Intelligent Power Mate
iSitePower-M

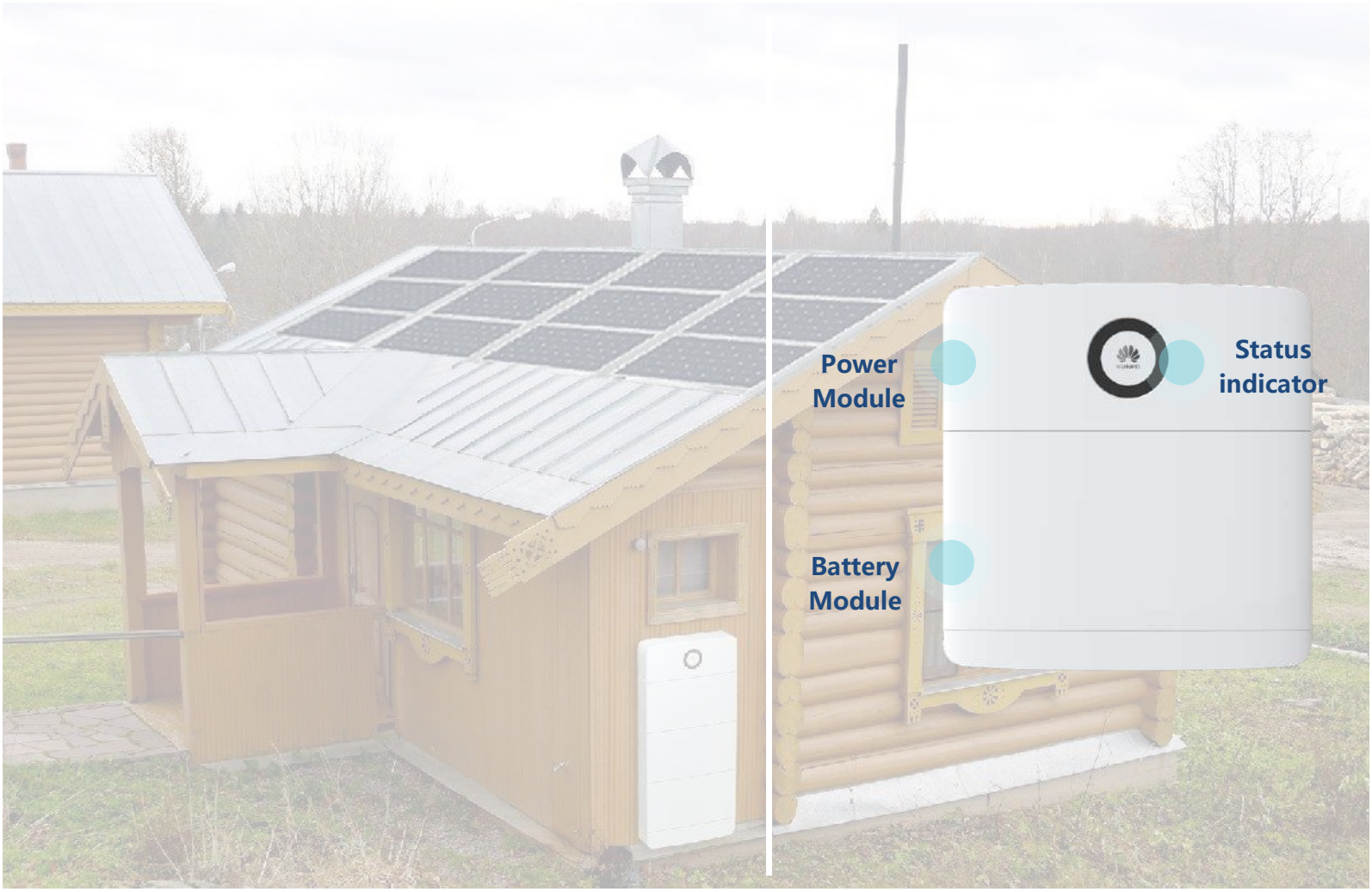
ISP-M-MAB05B1

ISP-M-MAP05A1

Introduction

iSitePower-M is a small-scale hybrid power solution. It integrates power supply, backup power, and management. It is widely used in off-grid and unreliable grid areas and provides reliable and stable backup power for residences, apartments, shops, and emergency scenarios.

iSitePower-M features a high-density design, small size, light weight, and IP65 protection level. It can be installed indoors, or on outdoors



Application

- Indoor & outdoor scenario, wall-mounted/floor-mounted
- Off-grid and unreliable grid areas, civil and commercial backup power
- Residences, apartments, shops, and emergency scenarios

Product parameters

Basic Parameters	Dimensions (W x H x D)	Single power module: 700 mm x 246 mm x 152 mm Single battery module: 700 mm x 390 mm x 158 mm Base (mandatory for floor installation): 700 mm x 55 mm x 147 mm Base (mandatory for wall-mounted installation): 700 mm x 118 mm x 184 mm
	weight	Approx. 17 kg for a single power module Approx.50 kg for a single energy storage module
	Installation Mode	Wall-mounted/ground-mounted
	Degree of protection	IP65
AC input	Input voltage system	Single-phase 200/208/220/230/240 VAC, 220 V AC by default
	Input voltage range	± 20%
	Input current	Max. 30 A
	Frequency	50/60Hz
	lightning protection	Differential mode: 3KA; common mode (two-wire pair PE): 5KA; 8/20 μs
PV input	Start-up voltage	100V DC
	Maximum input voltage	435V DC
	MPPT voltage range	90-420V DC
	Rated input voltage	345V DC
	Maximum input capacity of the MPPT	5.5KWp
	PV string quantity	2 strings
	Number of MPPT channels	1 channel
	Maximum input current	2*15A
	Maximum short circuit current	2*18A
	lightning protection	10 kA common mode (two-wire pair PE), 8/20 μs
AC output	Output voltage system	Single-phase 200/208/220/230/240 VAC, 220 V AC by default
	Output frequency	50/60 Hz. The default value is 50 Hz.
	Maximum output current	30A
	Input and output power	6kVA/5kW
	THD	≤ 3% R load
Bypass input power	Maximum bypass input power	6kW
overload capacity	102% ≤ Load ≤ 125%	30S
	125% < Load ≤ 150%	10s
	＞150%/short circuit	0.3S

Specifications

Battery parameters	Output input voltage	370-480VDC
	Rated capacity [1]	5 kWh per module
	Maximum capacity	Single system scenario: max. support 6 pcs batteries, 5 kW output (5Kw@30kWh) Parallel system scenarios: max. 3 power modules can be paralleled. Each power module supports max. 3 batteries (15Kw@45kWh)
	Maximum output power	2.5 kW per module
	cycle life	6000 times @ 25°C, 80% DOD
AC parallel box	Dimensions (W x H x D)	350 mm x 450 mm x 150 mm
	weight	Approx. 12 kg
	Input voltage	200/208/220/230/240 V AC. The default value is 220 V AC.
	Input current	Maximum 90A
	Output voltage	200/208/220/230/240 V AC. The default value is 220 V AC.
	Output current	Max. 90A
	Cable outlet mode	Bottom in and bottom out
	Installation Mode	Wall-mounted or pole-mounted installation
	Degree of protection	IP55
Environmental parameters	Operating temperature	0°C to 45°C (without +1120w/m^2 solar radiation)
	Transport temperature	- 40°C -+ 70°C
	Storage temperature	- 40°C -+ 70°C
	relative humidity	5%-95% (RH)
	Altitude Requirements	0~4000m (The operating temperature decreases by 1°C per 200m when the altitude is 2000 m to 4000 m.)
	Noise level	When temperature is 30°C, the noise is ≤40 dBA@1 m.

1. Test conditions: 100% depth of discharge(DoD), 0.2C rate charge & discharge at 25℃, at the beginning of life. If no PV modules are installed or the system has not detected sunlight for at least 24 hours, the minimum end of discharge SOC is 15%.

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ISP-M-MAP05A1

iSitePower-M V100R002C00

User Manual (MAP05A1, MAB05B1)

Issue 03

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About This Document

Purpose

This document describes the iSitePower-M system (including the power module MAP05A1 and battery module MAB05B1) in terms of its overview, installation, commissioning, maintenance, and technical specifications.

Intended Audience

This document is intended for:

- Sales engineers
- Hardware installation engineers
- Installation and commissioning engineers
- Technical support engineers
- Maintenance engineers

Symbol Conventions

The symbols that may be found in this guide are defined as follows.

Symbol	Description
DANGER	Indicates a hazard with a high level of risk which, if not avoided, will result in death or serious injury.
WARNING	Indicates a hazard with a medium level of risk which, if not avoided, could result in death or serious injury.
CAUTION	Indicates a hazard with a low level of risk which, if not avoided, could result in minor or moderate injury.
NOTICE	Indicates a potentially hazardous situation which, if not avoided, could result in equipment damage, data loss, performance deterioration, or unanticipated results. NOTICE is used to address practices not related to personal injury.

Symbol	Description
NOTE	Supplements the important information in the main text. NOTE is used to address information not related to personal injury, equipment damage, and environment deterioration.

Change History

Changes between document issues are cumulative. The latest document issue contains all updates made in previous issues.

Issue 03 (2022-10-28)

- Updated the safety precautions.
- Updated the electrical connection.
- Updated the description of application scenarios.
- Updated the system commissioning.

Issue 02 (2021-12-30)

- Added the label description.
- Added the description of application scenarios.
- Updated the description of battery recharge.
- Updated some specifications.

Issue 01 (2021-09-30)

This is the first official release.

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1 Safety Precautions

1.1 General Safety

Declaration

Before installing, operating, and maintaining the equipment, read this document and observe all the safety instructions on the equipment and in this document.

The "NOTICE", "WARNING", and "DANGER" statements in this document do not cover all the safety instructions. They are only supplements to the safety instructions. We will not be liable for any consequence caused by the violation of general safety requirements or design, production, and usage safety standards.

Ensure that the equipment is used in environments that meet its design specifications. Otherwise, the equipment may become faulty, and the resulting malfunction, component damage, personal injuries, or property damage are not covered under the warranty.

Follow local laws and regulations when installing, operating, or maintaining the equipment. The safety instructions in this document are only supplements to local laws and regulations.

We will not be liable for any consequences of the following circumstances:

- Operation beyond the conditions specified in this document
- Installation or use in environments that cannot meet relevant international, national, or local standards
- Unauthorized modifications to the product or software code or removal of the product
- Failure to follow the operation instructions and safety precautions on the product and in this document
- Equipment damage due to force majeure, such as earthquakes, fire, and storms
- Damage caused during transportation by the customer
- Damage caused by storage conditions that do not meet the requirements specified in related documents

- Damage to the hardware or data of the equipment due to customer's negligence, improper operation, or intentional damage
- System damage caused by improper operations of a third party or customer, including those in transportation, installation, and adjustment, alteration, or removal of identification marks

General Requirements

DANGER

Improper operations on high-voltage equipment may cause an electric shock or fire, which could result in death, serious injury, or serious property damage. Perform standard operations as follows:

- Do not install, use, or operate outdoor equipment and cables (including but not limited to moving equipment, operating equipment and cables, inserting connectors to or removing connectors from signal ports connected to outdoor facilities, working at heights, and performing outdoor installation) in harsh weather conditions such as lightning, rain, snow, and level 6 or stronger wind.
- Observe the operation procedures and safety precautions provided in this manual and other related documents.
- Observe the safety precautions specified in the warning signs and protection labels on the equipment.
- Use correct tools properly as required in this manual.
- Do not perform installation, cable connection, maintenance, or replacement when the equipment is energized.
- Do not clean the equipment with water.
- Do not open the host panel of the equipment.
- Check that the equipment is not damaged. For example, check that the battery is not dropped, bumped, or dented on the enclosure.
- Before handling a conductor surface or terminal, measure the contact point voltage and ensure that there is no risk of electric shock.
- Repaint any paint scratches caused during equipment transportation or installation in a timely manner. Equipment with scratches cannot be exposed to an outdoor environment for a long period of time.
- Ensure that battery terminal components are not affected during transportation. Do not hoist or move batteries by using battery terminals.
- Without prior consent from the manufacturer, do not alter the internal structure or installation procedure of the equipment.
- In the case of a fire, immediately leave the building or the equipment area, and turn on the fire alarm bell or make an emergency call. Do not enter the building on fire in any case.

NOTICE

- During transportation, turnover, installation, cable connection, and maintenance, comply with the national and local laws, regulations, and relevant standards.
- The materials and tools prepared by the customer must comply with the national and local laws, regulations, and relevant standards.

NOTE

You shall not reverse engineer, decompile, disassemble, adapt, add code to the device software or alter the device software in any other way, research the internal implementation of the device, obtain the device software source code, infringe on Huawei's intellectual property, or disclose any device software performance test results.

1.2 Personnel Requirements

- Personnel who plan to install or maintain the equipment must receive thorough training, understand all necessary safety precautions, and be able to correctly perform all operations.
- Only qualified professionals or trained personnel are allowed to install, operate, and maintain the equipment.
- Only qualified professionals are allowed to remove safety facilities and inspect the equipment.
- Personnel who will operate the equipment, including operators, trained personnel, and professionals, should possess the local national required qualifications in special operations such as high-voltage operations, working at heights, and operations of special equipment.
- Only professionals or authorized personnel are allowed to replace the equipment or components (including software).

NOTE

- Professionals: personnel who are trained or experienced in equipment operations and are clear of the sources and degree of various potential hazards in equipment installation, operation, maintenance
- Trained personnel: personnel who are technically trained, have required experience, are aware of possible hazards on themselves in certain operations, and are able to take protective measures to minimize the hazards on themselves and other people
- Operators: operation personnel who may come in contact with the equipment, except trained personnel and professionals

1.3 Electrical Safety

Grounding Requirements

- For the equipment that needs to be grounded, install the ground cable first when installing the equipment and remove the ground cable last when removing the equipment.
- Do not damage the ground conductor.

- Do not operate the equipment in the absence of a properly installed ground conductor.
- Ensure that the equipment is connected permanently to the protective ground. Before operating the equipment, check the electrical connection to ensure that it is securely grounded.

General Requirements

DANGER

Before connecting cables, ensure that the equipment is intact. Otherwise, electric shocks or fire may occur.

- Ensure that all electrical connections comply with local electrical standards.
- Ensure that the cables you prepared meet local regulations.
- Use dedicated insulated tools when performing high-voltage operations.

DC Operation

DANGER

Do not connect or disconnect power cables with power-on. Transient contact between the core of the power cable and the conductor will generate electric arcs or sparks, which may cause fire or personal injury.

- Before connecting cables, switch off the disconnector on the upstream equipment to cut off the power supply if people may contact energized components.
- Before connecting a power cable, check that the label on the power cable is correct.
- If the equipment has multiple inputs, disconnect all the inputs before operating the equipment.

Cabling Requirements

- When routing cables, ensure that a distance of at least 30 mm exists between the cables and heat-generating components or areas. This prevents damage to the insulation layer of the cables.
- Bind cables of the same type together. When routing cables of different types, ensure that they are at least 30 mm away from each other.
- The positions where cables are routed through pipes or holes must be protected to prevent the cables from being damaged by sharp edges or burrs.
- When the temperature is low, violent impact or vibration may damage the plastic cable sheathing. To ensure safety, comply with the following requirements:
  - Cables can be laid or installed only when the temperature is higher than 0°C. Handle cables with caution, especially at a low temperature.

- Cables stored at subzero temperatures must be stored at room temperature for at least 24 hours before they are laid out.

ESD

NOTICE

The static electricity generated by human bodies may damage the electrostatic-sensitive components on boards, for example, the large-scale integrated (LSI) circuits.

Wear ESD gloves when handling the equipment. Do not wear clothes prone to static electricity.

1.4 Battery Safety

Declaration

The Company shall not be liable for equipment functional abnormality, component damage, personal safety accident, property loss, or other damage caused by the following reasons:

- The batteries are not charged as required during storage, resulting in capacity loss or irreversible damage to the batteries.
- A battery is damaged, falls, or leaks due to improper operations or incorrect connection.
- After being installed and connected to the system, the batteries are not powered on in time, which causes damage to the batteries due to overdischarge.
- Battery running parameters are incorrectly set.
- The customer or a third party uses the batteries beyond the scenarios specified by the Company. For example, connect extra loads, or use with other batteries, including but not limited to batteries of other brands or batteries of different rated capacities.
- Damage is caused to batteries because the battery operating environment or external power parameters do not meet environment requirements. The actual operating temperature of batteries is too high or too low, or the power grid is unstable and experiences outages frequently.
- Batteries are frequently overdischarged due to improper maintenance, capacity is incorrectly expanded, or the batteries have not been fully charged for a long time.
- Batteries are not maintained based on the operation guide, such as failure to check battery terminals regularly.
- Batteries are stolen.
- The warranty period of batteries has expired.

Basic Requirements

DANGER

- Do not expose batteries at high temperatures or around heat-generating sources, such as sunlight, fire sources, transformers, and heaters. The battery may cause a fire if overheated.
- To avoid leakage, overheating, or fire, do not disassemble, alter, or damage batteries. For example, do not insert foreign objects into batteries or place batteries in water or other liquids.
- The fire hazard of the lithium-ion/sodium-ion battery energy storage system is high. Consider the following safety risks before handling batteries:
  - Battery electrolyte is combustible, toxic, and volatile.
  - Battery thermal runaway can generate flammable gas and harmful gas such as CO and HF.
  - The concentration of flammable gas generated from battery thermal runaway may cause deflagration and explosion.

- The batteries must be stored separately inside the packaging. Do not store batteries together with other materials or in the open air. Do not stack batteries too high.
- Do not use batteries beyond the warranty period.
- Do not remove the battery packaging before use. Batteries should be charged during storage by professionals as required. Put batteries back to their packaging after charge during storage.
- Move batteries in the correct direction. Do not place a battery upside down or tilt it.
- Protect batteries from impact.
- Do not perform welding or grinding work around batteries to prevent fire caused by electric sparks or arcs.
- Use batteries within the temperature range specified in this manual.
- Do not use damaged batteries (such as damage caused when a battery is dropped, bumped, or dented on the enclosure). Damaged batteries may release flammable gases. Do not store damaged batteries near undamaged products.
- Do not place damaged batteries in close proximity to flammable materials. Do not approach the damaged batteries unless you are a professional.
- Monitor damaged batteries during storage for signs of smoke, flame, electrolyte leakage, or heat.

Personal Safety

- Wear proper personal protective equipment (PPE) during operation. If there is a probability of personal injury or equipment damage, immediately stop the operations, report the case to the supervisor, and take feasible protective measures.
- Use tools correctly to avoid hurting people or damaging the equipment.

- Do not touch the energized equipment, as the enclosure is hot.
- To ensure personal safety and normal use of the equipment, the equipment must be reliably grounded before use.
- When a battery is faulty, the temperature may exceed the burn threshold of the touchable surface. Therefore, avoid touching the battery.
- Do not disassemble or damage the battery. The released electrolyte is harmful to your skin and eyes. Avoid contact with the electrolyte.
- Do not place irrelevant objects on the top of the equipment or insert them into any position of the equipment.
- Do not place inflammables around the equipment.
- To prevent explosions and body injury, do not place batteries in a fire.
- Do not place the battery module in water or other liquids.
- Do not short-circuit wiring terminals of batteries. Short circuits can cause a fire.
- Batteries may cause electric shocks and high short-circuit currents. When using the battery, pay attention to the following points:

  (a) Remove any metal objects from yourself, such as watches and rings.

  (b) Use tools with insulated handles.

  (c) Wear rubber gloves and boots.

  (d) Do not place tools or metal parts on top of batteries.

  (e) Before connecting or disconnecting battery terminals, disconnect the charging power supply.

  (f) Check whether batteries are accidentally grounded. If it is accidentally grounded, remove the power supply from the ground. Touching any part of a grounded battery can cause an electric shock. If these grounding points are removed during installation and maintenance, the possibility of electric shocks can be reduced.
- Do not use water to clean electrical components inside or outside of a cabinet.
- Do not stand on, lean on, or sit on the top of the equipment.
- Do not damage the modules of the equipment.

Battery Installation Requirements

- Before installing batteries, check whether the packaging is intact. Do not use batteries with damaged packaging.
- During installation, ensure that the positive and negative electrodes of a battery are not short-circuited.
- During installation, ensure that the screws are tightened properly using a torque wrench and check them regularly.
- After installing the equipment, remove idle packing materials such as cartons, foam, plastics, and cable ties from the equipment area.

Hazardous and Toxicity Class

DANGER

- Hazard: It may cause heat generation or electrolyte leakage if battery terminals contact with other metals. Electrolyte is flammable. In case of electrolyte leakage, move the battery from fire immediately.
- Toxicity: Vapor generated from burning batteries, may make eyes, skin, and throat irritate.

Battery Emergency Measures

DANGER

- Avoid contact with leaked liquids or gases in the case of battery leakage or abnormal odor. Do not approach the battery. Contact professionals immediately. Professionals must wear safety goggles, rubber gloves, gas masks, and protective clothing.
- Electrolyte is corrosive and can cause irritation and chemical burns. Should you come into direct contact with the battery electrolyte, do as follows:

  Inhalation: Evacuate contaminated areas, get fresh air immediately, and seek immediate medical attention.

  Eye contact: Immediately flush your eyes with water for at least 15 minutes, do not rub your eyes, and seek medical attention immediately.

  Skin contact: Wash the affected areas immediately with soap and water and seek medical attention immediately.

  Ingestion: Seek immediate medical attention.

Fire Emergency Measures

DANGER

- If a fire occurs, power off the system if it is safe to do so.
- Extinguish the fire with carbon dioxide, FM-200 or ABC dry powder fire extinguishers.
- Ask firefighters to avoid contact with high-voltage components during fire fighting to prevent the risk of electric shock.
- Overheating may cause batteries to deform and leak corrosive electrolyte or toxic gas. Keep away from the batteries to avoid skin irritation and chemical burns.

Flood Emergency Measures

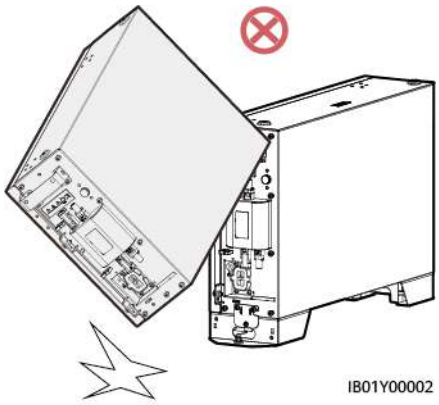
DANGER

- Power off the system if it is safe to do so.
- If any part of the batteries is submerged in water, do not touch the batteries to avoid electric shock.
- Do not use batteries that have been soaked in water. Contact a battery recycling company for disposal.

Dropped Battery Emergency Measures

DANGER

- If a battery pack is dropped or violently impacted during installation, internal damage may occur. Do not use such battery packs; otherwise, safety risks such as cell leakage and electric shock may arise.
- If a dropped battery has obvious damage or abnormal odor, smoke, or fire occurs, evacuate the personnel immediately, call emergency services, and contact the professionals. The professionals can use fire extinguishing facilities to extinguish the fire under safety protection.
- If a dropped battery has no obvious deformation or damage and no abnormal odor, smoke, or fire occurs, contact the professionals to transfer the battery to an open and safe place, or contact a recycling company for disposal.



Battery Recycling

- Dispose of used batteries in accordance with local laws and regulations. Do not dispose of batteries as household waste.
- If the batteries leak or are damaged, contact technical support or a battery recycling company for disposal.
- If the batteries are out of service life, contact a battery recycling company for disposal.

- Do not expose batteries to high temperatures or direct sunlight.
- Do not expose batteries to high humidity or corrosive environments.

Handling Battery Leakage

Avoid contact with leaked liquids or gases in case of battery leakage. Electrolyte is corrosive and can cause irritation and chemical burns. Should you come into direct contact with the leaked battery electrolyte, do as follows:

Inhalation: Evacuate contaminated areas, get fresh air immediately, and seek immediate medical attention.

Eye contact: Immediately flush your eyes with water for at least 15 minutes, do not rub your eyes, and seek medical attention immediately.

Skin contact: Wash the affected areas immediately with soap and water and seek medical attention immediately.

Intake: Ask for medical help immediately.

1.5 Storage Requirements

General Requirements

NOTE

- Record storage data such as temperature, humidity, and storage environment in compliance with the storage requirements in this manual.
- Do not store batteries for extended periods. Storing lithium batteries for extended periods may cause capacity loss. Generally, the irreversible capacity loss is 3% to 10% after lithium batteries are stored at the recommended storage temperature range for 12 months.

- The storage environment must comply with local regulations and standards.
- If a battery has been stored for longer than the allowed period, it must be checked and tested by professionals before use.
- Place batteries according to the signs on the packing case during storage. Do not put batteries upside down or sidelong.
- Stack battery packing cases in compliance with the stacking requirements on the external package.
- Handle batteries with caution to avoid damage.

The storage environment requirements are as follows:

- Ambient temperature: -10–55°C; recommended storage temperature: 20–30°C
- Relative humidity: 5% to 80%
- The batteries must be stored in a clean, dry, and well-ventilated place and be protected from dust and water vapor corrosion. The batteries must be protected against rain and water.
- Relative humidity: 5% to 80%
- Keep batteries away from direct sunlight.

1.6 Transportation Requirements

NOTICE

The product passes the certifications of the *UN38.3 (UN38.3: Section 38.3 of the sixth Revised Edition of the Recommendations on the Transport of Dangerous Goods: Manual of Tests and Criteria)* and *SN/T 0370.2-2009 (Part 2: Performance Test of the Rules for the Inspection of Packaging for Exporting Dangerous Goods)*. This product belongs to Class 9 dangerous goods.

Loading and unloading:

Load and unload the batteries in compliance with local laws, regulations, and industry standards. Reckless handling may cause short circuits or damage to batteries in the container, which may result in battery leakage, rupture, explosion, or fire.

Before transportation:

- Check that the batteries are intact and there is no obvious odor, smoke, or fire. Otherwise, the batteries cannot be transported.

NOTE

The product can be delivered to the site directly and transported by land and water. The packing case must be secured for transportation. Handle the product with care during loading, unloading, and transportation with moisture-proof measures in place. The actual capacity may vary depending on the environment conditions, such as temperature, transportation conditions, and storage conditions.

During transportation:

- The batteries cannot be transported by rail or air.
- Maritime transport must comply with the *International Maritime Dangerous Goods Code* (IMDG Code).
- Road transport must comply with the *International Carriage of Dangerous Goods by Road* (ADR) or JT T617.
- Comply with the requirements of the transportation regulatory authorities in the countries of departure, route, and destination.

Comply with the international regulations on the transport of dangerous goods and the requirements of the transport regulatory authorities of the respective countries.

Protect the packing case with the product from the following situations:

- Being dampened by rains, snows, or falling into water
- Falling or mechanical impact
- Being upside-down or tilted

NOTE

If any of the preceding exceptions occurs, take the emergency measures.

1.7 Installation Environment Requirements

- The installation and use environment must meet relevant international, national, and local standards for lithium batteries, and are in accordance with the local laws and regulations.
- Ensure that the battery is not accessible to children and away from daily working or living areas, including but not limited to the following areas: studio, bedroom, lounge, living room, music room, kitchen, study, game room, home theater, sunroom, toilet, bathroom, laundry, and attic.
- When installing the battery in a garage, keep it away from the drive way. It is recommended that the battery be mounted on the wall higher than the bumper to prevent collision.
- When installing the battery in a basement, keep good ventilation. Do not place flammable or explosive materials around the battery. It is recommended that the battery be mounted on the wall to avoid contact with water.
- Install the battery in a dry and well-ventilated environment. Secure the battery on a solid and flat surface.
- Install the battery in a sheltered place or install an awning over it to avoid direct sunlight or rain.
- Install the battery in a clean environment that is free from sources of strong infrared radiation, organic solvents, and corrosive gases.
- For areas prone to natural disasters such as floods, debris flows, earthquakes, and typhoons/hurricanes, take corresponding precautions for installation.
- Keep the battery away from fire sources. Do not place any flammable or explosive materials around the battery.
- Keep the battery away from water sources such as taps, sewer pipes, and sprinklers to prevent water seepage.
- Do not install the battery in a position where it is easy to touch as the temperature of the chassis and heat sink is high when the battery is running.
- To prevent fire due to high temperature, ensure that the vents and the cooling system are not blocked when the battery is running.
- Do not expose the battery to flammable or explosive gas or smoke. Do not perform any operation on the battery in such environments.
- Do not install the battery on a moving object, such as ship, train, or car.
- In backup power scenarios, do not use the battery for the following situations:

  a. medical devices substantially important to human life

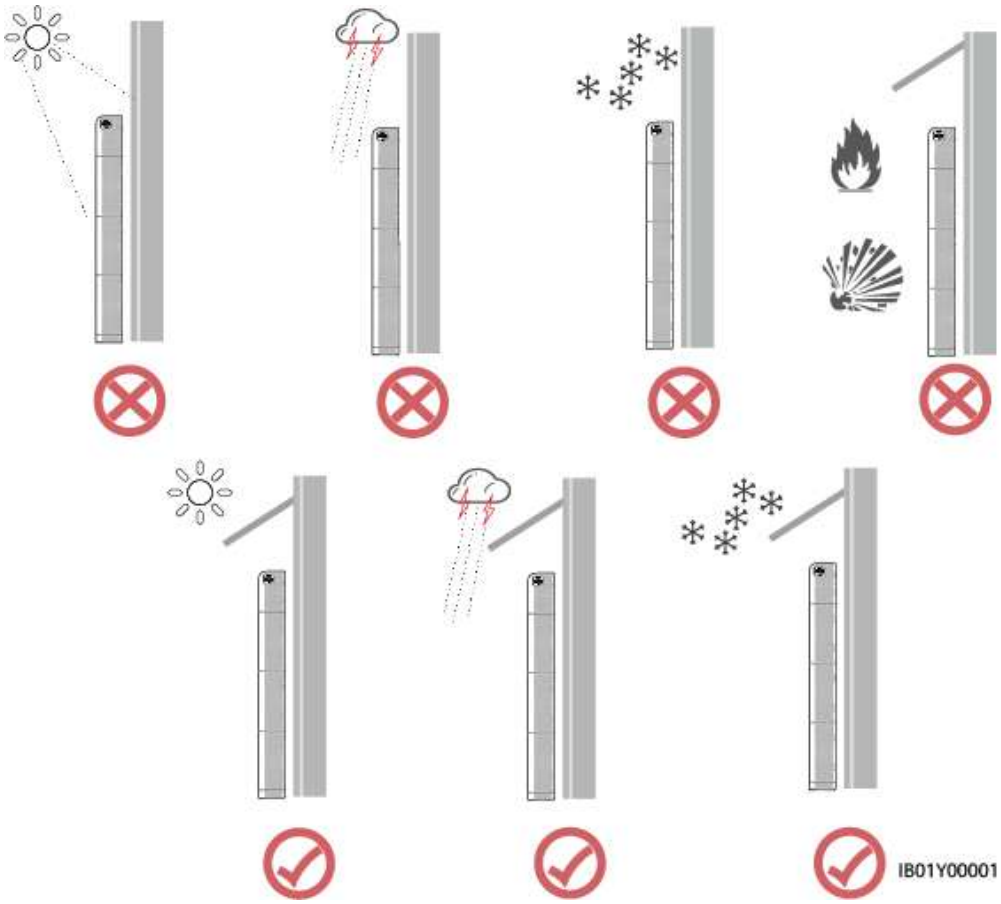
  b. control equipment such as trains and elevators, which may cause personal injury

  c. computer systems of social and public importance

  d. locations near medical devices

  e. other devices similar to those described above
- Do not install the battery outdoors in salt-affected areas because it may corrode. A salt-affected area refers to the region within 500 meters from the coast or prone to sea breeze. The regions prone to sea breeze vary with weather conditions (such as typhoons and monsoons) or terrains (such as dams and hills).

Figure 1-1 Installation environment



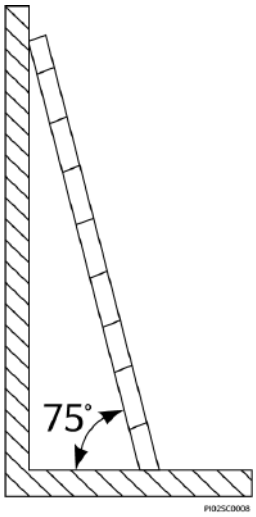
NOTE

The operation and service life of the battery depend on the operating temperature. Install the battery at a temperature equal to the ambient temperature or in a better environment.

1.8 Mechanical Safety

Using Ladders

- Use wooden or fiberglass ladders when you need to perform live working at heights.
- When a step ladder is used, ensure that the pull ropes are secured and the ladder is held firm.
- Before using a ladder, check that it is intact and confirm its load bearing capacity. Do not overload it.
- Ensure that the wider end of the ladder is at the bottom, or protective measures have been taken at the bottom to prevent the ladder from sliding,
- Ensure that the ladder is securely positioned. The recommended angle for a ladder against the floor is 75 degrees, as shown in the following figure. An angle rule can be used to measure the angle.



- When climbing a ladder, take the following precautions to reduce risks and ensure safety:
  - Keep your body steady.
  - Do not climb higher than the fourth rung of the ladder from the top.
  - Ensure that your body's center of gravity does not shift outside the legs of the ladder.

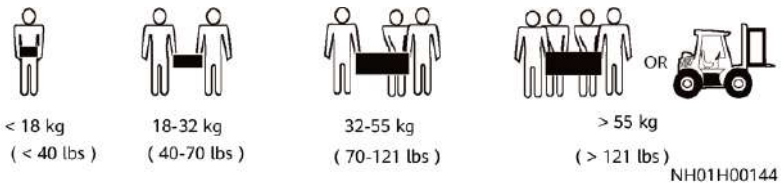
Drilling Holes

When drilling holes into a wall or ground, observe the following safety precautions:

- Wear goggles and protective gloves when drilling holes.
- When drilling holes, protect the equipment from shavings. After drilling, clean up any shavings that have accumulated inside or outside the equipment.

Moving Heavy Objects

- Be cautious to avoid injury when moving heavy objects.



- When moving the equipment by hand, wear protective gloves to prevent injuries.

1.9 Commissioning

When the equipment is powered on for the first time, ensure that professional personnel set parameters correctly. Incorrect settings may result in inconsistency with local certification and affect the normal operation of the equipment.

1.10 Maintenance and Replacement

DANGER

High voltage generated by the equipment during operation may cause an electric shock, which could result in death, serious injury, or serious property damage. Prior to maintenance, power off the equipment and strictly comply with the safety precautions in this document and relevant documents.

- Maintain the equipment with sufficient knowledge of this document and using proper tools and testing equipment.
- Before maintaining the equipment, power it off and follow the instructions on the delayed discharge label to ensure that the equipment is powered off.
- Place temporary warning signs or erect fences to prevent unauthorized access to the maintenance site.
- If the equipment is faulty, contact your dealer.
- The equipment can be powered on only after all faults are rectified. Failing to do so may escalate faults or damage the equipment.
- Do not open the cover without authorization. Otherwise, electric shocks may occur, and the resulting faults are beyond warranty scope.
- Installation personnel, maintenance personnel, and technical support personnel must be trained to operate and maintain the equipment safely and correctly, take comprehensive precautionary measures, and be equipped with protective instruments.
- Before moving or reconnecting the equipment, disconnect the mains and batteries and wait for five minutes until the equipment powers off. Before maintaining the equipment, check that no hazardous voltages remain in the DC bus or components to be maintained by using a multimeter.
- Battery maintenance should be carried out or supervised by personnel who are familiar with batteries and the precautions required.
- When replacing batteries, replace them with batteries or battery strings of the same model.
- Take out all external tools and parts from the equipment after maintenance is complete.
- If the equipment is not used for a long time, store and recharge batteries according to this document.

2 Product Description

2.1 Overview

Function

The iSitePower-M system consists of power modules and battery modules. It can store and release electricity based on the status of PV modules, mains, and diesel generators (DGs).

Model

- Model of the power module in the iSitePower-M: iSitePower-M-MAP05A1

Figure 2-1 Model number

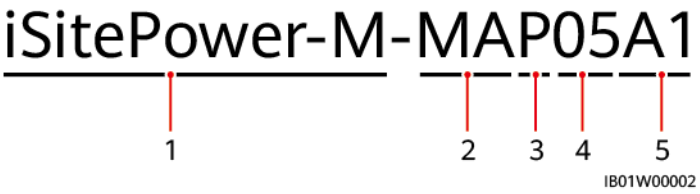


Table 2-1 Model description

No.	Meaning	Value
1	Product label	iSitePower-M: hybrid power supply series
2	Version	MA: product version
3	Module type	P: power module
4	Power level	05: 5kW
5	Design code	A1: module number

- Model of the battery module in the iSitePower-M: iSitePower-M-MAB05B1

Figure 2-2 Model number

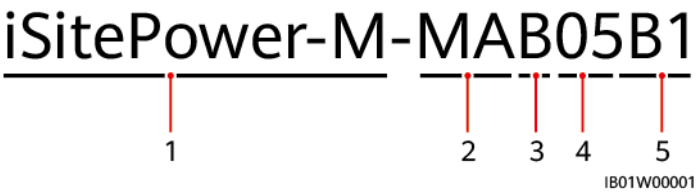
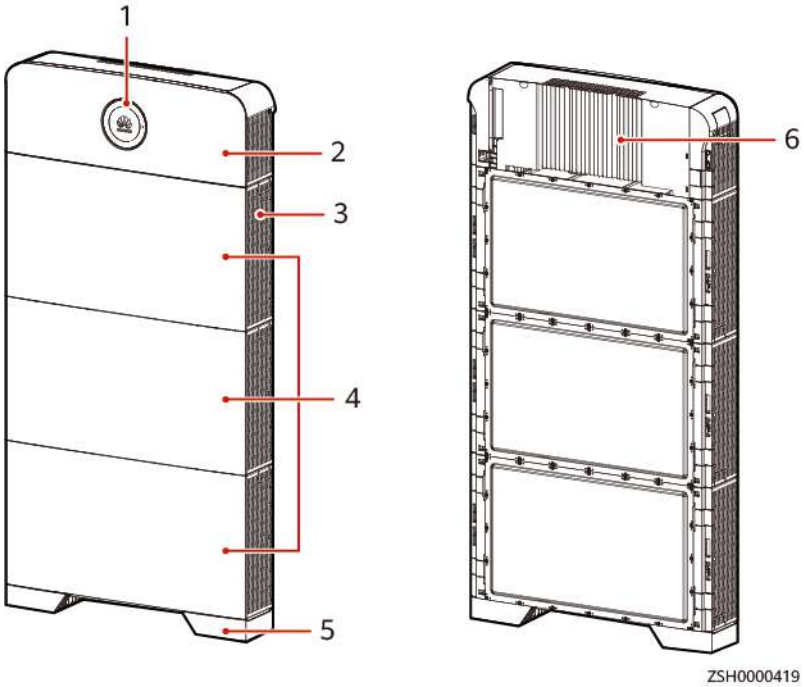


Table 2-2 Model description

No.	Meaning	Value
1	Product label	iSitePower-M: hybrid power supply series
2	Version	MA: product version
3	Module type	B: battery module
4	Power level	05: 5kWh
5	Design code	B1: module number

2.2 Appearance

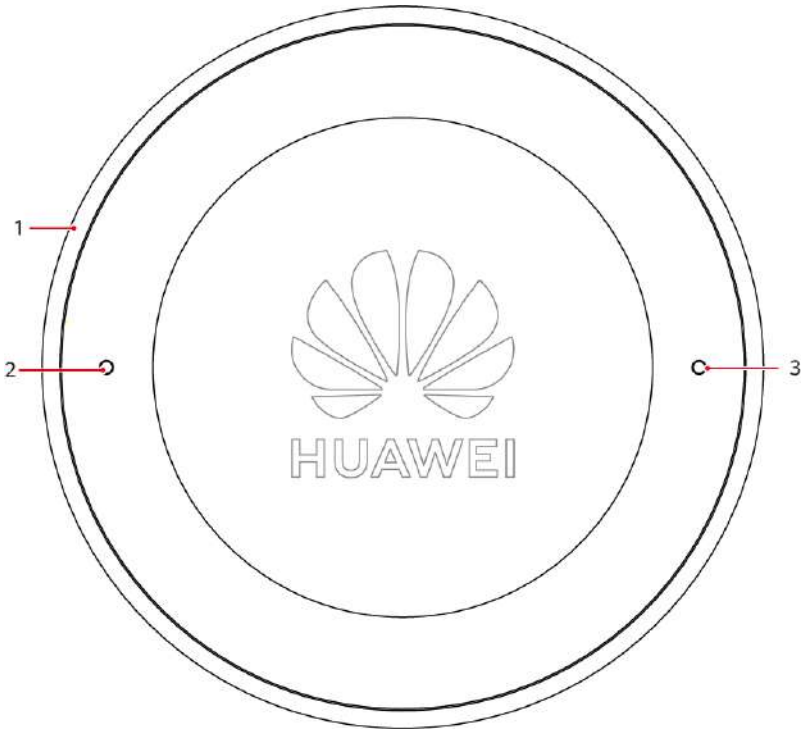
Figure 2-3 Appearance



(1) LED indicator (2) Power module (3) Decorative cover

(4) Battery modules (5) Base (6) Heat sink

Figure 2-4 LED indicators



(1) Annular strip light (2) Running indicator (3) WiFi indicator

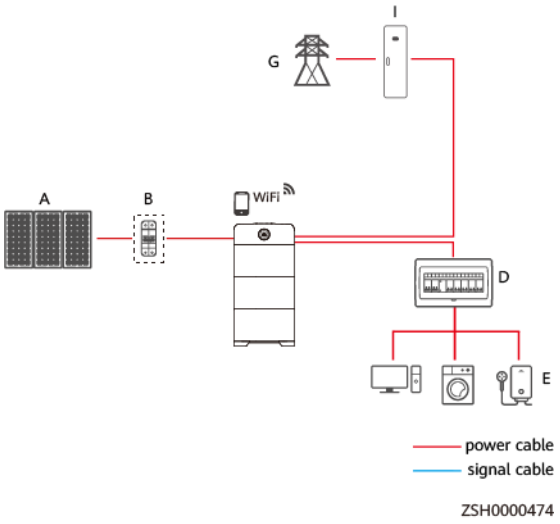
Table 2-3 Indicator description

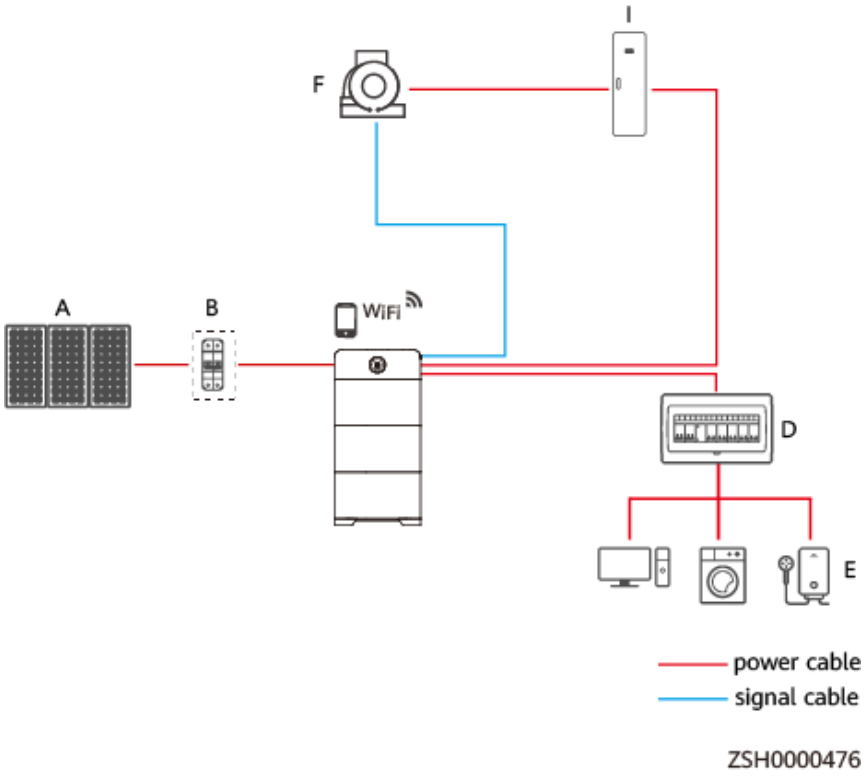
Indicator	Status	Description
Running indicator	Steady on in green	The power system is running properly.
	Off	• The power system is not running. • The power system is faulty. • The power system has no input current.
	Steady on in red	The power system is running properly, but an alarm is generated.
WiFi indicator	Off	The WiFi function is abnormal.
	Steady on in green	The WiFi function is normal.
Annular strip light	Steady on in green	Indicates the battery capacity and that the product is discharging. **NOTE** A part of the strip light dims when every 10% of battery power is consumed.

Indicator	Status	Description
	Blinking green at an interval of 1.25s	Indicates that the product is being charging.

2.3 System Networking

Figure 2-5 Networking diagram

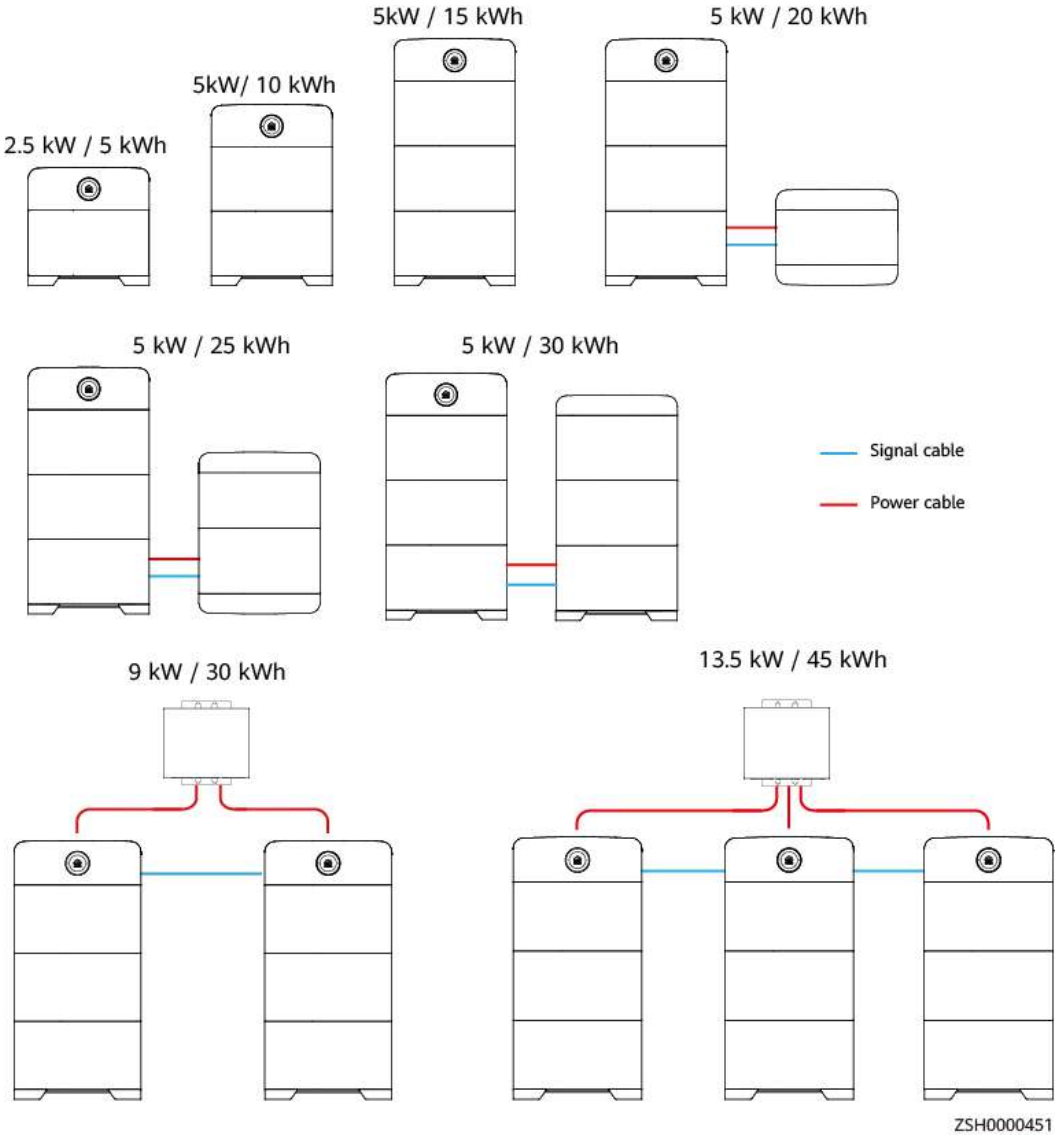




(A) PV string	(B) DC switch	(D) Power distribution box (PDB)
(E) Load	(F) DG	(G) Power grid
(I) Power distribution cabinet (PDC)		

The system supports capacity expansion and power expansion.

Figure 2-6 System configurations



NOTE

- Maximum capacity:
  1. In a single-node system, a maximum of six battery modules can be connected.
  2. In a parallel system, a maximum of three power modules can be connected. Each power module can connect to a maximum of three battery modules.
- In a parallel system, three routes of single-phase output can be combined but they cannot be used as three-phase output.
- In a parallel system, the number of battery modules on the master and slave products must be the same.
- In a parallel system, if the number of battery modules on the master and slave products are different (not recommended), the products with larger capacity may fail to fully discharge in heavy load scenarios.

Table 2-4 Recommended battery configuration

Scenario	Number of Power Modules	Number of Battery Modules	Power/Capacity of Battery Modules
Single-node system	1	1	2.5kW/5kWh
		2	5kW/10kWh
		3	5kW/15kWh
Single-node system (capacity expansion scenario)		4	5kW/20kWh
		5	5kW/25kWh
		6	5kW/30kWh
Parallel system	2	2	5kW/10kWh
		4	9kW/20kWh
		6	9kW/30kWh
	3	3	7.5kW/15kWh
		6	13.5kW/30kWh
		9	13.5kW/45kWh

NOTE

In a parallel system, if the number of battery modules in the master product is different from that in the slave product (not recommended), for example, two power modules and five battery modules, the power/capacity of battery modules is 9 kW/25 kWh.

2.4 Label Description

Enclosure Labels

Table 2-5 Enclosure label description

Label	Item	Description
	Tiltwatch	The product may tilt, which may cause personal injury or device damage. Secure the product to the ground using screws.
	Burn warning	Do not touch the product because the enclosure is hot when it is running.
	Delayed discharge	High voltage still exists after the product is powered off. It takes 5 minutes for the product to discharge to the safe voltage.
	Operation	• High voltage exists after the product is powered on. Only qualified and trained electrical technicians are allowed to install and operate the product. • Ground the product before powering it on.
	Refer to documentation	Reminds operators to refer to the documentation of the battery module.
	Operation warning	Do not remove the connector when the product is running.

Label	Item	Description
	Grounding label	Indicates the position for connecting the ground cable.
 (1P)PN/ITEM:XXXXXXXX (32P)MODEL:iSitePower-M MAP05A1 (S)SN:XXXXXXXXXXXX MADE IN CHINA	Serial number label	Indicates the product SN.
 MAC:XXXXXXXXXXXXXXXX	MAC address label	Indicates the MAC address.
WIFI SSID: iSitePower-M-XXXXXXXXXXXX PSW: Changeme 	WiFi login QR code	Scan the QR code to connect to the WiFi network of the product and log in to the product to set parameters locally.

NOTE

The labels are for reference only.

3 Components

3.1 Power Module

A power module consists of a power unit and a monitoring unit. The power unit is responsible for energy access and conversion. The monitoring unit is responsible for power signal access and monitoring management of PV, grid power, genset power, and batteries.

Figure 3-1 Power module

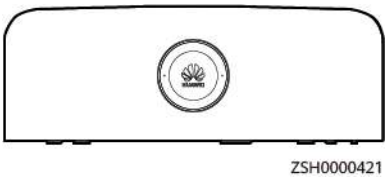
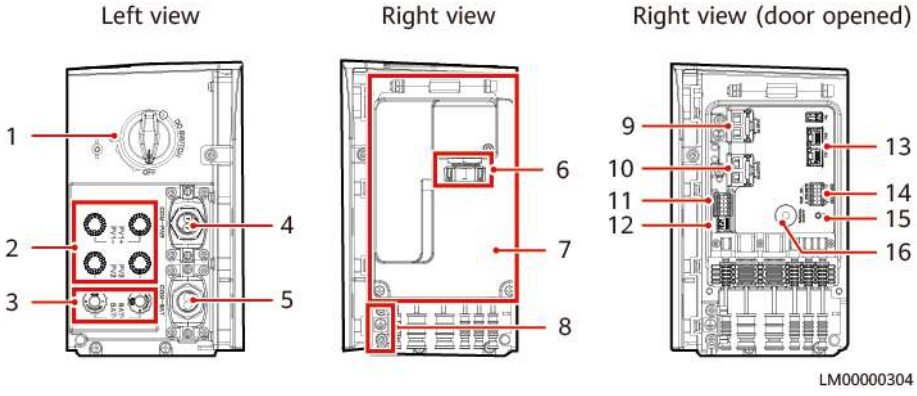


Figure 3-2 Ports on the power module



(1) DC SWITCH (PV maintenance switch)

(2) PV input ports

(3) Battery input ports

(4) COM-PAR (communications port between parallel power modules)

(5) COM-BAT (communications port between power module and battery module)

(6) Reserved port

(7) Maintenance compartment door	(8) Ground point	(9) AC input
(10) AC output	(11) Reserved port	(12) DIP switch
(13) FE ports（Parallel control communications port）	(14) COM and dry contact ports	(15) WiFi switch
(16) Manual ON/OFF switch		

DIP Switch

Figure 3-3 DIP switch

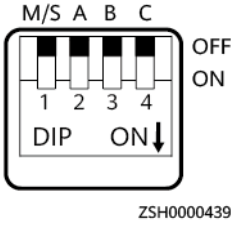


Table 3-1 DIP switch description

Parallel Power Module CAN Address	Pin 1 (M/S)	Pin 2 (A)	Pin 3 (B)	Pin 4 (C)	Remarks
1	ON	OFF	OFF	OFF	Master address
2	OFF	ON	OFF	OFF	Slave address
3	OFF	OFF	ON	OFF	Slave address

COM and Dry Contacts

Figure 3-4 Wiring terminals

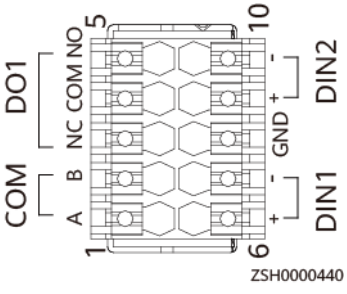


Table 3-2 Terminals on the panel

Pin	Signal	Description	Function
1	RS485A	RS485 signal	Reserved ports
2	RS485B		
3	NC	Dry contact output NC terminal	• Connect to a genset and control genset startup and shutdown signals[1]. • Connect to an EPO switch to remotely shut down the device.
4	COM	Dry contact output common terminal	
5	NO	Dry contact output NO terminal	
6	DIN1+	Dry contact input DIN 1	In the grid + genset scenario, the DIN dry contacts are used to detect grid signals.
7	DIN1-		
9	DIN2+	Dry contact input DIN 2	
10	DIN2-		
8	GND	-	-
Note [1]: For a genset that starts when the dry contact is open, connect the signal cable to ports NC and COM. For a genset that starts when the dry contact is closed, connect the signal cable to ports NO and COM.			

WiFi Switch

The power module has a built-in WiFi module. You can press the WiFi switch to enable or disable WiFi and reset the passwords of WiFi and the monitoring unit.

- Enable/Disable WiFi: Hold down the WiFi switch for at least 10s to enable or disable WiFi. The WiFi function is disabled by default.
- WiFi password and monitoring unit password reset: Press the WiFi switch for three times within 10s and each time lasts for 1s. Wait for more than 1s each time before pressing the switch again. Then the WiFi module is restarted, and the WiFi password and monitoring unit password are reset successfully.
- The last six digits of the product WiFi name are the same as the last six digits of the product SN. The default password is **Changeme**.

NOTICE

Password reset will result in system restart, which may interrupt the power supply to loads. Therefore, you are advised not to reset the passwords when power is supplying to loads.

Communications Ports

Table 3-3 Communications port description

Port	Communications Parameter	Communications Protocol	Function
COM-PAR	Baud rate: 1 Mbit/s	CAN protocol	Parallel communications port for power modules
COM-BAT	Baud rate: 250 kbit/s	CAN protocol	Parallel communications port between the battery module and power module
FE	10M/100M autonegotiation	FE1: BIN protocol/ HTTPS protocol	Parallel control communications port
		FE2: TCP-Modbus protocol	
NOTE The preceding ports are protected by security mechanisms.			

Table 3-4 COM-PAR pin definitions

Pin	Signal	Description
1	Synchronization signal 1+	Parallel synchronization signal
2	Synchronization signal 1–	
3	Synchronization signal 2+	
6	Synchronization signal 2–	
4	Synchronization signal 3+	
5	Synchronization signal 3–	
7	CANH	Parallel high-speed CAN
8	CANL	

Table 3-5 COM-BAT pin definitions

Pin	Signal	Description
1	START+	Manual ON/OFF switch
2	START-	
3, 4, 5, 6	Null	-
7	CANH	CAN bus high level
8	CANL	CAN bus low level

Table 3-6 Pin definitions for the FE port

Pin	Signal	Description
1	TX+	Transmit data over FE.
2	TX-	
3	RX+	Receive data over FE.
6	RX-	
4, 5, 7, 8	Null	-

3.2 Battery Module

The standard capacity is 5 kWh.

Figure 3-5 Appearance

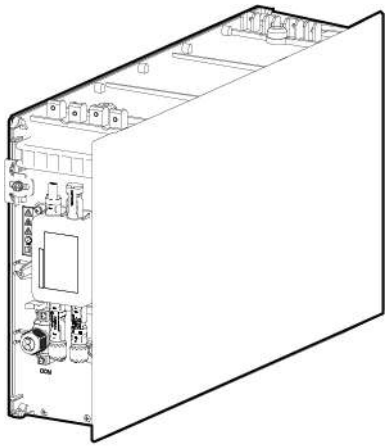
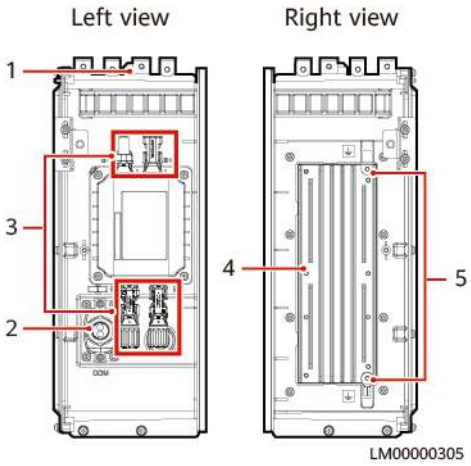


Figure 3-6 Ports on the battery module



(1) Alignment boss (2) COM port (3) Terminals for battery module cascading

(4) Heat sink (5) Ground points

Communications Port

Table 3-7 Communication port description

Port	Communications Parameter	Communications Protocol	Description
COM	Baud rate: 250 kbit/s	CAN protocol	Communications port for a battery module
NOTE The preceding port is protected by security mechanisms.			

Table 3-8 COM pin definition

Pin	Signal	Description
1	START+	Manual ON/OFF switch
2	START-	
3	Null	-
4	Null	
5	Null	
6	Null	
7	CANH	CAN bus high level

Pin	Signal	Description
8	CANL	CAN bus low level

3.3 (Optional) AC Parallel Box ACDB220-90-1B

The AC parallel box is used for paralleling of power modules to increase the system power. A maximum of three power modules can be connected in parallel.

Figure 3-7 ACDB220-90-1B

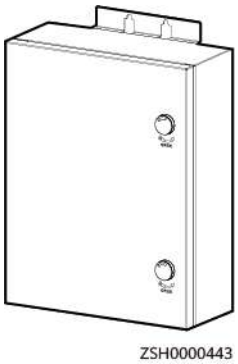
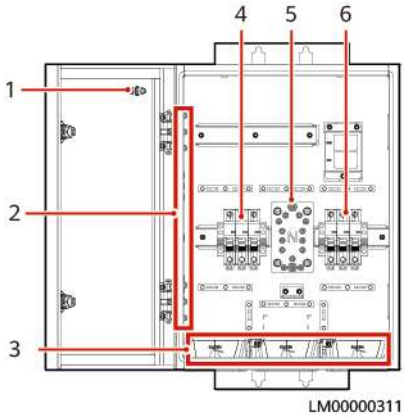


Figure 3-8 ACDB220-90-1B interior



(1) Ground point on the door (2) Ground bar (3) Cable bags

(4) AC input circuit breaker (5) N wiring terminal (6) AC output circuit breaker

4 Application Scenarios

The iSitePower-M is mainly used in houses, apartments, shops, and business outlets. Based on different energy inputs, the application scenarios are classified into four types.

- Solar-Only scenario
- Grid Scenario
- Solar-Grid Hybrid Scenario
- Solar-Genset Hybrid Scenario

NOTICE

In a parallel system, the battery depth of discharge (DOD) settings of the master and slave products can be different. When setting the battery DOD, you need to set the master and slave products separately.

Optimizers are not supported in any scenario.

In low irradiance scenarios, when batteries are overdischarged and the power grid is abnormal, if a battery module fails to start due to low irradiance protection, the handling suggestions are as follows (by priority):

Method 1: Wait for the power grid to recover, and then the battery module can start properly.

Method 2: If the battery module is not fully discharged and is shut down, start it by turning on the manual ON/OFF switch. If the battery module is fully discharged, activate and start it using other batteries with sufficient reserve.

Method 3: Charge the battery module at high irradiance for a maximum of half an hour, it can start properly. If it does not start and no alarm is generated during the charging period, please wait.

4.1 Solar-Only Scenario

Figure 4-1 Solar-only network diagram (one product)

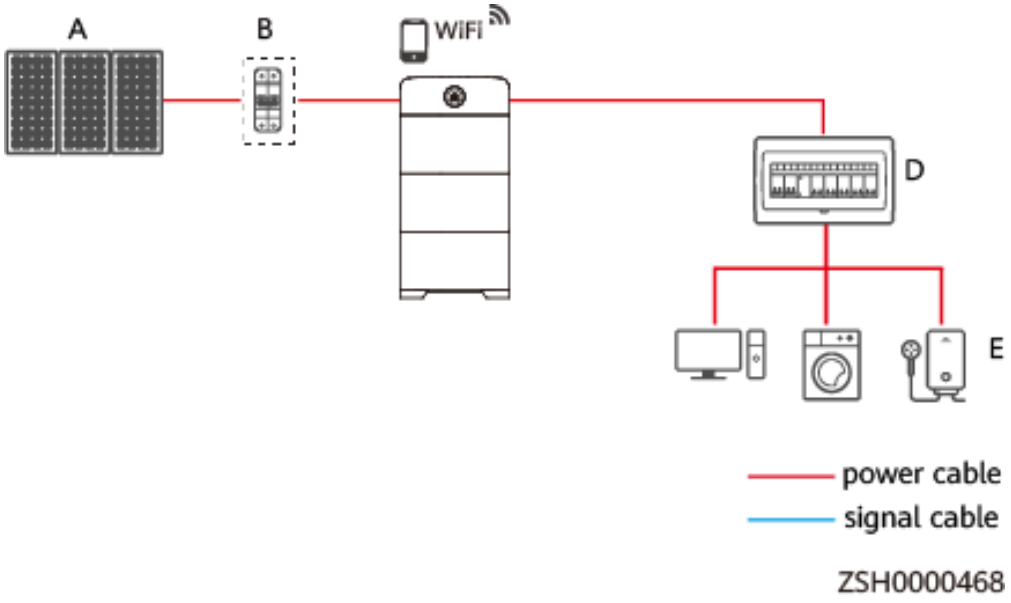
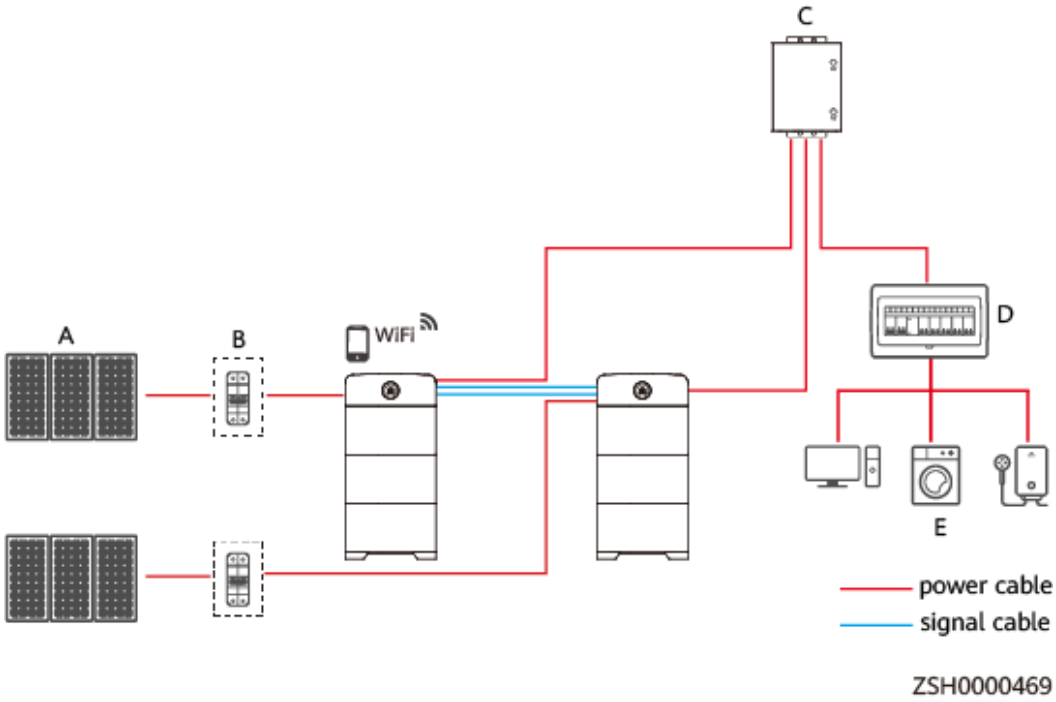


Figure 4-2 Solar-only network diagram (multiple products connected in parallel)



In the solar-only scenario, the power system works circularly as follows. The power source preference sequence is solar power > battery.

1. If the solar power is greater than the load power, solar power is supplied to loads and charges batteries.

2. If the solar power is less than the load power, solar power and battery power are supplied to loads at the same time.
3. If there is no solar power, batteries power loads.

4.2 Grid Scenario

Figure 4-3 Grid scenario network diagram (one product)

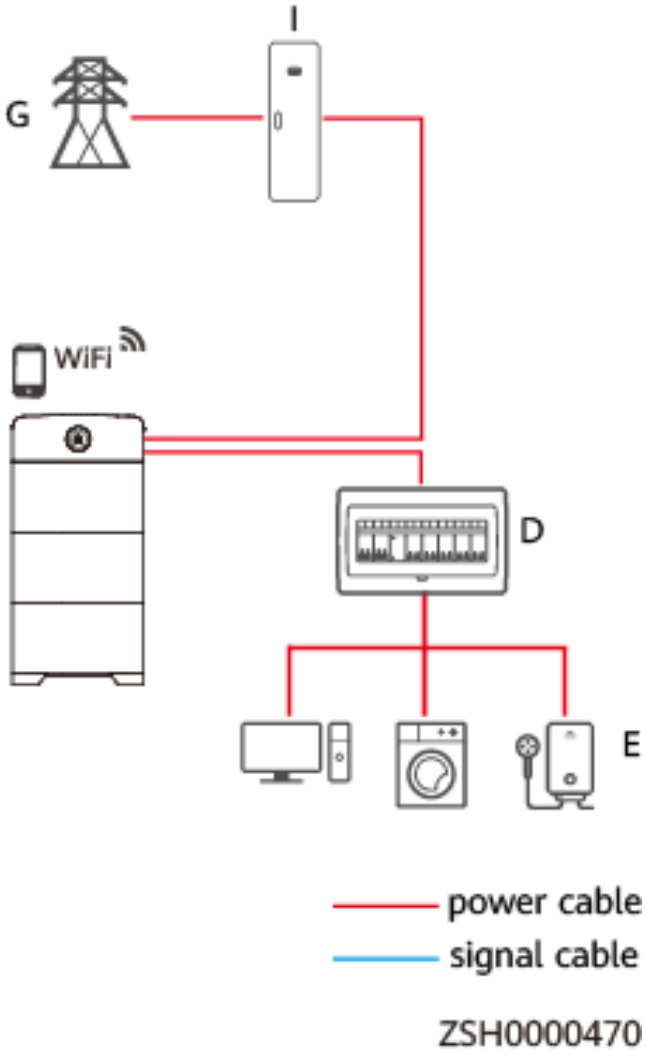
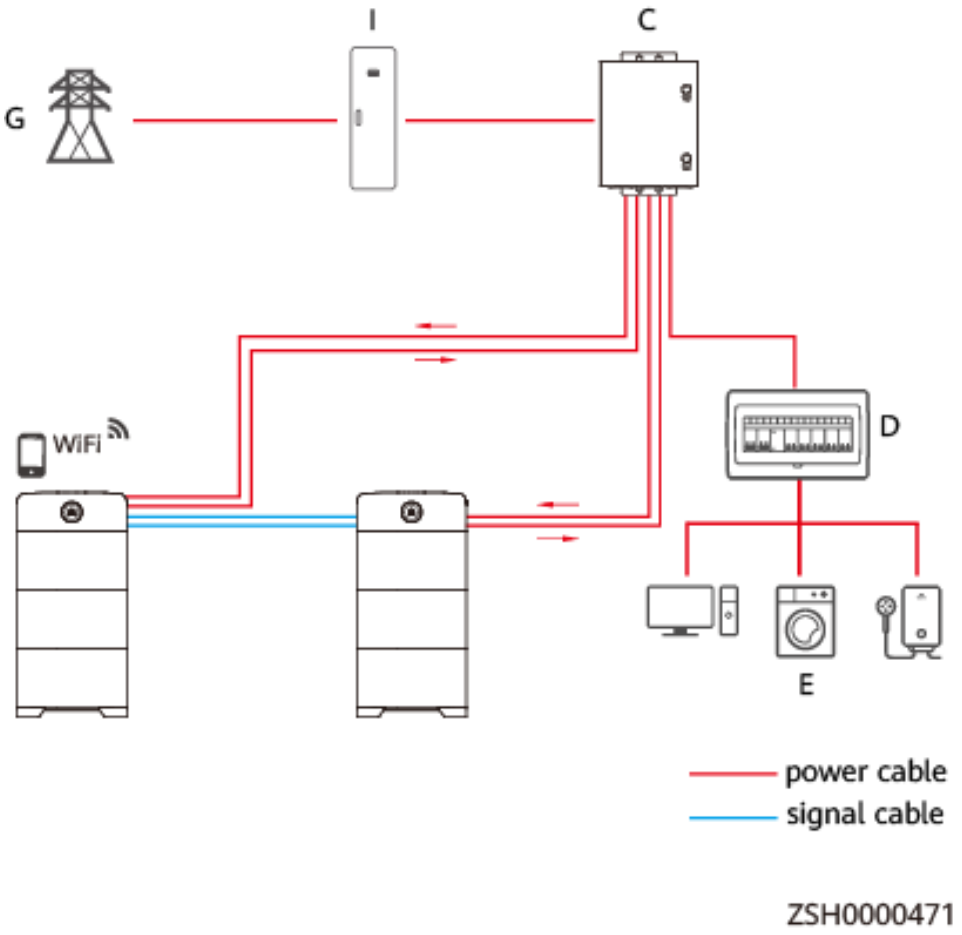


Figure 4-4 Grid scenario network diagram (multiple products connected in parallel)



In the grid scenario, the power system works circularly as follows. The power source preference sequence is grid > battery.

1. If grid power is available, grid power is supplied to loads and charges batteries if batteries are not fully charged.
2. If grid power is unavailable or abnormal (such as abnormal frequency, overvoltage, or undervoltage), batteries supply power to loads.

4.3 Solar-Grid Hybrid Scenario

Figure 4-5 Solar-grid hybrid scenario network diagram (one product)

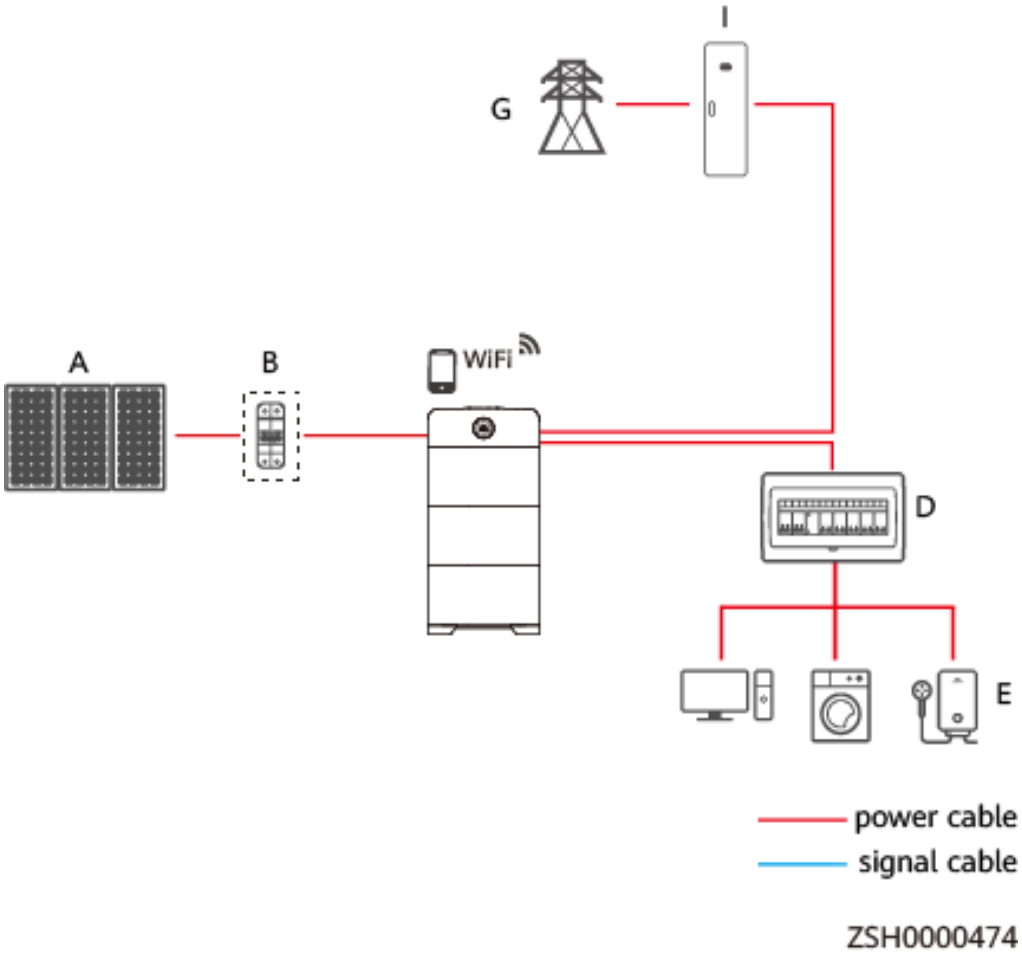
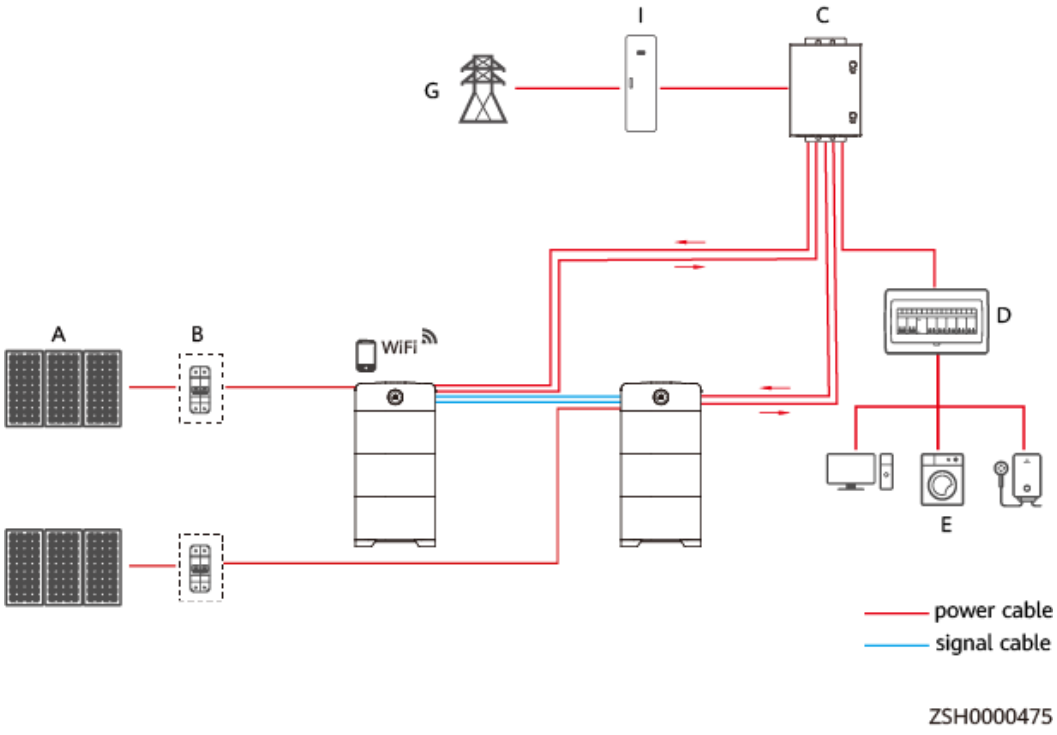


Figure 4-6 Solar-grid hybrid scenario network diagram (multiple products connected in parallel)



In the solar-grid hybrid scenario, the power system works circularly as follows. The power source preference sequence is solar power > grid > battery.

1. When both solar power and grid power are available and batteries are fully charged (100% SOC), solar power is preferentially supplied to loads. If solar power is insufficient, both solar power and battery power are supplied to loads. When **Discharge DOD** reaches the preset value, grid power is supplied to loads, and batteries are charged by solar power and grid power.
2. When solar power is available but grid power is unavailable (due to power outage or abnormal grid), if solar power is sufficient, it is supplied to loads and batteries; if solar power is insufficient, solar power and battery power are supplied to loads at the same time.

When solar power is unavailable, the power source preference sequence is grid > battery. When solar power is unavailable but grid power is available, grid power is supplied to loads and batteries. When both solar power and grid power are unavailable, batteries supply power to loads.

Figure 4-7 Setting **Discharge DOD** for a single-node system

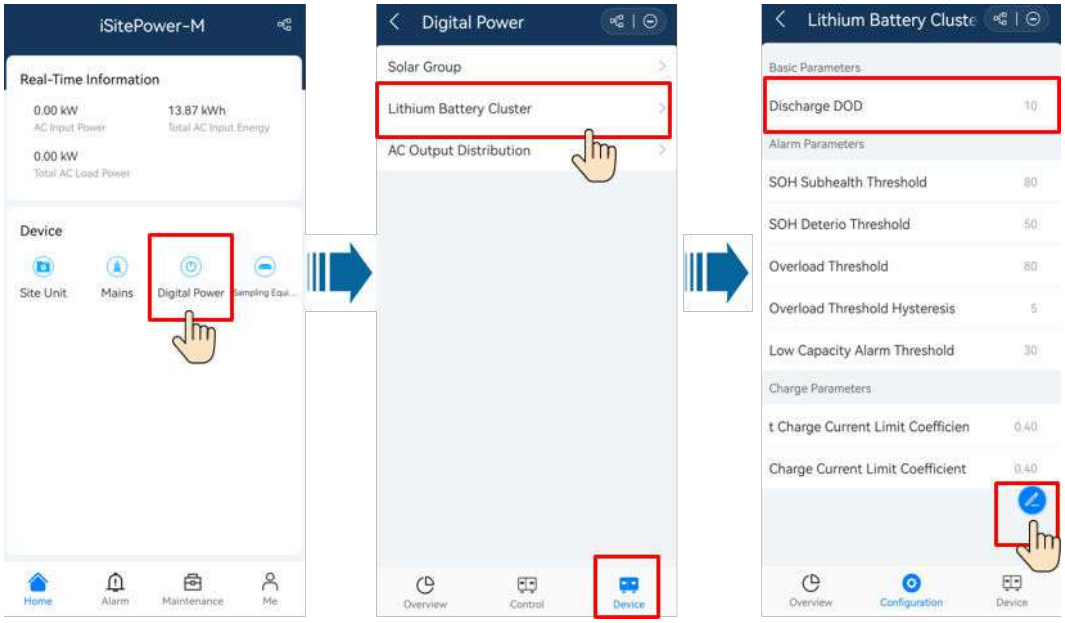
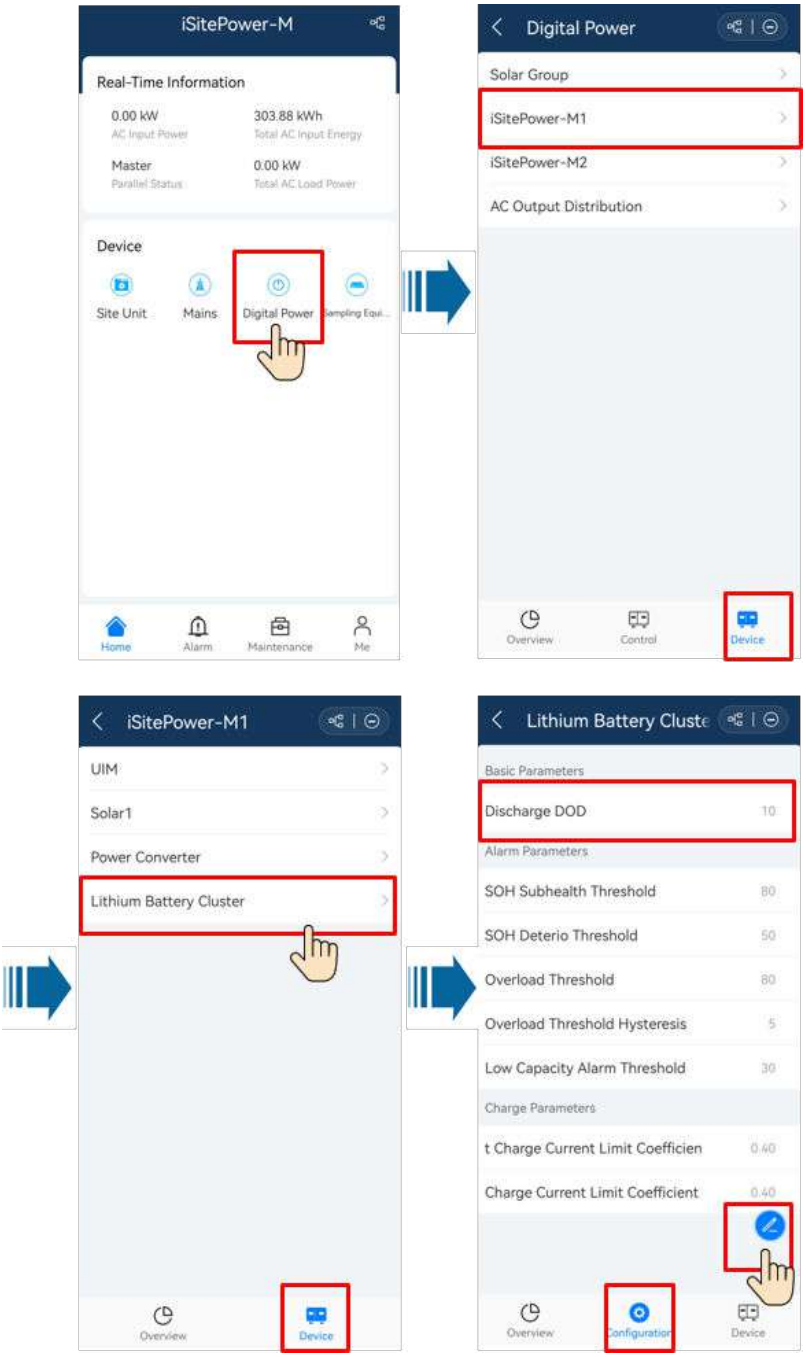


Figure 4-8 Setting **Discharge DOD** for a parallel system



Parameter	Description	Value Range
Discharge DOD	Set the battery depth of discharge. The default value is 85.	5–90

Parameter	Description	Value Range
Default Charge Current Limit Coefficient	Set the battery self-management current limit when battery communication fails. The default value is 0.15.	0.05–2
Charge Current Limit Coefficient	Set the battery scheduling current limit on the monitoring system when battery communication is normal. The default value is 0.4.	0.05–2

4.4 Solar-Genset Hybrid Scenario

Figure 4-9 Solar-genset hybrid scenario network diagram (one product)

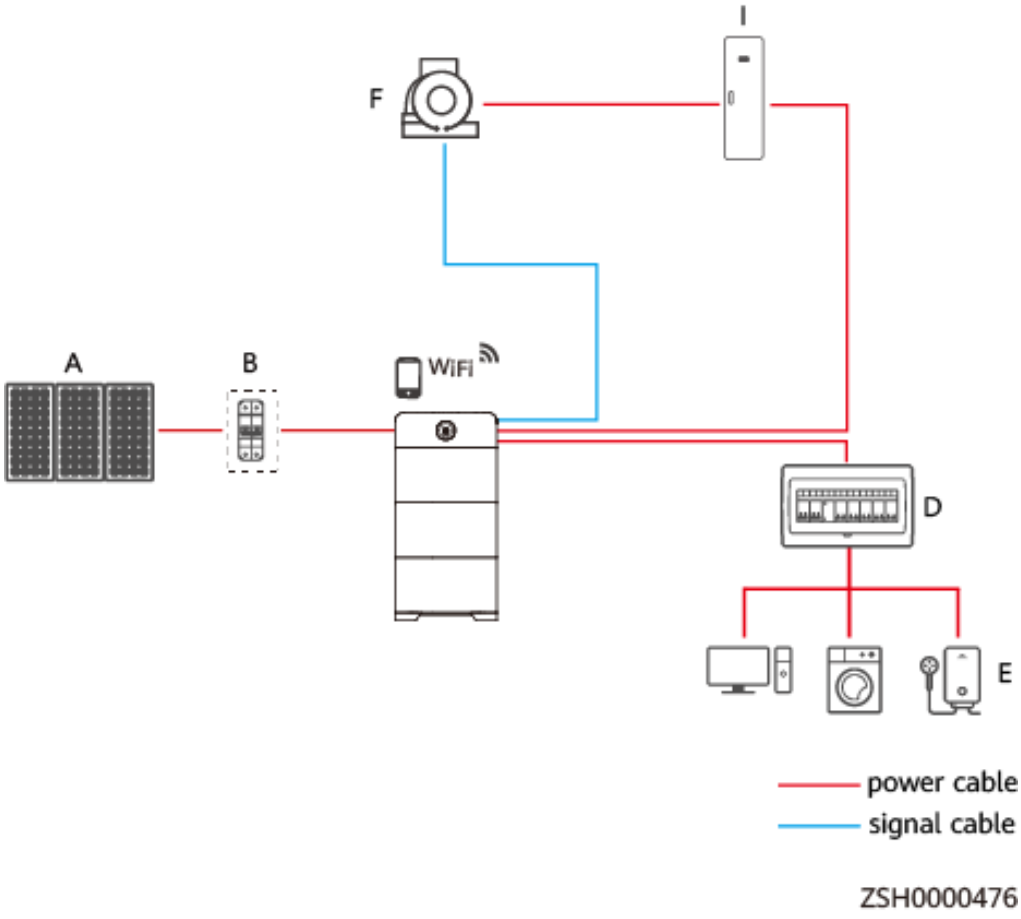
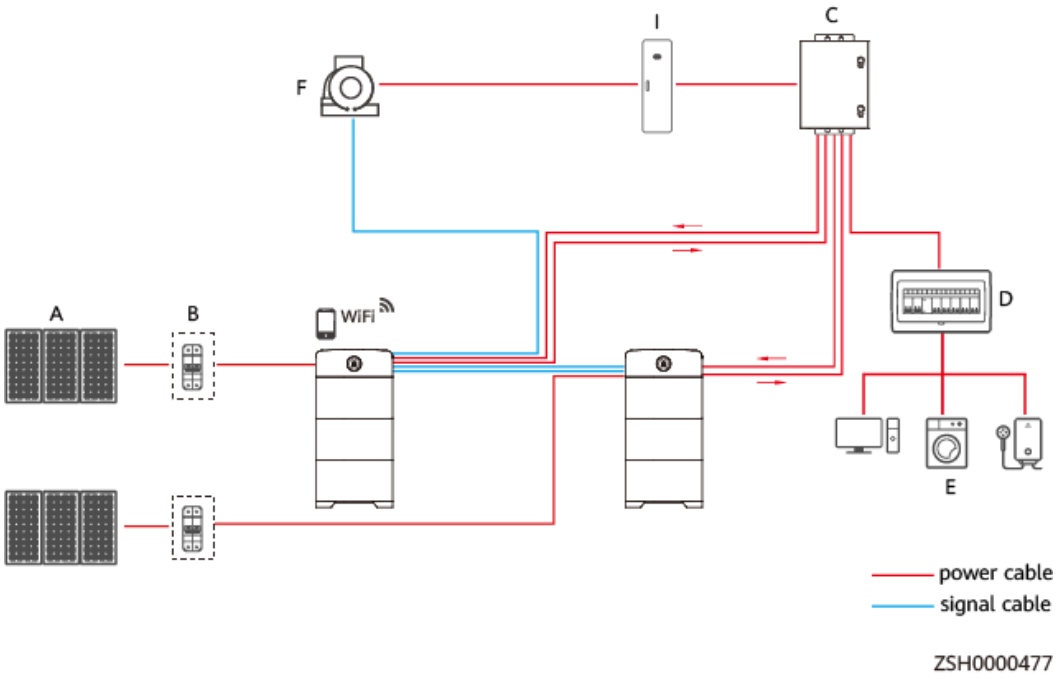


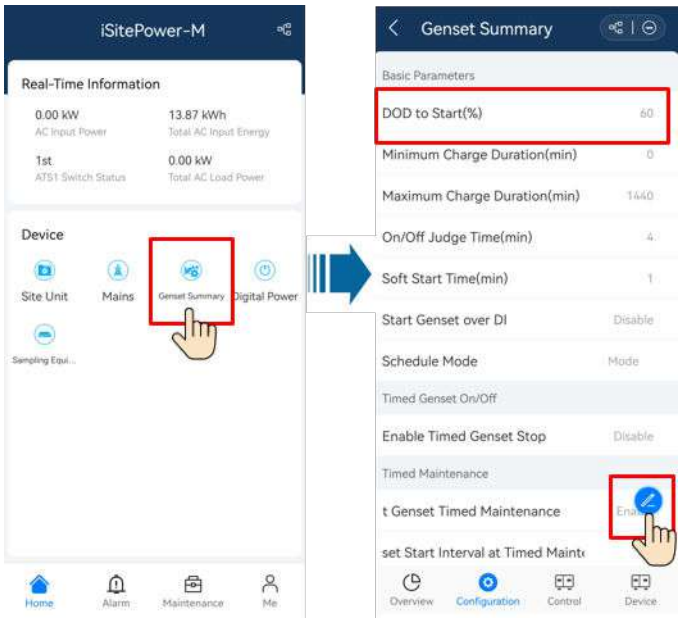
Figure 4-10 Solar-genset hybrid scenario network diagram (multiple products connected in parallel)



In the solar-genset hybrid scenario, the power system works circularly as follows. The power source preference sequence is solar power > battery > genset.

1. If solar power is available, it is supplied to loads and batteries. If solar power is insufficient, solar power and battery power are supplied to loads at the same time.
2. When solar power is available and the batteries stop discharging when **DOD to Start** is reached, the genset is started to supply power to loads, and the batteries are charged by solar power and the genset. When one of the following conditions is met, the genset shuts down: (1) Batteries are fully charged (100% SOC). (2) The genset runs for 20 minutes, the battery capacity is greater than **DOD to Start**, the solar input voltage is greater than 90 V, the genset charge power is less than 500 W, and the high irradiance lasts for more than 3 minutes.
3. When solar power is available but the genset is abnormal, if solar power is sufficient, it is supplied to loads and charges batteries; if solar power is insufficient, both solar power and battery power are supplied to loads.
4. When solar power is unavailable, batteries supply power to loads. When the batteries stop discharging when **DOD to Start** is reached, the genset is started.

Figure 4-11 Setting **DOD to Start**



Parameter	Description	Value Range
DOD to Start	Set the battery depth of discharge at which the genset is started and the batteries stop discharging. The default value is 60.	5–90
Schedule Mode	Set the genset scheduling mode. The default mode is **Cycle Mode**. **Tradition Mode**: The genset is started when the grid power fails and is shut down when the grid power is normal. **Cycle Mode**: The genset startup/shutdown control logic is executed in cycle mode. The genset is started when DOD to Start is reached. **No Control Mode**: The genset startup/shutdown is performed manually.	Tradition Mode Cycle Mode No Control Mode
Minimum Charge Duration	Set the minimum charge time. The default value is 0.	0–2880

Parameter	Description	Value Range
Maximum Charge Duration	Set the maximum charge time. The default value is 1440.	60–2880
On/Off Judge Time	Set the time to determine whether startup/shutdown is successful. The default value is 4.	3–30
Enable Timed Genset Stop	Set whether to shut down the genset on schedule. The default value is **Disable**.	Disable, Enable

5 System Installation

5.1 Installation Preparations

5.1.1 Checking Before the Installation

Checking Outer Packing

Before unpacking the device, check the outer packing for damage, such as holes and cracks, and check the device model. If any damage is found or the device model is not what you requested, do not unpack the product and contact your dealer as soon as possible.

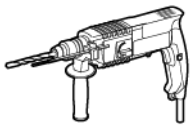
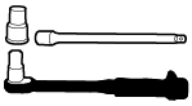
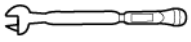
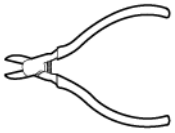
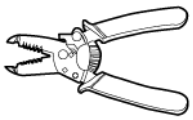
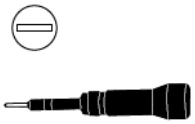
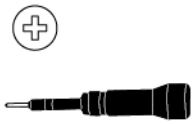
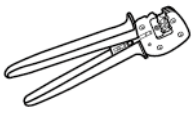
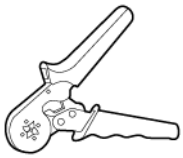
Checking Deliverables

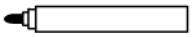
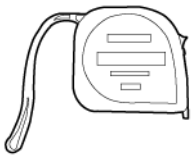
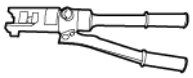
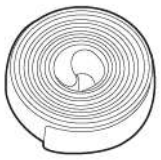
After unpacking the product, check that the deliverables are intact and complete, and free from any obvious damage. If any item is missing or damaged, contact your dealer.

NOTE

For details about the number of deliverables, see the Packing List in the packing case.

5.1.2 Tools and Instruments

Type	Tools and Instruments		
Installation	 Hammer drill	 Insulated torque socket wrench (including an extension bar)	 Adjustable torque wrench
	 Diagonal pliers	 Wire stripper	 Flat-head insulated torque screwdriver
	 Phillips insulated torque screwdriver	 Rubber mallet	 Utility knife
	 Cable cutter	 Crimping tool, model: PV-CZM-CZM41100 (preferred)/ CZM22100	 Cord end terminal crimping tool

Type	Tools and Instruments		
	 Removal tool (model: PV-MS-HZ open-end wrench)	 Cable tie	 Vacuum cleaner
	 Multimeter (DC voltage measurement range ≥ 600 V DC)	 Marker	 Steel measuring tape
	 Level	 Hydraulic pliers	 Heat shrink tubing
	 Heat gun	-	-
PPE	 Protective gloves	 Goggles	 Anti-dust mask

Type	Tools and Instruments		
	 Work shoes	-	-

5.1.3 Determining the Installation Position

Basic Requirements

- Do not install the product in a position where it is easy to touch because the temperature of the chassis and heat dissipater is high when it is running.
- Do not install the product in areas with flammable or explosive materials.
- Do not install the product outdoors in salt areas because it may corrode and cause fires. A salt area refers to the region within 500 m from the coast or prone to sea breeze. The regions prone to sea breeze vary with weather conditions (such as typhoons and monsoons) or terrains (such as dams and hills).
- Do not install the product in a position where children can touch it.

Installation Angle Requirement

The product can be ground-mounted and wall-mounted. The installation angle requirement is as follow:

- Do not install the product at forward tilted, back tilted, side tilted, horizontal, or upside down positions.

Requirements for the Wall and Ground

- Concrete walls and brick walls are recommended. Do not use sandwich panel or wooden walls.
- The bearing capacity of the ground must be greater than or equal to 500 kg/m^2.

Installation Dimensions

Reserve sufficient clearance around the product for installation and heat dissipation.

Figure 5-1 Installation dimensions for one product

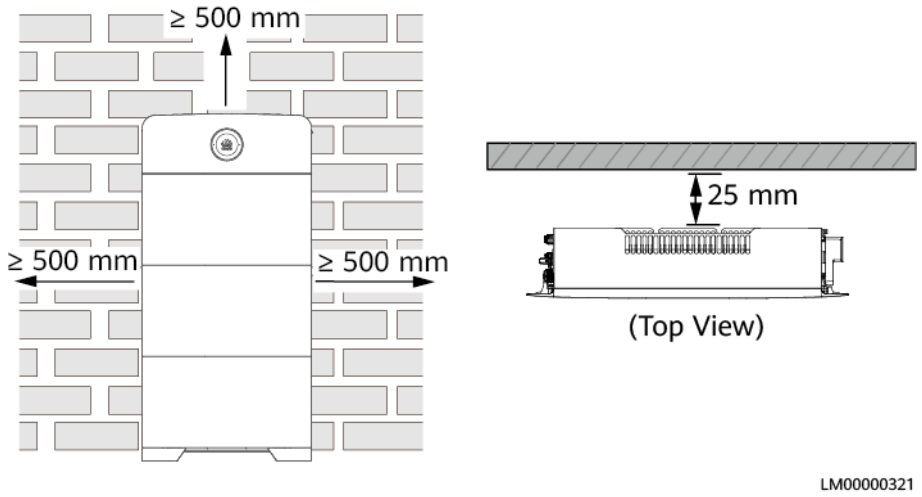
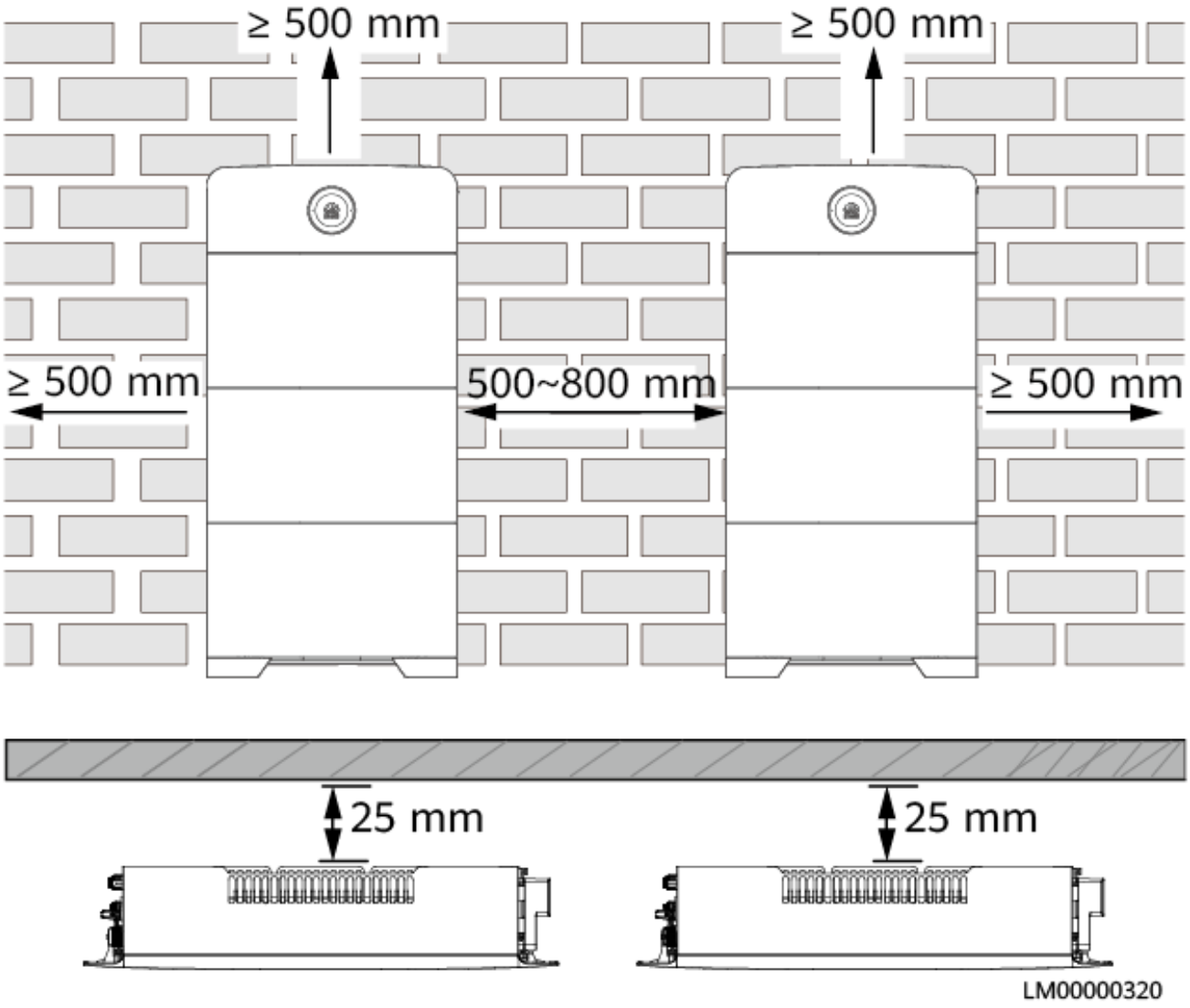


Figure 5-2 Installation space for a parallel system or capacity expansion scenario



5.2 Installing a Mounting Bracket

5.2.1 Ground Mounting

WARNING

The base must be secured to the ground using bolts. Otherwise, the device may tip over, causing personal injury or device damage.

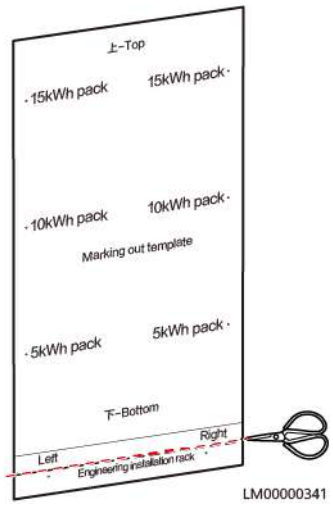
Procedure

NOTE

Two marking-off templates are required for ground mounting. A small marking-off template determines holes on the ground, and a large marking-off template determines holes on the wall.

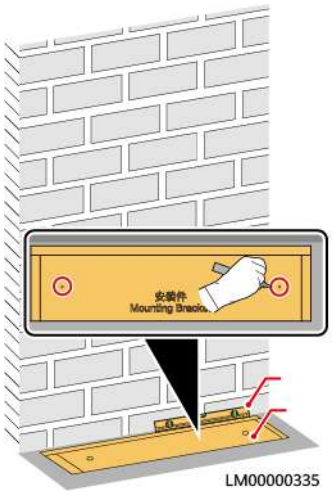
Step 1 Cut the marking-off template along the dotted line.

Figure 5-3 Cutting the marking-off template



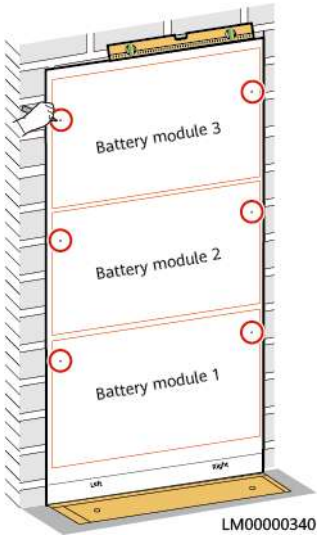
Step 2 Mark mounting holes for the base.

Figure 5-4 Marking mounting holes for the base



Step 3 Mark the mounting holes for battery modules.

Figure 5-5 Marking the mounting holes for battery modules

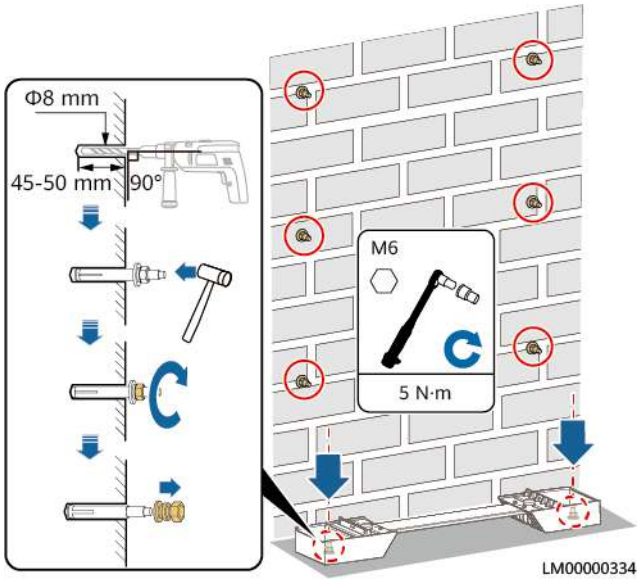


Step 4 Drill holes and install expansion bolts.

DANGER

When drilling holes, avoid the water pipes and power cables buried in the wall.

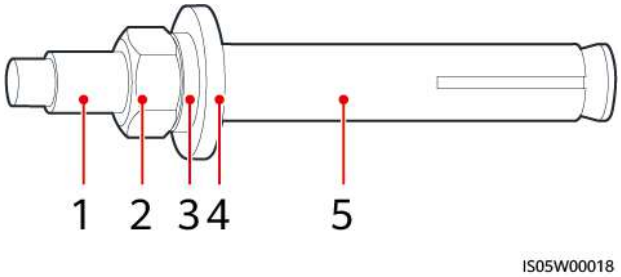
Figure 5-6 Installing expansion bolts



NOTE

Use the M6x60 expansion bolts delivered with the product to secure the mounting base. If the length or quantity of the M6x60 expansion bolts cannot meet the installation requirements, prepare M6 stainless steel expansion bolts by yourself. The expansion bolts delivered with the product are used for solid brick walls and concrete grounds. If other types of walls and grounds are used, ensure that the load bearing capacity requirements (the weight of one battery module is 50 kg) are met and appropriate bolts are selected.

Figure 5-7 M6 expansion bolt structure



(1) Bolt (2) Nut (3) Spring washer

(4) Flat washer (5) Expansion sleeve

NOTICE

- To prevent dust inhalation or contact with eyes, wear safety goggles and an anti-dust mask when drilling holes.
- Wipe away any dust in or around the holes and measure the hole spacing. If the holes are inaccurately positioned, drill holes again.
- Level the head of the expansion sleeve with the concrete wall or ground after removing the nut, spring washer, and flat washer. Otherwise, the mounting bracket will not be securely installed.
- Loosen the nut, spring washer, and flat washer of the expansion bolt at the bottom.

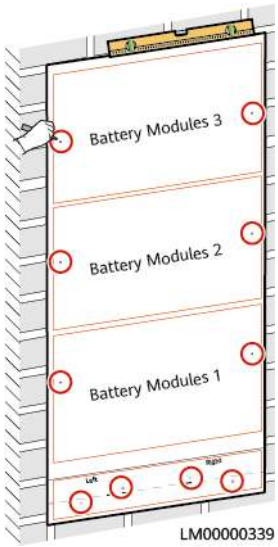
----End

5.2.2 Wall Mounting

Procedure

Step 1 Mark the mounting holes for the wall-mounting bracket and battery modules.

Figure 5-8 Standard mounting holes



Step 2 Drill holes and install expansion bolts.

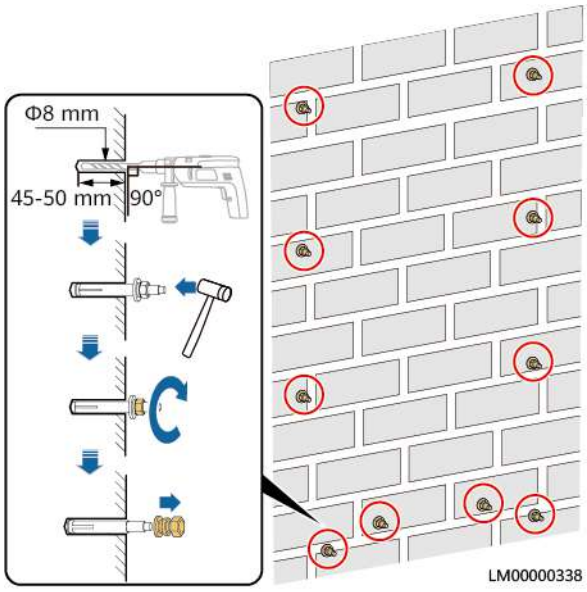
DANGER

When drilling holes, avoid the water pipes and power cables buried in the wall.

NOTE

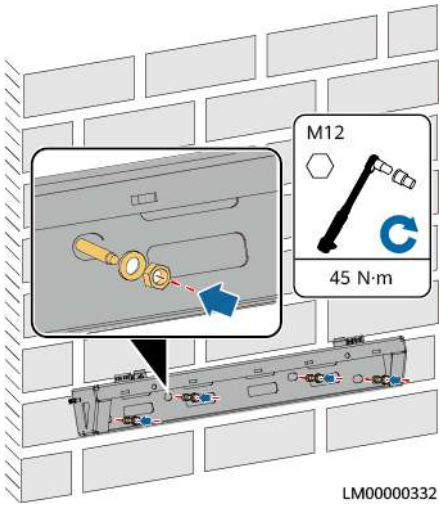
- Use the M12x60 expansion bolts delivered with the product to secure the wall-mounting bracket. If the length or quantity of the expansion bolts cannot meet the installation requirements, prepare M12 stainless steel expansion bolts by yourself.
- Use the M6x60 expansion bolts delivered with the product to secure the modules. If the length or quantity of the expansion bolts cannot meet the installation requirements, prepare M6 stainless steel expansion bolts by yourself.

Figure 5-9 Installing expansion bolts



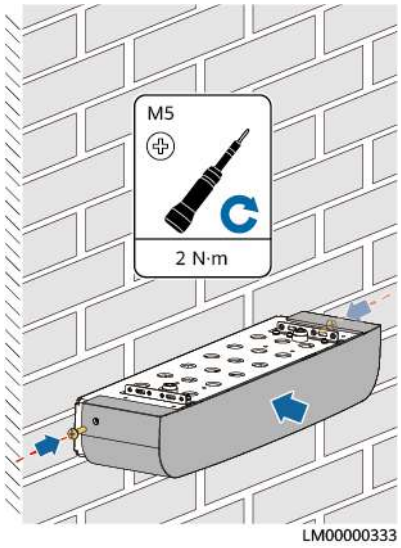
Step 3 Install a wall-mounting bracket.

Figure 5-10 Installing a wall-mounting bracket



Step 4 Install a wall-mounting bracket cover.

Figure 5-11 Installing the cover



----End

5.3 Installing Modules

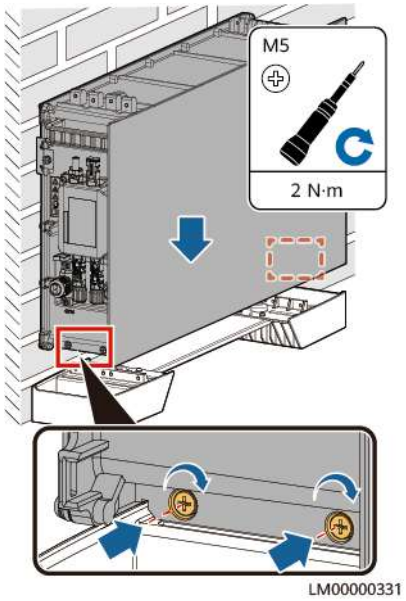
NOTICE

- Two persons are required to move a module.
- Battery modules must be secured to the wall.

Installing Modules

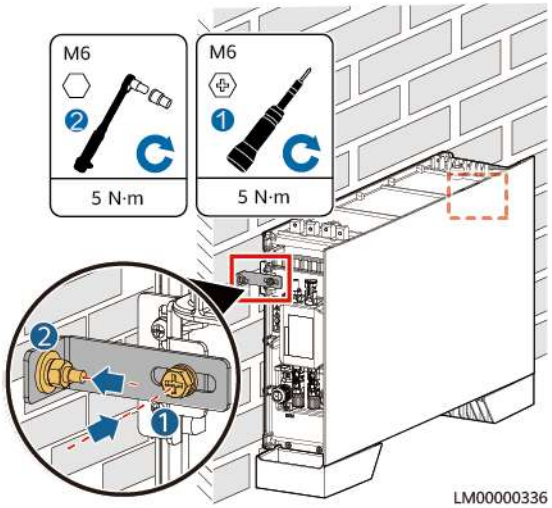
Step 1 Install a battery module on the base.

Figure 5-12 Installing a battery module



Step 2 Secure the battery module to the wall.

Figure 5-13 Securing the battery module



Step 3 Install the remaining battery modules and power module from bottom to top. Each time a module is installed, tighten the screws on the left and right, and then secure it against the wall.

Figure 5-14 Ground mounting completed

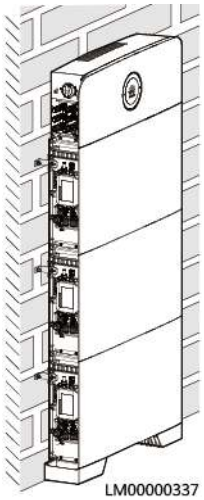
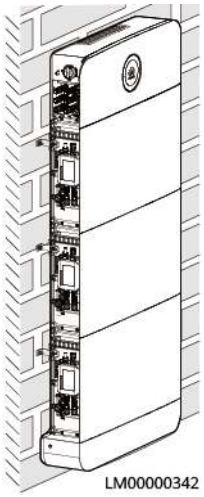


Figure 5-15 Wall mounting completed



----End

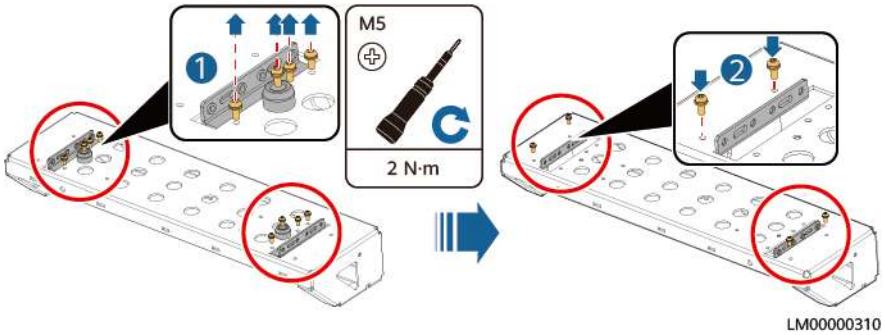
5.4 (Optional) Installing Battery Modules for Capacity Expansion

NOTICE

- A maximum of three battery modules can be installed on a bracket or base. If more than three battery modules are required, add a bracket.
- For details about how to install brackets and modules, see **5.2 Installing a Mounting Bracket** and **5.3 Installing Modules**.

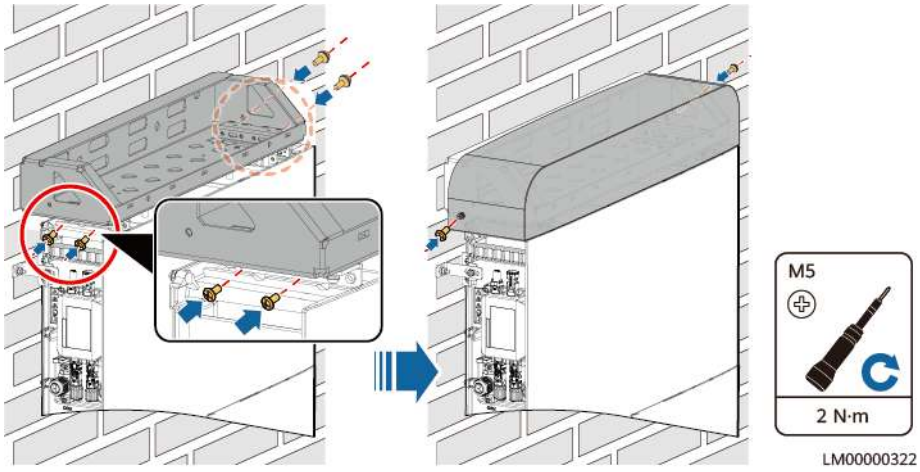
Step 1 Remove the L-shaped plates from the top cover, rotate them by 180 degrees, and install them back on the top cover.

Figure 5-16 Rotating the L-shaped sheets on the top cover



Step 2 Install the top cover on the battery module.

Figure 5-17 Installing the top cover



----End

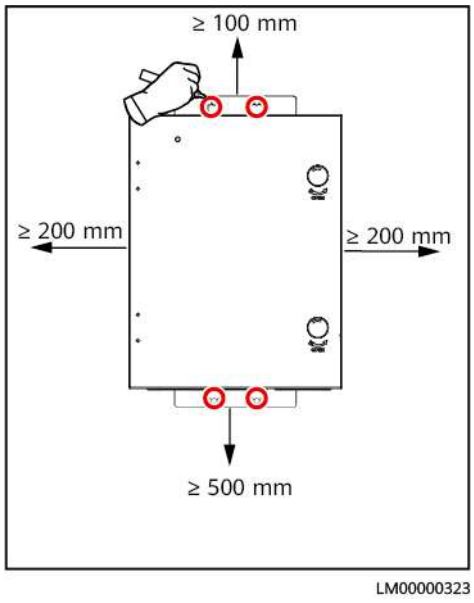
5.5 (Optional) Installing an AC Parallel Box

Prerequisites

In a parallel system, an AC parallel box must be configured.

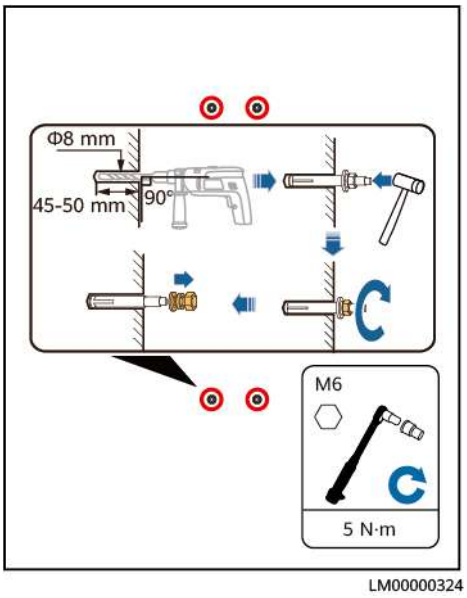
Step 1 Mark mounting holes.

Figure 5-18 Marking mounting holes



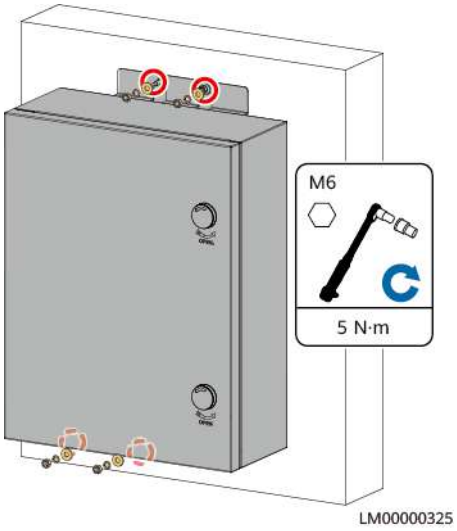
Step 2 Install expansion bolts.

Figure 5-19 Installing expansion bolts



Step 3 Install the AC parallel box on the wall.

Figure 5-20 Installing the AC parallel box



----End

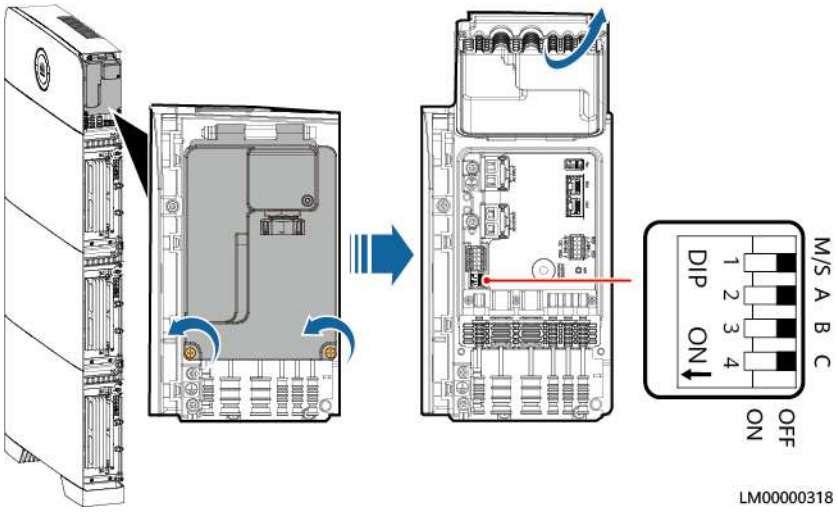
6 Setting the DIP Switch

NOTICE

- If the DIP switch settings are incorrect, the parallel function will fail. Ensure that correct DIP switches are set.
- The address DIP switch takes effect only after the device is restarted. Set the address DIP switch before powering on a device.
- Pin 1 (M/S) indicates whether the product is a master or slave. When Pin 1 is set to ON, the product is a master product. Otherwise, the product is a slave product. Pins 2–4 (A–C) indicate the high-speed CAN communication addresses in a parallel system.
- When only one product is used, set Pin 1 to ON.
- The default address is 0 (Pin 1 to Pin 4: OFF).

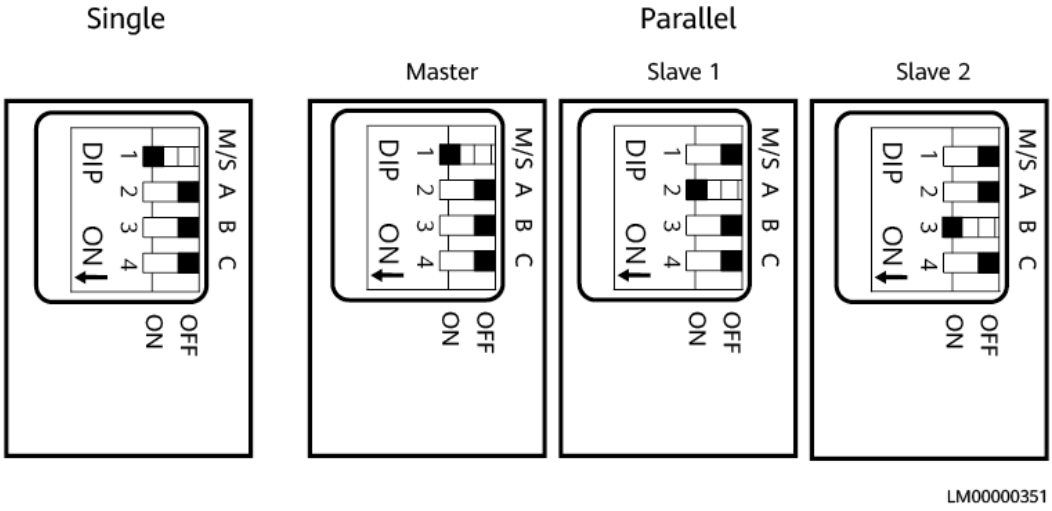
Step 1 Open the power module maintenance compartment.

Figure 6-1 Open maintenance compartment



Step 2 Set the DIP switch address.

Figure 6-2 Set the DIP switch address



----End

7 Preparing Cables

NOTICE

- Do not use aluminum cables to avoid electrochemical corrosion of copper and aluminum.
- Power cables should be able to withstand a temperature of at least 90°C.

NOTE

- The minimum cable diameter must comply with local cable standards.
- The factors that affect cable selection include the rated current, cable type, routing mode, ambient temperature, and maximum expected line loss.

7.1 Cables delivered with the product

Table 7-1 Cables delivered with the product

No.	Cable	Type
1	Battery power cable	Common outdoor PV cable in the industry
2	Battery signal cable	Outdoor shielded twisted pair cable
3	Ground cable (standard scenario)	Outdoor single-core copper cable

NOTICE

In capacity expansion scenarios, you need to purchase power cables and signal cables for bottom cascading from Huawei.

Table 7-2 (Optional) Cables in capacity expansion scenario

No.	Cable	Type
1	Battery power cable (bottom cascading cables)	Common outdoor PV cable in the industry
2	Battery signal cable (bottom cascading cables)	Outdoor shielded twisted pair cable

7.2 Cables prepared by the customer

7.2.1 Solar-Only Scenario

Table 7-3 Cables in Single-node system (capacity expansion scenario)

No.	One End	Other End	Type	Recommended Specifications
1	PV input ports	DC switch (customer side)	Common outdoor PV cable in the industry	• Conductor cross-sectional area: 4–6 mm^2 • Cable outer diameter: 5.5–9 mm
2	AC output	PDB (customer side)	Outdoor three-core copper cable (L/N/PE)	• Conductor cross-sectional area: 4–6 mm^2 • Cable outer diameter: 13.7–16.9 mm
3	Ground point	Ground bar (customer side)	Outdoor single-core copper cable	Main ground cable: 4–6 mm^2 (same as the cross-sectional area of the AC input power cable)
4	Ground point	Ground point on the module for capacity expansion	Outdoor single-core copper cable	Main ground cable: 6 mm^2

Table 7-4 Cables in parallel system scenario

No.	One End	Other End	Type	Recommended Specifications
1	PV input ports	DC switch (customer side)	Common outdoor PV cable in the industry	• Conductor cross-sectional area: 4–6 mm^2 • Cable outer diameter: 5.5–9 mm
2	Ground point	Ground bar (customer side)	Outdoor single-core copper cable	Main ground cable: 4–6 mm^2 (same as the cross-sectional area of the AC input power cable)
3	AC parallel box	AC output	Outdoor three-core copper cable (L/N/PE)	• Conductor cross-sectional area: 4–6 mm^2 • Cable outer diameter: 13.7–16.9 mm
4	AC parallel box	PDB (customer side)	Outdoor three-core copper cable (L/N/PE)	• Conductor cross-sectional area: 25 mm^2 • Cable outer diameter: 16–26 mm
5	AC parallel box	Ground bar (customer side)	Outdoor single-core copper cable	• Conductor cross-sectional area: 25 mm^2 • Cable outer diameter: 8–11 mm

7.2.2 Grid Scenario

Table 7-5 Cables in Single-node system (capacity expansion scenario)

No.	One End	Other End	Type	Recommended Specifications
1	AC output	PDB (customer side)	Outdoor three-core copper cable (L/N/PE)	• Conductor cross-sectional area: 4–6 mm^2 • Cable outer diameter: 13.7–16.9 mm
2	AC input	PDC (customer side)	Outdoor three-core copper cable (L/N/PE)	• Conductor cross-sectional area: 4–6 mm^2 • Cable outer diameter: 13.7–16.9 mm

No.	One End	Other End	Type	Recommended Specifications
3	Ground point	Ground bar (customer side)	Outdoor single-core copper cable	Main ground cable: 4–6 mm^2 (same as the cross-sectional area of the AC input power cable)
4	Ground point	Ground point on the module for capacity expansion	Outdoor single-core copper cable	Main ground cable: 6 mm^2

Table 7-6 Cables in parallel system scenario

No.	One End	Other End	Type	Recommended Specifications
1	Ground point	Ground bar (customer side)	Outdoor single-core copper cable	Main ground cable: 4–6 mm^2 (same as the cross-sectional area of the AC input power cable)
2	AC parallel box	PDB (customer side)	Outdoor three-core copper cable (L/N/PE)	• Conductor cross-sectional area: 25 mm^2 • Cable outer diameter: 16–26 mm
3	AC parallel box	AC output	Outdoor three-core copper cable (L/N/PE)	• Conductor cross-sectional area: 4–6 mm^2 • Cable outer diameter: 13.7–16.9 mm
4	AC parallel box	AC input	Outdoor three-core copper cable (L/N/PE)	• Conductor cross-sectional area: 4–6 mm^2 • Cable outer diameter: 13.7–16.9 mm
5	AC parallel box	PDC (customer side)	Outdoor three-core copper cable (L/N/PE)	• Conductor cross-sectional area: 25 mm^2 • Cable outer diameter: 16–26 mm
6	AC parallel box	Ground bar (customer side)	Outdoor single-core copper cable	• Conductor cross-sectional area: 25 mm^2 • Cable outer diameter: 8–11 mm

7.2.3 Solar-Grid Hybrid Scenario

Table 7-7 Cables in Single-node system (capacity expansion scenario)

No.	One End	Other End	Type	Recommended Specifications
1	PV input ports	DC switch (customer side)	Common outdoor PV cable in the industry	• Conductor cross-sectional area: 4–6 mm^2 • Cable outer diameter: 5.5–9 mm
2	AC output	PDB (customer side)	Outdoor three-core copper cable (L/N/PE)	• Conductor cross-sectional area: 4–6 mm^2 • Cable outer diameter: 13.7–16.9 mm
3	AC input	PDC (customer side)	Outdoor three-core copper cable (L/N/PE)	• Conductor cross-sectional area: 4–6 mm^2 • Cable outer diameter: 13.7–16.9 mm
4	Ground point	Ground bar (customer side)	Outdoor single-core copper cable	Main ground cable: 4–6 mm^2 (same as the cross-sectional area of the AC input power cable)
5	Ground point	Ground point on the module for capacity expansion	Outdoor single-core copper cable	Main ground cable: 6 mm^2

Table 7-8 Cables in parallel system scenario

No.	One End	Other End	Type	Recommended Specifications
1	PV input ports	DC switch (customer side)	Common outdoor PV cable in the industry	• Conductor cross-sectional area: 4–6 mm^2 • Cable outer diameter: 5.5–9 mm
2	Ground point	Ground bar (customer side)	Outdoor single-core copper cable	Main ground cable: 4–6 mm^2 (same as the cross-sectional area of the AC input power cable)

No.	One End	Other End	Type	Recommended Specifications
3	AC parallel box	PDB (customer side)	Outdoor three-core copper cable (L/N/PE)	• Conductor cross-sectional area: 25 mm^2 • Cable outer diameter: 16–26 mm
4	AC parallel box	AC output	Outdoor three-core copper cable (L/N/PE)	• Conductor cross-sectional area: 4–6 mm^2 • Cable outer diameter: 13.7–16.9 mm
5	AC parallel box	AC input	Outdoor three-core copper cable (L/N/PE)	• Conductor cross-sectional area: 4–6 mm^2 • Cable outer diameter: 13.7–16.9 mm
6	AC parallel box	PDC (customer side)	Outdoor three-core copper cable (L/N/PE)	• Conductor cross-sectional area: 25 mm^2 • Cable outer diameter: 16–26 mm
7	AC parallel box	Ground bar (customer side)	Outdoor single-core copper cable	• Conductor cross-sectional area: 25 mm^2 • Cable outer diameter: 8–11 mm

7.2.4 Solar-Genset Hybrid Scenario

Table 7-9 Cables in Single-node system (capacity expansion scenario)

No.	One End	Other End	Type	Recommended Specifications
1	PV input ports	DC switch (customer side)	Common outdoor PV cable in the industry	• Conductor cross-sectional area: 4–6 mm^2 • Cable outer diameter: 5.5–9 mm
2	AC output	PDB (customer side)	Outdoor three-core copper cable (L/N/PE)	• Conductor cross-sectional area: 4–6 mm^2 • Cable outer diameter: 13.7–16.9 mm
3	AC input	PDC (customer side)	Outdoor three-core copper cable (L/N/PE)	• Conductor cross-sectional area: 4–6 mm^2 • Cable outer diameter: 13.7–16.9 mm

No.	One End	Other End	Type	Recommended Specifications
4	COM and dry contact ports	Genset Control Signal	Outdoor shielded twisted pair cable (8 cores)	• Conductor cross-sectional area: 0.2–1 mm^2 • Cable outer diameter: 6.3–7.5 mm
5	Ground point	Ground bar (customer side)	Outdoor single-core copper cable	Main ground cable: 4–6 mm^2 (same as the cross-sectional area of the AC input power cable)
6	Ground point	Ground point on the module for capacity expansion	Outdoor single-core copper cable	Main ground cable: 6 mm^2

Table 7-10 Cables in parallel system scenario

No.	One End	Other End	Type	Recommended Specifications
1	PV input ports	DC switch (customer side)	Common outdoor PV cable in the industry	• Conductor cross-sectional area: 4–6 mm^2 • Cable outer diameter: 5.5–9 mm
2	Ground point	Ground bar (customer side)	Outdoor single-core copper cable	Main ground cable: 4–6 mm^2 (same as the cross-sectional area of the AC input power cable)
3	COM and dry contact ports	Genset control signal	Outdoor shielded twisted pair cable (8 cores)	• Conductor cross-sectional area: 0.2–1 mm^2 • Cable outer diameter: 6.3–7.5 mm
4	AC parallel box	PDB (customer side)	Outdoor three-core copper cable (L/N/PE)	• Conductor cross-sectional area: 25 mm^2 • Cable outer diameter: 16–26 mm
5	AC parallel box	AC output	Outdoor three-core copper cable (L/N/PE)	• Conductor cross-sectional area: 4–6 mm^2 • Cable outer diameter: 13.7–16.9 mm

No.	One End	Other End	Type	Recommended Specifications
6	AC parallel box	AC input	Outdoor three-core copper cable (L/N/PE)	• Conductor cross-sectional area: 4–6 mm^2 • Cable outer diameter: 13.7–16.9 mm
7	AC parallel box	PDC (customer side)	Outdoor three-core copper cable (L/N/PE)	• Conductor cross-sectional area: 25 mm^2 • Cable outer diameter: 16–26 mm
8	AC parallel box	Ground bar (customer side)	Outdoor single-core copper cable	• Conductor cross-sectional area: 25 mm^2 • Cable outer diameter: 8–11 mm

8 Electrical Connection

Precautions

DANGER

- Connect cables in accordance with the local installation laws and regulations.
- Before connecting cables, ensure that the DC SWITCH on the product and all the switches connected to the product are set to OFF. Otherwise, the high voltage of the product may result in electric shocks.
- Do not touch the manual ON/OFF switch when installing cables.

WARNING

- The equipment damage caused by incorrect cable connections is not covered under any warranty.
- Only certified electricians are allowed to connect cables.
- Operation personnel must wear proper PPE when connecting cables.

NOTE

The cable colors shown in the electrical connection diagrams provided in this chapter are for reference only. Select cables in accordance with local cable specifications (green and yellow cables are only used for protective grounding).

8.1 Solar-Only Scenario

8.1.1 Installing Ground Cables

Precautions

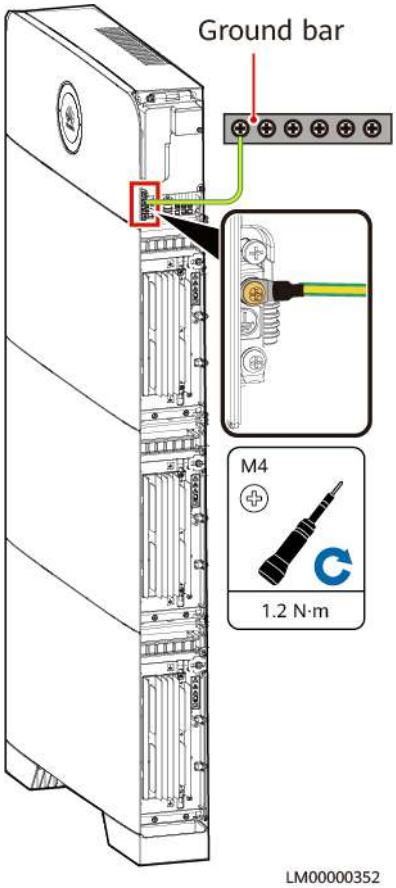
DANGER

Ensure that the ground cable is securely connected. Otherwise, electric shocks may occur.

Procedure

Step 1 Install ground cables.

Figure 8-1 Installing ground cables



----End

8.1.2 Installing the Internal Cable

CAUTION

- Do not reversely connect positive and negative battery module power cables.
- Use the power cables delivered with the product. If the number of cables is insufficient or any cable is damaged, contact the dealer to obtain cables. Do not prepare cables by yourself.

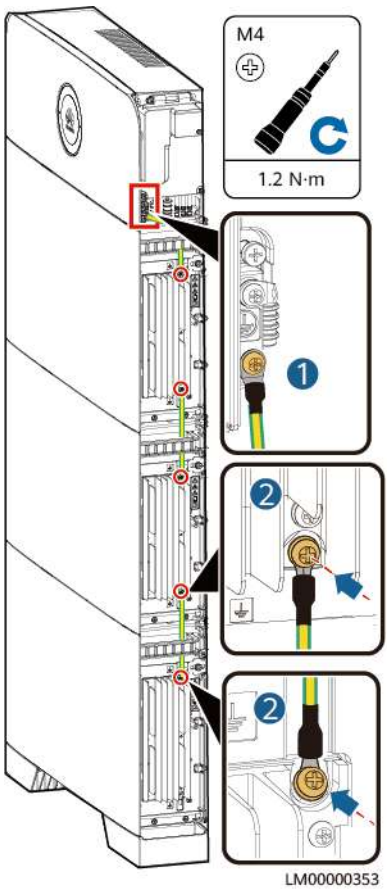
NOTICE

When a communications terminal is connected to a single network cable, a waterproof rubber plug must be installed.

Procedure

Step 1 Install ground cables.

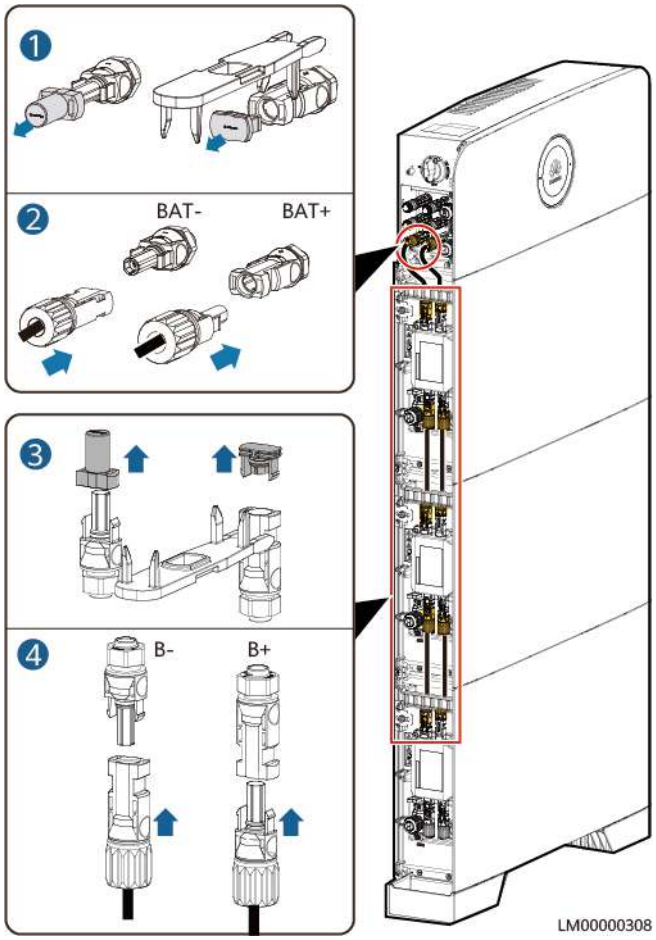
Figure 8-2 Installing ground cables



Step 2 Installing battery module power cables.

1. Use a wrench to remove the waterproof glands from the cascading terminals of the battery modules.
2. Install battery module power cables.
3. Use a removal wrench to remove the waterproof glands from the battery terminals on the power module.
4. Install power cables between the battery modules and power module.

Figure 8-3 Installing battery module power cables

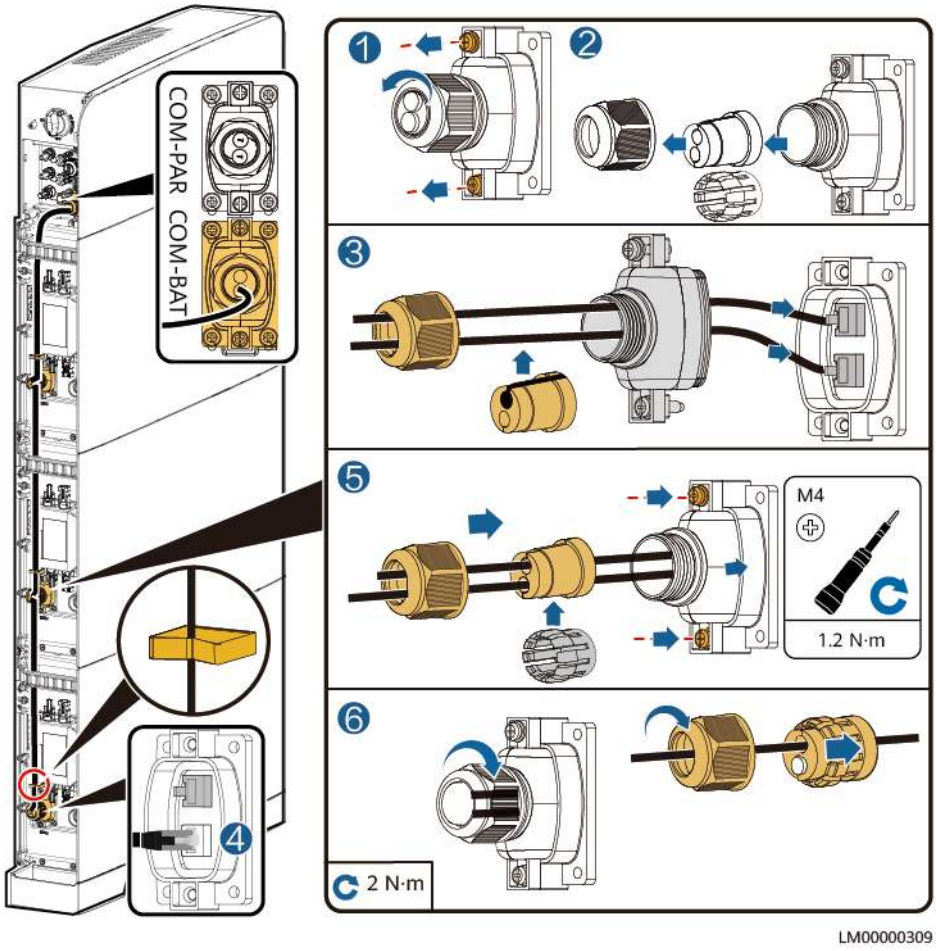


Step 3 Installing battery signal cables.

1. Remove the waterproof gland from the communications terminal of a battery module.
2. Remove the locking cap and waterproof rubber plug from the communications terminal housing.
3. Install communications cables for the battery module.
4. Install build-out resistors. Otherwise, the communication will be interrupted.
5. Lock the communications terminal waterproof gland,Reinstall the waterproof rubber plug.
6. Tighten the locking cap and secure the signal cables using cable clips.

Step 4 Install communications cables for other battery modules in sequence.

Figure 8-4 Installing battery signal cables



----End

8.1.3 Installing PV Input Power Cables

Procedure

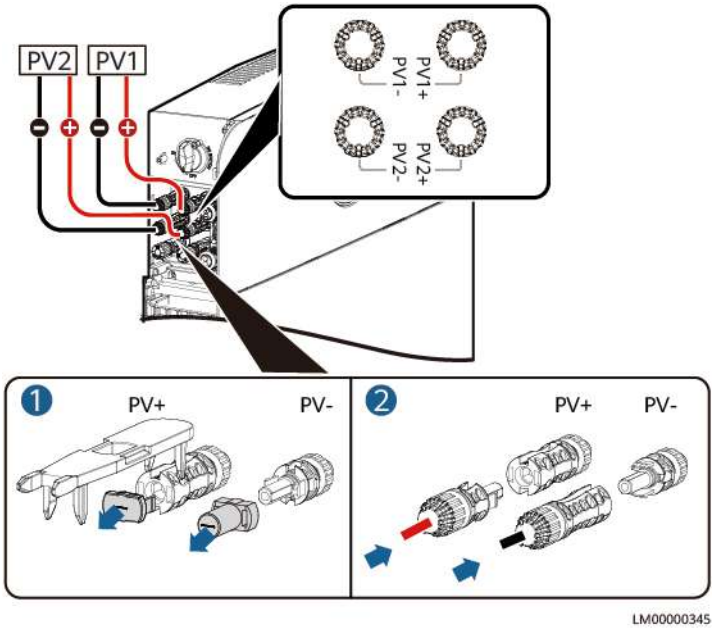
Step 1 Use a removal wrench to remove the waterproof gland from the PV input terminal on the power module.

NOTE

Take out the removal wrench from the decorative cover delivered with the product.

Step 2 Install the PV input power cables.

Figure 8-5 Installing the PV input power cables



----End

8.1.4 Install the AC Output Power Cable

CAUTION

- Do not reversely connect or short-circuit the live wire and neutral wire of an AC power cable.
- The PE wire of an AC power cable must be grounded.
- Do not reversely connect AC output power cables.

NOTICE

A leakage protection device must be configured for the AC output of the system. The leakage current must be 30 mA. You need to configure and install the device by yourself.

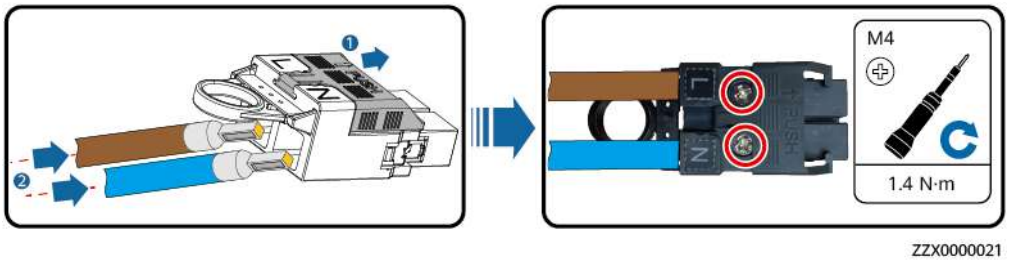
NOTE

In a single-node system, connect the other end of the AC output power cable to a PDB. In a parallel system, connect the other end of the AC output power cable to the AC parallel box.

Procedure

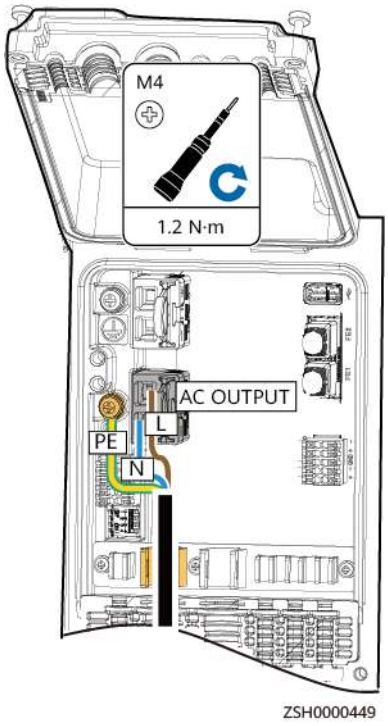
Step 1 Connect AC power cables to the terminal connectors.

Figure 8-6 Connecting cables to terminals



Step 2 Install the AC output power cable and secure the cable using cable clips.

Figure 8-7 Installing an AC output power cable



----End

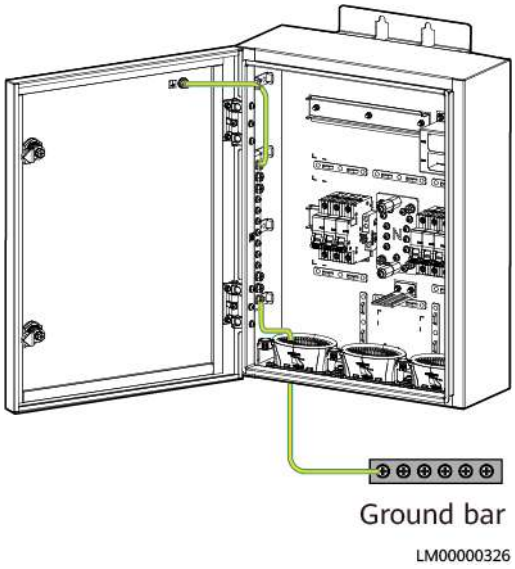
8.1.5 Installing Cables in a Parallel System

8.1.5.1 Installing a Ground Cable for the Parallel Box

Procedure

Step 1 Install a ground cable.

Figure 8-8 Installing a ground cable



----End

8.1.5.2 Installing AC Output Power Cables in a Parallel System

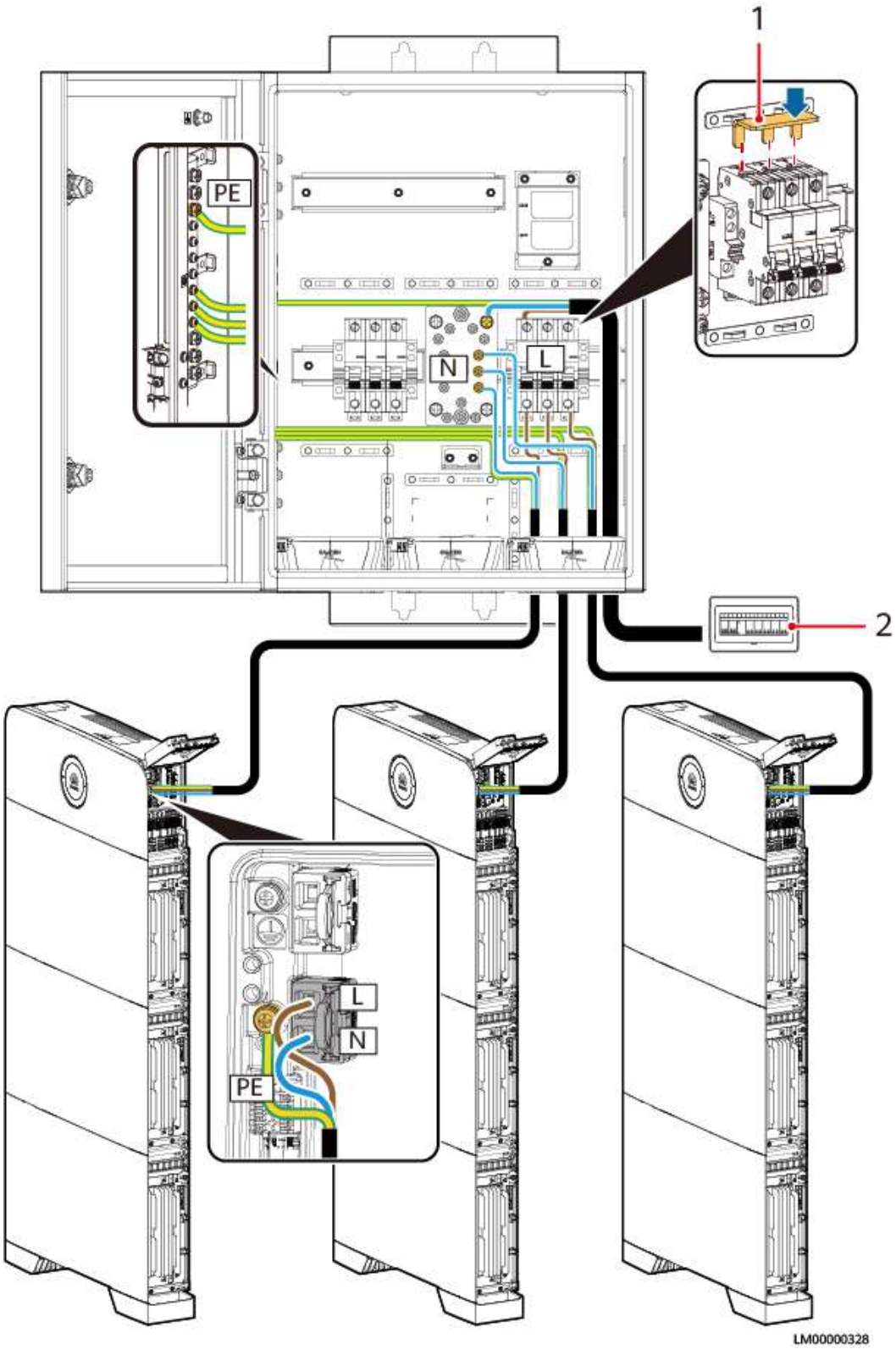
NOTICE

- Install short-circuit plates for AC output circuit breakers.
- The three cables from the AC output circuit breaker to the power modules must be of the same length.

Procedure

Step 1 Install AC output power cables of the parallel box.

Figure 8-9 Install AC output power cables of the parallel box



(1) Short-circuit plate	(2) PDB

----End

8.1.5.3 Installing Communications Cables in a Parallel System

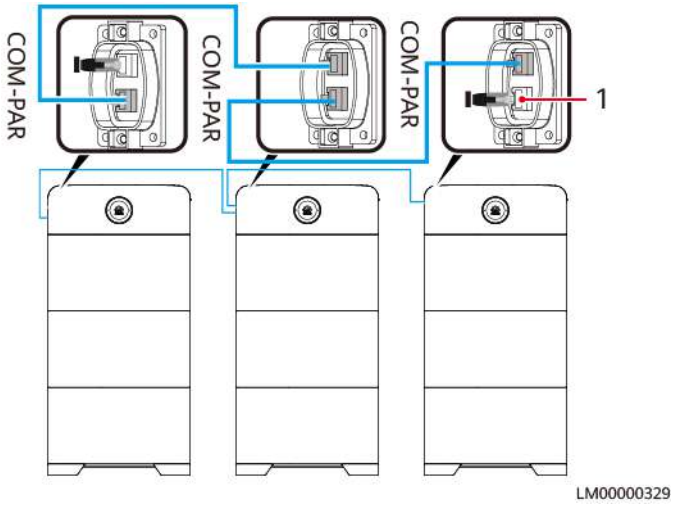
NOTICE

- When installing communications cables in a parallel system, install build-out resistors at the first and last modules. The build-out resistors are delivered with the product.
- The length of a single communications cable cannot exceed 3 m.
- The method of installing communications cables between power modules is the same as that between battery modules.

Procedure

Step 1 Install communications cables between parallel power modules.

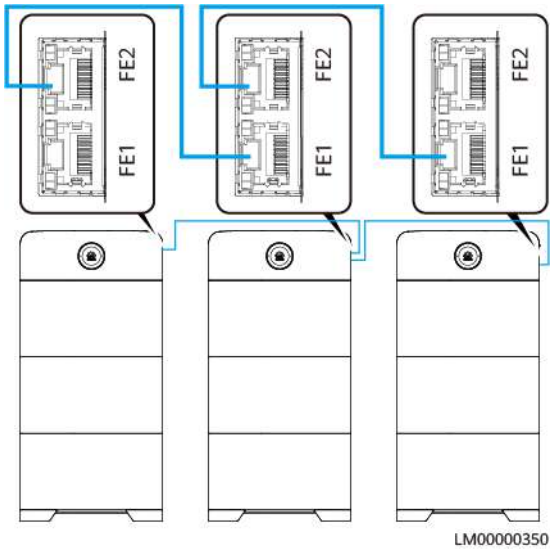
Figure 8-10 Installing communications cables



(1) Build-out resistor

Step 2 Connect the FE ports of the master and slave devices using a network cable.

Figure 8-11 Installing monitoring communications cables



----End

8.2 Grid Scenario

8.2.1 Installing Ground Cables

Precautions

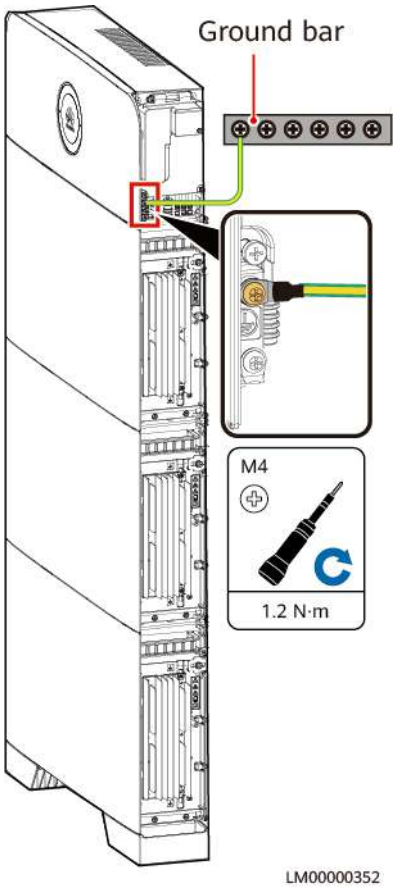
DANGER

Ensure that the ground cable is securely connected. Otherwise, electric shocks may occur.

Procedure

Step 1 Install ground cables.

Figure 8-12 Installing ground cables



----End

8.2.2 Installing the Internal Cable

CAUTION

- Do not reversely connect positive and negative battery module power cables.
- Use the power cables delivered with the product. If the number of cables is insufficient or any cable is damaged, contact the dealer to obtain cables. Do not prepare cables by yourself.

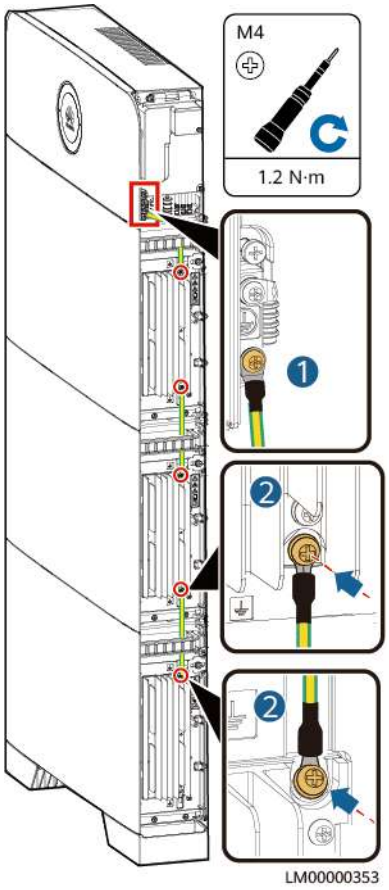
NOTICE

When a communications terminal is connected to a single network cable, a waterproof rubber plug must be installed.

Procedure

Step 1 Install ground cables.

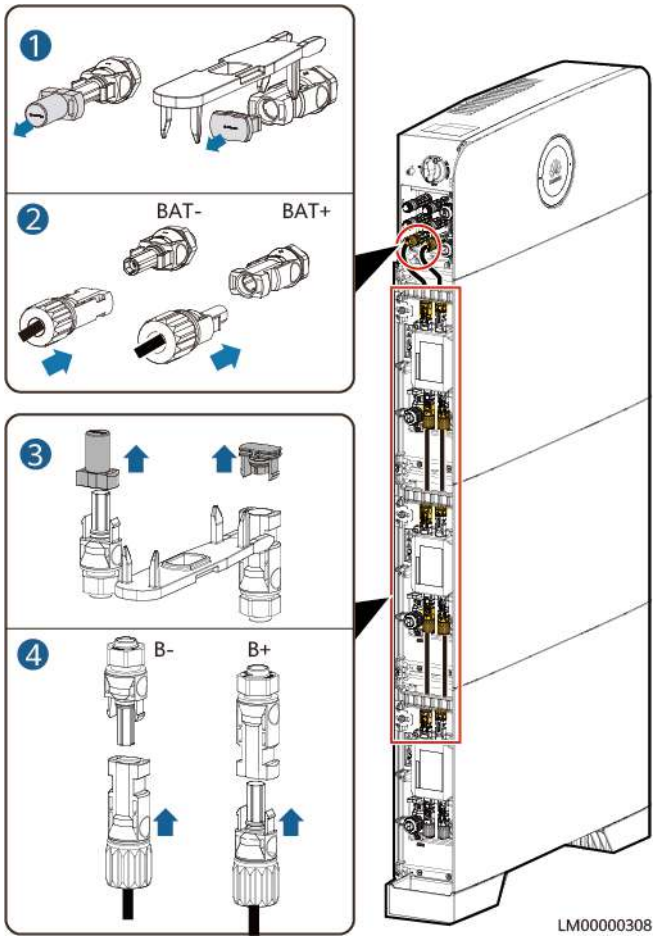
Figure 8-13 Installing ground cables



Step 2 Installing battery module power cables.

1. Use a wrench to remove the waterproof glands from the cascading terminals of the battery modules.
2. Install battery module power cables.
3. Use a removal wrench to remove the waterproof glands from the battery terminals on the power module.
4. Install power cables between the battery modules and power module.

Figure 8-14 Installing battery module power cables

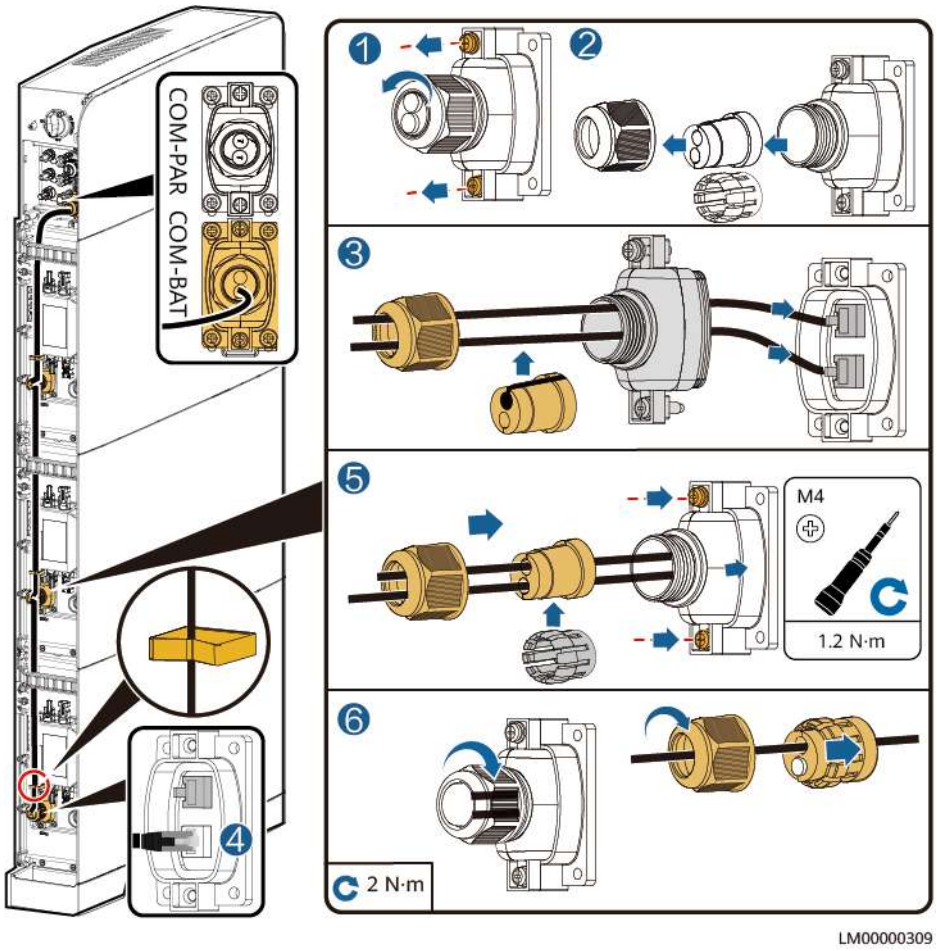


Step 3 Installing battery signal cables.

1. Remove the waterproof gland from the communications terminal of a battery module.
2. Remove the locking cap and waterproof rubber plug from the communications terminal housing.
3. Install communications cables for the battery module.
4. Install build-out resistors. Otherwise, the communication will be interrupted.
5. Lock the communications terminal waterproof gland,Reinstall the waterproof rubber plug.
6. Tighten the locking cap and secure the signal cables using cable clips.

Step 4 Install communications cables for other battery modules in sequence.

Figure 8-15 Installing battery signal cables



----End

8.2.3 Install the AC Output Power Cable

CAUTION

- Do not reversely connect or short-circuit the live wire and neutral wire of an AC power cable.
- The PE wire of an AC power cable must be grounded.
- Do not reversely connect AC output power cables.

NOTICE

A leakage protection device must be configured for the AC output of the system. The leakage current must be 30 mA. You need to configure and install the device by yourself.

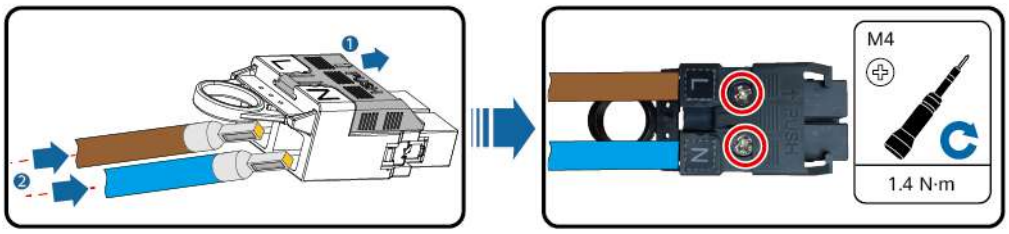
NOTE

In a single-node system, connect the other end of the AC output power cable to a PDB. In a parallel system, connect the other end of the AC output power cable to the AC parallel box.

Procedure

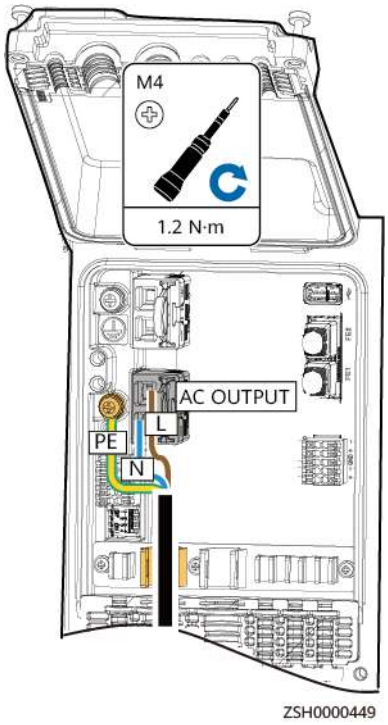
Step 1 Connect AC power cables to the terminal connectors.

Figure 8-16 Connecting cables to terminals



Step 2 Install the AC output power cable and secure the cable using cable clips.

Figure 8-17 Installing an AC output power cable



----End

8.2.4 Install the AC Input Power Cable

CAUTION

- Do not reversely connect or short-circuit the live wire and neutral wire of an AC power cable.
- The PE wire of an AC power cable must be grounded.
- Do not reversely connect AC input power cables.

NOTICE

- A surge protection device must be configured for the upstream AC input of the system. You need to configure and install the device by yourself.
- The upstream AC input of the system must be configured with an AC circuit breaker with a capacity of 40 A. The circuit breaker needs to be configured by the customer. The D-type tripping circuit breaker cannot be used because it cannot effectively protect the product.
- No leakage protection device is required for the upstream AC input. If a leakage protection device is configured, it is recommended that the leakage current be greater than or equal to 100 mA x *n*, where *n* is the number of power modules.

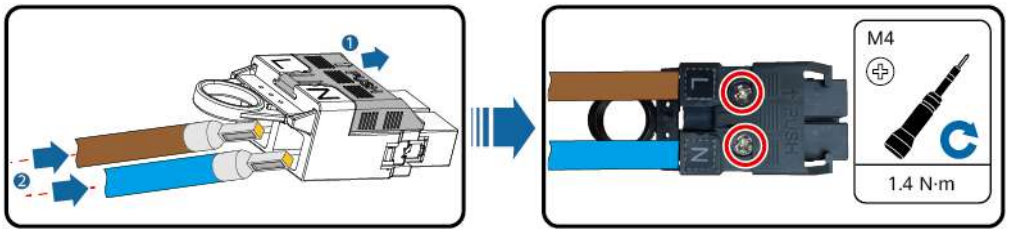
NOTE

In a single-node system, connect the other end of the AC input power cable to an AC PDC. In a parallel system, connect the other end of the AC input power cable to the AC parallel box.

Procedure

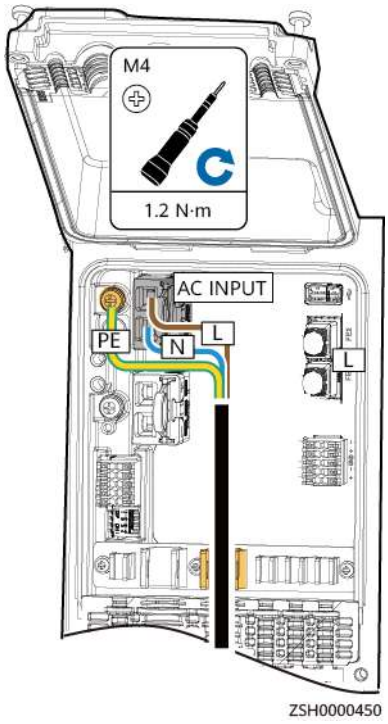
Step 1 Connect AC power cables to the terminal connectors.

Figure 8-18 Connecting cables to terminals



Step 2 Install the AC input power cable and secure the cable using cable clips.

Figure 8-19 Installing an AC input power cable



----End

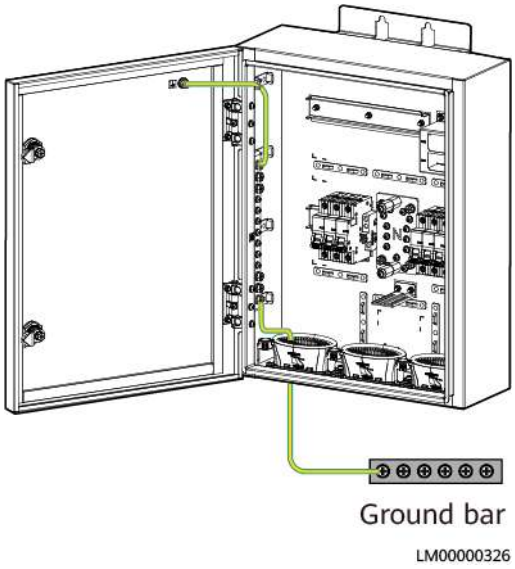
8.2.5 Installing Cables in a Parallel System

8.2.5.1 Installing a Ground Cable for the Parallel Box

Procedure

Step 1 Install a ground cable.

Figure 8-20 Installing a ground cable



----End

8.2.5.2 Installing AC Input Power Cables in a Parallel System

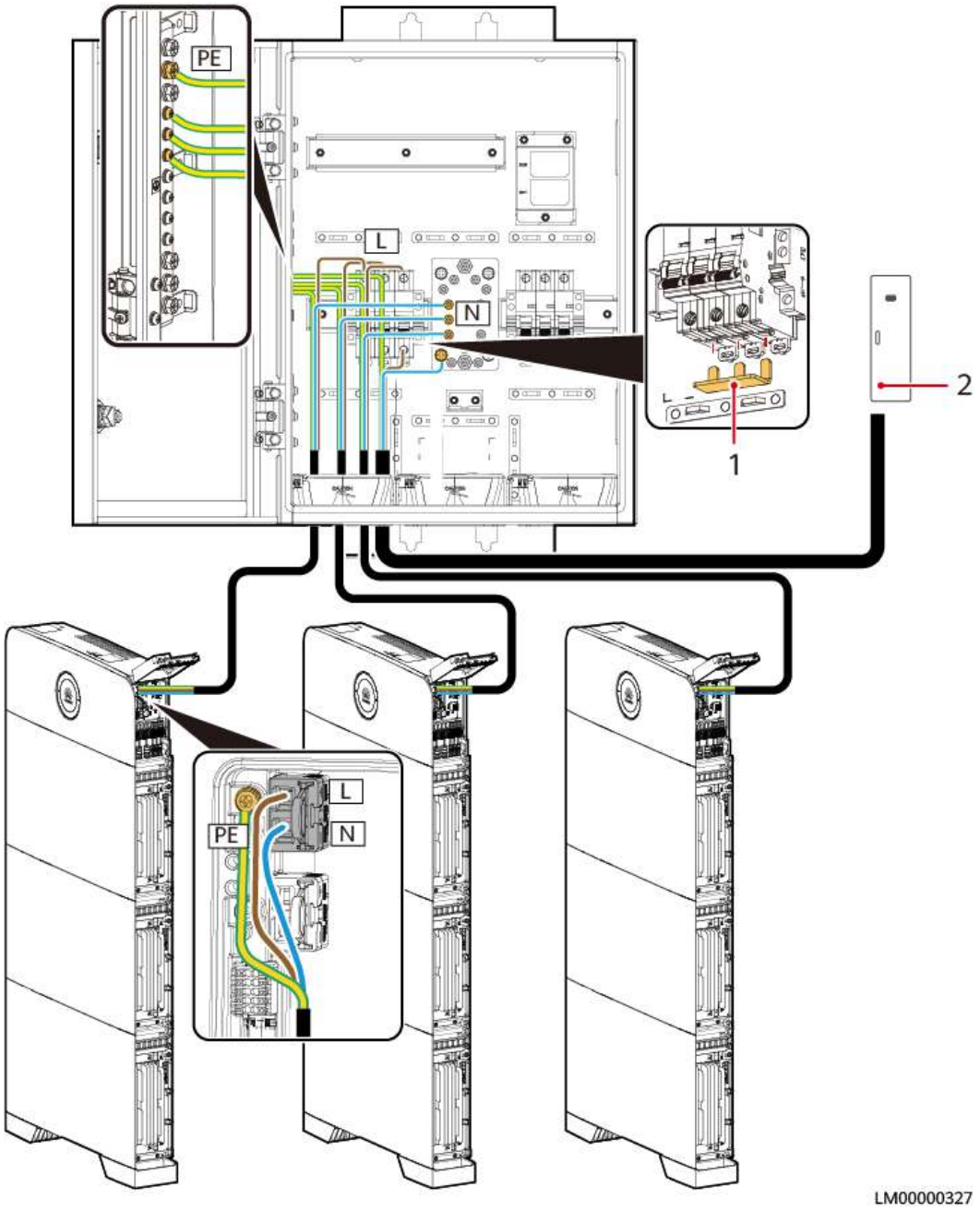
NOTE

- Install short-circuit plates for AC input circuit breakers.
- The three cables from the AC input circuit breaker to the power modules must be of the same length.

Procedure

Step 1 Install AC input power cables of the parallel box.

Figure 8-21 Install AC input power cables of the parallel box



(1) Short-circuit plate	(2) PDC

----End

8.2.5.3 Installing AC Output Power Cables in a Parallel System

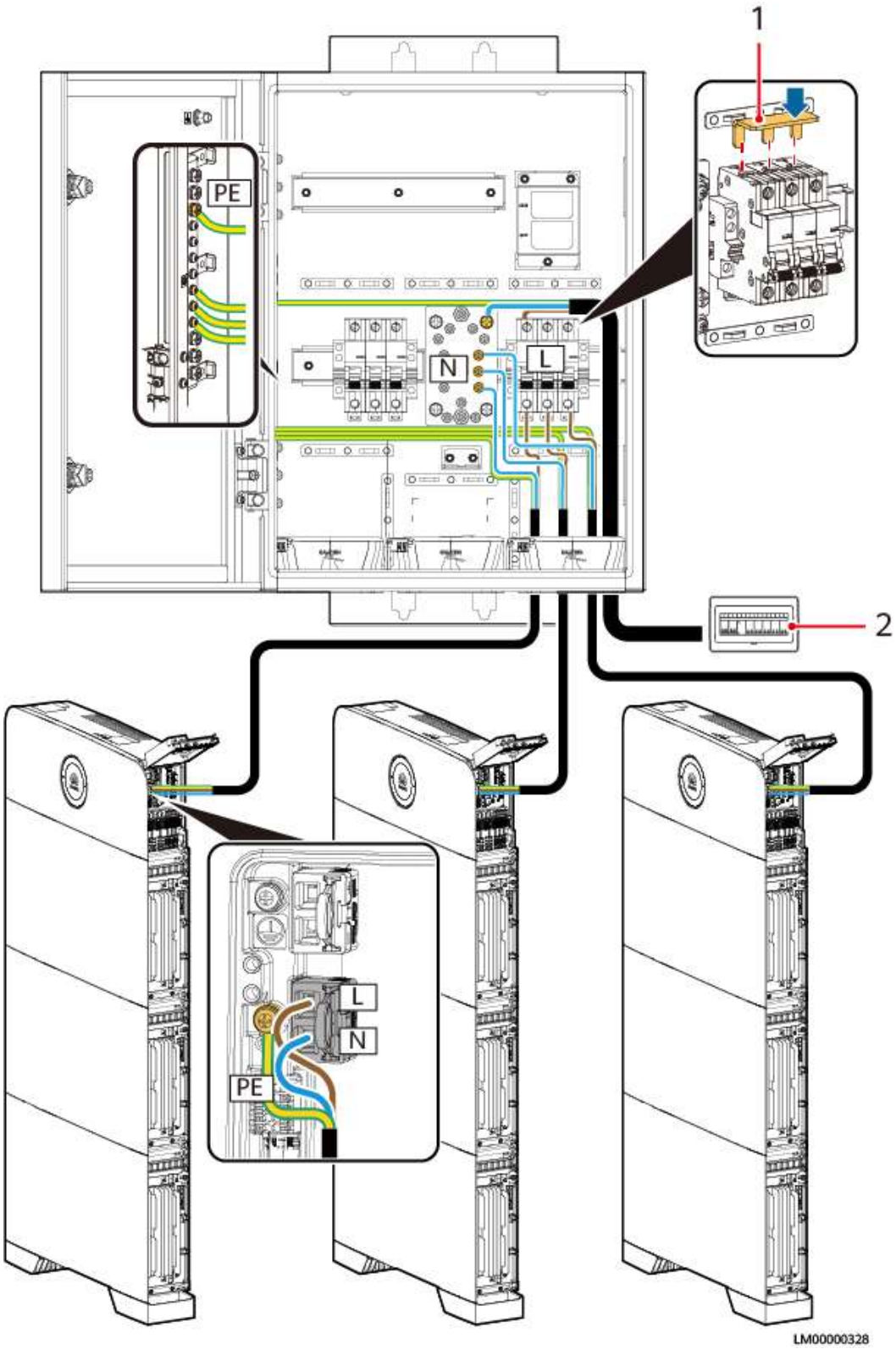
NOTICE

- Install short-circuit plates for AC output circuit breakers.
- The three cables from the AC output circuit breaker to the power modules must be of the same length.

Procedure

Step 1 Install AC output power cables of the parallel box.

Figure 8-22 Install AC output power cables of the parallel box



(1) Short-circuit plate	(2) PDB

----End

8.2.5.4 Installing Communications Cables in a Parallel System

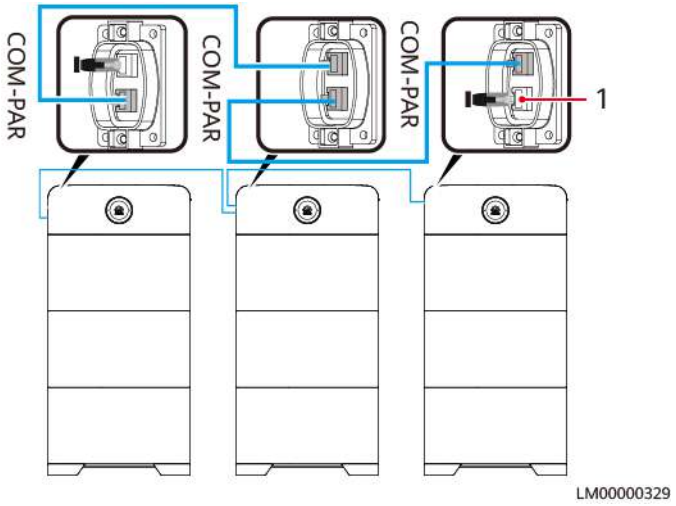
NOTICE

- When installing communications cables in a parallel system, install build-out resistors at the first and last modules. The build-out resistors are delivered with the product.
- The length of a single communications cable cannot exceed 3 m.
- The method of installing communications cables between power modules is the same as that between battery modules.

Procedure

Step 1 Install communications cables between parallel power modules.

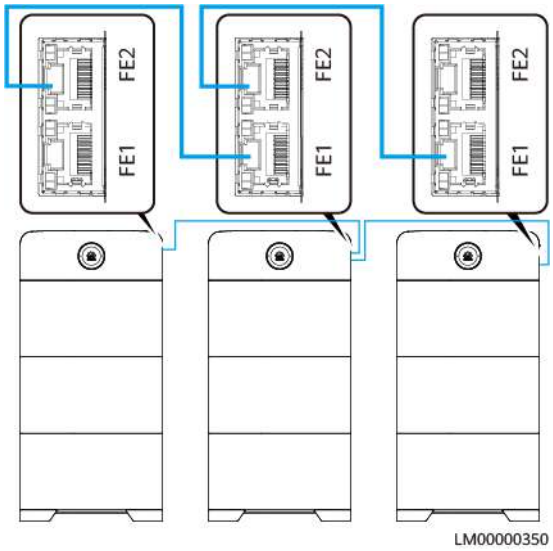
Figure 8-23 Installing communications cables



(1) Build-out resistor

Step 2 Connect the FE ports of the master and slave devices using a network cable.

Figure 8-24 Installing monitoring communications cables



----End

8.3 Solar-Grid Hybrid Scenario

8.3.1 Installing Ground Cables

Precautions

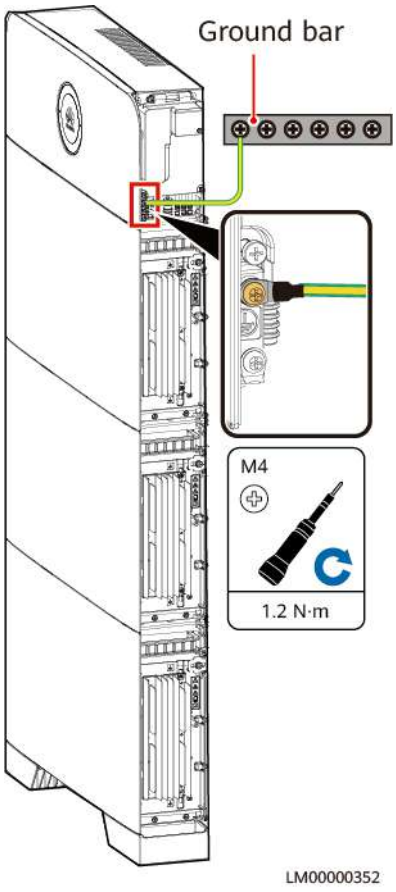
DANGER

Ensure that the ground cable is securely connected. Otherwise, electric shocks may occur.

Procedure

Step 1 Install ground cables.

Figure 8-25 Installing ground cables



----End

8.3.2 Installing the Internal Cable

CAUTION

- Do not reversely connect positive and negative battery module power cables.
- Use the power cables delivered with the product. If the number of cables is insufficient or any cable is damaged, contact the dealer to obtain cables. Do not prepare cables by yourself.

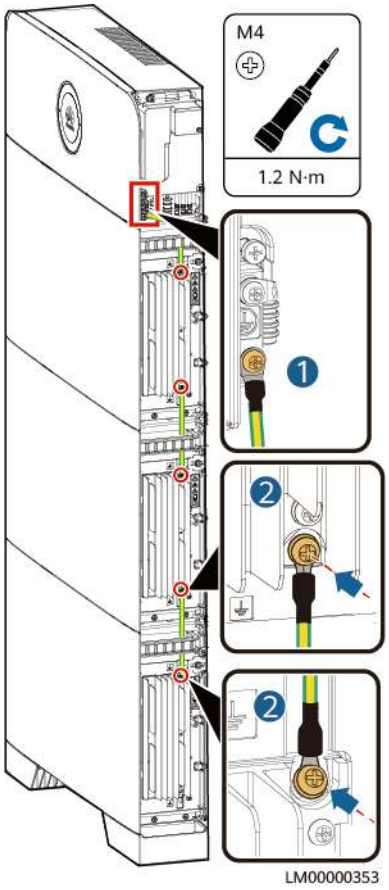
NOTICE

When a communications terminal is connected to a single network cable, a waterproof rubber plug must be installed.

Procedure

Step 1 Install ground cables.

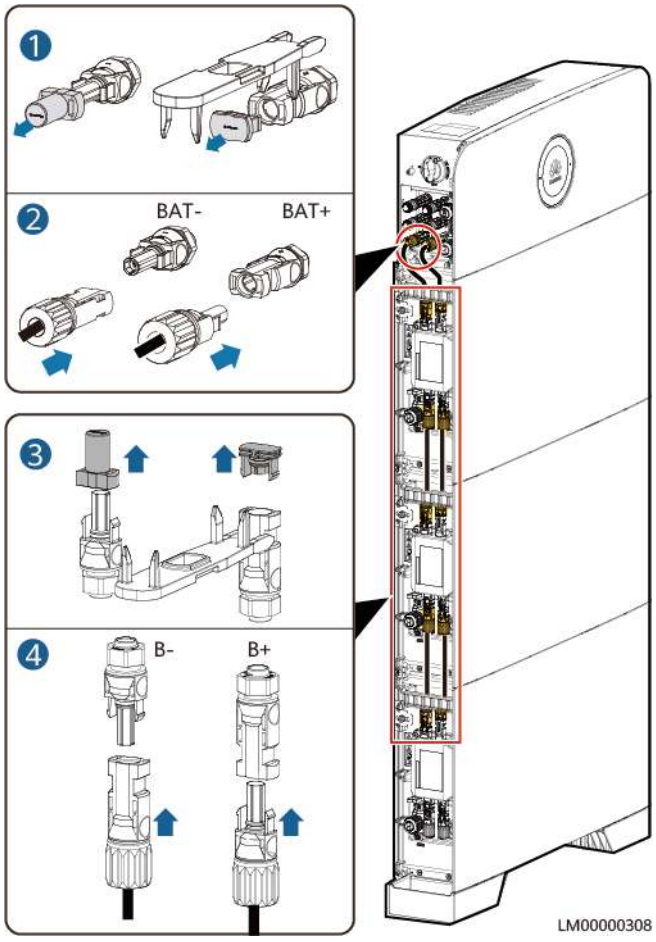
Figure 8-26 Installing ground cables



Step 2 Installing battery module power cables.

1. Use a wrench to remove the waterproof glands from the cascading terminals of the battery modules.
2. Install battery module power cables.
3. Use a removal wrench to remove the waterproof glands from the battery terminals on the power module.
4. Install power cables between the battery modules and power module.

Figure 8-27 Installing battery module power cables

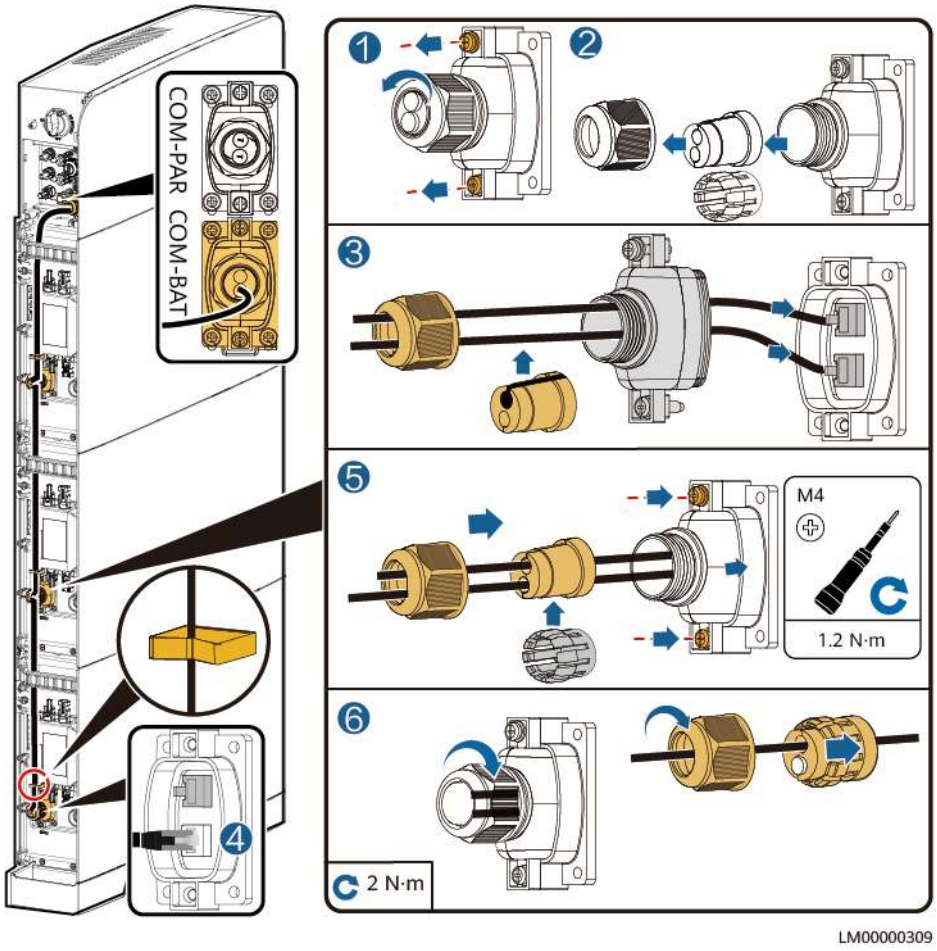


Step 3 Installing battery signal cables.

1. Remove the waterproof gland from the communications terminal of a battery module.
2. Remove the locking cap and waterproof rubber plug from the communications terminal housing.
3. Install communications cables for the battery module.
4. Install build-out resistors. Otherwise, the communication will be interrupted.
5. Lock the communications terminal waterproof gland,Reinstall the waterproof rubber plug.
6. Tighten the locking cap and secure the signal cables using cable clips.

Step 4 Install communications cables for other battery modules in sequence.

Figure 8-28 Installing battery signal cables



----End

8.3.3 Installing PV Input Power Cables

Procedure

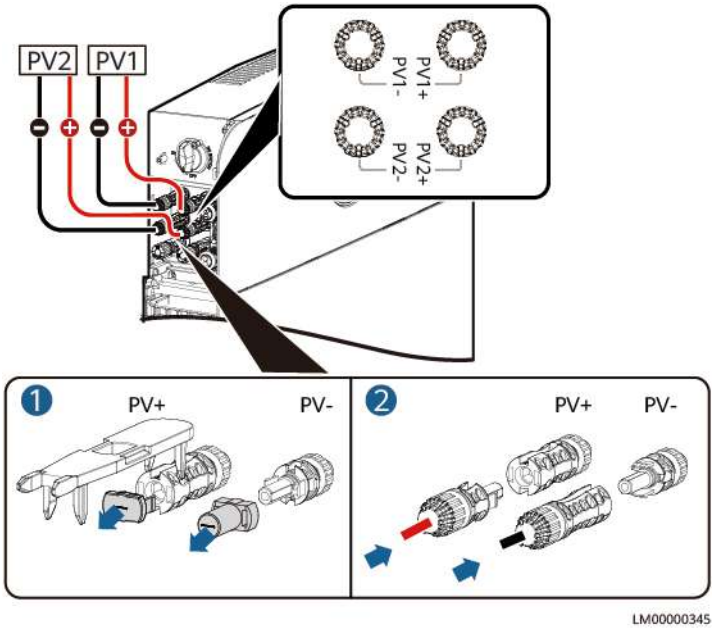
Step 1 Use a removal wrench to remove the waterproof gland from the PV input terminal on the power module.

NOTE

Take out the removal wrench from the decorative cover delivered with the product.

Step 2 Install the PV input power cables.

Figure 8-29 Installing the PV input power cables



----End

8.3.4 Install the AC Output Power Cable

CAUTION

- Do not reversely connect or short-circuit the live wire and neutral wire of an AC power cable.
- The PE wire of an AC power cable must be grounded.
- Do not reversely connect AC output power cables.

NOTICE

A leakage protection device must be configured for the AC output of the system. The leakage current must be 30 mA. You need to configure and install the device by yourself.

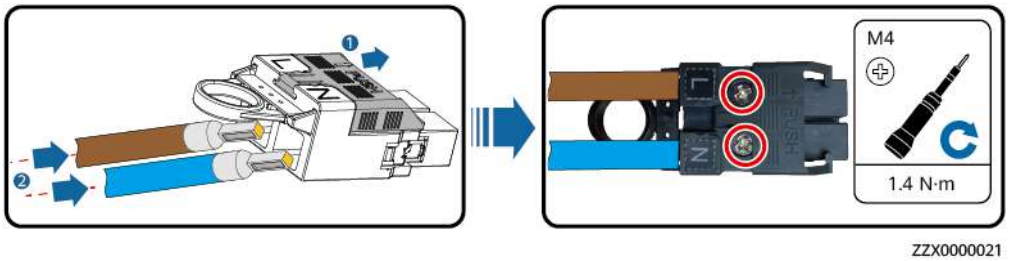
NOTE

In a single-node system, connect the other end of the AC output power cable to a PDB. In a parallel system, connect the other end of the AC output power cable to the AC parallel box.

Procedure

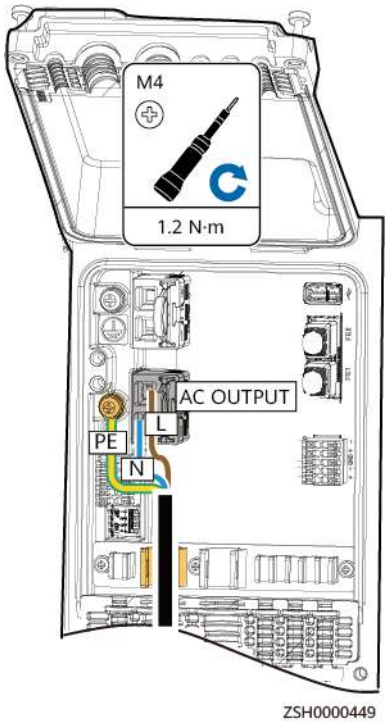
Step 1 Connect AC power cables to the terminal connectors.

Figure 8-30 Connecting cables to terminals



Step 2 Install the AC output power cable and secure the cable using cable clips.

Figure 8-31 Installing an AC output power cable



----End

8.3.5 Install the AC Input Power Cable

⚠ CAUTION

- Do not reversely connect or short-circuit the live wire and neutral wire of an AC power cable.
- The PE wire of an AC power cable must be grounded.
- Do not reversely connect AC input power cables.

NOTICE

- A surge protection device must be configured for the upstream AC input of the system. You need to configure and install the device by yourself.
- The upstream AC input of the system must be configured with an AC circuit breaker with a capacity of 40 A. The circuit breaker needs to be configured by the customer. The D-type tripping circuit breaker cannot be used because it cannot effectively protect the product.
- No leakage protection device is required for the upstream AC input. If a leakage protection device is configured, it is recommended that the leakage current be greater than or equal to 100 mA x *n*, where *n* is the number of power modules.

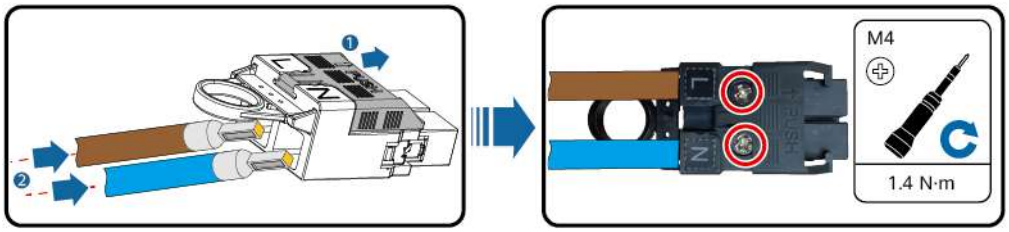
NOTE

In a single-node system, connect the other end of the AC input power cable to an AC PDC. In a parallel system, connect the other end of the AC input power cable to the AC parallel box.

Procedure

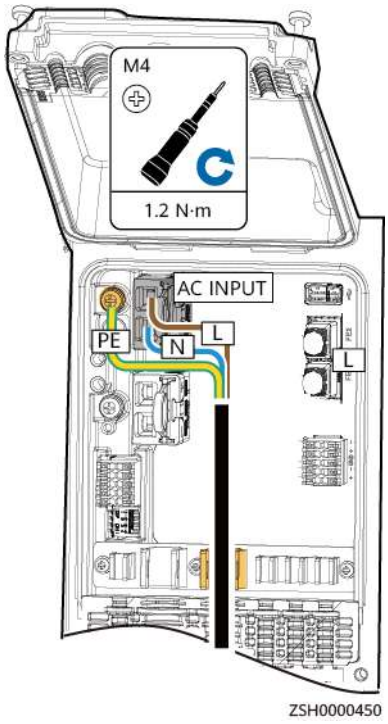
Step 1 Connect AC power cables to the terminal connectors.

Figure 8-32 Connecting cables to terminals



Step 2 Install the AC input power cable and secure the cable using cable clips.

Figure 8-33 Installing an AC input power cable



----End

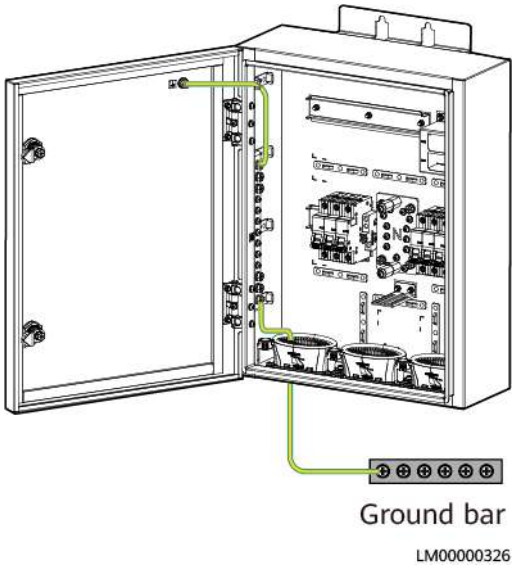
8.3.6 Installing Cables in a Parallel System

8.3.6.1 Installing a Ground Cable for the Parallel Box

Procedure

Step 1 Install a ground cable.

Figure 8-34 Installing a ground cable



----End

8.3.6.2 Installing AC Input Power Cables in a Parallel System

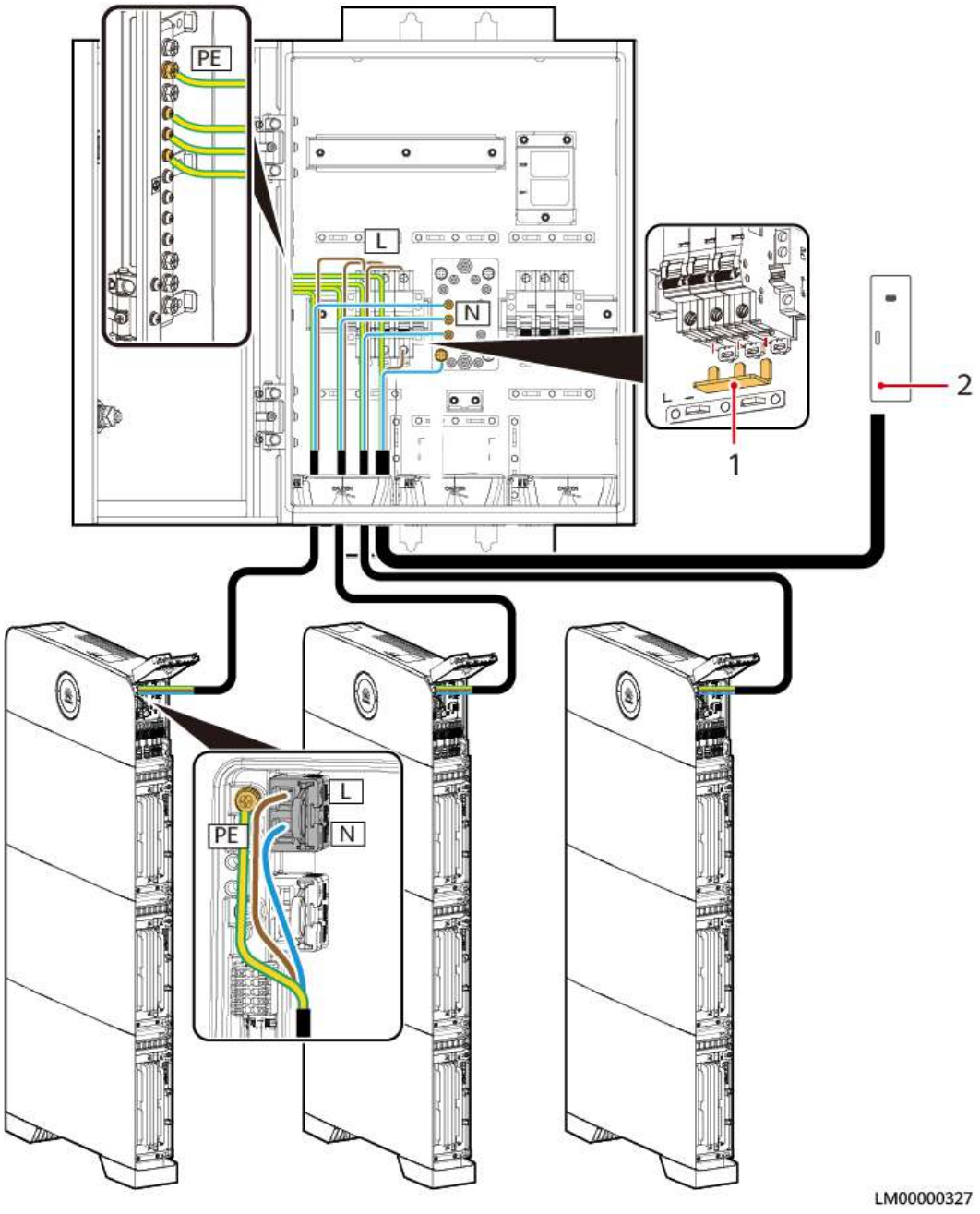
NOTE

- Install short-circuit plates for AC input circuit breakers.
- The three cables from the AC input circuit breaker to the power modules must be of the same length.

Procedure

Step 1 Install AC input power cables of the parallel box.

Figure 8-35 Install AC input power cables of the parallel box



(1) Short-circuit plate	(2) PDC

----End

8.3.6.3 Installing AC Output Power Cables in a Parallel System

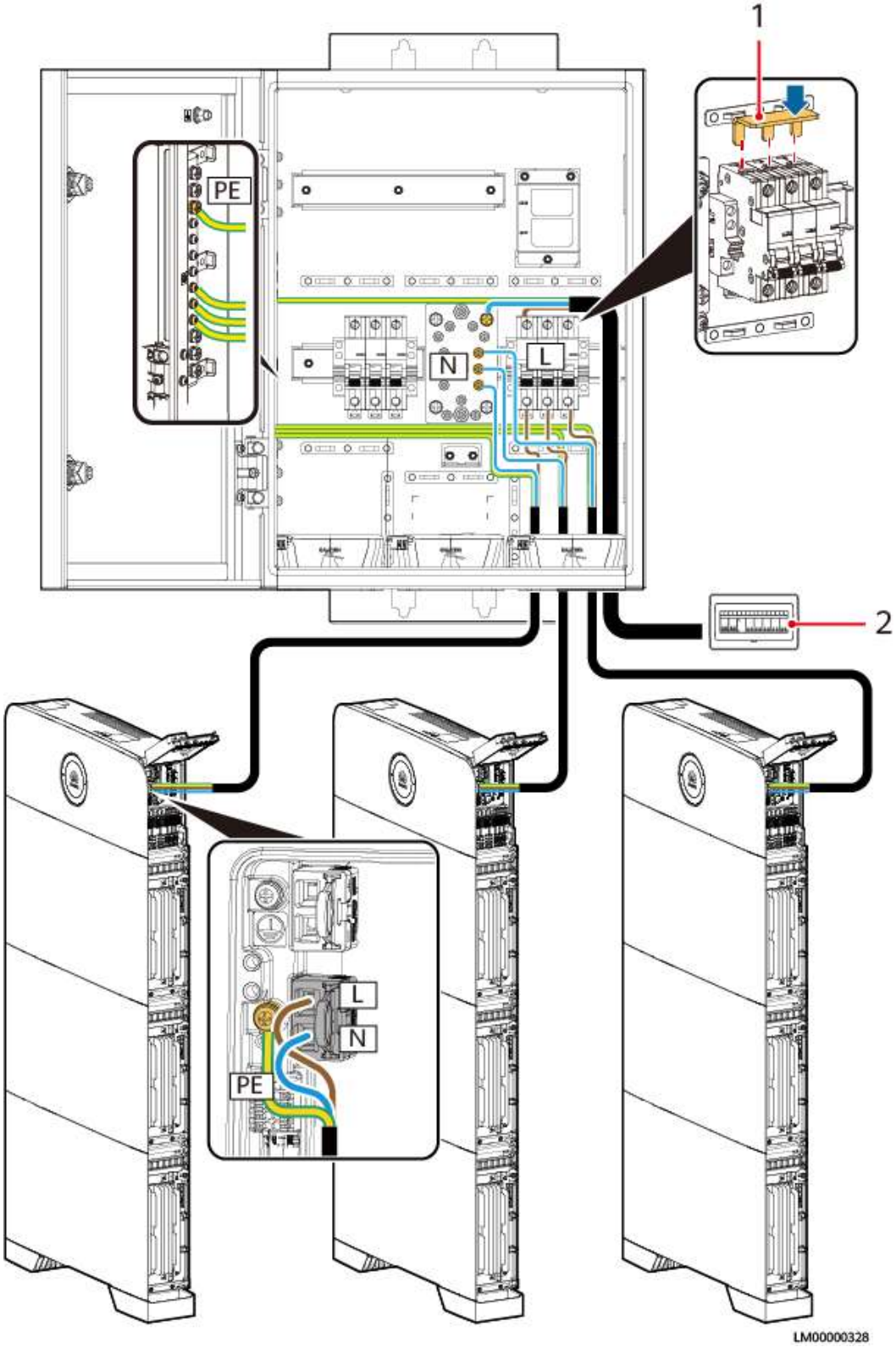
NOTICE

- Install short-circuit plates for AC output circuit breakers.
- The three cables from the AC output circuit breaker to the power modules must be of the same length.

Procedure

Step 1 Install AC output power cables of the parallel box.

Figure 8-36 Install AC output power cables of the parallel box



(1) Short-circuit plate	(2) PDB

----End

8.3.6.4 Installing Communications Cables in a Parallel System

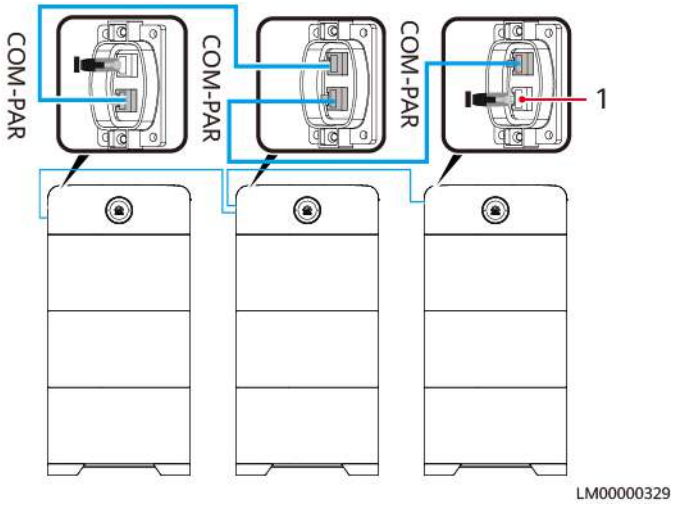
NOTICE

- When installing communications cables in a parallel system, install build-out resistors at the first and last modules. The build-out resistors are delivered with the product.
- The length of a single communications cable cannot exceed 3 m.
- The method of installing communications cables between power modules is the same as that between battery modules.

Procedure

Step 1 Install communications cables between parallel power modules.

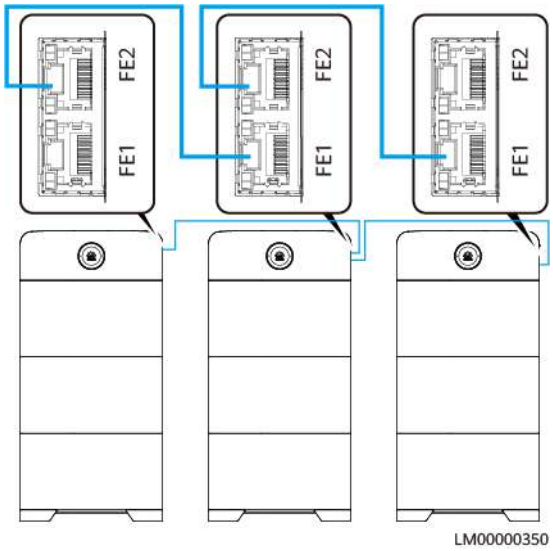
Figure 8-37 Installing communications cables



(1) Build-out resistor

Step 2 Connect the FE ports of the master and slave devices using a network cable.

Figure 8-38 Installing monitoring communications cables



----End

8.4 Solar-Genset Hybrid Scenario

8.4.1 Installing Ground Cables

Precautions

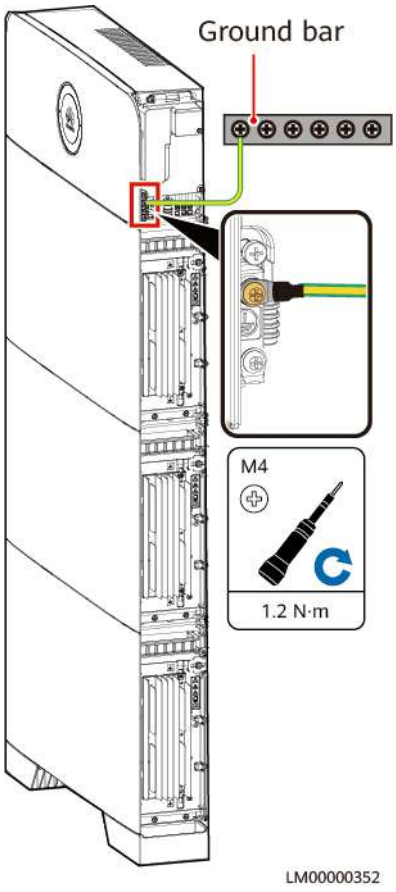
DANGER

Ensure that the ground cable is securely connected. Otherwise, electric shocks may occur.

Procedure

Step 1 Install ground cables.

Figure 8-39 Installing ground cables



----End

8.4.2 Installing the Internal Cable

CAUTION

- Do not reversely connect positive and negative battery module power cables.
- Use the power cables delivered with the product. If the number of cables is insufficient or any cable is damaged, contact the dealer to obtain cables. Do not prepare cables by yourself.

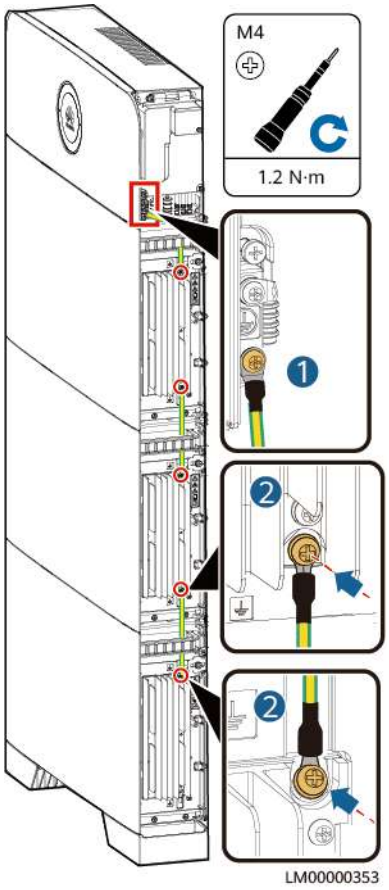
NOTICE

When a communications terminal is connected to a single network cable, a waterproof rubber plug must be installed.

Procedure

Step 1 Install ground cables.

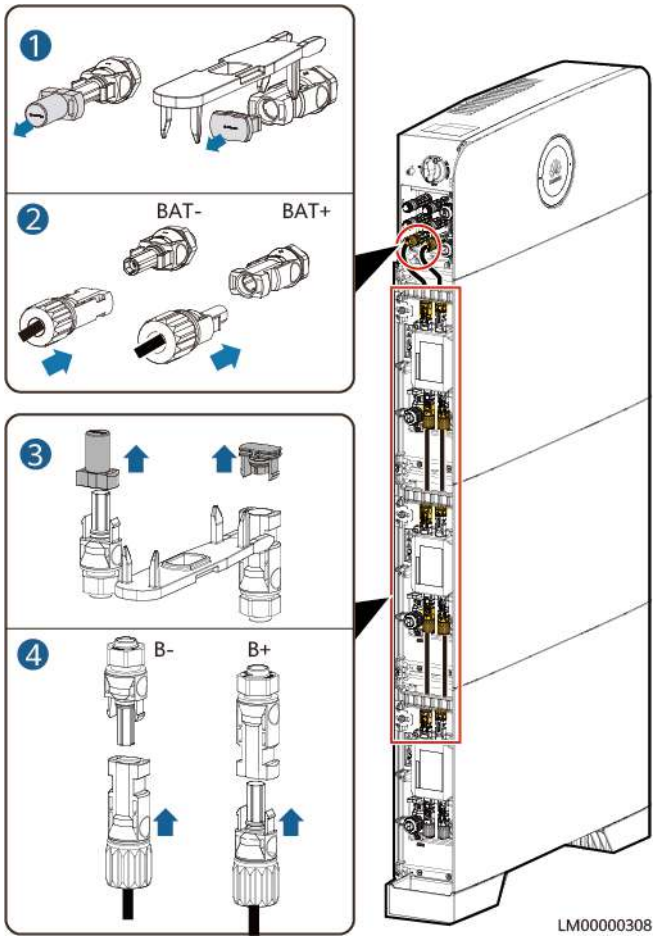
Figure 8-40 Installing ground cables



Step 2 Installing battery module power cables.

1. Use a wrench to remove the waterproof glands from the cascading terminals of the battery modules.
2. Install battery module power cables.
3. Use a removal wrench to remove the waterproof glands from the battery terminals on the power module.
4. Install power cables between the battery modules and power module.

Figure 8-41 Installing battery module power cables

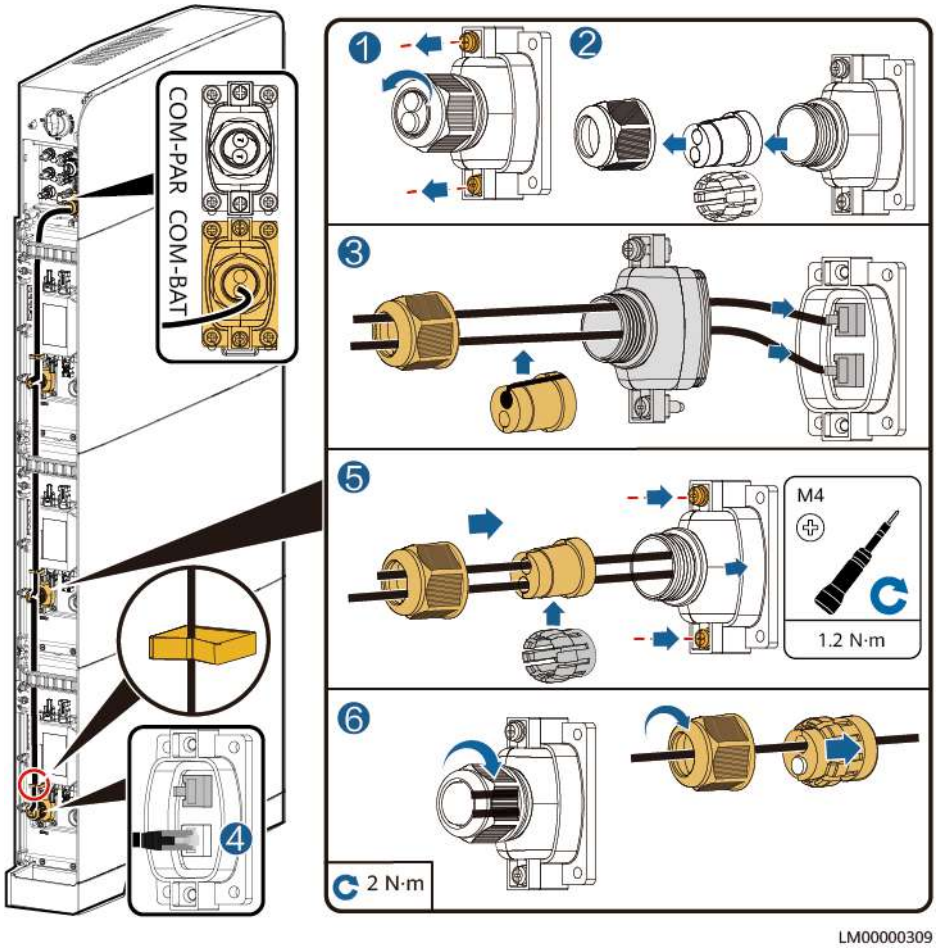


Step 3 Installing battery signal cables.

1. Remove the waterproof gland from the communications terminal of a battery module.
2. Remove the locking cap and waterproof rubber plug from the communications terminal housing.
3. Install communications cables for the battery module.
4. Install build-out resistors. Otherwise, the communication will be interrupted.
5. Lock the communications terminal waterproof gland,Reinstall the waterproof rubber plug.
6. Tighten the locking cap and secure the signal cables using cable clips.

Step 4 Install communications cables for other battery modules in sequence.

Figure 8-42 Installing battery signal cables



----End

8.4.3 Installing PV Input Power Cables

Procedure

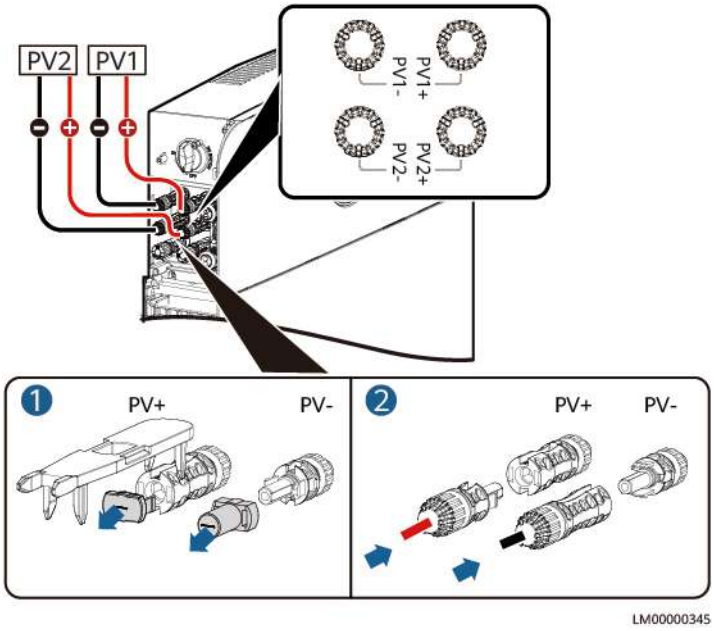
Step 1 Use a removal wrench to remove the waterproof gland from the PV input terminal on the power module.

NOTE

Take out the removal wrench from the decorative cover delivered with the product.

Step 2 Install the PV input power cables.

Figure 8-43 Installing the PV input power cables



----End

8.4.4 Install the AC Output Power Cable

CAUTION

- Do not reversely connect or short-circuit the live wire and neutral wire of an AC power cable.
- The PE wire of an AC power cable must be grounded.
- Do not reversely connect AC output power cables.

NOTICE

A leakage protection device must be configured for the AC output of the system. The leakage current must be 30 mA. You need to configure and install the device by yourself.

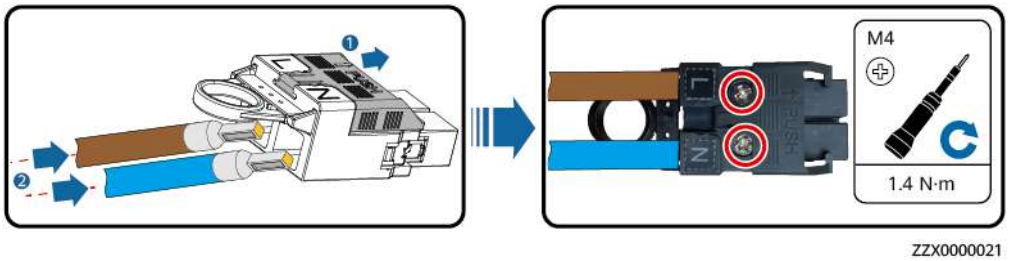
NOTE

In a single-node system, connect the other end of the AC output power cable to a PDB. In a parallel system, connect the other end of the AC output power cable to the AC parallel box.

Procedure

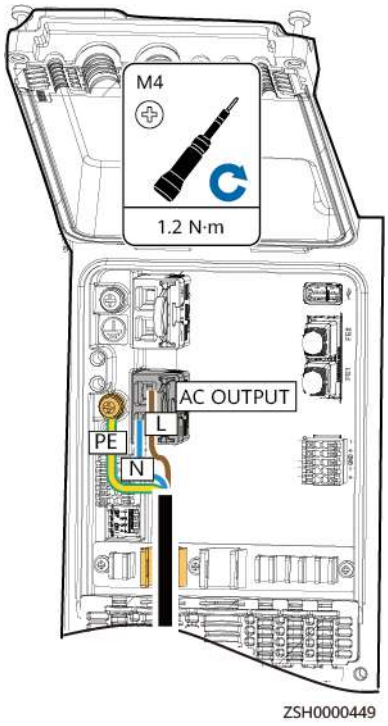
Step 1 Connect AC power cables to the terminal connectors.

Figure 8-44 Connecting cables to terminals



Step 2 Install the AC output power cable and secure the cable using cable clips.

Figure 8-45 Installing an AC output power cable



----End

8.4.5 Install the AC Input Power Cable

⚠ CAUTION

- Do not reversely connect or short-circuit the live wire and neutral wire of an AC power cable.
- The PE wire of an AC power cable must be grounded.
- Do not reversely connect AC input power cables.

NOTICE

- A surge protection device must be configured for the upstream AC input of the system. You need to configure and install the device by yourself.
- The upstream AC input of the system must be configured with an AC circuit breaker with a capacity of 40 A. The circuit breaker needs to be configured by the customer. The D-type tripping circuit breaker cannot be used because it cannot effectively protect the product.
- No leakage protection device is required for the upstream AC input. If a leakage protection device is configured, it is recommended that the leakage current be greater than or equal to 100 mA x *n*, where *n* is the number of power modules.

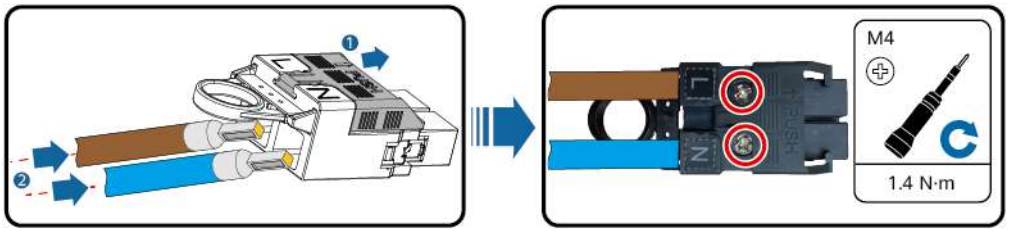
NOTE

In a single-node system, connect the other end of the AC input power cable to an AC PDC. In a parallel system, connect the other end of the AC input power cable to the AC parallel box.

Procedure

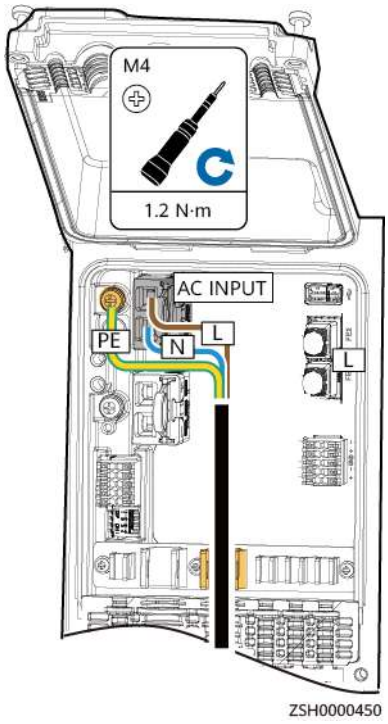
Step 1 Connect AC power cables to the terminal connectors.

Figure 8-46 Connecting cables to terminals



Step 2 Install the AC input power cable and secure the cable using cable clips.

Figure 8-47 Installing an AC input power cable



----End

8.4.6 Installing Genset Control Signal Cables

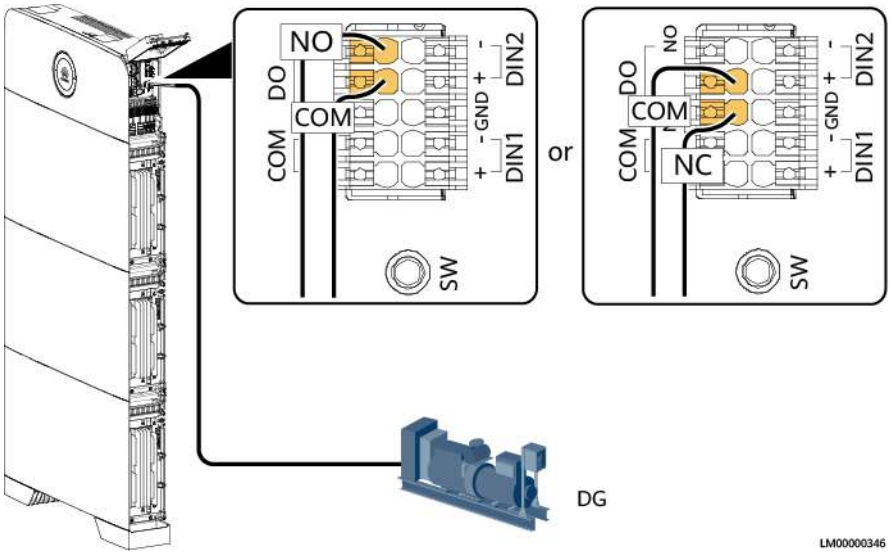
NOTICE

For a genset that starts when the dry contact is open, connect the signal cable to ports NO and COM. For a genset that starts when the dry contact is closed, connect the signal cable to ports NC and COM.

Procedure

Step 1 Install genset control signal cables.

Figure 8-48 Installing genset control signal cables



----End

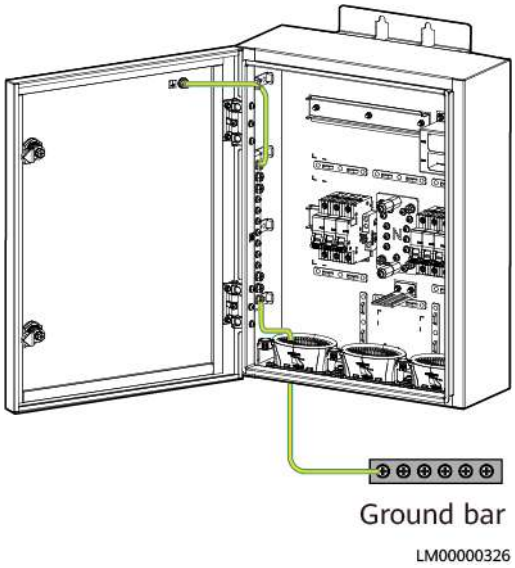
8.4.7 Installing Cables in a Parallel System

8.4.7.1 Installing a Ground Cable for the Parallel Box

Procedure

Step 1 Install a ground cable.

Figure 8-49 Installing a ground cable



----End

8.4.7.2 Installing AC Input Power Cables in a Parallel System

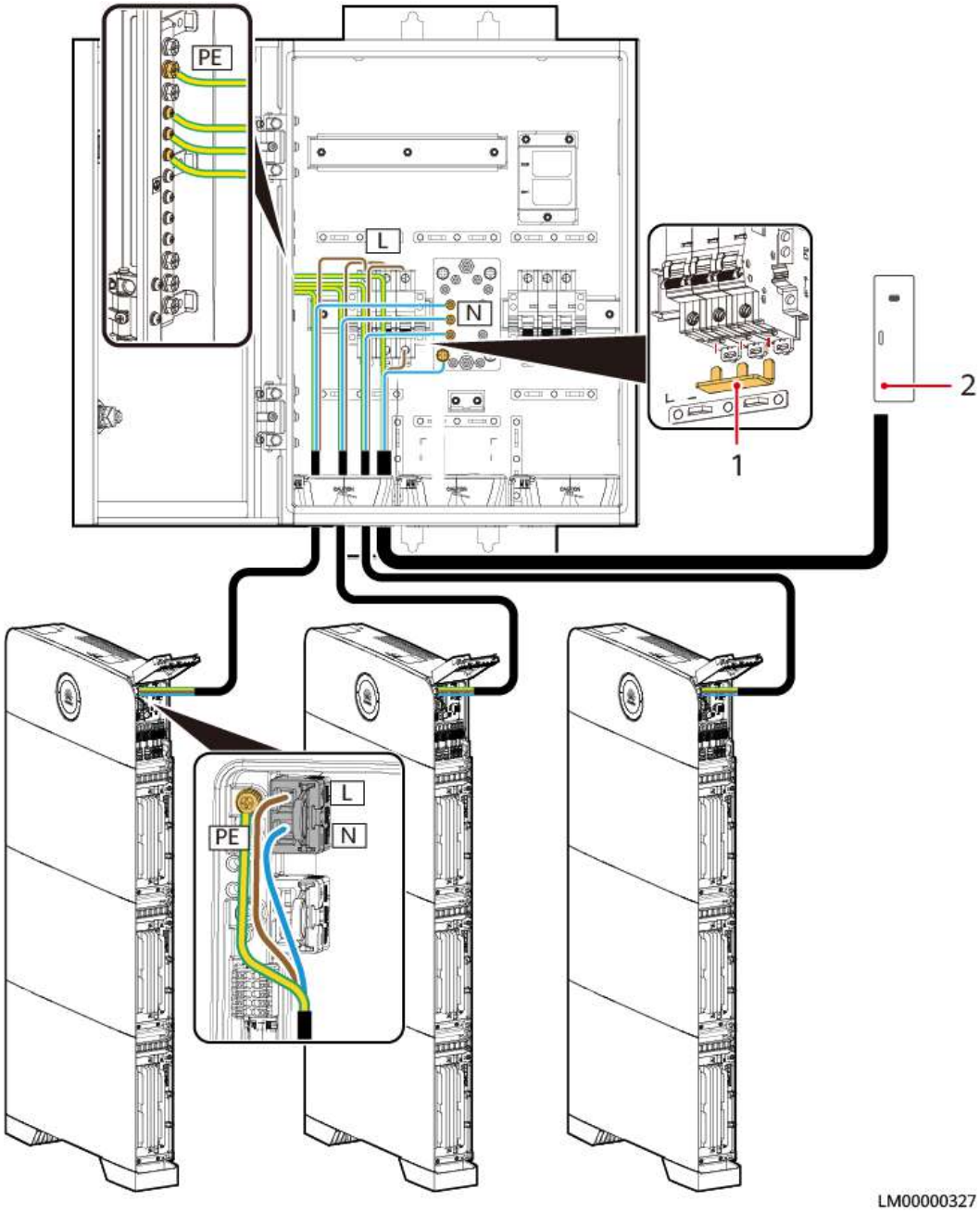
NOTE

- Install short-circuit plates for AC input circuit breakers.
- The three cables from the AC input circuit breaker to the power modules must be of the same length.

Procedure

Step 1 Install AC input power cables of the parallel box.

Figure 8-50 Install AC input power cables of the parallel box



(1) Short-circuit plate	(2) PDC

----End

8.4.7.3 Installing AC Output Power Cables in a Parallel System

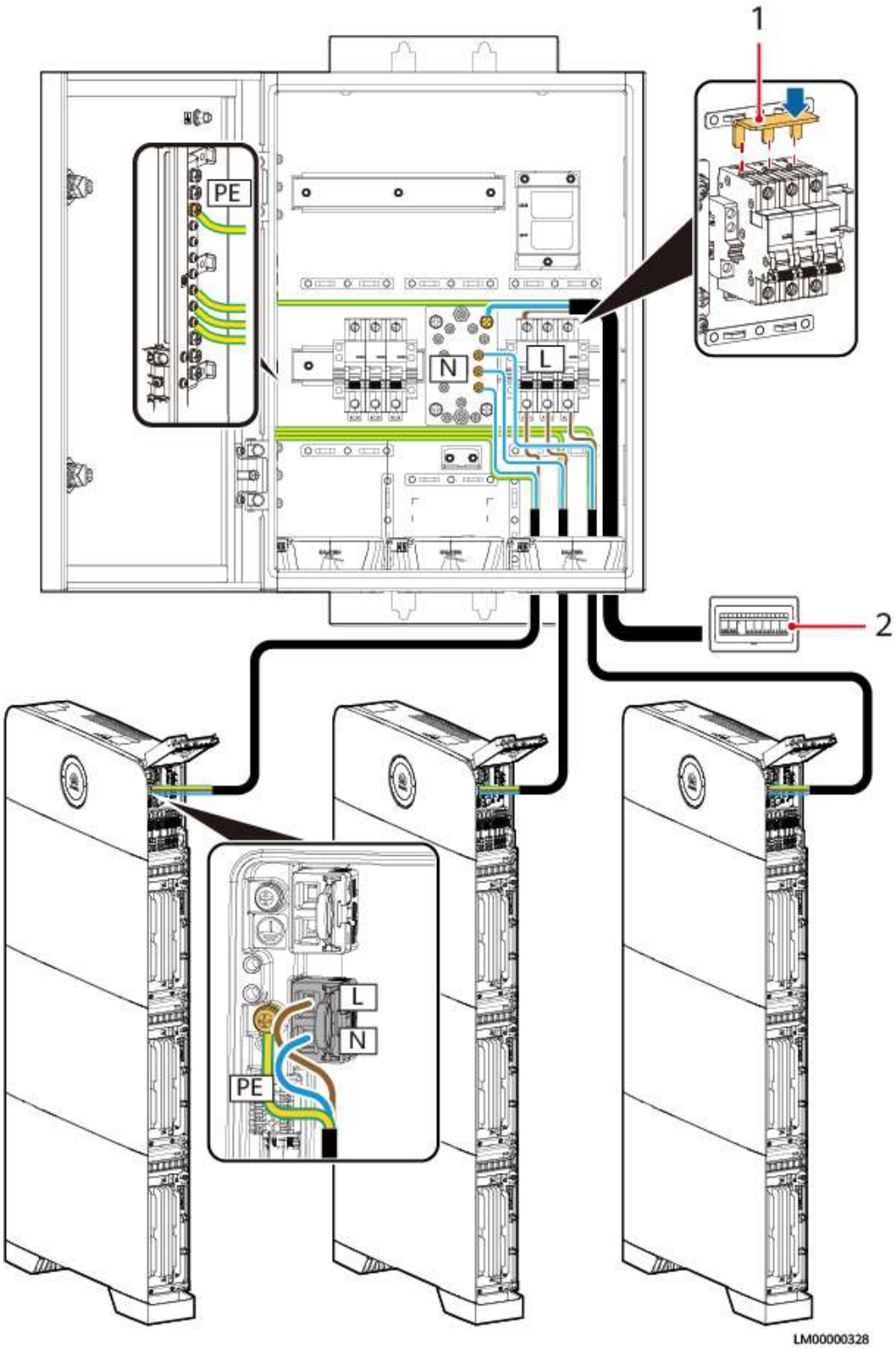
NOTICE

- Install short-circuit plates for AC output circuit breakers.
- The three cables from the AC output circuit breaker to the power modules must be of the same length.

Procedure

Step 1 Install AC output power cables of the parallel box.

Figure 8-51 Install AC output power cables of the parallel box



(1) Short-circuit plate	(2) PDB

----End

8.4.7.4 Installing Communications Cables in a Parallel System

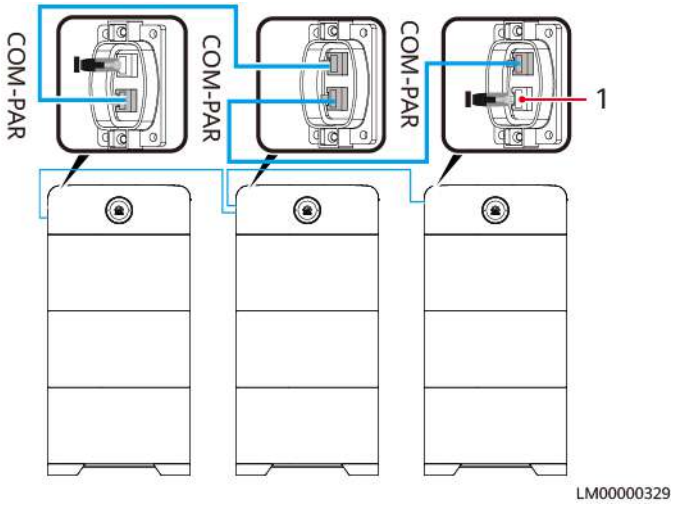
NOTICE

- When installing communications cables in a parallel system, install build-out resistors at the first and last modules. The build-out resistors are delivered with the product.
- The length of a single communications cable cannot exceed 3 m.
- The method of installing communications cables between power modules is the same as that between battery modules.

Procedure

Step 1 Install communications cables between parallel power modules.

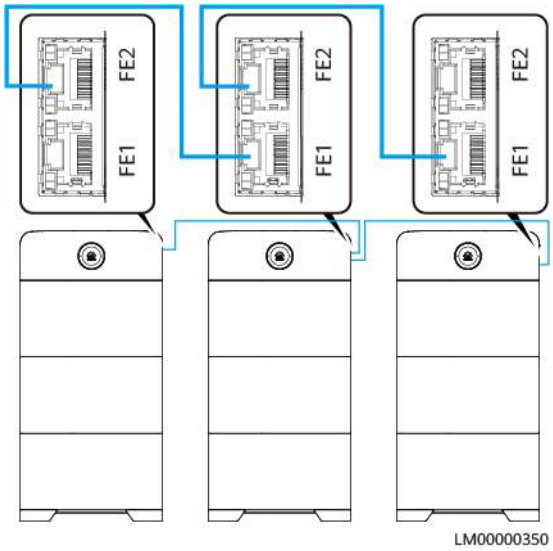
Figure 8-52 Installing communications cables



(1) Build-out resistor

Step 2 Connect the FE ports of the master and slave devices using a network cable.

Figure 8-53 Installing monitoring communications cables



----End

8.5 (Optional) Installing Cables in Capacity Expansion Scenario

NOTICE

- In capacity expansion scenarios, bottom cascading cables must be routed from the rear of the product.
- Cables outside the device must be routed through cable pipes.

8.5.1 Installing Ground Cables

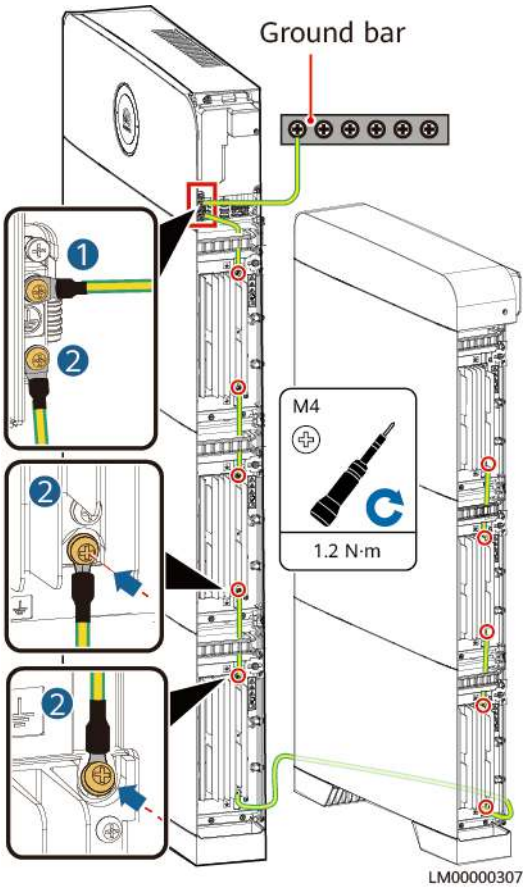
DANGER

Ensure that the ground cable is securely connected. Otherwise, electric shocks may occur.

Procedure

Step 1 Install ground cables.

Figure 8-54 Installing ground cables



----End

8.5.2 Installing the Internal Cable

CAUTION

- Do not reversely connect positive and negative battery module power cables.
- Use the power cables delivered with the product. If the number of cables is insufficient or any cable is damaged, contact the dealer to obtain cables. Do not prepare cables by yourself.

NOTICE

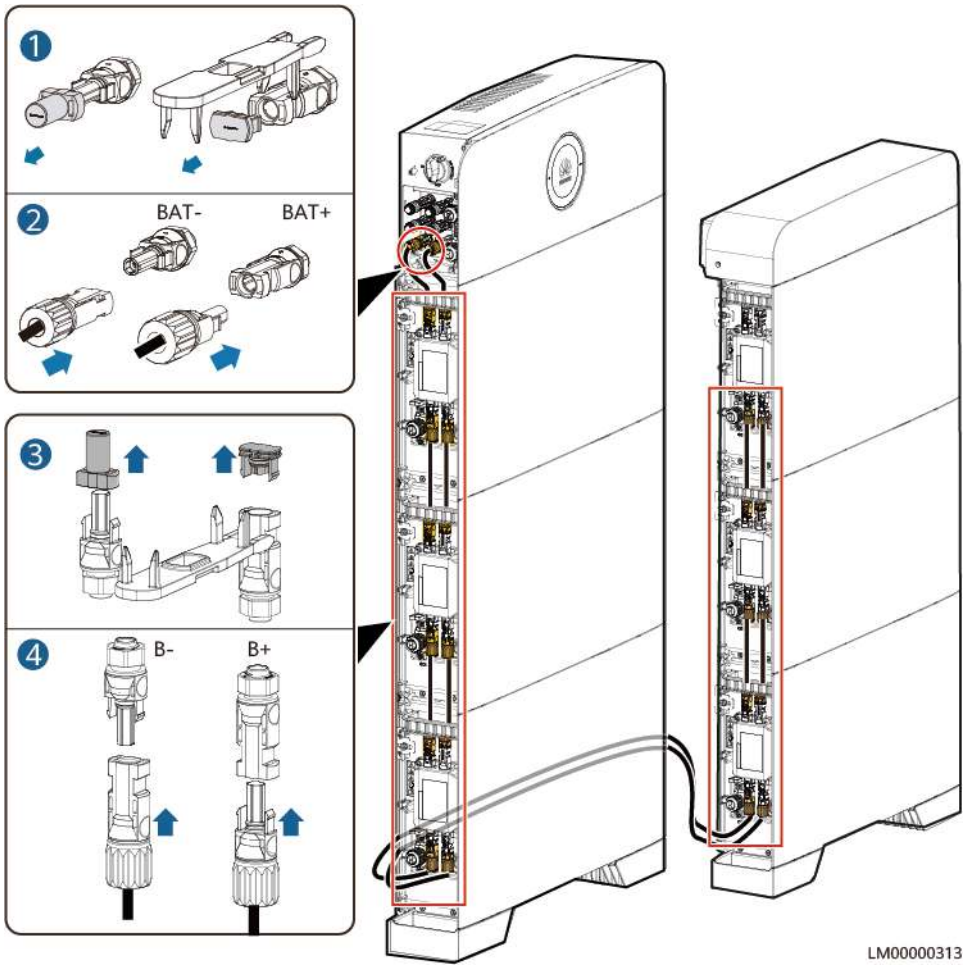
When a communications terminal is connected to a single network cable, a waterproof rubber plug must be installed.

Procedure

Step 1 Installing battery module power cables.

1. Use a wrench to remove the waterproof glands from the cascading terminals of the battery modules.
2. Install battery module power cables.
3. Use a removal wrench to remove the waterproof glands from the battery terminals on the power module.
4. Install power cables between the battery modules and power module.

Figure 8-55 Installing battery module power cables

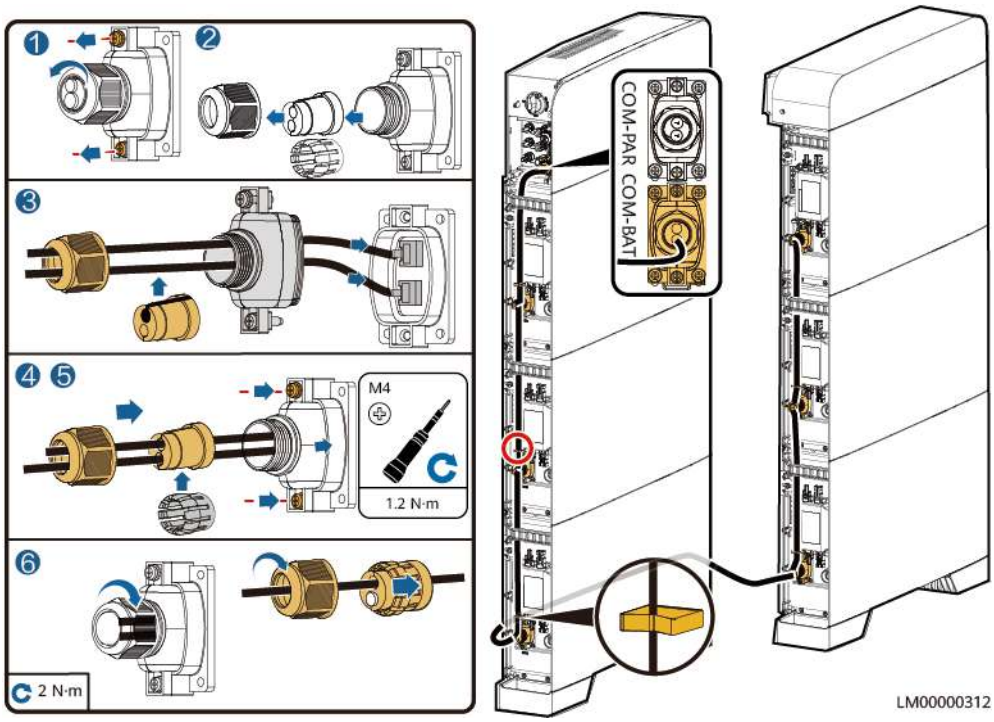


Step 2 Installing battery signal cables.

1. Remove the waterproof gland from the communications terminal of a battery module.
2. Remove the locking cap and waterproof rubber plug from the communications terminal housing.
3. Install communications cables for the battery module.
4. Lock the communications terminal waterproof gland.
5. Reinstall the waterproof rubber plug.
6. Tighten the locking cap and secure the signal cables using cable clips.

Step 3 Install communications cables for other battery modules in sequence.

Figure 8-56 Installing battery signal cables



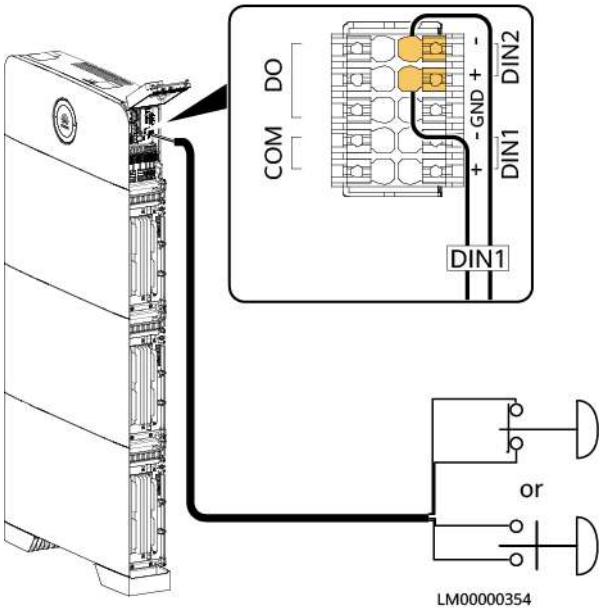
----End

8.6 (Optional) Connecting a Remote EPO Cable

NOTICE

- The EPO switch can be connected to the device and can be associated with DIN1/DIN2 through software configuration. By default, the EPO switch is closed.
- Press and hold the EPO switch for 3s to shut down the entire system (including the DG).
- The connection position of the EPO switch must be different from the mains detection position of the ATS.
- Prepare the EPO switch and cable before installation. The recommended cable size is 22 AWG.
- Equip the EPO switch with a protective cover to prevent misoperations, and protect the cable with a protective tube.

Figure 8-57 Connecting a remote EPO cable



8.7 Verifying the Installation

8.7.1 Verifying the Installation

Table 8-1 Check items and acceptance criteria

No.	Check Item	Expected Result
1	Product installation	The installation is correct and reliable.
2	Cables routing	Cables are routed properly as required by the customer.
3	Cable bonding	Cable ties are evenly distributed and no burr exists.
4	Grounding	Power cables, signal cables, and ground cables are correctly and securely connected.
5	Switch	The DC SWITCH and all switches connected to the product are OFF.
6	Short circuit at AC input and output ports	The live wire and neutral wire of an AC power cable is correctly connected.
7	Unused terminal and port	Unused terminals and ports are locked by waterproof glands.
8	Removal wrench	The removal wrench is placed in the original position in the decorative cover.

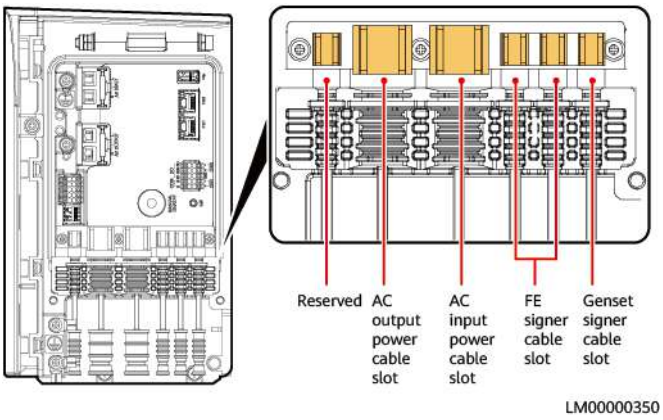
No.	Check Item	Expected Result
9	Installation environment	The installation space is proper, and the installation environment is clean and tidy.

8.7.2 Arranging Cables

NOTICE

Check that the cables are correctly connected. Then fasten the cables to the corresponding cable slots.

Figure 8-58 Cable hole distribution

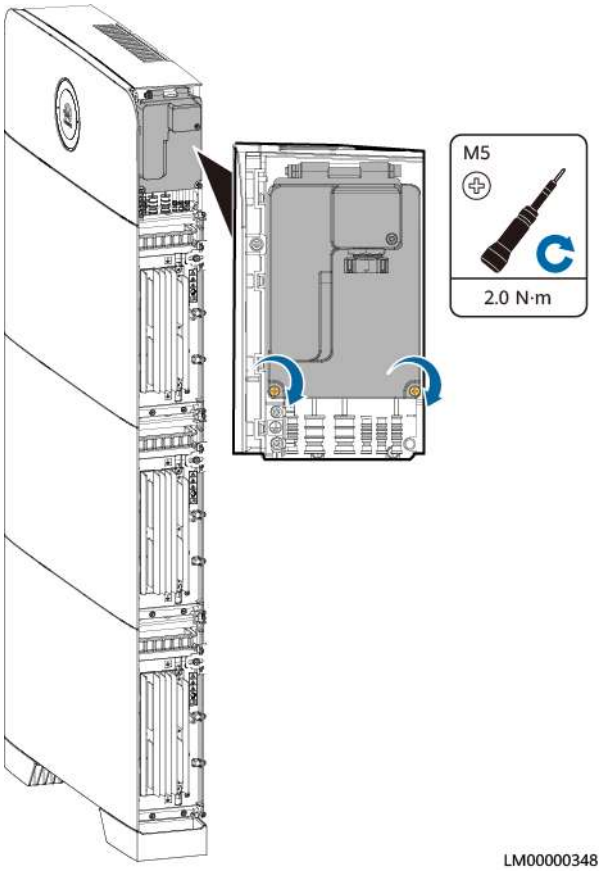


8.7.3 Subsequent Operations

Procedure

Step 1 Close the maintenance compartment door.

Figure 8-59 Closing the maintenance compartment door



Step 2 To facilitate cabling, you can cut the decorative cover based on the actual situation.

Figure 8-60 Cutting the left decorative cover

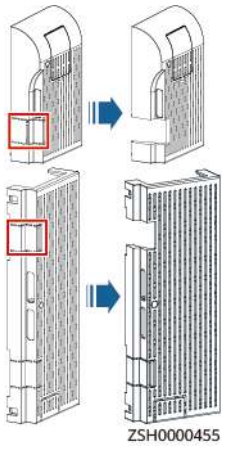
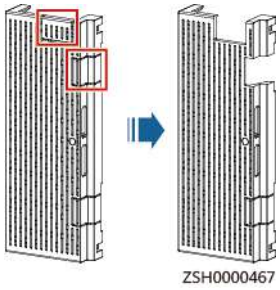


Figure 8-61 Cutting the right decorative cover

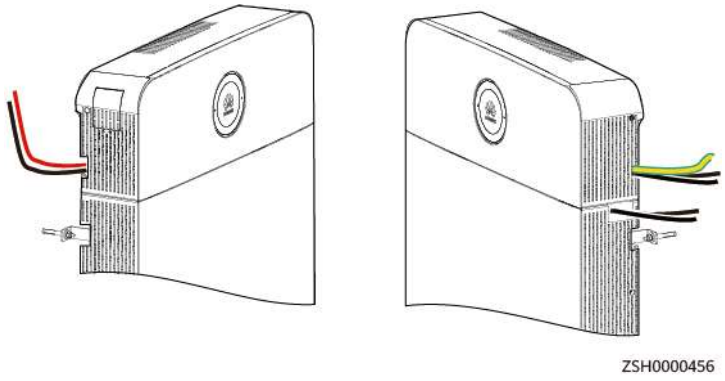


Step 3 Route the cables out of the cable holes.

NOTICE

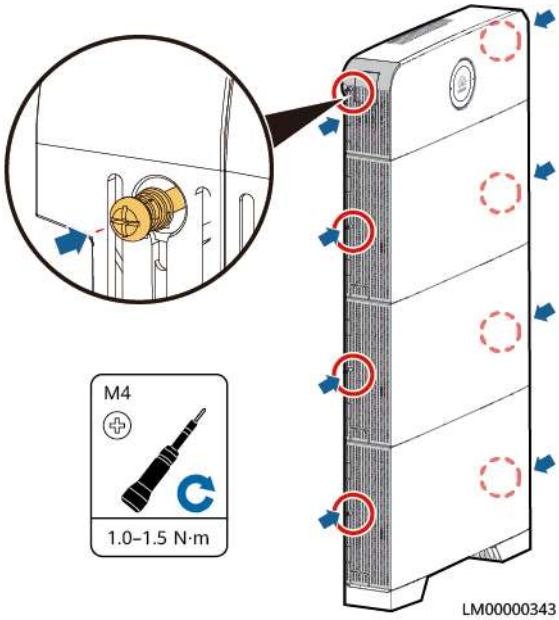
The outlet positions shown in the figure are for reference only. Select an appropriate cable outlet based on the actual cable thickness.

Figure 8-62 Cable routes



Step 4 Tighten the screws.

Figure 8-63 Installing the decorative covers



----End

9 System Commissioning

9.1 System Power-On

NOTICE

- The product must be powered on within 24 hours after being unpacked. During maintenance, the power-off time cannot exceed 24 hours.
- When there is no PV input and batteries are out of power, the product cannot be started. You need to manually clear the alarm on the app.
- If there is no PV or AC input, start the device through the manual ON/OFF switch.
- In a parallel system, after cables are connected, disconnect loads first. Start all slave products and then the master product. After all products are started, log in to the master product to set parameters.

Procedure

Step 1 Turn on the corresponding switch based on the scenario.

- If there is PV input, turn on the DC SWITCH.
- If there is no PV or AC input, hold down the manual ON/OFF switch for 5s.

Step 2 Switch on the upstream AC input circuit breaker for the iSitePower-M system.

Step 3 After the initial installation and power-on, observe the LED indicator to check the running status.

----End

9.2 Battery Commissioning

NOTICE

- When the output voltage system is adjusted, the system is powered off and then restarted. No manual operation is required.
- If there is no AC input, the product will be powered off during the upgrade. Therefore, you are advised to upgrade the product when AC input is available.

9.2.1 Installing the App

Prerequisites

- A mobile phone running Android 8.0 or later is available.
- The app cannot be installed on a tablet, folding screen, or landscape screen device.

Downloading and Installing the NetEco App

- Method 1: Search for NetEco in Huawei AppGallery and download the latest installation package.
- Method 2: Scan the QR code to download and install the latest installation package.

Figure 9-1 QR code

9.2.2 New Site Deployment

Refer to *iSitePower-M App Quick Guide* to perform app commissioning. You can scan the QR code to obtain *iSitePower-M App Quick Guide*.

Figure 9-2 QR code of *iSitePower-M App Quick Guide*

10 System Maintenance

10.1 System Power-Off

Precautions

- After the system powers off, the remaining electricity and heat may still cause electric shocks and body burns. Therefore, wear protective gloves 5 minutes after the system is powered off before performing any operation. Maintain the product after all indicators are off.
- When an iSitePower system is running, turning off the DC SWITCH of the product cannot completely power off the system. In this case, you cannot perform maintenance operations on the product.

Powering Off the System

Step 1 Switch off the upstream AC input circuit breaker for the iSitePower-M system.

Step 2 Set the DC SWITCH on the power module to OFF.

Step 3 Hold down the manual ON/OFF switch for 5s to shut down the battery module.

----End

10.2 Routine Maintenance

To ensure that the power system operates properly for a long term, you are advised to perform routine maintenance as described in this chapter.

⚠ CAUTION

Before cleaning the system, connecting cables, and checking the grounding reliability, power off the system.

Table 10-1 Maintenance checklist

Check Item	Check Method	Maintenance Interval
System cleanliness	Check periodically that the heat sinks are free from obstacles and dust.	Once every 6 to 12 months
System running status	• Check that the product is not damaged or deformed. • Check that the product does not generate abnormal sound when it is operating. • Check that the parameters are correctly set when the system is running.	Once every 6 months
Electrical connection	• Check that cables are secured. • Check that the cables are intact, especially that the parts touching the metallic surface are not scratched. • Check that the unused PV input terminals, communications terminals, and waterproof glands are locked.	The first inspection is 6 months after the initial commissioning. From then on, the interval can be 6 to 12 months.
Grounding reliability	Check that ground cables are securely connected.	The first inspection is 6 months after the initial commissioning. From then on, the interval can be 6 to 12 months.

10.3 Troubleshooting

Alarm severities are defined as follows:

- Major: The power system shuts down or some functions are abnormal due to a fault.
- Minor: Some components of the system are faulty but the system can still operate.

Table 10-2 Common alarms and troubleshooting measures

Alarm Name	Alarm Severity	Causes	Alarm Locating	Suggestion
Power module high temperature	Minor	1. The installation position of the power module is not well ventilated. 2. The ambient temperature is too high. 3. The power module does not work properly.		1. Check the ventilation and whether the ambient temperature of the power module exceeds the upper threshold. 2. If the ventilation is poor or the ambient temperature is too high, improve the ventilation and heat dissipation. 3. If the ventilation and ambient temperature are normal, contact your dealer or Huawei technical support.
Battery module abnormal	Major	An unrecoverable fault has occurred on an internal circuit of a battery module.		1. Check whether the power and communications cables are correctly connected. 2. Turn on the solar maintenance switch and AC input switch. 3. If the alarm persists, contact your dealer or Huawei technical support.

Alarm Name	Alarm Severity	Causes	Alarm Locating	Suggestion
Battery module cable disconnected	Major	1. Cables to a battery module are disconnected. 2. A battery module is abnormal.		1. Turn off the solar maintenance switch and AC input switch. 2. Check whether the power cable is properly installed (whether the terminal is loose or disconnected, or whether the cable is disconnected) by referring to the quick installation guide for the product. 3. After checking that cables are correctly connected, turn on the solar maintenance switch and AC input switch in sequence. 4. If the alarm persists, contact your dealer or Huawei technical support.
Battery module high temperature	Minor	1. The installation position is not well ventilated. 2. The ambient temperature is too high. 3. The power module does not work properly.		1. Check the ventilation and whether the ambient temperature of the product exceeds the upper threshold. 2. If the ventilation is poor or the ambient temperature is too high, improve the ventilation and heat dissipation. 3. If the ventilation and ambient temperature are normal, contact your dealer or Huawei technical support.

Alarm Name	Alarm Severity	Causes	Alarm Locating	Suggestion
Battery module low temperature	Minor	1. The ambient temperature is excessively low. 2. A battery module is abnormal.		1. Check whether the ambient temperature at the installation position is lower than the lower threshold. 2. If the ambient temperature is excessively low, improve the installation environment. 3. If the alarm persists after the ambient temperature becomes normal, contact your dealer or Huawei technical support.
Battery module short circuit	Major	1. A battery cable is short-circuited. 2. A battery module is abnormal.		1. Turn off the solar maintenance switch and AC input switch. 2. Check the power cable connection by referring to the quick installation guide. If the cable is damaged or short-circuited, replace it. 3. After checking that cables are correctly connected, turn on the solar maintenance switch and AC input switch in sequence. 4. If the alarm persists, contact your dealer or Huawei technical support.
Overload exceeding the time limit	Major	AC overload occurred.		1. Manually clear the alarm on the app. 2. Power off the system and restart it. 3. If the alarm persists, contact your dealer or Huawei technical support.

Alarm Name	Alarm Severity	Causes	Alarm Locating	Suggestion
PV Module Protected	Minor	PV module protection, input overvoltage / undervoltage protection, bus overvoltage / undervoltage protection, PV low irradiance, internal overtemperature.	1. Input overvoltage/ undervoltage protection: Check whether the PV input voltage is within the specified range on the mobile phone app or using a multimeter. If not, the PV input is abnormal. 2. PV low irradiance: Generally, a low irradiance alarm is likely to be generated in the early morning or at dusk. The alarm can be automatically cleared during high irradiance after the product runs for a maximum of 30 minutes or manually cleared using the mobile phone app. 3. Internal overtemperature: If the internal temperature exceeds the protection threshold, check whether	1. Check whether the alarm is cleared. If yes, no further action is required. If no, go to the next step. 2. Power off and then power on the system, and check whether the alarm is cleared. If yes, no further action is required. If no, go to the next step. 3. Contact Huawei technical support to check the module.

Alarm Name	Alarm Severity	Causes	Alarm Locating	Suggestion
			the ambient temperature is too high or whether the heat sink is blocked. Disconnect loads and let the system run for a period of time. Check whether the alarm is automatically cleared.	

Alarm Name	Alarm Severity	Causes	Alarm Locating	Suggestion
PV Module Fault	Major	PV module fault, relay fault, PV self-check error, insulation error, AFCI fault.	1. Relay fault: The relay is damaged, the power supply to the relay is abnormal, or the relay control signal is abnormal. Power off and then power on the system (disconnect the input and loads, and black start the battery). Check whether the alarm is cleared. 2. If the PV self-check is abnormal, disconnect the PV input and reconnect it. Check whether the alarm is cleared. 3. Insulation fault: Check whether PV modules, DC cables, and connectors are damaged, whether the insulation layer deteriorates, and whether the ambient humidity is high.	1. Check whether the alarm is cleared. If yes, no further action is required. If no, go to the next step. 2. Power off and then power on the system, and check whether the alarm is cleared. If yes, no further action is required. If no, go to the next step. 3. Contact Huawei technical support to check the module.

Alarm Name	Alarm Severity	Causes	Alarm Locating	Suggestion
PV Module Abnormal Shutdown	Major	The PV module shuts down abnormally.		1. Power off and then power on the module. Check whether the alarm is cleared. If yes, no further action is required. If no, go to the next step. 2. Contact Huawei technical support to check the module and return it to the factory for repair.
PV Reversely Connected	Major	The PV input power cables are reversely connected.	Check whether the positive and negative terminals of the PV module are reversely connected to the positive and negative terminals of the module.	1. Check whether the cables are reversely connected and rectify any incorrect cable connection. Check whether the alarm is cleared. If yes, no further action is required. If no, go to the next step. 2. Power off and then power on the system, and check whether the alarm is cleared. If yes, no further action is required. If no, go to the next step. 3. Contact Huawei technical support to check the module.

Alarm Name	Alarm Severity	Causes	Alarm Locating	Suggestion
Bypass Module Fault	Major	The bypass module is faulty, or the module address is abnormal.	1. Check cable connections (communications and output power cables): Check whether the parallel CAN cable is loose, damaged, or correctly connected. Check whether the AC output power cable is correctly connected. Reconnect the AC power supply and check whether the alarm is cleared. 2. Module address abnormal: Check whether the DIP switch settings are correct.	1. Check the parallel CAN communications cable and DIP switch settings. Check whether the alarm is cleared. If yes, no further action is required. If no, go to the next step. 2. Power off and then power on the system, and check whether the alarm is cleared. If yes, no further action is required. If no, go to the next step. 3. Contact Huawei technical support to check the module.

Alarm Name	Alarm Severity	Causes	Alarm Locating	Suggestion
Bypass Module Protected	Minor	Bypass module protection, input overvoltage / undervoltage protection, abnormal input frequency, input power failure, bypass overload.	1. Input overvoltage/ undervoltage protection: Check whether the mains input experiences overvoltage or undervoltage using the mobile phone app or a multimeter. 2. Input frequency abnormal: Check whether the voltage and frequency settings on the mobile phone app meet the local voltage and frequency requirements. 3. Fast input power failure: Check whether there is AC input on the mobile phone app. After the AC input is powered on again, check whether the alarm is cleared. 4. Bypass overload: Check whether the maximum AC load power (for example, the transient power when the air	1. Check whether the alarm is cleared. If yes, no further action is required. If no, go to the next step. 2. Power off and then power on the system, and check whether the alarm is cleared. If yes, no further action is required. If no, go to the next step. 3. Contact Huawei technical support to check the module.

Alarm Name	Alarm Severity	Causes	Alarm Locating	Suggestion
			conditioner starts) exceeds the threshold. Run the product within the load range in the specifications for a period of time and check whether the alarm is cleared.	
Address Conflict	Major	There are duplicate bypass module addresses.		Check whether there are duplicate bypass module addresses.
AC Input SPD Fault	Major	The SPD is faulty due to lightning strikes.		Replace the SPD.
AC Output Phase Failure	Major	The phase addresses are incorrectly set. Multiple power modules have the same phase addresses.		Check whether the DIP switch settings of phase addresses on the power modules are different.

Alarm Name	Alarm Severity	Causes	Alarm Locating	Suggestion
Inverter Module Fault	Major	Inverter module fault, overvoltage / undervoltage fault, output short circuit lockout, overload timeout lockout, output relay fault, INV self-check exception, internal overtemperature and lockout, output open circuit, inverter zero crossing loss, RCD detection circuit fault, RCD leakage current fault.	1. Overvoltage or undervoltage fault: Check whether the PV input voltage is within the specified range on the mobile phone app. If not, adjust the input voltage. 2. Output short-circuit lockout: Check whether the load or output cable is short-circuited. Rectify the fault and clear the alarm on the mobile phone app. 3. Lockout due to overload timeout: Check whether the output load exceeds the specifications and whether the product runs with overload for a long time. Clear the alarm on the mobile phone app, and ensure that the load is within the range in the specifications. 4. Internal overtemperatu	1. Check whether the alarm is cleared. If yes, no further action is required. If no, go to the next step. 2. Power off and then power on the system, and check whether the alarm is cleared. If yes, no further action is required. If no, go to the next step. 3. Contact Huawei technical support to check the module.

Alarm Name	Alarm Severity	Causes	Alarm Locating	Suggestion
			re: If the internal temperature exceeds the protection threshold, check whether the ambient temperature is too high or whether the heat sink is blocked. Disconnect loads and let the system run for a period of time. Check whether the alarm is automatically cleared. 5. RCD detection circuit fault: Clear the alarm on the mobile phone app and check whether the alarm is generated again. If yes, power off and restart the iSitePower-M system. Check whether the detection circuit can recover automatically after power-off. If the fault persists, call the maintenance personnel to	

Alarm Name	Alarm Severity	Causes	Alarm Locating	Suggestion
			power off and power on the system again. 6. Output relay fault: The output relay is damaged, the power supply to the relay is abnormal, or the relay control signal is abnormal. Power off and then power on the product, and check whether the alarm is cleared. 7. INV self-check abnormal: Power off and then power on the product and check whether the alarm is cleared. 8. RCD leakage current fault: Check whether the entire power supply loop (including the load) of the system has leakage current and whether the cables are deteriorated or damaged.	

Alarm Name	Alarm Severity	Causes	Alarm Locating	Suggestion
Inverter Module Protected	Minor	Inverter module protection, output short circuit, overload timeout, output overvoltage / undervoltage protection, parallel CAN communication failure, module current equalization failure, industrial-frequency synchronization cable fault, carrier synchronization cable fault, phase-lock failure, INV_BPS cable fault.	1. Output overvoltage/ undervoltage protection: Check whether the inverter output voltage is within the specified range on the mobile phone app or using a multimeter. Power off and then power on the product, and check whether the alarm is cleared. 2. Output short circuit: Check whether the load or output cable is short-circuited. After the fault is rectified, the alarm is automatically cleared. 3. Overload timeout: Check whether the output load exceeds the specifications and whether the product runs with overload for a long time. Run the product for a period of time within the load range in the specifications	1. Check whether the alarm is cleared. If yes, no further action is required. If no, go to the next step. 2. Power off and then power on the system, and check whether the alarm is cleared. If yes, no further action is required. If no, go to the next step. 3. Contact Huawei technical support to check the module.

Alarm Name	Alarm Severity	Causes	Alarm Locating	Suggestion
			and check whether the alarm is cleared. 4. Parallel CAN communication abnormal (an alarm is generated when the industrial-frequency synchronization cable, carrier synchronization cable, or INV_BPS cable is abnormal): Check whether the parallel CAN cable is loose or correctly connected and whether build-out resistors are connected. Reconnect the CAN communications cable. 5. Module current equalization abnormal: Log in to the app and check whether the output power of each power module is the same. (Check whether a parallel CAN communication abnormal alarm, industrial-	

Alarm Name	Alarm Severity	Causes	Alarm Locating	Suggestion
			frequency synchronization cable abnormal alarm, or carrier synchronization cable abnormal alarm is generated.)	
Overtemperature	Major	The temperature is high inside the module.		1. Power off and then power on the module. Check whether the alarm is cleared. If yes, no further action is required. If no, go to the next step. 2. Contact Huawei technical support to check the module and return it to the factory for repair.
Hardware Fault	Major	The EEPROM in the power module is faulty, DSP2 redundancy protection is triggered, or the PFC is faulty.The EEPROM in the power module is faulty, DSP2 redundancy protection is triggered, or the PFC is faulty.		1. Power off and then power on the module. Check whether the alarm is cleared. If yes, no further action is required. If no, go to the next step. 2. Contact Huawei technical support to check the module and return it to the factory for repair.

Alarm Name	Alarm Severity	Causes	Alarm Locating	Suggestion
Communication Failure	Major	The communications cable between the SMU and the module is loose.		1. Power off and then power on the module, and check whether the module running information is normal. If yes, no further action is required. If no, contact Huawei technical support.
Module Upgrade Failure	Major	The system experiences a power failure during an upgrade.		1. Upgrade the power module again and check whether the alarm is cleared. If yes, no further action is required.

10.4 Battery Storage and Recharge

Battery Acceptance Inspection

A battery recharge label must be put on the battery packing case to indicate the latest charge time.

Battery Storage Requirements

1. Place batteries according to the signs on the packing case during storage. Do not put batteries upside down or sidelong.
2. Stack battery packing cases by complying with the stacking requirements on the external package.
3. Handle batteries with caution to avoid damage.
4. The storage environment requirements are as follows:
   - Ambient temperature: –10°C to +55°C; recommended storage temperature: 20°C–30°C
   - Relative humidity: 5% to 80% RH
   - Dry, clean, and well-ventilated
   - Away from corrosive organic solvents and gases
   - Away from direct sunlight
   - At least 2 meters away from heat sources
5. Before storing batteries, disconnect them from external devices.
6. AC mains input voltage at the recharge position: single-phase power grid, 200/208/220/230/240 V AC

7. The warehouse keeper should collect battery storage information every month and periodically report the battery inventory information to the planning department. The batteries that have been stored for nearly 15 months (at –10°C to +25°C), 9 months (at 25°C–35°C), or 6 months (at 35°C–55°C) should be recharged in a timely manner.
8. Batteries should be delivered based on the "first in, first out" rule.
9. After the battery production test is complete and before the batteries are stored, the batteries must be recharged to at least 50% of the SOC.

Conditions for Judging Overdue Storage

It is recommended that batteries not be stored for a long period. They should be used soon after being deployed onsite. The batteries should be stored according to the following requirements.

Table 10-3 Lithium battery recharge interval

Required Storage Temperature	Actual Storage Temperature	Recharge Interval	Remarks
–10°C < T ≤ +55°C	T ≤ –10°C	Not allowed	Within the recommended storage duration: Use the batteries as soon as possible. Reaching the time for recharge: Recharge the batteries. The total storage duration should not exceed the warranty period.
	–10°C < T ≤ +25°C	15 months	
	25°C < T ≤ 35°C	9 months	
	35°C < T ≤ 55°C	6 months	
	T > 55°C	Not allowed	

1. Dispose of deformed, damaged, or leaking batteries directly irrespective of how long they have been stored.
2. The storage duration starts from the latest charge time labeled on the battery package. If a battery is qualified after recharge, update the latest charge time on the label (next recharge time = latest charge time + recharge interval).
3. The longest power storage period of a battery is three years. A battery can be recharged at most for three times within the three years. For example, it can be recharged every 8 months or every 12 months. It is recommended that batteries be scrapped if the longest storage period and maximum recharging times are exceeded.
4. If a lithium battery is stored for a long time, capacity loss may occur. After a lithium battery is stored for 12 months at the recommended storage temperature, the irreversible capacity loss rate is 3%–10%. If customers

perform a discharge test according to the specifications for batteries stored for too long, they may fail to pass the test.

Inspection Before Recharge

1. Before recharging a battery, you need to check its appearance. Recharge the battery if it is qualified or dispose of it if not.
2. The battery is qualified if it is free from the following symptoms:
   - Deformation
   - Shell damage
   - Leakage

Installing Modules and Cables for Battery Recharge

WARNING

Use standard cables provided by Huawei to connect power modules and battery modules. Do not use non-standard cables (such as extension cables and interconnection cables). If BAT+ and BAT– cables are reversely connected, the device will be damaged.

Step 1 For details about how to install a power module and battery module, see **5.3 Installing Modules**.

Step 2 For details about how to install battery recharge cables, see **8 Electrical Connection**.

Step 3 After the installation, refer to **8.7 Verifying the Installation** to verify the installation.

----End

Battery Power-On and Commissioning

NOTICE

- Ensure that the charge process is supervised to prevent any abnormality.
- If a battery experiences an abnormality such as bulging or smoking, stop charging immediately and dispose of it.
- Ensure that only trained professionals perform recharge operations.
- When the battery SOC is 0%, the product cannot be activated by pressing and holding the power button. It can be started only after the solar power and AC power are connected.
- It is recommended that a battery be charged to 50% SOC during recharge. Long-term storage will cause capacity loss. After lithium batteries are stored at the recommended storage temperature for 12 months, the irreversible capacity loss is 3% to 10%.

Prerequisites

Power cables and signal cables are connected correctly.

Procedure

Step 1 Turn on the corresponding switch based on the scenario.

- If there is PV input, turn on the DC SWITCH.
- If there is no PV input, hold down the manual ON/OFF switch for 5s.

Step 2 Turn the AC input switch to ON.

Step 3 Observe the annular strip light. If all green lights are steady on, battery charging is complete.

Step 4 After the charge is complete, turn off the upstream AC input circuit breaker of the iSitePower-M system and then the DC SWITCH. Hold down the manual ON/OFF switch for 5s to shut down the battery module. If other batteries need to be charged, repeat the preceding steps.

----End

10.5 Storage with Low SOC

After battery modules are powered off, static power consumption and self-discharge loss may occur in them. Therefore, charge battery modules in a timely manner and do not store them in low state of charge (SOC). Otherwise, the battery modules may be damaged due to overdischarge and need to be replaced.

Storing battery modules with low SOC may occur in the following scenarios:

- DC SWITCH on the power control module is OFF.
- The battery module power cables or signal cables are not connected.
- The battery modules cannot be charged due to a system fault after discharge.
- The battery modules cannot be charged due to incorrect configurations in the system.
- The battery modules cannot be charged due to no PV input and long-term mains failure.

Regardless of scenarios, the battery modules must be charged within the longest interval corresponding to the SOC when the battery modules are powered off. If the battery modules are not charged within the specified interval, the battery modules may be damaged due to overdischarge.

Power-Off SOC Before Storage	Maximum Charge Interval
SOC>5%	30 days
0≤SOC<5%	7 days

NOTE

When the battery SOC decreases to 0%, ensure that the battery modules are charged within seven days. Permanent battery faults caused by delayed charge due to customer reasons are beyond the warranty scope.

11 FAQs

11.1 Uneven Ground During the Installation

Use washers in the fitting bag to level the ground.

11.2 Tools for Preparing PV Cables

Use dedicated tools to prepare PV cables. Crimping tool model: PV-CZM-41100; open-end wrench model: PV-MS-HZ

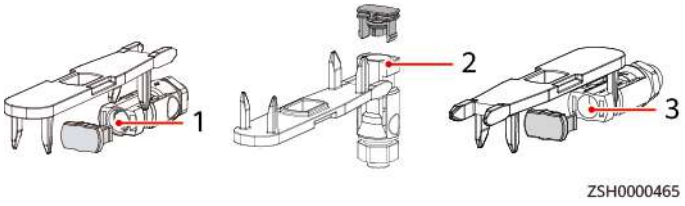
11.3 Special Cables

The battery power cable, battery power connector, and battery communications cable are customized to be waterproof and moisture-proof. If they are lost or damaged, contact your installer for replacement. Do not purchase or replace them by yourself.

11.4 Removing Power Terminals

There are three methods of using the cable removal tool. Select a proper method based on the actual situation.

Figure 11-1 Usage of the removal tool



(1) Power parallel port for battery modules (2) Battery cascading port (3) PV input port

11.5 Power-On

Do not touch the manual ON/OFF switch during the installation. Otherwise, electric shocks may occur.

11.6 SOC Changes

How does the SOC change from 99% to 100% when the battery is about to be fully charged?

When the SOC is greater than 99%, the battery switches to float charging and the charge current decreases gradually until the SOC reaches 100%.

11.7 Checking Cable Connections when the Product Fails to Be Upgraded

If the product fails to be upgraded, check the cable connections. Ensure that the cables are correctly connected and perform the upgrade again.

11.8 WiFi QR Code Scanning

Scan the QR code on the device to connect to the WiFi. If the connection fails, contact your installer.

11.9 Querying the Battery Capacity in the Parallel System Scenario

Query the total system capacity on the app.

11.10 Problem Handling

If you have any questions, contact your dealer or Huawei technical support.

11.11 Resetting Password

- Enable/Disable WiFi: Hold down the WiFi switch for at least 10s to enable or disable WiFi. The WiFi function is disabled by default.
- WiFi password and monitoring unit password reset: Press the WiFi switch for three consecutive times within 10s. Wait for more than 1s and press the switch again to reset the WiFi password and monitoring unit password.
- Password reset will result in system restart, which may interrupt the power supply to loads. Therefore, you are advised not to reset the passwords when power is supplying to loads.

11.12 Genset Settings on the App

When the AC input system is set to Mains+Genset or Genset on the app, the control mode cannot be switched within 12 minutes after the genset is created for the first time.

A Technical Specifications

A.1 iSitePower-M system

Table A-1 Environmental specifications

Item	Specifications
Operating temperature	0–45°C (When the ambient temperature is low, the battery module charging must be derated. When the ambient temperature is 0°C to 5°C and 5°C to 10°C, battery modules can be charged at 0.05C and 0.1C, respectively.)
Transportation temperature	–40°C to +60°C
Storage temperature	–40°C to +60°C
Relative humidity	5%–95% RH
Altitude	0–4000 m. (When the altitude ranges from 2000 m to 4000 m, high temperature derating applies and the operating temperature decreases by 1°C for each additional 200 m.)
Noise level	≤ 40 dBA at 1 m at 30°C ambient temperature
IP rating	IP66
Operating environment	Class C environment
Other requirements	• There should be no conductive dust, corrosive gas, or explosion hazard. • Dust, corrosive substances, pests, molds, and other indicators should be controlled in accordance with Class 4.1 requirements in ETSI EN 300 019-1-4 (V2.2.1).

Table A-2 Electrical Specifications

Item		Specifications
AC input	Input voltage	200/208/220/230/240 V AC
	Frequency	50/60 Hz
	Input current	Maximum current: 30 A
	Input capacity	6 kVA
PV input	Open-circuit voltage	85–435 V DC
	MPPT voltage	90–420 V DC
	Number of MPPT circuits	1
	MPPT capacity	5.5 kWp
	PV branch	2
	Maximum input current for one string	12.5 A
	Maximum short-circuit current for one string	18 A
AC output[1]	Output voltage	200/208/220/230/240 V AC, default value: 220 V AC
	Output frequency	50/60 Hz, default value: 50 Hz
	Output power	Maximum: 6 kVA/5 kW
	Output current	Maximum current: 30 A
	Power factor	0.8
Battery module capacity[2]		5 kWh/battery module. A maximum of six battery modules can be connected to a power module.
Bypass input frequency		6 kW
Overload capability		• 102% ≤ Load ≤ 125%: 30s • 125% < Load ≤ 150%: 10s • > 150%: short circuit, 0.3s
Surge protection	AC input	Differential mode: 3 kA (8/20 μs), common mode: 5 kA (8/20 μs), criterion C
	PV input	Common mode: 10 kA, 8/20 μs, criterion C
Note [1]: The output voltage and frequency must be the same as those of the local power grid. Note [2]: Test conditions: 100% DOD, 0.2C rate charge & discharge at 25°C, at the beginning of life.		

Table A-3 EMC specifications

Item	Specifications	
Electromagnetic interference (EMI)	Conducted emission (CE)	IEC 62920\CISPR11\EN 62040-2 AC port: Class B; PV port: Class A; signal port: Class B; FE port: Class B
	Radiated emission (RE)	IEC 62920\CISPR11\EN 62040-2 Class B
	Harmonic current	IEC 61000-3-12 AC power port: The current of each phase is greater than 16 A.
	Voltage fluctuation and flicker	IEC 61000-3-12 AC power port: Pst ≤ 1.0, P1t ≤ 0.65, dc ≤ 3%, dmax ≤ 4%. The time when the value of d(t) exceeds 3% is less than or equal to 200 ms.
Electromagnetic susceptibility (EMS)	Electrostatic discharge (ESD)	IEC 61000-4-2 Enclosure port: 6 kV (level B) contact discharge, 8 kV (level B) air discharge
	Electrical fast transient (EFT)	IEC 61000-4-4 AC power port: 2 kV, DC power port: 2 kV, signal port: 1 kV (criterion B)
	Radiated susceptibility (RS)	IEC 61000-4-3 Enclosure port: The test frequency range is 80 MHz to 6 GHz, 80% AM (1 kHz) modulation is used, and the test level is 10 V/m.
	Conducted susceptibility (CS)	IEC 61000-4-6 0.15–80 MHz: 10 V, 80% AM (1 kHz) modulation

Item	Specifications	
	Surge susceptibility	IEC 61000-4-5 • AC power port: horizontal 6 kV (line to line), 1.2/50 µs, 2 ohms, criterion B; vertical 6 kV (two lines to ground), 1.2/50 µs, 2 ohms, criterion B • Signal port (CAN, FE): differential mode: 1.5 kV (D. 1), 10/700 µs, 15 ohms + 25 ohms, criterion B; common mode: 4 kV (C.3), 10/700 µs, 15 ohms + 25 ohms/line, criterion B; differential mode: 1 kV (D.1), 1.2/50 µs, 42 ohms, criterion B; common mode: 2 kV (C.3), 1.2/50 µs, 2 ohms + 40 ohms x n/ line, criterion B • DI&DO, RS485: differential mode: 4 kV (line to line), 10/700 µs, 15 ohms + 25 ohms/line, criterion B; common mode: 4 kV (two or multiple lines to ground), 10/700 µs, 15 ohms + 25 ohms/line, criterion B; differential mode: 1 kV (line to line), 1.2/50 µs, 2 ohms + 40 ohms, criterion B; common mode: 2 kV (two or multiple lines to ground), 1.2/50 µs, 2 ohms +40 ohms x n/line, criterion B • Solar power port: differential mode: 2 kV (line to line), 1.2/50 µs, 2 ohms, criterion B; common mode: 4 kV (single line to ground), 1.2/50 µs, 12 ohms, criterion B
	Voltage dip	IEC 61000-4-11 • Voltage interruption (> 95% decrease) for 10 ms: performance grade B • Voltage interruption (> 95% decrease) for 20 ms: performance grade B • Voltage dip (> 30% decrease) for 500 ms: performance grade C • Voltage interruption (> 95% decrease) for 5000 ms: performance grade C

A.2 Power Module

Table A-4 System specifications

Item	Specifications
Dimensions (H x W x D)	246 mm x 700 mm x 152 mm
Weight	about 17 kg
Mounting mode	Ground-mounted and wall-mounted

A.3 Battery Module

Table A-5 System specifications

Item	Specifications
Dimensions (H x W x D)	390 mm x 700 mm x 158 mm
Weight	about 50 kg
Mounting mode	Ground-mounted and wall-mounted

A.4 AC Parallel Box

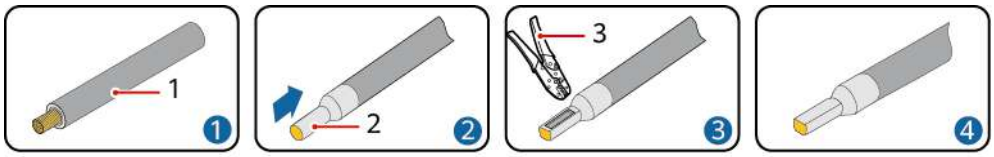
Table A-6 Specifications

Item	Specifications
Dimensions (H x W x D)	450 mm x 350 mm x 150 mm
Weight	12 kg
Input voltage	200/208/220/230/240 V AC, default value: 220 V AC
Input current	Maximum current: 90 A
Output voltage	200/208/220/230/240 V AC, default value: 220 V AC
Output current	Maximum current: 90 A
Cabling mode	Routed in and out from the bottom
Mounting mode	Mounted on a wall or pole (optional)
IP rating	IP55

B Preparing the Cable and Terminal

B.1 Preparing a Cord End Terminal

Figure B-1 Preparing a cord end terminal



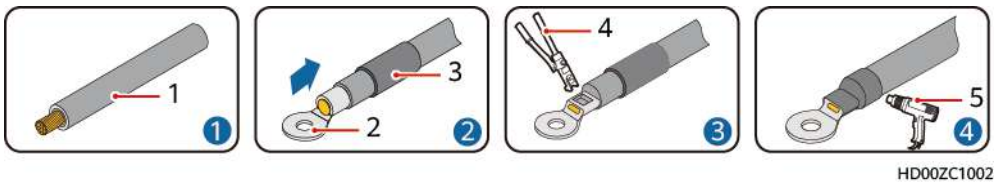
(1) Cable (2) Cord end terminal (3) Crimping tool

B.2 Preparing an OT Terminal

NOTICE

- Avoid scratching the core wire when stripping a cable.
- The cavity formed after the conductor crimp strip of the OT terminal is crimped must wrap the core wires completely. The core wires must contact the OT terminal closely.
- Wrap the wire crimping area with heat shrink tubing or insulation tape. The heat shrink tubing is used as an example.
- When using a heat gun, protect the equipment from being scorched.

Figure B-2 Preparing an OT terminal



(1) Cable (2) OT terminal (3) Heat shrink tubing

(4) Hydraulic pliers (5) Heat gun

B.3 Preparing a PV Input Power Cable

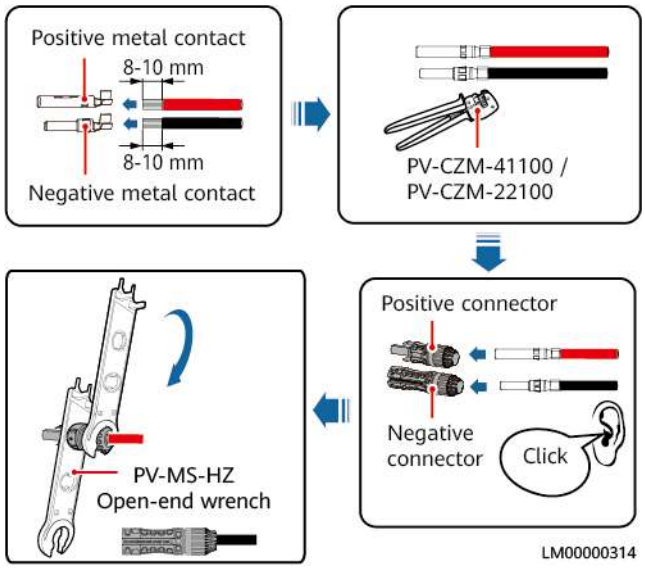
CAUTION

- Use the delivered Staubli MC4 EVO2 positive and negative metal terminals and connectors. Using incompatible positive and negative metal terminals and connectors may result in serious consequences. The caused device damage is not covered under any warranty or service agreement.
- Use professional tools to prepare cables.

NOTICE

- Cables with high rigidity, such as armored cables, are not recommended.
- Before assembling connectors, label the cable polarities correctly to ensure correct cable connections.
- A PV-CZM-41100 crimping tool is recommended.
- Use the wrench shown in the figure to tighten the locking nut. When the wrench slips during the tightening, it indicates that the locking nut has been tightened.
- After crimping the positive and negative metal terminals, pull the PV input power cables to ensure that they are connected securely.
- Insert the crimped metal terminals of the positive and negative power cables into the appropriate positive and negative connectors. Then pull the PV input power cables to ensure that they are connected securely.

Figure B-3 Preparing a PV input power cable



B.4 Stripping Length

Figure B-4 Stripping length

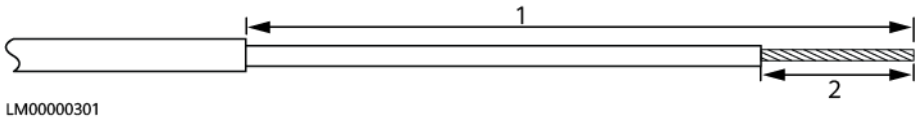


Table B-1 Definition of the cable stripping length (standard scenario)

No.	One End	Other End	1	2
1	PV input ports	DC switch (customer side)	N/A	8–10 mm
2	AC output	PDB (customer side)	100 mm	PE wire: 7 mm L/N wire: 17 mm
3	AC output	PDB (customer side)	75 mm	PE wire: 7 mm L/N wire: 17 mm
4	Ground point	Ground bar (customer side)	N/A	7 mm

Table B-2 Definition of the stripping length of cables for a parallel box (parallel system scenario)

No.	One End	Other End	1	2
1	AC parallel box	PDC (customer side)	L wire: 120 mm N wire: 120 mm PE wire: 140 mm	L wire: 16 mm N wire: 14 mm PE wire: 14 mm
2	AC parallel box	AC input	L wire: 410 mm N wire: 340 mm PE wire: 240 mm	L wire: 12 mm N wire: 7 mm PE wire: 7 mm
3	AC parallel box	AC output	L wire: 115 mm N wire: 220 mm PE wire: 370 mm	L wire: 12 mm N wire: 7 mm PE wire: 7 mm
4	AC parallel box	PDB (customer side)	L wire: 300 mm N wire: 325 mm PE wire: 580 mm	L wire: 16 mm N wire: 14 mm PE wire: 14 mm
5	AC parallel box	Ground bar (customer side)	N/A	14 mm

