as reset switch and automatic coding.

12. Equipped with functions such as LCD interface (optional), charge current limiting, buzzer and LED indicator.

13. Supports online upgrade function.

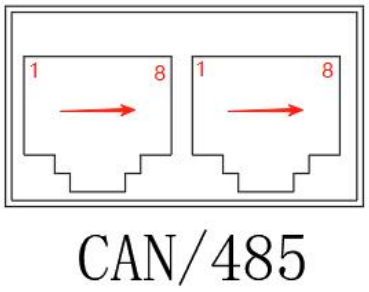
3.6.Interface Definition





RJ45	485A	485B	
NO.	Function	Function	Remarks
1	RS485B	RS485B	parallel communication
2	RS485A	RS485A	
3	GND	GND	
4	GND	GND	
5	DN_OP+	UP_IN	Automatic coding signal
6	GND	GND	
7	RS485A	RS485A	parallel communication
8	RS485B	RS485B	

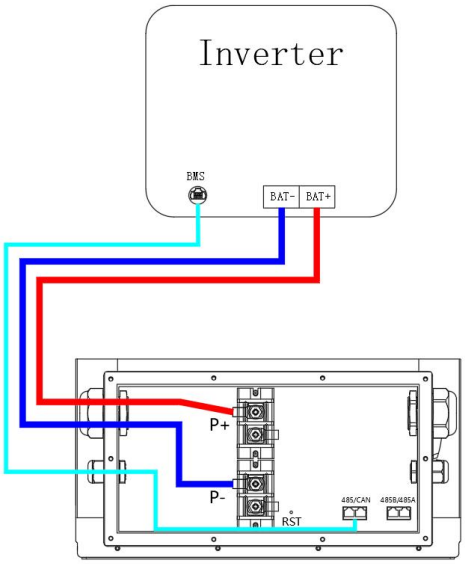
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RJ45	CAN	485	
NO.	**Function**	**Function**	**Remarks**
1	NC	RS485B1	Inverter 485 Communication
2	GND	RS485A1	
3	NC	GND	
4	CAN-H	NC	Inverter can Communication
5	CAN-L	NC	
6	NC	GND	Inverter 485 Communication
7	NC	RS485A1	
8	NC	RS485B1	

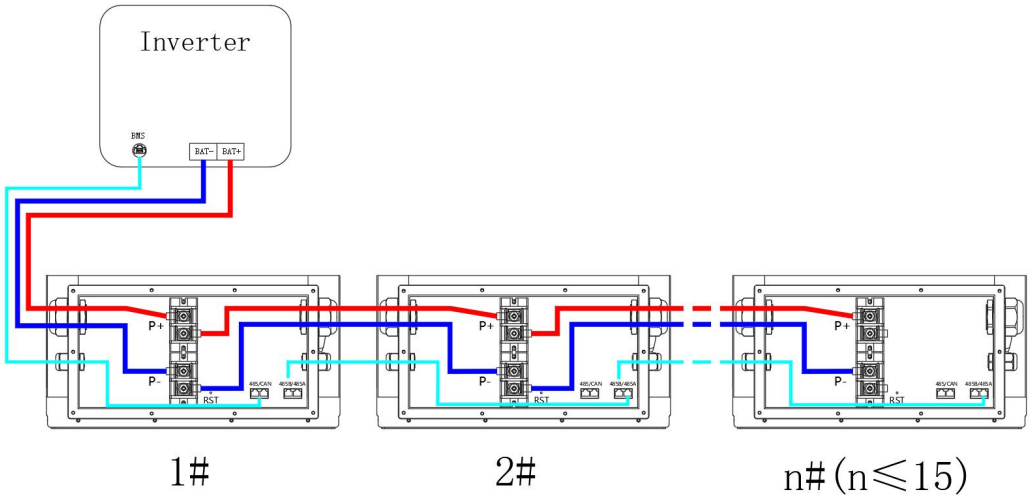
3.7.Wiring Diagram

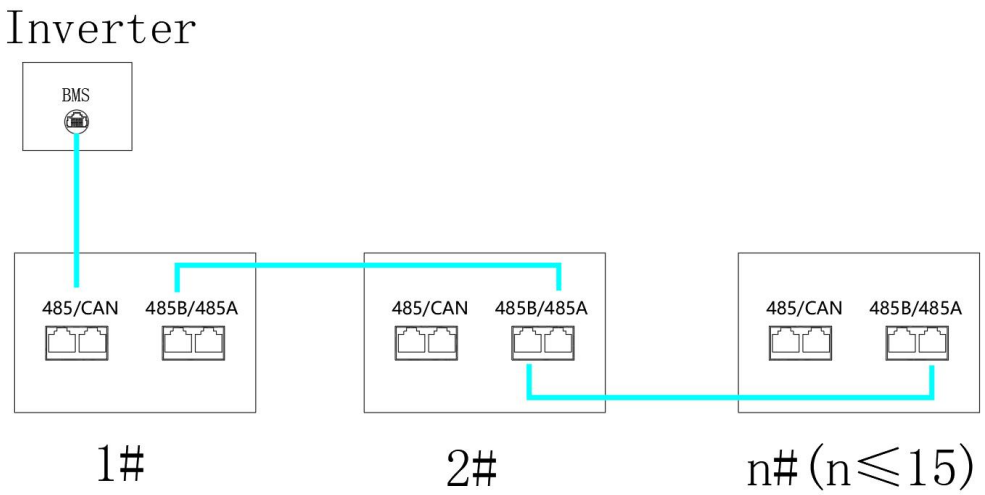
The wiring diagram for a single battery pack is as shown. The positive and negative cables connecting this product to the inverter **must be of the same length**. This solution is only applicable to inverters with a power ⩽ 8kW; if the inverter power exceeds 8kW, the inverter equipment must be derated for use.



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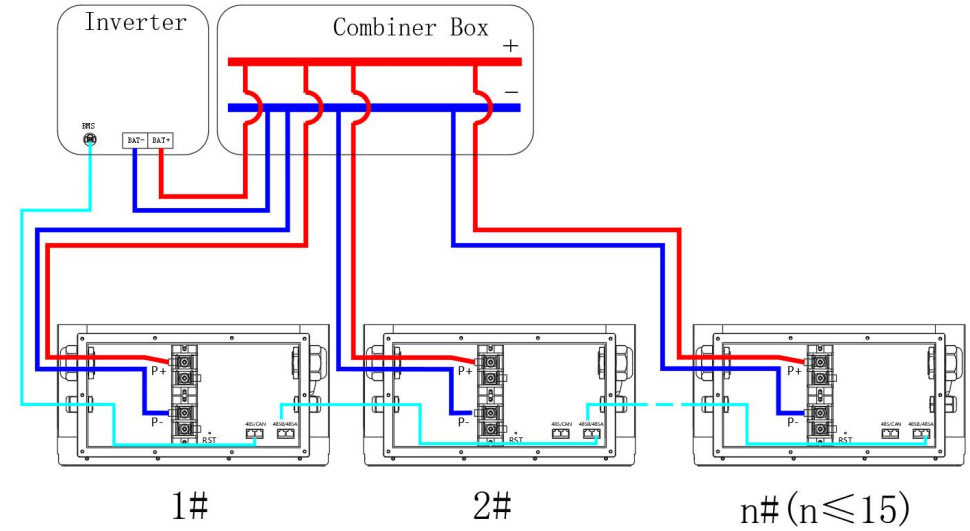
The wiring diagram for parallel connection of multiple battery packs is as shown. The positive and negative cables connecting this product to the inverter must be of the same length. The communication cables between batteries adopt a daisy-chain connection, and the system supports an automatic addressing function, eliminating the need for manual dip switch settings. This wiring method increases the system capacity through parallel connection of multiple battery packs but cannot expand the system power. This solution is only applicable to inverters with a power ⩽ 8kW; if the inverter power exceeds 8kW, the inverter equipment must be derated for use.

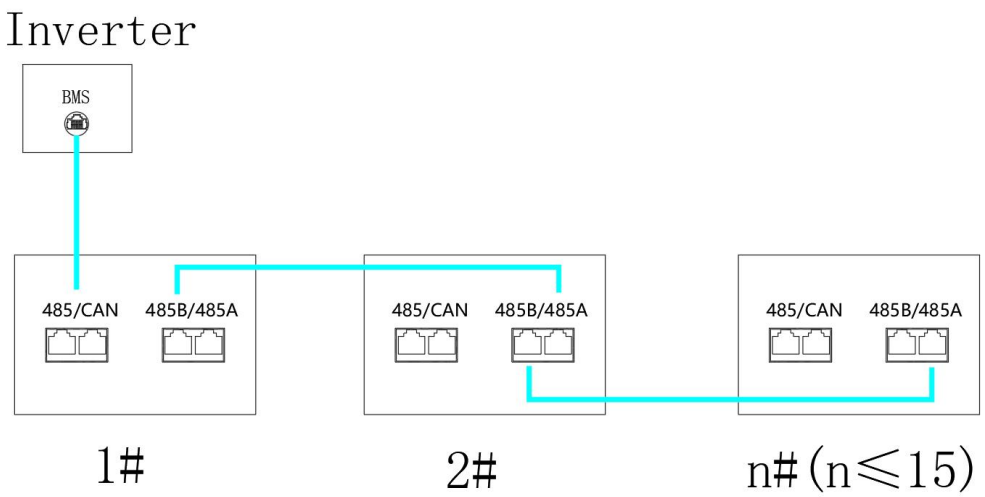




The wiring diagram for the parallel connection of multiple battery packs is as shown. The positive and negative cables connecting this product to the inverter **must be of the same length**. The communication cables between batteries adopt a daisy-chain connection, and the system supports an automatic addressing function, eliminating the need for manual dip switch settings. This wiring method increases the system power and capacity through the parallel connection of multiple battery packs. This solution is applicable to inverters with a power exceeding 8kW, and the maximum power of the inverter shall not exceed 8*N (where N is the number of parallel battery packs) kWh.

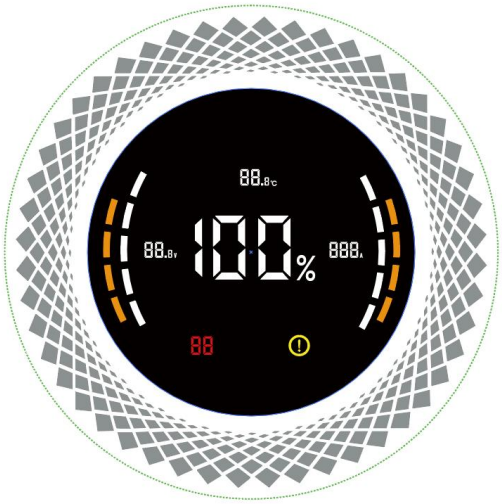
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3.8. Device Indicator Description



Charging Status: White running lights flash from the 0th to the 5th light.

Discharging Status: The light corresponding to the SOC power level flashes.

Standby Status: The light corresponding to the SOC power level remains steadily on.

Sleep Status: The screen can be turned off/on by touch; the host device (PC, APP) can set the screen's constant-on time.

Fault Code: Number (in red; see the table below for logical numbering).

Communication Fault: Communication failure between batteries or between the light board and the battery - indicated by yellow.

Voltage Display: Shows real-time battery voltage.

Current Display: Shows real-time discharging current.

Power Level Display: Shows real-time power percentage.

Temperature Display: Shows the internal temperature of the device.

Orange Light: Steadily on as a decorative strip.

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Code	Description	Code	Description	Code	Description
00	—	20	—	40	—
01	Cell Undervoltage Alarm	21	Cell Undervoltage Protection	41	—
02	Cell Overvoltage Alarm	22	Cell Overvoltage Protection	42	—
03	Pack Undervoltage Alarm	23	Pack Undervoltage Protection	43	NTC Fault
04	Pack Overvoltage Alarm	24	Pack Overvoltage Protection	44	Charge MOSFET Fault
05	—	25	—	45	Discharge MOSFET Fault
06	—	26	—	46	—
07	Charge Overcurrent Alarm	27	Charge Overcurrent Protection	47	—
08	Discharge Overcurrent Alarm	28	Discharge Overcurrent Protection	48	—
09	Charge Over-Temperature Alarm	29	Charge Over-Temperature Protection	49	—
10	Charge Under-Temperature Alarm	30	Charge Under-Temperature Protection	50	—
11	Discharge Over-Temperature Alarm	31	Discharge Over-Temperature Protection	51	—
12	Discharge Under-Temperature Alarm	32	Discharge Under-Temperature Protection	52	—

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Code	Description	Code	Description	Code	Description
13	Ambient Over-Temperature Alarm	33	Ambient Over-Temperature Protection	53	—
14	Ambient Under-Temperature Alarm	34	Ambient Under-Temperature Protection	54	—
15	MOSFET Over-Temperature Alarm	35	MOSFET Over-Temperature Protection	55	—
16	—	36	—	56	—
17	—	37	—	57	—
18	—	38	—	58	—
19	—	39	—	59	—

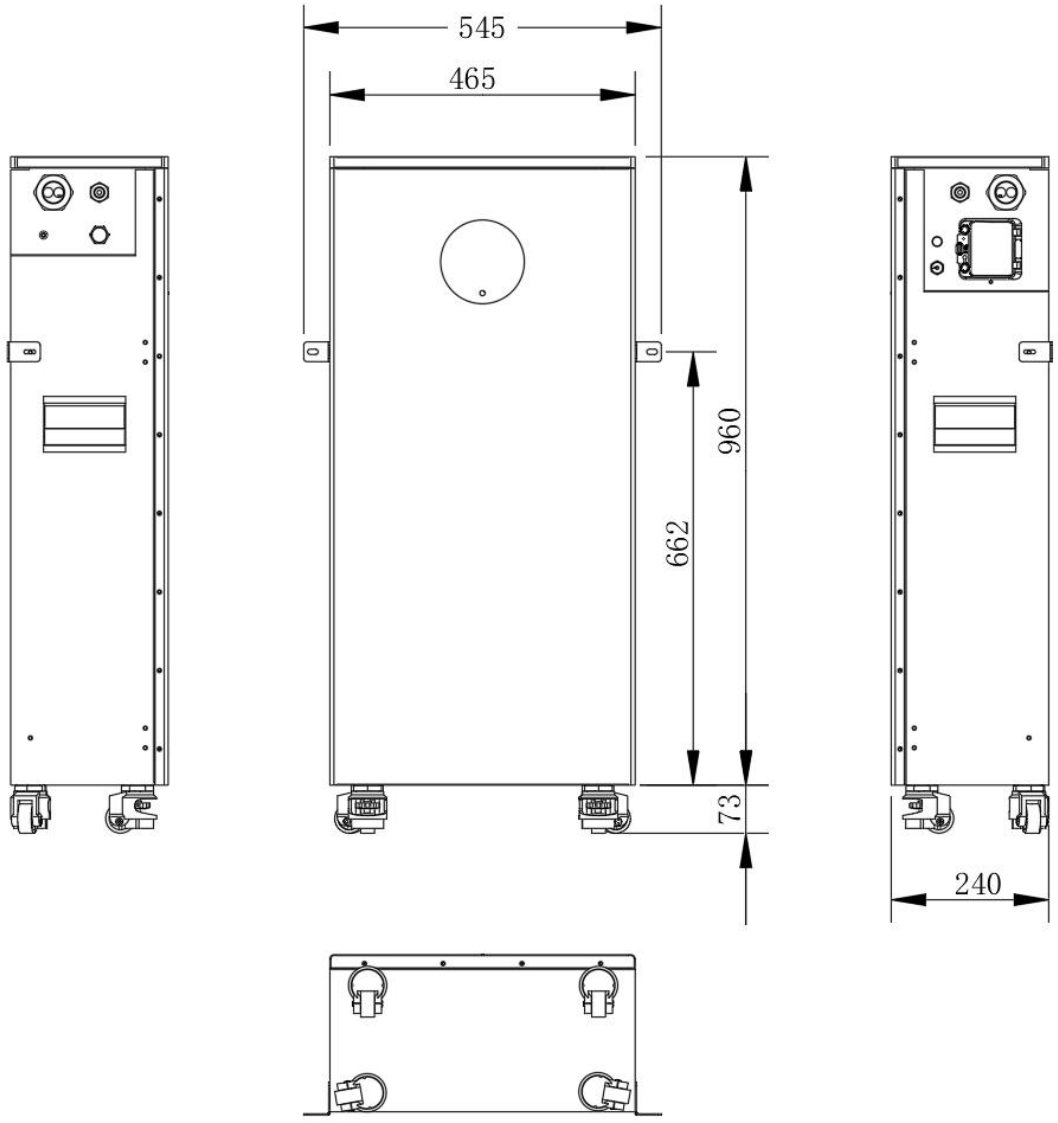
Power on/off operation:

operation	condition
Power on	First close the circuit breaker, then press and hold the button on the right side of the device for 1 second, and then release the button.
Power off	Operate when the device is powered on: first press and hold the button on the right side of the device for 1 second, release it, then open the circuit breaker.
Activation	When the BMS (Battery Management System) is in sleep mode, press and hold the reset button for 3 to 6 seconds, then release the reset button.
Sleep Mode	When the BMS is in working state, press and hold the reset button for 3 to 6 seconds, then release the reset button.
Hardware Reset	When the BMS is in working state, press and hold the specified button for 6 to 10 seconds. After releasing the button, the BMS will perform a hardware reset.

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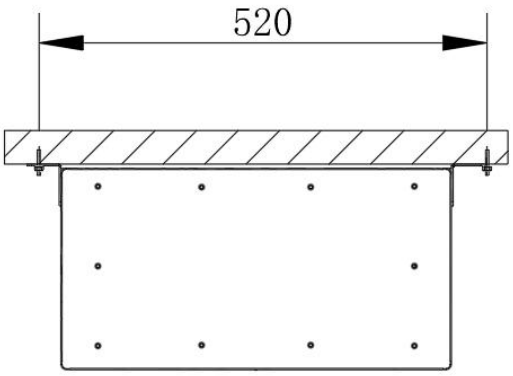
4. Product Installation

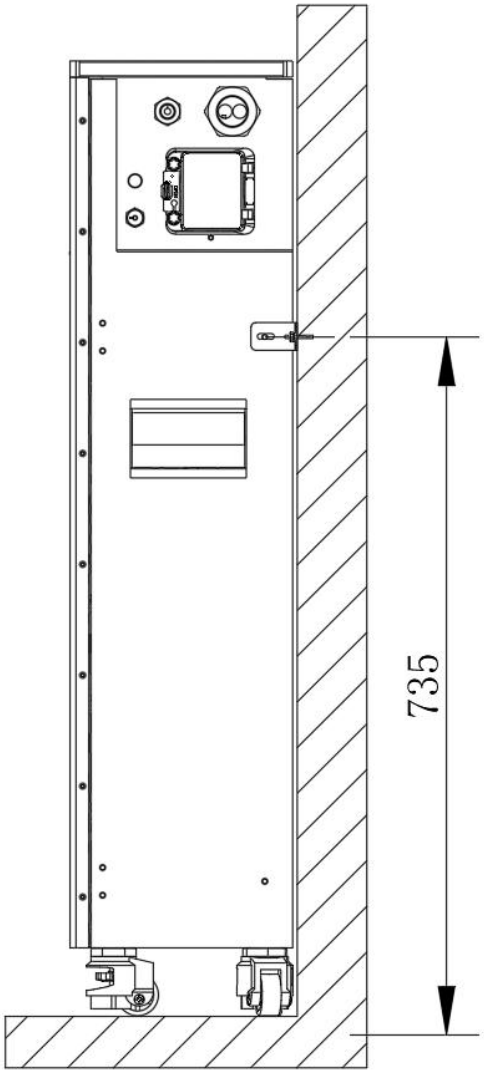
4.1. Product Dimensions



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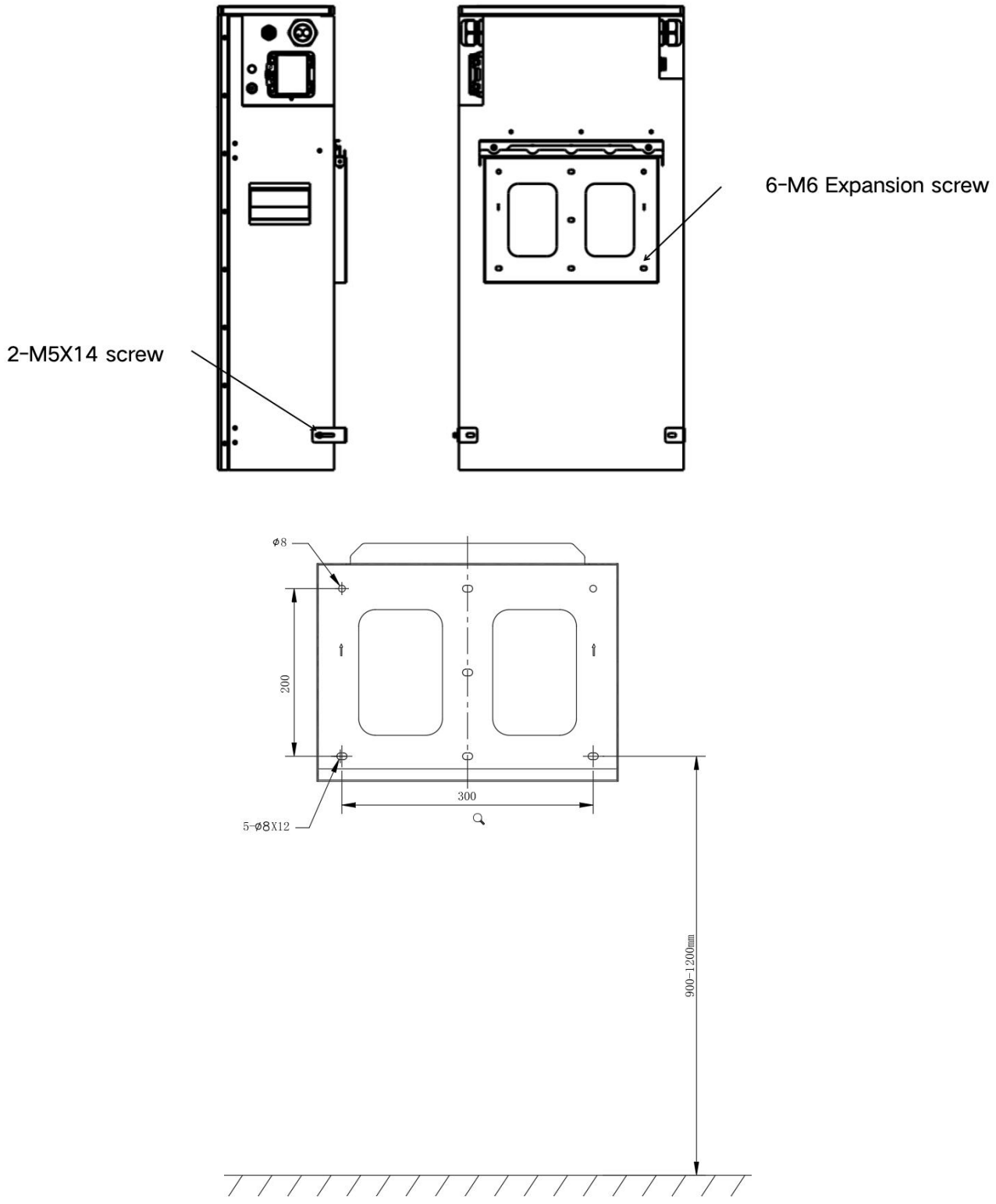
1、Floor-Standing





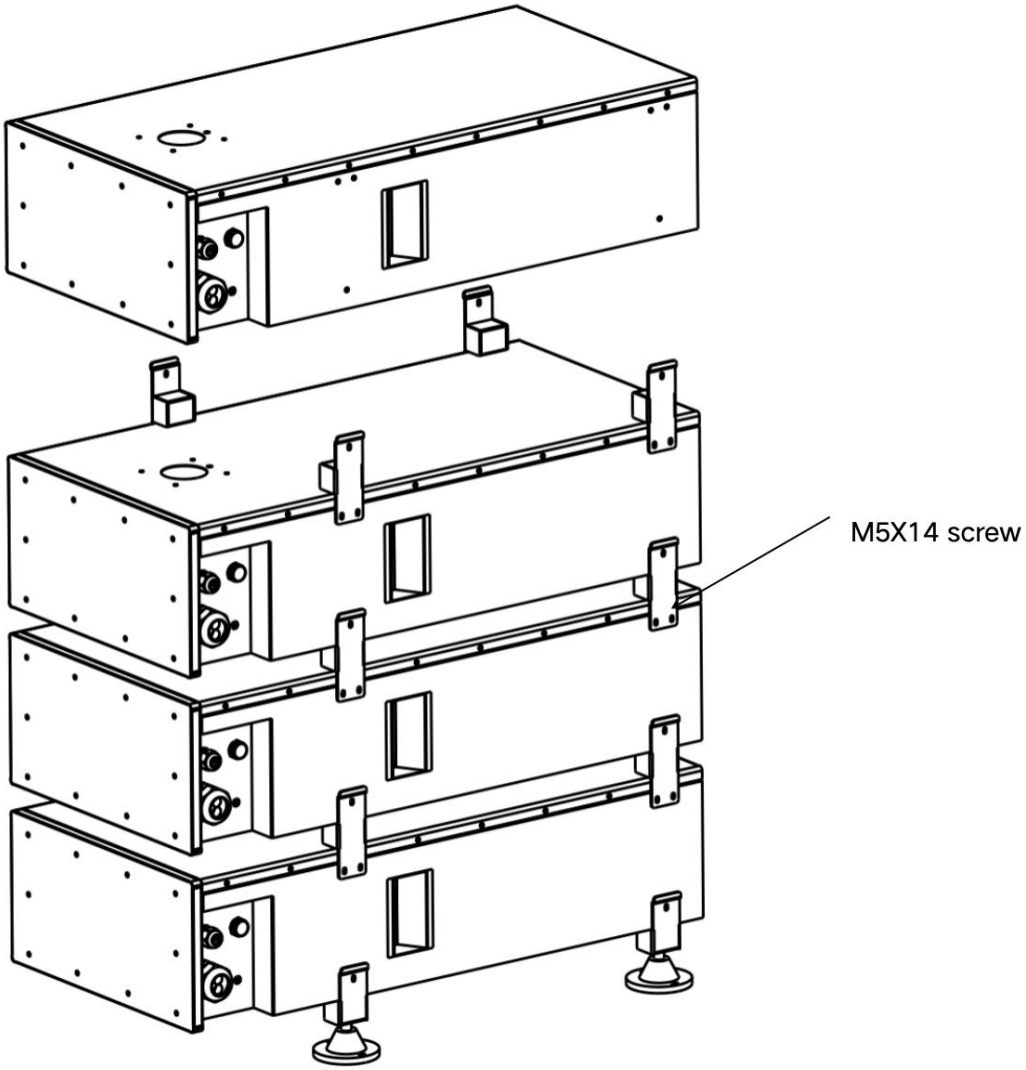
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2、Wall-Mounted



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3、Stacked



Installation Precautions

1.Reserve at least 300mm of space on the front and sides of the system.

2.To reduce the risk of fire and minimize damage, the walls, ceilings, and floors of the space where the energy storage system is placed should use fire-resistant materials as much as possible. Additionally, portable dry powder fire extinguishers or water-based fire extinguishers should be equipped.

3. During the installation process, please refer to the relevant applicable safety regulations for installation.

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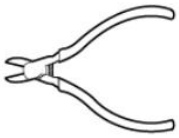
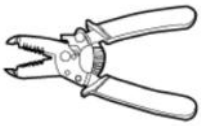
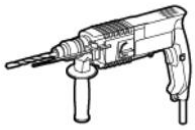
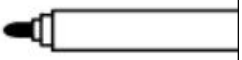
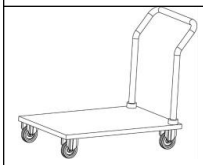
4.2. Check Packing List

No.	Item Name	Description	Unit	Quantity	Inspection	Notes
1	Energy Storage System	WX-16.0-LPB Pro	Set	1	☑	Standard
2	Positive Output Cable	1000mm Length, Red	Piece	1	☑	Standard
3	Negative Output Cable	1000mm Length, Black	Piece	1	☑	Standard
4	Wall-Mount Bracket	For securing upper part of battery system	PCS	2	☑	Standard
5	Network Port	Crystal Connector (RJ45 Ethernet Crystal Connector)	PCS	2	☑	Standard
6	Grounding Cable	Grounding Cable	PCS	1	☑	Standard
7	communication Cable	Network cable with RJ45 connectors	PCS	1	☑	Standard
9	Expansion bolt	M6*50	PCS	6	☑	Standard
10	Bracket Screws	M5*14	PCS	2	☑	Standard
11	Grounding Screw	M5*10	PCS	1	☑	Standard
12	Caster	84MM 50KG	PCS	4	☑	Standard
13		Fixing Bracket SGCC 140*53*43.5MM	PCS	12	☐	Optional
14	Self-stacking Accessory Kit	Fixing Bracket SGCC 92*53*63.5MM	PCS	4	☐	Optional
15		Anti-slip Foot Cup	PCS	4	☐	Optional
16		M5*14	PCS	40	☐	Optional
17	User Manual	Product User Manual	PCS	1	☑	Standard
18	Certificate of Conformity	Product Certification	PCS	1	☑	Standard
19	Inspection Report	Shipping Inspection Report	PCS	1	☑	Standard
20	Warranty Card	Warranty Documentation	PCS	1	☑	Standard

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4.3.Tool Preparation

The tools listed are for reference only. Actual tools may vary.
Additional tools may be required depending on the installation site. Please prepare accordingly.

 Cross insulation torque screwdriver	 One letter insulation torque screwdriver	 steel tape measure	 diagonal pliers
 Wire stripper	 wire cutter	 rubber hammer	 Utility knife
 Percussion drill	 percussion bit Φ8mm	 multimeter	 marking pen
 Level ruler	 Cable tie	 Hot air gun	 Vacuum cleaner
 wheelbarrow	 Heat shrinkable sleeve		

Personal protective equipment

 Protective gloves	 insulating gloves	 Protective goggles	 Anti-dust masks
 Reflective Vest	 insulating shoes	 safety hat	 safety belt

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4.4. Product installation

4.4.1. Unpacking

Transportation: Use a hand truck to move the battery system to the designated installation area.

Remove Outer Packaging: Carefully remove all external packaging materials.

Inspect & Unbox:

1. Check for any visible damage to the unit.
2. Use a utility knife to cut through packing straps and open the cardboard box.
3. Lift the battery system out of the box with proper lifting techniques.

4.4.2. Installation Environment Requirements

Do not install the battery cabinet in environments that are exposed to direct sunlight, high temperatures, low temperatures, or humidity.

Please keep the energy storage system away from water, flammable gases, corrosive substances, and heat sources.

Avoid installing energy storage systems in direct sunlight, dust, volatile gases, corrosive substances, and high salt environments.

Avoid installing energy storage systems on unstable or vibrating foundations.

Do not install the battery cabinet in a working environment with metal conductive dust. The optimal operating temperature of the battery is 20 ℃ -40 ℃. Working in environments with temperatures above 40 ℃ will reduce the battery's lifespan, while working in environments with temperatures below 0 ℃ will shorten the battery's backup time.

Please avoid using in environments with dust, volatile gases, corrosive gases, or high salt content.

Do not place flammable and explosive materials around the battery cabinet.

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4.4.3. Product installation steps

1. Positioning and Drilling: Mark the drilling positions on the wall according to the spacing of the battery's mounting brackets (ensure the wall load-bearing capacity meets the requirements), drill holes with an impact drill, and the hole diameter matches the expansion screws.

2. Fixing Mounting Brackets: Align the 2 mounting brackets with the drilled holes respectively, insert the expansion screws, and tighten them with tools to ensure the brackets are firmly fixed on the wall without looseness.

3. Mounting the Battery: Align the 16kWh home energy storage battery with the 2 mounting brackets on the wall, mount it stably, adjust the position to ensure the battery is level and firmly fixed without shaking.

Electrical Connections

--Short circuit detection: Select the resistance range of the multimeter and detect the positive and negative terminals being the same. If the resistance shows infinity, it indicates that the cable is not short circuited and can be used safely.

--Wire harness connection:
Connect the battery box to the ground wire: Users need to prepare M6 OT terminals and grounding cables (with a cross-sectional area of at least 6mm ^{2}).

Connection of power and communication cables:

1. Use the dedicated power cord (with a cross-sectional area of 50mm ^{2}) and communication cable (standard network cable, labeled for inverter) provided with the goods.

2. Ensure that the battery system is in a power-off state.

3. First connect the power cord to the input side interface of the inverter, and then connect it to the battery side interface.

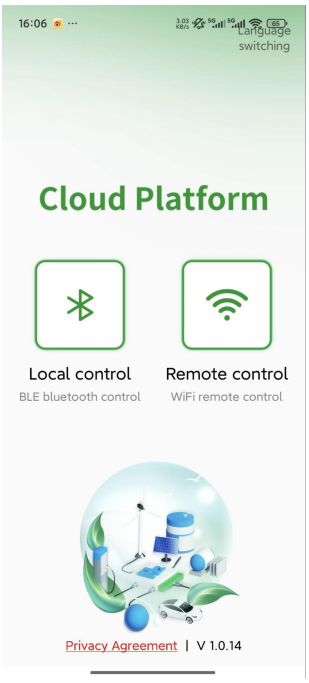
4. Use an RJ45 cable to connect one end to the CAN/485 interface of the battery and the other end to the CAN or RS485 communication interface of the inverter.

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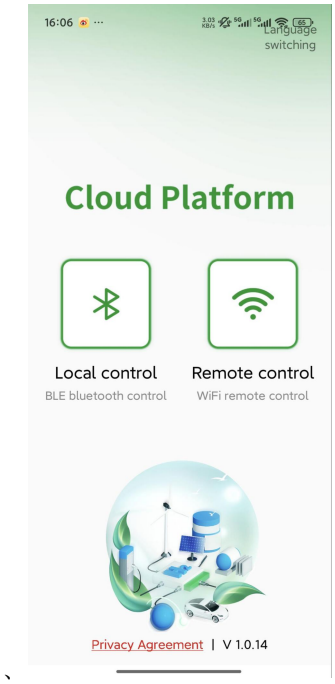
5. Product remote monitoring platform

Click on the icon to launch the software and select the cloud platform login method.



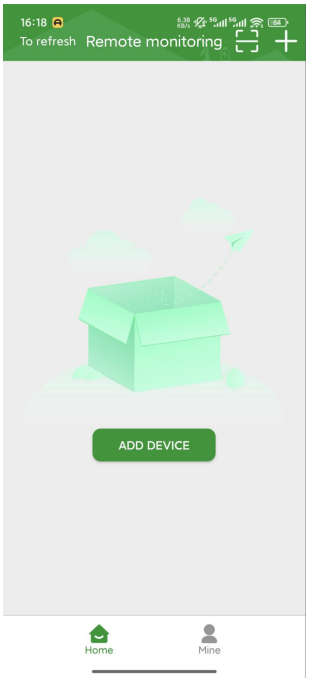


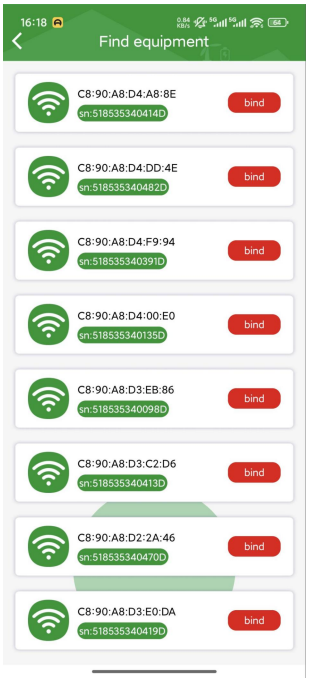
Register an account through email and log in to the software using the account password

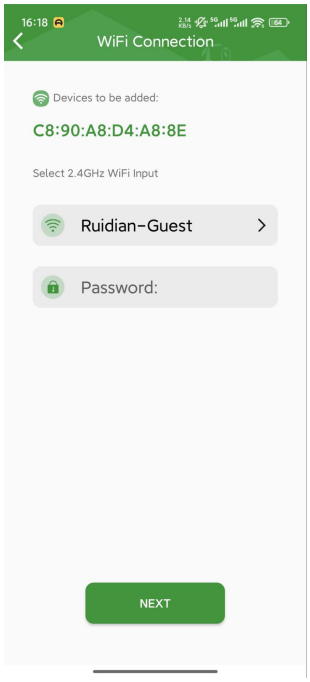


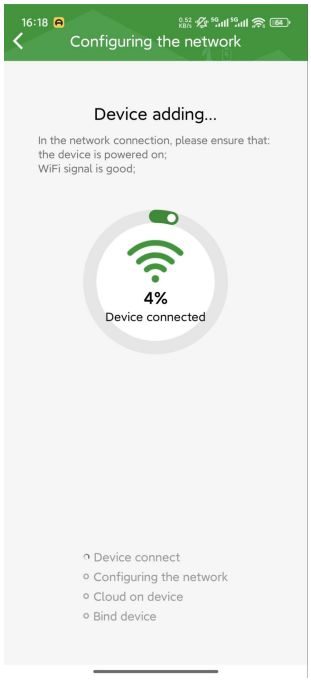
Open your phone's Bluetooth and click on 'Add Device' to discover the device through Bluetooth; Set WiFi connection network and network login password, successfully added device;

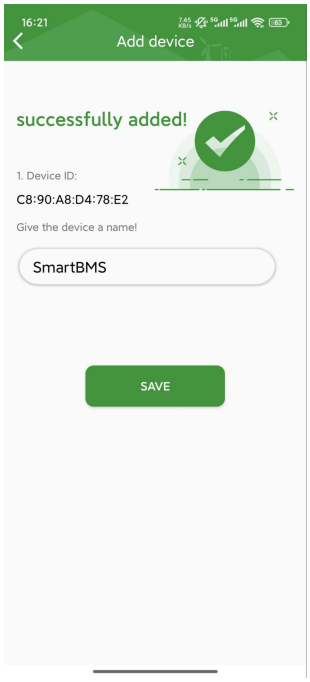
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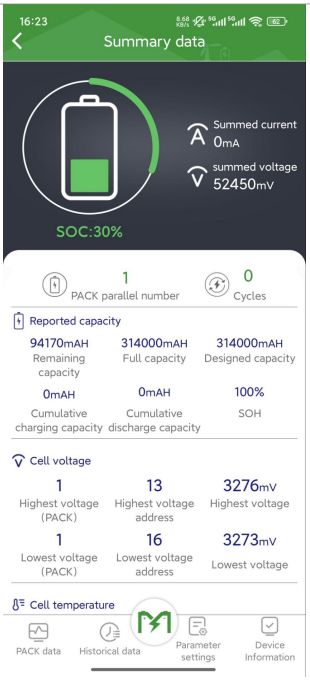


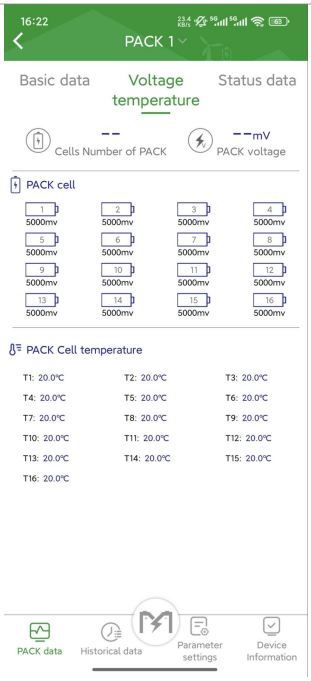




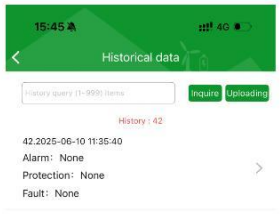
Through the monitoring interface, the operation summary data of the battery energy storage system, as well as the basic data, voltage temperature data, and status data of individual PACKs, can be observed;

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Through the historical data interface, by selecting the number of historical data queries, the historical operation data of the battery energy storage system can be queried, with a maximum of 1000 records;

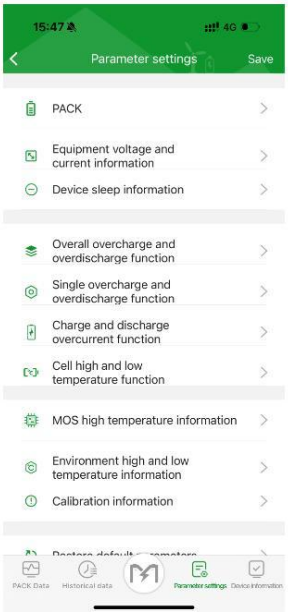


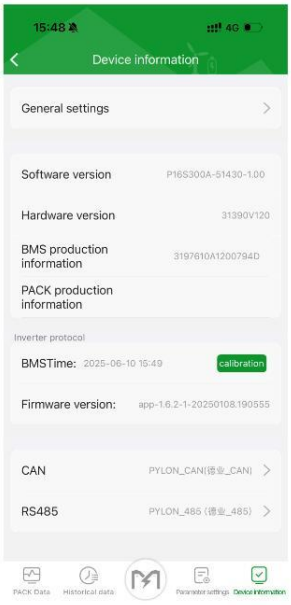


The operating parameters of the energy storage system can be set through the parameter setting interface (arbitrary adjustment of parameters may cause abnormal system operation);

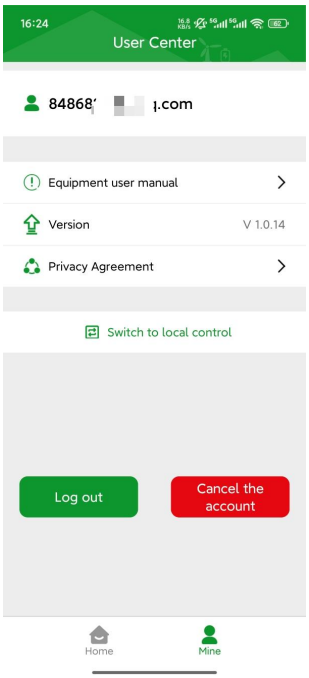
Through the device information interface, the operating mode of the energy storage system can be adjusted, the indicator light and buzzer alarm functions can be turned off, the current limiting function can be set, the system operating time can be calibrated, and the communication protocol of the energy storage system matching the inverter can be adjusted;

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Click on "My" to enter the user center, and then click on the device user manual to view detailed instructions for using the cloud platform.



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6. Product Maintenance



Please clean the dust on the top radiator and fan surface of the product in a timely manner during routine maintenance, and promptly remove flammable debris around the equipment. It is recommended to clean and maintain the radiator every 3-6 months, with maintenance intervals determined by the level of air pollution and operating time in different regions. When cleaning, please use dry cleaning tools such as cloths or brushes, and do not use organic solvents such as gasoline. Check the battery system at least once a month, and use the app to check if the battery voltage and temperature are normal. Check historical data to determine if there is a serious malfunction. If maintenance is required, please consult a service engineer.

7. Alarm information and handling

If an abnormality occurs during the operation of the device, the red indicator light will light up, and many alarms will automatically recover as the battery is charged and discharged, without the need for further processing; If the red indicator light cannot be restored for a long time, the following methods can be used to handle it:

1. According to the power on/off method, restart the equipment. If it can be restored to normal, there is no need to handle it;

2. Check the operating status of the battery system through the cloud based mobile app and contact our after-sales personnel for assistance;

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