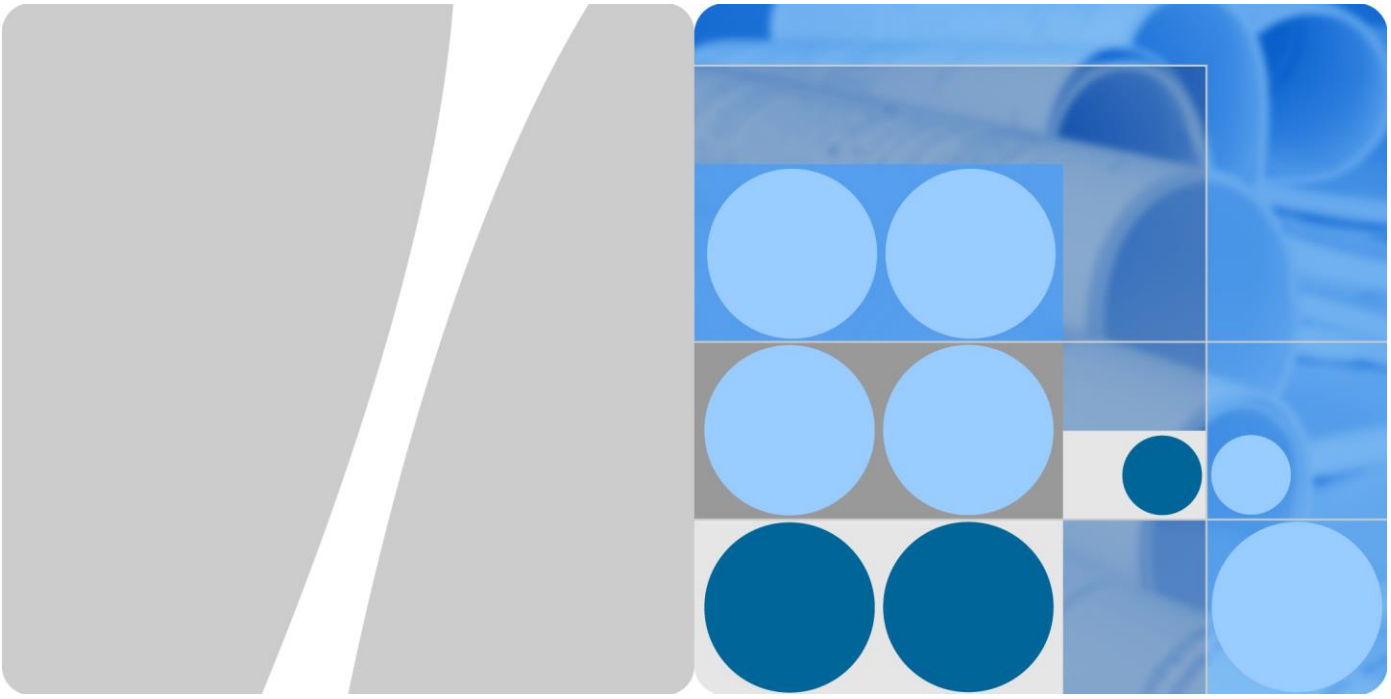

FusionModule2000 Smart Modular Data Center V500R003C10

Installation Guide

Issue 05

Date 2020-05-21

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About This Document

Purpose

This document describes the site requirements for installing the FusionModule2000 smart modular data center (smart module for short) as well as the methods for installing cabinets, devices, and cables, providing installation guidance and technical support for onsite installation personnel and technical support engineers.

The ECC800-Pro version is ECC800 V100R003C00.

Intended Audience

This document is intended for:

- Hardware installation engineers
- Commissioning engineers
- Maintenance engineers
- Technical support engineers

Symbol Conventions

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

Symbol	Description
	Indicates a hazard with a high level of risk which, if not avoided, will result in death or serious injury.
	Indicates a hazard with a medium level of risk which, if not avoided, could result in death or serious injury.
	Indicates a hazard with a low level of risk which, if not avoided, could result in minor or moderate injury.
	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 05 (2020-05-21)

Added section "(Optional) Installing NetCol5000-A035 Smart Cooling Products".

Added section "(Optional) Installing a TaiShan 200 Server".

Issue 04 (2020-01-21)

Updated the UIM20A expansion Module.

Issue 03 (2019-11-05)

Updated section "(Optional) Installing an ECC800-Pro".

Updated section "Installing an eLight".

Issue 02 (2019-08-30)

Updated ECC800-Pro.

Issue 01 (2019-07-20)

This issue is the first release.

Contents

1 Safety Information

1.1 General Safety

Statement

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", "CAUTION", "WARNING", and "DANGER" statements in this document do not cover all the safety instructions. They are only supplements to the safety instructions. Huawei 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 equipment 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.

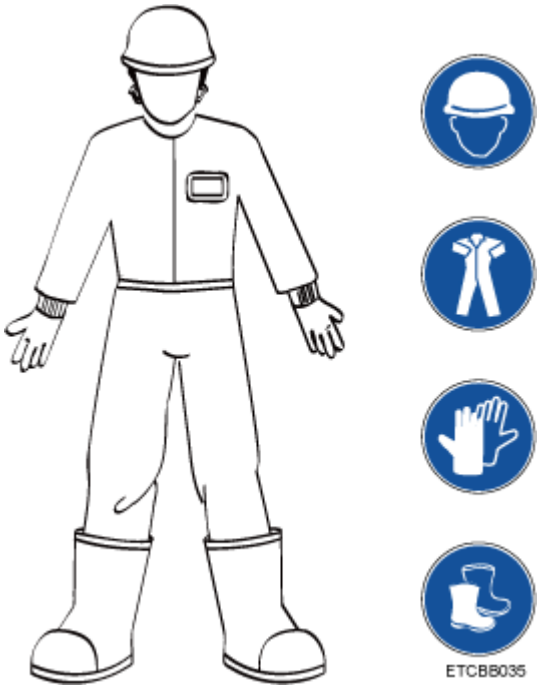
Huawei will not be liable for any consequences of the following circumstances:

- Operation beyond the conditions specified in this document
- Installation or use in environments which are not specified in relevant international or national 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
- Storage conditions that do not meet the requirements specified in this document

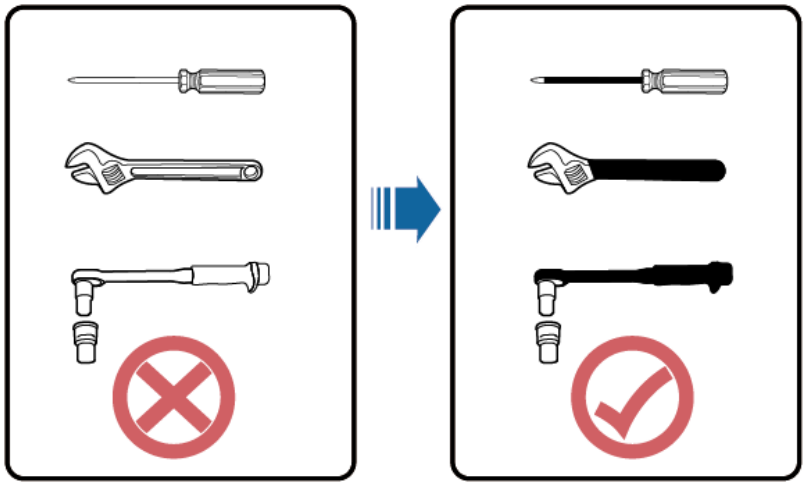
General Requirements

- 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.

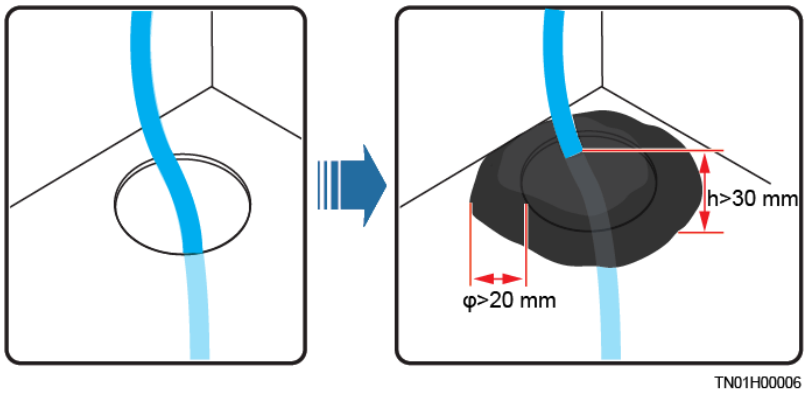
- Before installing, operating, or maintaining the equipment, remove any conductive objects such as watches or metal jewelry like bracelets, bangles, and rings to avoid electric shock.
- When installing, operating, or maintaining the equipment, wear dedicated protective gears such as insulation gloves, goggles, and safety clothing, helmet, and shoes, as shown in the following figure.



- Follow the specified procedures for installation, operation, and maintenance.
- Before handling a conductor surface or terminal, measure the contact point voltage and ensure that there is no risk of electric shock.
- After installing the equipment, remove idle packing materials such as cartons, foam, plastics, and cable ties from the equipment area.
- 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.
- Do not stop using protective devices. Pay attention to the warnings, cautions, and related precautionary measures in this document and on the equipment. Promptly replace warning labels that have worn out.
- Keep irrelevant people away from the equipment. Only operators are allowed to access the equipment.
- Use insulated tools or tools with insulated handles, as shown in the following figure.



- All cable holes should be sealed. Seal the used cable holes with firestop putty. Seal the unused cable holes with the caps delivered with the cabinet. The following figure shows the criteria for correct sealing with firestop putty.



- Do not scrawl, damage, or block any warning label on the equipment.
- Tighten the screws using tools when installing the equipment.
- Do not work with power on during installation.
- 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.
- Before operations, ensure that the equipment is firmly secured to the floor or other solid objects, such as a wall or an installation rack.
- Do not use water to clean electrical components inside or outside of a cabinet.
- Do not change the structure or installation sequence of equipment without permission.
- Do not touch a running fan with your fingers, components, screws, tools, or boards before the fan is powered off or stops running.

Personal Safety

- If there is a probability of personal injury or equipment damage during operations on the equipment, immediately stop the operations, report the case to the supervisor, and take feasible protective measures.
- To avoid electric shock, do not connect safety extra-low voltage (SELV) circuits to telecommunication network voltage (TNV) circuits.

- Do not power on the equipment before it is installed or confirmed by professionals.

1.2 Personnel Requirements

- Personnel who plan to install or maintain Huawei 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.
- 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
- Only professionals or authorized personnel are allowed to replace the equipment or components (including software).

1.3 Electrical Safety

Grounding

- 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 its electrical connection to ensure that it is securely grounded.

General Requirements

Use dedicated insulated tools when performing high-voltage operations.

AC and DC Power

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.

- If a "high electricity leakage" tag is attached on the equipment, ground the protective ground terminal on the equipment enclosure before connecting the AC power supply; otherwise, electric shock as a result of electricity leakage may occur.
- Before installing or removing a power cable, turn off the power switch.
- 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.
- A circuit breaker equipped with a residual current device (RCD) is not recommended.
- A damaged power cable must be replaced by the manufacturer, service agent, or professionals to avoid risks.
- High voltage operations and installation of AC-powered facilities must be performed by qualified personnel.

Cabling

- 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.
- Do not route cables behind the air intake and exhaust vents of the equipment.
- Ensure that cables meet the VW-1 flame spread rating requirements.
- 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.
- If an AC input power cable is connected to the cabinet from the top, bend the cable in a U shape outside the cabinet and then route it into the cabinet.
- 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.
- Do not perform any improper operations, for example, dropping cables directly from a vehicle.
- When selecting, connecting, and routing cables, follow local safety regulations and rules.

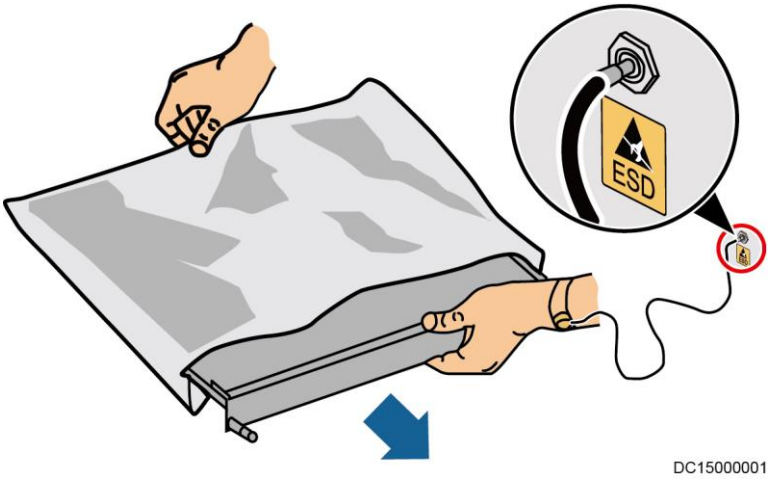
ESD

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 or a well-grounded ESD wrist strap when touching the device or handling boards or application-specific integrated circuits (ASICs).
- When holding a board, hold its edge without touching any components. Do not touch the components with your bare hands.
- Package boards with ESD packaging materials before storing or transporting them.

Figure 1-1 Wearing an ESD wrist strap



Neutral-Ground Voltage

It is recommended that the three-phase loads be equalized and the neutral-ground voltage be kept at less than 2 V to meet power distribution requirements.

1.4 Installation Environment Requirements

- To prevent fire due to high temperature, ensure that the ventilation vents or heat dissipation system are not blocked when the equipment is running.
- Install the equipment in an area far away from liquids. Do not install it under areas prone to condensation, such as under water pipes and air exhaust vents, or areas prone to water leakage, such as air conditioner vents, ventilation vents, or feeder windows of the equipment room. Ensure that no liquid enters the equipment to prevent faults or short circuits.
- If any liquid is detected inside the equipment, immediately disconnect the power supply and contact the administrator.
- Do not expose the equipment to flammable or explosive gas or smoke. Do not perform any operation on the equipment in such environments.
- Ensure that the equipment room provides good heat insulation, and the walls and floor are dampproof.
- Install a rat guard at the door of the equipment room.

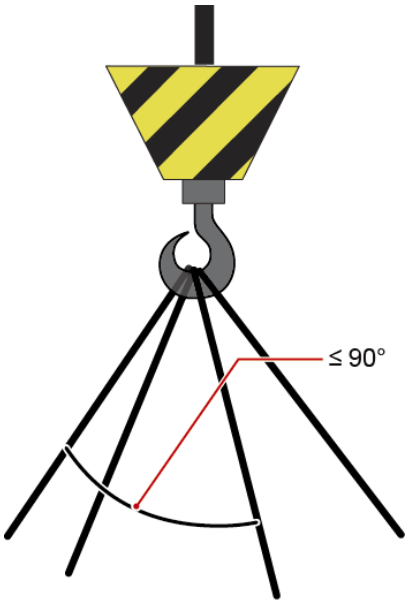
Installation at Heights

- Working at heights refers to operations that are performed at least 2 meters above the ground.
- Do not work at heights if the steel pipes are wet or other potential danger exists. After the preceding conditions no longer exist, the safety director and relevant technical personnel need to check the involved equipment. Operators can begin working only after obtaining consent.
- When working at heights, comply with local relevant laws and regulations.
- Only trained and qualified personnel are allowed to work at heights.
- Before working at heights, check the climbing tools and safety gears such as safety helmets, safety belts, ladders, springboards, scaffolding, and lifting equipment. If they do not meet the requirements, take corrective measures or disallow working at heights.
- Wear personal protective equipment such as the safety helmet and safety belt or waist rope and fasten it to a solid structure. Do not mount it on an insecure moveable object or metal object with sharp edges. Make sure that the hooks will not slide off.
- Set a restricted area and eye-catching signs for working at heights to warn away irrelevant personnel.
- Carry the operation machinery and tools properly to prevent them from falling off and causing injuries.
- Personnel involving working at heights are not allowed to throw objects from the height to the ground, or vice versa. Objects should be transported by tough slings, hanging baskets, highline trolleys, or cranes.
- Ensure that guard rails and warning signs are set at the edges and openings of the area involving working at heights to prevent falls.
- Do not pile up scaffolding, springboards, or other sundries on the ground under the area involving working at heights. Do not allow people to stay or pass under the area involving working at heights.
- Inspect the scaffolding, springboards, and workbenches used for working at heights in advance to ensure that their structures are solid and not overloaded.
- Any violations must be promptly pointed out by the site manager or safety supervisor and the involved personnel should be prompted for correction. Personnel who fail to stop violations will be forbidden from working.

1.5 Mechanical Safety

Hoisting Devices

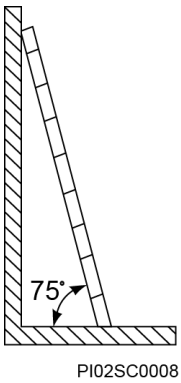
- Do not walk under hoisted objects.
- Only trained and qualified personnel should perform hoisting operations.
- Check that hoisting tools are available and in good condition.
- Before hoisting objects, ensure that hoisting tools are firmly secured onto a load-bearing object or wall.
- Ensure that the angle formed by two hoisting cables is no more than 90 degrees, as shown in the following figure.



- Do not drag steel ropes and hoisting tools or bump hoisted objects against hard objects during hoisting.

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 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. 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.



- 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 floor, observe the following safety precautions:

NOTICE

Do not drill holes into the equipment. Doing so may affect the electromagnetic shielding of the equipment and damage components or cables inside. Metal shavings from drilling may short-circuit boards inside the equipment.

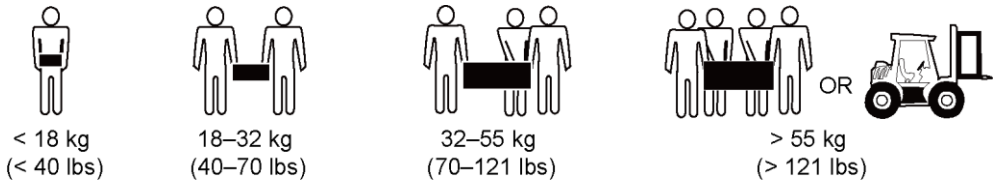
- Obtain the consent from the customer, subcontractor, and Huawei before drilling.
- Wear goggles and protective gloves when drilling holes.
- When drilling holes, protect the equipment from shavings. After drilling, clean up any shavings that have accumulated inside or outside the equipment.

Moving Heavy Objects

DANGER

When removing a heavy or unstable component from a cabinet, be aware of unstable or heavy objects on the cabinet.

- Be cautious to avoid injury when moving heavy objects.



- When moving the equipment by hand, wear protective gloves to prevent injuries.
- Move or lift the equipment by holding its handles or lower edges. Do not hold the handles of modules (such as power supply units, fans, and boards) that are installed in the equipment because they cannot support the weight of the equipment.
- Avoid scratching the cabinet surface or damaging cabinet components and cables during equipment transportation.
- When transporting the equipment using a forklift truck, ensure that the forks are properly positioned to ensure that the equipment does not topple. Before moving the equipment, secure it to the forklift truck using ropes. When moving the equipment, assign dedicated personnel to take care of it.
- Choose railways, sea, or a road with good condition for transportation to ensure equipment safety. Avoid tilt or jolt during transportation.
- Move a cabinet with caution. Any bumping or falling may damage the equipment.

1.6 Cooling System Safety

Welding

- At least two persons are required on a welding site.
- A welder must have a work permit.
- A welding site must be free from inflammables.
- Ensure that a fire extinguisher, wet wiper, and water container are available.
- A burning welding torch must not be placed on a component or on the floor, and must not be placed in a metal container with acetylene and oxygen. Otherwise, the gas may leak and cause a fire.
- High-temperature pipes after welding must be promptly cooled.
- Do not weld or cut on pressurized containers or pipes. Electric devices must be powered off before welding.

High Temperature and Pressure

- When maintaining or replacing components, pay attention to high-temperature components (such as the compressor, refrigerant pipe, and electric heater) to prevent scalds.
- When maintaining or replacing components, pay attention to high-pressure components (such as the compressor and refrigerant pipe) to prevent the refrigerant system from being cracked or exploded due to misoperations.

Refrigerant Frostbite

Refrigerant leakage may cause frostbite. Take protective measures (for example, wear antifreeze gloves) when handling refrigerant.

Storage and Recycling

- Do not store devices near a heat source or under direct sunshine.
- Keep devices away from fire or high-temperature objects, especially devices injected with pressurized nitrogen or refrigerant; otherwise, explosion or refrigerant leakage may occur, causing personal injury.

- The sign indicates that the product cannot be disposed of with other wastes that have a shell in European Union (EU) areas. To avoid environment pollution and harm to human health, wastes must be classified and recycled. This also promotes resource reuse. When recycling a device, fill in the device information in the recycling collection system or contact your dealer for help. The dealer can help you recycle devices in a safe and environment-friendly way.

1.7 Battery Safety

Basic Requirements

Before operating batteries, carefully read the safety precautions for battery handling and master the correct battery connection methods.

DANGER

- Do not expose batteries at high temperatures or around heat-generating devices, such as sunlight, fire sources, transformers, and heaters. Excessive heat exposure may cause the batteries to explode.
- Do not burn batteries. Otherwise, the batteries may explode.
- To avoid leakage, overheating, fire, or explosions, do not disassemble, alter, or damage batteries, for example, insert sundries into batteries or immerse batteries in water or other liquids.

- Wear goggles, rubber gloves, and protective clothing to prevent skin contact with electrolyte in the case of electrolyte overflow. If a battery leaks, protect the skin or eyes from the leaking liquid. If the skin or eyes come in contact with the leaking liquid, wash it immediately with clean water and go to the hospital for medical treatment.
- Use dedicated insulated tools.
- Move batteries in the required direction. Do not place a battery upside down or tilt it.
- Keep the battery loop disconnected during installation and maintenance.
- Use batteries of specified models. Using batteries of other models may damage the batteries.
- Dispose of waste batteries in accordance with local laws and regulations. Do not dispose of batteries as household waste. If a battery is disposed of improperly, it may explode.
- The site must be equipped with qualified fire extinguishing facilities, such as firefighting sands and powder fire extinguishers.

NOTICE

To ensure battery safety and battery management accuracy, use batteries provided with the UPS by Huawei. Huawei is not responsible for any battery faults caused by batteries not provided by Huawei.

Battery Installation

Before installing batteries, observe the following safety precautions:

- Install batteries in a well-ventilated, dry, and cool environment that is far away from heat sources, flammable materials, moistures, extensive infrared radiation, organic solvents, and corrosive gases. Take fire prevention measures.
- Place and secure batteries horizontally.

- Note the polarities when installing batteries. Do not short-circuit the positive and negative poles of the same battery or battery string. Otherwise, the battery may be short-circuited.
- Check battery connections periodically, ensuring that all bolts are securely tightened.
- When installing batteries, do not place installation tools on the batteries.

Battery Short Circuit

DANGER

Battery short circuits can generate high instantaneous current and release a great amount of energy, which may cause equipment damage or personal injury.

To avoid battery short-circuit, do not maintain batteries with power on.

Flammable Gas

NOTICE

- Do not use unsealed lead-acid batteries.
- To prevent fire or corrosion, ensure that flammable gas (such as hydrogen) is properly exhausted for lead-acid batteries.

Lead-acid batteries emit flammable gas when used. Ensure that batteries are kept in a well-ventilated area and take preventive measures against fire.

Battery Leakage

NOTICE

Battery overheating causes deformation, damage, and electrolyte spillage.

WARNING

When the electrolyte overflows, absorb and neutralize the electrolyte immediately. When moving or handling a battery whose electrolyte leaks, note that the leaking electrolyte may hurt human bodies.

- If the battery temperature exceeds 60°C, check for and promptly handle any leakage.
- Electrolyte overflow may damage the equipment. It will corrode metal parts and boards, and ultimately damage the boards.
- If the electrolyte overflows, follow the instructions of the battery manufacturer or neutralize the electrolyte by using sodium bicarbonate ($NaHCO_3$) or sodium carbonate (Na_2CO_3).

Lithium Battery

The safety precautions for lithium batteries are similar to those for lead-acid batteries except that you also need to note the precautions described in this section.

⚠ WARNING

There is a risk of explosion if a battery is replaced with an incorrect model.

- A battery can be replaced only with a battery of the same or similar model recommended by the manufacturer.
- When handling a lithium battery, do not place it upside down, tilt it, or bump it with other objects.
- Keep the lithium battery loop disconnected during installation and maintenance.
- Do not charge a battery when the ambient temperature is below the lower limit of the operating temperature (charging is forbidden at 0°C). Low-temperature charging may cause crystallization, which will result in a short circuit inside the battery.
- Use batteries within the allowed temperature range; otherwise, the battery performance and safety will be compromised.
- Do not throw a lithium battery in fire.
- When maintenance is complete, return the waste lithium battery to the maintenance office.

1.8 Others

- Exercise caution when shutting down the smart cooling product. Doing so may cause equipment and room overheating, which will damage the equipment.
- Exercise caution when powering off the rPDU or PDU2000. Doing so may affect the power supply to equipment, which will interrupt services.
- Exercise caution when manually shutting down the UPS inverter for transferring to bypass mode, or when adjusting the UPS output voltage level or frequency. Doing so may affect the power supply to equipment.
- Exercise caution when setting battery parameters. Incorrect settings will affect the power supply and battery lifespan.

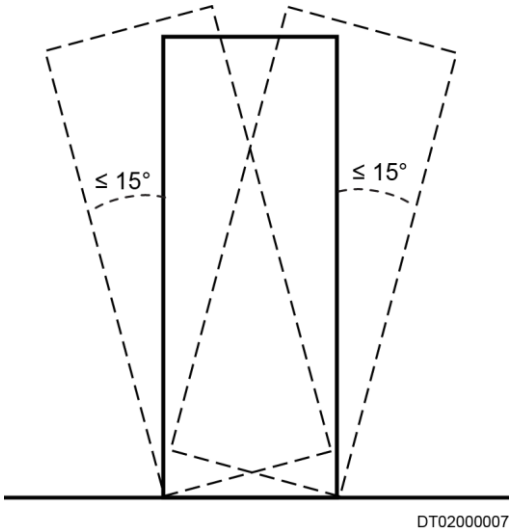
2 Installation Preparations

2.1 Precautions for Transportation and Placing

Precautions for Transportation

- Only trained personnel are allowed to move the cabinet. Use a pallet truck to transport the cabinet secured to a wooden support to the installation position. Insert the forks of the pallet truck in the middle position to ensure balance.
- Transport devices by railway, sea, or good road. No excessive tilt or jolt is allowed during the transportation. The device can only be tilted for at most 15° during loading and unloading, as shown in Figure 2-1.
- To prevent the cabinet from falling over, secure it to a pallet truck using ropes before moving it.
- Move the cabinet with caution. Any bumping or falling may damage the device.
- Unpack the device after moving it to the installation position. Avoid damaging the device during unpacking. Take down the device from the pallet only immediately before installation.

Figure 2-1 Cabinet tilt



Precautions for Placing

Place cardboard boxes in sequence based on their numbers.

Figure 2-2 Arranging components

2.2 Unpacking and Acceptance

Context

Unpack and inspect all cabinets, mechanical parts, and components. Check that all the items are intact and comply with the packing list on the presence of both the project supervisor and customer.

Procedure

Step 1 Unpack the carton labeled **Contain Packing List** and take out the *Packing List*.

Step 2 Check all items against the *Packing List*.

Step 3 If an item is incorrect or missing, contact Huawei technical support.

Step 4 If any item is damaged, fill in the *Cargo Replacement Application Form* and report it.

Step 5 Sign on the *Packing List* with the customer after verifying that all required items are delivered.

Step 6 Store the items properly.

----End

Follow-up Procedure

- Put the items to be installed immediately onto an ESD surface, such as a polyethylene (PE) bag or an expandable polyethylene (EPE) foam.
- Pack the items not to be installed immediately with their original packing materials. Put them in a dry and cool environment without exposure to sunlight or sources of strong electromagnetic radiation.

2.3 Installation Environment Check

Ensure that the installation environment meets the requirements before installation.

Table 2-1 Installation environment checklist

Check Item	Criteria	Check Result
Floor load bearing capacity	• Standard live load of the main equipment room: 8–12 kN/m^2 (If the battery cabinet is placed inside the module, use the standard live load of the main equipment room as a reference.) • Suspended load of the main equipment room: 1.2 kN/m^2 • Standard live load of the uninterruptible power system (UPS) room: 8–10 kN/m^2 • Standard live load of the battery room: 16 kN/m^2 • Standard live load of the monitoring center: 6 kN/m^2	□ Passed □ Failed
Equipment room net height	• In the scenario where the new main way is deployed (without bases), the minimum floor height is 2.8 m when 2.0 m high IT cabinets are deployed and 3.0 m when 2.2 m high IT cabinets are deployed. • In the scenario where the new main way is not deployed (without bases), the minimum floor height is 2.6 m when 2.0 m high IT cabinets are deployed and 2.8 m when 2.2 m high IT cabinets are deployed.	□ Passed □ Failed

Check Item	Criteria	Check Result
	NOTICE Equipment room net height (with bases) = Equipment room net height (without bases) + Base height	
Device passage and door height and width	Height ≥ 2.2 m and width ≥ 1.2 m (If a 2200 mm high cabinet cannot go through, tilt the cabinet.)	□ Passed □ Failed
Floor levelness	Allowed deviation: 2000±3 mm	□ Passed □ Failed
Elevator	• Elevator load bearing capacity > 1.5 t • Elevator internal size: height > 2.4 m or depth > 2.7 m	□ Passed □ Failed
Cable tray	Cable trays are preinstalled in the equipment room for routing signal cables and power cables.	□ Passed □ Failed
Power supply	380–415 V AC ± 10%, 3 Ph, 50/60 Hz	□ Passed □ Failed
Fire extinguishing	Indoor gas-extinguishing system	□ Passed □ Failed
Floor drain	DN50 or larger, made of cast iron or stainless steel	□ Passed □ Failed
Grounding	• The equipment room grounding system is a TN-S or TN-C-S system. • The equipment room ground grid has a ground resistance no greater than 10 ohms. (If the ground resistance exceeds 10 ohms, ensure that the equivalent ground radius of the ground grid exceeds 5 meters.) • Ground bars are deployed over the cable tray or under the raised floor.	□ Passed □ Failed
Monitoring port	• One LAN switch Ethernet port: connects to the customer subnet to monitor devices inside the module. • (Optional) Two fire control dry contacts (access actuator and PDC fire control terminal): connect to the fire extinguishing system of the equipment room for linkage. • (Optional) SIM card: Supports the 4G module. The ECC800-Pro supports short message service (SMS) message sending and 4G communication (including full frequency), is compatible with 3G (WCDMA) and 2G (GSM) communication, and provides a	□ Passed □ Failed

Check Item	Criteria	Check Result
	standard SIM card slot. If the collector supports the SMS alarm function, configure a SIM card. **NOTE** If there are multiple modules, configure a collector for each module. For the collectors that support the SMS alarm function, configure a SIM card for each collector. • IP address: Each collector, camera, and VCN require an IP address, respectively.	

NOTE

If any of the requirements is not met, contact Huawei technical support.

2.4 Site Requirements

Figure 2-3 Single-row scenario

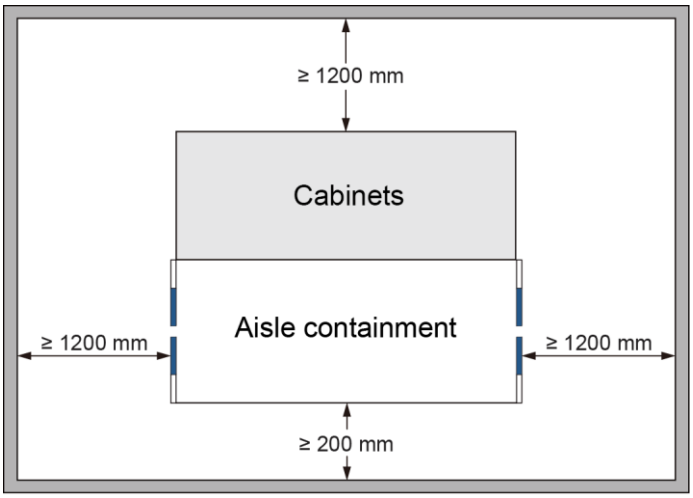
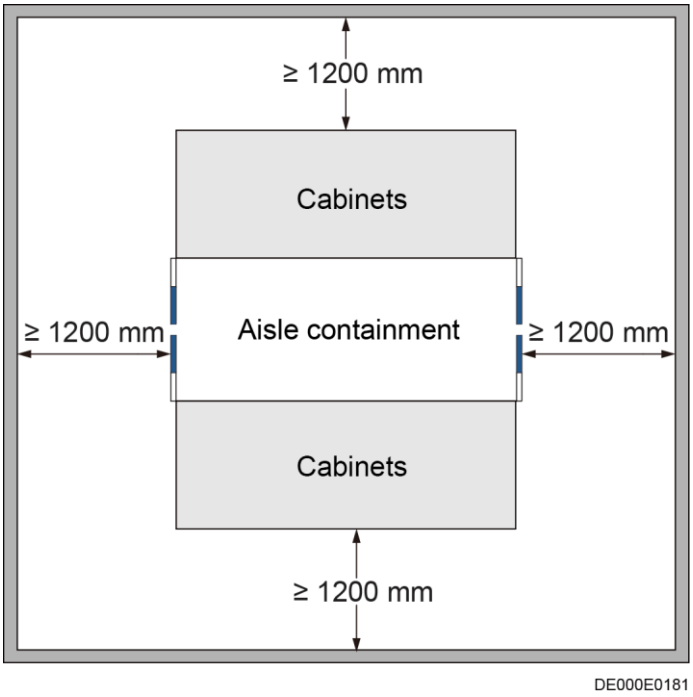


Figure 2-4 Dual-row scenario



2.5 Reference Documentation

Before installation, prepare the following documents in addition to this document.

Table 2-2 Reference documents

System Category	Component	Document
Power supply and distribution system	Precision PDC	*PDU8000 Modular Precision PDC V2.0 User Manual*
	Integrated PDC	*PDU8000 Modular Integrated PDC V1.0 Quick Guide*
	Integrated UPS	*UPS5000-E-(50 kVA–125 kVA) Quick Guide (Integrated UPS 3.0)* *UPS5000-E-(60 kVA–125 kVA) Quick Guide (Integrated UPS 3.0)*
	New Main Way	*New Main Way 2.0 Quick Guide*
	Smart cooling product power distribution box	*PDU8000 Power Distribution Box-T Quick Installation Guide (02402732-005)* *PDU8000 Power Distribution Box-T Quick Installation Guide (02402732-006)*
	iBattery	*iBattery 3.0 Quick Guide*

System Category	Component	Document
Cooling system	NetCol5000-A025 In-row Air Cooled Smart Cooling Product	*NetCol5000-A025 In-row Air Cooled Smart Cooling Product Quick Guide (300 mm Width)*
	NetCol5000-A035 In-row Air Cooled Smart Cooling Product	*NetCol5000-A035 In-row Air Cooled Smart Cooling Product Quick Guide (300 mm Width)*
	NetCol5000-A050 In-row Air Cooled Smart Cooling Product	*NetCol5000-A050 In-row Air Cooled Smart Cooling Product Quick Guide*
	Outdoor unit	*NetCol500 Variable Speed Outdoor Unit User Manual*
Facility management system	ECC800-Pro	*ECC800 Data Center Controller V100R003C00 User Manual (for ECC800-Pro)*
	NetEco	*iManager NetEco Product Documentation - (NetEco Version)*
Others	N/A	*Smart Modular Data Center Quick Reference Guide* includes the following documents: • *Smart Modular Data Center Installation Quick Start* • *Smart Modular Data Center Cable Routing Diagram for a Dual-Row Aisle Containment* • *Smart Modular Data Center Management System Wiring Diagram*
	Cable tray	*Indoor Cable Tray Installation Guide*
	Base	*FusionModule2000 Smart Modular Data Center V500R003C10 Base Design Diagram*

NOTE

The ECC800/NetEco version depends on the version in use. Click  on the ECC800/NetEco WebUI to obtain the current version.

2.6 Tools Prepared Onsite

2.6.1 Tools Delivered with Equipment

Marking-off Template

A marking-off template is used for drawing lines to determine an installation position. The marking-off template is available in the No. 0 package.

Figure 2-5 Marking-off template for a 1200 mm deep cabinet

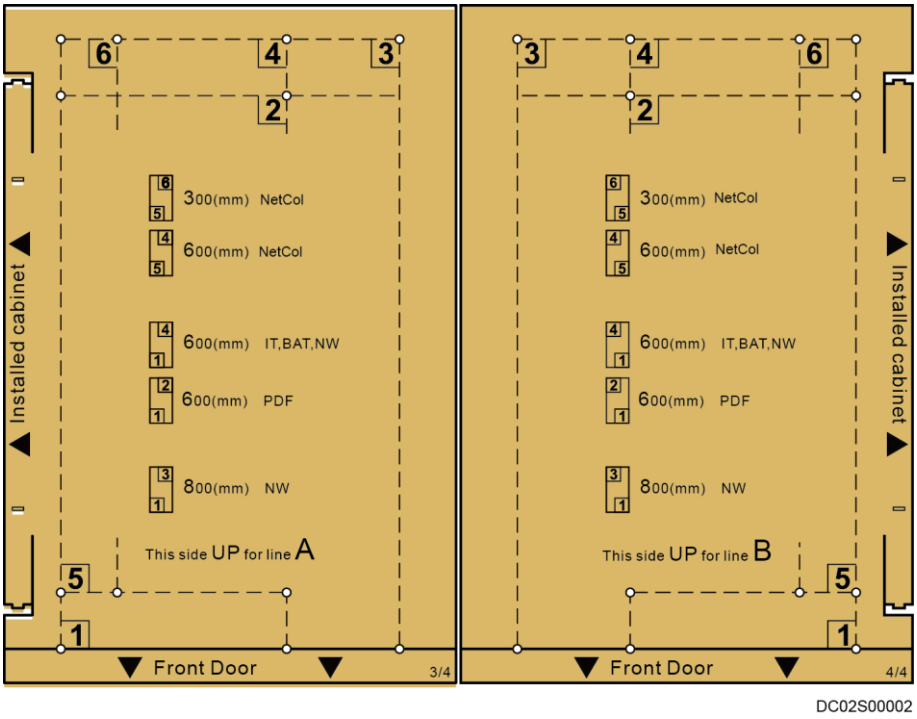
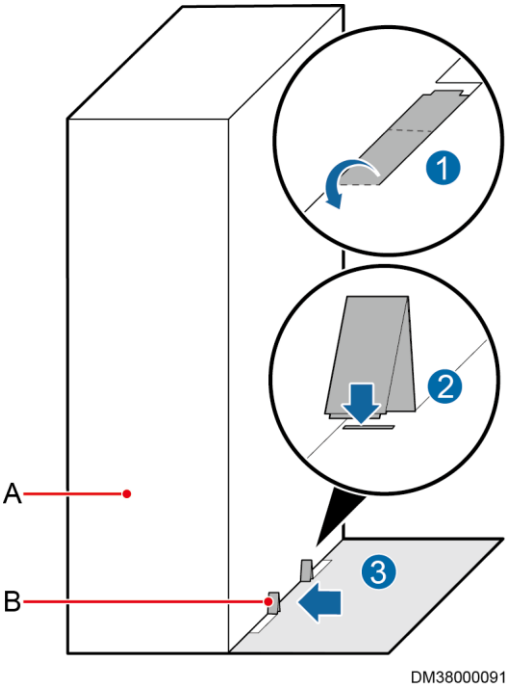


Figure 2-6 Usage of marking-off templates



(A) Properly located cabinet (B) Marking-off template edgefolds

Aisle Check Tool

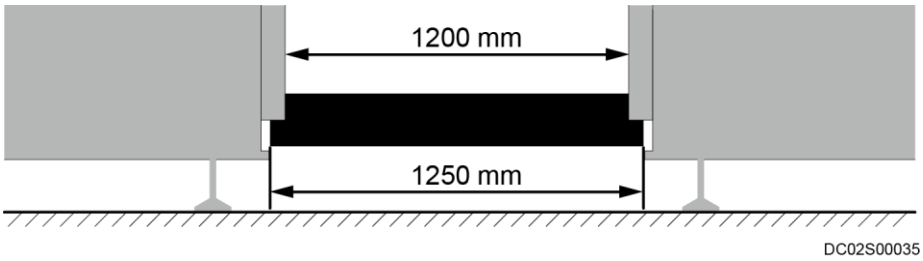
Aisle check tool dimension description:

- Longer-side length: check whether the distance between the cabinet frames in two rows of cabinets is 1250 mm.
- Shorter-side length: check whether the distance between the doors in two rows of cabinets is 1200 mm.

NOTICE

When checking the height, ensure that the floor levelness meets engineering requirements (floor levelness tolerance: 3 mm/2000 mm).

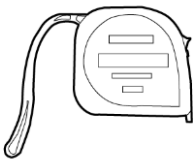
Figure 2-7 Aisle check tool

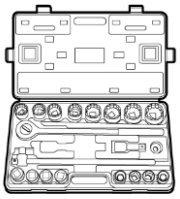
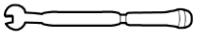
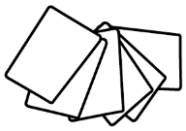
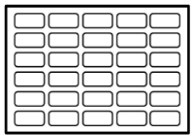
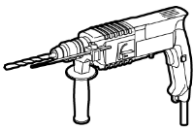
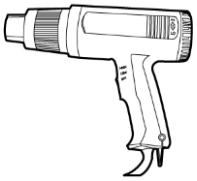
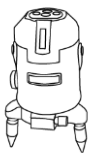
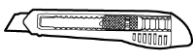
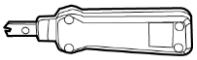
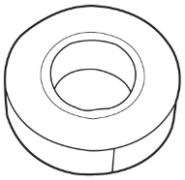
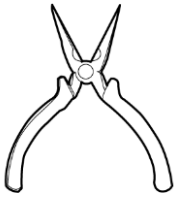
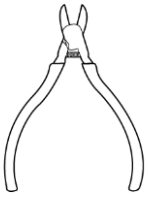
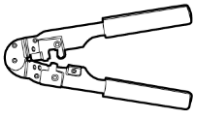


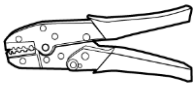
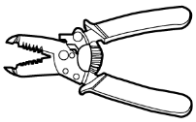
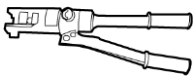
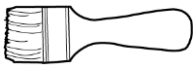
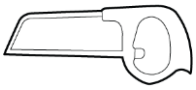
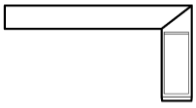
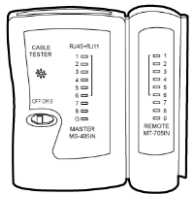
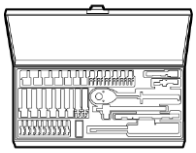
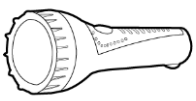
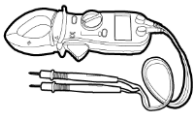
2.6.2 Tools and Instruments

This section lists the tools and instruments required for installation.

Table 2-3 Common tools

Tool Name, Specifications, and Appearance			
Protective gloves	Marker	Measuring tape (5 m)	Level
			
Step ladder (2 m)	Phillips screwdriver	Phase sequence meter	Flat-head screwdriver (2–5 mm)

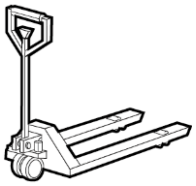
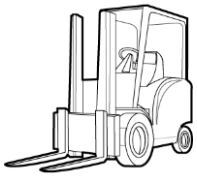
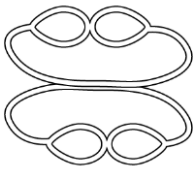
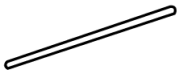
Tool Name, Specifications, and Appearance			
			
Adjustable wrench (6")	Socket wrench M4/M6/M8/M12	Hex key	Box-end wrench M6/M8/M12
			
Torque wrench (28 mm)	Solid wrench (12#/13#/18#)	Cotton cloth	Label
			
Electric screwdriver	Hand drill (Φ3/Φ3.7/Φ4/Φ4.5/ Φ5/Φ6/Φ10/Φ12 bit)	Hammer drill (Φ16 bit)	Heat gun
			
Laser locator	Utility knife	Electrician's knife	Impact tool
			
Insulation tape	Needle-nose pliers	Diagonal pliers	RJ45 crimping tool
			

Tool Name, Specifications, and Appearance			
Crimping tool	Wire stripper	Hydraulic pliers	Wire clippers
			
Cable tie	Multimeter	Electroprobe	Brush
			
Claw hammer	Vacuum cleaner	Hacksaw	Handsaw
			
Right angle	Heat shrink tubing	Network cable tester	Rubber mallet
			
Adjustable socket screwdriver	Flashlight	Clamp meter	-
			-

NOTE

This table may not list some tools required at specific sites. Onsite installation personnel and technical support personnel should prepare tools based on site requirements.

Table 2-4 Transportation and unpacking tools

Tool Name, Specifications, and Appearance			
Pallet truck	Diesel forklift	Lifting rope (bearing capacity ≥ 400 kg)	Lever (bearing capacity ≥ 400 kg)
			

2.7 Personnel Requirements

Only trained and qualified personnel who fully understand basic safety precautions are allowed to install and operate a modular data center.

⚠ CAUTION

Huawei will not be liable for any consequence caused by the violation of this document.

The requirements are as follows:

- Customers' installation personnel must be trained by Huawei and understand how to install and operate a modular data center.
- The number of installation personnel varies depending on the project progress and the installation environment. Typically, three to five persons are required.
- People who need to work at heights must have the required work permit.

2.8 Scenario Description

NOTICE

- The floor plan and exterior diagrams only indicate the relative positions of components. For the detailed installation position, see the engineering layout diagram and actual objects.
- The PDC in smart module A is an integrated UPS, with batteries deployed inside the aisle containment.
- The PDC in smart module B is an integrated PDC or precision PDC, with batteries and UPS deployed outside the aisle containment.
- The PDC in smart module A (with batteries deployed outside) is an integrated UPS, with batteries deployed outside the aisle containment.
- It is recommended that two smart cooling products with the heating and humidification functions be installed for the standard configuration. In the dual-row aisle containment, the two smart cooling products should be placed at both ends of the aisle. If more than two smart cooling products with the heating and humidification functions are to be configured, distribute them evenly in the aisle depending on the actual condition.

2.8.1 Power Supply and Distribution Cabinet Scenario (Dual-Row)

Figure 2-8 Floor plan of the dual-row aisle containment

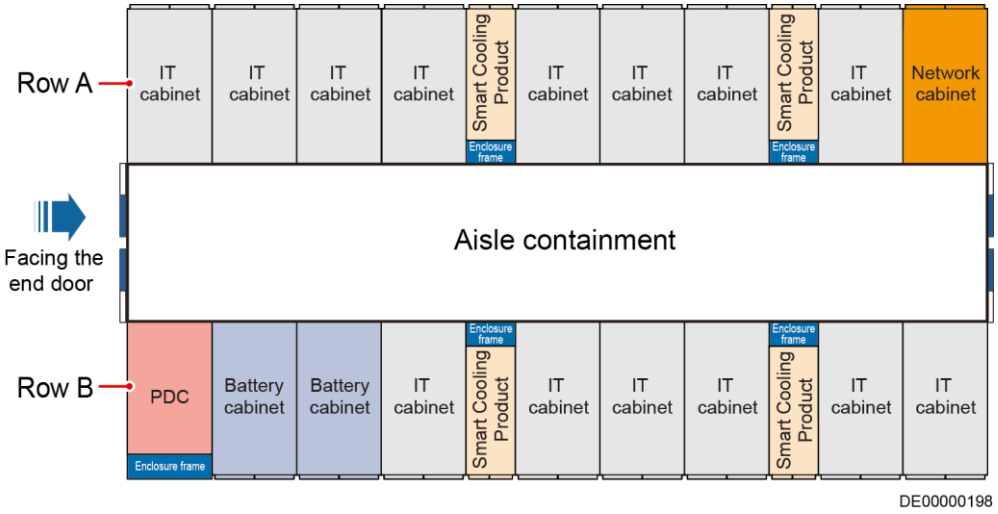
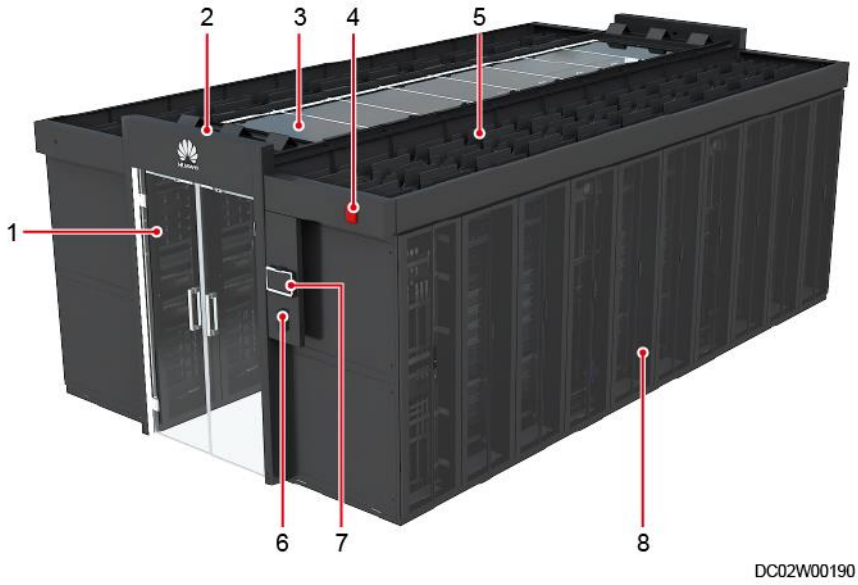


Figure 2-9 Exterior of the dual-row aisle containment



(1) End door (2) Control skylight (3) Flat or rotating skylight

(4) Alarm beacon (5) Cable trough (6) Access control device

(7) Pad (8) Cabinet

2.8.2 Power Supply and Distribution Cabinet Scenario (Single-Row)

Figure 2-10 Floor plan of the single-row aisle containment

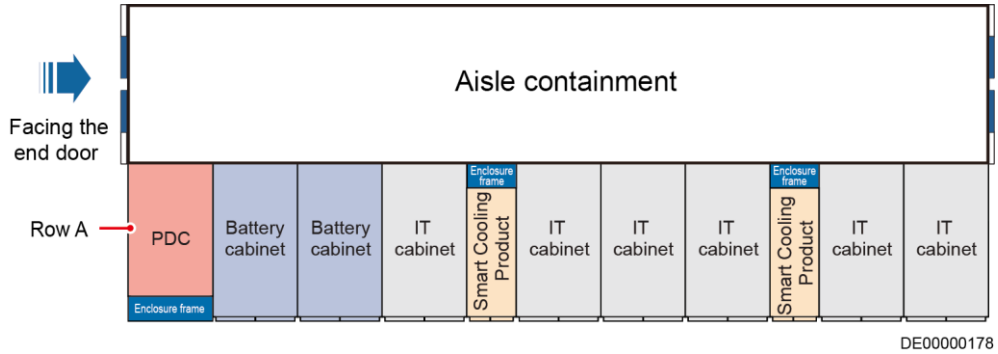
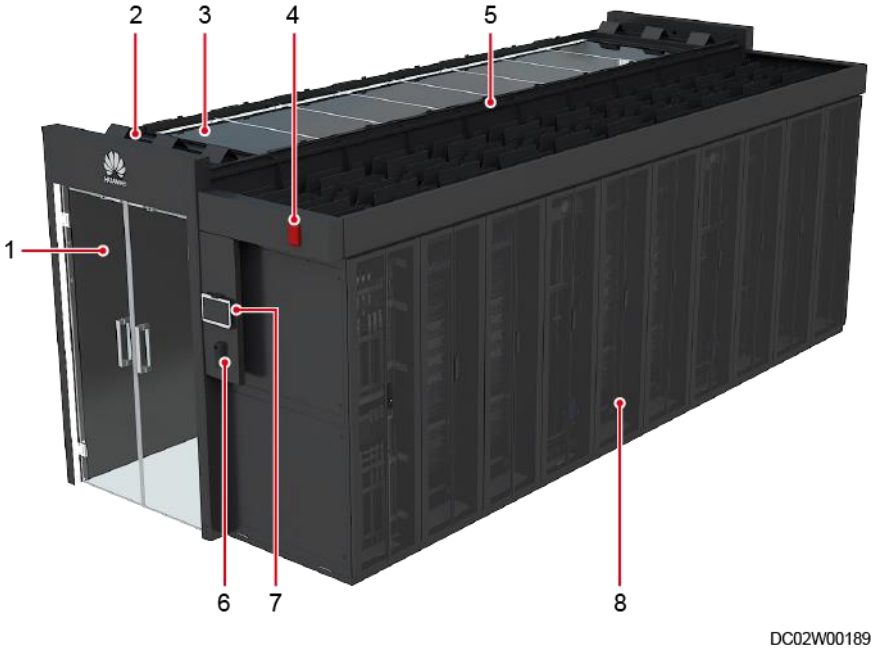


Figure 2-11 Exterior of the single-row aisle containment



(1) End door
(2) Control skylight
(3) Flat or rotating skylight
(4) Alarm beacon
(5) Cable trough
(6) Access control device
(7) Pad
(8) Cabinet

2.8.3 New Main Way Scenario (Dual-Row)

Figure 2-12 Floor plan of the dual-row aisle containment

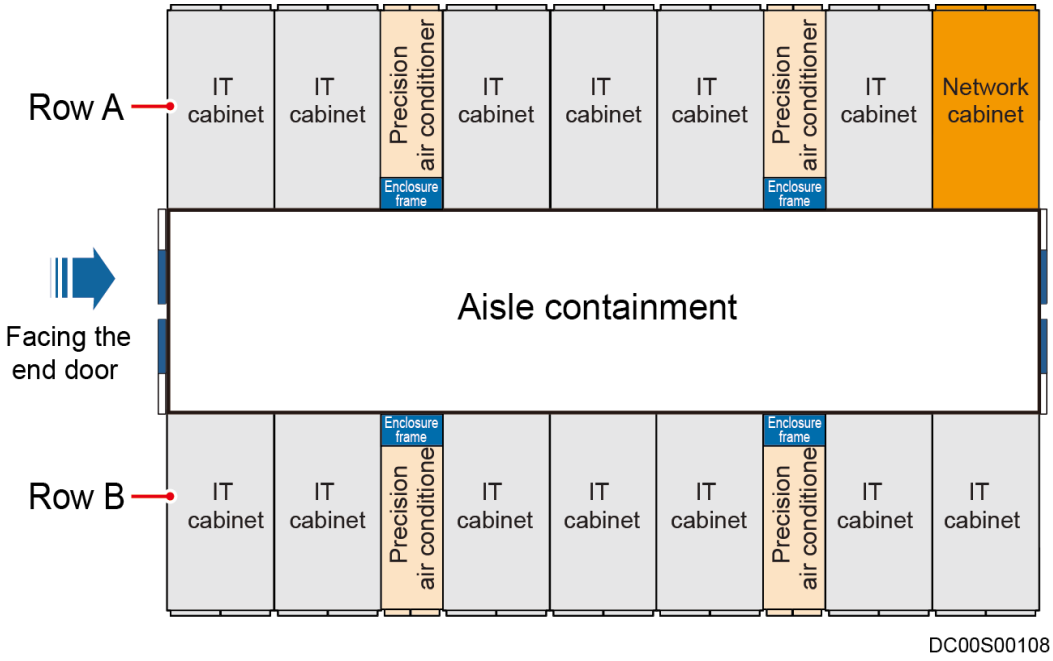
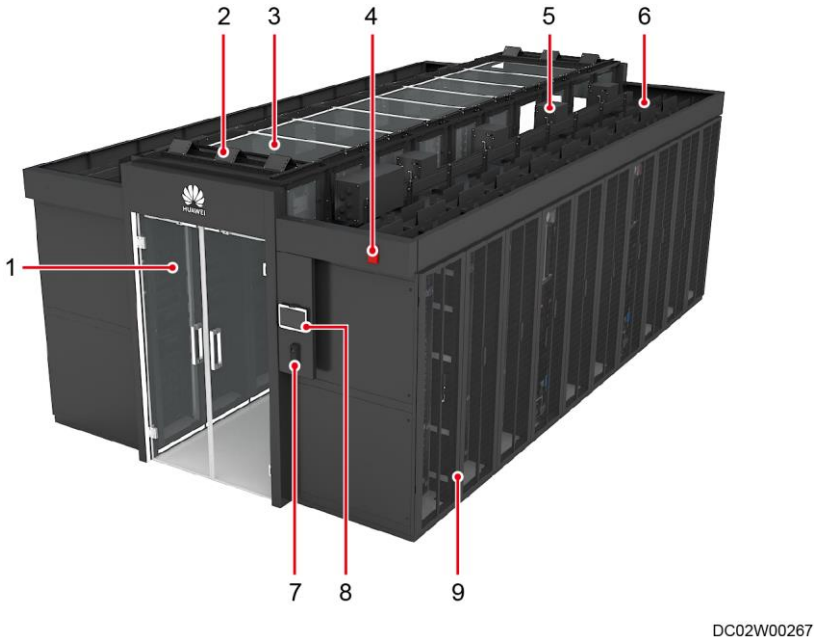


Figure 2-13 Exterior of the dual-row aisle containment



(1) End door (2) Control skylight (3) Flat or rotating skylight

(4) Alarm beacon (5) New main way (6) Cable trough

(7) Access control device (8) Pad (9) Cabinet

2.8.4 New Main Way Scenario (Single-Row)

Figure 2-14 Floor plan of the single-row aisle containment

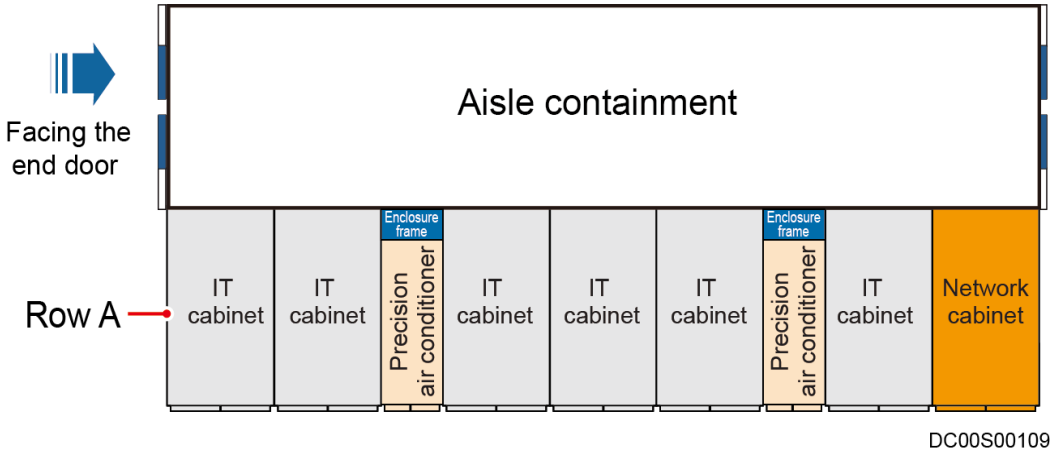
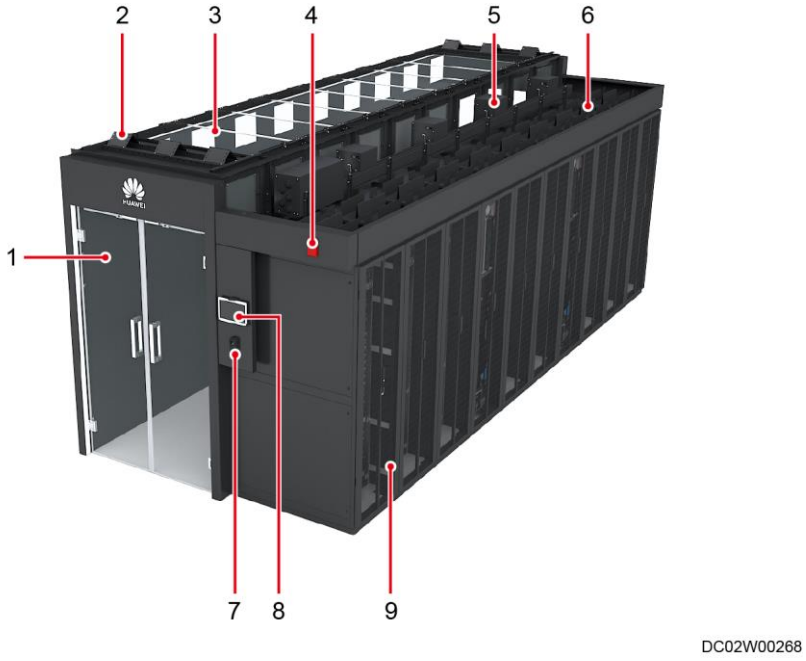


Figure 2-15 Exterior of the single-row aisle containment



(1) End door
(2) Control skylight
(3) Flat or rotating skylight
(4) Alarm beacon
(5) New main way
(6) Cable trough
(7) Access control device
(8) Pad
(9) Cabinet

3 Smart Module Layout Requirements

3.1 Layout Requirements for Standard Dual-Row Aisle Containment

Prerequisites

The floor levelness meets engineering requirements (levelness tolerance: ±3 mm).

Procedure

Step 1 Determine the installation position for the smart module based on the onsite engineering layout diagram.

Step 2 Use a laser locator to mark two lines that are perpendicular to each other in a corner of the planned installation position.

NOTE

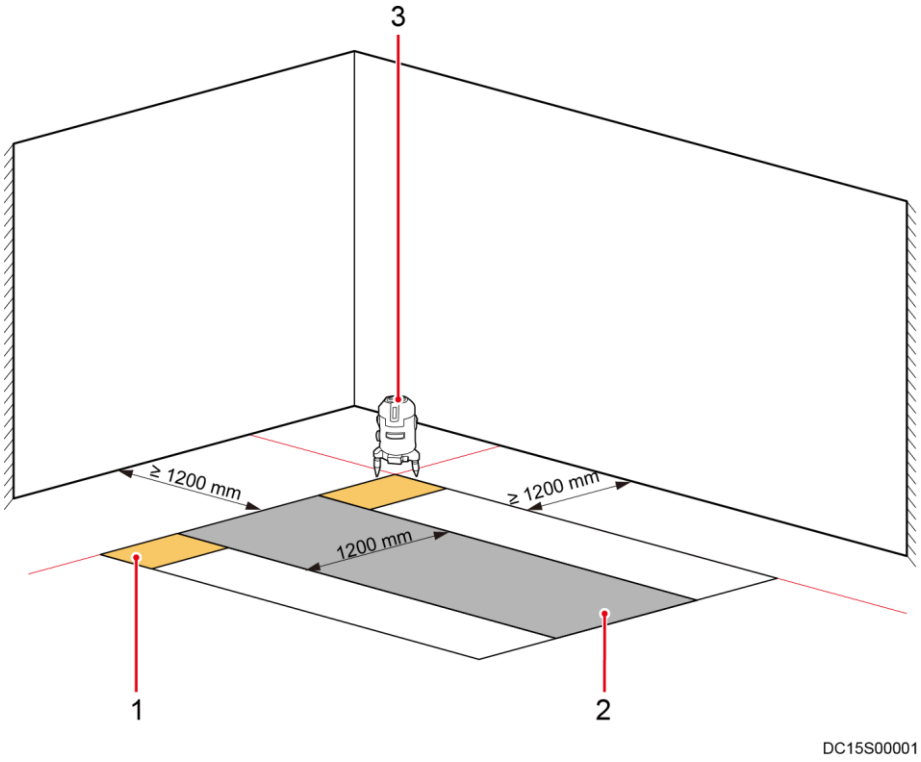
If no laser locator is available, use a right angle and thin rope to mark the two perpendicular lines.

Step 3 Place one corner of the marking-off template at the crossing point of the perpendicular lines to determine the position for an end cabinet. Use a marker to mark the outline of the marking-off template and the mounting holes for the cabinet on the floor.

NOTICE

If there is no need to secure the cabinet to the floor, mark only the outline of the marking-off template.

Figure 3-1 Using a laser locator for positioning (dual-row aisle containment)



(1) Marking-off template (2) Aisle containment (3) Laser locator

Step 4 Use a measuring tape to measure the aisle distance and mark the position for the end cabinet in the other row in the same way.

----End

3.2 Layout Requirements for Standard Single-Row Aisle Containment

Prerequisites

The floor levelness meets engineering requirements (levelness tolerance: ±3 mm).

Preparations

Tools: laser locator, marker, measuring tape

Document: onsite engineering layout diagram

Procedure

Step 1 Determine the installation position for the smart module based on the onsite engineering layout diagram.

Step 2 Use a laser locator to mark two lines that are perpendicular to each other in a corner of the planned installation position.

NOTE

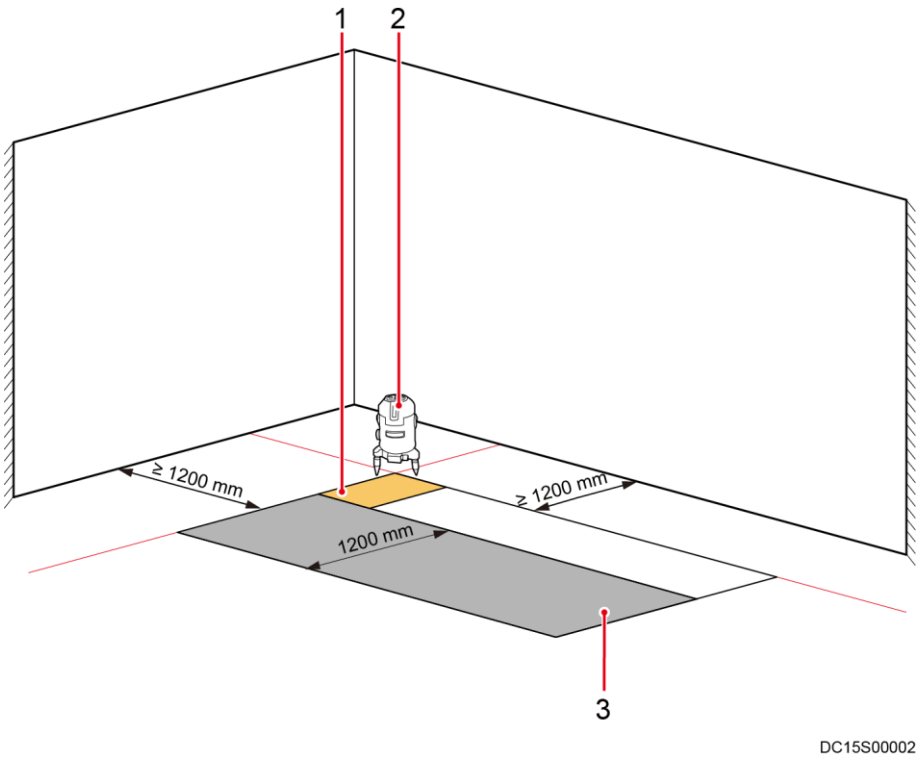
If no laser locator is available, use a right angle and thin rope to mark the two perpendicular lines.

Step 3 Place one corner of the marking-off template at the crossing point of the perpendicular lines to determine the position for an end cabinet. Use a marker to mark the outline of the marking-off template and the mounting holes for the cabinet on the floor.

NOTICE

If there is no need to secure the cabinet to the floor, mark only the outline of the marking-off template.

Figure 3-2 Using a laser locator for positioning (single-row aisle containment)



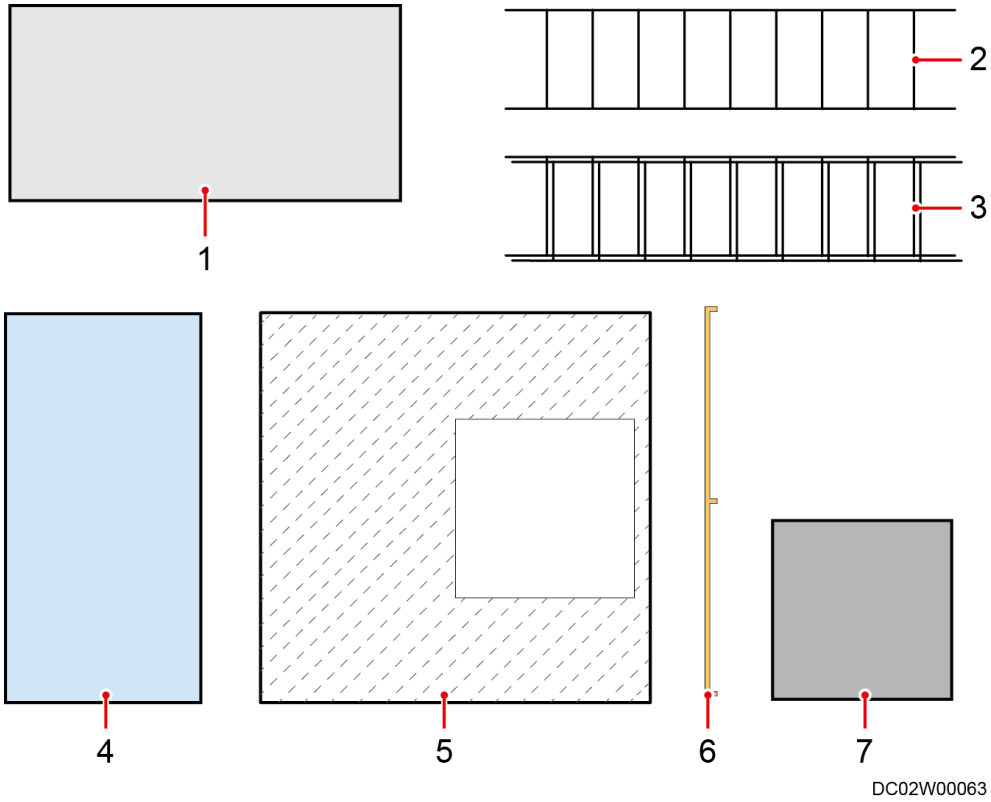
(1) Marking-off template (2) Laser locator (3) Aisle containment

----End

3.3 Layout Requirements for Dual-Row Aisle Containment with a Column

This section describes the column position in the scenario with a column relative to the adjustable skylight, sealing plates, and cable trays.

Figure 3-3 Legend



(1) Cabinet

(2) Single layer of cable tray

(3) Double layer of cable trays

(4) Flat or rotating skylight

(5) Adjustable skylight

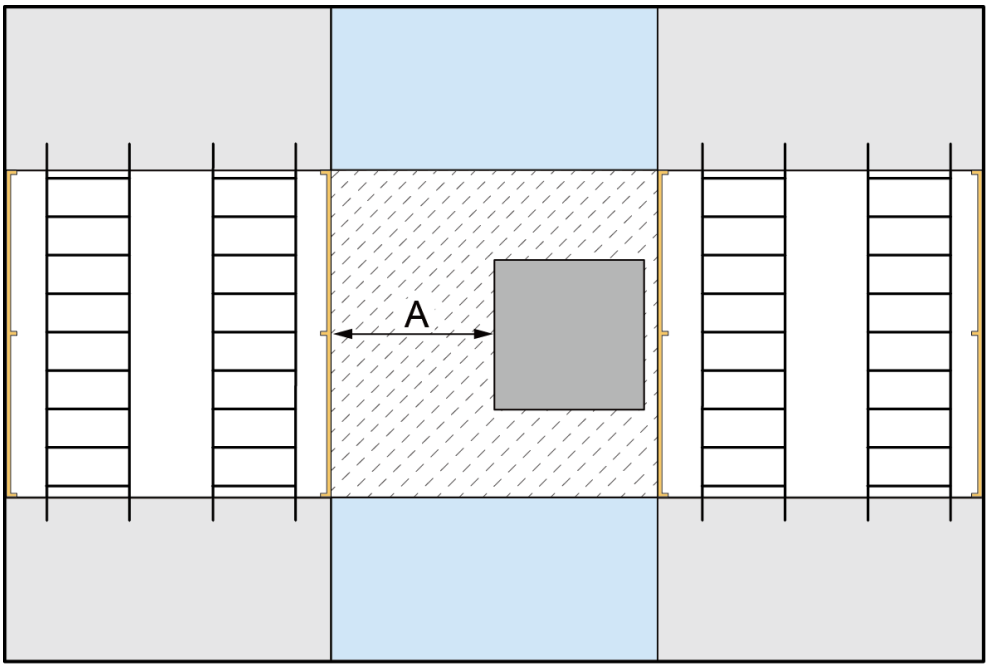
(6) Sealing plate

(7) Column in the equipment room

NOTICE

If a column in the data center is irregular, ensure that the maximum cross section of the column does not interfere with cabinets.

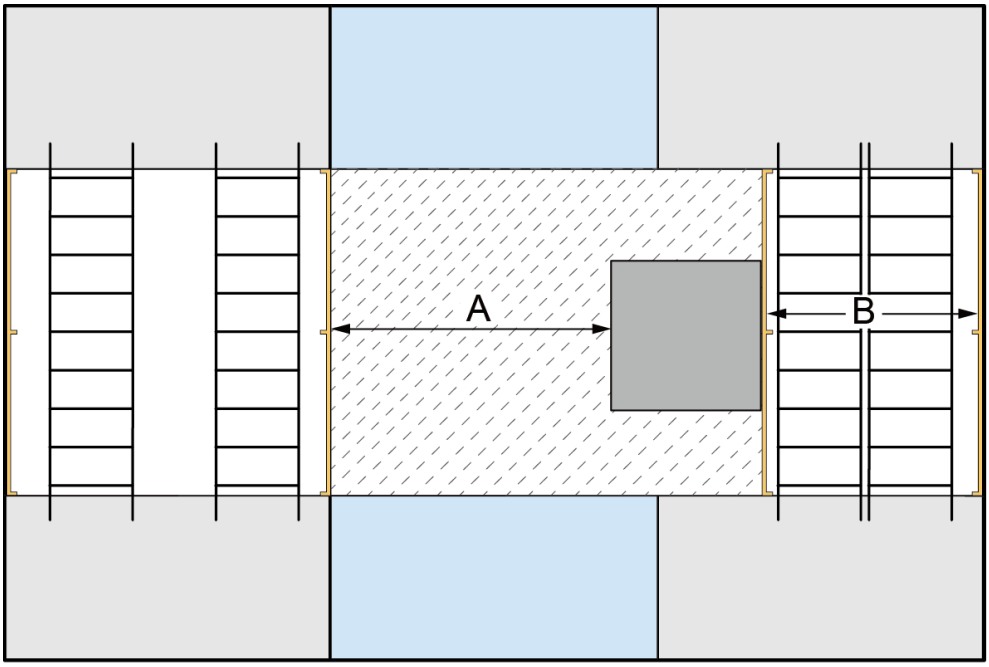
Figure 3-4 Column in the aisle containment (A < 800 mm)



NOTE

- Cabinet places on both sides of the column are left blank and sealed by sealing plates. Directions of the concave sides of the sealing plates are shown in Figure 3-4.
- Install cable trays over the cabinets on both sides of the blank cabinet places for routing strong-current and weak-current cables.
- Install an adjustable skylight over the aisle containment. The area to be covered by the adjustable skylight is shown in Figure 3-4.

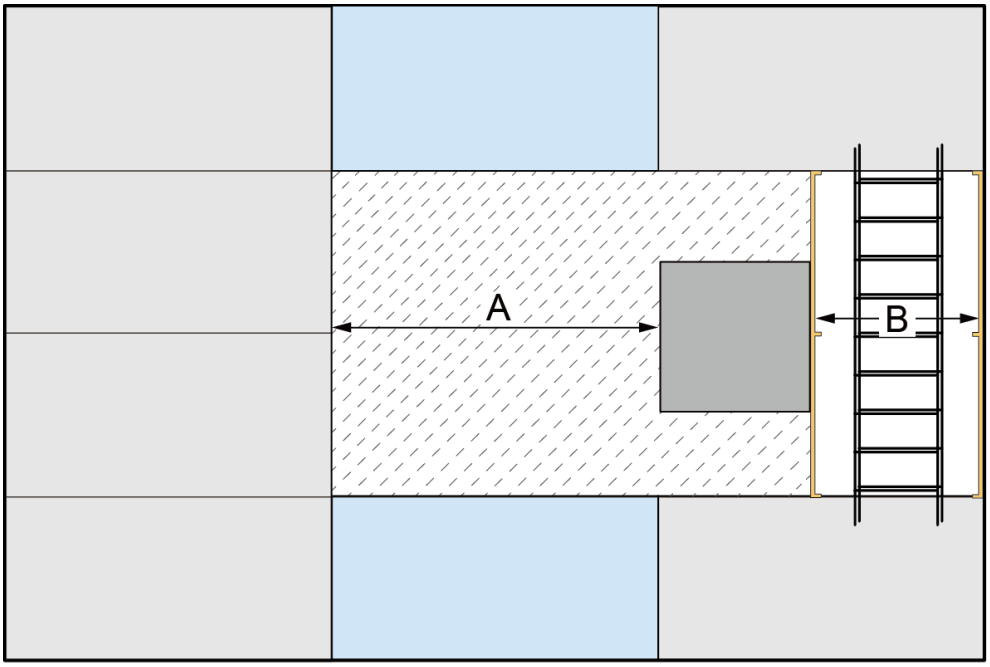
Figure 3-5 Column occupying part of a cabinet place (A < 800 mm and B ≥ 800 mm)



NOTE

- Cabinet places on both sides of the column are left blank and sealed by sealing plates. Directions of the concave sides of the sealing plates are shown in Figure 3-5.
- Install cable trays over the cabinets on both sides of the blank cabinet places for routing strong-current and weak-current cables.
- Install an adjustable skylight over the aisle containment. The area to be covered by the adjustable skylight is shown in Figure 3-5.

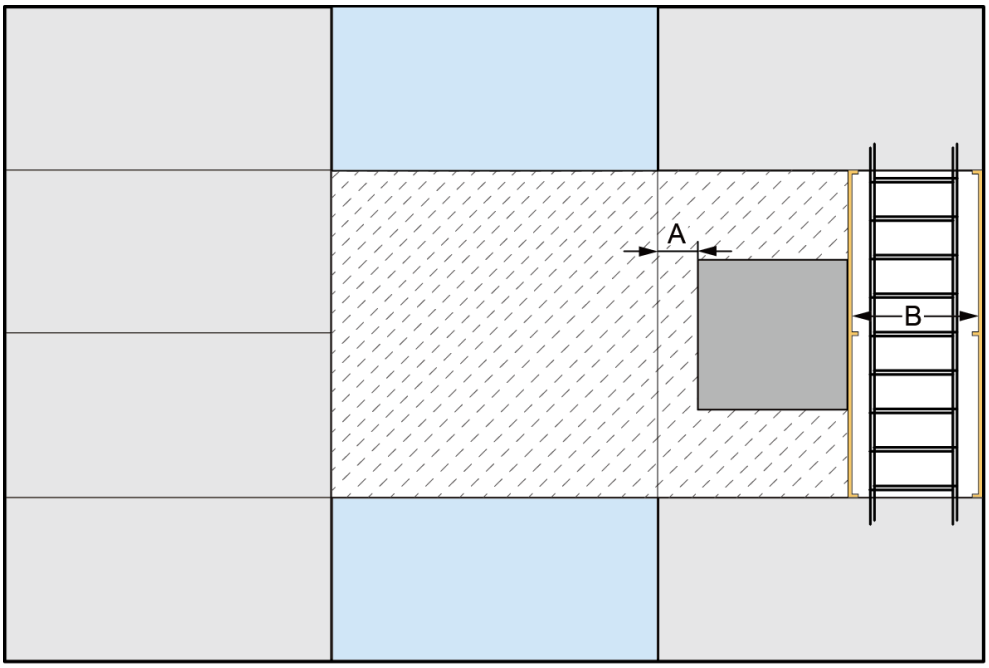
Figure 3-6 Column occupying part of a cabinet place (A ≥ 800 mm and B ≥ 400 mm)



NOTE

- Cabinet places on both sides of the column are left blank and sealed by sealing plates. Directions of the concave sides of the sealing plates are shown in Figure 3-6.
- Install cable trays over the cabinets on both sides of the blank cabinet places. If the cable trays cannot be installed in combined mode, install them in layered mode, the upper for routing weak-current cables while the lower for routing strong-current cables.
- Install an adjustable skylight over the aisle containment. The area to be covered by the adjustable skylight is shown in Figure 3-6.

Figure 3-7 Column in a row of cabinets (A < 70 mm and B ≥ 400 mm)



NOTE

- Cabinet places on the column side are left blank and sealed by sealing plates. Directions of the concave sides of the sealing plates are shown in Figure 3-7.
- Install cable trays over the cabinets on both sides of the blank cabinet places. If the cable trays cannot be installed in combined mode, install them in layered mode, the upper for routing weak-current cables while the lower for routing strong-current cables.
- Install an adjustable skylight over the aisle containment. The area to be covered by the adjustable skylight is shown in Figure 3-7.

Figure 3-8 Column in a row of cabinets (A ≥ 400 mm and B ≥ 0 mm)

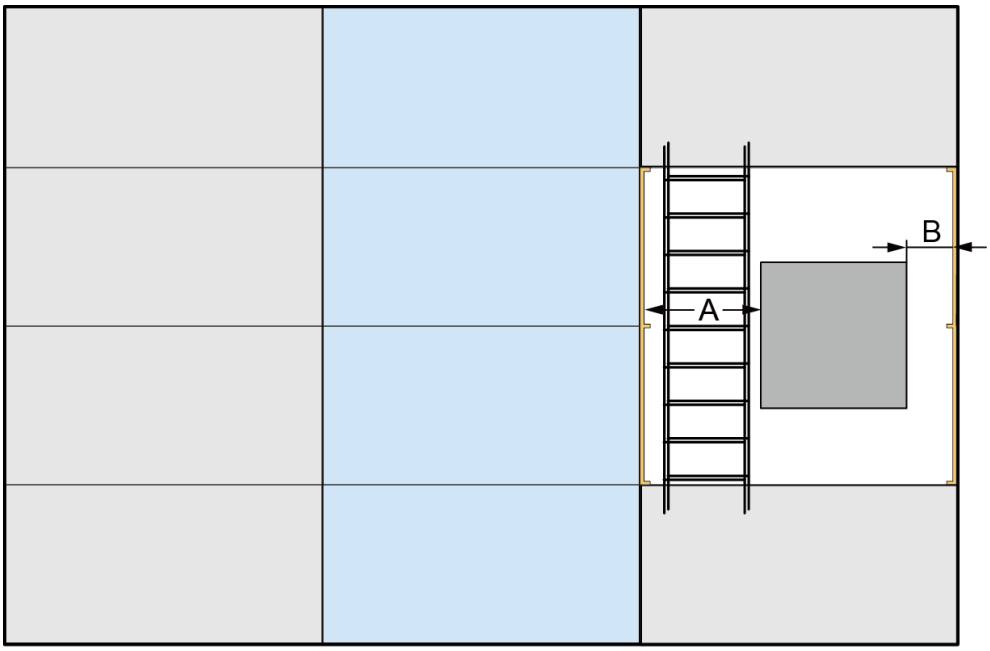
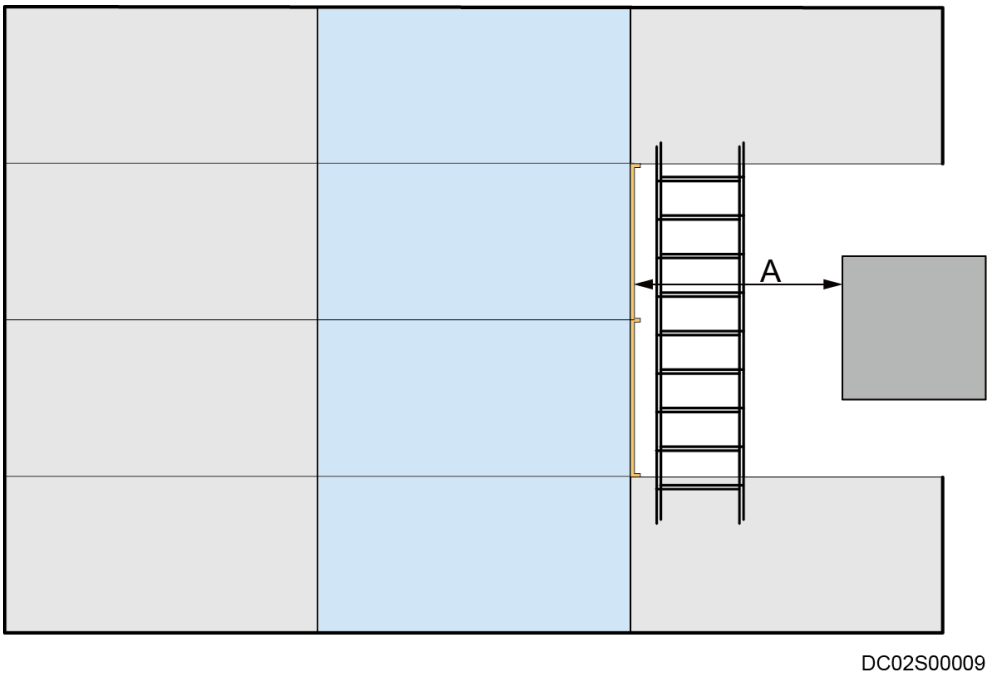


Figure 3-9 Column in a row of cabinets (A ≥ 400 mm)



NOTE

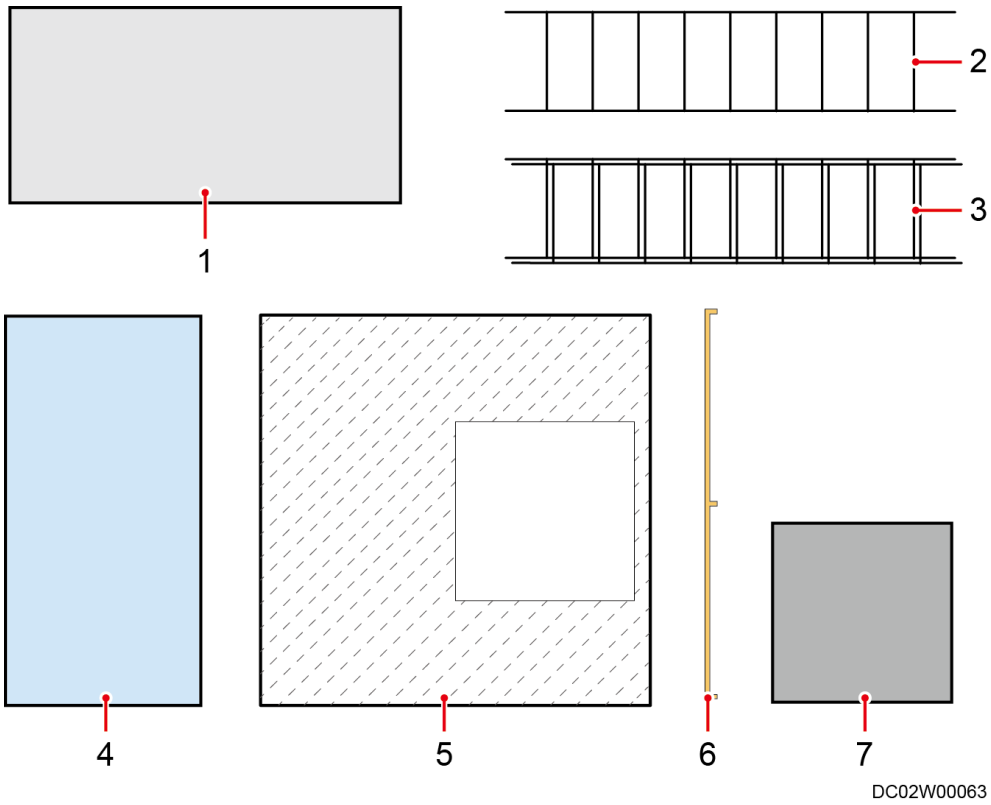
- Seal both sides of the column using sealing plates. Directions of the concave sides of the sealing plates are shown in Figure 3-8.
- Install cable trays over the cabinets on both sides of the blank cabinet places. If the cable trays cannot be installed in combined mode, install them in layered mode, the upper for routing weak-current cables while the lower for routing strong-current cables.

- Install flat or rotating skylights over the aisle containment.
- If sealing plates cannot be installed on both sides of the column, install sealing plates only near the aisle containment.

3.4 Layout Requirements for Single-Row Aisle Containment with a Column

This section describes the column position in the scenario with a column relative to the adjustable skylight, sealing plates, and cable trays.

Figure 3-10 Legend



(1) Cabinet

(2) Single layer of cable tray

(3) Double layer of cable trays

(4) Flat or rotating skylight

(5) Adjustable skylight

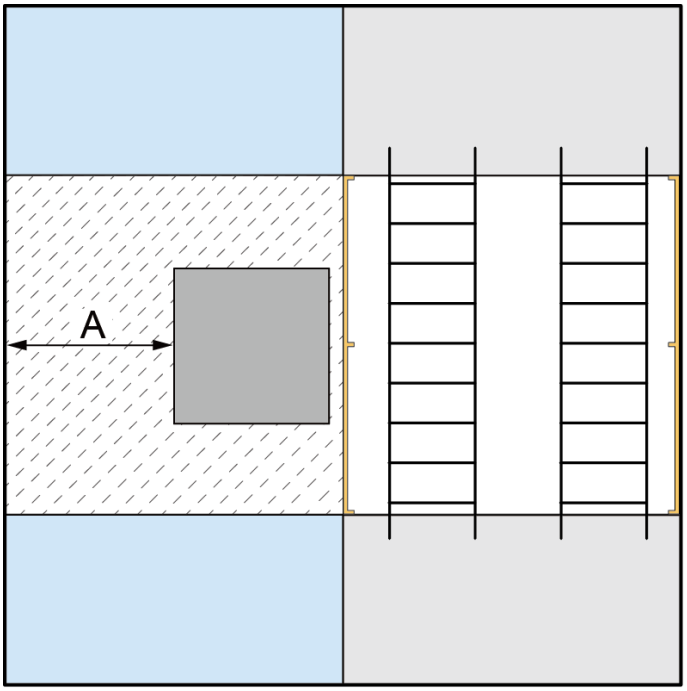
(6) Sealing plate

(7) Column in the equipment room

NOTICE

If a column in the data center is irregular, ensure that the maximum cross section of the column does not interfere with cabinets.

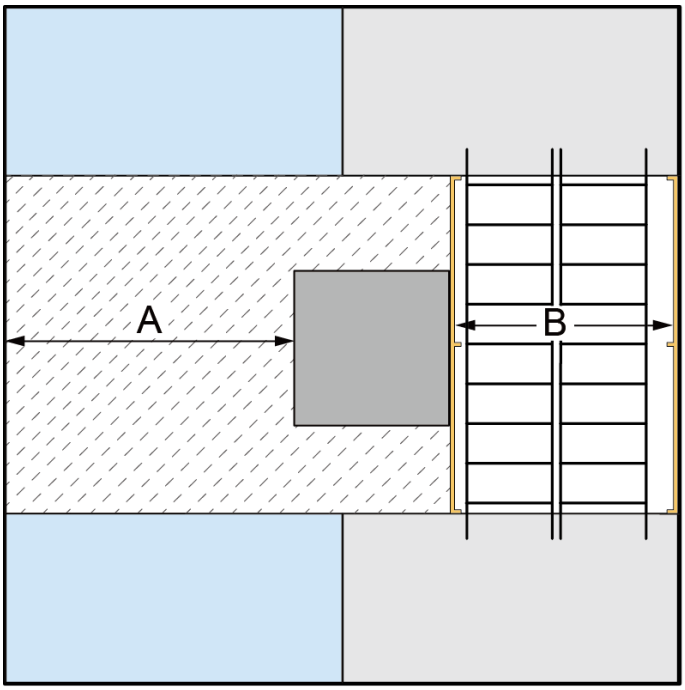
Figure 3-11 Column in the aisle containment (A < 800 mm)



NOTE

- Cabinet places on the column side are left blank and sealed by sealing plates. Directions of the concave sides of the sealing plates are shown in Figure 3-11.
- Install cable trays over the cabinets on both sides of the blank cabinet places for routing strong-current and weak-current cables.
- Install an adjustable skylight over the aisle containment. The area to be covered by the adjustable skylight is shown in Figure 3-11.

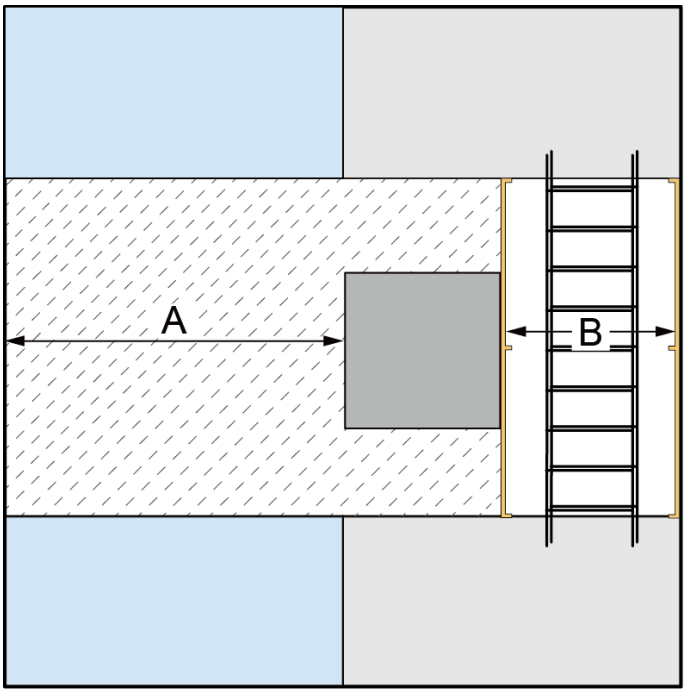
Figure 3-12 Column occupying part of a cabinet place (A < 800 mm and B ≥ 800 mm)



NOTE

- Cabinet places on the column side are left blank and sealed by sealing plates. Directions of the concave sides of the sealing plates are shown in Figure 3-12.
- Install cable trays over the cabinets on both sides of the blank cabinet places. If the cable trays cannot be installed in combined mode, install them in layered mode, the upper for routing weak-current cables while the lower for routing strong-current cables.
- Install an adjustable skylight over the aisle containment. The area to be covered by the adjustable skylight is shown in Figure 3-12.

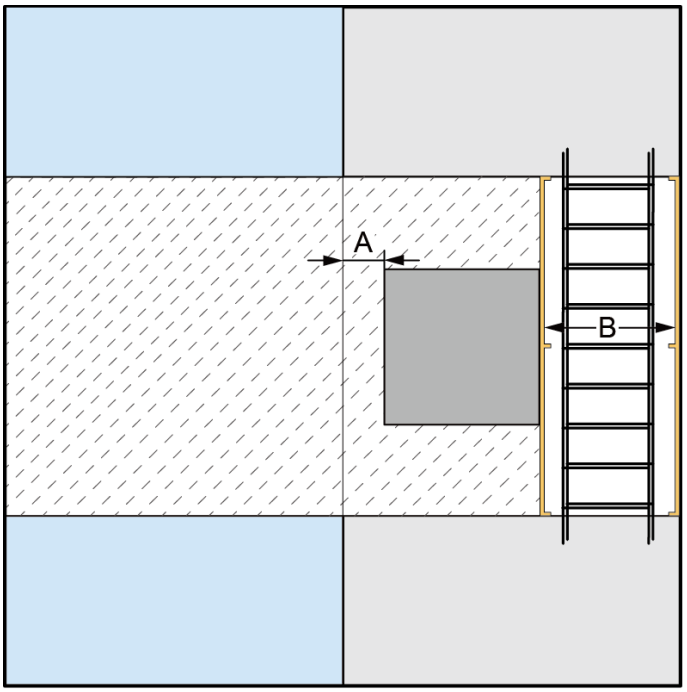
Figure 3-13 Column occupying part of a cabinet place (A ≥ 800 mm and B ≥ 400 mm)



NOTE

- Cabinet places on the column side are left blank and sealed by sealing plates. Directions of the concave sides of the sealing plates are shown in Figure 3-13.
- Install cable trays over the cabinets on both sides of the blank cabinet places. If the cable trays cannot be installed in combined mode, install them in layered mode, the upper for routing weak-current cables while the lower for routing strong-current cables.
- Install an adjustable skylight over the aisle containment. The area to be covered by the adjustable skylight is shown in Figure 3-13.

Figure 3-14 Column in a row of cabinets (A < 70 mm and B ≥ 400 mm)



NOTE

- Cabinet places on the column side are left blank and sealed by sealing plates. Directions of the concave sides of the sealing plates are shown in Figure 3-14.
- Install cable trays over the cabinets on both sides of the blank cabinet places. If the cable trays cannot be installed in combined mode, install them in layered mode, the upper for routing weak-current cables while the lower for routing strong-current cables.
- Install an adjustable skylight over the aisle containment. The area to be covered by the adjustable skylight is shown in Figure 3-14.

Figure 3-15 Column in a row of cabinets (A ≥ 400 mm and B ≥ 0 mm)

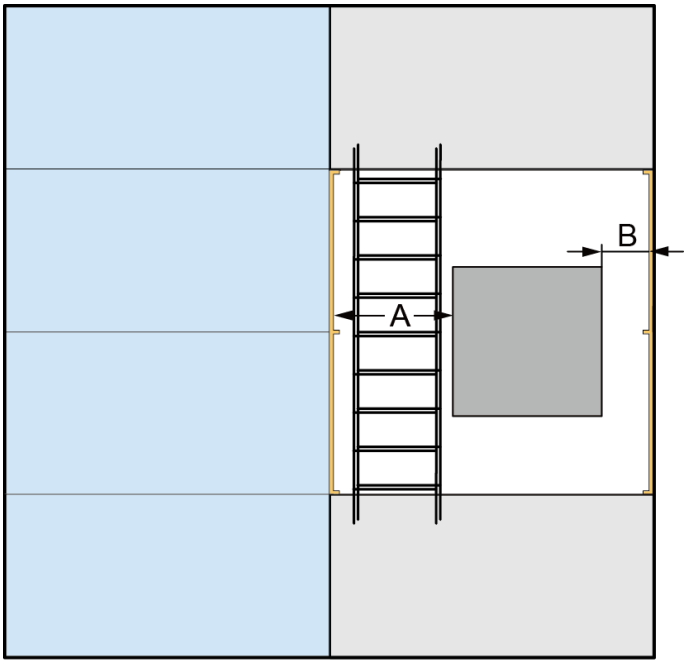
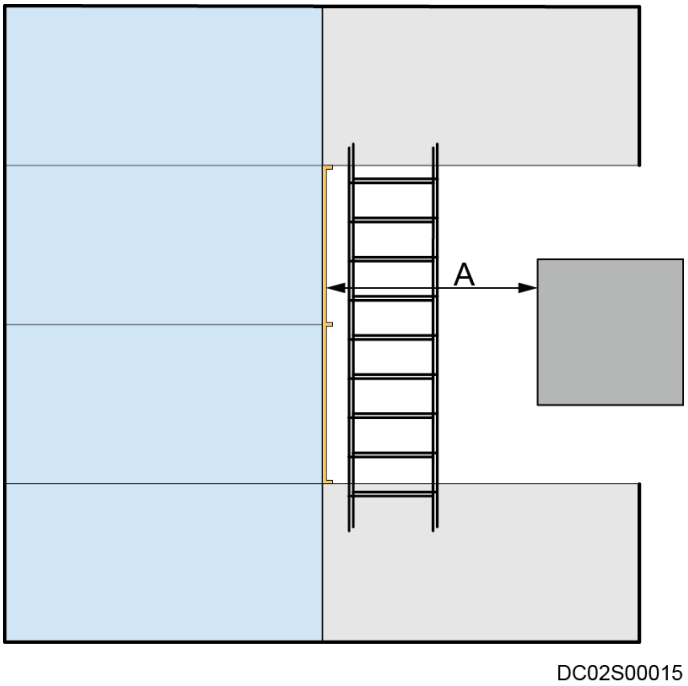


Figure 3-16 Column in a row of cabinets (A ≥ 400 mm)



NOTE

- Seal both sides of the column using sealing plates. Directions of the concave sides of the sealing plates are shown in Figure 3-15.

- Install cable trays over the cabinets on both sides of the blank cabinet places. If the cable trays cannot be installed in combined mode, install them in layered mode, the upper for routing weak-current cables while the lower for routing strong-current cables.
- Install flat or rotating skylights over the aisle containment.
- If sealing plates cannot be installed on both sides of the column, install sealing plates only near the aisle containment.

4 (Optional) Installing Bases

4.1 Precautions for Installing Bases

To ensure that bases fit cabinet connecting structures, configure bases with different specifications for different cabinets. For the detailed dimensions of bases, see the installation diagrams and parameter manual.

- If there are bases, install smart cooling products first.
- If there are no bases, install cabinets from the end cabinet in sequence.

NOTICE

If you do not use the bases provided by Huawei, design the load bearing requirements for bases according to the service plan.

- The load bearing capacity of each base is at least 2 tons.
- Assume that each row of cabinets is configured with N bases:
  - If N is less than 5, you can install all the bases at a time. After installation, check that the total length of each row of bases is the sum of nominal widths of all bases (tolerance –3 mm to 0 mm).
  - If N is greater than or equal to 5, you are advised to install five bases at a time. After installation, check that the total length of the bases is the sum of nominal widths of all bases (tolerance –3 mm to 0 mm). After installing five bases, check whether the total length of the five bases and the difference between their diagonal lengths meet the requirements.

    If the difference meets the requirements, tighten the bolts and continue to install next five bases. If the difference does not meet the requirements, adjust the bases to meet the requirements before tightening the bolts to prevent bases from being secured in a parallelogram or trapezoid shape.
- To ensure accurate locations, you are advised to determine base locations using a laser locator before installing bases.
- $|L1–L2| \leq 5$ mm, $|L3–L4| \leq 5$ mm

Figure 4-1 Single-row base layout (unit: mm)

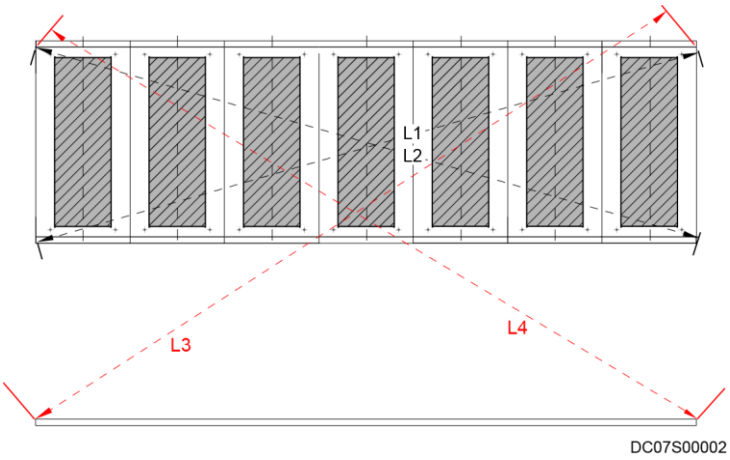
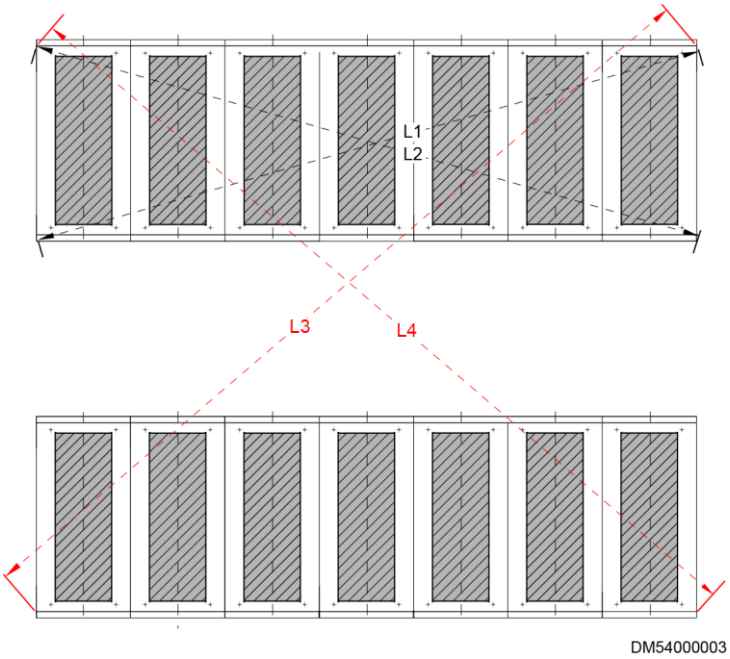


Figure 4-2 Dual-row base layout (unit: mm)



4.2 Installing Bases with Adjustable Dimension

Context

A base with adjustable dimensions can be 300 mm, 600 mm, or 800 mm wide, and applies to the PDC, battery cabinet, IT cabinet, network cabinet, and air conditioner cabinet.

Table 4-1 Specifications of bases with adjustable dimensions

Type	Dimensions
300 mm wide base	Height (adjustable): 270–410 mm; depth (adjustable): 1000 mm, 1100 mm, or 1200 mm
	Height (adjustable): 410–700 mm; depth (adjustable): 1000 mm, 1100 mm, or 1200 mm
600 mm wide base	Height (adjustable): 270–410 mm; depth (adjustable): 1000 mm, 1100 mm, or 1200 mm
	Height (adjustable): 410–700 mm; depth (adjustable): 1000 mm, 1100 mm, or 1200 mm
800 mm wide base	Height (adjustable): 270–410 mm; depth (adjustable): 1000 mm, 1100 mm, or 1200 mm
	Height (adjustable): 410–700 mm; depth (adjustable): 1000 mm, 1100 mm, or 1200 mm

Figure 4-3 300 mm wide base hole dimensions (Unit: mm)

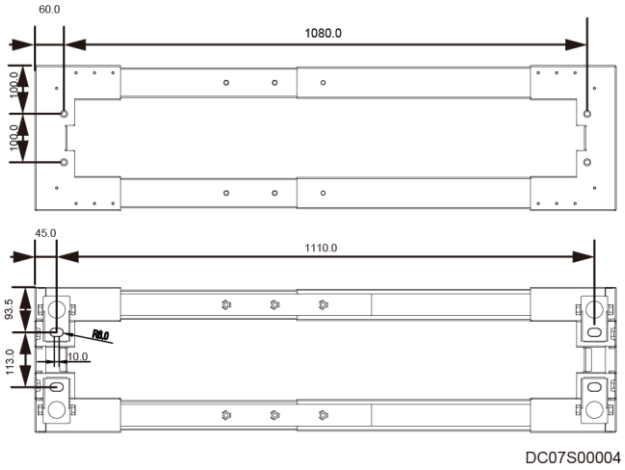


Figure 4-4 600 mm wide base hole dimensions (Unit: mm)

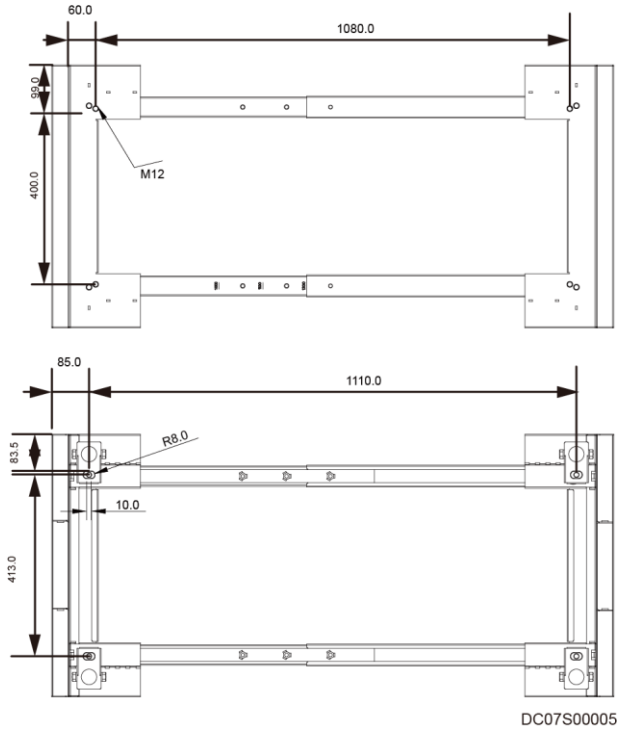
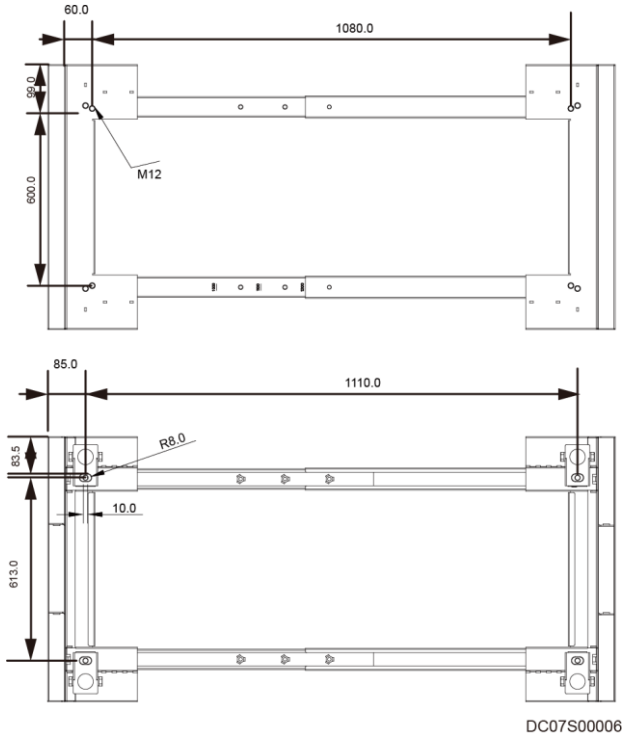


Figure 4-5 800 mm wide base hole dimensions (Unit: mm)



Preparations

Tools: ruler, marker, torque wrench, Phillips screwdriver, right angle, hammer drill, φ16 drill bit, level

Materials: base and accessories, expansion bolt, base connecting plate, washer, floor holder

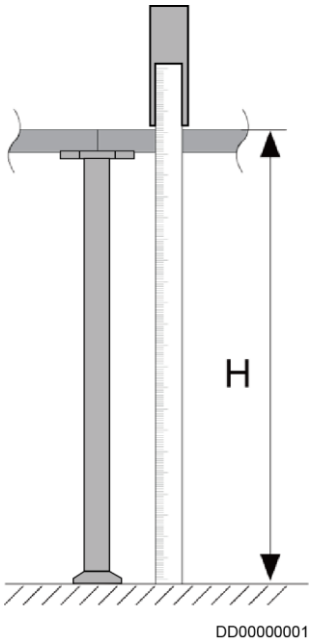
Document: base installation position diagram

Procedure

Step 1 Adjust the base height.

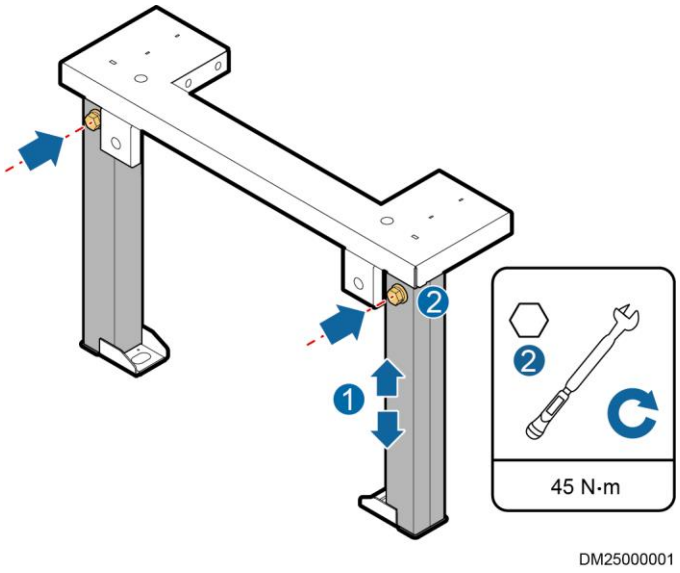
1. Measure the distance (H) between the concrete floor and the upper surface of the ESD floor using a ruler and record the value of H.

   Figure 4-6 Measuring the ESD floor height

2. Adjust the base height to H and tighten the height locking bolts on the feet.

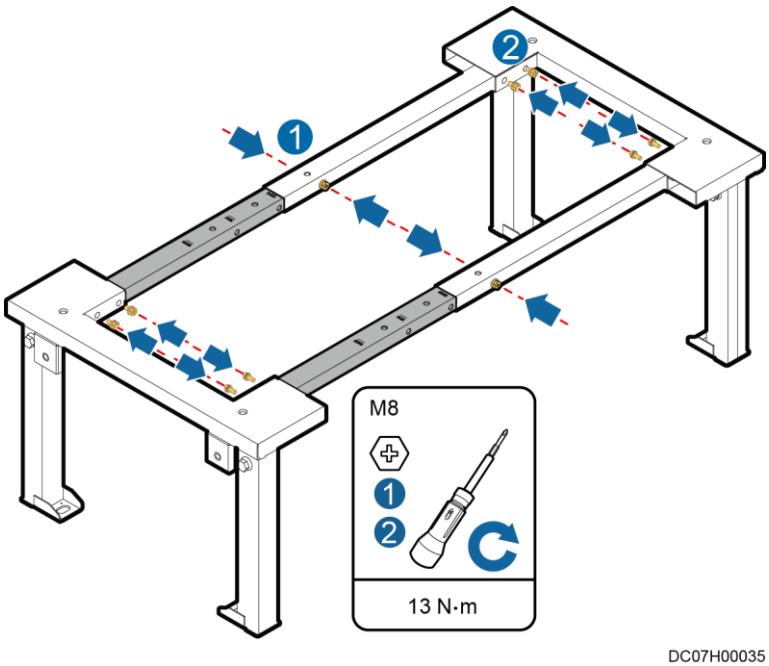
Figure 4-7 Tightening height locking bolts



Step 2 Assemble the base.

1. Adjust the base depth based on the cabinet depth
2. Tighten the bolt assembly on the telescopic rod.

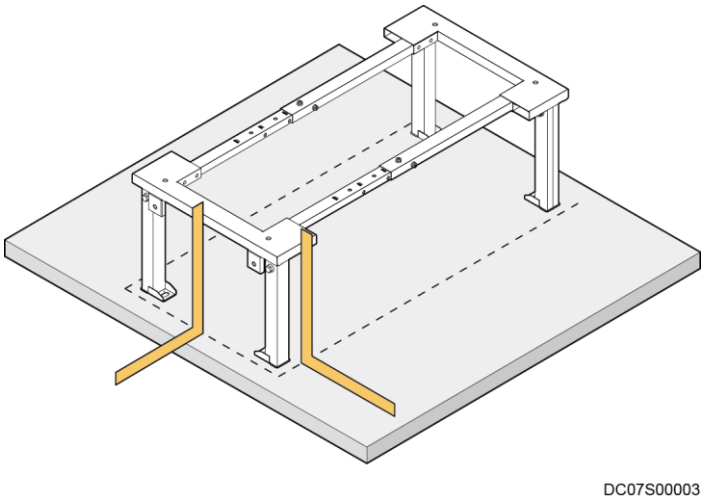
Figure 4-8 Assembling a base



3. Assemble the telescopic rod and the base, and then tighten the bolt assembly.

Step 3 Use a right angle to position the end cabinet base, and ensure that the outline of the upper surface of the base aligns with the cabinet bottom outline on the floor.

Figure 4-9 Positioning the first base

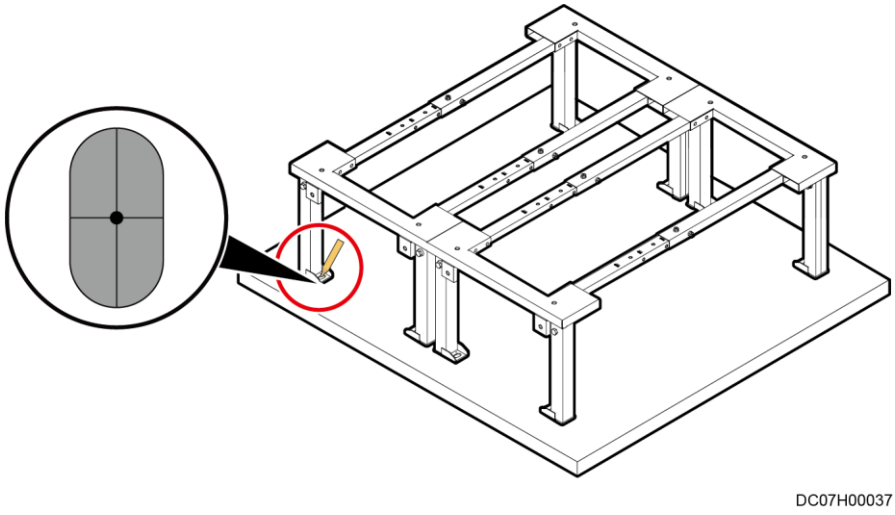


Step 4 Use the end cabinet base as the reference and place other cabinet bases.

Step 5 Check that the installation position meets the requirements.

Step 6 Use a marker to mark hole positions.

Figure 4-10 Positioning



Step 7 Move away the base, use a hammer drill with a φ16 drill bit to drill holes to a depth of 52–60 mm at the installation position, and install expansion sleeves.

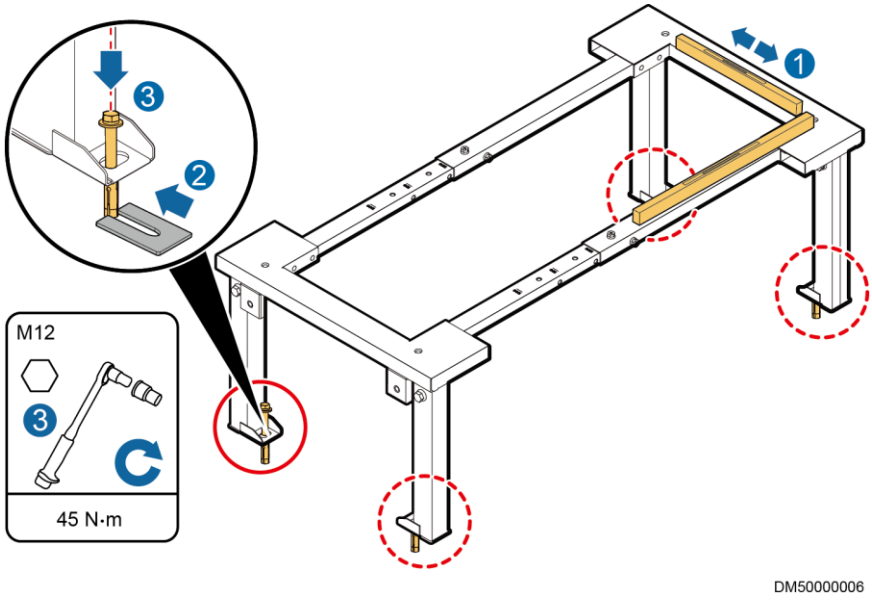
Step 8 Move the base back, install expansion bolts, and partially tighten them.

Step 9 Measure the levelness of the base using a level, as shown by (1) in below figure.

NOTE

If a base is not level, put washers under it, as shown by (2) in below figure

Figure 4-11 Leveling a base

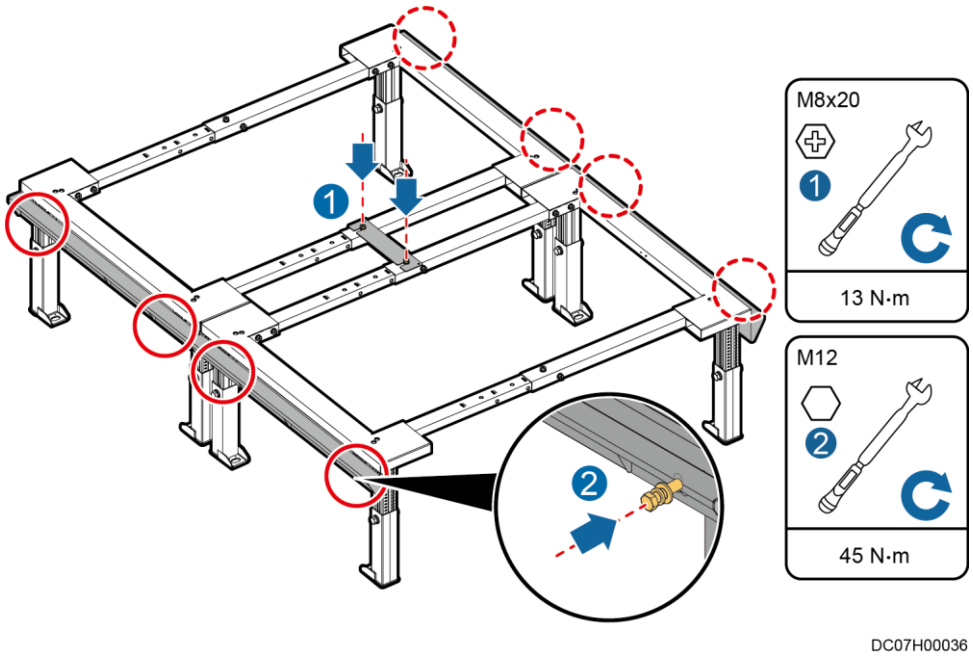


Step 10 Tighten expansion bolts, as shown by (3) in above figure.

Step 11 Secure other bases in the same way.

Step 12 Connect bases using connecting plates, as shown by (1) in below figure.

Figure 4-12 Connecting bases



Step 13 Screw the floor holder to the base, as shown by (2) in above figure.

----End

Follow-up Procedure

Check the installation and ensure that adjacent bases are in close contact with each other and the gap is even.

5 Installing the PDC

5.1 Moving the PDC

Context

NOTICE

- Only trained personnel are allowed to move the PDC. Use a forklift truck to transport the PDC box secured to a wooden support to the installation position.
- To prevent the PDC from falling over, secure the PDC box to the forklift truck using ropes before moving it.
- Move the PDC with caution to avoid bumping or toppling, which may damage the PDC. After placing the PDC in the installation position, unpack it with care to avoid scratches. Keep the PDC steady during unpacking.
- If the PDC installation environment is in poor condition and the PDC needs to be stored for a long time after it is unpacked, take measures to prevent dust. It is recommended that the PDC be wrapped with the original plastic coat.

Preparations

Tools: forklift truck, adjustable wrench, diagonal pliers

Materials: PDC and accessories, sliding plate

Document: cabinet layout diagram

Skill requirement: forklift driver, common technician

Procedure

Step 1 Check whether the PDC packing is intact.

Step 2 Cut off and remove the binding straps, and remove the packing.

Step 3 Remove the plastic bag and take out the fitting box and sliding plates.

Step 4 Check whether the PDC is intact.

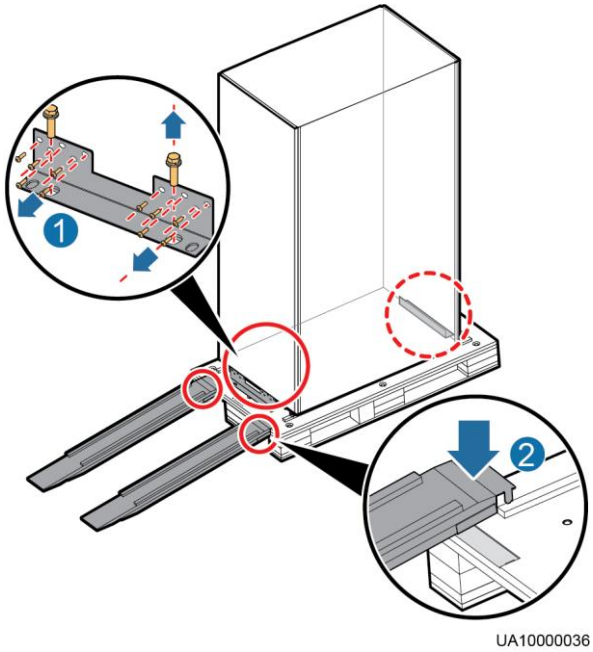
1. Check the exterior of the PDC and check whether the PDC is damaged during transportation. If any damage is found, notify the carrier immediately.
2. Check that the fittings comply with the packing list. If some fittings are missing or do not comply with the packing list, record the information and contact your local Huawei office immediately.

Step 5 After verifying that the PDC is intact, remove the L-shaped brackets securing the cabinet and pallet, and insert the two sliding plates under the pallet.

NOTE

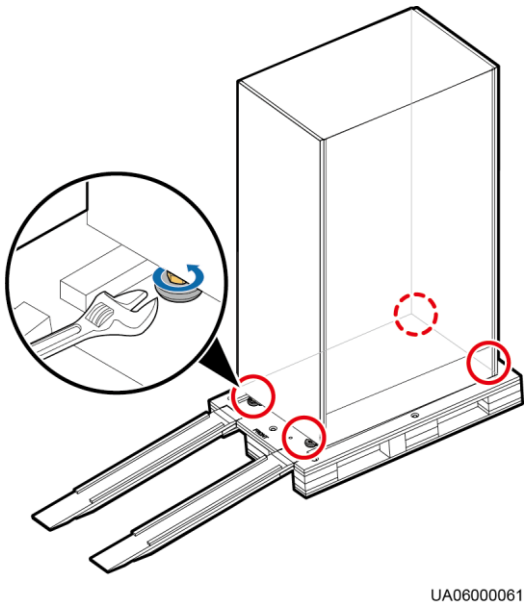
Ensure that the sliding plates are properly installed in step (2) in Figure 5-1; otherwise, the sliding plates may shift when the PDC is unloaded.

Figure 5-1 Removing an L-shaped bracket



Step 6 Raise the four leveling feet to the highest position using an adjustable wrench.

Figure 5-2 Raising the leveling feet



Step 7 Move the PDC over its castors to the installation position.

NOTE

If there are bases, place the PDC on the base.

----End

5.2 Installing an Enclosure Frame

For details, see the document delivered with the PDC.

5.3 (Optional) Installing a Top Frame

Context

In 2200 mm scenarios, a top frame is used to increase the cabinet height by 200 mm.

NOTE

This top frame applies only to the power distribution cabinets (including the integrated PDC, precision PDC, and integrated UPS) at both ends of the aisle.

Preparations

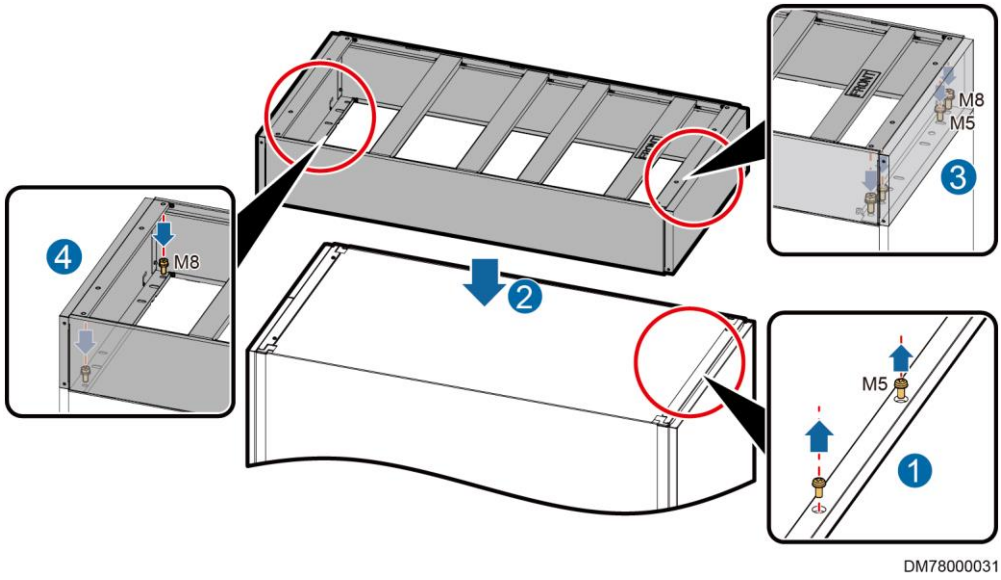
Tool: Phillips screwdriver

Material: top frame

Procedure

Step 1 Remove the two M5x10 tapping screws that secure the front door sealing plate on the top of the cabinet, as shown by (1) in Figure 5-3.

Figure 5-3 Installing a top frame



Step 2 Place the top frame, the side with **FRONT** facing upwards and the end near **FRONT** facing the cabinet front door, as shown by (2) in Figure 5-3.

Step 3 Secure the top frame.

1. Use four M8x20 screw assemblies to secure the top frame to the cabinet, as shown by (3) and (4) in Figure 5-3.
2. Install two M5x10 tapping screws at the front of the top frame to set up equipotential bonding between the cabinet and the top frame, as shown by (3) in Figure 5-3.

----End

6 Installing the Network Cabinet, IT Cabinet, and Battery Cabinet

6.1 Moving the Network Cabinet, IT Cabinet, and Battery Cabinet

Preparations

Tool: adjustable wrench

Procedure

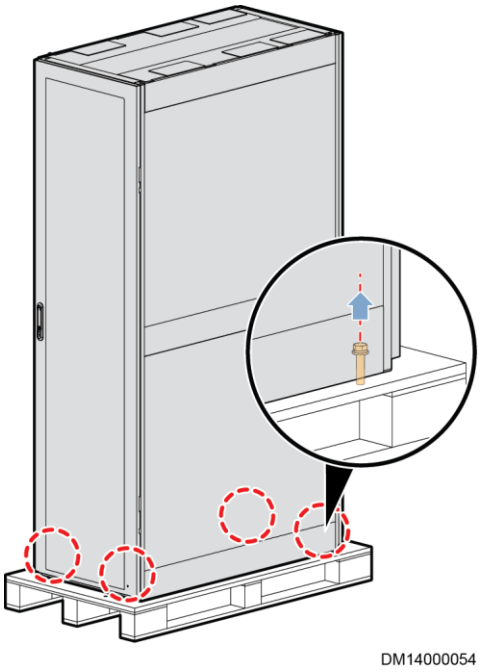
Step 1 Move the cabinet to the planned installation position.

Step 2 Remove the screws that secure the cabinet to the pallet.

NOTE

If the cabinet needs to be secured, save the screws you removed from the pallet for future use.

Figure 6-1 Removing screws



Step 3 Remove the cabinet from the pallet and place the cabinet in the installation position.

NOTE

If there is a base, place the cabinet on the base.

----End

6.2 (Optional) Installing Side Plates for IT Cabinets

Context

- If an IT cabinet is not equipped with side plates and placed in the end position, side plates need to be installed to ensure that the outer side of an end cabinet has side plates.
- If two cabinets share side plates and placed in the end position, the side plates need to be adjusted to ensure that the outer side of an end cabinet has side plates.

Preparations

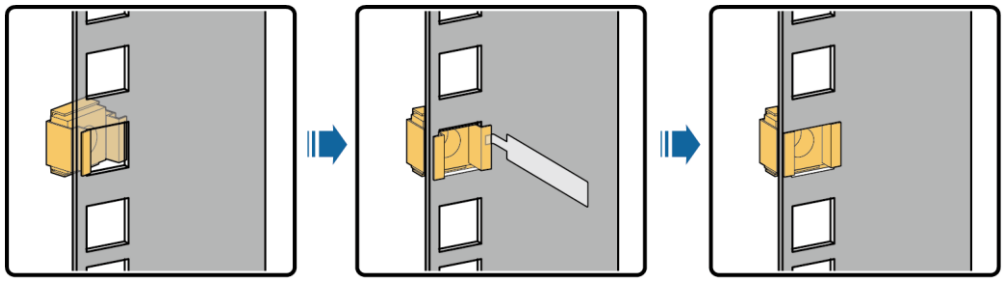
Tools: Phillips screwdriver, flat-head screwdriver

Material: side plate

Procedure

Step 1 Install floating nuts.

Figure 6-2 Installing a floating nut



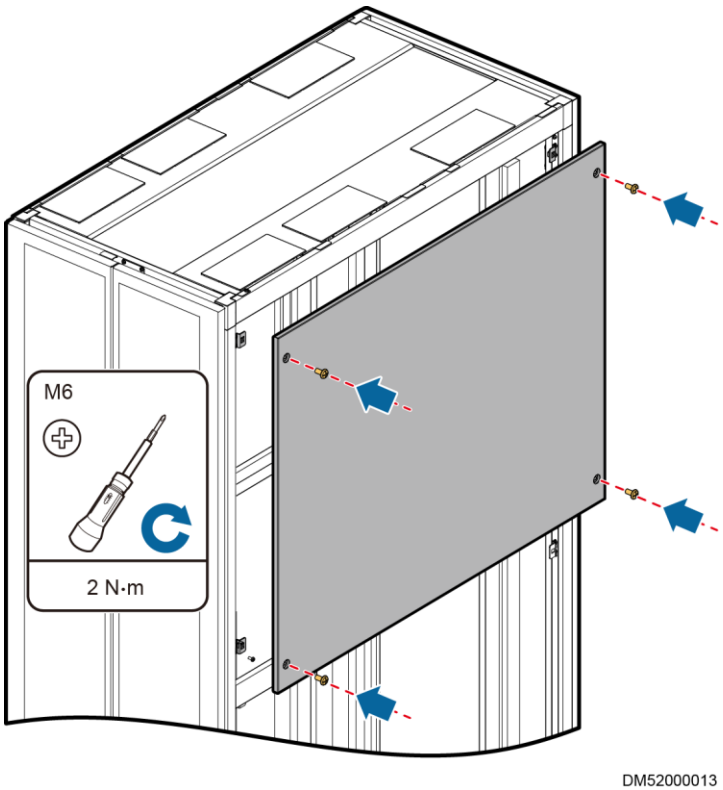
Step 2 (Optional) Remove side plates based on the labels on the side plates to be adjusted.

Step 3 Secure each side plate to the outer side of the end cabinet.

NOTE

Install two side plates for each end cabinet, one in the upper part and the other in the lower part.

Figure 6-3 Installing a cabinet side plate



Step 4 (Optional) After adjusting side plates, remove the labels on the plates.

----End

6.3 (Optional) Taking out rPDU Cables

Preparations

Tools: diagonal pliers

Procedure

Step 1 Remove the rodent-proof mesh on the top of the rPDU in a cabinet, and take out the rPDU cables from the top.

Step 2 Lay out the rPDU cables on the cabinet top, and reinstall the rodent-proof mesh.

NOTICE

Cut the rodent-proof mesh based on the cable thickness using diagonal pliers. If the opening is too large, unwanted things may fall into the cabinet through the opening.

----End

Follow-up Procedure

Before connecting the power plug of a device to the rPDU, loosen the locking device on the rPDU. After connecting the power plug, tighten the locking device.

6.4 (Optional) Taking out Industrial Connectors

Prerequisites

The rPDUs are equipped with industrial connectors.

Preparations

Tool: diagonal pliers

Procedure

Step 1 Remove the rodent-proof mesh on the top of the rPDU in a cabinet, and take out the two industrial connectors from the top.

Step 2 Lay out the industrial connectors and cables on the cabinet top, and reinstall the rodent-proof mesh.

NOTICE

Cut the rodent-proof mesh based on the cable thickness using diagonal pliers. If the opening is too large, unwanted things may fall into the cabinet through the opening.

----End

Follow-up Procedure

Before connecting the power plug of a device to the rPDU, loosen the locking device on the rPDU. After connecting the power plug, tighten the locking device.

6.5 (Optional) Adjusting Battery Cabinet Side Plates

If an auxiliary battery cabinet (no circuit breaker) is deployed in the smart module, remove the plate on one side of the main battery cabinet and install the side plate on the outer side of the auxiliary cabinet based on the label on the main battery cabinet. Ensure that there are side plates on the outer sides of the main and auxiliary battery cabinets and there is no side plate between the adjacent battery cabinets.

NOTE

After adjusting the side plate of the battery cabinet, remove the label which indicates side plate adjustment from the main battery cabinet.

6.6 (Optional) Installing a Battery Cabinet Top Frame

Context

In 2200 mm scenarios, a top frame is used to increase the cabinet height by 200 mm.

NOTE

This top frame applies only to the power distribution cabinets (including the integrated PDC, precision PDC, and integrated UPS) at both ends of the aisle.

Preparations

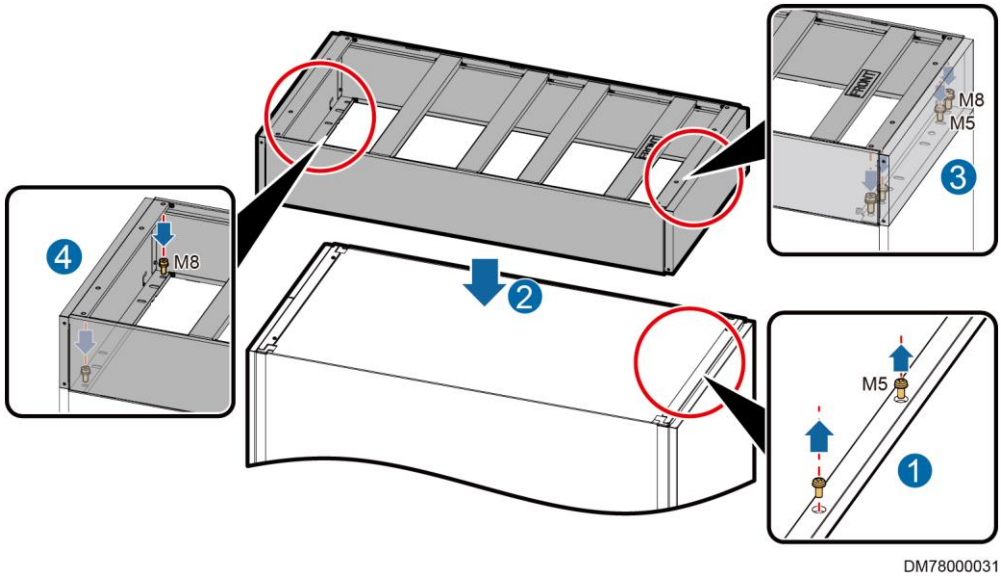
Tool: Phillips screwdriver

Material: top frame

Procedure

Step 1 Remove the two M5x10 tapping screws that secure the front door sealing plate on the top of the cabinet, as shown by (1) in Figure 6-4.

Figure 6-4 Installing a top frame



Step 2 Place the top frame, the side with **FRONT** facing upwards and the end near **FRONT** facing the cabinet front door, as shown by (2) in Figure 6-4.

Step 3 Secure the top frame.

1. Use four M8x20 screw assemblies to secure the top frame to the cabinet, as shown by (3) and (4) in Figure 6-4.
2. Install two M5x10 tapping screws at the front of the top frame to set up equipotential bonding between the cabinet and the top frame, as shown by (3) in Figure 6-4.

----End

6.7 (Optional) Installing a Horizontal Ground Bar

Context

Install one horizontal ground bar with a BOM number of 21170398 inside the battery cabinet or IT cabinet closest to the PDC for each row of cabinets.

Preparations

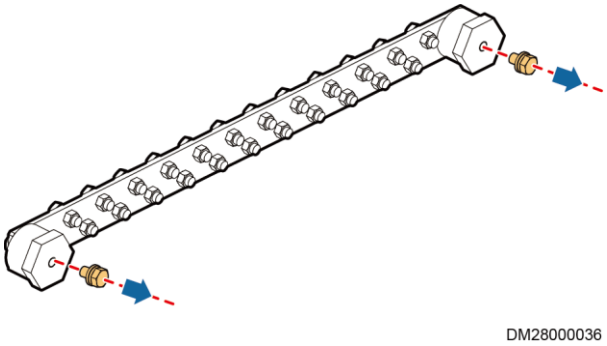
Tools: adjustable wrench, torque wrench

Material: horizontal ground bar

Procedure

Step 1 Remove the two M8 screws from the horizontal ground bar.

Figure 6-5 Removing M8 screws

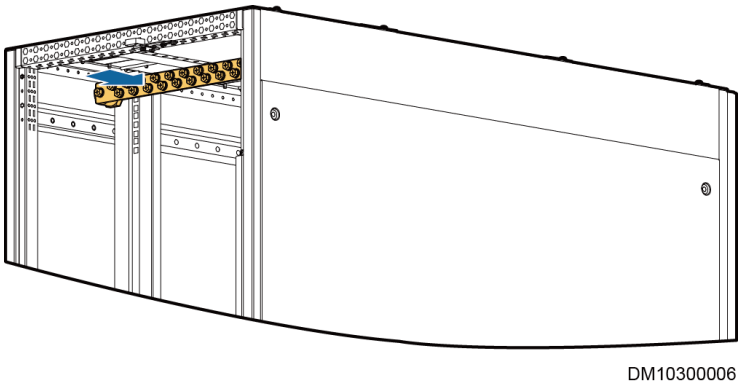


Step 2 Open the cabinet rear door, install the horizontal ground bar on the topmost position of the rack rail (outside), and secure the ground bar using the M8 screws removed earlier.

NOTE

Install the horizontal ground bar in the battery cabinet or IT cabinet adjacent to the PDC.

Figure 6-6 Installing a horizontal ground bar



----End

6.8 (Optional) Installing a Vertical Ground Bar

Context

Install the vertical ground bar in the IT cabinet that is closest to the PDC. The BOM number of the vertical ground bar is 21241363.

Preparations

Tool: Phillips screwdriver

Material: vertical ground bar

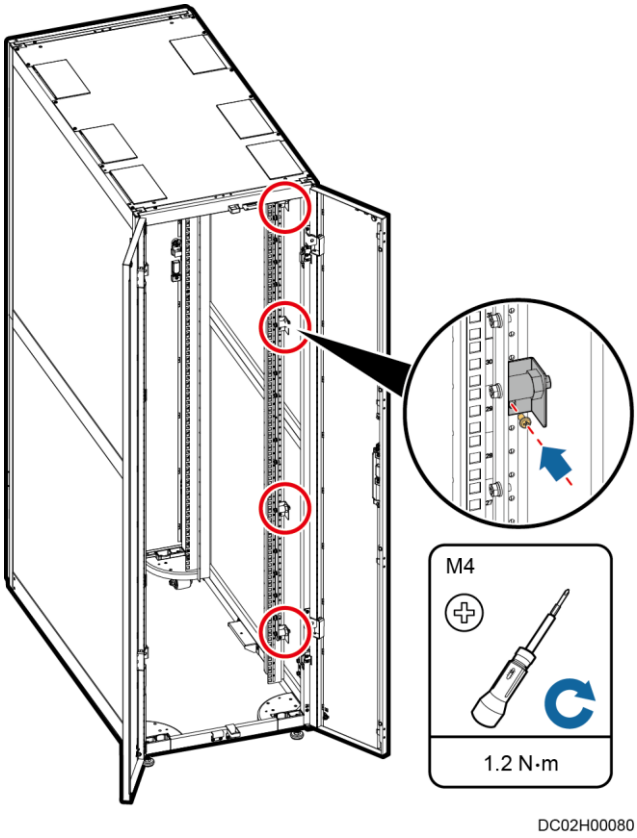
Procedure

Step 1 Open the cabinet rear door and use four M4 screws to secure the vertical ground bar to the right mounting bar.

NOTE

The specific securing positions are the screw holes in the middle of the 04 U, 14 U, 29 U, and 39 U positions.

Figure 6-7 Installing a vertical ground bar



----End

7 Installing Smart Cooling Products

7.1 (Optional) Installing NetCol5000-A025 Smart Cooling Products

For details, see the document delivered with the equipment or obtain the required document according to the section "Documentation Preparations".

NOTE

- If there are bases, install smart cooling products on the bases.
- The equivalent length of a single pipe is ≤80m. If the outdoor unit is higher than the indoor unit, the vertical height difference is ≤20m. When the indoor unit is higher than the outdoor unit, the vertical height difference is ≤5m.
- If air conditioner pipes are connected, install the top frame in the top piping scenario. If they are not connected, install the top frame in the bottom piping scenario.

7.1.1 (Optional) Installing the Enclosure Frame

Procedure

Step 1 Open the front door, cut off the cable ties binding the LCD cable, and disconnect the front door ground cable. Then lift and remove the front door.

NOTE

Install the enclosure frame on the front door side.

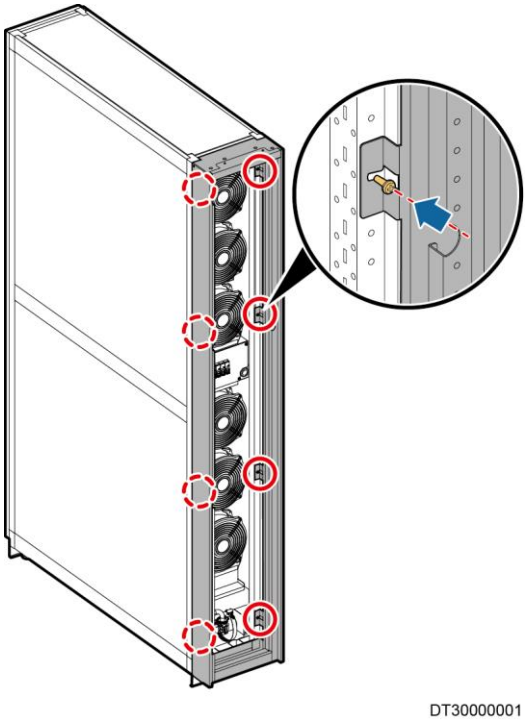
Step 2 Remove one bolt fastener, two cabinet connecting plates, and two hinges.

Step 3 Secure the enclosure frame to the front door frame using eight M5x10 tapping screws, and secure the bolt fastener, cabinet connecting plates, and hinges to the enclosure frame.

Step 4 Pull the LCD signal cable until the door can be smoothly opened and closed, install the LCD signal cable, and put back the NTC cable. Connect the ground cable under the front door to the ground point marked on the enclosure frame.

Step 5 Bind the LCD and the NTC cables to the previous binding position using cable ties, and install the front door.

Figure 7-1 Installing an enclosure frame



----End

7.1.2 (Optional) Installing Top Frames (Top Pipe Routing)

Prerequisites

If the cabinet is 2200 mm high, install top frames after installing smart cooling product enclosure frames.

Preparations

Tool: Phillips screwdriver

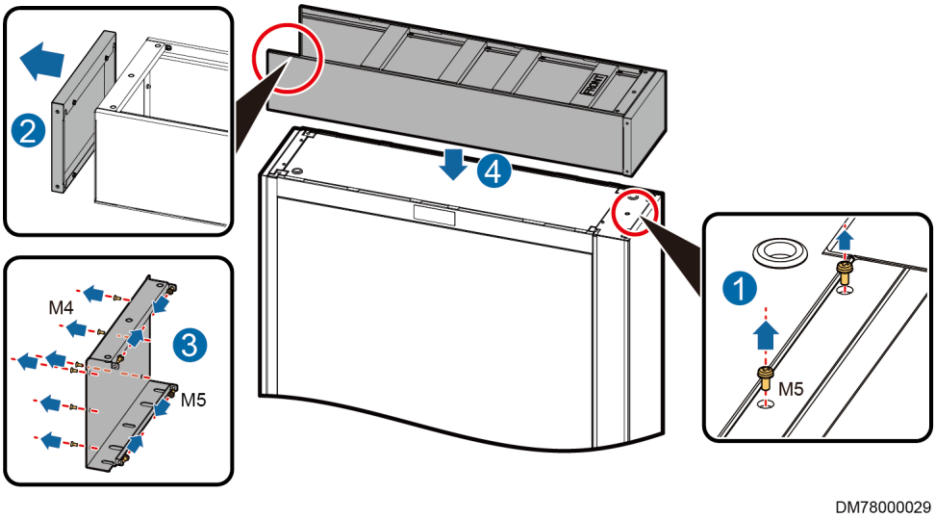
Procedure

Step 1 Remove the two M5x10 tapping screws that secure the front door sealing plate on the top of the cabinet, as shown by (1) in Figure 7-2.

Step 2 Remove the rear decorative plate from the top frame, and then remove the four M5x10 tapping screws and the six M4x10 countersunk screws from the rear plate of the top frame, as shown by (2) and (3) in Figure 7-2. Then remove the rear plate.

Step 3 Place the top frame and ensure that the side with **FRONT** faces upwards toward the cabinet front door, as shown by (4) in Figure 7-2.

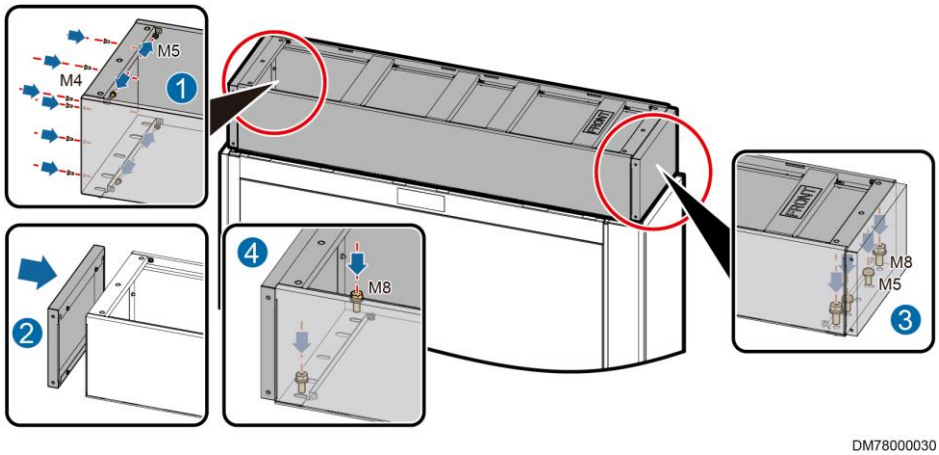
Figure 7-2 Placing a top frame



Step 4 Secure the top frame.

1. Use the four M5x10 tapping screws and the six M4x10 countersunk screws to secure the rear plate to the top frame, and clamp the rear decorative plate, as shown by (1) and (2) in Figure 7-3.
2. Use four M8x20 screw assemblies to secure the top frame to the cabinet, as shown by (3) and (4) in Figure 7-3.
3. Install two M5x10 tapping screws at the front of the top frame to set up equipotential bonding between the cabinet and the top frame, as shown by (3) in Figure 7-3.

Figure 7-3 Securing a top frame



----End

7.1.3 (Optional) Installing Top Frames (Bottom Pipe Routing)

Prerequisites

If the cabinet is 2200 mm high, install top frames after installing smart cooling product enclosure frames.

Preparations

Tool: Phillips screwdriver

Material: top frame

Procedure

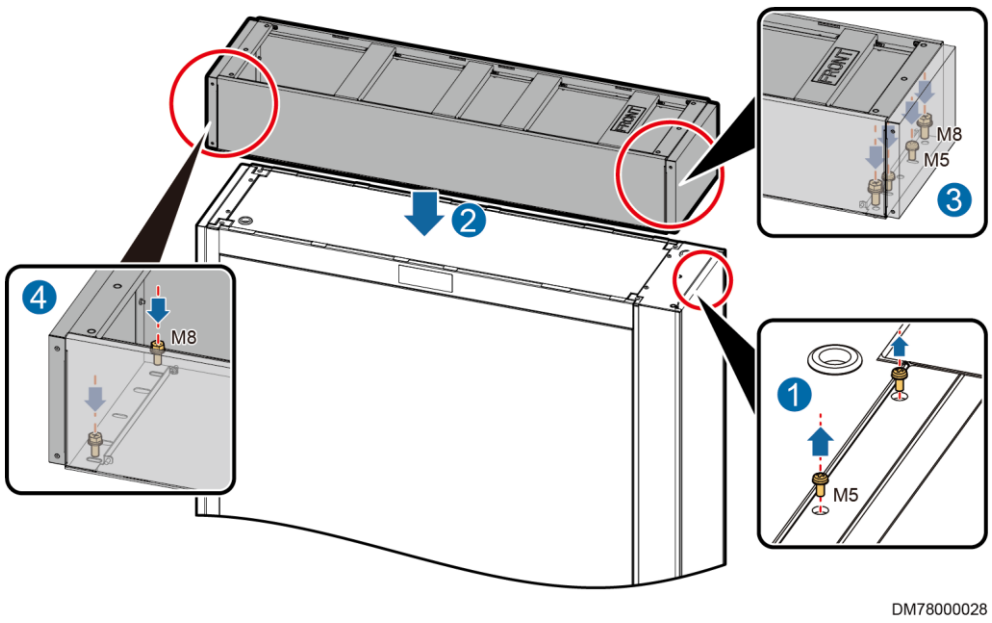
Step 1 Remove the two M5x10 tapping screws that secure the front door sealing plate on the top of the cabinet, as shown by (1) in Figure 7-4.

Step 2 Place the top frame and ensure that the side with **FRONT** faces upwards toward the cabinet front door, as shown by (2) in Figure 7-4.

Step 3 Secure the top frame.

1. Use four M8x20 screw assemblies to secure the top frame to the cabinet, as shown by (3) and (4) in Figure 7-4.
2. Install two M5x10 tapping screws at the front of the top frame to set up equipotential bonding between the cabinet and the top frame, as shown by (3) in Figure 7-4.

Figure 7-4 Installing a top frame



----End

7.1.4 (Optional) Installing a 300 mm Wide Smart Cooling Product Adaptive Frame

Context

- If an odd number of 300 mm wide smart cooling products are installed, an adaptive frame should be installed so that the lengths of the two cabinet rows are the same. The BOM number of a smart cooling product adaptive frame is 21242047.
- An adaptive frame consists of a front panel, a rear panel, and a top panel. The front panel and rear panel are the same.

Preparations

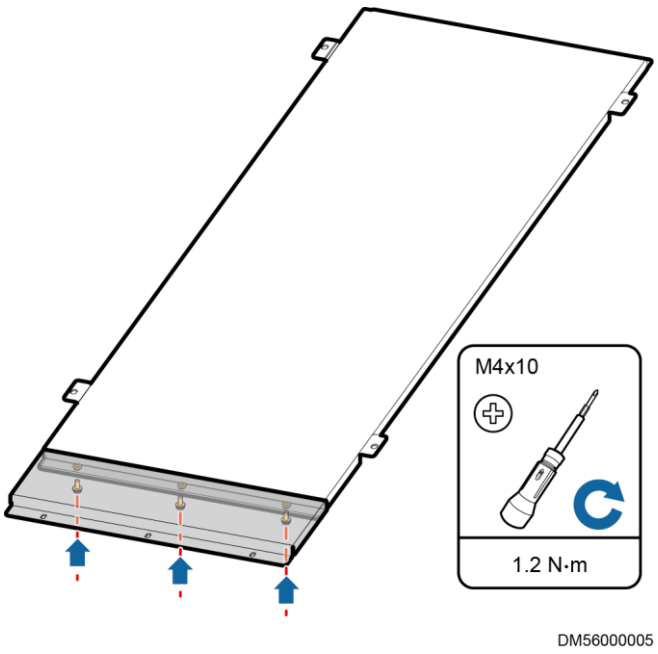
Tool: Phillips screwdriver

Materials: front panel, rear panel, top panel, connecting kit

Procedure

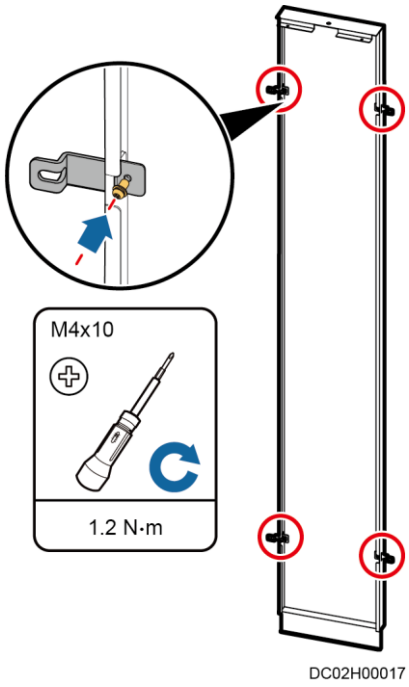
Step 1 (Optional) If the cabinet depth is 1200 mm, use three M4x10 screw assemblies to assemble the top panel.

Figure 7-5 Assembling a top panel



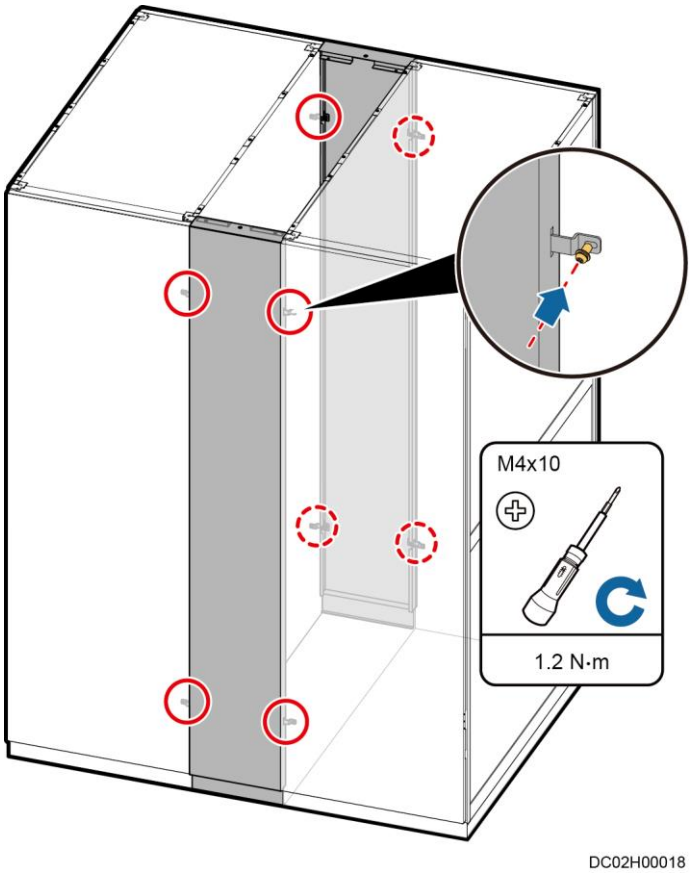
Step 2 Use M4x10 screw assemblies to secure connecting kits to the front and rear panels.

Figure 7-6 Installing connecting kits



Step 3 Clamp the front panel between cabinets and ensure that its surface is flush with the cabinet doors. Use connecting kits and M4x10 screw assemblies to connect the front panel to the adjacent cabinets.

Figure 7-7 Securing an adaptive frame



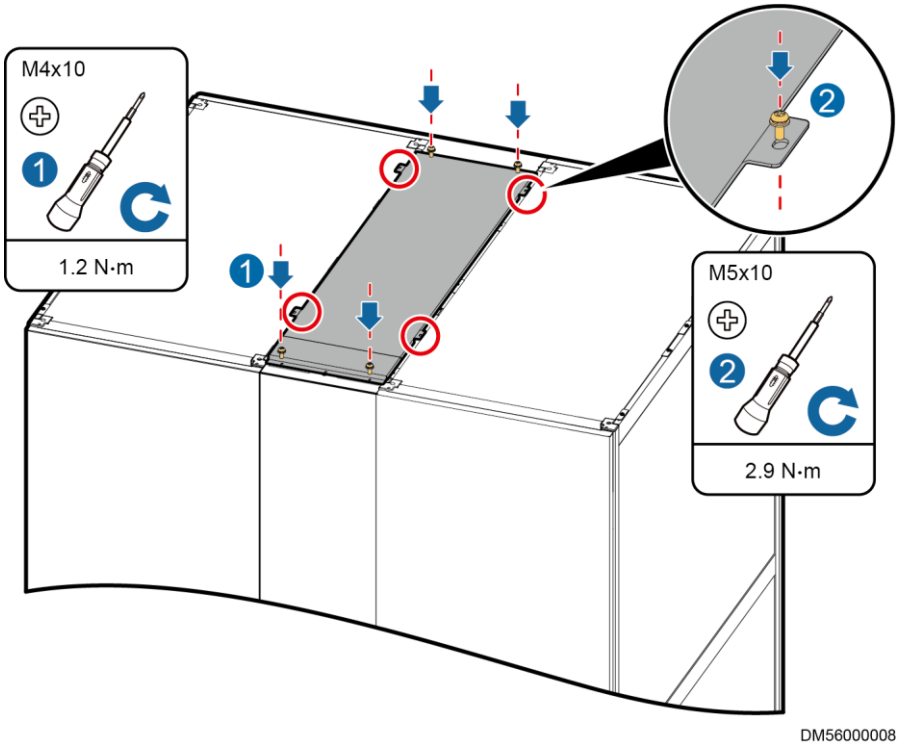
Step 4 Install the rear panel in the same way.

Step 5 Use four M4x10 screw assemblies to secure the top panel to the front and rear panels, as shown by (1) in Figure 7-8.

NOTICE

Do not over-tighten the top panel of the adaptive frame. Otherwise, the top panel will be uneven.

Figure 7-8 Securing a top panel



Step 6 Use four M5x10 tapping screws to secure the top panel to the adjacent cabinets, as shown by (2) in Figure 7-8.

----End

7.1.5 (Optional) Installing a Top Frame for an Adaptive Frame

Preparations

Tool: Phillips screwdriver

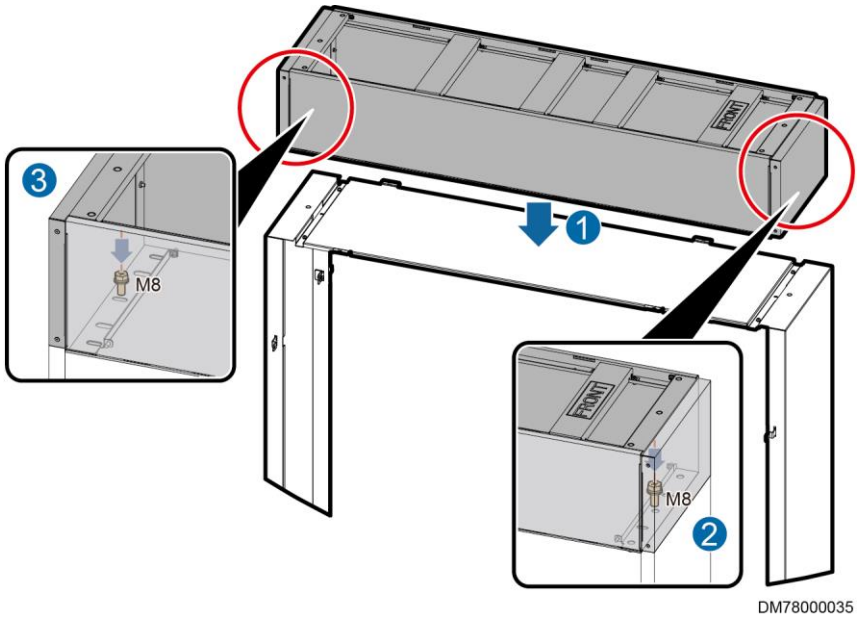
Material: top frame for an adaptive frame

Procedure

Step 1 Place the top frame and ensure that the side with **FRONT** faces upwards toward the front of the adaptive frame.

Step 2 Use screw assemblies to secure the top frame to the adaptive frame.

Figure 7-9 Installing a top frame



----End

7.2 (Optional) Installing NetCol5000-A035 Smart Cooling Products

For details, see the document delivered with the equipment or obtain the required document according to the section "Documentation Preparations".

NOTE

If air conditioner pipes are connected, install the top frame in the top piping scenario. If they are not connected, install the top frame in the bottom piping scenario.

7.2.1 (Optional) Installing Top Frames (Top Pipe Routing)

Prerequisites

If the cabinet is 2200 mm high, install top frames after installing smart cooling product enclosure frames.

Preparations

Tool: Phillips screwdriver

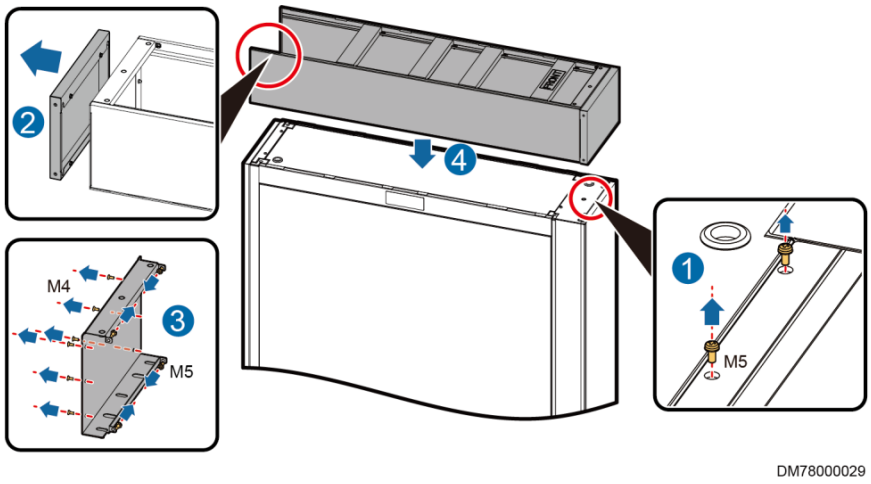
Procedure

Step 1 Remove the two M5x10 tapping screws that secure the front door sealing plate on the top of the cabinet, as shown by (1) in Figure 7-10.

Step 2 Remove the rear decorative plate from the top frame, and then remove the four M5x10 tapping screws and the six M4x10 countersunk screws from the rear plate of the top frame, as shown by (2) and (3) in Figure 7-10. Then remove the rear plate.

Step 3 Place the top frame and ensure that the side with **FRONT** faces upwards toward the cabinet front door, as shown by (4) in Figure 7-10.

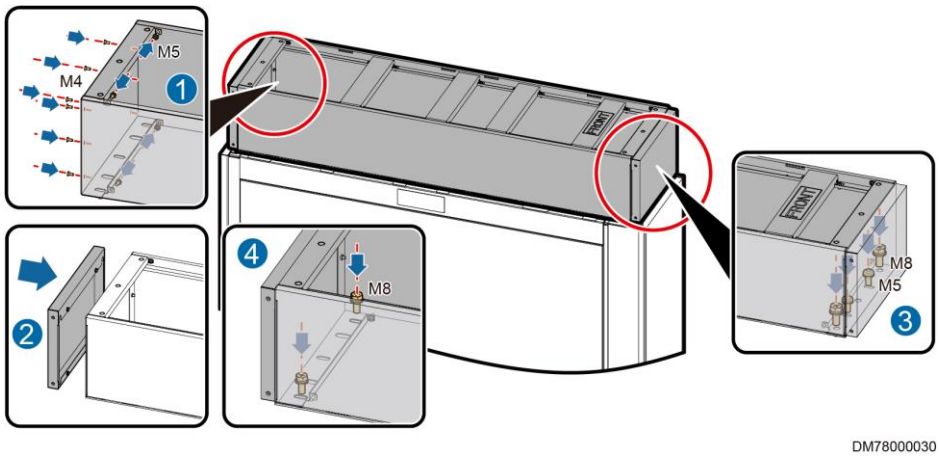
Figure 7-10 Placing a top frame



Step 4 Secure the top frame.

1. Use the four M5x10 tapping screws and the six M4x10 countersunk screws to secure the rear plate to the top frame, and clamp the rear decorative plate, as shown by (1) and (2) in Figure 7-11.
2. Use four M8x20 screw assemblies to secure the top frame to the cabinet, as shown by (3) and (4) in Figure 7-11.
3. Install two M5x10 tapping screws at the front of the top frame to set up equipotential bonding between the cabinet and the top frame, as shown by (3) in Figure 7-11.

Figure 7-11 Securing a top frame



----End

7.2.2 (Optional) Installing Top Frames (Bottom Pipe Routing)

Prerequisites

If the cabinet is 2200 mm high, install top frames after installing smart cooling product enclosure frames.

Preparations

Tool: Phillips screwdriver

Material: top frame

Procedure

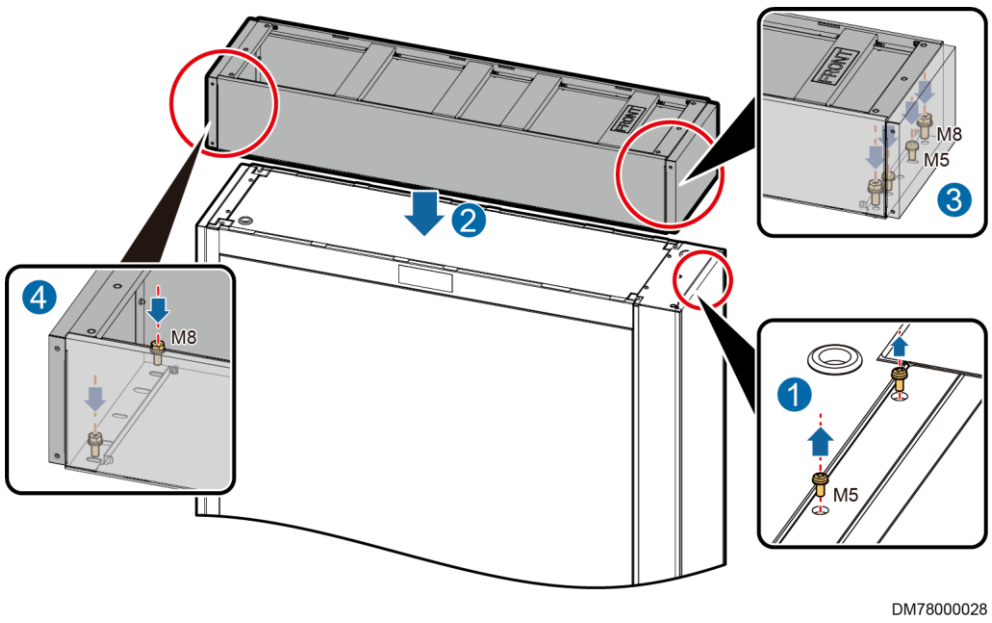
Step 1 Remove the two M5x10 tapping screws that secure the front door sealing plate on the top of the cabinet, as shown by (1) in Figure 7-12.

Step 2 Place the top frame and ensure that the side with **FRONT** faces upwards toward the cabinet front door, as shown by (2) in Figure 7-12.

Step 3 Secure the top frame.

1. Use four M8x20 screw assemblies to secure the top frame to the cabinet, as shown by (3) and (4) in Figure 7-12.
2. Install two M5x10 tapping screws at the front of the top frame to set up equipotential bonding between the cabinet and the top frame, as shown by (3) in Figure 7-12.

Figure 7-12 Installing a top frame



----End

7.2.3 (Optional) Installing a 300 mm Wide Smart Cooling Product Adaptive Frame

Context

- If an odd number of 300 mm wide smart cooling products are installed, an adaptive frame should be installed so that the lengths of the two cabinet rows are the same. The BOM number of a smart cooling product adaptive frame is 21242047.
- An adaptive frame consists of a front panel, a rear panel, and a top panel. The front panel and rear panel are the same.

Preparations

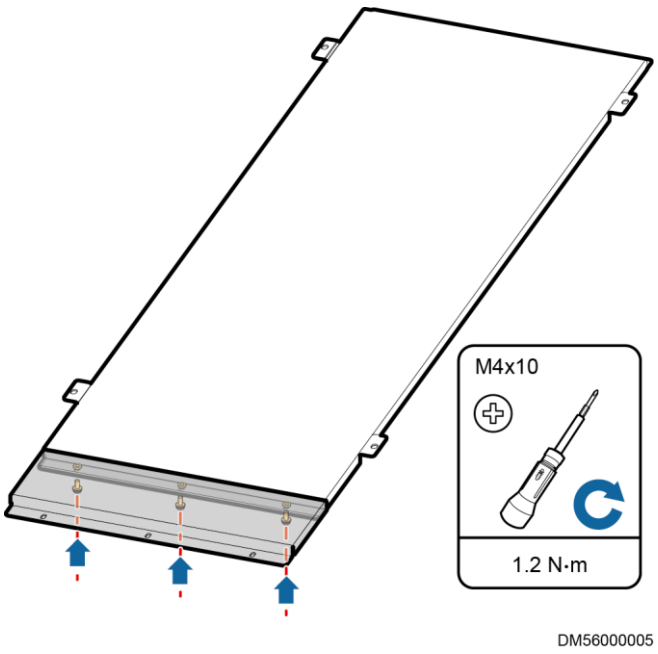
Tool: Phillips screwdriver

Materials: front panel, rear panel, top panel, connecting kit

Procedure

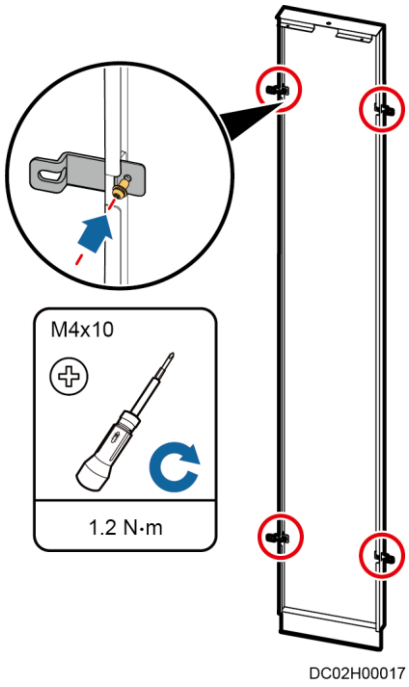
Step 1 (Optional) If the cabinet depth is 1200 mm, use three M4x10 screw assemblies to assemble the top panel.

Figure 7-13 Assembling a top panel



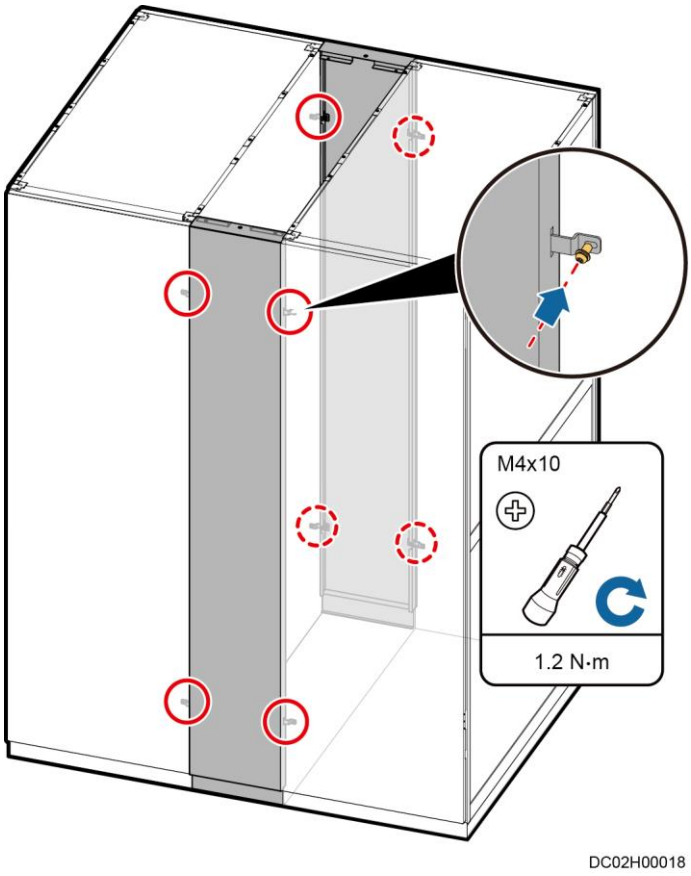
Step 2 Use M4x10 screw assemblies to secure connecting kits to the front and rear panels.

Figure 7-14 Installing connecting kits



Step 3 Clamp the front panel between cabinets and ensure that its surface is flush with the cabinet doors. Use connecting kits and M4x10 screw assemblies to connect the front panel to the adjacent cabinets.

Figure 7-15 Securing an adaptive frame



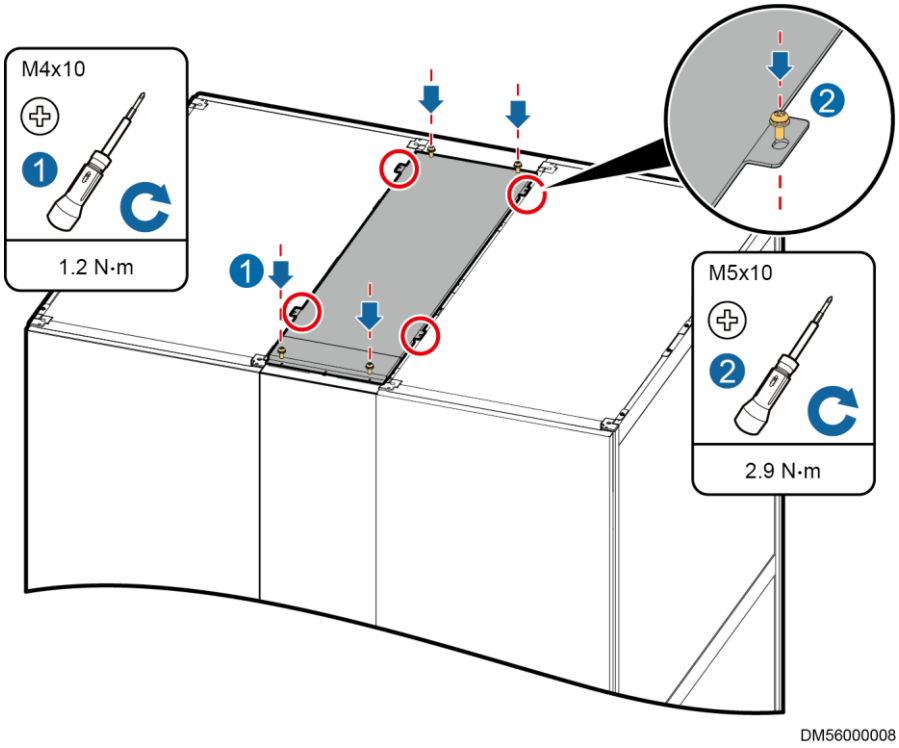
Step 4 Install the rear panel in the same way.

Step 5 Use four M4x10 screw assemblies to secure the top panel to the front and rear panels, as shown by (1) in Figure 7-16.

NOTICE

Do not over-tighten the top panel of the adaptive frame. Otherwise, the top panel will be uneven.

Figure 7-16 Securing a top panel



Step 6 Use four M5x10 tapping screws to secure the top panel to the adjacent cabinets, as shown by (2) in Figure 7-16.

----End

7.2.4 (Optional) Installing a Top Frame for an Adaptive Frame

Preparations

Tool: Phillips screwdriver

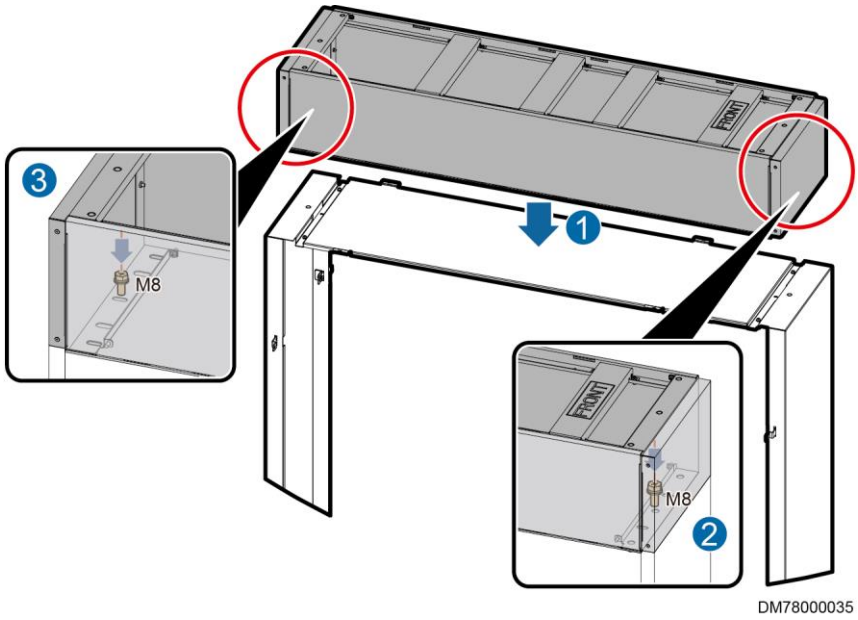
Material: top frame for an adaptive frame

Procedure

Step 1 Place the top frame and ensure that the side with **FRONT** faces upwards toward the front of the adaptive frame.

Step 2 Use screw assemblies to secure the top frame to the adaptive frame.

Figure 7-17 Installing a top frame



----End

7.3 (Optional) Installing NetCol5000-A050 Smart Cooling Products

For details, see the document delivered with the equipment or obtain the required document according to the section "Documentation Preparations."

NOTE

- The equivalent length of a single pipe is ≤100m. If the outdoor unit is higher than the indoor unit, the vertical height difference is ≤30m. When the indoor unit is higher than the outdoor unit, the vertical height difference is ≤8m.
- If air conditioner pipes are connected, install the top frame in the top piping scenario. If they are not connected, install the top frame in the bottom piping scenario.

7.3.1 (Optional) Installing Top Frames (Top Pipe Routing)

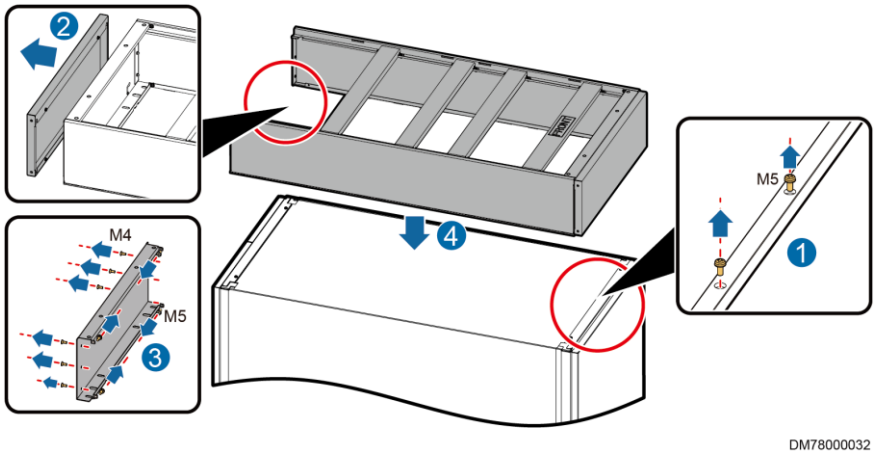
Preparations

Tool: Phillips screwdriver

Procedure

Step 1 Remove the two M5x10 tapping screws that secure the front door sealing plate on the top of the cabinet, as shown by (1) in Figure 7-23.

Figure 7-18 Placing a top frame



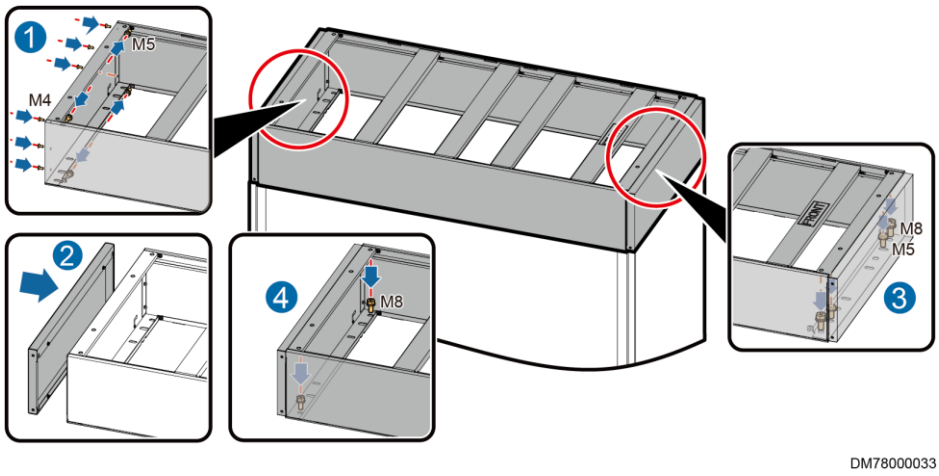
Step 2 Remove the rear decorative plate from the top frame, and then remove the four M5x10 tapping screws and the six M4x10 countersunk screws from the rear plate of the top frame, as shown by (2) and (3) in Figure 7-23. Then remove the rear plate.

Step 3 Place the top frame and ensure that the side with **FRONT** faces upwards toward the cabinet front door, as shown by (4) in Figure 7-23.

Step 4 Secure the top frame.

1. Use the four M5x10 tapping screws and the six M4x10 countersunk screws to secure the rear plate to the top frame, and clamp the rear decorative plate, as shown by (1) and (2) in Figure 7-24.

Figure 7-19 Securing a top frame



2. Use four M8x20 screw assemblies to secure the top frame to the cabinet, as shown by (3) and (4) in Figure 7-24.
3. Install two M5x10 tapping screws at the front of the top frame to set up equipotential bonding between the cabinet and the top frame, as shown by (3) in Figure 7-24.

----End

7.3.2 (Optional) Installing Top Frames (Bottom Pipe Routing)

In the scenario where smart cooling product pipes are routed from the bottom, the top frame is installed in the same way as the top frame of a PDC. For details, see section "Installing a Top Frame" under "Installing the PDC."

7.4 Installing Smart Cooling Product Outdoor Units and Routing Pipes

For details about how to install outdoor units and route pipes, see smart cooling product documents or obtain the required document according to the section "Documentation Preparations."

7.5 Installing the Water Cooling Module and Routing Pipes

For details about how to water cooling module and route pipes, see smart cooling product documents or obtain the required document according to the section "Documentation Preparations."

8 Combining Cabinets

Prerequisites

If there are bases, the bases are leveled and cabinets are placed on the bases.

Preparations

Tools: socket wrench, level, Phillips screwdriver

Document: cabinet layout diagram

Procedure

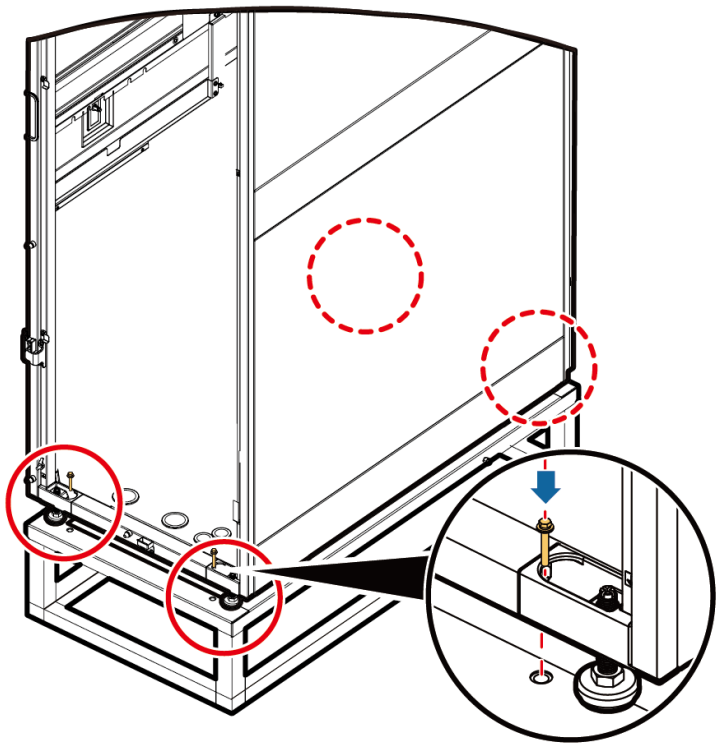
Step 1 (Optional) Partially secure the cabinets to the bases.

NOTE

- If bases are required, perform this step for the PDC, network cabinet, IT cabinet, 600 mm wide smart cooling product, and 300 mm wide M-type smart cooling product with feet.
- If bases are required, go to Step 3 for cabinets without feet.

1. Align the mounting holes on the cabinet with those on the base.
2. Insert M12x80 screw assemblies into the mounting holes for the cabinet and base, and partially tighten the screws.

Figure 8-1 Partially securing the cabinet to its base



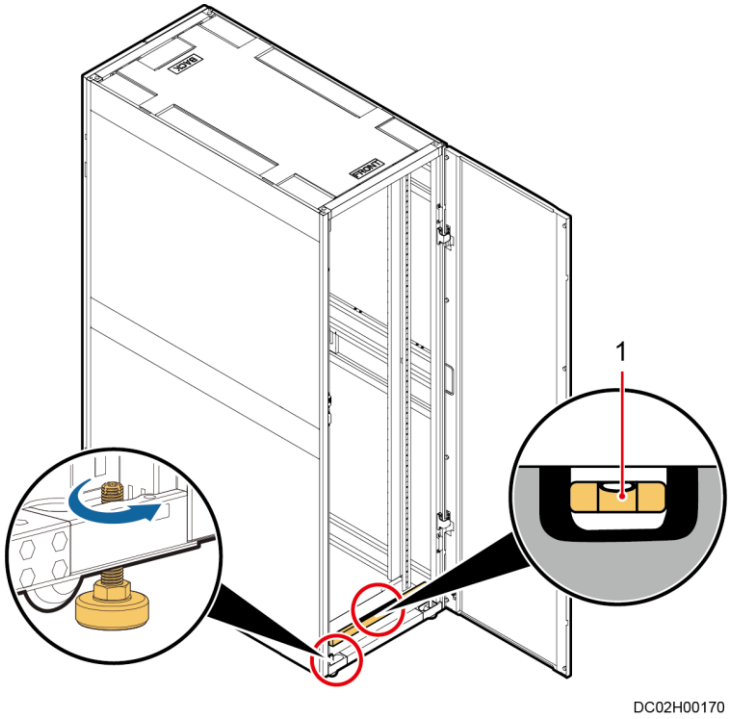
DM38000043

Step 2 Level the cabinets and ensure that the height deviation of cabinets is less than 3 mm, and the cabinet height cannot be less than 2000 mm.

NOTICE

- Do not remove the anchor bolts. Otherwise, rework is required if the cabinet height does not meet requirements.
- Anchor bolt adjustment method: Wrench an anchor bolt clockwise to elevate a cabinet, or wrench an anchor bolt anticlockwise to lower it. Anchor bolts can be adjusted within a range of 0–8 mm.
- Put a level at the bottom of the cabinet in width and depth directions and check that the air bubble is in the middle between the two lines marked on the glass tube.

Figure 8-2 Leveling a cabinet



(1) Level

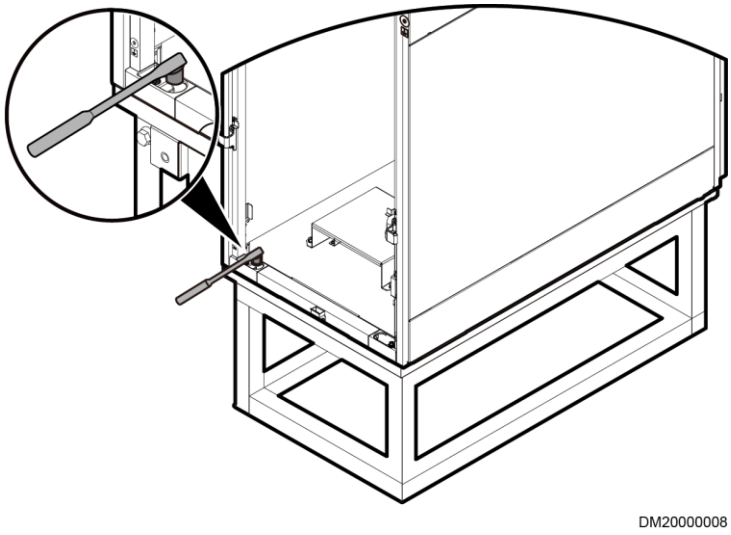
Step 3 (Optional) Secure cabinets on the bases.

NOTE

Perform this step if bases are required.

- For the PDC, network cabinet, IT cabinet, 600 mm wide smart cooling product, and 300 mm wide M-type smart cooling product:
  a. Install the spring washers, flat washers, and insulation coverings on the bolts.
  b. Use an M20 torque wrench to tighten the four bolts in diagonal order.

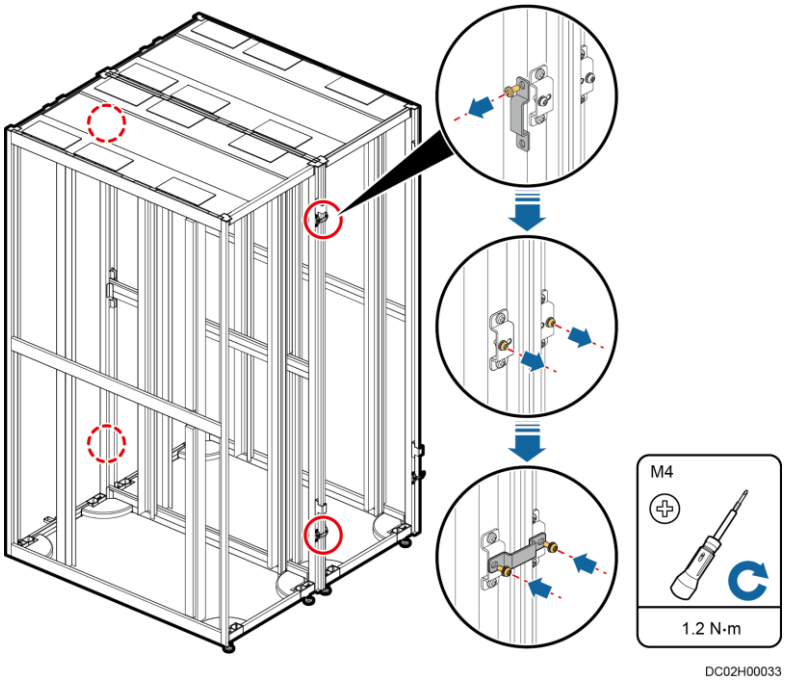
Figure 8-3 Securing the cabinet



Step 4 Combine adjacent cabinets.

1. Remove the M5x10 tapping screws that secure the connecting kit and then remove the connecting kit.
2. Remove M4x10 screw assemblies from the position for combining cabinets.
3. Secure the connecting kit using the M4x10 screw assemblies.

Figure 8-4 Combining cabinets



----End

9 Grounding Cabinets

M-type Grounding

Cabinets are grounded by cables connected from the main ground bars to the nearby ground grid.

Figure 9-1 M-type grounding diagram (single-row cabinets)

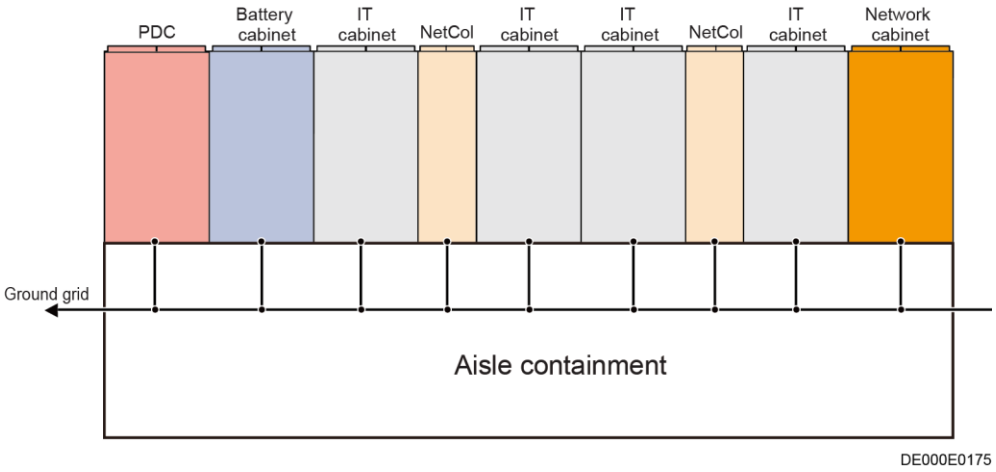
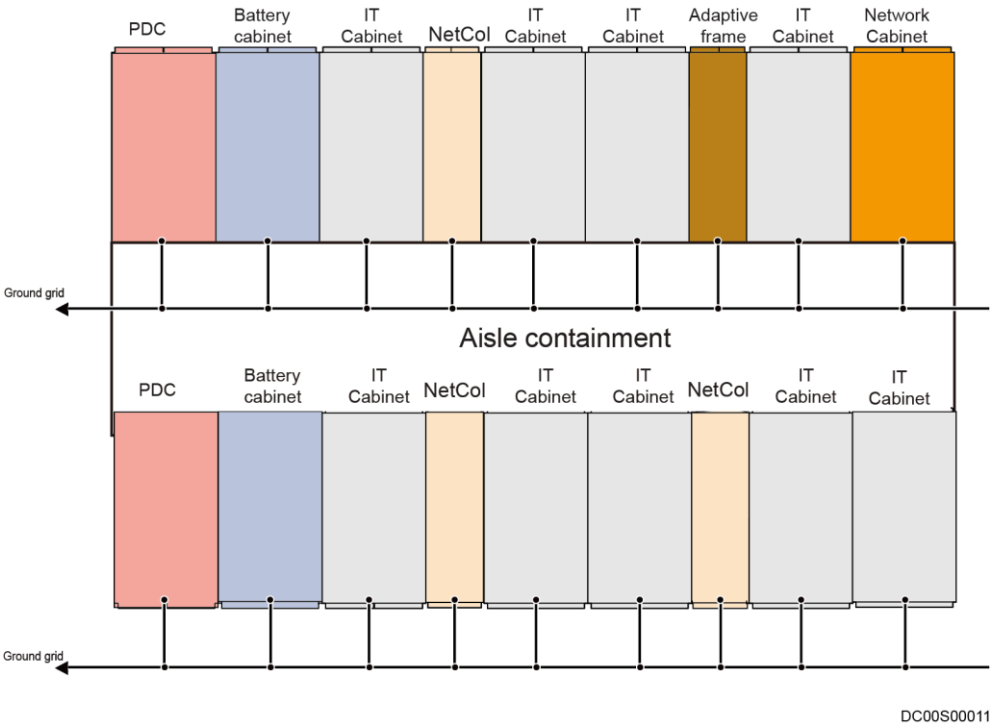


Figure 9-2 M-type grounding diagram (dual-row cabinets)



10 Installing the Aisle Containment

10.1 Installing Sealing Plates (Single-Row Scenario)

Context

NOTICE

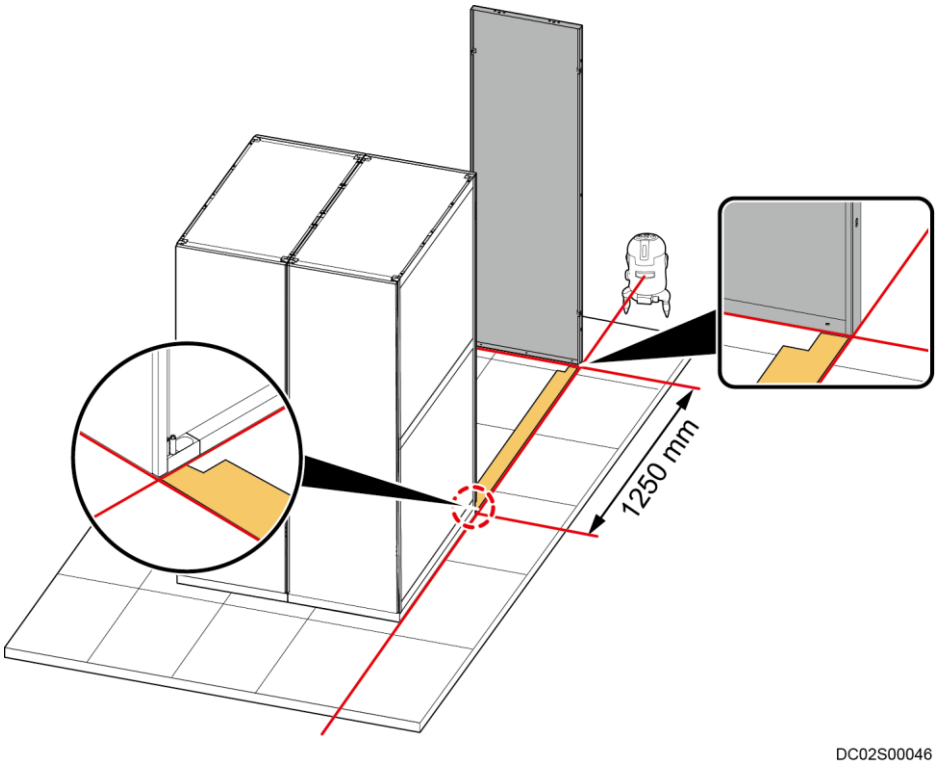
If sealing plates should be less than 300 mm away from a wall, adjust the installation sequence of the aisle containment.

1. Secure the sealing plates and skylight connective plates for the end cabinet in each row.
2. Secure the sealing plates to the floor.
3. Install the skylights.
4. Install other sealing plates and skylights in the same way.

Procedure

Step 1 Determine the position for installing sealing plates using a laser locator, aisle check tool, and marker.

Figure 10-1 Determining the position for installing sealing plates

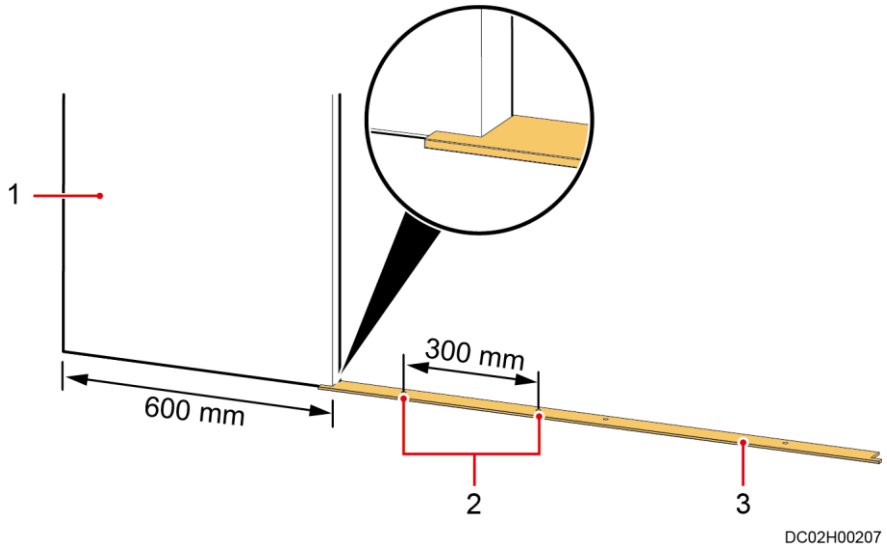


NOTE

- The cabinets and sealing plates at the ends of the single-row aisle containment should be placed with a front-backward deviation no greater than 1.5 mm.
- When determining the position, verify that adjacent sealing plates will be in close contact with each other.

Step 2 Determine the mounting holes for the sealing plates using a check tool and mark the holes.

Figure 10-2 Determining the mounting holes for sealing plates



(1) 600 mm wide sealing plate
(2) Mounting holes for a 600 mm wide sealing plate
(3) Check tool

Step 3 Place the sealing plates based on the marked holes.

NOTICE

When placing sealing plates, keep the smooth plane facing the outside of the aisle.

Step 4 (Optional) If the floor is uneven, add a 1.0 mm or 2.0 mm high spacer under the lower sealing plate.

Figure 10-3 Installing sealing plates (for 2000 mm high cabinets)

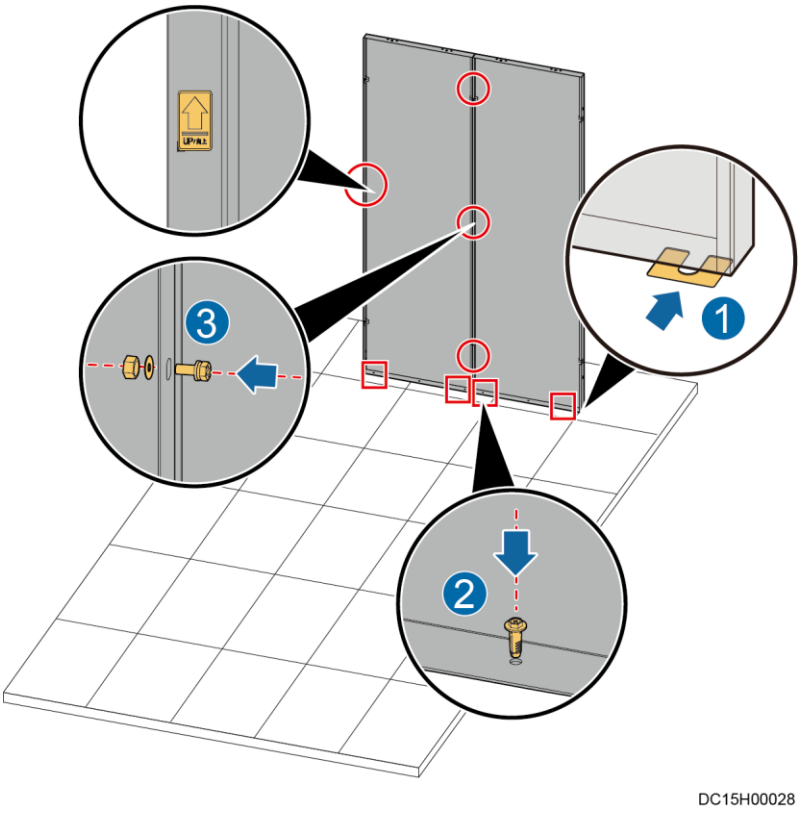
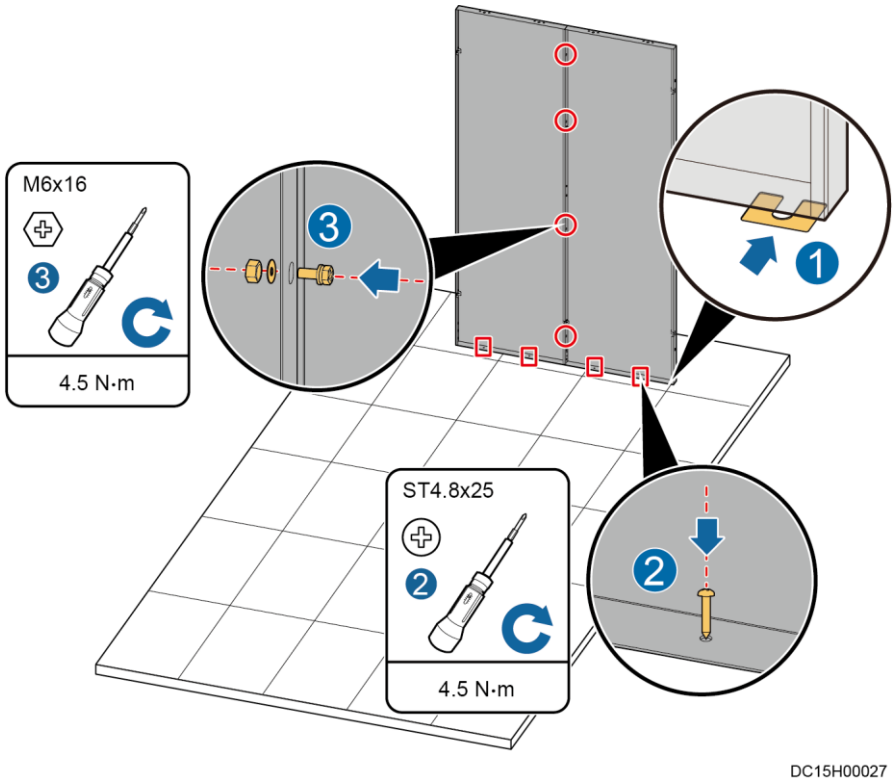


Figure 10-4 Installing sealing plates (for 2200 mm high cabinets)



Step 5 Secure the sealing plates to the floor.

NOTICE

The number of screws used for securing the sealing plate must be the same as the number of corresponding holes in the lower end of the plate.

Step 6 Install skylights above the secured sealing plates by referring to the section about installing skylights.

Step 7 Install other sealing plates and skylights in the same way.

Step 8 Combine adjacent sealing plates using screws, flat washers, and nuts.

----End

10.2 Installing Sealing Plates Around a Column (in Scenarios with a Column)

Prerequisites

The adjustable skylight and cable tray in the scenario with a column have been installed.

Context

Because of the column, it is inevitable that certain cabinet places in the smart module are not suitable for installing cabinets. Therefore, sealing plates need to be installed to ensure the air tightness of the aisle containment.

Secure the sealing plates away from the aisle by combining them with the cabinet to keep the elegance of the smart module. Stand outside the smart module during installation.

Table 10-1 Sealing plate types

Sealing Plate	BOM Number
300 mm wide, 2000 mm high sealing plate	21500707
600 mm wide, 2000 mm high sealing plate	21500718
800 mm wide, 2000 mm high sealing plate	21500720
300 mm wide, 2200 mm high sealing plate	21500939
600 mm wide, 2200 mm high sealing plate	21500940
800 mm wide, 2200 mm high sealing plate	21500941

Preparations

Tools: Phillips screwdriver, hammer drill

Materials: sealing plates and accessories, plastic expansion bolts, washers

Procedure

Step 1 Determine the positions of sealing plates, directions of the concave sides of sealing plates, and the area covered by the adjustable skylight based on the actual installation environment.

Step 2 Install the sealing plates near the aisle.

NOTE

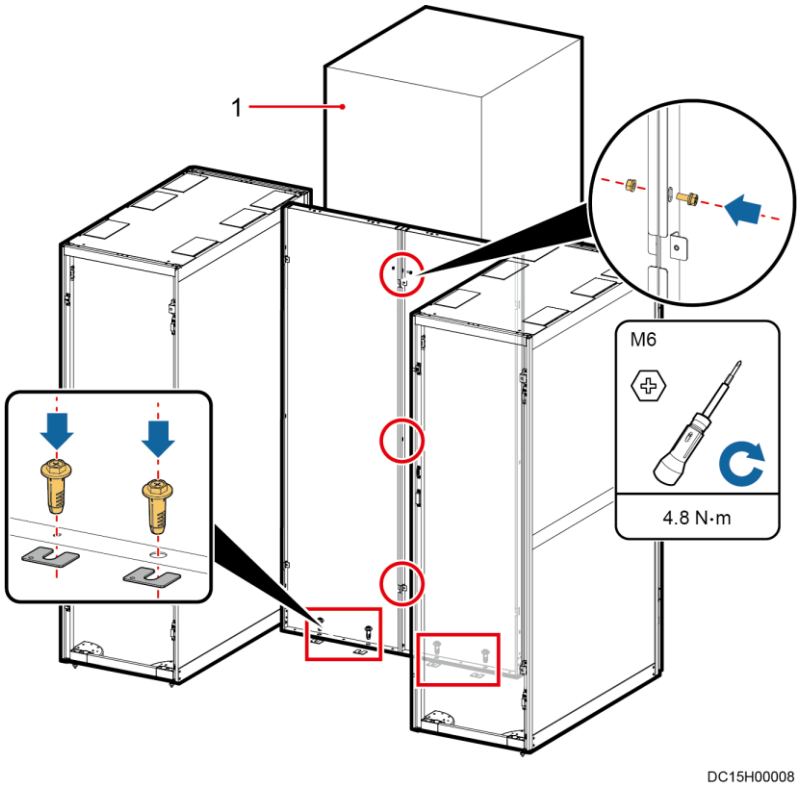
Install the sealing plates near the aisle containment first, and then the sealing plates near the smart module exterior.

1. Secure the two sealing plates using three M6 screws and nuts.
2. Place the connected sealing plates at the specified installation position, facing the correct direction.
3. Use a hammer drill with a 15 mm drill bit to drill four holes that are 45–50 mm deep at the bottom of the sealing plate, and secure the sealing plate to the floor using four plastic expansion bolts (labeled DKBA44091028) and washers.

NOTE

If drilling holes in the ESD floor is not allowed onsite, use four ST4.8x25 self-drilling tapping screws and washers for securing.

Figure 10-5 Installing sealing plates near an aisle



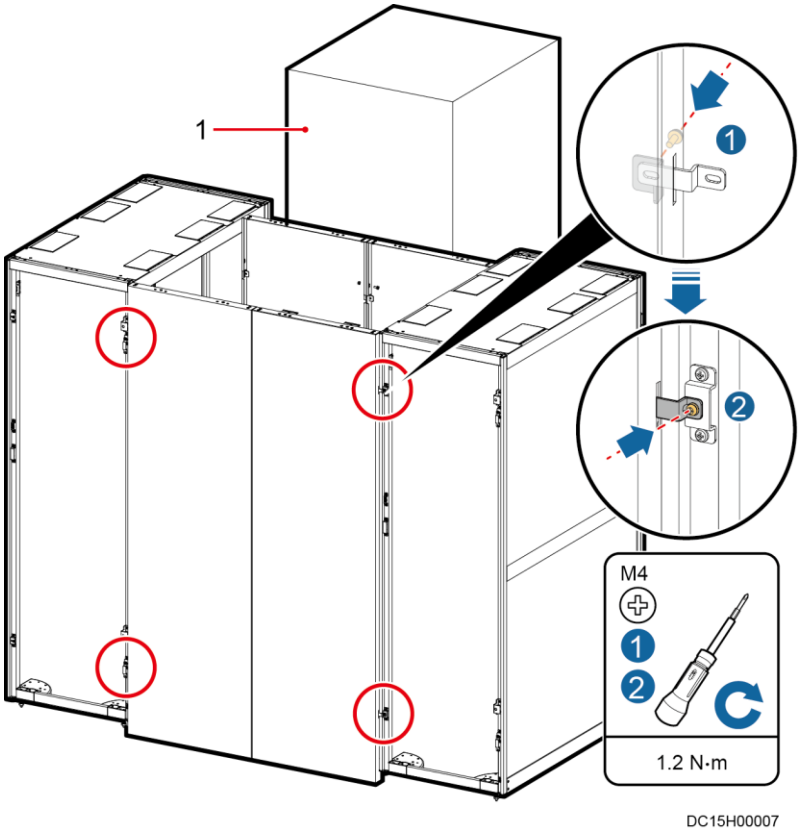
(1) Column

Step 3 Secure the two sealing plates using three M6 screws and nuts.

Step 4 Place the connected sealing plates at the specified installation position, facing the correct direction.

Step 5 Secure the connecting kits obtained from the sealing plate fitting bag to the sealing plate using M4 screws, and then secure the sealing plate to the cabinet.

Figure 10-6 Installing sealing plates away from the aisle



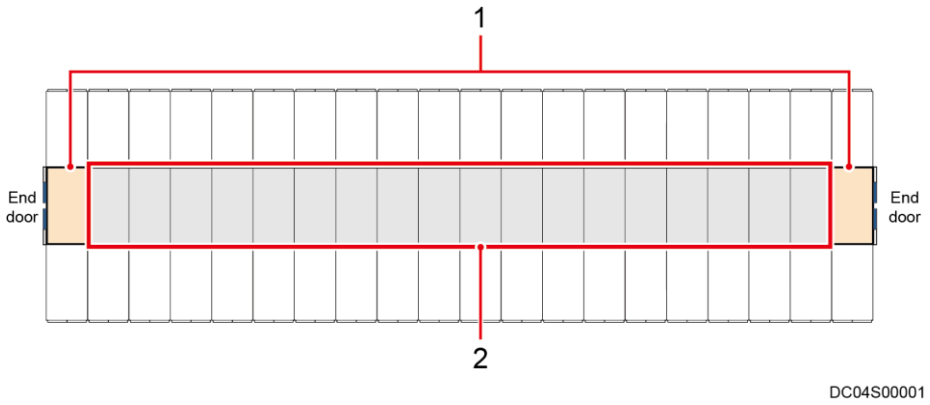
(1) Column

----End

10.3 Installing Skylights

10.3.1 Skylight Layout

Figure 10-7 Aisle skylight layout



(1) Control skylights (2) Rotating skylights or flat skylight

NOTE

If the number of cabinets in one row is greater than 12, the number of control skylights is 3. Apart from the end door positions near the two ends, install a control skylight in the middle of the aisle.

10.3.2 Installing Control Skylights, Flat Skylights and Rotating Skylights

Prerequisites

Install skylights one by one from one end of the smart module based on the onsite engineering layout diagram.

1 Do not squeeze the skylights when installing them. Otherwise, the skylight connecting plates may be deformed

2 When installing a rotating skylight, verify that the rotating skylight can be properly rotated. After installing all skylights, install the end door.

Preparations

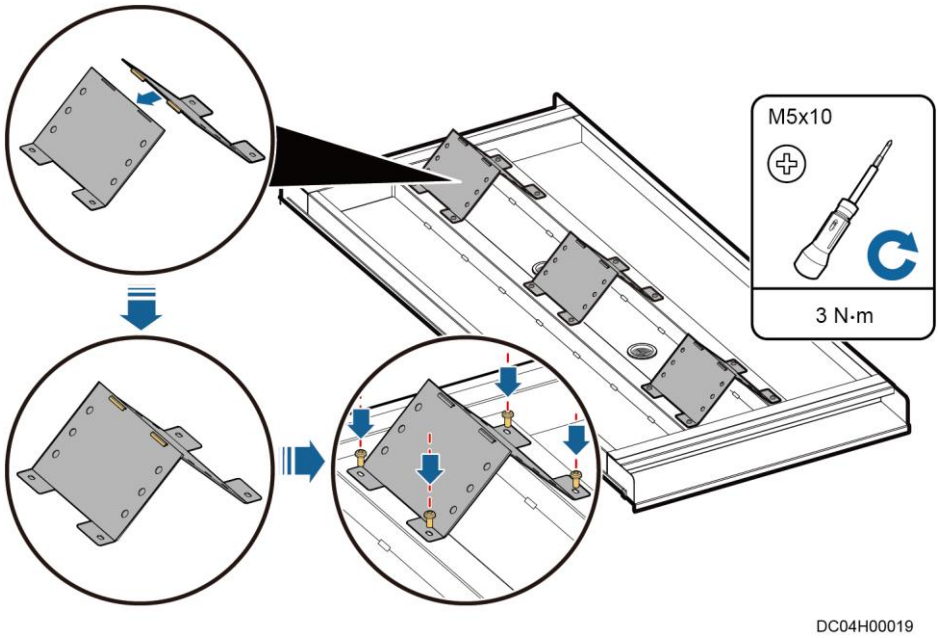
Tools: Phillips screwdriver, adjustable wrench, step ladder

Materials: skylight connective plate, skylight plate, cable separation plate, shadow shield

Procedure

Step 1 Install cable separation plates on a control skylight.

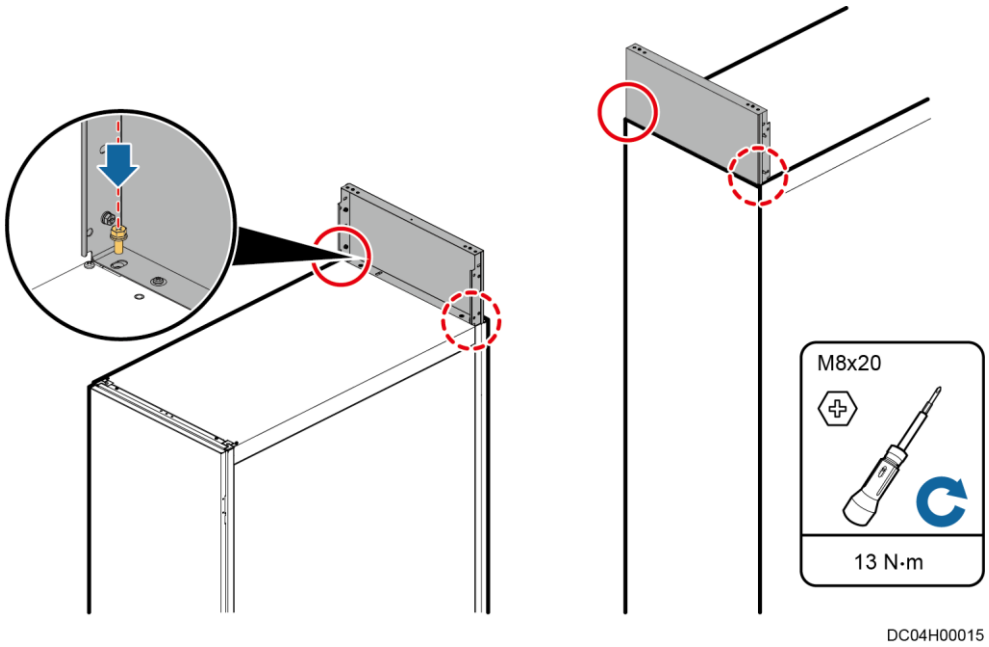
Figure 10-8 Installing cable separation plates



Step 2 Install skylight connective plates.

1. Install normal height skylight connective plates.

Figure 10-9 Installing skylight connective plates

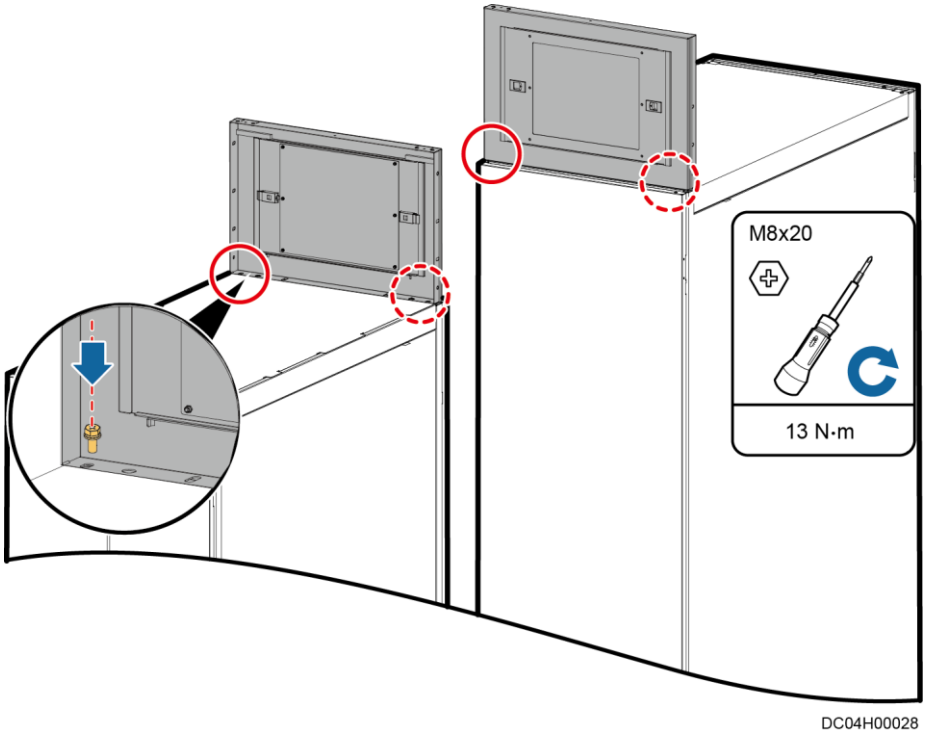


2. (Optional) Installing a maintenance skylight.

NOTE

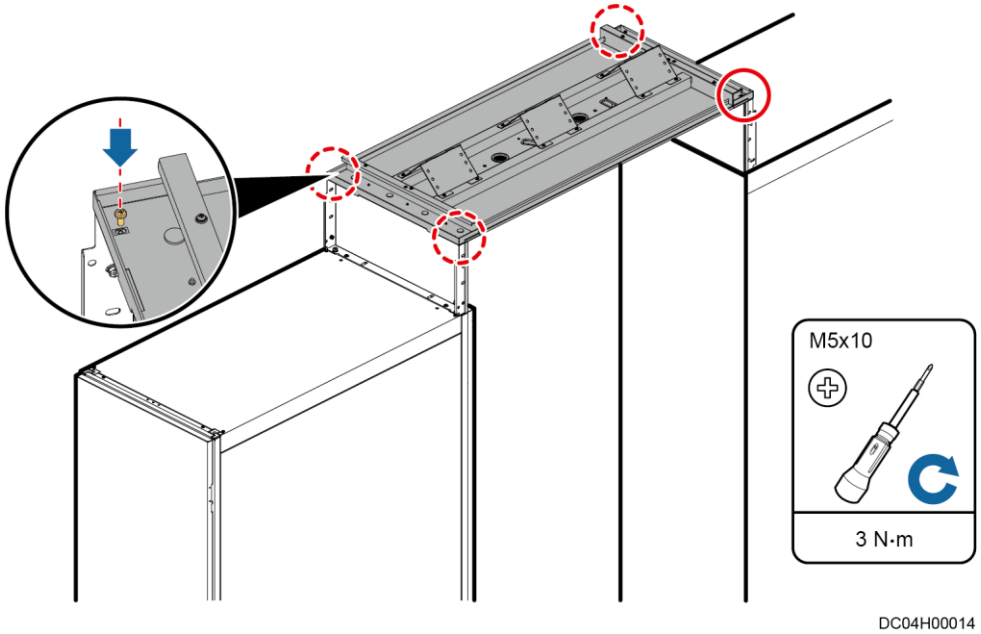
Use the maintenance skylight in the internal maintenance scenario of the new main way.

Figure 10-10 Installing maintenance skylight connective plates



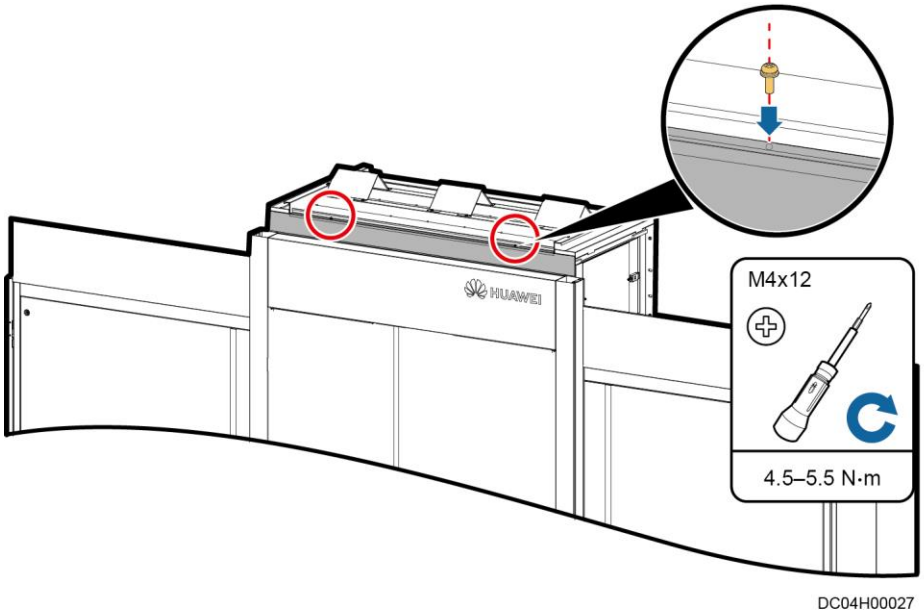
Step 3 Secure the control skylight to the skylight connective plates.

Figure 10-11 Securing a control skylight



Step 4 (Optional) Install air baffles between the 2000 mm high-end door and the maintenance skylight.

Figure 10-12 Installing air baffle



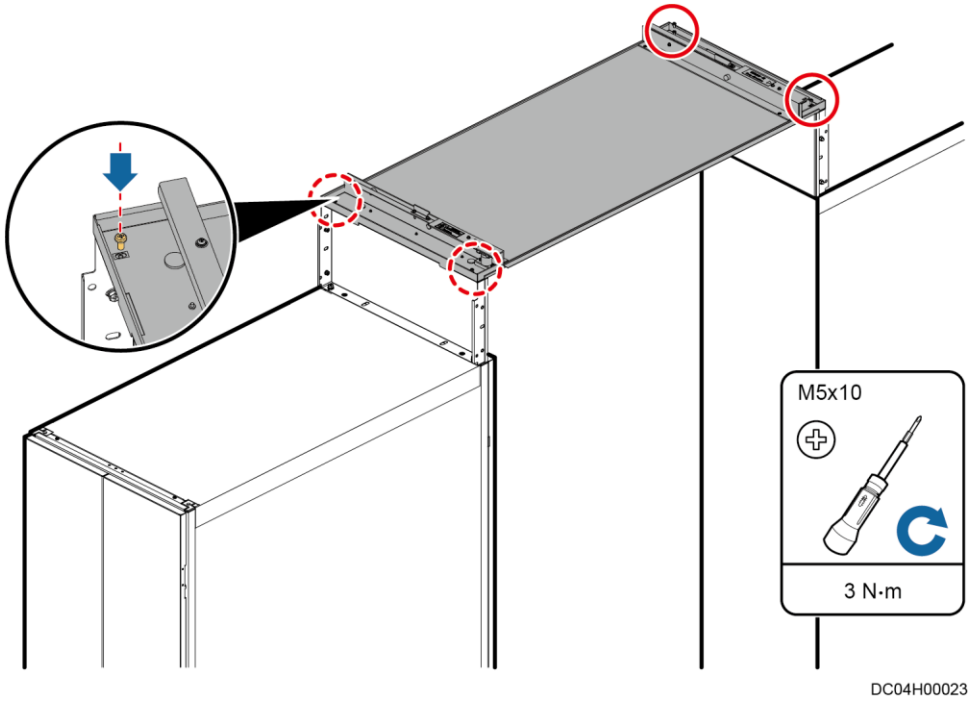
Step 5 Install adjacent skylight connective plates.

NOTICE

- Move and secure skylights with care and do not tread on them.
- Place a skylight based on the **Keep direction** label on the skylight.

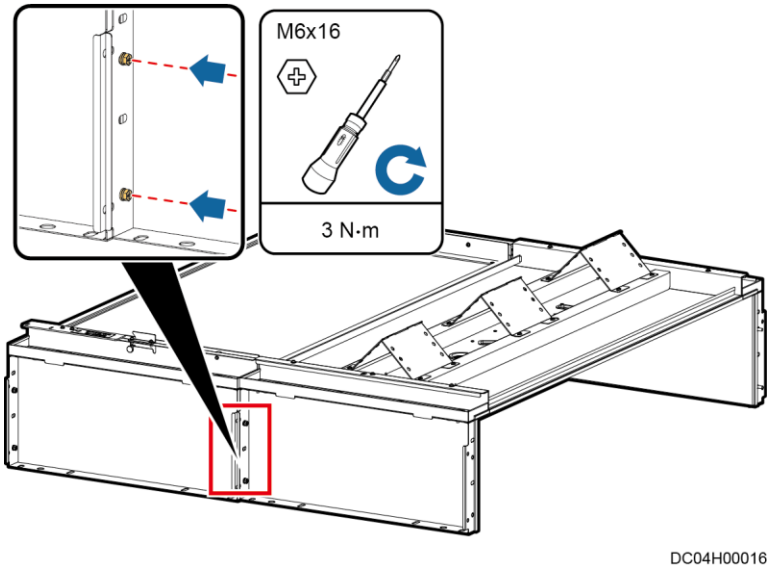
Step 6 Secure the rotating skylight to the skylight connective plates.

Figure 10-13 Securing a rotating skylight



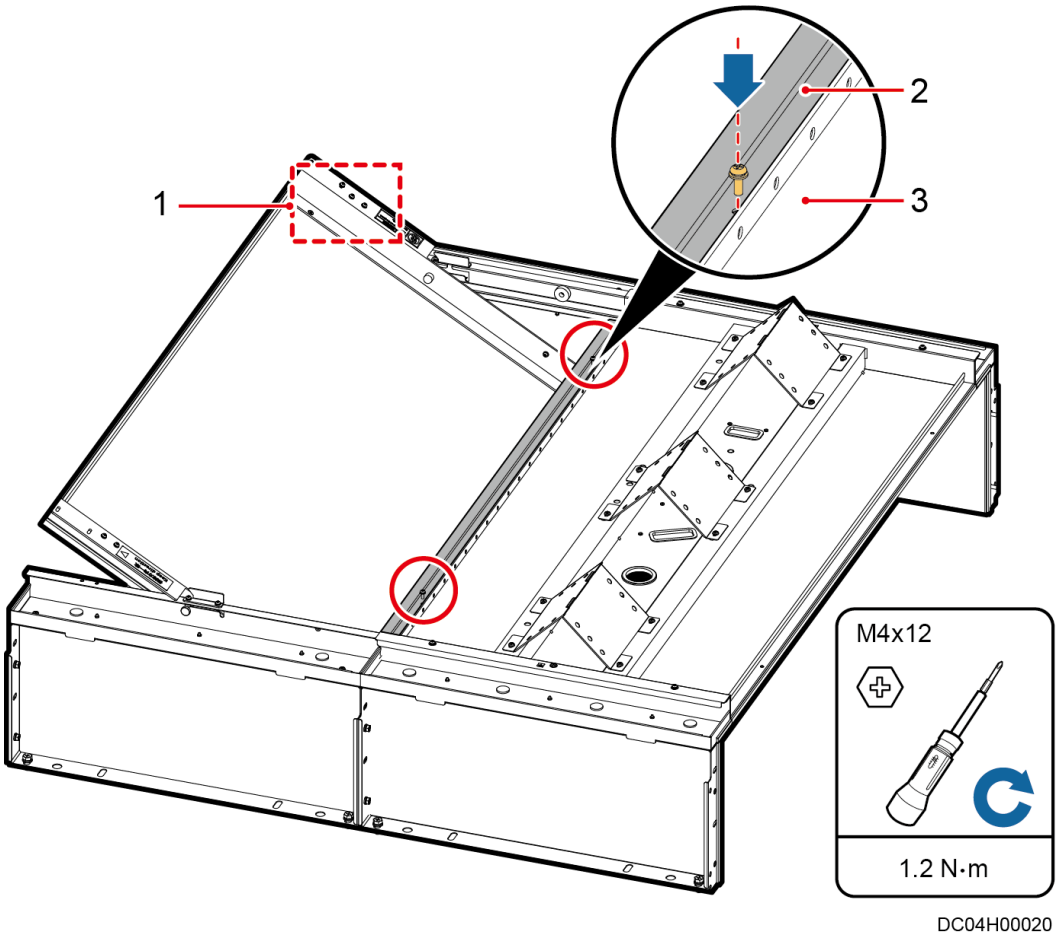
Step 7 Secure the two adjacent skylight connective plates.

Figure 10-14 Securing adjacent skylight connective plates



Step 8 Install a shadow shield between the control skylight and rotating skylight.

Figure 10-15 Installing a shadow shield



(1) Installation position for a skylight magnetic lock | (2) Shadow shield | (3) Control skylight

NOTE

Only one shadow shield needs to be installed in one aisle.

Step 9 Install other skylights in sequence by referring to the onsite engineering layout diagram.

----End

10.3.3 Installing Adjustable Skylights (in Scenarios with a Column)

Prerequisites

The sealing plates near the aisle have been installed and secured.

Preparations

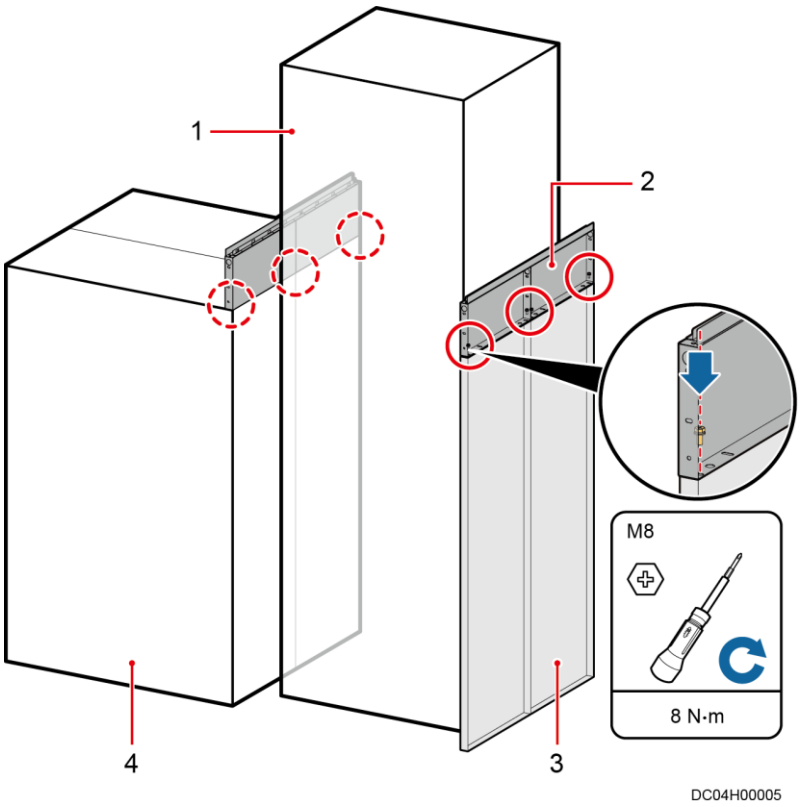
Tools: Phillips screwdriver, hook knife, marker, hand-held drill

Materials: skylight connective plate, telescopic edge, PC plate fastener, PC plate support, PC plate, L-shaped mounting bracket

Procedure

Step 1 Secure skylight connective plates to sealing plates or cabinets using eight M8 bolts.

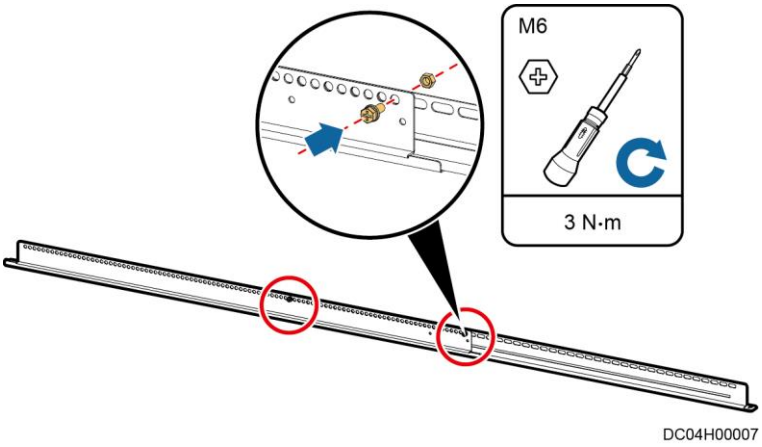
Figure 10-16 Installing a skylight connective plate



(1) Column
(2) Skylight connective plate
(3) Sealing plate near an aisle
(4) Cabinet

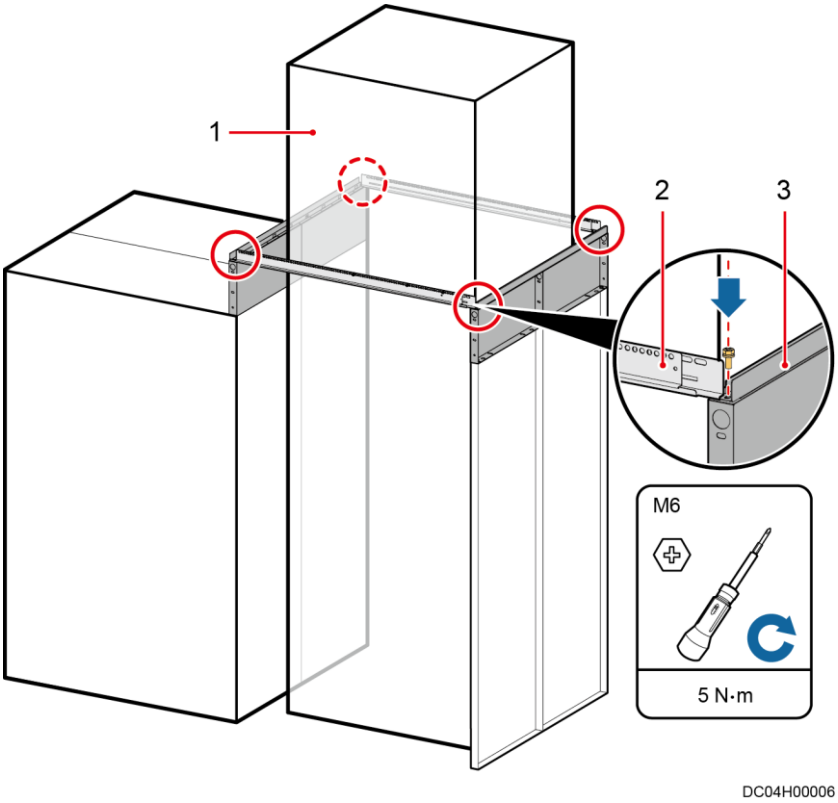
Step 2 Extend the two telescopic edges to an appropriate length and secure each using one M6 bolt.

Figure 10-17 Adjusting the length of a telescopic edge



Step 3 Secure the telescopic edge to the skylight connective plate using four M6 bolts.

Figure 10-18 Installing telescopic edges



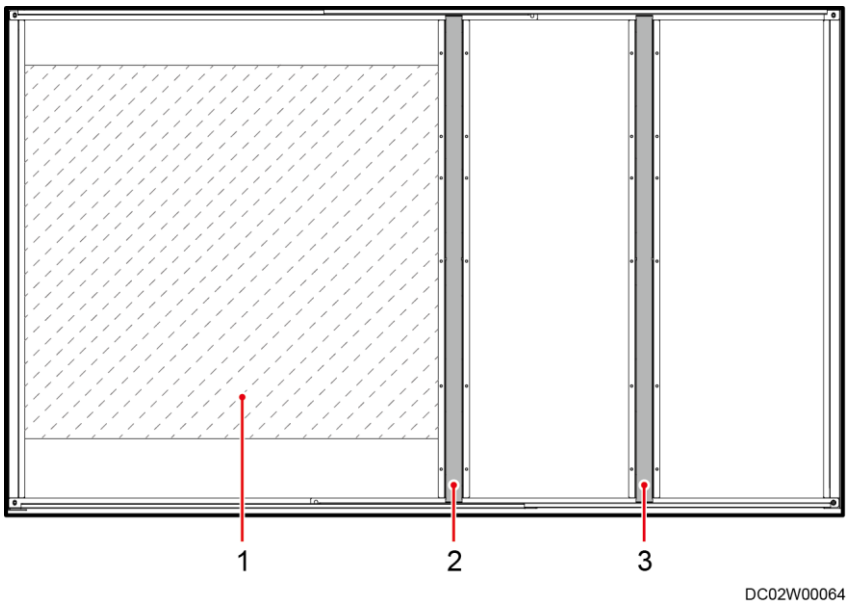
(1) Column (2) Telescopic edge (3) Skylight connective plate

Step 4 Select positions for installing PC plate supports. As shown in Figure 10-19, PC plate support 1 should be installed closely to the column, and PC plate support 2 should be installed in the middle between PC plate support 1 and the edge of the adjustable skylight.

NOTE

If the space between the right side of the column and the right side of the adjustable skylight is less than 600 mm, PC plate support 2 is optional.

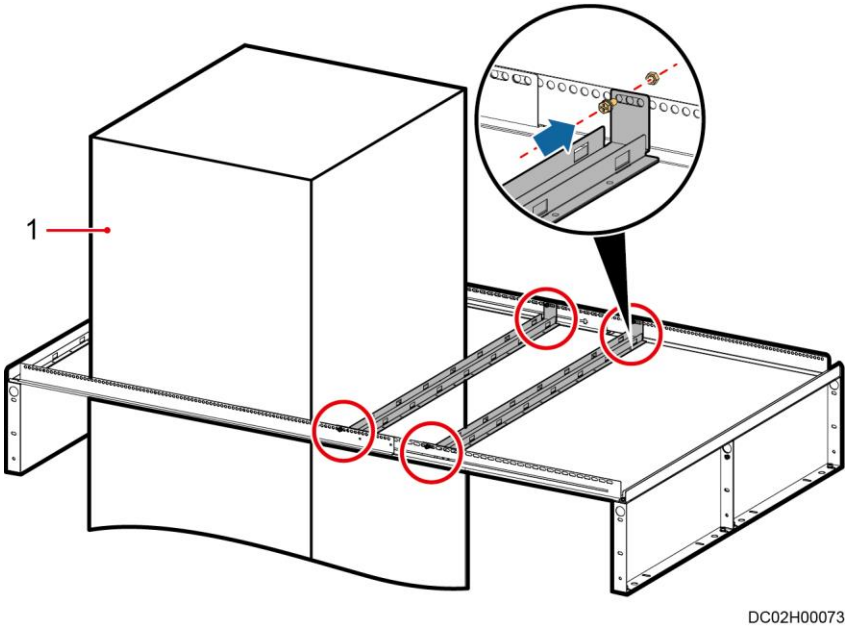
Figure 10-19 Adjustable skylight top view



(1) Column (2) PC plate support 1 (3) PC plate support 2

Step 5 Secure the two PC plate supports to the telescopic edges using four M6 screws and nuts.

Figure 10-20 Installing PC plate supports



(1) Column

Step 6 Install L-shaped mounting brackets.

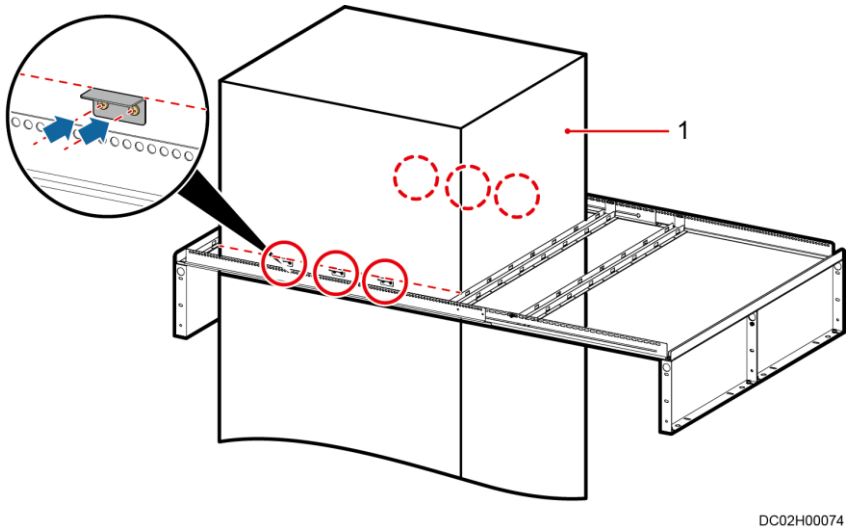
1. Trim the PC plate using a hook knife and place it on the adjustable skylight.

NOTE

To ensure a neat section after trimming, trim the PC plate using the aisle check tool in the No. 0 packing box.

2. Use a marker to mark a line on the column where the PC plate closely attaches to the column.
3. Move away the PC plate. Drill holes in the column and secure the L-shaped mounting brackets to the column using plastic expansion bolts.

Figure 10-21 Securing L-shaped mounting brackets

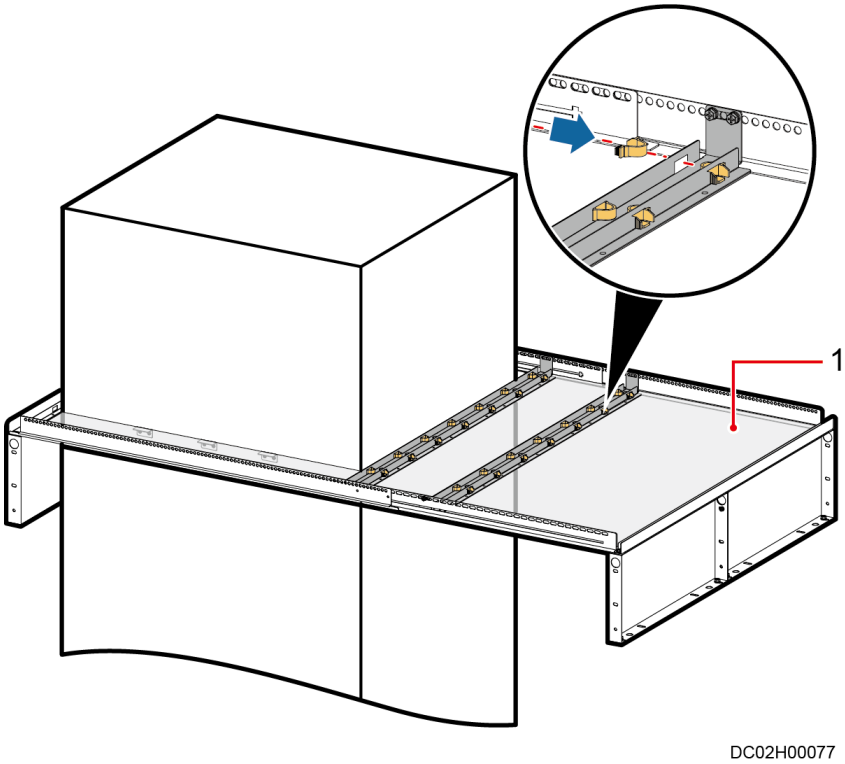


(1) Column

Step 7 Install PC plates.

1. Pave the PC plate on the adjustable skylight.
2. Secure PC plate fasteners to PC plate supports.

Figure 10-22 Installing PC plates



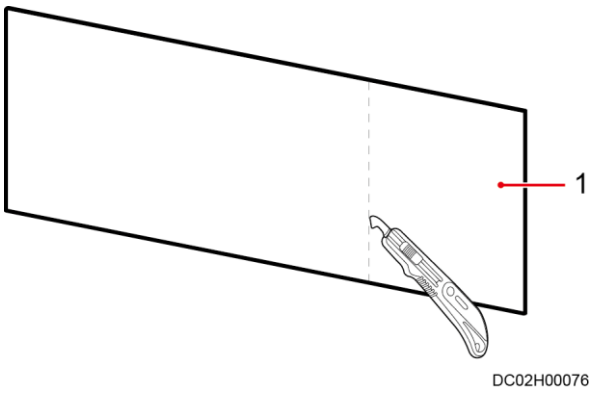
(1) PC plate

Step 8 Trim the PC plate to an appropriate size using a hook knife.

NOTE

To ensure a neat section after trimming, trim the PC plate using the aisle check tool in the No. 0 packing box.

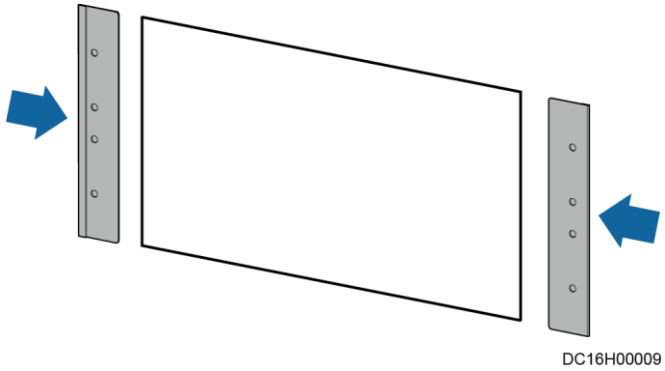
Figure 10-23 Trimming a PC plate



(1) PC plate

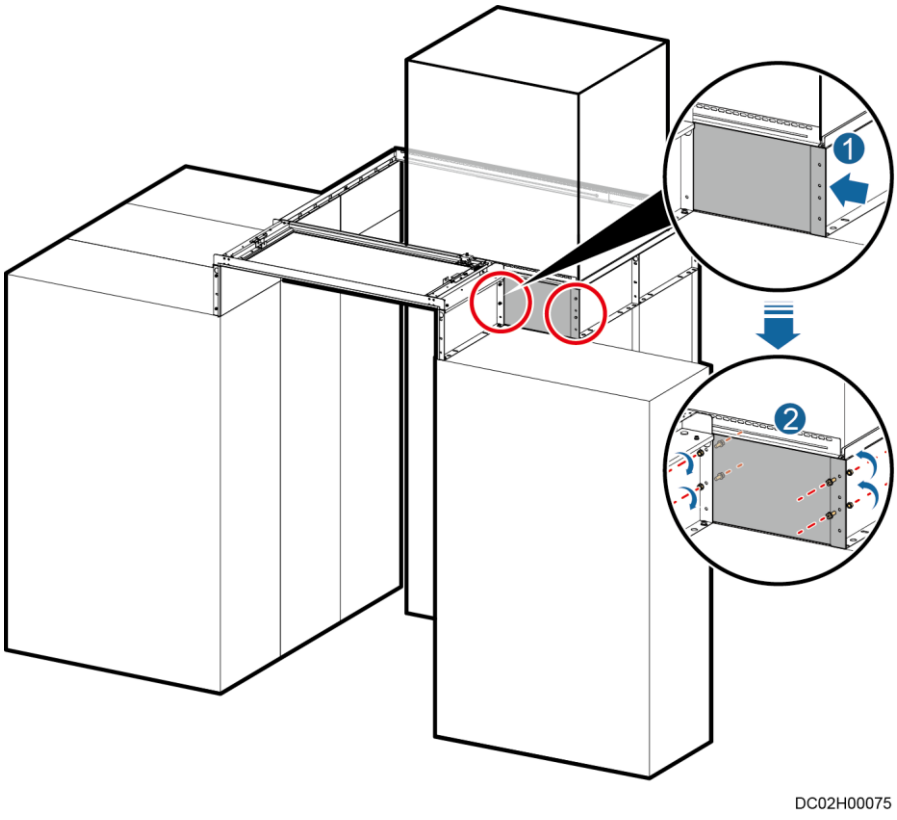
Step 9 Attach the PC plate fastener to the trimmed PC plate.

Figure 10-24 Attaching a PC plate fastener to a trimmed PC plate



Step 10 Secure the PC plate fastener and the trimmed PC plate to the skylight connective plate.

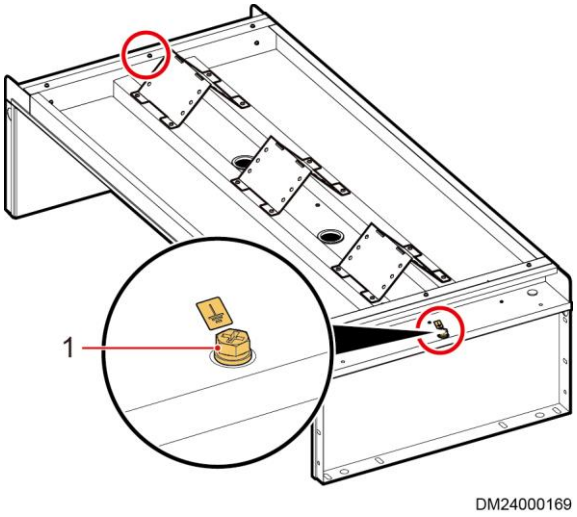
Figure 10-25 Securing an adjustable skylight side sealing plate



----End

10.3.4 (Optional) Grounding Control Skylights

Figure 10-26 Control skylight ground points



(1) Ground point

Connect one end of the control skylight ground cable to any ground point on the control skylight (as shown by 1 in Figure 10-26), and secure the other end to the top of the cabinet using M5x10 tapping screws.

10.4 Installing the Cabinet Bottom Sealing Plate

Context

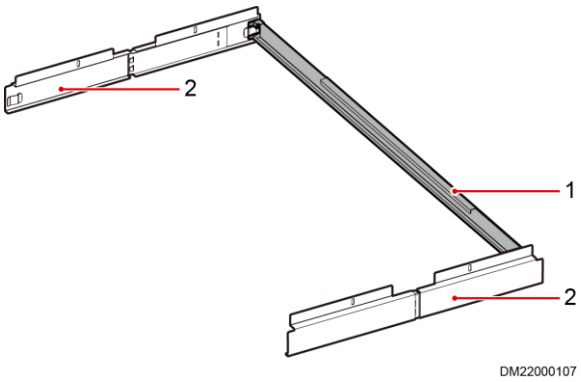
Cabinet bottom sealing plates need to be installed only at the bottom of 2000 mm high cabinets.

Table 10-2 Specifications of cabinet bottom sealing plates

Installation Position	Type	BOM Number	Notice
Middle cabinet	600 mm wide front and rear sealing plates	21242005	Applies to cabinets that are 600 mm wide and 2000 mm high.
	800 mm wide front and rear sealing plates	21242301	Applies to cabinets that are 800 mm wide and 2000 mm high.
	300 mm wide front and rear sealing	Available in the materials for 300	Applies to 300 mm wide smart cooling

Installation Position	Type	BOM Number	Notice
	plates	mm wide smart cooling products.	products.
End cabinet	Front and rear sealing plates + side sealing plates (assembled by five components)	Available in the aisle door materials.	Applies to only end cabinets.
Cabinets at both sides of a column (scenarios with a column)	Front and rear sealing plates + side sealing plates (assembled by five components)	21242007	Applies to only cabinets at both sides of a column in scenarios with a column.

Figure 10-27 Bottom sealing plates for end cabinets

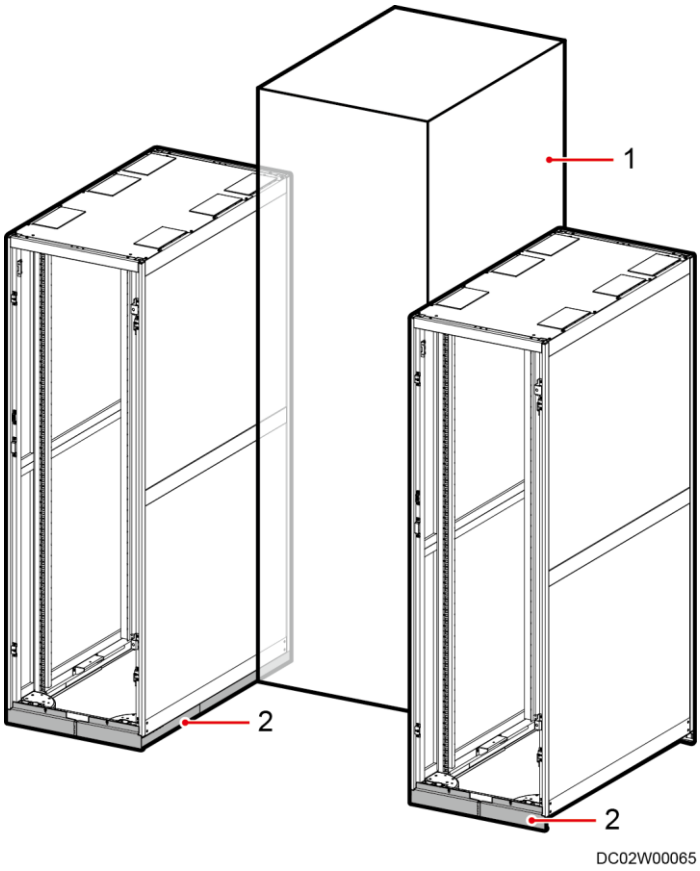


(1) Side sealing plate (2) Front or rear sealing plate

NOTE

Each of the front and rear sealing plates is assembled by two components. The length after assembly can be 600 mm or 800 mm.

Figure 10-28 Bottom sealing plates installed for cabinets at both sides of a column



(1) Column (2) Cabinet bottom sealing plate

Preparations

Tool: Phillips screwdriver

Material: cabinet bottom sealing plate

Document: cabinet bottom sealing plate installation position diagram

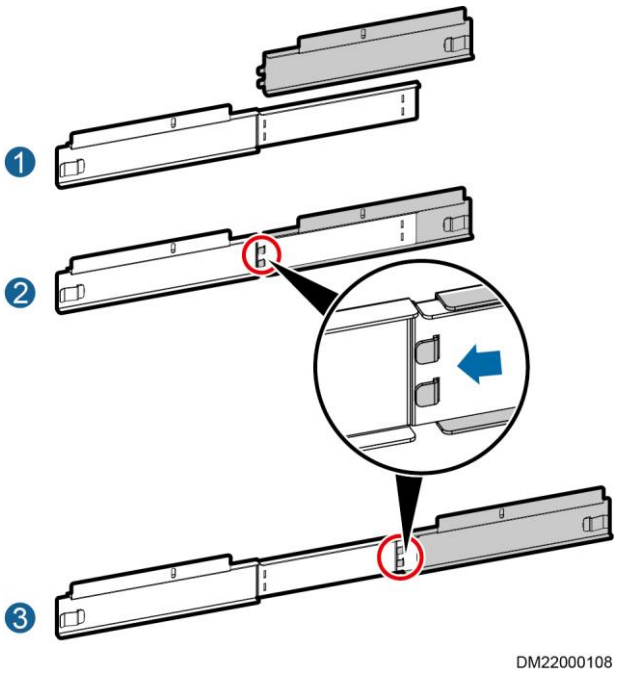
Procedure

Step 1 Assemble front and rear sealing plates that are as wide as the cabinet.

NOTICE

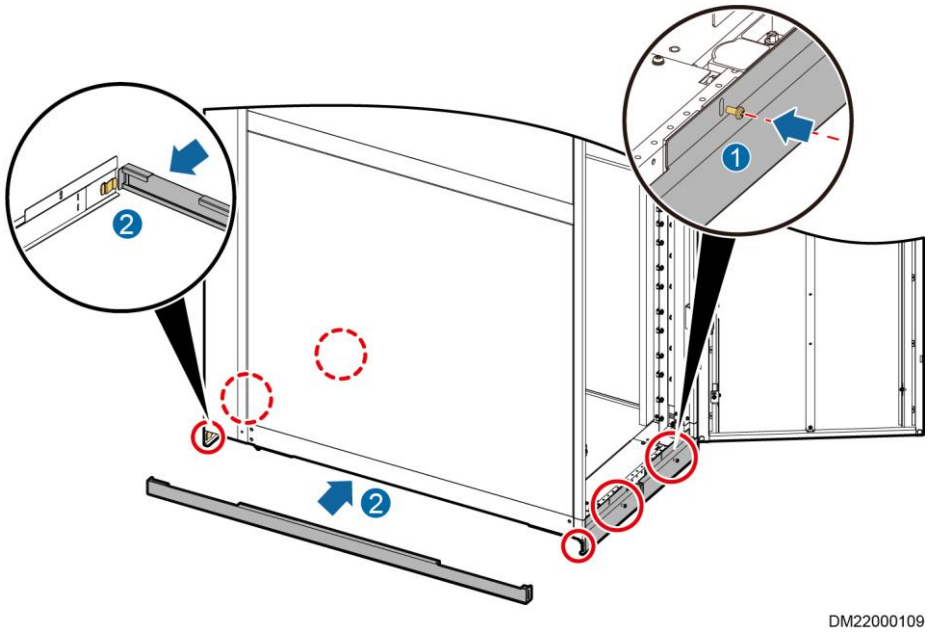
- (1) in Figure 10-29 shows the individual front and rear sealing plates.
- (2) in Figure 10-29 shows the assembled front and rear sealing plates for 600 mm wide cabinets.
- (3) in Figure 10-29 shows the assembled front and rear sealing plates for 800 mm wide cabinets.
- Front and rear sealing plates for middle cabinets do not need to be assembled. Only front and rear sealing plates for end cabinets and cabinets at both sides of a column need to be assembled.

Figure 10-29 Assembling front and rear sealing plates



Step 2 Secure the front and rear sealing plates to the cabinet using four M5x10 tapping screws, as shown by (1) in Figure 10-30.

Figure 10-30 Securing sealing plates



Step 3 Place the side sealing plate with the side with dents upward, and snap the side sealing plate into the front and rear sealing plates, as shown by (2) in Figure 10-30.

NOTICE

Side sealing plates need to be installed only for end cabinets and cabinets at both sides of a column, but not middle cabinets.

----End

10.5 Installing End Doors

Table 10-3 Pre-installation checklist

No.	Check Item	Result
1	The cabinets have been leveled. If there is a height deviation, its absolute value does not exceed 3 mm.	□ Passed □ Failed
2	The distance between cabinet doors inside the dual-row aisle containment is 1200 mm (±3 mm). The distance between cabinet doors and sealing plates inside the single-row aisle containment is 1225 mm (±3 mm).	□ Passed □ Failed
3	The cabinets in both rows at the ends of the dual-row aisle containment are placed with a front-backward deviation no greater than 1.5 mm.	□ Passed □ Failed

No.	Check Item	Result
	The cabinets and sealing plates at the ends of the single-row aisle containment are placed with a front-backward deviation no greater than 1.5 mm.	
4	The height deviation between the floor surface and base top is within 3 mm, and no deviation is preferred.	□ Passed □ Failed

10.5.1 (Optical) Installing Revolving Doors

Context

The BOM number for a revolving Door is 21501713 or 21501714.

Preparations

Tools: Phillips screwdriver, hex key, step ladder, level

Materials: revolving doors and accessories

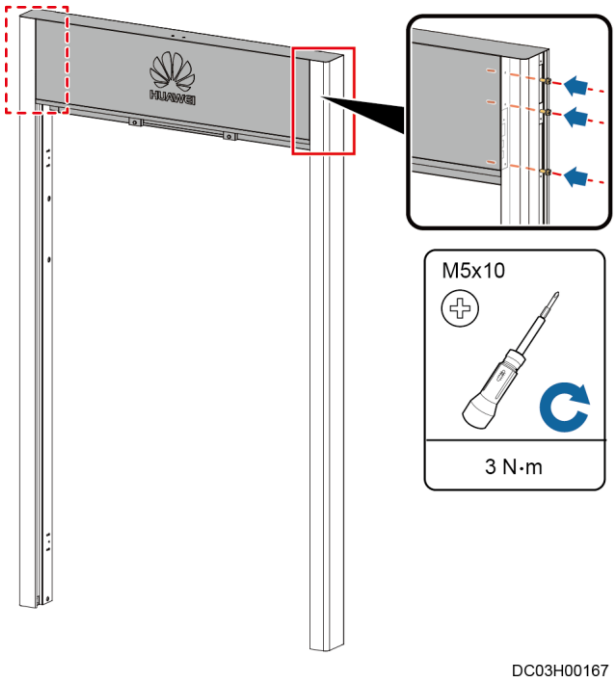
Procedure

Step 1 Secure the posts to the door head.

NOTE

- Before installation, remove the rear cover of the door head and reinstall it after all components are installed.
- After removing the maintenance panels from both sides of the posts, put the posts and door head horizontally on the floor and assemble them. After the assembly is complete, verify that the posts are flush with the door head.

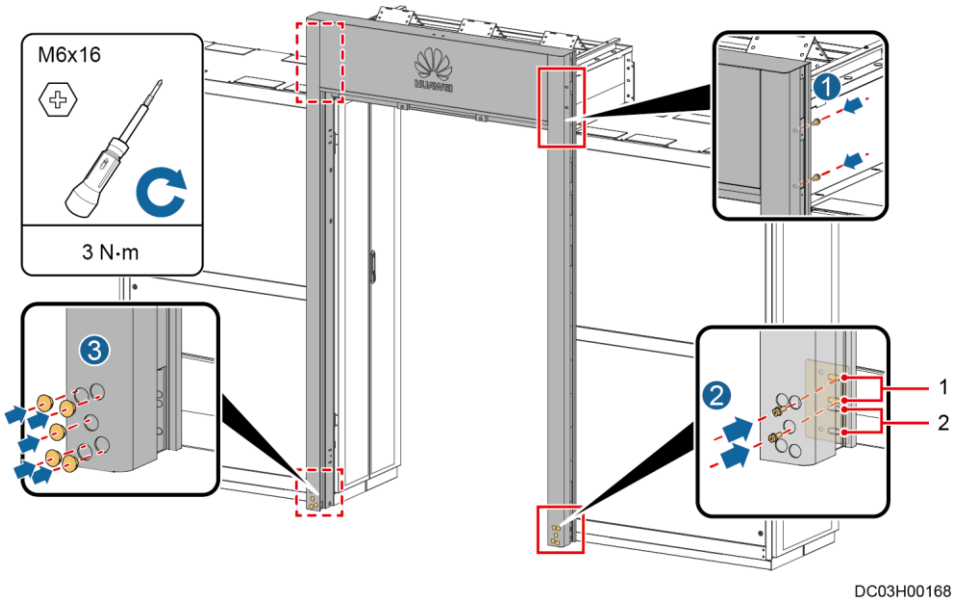
Figure 10-31 Securing the posts to the door head



Step 2 Install a door frame.

1. Secure the posts to the skylight connective plate.
2. Secure the bottom of the posts to the cabinets.
3. Install rubber plugs. The installation is complete.

Figure 10-32 Installing a door frame



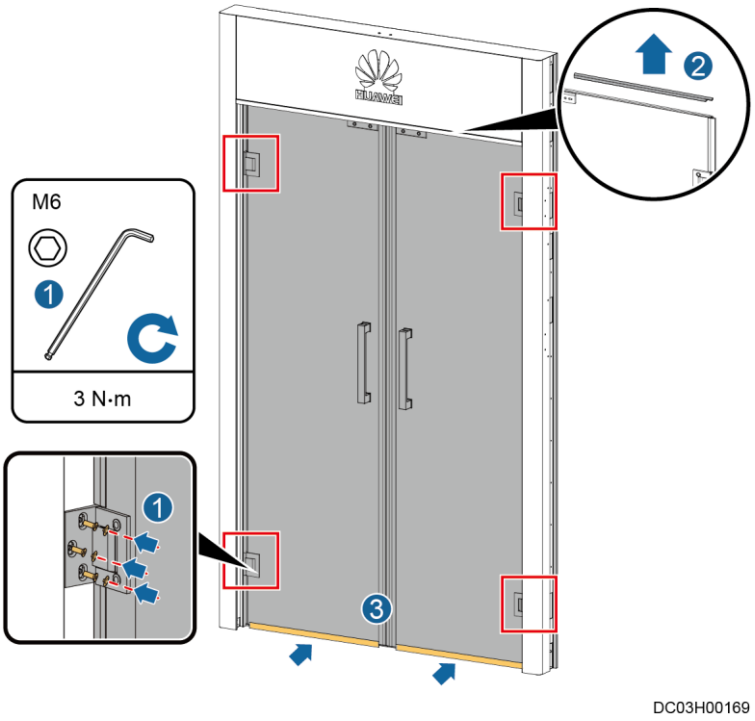
(1) Securing holes for cabinets with castors

(2) Securing holes for cabinets without castors

Step 3 Install door panels.

1. Secure the door panels to the door posts.
2. Open the revolving door and remove the four rubber pads from the top and bottom of the door panels.
3. Install removable rubber strips at the bottom of the glass door panel exterior.

Figure 10-33 Installing door panels



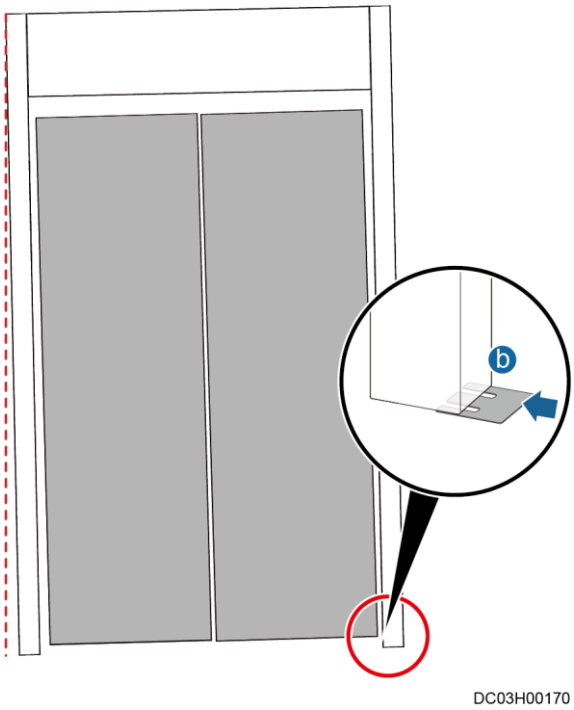
Step 4 (Optional) Adjusting the gap between the door panels.

NOTE

After the door panels are installed and closed, the gap between panels may be uneven and look ungraceful. If the gaps are even, skip this procedure.

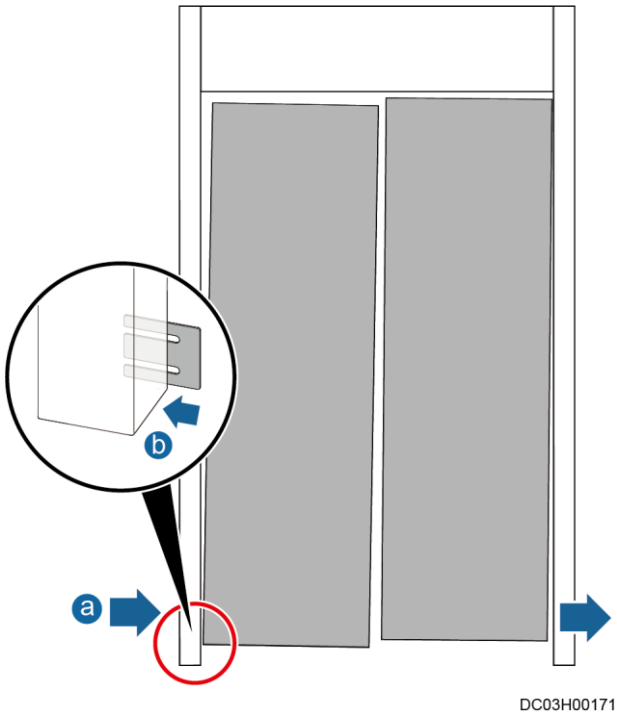
- Tilted door panel
  a. If the door frame tilts by a large degree, adjust the castors or anchor bolts of the cabinet. If a post is lifted off the floor due to the adjustment, add a spacer under the post.
  b. If the door frame slightly tilts, add a spacer under the appropriate post to correct the tilt.

Figure 10-34 Tilted door panel



- Varying gap between the door panel and the upper frame mounting kit or door mismatch
  a. If there is a gap between the door panel and upper frame mounting kit (a corner tilts downwards), you can push up the lower end of the post. If a corner of a door panel tilts upwards, pull the lower end of the post.
  b. If door panels mismatch, loosen screws between the posts and cabinets and insert spacers to make the door panels on the same horizontal plane when they are closed. After adjustment, tighten all screws.

Figure 10-35 Varying gap between the door panel and the upper frame mounting kit or door mismatch



NOTE

If the door gap is still uneven after the preceding measures are taken, remove, reinstall, and adjust the rubber strip on one door panel until the door panel edges are in close contact.

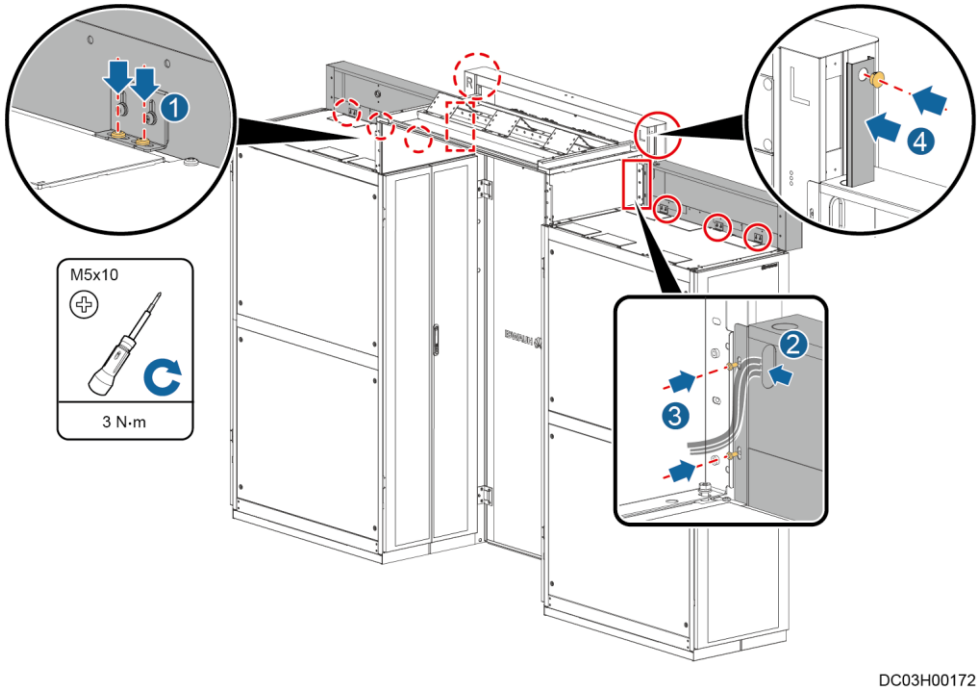
Step 5 Install door boxes and side covers for the posts.

NOTE

- Before installing the door boxes, check whether the eLight needs to be installed. If the eLight needs to be installed, install it first and then perform the following steps.
- In case of 1100 mm cabinet scenario, the 1100 door box separately delivered is used, the 1200 mm door box packaged in the door materials is abandoned.

1. Facing the aisle, secure the door boxes labeled **L** and **R** to the top of the cabinet.
2. Pull out the cable that is pre-deployed inside the post from the side hole to facilitate subsequent cable connection.
3. Secure the door box interior to the skylight connective plate.
4. Install the side covers on the top of the posts and install rubber plugs.

Figure 10-36 Installing door boxes and side covers for the posts



----End

10.5.2 (Optical) Installing Sliding Doors

Context

The BOM number for a sliding door is 21501718 or 21501712.

Preparations

Tools: Phillips screwdriver, flat-head screwdriver, step ladder, level

Materials: sliding doors and accessories

Procedure

Step 1 Install an internal door frame.

1. Secure the internal posts to the internal door head.

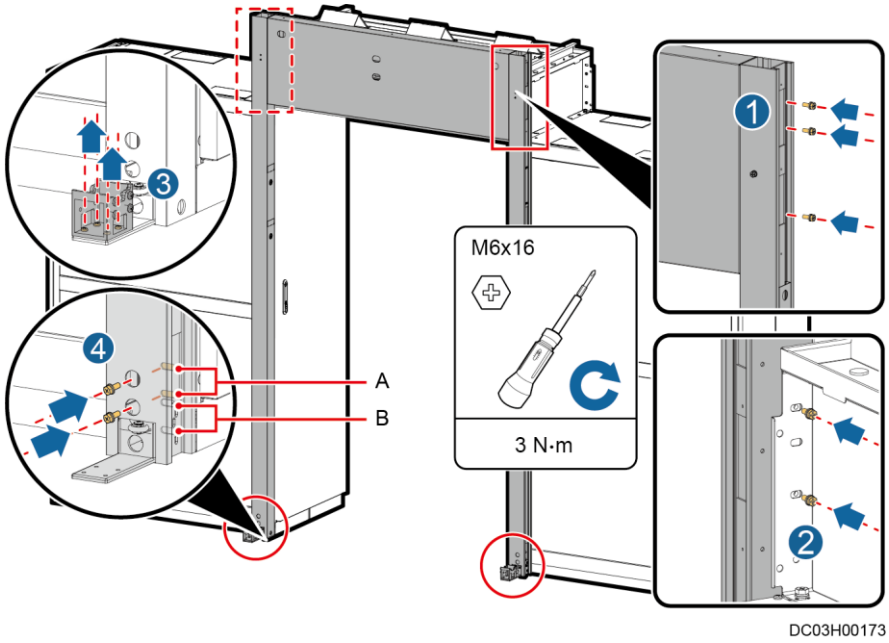
NOTE

- Before installation, remove the rear cover of the door head and reinstall it after all components are installed.
- After removing the maintenance panels from both sides of the posts, put the posts and door head horizontally on the floor and assemble them. After the assembly is complete, verify that the posts are flush with the door head.

2. Secure the posts to the skylight connective plate.
3. Remove the front wheel of the damper.

4. Secure the bottom of the posts to the cabinets.

Figure 10-37 Installing inner door frame

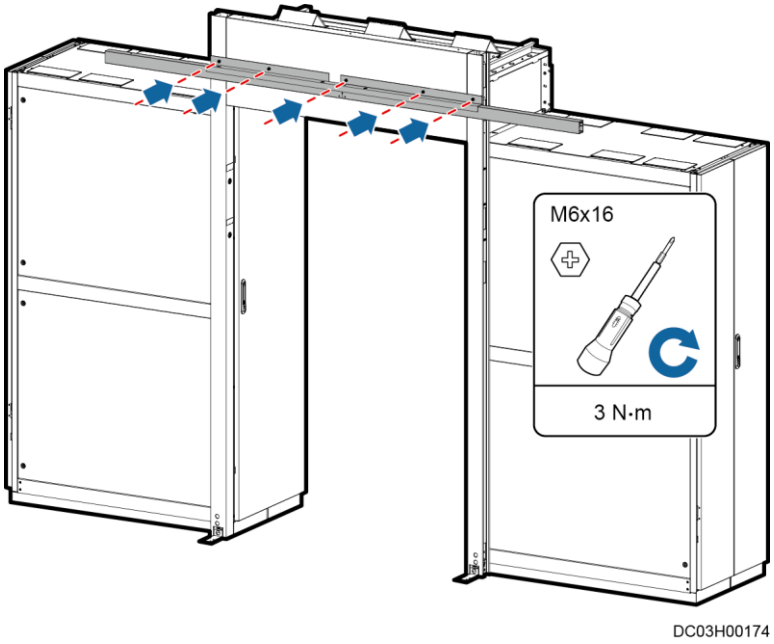


(A) Securing holes for cabinets with castors

(B) Securing holes for cabinets without castors

Step 2 Secure the guide rail to the door frame.

Figure 10-38 Securing the guide rail



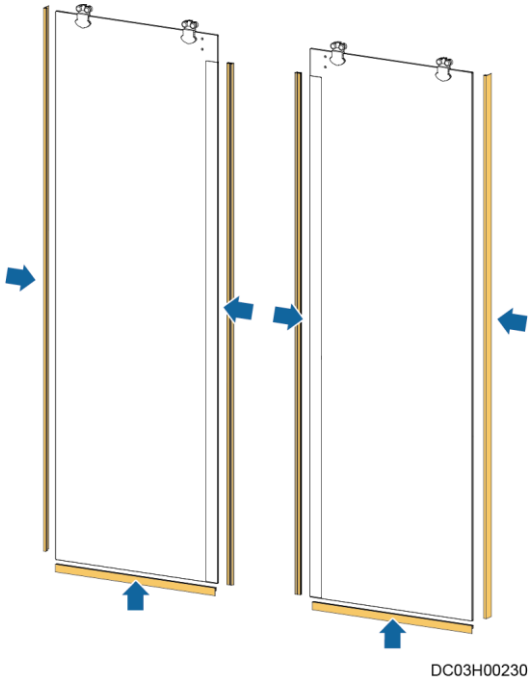
Step 3 Install the rubber strips.

1. Remove the protective rubber strips from the glass door.
2. Install the door rubber strips.

NOTE

- Ensure that the door is in close contact with the rubber strips without gaps.
- Ensure that the inner and outer rubber strips are flush with the door and the rubber strip at the bottom is as wide as the door.

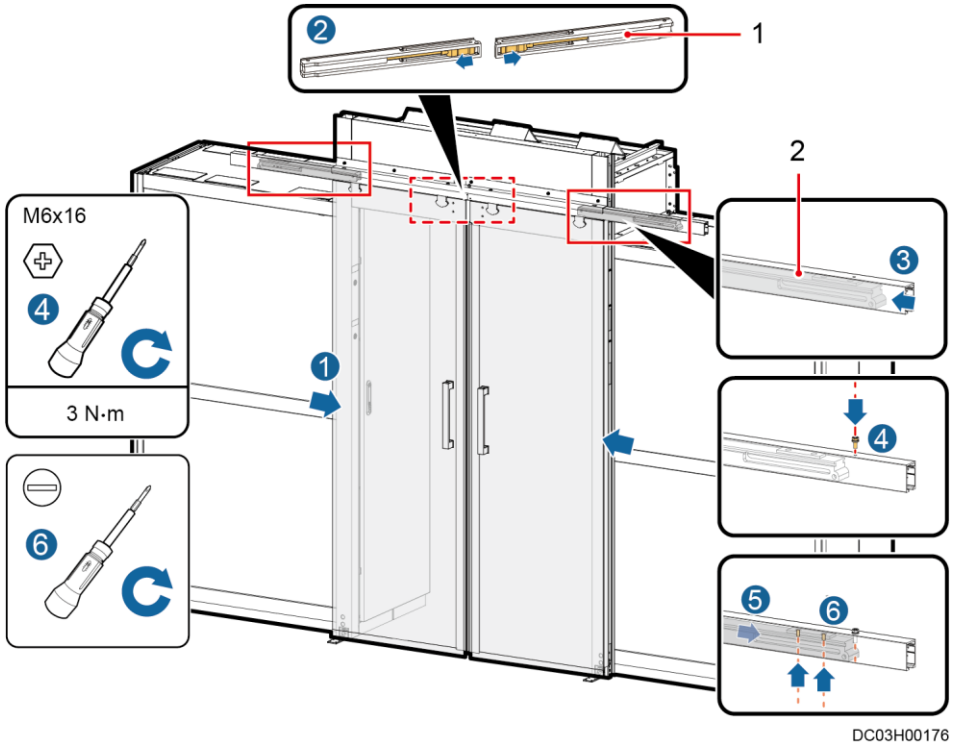
Figure 10-39 Installing the door rubber strips



Step 4 Installing a Glass Door.

1. Push the door onto the guide rail.
2. Set the spring of the middle buffer to the compressed state.
3. Push an end buffer into each end of the guide rail according to the direction of the arrow on the label.
4. Secure the screws at both ends of the guide rail.
5. Push the buffers to the ends of the guide rail until they are in close contact with the guide rail screws.
6. Secure the buffers when the springs of the buffers are in the compressed state.

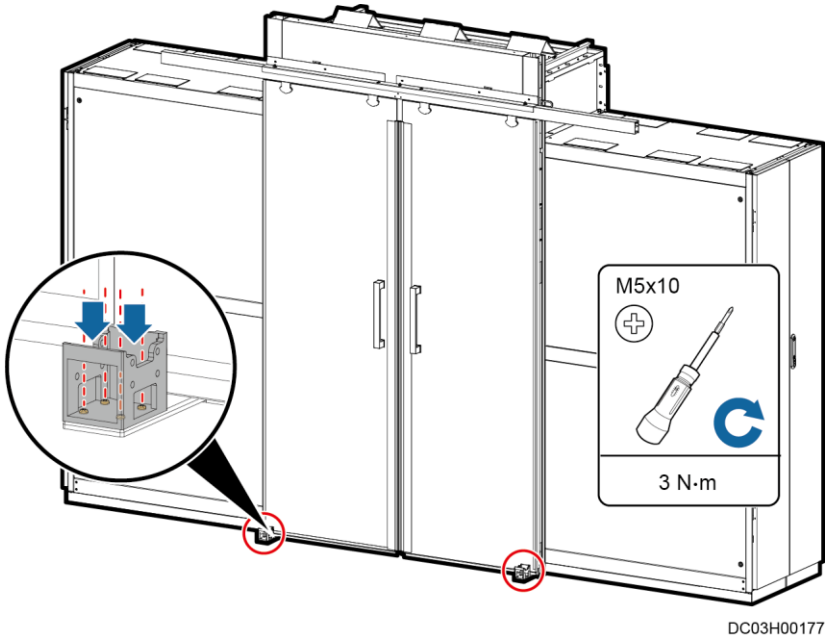
Figure 10-40 Installing glass doors



(1) Middle buffer (2) End buffer

Step 5 Reinstall the front wheel of the damper.

Figure 10-41 Reinstalling the front wheel of the damper



(1) Post (2) Door panel (3) Damper

NOTE

- Ensure that there is no gap between the glass doors and they are flush.
- Ensure that there is no friction between the glass doors and posts.
- Ensure that the bumper is installed correctly

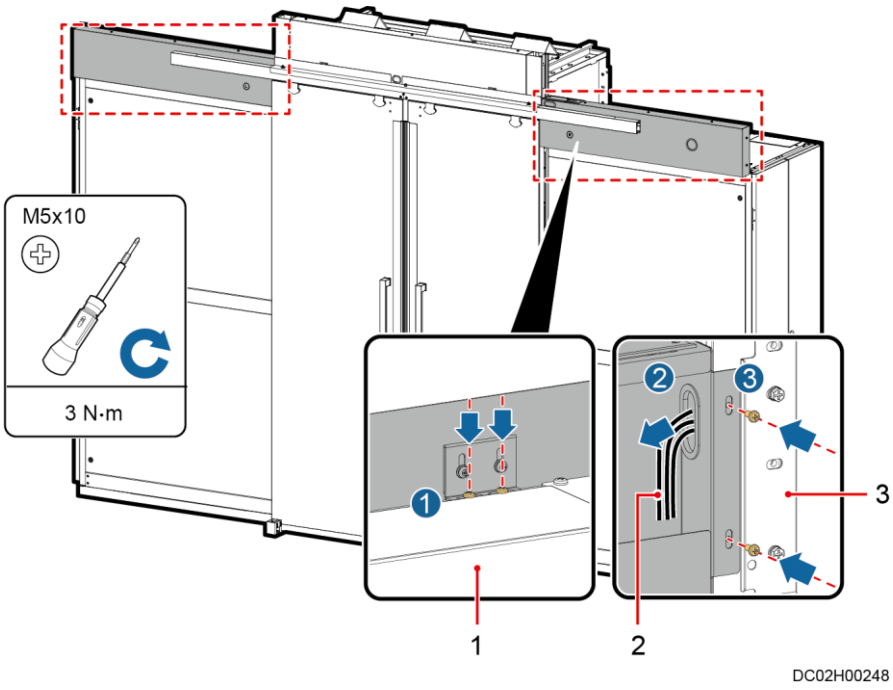
Step 6 Install door box hanging kits.

1. Facing the aisle, secure the door box hanging kits labeled **L** and **R** to the top of the cabinet.
2. Pull out the cables that are preinstalled in the post.
3. Secure the door box hanging kits to the posts.

NOTE

For the 1100 mm cabinet scenario, you can use the separately delivered 1100 mm door box and abandon the 1200 mm door box packaged in the door materials.

Figure 10-42 Install door box hanging kits

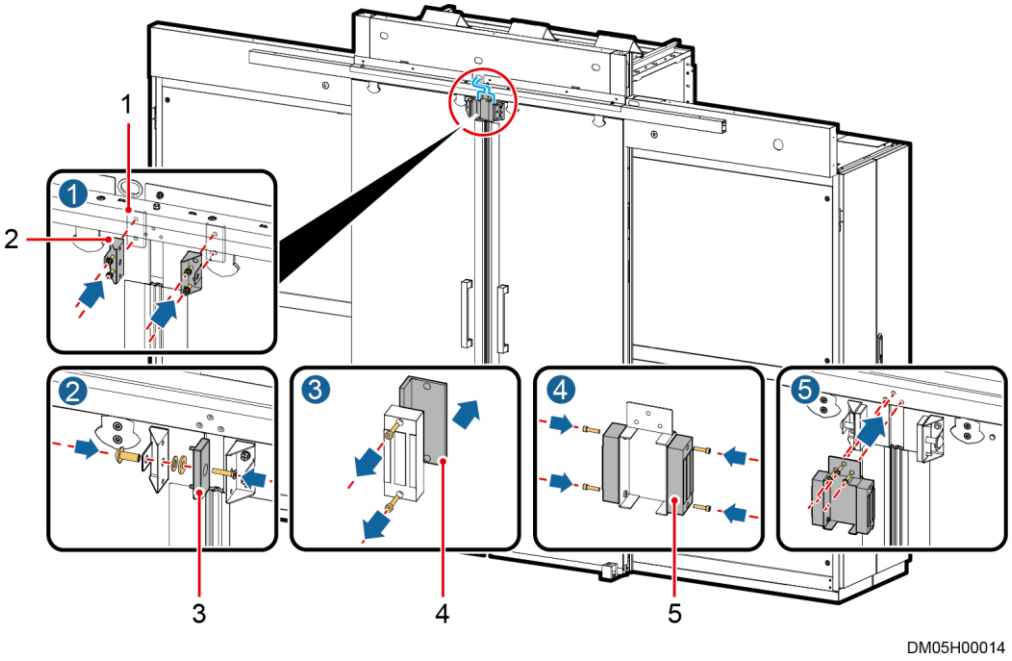


(1) Top of the cabinet (2) Preinstalled cables (3) Skylight connective plate

Step 7 Install magnetic locks and adjust the magnetic lock gap

1. Secure the magnet fastener and washer to the door panel.
2. Secure the magnets on the left and right sides to the fasteners respectively.
3. Remove the magnetic lock accessory and keep the two removed screws for later use.
4. Secure the two magnetic locks to the magnetic lock fasteners using screws.
5. Secure the assembled magnetic locks to the guide rail.

Figure 10-43 Installing magnetic locks and adjusting the magnetic lock gap



(1) Washer (2) Magnet fastener (3) Magnet

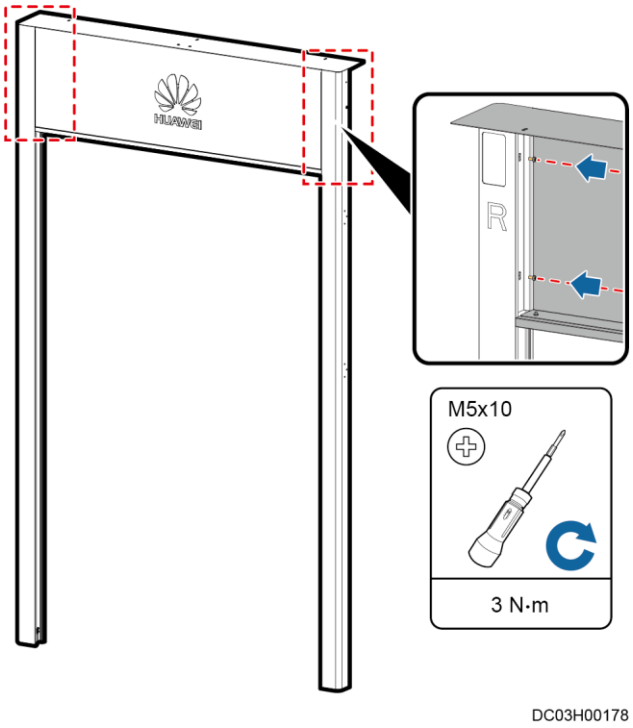
(4) Magnetic lock accessory (5) Magnetic lock fastener

Step 8 Secure the external posts to the external door head.

NOTE

- Put the posts and door head horizontally on the floor and assemble them.
- After the assembly is complete, verify that the posts are flush with the door head.

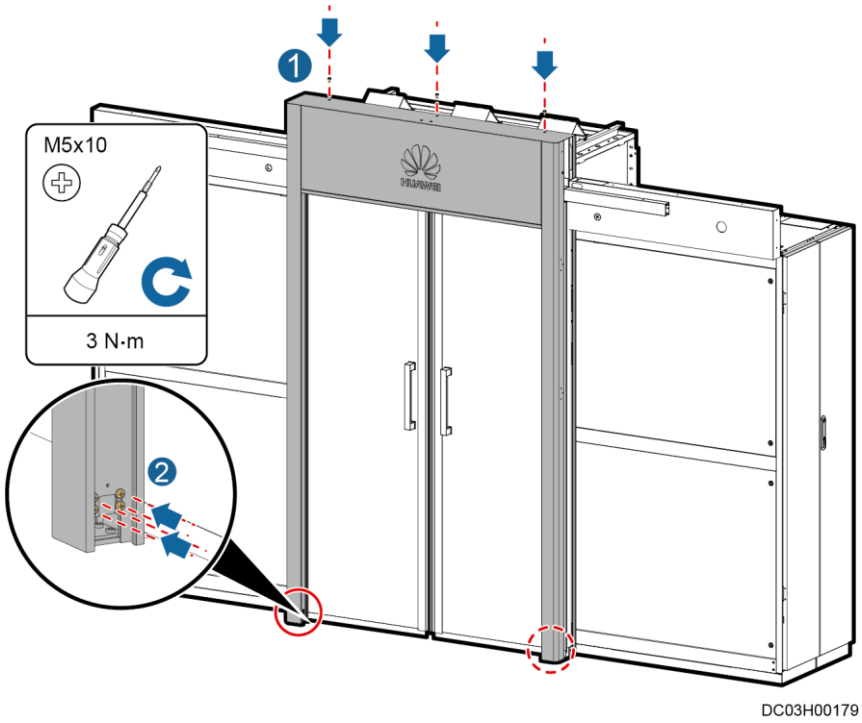
Figure 10-44 Securing the external door head to the external post.



Step 9 Install an external door frame.

1. Lift the door frame, and secure it to the top of the internal door frame of the cabinet.
2. Tighten the screws at the bottom of the posts.

Figure 10-45 Installing an external door frame

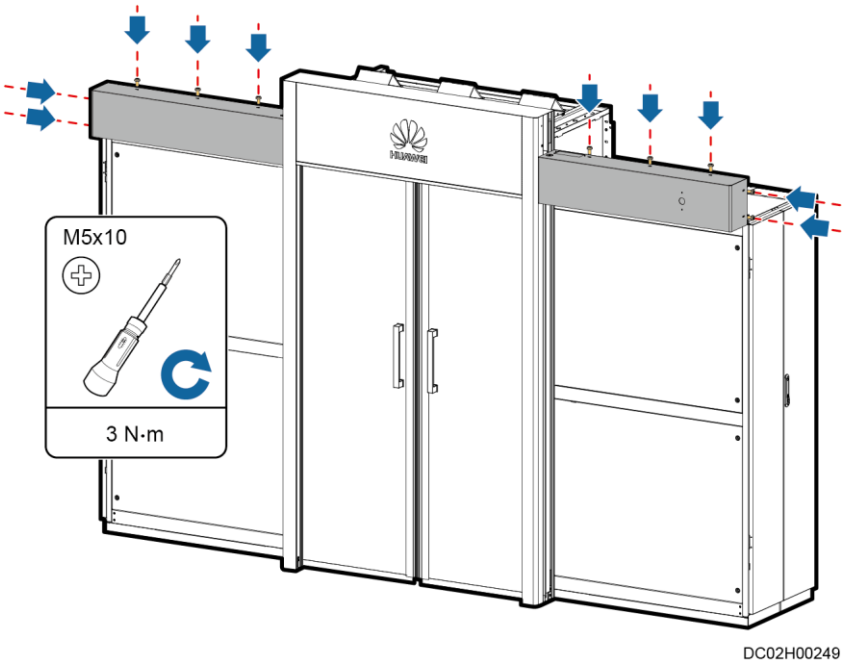


Step 10 Install door boxes.

NOTE

- Before installing the door boxes, check whether the eLight needs to be installed.
- If the eLight needs to be installed, you are advised to install the eLight first and then perform this step.

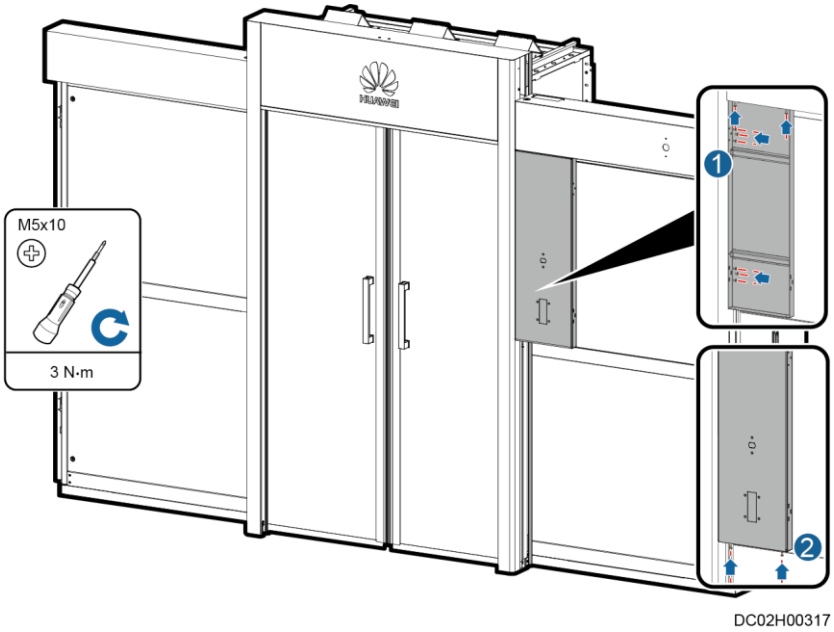
Figure 10-46 Installing door boxes



Step 11 (Optional) Install the pad mounting kit.

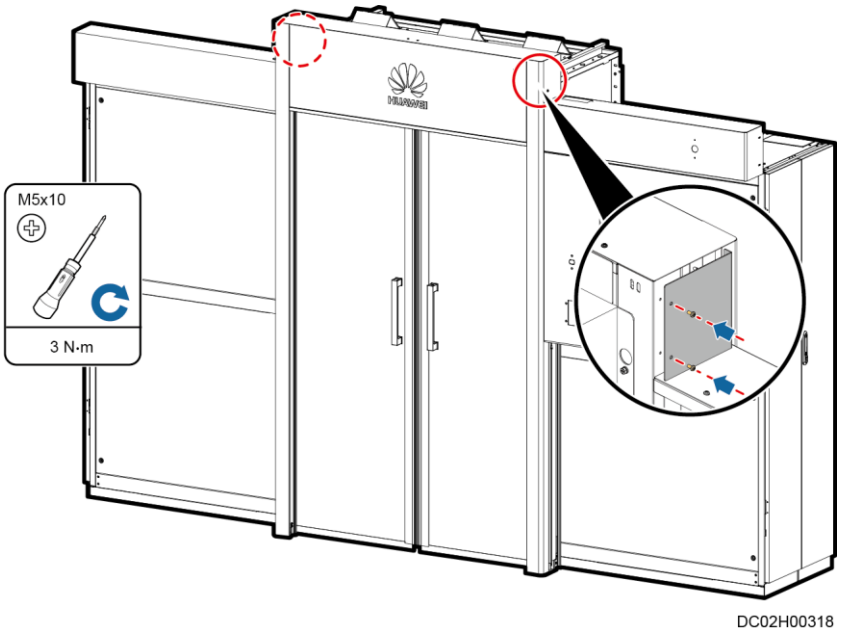
1. Install the bottom plate of the pad mounting kit.
2. Install the cover of the pad mounting kit.

Figure 10-47 Installing the pad mounting kit



Step 12 Install the side cover of the posts.

Figure 10-48 Installing the side cover of the posts



----End

10.5.3 (Optical) Installing Electric Sliding Door

Context

The BOM number of electric sliding door is 21501718-001 or 21501712-001.

Preparations

Tools: Phillips screwdriver, flat-head screwdriver, step ladder, level

Materials: electrical sliding doors and accessories

Procedure

Step 1 Install an internal door frame.

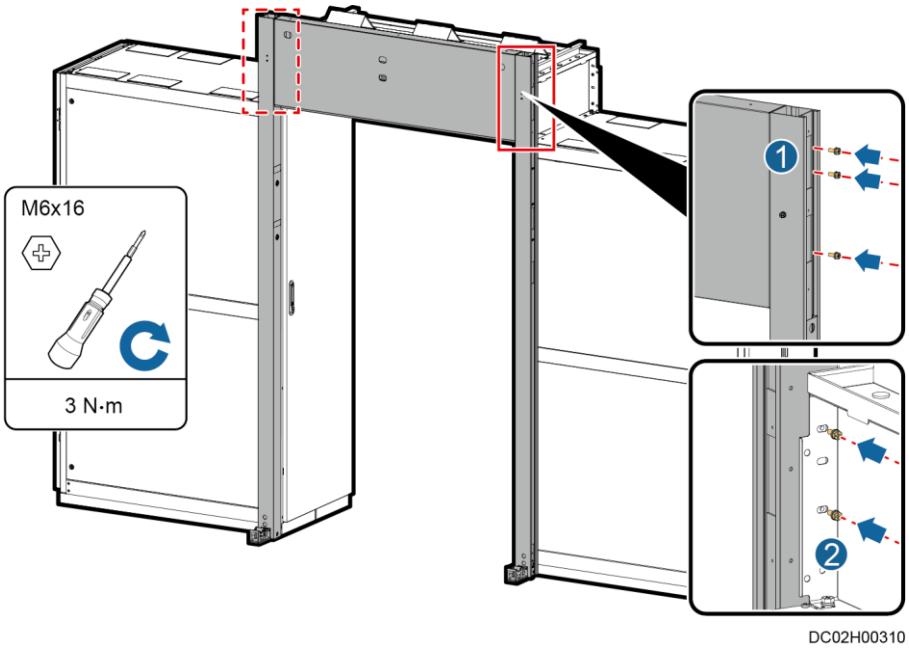
1. Secure the internal posts to the internal door head.

   NOTE

   After removing the maintenance panels from both sides of the posts, put the posts and door head horizontally on the floor and assemble them. After the assembly is complete, verify that the posts are flush with the door head.

2. Secure the posts to the skylight connective plate.

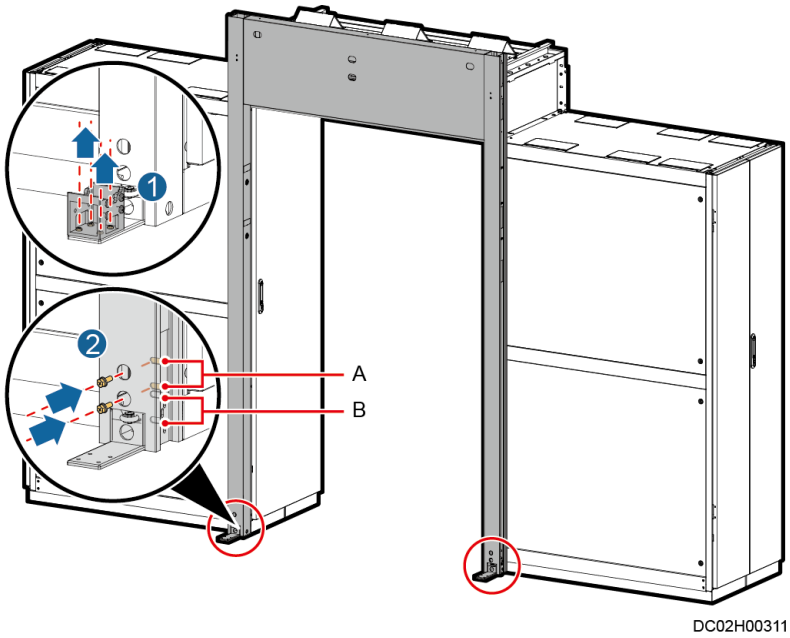
Figure 10-49 Installing an internal door frame



Step 2 Secure the bottom of the posts.

1. Remove the front wheel of the damper.
2. Secure the bottom of the posts to the cabinets.

Figure 10-50 Securing the bottom of the posts

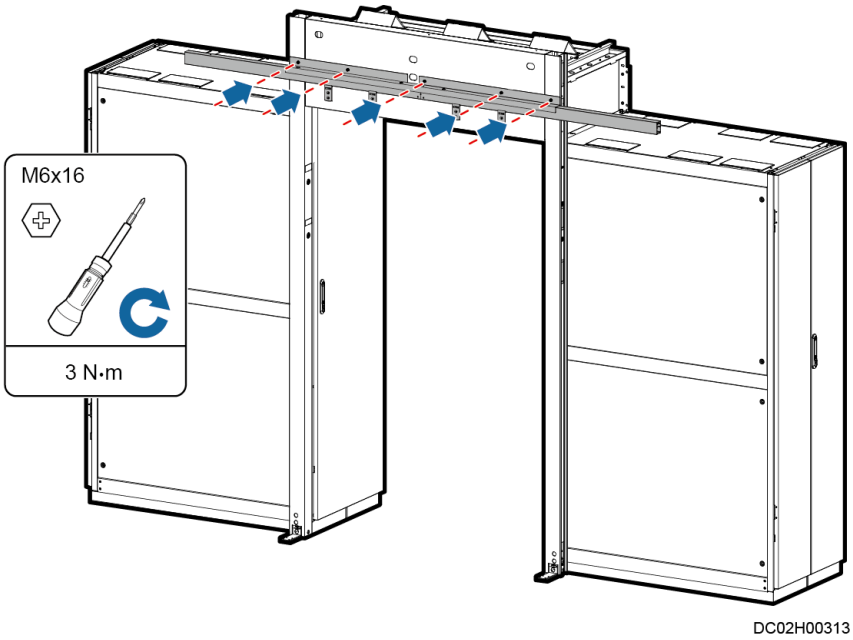


(A) Securing holes for cabinets with castors

(B) Securing holes for cabinets without castors

Step 3 Install a guide rail and secure it to the door frame.

Figure 10-51 Installing a guide rail

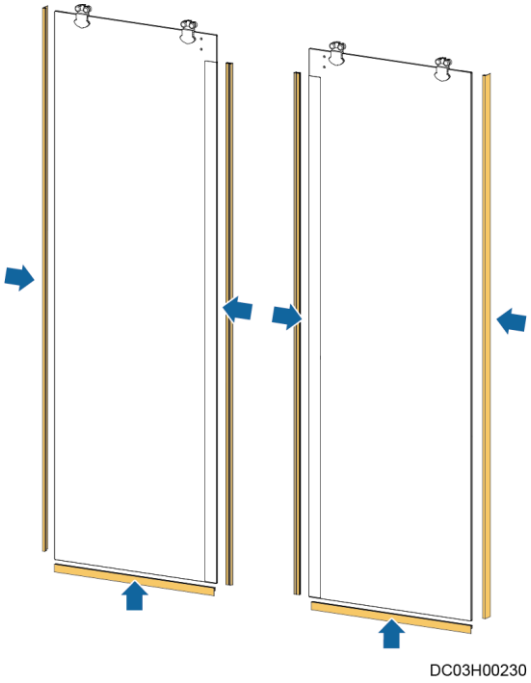


Step 4 Remove the protective rubber strips from the glass door and install door rubber strips.

NOTE

- Ensure that the door is in close contact with the rubber strips without gaps.
- Ensure that the inner and outer rubber strips are flush with the door and the rubber strip at the bottom is as wide as the door.

Figure 10-52 Installing door rubber strips



Step 5 Install a glass door.

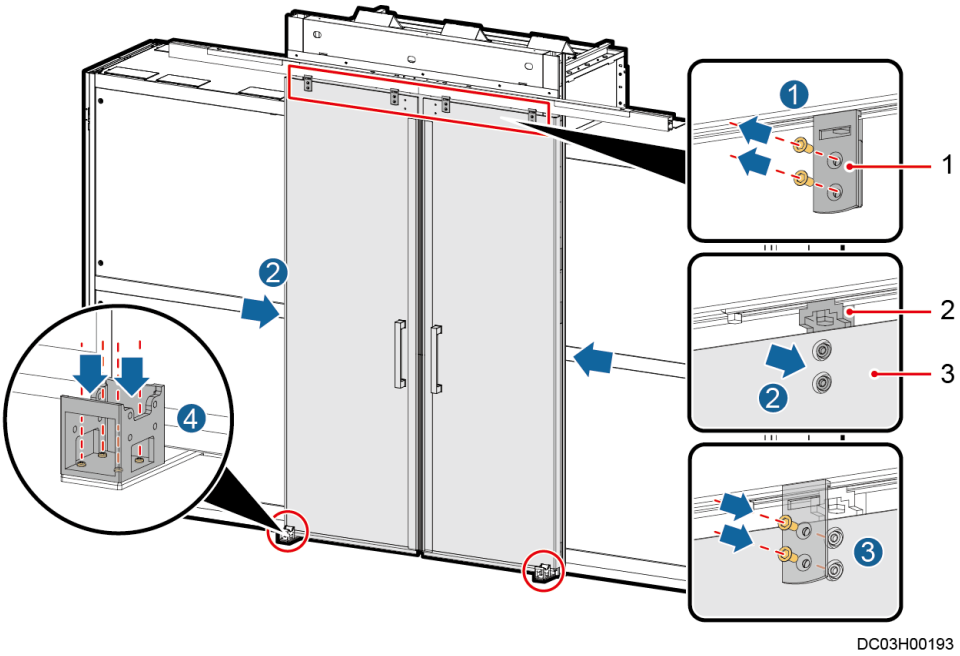
1. Remove the cover of the suspension clamp.
2. Push the glass door into the damper and mount it on the hole in the suspension clamp base.
3. Reinstall the cover of the suspension clamp.

NOTE

- Ensure that there is no gap between the glass doors and they are flush.
- Ensure that there is no friction between the glass doors and posts.

4. Reinstall the front wheel of the damper back.

Figure 10-53 Installing a glass door



(1) Suspension clamp cover (2) Suspension clamp base (3) Glass door

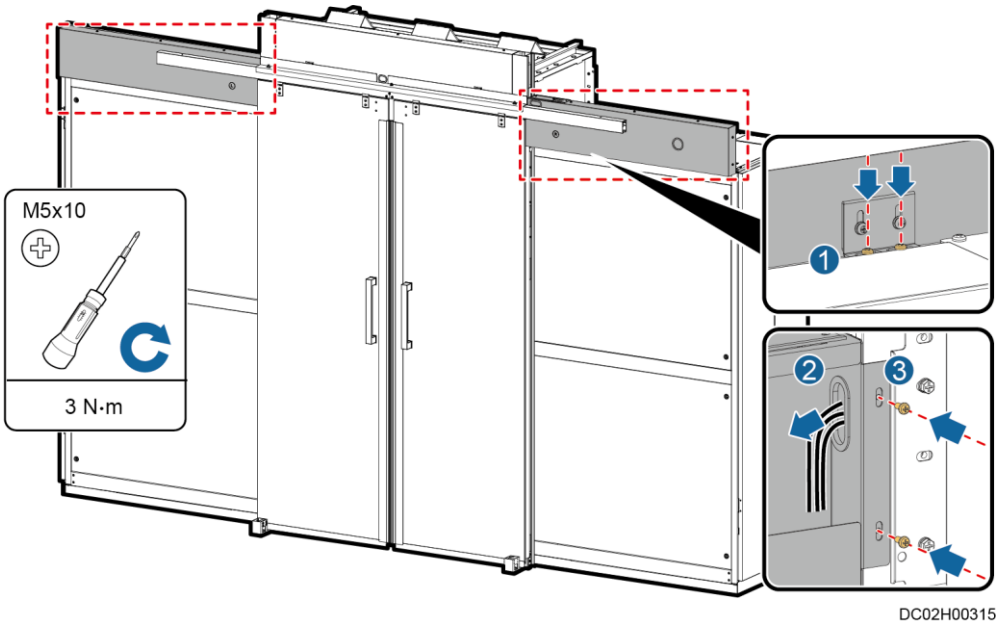
Step 6 Install door box hanging kits.

NOTE

For the 1100 mm cabinet scenario, you can use the separately delivered 1100 mm door box and abandon the 1200 mm door box packaged in the door materials.

1. Facing the aisle, secure the door box hanging kits labeled L and R to the top of the cabinet.
2. Pull out the cables that are preinstalled in the post.
3. Secure the door box hanging kits to the posts.

Figure 10-54 Installing door box hanging kits

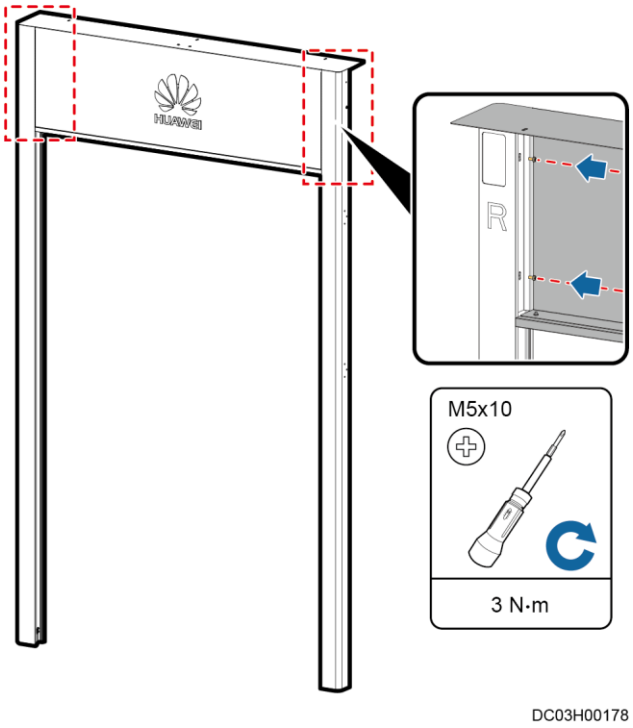


Step 7 Secure the external posts to the external door head.

NOTE

- Put the posts and door head horizontally on the floor and assemble them.
- After the assembly is complete, verify that the posts are flush with the door head.

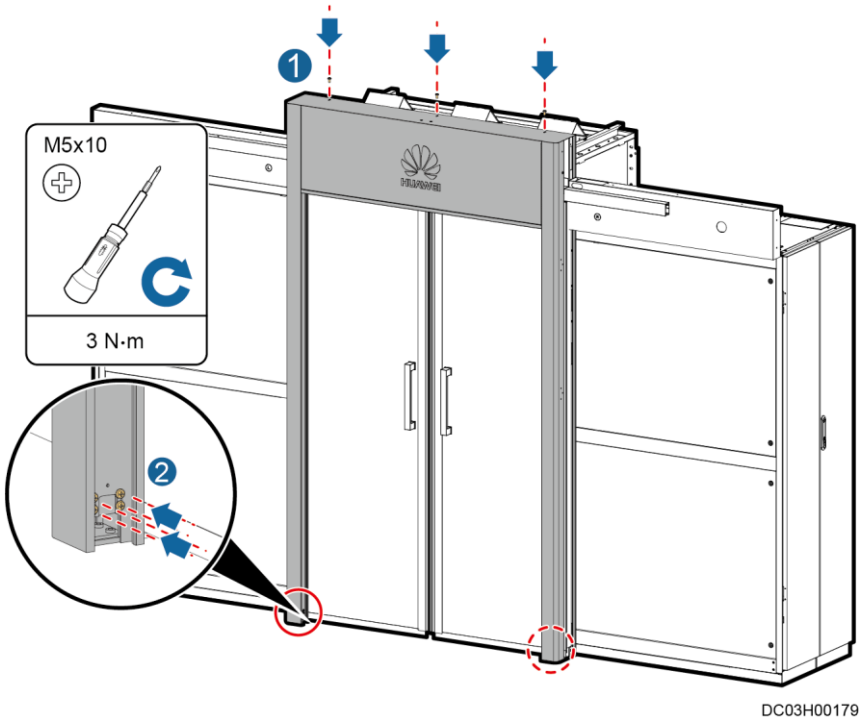
Figure 10-55 Securing the external door head to the external post



Step 8 Install an external door frame.

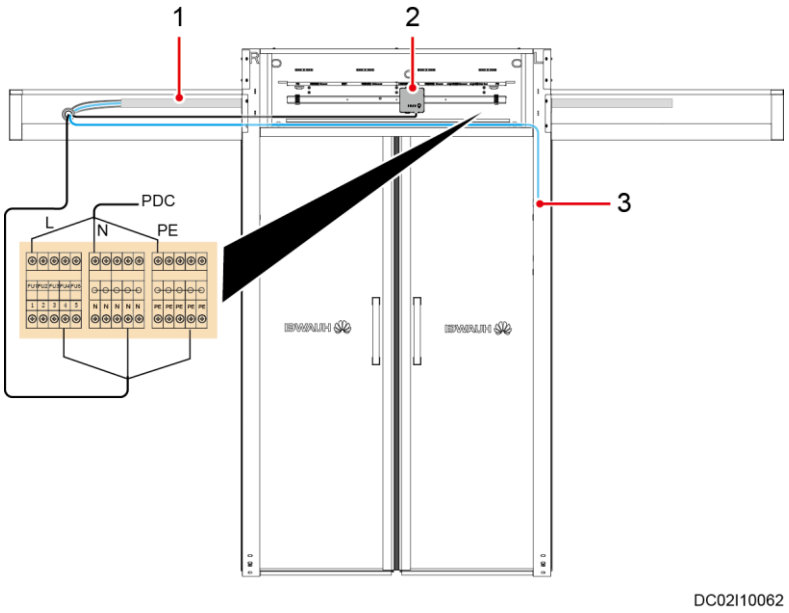
1. Lift the door frame, and secure it to the top of the internal door frame of the cabinet.
2. Tighten the screws at the bottom of the posts.

Figure 10-56 Installing an external door frame



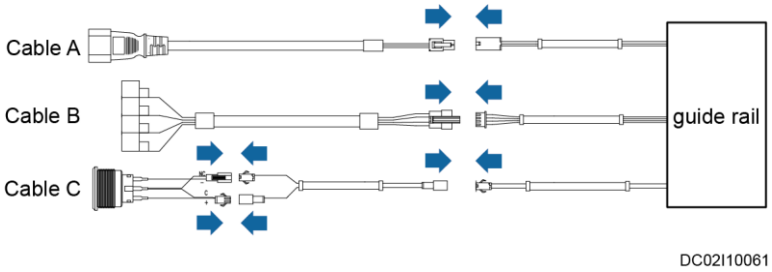
Step 9 Connect cables.

Figure 10-57 Connecting cables



(1) Guide rail (2) Access actuator (3) Emergency button

Figure 10-58 Connecting terminal cables



Step 10 Perform the power-on commissioning.

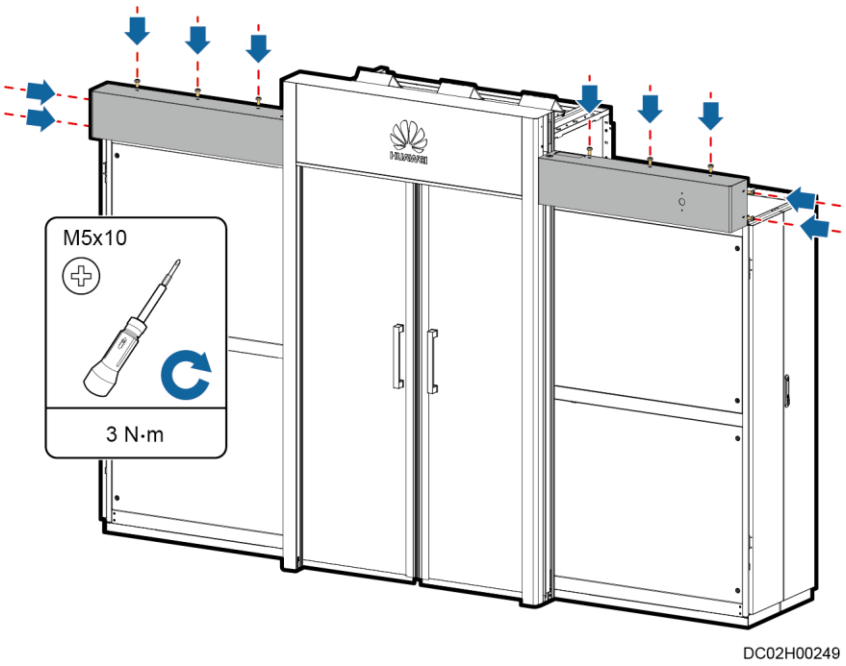
1. Power on the rPDU that supplies power to the electric sliding door.
2. The electric sliding door starts self-learning and runs. After the door is closed, the self-learning is complete.
3. Press the emergency button to manually open and then close the door.
4. Press the door open button to automatically open or close the door.

Step 11 Install door boxes.

NOTE

- Before installing the door boxes, check whether the eLight needs to be installed.
- If the eLight needs to be installed, you are advised to install the eLight first and then perform this step.

Figure 10-59 Installing door boxes



Step 12 (Optional) Install the pad mounting kit.

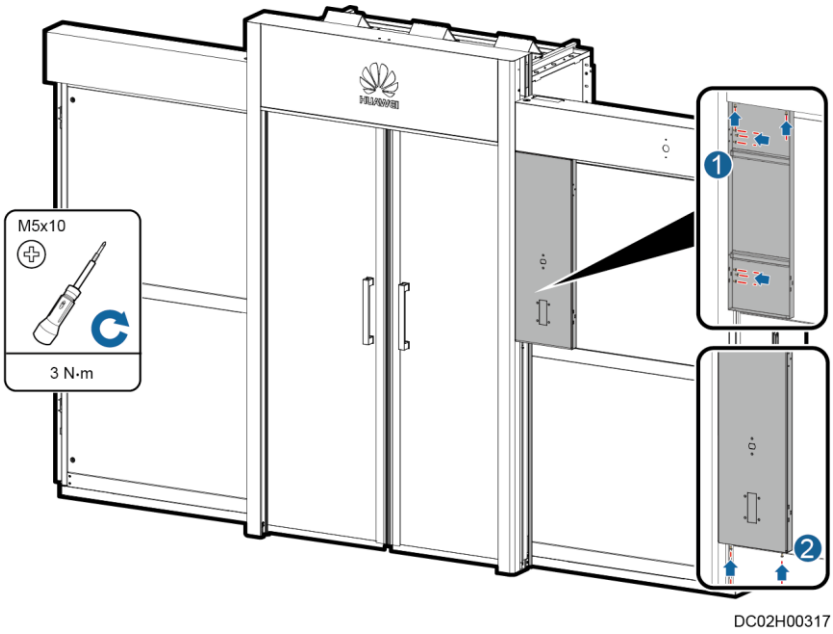
1. Install the bottom panel of the pad mounting kit.

NOTE

Route the cables of the pad and access control device, and close the cover of the pad mounting kit.

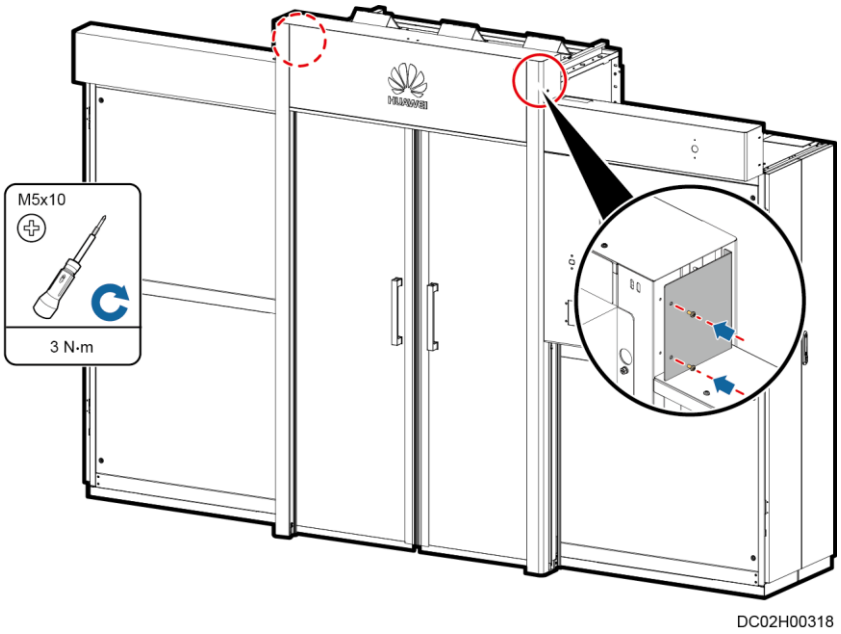
2. Install the cover of the pad mounting kit.

Figure 10-60 Installing the pad mounting kit



Step 13 Install the side cover of the posts.

Figure 10-61 Installing the side cover of the posts



----End

10.5.4 (Optical) Installing the eLight

Prerequisites

The sliding door, revolving door, or auto door has been installed.

Install the eLight in the door frame of the sliding door, revolving door, or auto door.

NOTE

The actual door appearance prevails. The figure is for reference only.

Preparations

Tools: Phillips screwdriver, step ladder

Materials: eLight and accessories

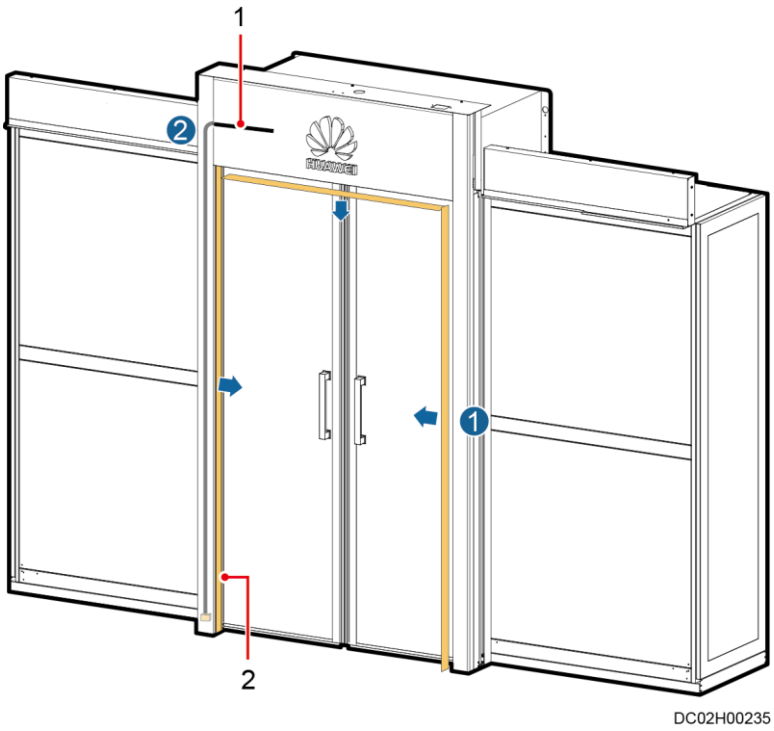
The BOM number of the eLight system is 52220928.

Procedure

Step 1 Place the strip light cable.

1. Remove three white rubber panels from the door frame.
2. Place the strip light extension cable from the top of the post.

Figure 10-62 Placing the strip light cable



(1) Strip light extension cable (2) Rubber panel

Step 2 Install the strip light and connect the cable.

1. Route the strip light from the bottom of the right post along the door frame to the bottom of the left post, and secure it using fasteners.

NOTE

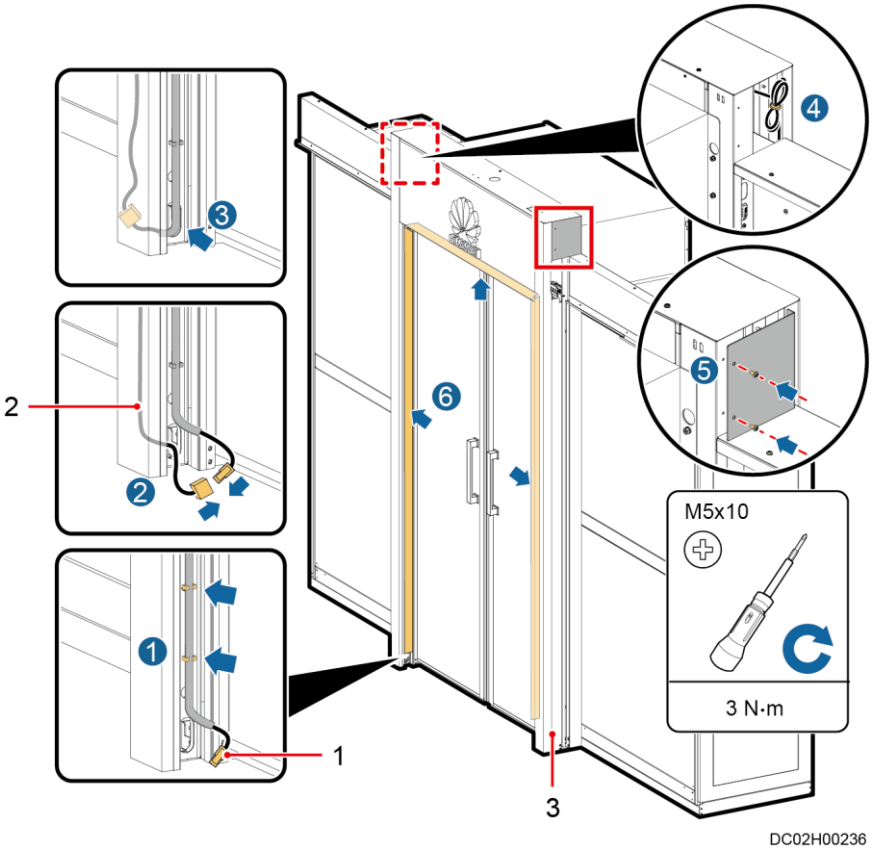
When securing the strip light to the top of the door frame, ensure that the strip light is smooth and does not protrude.

2. Connect the strip light extension cable of the door post to the strip light terminal.
3. Route the cable and redundant strip light that has been connected into the post.
4. Pull straight the strip light and its extension cable. Use a cable tie to bind the extension cable to the cable hole on the top of the post.
5. Secure the side covers for the posts.
6. Reinstall the three white rubber panels on the door frame.

NOTE

Ensure that there is no gap between the joints at both ends of the top rubber panel.

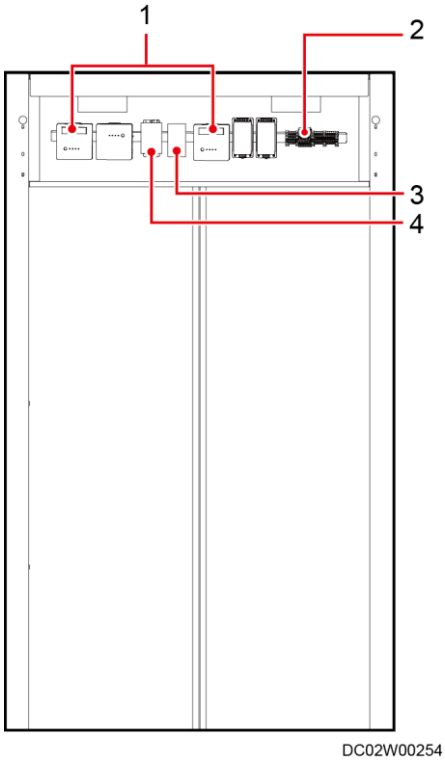
Figure 10-63 Installing the strip light and connecting the cable



(1) Strip light terminal (2) Strip light extension cable (3) Right post

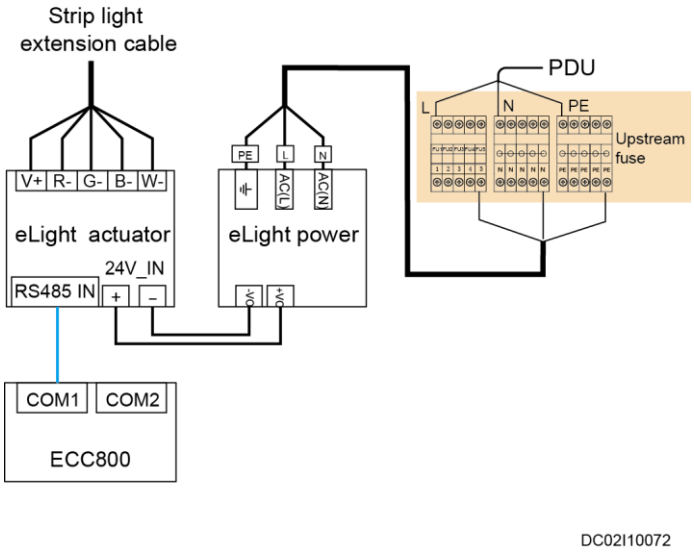
Step 3 Connect cables to the eLight system.

Figure 10-64 Positions of the eLight actuator and power supply (Inside the aisle)



(1) AC actuator
(2) Upstream fuse
(3) eLight actuator
(4) eLight power supply

Figure 10-65 Cable connection for the eLight system



NOTE

- Connect the eLight signal cables of two end doors to COM1 and COM2 on the ECC800-Pro respectively.
- Whether the PE cable to the power supply needs to be connected depends on the actual power port.

----End

10.6 (Optical) Installing Top Sealing Plates for the Smart Module

Context

Top sealing plates are used to decorate the smart module and installed on the top of the cabinets that are away from the aisle containment.

The top sealing plates can be 300 mm, 600 mm, and 800 mm wide. They are installed on the top of cabinets of the respective width.

Install appropriate top sealing plates based on the actual cabinet dimensions.

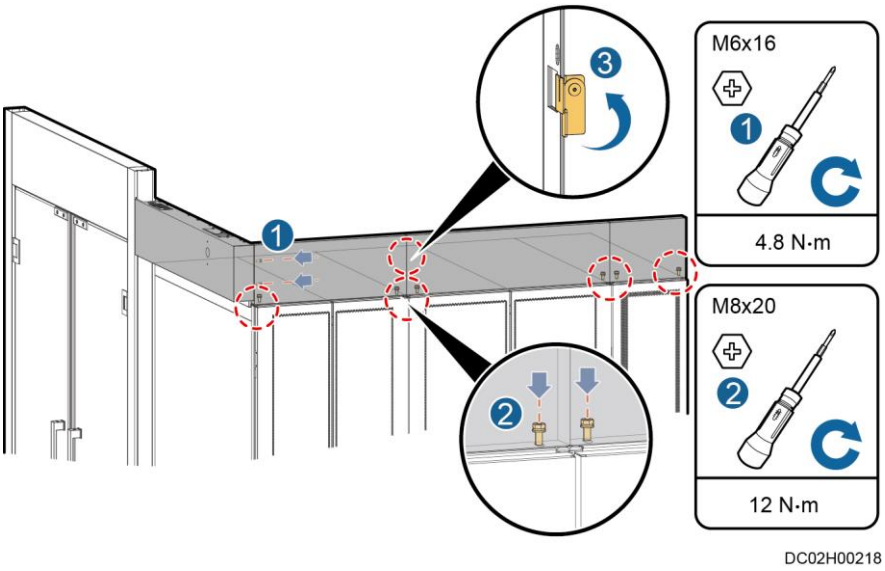
Procedure

Step 1 Secure the top sealing plates to the end door mechanical part.

Step 2 Install the top sealing plates on the cabinets.

Step 3 Rotate the locking latch to secure two top sealing plates.

Figure 10-66 Installing top sealing plates



Step 4 Install all the top sealing plates on the cabinets in sequence.

----End

10.7 Attaching Cabinet Labels

Prerequisites

Skylights and end doors are secured.

Context

Cabinet labels are useful for subsequent cable connections.

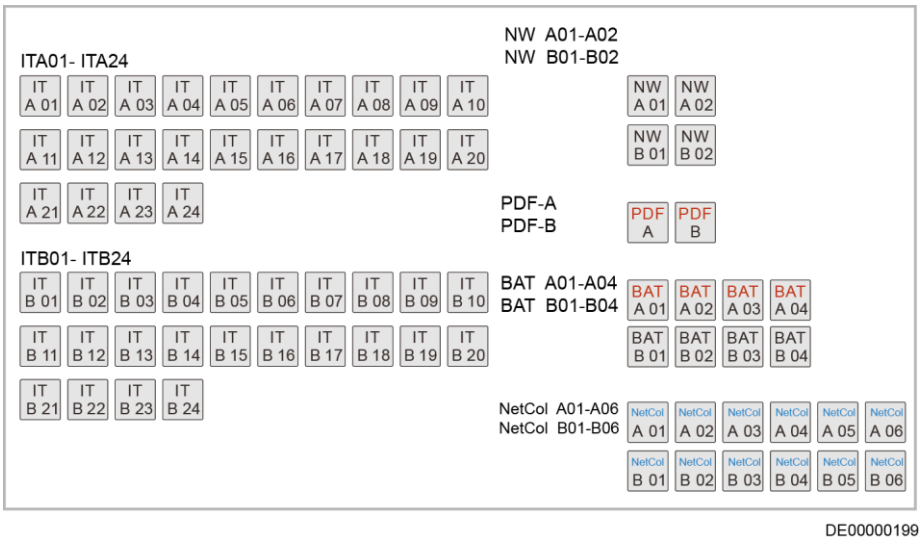
Preparations

Materials: labels

Procedure

Step 1 Take cabinet labels out of package 0.

Figure 10-67 Cabinet labels



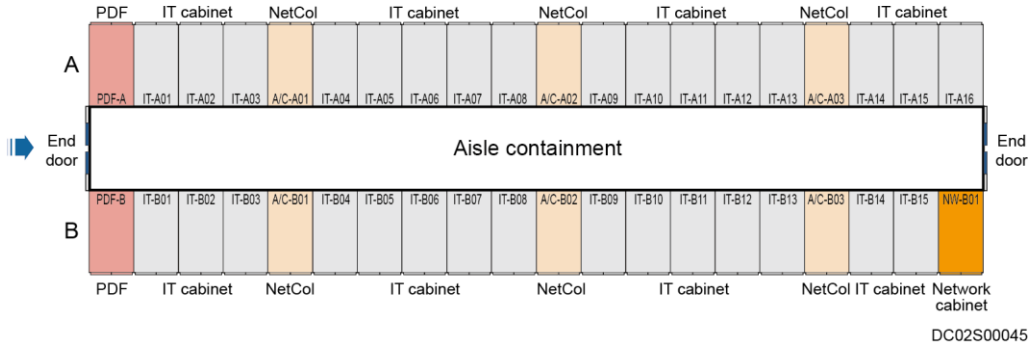
Cabinet naming rule in the smart module: cabinet type - row in which the cabinet is located - sequence number.

Table 10-4 Label naming rule

Category	Letter/Digit	Description
Cabinet type	IT	IT cabinet
	NW	Network cabinet
	PDF	Power distribution cabinet
	BAT	Battery cabinet

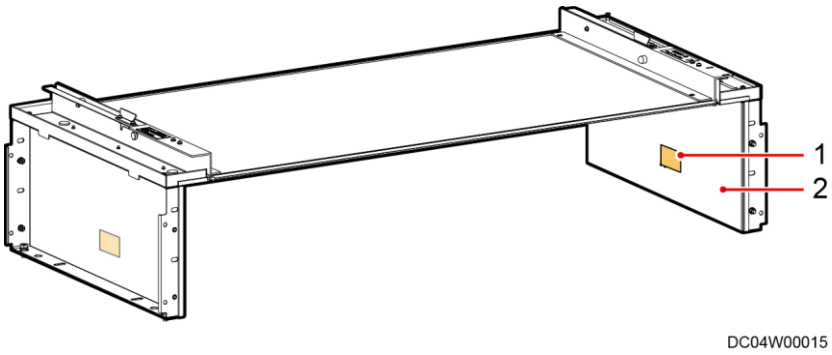
Category	Letter/Digit	Description
	NetCol	smart cooling product
Row in which the cabinet is located	A	Row A
	B	Row B
Sequence number	01–24	Sequence number of each type of cabinets

Figure 10-68 Label naming



Step 2 Attach a label to the imprinted position on the skylight connective plate.

Figure 10-69 Attaching cabinet labels

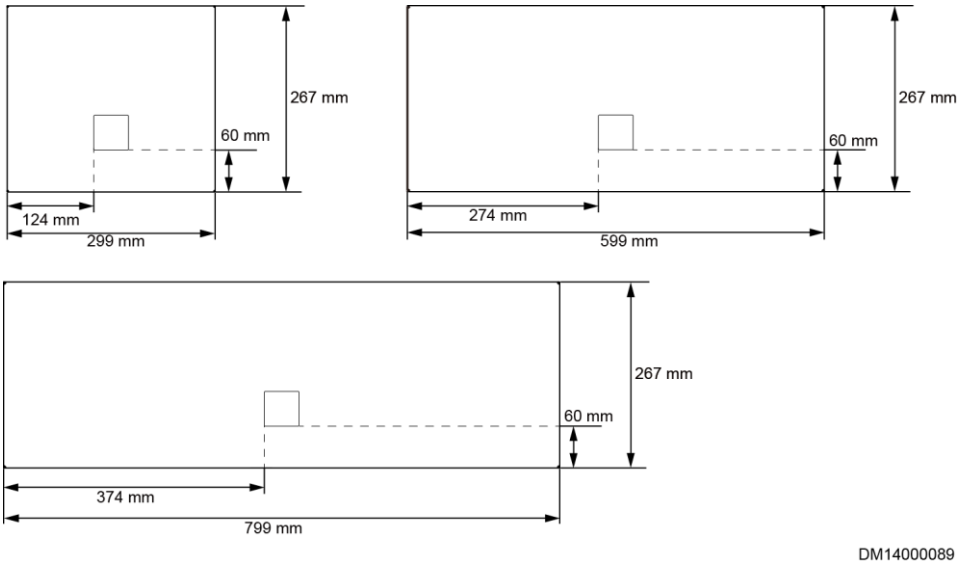


(1) Label attaching position imprint (2) Skylight connective plate

NOTE

- Ensure that labels are properly aligned.
- If there is no dented imprint on the skylight connective plate, attach a label at the accurate position shown in Figure 10-70.

Figure 10-70 Position for attaching a label



----End

11 Installing Cable Troughs and Cable Trays

11.1 Installing Cable Troughs

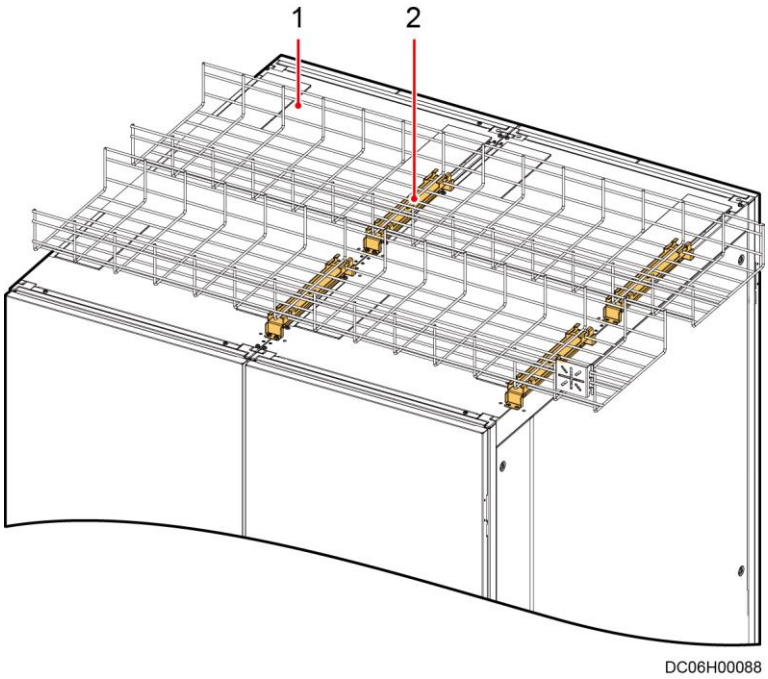
11.1.1 (Optional) Installing a New Main Way

For detailed operations, see the documentation delivered with the equipment or obtain the documentation by referring to the "Reference Documentation" section.

11.1.2 (Optical) Installing a Mesh Cable Trough

Prerequisites

Figure 11-1 Appearance of the Mesh Cable Trough



(1) Mesh cable trough (2) Supports

Context

The length of the mesh cable trough is 2000 mm. If the cabinet length is not an integer multiple of 2000 mm, cut the mesh cable trough to a proper length.

NOTE

- For example, if the aisle length is 4800 mm, install the mesh cable trough as follows: 2 x 2000 mm + 800 mm.
- The cut mesh cable trough has sharp corners and needs to be polished to avoid injury.

Preparations

Tools: socket wrench, Phillips screwdriver, hexagon spanner

Materials: mesh cable trough, support, and cable trough connecting kit

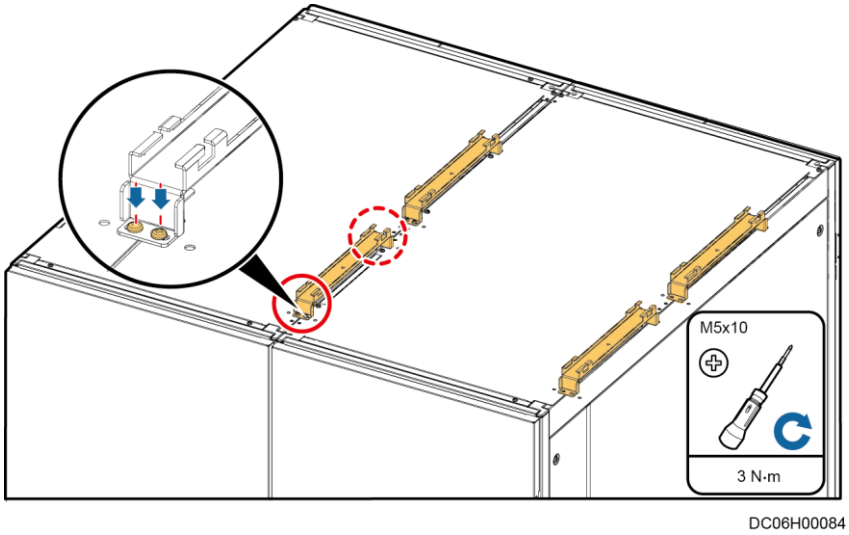
Procedure

Step 1 Secure the supports to the top of the cabinet using four M5x10 screws.

NOTICE

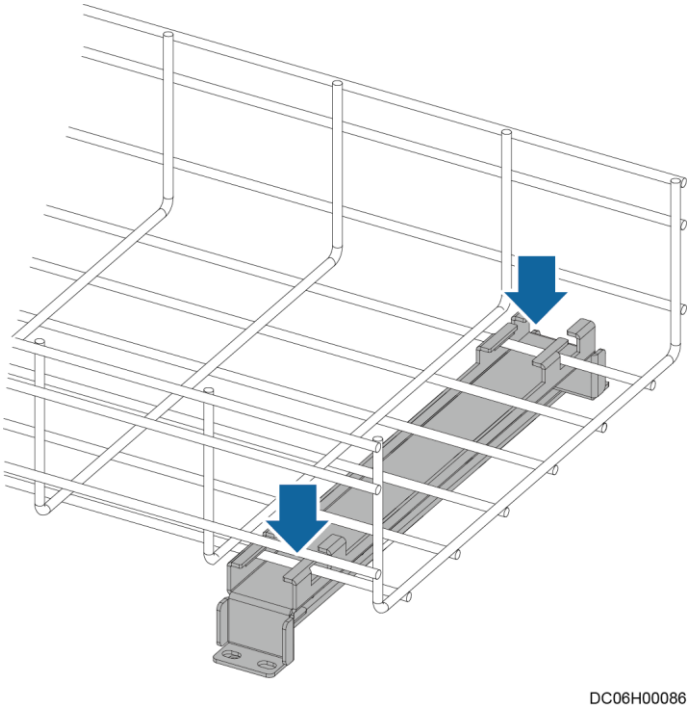
- The angles of the triangular holes on all supports must face the front door of the cabinet. Otherwise, the mesh cable trough cannot be installed.
- There are four holes on one side of the support. Use the middle two holes to install the support. Install the supports in the same row in the correct mounting holes on the cabinets. Do not install the supports in incorrect holes.
- The L-shaped slots are in the same direction.

Figure 11-2 Installing the supports (Cabinet front door view)



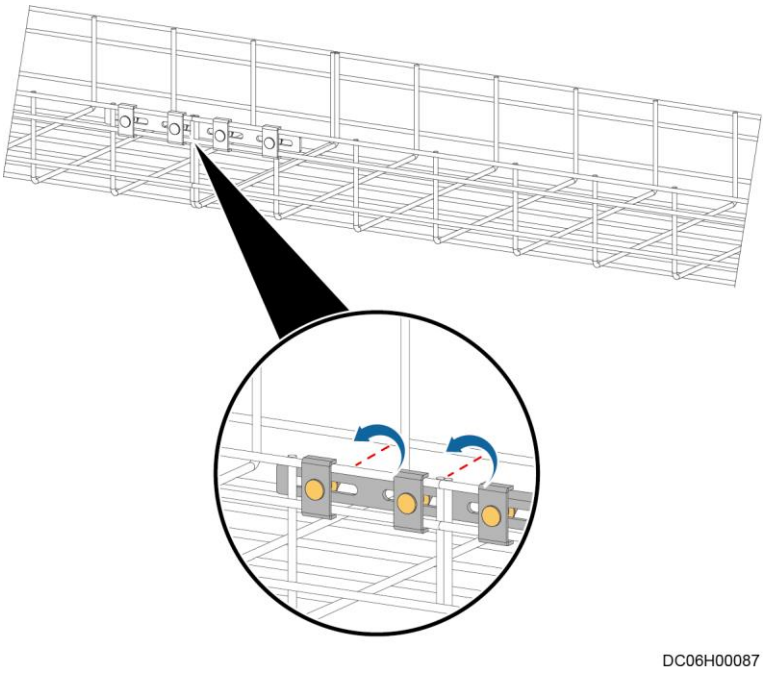
Step 2 Insert the mesh cable trough into the L-shaped slot of the support and adjust the position, and press the fastener to secure the mesh cable trough.

Figure 11-3 Installing the cable through



Step 3 Use connecting kits at the joint between the two mesh cable troughs, and secure the connecting kits using a hexagon spanner.

Figure 11-4 Connecting the connecting kits of the cable trough



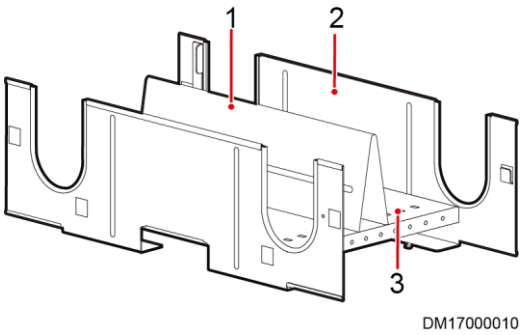
----End

11.1.3 (Optical) Installing Cable Troughs (600 mm or 800 mm Wide)

Context

- Install 600 mm wide cable troughs on the top of 600 mm wide cabinets. Install one strong-current cable trough and one weak-current cable trough on the top of every cabinet.
- Install 800 mm wide cable troughs on the top of 800 mm wide cabinets. Install one strong-current cable trough and one weak-current cable trough on the top of every cabinet.
- Install two cable troughs on the top of PDCs first, and then install cable troughs on the top of other cabinets along the aisle in sequence.
- Figure 11-5 shows a 600 mm wide cable trough. Its BOM number is 21501142.
- The BOM number of an 800 mm wide cable trough is 21501140.

Figure 11-5 Cable trough components

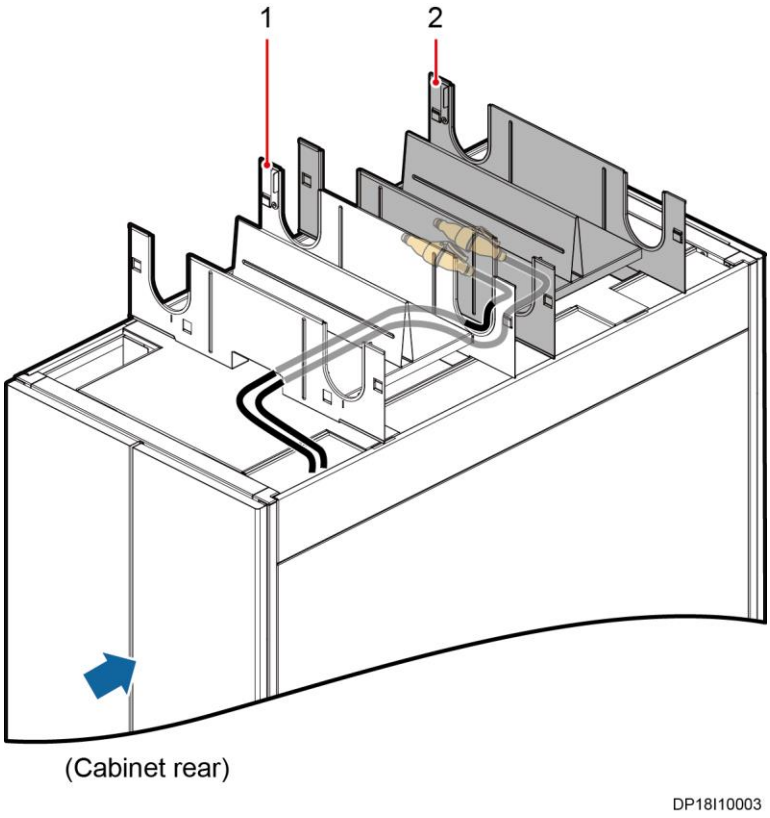


(1) Partition plate (2) Vertical plate (3) Tray

When installing cable troughs, be aware of rPDU cables and industrial connectors:

- Cold aisle scenario: Install cable troughs above the front door of a cabinet first. When installing cable troughs above the rear door, move the cables to the open area of the cable troughs. After installing cable troughs above the rear door, place the rPDU cables and industrial connectors inside the cable troughs above the front door. For details, see Figure 11-6.
- Hot aisle scenario: After cable troughs above the front and rear doors are installed, place the rPDU cables and industrial connectors in the cable trough above the rear door.
- After rPDU cables and industrial connectors are placed, bind the cables to the cable trough using cable ties.
- The strong-current cable trough must be close to the aisle containment.

Figure 11-6 rPDU cable routing on the top of a cabinet



(1) Weak-current cable trough (2) Strong-current cable trough

Preparations

Tool: Phillips screwdriver

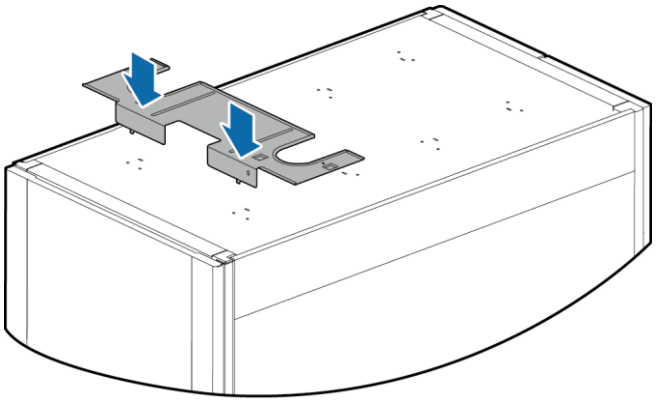
Materials: cable trough and accessories

Document: cable trough installation position diagram

Procedure

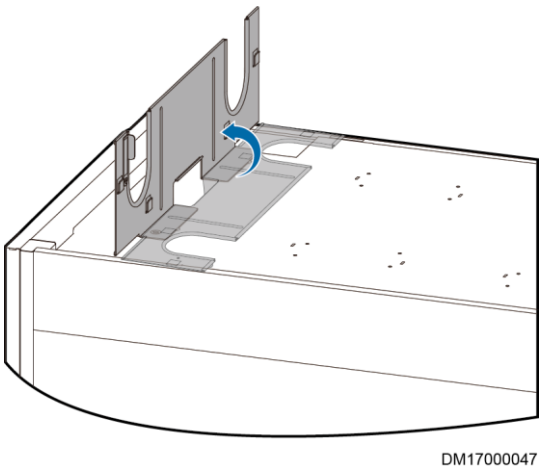
Step 1 Keep a vertical plate of the cable trough flush with the top surface of the cabinet and clamp the clasps into the mounting holes in the first row counting from the front door to the rear door.

Figure 11-7 Clamping a vertical plate



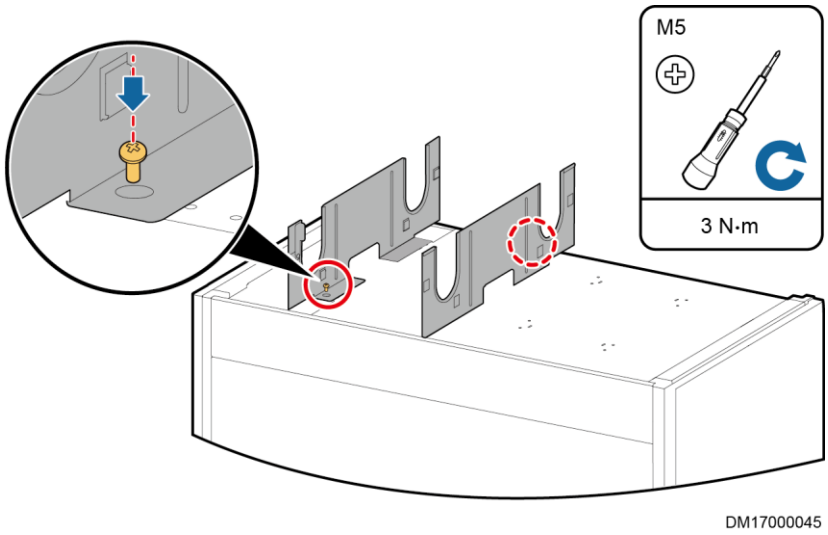
Step 2 Rotate the vertical plate by 90 degrees to stand it on the top plate of the cabinet.

Figure 11-8 Rotating the vertical plate by 90 degrees



Step 3 Install the other vertical plate into the mounting hole in the second row counting from the front door to the rear door in the same way. Install one M5x10 tapping screw inside either of the two vertical plates to ensure equipotential bonding with the cabinet.

Figure 11-9 Installing the other vertical plate

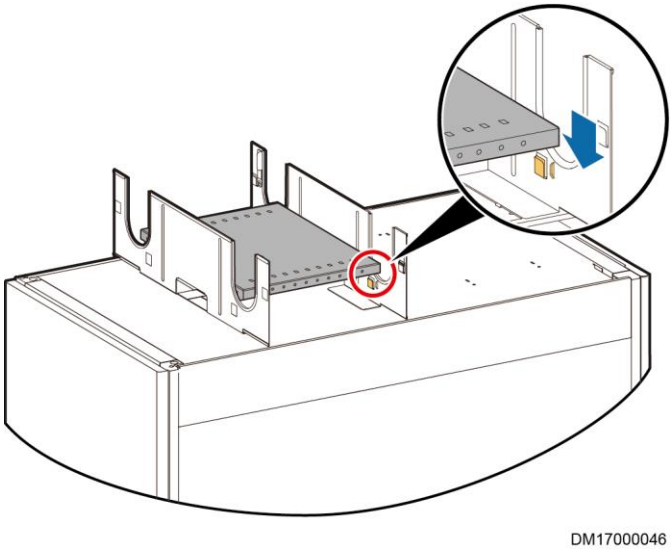


Step 4 Press a tray along the two vertical plates down to the place between the four clasps and the cable bridge. Ensure that the tray is fully into the clasps.

NOTE

When installing the tray, do not remove the grommet strip on the U-shaped trough.

Figure 11-10 Installing a tray

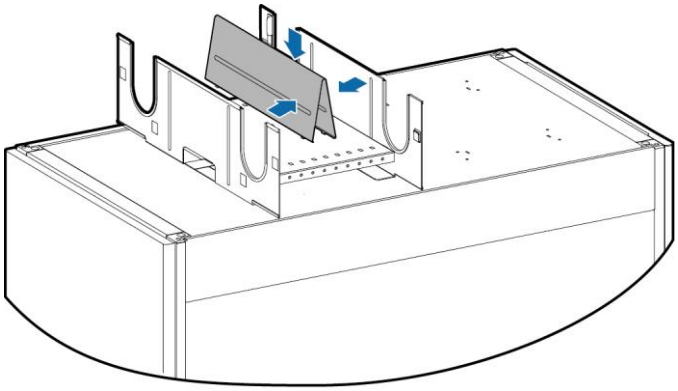


Step 5 Install a partition plate. Press both sides of the V-shaped partition plate with both hands to decrease the angle to a proper degree, and clamp the clasps at the bottom into the nearby holes.

NOTE

By default, clamp the clasps into the two holes in the middle. In actual conditions, you can select holes as required.

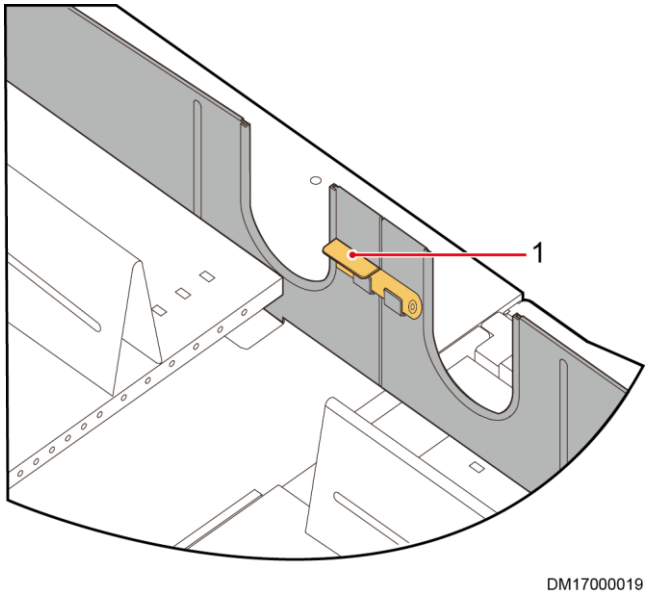
Figure 11-11 Installing a partition plate



Step 6 Install adjacent cable troughs in the same way.

Step 7 Rotate the interconnecting lever and clamp it into the clasps until the lever is horizontal. This operation interconnects the cable troughs.

Figure 11-12 Installing an interconnecting lever



(1) Interconnecting lever

Step 8 Install the cable trough above the rear door in a similar way.

----End

11.1.4 (Optical) Installing Cable Troughs (300 mm Wide)

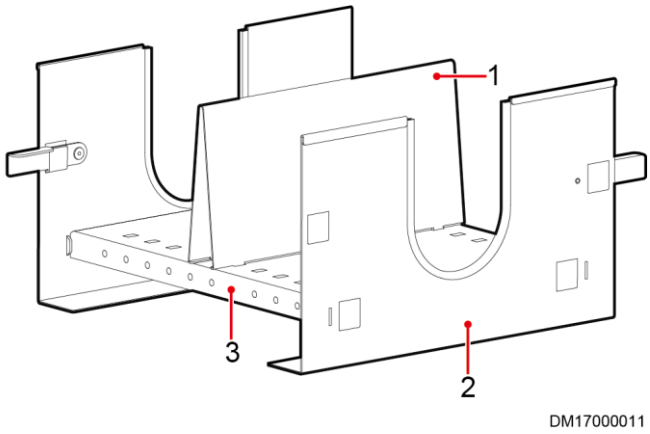
Prerequisites

The 600 mm wide cable troughs have been installed.

Context

Install a 300 mm wide cable trough at the top of a 300 mm wide cabinet. The BOM number of the cable trough is 21501141.

Figure 11-13 300 mm wide cable trough



(1) Partition plate (2) Vertical plate (3) Tray

Preparations

Tool: Phillips screwdriver

Materials: cable trough and accessories

Document: cable trough installation position diagram

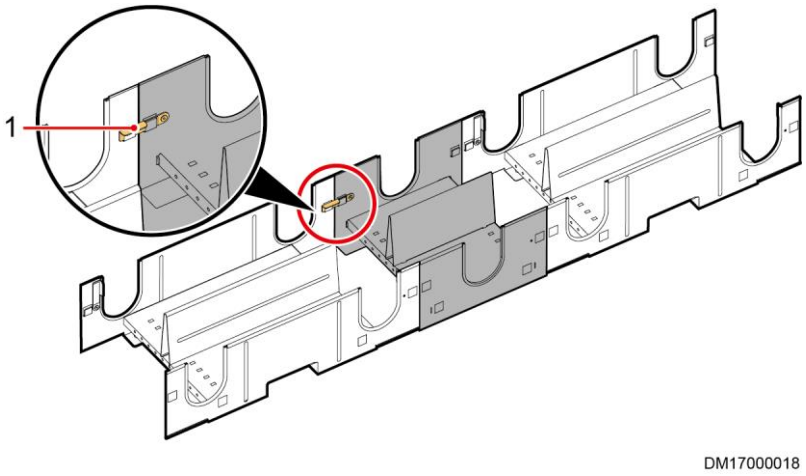
Procedure

Step 1 Place two vertical plates upright on the top of the 300 mm wide cabinet, and press a tray along the two vertical plates down to the clasps at the bottom.

Step 2 Press both sides of the V-shaped partition plate with hands to decrease the angle to a proper degree, and clamp the clasps at the bottom into the square holes nearby.

Step 3 Align the assembled cable trough with the adjacent 600 mm wide cable troughs, and rotate the interconnecting lever to connect the troughs in parallel.

Figure 11-14 Connecting a 300 mm wide cable trough to a 600 mm wide cable trough



(1) Interconnecting lever

----End

11.1.5 Installing End Panels for Cable Troughs

Context

- Typically, end panels are installed only on cable troughs of cabinets at the two ends of an aisle.
- A red end panel indicates that the corresponding cable trough is for power cables, and a blue end panel for signal cables.
- Generally, the power cable trough is located close to the aisle containment, and the signal cable trough is located far away from the aisle containment.

NOTE

Obtain the cable trough end panels from the end door materials.

Preparations

Material: cable trough end panel

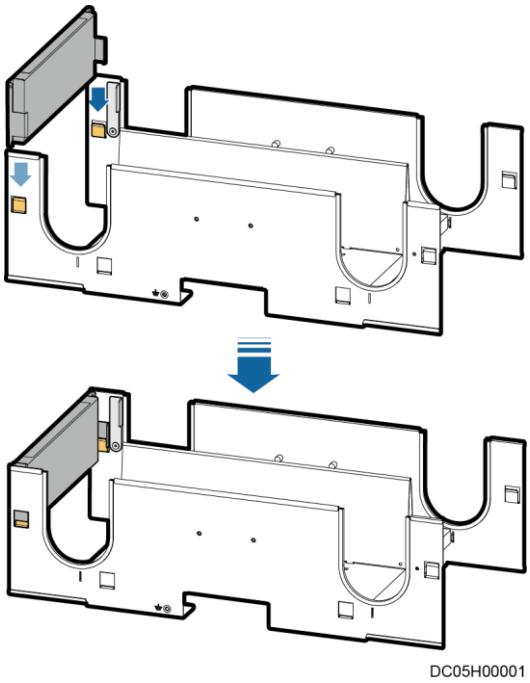
Procedure

Step 1 Hold the top of the end panel with both hands to keep it vertical. Press it from up to down into the hooks at the end of the cable troughs until the top of the end panel aligns with the top of the cable trough.

NOTE

During installation, the interconnecting lever is vertical.

Figure 11-15 Pressing an end panel into the hooks



----End

11.2 Installing Cable Trays

11.2.1 (Optional) Installing Cable Trays (Dual-Row Aisle Containment)

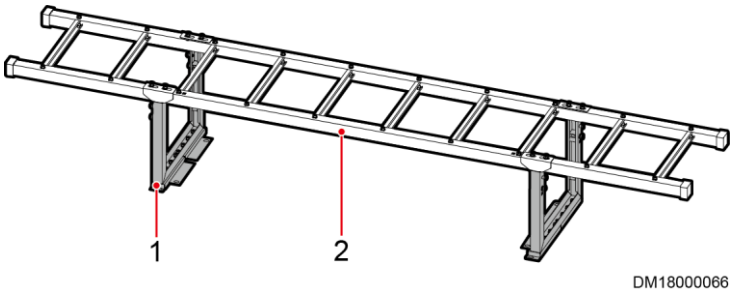
Prerequisites

The skylights have been installed.

Context

If cable trays are required, install them on the top of end cabinets.

Figure 11-16 Cable tray components



(1) Cable ladder support (2) Cable ladder

Preparations

Tools: socket wrench, Phillips screwdriver

Materials: cable ladder support, cable ladder, cable ladder ground cable

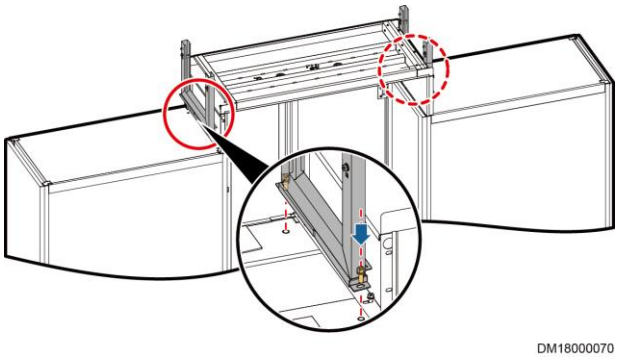
Procedure

Step 1 Use four M6x16 screws to secure the cable ladder supports to the top of cabinets.

NOTICE

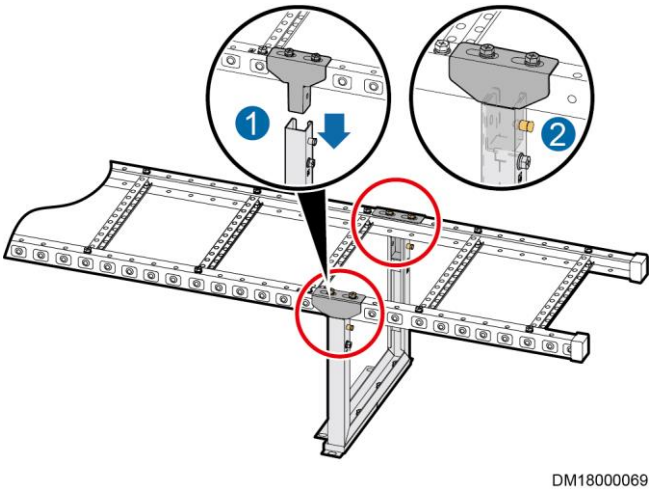
Ensure that the side with ground screws faces outside.

Figure 11-17 Installing cable ladder supports



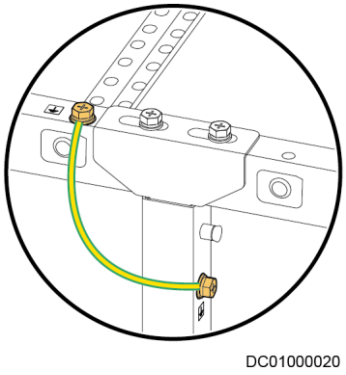
Step 2 Insert the cable ladder into the cable ladder supports and adjust the position until the spring holders are snapped into the holes in the T-shaped bracket.

Figure 11-18 Installing a cable ladder



Step 3 Use a ground cable to connect the ground screws on the cable ladder and its supports.

Figure 11-19 Installing a cable tray ground cable



----End

11.2.2 Installing Cable Trays (in Scenarios with a Column)

Prerequisites

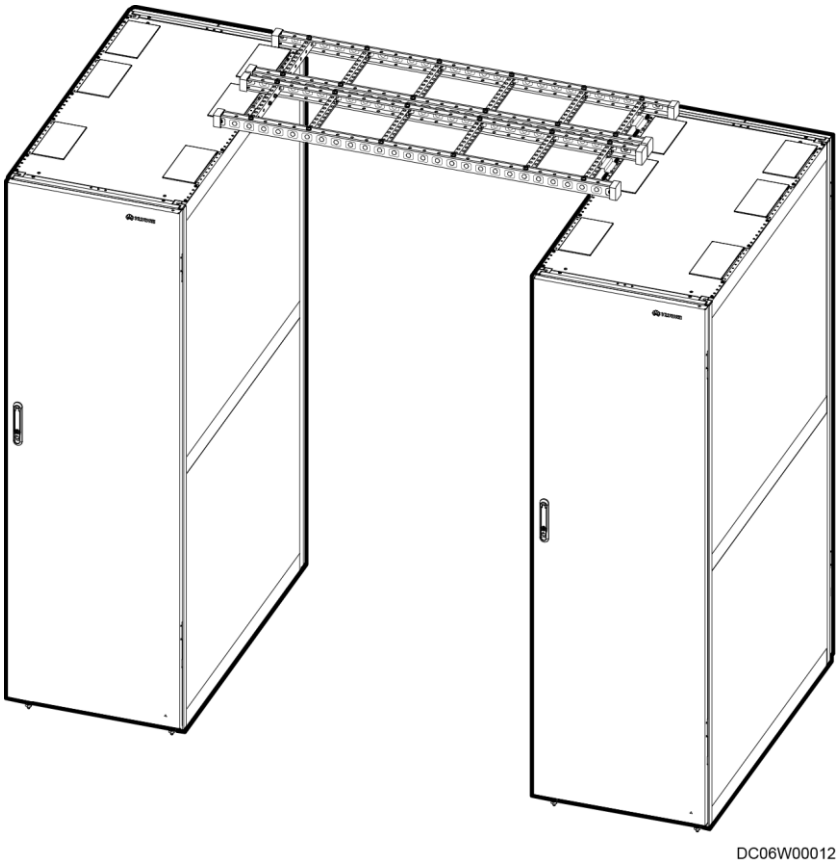
Determine the position and mode (combined or layered) for installing cable trays based on the actual installation environment.

Context

Cable trays can be installed in two modes:

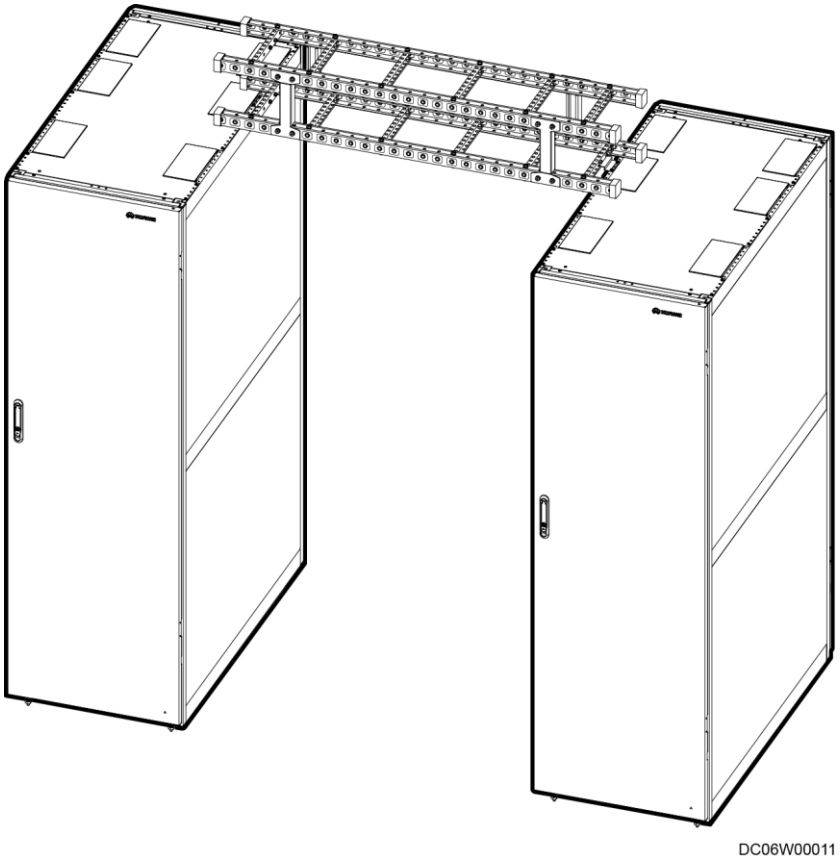
- Combined installation

Figure 11-20 Combined installation



- Layered installation

Figure 11-21 Layered installation



Layered installation is used as an example to illustrate the installation method.

Preparations

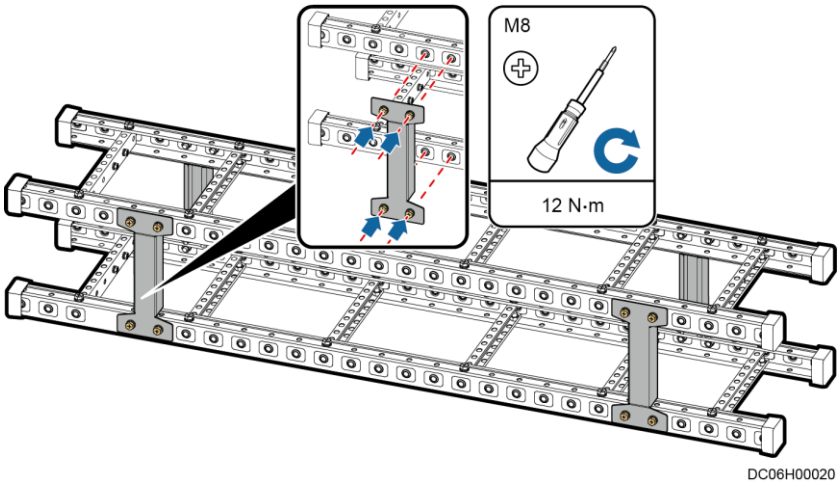
Tool: Phillips screwdriver

Materials: cable tray, cable tray supports

Procedure

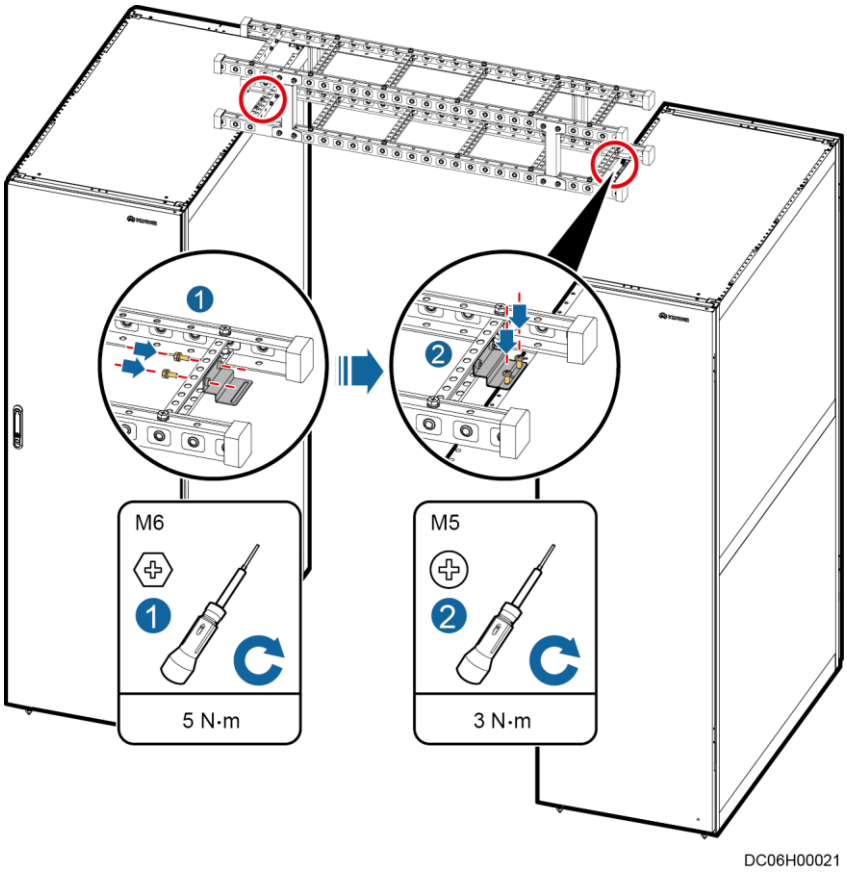
Step 1 Screw the cable tray supports at the coated positions on the cable trays.

Figure 11-22 Assembling a cable tray



Step 2 Secure cable trays to cabinets.

Figure 11-23 Securing cable trays



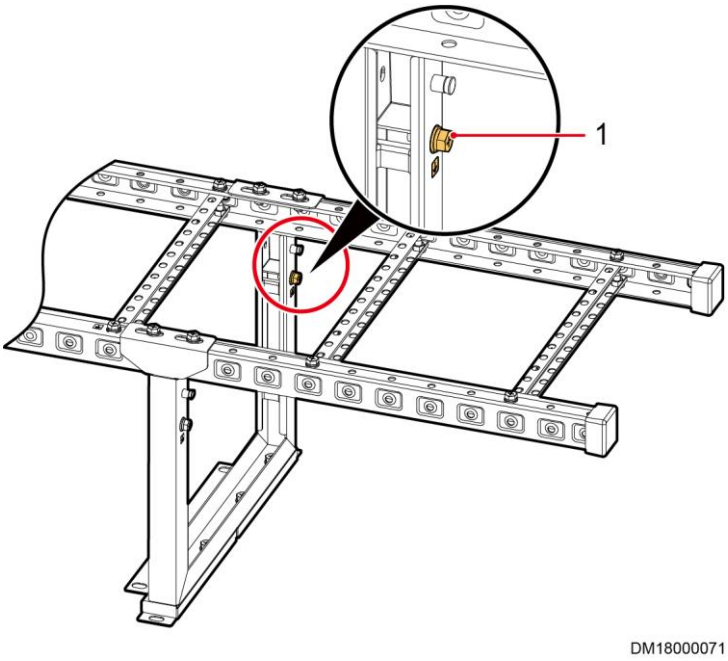
----End

11.2.3 (Optional) Installing Indoor Cable Trays

For details, obtain the required document according to the section "Documentation Preparations."

11.2.4 (Optional) Grounding Cable Trays

Figure 11-24 Cable tray ground points



(1) Ground point

Connect one end of the cable tray ground cable to either of the idle ground points on the cable tray, and secure the other end to the top of the cabinet using M5x10 tapping screws.

12 (Optional) Installing Aisle Lights

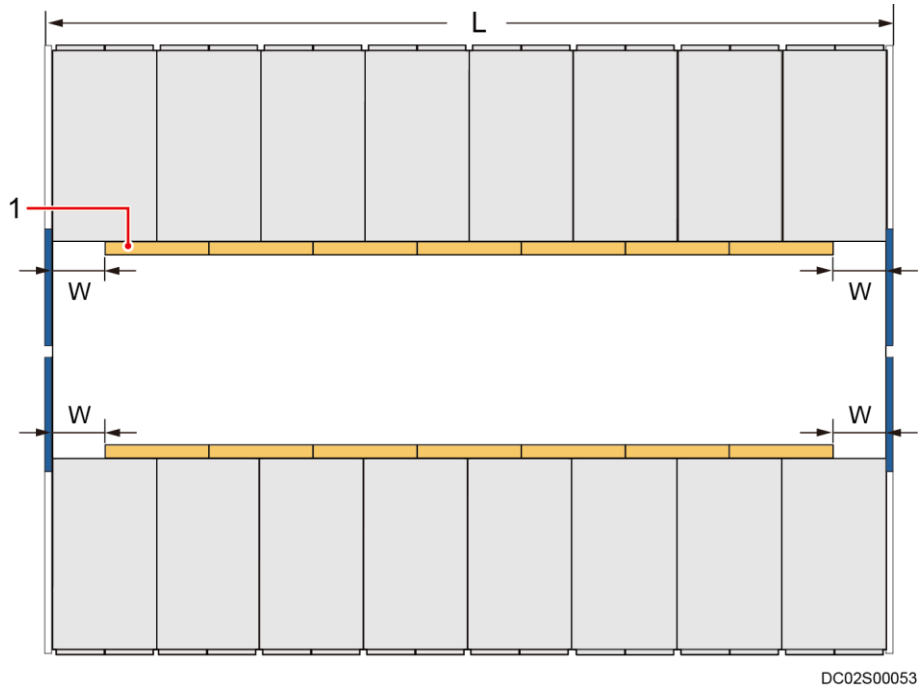
Prerequisites

- A light tube is 600 mm long.
- Number of light tubes in a row N (rounded down) = Aisle length L/Light tube length
- If the light tubes cannot cover the entire length of the aisle, reserve the same installation distance (W) at both ends of the aisle: W = (L – 600 x N)/2.

NOTE

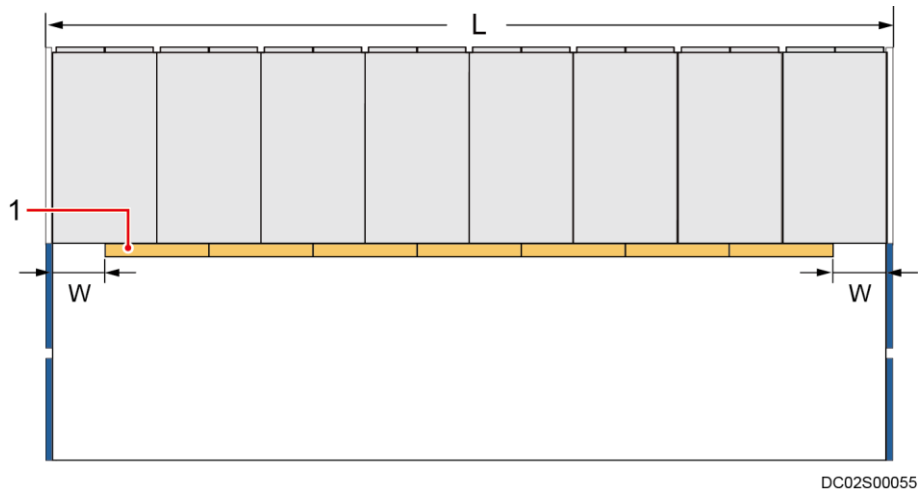
For example: If the aisle length is 4800 mm and there are 7 light tubes in a row, the reserved installation distance at both ends of the aisle should be 300 mm.

Figure 12-1 Aisle light layout (dual-row scenario)



(1) Light tube

Figure 12-2 Aisle light layout (single-row scenario)



(1) Light tube

NOTE

- A maximum of 13 aisle lights can be connected in series. If the number exceeds 13, they should be installed in different groups.
- Redundant light tubes are delivered.
- Grouping rule: Divide into equal groups if possible and ensure that the light cables are routed out of the nearby cable holes in skylight plates.

Context

- Install aisle lights in parallel. Connect the first and last light tubes on aisle sides in series. Install the light tubes on the skylight plates. The BOM number of aisle lights is 52220980.
- A light tube has male and female connectors at both ends for interconnection. When installing lights, ensure that all the male connectors face the same direction (also the female connectors) for serial connection of light tubes.
- Lights are installed in the same way in both single-row and dual-row aisle containments. This section describes how to install lights in a dual-row aisle containment.

Preparations

Tools: Phillips screwdriver, crimping tool, wire stripper, diagonal pliers

Materials: light tube, light holder, multi-cord end terminal

Document: aisle light installation position diagram

Procedure

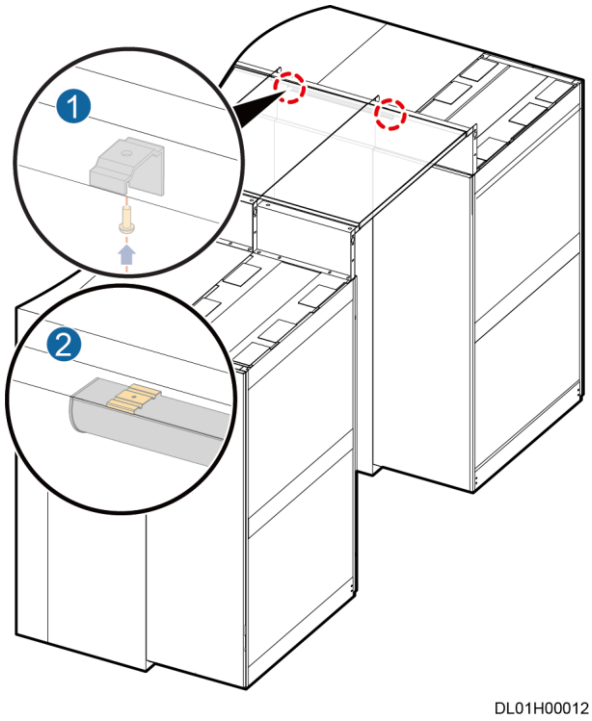
Step 1 Install lights.

1. Secure light holders to the skylight connective plates using M3 screws.
2. Secure light tubes to the light holders.

NOTE

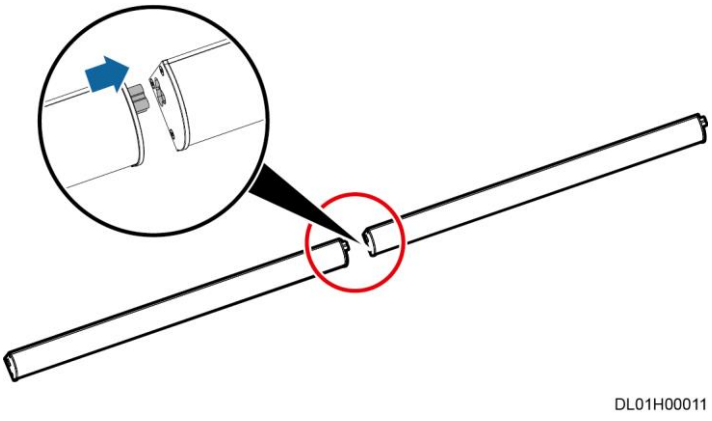
Ensure that each light tube is secured by two holders.

Figure 12-3 Installing a light tube



Step 2 Install other lights in sequence and connect the lights in series.

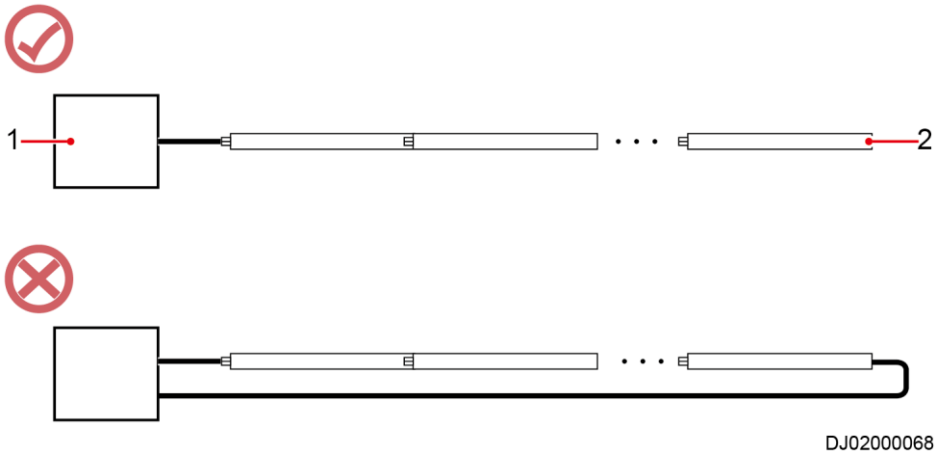
Figure 12-4 Connecting lights in series



NOTICE

- Interconnect the male and female connectors of lights in the same group.
- For lights in the same group, only the light in either end needs to be connected to the power supply.

Figure 12-5 Cable connections to lights in the same group



(1) AC actuator (2) Light

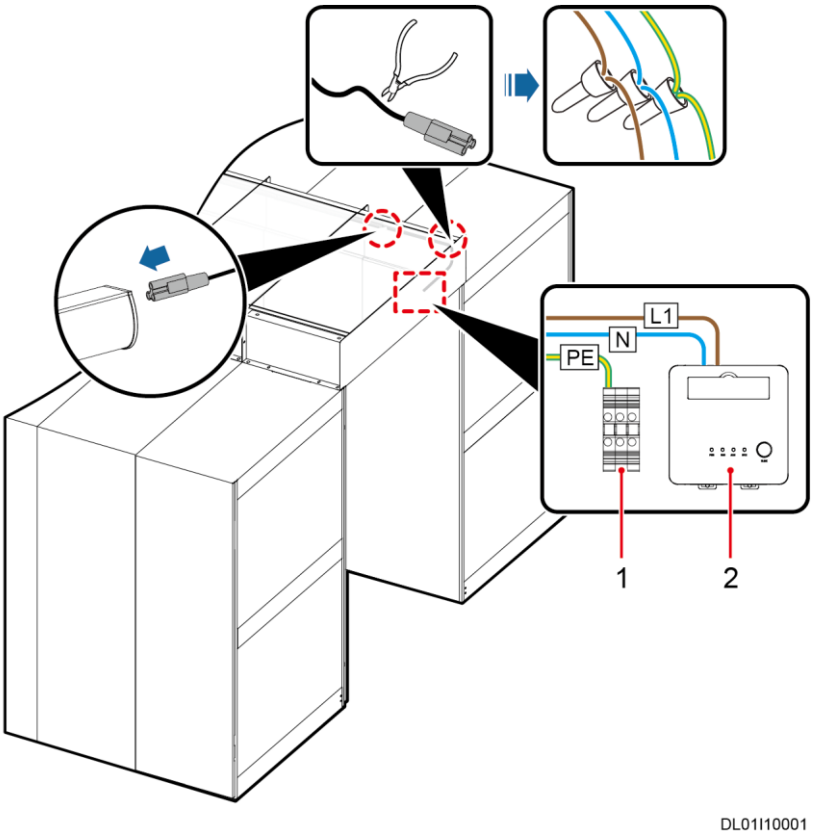
Step 3 Connect one end of the cable delivered with the light tube to the light, cut off the plug at the other end, strip the insulation layer for the cut end, and route the cable out of the aisle containment.

Step 4 Secure the stripped cable to the cable distributed to the site using a multi-cord end terminal, and route it to the AC actuator and PE terminal through the cable trough.

NOTICE

When connecting the cables, mark the L (brown), N (blue), and PE (yellow-and-green) wires to ensure correct connection.

Figure 12-6 Connecting cables to lights (using one route of light tubes as an example)



(1) PE terminal (2) AC actuator

NOTE

- Every route of light tubes needs to be connected to a PE terminal, which should be close to the corresponding AC actuator.
- For details about cable connections in different scenarios, see *Smart Modular Data Center Management System Wiring Diagram*.

----End

13 (Optical) Installing an Atmosphere Light

Prerequisites

The atmosphere light is installed at the bottom of the cabinet in the aisle.

The length of a single atmosphere light is 15,000 mm.

Context

- Install atmosphere lights in parallel. The BOM number of atmosphere lights is 52221117.
- Install lights in the same way in both single-row and dual-row aisle containments. This section describes how to install lights in a dual-row aisle containment.

NOTE

- If the aisle length ≤ 7,500 mm, only one atmosphere indicator and one atmosphere light power supply is required.
- If the aisle length is > 7,500 mm, two atmosphere lights need to be cut to a proper length and two atmosphere light power supplies are required.
- After cutting an atmosphere light, remove the protective caps at the ends of the light and install them onto the position where the light is cut. This is to prevent electrical leakage.

Figure 13-1 Cable connection for the atmosphere light system 1

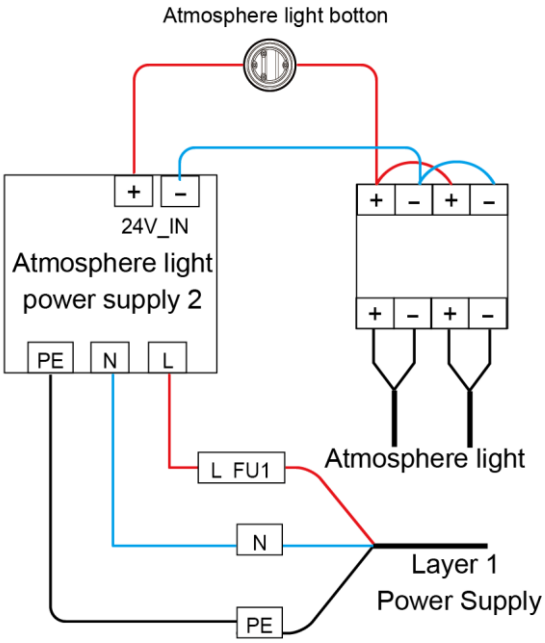
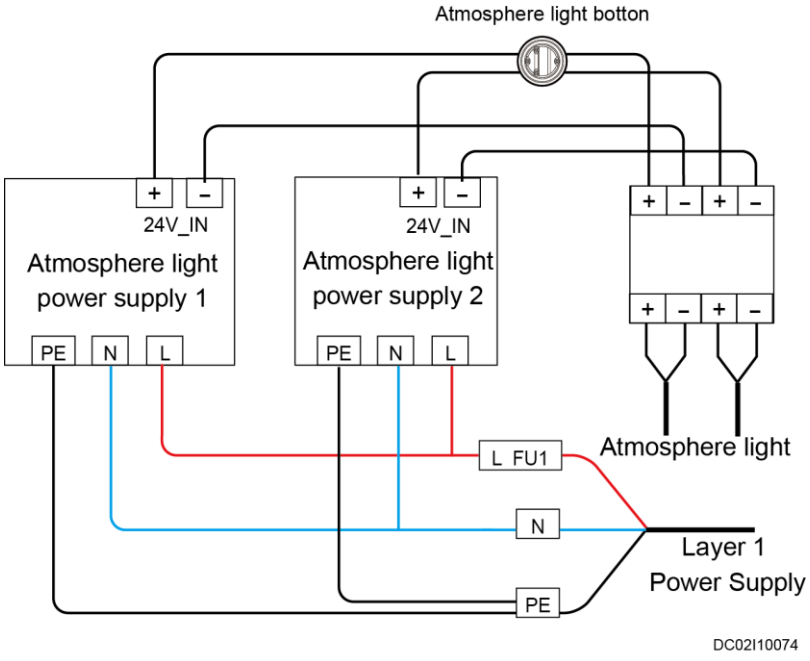


Figure 13-2 Cable connection for the atmosphere light system 2



Preparations

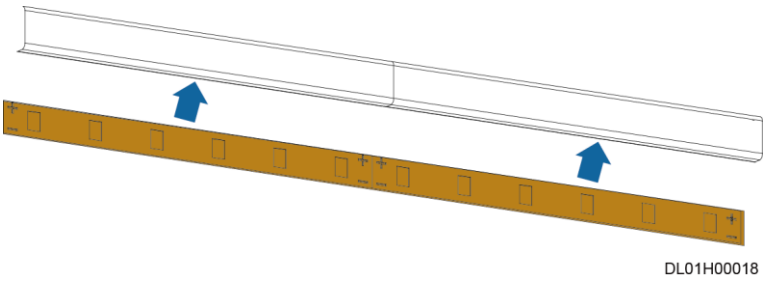
Tools: Phillips screwdriver, step ladder

Materials: atmosphere light and accessories

Procedure

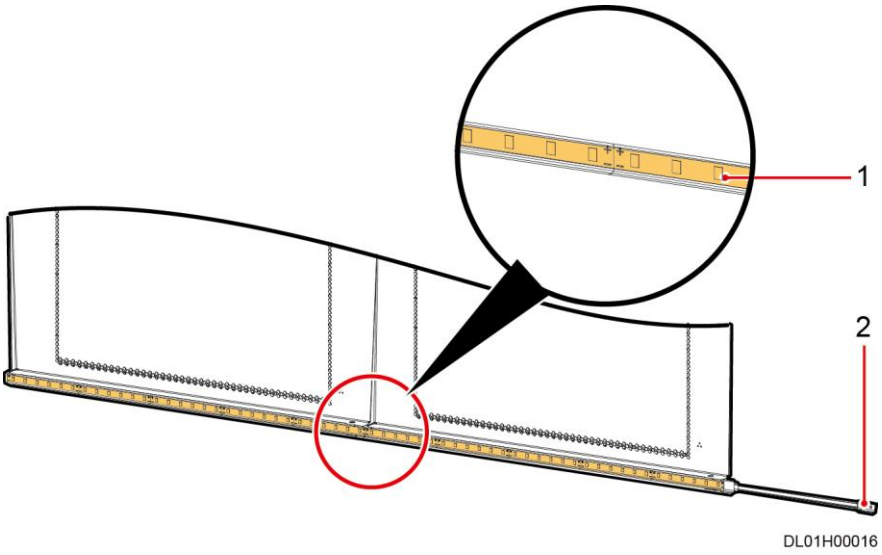
Step 1 Insert the atmosphere light strip into the buckle.

Figure 13-3 Installing atmosphere light strip



Step 2 Attach the buckle to the bottom of the cabinet.

Figure 13-4 Installing the atmosphere light

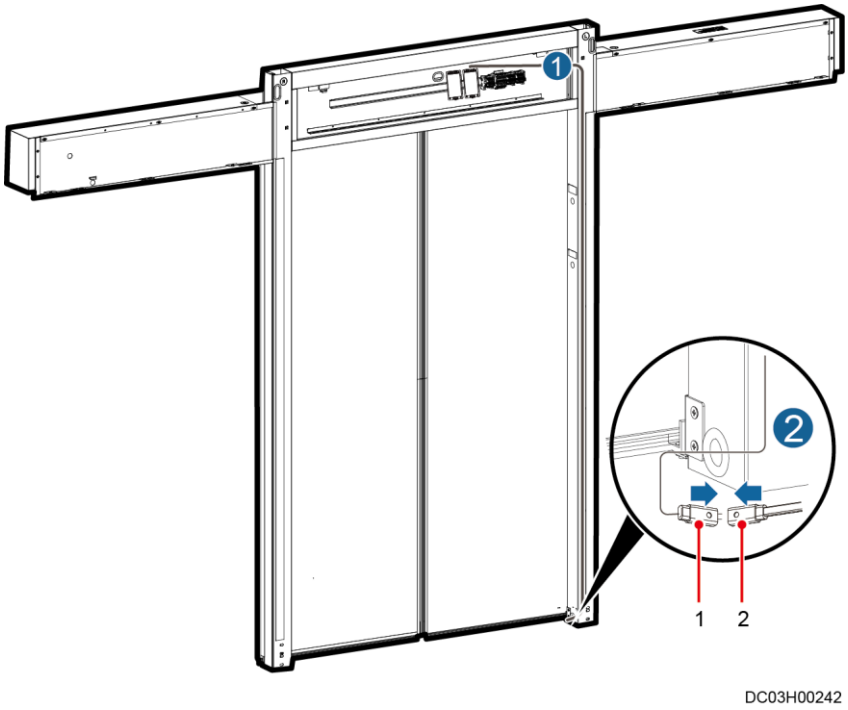


(1) Atmosphere light (2) Strip light terminal

Step 3 Place the strip light cable and connect the strip light cable.

1. Connect the atmosphere light cable from the end door to the lower part of the inner door frame.
2. Connect the cable connector to the strip light terminal.

Figure 13-5 Connecting light cable



(1) Cable connector (2) Strip light terminal

Step 4 Install the atmosphere light button.

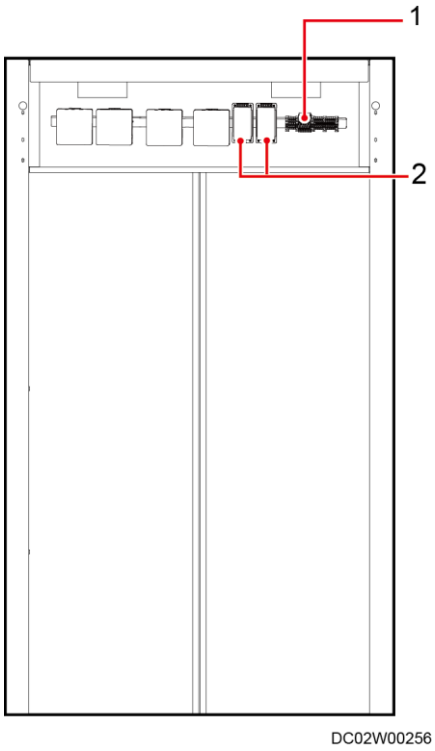
NOTE

For details about the installation mode of the air indicator button, see section "Installing a Button".

The atmosphere light button is installed above the column on the right side door.

Step 5 Connect cables to the atmosphere light system.

Figure 13-6 Installation position of the atmosphere light power supply (inside the aisle)



(1) Upstream fuse (2) Atmosphere light power supply

NOTE

When the aisle length is ≤ 7,500 mm, use one atmosphere light power supply. When the aisle length is > 7,500 mm, use two atmosphere light power supplies.

----End

14 Installing Power Supply and Distribution Devices

14.1 (Optional) Installing the UPS Outside the Smart Module

For details, see the document delivered with the equipment or obtain the required document according to the section "Documentation Preparations."

14.2 (Optional) Installing a Battery Cabinet Outside the Smart Module

A battery cabinet is installed in the same way as installing other cabinets. The installation position depends on the bidding design.

14.3 (Optional) Installing Batteries

Precautions

- To ensure personal safety, unpack, transport, and install batteries by following the instructions in the manuals delivered with the batteries.
- Except for necessary functional parts, wrap the exposed metal parts of tools such as Phillips screwdrivers and wrenches with at least two layers of insulation tape.
- Wrap the OT terminal of a cable with insulation tape, and remove the tape when the cable is placed in position and the terminal connection is verified.
- Leave one break point disconnected when connecting batteries on each layer, and connect the break point on each layer after other cables are connected.
- Tighten screws to prevent sparks generated upon power-on.
- Only qualified technicians can connect battery cables.
- Ensure that all the safety measures have been taken before installation.
- Ensure that the circuit breakers in the BCB box are OFF during installation.
- Never short-circuit the two poles of a battery when handling or installing batteries.

Preparations

Tools: Phillips screwdriver, pallet truck, wrench, protective gloves

Materials: insulation tape, battery, copper bar or cable

Documents: battery wiring diagram, documents delivered with the batteries

Skill requirement: personnel qualified for installing batteries

Procedure

Step 1 Use a pallet truck to move batteries to a position near the installation position.

Step 2 Unpack the batteries.

Step 3 Install the batteries from bottom to top on the battery rack based on the battery wiring diagram.

NOTICE

Due to space limitation, connect power cables after placing batteries on one layer.

Step 4 Connect power cables to batteries based on the battery wiring diagram.

----End

Follow-up Procedure

Verify the battery cable connections. Ensure that the battery quantity and cable connections comply with the design and the cables or copper bars are reliably installed.

14.4 (Optional) Installing a Smart Cooling Product PDB

For details, see the document delivered with the equipment or obtain the required document according to the section "Documentation Preparations."

NOTE

In the scenarios with a new main way or precision PDC, install a power distribution box (PDB) to supply power to smart cooling products.

The smart cooling product PDB weighs about 44 kg. It is recommended that it be installed on a concrete wall that is at least 70 mm thick.

Figure 14-1 Smart cooling product PDB dimensions

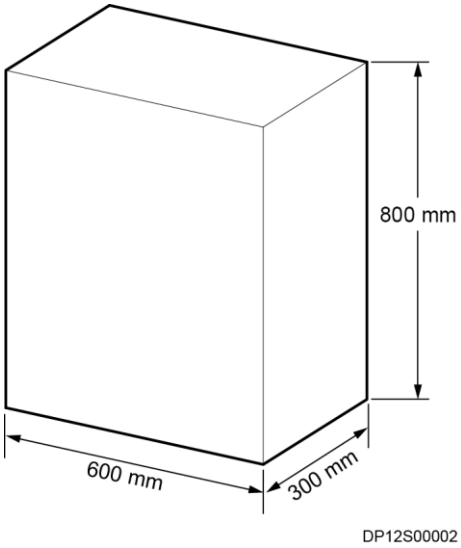
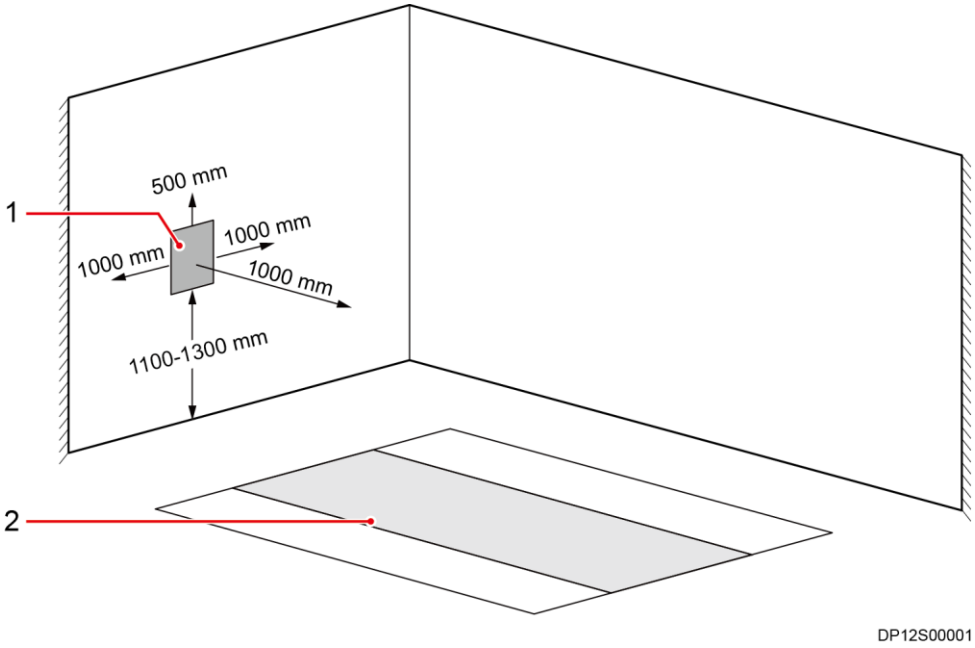


Figure 14-2 Installation layout and space requirements for the smart cooling product PDB



(1) Smart cooling product PDB (2) Smart module

NOTE

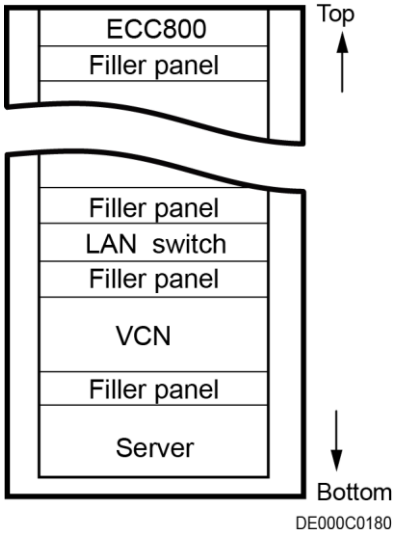
The installation layout and space requirements of the smart cooling product PDB are for reference only. They can be adjusted based on the actual situation.

15 Installing Monitoring Devices

15.1 Equipment Layout in the Network Cabinet

Diverse monitoring devices are available. Determine the installation plan based on the configurations. Figure 15-1 specifies the installation positions for certain monitoring devices, which are for reference only.

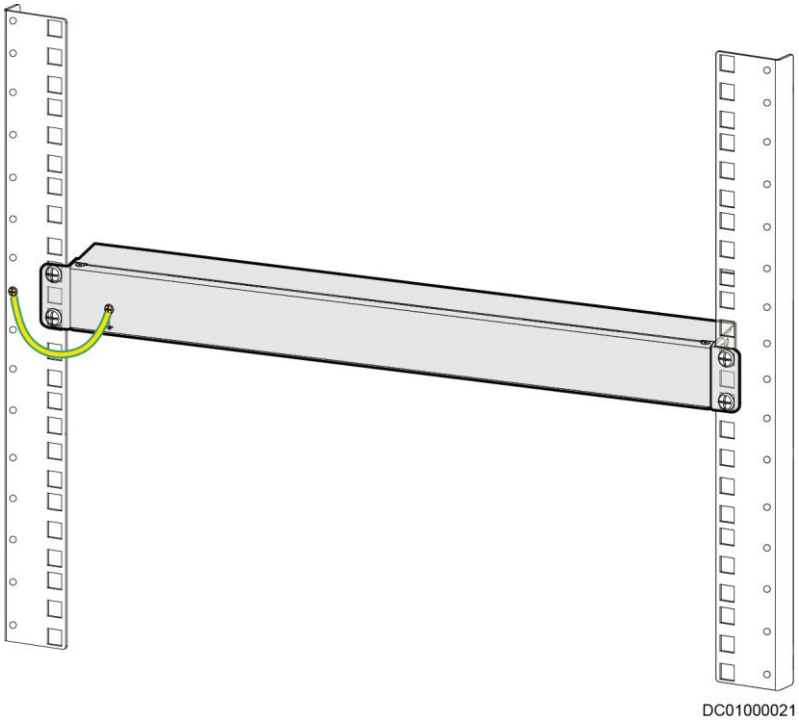
Figure 15-1 Equipment layout in the network cabinet



NOTE

- Relocate the cable manager in the rear door position as high as the device to be installed.
- Use a flat-head screwdriver to insert floating nuts into the device mounting holes in the rack rails of the network cabinet. Ensure that the floating nuts on both sides are on the same horizontal line.
- Before connecting power cables for the device, use the ground cable delivered with the device to connect from the device ground point to the cabinet ground point close to the device mounting holes, as shown in Figure 15-2. When there is a special grounding requirement and a cabinet ground bar can be deployed, use the ground cable prepared by the customer to connect from the device ground point to the cabinet ground bar.

Figure 15-2 Connecting a device ground cable



15.1.1 (Optional) Installing a TaiShan 200 Server

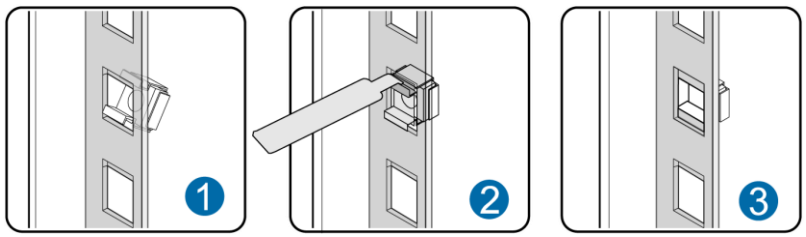
Context

This section uses a TaiShan 200 server as an example. For more information, see the documents delivered with the server.

Procedure

Step 1 Determine the installation position of the server and check whether floating nuts are installed. If not, install them first.

Figure 15-3 Installing a floating nut

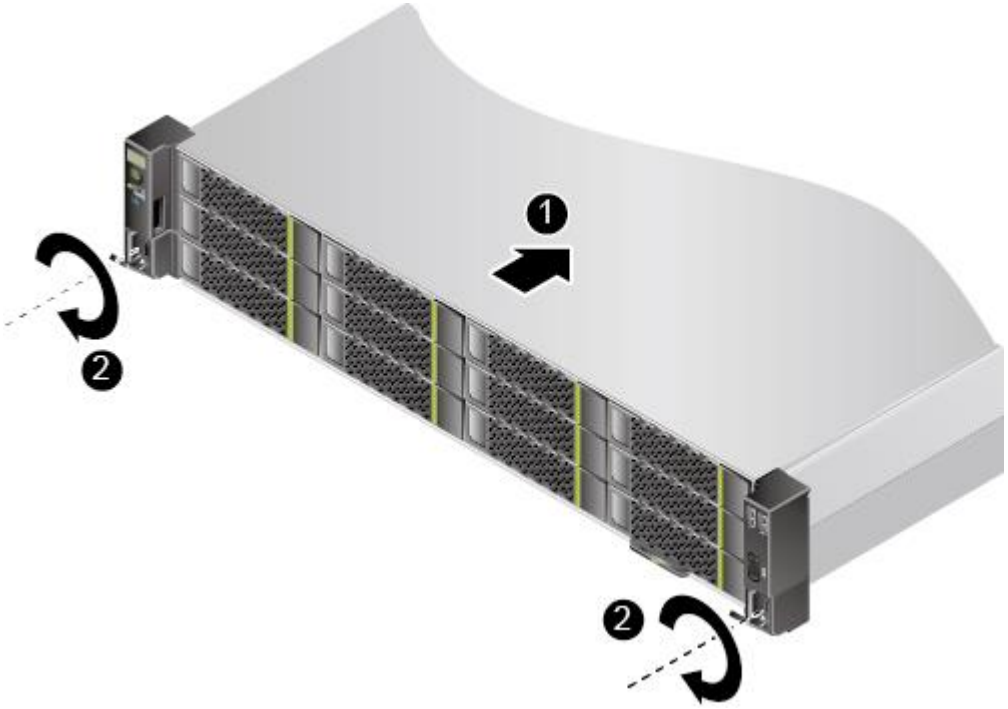


Step 2 Lift the server. This task requires at least two people.

Step 3 Place the server on the guide rails and push it in to the cabinet.

Step 4 When the two mounting ears on the server contact the mounting bars on the rack, tighten the captive screws on the mounting ears to secure the server.

Figure 15-4 Installing a TaiShan 200 server



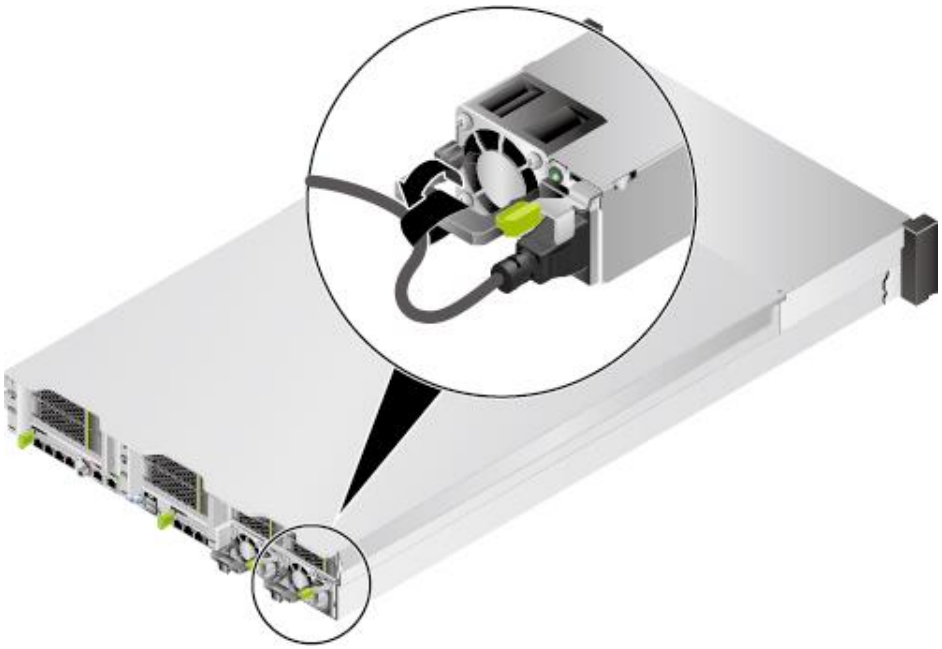
Step 5 Connect the power cable to the TaiShan 200 server.

1. Wear an ESD wrist strap or ESD gloves.
2. Connect one end of the power cable to the cable port on the AC power module of the server.

Figure 15-5 Connecting the power cable

3. Use a hook-and-loop fastener to secure the power cable.

Figure 15-6 Securing the power cable



4. Route the power cable along the cable tray neatly, use cable ties to bind the power cable, and use diagonal pliers to trim off the excess of the cable ties.

----End

15.1.2 Installing the VCN510

Context

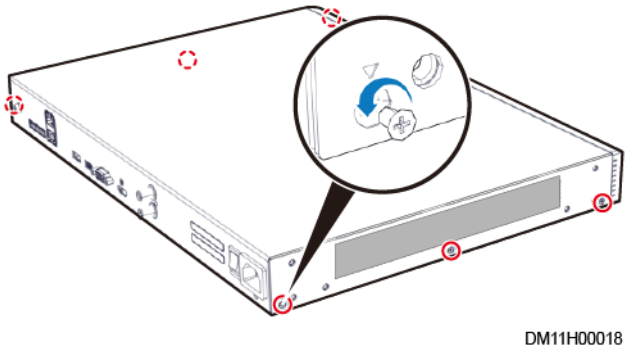
The VCN510 does not carry disks when being delivered. First install disks and then install the device in a network cabinet.

Procedure

Step 1 Install a hard disk.

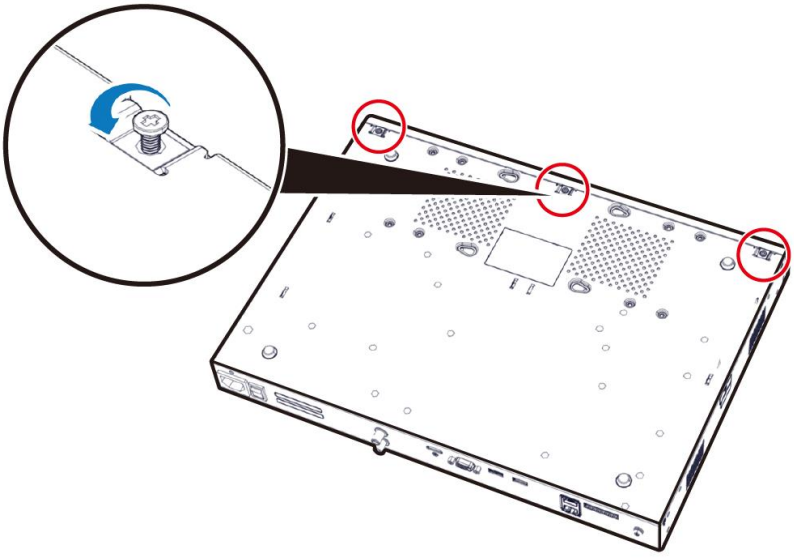
1. Use a Phillips screwdriver to loosen three fastening screws (M3 x 6 countersunk screw, black) on the left and right of the subrack covers shown in the lower-left figure.

Figure 15-7 Removing screws



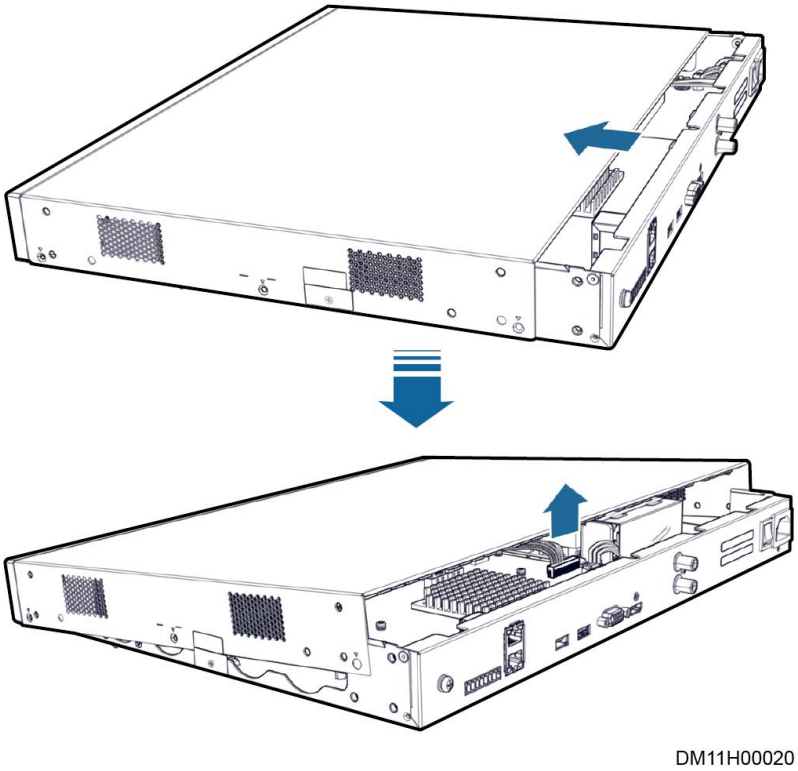
2. Then loosen the three fastening screws (M3 x 5 grub screw, white) that are used to connect the subrack bottom to the front panel. Remove the subrack cover and front panel as shown in the lower-right figure.

Figure 15-8 Removing screws



3. Remove the upper cover of the chassis in the following way: Hold the bottom cover of the chassis with one hand, and use the other hand to push the upper cover of the chassis towards the front panel with a proper force. Then, remove the upper cover, as shown in the lower-right figure.

Figure 15-9 Removing the upper cover of the chassis

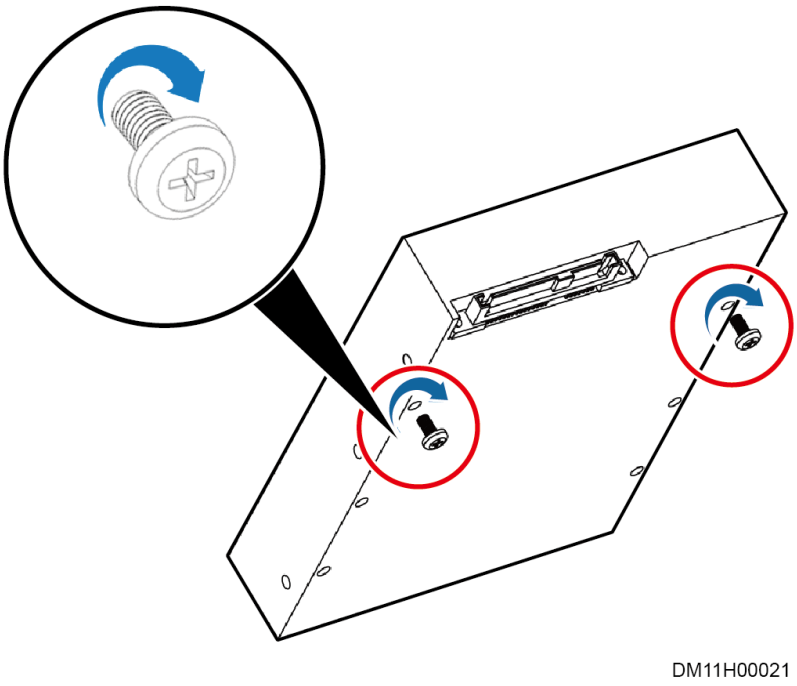


NOTE

When removing the upper cover from the chassis, do not use one hand to perform this operation. Otherwise, the upper cover may collide with the components inside the device, bringing risks of component damages.

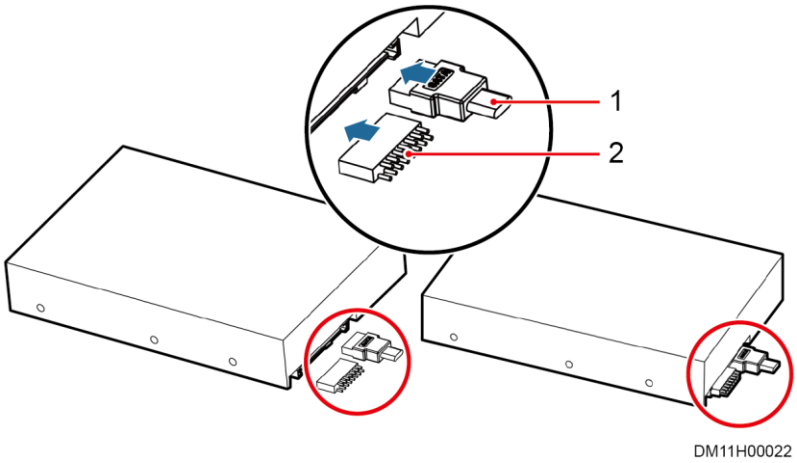
4. Take two #6-32UNC screws from the screw package (there are eight screws in the package) and preinstall the two screws in the holes near the cable outlet on the hard disk backplane. Tighten the screw threads for three circles (ensure that the screws do not fall naturally).

Figure 15-10 Installing disk screws



5. Insert the SATA and power cables into the corresponding interfaces on the disk. During cable connection, ensure that the metallic plate of the SATA cable faces upward.

Figure 15-11 Installing the SATA cable and power cable



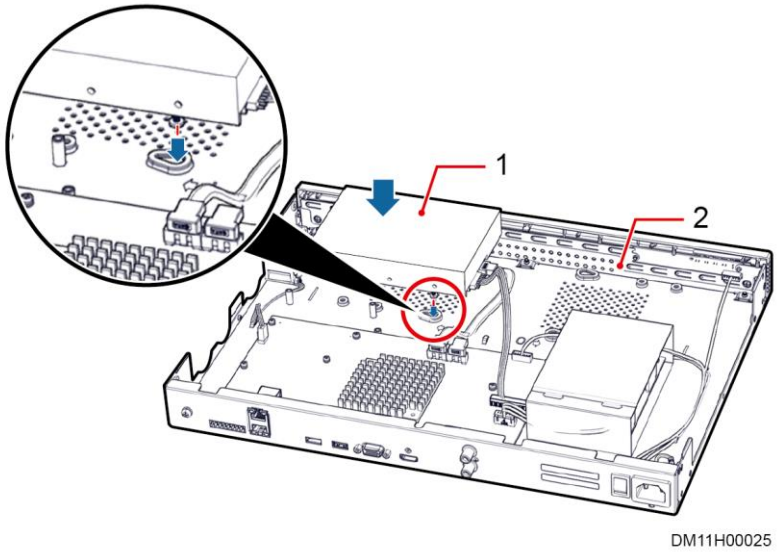
(1) SATA cable (2) Power cable

NOTE

When the VCN510 is delivered, the SATA cable connecting to the hard disk is fixed using blue tapes. Before installing the hard disk, remove the tapes.

6. Install a disk in No.1 position. Place the disk above the No.1 disk installation position. Align the preinstalled screws with the cucurbit holes on the bottom cover of the chassis. Then, horizontally place the disk. Ensure that the screws are in the holes.

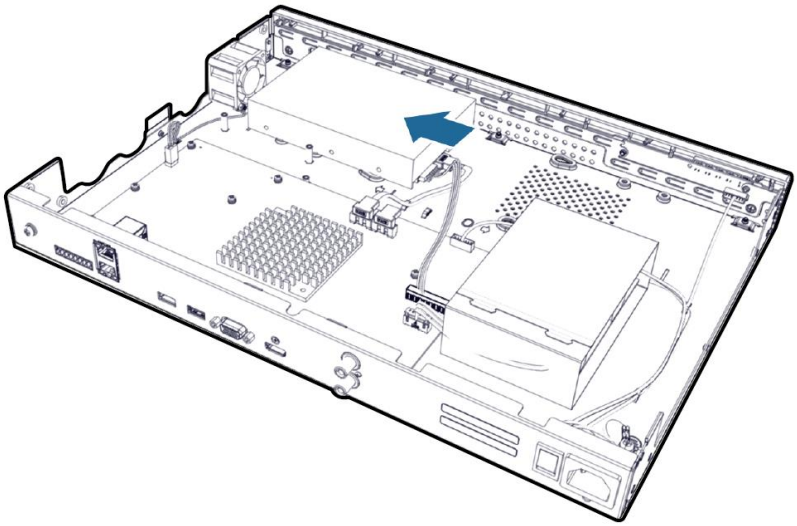
Figure 15-12 Disk installation positions



(1) No.1 disk installation position (2) No.0 disk installation position

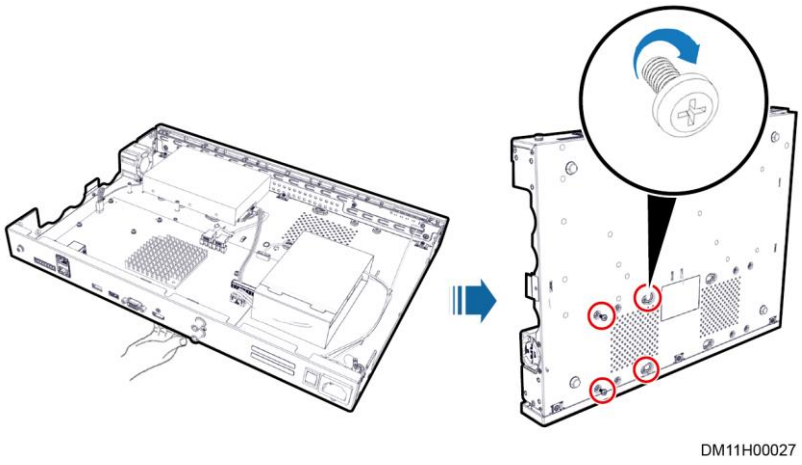
7. Push the disk following the direction shown in the lower-right figure to enable the two preinstalled screw heads to slide into the cucurbit holes.

Figure 15-13 Installing a hard disk



8. Hold the disk with one hand. Use the other hand to turn over the device at a 90-degree angle. Fasten the preinstalled screws from the rear panel of the device. Take another two #6-32UNC screws. Insert them into another two holes on the disk (for a disk with six holes, you are advised to install the screws into the two holes that are far away from the cable outlet) and fasten them.

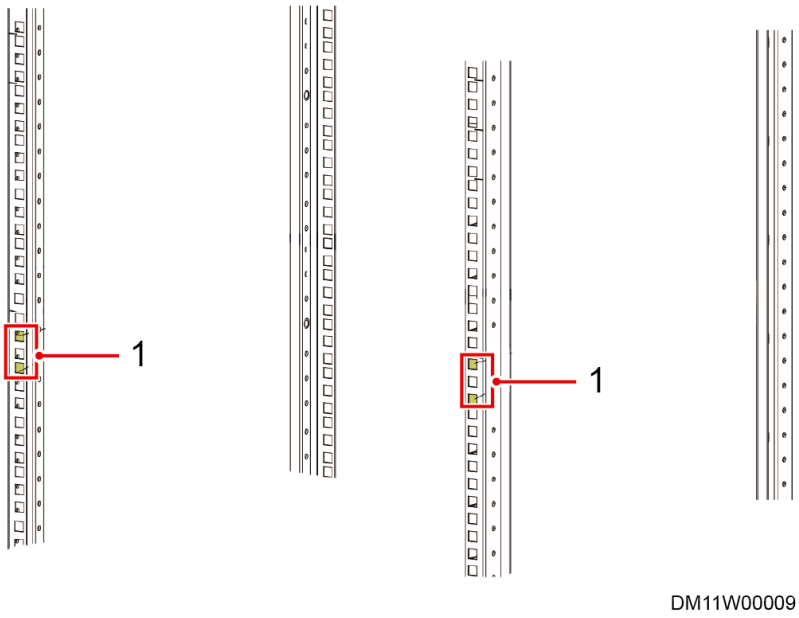
Figure 15-14 Installing a hard disk



9. Install a disk in No.0 position. Install the disk in No.0 position in the same way for installing a disk in No.1 position. During disk installation, ensure that the direction for pushing the disk in No.0 position is opposite to that for pushing the disk in No.1 position.
10. Install the upper cover of the chassis. Place the upper cover of the chassis. Fasten the three screws on the bottom cover of the chassis and the six screws on the left and right sides of the chassis to fix the upper cover of the chassis.

Step 2 Installing the floating nuts. Determine the mounting holes for the VCN510 in the network cabinet based on the engineering layout diagram, adjust the guide rails and install floating nuts.

Figure 15-15 Installing the floating nuts



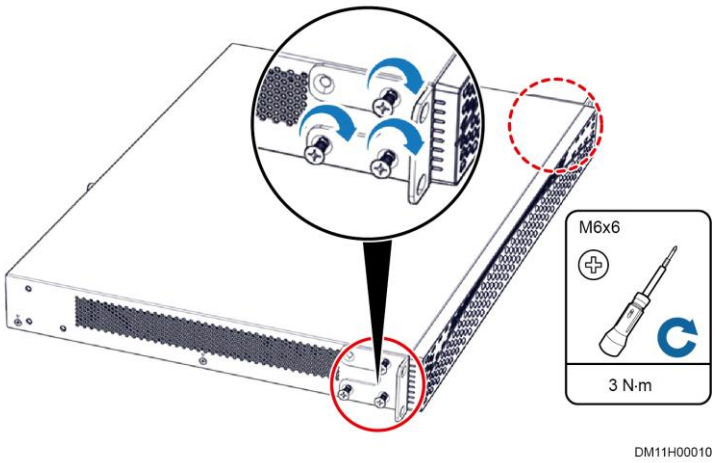
(1) Floating nuts

NOTE

The VCN510 is compact and lightweight. It can be directly fixed on the cabinet with M6 screws and mounting ears without using a guide rail. If a guide rail has been installed in the cabinet, you are advised to remove the guide rail first and then install the device in the cabinet. The VCN510 is equipped with right-to-left airflow, so installing a guide rail may affect the heat dissipation and lower the device performance accordingly.

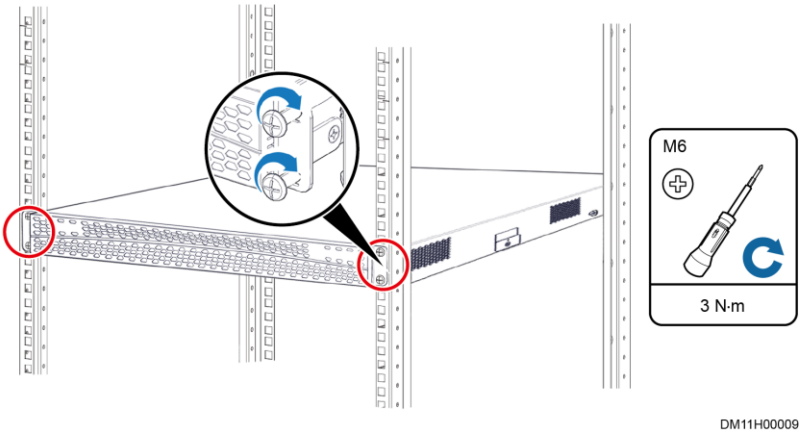
Step 3 Install mounting ears. Take six mounting ear screw (M4 x 6 countersunk screws, white). Use three screws to configure one mounting ear on the left of the front panel and the same way to configure the other ones on the right side. Then use a Phillips screwdriver to fasten the screws to fix the mounting ears.

Figure 15-16 Installing mounting ears



Step 4 Install the device. Carry the device to be cabinet. Ensure that the mounting ears at both sides of the device are tightly attached to the mounting bar in front of the cabinet. Use one hand to hold the device. Use the other hand to thread M6 screws (prepared by customers) through the slotted hole on the mounting ear. Use a Phillips screwdriver to fix the M6 screws on the mounting ears. Each mounting ear uses two M6 screws.

Figure 15-17 Installing the VCN510



----End

15.1.3 Installing the VCN520

Context

- The VCN520 does not carry disks when being delivered. First install disks and then install the device in a network cabinet.

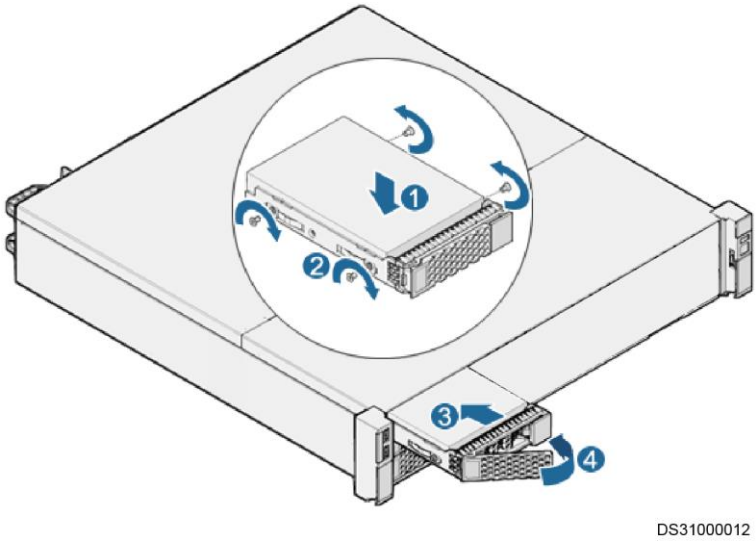
- After the VCN520 is delivered to the site, disk filler panels are installed in slots where disks are not installed, by default. You are not advised to remove the filler panels from the slots where disks are not installed, because removing the filler panels will affect the heat dissipation of fans and generate some noises.

Procedure

Step 1 Install a hard drive.

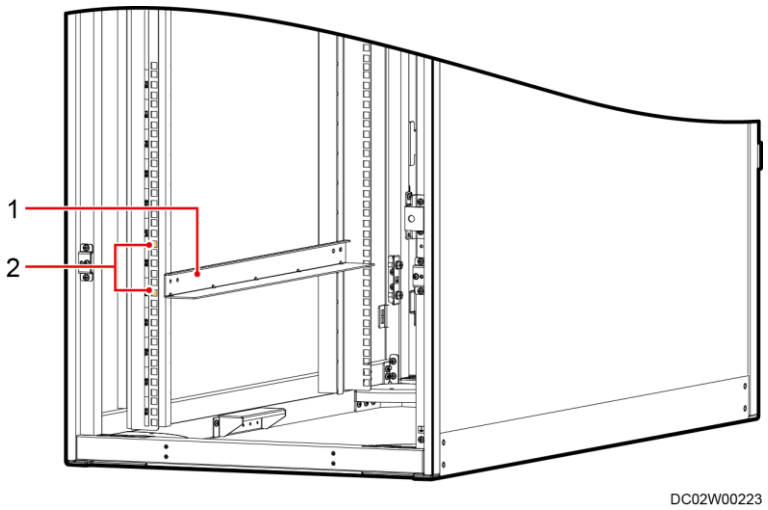
1. Install a hard drive.
2. Secure the hard drive to the front panel using a screwdriver.
3. Push the hard drive into the subrack along the guide rails until it cannot move forwards.
4. Close the ejector lever and push the hard drive in position.

Figure 15-18 Installing a hard drive



Step 2 Determine the mounting holes for the VCN520 in the network cabinet based on the engineering layout diagram, adjust the guide rails and install floating nuts.

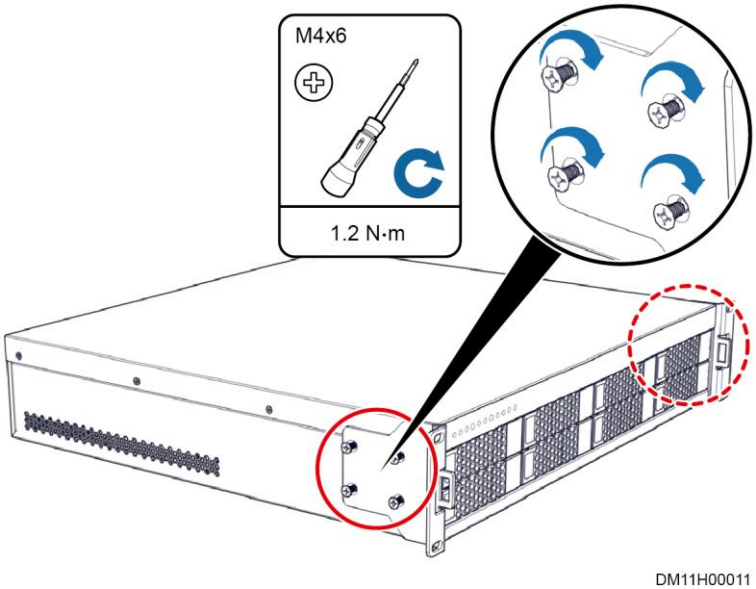
Figure 15-19 Installing the floating nuts



(1) Guide rail (2) Floating nut installation position

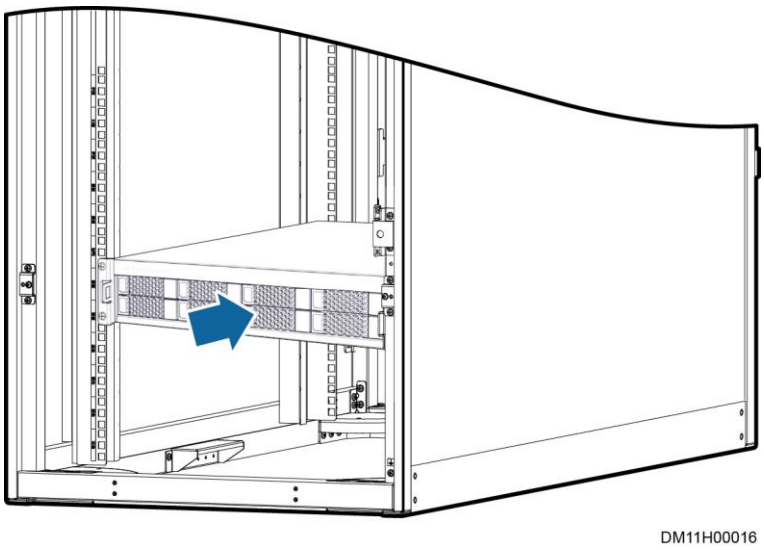
Step 3 Use four screws to configure one mounting ear on the left of the front panel and the same way to configure the other ones on the right side. Then use a Phillips screwdriver to fasten the screws to fix the mounting ears.

Figure 15-20 Installing mounting ears



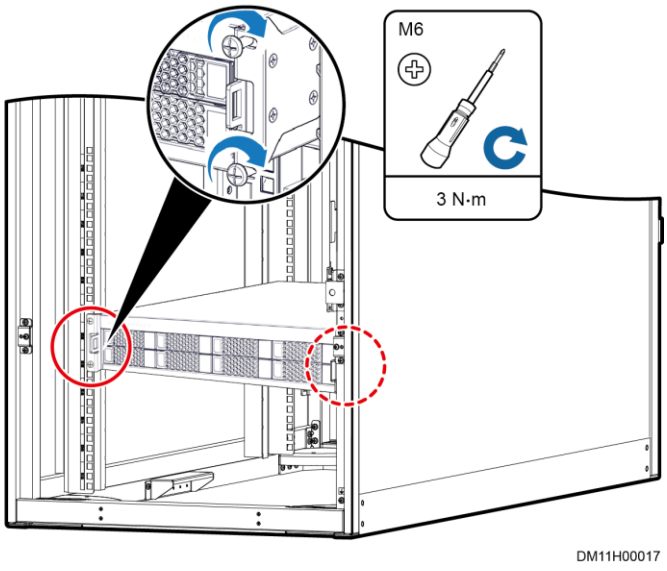
Step 4 Place the VCN520 on the guide rails. Keep pushing the subrack until the mounting ears of the subrack are close to the mounting bar at the front of the network cabinet.

Figure 15-21 Placing a VCN520



Step 5 Put two M6 screws through the slotted holes of one mounting ear and use a Phillips screwdriver to fasten the screws to secure the device to the rack rail at front of the network cabinet.

Figure 15-22 Securing a VCN520



----End

15.1.4 Installing the VCN540

Context

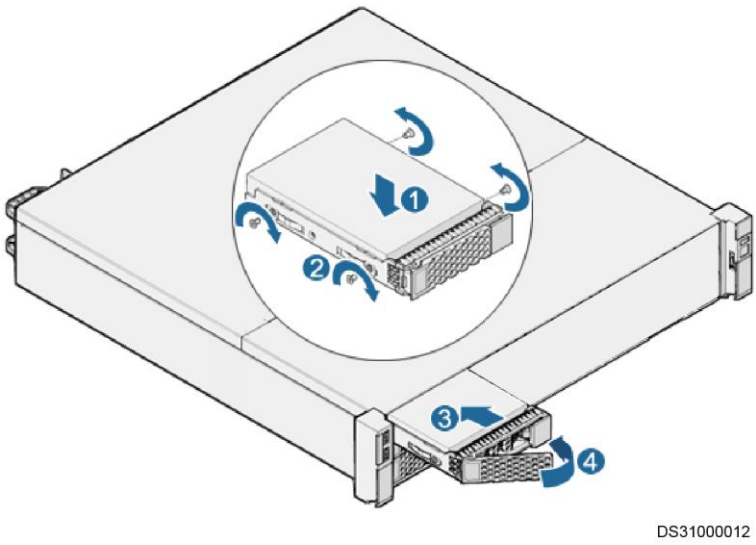
- The VCN540 does not carry disks when being delivered. First install disks and then install the device in a network cabinet.
- After the VCN540 is delivered to the site, disk filler panels are installed in slots where disks are not installed, by default. You are not advised to remove the filler panels from the slots where disks are not installed, because removing the filler panels will affect the heat dissipation of fans and generate some noises.

Procedure

Step 1 Install a hard drive.

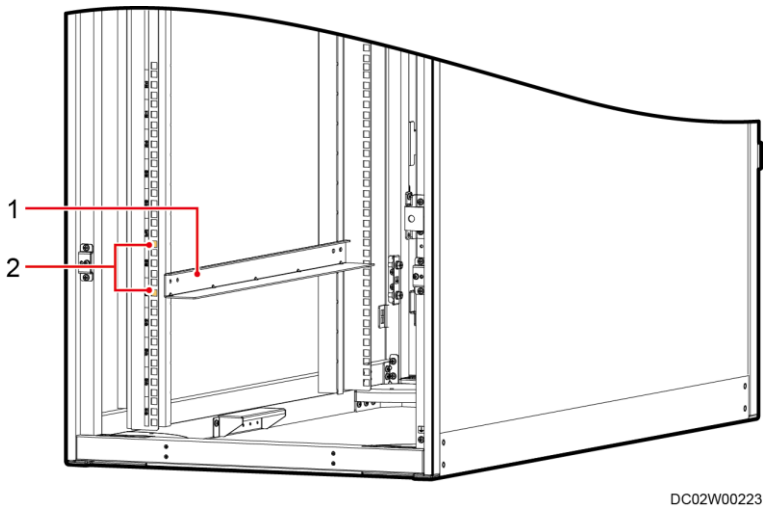
1. Install a hard drive.
2. Secure the hard drive to the front panel using a screwdriver.
3. Push the hard drive into the subrack along the guide rails until it cannot move forwards.
4. Close the ejector lever and push the hard drive in position.

Figure 15-23 Installing a hard drive



Step 2 Determine the mounting holes for the VCN540 in the network cabinet based on the engineering layout diagram, adjust the guide rails and install floating nuts.

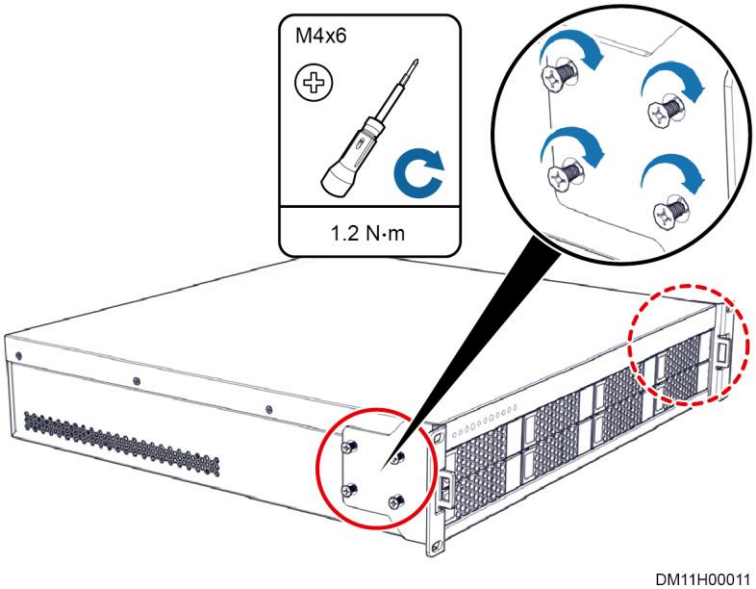
Figure 15-24 Installing the floating nuts



(1) Guide rail (2) Floating nut installation position

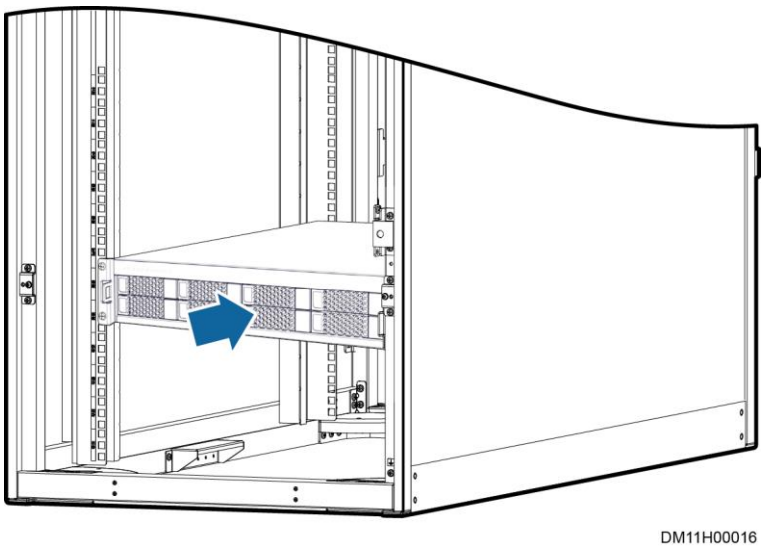
Step 3 Use four screws to configure one mounting ear on the left of the front panel and the same way to configure the other ones on the right side. Then use a Phillips screwdriver to fasten the screws to fix the mounting ears.

Figure 15-25 Installing mounting ears



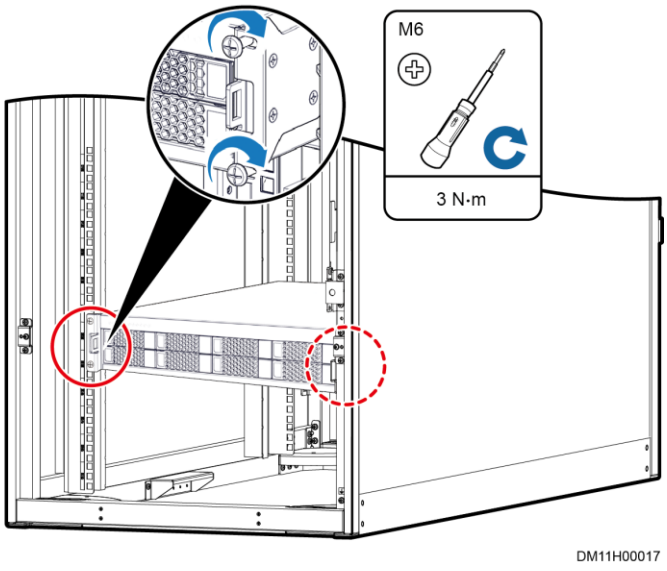
Step 4 Place the VCN540 on the guide rails. Keep pushing the subrack until the mounting ears of the subrack are close to the mounting bar at the front of the network cabinet.

Figure 15-26 Placing a VCN540



Step 5 Put two M6 screws through the slotted holes of one mounting ear and use a Phillips screwdriver to fasten the screws to secure the device to the rack rail at front of the network cabinet.

Figure 15-27 Securing a VCN540



----End

15.1.5 (Optional) Installing a LAN Switch

Preparations

Tool: Phillips screwdriver

Materials: LAN switch and accessories

Document: installation position diagram for monitoring devices in the network cabinet

Procedure

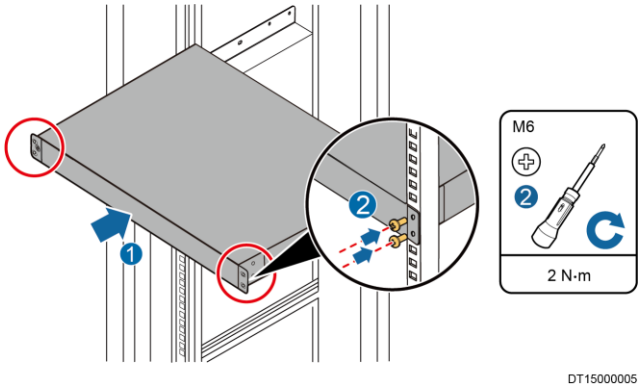
Step 1 Determine the mounting holes for a LAN switch based on the installation position diagram for monitoring devices in the network cabinet, adjust the guide rails, and install floating nuts.

Step 2 Install the mounting ears delivered with the LAN switch, and secure the LAN switch to the rack rails in the front of the cabinet.

NOTE

This section describes only the installation method. The actual product appearance prevails.

Figure 15-28 Installing a LAN switch



Step 3 Connect the LAN switch power cable to the rPDU.

NOTE

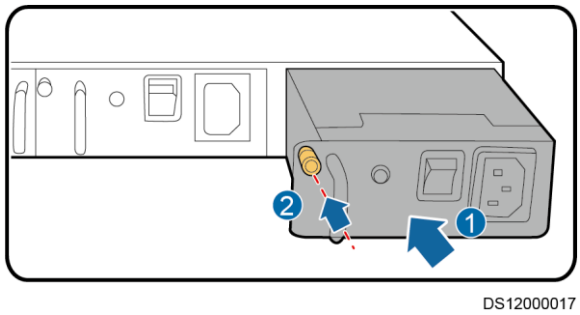
The positions of power cable ports vary depending on the LAN switch models. Connect the power cable based on the actual power port of the LAN switch.

----End

Follow-up Procedure

If a 24-port LAN switch is configured, two power modules need to be installed for the LAN switch onsite. Insert the power modules into the power slots of the 24-port LAN switch, and tighten the captive screws on the power module panel.

Figure 15-29 Installing the power modules for a 24-port LAN switch



15.1.6 (Optional) Installing an ECC800-Pro

Preparations

Tool: Phillips screwdriver

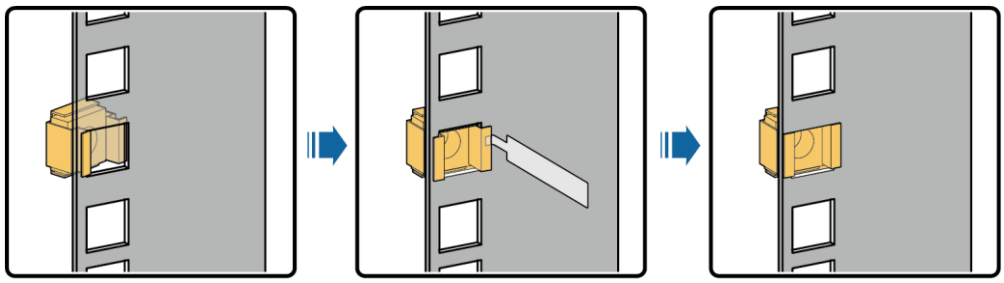
Materials: ECC800-Pro, SIM card, RF_Z antenna, 4G antenna

Document: installation position diagram for monitoring devices in the network cabinet

Procedure

Step 1 Determine the mounting holes for an ECC800-Pro based on the installation position diagram for monitoring devices in the network cabinet, adjust the guide rails, and install floating nuts.

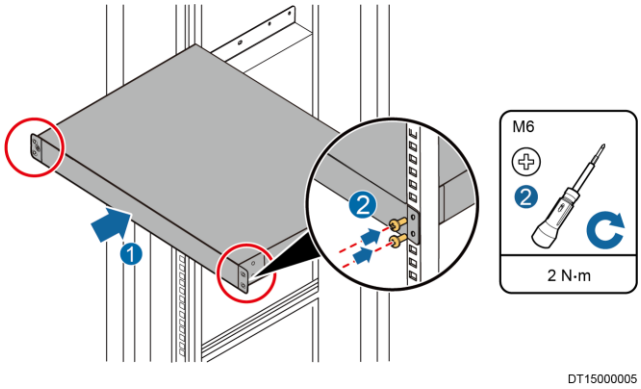
Figure 15-30 Installing floating nuts



Step 2 Place the ECC800-Pro in the network cabinet with caution.

Step 3 Secure the ECC800-Pro in the network cabinet by tightening the M6 screws on the mounting ears.

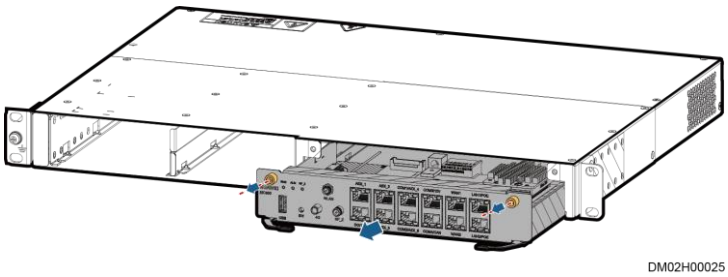
Figure 15-31 Installing an ECC800-Pro



Step 4 (Optional) Remove the ECC800-Pro main control module and install the SIM card in the correct slot of the main control module as required.

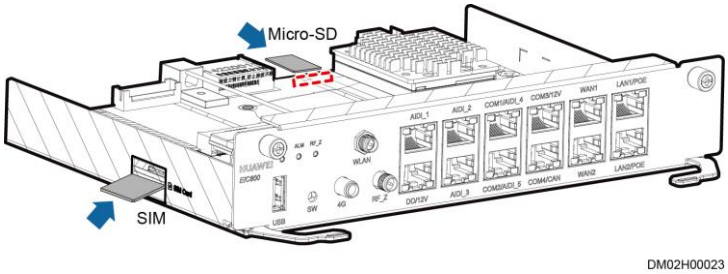
1. Loosen the captive screws on both sides of the ECC800-Pro main control module, pull the handles on both sides of the main control module, and take out the main control module.

Figure 15-32 Removing the ECC800-Pro main control module



2. Install the Micro-SD and SIM card in the correct slot on the left side of the ECC800-Pro main control module.

Figure 15-33 Installing a Micro-SD and SIM card

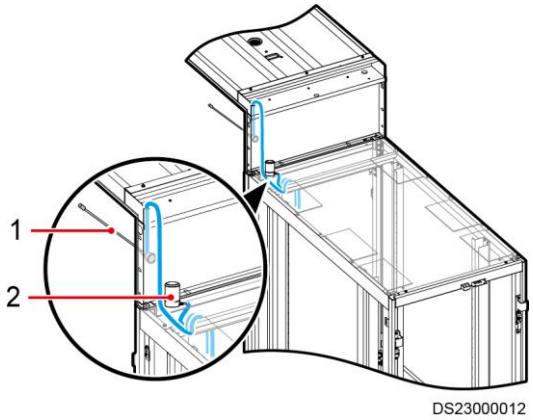


3. Reinstall the ECC800-Pro main control module in the ECC800-Pro subrack, and tighten the captive screws on both sides of the module.

Step 5 Install the antenna.

1. The antenna can be installed using the magnet on its base. Attach the RF_Z antenna to the skylight connective plate above the top of the network cabinet in the aisle containment. (Optional) Attach the 4G antenna to the skylight connective plate or the network cabinet top plate outside the aisle containment.
2. Route the RF_Z antenna cable through the cable hole in the skylight plate, through the rodent-proof mesh and sponge strip on the top of the cabinet, and to the correct port on the ECC800-Pro. (Optional) Route the 4G antenna cable through the rodent-proof mesh and sponge strip on the top of the cabinet and to the correct port on the ECC800-Pro.

Figure 15-34 Installing an antenna



(1) RF_Z antenna (2) 4G antenna

3. Connect the RF_Z antenna cable to the RF_Z antenna port on the ECC800-Pro. (Optional) Connect the 4G antenna cable to the 4G antenna port on the ECC800-Pro.

Figure 15-35 Connecting an antenna cable

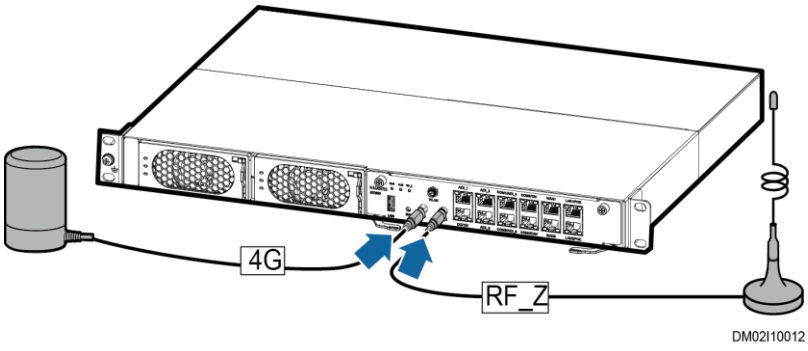
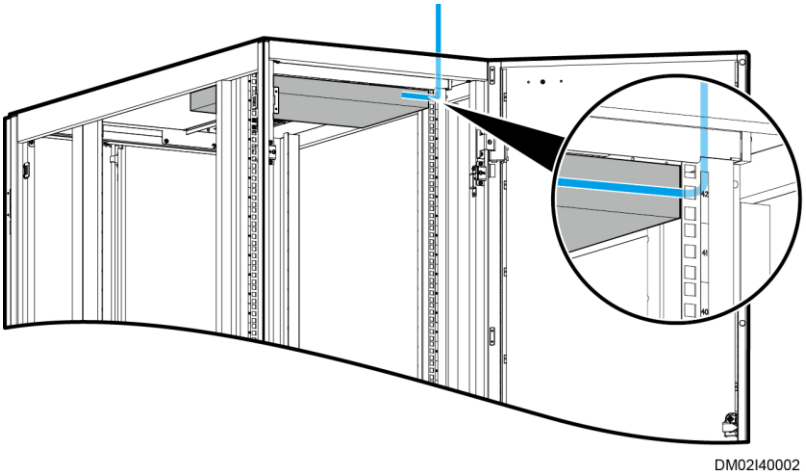


Figure 15-36 Antenna cable route inside a cabinet



Step 6 Connect the ECC800-Pro power cable to the rPDU.

----End

15.2 (Optional) Installing a Rack Environment Unit

Context

- Install rack environment units on the rack rails of the rear doors of the IT cabinet and network cabinet.
- If a ground bar is installed on the top of the rack rail, install a rack environment unit at the 40 U position (2000 mm IT cabinet) or 45 U position (2200 mm IT cabinet). A cable manager should be installed between the rack environment unit and the ground bar.
- If no ground bar is installed on the top of the rack rail, install a rack environment unit on the top of the rack rail.

Preparations

Tool: Phillips screwdriver

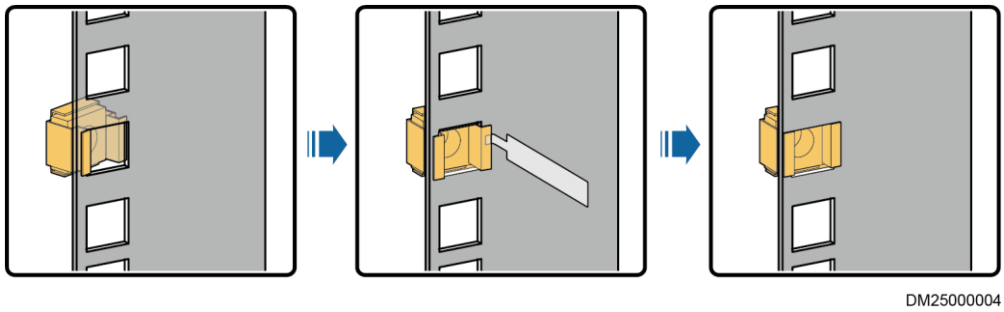
Material: rack environment unit

Document: engineering layout diagram

Procedure

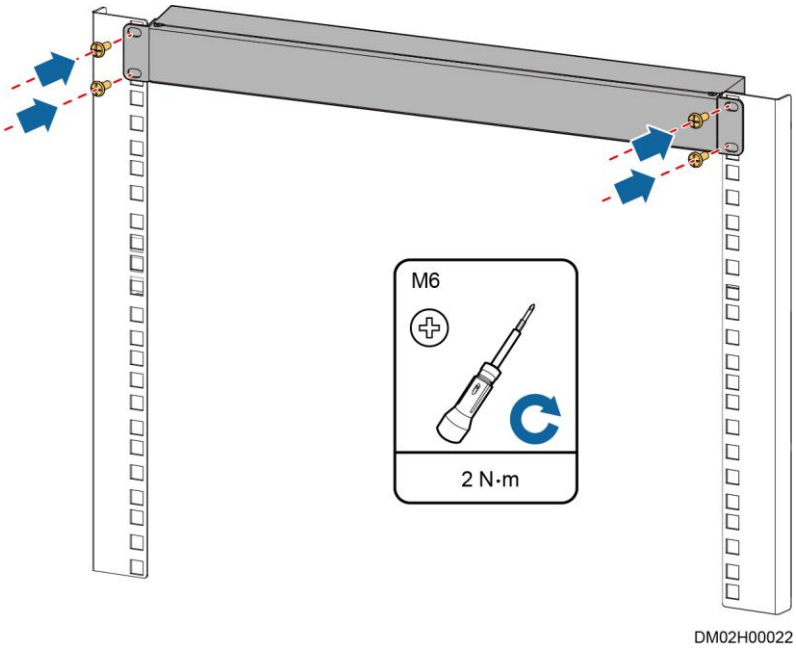
Step 1 Determine the mounting holes for the rack environment unit in the cabinet based on the engineering layout diagram and install floating nuts.

Figure 15-37 Installing a floating nut



Step 2 Secure the rack environment unit to the top 1 U position of the cabinet by tightening the M6 screws on the left and right mounting ears.

Figure 15-38 Installing a rack environment unit



Step 3 Connect the ground cable of the rack environment unit to the nearby ground hole on the cabinet mounting bar.

----End

15.3 UIM20A Expansion Module Configuration Principles

- Standard scenario

  Each cabinet is equipped with one UIM20A expansion module.

  Each cabinet contains two or more types of smart components, including the smart U space manager, smart rPDU, cabinet electronic lock, and T/H sensor.

Table 15-1 Cable connection mode in a standard scenario

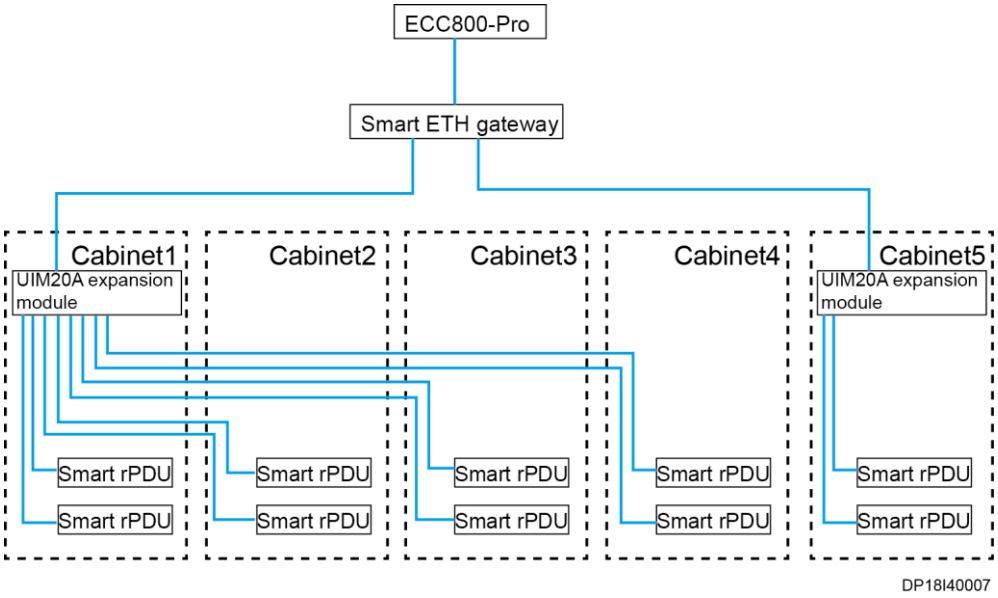
COM Port	COM1	COM3	COM5	COM7
Connected Device	rPDU1	Cabinet electronic lock on the front door	T/H sensor	NA
COM Port	COM2	COM4	COM6	COM8
Connected Device	rPDU2	Cabinet electronic lock on the rear door	Smart U space manager	NA

- Extended scenario

  Four cabinets share one UIM20A expansion module.

  Each cabinet contains only one type of smart device. The port for connecting the smart device to the UIM20A expansion module must meet the following cable connection rules.

  Figure 15-39 Cable connections (using a smart rPDU as an example)



NOTE

- The smart devices supported in this scenario include the smart U space manager, smart rPDU, cabinet electronic lock, and T/H sensor.
- In this scenario, devices connected to the UIM20A expansion module cannot be cascaded.
- If the actual number of IT cabinets is not an integral multiple of 4, the remaining COM ports on the UIM20A expansion module are idle based on the cable connection rules.

Table 15-2 Physical connection mode 1 in the **UIM20A expansion module** one-to-four scenario

COM Port	COM1	COM3	COM5	COM7
Connected Device	Cabinet 1: rPDU1	Cabinet 2: rPDU1	Cabinet 3: rPDU1	Cabinet 4: rPDU1
COM Port	COM2	COM4	COM6	COM8
Connected Device	Cabinet 1: rPDU2	Cabinet 2: rPDU2	Cabinet 3: rPDU2	Cabinet 4: rPDU2

Table 15-3 Physical connection mode 2 in the UIM20A expansion module one-to-four scenario

COM Port	COM1	COM3	COM5	COM7
Connected Device	Cabinet 1: smart U space manager	Cabinet 2: smart U space manager	Cabinet 3: smart U space manager	Cabinet 4: smart U space manager
COM Port	COM2	COM4	COM6	COM8
Connected Device	N/A	N/A	N/A	N/A

Table 15-4 Physical connection mode 3 in the UIM20A expansion module one-to-four scenario

COM Port	COM1	COM3	COM5	COM7
Connected Device	Cabinet 1: cabinet electronic lock on the front door	Cabinet 2: cabinet electronic lock on the front door	Cabinet 3: cabinet electronic lock on the front door	Cabinet 4: cabinet electronic lock on the front door
COM Port	COM2	COM4	COM6	COM8
Connected Device	Cabinet 1: cabinet electronic lock on the rear door	Cabinet 2: cabinet electronic lock on the rear door	Cabinet 3: cabinet electronic lock on the rear door	Cabinet 4: cabinet electronic lock on the rear door

Table 15-5 Physical connection mode 4 in the UIM20A expansion module one-to-four scenario

COM Port	COM1	COM3	COM5	COM7
Connected Device	Cabinet 1: T/H sensor	Cabinet 2: T/H sensor	Cabinet 3: T/H sensor	Cabinet 4: T/H sensor
COM Port	COM2	COM4	COM6	COM8

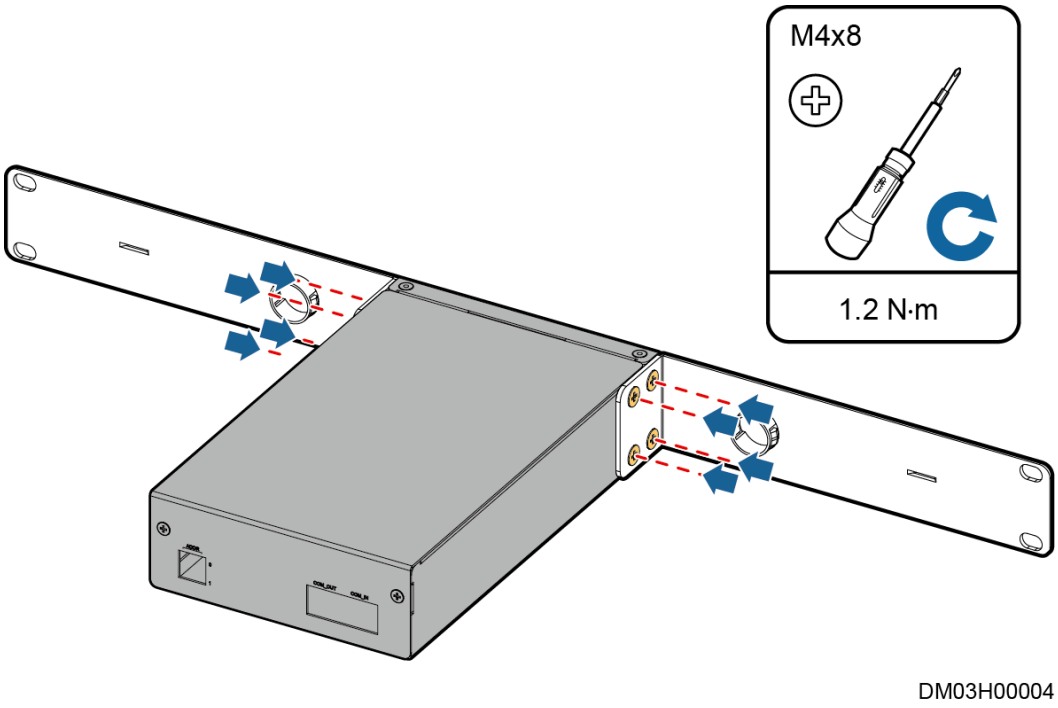
Connected Device	N/A	N/A	N/A	N/A

15.4 Installing a UIM20A Expansion Module

Procedure

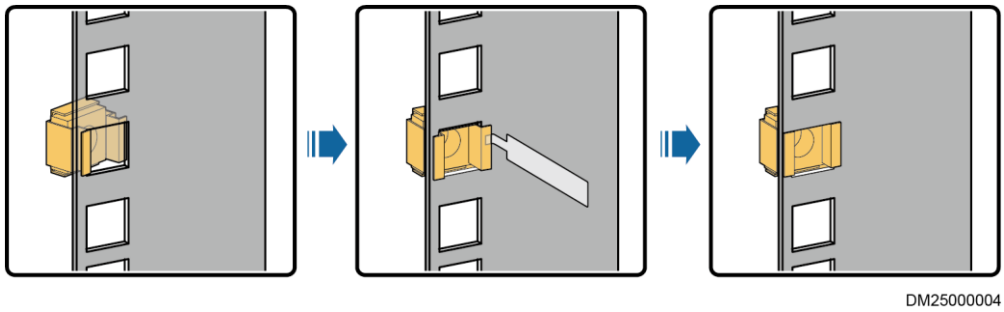
Step 1 Secure a mounting ear to each of the two sides of the UIM20A expansion module using four M4 screws.

Figure 15-40 Installing mounting ears



Step 2 Determine the mounting holes for the UIM20A expansion module in a cabinet based on the engineering layout diagram, and install floating nuts.

Figure 15-41 Installing floating nuts

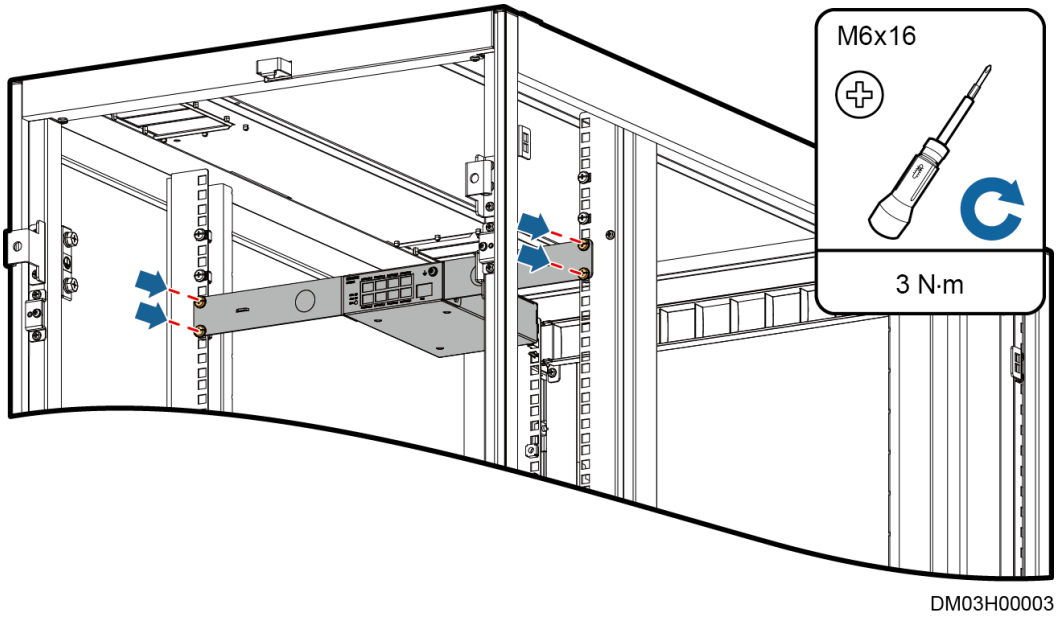


Step 3 Secure the UIM20A expansion module to the cabinet by tightening the M6 screws on the left and right mounting ears clockwise.

NOTE

Installation position: The third U space from the top to the bottom at the rear of the cabinet.

Figure 15-42 Installing a UIM20A expansion module



----End

15.5 Installing a Smart U Space Manager

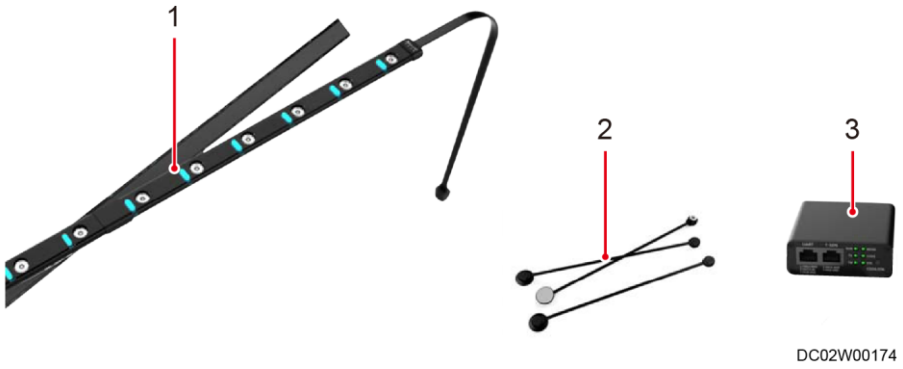
15.5.1 Installing a Smart U Space Manager (Connected to a Rack Environment Unit)

Context

The BOM number of the smart U space manager is 52273314. The BOM number of the U space electronic label is 52273315.

The smart U space manager consists of the following components.

Figure 15-43 Smart U space manager appearance



(1) Asset detection strip (2) U space electronic label (3) Main control box

Procedure

Step 1 Align the first detection point of the asset detection strip with the cabinet 42 U position and attach it to the rack.

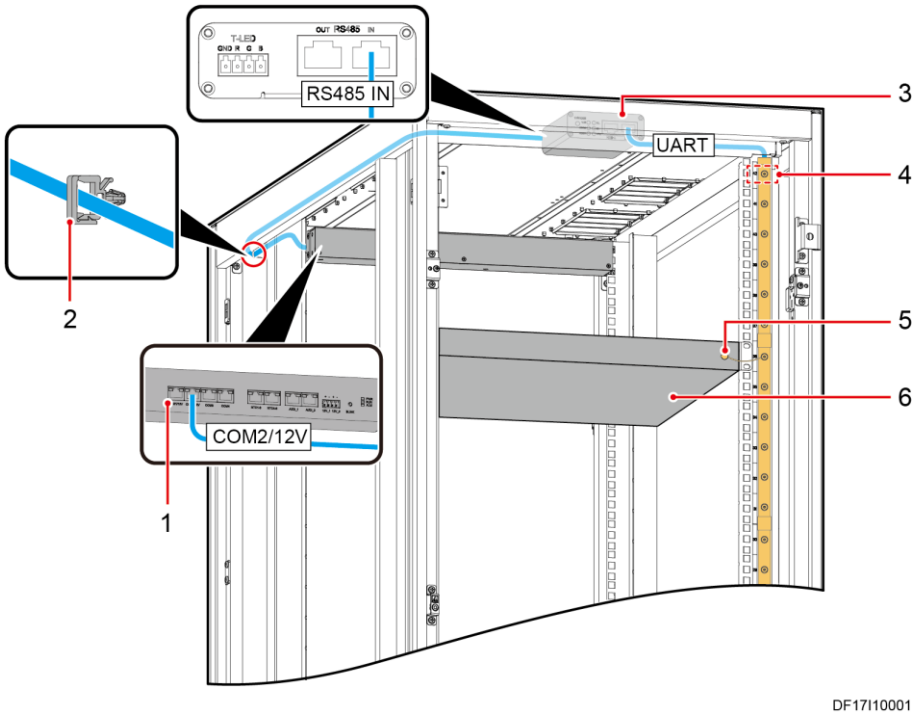
Step 2 Attach the main control box to the top of the cabinet interior (if there is space at the top of the cabinet interior) or exterior (if there is no space at the top of the cabinet interior).

Step 3 Connect cables between devices and secure the cables using fasteners.

NOTE

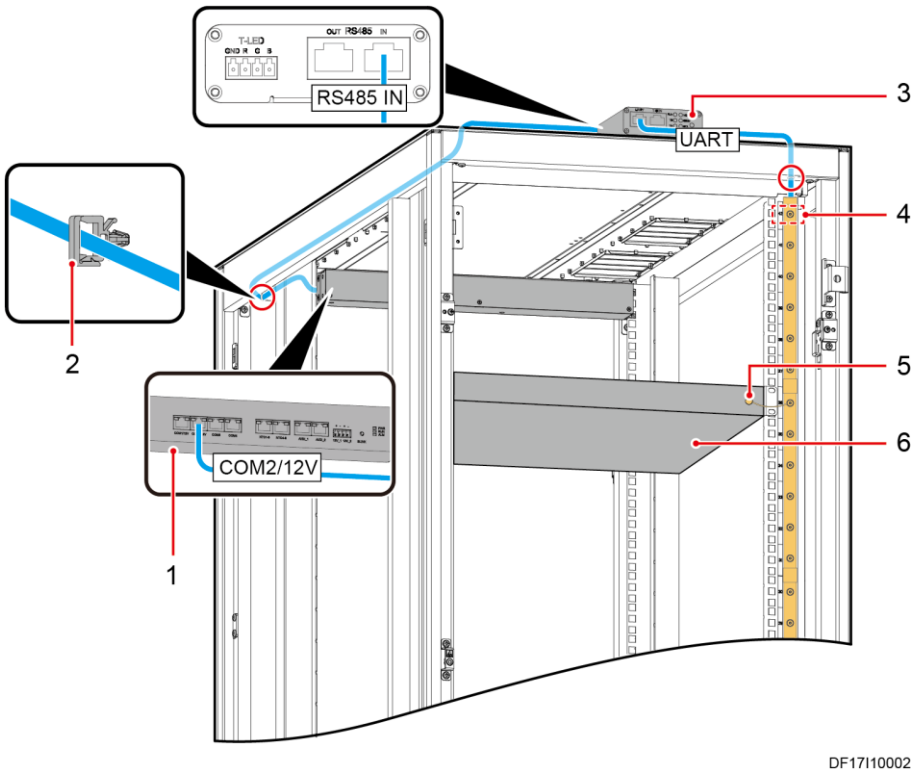
- The securing positions of fasteners are for reference only. The actual mounting holes on the cabinets prevail.
- The cable between the main control box and the rack environment unit is delivered with the smart U space manager.

Figure 15-44 Installing a smart U space manager (main control box attached to the top of the cabinet interior)



(1) Rack environment unit	(2) Fastener	(3) Main control box
(4) Asset detection strip (42 U detection point)	(5) U space electronic label	(6) Server

Figure 15-45 Installing a smart U space manager (main control box attached to the top of the cabinet exterior)



(1) Rack environment unit	(2) Fastener	(3) Main control box
(4) Asset detection strip (42 U detection point)	(5) U space electronic label	(6) Server

----End

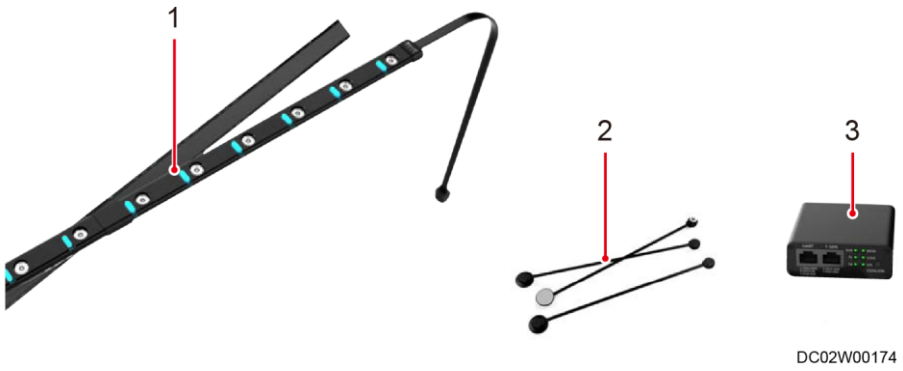
15.5.2 Installing a Smart U Space Manager (Connected to a UIM20A Expansion Module)

Context

The BOM number of the smart U space manager is 52273314. The BOM number of the U Asset Label is 52273315.

The smart U space manager consists of the following components.

Figure 15-46 Smart U space manager appearance



(1) Asset detection strip (2) U Asset Label (3) Main control box

Procedure

Step 1 Align the first detection point of the asset detection strip with the cabinet 42 U position and attach it to the rack.

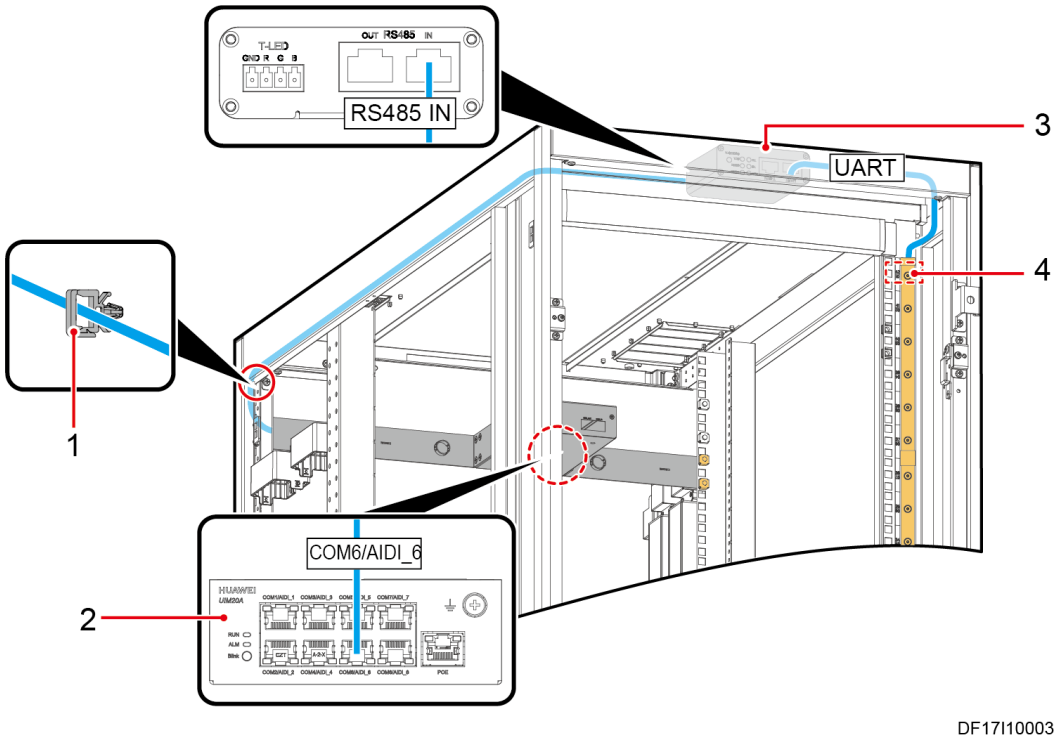
Step 2 Attach the main control box to the top of the cabinet interior (if there is space at the top of the cabinet interior) or exterior (if there is no space at the top of the cabinet interior).

Step 3 Connect cables between devices and secure the cables using fasteners.

NOTE

- The securing positions of fasteners are for reference only. The actual mounting holes on the cabinets prevail.
- The cable between the main control box and the UIM20A expansion module unit is delivered with the smart U space manager.
- In a standard scenario, connect a smart U space manager to the COM6/AIDI_6 port on the UIM20A expansion module.
- In a scenario where one UIM20A expansion module maps to four cabinets, connect smart U space managers to the COM1/AIDI_1, COM3/AIDI_3, COM5/AIDI_5, and COM7/AIDI_7 ports on the UIM20A expansion module. If the number of IT cabinets is not an integer multiple of 4, according to the cable connection rules, redundant COM ports exist on the UIM20A expansion module.

Figure 15-47 Installing a smart U space manager (main control box attached to the top of the cabinet interior)



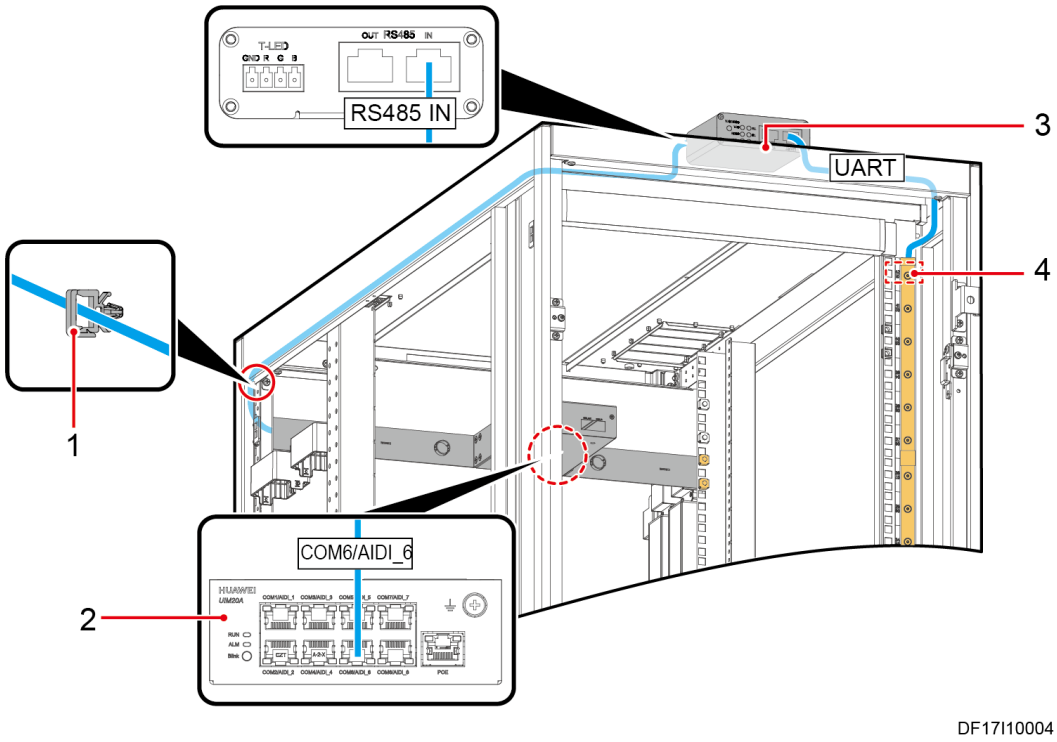
(1) Fastener

(2) UIM20A Expansion Module

(3) Main control box

(4) Asset detection strip (42 U detection point)

Figure 15-48 Installing a smart U space manager (main control box attached to the top of the cabinet exterior)



(1) Fastener

(2) UIM20A Expansion Module

(3) Main control box

(4) Asset detection strip (42 U detection point)

----End

15.6 Installing Temperature Sensors in Cabinets

15.6.1 (Optional) Installing Cabinet Temperature Sensors (Connected to a Rack Environment Unit)

Context

The BOM number of the temperature sensor is 33010557, including two temperature sensor cables and one extension cable. Each temperature sensor cable contains three NTCs.

Install temperature sensors in the IT cabinet and network cabinet.

Procedure

Step 1 Secure temperature sensors to the corresponding cabinet.

Step 2 Route the extension cable through the sponge strips between the rack rail and side panel, and secure the cable.

Step 3 Connect one end of the extension cable to the temperature sensor on the front door.

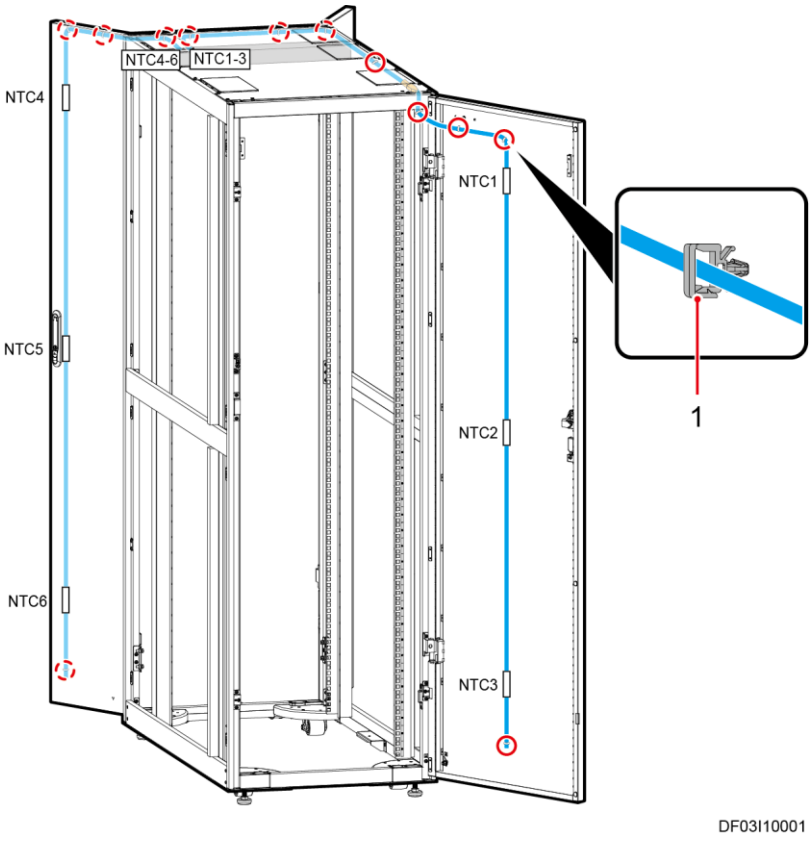
Step 4 Connect the other end of the extension cable and the temperature sensor on the rear door to the rack environment unit.

Step 5 Bind the cables with fasteners.

NOTE

- The securing positions of fasteners are for reference only. The actual mounting holes on the cabinets prevail.
- The temperature sensor is installed in the middle of the cabinet door and is vertical from top to bottom after installation.

Figure 15-49 Installing temperature sensors



(1) Fastener

----End

15.6.2 (Optional) Installing a Cabinet Temperature Sensor (Connected to the UIM20A Expansion Module)

Context

The BOM number of the temperature sensor is 33010557, including two temperature sensor cables and one extension cable. Each temperature sensor cable contains three NTCs.

The BOM number of T/H sensors is 02312PBL.

Install temperature sensors in the IT cabinet and network cabinet.

Procedure

Step 1 Attach the temperature sensor to the top of the cabinet.

Step 2 Secure temperature sensors to the corresponding cabinet.

Step 3 Route the extension cable through the sponge strips between the rack rail and side panel, and secure the cable.

Step 4 Connect one end of the extension cable to the temperature sensor on the rear door.

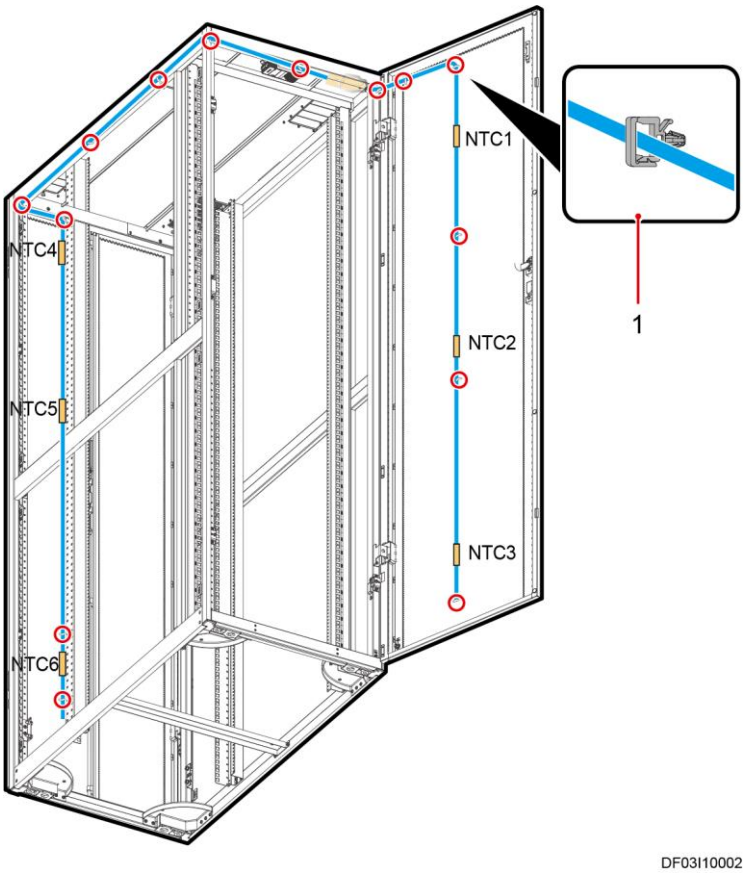
Step 5 Connect the other end of the extension cable and the temperature sensor on the front door to the T/H sensor.

Step 6 Bind the cables with fasteners.

NOTE

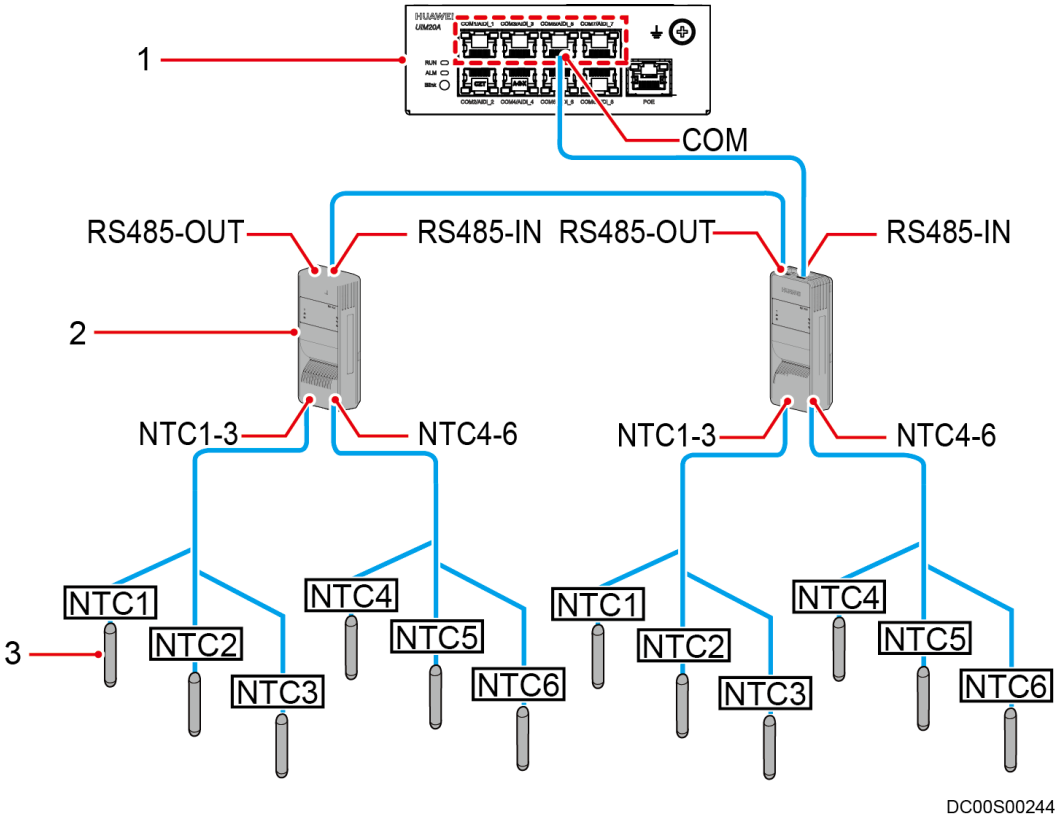
- The securing positions of fasteners are for reference only. The actual mounting holes on the cabinets prevail.
- The temperature sensors are installed in the middle of the cabinet door and are vertical from top to bottom after installation.
- If a T/H sensor is connected in a standard scenario, connect it to the COM5/AIDI_5 port on the UIM20A expansion module.
- If a T/H sensor is connected in a one-to-four scenario, connect it to the COM1/AIDI_1, COM3/AIDI_3, COM5/AIDI_5, and COM7/AIDI_7 ports on the UIM20A expansion module. If the number of IT cabinets is not an integer multiple of 4, connect the sensor based on the cable connection rules, redundant COM ports on the UIM20A expansion module are idle.

Figure 15-50 Installing temperature sensors



(1) Fastener

Figure 15-51 Connecting cables to the temperature sensors



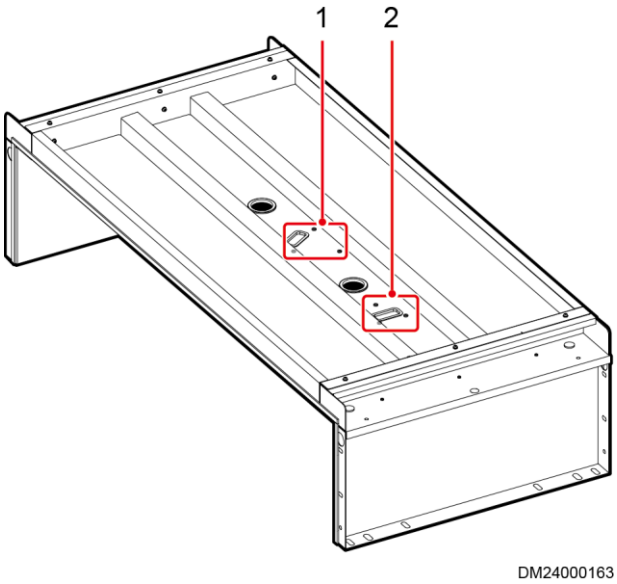
(1) UIM20A expansion module (2) TH sensor (3) Temperature sensor

----End

15.7 Installing Monitoring Devices on a Control Skylight

Monitoring devices should be installed in appropriate holes on the control skylight.

Figure 15-52 Control skylight



(1) Camera mounting hole

(2) Mounting hole for the multi-functional sensor or smoke detector

NOTE

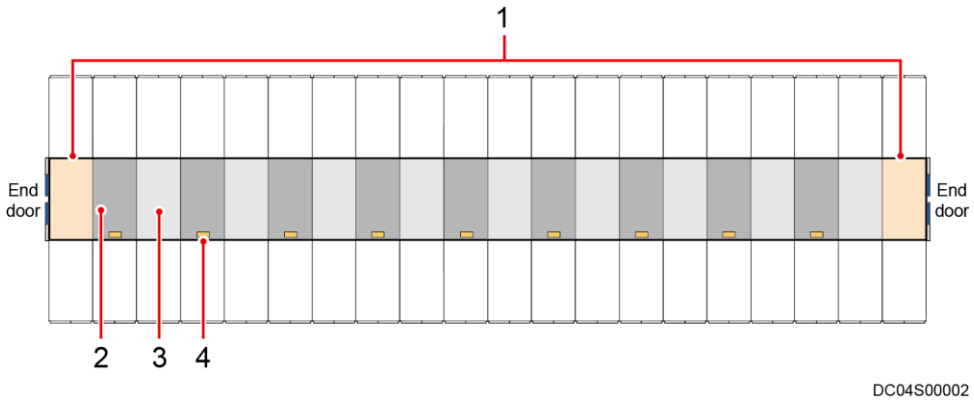
- After monitoring devices are installed on the control skylight and cables are routed, attach a piece of sponge to each of the two monitoring device mounting holes outside the top of the control skylight to block the holes.
- If no monitoring device is installed on the control skylight, attach sponge to the mounting holes outside the top of the control skylight to block the holes.
- Obtain black sponge from the fitting bag for the control skylight.

15.7.1 Installing a Skylight Magnetic Lock

Context

The BOM number of a skylight magnetic lock is 02070262.

Figure 15-53 Layout of skylight magnetic locks



(1) Control skylights (2) Rotating skylight (3) Flat skylight

(4) Skylight magnetic lock

NOTE

The layout diagram of skylight magnetic locks is for reference only. The actual layout prevails.

Preparations

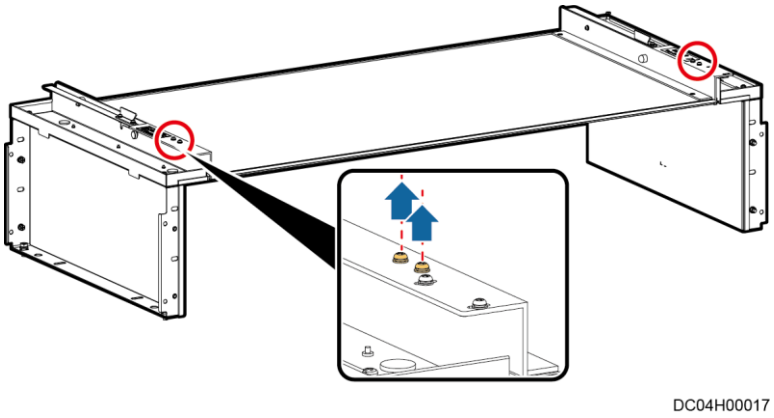
Tool: Phillips screwdriver

Material: magnetic lock

Procedure

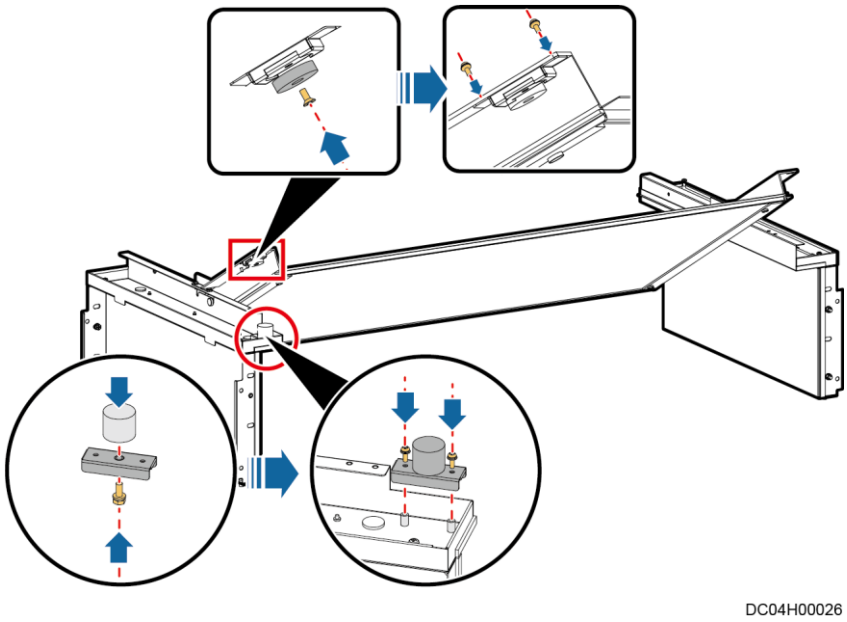
Step 1 Remove screws from the skylight.

Figure 15-54 Removing screws from the skylight



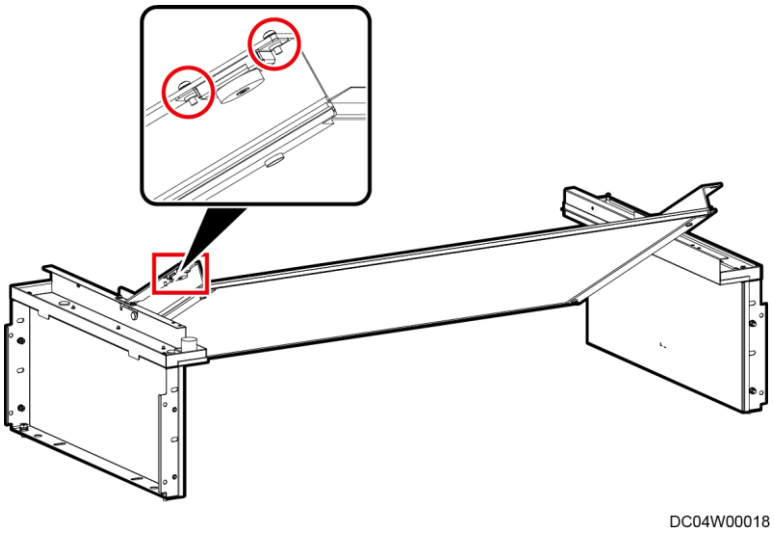
Step 2 Install a skylight magnetic lock.

Figure 15-55 Installing a skylight magnetic lock



Step 3 (Optional) Adjust the position of the skylight magnetic lock until the magnetic lock fully closes.

Figure 15-56 Adjusting a skylight magnetic lock



----End

15.7.2 Installing a Camera

Prerequisites

Control skylights have been installed.

Context

The camera needs to be installed on a control skylight.

Preparations

Tool: Phillips screwdriver

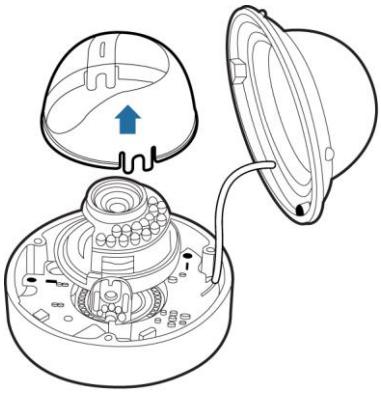
Materials: SD card, camera

Procedure

Step 1 Install an SD card.

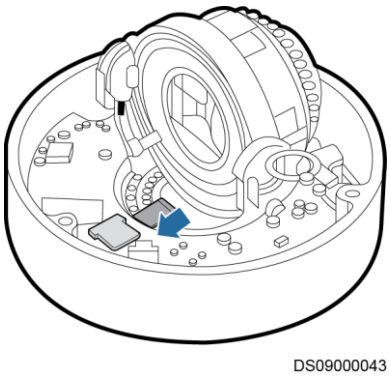
1. Loosen the screws on the front cover of the camera, remove the front cover, and take out the inner cover clipped on the lens.

Figure 15-57 Removing the front and inner covers



2. Gently insert the SD card into the SD card slot.

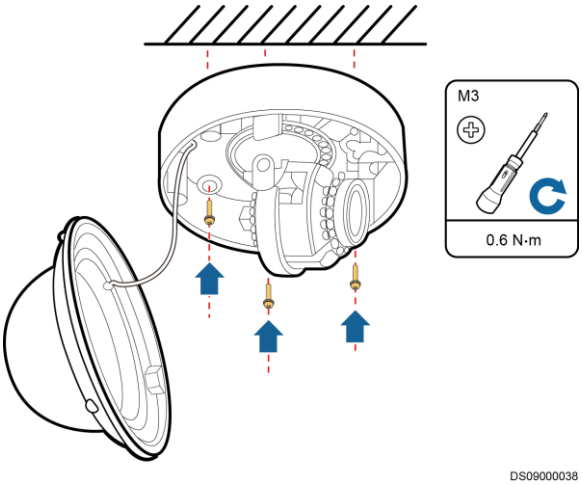
Figure 15-58 Installing an SD card



Step 2 Route the camera cable through the control skylight.

Step 3 Align the holes in the camera base with the holes in the control skylight, and use three M3 screws to secure the camera to the control skylight.

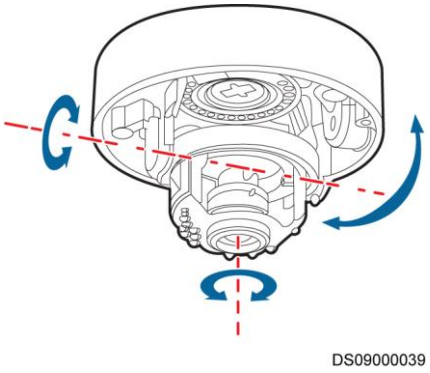
Figure 15-59 Installing a camera base



NOTE

The camera features a three-axis design, and is delivered with an auxiliary video cable for connecting to display devices such as monitors. The camera base can be adjusted by 0–355° horizontally and 0–75° vertically. The camera lens can be adjusted by 0–355° to ensure that the monitoring image is horizontal, facilitating installation in different directions.

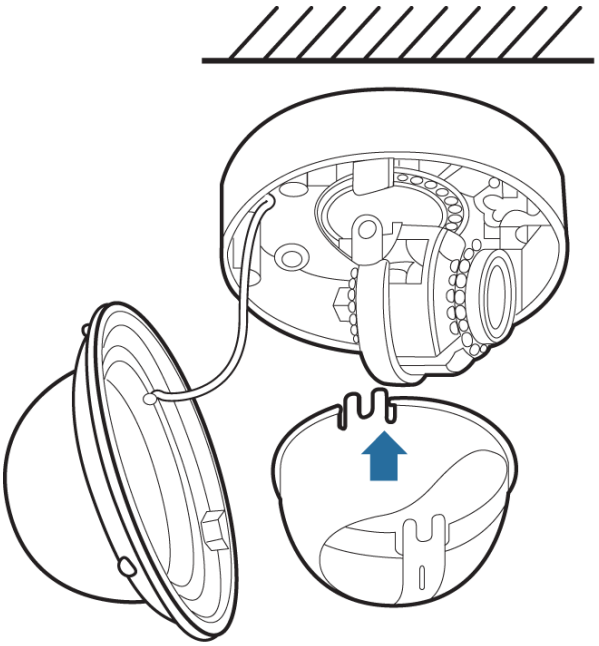
Figure 15-60 Three-axis adjustment



Step 4 Adjust the infrared light panel of the camera and keep the photoresistor perpendicular to the camera base to avoid blocking the infrared light and photoresistor.

Step 5 Install the inner cover.

Figure 15-61 Installing an inner cover

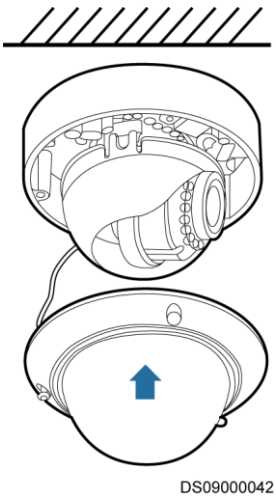


Step 6 Install the front cover of the camera in the direction shown in Figure 15-62, and tighten the screws on the front cover.

NOTE

Remove the protective film from the transparent cover.

Figure 15-62 Installing a front cover



----End

15.7.3 (Optional) Installing a Smoke Detector

Context

The screws for installing a smoke detector are located in the fitting bag of the supporting object.

Preparations

Tool: Phillips screwdriver

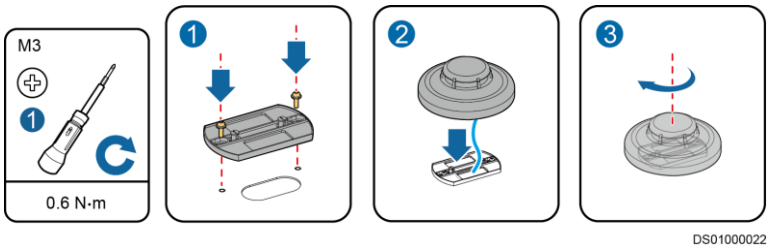
Material: smoke detector

Procedure

Step 1 Rotate the smoke detector body counterclockwise to separate the body from the base.

Step 2 Use M3x10 screws to secure the smoke detector base to the appropriate position on the control skylight.

Figure 15-63 Installing a smoke detector



Step 3 Route the smoke detector cable through the reserved cable hole.

Step 4 Align the mounting hole on the smoke detector body with the mounting hole on the base, and rotate the body clockwise until it locks in.

----End

15.7.4 (Optional) Installing Multi-Functional Sensors

Context

The BOM number of a multi-functional sensor is 33010477.

Preparations

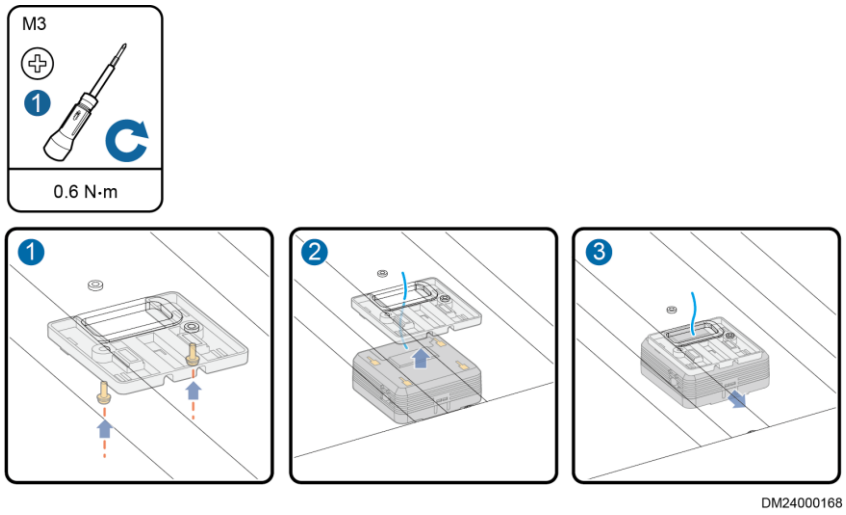
Tool: Phillips screwdriver

Material: multi-functional sensor

Procedure

Step 1 Align the holes in the mounting base for the multi-functional sensor with the holes in the control skylight, and use two M3x10 screw assemblies to secure the mounting base to the control skylight.

Figure 15-64 Installing a multi-functional sensor



Step 2 Route the cable of the multi-functional sensor through the cable hole in the control skylight.

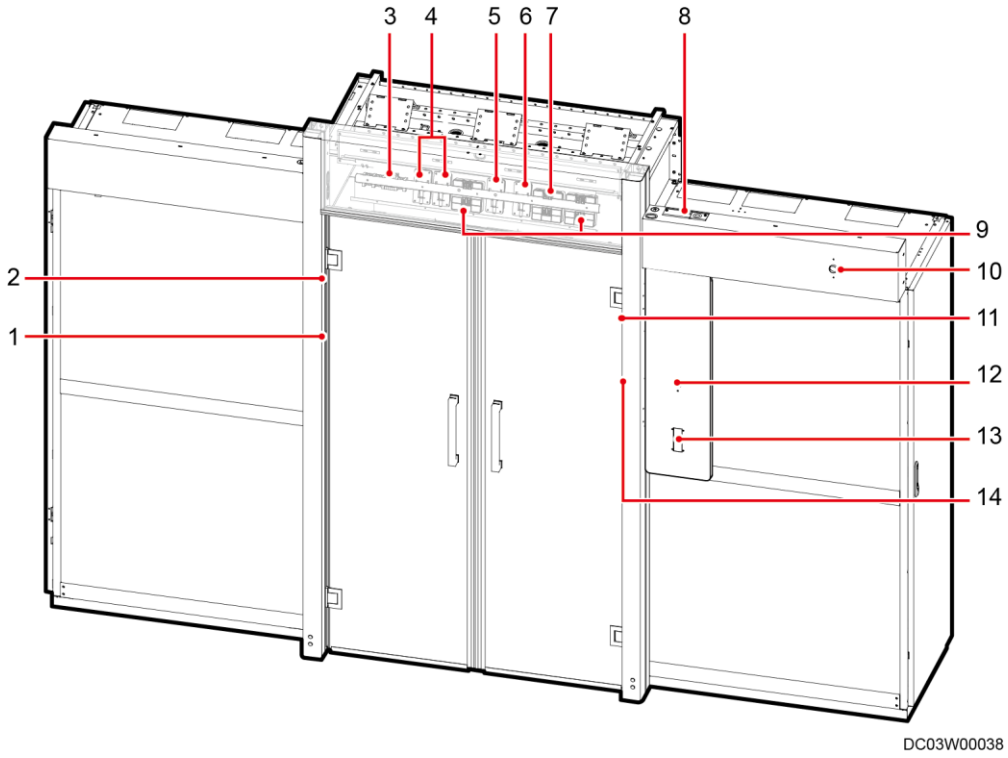
Step 3 Secure the multi-functional sensor body to the base.

----End

15.8 Installing Monitoring Devices on the End Door

15.8.1 Layout of Monitoring Devices on the End Door

Figure 15-65 Layout of monitoring devices on the end door



(1) For the exit button	(2) For the emergency button	(3) For the upstream fuse
(4) For the atmosphere light power supply	(5) For the eLight actuator	(6) For the eLight power supply
(7) For the Access actuator	(8) For the pad power connector	(9) For the AC actuator
(10) For the alarm beacon	(11) For the atmosphere light button	(12) For the pad
(13) For the access control device	(14) For the light button	

NOTE

- A revolving door is used as an example to describe the layout of monitoring devices on the end door.
- Skylight actuator can be installed in the position of the atmosphere light power supply.

15.8.2 Installing an Actuator or Converter

Context

The monitoring devices mentioned in this section can be installed in the same way. The AC actuator is used as an example.

Table 15-6 Mapping between the names and BOM numbers of monitoring actuators and converters

Item	BOM Number	Description
AC actuator	52271876	Install it at the upper frame mounting kit for the PDC in the smart module.
Access actuator	52271874	Install it at the upper frame mounting kit for the PDC or network cabinet in the smart module.
eLight actuator	52220928	Install it at the upper frame mounting kit for the PDC in the smart module.
eLight power supply	52220928	Install it at the upper frame mounting kit for the PDC in the smart module.
Atmosphere light power supply	52221117	Install it at the upper frame mounting kit for the PDC in the smart module.
Skylight actuator	52271875	Install it at the upper frame mounting kit for the end door in the smart module.

Preparations

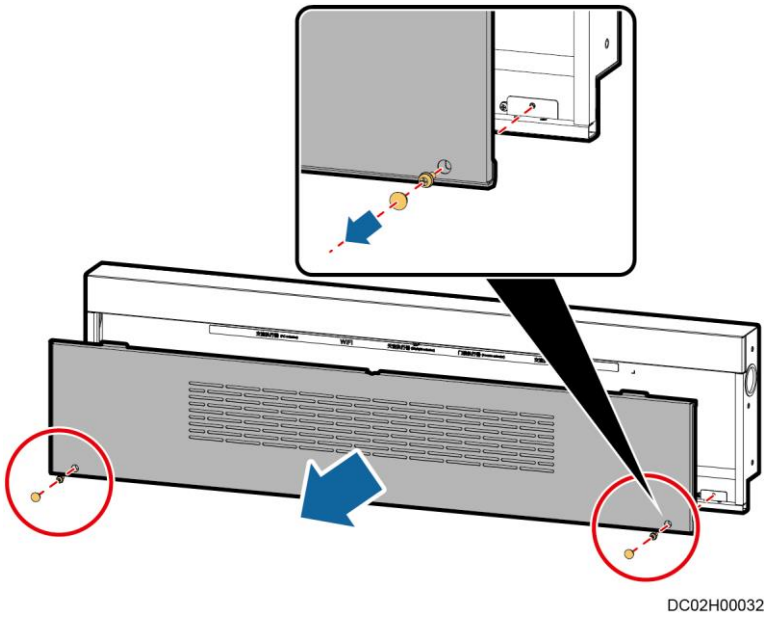
Tool: Phillips screwdriver

Materials: AC actuator, positioning kit

Procedure

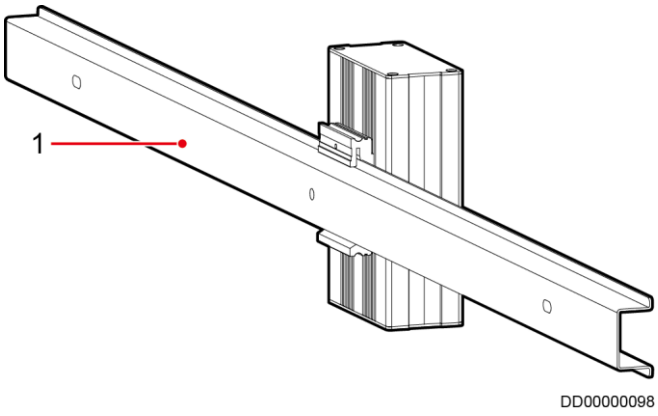
Step 1 Remove the fastener, remove M4 screws, and take off the rear plate.

Figure 15-66 Removing the rear plate from the upper frame mounting kit



Step 2 Install the AC actuator onto the guide rail. Determine the installation position for the AC actuator based on the label on the upper frame mounting kit. Align the upper slot on the rear mounting kit of the AC actuator with the upper part of the guide rail and then press the lower part of the converter to clamp the lower slot of the converter to the guide rail. Shake the AC actuator in different directions to check that it is securely installed.

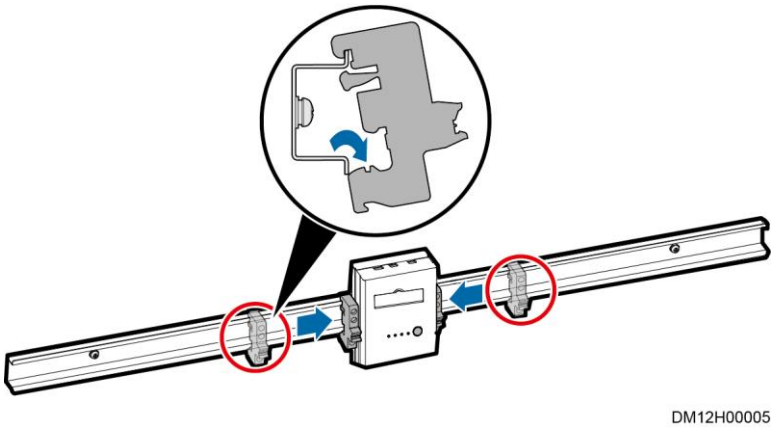
Figure 15-67 Installing the AC actuator onto the guide rail



(1) Guide rail

Step 3 Install positioning kits. Install two positioning kits on the two sides of the AC actuator to limit the movement of the converter.

Figure 15-68 Installing positioning kits



Step 4 Install other actuators. Install other actuators in place in a similar way and secure them using positioning kits.

Step 5 After connecting actuator or converter cables, reinstall the rear plate for the upper frame mounting kit.

----End

15.8.3 Installing an Alarm Beacon

Context

The BOM number of an alarm beacon is 22010028. By default, one smart module is equipped with one alarm beacon only.

NOTICE

Install the alarm beacon on a visible end door near the equipment room door.

Preparations

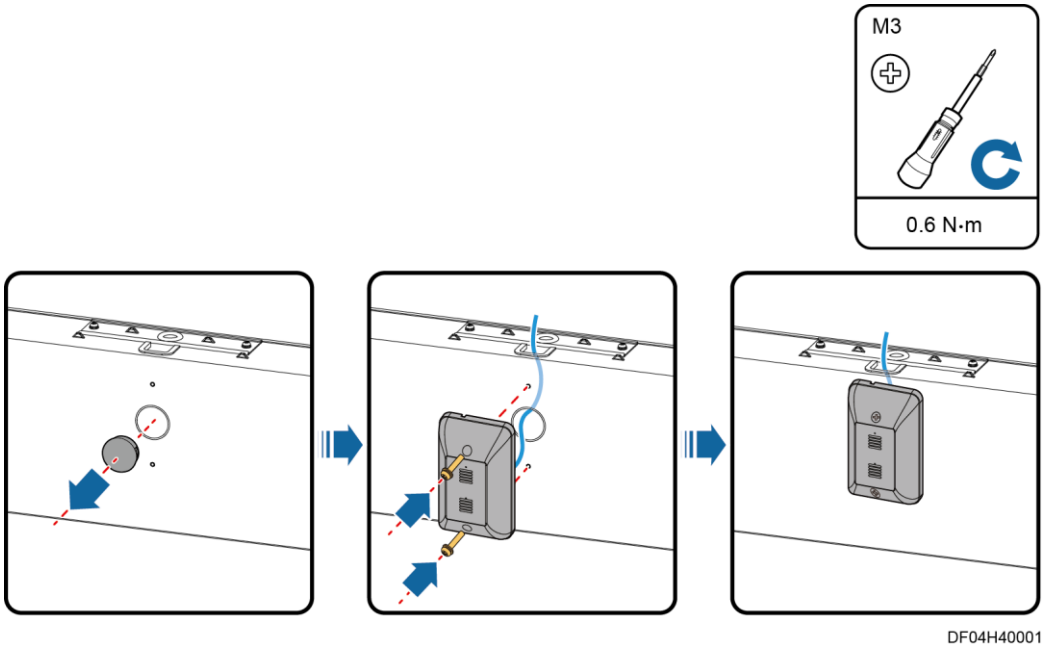
Tool: Phillips screwdriver

Material: alarm beacon

Procedure

Step 1 Remove the buckle from the alarm beacon mounting position.

Figure 15-69 Installing an alarm beacon



Step 2 Route the alarm beacon cable through the door box cable hole.

Step 3 Secure the alarm beacon to the door box using two M3 screws.

----End

15.8.4 (Optional) Installing a Revolving Door Magnetic Lock

Context

The BOM number for a revolving door magnetic lock is 02070261.

Preparations

Tools: hex key, Phillips screwdriver

Materials: magnetic lock and accessories, white rubber washer

Document: revolving door monitoring device installation position diagram

Procedure

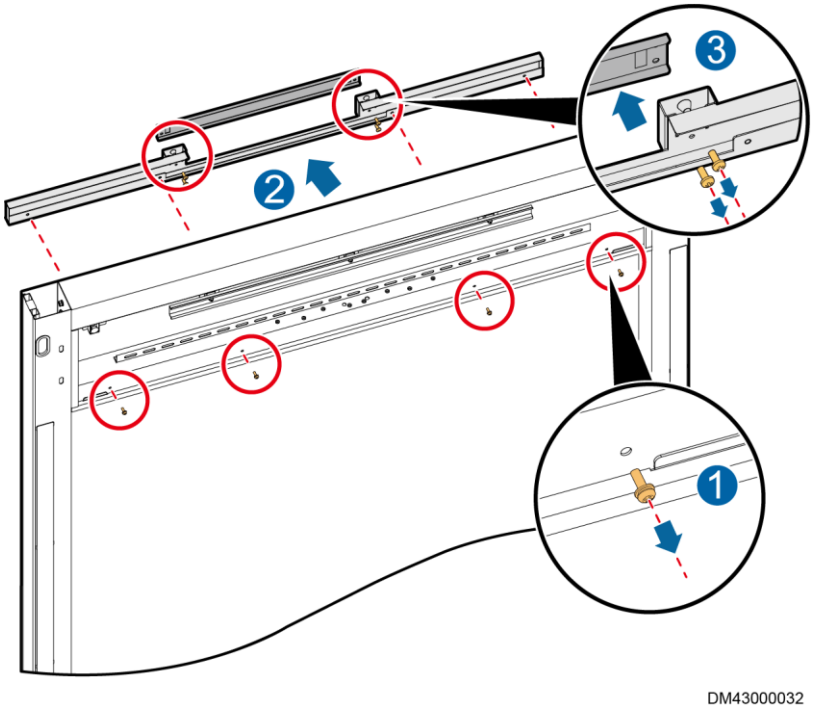
Step 1 Remove the cover of the magnetic lock. The cover of the magnetic lock is located under the mounting kit above the door. If no magnetic lock is configured, the cover is used to cover up the magnetic lock installation position. If a magnetic lock is configured, remove the cover and install the magnetic lock.

NOTE

After a magnetic lock is installed, the cover can be discarded.

1. Remove the cover at the rear of the mounting kit above the door, remove the four screws at the bottom of the mounting kit, and keep the screws aside.
2. Remove the mounting plate of the magnetic lock cover.
3. Remove the four screws on the mounting plate of the magnetic lock cover, and remove the cover of the magnetic lock.

Figure 15-70 Removing the cover of the magnetic lock

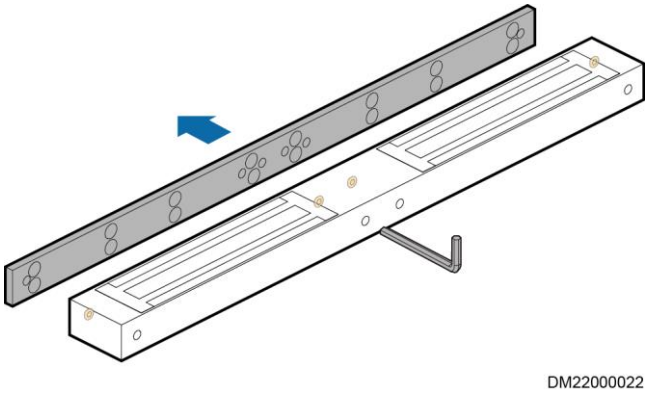


Step 2 Remove the fixing plate of the magnetic lock. Remove the fixing plate of the revolving door magnetic lock using the hex key delivered with the magnetic lock.

NOTE

Four hex socket screws need to be removed in this step.

Figure 15-71 Removing the fixing plate of a magnetic lock



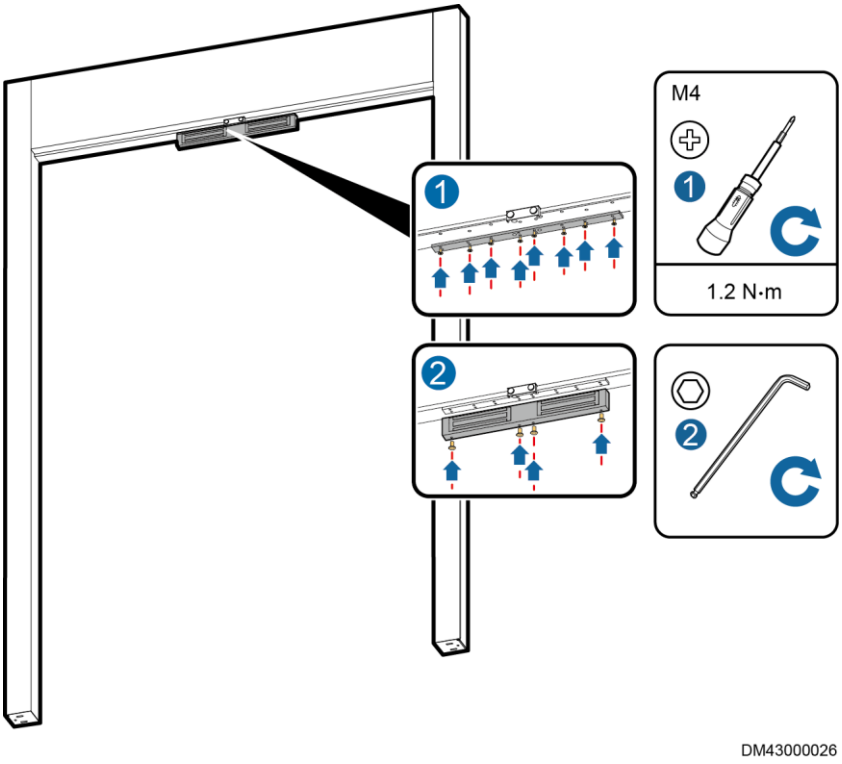
Step 3 Install the magnetic lock fixing plate. Secure the magnetic lock fixing plate to the upper frame mounting kit using eight M4 countersunk screws, as shown by (1) in Figure 15-72.

NOTICE

Pay attention to the direction of the magnetic lock fixing plate, and ensure that the protruded surface of the magnetic lock faces the magnet.

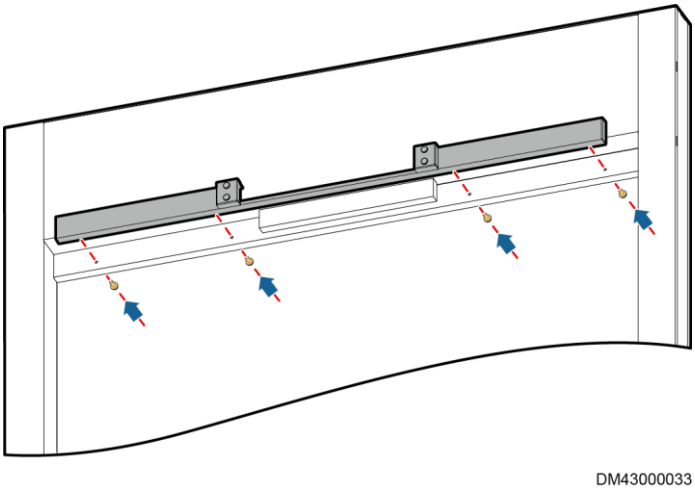
Step 4 Install the magnetic lock. Route cables of the magnetic lock into the upper frame mounting kit, and secure the magnetic lock to the fixing plate using the hex key delivered with the magnetic lock, as shown by (2) in Figure 15-72.

Figure 15-72 Installing a magnetic lock



Step 5 Install the mounting plate of the magnetic lock cover.

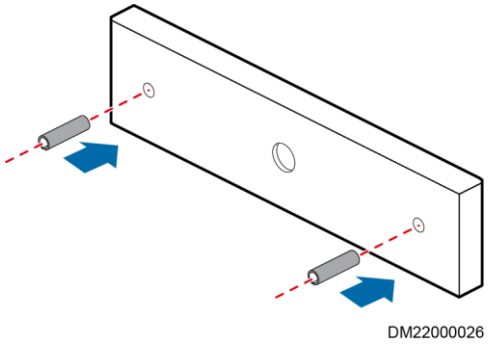
Figure 15-73 Installing the mounting plate of the magnetic lock cover



Step 6 Install the magnet.

1. Take the magnet out of the magnetic lock fitting bag, and insert the positioning pins of the magnet into the magnet using a rubber mallet.

   Figure 15-74 Installing positioning pins of the magnet

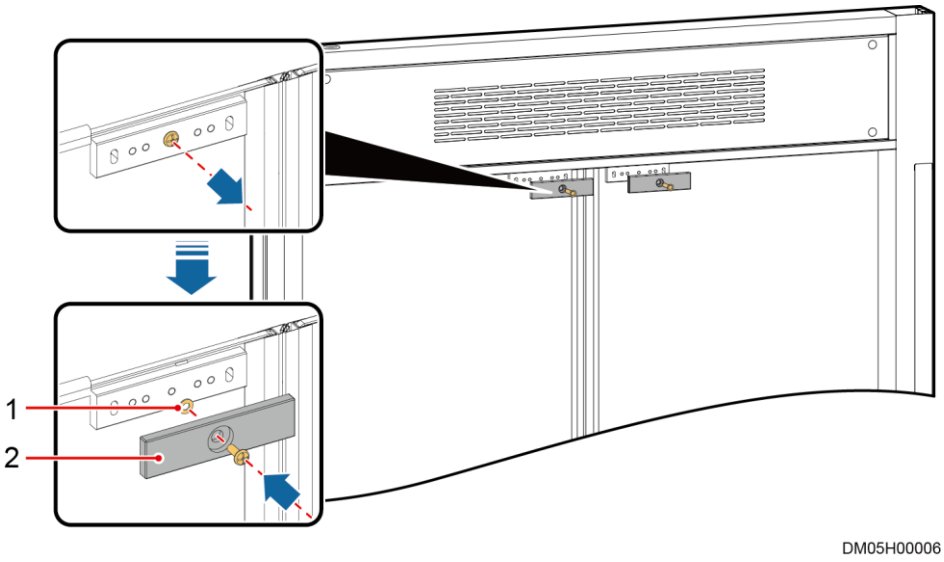
   

2. Insert the assembled magnet into the magnetic lock base on the revolving door, and secure the magnet to the door using the screws on the door and the white washer delivered with the magnet lock.

   NOTE

   When securing the magnet to the door panel, do not over-tighten the screws so that the white rubber washer is elastic. The washer will adjust the magnet to a correct position because of its elasticity.

Figure 15-75 Installing the magnet



(1) White rubber washer (2) Magnet

Step 7 (Optional) Adjust the magnet.

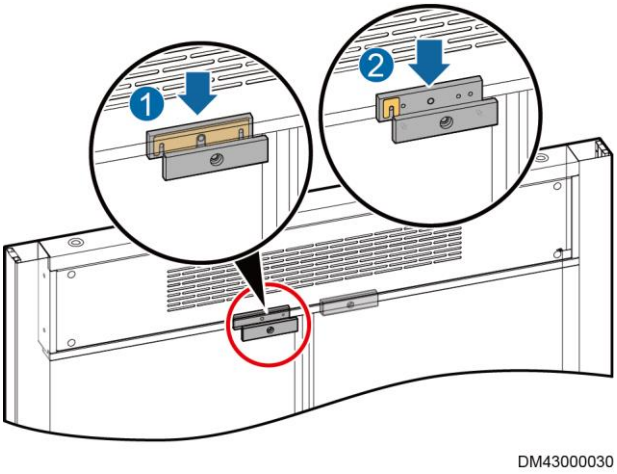
If the magnet does not work properly after power-on, check that:

1. The magnet provides magnetic force by attaching magnetizable iron parts to it.
2. The revolving door magnetic lock is aligned with the magnet face-to-face.
3. No gap exists between the revolving door magnetic lock and the magnet.

If any of the preceding conditions is not met, the magnetic lock fails to attract the magnet. Troubleshoot the magnet as follows:

1. Check the circuit and rectify any circuit fault.
2. Adjust the magnet base and the door panel to align the magnetic lock with the magnet face-to-face. Ensure that the deviation is minimum.
3. If a gap exists between the revolving door magnetic lock and the magnet, rectify the fault as shown by (1) in Figure 15-76.
4. If the magnet is not level, rectify the fault as shown by (2) in Figure 15-76 to adjust the magnet levelness.

Figure 15-76 Adjusting the gap



----End

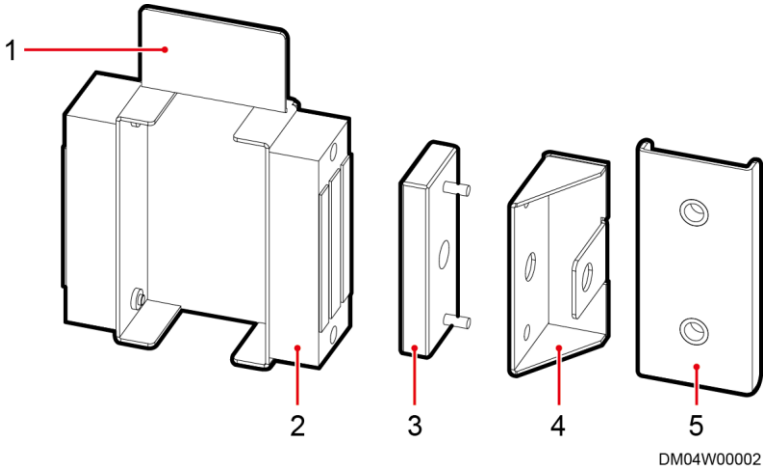
15.8.5 (Optional) Installing a Sliding Door Magnetic Lock

Context

A sliding door magnetic lock is optional in dual-row cabinet scenarios.

The BOM number for a sliding door magnetic lock is 02070215. The following components are required for installing a magnetic lock.

Figure 15-77 Components of a sliding door magnetic lock



(1) Magnetic lock fastener

(2) Magnetic lock

(3) Magnet

(4) Magnet fastener

(5) Magnet washer

Preparations

Tool: Phillips screwdriver

Materials: magnetic lock and accessories

Procedure

Step 1 Take out the magnetic lock and disassemble it, and keep the two screws aside.

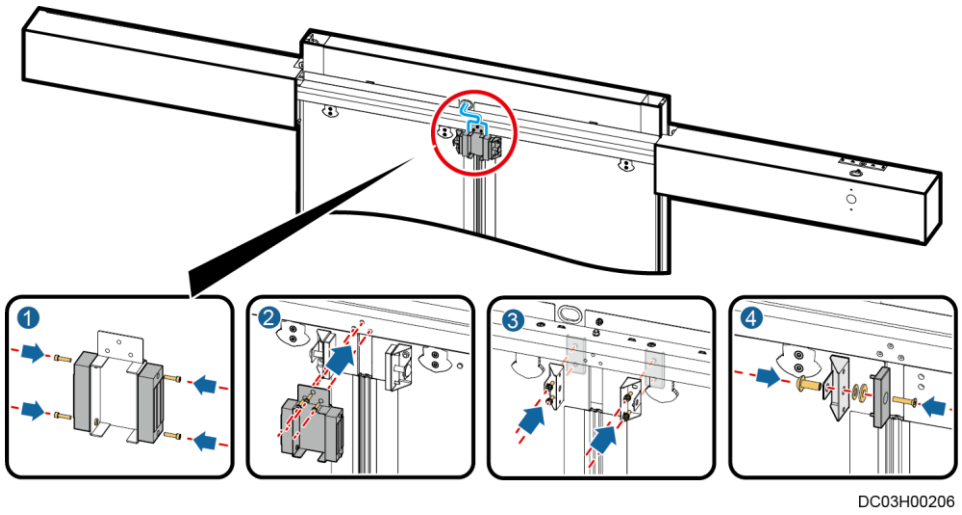
Step 2 Secure the disassembled magnetic lock to the magnetic lock fastener using the screws removed in the previous step.

Step 3 Secure the assembly of the magnetic lock and magnetic lock fastener to the guide rail using three M4 screws.

Step 4 (Optional) Adjust the magnet fastener slightly in the horizontal direction to make the magnet closely attached to the magnetic lock.

Step 5 Secure the magnet to the magnet fastener using the screws and washers available in the fitting bag of the sliding door magnetic lock.

Figure 15-78 Installing a sliding door magnetic lock



----End

15.8.6 Installing a Button

Context

- The light button and door exit button (green) can reset automatically. Their BOM numbers are both 16050101.
- You need to manually reset the emergency button (red). Its BOM number is 16050102.
- You need to manually reset the atmosphere light button. Its BOM number is 52221117.

You can install the light button, door exit button, emergency button and atmosphere light button in the same way.

Preparations

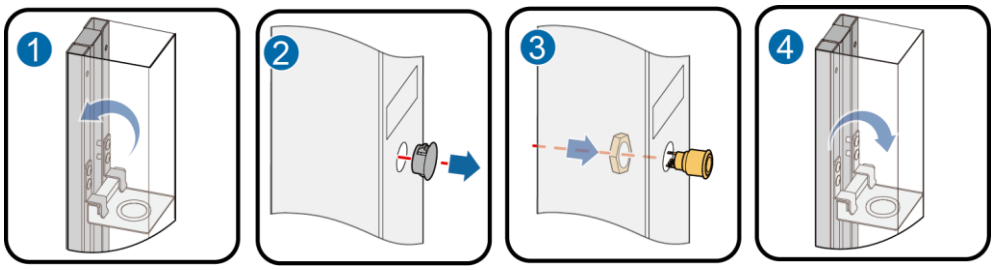
Tool: socket wrench

Material: button

Procedure

Step 1 Remove the side plate from the post, as shown by (1) in below figure.

Figure 15-79 Installing a button



Step 2 Remove the buckle from the button mounting position, as shown by (2) in above figure.

Step 3 Secure the button to the post using the nut delivered with the button, as shown by (3) in above figure.

Step 4 Route the button cables out of the cable hole in the upper part of the post and then into the upper frame mounting kit of the end door.

Step 5 Reinstall the post side plate, as shown by (4) in above figure.

----End

15.8.7 Installing a Monitoring Device on the Pad Mounting Kit

Sliding door and revolving door scenarios: The BOM number of the pad mounting kit is 21243556.

NOTE

When securing monitoring devices to the pad mounting kit, do not use the screws delivered with the monitoring devices.

15.8.7.1 (Optional) Installing a Card Reader with a Keypad

Context

The BOM number of a card reader with a keypad is 02070172.

Preparations

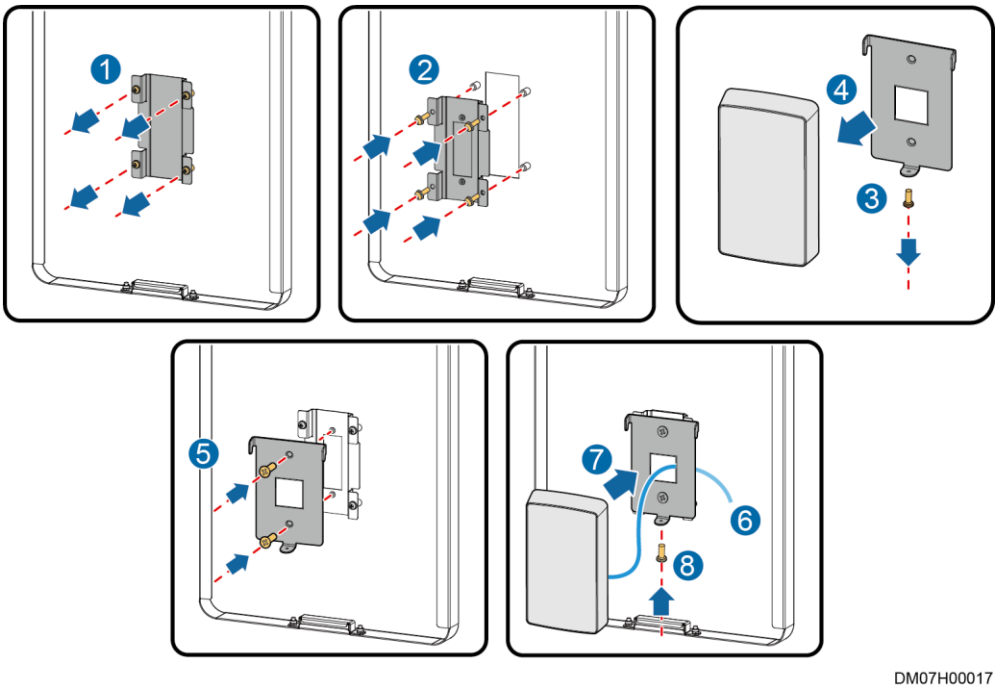
Tool: Phillips screwdriver

Materials: card reader with a keypad and accessories

Procedure

Step 1 Remove the baffle plate from the installation position, as shown by (1) in Figure 15-80.

Figure 15-80 Installing a card reader with a keypad



Step 2 Secure the baffle plate with a cable hole on the lower part to the pad mounting kit, as shown by (2) in Figure 15-80.

NOTE

Keep the protruding plane of the baffle plate flush with the end plane of the pad mounting kit.

Step 3 Remove the M2x5 screws (set aside) of the card reader with a keypad and take off the baseplate, as shown by (3) and (4) in Figure 15-80.

Step 4 Secure the baseplate to the baffle plate using two M3x8 countersunk screws, as shown by (5) in Figure 15-80.

Step 5 Route the cable of the card reader with a keypad through the cable hole in the baffle plate, as shown by (6) in Figure 15-80.

Step 6 Secure the card reader with a keypad to the baseplate, as shown by (7) and (8) in Figure 15-80.

----End

15.8.7.2 (Optional) Installing a Fingerprint and Card Reader

Context

The BOM number of a fingerprint and card reader is 02070173.

Preparations

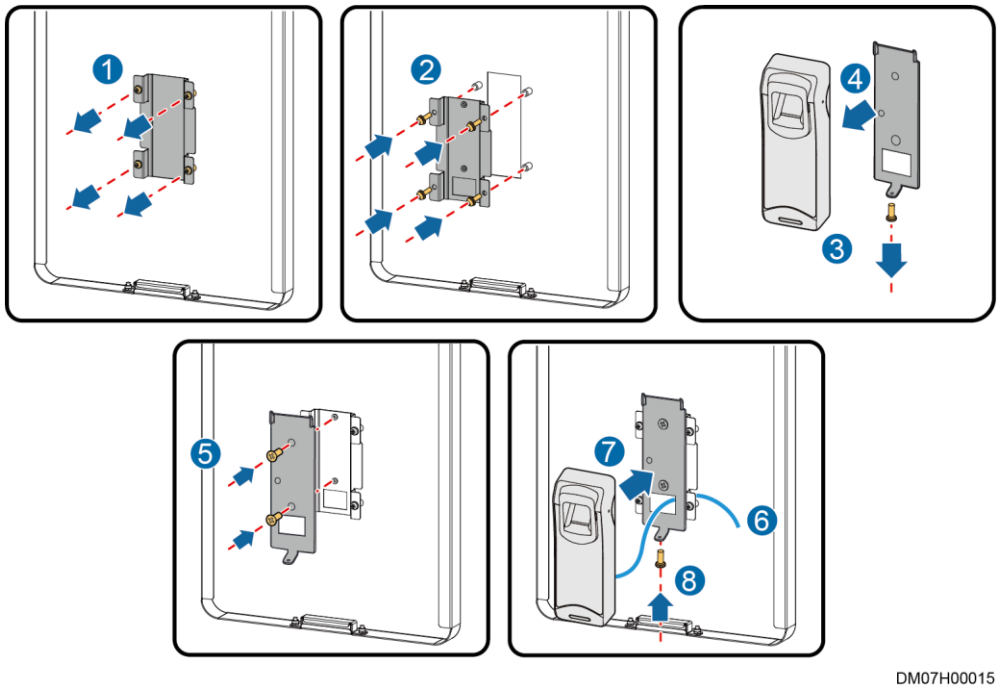
Tool: Phillips screwdriver

Materials: fingerprint and card reader and accessories

Procedure

Step 1 Remove the baffle plate from the installation position, as shown by (1) in Figure 15-81.

Figure 15-81 Installing a fingerprint and card reader



Step 2 Secure the baffle plate with a cable hole on the lower part to the pad mounting kit, as shown by (2) in Figure 15-81.

NOTE

Keep the protruding plane of the baffle plate flush with the end plane of the pad mounting kit.

Step 3 Remove the M2.5 screws (set aside) of the fingerprint and card reader and take off the baseplate, as shown by (3) and (4) in Figure 15-81.

Step 4 Secure the baseplate to the baffle plate using two M3x8 countersunk screws, as shown by (5) in Figure 15-81.

Step 5 Route the fingerprint and card reader cable through the cable hole in the baffle plate, as shown by (6) in Figure 15-81.

Step 6 Secure the fingerprint and card reader to the baseplate, as shown by (7) and (8) in Figure 15-81.

----End

15.8.7.3 (Optional) Installing a Fingerprint and Card Reader with a Keypad

Context

The BOM number of a fingerprint and card reader with a keypad is 02070174.

Preparations

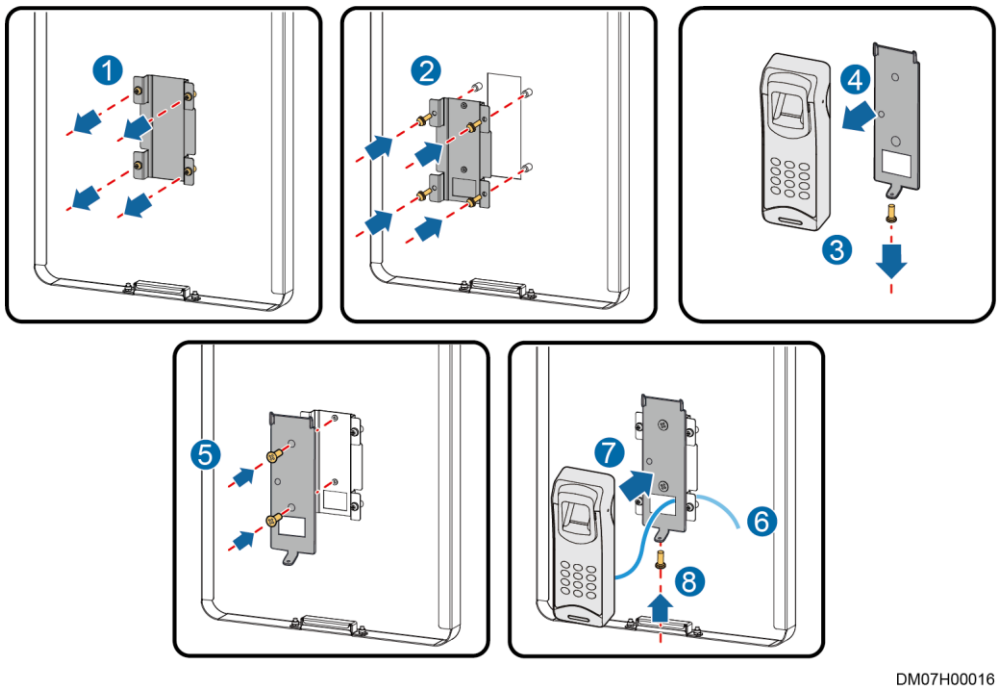
Tool: Phillips screwdriver

Materials: fingerprint and card reader with a keypad and accessories

Procedure

Step 1 Remove the baffle plate from the installation position, as shown by (1) in Figure 15-82.

Figure 15-82 Installing a fingerprint and card reader with a keypad



Step 2 Secure the baffle plate with a cable hole on the lower part to the pad mounting kit, as shown by (2) in Figure 15-82.

NOTE

Keep the protruding plane of the baffle plate flush with the end plane of the pad mounting kit.

Step 3 Remove the M2.5 screws (set aside) of the fingerprint and card reader with a keypad and take off the baseplate, as shown by (3) and (4) in Figure 15-82.

Step 4 Secure the baseplate to the baffle plate using two M3x8 countersunk screws, as shown by (5) in Figure 15-82.

Step 5 Route the cable of the fingerprint and card reader with a keypad through the cable hole in the baffle plate, as shown by (6) in Figure 15-82.

Step 6 Secure the fingerprint and card reader with a keypad to the baseplate, as shown by (7) and (8) in Figure 15-82.

----End

15.8.7.4 (Optional) Installing an IC Card Reader

Context

The BOM number of an IC card reader is 06080327.

Preparations

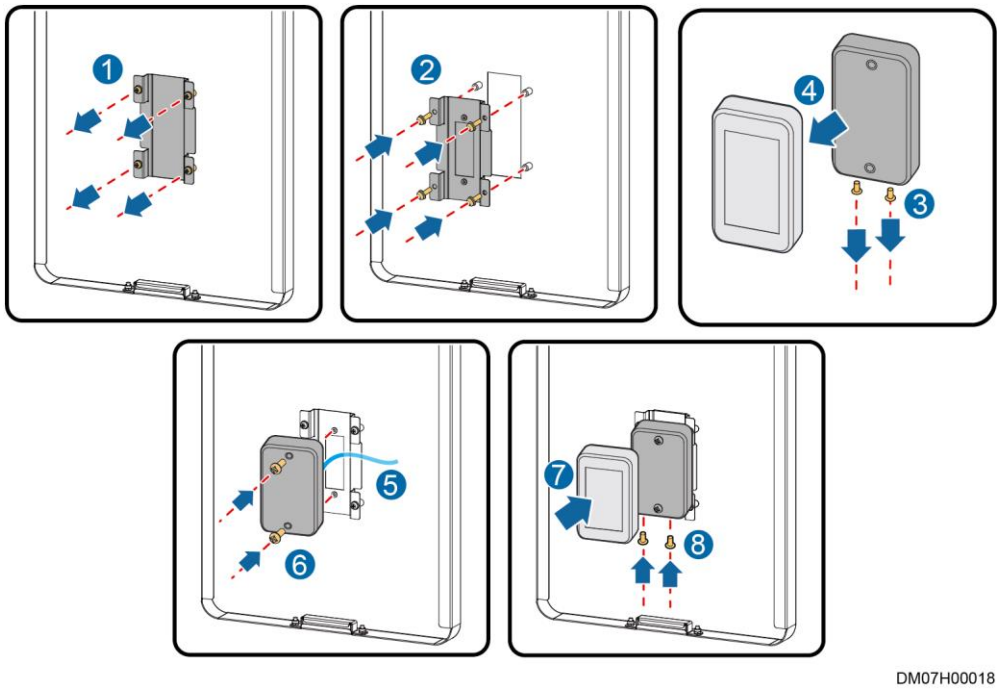
Tool: Phillips screwdriver

Materials: IC card reader and accessories

Procedure

Step 1 Remove the baffle plate from the installation position, as shown by (1) in Figure 15-83.

Figure 15-83 Installing an IC card reader



Step 2 Secure the baffle plate with a cable hole on the lower part to the pad mounting kit, as shown by (2) in Figure 15-83.

NOTE

Keep the protruding plane of the baffle plate flush with the end plane of the pad mounting kit.

Step 3 Remove the screws from the IC card reader cover (set aside) and take off the cover, as shown by (3) and (4) in Figure 15-83.

Step 4 Route the IC card reader cable through the cable hole in the baffle plate, as shown by (5) in Figure 15-83.

Step 5 Keep the screw holes of the cover at the bottom and use two M3x8 screws to secure the IC card reader to the baffle plate, as shown by (6) in Figure 15-83.

Step 6 Secure the cover to the IC card reader, as shown by (7) and (8) in Figure 15-83.

NOTICE

After the IC card reader has been installed properly, reinstall the cover on the card reader immediately. Otherwise, the card reader will trigger an alarm after it is powered on.

----End

15.8.7.5 Installing a Pad

Context

The BOM number of a pad is 01091655. The BOM number of the pad mounting bracket is 21203286.

Preparations

Tool: Phillips screwdriver

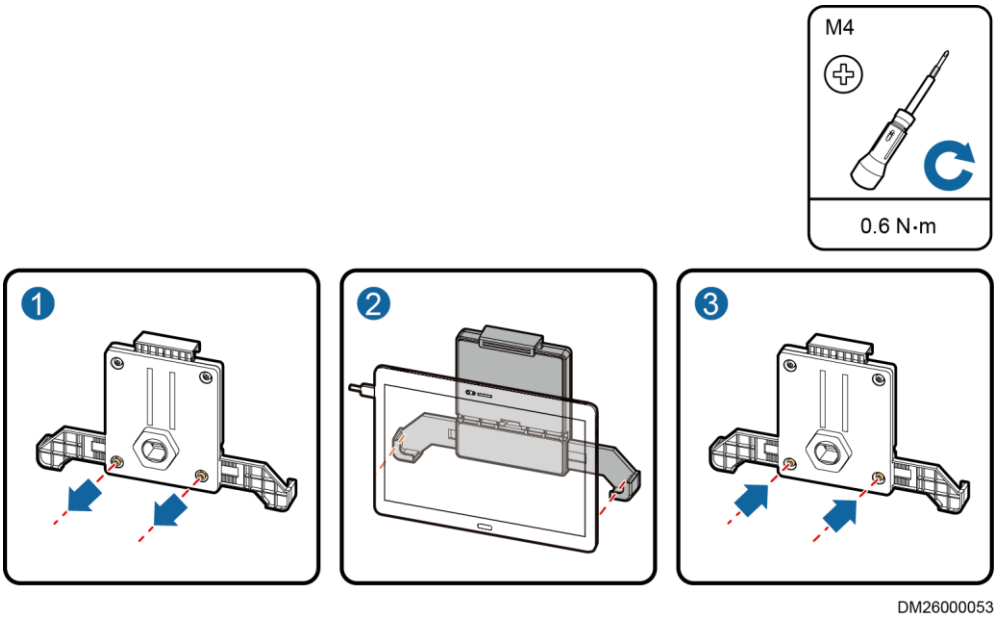
Materials: pad mounting bracket, pad

Procedure

Step 1 (Optional) If the feet in the lower part of the pad mounting bracket are not as wide as the pad, adjust the feet, as shown in Figure 15-84.

1. Loosen the M4x12 screws on the foot (do not remove it), as shown by (1) in Figure 15-84.
2. Adjust the foot symmetrically until it is as wide as the pad, as shown by (2) in Figure 15-84.
3. Tighten the M4x12 screws on the foot, as shown by (3) in Figure 15-84.

Figure 15-84 Adjusting the foot



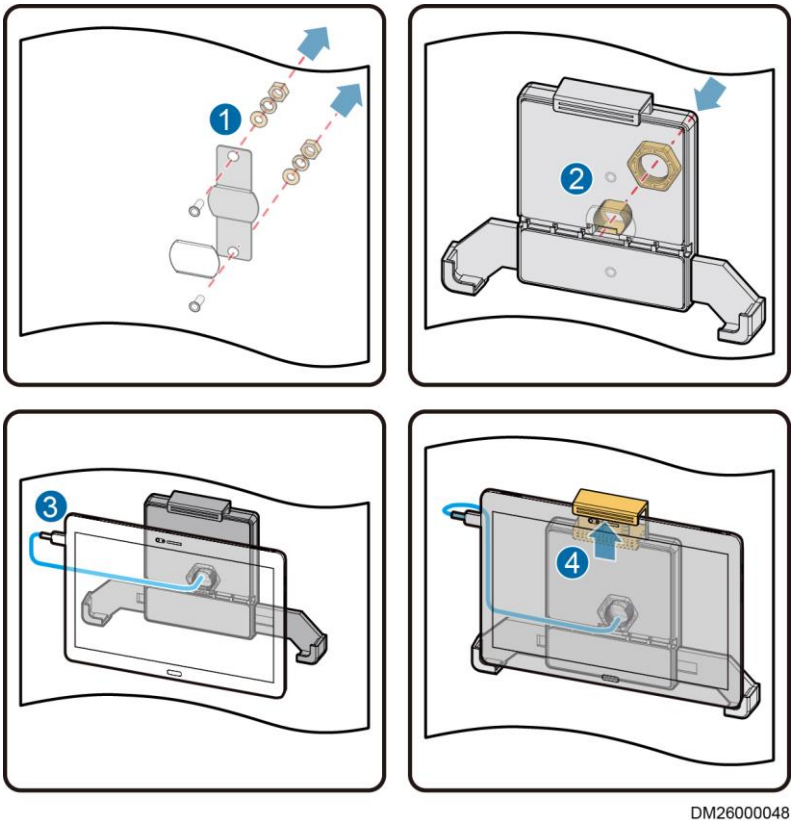
Step 2 Remove the cable hole baffle plate from the pad mounting kit, as shown by (1) in Figure 15-85.

Step 3 Remove the nut from the pad mounting bracket and secure the bracket to the pad mounting kit using the nut, as shown by (2) in Figure 15-85.

Step 4 Route the pad power cable through the cable hole in the pad mounting kit and connect it to the pad, as shown by (3) in Figure 15-85.

Step 5 Adjust the foot in the upper part of the pad mounting bracket and clamp the pad into the mounting bracket, as shown by (4) in Figure 15-85.

Figure 15-85 Installing a pad



----End

15.8.7.6 Securing the Pad Mounting Kit

Preparations

Tool: Phillips screwdriver

Material: pad mounting kit

NOTE

The pad mounting kit is installed in the same way on the revolving door and sliding door. The following figure uses a sliding door as an example.

Procedure

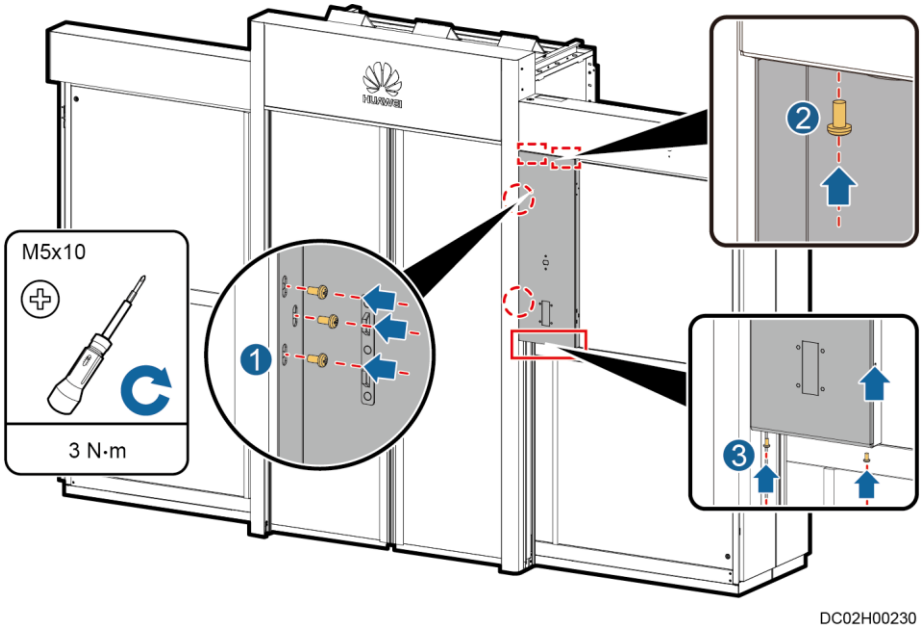
Step 1 Secure the pad mounting kit.

1. Use screws to secure the bottom plate of the pad mounting kit to the door post.
2. Use screws to secure the bottom plate of the pad mounting kit to the door box.
3. Clamp the cover of the pad mounting kit to the bottom plate of the pad mounting kit and secure them using screws.

NOTE

Route the cables of the pad and access control device, and close the cover of the pad mounting kit.

Figure 15-86 Securing the pad mounting kit



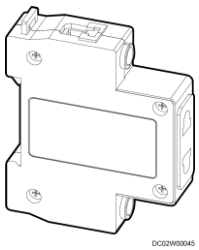
----End

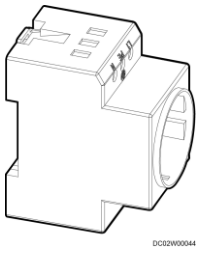
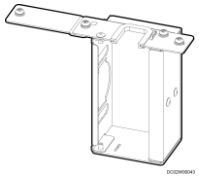
15.8.7.7 Installing a Pad Power Connector

Prerequisites

Before installing a pad power connector, prepare the materials listed in Table 15-7.

Table 15-7 Material list

Item	Exterior	Description
Pad power connector		The BOM number is 14190892.

Item	Exterior	Description
Pad power connector		The BOM number is 14190242.
Pad power connector holder		Obtain it from the aisle door accessories.

Preparations

Tools: Phillips screwdriver

Materials: pad power connector, pad power connector holder

Procedure

Step 1 Assemble the pad power connector holder.

1. Clamp the power connector to the guide rail of the holder.
2. Install the holder cover using two M4x12 screw assemblies.
3. Install the holder baffle plate using one M4x12 screw assembly.

Figure 15-87 Assembling the pad power connector holder (BOM number: 14190892)

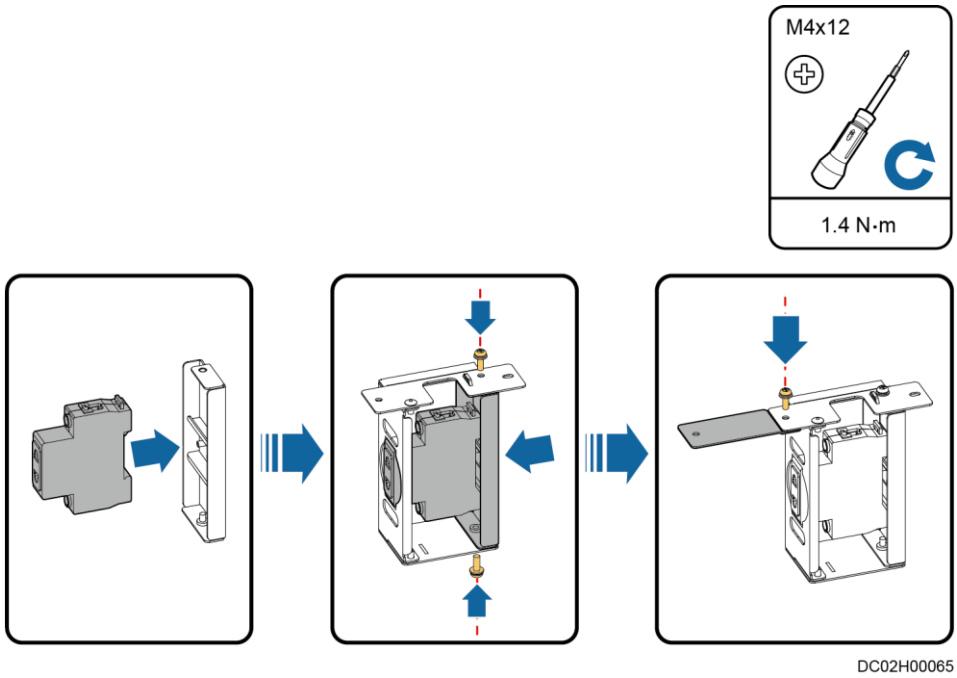
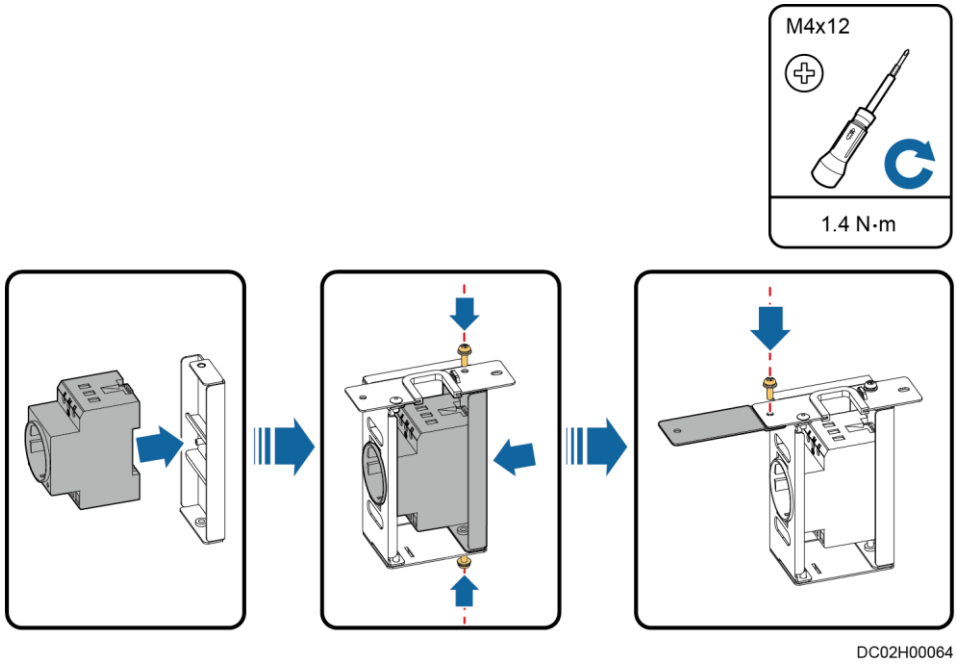


Figure 15-88 Assembling the pad power connector holder (BOM number: 14190242)



Step 2 Connect cables from the power connector to the AC actuator, and route the cables.

Figure 15-89 Connecting power connector cables (BOM number: 14190892)

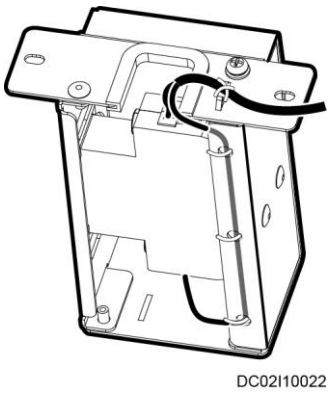
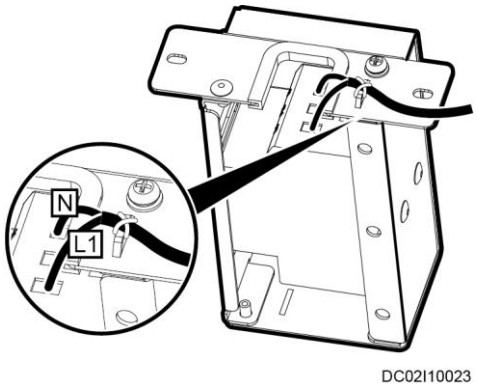


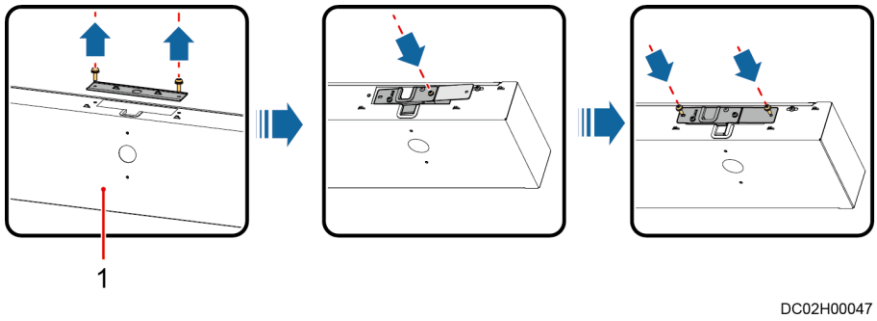
Figure 15-90 Connecting power connector cables (BOM number: 14190242)



Step 3 Secure the pad power connector holder.

1. Remove the baffle plate from the power connector mounting holes in the door box.
2. Secure the pad power connector holder to the door box using two M4x12 screw assemblies.

Figure 15-91 Securing the pad power connector holder



(1) Door box

----End

15.9 Installing Monitoring Devices on Cable Troughs

15.9.1 Layout of Smart ETH Gateways (Dual-Row Scenario)

NOTE

Components marked in the same background color should be connected to the same smart ETH gateway.

Table 15-8 Scenario 1

Scenario	Rules for Deploying Smart ETH Gateways
• Rack environment unit or UIM20A expansion module not deployed • Module length ≤ 7 m and the number of smart cooling products ≤ 4	Deploy 1 PCS for each end cabinet in the smart module, not for other cabinets. A total of 4 PCS should be deployed.

Figure 15-92 Layout of smart ETH gateways in scenario 1

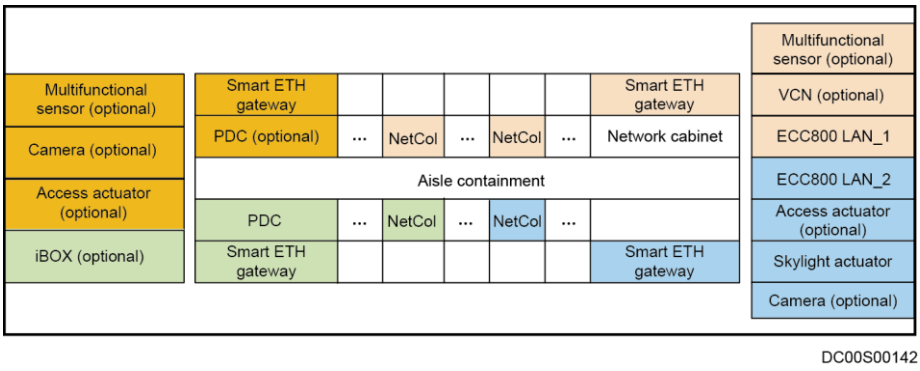


Table 15-9 Scenario 2

Scenario	Rules for Deploying Smart ETH Gateways
• Rack environment unit or UIM20A expansion module not deployed • Module length > 7 m and the number of smart cooling products > 4	Deploy 1 PCS for each end cabinet and IT cabinet in the middle in the smart module, not for other cabinets. A total of 6 PCS should be deployed.

Figure 15-93 Layout of smart ETH gateways in scenario 2

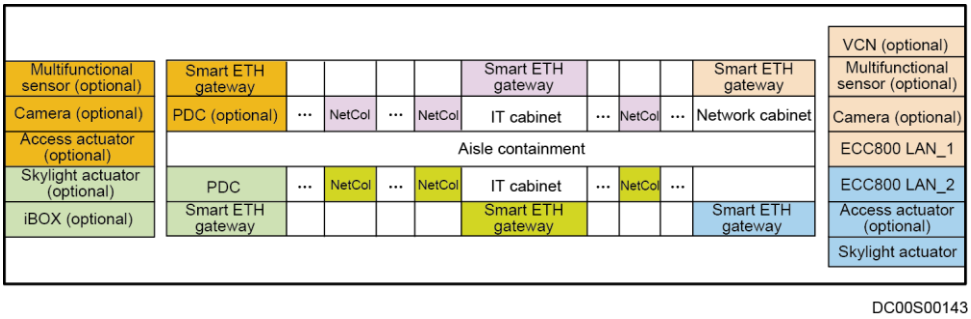
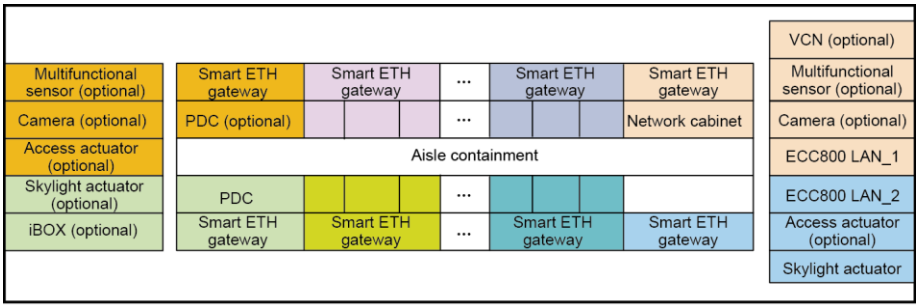


Table 15-10 Scenario 3

Scenario	Rules for Deploying Smart ETH Gateways
Rack environment unit or UIM20A expansion module deployed	Deploy 1 PCS for each end cabinet and 1 PCS for every three cabinets among other cabinets in the smart module.

Figure 15-94 Layout of smart ETH gateways in scenario 3



NOTE

- When the smart module is 4 m long or less, no multi-functional sensor is deployed in the network cabinet.
- When the smart module is longer than 7 m, deploy one multi-functional sensor in the middle of the smart module aisle (one more control skylight is deployed). The multi-functional sensor can be connected to any smart ETH gateway in the middle.

15.9.2 Layout of Smart ETH Gateways (Single-Row Scenario)

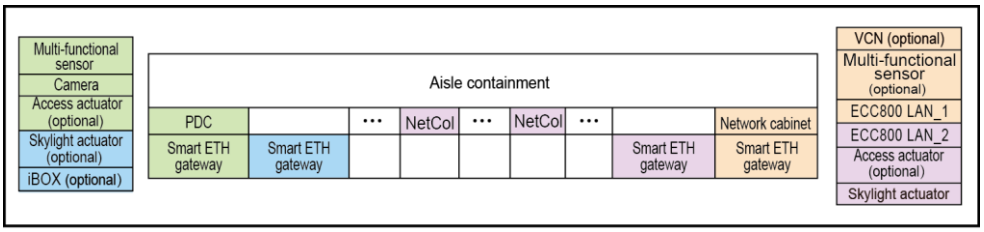
NOTE

Components marked in the same background color should be connected to the same smart ETH gateway.

Table 15-11 Scenario 1

Scenario	Rules for Deploying Smart ETH Gateways
• Rack environment unit or UIM20A expansion module not deployed • Module length ≤ 7 m and the number of smart cooling products ≤ 4	Deploy 2 PCS for each end cabinet in the smart module, not for other cabinets. A total of 4 PCS should be deployed.

Figure 15-95 Layout of smart ETH gateways in scenario 1

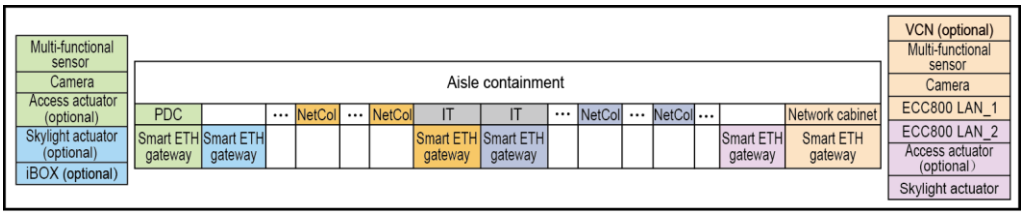


DC00S00145

Table 15-12 Scenario 2

Scenario	Rules for Deploying Smart ETH Gateways
• Rack environment unit or UIM20A expansion module not deployed • Module length > 7 m and the number of smart cooling products > 4	Deploy 2 PCS for each end cabinet and IT cabinet in the middle in the smart module, not for other cabinets. A total of 6 PCS should be deployed.

Figure 15-96 Layout of smart ETH gateways in scenario 2



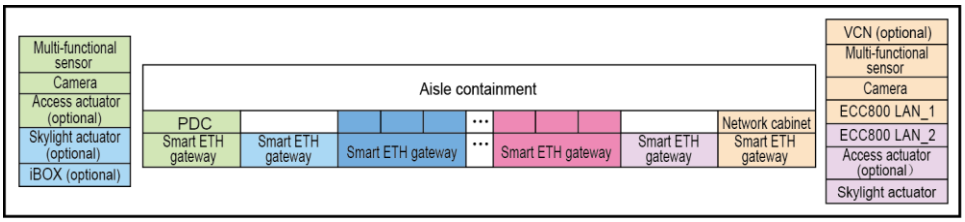
DC00S00146

Table 15-13 Scenario 3

Scenario	Rules for Deploying Smart ETH Gateways
Rack environment unit or UIM20A	Deploy 2 PCS for each end cabinet and 1 PCS for every three cabinets among other

Scenario	Rules for Deploying Smart ETH Gateways
expansion module deployed	cabinets in the smart module.

Figure 15-97 Layout of smart ETH gateways in scenario 3



NOTE

- When the smart module is 4 m long or less, no multi-functional sensor is deployed in the network cabinet.
- When the smart module is longer than 7 m, deploy one multi-functional sensor in the middle of the smart module aisle (one more control skylight is deployed). The multi-functional sensor can be connected to any smart ETH gateway in the middle.

15.9.3 Installing a Smart ETH Gateway

Preparations

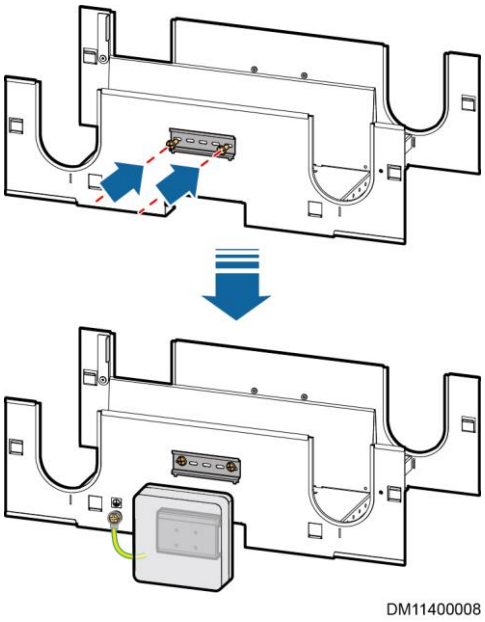
Tool: Phillips screwdriver

Materials: smart ETH gateway and accessories

Procedure

Step 1 Use two M4x10 screw assemblies to secure the guide rail for the smart ETH gateway to the cable trough, as shown in Figure 15-98.

Figure 15-98 Installing a smart ETH gateway



Step 2 Connect one end of the ground cable available in the smart ETH gateway package to the ground point at the lower part of the cable trough using one M4 screw, and connect the other end to the ground point on the side of the smart ETH gateway, as shown in Figure 15-98.

NOTE

The M4 screw used for connecting the ground cable to the cable trough is available in the cable trough package.

Step 3 Install the smart ETH gateway to the guide rail, as shown in Figure 15-98.

1. Align the upper slot of the guide rail for the smart ETH gateway with the upper part of the guide rail, and pre-mount it onto the guide rail.
2. Press the lower part of the smart ETH gateway to clamp the smart ETH gateway onto the guide rail.
3. Shake the smart ETH gateway in different directions to ensure that it is reliably installed.

----End

15.10 Rules for Deploying T/H Sensors

Context

- Determine the number of T/H sensors to be deployed based on the number of smart cooling products.
- Each smart cooling product can be configured with three more external T/H sensors.

Procedure

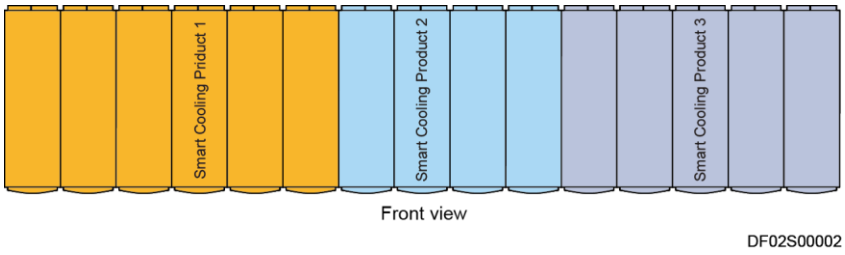
Step 1 Mark management areas based on the smart cooling product layout.

- Scenario 1: There is an odd number of IT cabinets between smart cooling products. In this scenario, categorize the cabinet in the middle of the two smart cooling products to the area of the smart cooling product on the left (front view), as shown in Figure 15-99.

NOTE

Components in the background with the same color belong to the same area.

Figure 15-99 Categorizing an odd number of cabinets

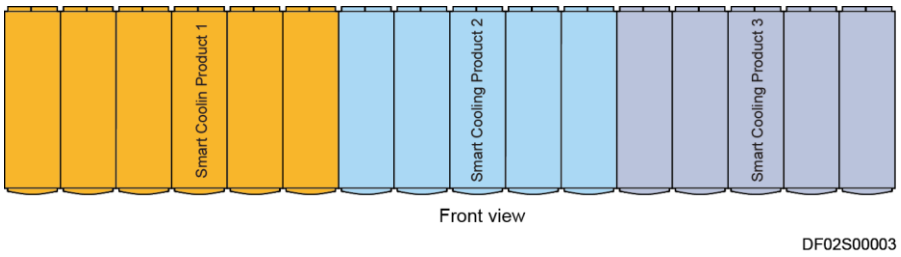


- Scenario 2: There is an even number of IT cabinets between smart cooling products. In this scenario, categorize the cabinets evenly, as shown in Figure 15-100.

NOTE

Components in the background with the same color belong to the same area.

Figure 15-100 Categorizing an even number of cabinets



Step 2 Assign T/H sensors by area.

Assign three T/H sensors to each area as follows:

1. Assign the first T/H sensor to the cabinet furthest from the smart cooling product, as shown by (1) in Figure 15-101 and Figure 15-102.

NOTE

If there is the same number of cabinets on the two sides of a smart cooling product (as shown by smart cooling product 3 in Figure 15-101 and Figure 15-102), preferentially deploy a T/H sensor to the cabinet on the left side of the smart cooling product.

2. Assign the second T/H sensor to the cabinet furthest from the other side of the smart cooling product, as shown by (2) in Figure 15-101 and Figure 15-102.
3. Assign the third T/H sensor to the cabinet that is between the first T/H sensor and the smart cooling product and near the smart cooling product, as shown by (3) in Figure 15-101 and Figure 15-102.

Figure 15-101 Assigning T/H sensors for an odd number of cabinets between smart cooling products

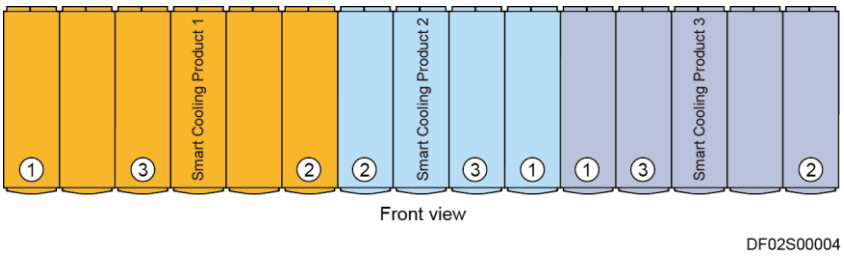
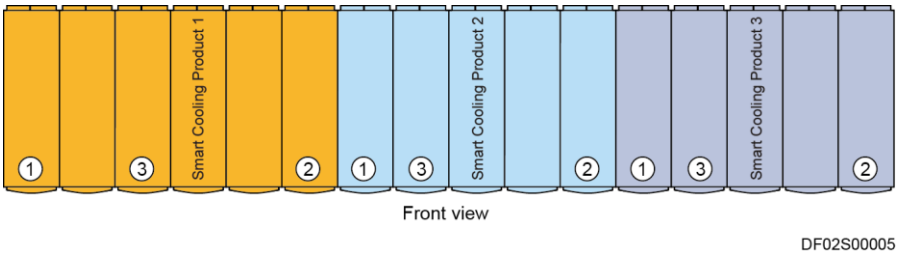


Figure 15-102 Assigning T/H sensors for an even number of cabinets between smart cooling products



----End

15.11 Installing a Temperature and Humidity Sensor

NOTE

- When the NetCol5000-A025 smart cooling products are selected, please use the BOM No. 02310NBS's temperature and humidity sensor.
- When the NetCol5000-A050 smart cooling products are selected, please ues the BOM No. 33010516's temperature and humidity sensor.

15.11.1 (Optional) Installing a Temperature and Humidity Sensor

A temperature and humidity sensor collects the temperature and humidity data of the front and rear doors of IT cabinets. The smart cooling product controls the temperature and humidity in the aisle containment based on the data collected by the temperature and humidity sensor.

Prerequisites

NOTE

In the smart module scenario, the supply-air control and return-air control of the smart cooling product are not recommended. If a cold aisle containment is configured, it is advised to adopt cold aisle control; if a hot aisle containment is configured, it is advised to adopt hot aisle control.

Term description

- Supply-air control by a smart cooling product: The smart cooling product controls the temperature at its front door so that the temperature is close to the temperature set on the smart cooling product.
- Return-air control by a smart cooling product: The smart cooling product controls the temperature at its rear door so that the temperature is close to the temperature set on the smart cooling product.
- Cold aisle control by a smart cooling product: The smart cooling product controls the temperature at front doors of IT cabinets so that the temperature is close to the temperature set on the smart cooling product.
- Hot aisle control by a smart cooling product: The smart cooling product controls the temperature at rear doors of IT cabinets so that the temperature is close to the temperature set on the smart cooling product.

Context

If the smart cooling product implements cold aisle control, install the temperature and humidity sensor on the front door frame of the IT cabinet. If the smart cooling product implements hot aisle control, install the temperature and humidity sensor on the rear door frame of the IT cabinet.

Preparations

Tool: Phillips screwdriver

Materials: temperature and humidity sensor, temperature and humidity sensor base

Document: temperature and humidity sensor installation position diagram

Procedure

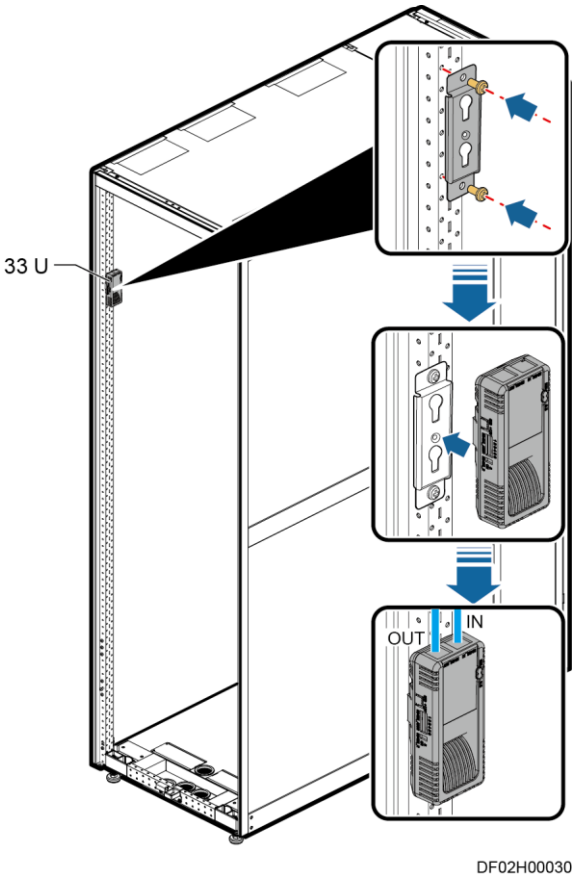
Step 1 Use M5x10 tapping screws to secure the temperature and humidity sensor base to the 33 U position of the IT cabinet door frame.

NOTE

The temperature and humidity sensor can be installed between the 33 U and 40 U positions based on site requirements.

Step 2 Mount the temperature and humidity sensor onto the base.

Figure 15-103 Installing a temperature and humidity sensor



NOTE

The T/H sensors inside the cabinet are secured at the return air side and their IN ports are connected to the main control board. When connecting the T/H sensors outside the cabinet, connect the OUT port of one T/H sensor inside the cabinet to the IN port of the next T/H sensor outside the cabinet. Connect all T/H sensors in series in this way.

Step 3 Set the DIP switches of T/H sensors.

Figure 15-104 DIP switches

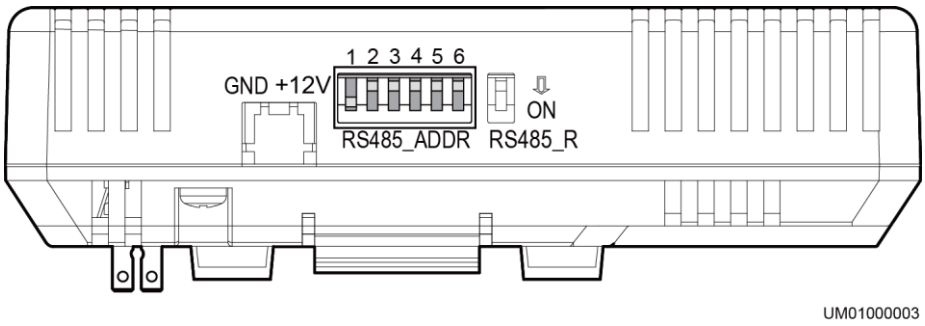


Table 15-14 DIP switch setting on a T/H sensor

Location	Display Name	Address	DIP Switch Sequence No.					
			1	2	3	4	5	6
Air return side	Return air 2 temp/humid	1	ON	OFF	OFF	OFF	OFF	OFF
Cold aisle	Cold aisle 1 temp/humid	11	ON	ON	OFF	ON	OFF	OFF
	Cold aisle 2 temp/humid	12	OFF	OFF	ON	ON	OFF	OFF
	Cold aisle 3 temp/humid	13	ON	OFF	ON	ON	OFF	OFF
	Cold aisle 4 temp/humid	14	OFF	ON	ON	ON	OFF	OFF
	Cold aisle 5 temp/humid	15	ON	ON	ON	ON	OFF	OFF
Hot aisle	Hot aisle 1 temp/humid	21	ON	OFF	ON	OFF	ON	OFF
	Hot aisle 2 temp/humid	22	OFF	ON	ON	OFF	ON	OFF
	Hot aisle 3 temp/humid	23	ON	ON	ON	OFF	ON	OFF
	Hot aisle 4 temp/humid	24	OFF	OFF	OFF	ON	ON	OFF
	Hot aisle 5 temp/humid	25	ON	OFF	OFF	ON	ON	OFF

NOTICE

- The default addresses of T/H sensors purchased from Huawei are 1.
- Keep the last RS485_R toggle switch at OFF.
- After the addresses are set, power on the device. On the display's home screen, choose **Settings** > **System Settings** > **T/H Sensor**, and set the sensors in the aisles corresponding to the addresses to **Enable**. Otherwise, the sensors will not work.

----End

15.11.2 (Optional) Installing a Temperature and Humidity Sensor (33010516)

Context

If the smart cooling product implements cold aisle control, install the temperature and humidity sensor on the front door frame of the IT cabinet. If the smart cooling product implements hot aisle control, install the temperature and humidity sensor on the rear door frame of the IT cabinet.

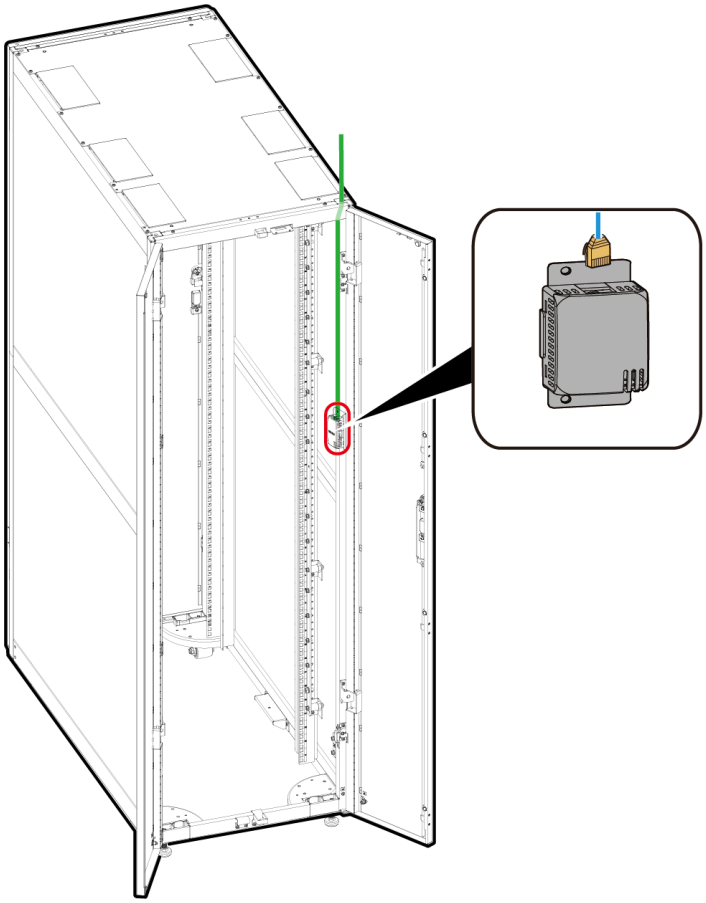
Procedure

Step 1 Attach the temperature and humidity sensor to the 33 U position of the IT cabinet door frame.

NOTE

The temperature and humidity sensor can be installed between the 33 U and 40 U positions based on site requirements.

Figure 15-105 Cables routed outside the cabinet



Step 2 Set the DIP switches of T/H sensors. Table 15-15 shows how to set the DIP switches for T/H sensors.

Table 15-15 DIP switch setting on a T/H sensor

Location	Display Name	Address	DIP Switch Sequence No.					
			1	2	3	4	5	6
Cold aisle	Cold aisle 1 temp/humid	11	ON	ON	OFF	ON	OFF	OFF
	Cold aisle 2 temp/humid	12	OFF	OFF	ON	ON	OFF	OFF
	Cold aisle 3 temp/humid	13	ON	OFF	ON	ON	OFF	OFF
	Cold aisle 4 temp/humid	14	OFF	ON	ON	ON	OFF	OFF
	Cold aisle 5 temp/humid	15	ON	ON	ON	ON	OFF	OFF
Hot aisle	Hot aisle 1 temp/humid	21	ON	OFF	ON	OFF	ON	OFF
	Hot aisle 2 temp/humid	22	OFF	ON	ON	OFF	ON	OFF
	Hot aisle 3 temp/humid	23	ON	ON	ON	OFF	ON	OFF
	Hot aisle 4 temp/humid	24	OFF	OFF	OFF	ON	ON	OFF
	Hot aisle 5 temp/humid	25	ON	OFF	OFF	ON	ON	OFF

NOTICE

- The default addresses of T/H sensors purchased from Huawei are 1.
- Keep the last RS485_R toggle switch at OFF.
- After the addresses are set, power on the device. On the display's home screen, choose **Settings** > **System Settings** > **T/H Sensor**, and set the sensors in the aisles corresponding to the addresses to Enable. Otherwise, the sensors will not work.

----End

15.12 Installing a WLDS900 Water Sensor

The water sensor mentioned in this section is configured for the smart module, rather ta smart cooling products. If this water sensor is installed, you do not have to install the water sensor configured for smart cooling products.

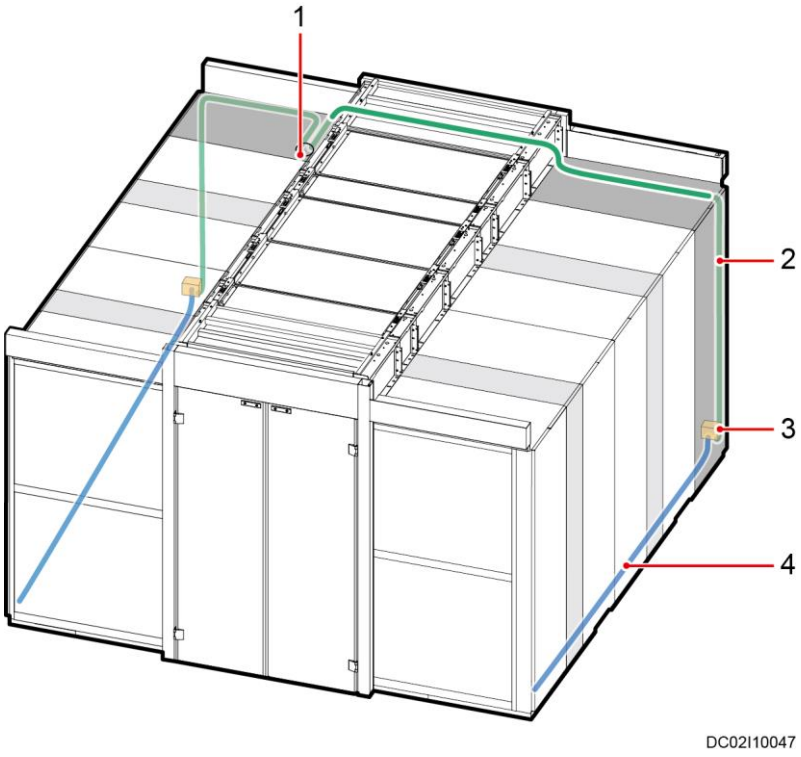
NOTICE

The water sensor should be installed in the lowest position in the equipment room and cannot be installed in a place (such as water pipes or cold air outlets) that is prone to condensing.

15.12.1 Laying Out the Water Detection Cable (Dual-Row Scenario)

Context

Figure 15-106 Laying out the water detection cable (2000 mm high cabinet with top pipe routing)

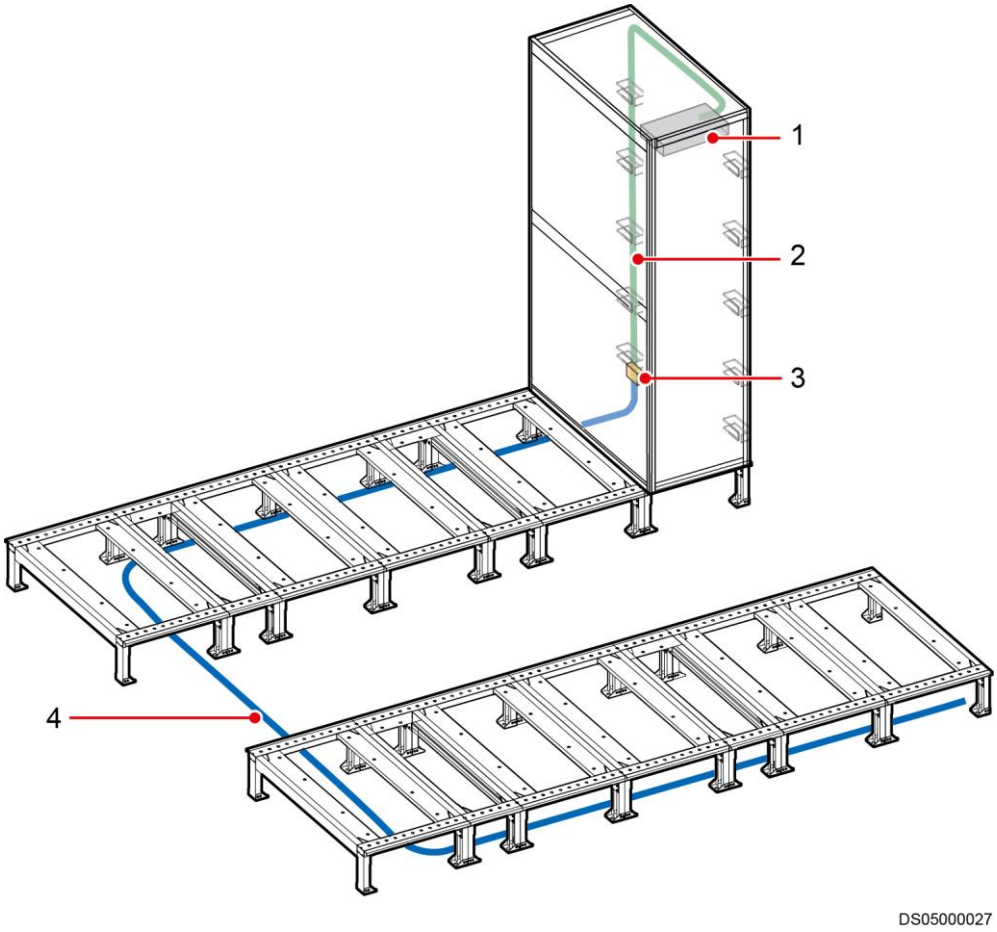


(1) ECC800 (2) Network cable (3) Water detector (4) Water detection cable

NOTE

For a 2200 mm high cabinet with top pipe routing, route the water detection cable along the smart cooling product water pipe and bind the water detection cable to the bottom of the water pipe using cable ties.

Figure 15-107 Laying out the water detection cable (bottom pipe routing)



(1) ECC800 (2) Network cable (3) Water detector (4) Water detection cable

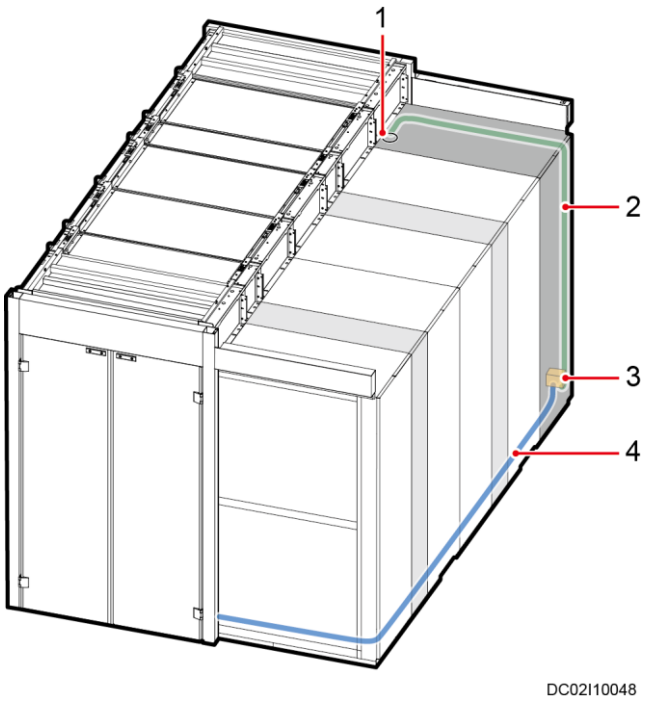
NOTICE

Do not contact the water detection cable with metal, for this action will cause a false alarm. Take protective measures when routing a water detection cable.

15.12.2 Laying Out the Water Detection Cable (Single-Row Scenario)

Context

Figure 15-108 Laying out the water detection cable (2000 mm high cabinet with top pipe routing)

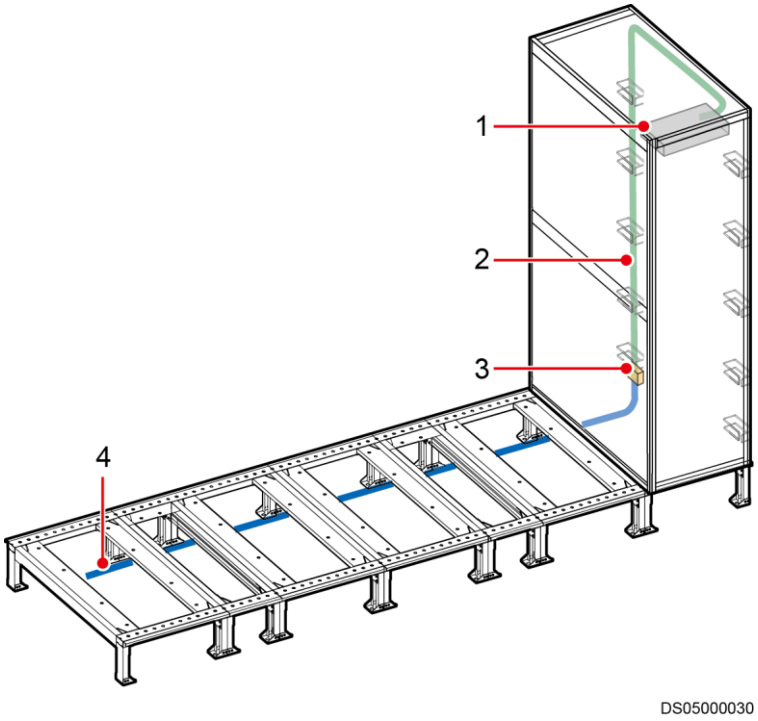


(1) ECC800 (2) Network cable (3) Water detector (4) Water detection cable

NOTE

For a 2200 mm high cabinet with top pipe routing, route the water detection cable along the smart cooling product water pipe and bind the water detection cable to the bottom of the water pipe using cable ties.

Figure 15-109 Laying out the water detection cable (bottom pipe routing)



(1) ECC800 (2) Network cable (3) Water detector (4) Water detection cable

NOTICE

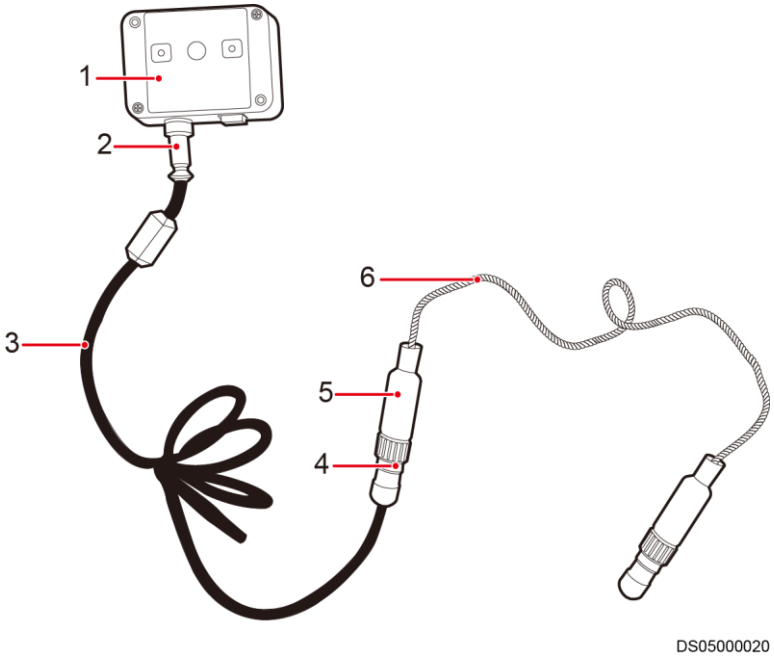
Do not contact the water detection cable to metal, for this action will cause a false alarm. Take protective measures when routing a water detection cable.

15.12.3 Connecting a Cable to the WLDS900 Water Sensor

Context

- The water sensor is composed of the water detection cable (BOM number: 33010445), water detector (BOM number: 33010352), and conversion cable (packed with the water detector).
- When the smart cooling product pipes are routed from the top, the water detector is installed in the network cabinet and its opposite cabinet, and bound to the rack rail at the rear door using cable ties. The binding position is 5 U away from the cabinet bottom.
- When the smart cooling product pipes are routed from the bottom, the water detector is installed in the network cabinet, and bound to the rack rail at the rear door using cable ties. The binding position is 5 U away from the cabinet bottom.
- A single water detection cable is 5 meters long. If a longer cable is required, connect multiple water detection cables to increase the length. One water detector can connect to a maximum of nine water detection cables.

Figure 15-110 Water sensor



(1) Water detector

(2) Conversion cable end A, connected to the water detector

(3) Conversion cable

(4) Conversion cable end B, connected to the water detection cable

(5) Water detection cable end A, connected to the conversion cable

(6) Water detection cable

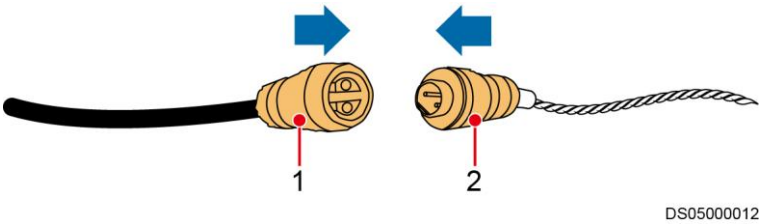
Preparations

Materials: water detection cable, conversion cable

Procedure

Step 1 Connect the water detection cable and conversion cable.

Figure 15-111 Connecting cables



(1) Conversion cable end B, connected to the water detection cable

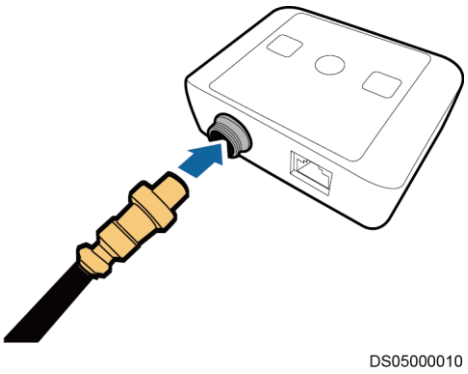
(2) Water detection cable end A, connected to the conversion cable

NOTE

The water detection cable and conversion cable are interconnected through the male and female connectors.

Step 2 Connect the other end of the conversion cable to the water detector.

Figure 15-112 Connecting the water detector



----End

15.12.4 Routing a Water Detection Cable

Context

NOTICE

Do not contact the water detection cable with metal, for this action will cause a false alarm. Take protective measures when routing a water detection cable.

Preparations

Materials: water detection cable fastener, water detection cable and accessories

Document: water detection cable routing position diagram

Procedure

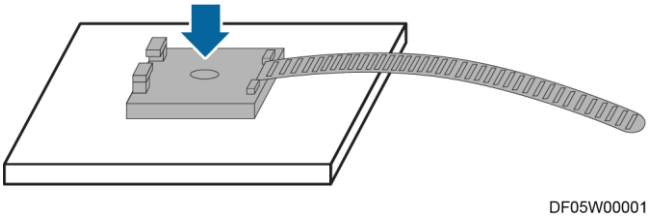
Step 1 Plan the installation position for the fastener of the water detection cable. Ensure that the water detection cable placed on the fastener is in good contact with the floor.

NOTE

One fastener is provided for a 1 meter long water detection cable.

Step 2 Tear off the protection paper from the rear of the fastener, and then securely attach the fastener to the floor.

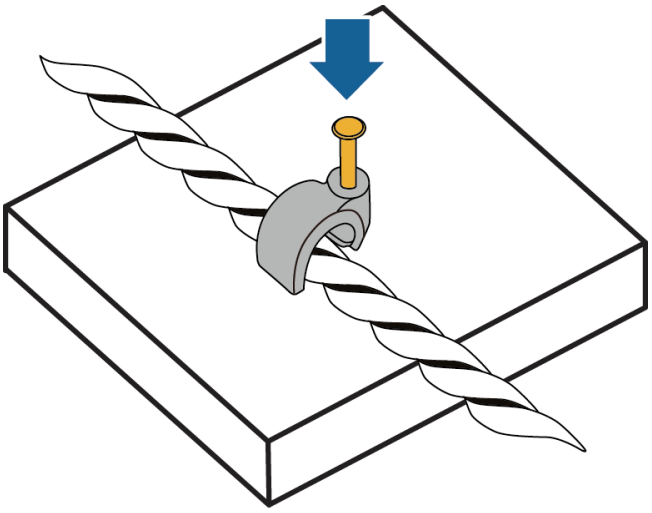
Figure 15-113 Installing a fastener



NOTE

When securing the water detection cable to the concrete floor, use the cable clips delivered with the cable to secure the cable.

Figure 15-114 Installing a cable clip

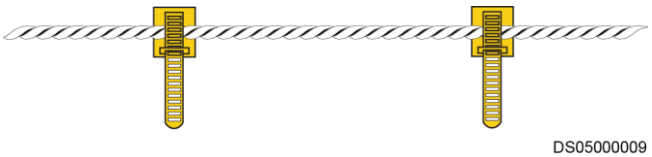


Step 3 Place the water detection cable onto the fastener, secure the fastener, and keep the water detection cable in close contact with the floor.

NOTE

If multiple water detection cables are connected in series, connect the male connector of one cable to the female connector of another.

Figure 15-115 Securing a water detection cable



----End

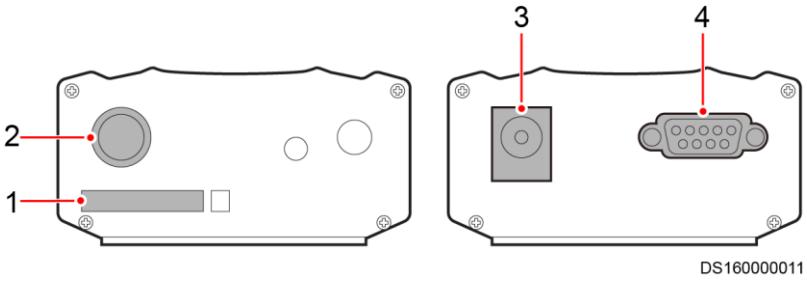
15.13 Installing a GSM Modem

Prerequisites

An idle serial port is available on the TaiShan server.

Context

Figure 15-116 Ports on the GSM modem



(1) SIM card slot
(2) Antenna port
(3) Power cable port
(4) Serial port

Preparations

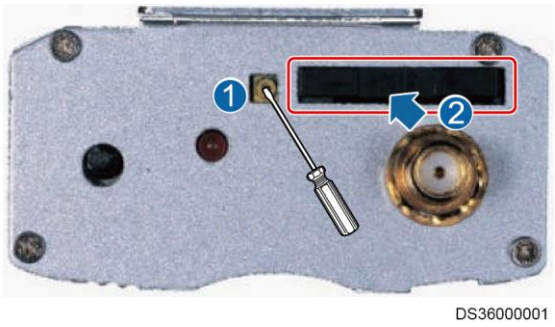
Materials: GSM modem (BOM number: 50030084), SIM card, antenna (BOM number: 27010824), power adapter, power connector (BOM number: 14190143), cable tie

Procedure

Step 1 Use a cable tie to bind the GSM modem to a position near the TaiShan server and on the rack rail of the rear door of the network cabinet.

Step 2 Press the yellow button using a thin object (such as a thin screwdriver) to eject the SIM card tray, and place the SIM card in the tray in the correct position.

Figure 15-117 Installing a SIM card



Step 3 Attach the antenna to the skylight connective plate or the top plate of the network cabinet outside the aisle containment. Connect the antenna cable to the antenna port on the modem.

NOTE

Do not use the antenna delivered with the modem.

Step 4 Connect one end of the serial port cable to the serial port on the GSM modem, and connect the other end to an idle port on the TaiShan server.

NOTE

- For the connection method, see the documents delivered with the modem.
- If the serial port on the TaiShan server does not match the connector of the serial port cable, use the serial port cable adapter delivered with the modem.

Step 5 Connect one end of the power adapter to the modem and the other end to the 220 V power supply through a power connector.

NOTE

- Use the power adapter delivered with the modem.
- For the connection method, see the documents delivered with the modem.

----End

16 Connecting Cables

16.1 System Cabling Rules

Attaching Cable Labels

NOTICE

A cable label must be consistent with the corresponding IT cabinet number.

- Find the corresponding cable based on the wiring diagram in the cable fitting bag, and attach the corresponding cable label taken out from the cable fitting bag to both ends of the cable by wrapping the ends.

NOTE

The cable labels must completely wrap the cable without wrinkles.

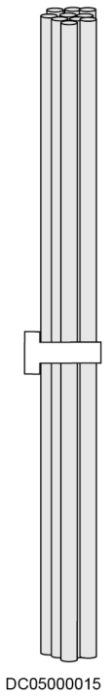
- Attach the cable labels 20 mm away from the plug except for special circumstances. For example, a label shall not be attached to the bending part of a cable or attached in some positions that may affect cable installation.
- If a label conflicts with a cable tie, attach the label to the outer side of the cable tie.
- Attach labels to both ends of a cable.

Requirements for Neatly Routing and Binding Cables

To route and bind cables in an appealing way, follow these rules:

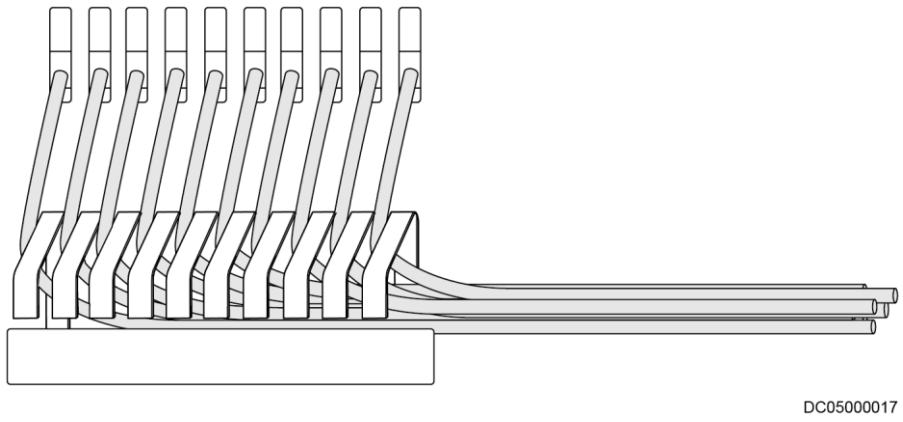
1. Neatly organize exterior cables in a large bundle of cables and prevent cable tangles that are avoidable, as shown in Figure 16-1.

Figure 16-1 Neatly organizing cables



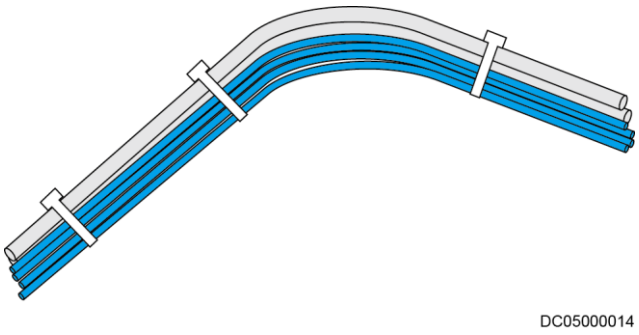
2. Keep a large number of cables neat and appealing in a network cabling cabinet by using cable organizers. Move the excess parts of cables in unnoticeable positions, as shown in Figure 16-2.

Figure 16-2 Cable organizer



3. Route and lay out a large number of cables in different areas to ensure neat cabling and facilitate cable search and maintenance.
4. Route several flat cables along the same path and then overlap them as one.
5. Arrange cables on distinct layers and prevent cable tangles that are avoidable when cables in different colors are bound together, as shown in Figure 16-3. Also comply with these rules when cables of different thickness are bound together. Arrange cables by thickness when arrangement by thickness conflicts with arrangement by color.

Figure 16-3 Binding cables in different colors



Cable Spacing Requirements

Comply with the following requirements if possible to lay out different types of cables:

1. Separate AC and DC power cables from diverse non-shielded signal cables. Keep the cable spacing greater than 100 mm or use grounded metal for isolation purposes. Do not bind the cables together. Preferentially route the cables along different sides of cabinets.
2. Network cables and optical cables are recommended to be routed separately.

Safety and Reliability Requirements for Routing and Binding Cables

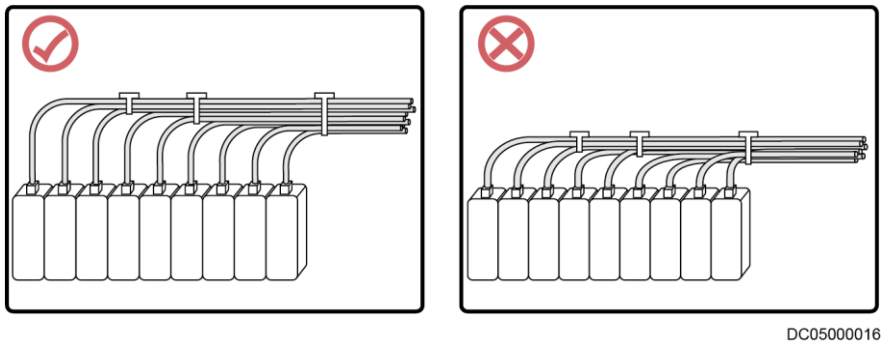
1. Unless otherwise specified in a design file, ensure that the bend radius (R) of a cable meets the following requirements:
   - Common cable: $R \geq 3d$
   - Optical cable: $R \geq 40$ mm

NOTE

R indicates the bend radius, and d indicates the cable diameter.

2. Reserve slack at cable connection positions to facilitate connection and disconnection and to prevent stress. Do not leave the cables tight and prevent connector misalignment, as shown in Figure 16-4.

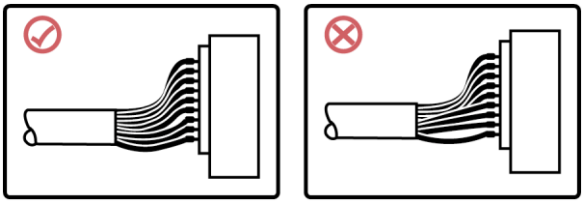
Figure 16-4 Cable connection positions



3. Before installing a semi-flexible cable, use a dedicated tool to curve the cable. Do not curve the cable while holding the cable connector by hand.

4. If a number of wire terminals are connected to a multi-point connector, provide slack and arrange them neatly to prevent stress on certain wires, as shown in Figure 16-5.

Figure 16-5 Cable connections



5. Protect cable holes in a metal kit with grommet strips. Alternatively, ensure that the holes are rounded, free from burrs or sharp edges.
6. Keep cables far away from heat sources such as radiators and heat vents. If unavoidable, take heat resistant measures.
7. Keep cables far away from operating components such as fan blades and do not bind cables to an airflow path of fans.
8. Prevent rotating components such as doors from squeezing or pulling cables.

Cable Binding Requirements

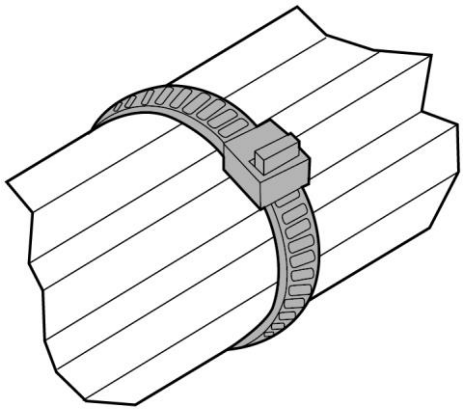
Bind cables reliably along the route and ensure that the binding interval meets the requirements in Table 16-1.

Table 16-1 Cable binding interval

Cable Diameter (mm)	Binding Interval (mm)
< 10	150
10–30	200
> 30	300

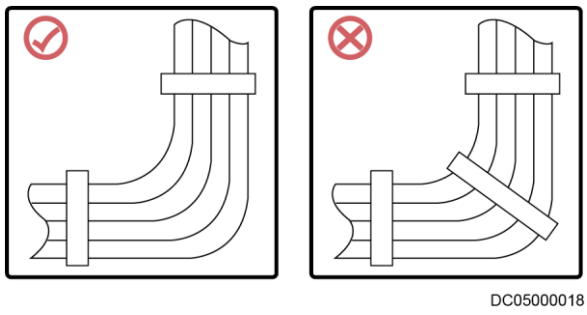
1. Bind cables with a moderate force and ensure that cables are not misshapen to prevent compromising the signal quality.
2. After binding cables, cut off the excess parts of cable ties and trim away any burrs, as shown in Figure 16-6.

Figure 16-6 Cutting off the excess part of a cable tie



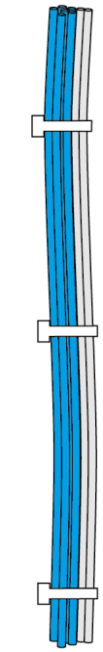
3. Do not use cable ties at a place where the cables are bent. Otherwise, the cable cores may break due to strong stress, as shown in Figure 16-7.

Figure 16-7 Binding cables in a bending area



4. Ensure that the cable ties are wrapped and secured in the same direction and do not generate interference with subsequent operations, as shown in Figure 16-8.

Figure 16-8 Direction for securing cable ties



16.2 Cable Connection Process

Preparations

Tools: thin rope, protective gloves, measuring tape

Materials: cable, marker, label

Procedure

Step 1 Use a thin rope to measure the required cable length based on the actual cable route.

NOTE

- To improve installation efficiency, complete all cable measurements before performing subsequent operations.
- You are advised to lay out cables to the measured cable route length plus about 1 m.

Step 2 Route cables.

1. Select the designed cables.
2. Lay out cables to the required length.

NOTICE

To avoid damaging the cable sheathings, do not press or stab cables with a hard object and do not drag cables on the ground at will during cable layout.

3. Attach labels to both ends of cables that you have laid out.

NOTICE

Ensure that the labels are clear, endurable, and consistent between both ends.

Step 3 Label cables.

1. (Optional) Prepare labels based on site requirements.

NOTICE

- Label information must be clear and specific.
- Labels must be easy to attach and can be securely attached.
- Labels must be resistant to corrosion and deterioration.

2. Remove the simple labels attached to a cable during layout and attach labels to both ends of the cable.

NOTICE

- Labels must be securely attached.
- Labels must be attached in eye-catching positions on cables for ease of maintenance.
- The labels on both ends of a cable must be the same.

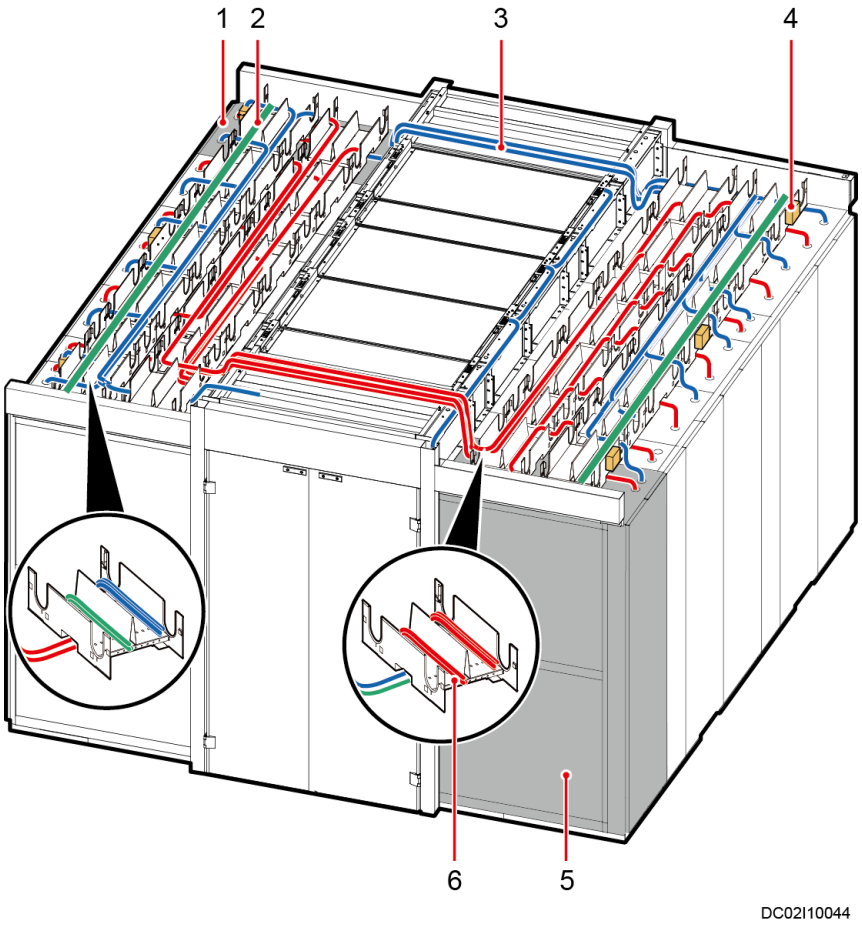
----End

16.3 Cable Routes for the Dual-Row Aisle Containment Scenario (Power Supply and Distribution Cabinet)

NOTICE

Ensure that strong-current cables and weak-current cables are at least 100 mm away from each other.

Figure 16-9 Power cable and signal cable routes



(1) Network cabinet (2) Optical fiber (3) Signal cable

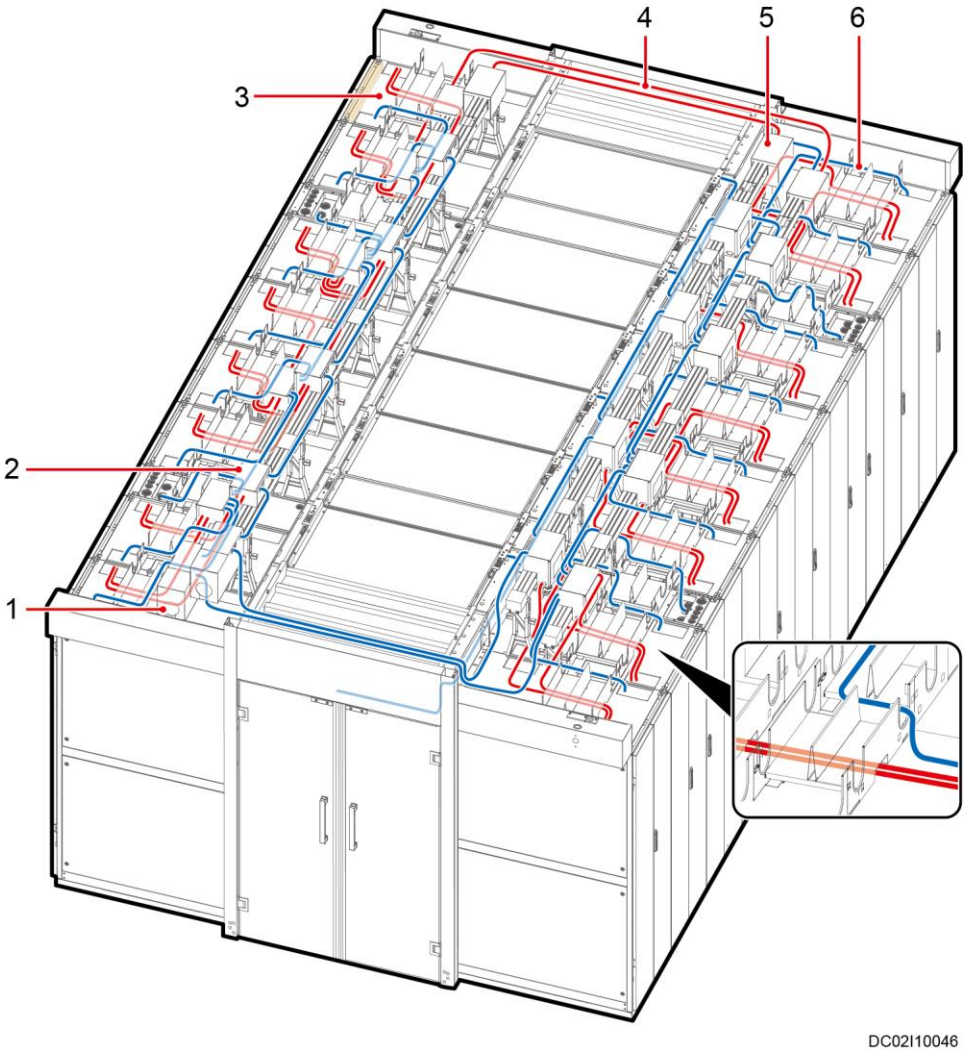
(4) Smart ETH gateway (5) PDC (6) Power cable

16.4 Cable Routes for the Dual-Row Aisle Containment Scenario (New Main Way)

NOTICE

- Ensure that strong-current cables and weak-current cables are at least 100 mm away from each other.
- Power cables are first connected to the general input unit in the smart module.

Figure 16-10 Power cable and signal cable routes



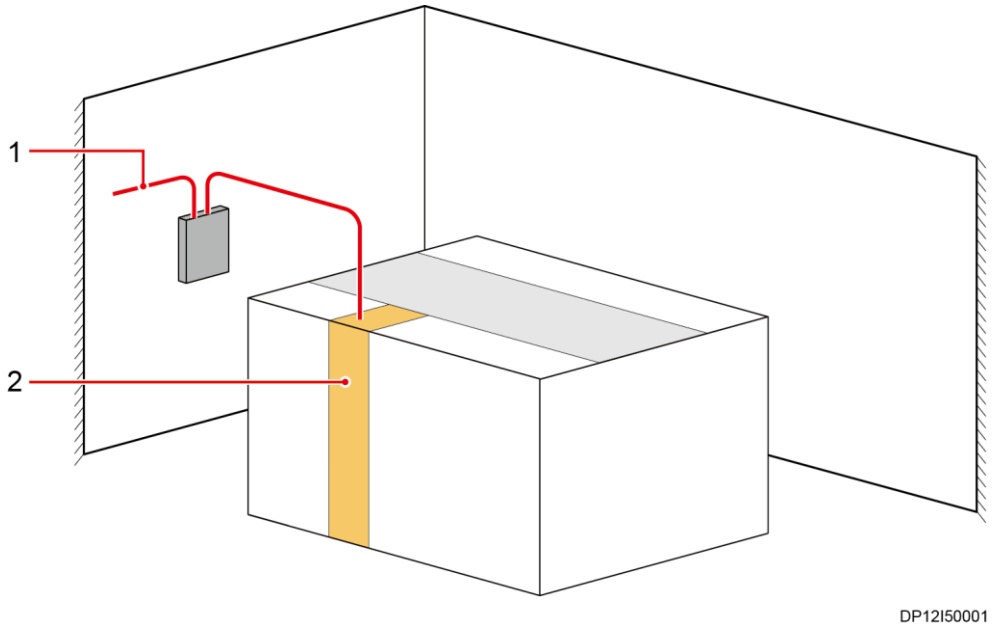
(1) General input unit (2) Power distribution unit (3) Network cabinet

(4) Power cable (5) Conversion unit (6) Signal cable

16.5 (Optional) Cable Routing for the Smart Cooling Product PDB

Cabling mode for the smart cooling product PDB: Cables can be routed in from the top and out from the top or bottom.

Figure 16-11 Cable routing for the smart cooling product PDB



(1) Input power cables for the smart cooling product PDB (powered by the customer's power supply)

(2) Smart cooling product

NOTE

The figure is for reference only. The actual scenario prevails.

16.6 Connecting Cables to the Power Supply and Distribution System

16.6.1 rPDU Naming in the IT Cabinet

rPDUs are installed at the rear of an IT cabinet.

Figure 16-12 rPDU naming in the IT cabinet

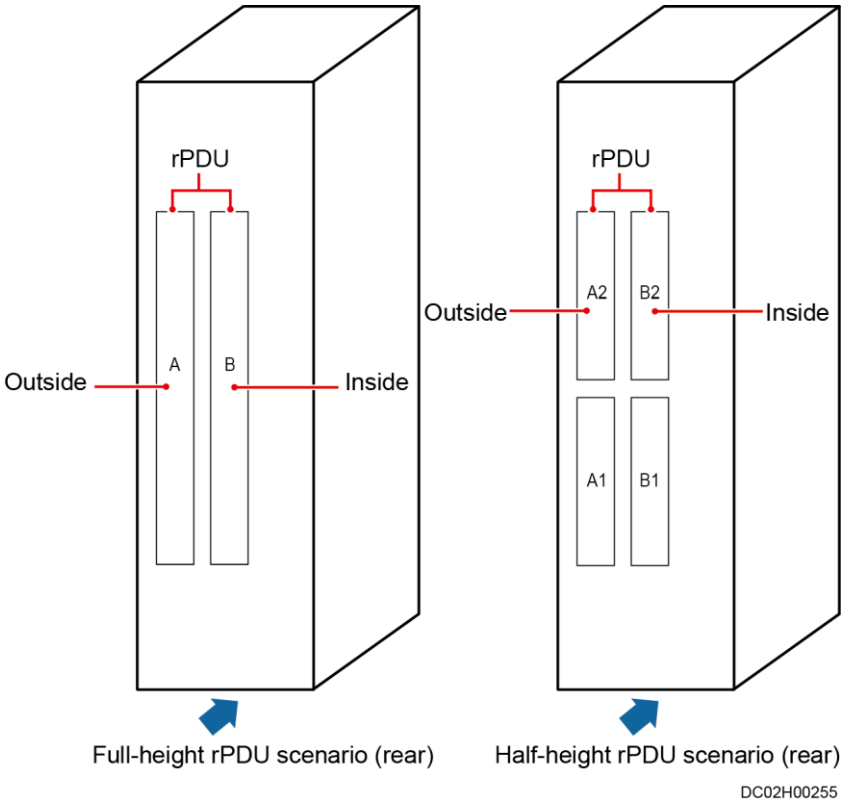
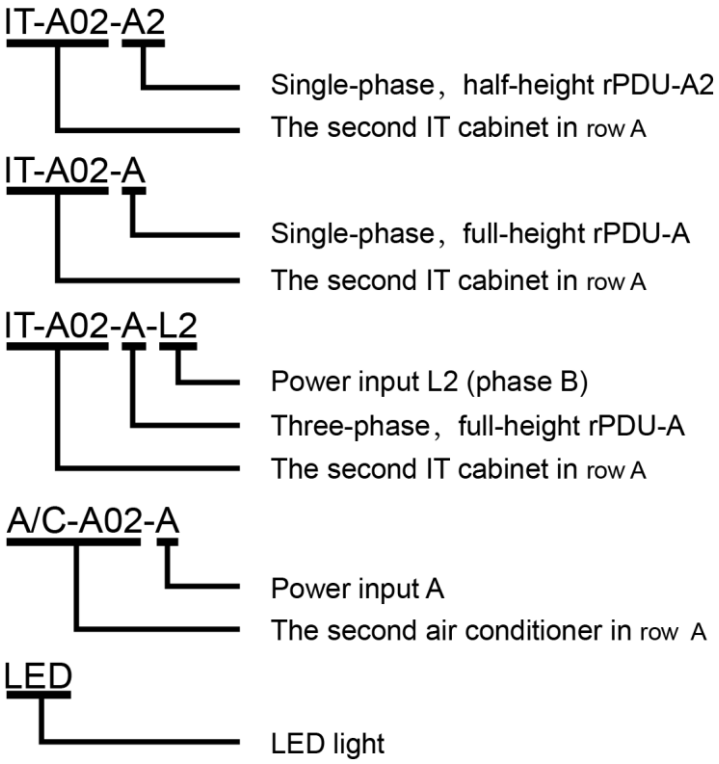
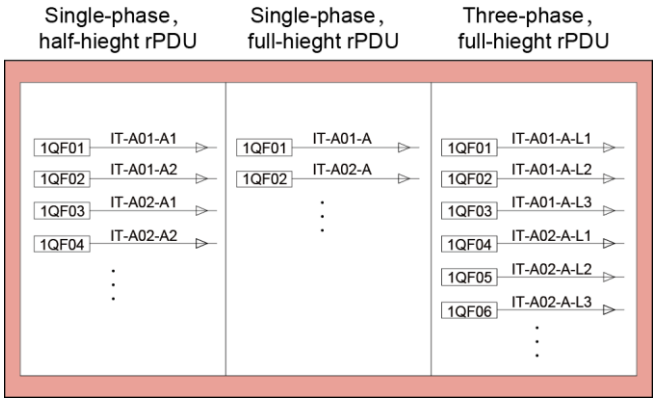


Figure 16-13 Wiring diagram naming description



The wiring diagrams use single-phase full-height rPDUs as an example. In single-phase half-height rPDU and three-phase full-height rPDU scenarios, the wiring diagram naming is shown in the following figure.

Figure 16-14 Description of wiring diagrams for rPDUs with different configurations



16.6.2 (Optical) Connecting Cables to an Integrated PDC

Wiring principles in an N+1 scenario:

- Connect output cables based on the switch number sequence (ascending order). Connecting sequence: IT cabinet (row A route A → row B route A → row A route B → row B route B).

- Twelve QFs are reserved respectively for the IT cabinet row A route A (1QF1–1QF12), row B route A (1QF13–1QF24), row A route B (1QF25–1QF36), and row B route B (1QF37–1QF48).

Figure 16-15 Wiring diagram for an N+1 power distribution scenario (single input of smart cooling product power distribution)

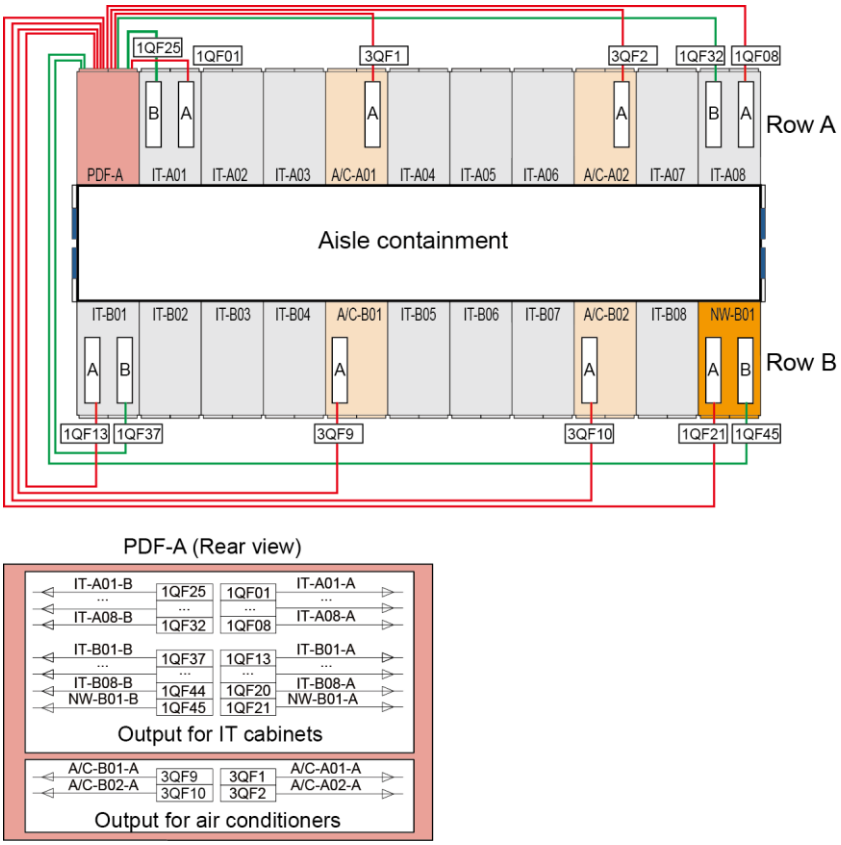
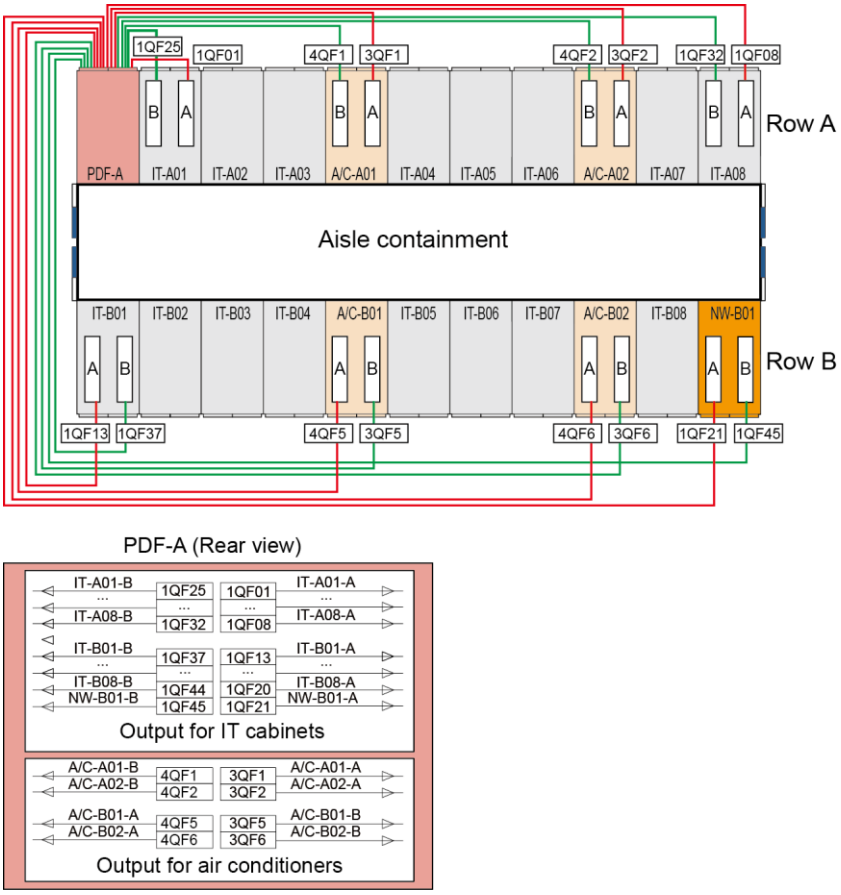


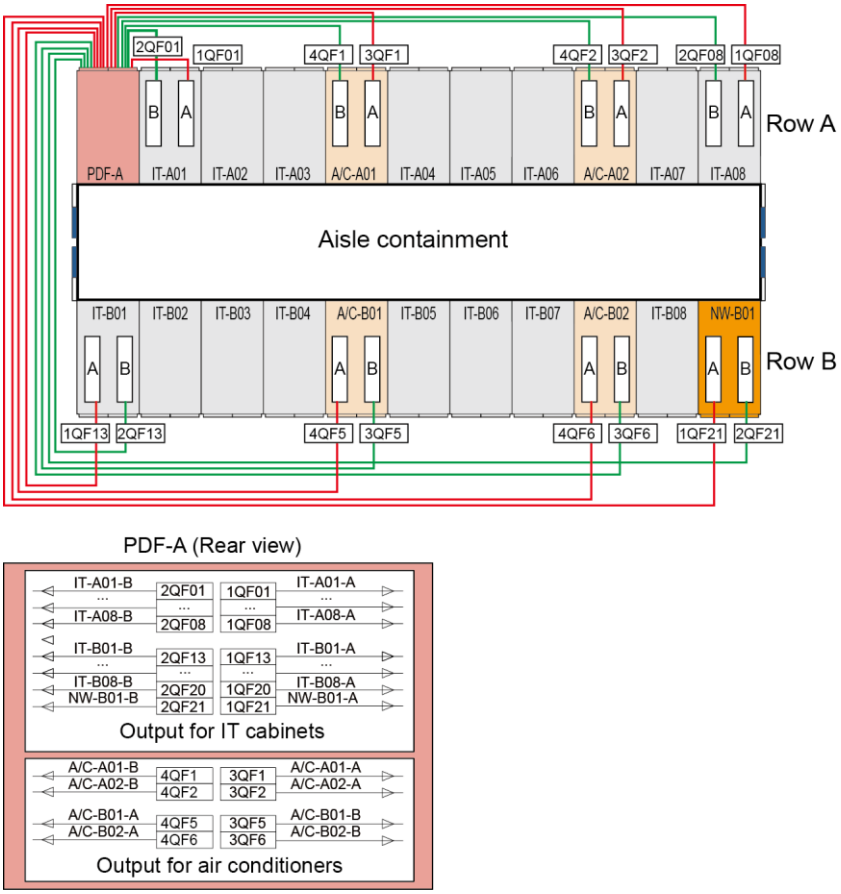
Figure 16-16 Wiring diagram for an N+1 power distribution scenario (dual inputs of smart cooling product power distribution)



Wiring principles in a 2N non-physical isolation scenario:

- 1QFn in the PDC supplies power to the route A rPDU of all the cabinets in the aisle. 2QFn in the PDC supplies power to the route B rPDU of all the cabinets in the aisle.
- Connect output cables based on the switch number sequence (ascending order) for each route. Connecting sequence: row A IT cabinets → row B IT cabinets.
- Twelve QFs are reserved respectively for the IT cabinet row A route A (1QF1–1QF12), row B route A (1QF13–1QF24), row A route B (2QF1–2QF12), and row B route B (2QF13–2QF24).

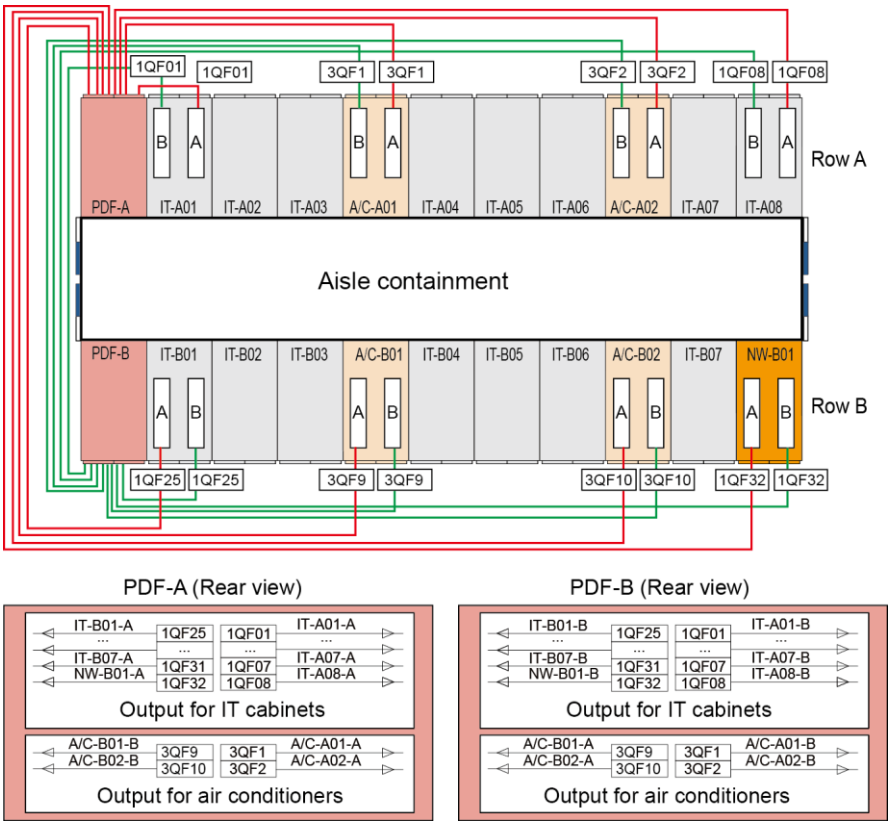
Figure 16-17 Wiring diagram for a 2N power distribution non-physical isolation scenario



Wiring principles in a 2N physical isolation scenario:

- The PDC labeled as PDF-A supplies power to the route A rPDU of all the cabinets in the aisle. The PDC labeled as PDF-B supplies power to the route B rPDU of all the cabinets in the aisle.
- In each PDC, connect output cables based on the switch number sequence (ascending order). Connecting sequence: row A IT cabinets → row B IT cabinets.
- The PDC labeled as PDF-A is assigned to the IT cabinet row A route A (1QF1–1QF24) and row B route A (1QF25–1QF48).
- The PDC labeled as PDF-B is assigned to the IT cabinet row A route B (1QF1–1QF24) and row B route B (1QF25–1QF48).

Figure 16-18 Wiring diagram for a 2N power distribution physical isolation scenario



16.6.3 Connecting Cables to an Integrated UPS

Wiring principles in an N+1 scenario:

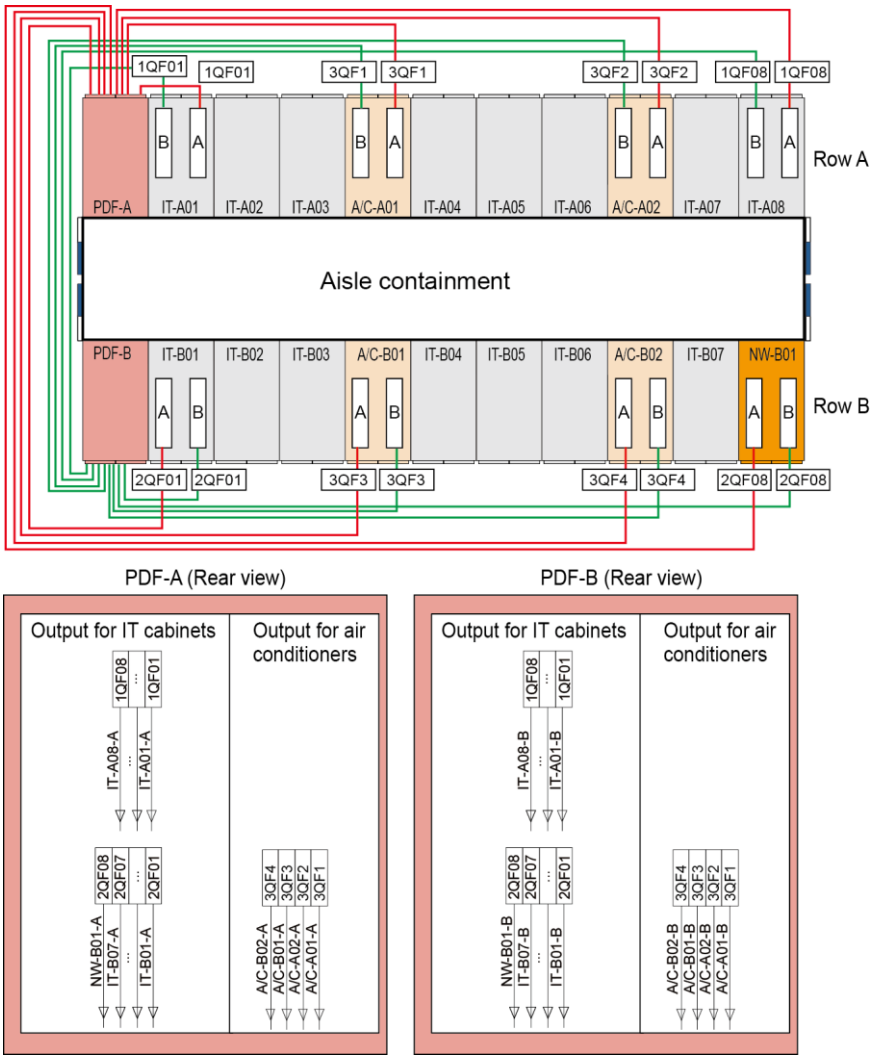
- The power distribution of the integrated UPS is labeled as PDF-A in the figure.
- Connect output cables based on the switch number sequence (ascending order). Connecting sequence: IT cabinet (row A route A -> row B route A -> row A route B -> row B route B).
- Twelve QFs are reserved respectively for the IT cabinet row A route A (1QF1–1QF12), row B route A (1QF13–1QF24), row A route B (2QF1–2QF12), and row B route B (2QF13–2QF24).

Figure 16-19 Wiring diagram for an N+1 power distribution scenario

Wiring principles in a 2N physical isolation scenario:

- The power distribution of the integrated UPS-A is labeled as PDF-A in the figure. The power distribution of the integrated UPS-B is labeled as PDF-B in the figure.
- PDF-A supplies power to the route A rPDU of all the cabinets in the aisle. PDF-B supplies power to the route B rPDU of all the cabinets in the aisle.
- In each PDC, connect output cables based on the switch number sequence (ascending order). Connecting sequence: row A IT cabinets -> row B IT cabinets.

Figure 16-20 Wiring diagram for a 2N power distribution physical isolation scenario

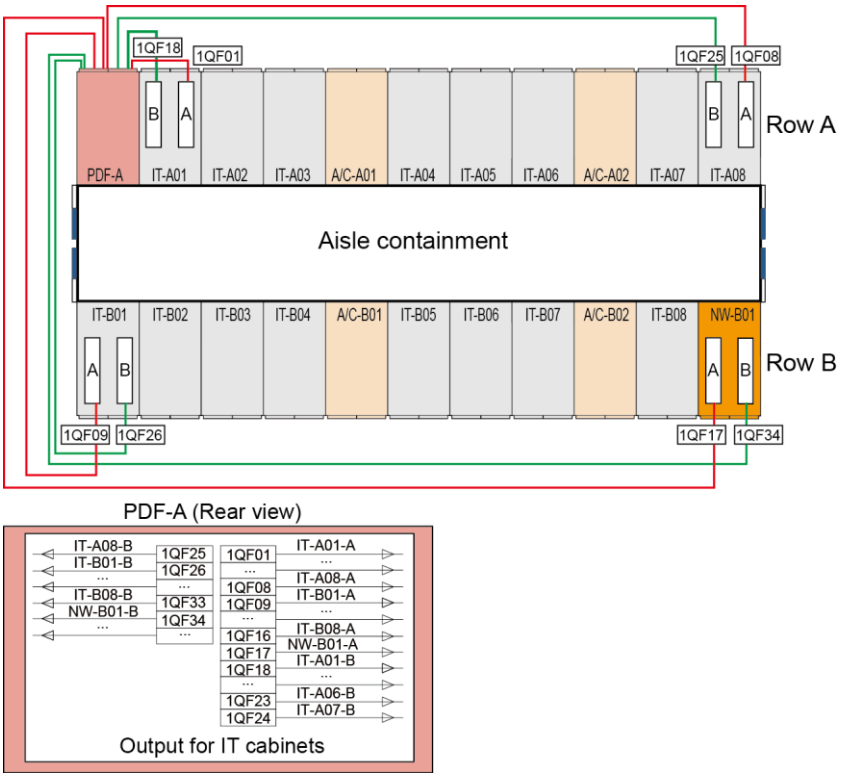


16.6.4 (Optical) Connecting Cables to a Precision PDC

Wiring principles in an N+1 scenario:

- Connect output cables based on the switch number sequence (ascending order). Connecting sequence: IT cabinet (row A route A → row B route A → row A route B → row B route B).
- The configuration in the figure is used as an example: IT cabinet row A route A (1QF1–1QF8), row B route A (1QF9–1QF17), row A route B (1QF18–1QF25), and row B route B (1QF26–1QF34).

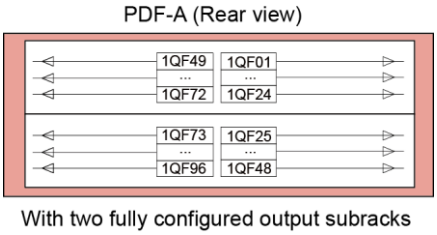
Figure 16-21 Wiring diagram for an N+1 power distribution scenario



NOTE

The preceding figure uses the configuration of a fully configured output subrack as an example. When there are two fully configured output subracks, the serial numbers are arranged based on the following rule. Connect output cables based on the switch number sequence (ascending order).

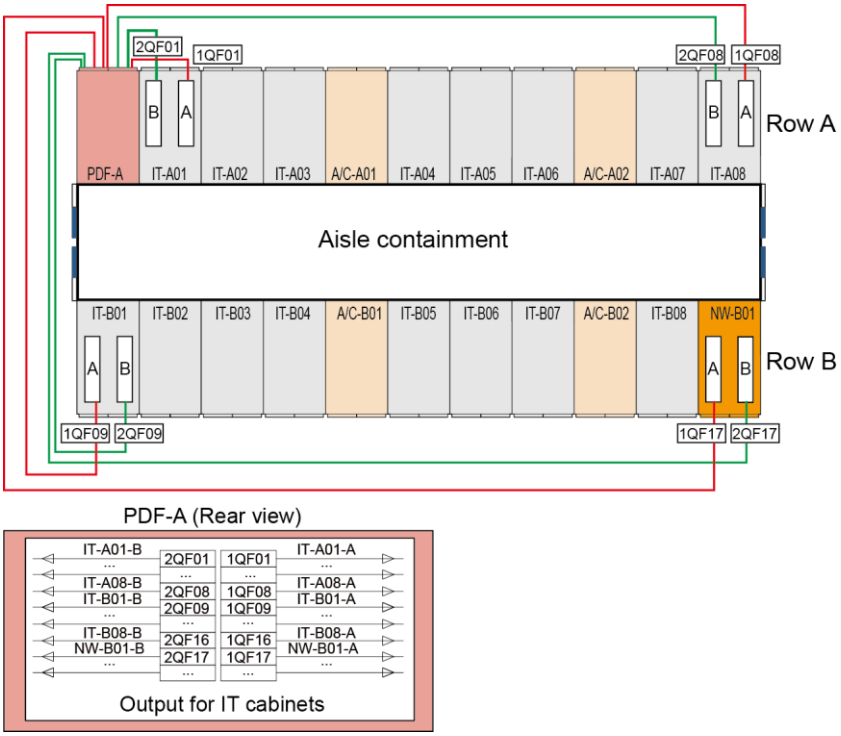
Figure 16-22 Serial number definition of two fully configured output subracks



Wiring principles in a 2N non-physical isolation scenario:

- 1QFn in the PDC supplies power to the route A rPDU of all the cabinets in the aisle. 2QFn in the PDC supplies power to the route B rPDU of all the cabinets in the aisle.
- Connect output cables based on the switch number sequence (ascending order) for each route. Connecting sequence: row A IT cabinets → row B IT cabinets.
- The configuration in the figure is used as an example: IT cabinet row A route A (1QF1–1QF8), row B route A (1QF9–1QF17), row A route B (2QF1–2QF8), and row B route B (2QF9–2QF17).

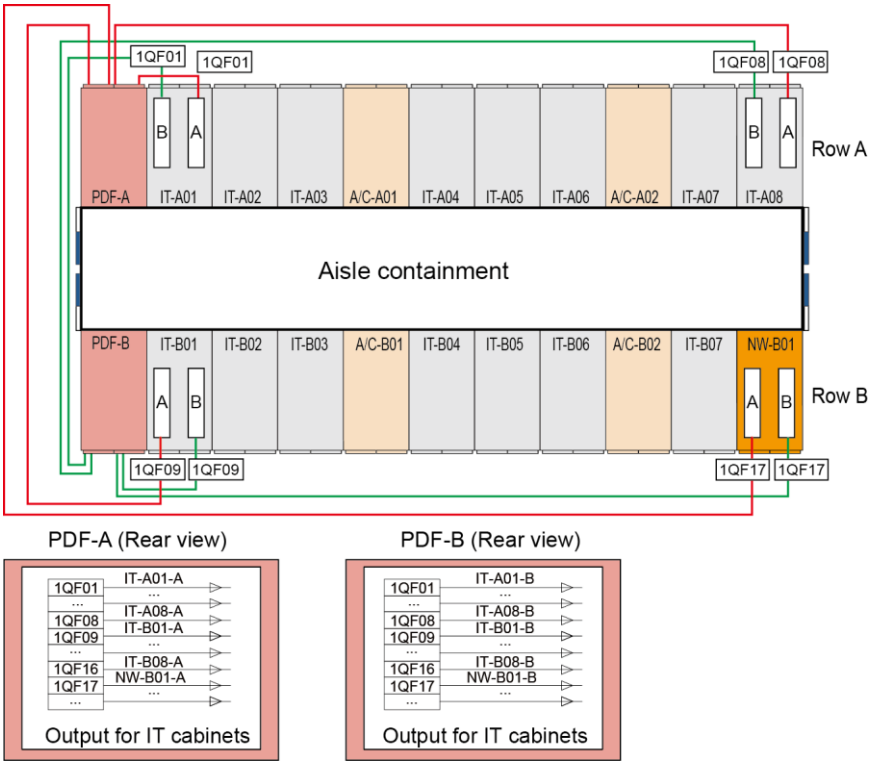
Figure 16-23 Wiring diagram for a 2N power distribution non-physical isolation scenario



Wiring principles in a 2N physical isolation scenario:

- The PDC labeled as PDF-A supplies power to the route A rPDU of all the cabinets in the aisle. The PDC labeled as PDF-B supplies power to the route B rPDU of all the cabinets in the aisle.
- In each PDC, connect output cables based on the switch number sequence (ascending order). Connecting sequence: row A IT cabinets → row B IT cabinets.
- The configuration in the figure is used as an example: The PDC labeled as PDF-A is assigned to the IT cabinet row A route A (1QF1–1QF8) and row B route A (1QF9–1QF17).
- The configuration in the figure is used as an example: The PDC labeled as PDF-B is assigned to the IT cabinet row A route B (1QF1–1QF8) and row B route B (1QF9–1QF17).

Figure 16-24 Wiring diagram for a 2N power distribution physical isolation scenario



Wiring principles for the smart cooling product PDB:

- In the smart cooling product PDB, connect output cables based on the switch number sequence (ascending order). Connecting sequence: row A smart cooling product cabinets → row B smart cooling product cabinets → AC actuators.
- The output switches corresponding to the smart cooling products are numbered QF1 to QF8. The output switches corresponding to the AC actuators are numbered QF9 to QF11.

Figure 16-25 Wiring diagram for N+1 power distribution smart cooling product PDB

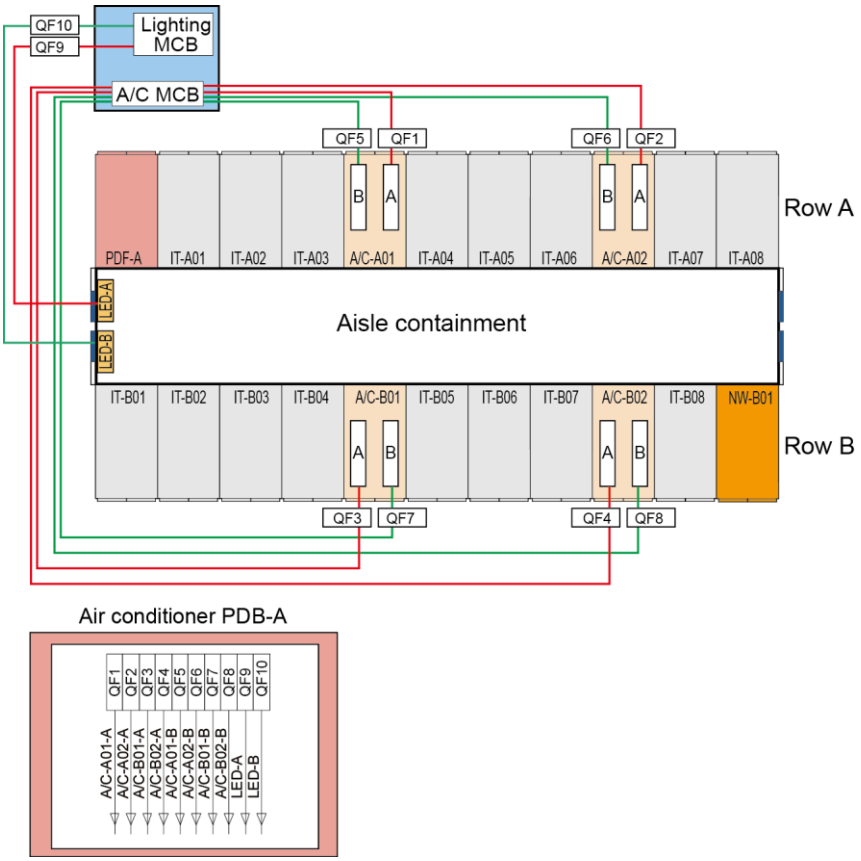
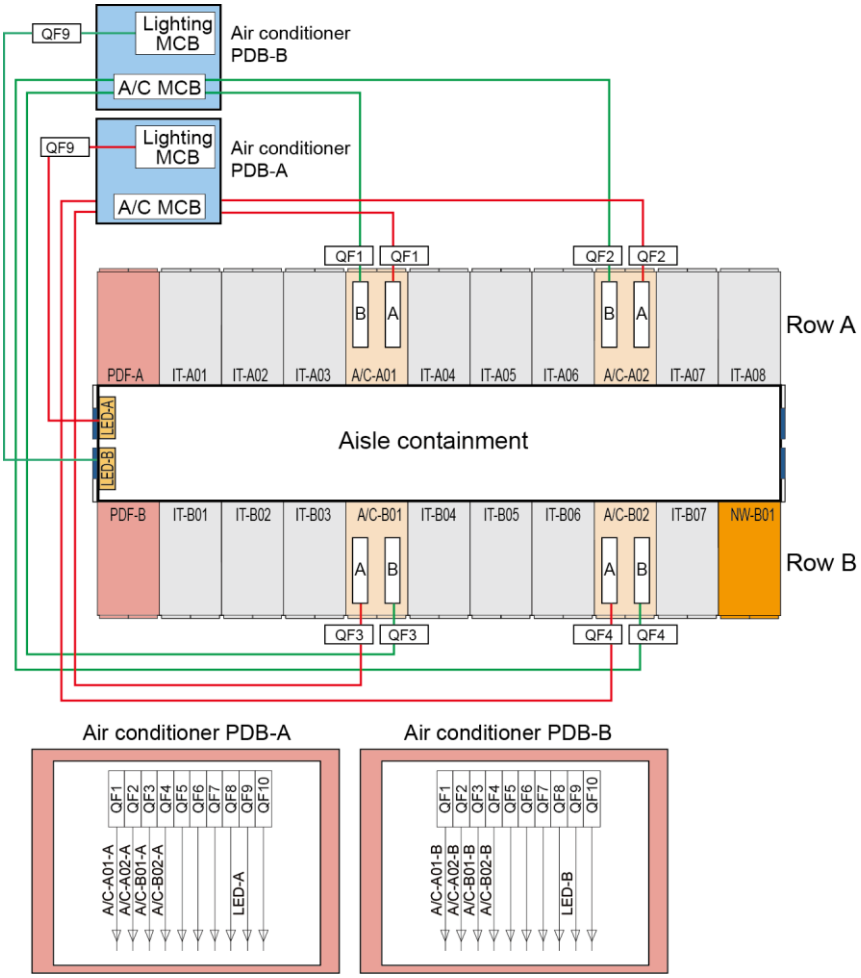


Figure 16-26 Wiring diagram for 2N power distribution smart cooling product PDB



16.6.5 Connecting Battery Cables

Precautions for Connecting Battery Cables

- For details about how to connect battery cables, see the battery cable connection diagram delivered with the cables.
- Battery trays consist of supports and trays, with space reserved between supports and trays on adjacent layers for operation before battery cabinets are delivered. To remove the battery trays, perform the following operations:
  a. Remove the battery trays from top to bottom.
  b. Install batteries and connect cables from bottom to top.

NOTICE

When installing batteries, install battery trays at first, and then place batteries onto the trays and connect cables. Do not move all the batteries into the cabinet after placing them on the trays and connecting cables.

- When placing batteries, install separators between adjacent batteries. If the battery capacity is 65 Ah or more, there is no need to install a separator in the depth direction of the battery cabinet. After placing the batteries, attach the battery labels on the middle position at the battery top from positive terminals in sequence based on the wiring diagram.

Figure 16-27 Installing a separator

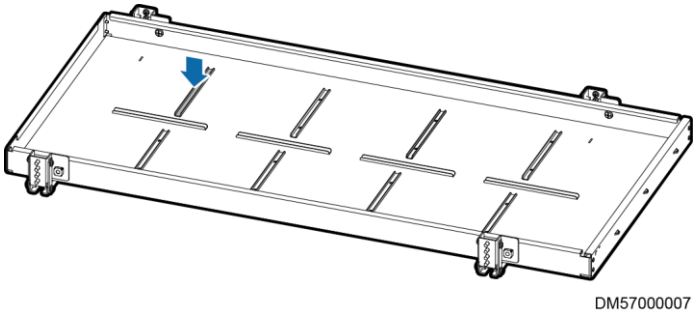
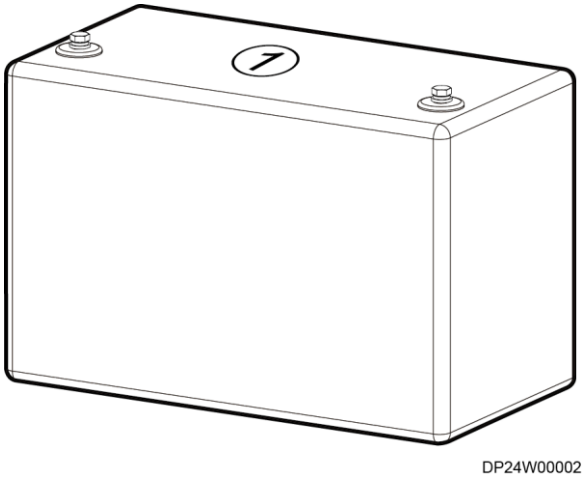
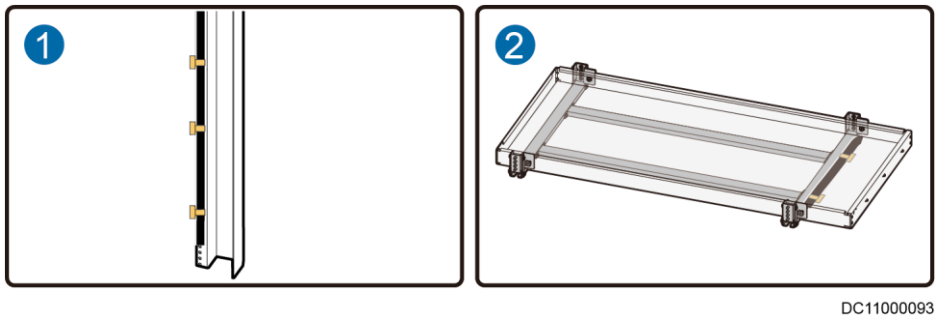


Figure 16-28 Attaching the battery label



- Route and secure cables between layers along the rack rail in the vertical direction, as shown by (1) in Figure 16-29.
- Route and secure cables between layers along the tray supporting beam in the horizontal direction, as shown by (2) in Figure 16-29.

Figure 16-29 Cable routes

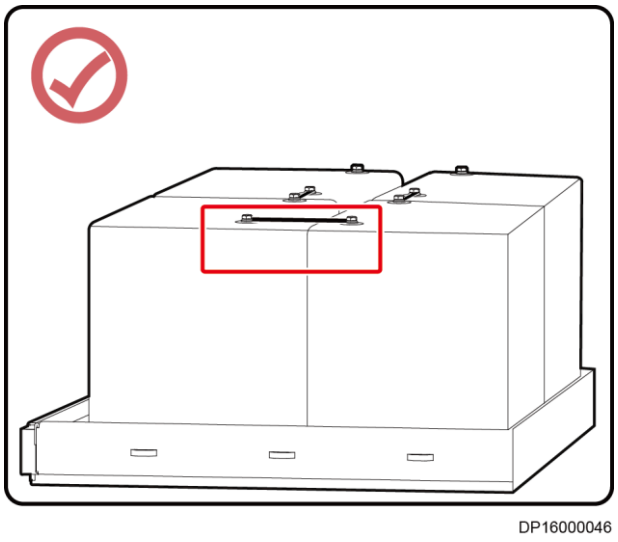


- (Optional) When battery cabinets are installed adjacent to each other, remove the upper side plates from the battery cabinets for routing cables to the corresponding ports.

Correct Method for Connecting Battery Cables

- If the length of a battery cable equals the distance between two battery terminals, connect the cable straight through.

Figure 16-30 Directly connecting two batteries



- If the length of a battery cable is longer than the distance between two battery terminals, connect the cable in the way shown in Figure 16-31. To prevent misshaping battery terminals, do not connect the cable in the way shown in Figure 16-32.

Figure 16-31 Correct battery cable connection method

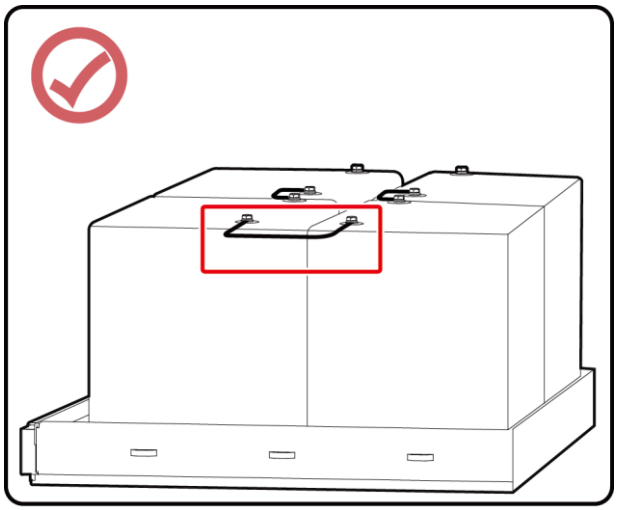
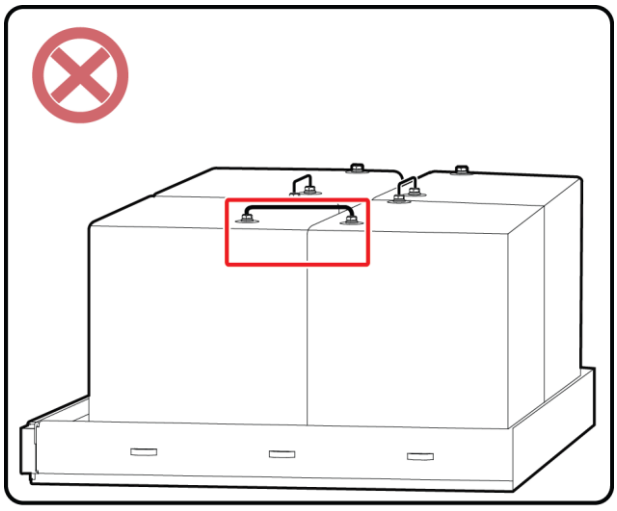


Figure 16-32 Incorrect battery cable connection method



Connecting Cables to the Circuit Breaker in a Battery Cabinet

CAUTION

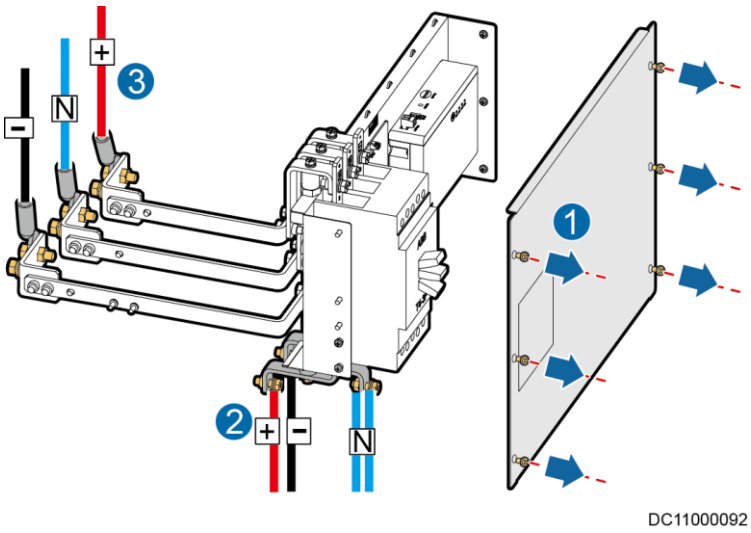
Before connecting cables, ensure that the circuit breaker is OFF.

Connect cables to the circuit breaker as follows:

1. Remove the circuit breaker panel.
2. Connect cables to battery terminals +, N, and –.
3. Connect cables to UPS terminals +, N, and –.

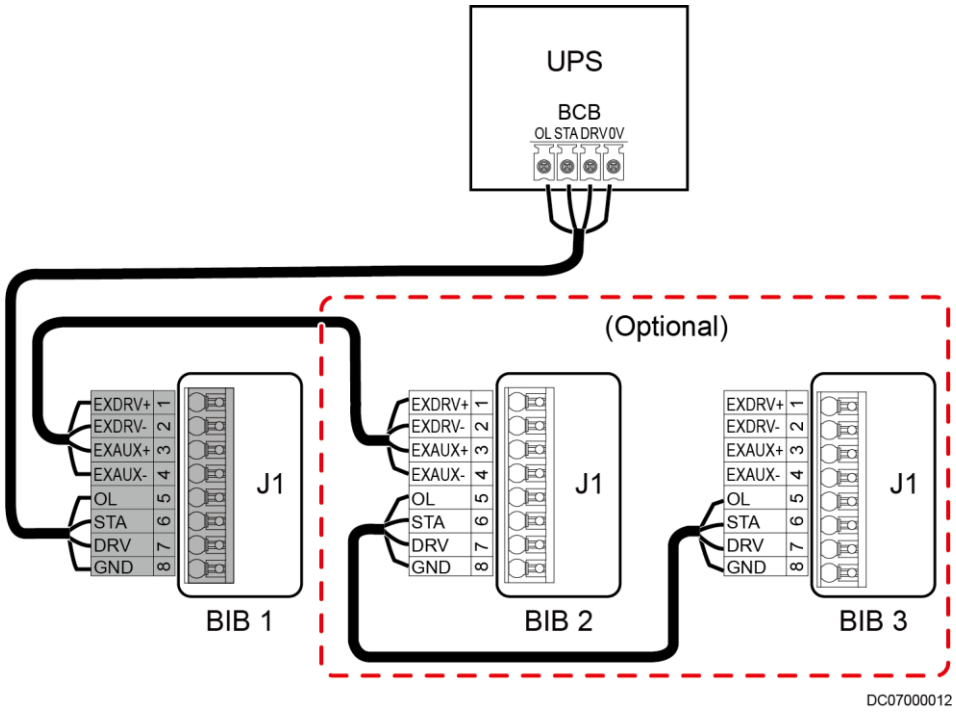
4. (Optional) If two battery strings are deployed, connect the UPS terminals +, N, and – for one battery string to the UPS terminals +, N, and – for the other battery string.

Figure 16-33 Connecting power cables to the circuit breaker



5. (Optional) If the intelligent battery monitoring system is not deployed, use a 04080376 cable to connect the J1 port on the battery control board (BIB) to the corresponding port on the UPS. Alternatively, use a 04080377 cable for cascading and use a 04080376 cable for connecting to the corresponding port on the UPS.

Figure 16-34 Connecting monitoring cables to the circuit breaker



6. (Optional) If an intelligent battery monitoring system is configured, install, connect cables to, and power on the system by referring to the iBattery documentation or the documentation in the section "Reference Documentation."

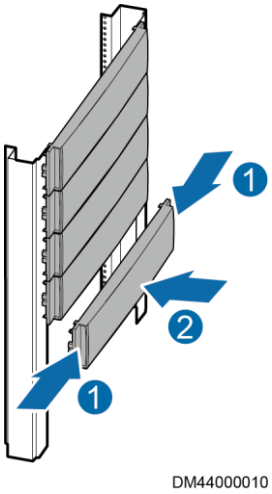
Installing Panels

1. Reinstall the circuit breaker panel.
2. Secure filler panels to the rack rails on the rear door.

NOTE

Each filler panel occupies 2 U. Install them according to the U position markings on the cabinet. Ensure that filler panels fully cover the rack rails.

Figure 16-35 Installing filler panels

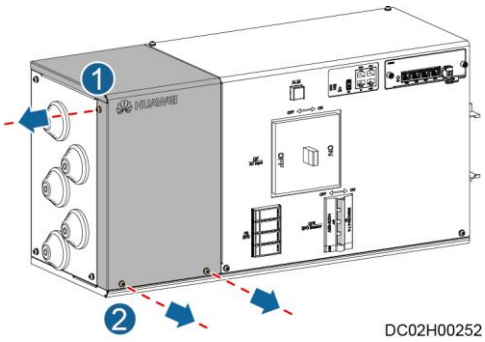


16.6.6 Installing Cables for the New Main Way

Procedure

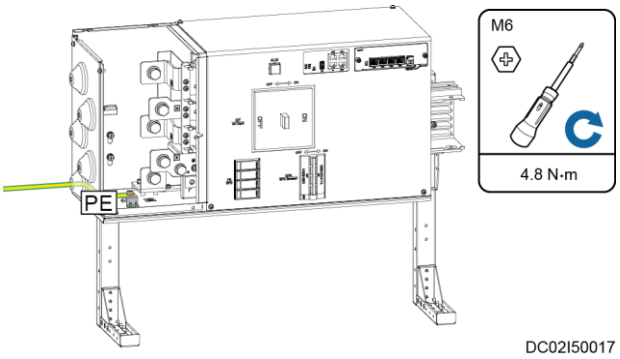
Step 1 Remove the cover from the general input unit.

Figure 16-36 Removing the cover



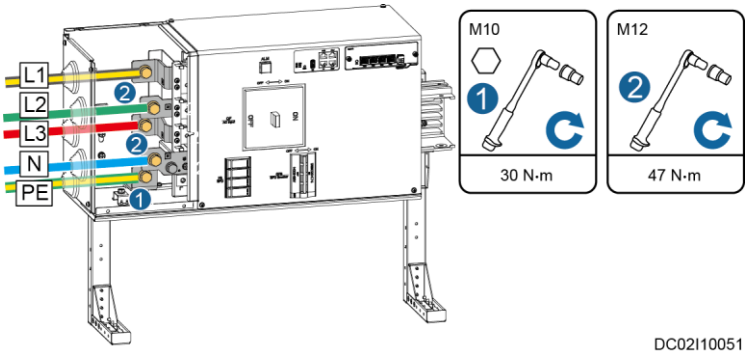
Step 2 Install the equipotential ground cable.

Figure 16-37 Install the equipotential ground cable



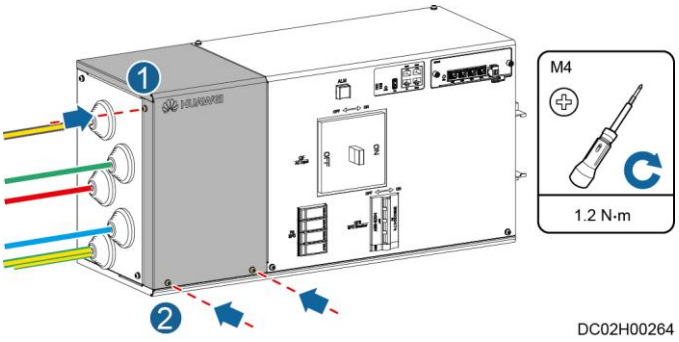
Step 3 Install AC input power cables.

Figure 16-38 Install AC input power cables



Step 4 Reinstall the cover of the general input unit.

Figure 16-39 Installing the cover

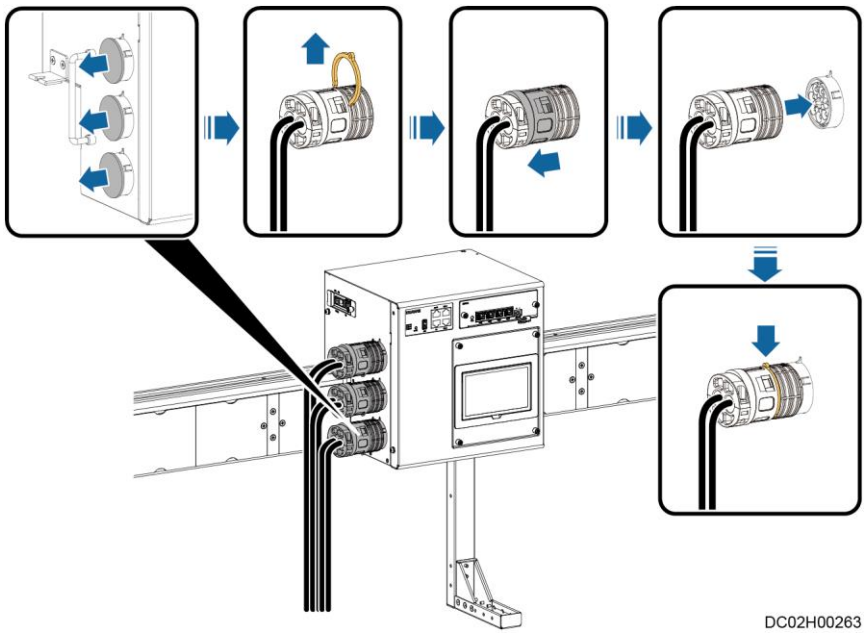


Step 5 Install load cables.

Output Connector	Single Phase PDU	Three Phase PDU
XT1	QF1	QF1

Output Connector	Single Phase PDU	Three Phase PDU
	QF2	
XT2	QF3	QF2
	QF4	
XT3	QF5	N/A
	QF6	

Figure 16-40 Installing load cables



Step 6 Install Cascade Cables.

Figure 16-41 Cascading port of the general input unit

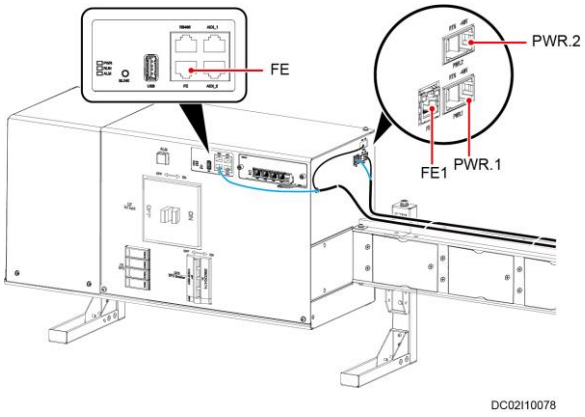


Figure 16-42 Power distribution unit cascading port

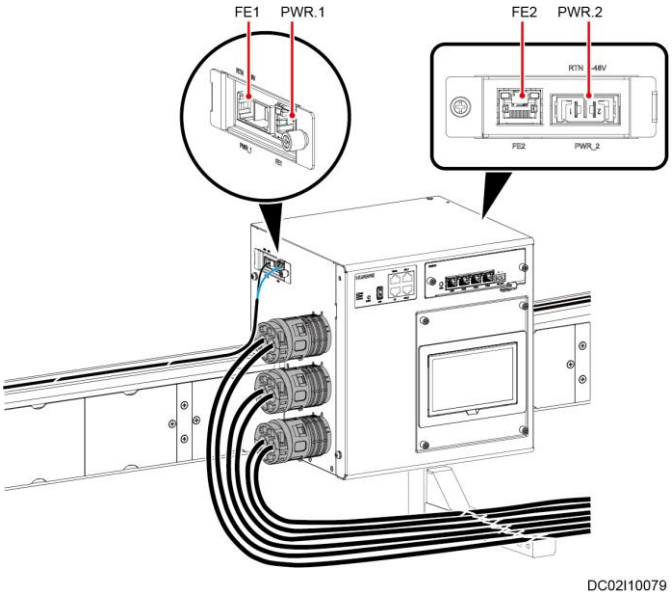


Figure 16-43 Single-row aisle containment (N+1 scenario)

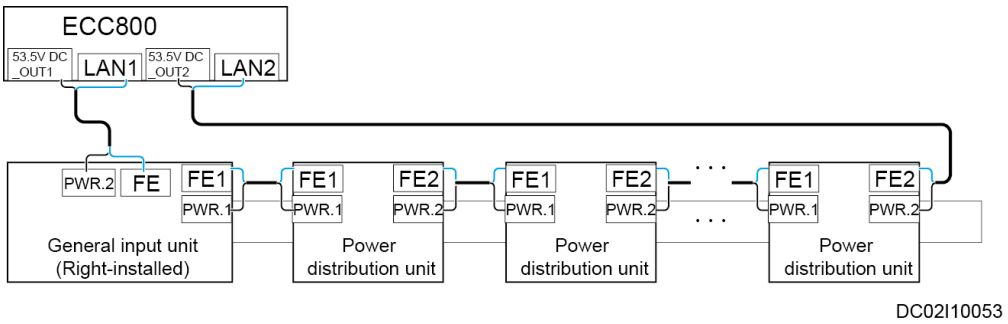


Figure 16-44 Single-row aisle containment (2N scenario)

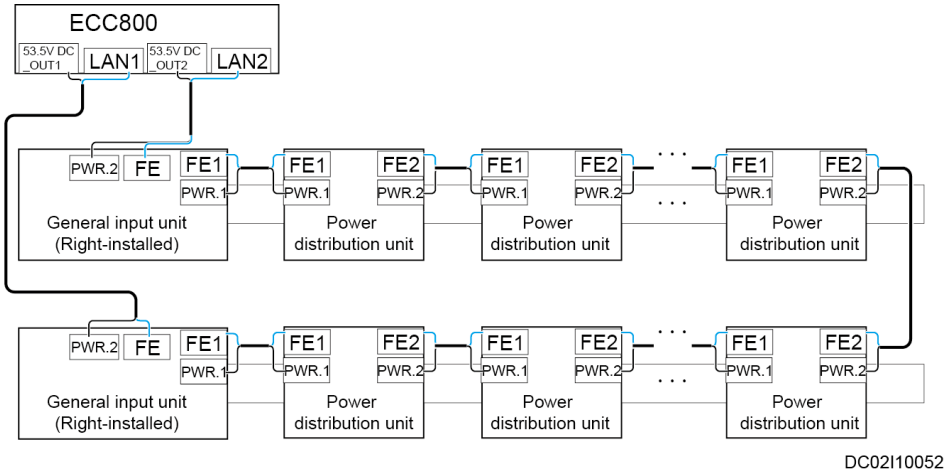


Figure 16-45 Dual-row aisle containment (2N scenario)

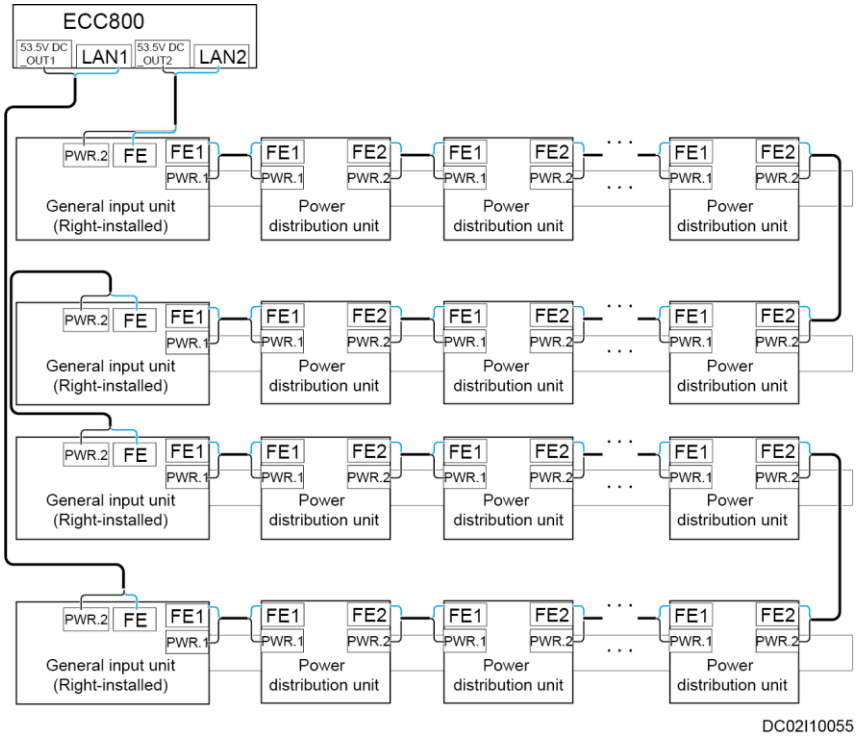
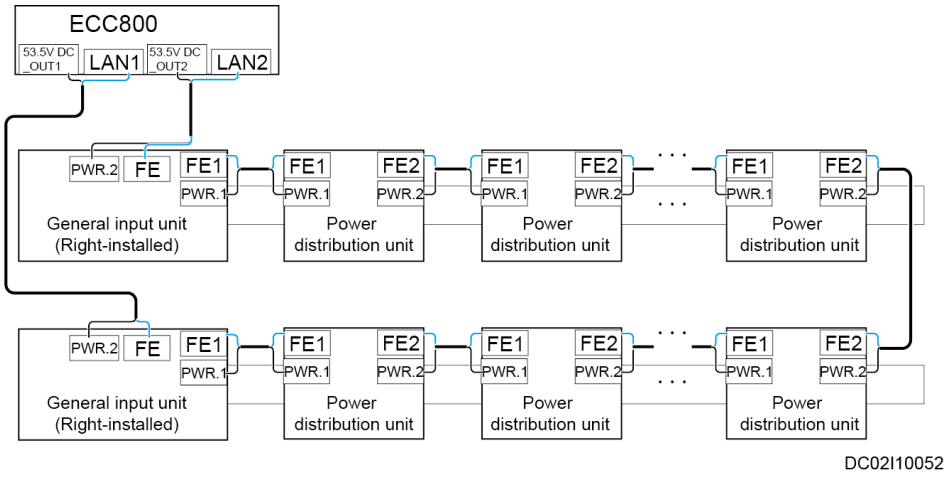


Figure 16-46 Dual-row aisle containment (2N/N+1 scenario)



----End

16.6.7 (Optional) Connecting Cables to Industrial Connectors

NOTICE

Figure 16-47 to Figure 16-48 show only the cable connection methods. The industrial connector cable connections depend on the industrial connector type and wiring port silk screen.

Figure 16-47 Connecting cables to the industrial connector (three-core cable)

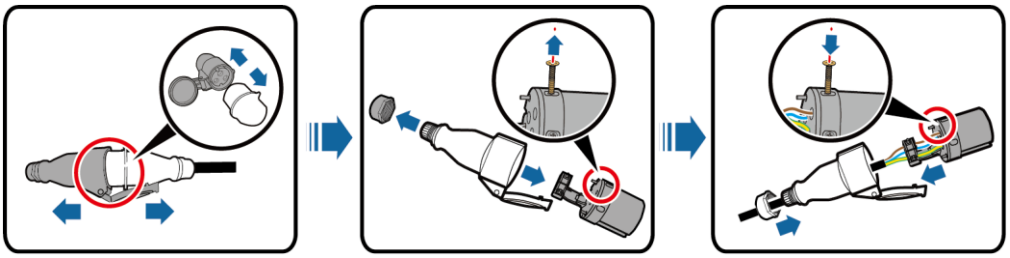
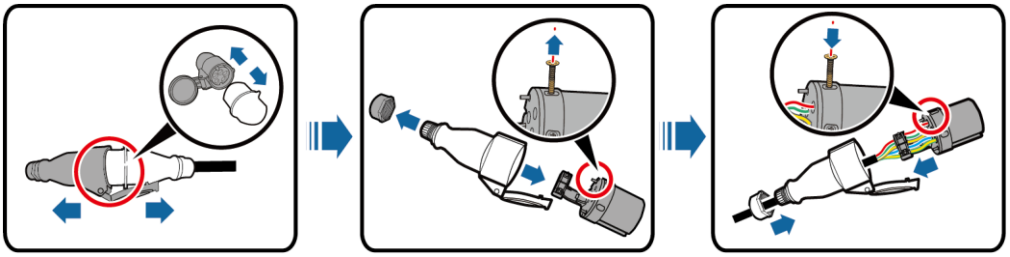


Figure 16-48 Connecting cables to the industrial connector (five-core cable)



16.6.8 (Optional) Connecting rPDU Cables

Context

If the rPDU is not provided with industrial connectors, connect the rPDU cables and lay out the cables on the cabinet top.

Preparations

Tools: Phillips screwdriver, flat-head screwdriver, diagonal pliers, protective gloves

Material: cable tie

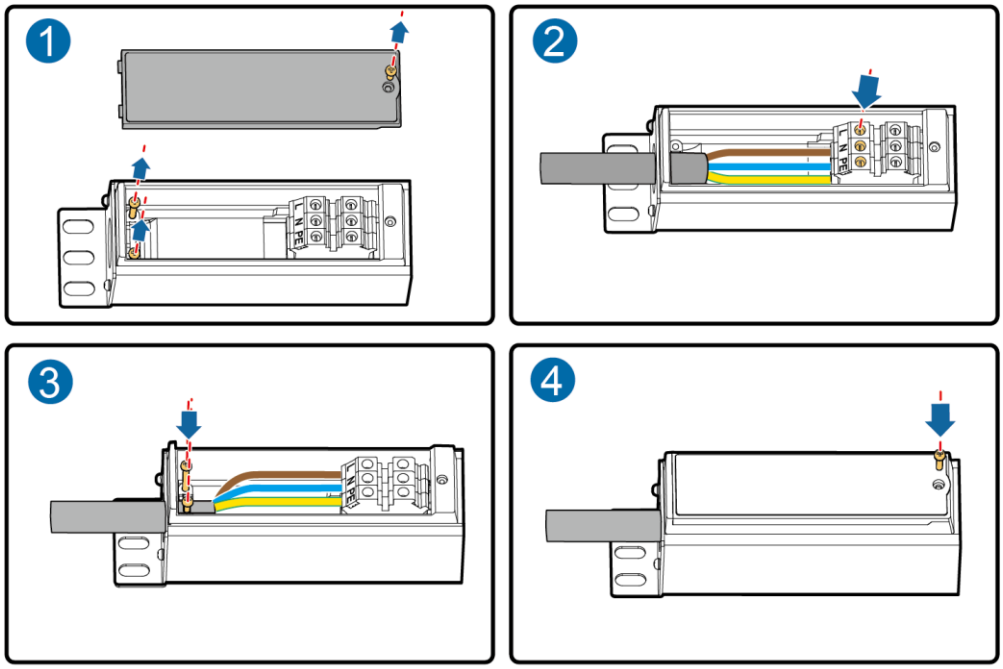
Procedure

Step 1 Connect the rPDU cables.

NOTICE

rPDU cable connections depend on the rPDU type and wiring port silk screen.

Figure 16-49 Connecting rPDU cables



Step 2 Remove the rodent-proof mesh from the top of the cabinet, use diagonal pliers to cut openings that allow cables to run through, and take out the rPDU cables through the openings.

Step 3 Lay out the rPDU cables on the top of the cabinet and reinstall the rodent-proof mesh.

Step 4 Install the rPDU cables for other IT cabinets in the same way.

----End

Follow-up Procedure

Before connecting the power plug of a device to the rPDU, loosen the locking device on the rPDU. After connecting the power plug, tighten the locking device.

16.6.9 Connecting Smart rPDU Signal Cables (Connected to a Rack Environment Unit)

Context

One end of the signal cables has been connected to the smart rPDU.

The BOM number of the rPDU is 02122280.

The installation position for the smart rPDU near the cabinet rear door varies depending on the actual product.

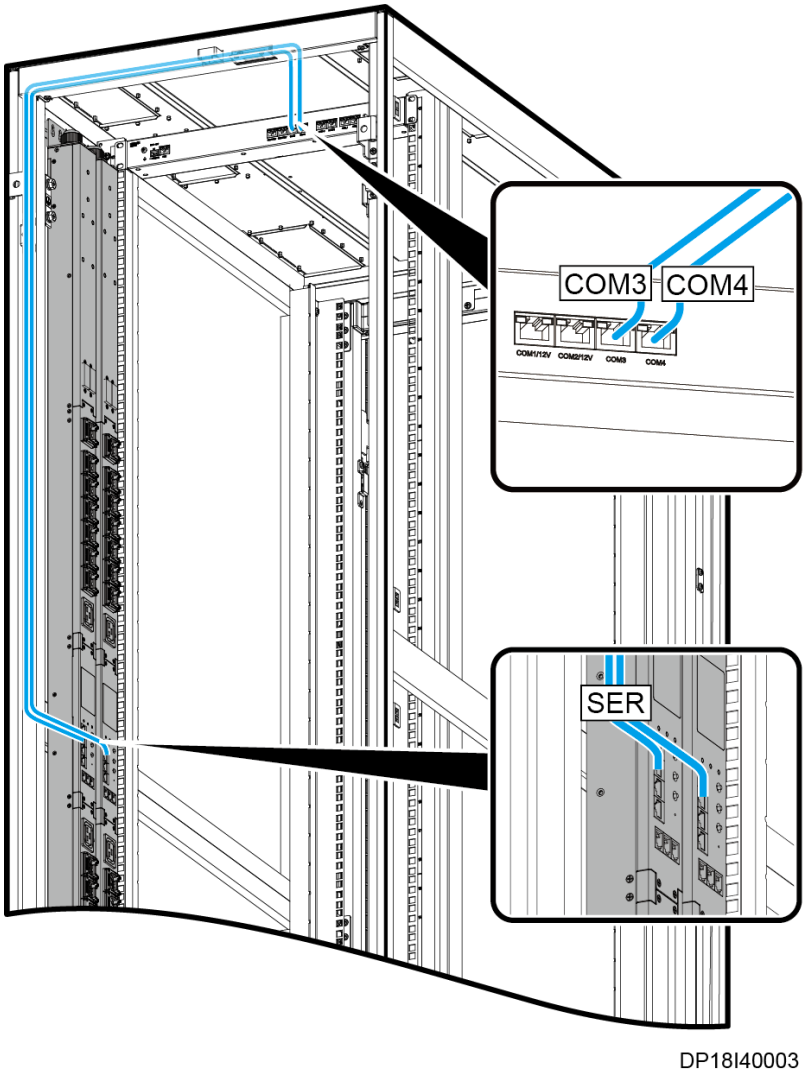
Procedure

Step 1 Insert the smart rPDU signal cables bound on the top of the cabinet to COM3 and COM4 of the rack environment unit respectively.

NOTICE

- COM3 has a mapping relationship with route A and COM4 have a mapping relationship with cabinet B. Otherwise, the alarm convergence feature cannot be implemented.
- The appearance of the actual smart rPDU prevails. Select an appropriate connection mode based on the actual situation.
- The installation positions of the smart rPDUs in the cabinet depend on the actual delivery. The following figure is for reference only.

Figure 16-50 Connecting smart rPDU signal cables



Step 2 Bind the cables to the cabinet using cable ties.

----End

Example

The signal cables are delivered with the materials. If the signal cables are lost, prepare signal cables based on the following definition of signal cable terminals.

Figure 16-51 Smart rPDU signal cable

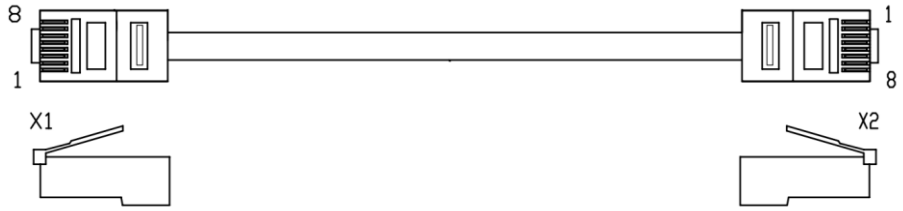


Table 16-2 Signal cable terminal definition

rPDU Side	Color (Status)	Rack Environment Unit Side
X1.1	Left open	X2.1
X1.2	Left open	X2.2
X1.3	Left open	X2.3
X1.4	Blue	X2.4
X1.5	Blue-and-white	X2.5
X1.6	Left open	X2.6
X1.7	Left open	X2.7
X1.8	Left open	X2.8

16.6.10 Connecting Smart rPDU Signal Cables (Connected to the UIM20A Expansion Module)

Context

One end of the signal cables has been connected to the smart rPDU.

The BOM number of the rPDU is 02122280.

The installation position for the smart rPDU near the cabinet rear door varies depending on the actual product.

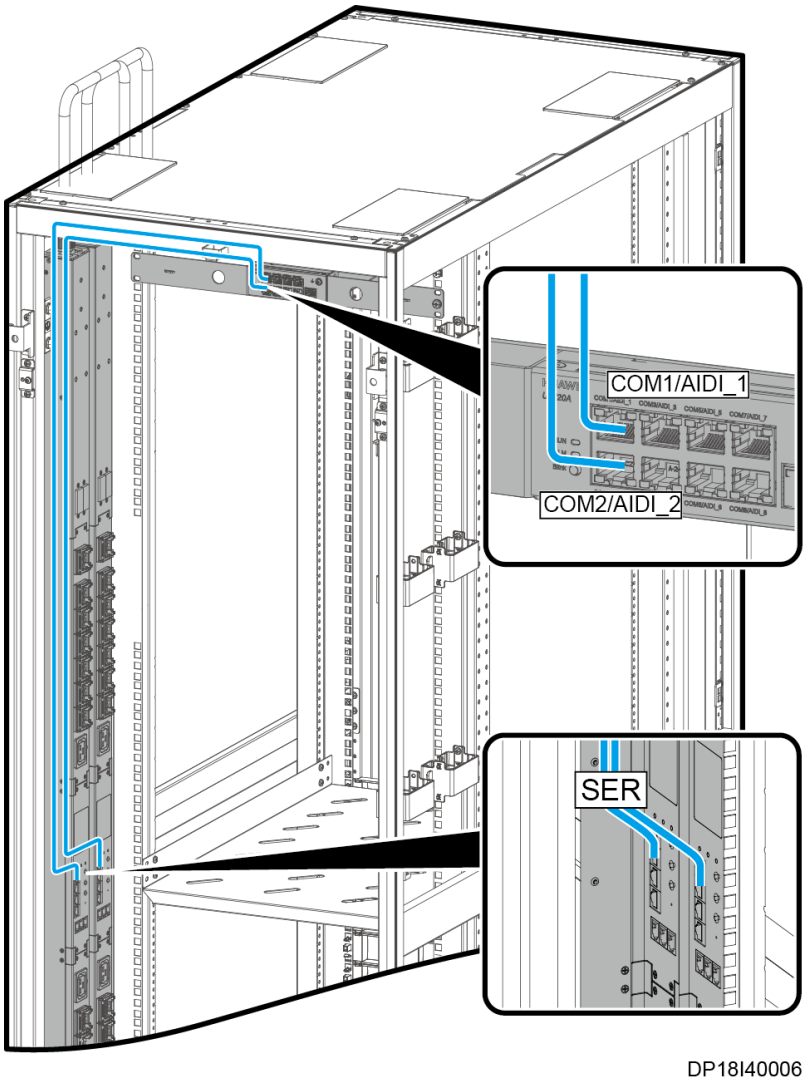
Procedure

Step 1 Insert the smart rPDU signal cables bound on the top of the cabinet to COM1 and COM2 of the UIM20A expansion module respectively.

NOTICE

- COM1 corresponds to route A of the cabinet, and COM2 corresponds to route B of the cabinet. If they are connected incorrectly, the alarm convergence feature cannot be implemented.
- The appearance of the actual smart rPDU prevails. Select an appropriate connection mode based on the actual situation.
- The actual installation position of the smart rPDU in the cabinet prevails. The figure is for reference only.

Figure 16-52 Connecting Smart rPDU Signal Cables



Step 2 Bind the cables to the cabinet using cable ties.

----End

Example

The signal cables are delivered with the materials. If the signal cables are lost, prepare signal cables based on the following definition of signal cable terminals.

Figure 16-53 Smart rPDU signal cable

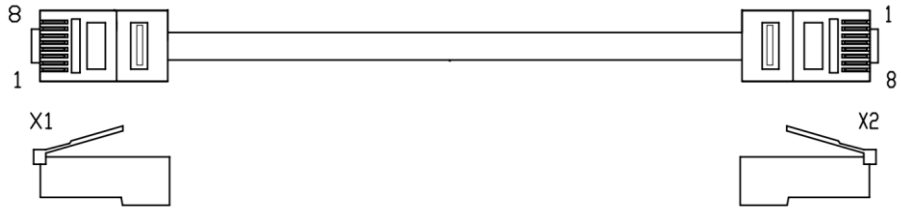


Table 16-3 Signal cable terminal definition

rPDU Side	Color (Status)	UIM20A Expansion Module
X1.1	Left open	X2.1
X1.2	Left open	X2.2
X1.3	Left open	X2.3
X1.4	Blue	X2.4
X1.5	Blue-and-white	X2.5
X1.6	Left open	X2.6
X1.7	Left open	X2.7
X1.8	Left open	X2.8

16.7 Connecting Cables to the Cooling System

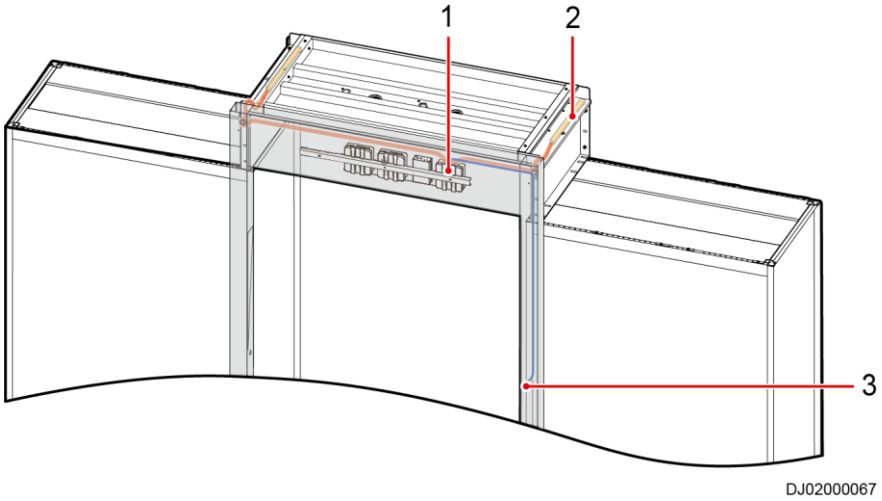
For details, see the document delivered with the equipment or obtain the required document according to the section "Documentation Preparations."

16.8 Installing Cables for the Facility Management System

For details, see the document delivered with the No. 0 packing case of the equipment or obtain the required document according to the section "Documentation Preparations."

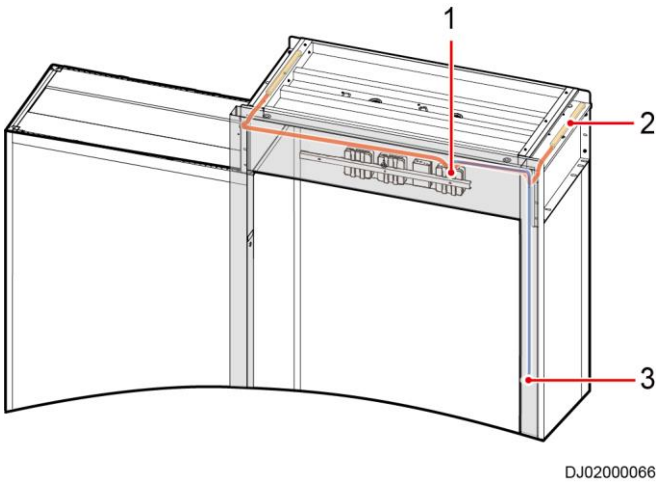
16.9 Cable Routes for the Aisle Lighting System

Figure 16-54 Cable routes for the aisle lighting system (dual-row scenario)



(1) AC actuator (2) Light (3) Light button

Figure 16-55 Cable routes for the aisle lighting system (single-row scenario)



(1) AC actuator (2) Light (3) Light button

16.10 Cable Routes for the Pad and Access Control Device

The cable routes for the pad and access control device on the sliding door and revolving door are the same. The following figure uses a sliding door as an example.

Figure 16-56 Cable routes for the pad and access control device (sliding door scenario)

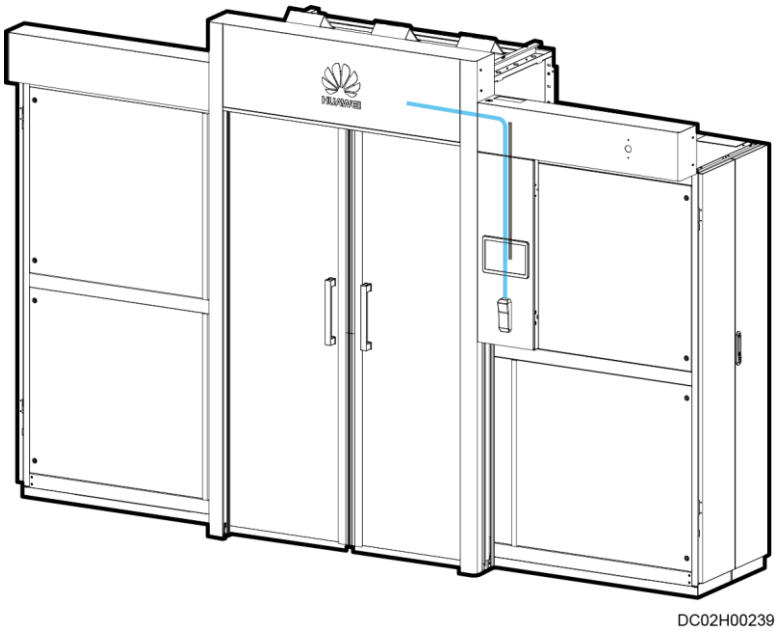
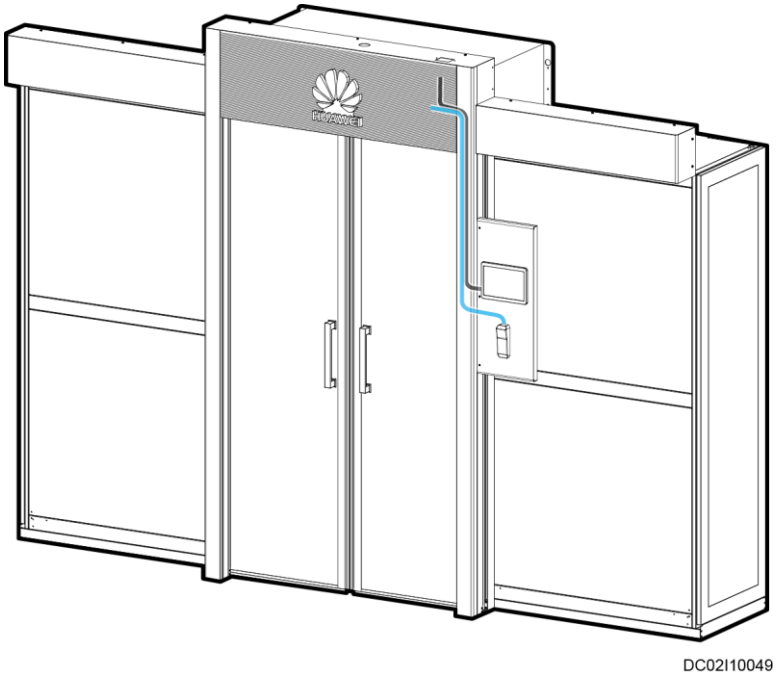


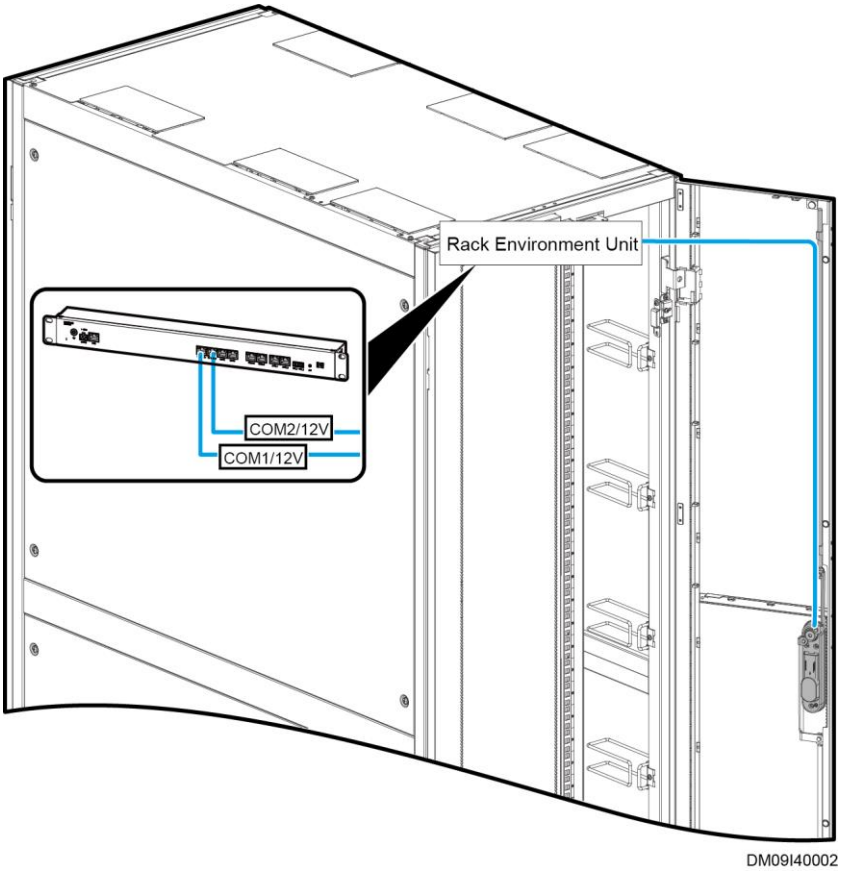
Figure 16-57 Cable routes for the pad and access control device (auto door scenario)



16.11 Cable Route of the Electronic Lock on the Rear Door of the Cabinet

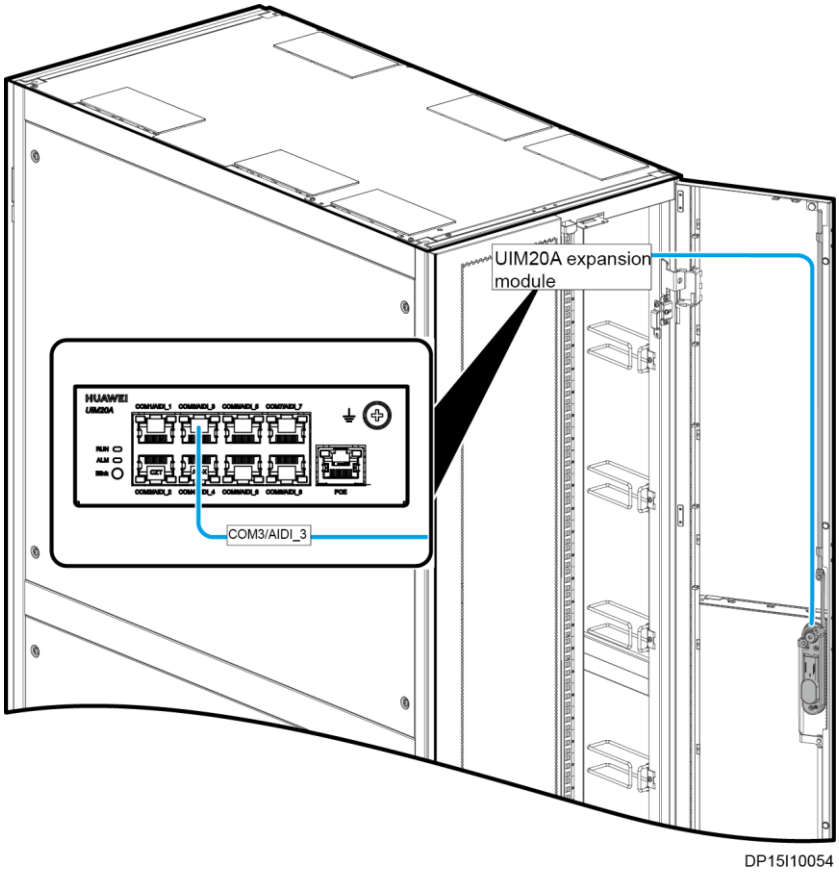
Connected to a rack environment unit: The electronic lock on the rear door is connected to the COM1 or COM2 port on the rack environment unit.

Figure 16-58 Cable route of the electronic lock on the rear door of the cabinet



- Connected to a UIM20A expansion module: The electronic lock on the rear door is connected to the COM3 or COM4 port on the rack environment unit.

Figure 16-59 Cable route of the electronic lock on the rear door of the cabinet



A Appendix

A.1 Installing an Expansion Bolt

Preparations

Tools: adjustable wrench, hammer drill, rubber mallet, protective gloves, vacuum cleaner

Material: expansion bolt

Procedure

Step 1 Drill a hole at the position for installing the expansion bolt using a hammer drill with the hole depth of 52 mm to 60 mm.

Step 2 Partially tighten the expansion bolt and vertically insert it into the hole. Knock the expansion bolt using a rubber mallet until the expansion sleeve is fully inserted into the hole.

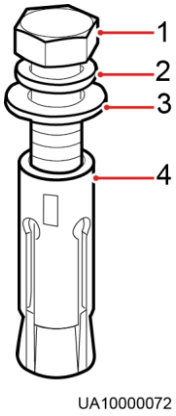
Step 3 Rotate the expansion bolt clockwise using a wrench until the expansion sleeve fully expands.

Step 4 Rotate the expansion bolt counterclockwise to remove it together with the spring washer and flat washer.

NOTE

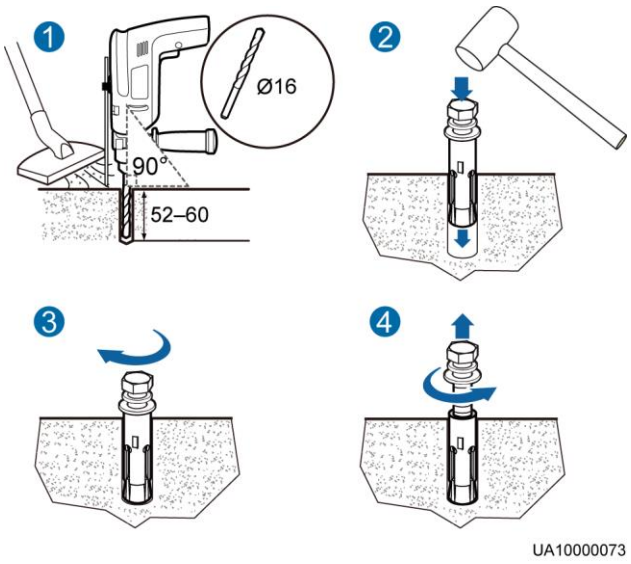
Put aside the removed expansion bolt for securing the cabinet.

Figure A-1 Expansion bolt



(1) M12 bolt
(2) Spring washer
(3) Flat washer
(4) Expansion sleeve

Figure A-2 Drilling a hole and installing an expansion bolt (unit: mm)



----End

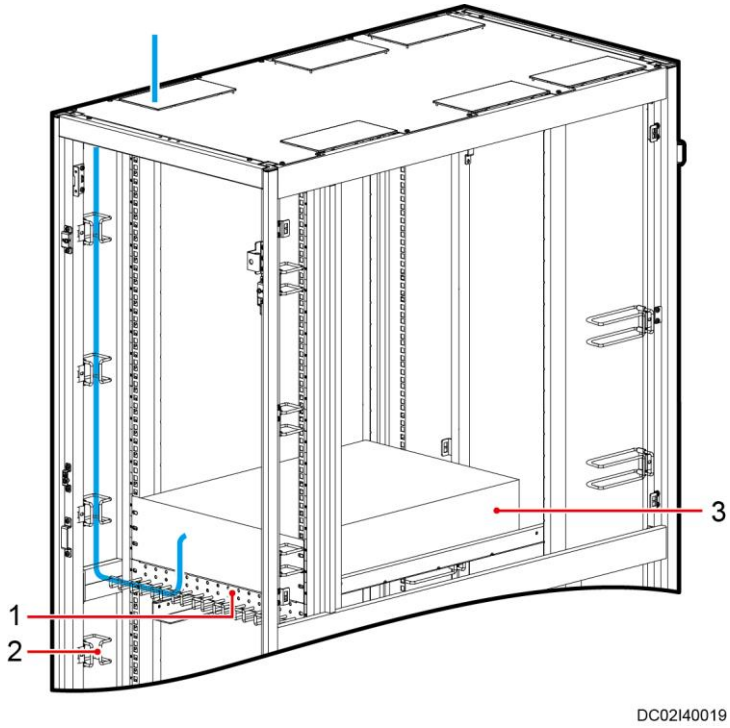
A.2 Cable Routes Inside an IT Cabinet

NOTE

- Signal cables or weak-current cables inside cabinets are sorted by cable managers, cable rings, and cable trays.
- The cable colors shown in figures are for reference only.

Figure A-3, Figure A-4, and Figure A-5 show the routes of the cables out from the front of customer equipment.

Figure A-3 Cable route along a horizontal cable manager



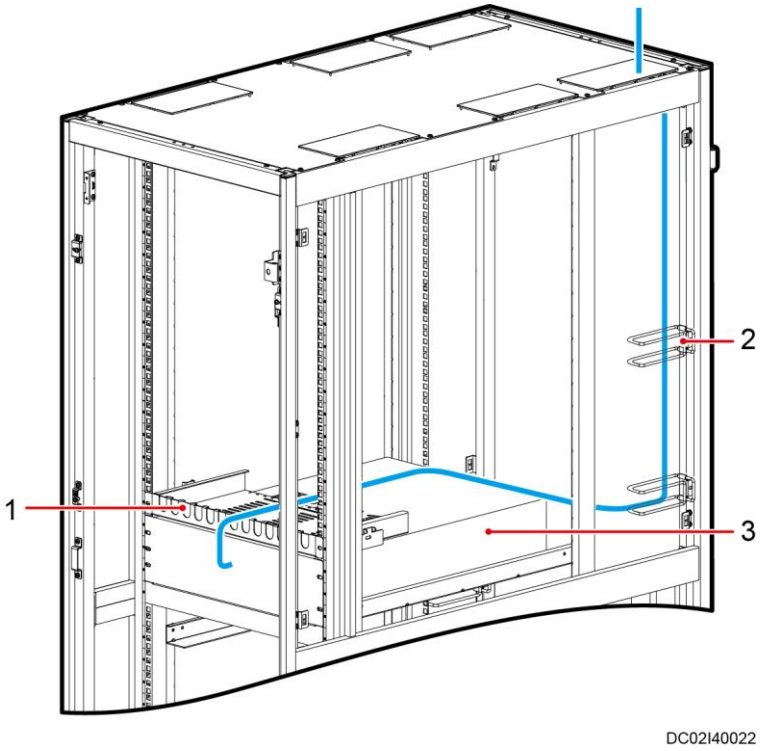
(1) Cable manager (2) Small cable ring

(3) Customer equipment

NOTE

- The small cable ring is optional and used to manage the cable routes in the vertical direction.
- The cable manager is installed in the front of a cabinet by default. You can install it in the rear of a cabinet if necessary.

Figure A-4 Cable route along a cable tray



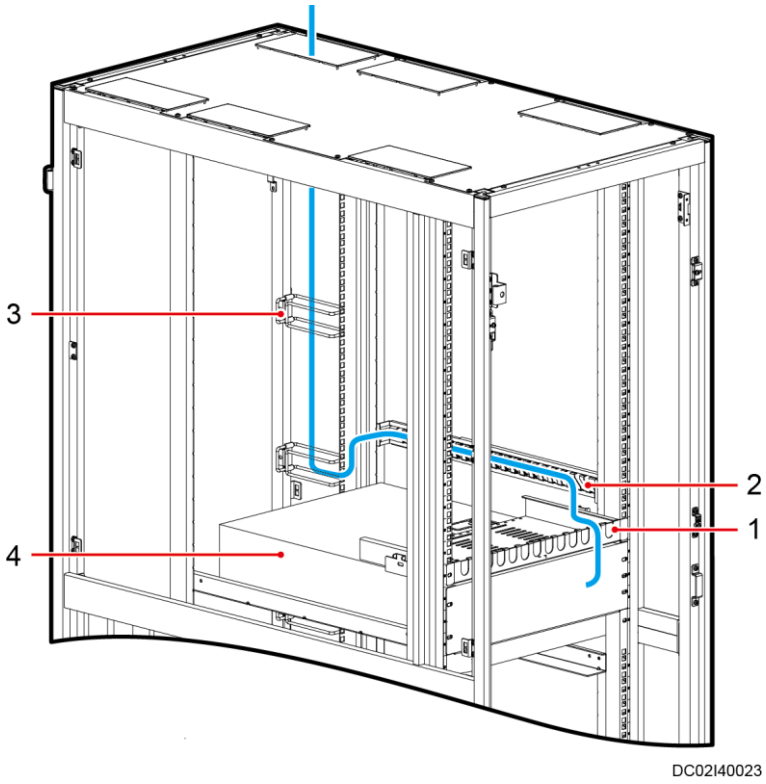
(1) Cable tray (2) Big cable ring

(3) Customer equipment

NOTE

The cable tray is optional and used to lead cables from the cabinet front to the cabinet rear.

Figure A-5 Cable route along a depth-directed cable tray



(1) Cable tray
(2) Depth-directed cable tray
(3) Big cable ring
(4) Customer equipment

NOTE

- The cable tray is optional and used to lead cables from the cabinet front to the cabinet rear.
- The depth-directed cable tray is optional and used to manage the cable routes on the side of a cabinet.

Figure A-6 and Figure A-7 show the routes of the cables out from the rear of customer equipment.

Figure A-6 Power cable route

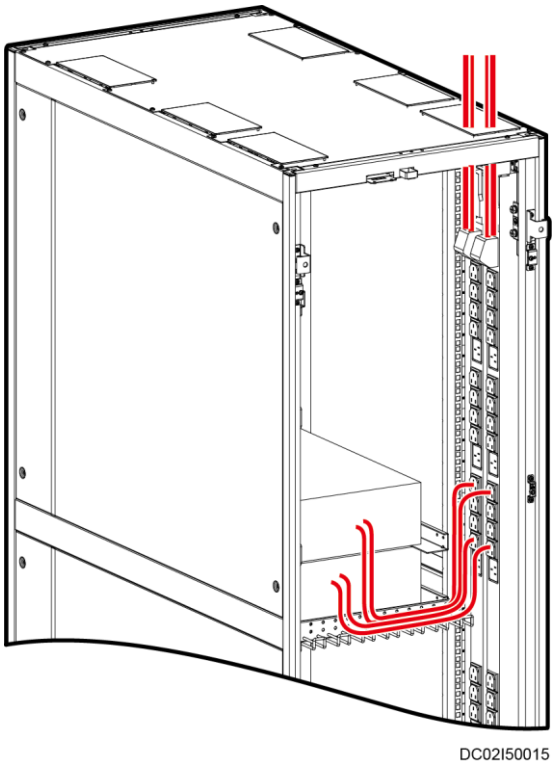
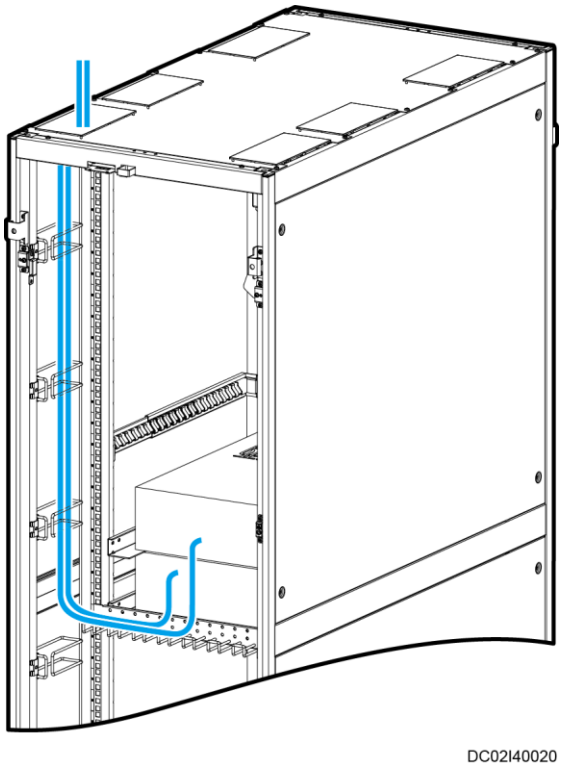
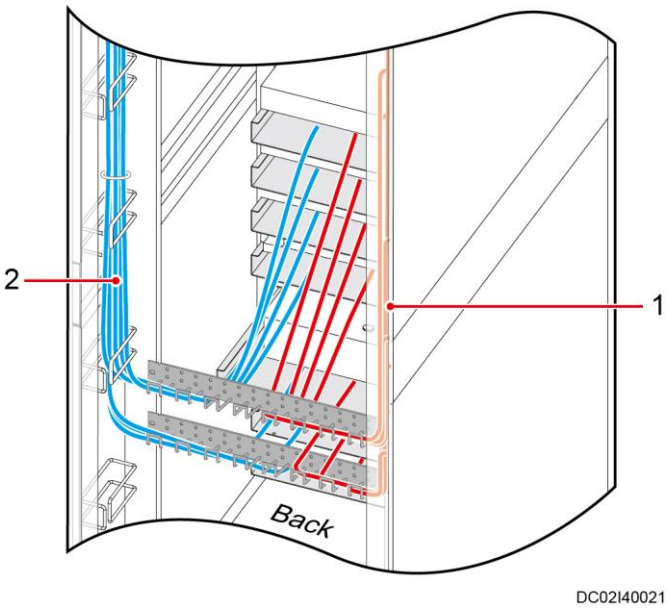


Figure A-7 Signal cable route



A.3 Cable Routes for the Network Cabinet

Figure A-8 Cable routes for the network cabinet



(1) Power cable (2) Signal cable

A.4 Preparing Monitoring Cables

Prerequisites

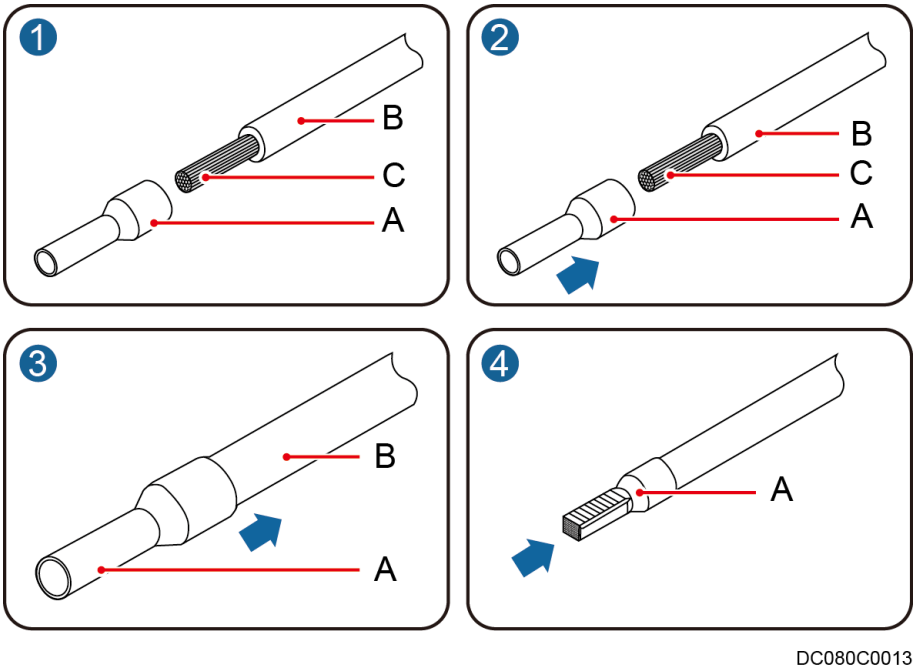
- A network cable, cord end terminals, and RJ45 connectors are prepared.
- The following tools are prepared:
  - Wire stripper
  - Crimping tool
  - RJ45 crimping tool
  - Electrician's knife
  - Insulation tape

Preparing a Cord End Terminal

Figure A-9 shows how to prepare a cord end terminal.

1. Strip the insulation layer of cable B to expose cable core C.
2. Put cable core C through cord end terminal A.
3. Crimp the metal part of cord end terminal A using the crimping tool.

Figure A-9 Preparing a cord end terminal

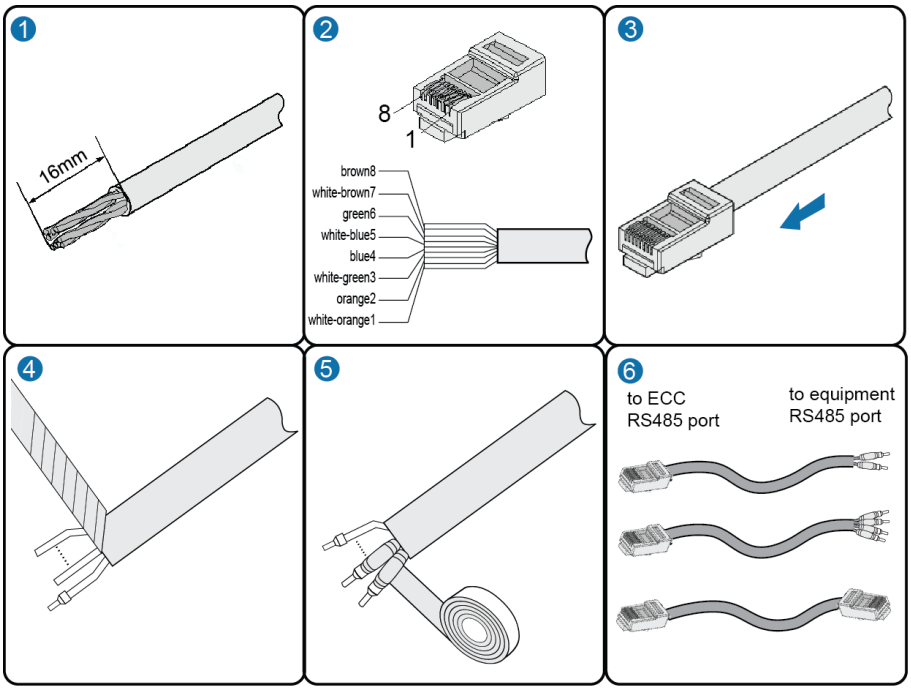


(A) Cord end terminal connector (B) Insulation layer (C) Copper core wire

Preparing RS485 Monitoring Cables

Figure A-10 shows how to prepare an RS485 monitoring cable for the ECC collector.

Figure A-10 Preparing an RS485 monitoring cable for the ECC collector

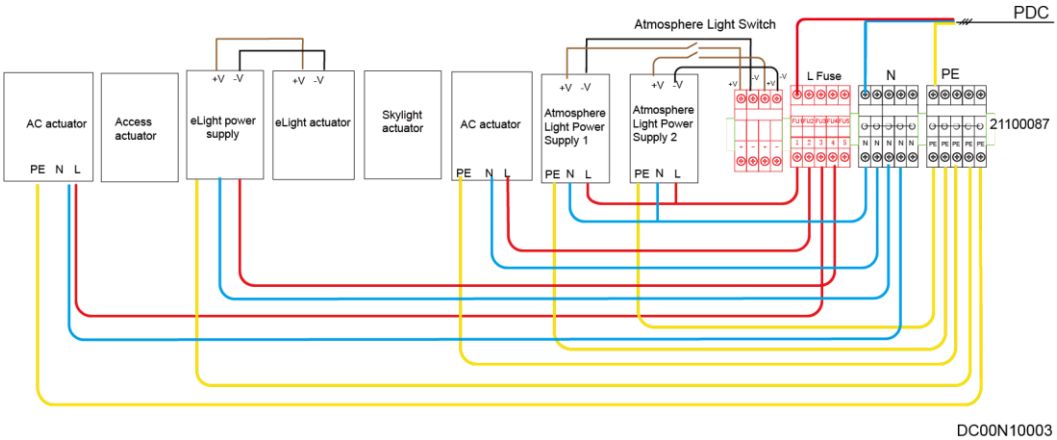


Preparing a Dry Contact Monitoring Cable

The method for preparing a dry contact monitoring cable is similar to the method for preparing an RS485 monitoring cable. Prepare cord end terminals on both ends of each required cable core based on the number of dry contacts.

A.5 Layer 1 Power Supply Solution

Figure A-11 Layer 1 Power Supply Solution (Inside the aisle)



A.6 (Optional) Connecting Linkage Cables Between the Gas Extinguishing Controller and Equipment Room ATS

Context

NOTICE

After a linkage cable is connected between the gas extinguishing controller and equipment room ATS, if the gas extinguishing controller generates a fire signal, the ATS disconnects non-firefighting power supply and stops supplying power to smart cooling products in the data center.

Linkage cables can be connected between the gas extinguishing controller and equipment room ATS in the following two ways:

- Link the fire alarm bell and ATS. When the fire alarm bell rings, the ATS disconnects non-firefighting power supply.
- Link the alarm beacon and ATS. When the alarm beacon is triggered, the ATS disconnects non-firefighting power supply.

This section describes how to link a JB-QBL-QM200 gas extinguishing controller and the ATS using cables.

Preparations

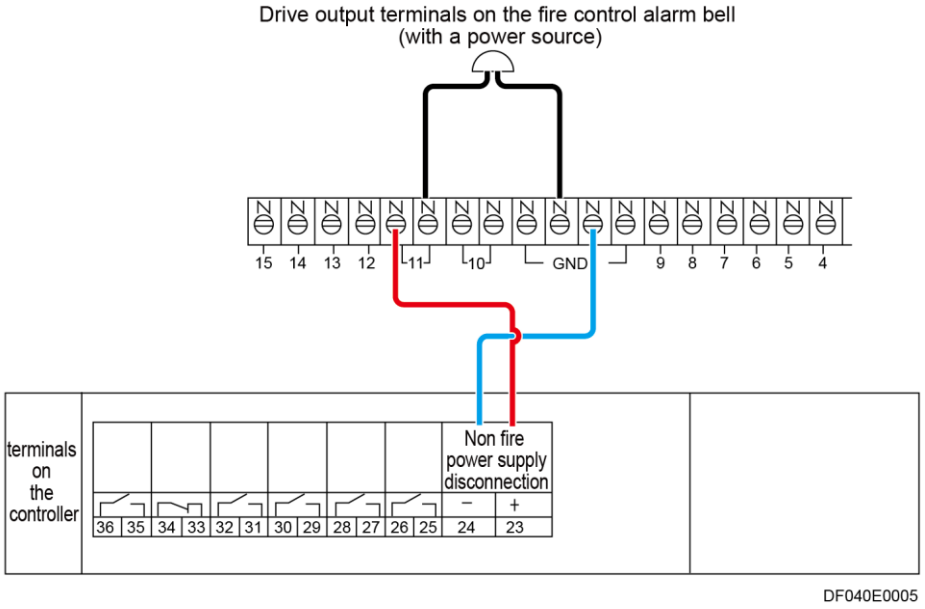
Tool: Phillips screwdriver

Material: cable tie

Procedure

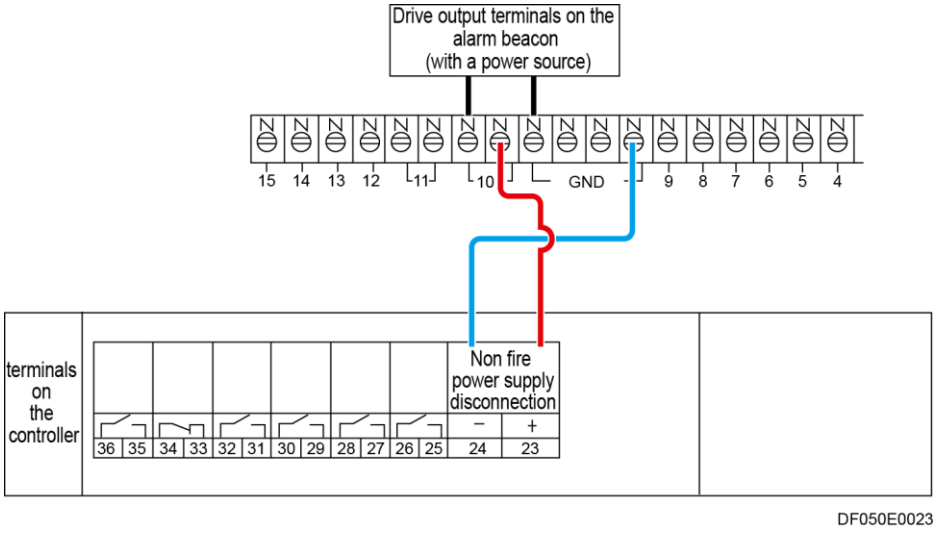
- Connect linkage cables between the drive output ports for the fire alarm bell on the gas extinguishing controller and the non-firefighting power disconnection ports on the ATS, as shown in Figure A-12.

Figure A-12 Connecting linkage cables between the fire alarm bell and ATS



- Connect linkage cables between the drive output ports for the alarm beacon on the gas extinguishing controller and the non-firefighting power disconnection ports on the ATS, as shown in Figure A-13.

Figure A-13 Connecting linkage cables between the alarm beacon and ATS



----End

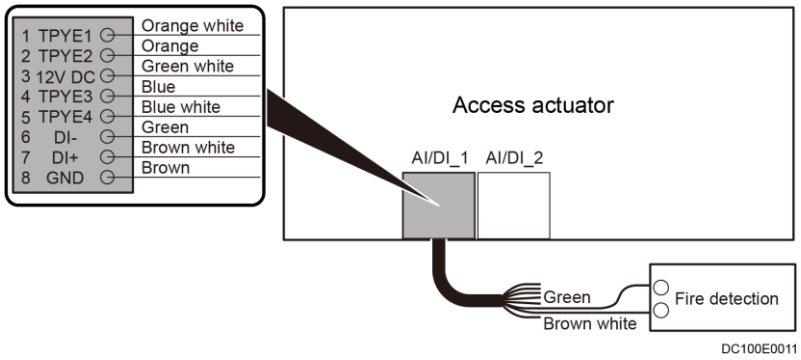
A.7 (Optional) Connecting Linkage Cables Between the Equipment Room Fire Extinguishing System and Access Actuator

After linkage cables are connected between the equipment room fire extinguishing system and access actuator, the access actuator opens data center doors when the fire extinguishing system generates an alarm signal.

- Fire alarm signals are dry contact signals generated by the fire extinguishing system selected by the customer.
- Fire alarm signals are valid only when the dry contact is closed.

Connect fire alarm signal cables to the DI– and DI+ pins at the AI/DI_1 or AI/DI_2 port on the access actuator. The following figure uses connection to the AI/DI_1 port as an example.

Figure A-14 Connecting fire alarm signal cables to the access actuator



B Installation Verification

Cabinet Installation Checklist

No.	Check That	Check Result
1	The cabinets are placed according to the equipment room layout diagram.	□ Compliant □ Incompliant
2	The height deviation of all cabinets and the depth deviation of adjacent cabinets are less than 5 mm.	□ Compliant □ Incompliant
3	All bolts are tightened, especially the bolts used for electric connection. Flat washers and spring washers are installed properly.	□ Compliant □ Incompliant
4	The cabinet is clean and complies with dustproof requirements.	□ Compliant □ Incompliant
5	The paint on the cabinet exterior is intact. If paint flakes off, repaint that area to avoid corrosion.	□ Compliant □ Incompliant
6	The cabinet door and lock work properly.	□ Compliant □ Incompliant
7	All labels are correct, clear, and complete.	□ Compliant □ Incompliant
8	There is no foreign matter such as adhesive tape, cable ties, paper, or packing materials left around the cabinet.	□ Compliant □ Incompliant
9	The cabinet filler panels are in proper positions so that the cold aisle and hot aisle are isolated.	□ Compliant □ Incompliant

Aisle Containment Checklist

No.	Check Item	Check Result
1	All components of the aisle containment are installed.	□ Compliant □ Incompliant
2	The end doors can be opened and closed smoothly.	□ Compliant □

No.	Check Item	Check Result
		Incompliant
3	The gap between end doors is even.	□ Compliant □ Incompliant
4	After the end door is closed, the rubber strip in the middle seals the gap properly.	□ Compliant □ Incompliant
5	After the double revolving door is closed, the height deviation of the two door panels is less than 5 mm.	□ Compliant □ Incompliant
6	The rotating skylights work smoothly.	□ Compliant □ Incompliant
7	The end planes of skylight connective plates are flush with each other.	□ Compliant □ Incompliant
8	The skylight electromagnet firmly suctions the skylight when the power is on, and the skylight drops naturally when the power is off.	□ Compliant □ Incompliant
9	All labels are correct, clear, and complete.	□ Compliant □ Incompliant
10	There is no foreign matter such as adhesive tape, cable ties, paper, or packing materials left in and around the aisle.	□ Compliant □ Incompliant

Cable Installation Checklist

No.	Check Item	Check Result
1	All cable joints are secured properly, especially the cable joints between network cables and cables inside cabinets.	□ Compliant □ Incompliant
2	Exposed parts near the wiring terminals and lugs are wrapped with PVC insulation tape or heat shrinking tubing.	□ Compliant □ Incompliant
3	All wiring terminals are securely installed with flat washers and spring washers and are in good contact.	□ Compliant □ Incompliant
4	Cables are bound neatly, and cable ties are secured evenly and properly in the same direction.	□ Compliant □ Incompliant
5	Cables are routed in a way convenient for maintenance and capacity expansion.	□ Compliant □ Incompliant
6	All labels at the cable ends are clear.	□ Compliant □ Incompliant
7	Excess sections of cable ties are neatly cut.	□ Compliant □ Incompliant
8	There is no unnecessary adhesive tape or cable tie on	□ Compliant □

No.	Check Item	Check Result
	cables.	Incompliant

Electric Installation Checklist

No.	Check Item	Check Result
1	All ground cables are copper cables with diameters meeting the requirements. No switch or fuse is installed at the middle of a ground cable, and no short-circuit occurs.	□ Compliant □ Incompliant
2	Ground cables, AC input power cables, and internal cables are connected in accordance with the circuit diagram and screws are secured. No short-circuit occurs on power inputs or outputs.	□ Compliant □ Incompliant
3	Power cables and ground cables are not coiled and extra parts are cut off.	□ Compliant □ Incompliant
4	Lugs for power cables and protective ground cables are soldered or crimped securely.	□ Compliant □ Incompliant
5	Power cables and ground cables are routed and bundled separately from other cables.	□ Compliant □ Incompliant
6	Batteries are free from damage, cracks, and bulges.	□ Compliant □ Incompliant
7	Batteries are neat and do not leak electrolyte.	□ Compliant □ Incompliant
8	Wiring terminals of batteries are free from damage, break, and acid leakage.	□ Compliant □ Incompliant
9	Battery safety valves are intact, without leakages.	□ Compliant □ Incompliant
10	Battery cables are correctly connected, and the terminal voltages of battery strings are normal.	□ Compliant □ Incompliant
11	DIP switches on devices are correctly set.	□ Compliant □ Incompliant

Customer signature:

Check date:

C Acronyms and Abbreviations

A	
AC	Alternating Current
ATS	Automatic Transfer Switch
B	
BCB	Battery Circuit Breaker
BIB	Battery Control I/O Board
BIM	Battery Interface Module
BSPP	British Standard Pipe Parallel Thread
BSPT	British Standard Taper Pipe Thread
C	
CIM	Communication Interface Module
D	
DC	Direct Current
E	
ECC	Energy Control Center
EPDM	Ethylene-Propylene-Diene tripolymer
EPE	Expandable Polyethylene
ETH	Ethernet
F	

FE	Fast Ethernet
I	
iBAT	ibattery
IC	Integrated Circuit
IT	Internet Technology
N	
NTC	Negative Temperature Coefficient
P	
PDC	Power Distribution Cabinet
PDU	Power Distribution Unit
PE	Protective Earthing
PoE	Power over Ethernet
PP-R	Polypropylene Random
PVC	Polyvinyl Chloride
S	
SD	Secure Digital
SIM	Subscriber Identity Module
U	
UPS	Uninterruptible Power System
V	
VCN	Video Cloud Node
W	
WiFi	Wireless Fidelity

D Common Screw Torques

Application Scenario	Screw Specifications		Torque (Kgf·cm) (Tolerance: ±10%)
Board, module, or panel installation	M2.5 captive screw		2.1–2.5
	M3 captive screw		3.8–4.2
	Captive	M2.5	3
		M3	6
Guide rail installation	Cross recessed pan head thread forming screw M5 (GB/T 6560-1986)		30
Subrack or box-type module installation	M3 screw assembly (mounting ear)		6
	M4 countersunk screw (mounting ear)		12
	M6 panel screw		20
Grounding	M4		14
	M6		48
	M8		120
Cabinet or chassis installation, cable tray, upper fastener, or antiseismic enhancement installation, cabinet combination, or outdoor cable clip	ST3.5 tapping screw + plastic expansion sleeve		3
	M4		12
	Cross recessed pan head thread forming screw M5 (GB/T 6560-1986)		30
	M6		30
	M8/M8 expansion bolt (tension/implosion)		130

Application Scenario	Screw Specifications	Torque (Kgf·cm) (Tolerance: ±10%)
	M10/M10 expansion bolt (tension/implosion)	250
	M12/M12 expansion bolt (tension/implosion)	450
DB style connector	2-56 (M2.5)	2.5
	4-40 (M3) metal head or plastic head	4
Positive and negative battery terminals	M6	40–60
	M8	130–150
	M10	150–200
OT terminal for power cables	M2 screw assembly	2.5
	M3 screw assembly	6
	M4 screw assembly	16
	M5 screw assembly	40
	M6 screw assembly	50
	M8 screw assembly	80
	M10 screw assembly	150
	M12 screw assembly	260
	M16 screw assembly	350
Cord end terminal block	M2	2.2–2.5
	M2.5	5–6
	M3	6–8
	M3.5	8–16
	M4	15–18
	M5	25–30
	M6	32–37

