



**FusionModule500 Smart Mini Data Center  
V100R021C00**

**User Manual**

**Issue**      02  
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# About This Document

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## Purpose

This document describes the FusionModule500 Smart Mini Data Center (smart module for short) in terms of its installation, commissioning, operation, and maintenance.





## Intended Audience


This document is intended for:

- Sales engineers
- Technical support engineers
- System 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 02 (2020-12-25)

Added information about IVS1800 overview, installation, commissioning, and maintenance.

### Issue 01 (2020-10-28)

This issue is the first official release.



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# 1 Safety Information

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## 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.

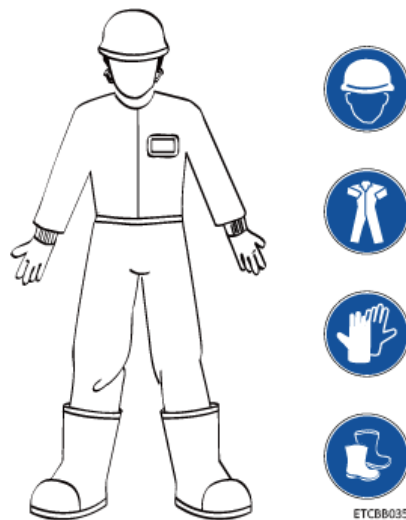
Follow local laws and regulations when installing, operating, or maintaining the equipment. The safety instructions in this document are only supplements to local laws and regulations.

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

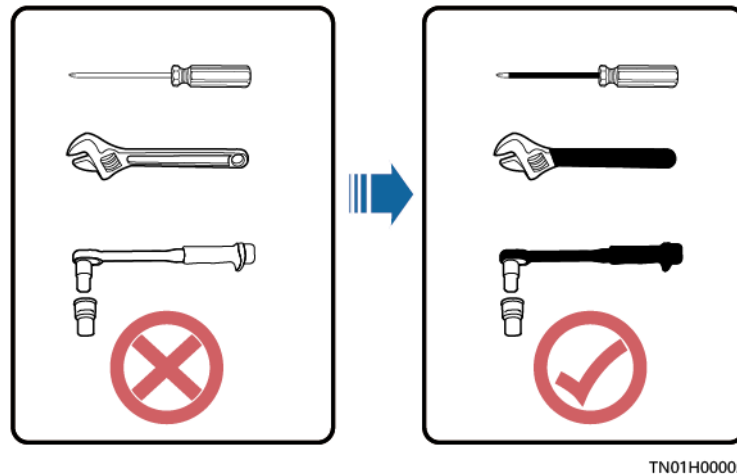
## General Requirements

- 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 personal protective equipment such as insulation gloves, goggles, and safety clothing, helmet, and shoes, as shown in the following figure.

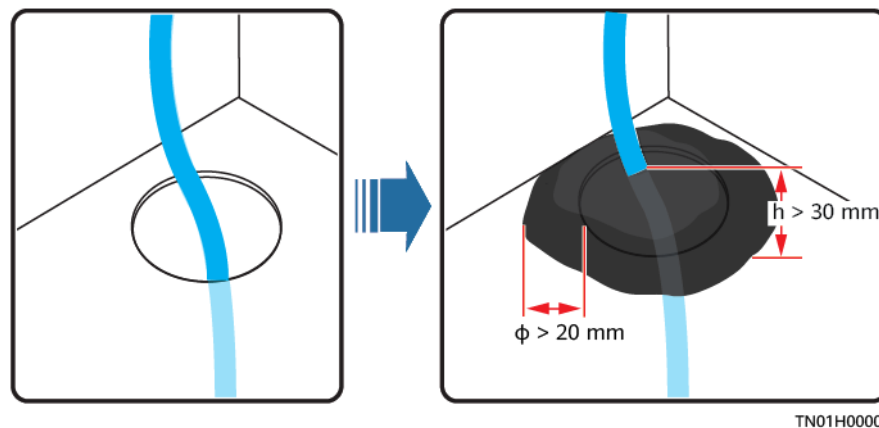


- Follow the specified procedures for installation, operation, and maintenance.
- Before handling a conductor surface or terminal, measure the contact point voltage and ensure that there is no risk of electric shock.
- After installing the equipment, remove idle packing materials such as cartons, foam, 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.
- When installing devices, use a torque wrench with a proper measurement range to tighten bolts. Ensure that the wrench is not skewed and the torque error does not exceed 10%.
- 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

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** 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.

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- 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 or ZB flame spread rating requirements or higher.
- 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.

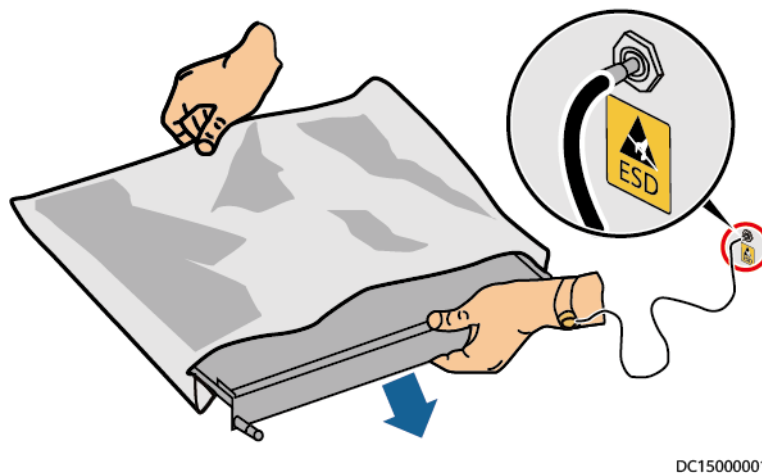
## ESD

### 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.

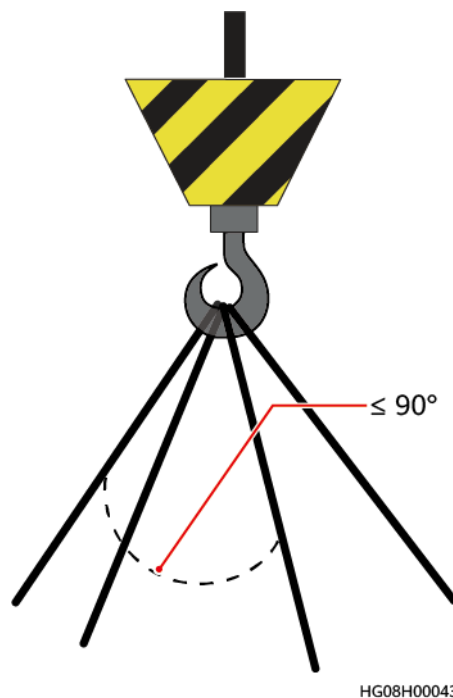
## Installation at Heights

- 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

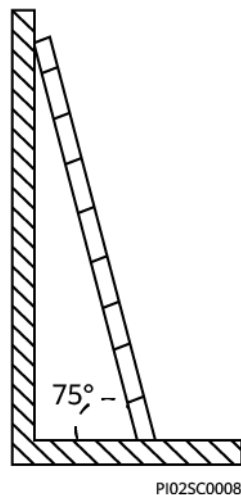
- Do not walk under hoisted objects.
- Only trained and qualified personnel should perform hoisting operations.
- Check that hoisting tools are available and in good condition.
- Before hoisting objects, ensure that hoisting tools are firmly secured onto a load-bearing object or wall.
- Ensure that the 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:

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### 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 and subcontractor 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.

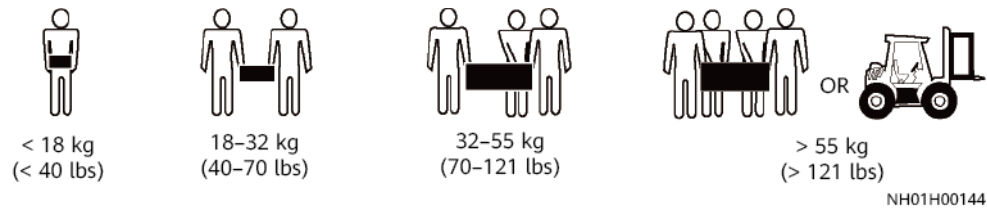
## Moving Heavy Objects

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### 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.

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#### 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.

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## 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.

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

## Flammable Gas

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#### 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

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### NOTICE

Battery overheating causes deformation, damage, and electrolyte spillage.

---

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### 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<sub>3</sub>) or sodium carbonate (Na<sub>2</sub>CO<sub>3</sub>).

## 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.

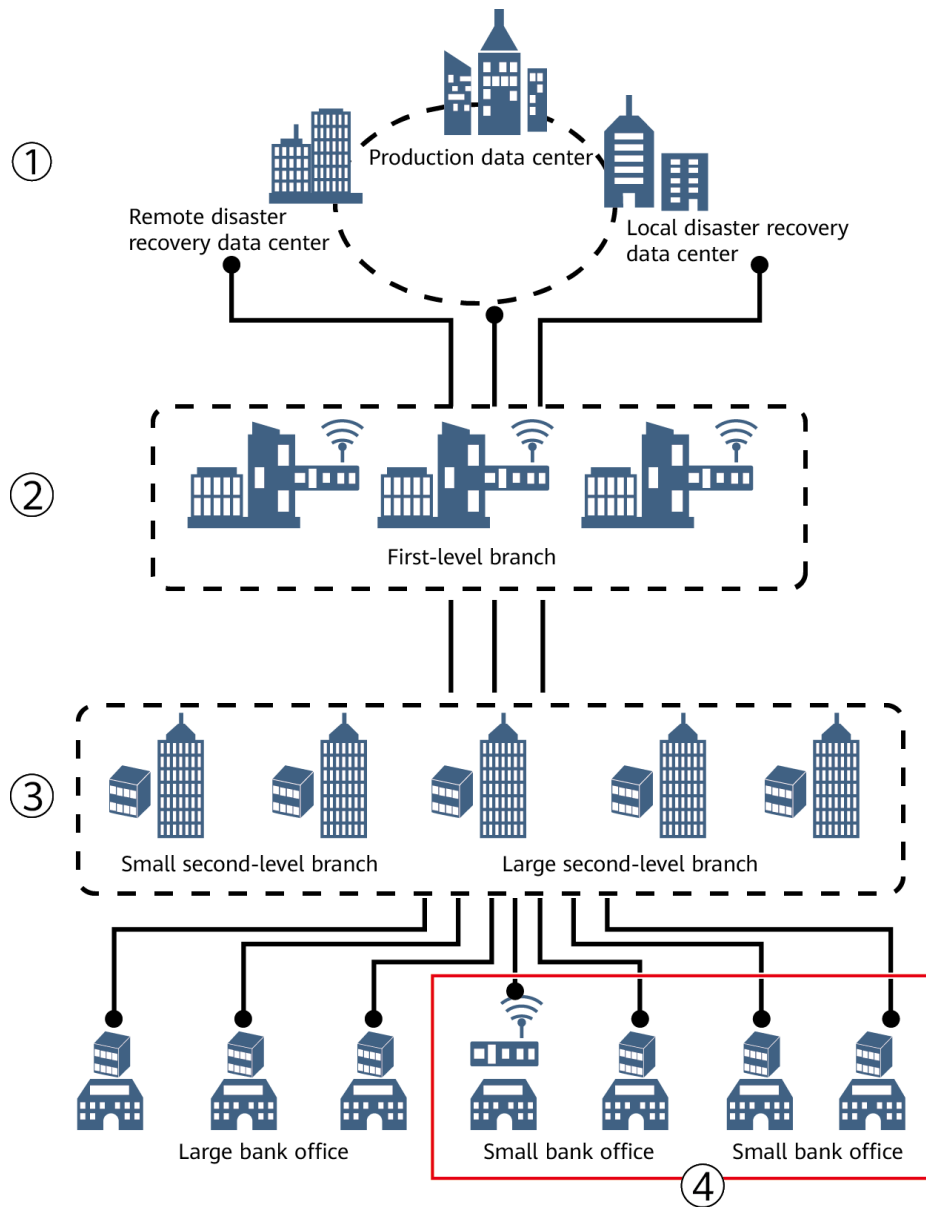
# 2 Overview

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## 2.1 Positioning

To meet the requirements for customers' growing services, Huawei launches the FusionModule500 that can be rapidly deployed and flexibly expanded. The FusionModule500 is positioned as a smart module solution and occupies about 10 m<sup>2</sup>. It is mainly used in the equipment rooms of county-level governments, bank business outlets, and small and medium-sized enterprises.

Figure 2-1 Position of the FusionModule500 in the financial industry



DM00N00002

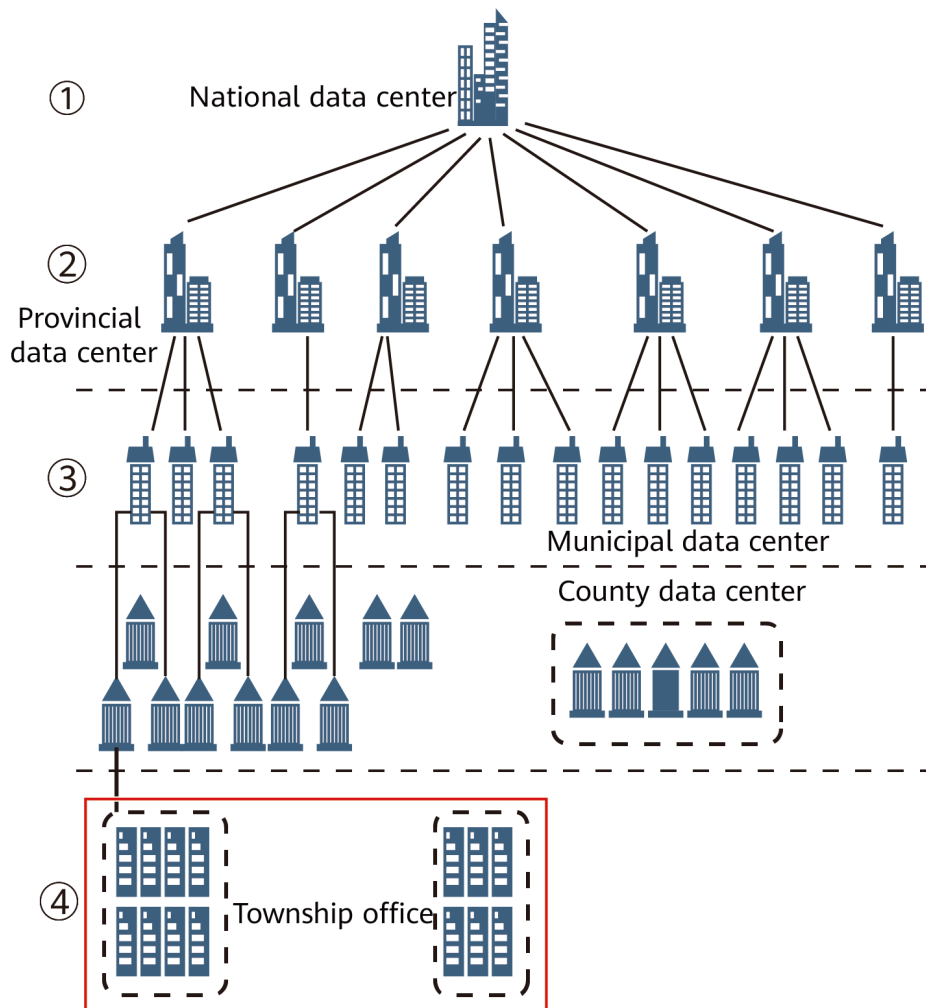
(1) FusionModule5000

(2) FusionModule2000

(3) FusionModule800

(4) FusionModule500

**Figure 2-2** Position of the FusionModule500 for governments



DM00N00001

(1) FusionModule5000

(2) FusionModule2000

(3) FusionModule800

(4) FusionModule500

## 2.2 Features

### High Integration

The smart module integrates the cabinet system, power supply and distribution system, cooling system, management system, surge protection and grounding system, and integrated cabling system to provide a comprehensive solution.

### High Safety and Reliability

- The Converged Cabinet incorporates the UPS, monitoring system, and power distribution system that are designed in modular manner and feature high security and reliability.
- The powerful monitoring system allows you to master the infrastructure status anytime and improves the protection capability of cabinets.

## High Scalability

- The modular design allows the smart module to be flexibly configured so that fast capacity expansion can be achieved.
- The smart module provides redundant power ports and communications ports for future expansion.

## Powerful Monitoring

- Provides various sensors to monitor the functional modules.
- Provides a pad to easily manage the functional modules locally.

## 2.3 Typical Application Scenarios and Configurations

### 2.3.1 Typical Scenarios

The smart module is mainly used in the equipment rooms of bank business outlets, small and medium-sized enterprises, and governments.

### 2.3.2 Typical Configurations

Figure 2-3 Converged Cabinet





**Table 2-1** Typical configuration

Item	Specifications
Cabinet dimensions (H x W x D)	2000 mm x 600 mm x 1350 mm
Power backup time	60–240 minutes
Power distribution	UPS2000-G, lithium battery, and rPDU
Monitoring	ECC800-Pro, temperature and humidity (T/H) sensor, smoke detector, water sensor, PAD, intelligent lock, WiFi converter (optional), and NetEco (optional)

# 3 System Architecture

## 3.1 Structural System

The cabinet possesses the following features:

- The cabinet houses standard 19-inch wide devices.
- Half-height rPDUs can be vertically installed at the rear of the cabinet.
- The position of each U is marked on the vertical mounting bars.
- The front and rear doors of the cabinet can be locked, and can be unlocked by using dedicated keys.
- The cabinet can be installed on a base (which needs to be prepared by customers).
- The cabinet can house ICT devices with a depth of no more than 750 mm.

**Table 3-1** Cabinet technical specifications

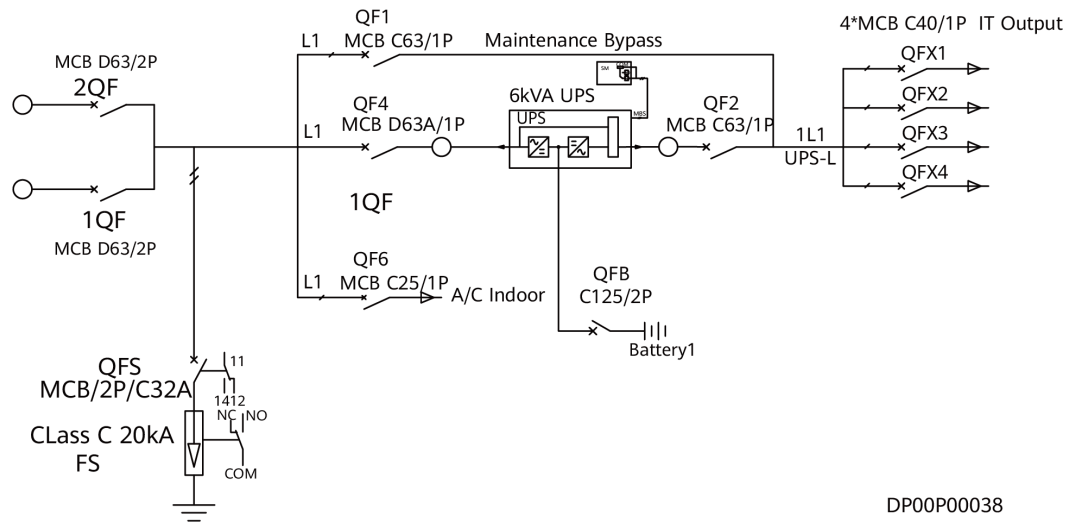
Item	Specifications
Color	Black
Material	High-intensity class A carbon cold rolled steel plate and zinc-coated steel plate
Air channel	Cold aisle containment
Installation mode	Installed on a concrete floor or electrostatic discharge (ESD) floor
Static load	1500 kg
Dynamic load	1000 kg
IP rating	IP20

## 3.2 Power Supply and Distribution System

### 3.2.1 Overview

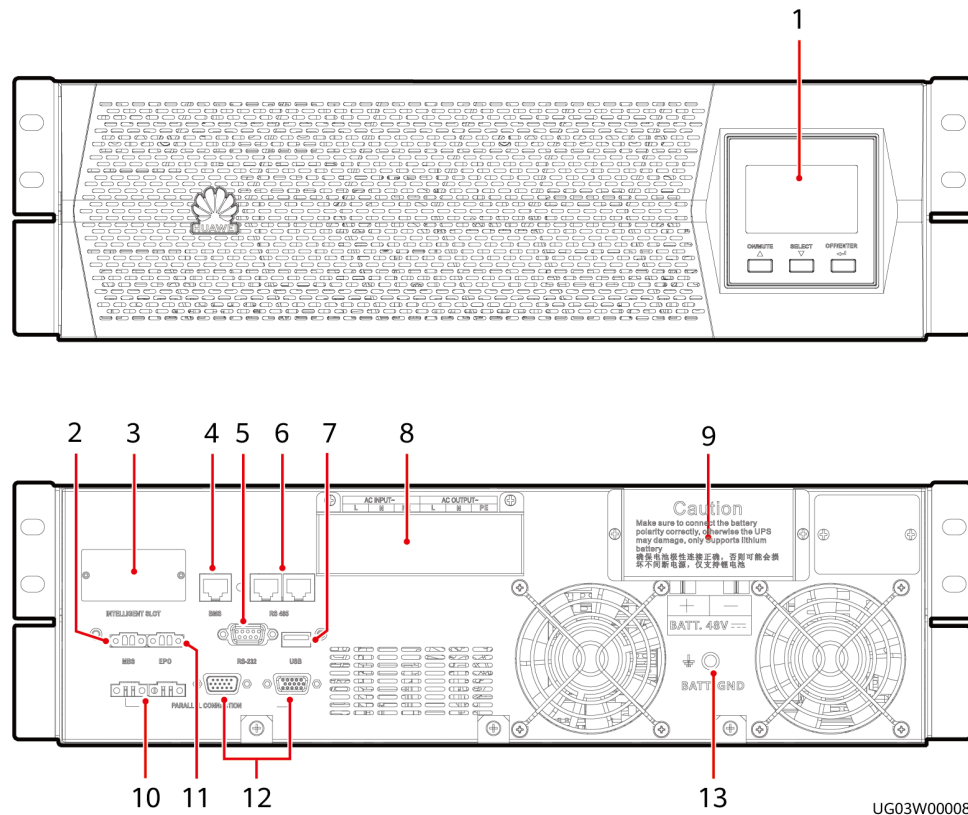
The UPS supplies uninterruptible power to IT loads by means of lithium batteries when the external power supply fails.

**Figure 3-1** Power distribution principles in the UPS scenario



### 3.2.2 6 kVA UPS

Figure 3-2 Front and rear views of a 6 kVA UPS



- |  |  |  |
|--|--|--|
| (1) Liquid crystal display (LCD)         | (2) Maintenance bypass (MBS) port                    | (3) Optional card slot   |
| (4) Battery management system (BMS) port | (5) RS232 communications port <sup>b</sup>           | (6) RS485 communications ports (connect to northbound devices) |
| (7) USB port <sup>a</sup>                | (8) AC input and output terminals (behind the cover) | (9) Battery input terminal (behind the cover)                  |
| (10) Parallel current equalization port  | (11) Emergency power-off (EPO) port                  | (12) Parallel communication ports                              |
| (13) Battery PE terminal                 |  |  |

 **NOTE**

- The RS485 port supports only the Modbus RTU protocol.
- a: The USB port supports the serial port communication protocol. The USB port can be used to export logs and send serial port commissioning commands.
- b: The RS232 port supports the serial port communication protocol. The RS232 port can be used to export logs, send serial port commissioning commands, and upgrade the UPS main power program online.

**Table 3-2** 6 kVA UPS technical specifications

Item	Specifications
Rated capacity	6 kVA
Number of phases	1
Input power factor	≥ 0.99
Output power factor	≥ 0.9
Rated input voltage	220 V AC/230 V AC/240 V AC
Input voltage range	110–280 V AC; < 176 V AC: derated; 110 V AC: 50% load
Rated input frequency	50 Hz/60 Hz
Input frequency range	<ul style="list-style-type: none"> <li>• 50 Hz: 46–54 Hz</li> <li>• 60 Hz: 56–64 Hz</li> </ul>
Output frequency range	50 Hz±0.5%
Peak efficiency	Normal mode: 93% (online mode) Normal mode: 90%
Dimensions (H x W x D)	131 mm x 438 mm x 480 mm
Weight	15 kg

### 3.2.3 Power Distribution Subrack

**Table 3-3** Technical specifications

Item	Specifications
Maximum input current	63 A
Number of phases	1
Input frequency	50 Hz/60 Hz
Input voltage	220 V

Item	Specifications
Output frequency	50 Hz/60 Hz
General input	2 x 63 A/2P
UPS input	63 A/1P
Battery power distribution	125 A/2P x 2
Air conditioner power distribution	25 A/1P MCB x 2
UPS output	63 A/1P
UPS bypass	63 A/1P
Output branch	4 x 40 A/1P
Dimensions (H x W x D)	130 mm x 442 mm x 450 mm

### 3.2.4 (Optional) rPDU

The rPDU is a basic socket, rather than a monitoring socket.

**Figure 3-3** Half-height rPDU



**Table 3-4** rPDU technical specifications

Item	Specifications (Vertically Installed Half-Height rPDU)
Rated current	32 A
Input frequency	50 Hz/60 Hz
Input port	Cord end terminal, no input cable
Output port configuration	IEC: 9 x C13 + 3 x C19 China standard: 9 x 10 A + 3 x 16 A
Rated output current	32 A

### 3.2.5 Lithium Battery ESM-48100B1

Lithium batteries provide backup power. When the mains is normal, the UPS charges batteries. When the mains fails, lithium batteries supply power to the UPS.

**Figure 3-4** Lithium battery



**Table 3-5** Lithium battery technical specifications

Item	Specifications
Capacity	100 Ah
Voltage	48 V DC
Application scope	6 kVA UPS
Dimensions (H x W x D)	130 mm x 442 mm x 396 mm (excluding mounting ears)
Weight (one lithium battery)	43 kg
Maximum charge/discharge current	100 A/100 A@35°C (The actual charge current depends on the UPS charge capability.)
Maximum charge/discharge power	4800 W
Installation mode	Rack-mounted

## 3.3 Cooling System

### 3.3.1 Application Conditions

#### Operating Environment

**Table 3-6** Operating environment

Item	Split-Type Air Conditioner
Operating temperature	Indoor unit: 0–45°C Outdoor unit: -20°C to +45°C

Item	Split-Type Air Conditioner
Indoor unit operating humidity	5%–95% RH (non-condensing)
Storage temperature	–40°C to +70°C (without refrigerant) –40°C to +55°C (with refrigerant)
Storage humidity	5%–95% RH (non-condensing)
Altitude	0–4000 m (derated when the altitude ranges from 1000 m to 4000 m)

## Installation Requirements

**Table 3-7** Installation requirements

Item	Split-Type Air Conditioner
Installation mode	Rack-mounted
Height distance between indoor and outdoor units	–5 m to +20 m (outdoor unit placed higher)
Maximum equivalent length of the one-way pipe	60 m. If the length exceeds 60 m, contact the local customer service center.

### 3.3.2 Technical Specifications

**Table 3-8** Technical specifications

Item	Split-Type Air Conditioner
Power system	220–240 V AC, 50 Hz, 1 phase
Refrigerant	R410A
Cooling capacity	3.5 kW <sup>a</sup>
Fan type	EC fan
Air supply mode	Front air supply and rear air return
Dimensions (H x W x D) <sup>b</sup>	223 mm x 442 mm x 800 mm
Weight	Indoor unit: < 40 kg Outdoor unit: < 50 kg
IP rating	Indoor unit: IP20 Outdoor unit: IPX5



Item	Split-Type Air Conditioner
a: The cooling capacity is obtained when the indoor dry bulb temperature is 37°C, the indoor wet bulb temperature is 24°C, and the outdoor dry bulb temperature is 35°C. The actual cooling capacity varies depending on the indoor and outdoor ambient temperatures and relative humidity.	

## 3.4 Management System

### 3.4.1 Overview

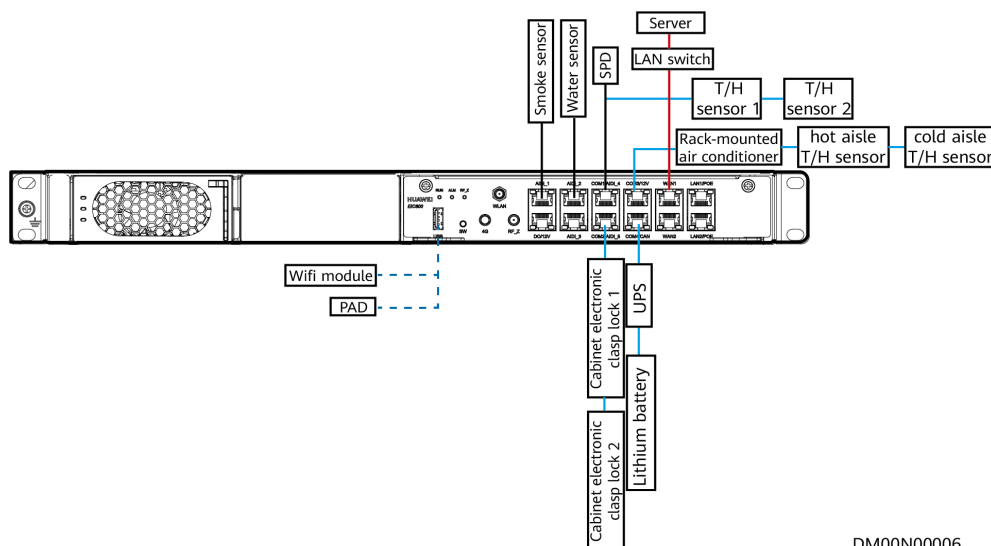
The smart module monitoring solution consists of the collector and monitoring components. The ECC800-Pro functions as the collector.

The smart module provides a module-level PAD for local intelligent management in terms of real-time monitoring, status browsing, alarm management, and system configuration.

The NetEco can manage the infrastructures of a single data center or of data centers in various areas in a centralized manner.

The ECC800-Pro manages the real-time status, alarms, and configuration information about the devices inside the smart module. It also provides a graphical user interface (GUI) for ease of operating and maintaining devices inside the smart module.

Figure 3-5 System network diagram



DM00N00006

### 3.4.2 System Functions

### 3.4.2.1 Monitoring

- Temperature and humidity monitoring: Detects and collects statistics on the ambient temperature and humidity inside the smart module.
- Water leakage monitoring: Detects water leakage at the bottom of the smart module and provides real-time alarm signals.
- Smoke monitoring: Detects smoke in the smart module and provides real-time alarm signals.
- Power distribution monitoring:
  - a. (In the intelligent power distribution scenario) Monitors the general mains input voltage, frequency, current, and power, as well as the UPS input voltage, frequency, current, and so on.
  - b. (In the non-intelligent power distribution scenarios) Monitors the UPS input voltage, frequency, current, and so on.
- Smart cooling product monitoring:
  - a. Configures the supply air temperature set point in a unified manner, without the need to separately configure it for each smart cooling product.
  - b. Monitors and displays the fan speed, and displays the running percentage.
  - c. Displays the cooling load rate.
  - d. Monitors and displays the compressor running status.
  - e. Displays the real-time running status of the heating and humidifying.
- Video surveillance: Connects to three cameras and provides PoE power supply; accesses real-time video images on the WebUI and invokes historical monitoring data.

### 3.4.2.2 App View

- Generates a 2.5D layout view that matches the actual layout of the smart module, including the power distribution module, smart cooling product, and T/H sensor. In addition, the resource usage rate of electric energy (displayed only when the intelligent power distribution module is configured), ambient temperature and humidity of the smart module are displayed on the home screen of the app.
- Displays the resource usage of the electric energy of the smart module and each cabinet (displayed only when the intelligent power distribution module is configured).
- Displays the real-time status and alarms of the aisle temperature and humidity sensor in the plan view.
- After logging in to the app installed on the PAD, you can open the cabinet door on the corresponding screen.

### 3.4.2.3 Alarm

- The system monitors the status of smart cooling products, power distribution, and environment. If a fault or parameter error occurs, the system generates an alarm in real time. You can view the alarm cause and solution in the alarm details.

- Alarms can be classified into four severities: critical, major, minor, and warning. The alarm severities can be user-defined.
- Active alarms can be filtered by device and alarm severity.
- Alarm notifications can be sent by email and SMS.
- A maximum of 500 concurrent active alarms are supported.

### 3.4.2.4 Historical Data Query

- Historical alarm: You can view the alarms that have been generated in the system. The historical alarm information includes the device name, alarm name, alarm severity, alarm generation time, and alarm clearance time.
- Performance data statistics: You can view historical data of devices to help analyze data or problems.
- Operation log: You can view logs of key operations, such as user login, parameter modification, data export, device upgrade, and access control events.
- Data export: You can export historical data of the ECC800-Pro and some southbound devices.

### 3.4.2.5 Linkage Control

- Supports the linkage logic of aisle smoke alarms or high temperature alarms. By default, the cabinet doors are opened through linkage by default.

#### NOTE

The aisle smoke sensor alarm cannot trigger the customer's fire extinguishing system. Only dry contact alarm signals are provided.

- If the protected area of the fire extinguishing system is in the smart module, when a smoke alarm is generated, the door of the linked cabinet is not opened. If the door is opened, an alarm (door status alarm) is generated.
- If the protected area of the fire extinguishing system is outside the smart module, when a smoke alarm is generated, the rear door of the linked cabinet is opened.

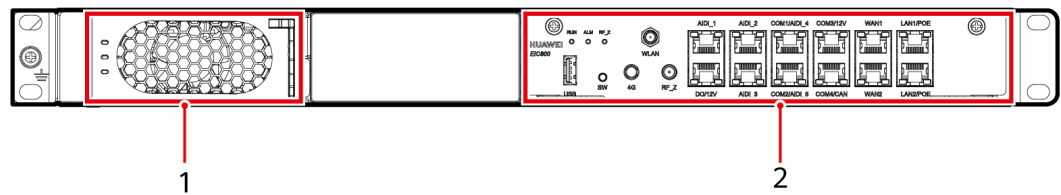
## 3.4.3 Key Hardware Devices

### 3.4.3.1 ECC800-Pro

#### 3.4.3.1.1 Product Configuration

The ECC800-Pro data center controller is used to monitor the devices and environment in the smart module. It consists of the power module and main control module. You can insert and remove the power module.

**Figure 3-6** ECC800-Pro



DM02W00029

(1) Power module

(2) Main control module

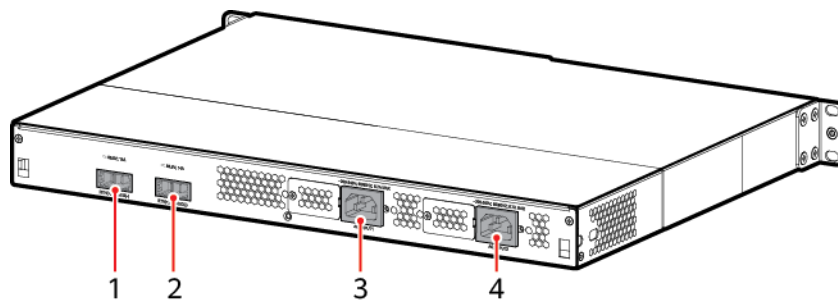
**Table 3-9** ECC800-Pro environmental specifications

Item	Specifications
Operating temperature	-20°C to +50°C
Storage temperature	-40°C to +70°C
Relative humidity	5%–95% RH (non-condensing)
Altitude	0–4000 m (When the altitude is between 3000 m and 4000 m, the temperature decreases by 1°C for each additional 200 m.)

**Table 3-10** ECC800-Pro structural specifications

Item	Specifications
Dimensions (L x W x H)	442 mm x 330 mm x 43.6 mm
Weight	6.3 kg (with a single power module and a main control module)
Color	Black
Installation requirements	Can be installed in a 1 U space in a standard 19-inch cabinet
Environmental protection	RoHS5, REACH, WEEE

Figure 3-7 ECC800-Pro (rear view)



DM02W00010

- (1) 53.5V DC\_OUT1
- (2) 53.5V DC\_OUT2
- (3) AC\_INPUT1
- (4) AC\_INPUT2

## Power Port

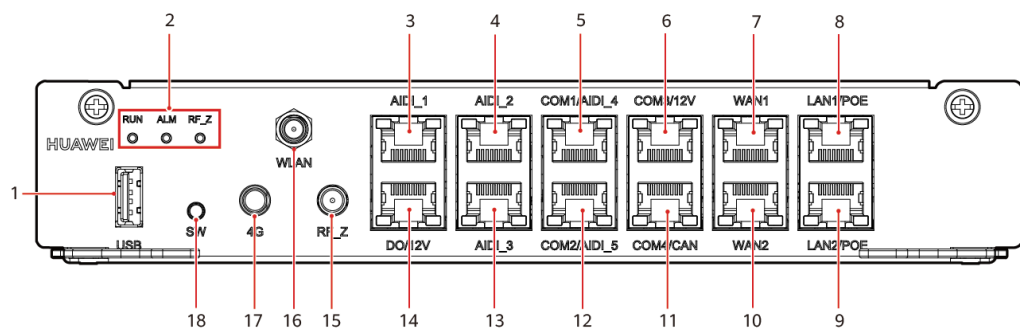
The ECC800-Pro provides four power ports, including two AC input ports (AC\_INPUT1 and AC\_INPUT2) and two DC output ports (DC\_OUTPUT1 and DC\_OUTPUT2). [Table 3-11](#) provides the power port pin definitions.

Table 3-11 Power port pin definitions

Port Type	Pin sequence	Description
AC	Pin1	L
	Pin2	PE
	Pin3	N
DC	Pin1	48V+
	Pin2	48VGND

### 3.4.3.1.2 Main Control Module

Figure 3-8 ECC800-Pro collector main control module



DM02W00024

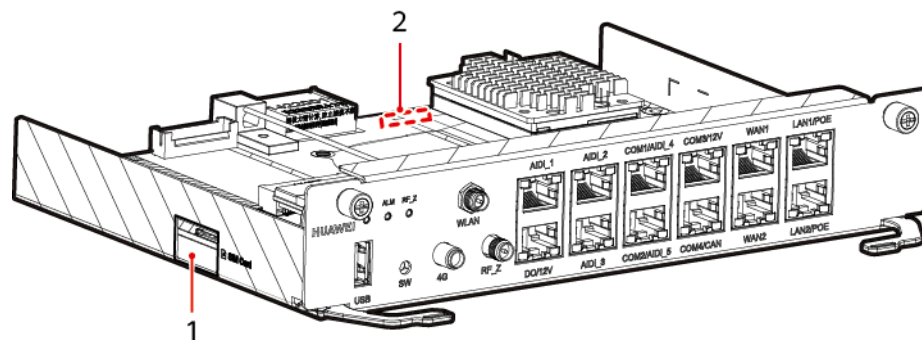
- (1) USB
- (2) Status indicator
- (3) AIDI\_1
- (4) AIDI\_2

- |                 |                |                      |                      |
|-----------------|----------------|----------------------|----------------------|
| (5) COM1/AIDI_4 | (6) COM3/12V   | (7) WAN1             | (8) LAN1/POE         |
| (9) LAN2/POE    | (10) WAN2      | (11) COM4/CAN        | (12) COM2/AIDI_5     |
| (13) AIDI_3     | (14) DO/12V    | (15) RF_Z (802.15.4) | (16) WLAN (reserved) |
| (17) 4G         | (18) SW button |                      |                      |

**NOTE**

The WLAN port is reserved and cannot be connected to a WLAN antenna for WLAN communication.

**Figure 3-9** ECC800-Pro main control module (side view)



DM02W00025

(1) SIM card slot

(2) Micro SD card slot (reserved)

## Specifications

**Table 3-12** Technical specifications of the ECC800-Pro main control module

Item	Specifications
Power input	<ul style="list-style-type: none"> <li>Supports one AC input.</li> <li>Rated voltage: 200–240 V AC</li> <li>Rated frequency: 50/60 Hz</li> </ul>
Power output	<ul style="list-style-type: none"> <li>Output voltage: 42–58 V DC (rated voltage: 53.5 V DC)</li> <li>Output power of two power module supplies: 2000 W (200–240 V AC); 940 W (linear derating at 85–175 V AC)</li> <li>Output power of a single power module supply: 1000 W (200–240 V AC); 470 W (linear derating at 85–175 V AC)</li> </ul>
WAN port	<ul style="list-style-type: none"> <li>Supports two WAN ports. WAN1 is used to connect to the management system, and WAN2 is used for maintenance. The ports support autonegotiation of 10/100/1000 Mbit/s communication rates.</li> <li>Connect shielded network cables to the WAN ports.</li> </ul>

Item	Specifications
LAN port	<ul style="list-style-type: none"> <li>Supports two LAN ports, which can be connected to the LAN. The ports support autonegotiation of 10/100/1000 Mbit/s communication rates.</li> <li>Connect shielded network cables to the LAN ports.</li> </ul>
RS485 serial port expansion	<ul style="list-style-type: none"> <li>Output voltage: 13–15 V DC (rated voltage: 14.5 V DC)</li> <li>Four RS485 ports with the default communications rate of 9600 bit/s</li> <li>COM1–COM3 ports provide 12 V DC power.</li> <li>The power supply can be switched on or off and is on by default.</li> </ul>
PoE expansion	Supports two PoE (GE) ports for expansion of the PoE bus, and supports network isolation and ring network.
AIDI expansion (RJ45)	<ul style="list-style-type: none"> <li>Output voltage: 13–15 V DC (rated voltage: 14.5 V DC)</li> <li>Provides five universal AIDI ports for connecting to sensors such as smoke sensors, water sensors, and NTC sensors. AIDI_1 to AIDI_3 are full-function AIDI ports, and AIDI_4 to AIDI_5 are simplified AIDI ports without type identification.</li> <li>The power supply can be switched on or off and is on by default.</li> </ul>
DO expansion (RJ45)	<ul style="list-style-type: none"> <li>Output voltage: 13–15 V DC (rated voltage: 14.5 V DC)</li> <li>Supports one active DO port.</li> <li>The power supply can be switched on or off and is on by default.</li> </ul>
Fault isolation	<p>There are three groups of 12 V ports. A group has a maximum current of 660 mA, a route has a maximum current of 800 mA, and the maximum total current is 2 A.</p> <p>Group 1: 12 V of the AIDI_1 and DO/12V ports</p> <p>Group 2: 12 V of the AIDI_2, COM1/AIDI_4, and COM3/12V ports</p> <p>Group 3: 12 V of the AIDI_3 and COM2/AIDI_5 ports</p>
Wireless communication	Supports wireless communication that complies with IEEE802.15.4.

Item	Specifications
4G	<p>Supports the 4G module, SMS sending, and 3G communication, and provides a standard SIM card slot.</p> <ol style="list-style-type: none"> <li>1. China: 2G and 4G networks support China Unicom or China Mobile SIM cards, and 3G networks support only China Unicom SIM cards.</li> <li>2. Outside China: Select SIM cards according to the following wireless modes and frequency bands: <ul style="list-style-type: none"> <li>• 4G: wireless mode (FDD-LTE and TDD-LTE), coverage frequency band (B1, B3, B5, B7, B8, and B20)</li> <li>• 3G: wireless mode (WCDMA), coverage frequency bands (B38, B40, and B41)</li> <li>• 2G: wireless mode (GSM), coverage frequency band (900/1800 MHz)</li> </ul> </li> </ol> <p><b>NOTE</b></p> <ul style="list-style-type: none"> <li>• The prerequisite for using a SIM card is that the site has signal coverage.</li> <li>• Due to the performance limitation of the wireless module, China Telecom SIM cards are not supported.</li> </ul>
USB	<ul style="list-style-type: none"> <li>• Supports USB 2.0 and 5 V, 1 A power supply.</li> <li>• After installing the WiFi module, connect the WiFi module to the ECC800-Pro using the app on the mobile phone or tablet computer to view the basic information about the smart module, such as layout, resources, energy efficiency, environment, and alarms.</li> <li>• You can insert a USB flash drive to export historical data and configuration files and import configuration files.</li> </ul>
SW button	<ul style="list-style-type: none"> <li>• Restores the default IP address, factory settings, and user information.</li> <li>• Supports RF_Z (802.15.4) networking.</li> </ul>

**Table 3-13** ECC800-Pro RF\_Z parameters

Item	Specifications
RF_Z Operation Frequency	2405–2480 MHz
RF_Z EIRP (max.)	8 dBm



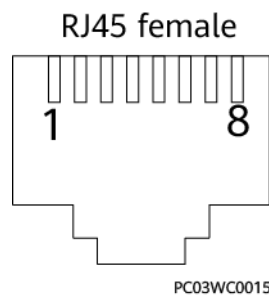
**Table 3-14** ECC800-Pro 4G parameters

Item	Specifications
3G/4G operation frequency	LTE (FDD): BAND1, BAND2, BAND3, BAND4, BAND5, BAND7, BAND8, BAND20 DC-HSPA+/HSPA+/HSPA/UMTS: 850/900/1900/2100 MHz GSM/GPRS/EDGE: 850/900/1800/1900 MHz
3G/4G EIRP (max.)	23 dBm

## Communications Port

The ECC800-Pro provides the following communications ports. [Figure 3-10](#) shows the pins of the RJ45 port.

**Figure 3-10** RJ45 port pins



There are four GE ports, that is, two WAN ports (WAN1 and WAN2) and two LAN ports (LAN1/POE and LAN2/POE).

**Table 3-15** GE port pin definitions

Item	Description	
Pin sequence	Pin1	GE1+
	Pin2	GE1-
	Pin3	GE2+
	Pin4	GE3+
	Pin5	GE3-
	Pin6	GE2-
	Pin7	GE4+
	Pin8	GE4-
Indicator	Green indicator	Linked, steady on

Item		Description
	Yellow indicator	ACT data communication, blinking

**Table 3-16** COM1/AIDI\_4, COM2/AIDI\_5 port pin definitions

Item		Description
Pin sequence	Pin1	RS485+
	Pin2	RS485-
	Pin3	12V DC_OUT
	Pin4	RS485+
	Pin5	RS485-
	Pin6	DI-
	Pin7	DI+
	Pin8	GND
Indicator	Green indicator	Power output indicator <ul style="list-style-type: none"> <li>Steady on: The 12 V DC output is normal.</li> <li>Off: No 12 V DC output is provided.</li> </ul>

**Table 3-17** COM3/12V port pin definitions

Item		Description
Pin sequence	Pin1	RS485+
	Pin2	RS485-
	Pin3	12V DC_OUT
	Pin4	RS485+
	Pin5	RS485-
	Pin6	-
	Pin7	-
	Pin8	GND
Indicator	Green indicator	Power output indicator <ul style="list-style-type: none"> <li>Steady on: The 12 V DC output is normal.</li> <li>Off: No 12 V DC output is provided.</li> </ul>

**Table 3-18** COM4/CAN port pin definitions

Item		Description
Pin sequence	Pin1	RS485+
	Pin2	RS485-
	Pin3	-
	Pin4	RS485+
	Pin5	RS485-
	Pin6	-
	Pin7	CAN_H
	Pin8	CAN_L

The following provides the AIDI\_1, AIDI\_2 and AIDI\_3 ports pin definitions.

 **NOTE**

- Pins 1, 2, 4, and 5 identify sensor types.
- Pin 3 and Pin 8 are power output ports.
- Pin 6 and Pin 7 collect sensor data. Pin 7 can detect current type sensors (4–20 mA). Pin 6 and Pin 7 can detect the output status of passive dry contact type sensors. Pin 3 and Pin 7 can detect temperature sensors.

**Table 3-19** AIDI\_1, AIDI\_2 and AIDI\_3 ports pin definitions

Item		Description
Pin sequence	Pin1	Type_1
	Pin2	Type_2
	Pin3	12V DC
	Pin4	Type_3
	Pin5	Type_4
	Pin6	DI-
	Pin7	DI+
	Pin8	GND
Indicator	Green indicator	Power output indicator <ul style="list-style-type: none"> <li>• Steady on: The 12 V DC output is normal.</li> <li>• Off: No 12 V DC output is provided.</li> </ul>

**Table 3-20** DO/12V port pin definitions

Item		Description
Pin sequence	Pin1	-
	Pin2	-
	Pin3	12V DC_OUT
	Pin4	-
	Pin5	-
	Pin6	DO_OUT+
	Pin7	DO_OUT-
	Pin8	GND
Indicator	Green indicator	Power output indicator <ul style="list-style-type: none"><li>Steady on: The 12 V DC output is normal.</li><li>Off: No 12 V DC output is provided.</li></ul>

**Table 3-21** USB port pin definitions

Item		Description
Pin sequence	Pin1	5V
	Pin2	DM
	Pin3	DP
	Pin4	GND

## Indicators

**Table 3-22** Indicators on the ECC800-Pro main control module

Indicator	Color	Name	Status	Description
RUN	Green	Running status indicator	Steady on	The power supply is normal, the program is being loaded.
			Off	The power supply is abnormal.

Indicator	Color	Name	Status	Description
			Blinking at long intervals	The software runs properly (the indicator blinks at 0.5 Hz, on for 1s and then off for 1s) or the ECC800-Pro registers with the NetEco successfully.
			Blinking at short intervals	The ECC800-Pro does not register with the NetEco (the indicator blinks at 5 Hz, on for 0.125s and then off for 0.125s).
ALM	Red	Alarm indicator	Steady on	A system failure alarm is generated.
			Off	The system is normal.
RF_Z	Green	Communication status indicator	Blinking at long intervals	A network is set up, and no node access is allowed (the indicator blinks at 0.5 Hz, on for 1s and then off for 1s).
			Blinking at super short intervals	A network is set up, and node access is allowed (the indicator blinks at 10 Hz, on for 0.05s and then off for 0.05s).

## SW Button

Table 3-23 SW button description



Function Description	Operation Description	Indicator Status
Wireless network RF_Z (802.15.4) pairing	In non-wireless network (802.15.4) pairing mode, press and hold down the button for 3s to 5s to enter the wireless network pairing mode.	The RF_Z indicator is blinking at super short intervals.
	In wireless network (802.15.4) pairing mode, press and hold down the button for 3s to 5s to exit the pairing mode; or the system automatically exits the pairing mode after 30 minutes without pressing the button.	The RF_Z indicator is blinking at long intervals.


Function Description	Operation Description	Indicator Status
	Press and hold down the button for more than 8s to clear network parameters.	The RF_Z indicator is steady on.
WLAN enabling	Press the button for less than 3s to enable WLAN.	None
Restoring the default IP address, factory settings, and user information	Press and hold down the button for 1 minute.	None

### 3.4.3.1.3 Power Module

#### Indicator

Table 3-24 PSU indicator description

Indicator	Color	Name	Status	Description
	Green	Power indicator	Steady on	The converter has a power input.
			Off	The converter has no power input or is faulty.
			Blinking at long intervals	The converter is being queried (the indicator blinks at 0.5 Hz, on for 1s and then off for 1s).
			Blinking at short intervals	The converter application program is being loaded (the indicator blinks at 4 Hz, on for 0.125s and then off for 0.125s).
	Yellow	Alarm indicator	Steady on	The converter generates a forewarning indicating that power will be limited due to ambient overtemperature, or generates a protection shutdown alarm due to ambient overtemperature or undertemperature.
				Power input overvoltage or undervoltage protection
				Reverse DC input connection

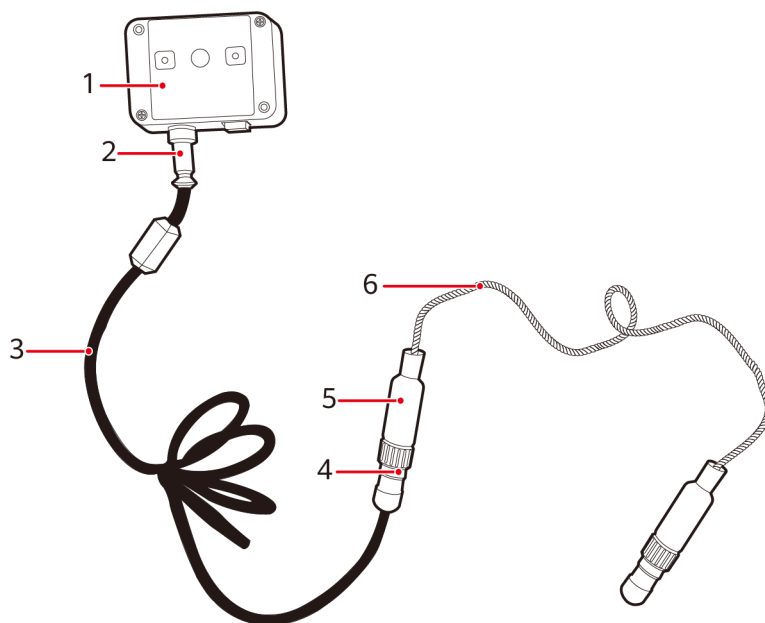
Indicator	Color	Name	Status	Description
				Slight current imbalance
				Output overvoltage
				Hibernation
			Off	The converter generates no protection alarms.
			Blinking at long intervals	The communication between the converter and the outside is interrupted (the indicator blinks at 0.5 Hz, on for 1s and then off for 1s).
	Red	Fault indicator	Steady on	The converter locks out due to output overvoltage.
				The converter delivers no output due to internal faults.
			Off	The converter is working properly.

### 3.4.3.2 Environment Monitoring System

#### 3.4.3.2.1 WLDS900 Water Sensor

The WLDS900 water sensor with the BOM number of 33010352 consists of a water detection cable, a water detector, and a conversion cable.

**Figure 3-11** WLDS900 water sensor



DS05000020

- (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

**Table 3-25** WLDS900 water sensor specifications

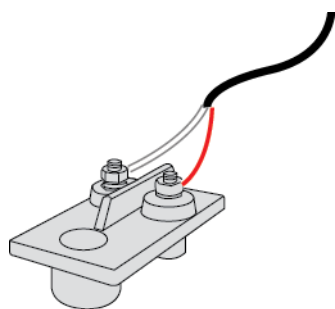
Item	Specification
Operating voltage	12 V DC (9–16 V DC)
Operating temperature	–20°C to +70°C
Storage temperature	–40°C to +85°C
Humidity	10%–80% RH (non-condensing)

### 3.4.3.2.2 Electrode Water Sensor

The electrode water sensor with the BOM number of 33010444 contains electrode probes and cables.



**Figure 3-12** Electrode water sensor



PO01WC0769

**Table 3-26** Technical specifications of the electrode water sensor

Item	Specification
Operating temperature	-40°C to +80°C
Storage temperature	-40°C to +80°C

### 3.4.3.2.3 T/H Sensor

**Figure 3-13** Appearance



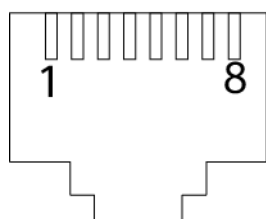
The T/H sensor uses an RJ45 connector.

**NOTE**

The appearance of the T/H sensor depends on the onsite delivery.

**Figure 3-14** Pins of an RJ45 connector

RJ45 female



PC03WC0015

**Table 3-27** RJ45 port pin definitions

Pin	Description
Pin1 or Pin 4	A
Pin2 or Pin 5	B
Pin3	V+
Pin6	V-
Pin7	Reserved

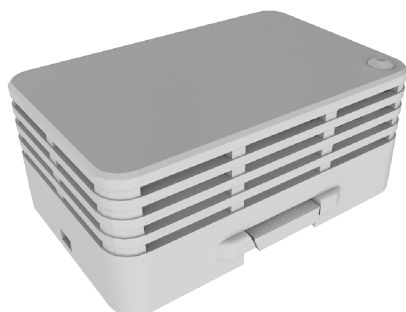
**Table 3-28** T/H sensor specifications

Item	Specifications
Temperature measuring range	-20°C to +70°C
Temperature accuracy	±1°C
Humidity measuring range	5%–95% RH
Humidity precision	±5% RH (25°C, 20%–80% RH)
Operating temperature	-20°C to +70°C
Operating voltage	9–16 V DC
Storage temperature	-40°C to +70°C
Output	RS485

### 3.4.3.2.4 Smoke Detector

A smoke detector detects smoke around cabinets.

**Figure 3-15** Smoke detector



DF01W00003

**Table 3-29** Smoke detector technical specifications

Item	Specifications
Operating voltage	9-27 V
Alarm current	< 20 mA
Indication	Monitoring: The red indicator blinks once every 3 to 8 seconds. Alarm reporting: The red indicator is steady on.
Operating temperature	-10°C to +55°C
Ambient humidity	≤ 95% RH
Dimensions (H x W x D)	31 mm x 75 mm x 51 mm (with the base)
Weight	50 g

### 3.4.3.3 Video Management System

#### 3.4.3.3.1 (Optional) Camera

The C3220 camera is a two-megapixel infrared zoom dome camera that can be ceiling-mounted.

**Figure 3-16** C3220 camera



**Table 3-30** C3220 camera technical specifications

Item	Specifications
Image sensor	1/2.7" two-megapixel progressive scan CMOS
Minimum illumination	<ul style="list-style-type: none"> <li>• Color: 0.002 lux (F1.2, AGC ON, 1/30s shutter speed)</li> <li>• Black/White: 0.0005 lux (F1.2, AGC ON, 1/30s shutter speed); 0 lux (infrared illuminator enabled)</li> </ul>

Item	Specifications
Wide dynamic range	120 dB
Focal length	2.8–12 mm
Video compression standard	H.265/H.264/MJPEG
Maximum resolution	1920x1080
Power supply	12 V DC, PoE
IP rating	IP67
Vandal resistant rating	IK10

### 3.4.3.3.2 (Optional) IVS1800

Figure 3-17 IVS1800



Table 3-31 Performance specifications

Category	Item	IVS1800-C08-04T (16CH)	IVS1800-C08-04T (64CH)
Device performance	Network video inputs	16-channel 1080p, up to 160 Mbit/s access bandwidth	64-channel 1080p, up to 320 Mbit/s access bandwidth Up to 160 Mbit/s access bandwidth with intelligent services enabled
	Video transfer	16-channel 1080p, up to 160 Mbit/s forwarding bandwidth	64-channel 1080p, up to 320 Mbit/s forwarding bandwidth Up to 160 Mbit/s forwarding bandwidth with intelligent services enabled
	Playback/Download	16-channel 1080p, up to 80 Mbit/s playback bandwidth	32-channel 1080p, up to 160 Mbit/s playback bandwidth

Category	Item	IVS1800-C08-04T (16CH)	IVS1800-C08-04T (64CH)
Platform performance	IP cameras connected	16 cameras to one IVS1800	64 cameras to one IVS1800

**Table 3-32** Hardware specifications

Category	Item	Specifications
Storage capacity	Hard disk quantity	8
	Hard disk port	SATA3.0
	Hard disk type	Enterprise-level disks: 4 TB, 6 TB, 8 TB, or 10 TB Monitoring-level disks: 4 TB or 6 TB
Controller	Processor	Hi3559A
	Memory	8 GB DDR4
External ports	Network port	Two 10/100/1000 Mbit/s Ethernet ports
	USB ports	Three USB ports (two USB 2.0 ports on the front panel and one USB 3.0 port on the rear panel)
	Audio input	1 channel, RCA port
	Audio output	1 channel, RCA port
	Alarm port	4-channel alarm input, 2-channel alarm output
Other specifications	Power consumption (8 hard disks included)	124 W
	Power supply	110–220 V AC
	Weight (hard disks excluded)	6.60 kg

Category	Item	Specifications
	Dimensions (H x W x D)	86 mm x 442 mm x 467 mm

### 3.4.3.3.3 (Optional) VCN510

Figure 3-18 Appearance



Table 3-33 Performance specifications

Item	Specifications
Device access and video storage	Supports a maximum of eight video access channels or 128 Mbit/s video access bandwidth.
Video forwarding	Supports a maximum of 32 video forwarding channels or 256 Mbit/s video forwarding bandwidth.
Video playback and download	Supports a maximum of eight video playback and download channels or 128 Mbit/s video playback and download bandwidth.
Ingress and egress bandwidth	The ingress bandwidth does not exceed 128 Mbit/s. The egress bandwidth does not exceed 256 Mbit/s.

Table 3-34 Hardware specifications

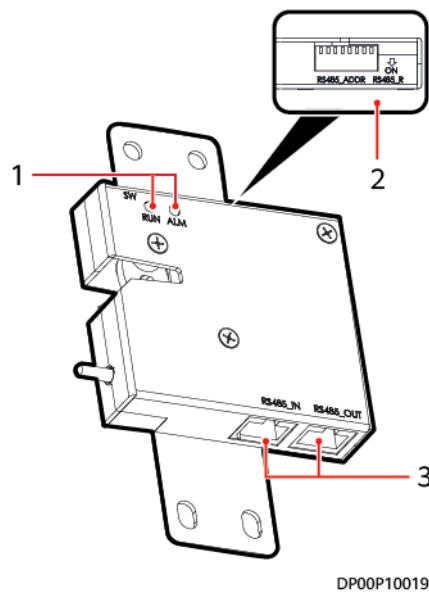
Item	Specifications
Number of disks	2
Whether the hard disk supports hot swap	No
Supported hard disk type	3 TB, 4 TB, 6 TB, or 8 TB SATA disks

Item	Specifications
CPU type and maximum number of supported CPUs	1 x ARM Cortex A17 Quad-core @Max. 1.4 GHz
Memory capacity	1 GB
Network port	Two GE network ports
Power parameters	<ul style="list-style-type: none"> <li>One power module</li> <li>AC power (100 V AC to 240 V AC; 50 or 60 Hz)</li> </ul>
Weight in full configuration (including disks)	≤ 5 kg
Maximum power consumption (including hard disks)	< 60 W
Dimensions (H x W x D)	43.6 mm x 442 mm x 310 mm (1 U, excluding the panel) 43.6 mm x 442 mm x 320 mm (1 U, including the panel)

### 3.4.3.4 Cabinet Electronic Clasp Lock

The cabinet electronic clasp lock is used to manage access control. It can be automatically unlocked, or manually locked and unlocked.

**Figure 3-19** Cabinet electronic clasp lock



(1) LED indicator

(2) DIP switch

(3) RJ45 power port

**Table 3-35** RJ45 port definitions

No.	Pin Description	Description
1	RS485+	RS485+
2	RS485-	RS485-
3	+12 V power supply	+12VDC
4	RS485+	RS485+
5	RS485-	RS485-
6	-	-
7	-	-
8	Ground	GND

**Table 3-36** LED indicator status

Indicator	Color	Name	Operation	Status	Description
RUN	Green	Module running indicator	/	Blinking	<ul style="list-style-type: none"> <li>The door lock is paired with the host, and the power supply is normal: The indicator blinks at 0.5 Hz (on for 1s and then off for 1s).</li> <li>The door lock fails to pair with the host: The indicator blinks at 4 Hz (on for 0.125s and then off for 0.125s).</li> </ul>
				Off	The power supply is abnormal.
			Press SW.	Blinking intermittently at super short intervals	<ul style="list-style-type: none"> <li>The indicator blinks at super short intervals for 0.5s, and then off for 0.5s.</li> <li>The indicator blinks at super short intervals (blinking at 10 Hz, on for 0.05s and then off for 0.05s). The cycle lasts for 5s.</li> </ul>
ALM	Red	Alarm indicator	/	Steady on	A system failure alarm is generated.

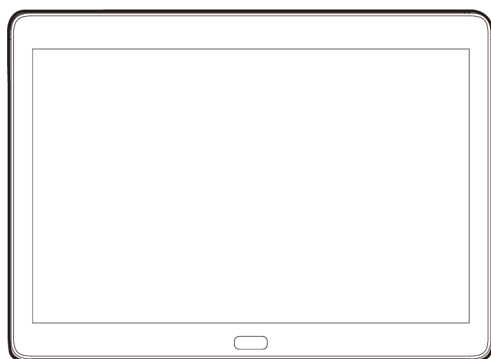


Indicator	Color	Name	Operation	Status	Description
				Off	The system is normal.

### 3.4.3.5 PAD

The pad allows the wireless access from the data center management system. You can monitor the equipment in the data center and environmental parameters in real time over the app. The recommended model is T5-10.

Figure 3-20 PAD



DM26000026

Table 3-37 Pad structural specifications

Item	Specifications
Dimensions (L x W x H)	243 mm x 164 mm x 7.8 mm
Weight	About 460 g

Table 3-38 Pad technical specifications

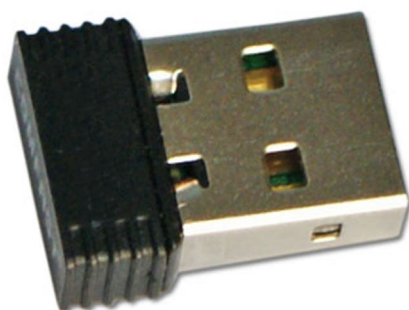
Item	Specifications
Touchscreen	10.1-inch, 1920 x 1200 resolution, IPS screen, and multi-touch
Storage	<ul style="list-style-type: none"> <li>• Machine: 32 GB</li> <li>• Memory: 3 GB</li> <li>• LPDDR3 extension card: Micro SD, a maximum of 256 GB (non-standard configuration)</li> </ul>

Item	Specifications
Button/Port	<ul style="list-style-type: none"> <li>• Touch button + power switch and volume button</li> <li>• 3.5 mm stereo headphones port</li> <li>• Micro SD card port</li> <li>• MicroUSB port</li> </ul>
Camera	<ul style="list-style-type: none"> <li>• Rear camera: 8-megapixel, F2.4 aperture, automatic focus</li> <li>• Front camera: 2-megapixel, F2.4 aperture, fixed focus</li> <li>• Sensor type: BSI</li> <li>• Flash: not supported</li> <li>• Video recording: rear camera up to 1080 pixels at 30 FPS; front camera up to 720 pixels at 30 FPS</li> <li>• Zoom mode: digital zoom</li> <li>• Photo resolution: rear camera up to 8 M (3264 x 2448 pixels); front camera up to 1.9 M (1600x1200 pixels)</li> </ul>
Battery	<ul style="list-style-type: none"> <li>• Materials: Li-polymer</li> <li>• Capacity: 5100 mAh (typical value) or 4980 mAh (rated value)</li> <li>• WiFi connection/web page browse time: about 6.5 hours</li> <li>• Power adapter charge time: about 3.5 hours (5 V 2 A adapter)</li> </ul>

### 3.4.3.6 (Optional) WiFi Module

The WiFi module provides WiFi signals for equipment such as pads and mobile phones to interact with the host computer.

**Figure 3-21** WiFi module



DC02W00272

**Table 3-39** Technical specifications

Item	Specifications
Wireless standard	IEEE 802.11n, IEEE 802.11g, and IEEE 802.11b
Network bandwidth	<ul style="list-style-type: none"><li>• 11n: up to 150 Mbps</li><li>• 11g: up to 54 Mbps</li><li>• 11b: up to 11 Mbps</li></ul>
Frequency band	2.4–2.4835 GHz
Wireless transmission power	20 dBm (MAX EIRP)
Supported operating system	Windows 2000/XP/Vista/Linux/Win 7
Port	USB 2.0 Hi-Speed connector
Voltage range	5.0 V DC±5%
Operating temperature	-20°C to +70°C
Storage temperature	-40°C to +90°C
Relative humidity	10%–90% RH (non-condensing)
Storage humidity	5%–90% RH (non-condensing)
Power	< 0.8 W

## 3.4.4 (Optional) NetEco Intelligent Data Center Management System

### 3.4.4.1 System Overview

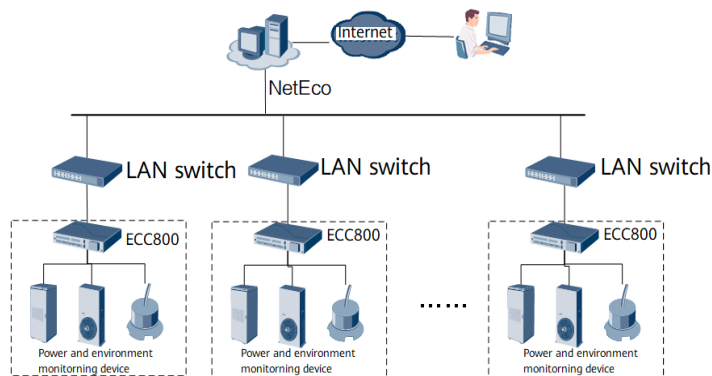
With a flexible structure and modular design, the NetEco can manage facilities of one data center or centrally manage facilities of multiple data centers in different regions.

The management system provides a GUI to implement comprehensive management functions based on requirements. The system mainly monitors following devices:

- Power equipment: smart cooling product, Power distribution module, UPS, and so on

- Environment equipment: water sensor, temperature and humidity sensor, and so on
- Video equipment: camera, and so on
- Access control equipment: A standard access management system is integrated to manage and monitor key information such as door status, card swiping, and permission setting.
- Standard network management interface: The NetEco provides SNMP interfaces to communicate with third-party NMSs. The system can be customized to support other protocols for the access from different devices.

**Figure 3-22** Networking diagram



### 3.4.4.2 Server

The NetEco can be deployed on one of the following servers according to the management capability requirement.

**Table 3-40** Server

Model	Configuration
TaiShan 200 (Model 2280) standard configuration	2 x Kunpeng 920 48-core@2.6 GHz, 4 x 32 GB memory, 2 x 1.2 TB + 8 x 1.8 TB drives
TaiShan 200 (Model 2180) basic configuration	1 x Kunpeng 920 32-core@2.6 GHz, 2 x 32 GB memory, 2 x 1.2 TB drives
2288X V5-H22X-standard configuration	2 x 5218 16-core@2.3 GHz CPU, 4 x 32 GB memory, 2 x 1.2 TB + 8 x 1.8 TB SAS drives
2288X V5-H22X-basic configuration	2 x 4208 8-core@2.1 GHz CPU, 2 x 32 GB memory, 2 x 1.2 TB SAS drives

### 3.4.4.3 LAN Switch

Select LAN switches based on site requirements.

**Table 3-41** LAN switch

Model	Maximum Number of Ports
S5331-H24P4XC	Twenty-four 10/100/1000BASE-T Ethernet ports, four 10GE SFP+ ports
S5731-H24P4XC	Twenty-four 10/100/1000BASE-T Ethernet ports, four 10GE SFP+ ports

## 3.5 Surge Protection and Grounding System

### 3.5.1 Surge Protection Solution

The Smart Module is mainly used for building equipment rooms. Its power distribution system is a subsystem of the building power distribution system. Class I surge protective devices (SPDs) of the power system are provided by the general low-voltage power distribution room or cabinet of the building.

### 3.5.2 Grounding Solution


#### Cabinet Potential Grounding

A general ground bar is installed in the cabinet. Ground terminals of the cabinet are connected to the ground bar using a ground cable with a minimum cross-sectional area of 16 mm<sup>2</sup>.

 **NOTE**

The AC input power is from the upstream power distribution system. The cross-sectional areas of ground cables are determined according to IEC 60364-5-54.

#### Cabinet Grounding

- Metal components and parts of cabinets are properly connected. A structural connection area is protected and applied with antioxidants. An area protected with painting should ensure proper metal surface contact for two connected components. The DC resistance is within 0.1 ohm between any two connected metal components. Use a ground cable to connect two metal components that cannot be directly connected, such as cabinets and cabinet doors. A cable for connecting these two metal components has a minimum cross-sectional area of 6 mm<sup>2</sup>.
- A ground bar or general ground point is provided in the cabinet for equipment grounding. The ground bar does not need to be insulated.
- A ground terminal is greater than or equal to M8 in dimensions. A yellow ground label  is attached close to the general ground terminal for cabinets.

- Connect equipotential cables to metal components without carrying currents in the module, such as metal doors and windows. Each equipotential cable has a minimum cross-sectional area of 6 mm<sup>2</sup>.

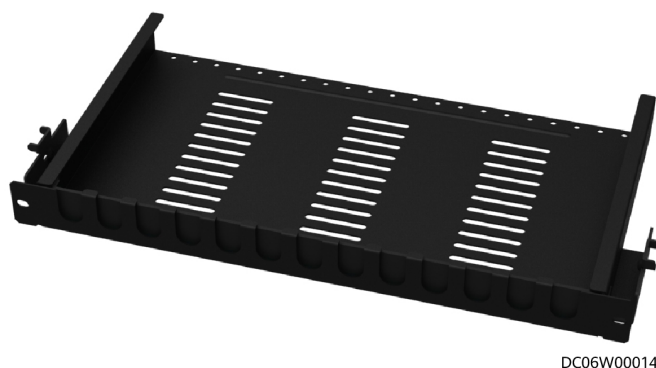
## 3.6 Cable Management

A cable tray is used inside a cabinet to route cables from the front to the rear.

### Cable Tray

A cable tray is used for forward and backward cabling. It uses mounting ears to facilitate device installation.

**Figure 3-23** Cable tray



DC06W00014

**Table 3-42** Cable tray technical specifications

Dimensions (H x W x D)	Weight	Space Occupied
43.6 mm x 482.6 mm x 250 mm	1.89 kg	1 U


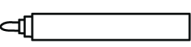
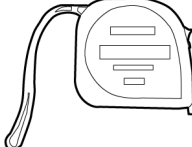





# 4 Installation Guide


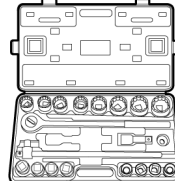


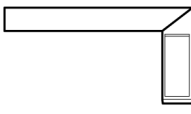
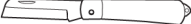
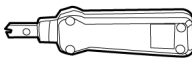

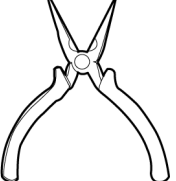
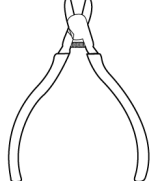
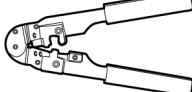
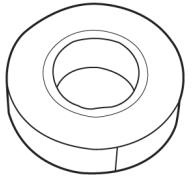
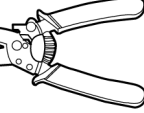

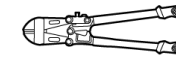
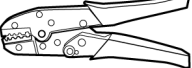
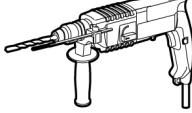

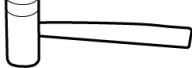
## 4.1 Installation Preparations

### 4.1.1 Tools and Instruments

Prepare the tools and meters required for installation.

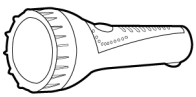
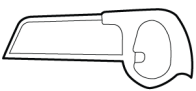
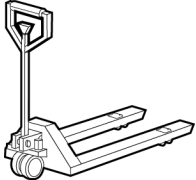
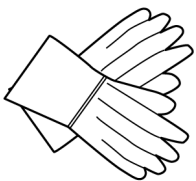
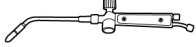
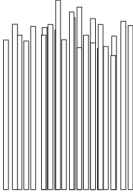

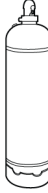
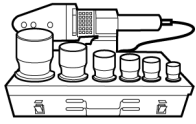
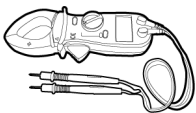
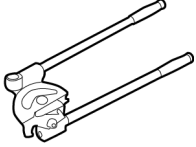

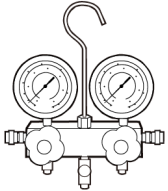
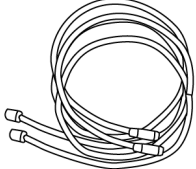


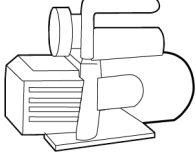
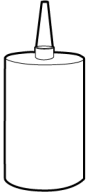
**Table 4-1** General tools and instruments

Name, Specifications, and Appearance			
Protective gloves	Marker	Measuring tape (5 m)	Level
			
Step ladder (2 m)	Phillips screwdriver (M4, M6, and M8)	Flat-head screwdriver (2-5 mm)	Torque wrench
			
Adjustable wrench (6")	Socket wrench (M6, M8, and M12)	Hex key (5 mm)	Laser locator

Name, Specifications, and Appearance			
			
Right angle	Electrician's knife	Impact tool	Heat gun
			
Needle-nose pliers	Diagonal pliers	RJ11 crimping tool	Polyvinyl chloride (PVC) insulation tape
			
Wire stripper	Hydraulic pliers	Wire clippers	Crimping tool
			
Multimeter	Electroprobe	Heat shrink tubing	Cable ties
			-
Hammer drill	Electric screwdriver	Rubber mallet	-



**Table 4-2** Tools and instruments for installing smart cooling products

Name, Specifications, and Appearance			
Flashlight	Hacksaw	Pallet truck	Electric balance
			
Antifreeze gloves	Cutter	Welding torch	5% silver solder
			
Oxygen	Acetylene	Hot melt device	Clamp meter
			
Pipe bender	Insulation gloves	Pressure gauge (1 PCS) <sup>a</sup>	Leather hose (3 PCS) <sup>a</sup>
			
Nitrogen <sup>b</sup>	Reducing valve <sup>c</sup>	Vacuum pump <sup>d</sup>	Water pipe thread sealant <sup>e</sup>
			

Name, Specifications, and Appearance
<p>a. Pressure gauge and leather hose: dedicated for R410A. The measuring range of the pressure gauges must be at least 4.0 MPa, and the leather hoses must withstand a pressure of at least 4.5 MPa. Ensure that the leather pipes match the 1/4 inch needle valves inside the unit. If necessary, prepare needle valve adapters.</p> <p>b. Dry nitrogen.</p> <p>c. Nitrogen reducing valve: A reducing valve must be installed on the head of the nitrogen cylinder, and the reducing valve range must be at least 4.0 MPa.</p> <p>d. Vacuum pump airflow: 2–4 L/s; absolute vacuum: ≤ 60 Pa.</p> <p>e. For equipment with humidifiers, ensure that the water pipe thread sealant can resist temperatures higher than 85°C and the following requirements are met:</p> <ul style="list-style-type: none"> <li>• Applicable to all pipe materials</li> <li>• Anaerobic metal pipe thread sealant with PTEF as the padding</li> <li>• Maximum gap: 0.5 mm</li> <li>• Pressure resistance: above 1.6 MPa</li> <li>• Compliant with the industry standard JB/T7311-2008 <i>Technical Specification for the Application of Anaerobic Glue in Engineering Machinery</i></li> </ul>

## 4.1.2 Installation Environment Check

Ensure that the installation environment meets the requirements before installation.

**Table 4-3** Installation environment checklist

Check Item	Specifications	Check Result
Operating temperature	Indoor operating temperature range: 0°C to 40°C	<input type="checkbox"/> Passed <input type="checkbox"/> Failed
Operating humidity	5%–95% RH	<input type="checkbox"/> Passed <input type="checkbox"/> Failed
Physical environment of the equipment room	The interior is clean and tidy, free from dust and conductive pollution.	<input type="checkbox"/> Passed <input type="checkbox"/> Failed
Altitude	0–4000 m (The power is derated as described in IEC 62040-3 when the altitude exceeds 1000 m.)	<input type="checkbox"/> Passed <input type="checkbox"/> Failed
Levelness	Allowed deviation: 3/2000 mm	<input type="checkbox"/> Passed <input type="checkbox"/> Failed

Check Item	Specifications	Check Result
Equipment room height	≥ 2.6 m	<input type="checkbox"/> Passed <input type="checkbox"/> Failed
Equipment room area	≥ 10.15 m <sup>2</sup>	<input type="checkbox"/> Passed <input type="checkbox"/> Failed
Equipment room maintenance clearance	At least 1200 mm, 1000 mm, and 1200 mm maintenance clearance should be reserved at the front door, rear, and side of the cabinet, respectively. The cabinet can be installed against the wall.	<input type="checkbox"/> Passed <input type="checkbox"/> Failed
Power system	220 V/230 V/240 V, 1 Ph, 50 Hz/60 Hz	<input type="checkbox"/> Passed <input type="checkbox"/> Failed
Water port	Condensate drain outlet: Drains condensate water from the smart cooling product.	<input type="checkbox"/> Passed <input type="checkbox"/> Failed
	Humidifier water pipe port: Connects to external water pipes to supply water to the humidifier.	<input type="checkbox"/> Passed <input type="checkbox"/> Failed

 **NOTE**

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

### 4.1.3 Site Equipment Preparation

- All cabinets and devices have been delivered to the site and checked against the delivery list.
- Cabinets and devices need to be transported to the specified positions based on the detailed equipment room layout diagram and unpacked for further installation.

 **CAUTION**

Pay attention to the following when unpacking batteries:

- Insert a flat-head screwdriver into the gap between the wooden crate and its top cover. Then pry off the top cover along the external edge of the cover until the cover can be taken out from the crate.
- Be careful to prevent your hands from being hurt by nails during unpacking.

## 4.1.4 Installation Scenarios

### Cabinet Scenario

**Figure 4-1** Component layout in the cabinet scenario

42	ECC800-Pro
41	
40	Power distribution unit
39	
38	
37	UPS
36	
35	LAN Switch (optional)
34	
33	
32	Server (optional)
31	
30	
29	VCN / IVS1800 (optional)
28	
27	
26	
25	
24	
23	
22	
21	
20	
19	Cable tray (optional)
18	
17	100 Ah lithium battey (optional)
16	
15	
14	100 Ah lithium battey (optional)
13	
12	
11	100 Ah lithium battey (optional)
10	
9	
8	100 Ah lithium battey
7	
6	Cable tray
5	
4	
3	Split-type air conditioner
2	
1	

DC00W00060

**Table 4-4** Components in the cabinet scenario

No.	Component	Onsite Installation	Onsite Cable Connection
(1)	ECC800-Pro	Not required	Not required
(2)	UPS	Not required	Required
(3)	Lithium battery	Required	Required
(4)	(Optional) Camera	Required	Required
(5)	T/H sensor	Required	Required
(6)	Water sensor	Required	Required
(7)	PDU2000	Not required	Required

No.	Component	Onsite Installation	Onsite Cable Connection
(8)	Smoke detector	Not required	Not required
(9)	3.5 kW split-type air conditioner	Required	Required

 **NOTE**

If the VCN or IVS1800, server, and LAN switch are configured, determine their installation positions based on the site requirements.

## 4.1.5 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 based on the project progress and installation environment. Typically, two to three persons are required.

## 4.2 Hardware Installation

The angle of door opening by the gas spring is 110°. Ensure that the door opening angle is less than 110°.

### 4.2.1 Cabinet Transportation and Unpacking

#### Context

- Only trained personnel are allowed to move the cabinet. Remove the packed cabinet from the pallet using a pallet truck and move the cabinet to the installation position.
- To prevent the cabinet from falling over, secure it to the pallet truck using ropes before moving it.
- To prevent shocks or falls, move the cabinet gently. After placing the cabinet in the installation position, unpack it and take care to prevent scratches. Keep the cabinet steady during unpacking.

- If the cabinet installation environment is in poor condition, to well store the cabinet after it is unpacked, take measures to prevent dust. You can wrap the cabinet with the original plastic coat.

---

**NOTICE**

Do not tear down the transparent film from the glass door during the installation. The film will be removed after the entire module is installed.

---

## Procedure

- Step 1** Use a pallet truck to transport the cabinet to the installation position.
- Step 2** Check that the cabinet package is intact.
- Step 3** Cut off and remove the binding straps, and remove the packing.
- Step 4** Remove pallets from ordinary cabinets.
1. Remove the plastic bag and take out the fitting box.
  2. Check the cabinet exterior for damage. If any damage is found, notify the carrier immediately.
  3. Check against the packing list that the equipment and fittings are correct and complete. If some fittings are missing or do not comply with the packing list, record the information and contact your local Huawei office immediately.
  4. After checking that the cabinet is intact, remove the screw assemblies that secure the cabinet to the pallet, as shown in [Figure 4-2](#).

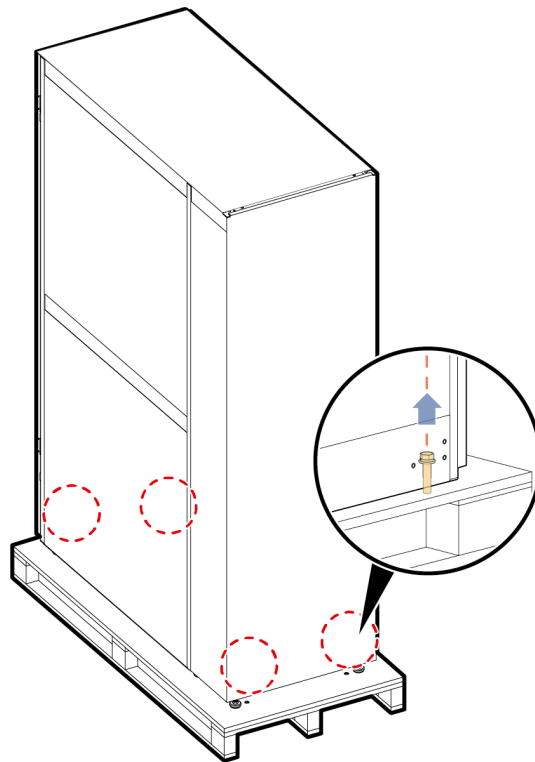
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**NOTICE**

Set the screw assemblies aside for they will be used in installation steps.

---

**Figure 4-2** Removing an ordinary cabinet



DM1400018

5. Remove the cabinet from the pallet and move the cabinet to the installation position.

---

**NOTICE**

To avoid personal injury, prevent the cabinet from falling over during transportation.

---

----End

## 4.2.2 (Optional) Removing the Aisle Containment

### Prerequisites

The cabinets have been transported to the destination place and unpacked.

### Context

If the site elevator is too small to transport a cabinet, remove the aisle containment from the cabinet. Reassemble them after transporting them to the installation position. Then perform subsequent operations.

---

**NOTICE**

The cabinet front door is made of glass. Pay attention to the following during transportation:

- Move the cabinet with caution.
  - Ensure that the glass door does not collide with sharp objects.
  - Place the glass door stably and reliably.
- 

**Procedure**

**Step 1** Open the front and rear doors of the cabinet.

**Step 2** (Optional) Cut off the cable tie on the PAD cable in the cabinet, and pull the cable into the cabinet through the front door.

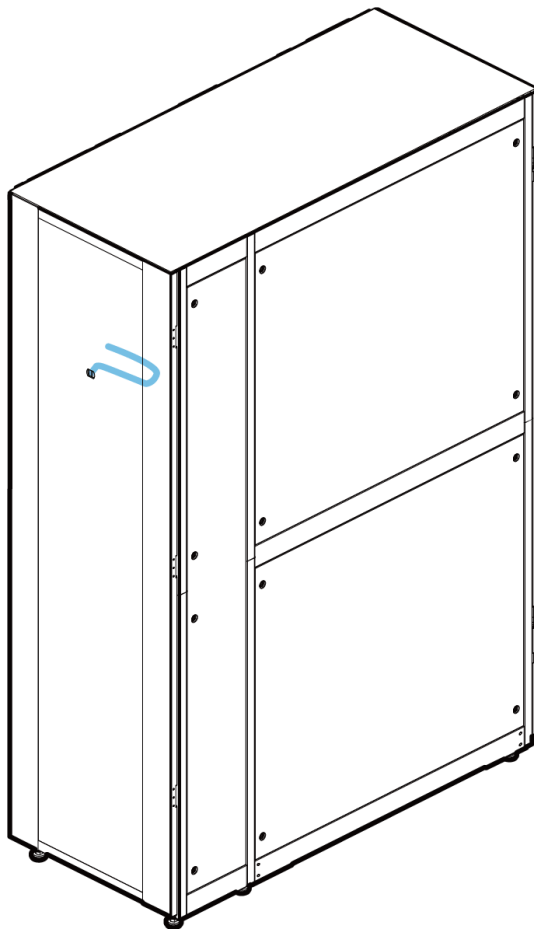
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**NOTICE**

Record the PAD cable route because you need to bind the PAD cable along the original route in subsequent installation.

---

**Figure 4-3** Removing the PAD cable

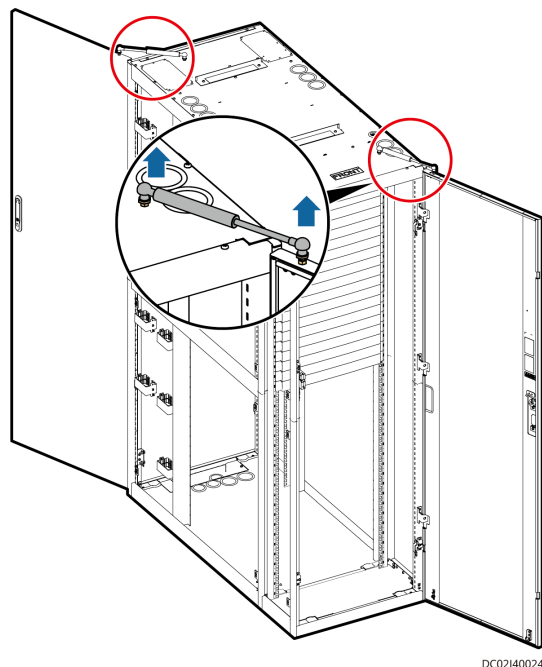


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- Step 3** Loosen the gas spring nuts using an adjustable wrench and remove the gas springs.

**Figure 4-4** Removing the gas springs



- Step 4** Disconnect the cabinet ground cable.

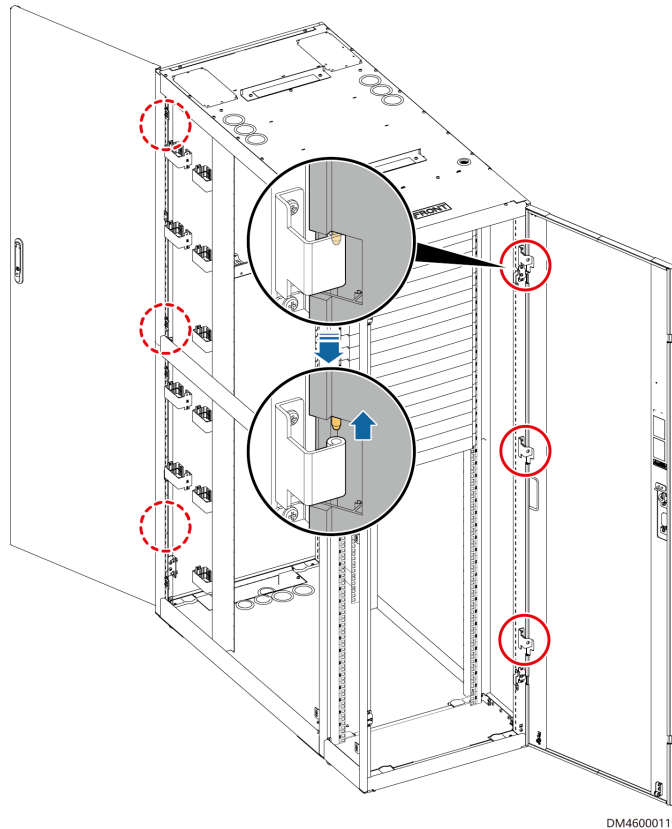
- Step 5** Lift the cabinet doors off the hinges. Remove the front and rear doors.

---

**NOTICE**

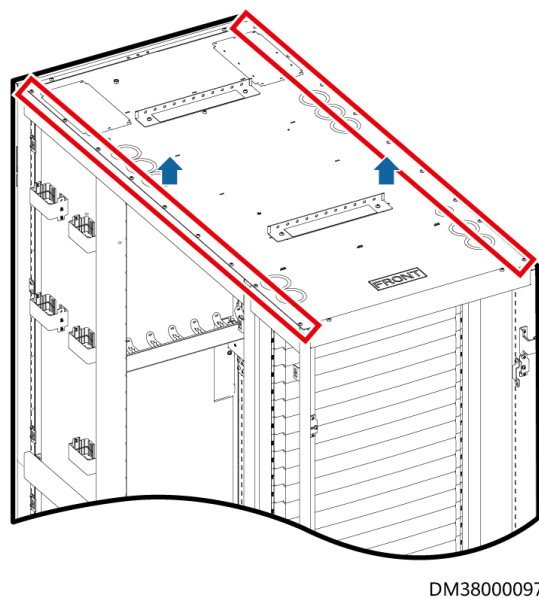
- The cabinet front door is heavy. Arrange at least two persons to carry the door.
  - Before removing a cabinet door, disconnect the ground cable between the cabinet door and the cabinet.
-

**Figure 4-5** Removing the cabinet doors



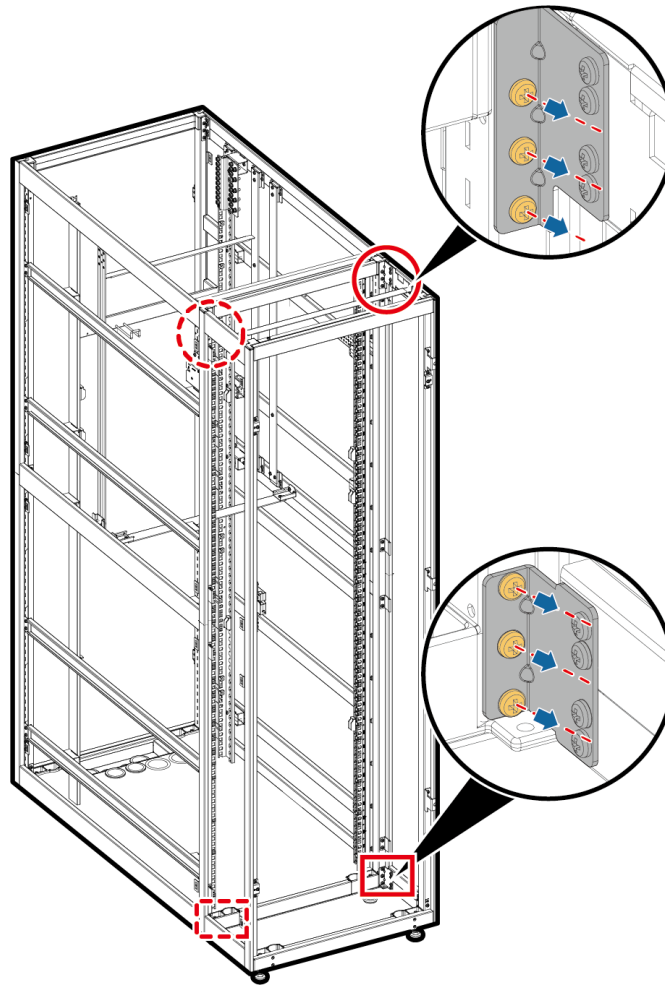
**Step 6** Remove the top plate from the cabinet using a Phillips screwdriver.

**Figure 4-6** Removing the top plate



**Step 7** Remove the screws securing the aisle containment to the cabinet using a Phillips screwdriver, and remove the aisle containment from the cabinet.

**Figure 4-7** Removing an aisle containment



DC00S00152

**Step 8** Move the removed glass doors, gas springs, top plate, aisle containment, and cabinet to the specified installation position using an elevator.

**Step 9** Assemble the removed components with the cabinets by referring to [Step 7](#) to [Step 2](#).

----End

## 4.2.3 Installing a Cabinet

### Prerequisites

The floor levelness meets engineering requirements.

### Context

To position a cabinet, perform the following steps:

1. Determine the position of the cabinet based on the engineering layout diagram.
2. Place the cabinet at the correct installation position.

## Procedure

- Step 1** Determine the cabinet position based on the engineering layout diagram.
- Step 2** Place the cabinet at the correct installation position.
- Step 3** Level the cabinet using a wrench.

---

### NOTICE

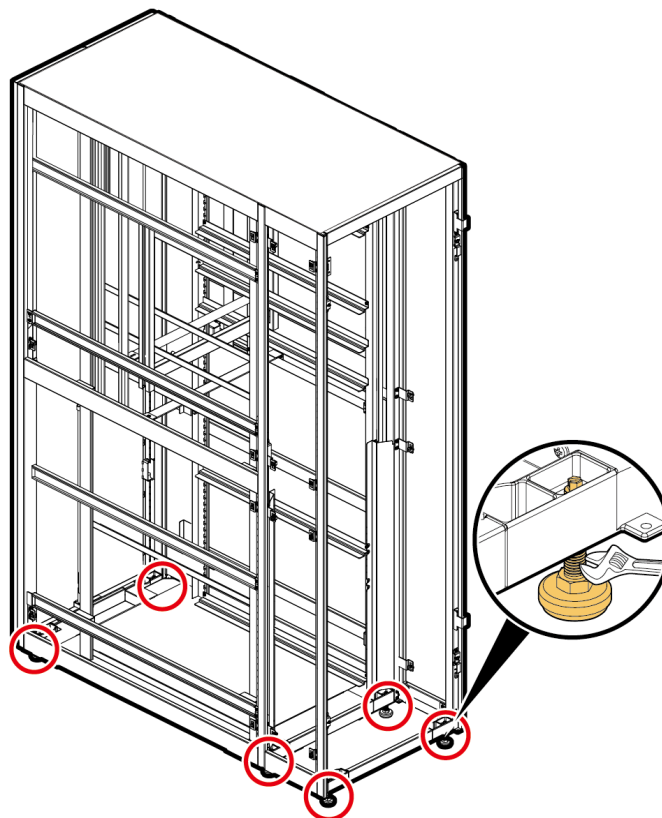
- Use a measuring tape to check that the vertical distance between the top of the 2000 mm high cabinet and the floor is 2000 mm (+3 mm). Then use a level to check that the cabinet is level.
- If the leveling height of the cabinet does not meet the requirements, the cabinet cannot be opened or closed properly.

---

### NOTE

- To ensure the cabinet steadiness, adjust all the six anchor bolts at the bottom of the cabinet in place.
- After leveling the anchor bolts in the first and last rows, use a flat-head screwdriver to level the anchor bolts in the middle row until they are in close contact with the ground.
- 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 leg, or wrench an anchor bolt anticlockwise to lower it. The anchor bolts can be adjusted within a range of 0-8 mm.
- Levelness check standard: Ensure that the cabinet is level in width and depth directions when leveling the cabinet. 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 4-8** Leveling a cabinet



DM14000017

----End

## 4.2.4 Installing a Smart Cooling Product

### 4.2.4.1 Materials

#### (Optional) Refrigerant R410A

---

#### NOTICE

Do not use unqualified refrigerant. Huawei will not be liable for any equipment damage caused by unqualified refrigerant.

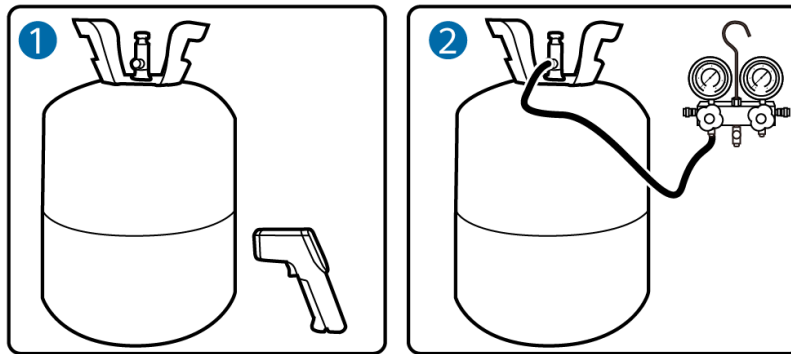
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Customers can purchase this material from Huawei or other vendors. Verify that the refrigerant is authentic in the following ways:

1. Refrigerant from name brands such as DuPont, Daikin, and Honeywell is recommended.
2. Dial the refrigerant vendor's hotline to confirm the refrigerant authenticity.
3. Place the refrigerant tank indoors for 24 hours. Use a point thermometer to measure the outer surface temperature of the refrigerant tank, and connect a pressure gauge to the tank to measure the internal pressure, as shown in

**Figure 4-9.** Find the saturation pressure corresponding to the measured outer surface temperature from **Table 4-5**. If the deviation between the saturation pressure and the measured internal pressure is greater than 0.2 MPa, the refrigerant does not meet the requirements, and needs to be replaced.

**Figure 4-9** Checking the refrigerant



DT53000205

**Table 4-5** Mapping between the saturation pressure and the saturation temperature for R410A

Saturation Temperature (°C)	Gauge Pressure (MPa)	Saturation Temperature (°C)	Gauge Pressure (MPa)	Saturation Temperature (°C)	Gauge Pressure (MPa)
0	0.7	19	1.31	38	2.21
1	0.73	20	1.35	39	2.27
2	0.75	21	1.39	40	2.33
3	0.78	22	1.4	41	2.39
4	0.81	23	1.47	42	2.45
5	0.84	24	1.51	43	2.51
6	0.87	25	1.56	44	2.57
7	0.9	26	1.60	45	2.63
8	0.93	27	1.65	46	2.7
9	0.96	28	1.69	47	2.76
10	0.99	29	1.74	48	2.83
11	1.02	30	1.79	49	2.9
12	1.05	31	1.84	50	2.97
13	1.09	32	1.89	51	3.04
14	1.12	33	1.94	52	3.11
15	1.16	34	1.99	53	3.19

Saturation Temperature (°C)	Gauge Pressure (MPa)	Saturation Temperature (°C)	Gauge Pressure (MPa)	Saturation Temperature (°C)	Gauge Pressure (MPa)
16	1.19	35	2.04	54	3.26
17	1.23	36	2.1	55	3.34
18	1.27	37	2.15	-	-

**NOTE**

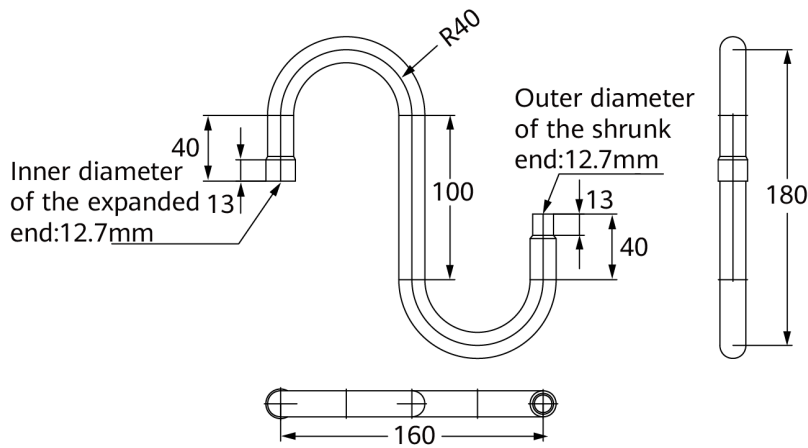
1 MPa ≈ 10 bar ≈ 145 psi ≈ 10.2 kgf/cm<sup>2</sup>

## Oil Trap

**NOTICE**

If the outdoor unit is installed 6 m higher than the indoor unit, install an oil trap every 6 m to 7.5 m on the gas pipe to ensure that the compressor oil flowing from the vertical gas pipe to the oil trap can be quickly taken away when the compressor restarts after shutdown.

**Figure 4-10** Oil trap (unit: mm)



## (Optional) Gas Pipe, Liquid Pipe, and Thermal Insulation Foam

**Table 4-6** Specifications

Item	Specifications
Gas pipe	3/8 inch (9.52 mm), pressure withstanding capacity ≥ 4.5 MPa

Item	Specifications
Liquid pipe	2/9 inch (6 mm), pressure withstanding capacity $\geq 4.5$ MPa
Thermal insulation foam	$\geq 13$ mm

## Water Pipe

Drainpipes are hoses that extend 1 m out of the smart cooling product.

Condensate pipes can be PVC pipes, galvanized steel pipes, or aluminum-plastic pipes.

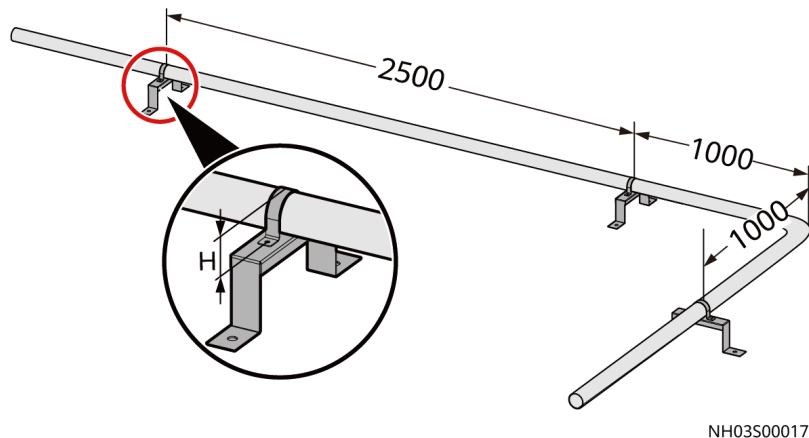
**Table 4-7** Specifications

Item	Specifications
Automatic drainpipe	22 mm (outer diameter)
Forcible drainpipe	6 mm (outer diameter)

## Pipe Support

**Figure 4-11** shows supports for a refrigerant or water pipe. Select supports based on site conditions.

**Figure 4-11** Pipe supports (unit: mm)



### NOTE

- The height of a U-shaped pipe clamp equals the pipe diameter with thermal insulation foam minus 5 mm. The pipe supports are to be purchased by the customer.
- The recommended material for pipe supports and clamps is 304 stainless steel.
- Install a support every 2500 mm in the straight sections of pipes, and 1000 mm away from each bending point in the turning section.



## Cable

### NOTICE

- The site ground resistance must be less than 0.1 ohm.
- The cable fire resistance rating must be at least VB.

**Table 4-8** Cable specifications


Application Scenario	Specifications	Remarks
(Optional) Outdoor unit power cable	Electrical power cable, 600 V, ZA-RVV, 4 x 2.5 mm <sup>2</sup> , black (four core wires: brown, black, blue, yellow/green), 46 A, outdoor cable, CE	The length is determined based on site survey.
	Common terminal, single-wire cord end terminal, 2.5 mm <sup>2</sup> , insertion depth 12 mm, blue	Delivered with the fittings
	Bare crimp terminal, OT, 2.5 mm <sup>2</sup> , M4, tin plated, 16–14 AWG	Delivered with the fittings

### 4.2.4.2 Layout Principles

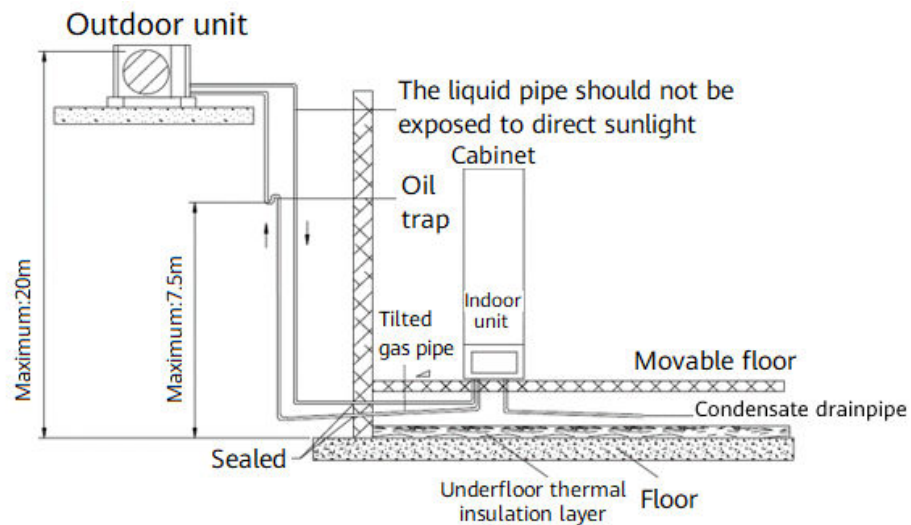
The layout principles are as follows:

- If the outdoor unit is placed higher than the indoor unit, the maximum height deviation between them should be less than or equal to 20 m. Install an oil trap every 6 m to 7.5 m along the gas pipe in the vertical direction to ensure system reliability.
- If the indoor unit is placed higher than the outdoor unit, the maximum height deviation between them should be less than or equal to 5 m.

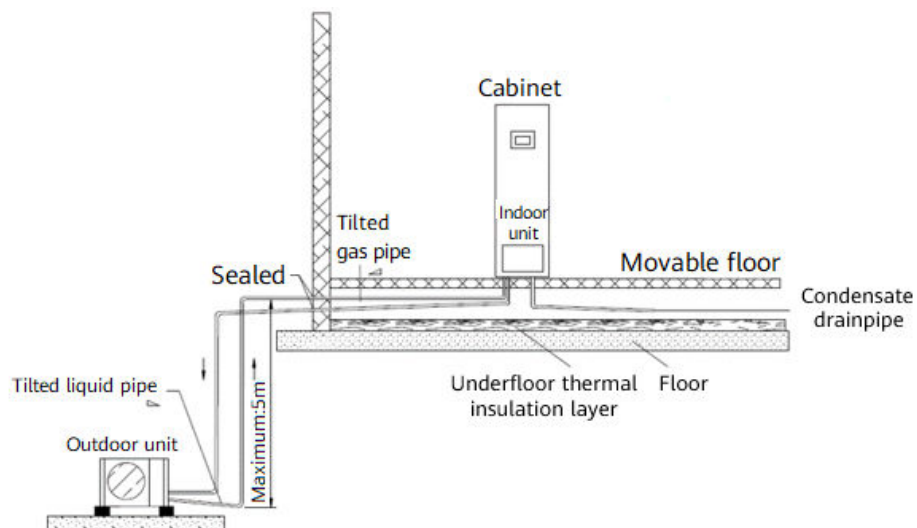
### NOTICE

- The height deviation refers to the distance between the stop valve of the indoor unit and that of the outdoor unit.
-  is a sign of a tilt, and indicates that the scale of the pipe tilting is at least 1:200. The pipe tilting direction should be consistent with the hypotenuse of the right triangle.

**Figure 4-12** Layout for the scenario where the outdoor unit is placed higher than the indoor unit



**Figure 4-13** Layout for the scenario where the indoor unit is placed higher than the outdoor unit

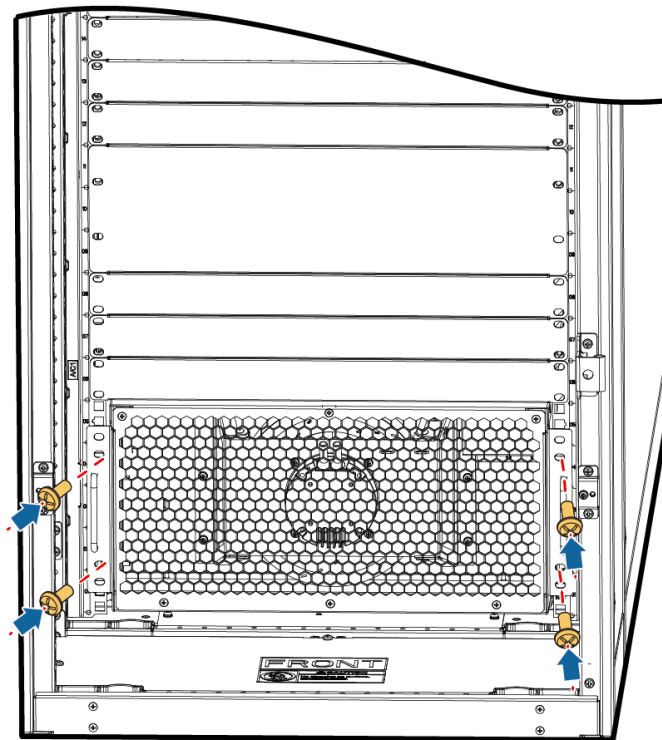


### 4.2.4.3 Installing an Indoor Unit

#### Procedure

- Step 1** Remove the filler panels from the 1st U to the 5th U of the cabinet.
- Step 2** Push the indoor unit of the smart cooling product into the bottom of the cabinet along the guide rails, and secure the indoor unit using M6 screws based on the positions of floating nuts on the cabinet mounting bars.

**Figure 4-14** Installing an indoor unit



DA02H00002

**NOTE**

- Remove the desiccant bound to the front panel of the smart cooling product before installation.
- The indoor unit of the smart cooling product does not have an external indicator. The main control board inside the indoor unit has an indicator, which can be seen only after the rear panel is opened.

----End

#### 4.2.4.4 Exhausting Nitrogen from an Indoor Unit

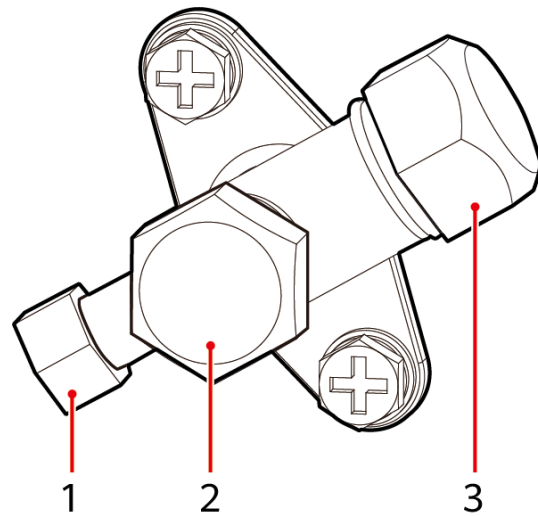
##### Context

**NOTE**

0.5 MPa nitrogen is injected into the indoor unit for transportation.

Nitrogen needs to be exhausted from the indoor unit through the gas pipe needle valve of the indoor unit stop valve. [Figure 4-15](#) shows a stop valve.

**Figure 4-15** Stop valve



NH01W00025

(1) Needle valve nut

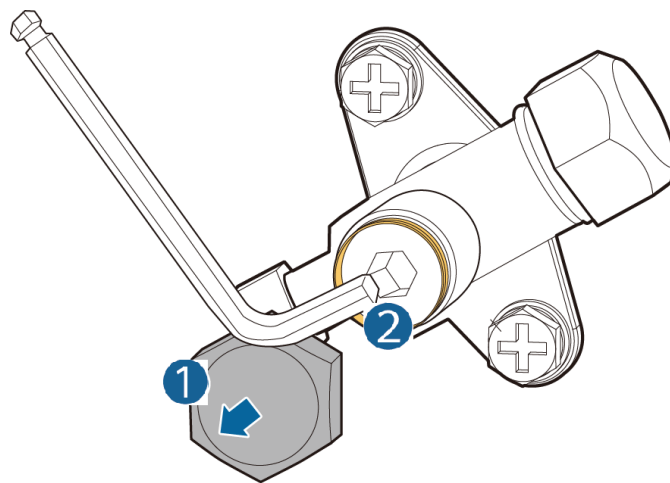
(2) Rear cover nut

(3) Black plastic nut

## Procedure

**Step 1** Open the stop valve on the gas pipe of the indoor unit using a 5 mm hex key.

**Figure 4-16** Opening a stop valve plug



NH01H00047

**Step 2** Remove the needle valve nut at the gas pipe of the indoor unit, connect a rubber hose and a pressure gauge to the gas pipe needle valve, and slowly exhaust nitrogen, as shown in [Figure 4-17](#).

---

**CAUTION**

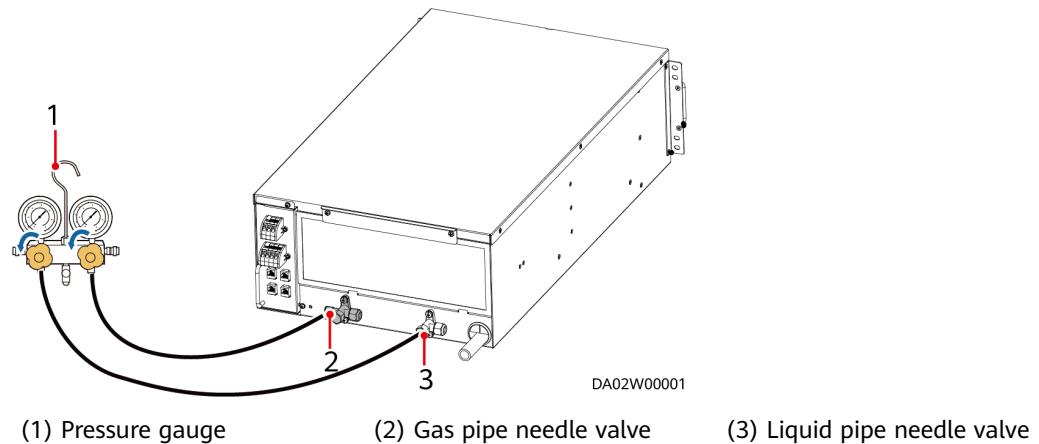
When you connect the rubber hose, the pressure gauge valve should be closed. When exhausting nitrogen, ensure that the rubber hose is secured. Otherwise, personal injury will be caused as a result of the airflow impact.

---

**NOTICE**

There should be a great sound of airflow during the exhausting.

**Figure 4-17** Exhausting nitrogen from an indoor unit



**NOTE**

When exhausting nitrogen, do not remove the valve plug in case of losing it.

**Step 3** After the airflow sound disappears, reinstall the needle valve nut.

----End

## 4.2.4.5 Installing an Outdoor Unit

### 4.2.4.5.1 Installation Requirements

#### Precautions

- An outdoor unit must be installed by professionals.
- When a smart cooling product needs to be moved or reinstalled, ask professionals for help. Do not perform operations by yourself.
- Do not store an outdoor unit in a damp environment such as a moist basement or rain, because the humidity will cause short circuits.

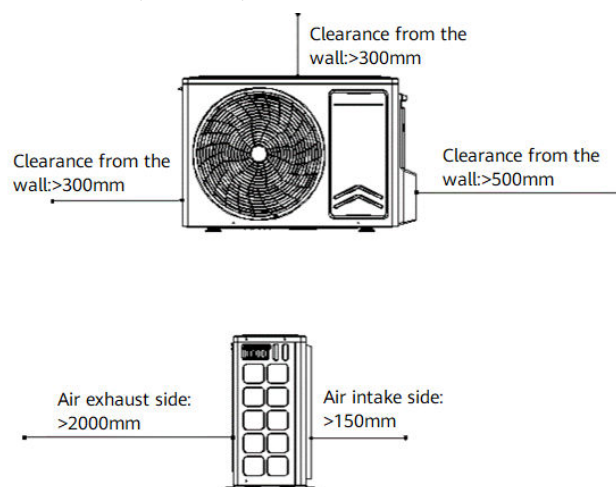
#### Environmental Requirements

- To avoid a fire disaster, install an outdoor unit in a dry and well-ventilated place without flammable gas leakage.
- Select a place away from direct sunlight and radiation from other heat sources. If the sunlight or heat radiation cannot be avoided, cover the outdoor unit.
- Do not install an outdoor unit in a place with much salt or corrosive gas.
- When installing the outdoor unit, ensure that the air intake vent and air exhaust vent of the condenser are not dirty or blocked. Install an outdoor unit in a clean area that is away from residential areas.

- At a high place with strong winds, install the outdoor unit against a wall to ensure the normal operating of fans. Install a baffle plate when necessary to prevent the outdoor unit from toppling in strong winds.
- Install an outdoor unit against a wall if possible. If the site conditions cannot meet the requirements and the local outdoor temperature may be below  $-10^{\circ}\text{C}$ , install a baffle plate by referring to the space requirements. The baffle plate height and width should be greater than or equal to the outdoor unit height and width, respectively.
- If the site installation environment is complicated and the preceding conditions are not met, contact Huawei technical support.

## Space Requirements

Figure 4-18 Space requirements



### 4.2.4.5.2 Securing an Outdoor Unit

#### Prerequisites

- The M10 expansion bolts used for securing an outdoor unit have been prepared.
- The concrete groundwork is prepared.

## Context

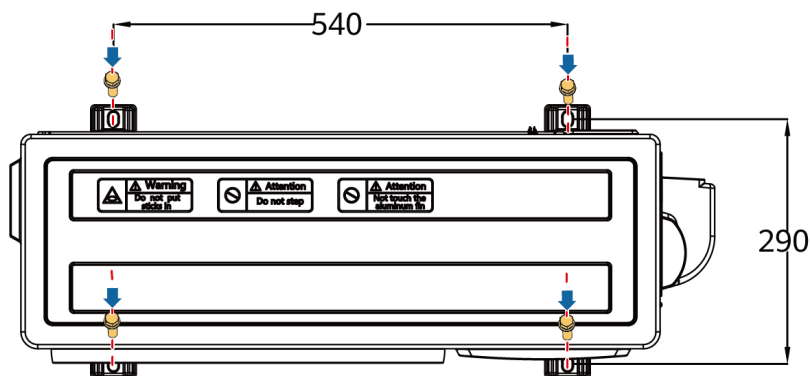
### NOTICE

- Move the outdoor unit close to the installation position before unpacking. You are advised to keep the outdoor unit vertical during transportation. If tilt is not avoidable, the tilt angle cannot exceed 15°.
- Do not hold the fan guard on the shell. Otherwise, it will be deformed.
- Do not touch the blades using hands or any other object.
- Remove the desiccant bound to the outdoor unit before installation.
- The outdoor unit is transported with refrigerant.

## Procedure

- Step 1** Determine the four mounting holes of the outdoor unit based on the installation dimensions and drill holes in the concrete base.
- Step 2** Align the outdoor unit mounting holes with the holes in the concrete base, and secure the outdoor unit to the concrete base using four M10 expansion bolts, as shown in [Figure 4-19](#).

**Figure 4-19** Installing an outdoor unit (unit: mm)



----End

### 4.2.4.6 Installing a Low-Temperature Component

#### Prerequisites

When the outdoor temperature is lower than  $-20^{\circ}\text{C}$ , a low-temperature component can be used to ensure normal operation at  $-40^{\circ}\text{C}$ .

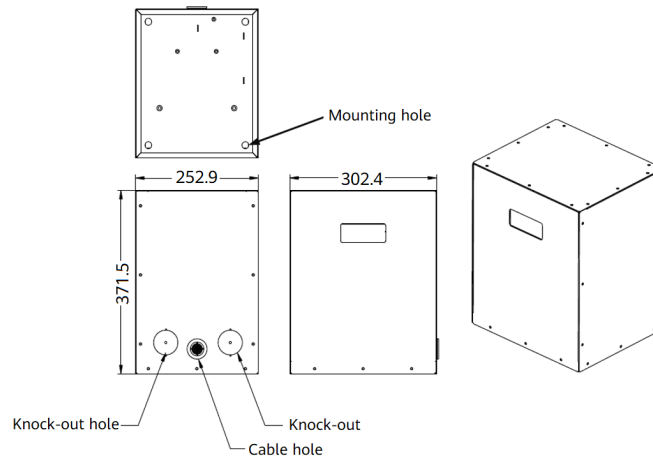
### NOTICE

The copper pipes of the low-temperature component need to be welded, which is different from pipe connection mode of the entire smart cooling product system.

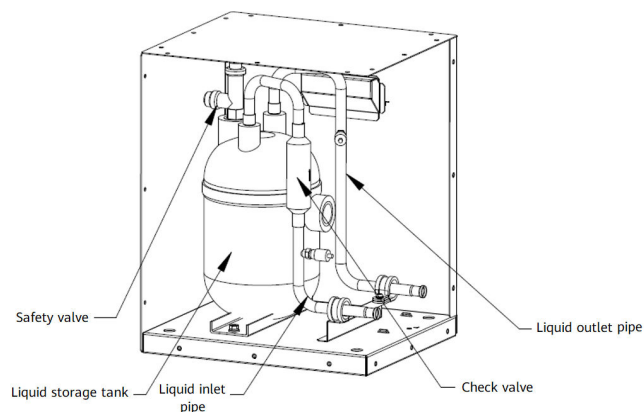
## Procedure

**Step 1** Place the low-temperature component in an open indoor area.

**Figure 4-20** Appearance of a low-temperature component



**Figure 4-21** Interior of a low-temperature component



**Step 2** Connect pipes. The low-temperature component has no dedicated wiring terminal and uses the 5 m power cable delivered with it.

The low-temperature component pipes need to be welded. The procedure is as follows:

1. Remove the side panel with knock-out holes.
2. Knock off the sheet metal from the knock-out holes on the side panel and fit the side panel into the copper pipes to be welded.
3. Weld the liquid inlet pipe and liquid outlet pipe.
4. Secure the side panel to the low-temperature component.

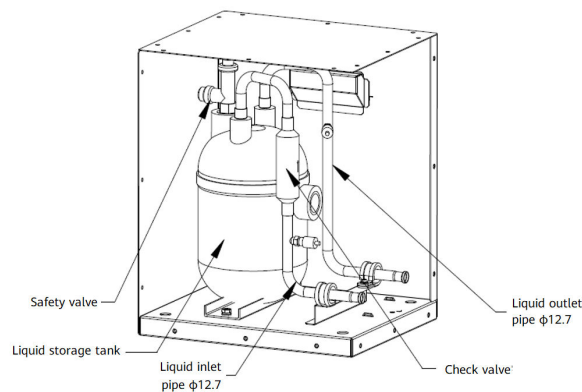


### NOTICE

The liquid inlet pipe and liquid outlet pipe of the low-temperature component are  $\phi 12.7$  mm copper pipes.

- If  $\phi 12.7$  mm liquid pipes are required, no expansion or shrinkage is required for connecting the low-temperature component.
- If  $\phi 9.52$  mm liquid pipes are required, expand or shrink the pipes when connecting the low-temperature component.

**Figure 4-22** Liquid pipes of the low-temperature component



----End

## 4.2.4.7 Connecting Pipes

### Pipe Cleaning

Ensure that the pipes are clean and free from rust, oxidation, sand, and oil stains. Clean the pipes when necessary during the installation and maintenance of the unit.

1. Clean copper pipes: If there are impurities such as oxide scale in a copper pipe, use nitrogen or compressed dry air to clean the copper pipe. During maintenance, if there are many oil stains in a copper pipe, charge a proper amount of trichloroethylene or carbon tetrachloride. After the oil stains dissolve, blow air to clean the copper pipe. Ensure proper indoor ventilation to prevent the operator from being poisoned.
2. Clean the air-cooled condenser: The fins of the air-cooled condenser are easy to be attached with dust and oil stains, which reduces the frontal area and the air volume. Therefore, the condenser must be cleaned regularly. Brushing and blowing are commonly used. Protect the fins and heat exchange pipes during cleaning. Do not use hard objects to wash or knock.

## Pipe Length

### NOTICE

Lay out pipes based on site requirements and the following principles:

- The length of a pipe should be as short as possible. The recommended length is within 10 m. Avoid unnecessary turnings, lifting, and falling.
- Minimize the height difference between the indoor and outdoor units.
- Minimize the number of bends for pipes.
- The total length of the pipe connecting the indoor and outdoor units equals the equivalent length of the straight pipe plus the length of the one-way straight pipe connecting the indoor and outdoor units.

**Table 4-9** Equivalent length of the straight pipe (unit: mm)

Equivalent Length of Components			
Copper Pipe Diameter	Equivalent Length		
	45-degree Bend	90-degree Bend	180-degree Bend
15.88	150	250	500
12.7	140	250	500
9.52	100	200	340
6	60	120	240

If the pipe between the indoor unit and outdoor unit is longer than 10 m, increase the pipe diameter to reduce system resistance. The following table lists the recommended pipe dimensions.

**Table 4-10** Pipe dimensions

Pipe Length	Gas Pipe	Liquid Pipe
10 m	9.52	6
20 m	12.7	9.52
30 m	12.7	9.52
40 m	12.7	9.52
50 m	12.7	9.52
60 m	12.7	9.52

## Connection Procedure

### WARNING

- Release nitrogen from the indoor unit before connecting it.
- Prepare copper pipes for connecting indoor and outdoor units. Ensure that the copper pipes are clean, free from impurities and moisture.
- If a copper pipe needs to be routed through the wall, seal both ends of the copper pipe before routing it through the wall.
- After a pipe is connected, charge dry nitrogen, test leakage, and vacuumize the pipe.

### Step 1 Obtain tools.

Ensure that all tools, spare parts, and materials are available. Tools include the hex key, hammer drill, vacuum pump, nitrogen cylinder, piping tool, and refrigerant pressure gauge.

### Step 2 Drill holes in the wall.

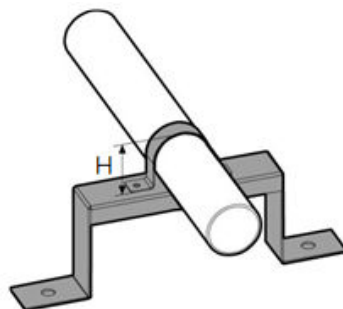
Drill round or rectangular holes at the bottom of the wall for routing connecting pipes, drainpipes, and power cables. When a system pipe passes through the wall, the end of the pipe must be effectively sealed to prevent sundries from entering the copper pipe.

### Step 3 Connect pipes.

- Connect copper pipes based on the unit specifications.
- Install the refrigerant pipe and check whether the pipe thread is sealed for protection.

The following figure shows the support for a refrigerant pipe or water pipe. The actual support dimensions prevail.

**Figure 4-23** Appearance



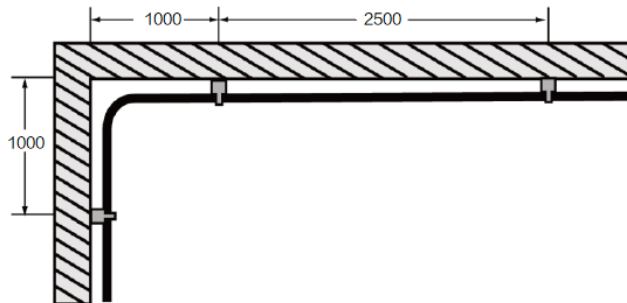
### NOTE

U-shaped pipe clamp height  $H$  (mm) = Pipe diameter (including thermal insulation foam) – 5 mm

To minimize noise due to vibration, perform the following operations:

1. When the direction of the refrigerant pipe is changed, add a support at the position that is 1000 mm away from the changing point.
2. When the refrigerant pipe is straight, add a support every 2500 mm.

**Figure 4-24** Securing supports

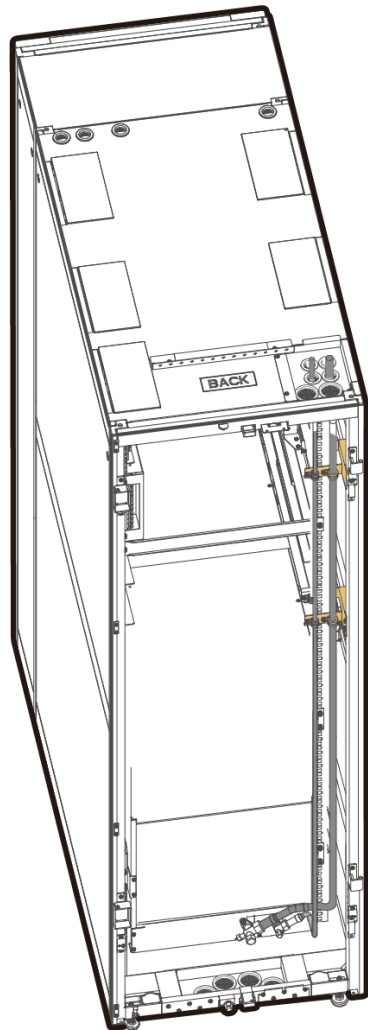


**NOTE**

Onsite personnel are responsible for preparing the required materials and installing the supports.

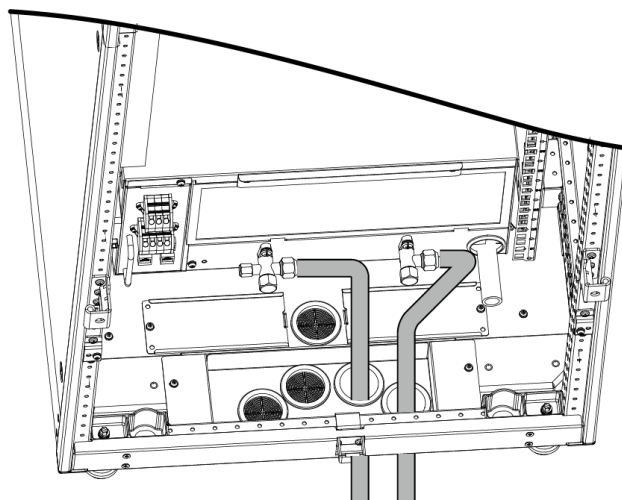
**Step 4** Connect the threaded connector.

**Figure 4-25** Top piping scenario



DA02H00006

**Figure 4-26** Bottom piping scenario



DA02H00003

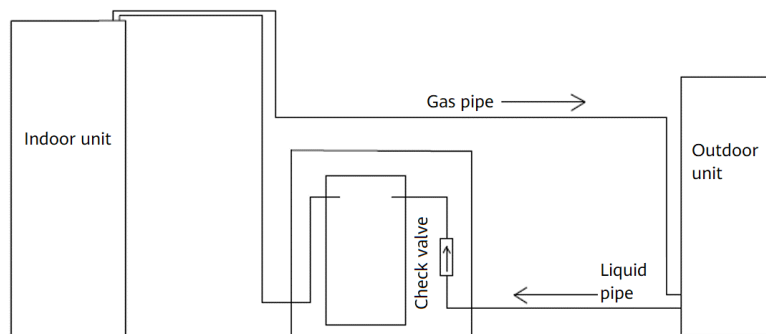
**Step 5** If a low-temperature component is configured, connect the pipe to the low-temperature component.

**NOTE**

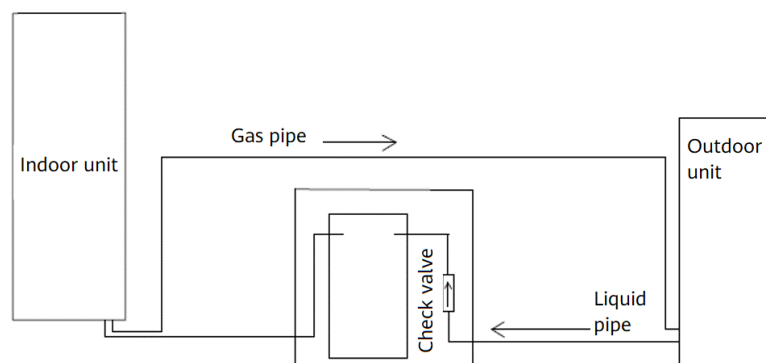
Top or bottom piping does not affect the installation of the low-temperature component. However, the following requirements must be met:

- If the height difference between the outdoor unit and the indoor unit is greater than 5 m, the low-temperature component must be installed indoors.
- If the low-temperature component is placed lower than the indoor unit, the height difference between the top of the low-temperature component and the bottom of the indoor unit cannot exceed 500 mm.

**Figure 4-27** Pipe connection with a low-temperature component (top piping)



**Figure 4-28** Pipe connection with a low-temperature component (bottom piping)



----End

#### 4.2.4.8 Injecting Nitrogen to Preserve Pressure

##### Context

**NOTICE**

- The measuring range of the pressure gauge must be at least 4.0 MPa, and the rubber hose must withstand a pressure of at least 4.5 MPa.
- During pressure preservation, do not remove the rubber hose and pressure gauge; otherwise, nitrogen may leak.

## Procedure

**Step 1** Open the stop valve for the gas pipe of the indoor unit.

### NOTICE

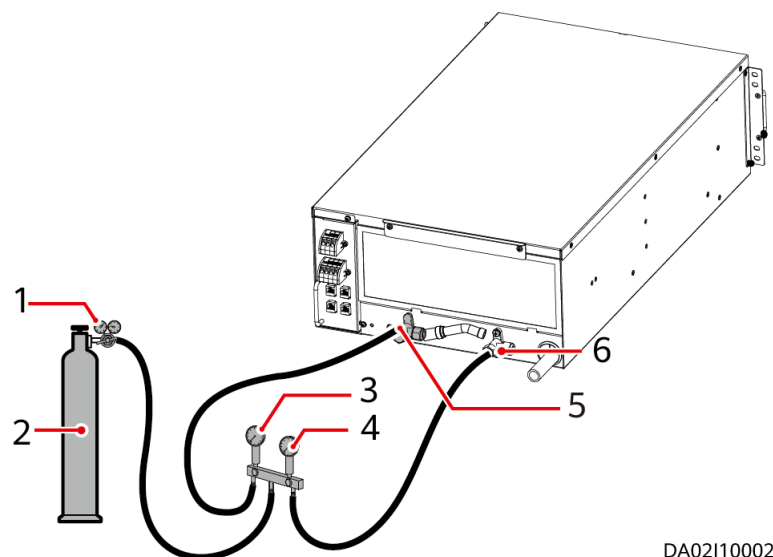
Before opening the indoor unit stop valve, ensure that the stop valve on the gas pipe of the outdoor unit is closed.

**Step 2** Connect the pressure gauge, rubber hose, and nitrogen cylinder. A reducing valve must be installed on the head of the nitrogen cylinder, as shown in [Figure 4-29](#). The outlet pressure of the reducing valve must not exceed 3.5 MPa.

### NOTICE

If the outlet pressure of the reducing valve is greater than 3.5 MPa, components may be damaged.

**Figure 4-29** Leakage test with nitrogen



DA02110002

- |                         |                           |                              |
|-------------------------|---------------------------|------------------------------|
| (1) Nitrogen cylinder   | (2) Reducing valve        | (3) Low pressure gauge       |
| (4) High pressure gauge | (5) Gas pipe needle valve | (6) Liquid pipe needle valve |

**Step 3** Inject 3.5 MPa nitrogen and preserve the pressure for 24 hours. The system pressure should stay constant under unchanging ambient temperature conditions. If there is a considerable temperature change and the pressure changes, perform the test again.

**Step 4** If welding defects exist, locate and repair the leak point. If the pressure does not change, exhaust the nitrogen through the injection needle valve.

----End

## Result

After the copper pipes of the low-temperature component are connected (the stop valve of the indoor unit should be open), inject nitrogen through the upstream and downstream needle valves of the expansion valve to 3.5 MPa and preserve the pressure for 24 hours. The system pressure should stay constant under unchanging ambient temperature conditions. If there is a considerable temperature change and the pressure changes, perform the test again. After the air tightness test is performed, exhaust nitrogen.

---

### WARNING

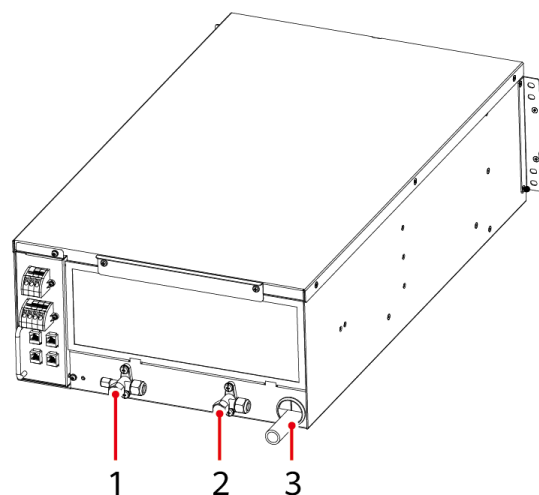
- Do not use compressed air because water and impurities in the air affect the system operation.
  - Do not use oxygen or acetylene for a leakage test.
- 

## 4.2.4.9 Connecting Water Pipes

### Context

The water pipes to be connected onsite is the condensate drainpipe, which can be routed from the top or bottom as required.

**Figure 4-30** Holes in the smart cooling product



DA02W00003

(1) Gas pipe stop valve

(2) Liquid pipe stop valve

(3) Drainage hole

## Top Piping

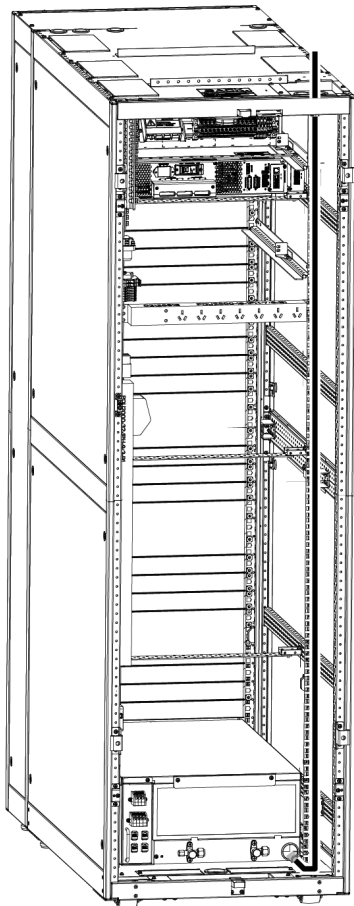
**Step 1** Connect the drainpipe, as shown in [Figure 4-31](#).



**NOTICE**

- A  $\phi 22$  mm automatic drainpipe cannot be routed from the top. A  $\phi 6$  mm forcible drainpipe is used. The lift of the forcible drainage pump is 5 m.
- After routing the pipe, secure it to the pipe assembly using cable ties.
- The drainpipe inside the indoor unit must be wrapped with the thermal insulation tubing in fittings.

**Figure 4-31** Drainpipe routed from the top



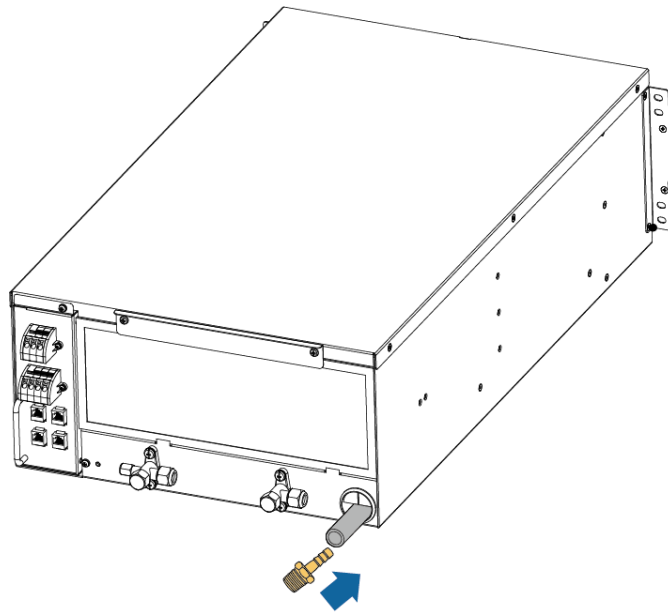
DA02110004

----End

## Bottom Piping

- Step 1** Take out a drainpipe connector from the fitting bag and put the connector on the other end of the drainpipe, as shown in [Figure 4-32](#).

**Figure 4-32** Connecting a drainpipe



DA02H00009

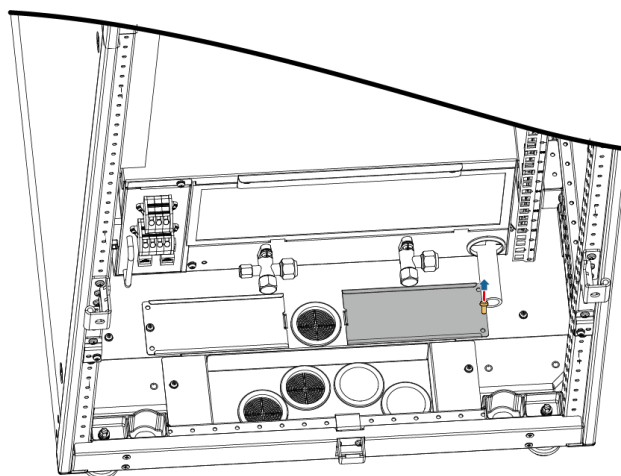
**Step 2** Route the drainpipe from the bottom.

**NOTICE**

- The smart cooling product fitting bag contains drainpipe connectors. Use hoses or rigid pipes based on the site requirements.
- The drainpipe inside the indoor unit must be wrapped with the thermal insulation tubing in fittings.

1. Remove the baffle plate from the water pipe hole at the bottom of the cabinet.

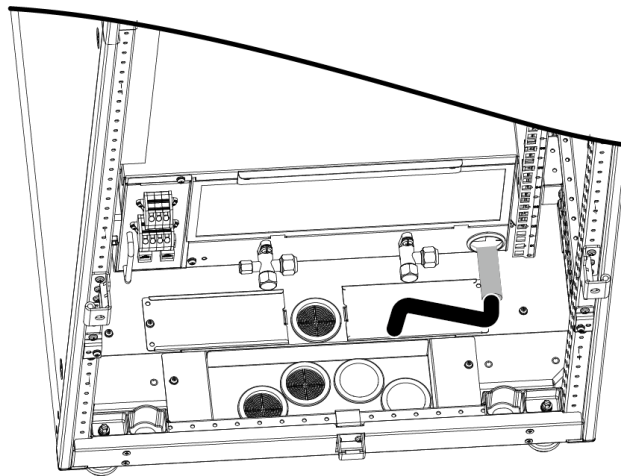
**Figure 4-33** Removing the baffle plate from the bottom of the cabinet



DA02H00010

2. Install the drainpipe.

**Figure 4-34** Drainpipe routed from the bottom



DA02110005

---

**NOTICE**

After routing a water pipe, secure it to the pipe assembly using cable ties, and seal the cable hole using firestop putty.

---

----End

### Follow-up Procedure

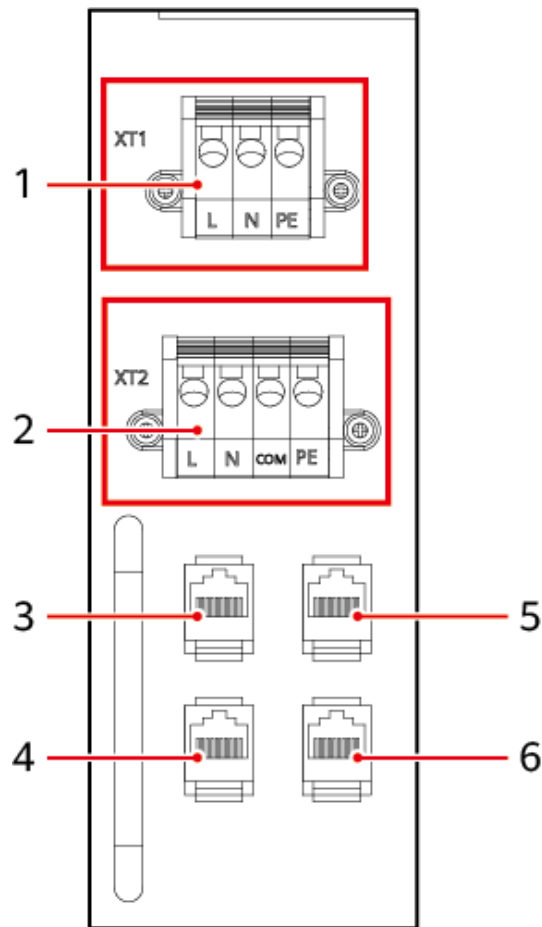
- Step 1** After connecting the drainpipe, power on the smart cooling product, add water to the water pan until the low float switch is raised, and check whether drainage is normal.
- Step 2** Ensure that the condensate pipe is not bent during installation and connection.

----End

### 4.2.4.10 Connecting Cables

The indoor unit uses the single-phase power supply from the smart cooling product control unit. The outdoor unit is energized by the power distribution unit in the cabinet.

Figure 4-35 Electrical ports on the indoor unit

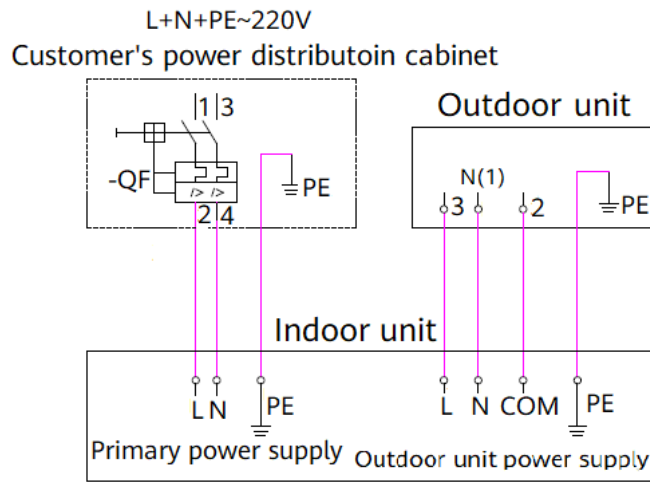


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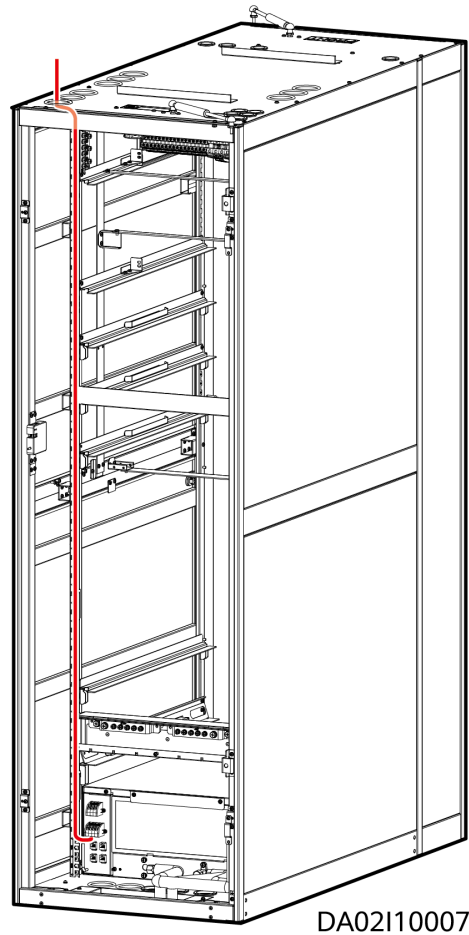
- |                               |                              |
|-------------------------------|------------------------------|
| (1) Main power ports          | (2) Outdoor unit power ports |
| (3) Debugging port            | (4) Communications port      |
| (5) Teamwork control CAN port | (6) T/H sensor port          |

Figure 4-36 shows the cable connections to the smart cooling product. Figure 4-37 shows the cable route between the electrical port on the indoor unit and the outdoor unit.

**Figure 4-36** Cable connections to the smart cooling product



**Figure 4-37** Cable route between indoor and outdoor units



**NOTICE**

- To ensure personal safety, ensure that the metal shell of the smart cooling product is properly connected to the ground electrode after installing the product. Ground the smart cooling product properly during installation.
- The power input of all indoor units is single-phase, three-wire (L+N+PE).
- The cables for connecting the indoor and outdoor units need to be provided by the customer.
- The supply voltage must be within the normal range (187 V to 253 V).
- The original cables in the unit cannot be changed under any circumstances.
- Do not reversely connect the L and N cables.
- Ensure that all wiring terminals are securely installed.
- All safety protection devices in the unit are set before delivery. Do not adjust them by yourself.
- Cables must be routed through protective tubes for protection.

## Power Supply to the Low Ambient Kit

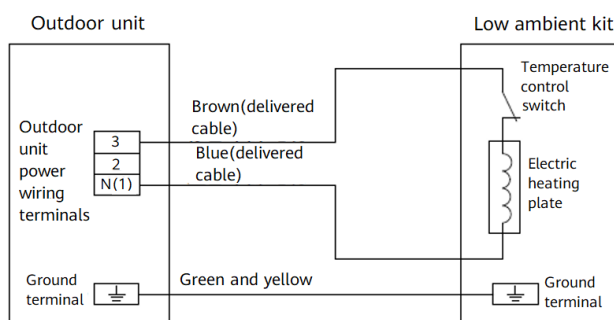
Power supply mode: Connect the outdoor unit terminals to the low ambient kit. Connect the brown cable to the L phase of 220 V AC and the blue cable to the N phase of 220 V AC.

**NOTICE**

The brown cable and blue cable are two-core low-temperature-resistant cables delivered with the low ambient kit. The length is 5 m.

If the delivered 5 m cable is not long enough, use a welding iron to welding the cable and the extension cable, and then use heat shrink tubing to protect the cable. (The cable must be connected indoors.)

**Figure 4-38** Connecting the low ambient kit to the power supply



## 4.2.4.11 Vacuumization

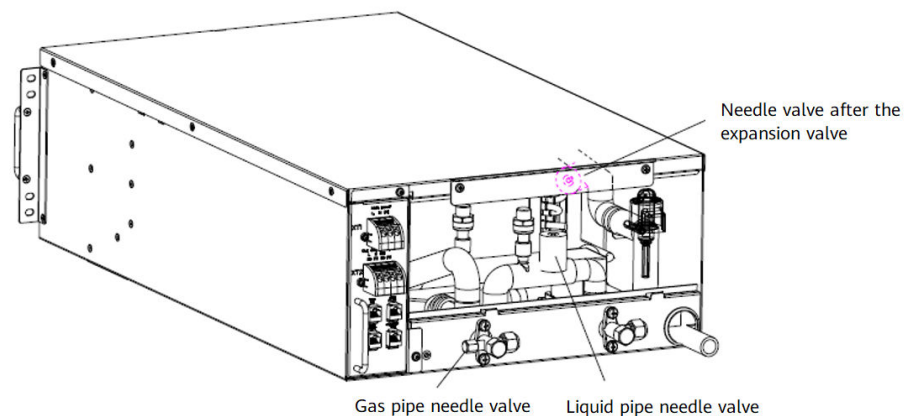
### Prerequisites

- All pipe connectors are correct, and the refrigerant pipe tilts and has supports.
- All pipes have been checked for leakage, and all pipes are not bent by a large angle.
- The hose clamps and cable ties of the drainpipe are secured. Water pipe joints have been sealed by sealant.
- The refrigerant pipe and water pipe are wrapped with thermal insulation foam.
- All nitrogen has been exhausted from the indoor unit.
- The stop valves for the gas pipe and liquid pipe of the indoor unit are open.
- The stop valves for the gas pipe and liquid pipe of the outdoor unit are closed.

#### NOTICE

- Vacuumization is required for the indoor unit, outdoor unit, and low-temperature component.
- During vacuumization, open the stop valve of the indoor unit, and exhaust air from the gas pipe needle valve and liquid pipe needle valve of the indoor unit. Do not exhaust air from only one end. (If a unit is configured with a low ambient kit, exhaust air from the liquid outlet pipe of the liquid storage tank of the low ambient kit.)

Figure 4-39 Indoor unit needle valves



### Context

Tools: pressure gauge (measuring range  $\geq 4.0$  MPa), rubber hose (withstand pressure  $\geq 4.5$  MPa), vacuum pump

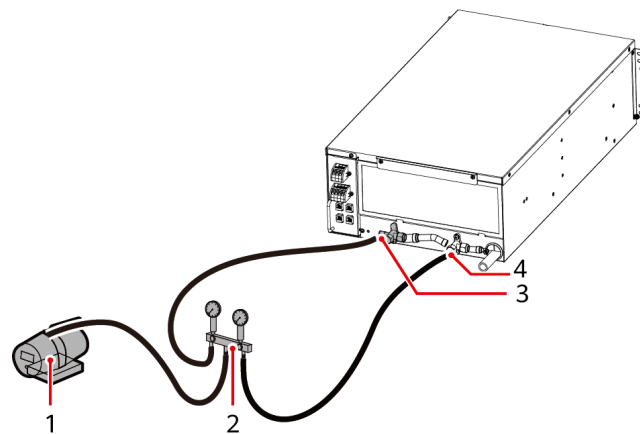
## Procedure

- Step 1** Connect a pressure gauge to the gas pipe needle valve (low pressure, thick pipe) and liquid pipe needle valve (high pressure, thin pipe) of the indoor unit, and connect a vacuum pump.

The low ambient kit has a check valve. Vacuumize through the liquid inlet pipe before the check valve and the liquid outlet pipe.

- Step 2** Check that all pressure gauge valves are open.

**Figure 4-40** Vacuumization (indoor unit)



DA02110003

- (1) Vacuum pump      (2) Pressure gauge      (3) Gas pipe needle valve      (4) Liquid pipe needle valve

- Step 3** In the beginning, the vacuum pump makes loud noises and exhausts white smoke from the exhaust vent. After 10 minutes, if it still exhausts white smoke, observe it for another 10 minutes because the cooling system may not be sealed properly or there may be too much water in the cooling system.
- Step 4** After 20 minutes, the pressure gauge pointer should be in the negative area and the vacuum pump makes small noises. Close and open the pressure gauge alternatively for several times. The position of the pressure gauge pointer and the noises made by the vacuum pump do not change. Otherwise, the cooling system may not be sealed properly.
- Step 5** Check that the time for vacuumization is 80 minutes or longer after ensuring that the cooling system does not leak, and that the pressure displayed on the vacuum pump is less than or equal to 60 Pa (absolute pressure). When the pressure stops dropping, pump for another 10 minutes.
- Step 6** After vacuumization, close all valves of the pressure gauge and the vacuum pump without disconnecting the pump. Preserve the pressure for 10 minutes, and verify that the absolute pressure of the cooling system is not greater than 90 Pa.

### NOTE

If the minimum reading of the pressure gauge is greater than 60 Pa (absolute pressure), ensure that the pointer stays at the smallest scale of the pressure gauge in vacuumizing and preserve the pressure for 1 hour. Then check that the pressure does not rise.



- Step 7** After ensuring that the pressure does not rise, open the stop valves for the gas pipe and liquid pipe of the outdoor unit.

---

**NOTICE**

- After the outdoor unit stop valves are opened, the refrigerant in the outdoor unit flows to the engineering pipe and indoor unit pipe. When performing other operations, be careful to prevent refrigerant from spraying out.
  - After the vacuumization and before removing the rubber hose, ensure that there is positive pressure inside the refrigerant pipe of the indoor unit.
- 

- Step 8** For the unit configured with a low ambient kit, perform vacuumization through the needle valves before and after the expansion valve of the indoor unit as well as the needle valve of the liquid outlet pipe of the liquid storage tank to ensure that all pipes are vacuumized. If a check valve is installed on the system pipe, vacuumize through the upstream and downstream parts of the check valve.

- Step 9** Add refrigerant oil.

Refrigerant will cause the refrigerant oil in the system to be diluted, which affects the lubrication and cooling effect of the refrigerant oil. Therefore, you need to add refrigerant oil. The model of the refrigerant oil used by the unit is FV50S. If refrigerant oil of an incorrect model is used, the compressor may be irreversibly damaged.

Refrigerant oil has been added to the unit based on the standard pipe length before delivery. If the pipe between the indoor unit and outdoor unit is longer than 10 m, add refrigerant oil to the system to ensure normal system operation. The following lists the amount of refrigerant oil to be added for each 1 m increase in the length of the pipe connecting the indoor and outdoor units:

- Formula for calculating the amount of refrigerant oil to be added: Amount of refrigerant oil to be added (ml) = 300 (ml) + Amount of refrigerant to be added (kg) x 22.6
- Time for adding refrigerant oil: after vacuumizing and before filling refrigerant
- Position for adding refrigerant oil: through the gas pipe needle valve of the indoor unit

The amount of refrigerant to be added refers to the amount of refrigerant that exceeds the standard amount. Generally, extra refrigerant needs to be added when the pipe length exceeds the standard length.

 **NOTE**

Refrigerant added to the low ambient kit causes the refrigerant oil in the system to be diluted, which affects the lubrication and cooling effect of the refrigerant oil. Therefore, you need to add refrigerant oil. Add 200 ml refrigerant oil for a 5 U rack-mounted smart cooling product.

- Step 10** Fill refrigerant.

When the smart cooling product is shut down, refrigerant can be filled from the exhaust pipe (high pressure, thin pipe of the compressor). When the smart cooling

product is started, refrigerant must be sucked from the needle valve after the expansion valve. The refrigerant cylinder should be upside down or tilted (more than 45°). Ensure that the refrigerant is slowly sucked into the compressor, preventing the compressor from being damaged due to slugging.

Refrigerant has been filled in the outdoor unit based on the standard pipe length before delivery. If the pipe between the indoor unit and outdoor unit is less than or equal to 10 m, no extra refrigerant needs to be filled.

For a 5 U rack-mounted smart cooling product with a low ambient kit, the amount of refrigerant to be filled is the amount of refrigerant to be filled for a 5 U rack-mounted smart cooling product without a low ambient kit plus 2 kg.

If the pipe between the indoor unit and outdoor unit is longer than 10 m, add refrigerant to the system to ensure normal system operation. The following table lists the amount of refrigerant to be added for each 1 m increase in the length of the pipe connecting the indoor and outdoor units.

**Table 4-11** Amount of refrigerant to be added

Liquid Pipe Diameter (mm)	Amount of Refrigerant to Be Added (kg/m)
6	0.009
9.52	0.04
12.7	1

----End

## 4.2.5 Installing Power Supply and Distribution Devices

### 4.2.5.1 Installing Lithium Batteries

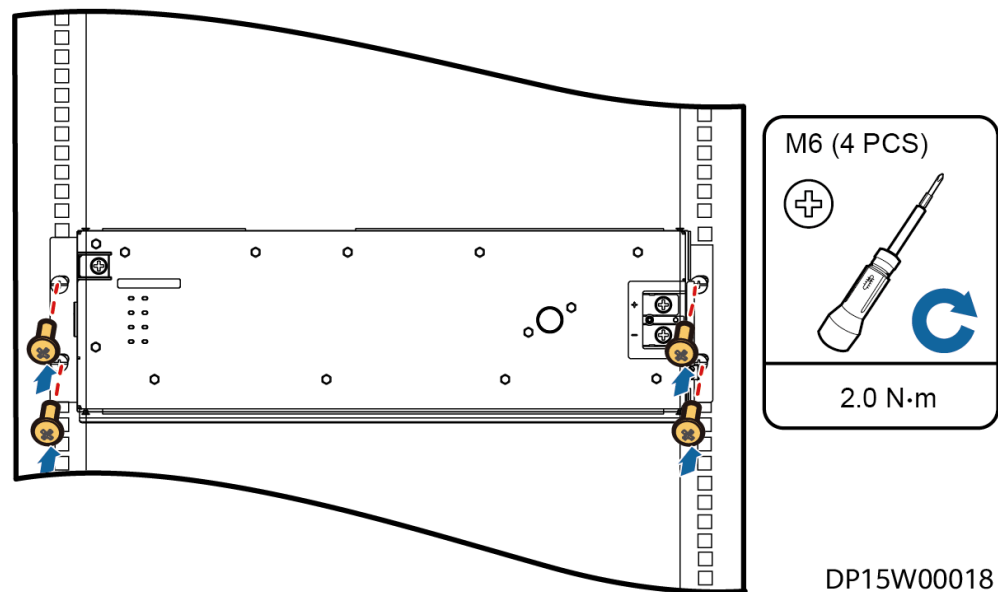
#### Context

Install lithium batteries in the 7 U or higher position of the cabinet.

#### Procedure

**Step 1** Push a lithium battery into the cabinet and secure it.

**Figure 4-41** Installing a lithium battery



#### NOTICE

- The lithium battery weighs about 43 kg. Check the load-bearing capability of the rack tray before installation.
- The lithium battery is 396 mm deep. Check the depth of the rack before installation.
- The lithium battery can be installed in a 19-inch rack with guide rails and a tray. Check whether the load-bearing capability meets requirements.
- If multiple lithium batteries are installed, certain clearances should be reserved. The space for each lithium battery should be at least 3 U. The lithium batteries cannot be directly stacked or vertically placed.
- Install lithium batteries from bottom to top.

**Step 2** Install the protective covers for the positive and negative poles of the lithium batteries.

**Step 3** Install other lithium batteries in the same way.

----End

### 4.2.5.2 (Optional) Installing Busbars

#### Prerequisites

If there is more than one lithium battery, install busbars.

Install busbars before installing the PDU2000.

## Procedure

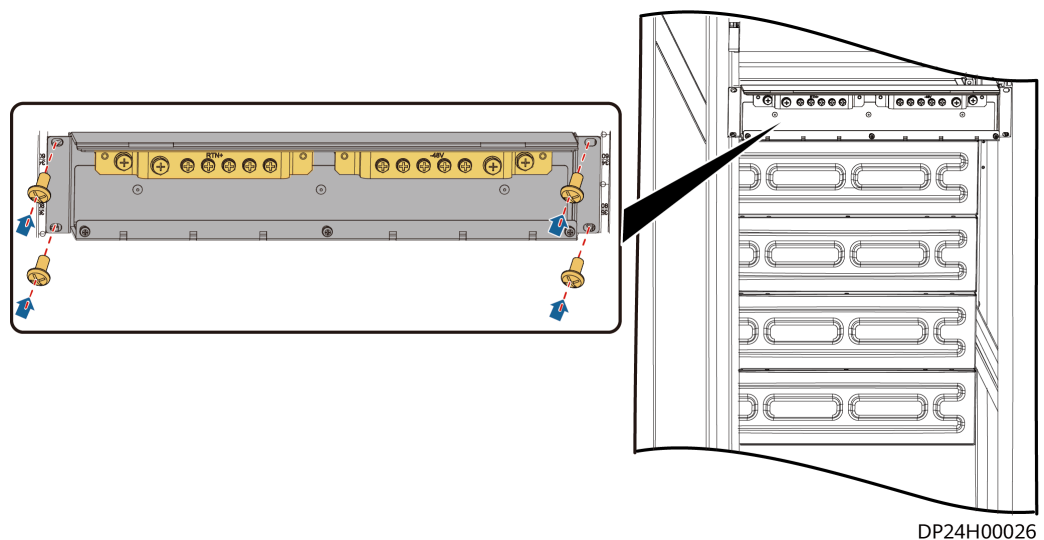
### Step 1 Install busbars.

1. Open the cabinet rear door.
2. Install floating nuts at the busbar installation position.
3. Secure the busbar to the installation position using screws.

#### NOTE

The busbar is installed 2 U above the last lithium battery. Determine the busbar installation position based on the lithium battery configuration.

**Figure 4-42** Installing busbars



----End

### 4.2.5.3 Installing PDU2000s

#### Context

Two half-height rPDUs for vertical installation are configured.

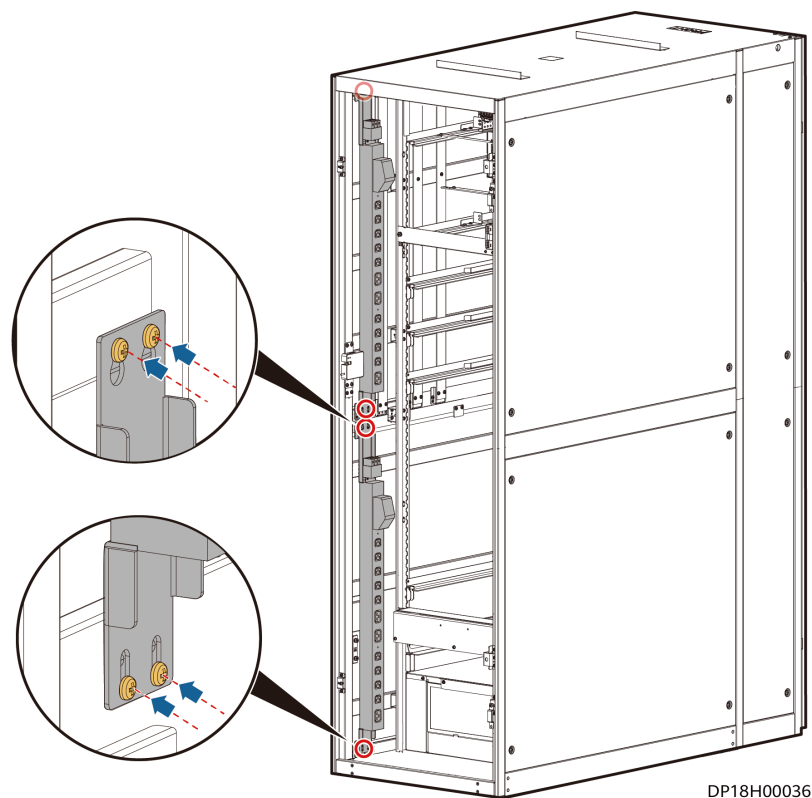
#### Procedure

##### Step 1 Install a half-height PDU2000.

1. Open the cabinet rear door.
2. Secure the half-height PDU2000 to the installation position using screws.

##### Step 2 Install the other PDU2000 in the same way.

Figure 4-43 Installing PDU2000s



----End

## 4.2.6 Installing Monitoring Devices

### 4.2.6.1 Installing the SIM Card and Antenna

If a subscriber identity module (SIM) card and an antenna are configured, perform the following steps to install them.

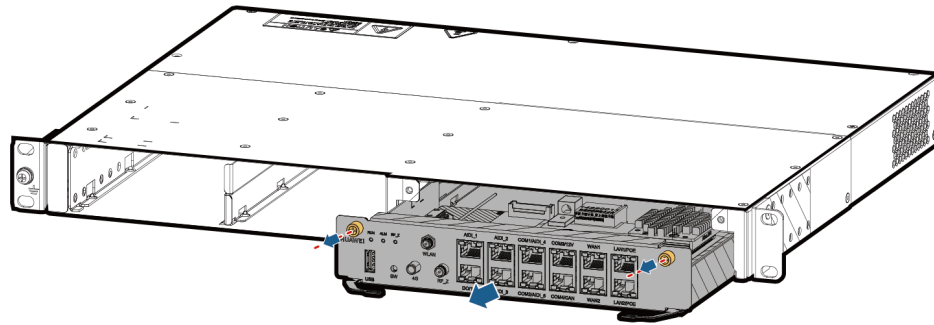
#### Procedure

- Step 1** Record the positions of the signal cables connected to the panel of the ECC800-Pro main control module, and then disconnect the signal cables.
- Step 2** Remove the ECC800-Pro main control module, and then insert the SIM card into the left slot of the ECC800-Pro main control module.

#### NOTE

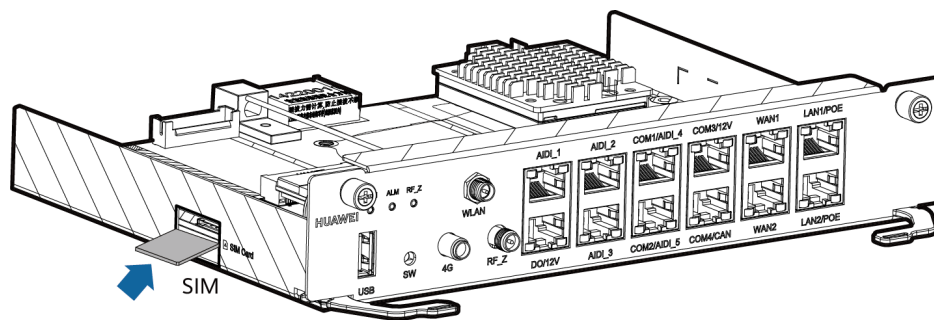
The SIM card needs to support LTE, WCDMA, or GSM.

**Figure 4-44** Removing the ECC800-Pro main control module



DM02H00026

**Figure 4-45** Installing a SIM card



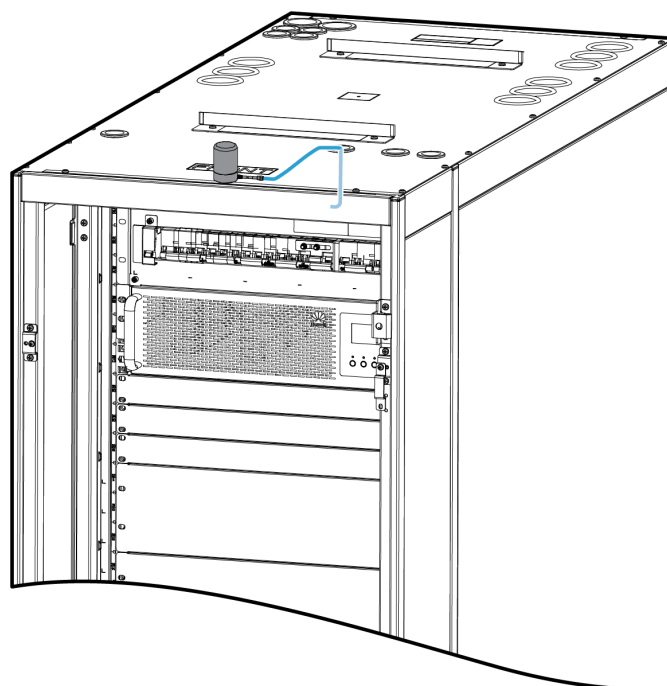
DC00500216

**Step 3** Reconnect the signal cable to the panel of the ECC800-Pro main control module based on the recorded position.

**Step 4** Install the antenna.

1. Attach the antenna to the middle of the cabinet top.
2. Route the antenna cable into the cabinet through the signal cable hole at the top of the cabinet and then to the appropriate port on the ECC800-Pro.

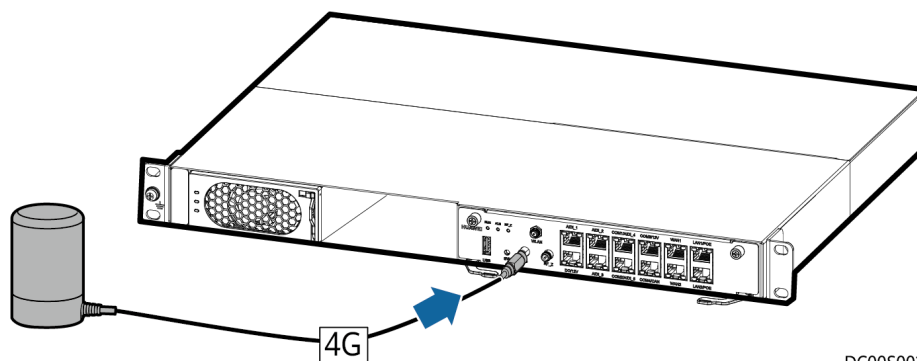
**Figure 4-46** Antenna cable routing



DC02140030

3. Connect the antenna cable to the antenna port on the ECC800-Pro.

**Figure 4-47** Installing an antenna cable



DC00500264

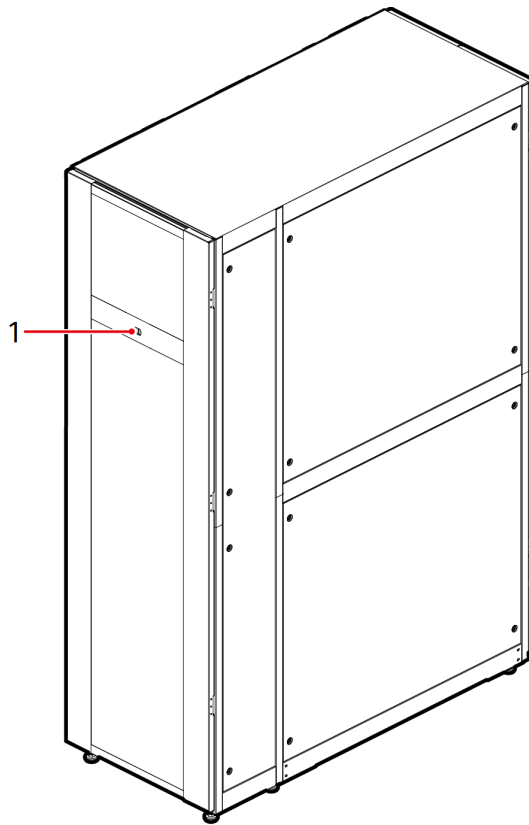
----End

## 4.2.6.2 Installing a PAD

### Context

The PAD is to be installed on the front door of the cabinet.

**Figure 4-48** PAD installation position



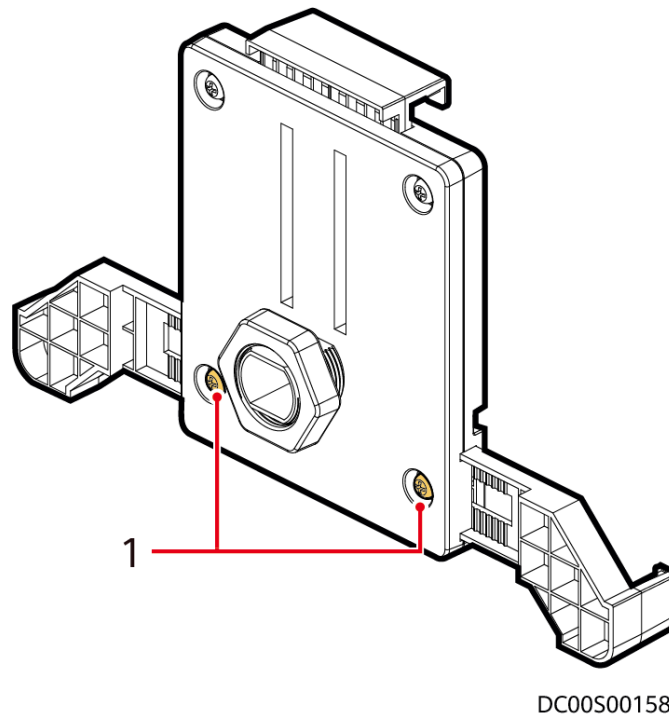
(1) PAD installation position

## Procedure

- Step 1** Adjust the width and height of the PAD support to match the dimensions of the PAD to be installed.



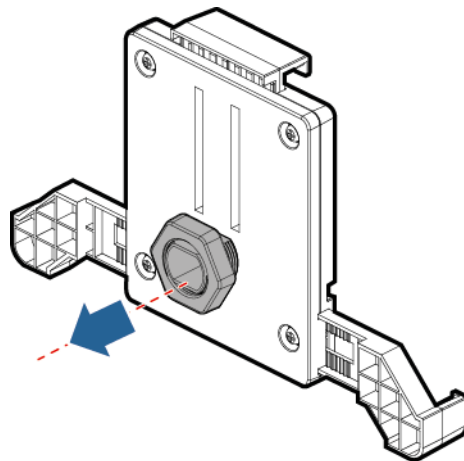
**Figure 4-49** Adjusting screws



(1) Adjustment screws

**Step 2** Remove nuts from the PAD support, insert the support into the mounting holes on the cabinet front door, and reinstall the nuts to secure the support to the front door.

**Figure 4-50** Removing the nut



**Step 3** Route the PAD power cable to the cable hole in the PAD support and connect the cable to the PAD.

**Step 4** Adjust the feet above the PAD support and clamp the PAD to the PAD support.

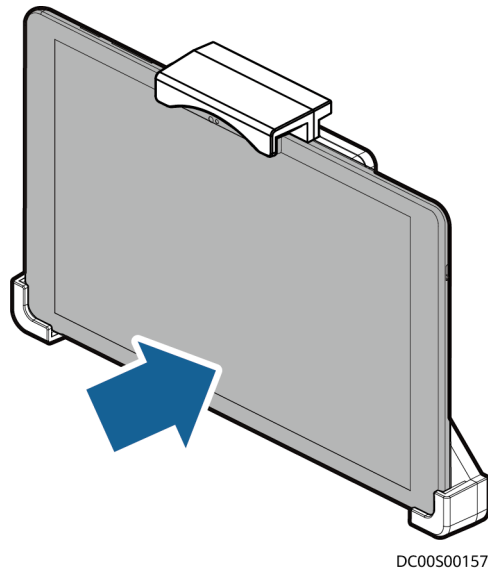
---

**NOTICE**

Ensure that the PAD is installed securely and reliably.

---

**Figure 4-51** Installing a PAD



**Step 5** Connect the cable from the USB port on the ECC800-Pro to the charging port on the PAD.

---

**NOTICE**

If the PAD screen needs to remain on for a long time during usage, adjust the brightness to below 80%.

---

----End

### 4.2.6.3 Installing a Remote T/H Sensor for the Smart Cooling Product

#### Procedure

**Step 1** Install a T/H sensor.

1. Open the front and rear doors of the cabinet.
2. Unpack the two T/H sensors, and attach one to the 33 U position on the right post of the front door and the other to the 3-4 U position on the right post of the rear door of the cabinet.

 **NOTE**

The installation positions of the T/H sensors can be adjusted as required.

**Step 2** Set the DIP switch address of the T/H sensor on the front door to 2 and that of the T/H sensor on the rear door to 1.

**Table 4-12** DIP switch settings on T/H sensors

Address	DIP Switch Sequence No.					
	1	2	3	4	5	6
1	ON	OFF	OFF	OFF	OFF	OFF
2	OFF	ON	OFF	OFF	OFF	OFF

**NOTICE**

The default address of T/H sensors purchased from Huawei is 1.

----End

### 4.2.6.4 Installing T/H Sensors

#### Procedure

**Step 1** Install T/H sensors.

1. Open the front and rear doors of the cabinet.
2. Unpack the two T/H sensors and attach one sensor to the mounting bars at the 40th U position on the front door and the other to the 34th U position on the rear door of the cabinet.

 **NOTE**

The installation positions of the T/H sensors can be adjusted as required.

**Step 2** Set the DIP switch address of the T/H sensor on the front door to 2 and that of the T/H sensor on the rear door to 1.

**Table 4-13** DIP switch setting on a T/H sensor

Address	DIP Switch Sequence No.					
	1	2	3	4	5	6
1	ON	OFF	OFF	OFF	OFF	OFF
2	OFF	ON	OFF	OFF	OFF	OFF

**NOTICE**

The default address of T/H sensors purchased from Huawei is 1.

----End

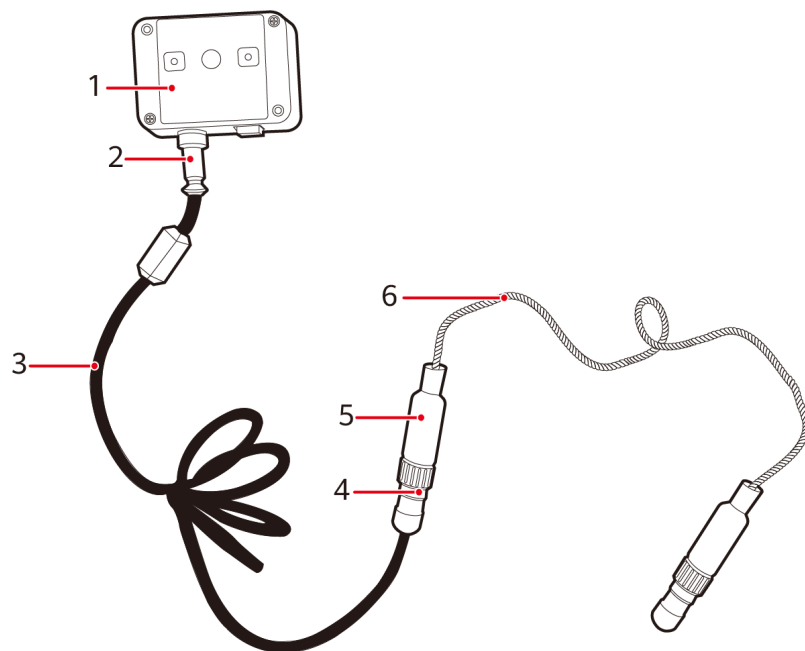
### 4.2.6.5 Routing the Cable to a WLDS900 Water Sensor

If the water sensor is required, perform the following steps to install it.

#### 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).
- The water detector is bound to the 5th U position on the left mounting bar of the cabinet rear door.
- The water detection cable and water detector are interconnected using the conversion cable.
- A single water detection cable is 5 meters long. If a longer cable is required, connect the male connector of a water detection cable to the female connector of another. One water detector can be connected to a maximum of nine water detection cables.

Figure 4-52 Water sensor



DS05000020

- |  |  |                           |
|--|--|---------------------------|
| (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 |

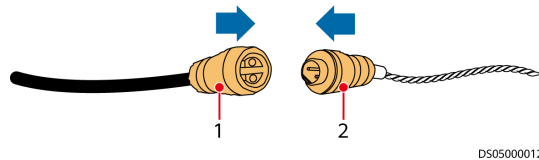
#### NOTICE

Do not contact the water detection cable to metal, for this action will cause a false alarm. Take protective measures when routing the water detection cable.

## Procedure

**Step 1** **Figure 4-53** shows how to connect the water detection cable to the conversion cable.

**Figure 4-53** Connecting cables



(1) Conversion cable end B, connected to the water detection cable

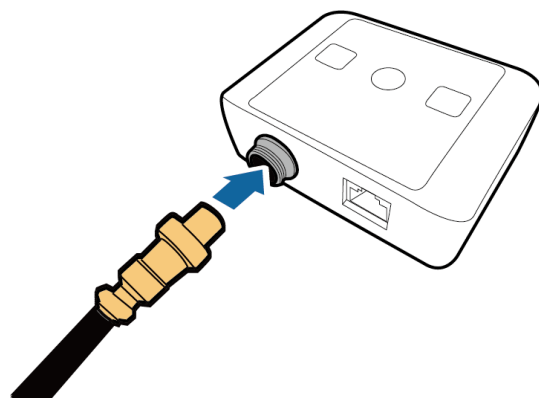
(2) Water detection cable end A, connected to the conversion cable

### 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, as shown in **Figure 4-54**.

**Figure 4-54** Connecting the water detector



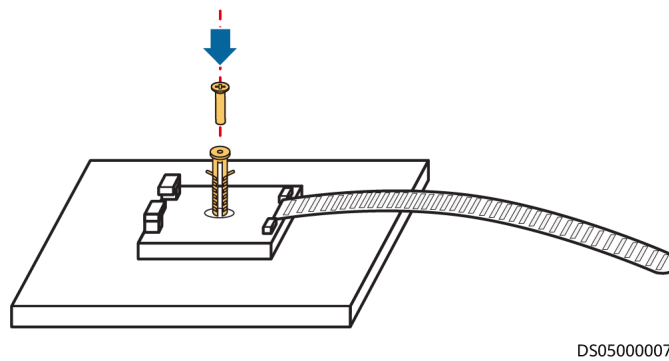
**Step 3** Plan the installation position for the fastener of the water detection cable. Ensure that the water detection cable placed on the fastener is in good contact with the floor.

**Step 4** Tear off the protection paper from the rear of the fastener, and then securely attach the fastener to the floor.

- If the fastener cannot be securely attached to the floor, go to **Step 5**.
- If the fastener is securely attached to the floor, go to **Step 6**.

**Step 5** Drill holes in the floor with the same dimensions as the expansion bolts for the fastener. Use the expansion bolts to secure the fastener to the floor, as shown in **Figure 4-55**.

**Figure 4-55** Installing fasteners

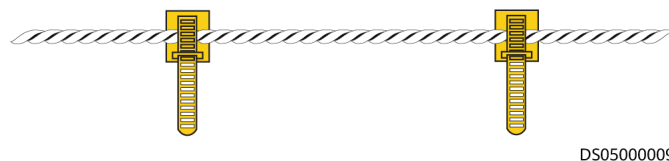


**NOTICE**

When laying out the water detection cable, ensure that the water detector is close to the cabinet to facilitate further cable connections.

- Step 6** Place the water detection cable onto the fastener, secure the fastener, and keep the water detection cable in close contact with the floor, as shown in [Figure 4-56](#).

**Figure 4-56** Securing a water detection cable



**NOTE**

If multiple water detection cables are connected in series, connect the male connector of one cable to the female connector of another.

----End

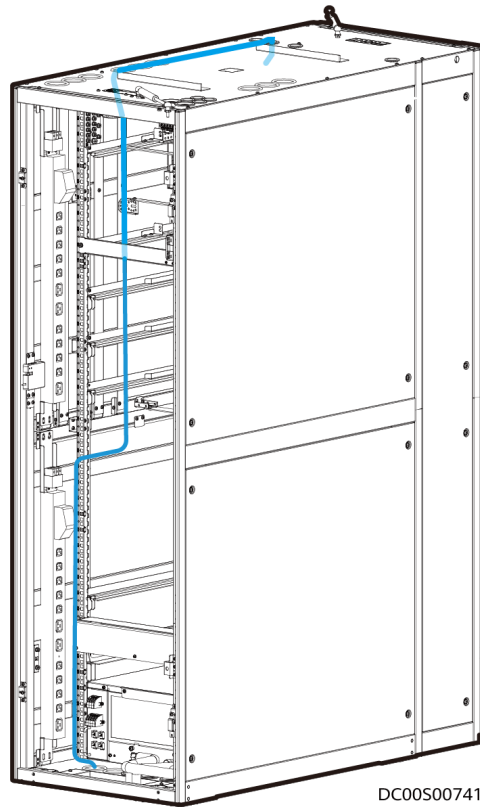
### 4.2.6.6 Installing an Electrode Water Sensor

If the water sensor is required, perform the following steps to install it.

#### Procedure

- Step 1** Place the water sensor on the floor under the cabinet.
- Step 2** Route the water sensor cable through the cable hole in the lower cover of the cabinet.
- Step 3** Connect it to the water sensor cable connected to the ECC.

**Figure 4-57** Signal cable routing



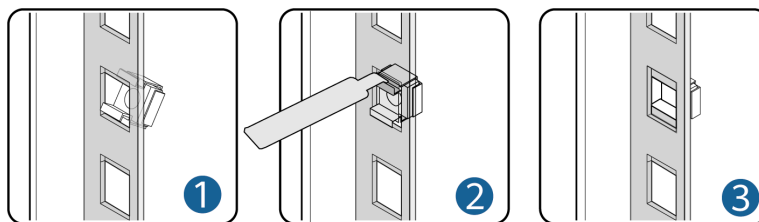
----End

### 4.2.6.7 (Optional) Installing a Server

#### Procedure

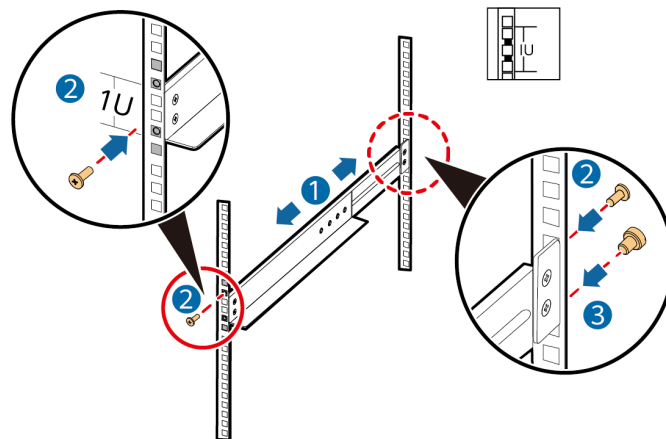
- Step 1** Determine the installation position of the server and check whether floating nuts are installed. If not, install them first.

**Figure 4-58** Installing a floating nut



- Step 2** Install guide rails.

**Figure 4-59** Installing guide rails



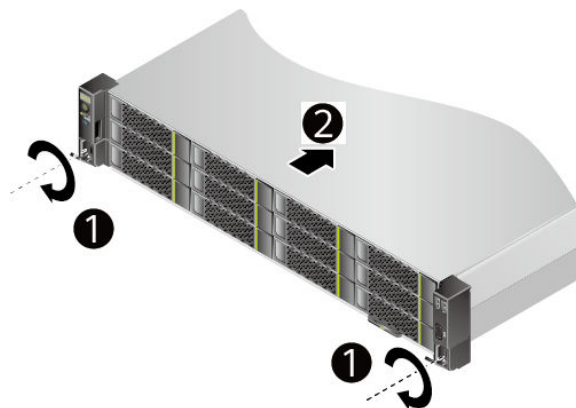
DM10200003

1. Place a guide rail horizontally at the installation position in the cabinet.
2. Tighten the screws to secure the guide rail.
3. Repeat the preceding steps to install the other guide rail.

**Step 3** Arrange at least two people to lift the server, place the server on the guide rails, and push it into 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 4-60** Installing a server

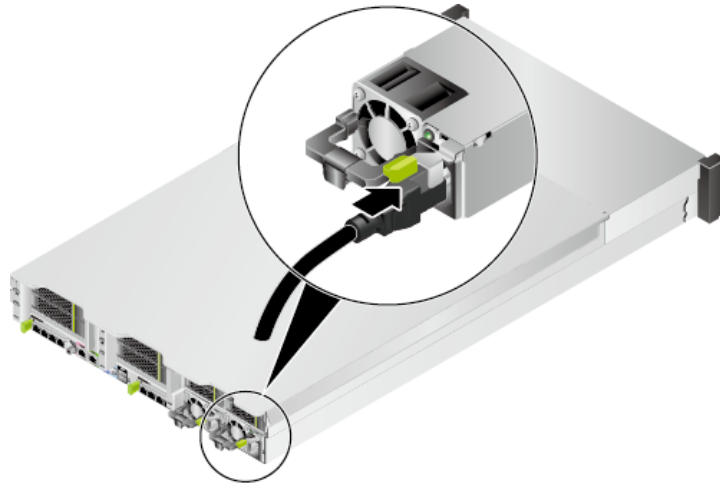


**Step 5** Connect the server power cable.

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.

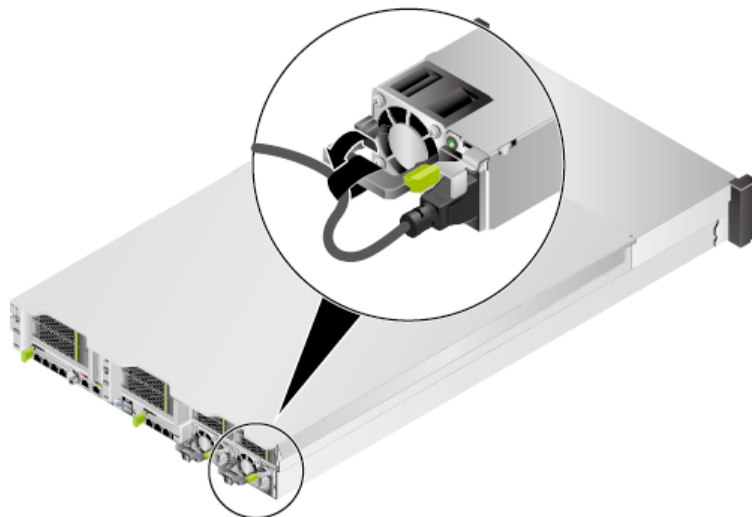


**Figure 4-61** Connecting the power cable



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

**Figure 4-62** 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

#### 4.2.6.8 (Optional) Installing a Camera

##### Prerequisites

- A camera and tools for installing it have been prepared.
- The network cable used for camera communication has been prepared.

##### Context

The camera and its mounting plate need to be installed on the top of the front door of the end cabinet.

## Preparations

Tool: Phillips screwdriver

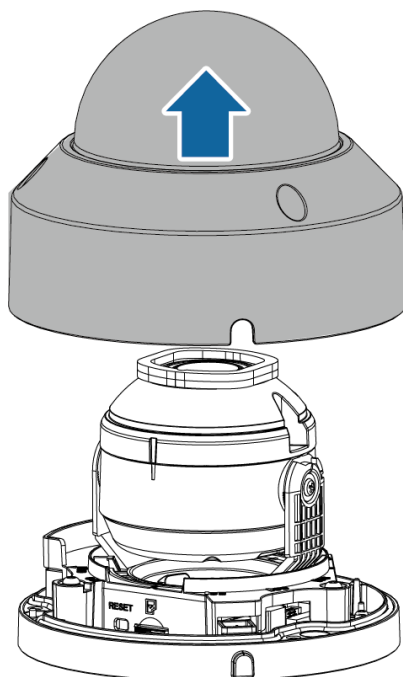
Materials: SD card, camera

## Procedure

### Step 1 Install an SD card.

1. Remove the transparent cover using a Phillips screwdriver.

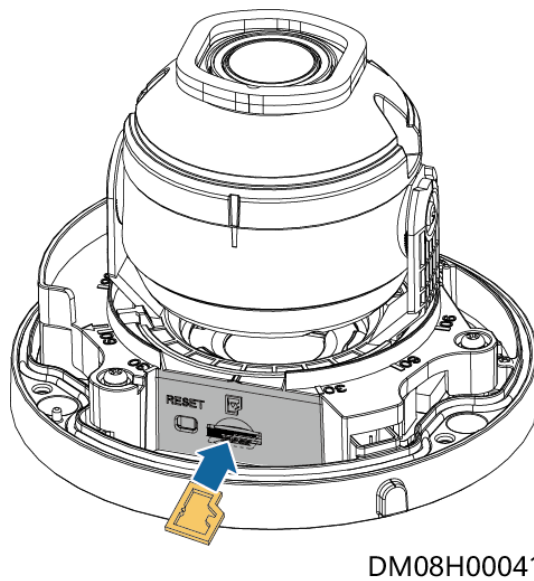
**Figure 4-63** Removing the transparent cover



DM08H00040

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

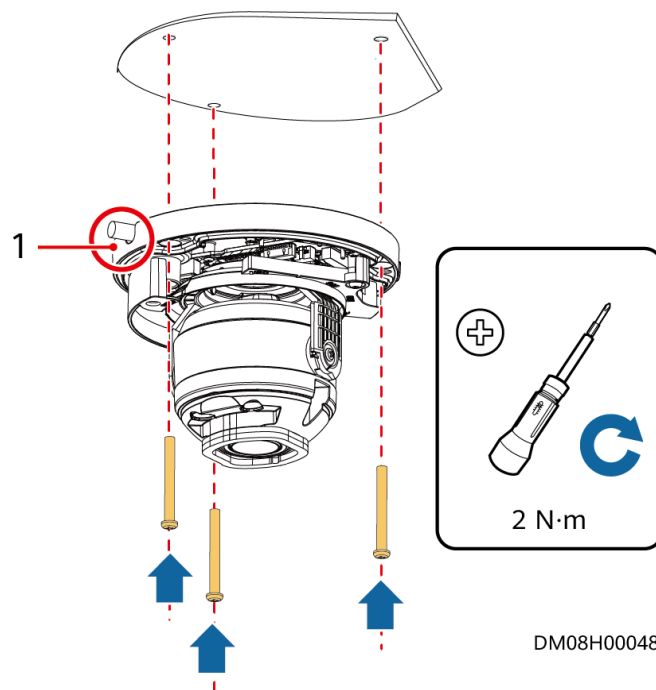
**Figure 4-64** Installing an SD card



**Step 2** Route the camera cable through the top of the cabinet.

**Step 3** Align the mounting holes in the camera base with those in the mounting plate, and screw the camera to the mounting plate.

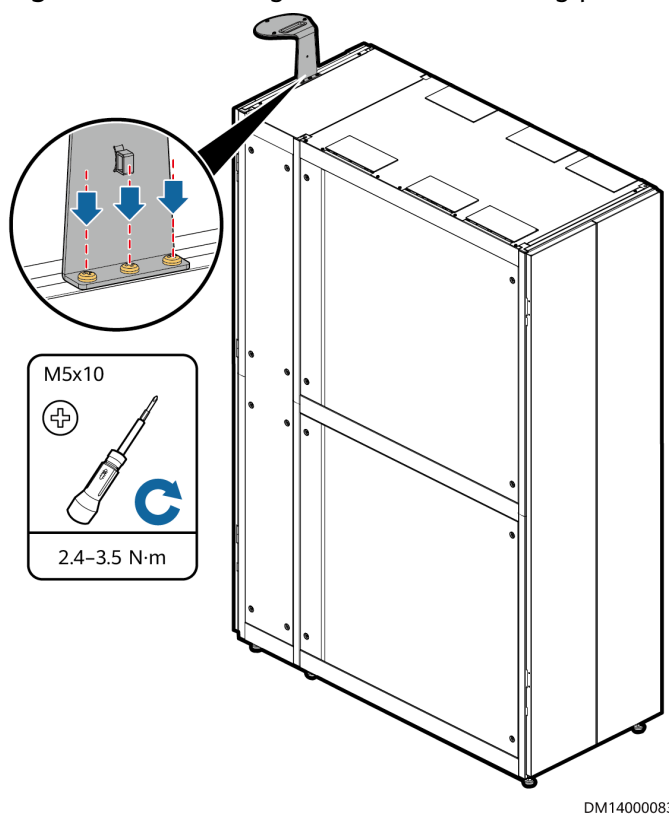
**Figure 4-65** Installing a camera base



(1) Cable outlet

**Step 4** Install the mounting plate with the camera at the top of the front door of the end cabinet, as shown in [Figure 4-66](#).

**Figure 4-66** Installing the camera mounting plate

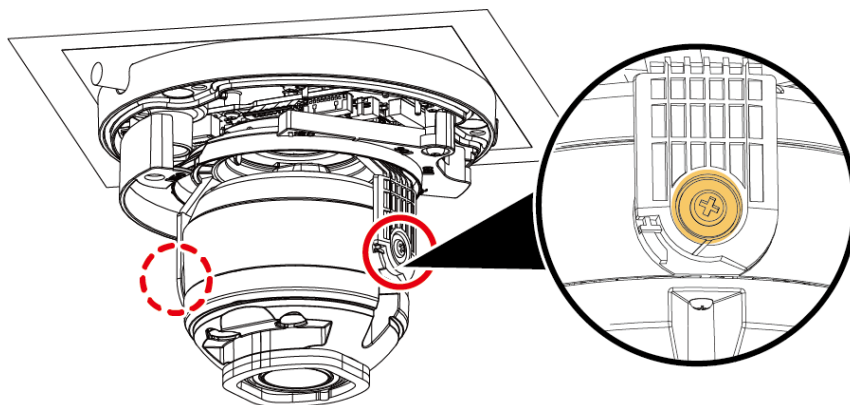


**Step 5** Use a Phillips screwdriver to loosen the screws on both sides of the lens, adjust the surveillance angle, and tighten the screws to 0.6 N·m.

**Figure 4-67** Adjusting the camera

**NOTICE**

- By default, the camera is horizontally installed, and the surveillance video is displayed horizontally. During the installation, adjust the surveillance angle to avoid video image rotation after the installation.
- When adjusting the surveillance angle, pay attention to the position of the illuminator to prevent the illuminator from being blocked.

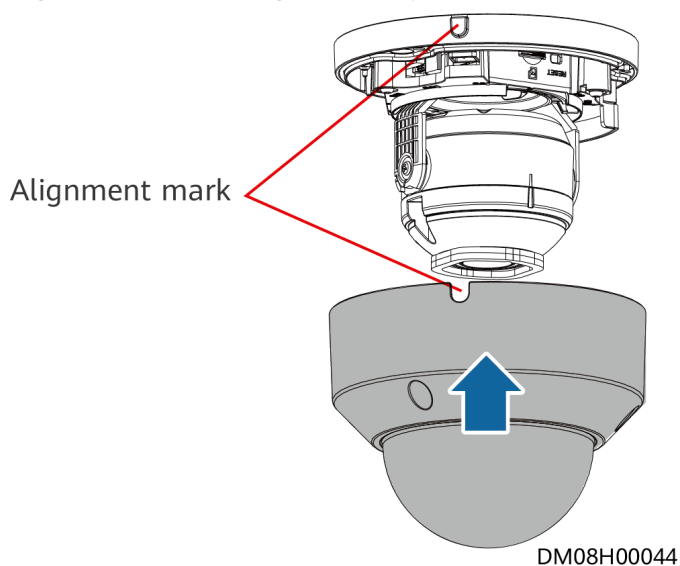


 **NOTE**

The camera features a three-axis design. The camera can be adjusted by  $-175^{\circ}$  to  $+180^{\circ}$  horizontally, and the lens can rotate  $-175^{\circ}$  to  $+180^{\circ}$  and be adjusted by  $0^{\circ}$  to  $65^{\circ}$  vertically.

- Step 6** Align the transparent cover with the screw holes on the base, close the transparent cover, and use a Phillips screwdriver to tighten the screws to 0.8 N·m.

**Figure 4-68** Installing the transparent cover



----End

#### 4.2.6.9 (Optional) Installing a LAN Switch

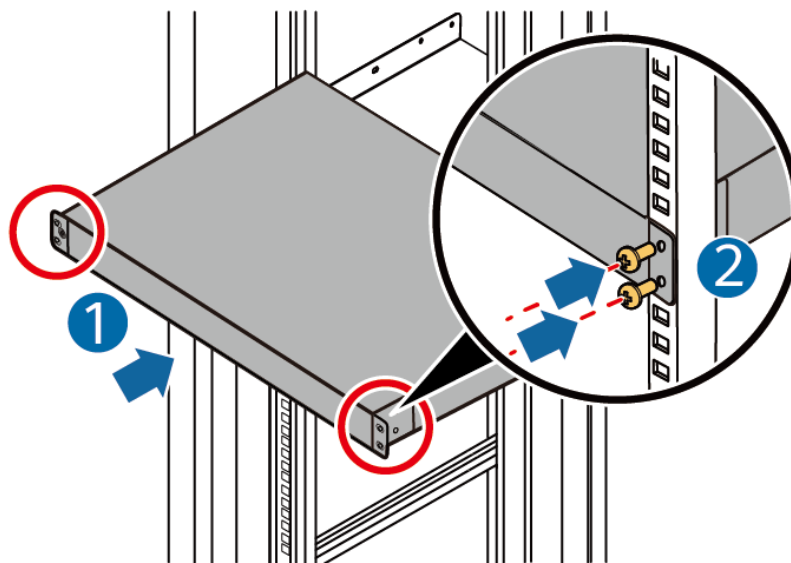
##### Procedure

- Step 1** Locate the LAN switch installation position in the cabinet, and install guide rails and floating nuts.
- Step 2** Install the mounting ears delivered with the LAN switch and secure the LAN switch to the rack rails at the front of the cabinet.

 **NOTE**

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

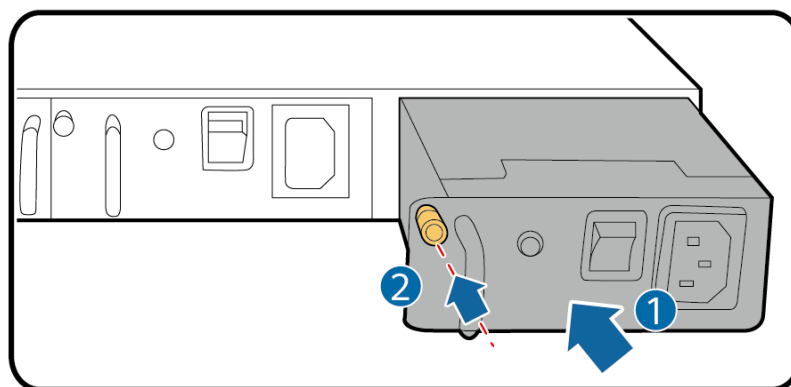
**Figure 4-69** Installing a LAN switch



DT15000005

- Step 3** Connect the LAN switch power cable to the PDU2000.
- Step 4** Connect a port on the LAN switch to the WAN1 port on the ECC800-Pro using a network cable.
- Step 5** Insert a power module into the power slot of the LAN switch, and tighten the captive screws on the power module panel.

**Figure 4-70** Installing a power module for a LAN switch



DS12000017

----End

#### 4.2.6.10 (Optional) Installing a VCN510

##### Context

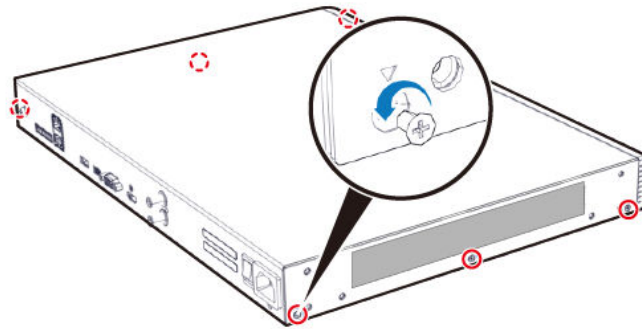
By default, the VCN510 is delivered without a disk. After the VCN510 is delivered to the site, install hard disks as required and then install the VCN510 in the cabinet.

## Procedure

### Step 1 Install a hard disk.

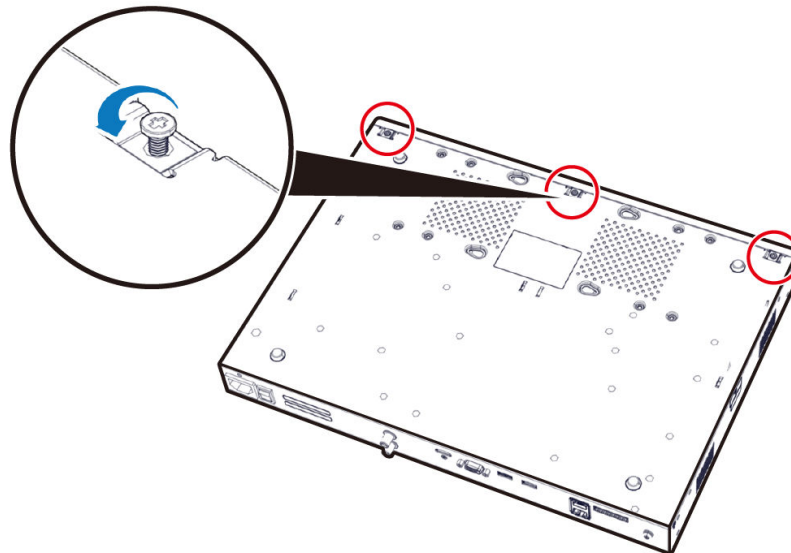
1. Use a Phillips screwdriver to loosen three fastening screws (M3 x 6 countersunk screw, black) on the left and right of the subrack covers shown in the lower-left figure.

**Figure 4-71** Removing screws



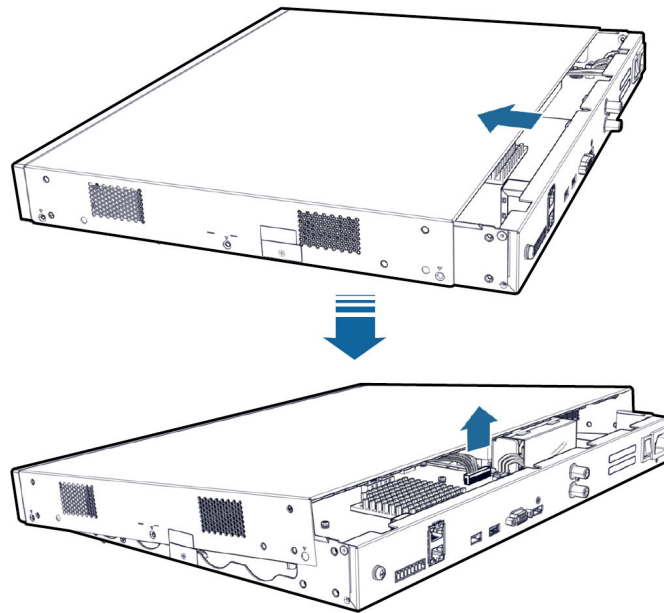
2. Then loosen the three fastening screws (M3 x 5 grub screw, white) that are used to connect the subrack bottom to the front panel. Remove the subrack cover and front panel as shown in the lower-right figure.

**Figure 4-72** Removing screws



3. Remove the chassis cover. Hold the chassis cover with one hand, and push the chassis cover towards the front panel with the other hand. Then remove the chassis cover with both hands.

**Figure 4-73** Removing the upper cover of the chassis

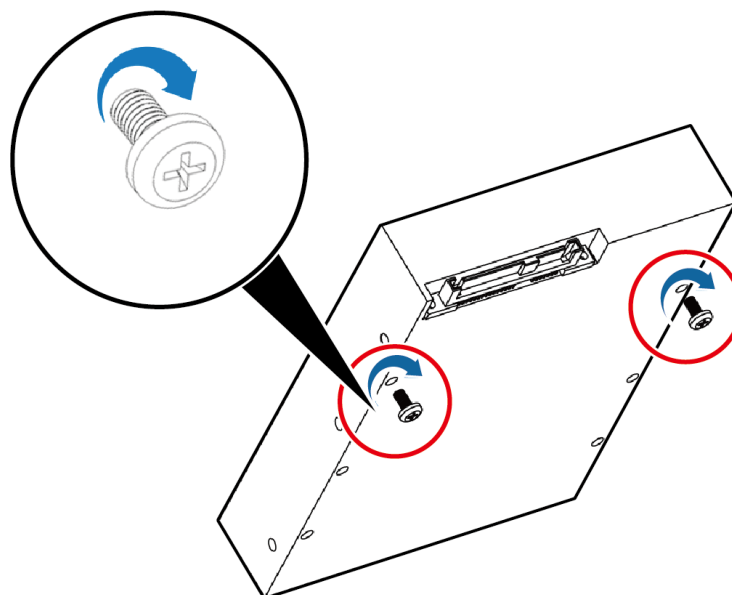


**NOTE**

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).

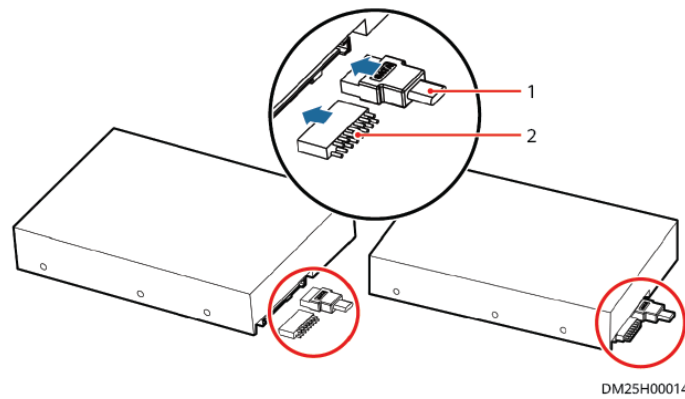
**Figure 4-74** Installing disk screws



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



**Figure 4-75** Installing the SATA cable and power cable



(1) SATA cable

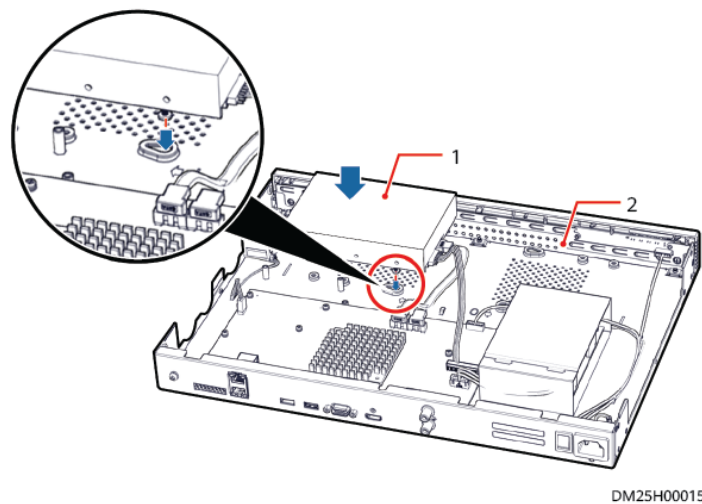
(2) Power cable

**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 4-76** Disk installation positions

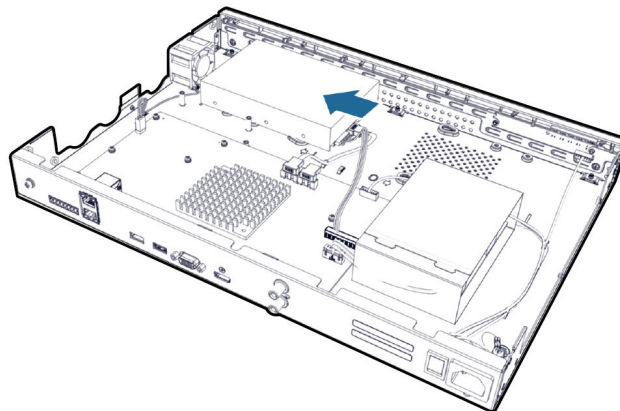


(1) No. 1 disk installation position

(2) No. 0 disk installation position

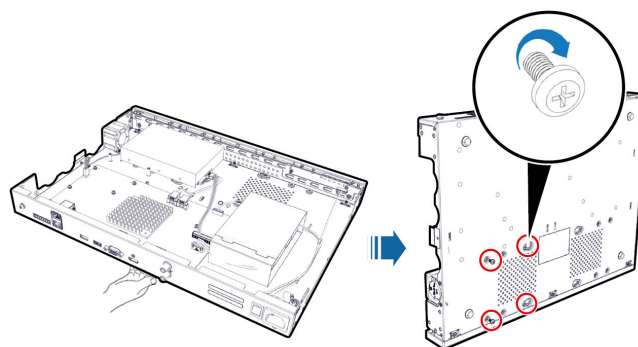
7. Push the hard disk in the direction shown in the following figure to enable the two preinstalled screw heads to slide into the cucurbit holes.

**Figure 4-77** 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.

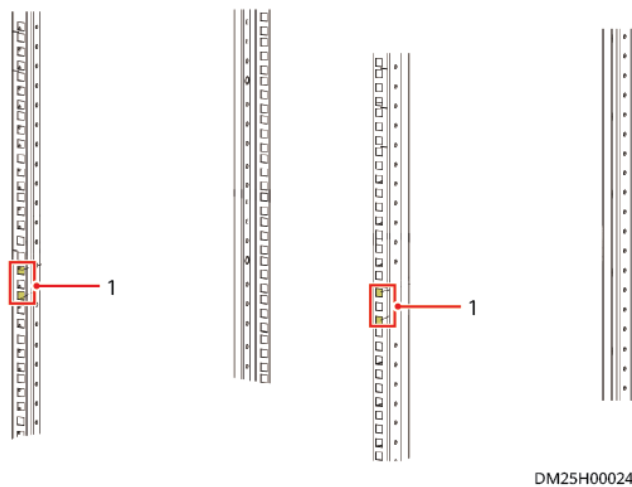
**Figure 4-78** Installing a hard disk



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** Install the floating nuts. Determine the mounting holes for the VCN510 in the cabinet based on the cabinet device layout diagram. Insert one end of the floating nut into the square hole from the inside of the cabinet to the outside of the cabinet, and lock the lower frame of the square hole. Use a floating nut mounting bar to hook the other end of the floating nut and pull the floating nut until it snaps into the upper frame of the square hole.

**Figure 4-79** Installing the floating nuts



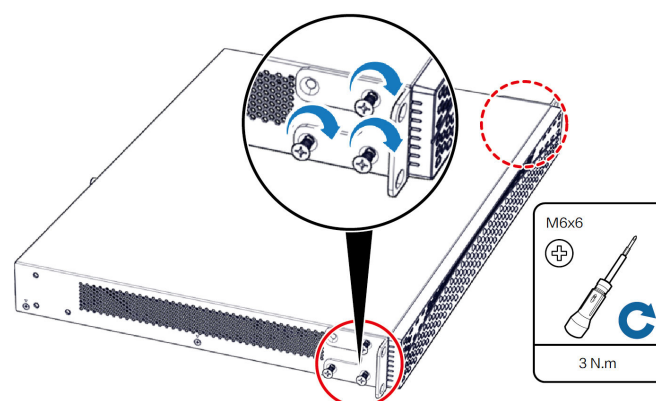
(1) Floating nuts

**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.

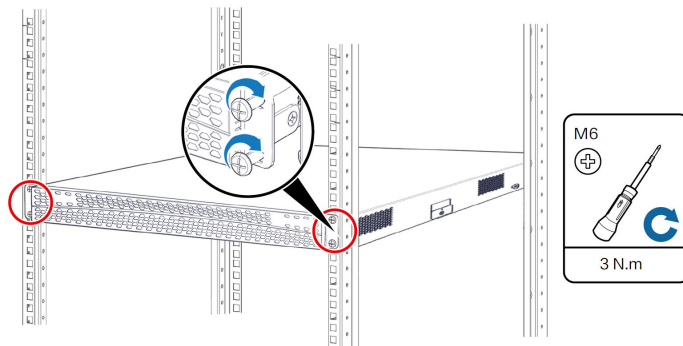
**Figure 4-80** Installing mounting ears



**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 4-81** Installing the device



----End

#### 4.2.6.11 (Optional) Installing an IVS1800

##### Context

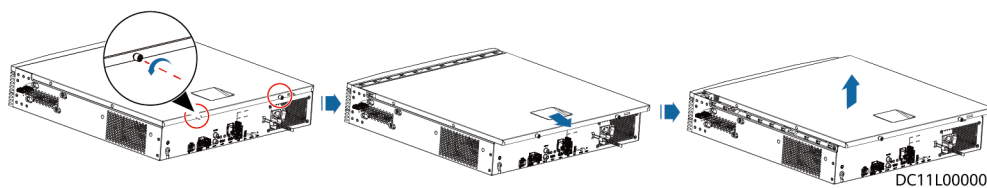
By default, the IVS1800 is delivered without disks. After the IVS1800 is delivered to the site, install hard disks as required and then install the IVS1800 in the cabinet.

##### Procedure

###### Step 1 Install hard disks.

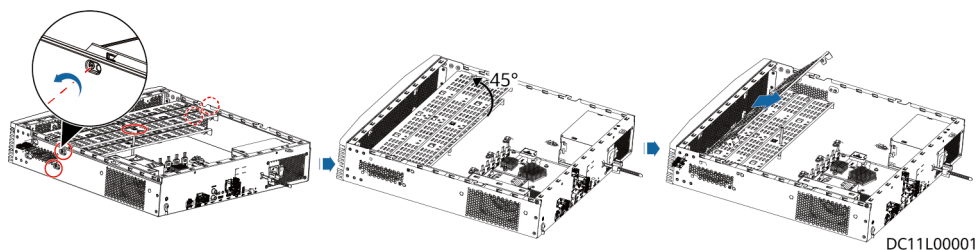
1. Use a PH2 screwdriver to remove the two black screws on the rear of the chassis cover, and take off the chassis cover.

**Figure 4-82** Removing the chassis cover



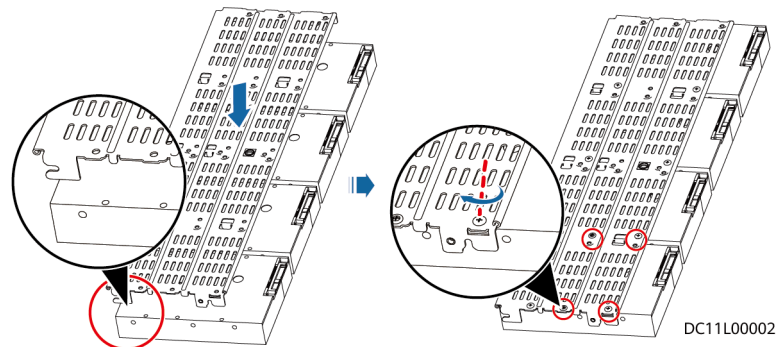
2. Remove two black screws on each side of the chassis and the silvery white one on top of the hard disk tray, raise the hard disk tray by 45 degrees, and take out the upper and then lower layers of hard disk tray.

**Figure 4-83** Removing the hard disk tray



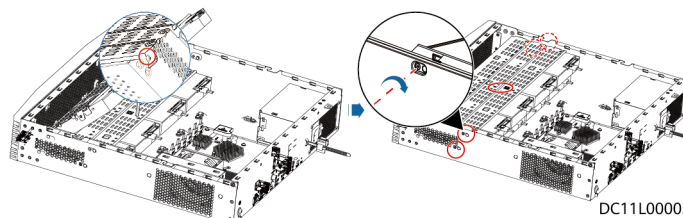
3. Place the hard disks with ports facing upwards and align the screw holes on the hard disk tray with the hard disks and fasten the screws. Before the installation, ensure that the fastener of the hard disk tray is on a different side from the hard disk port, as shown in the lower left figure.

**Figure 4-84** Installing hard disks



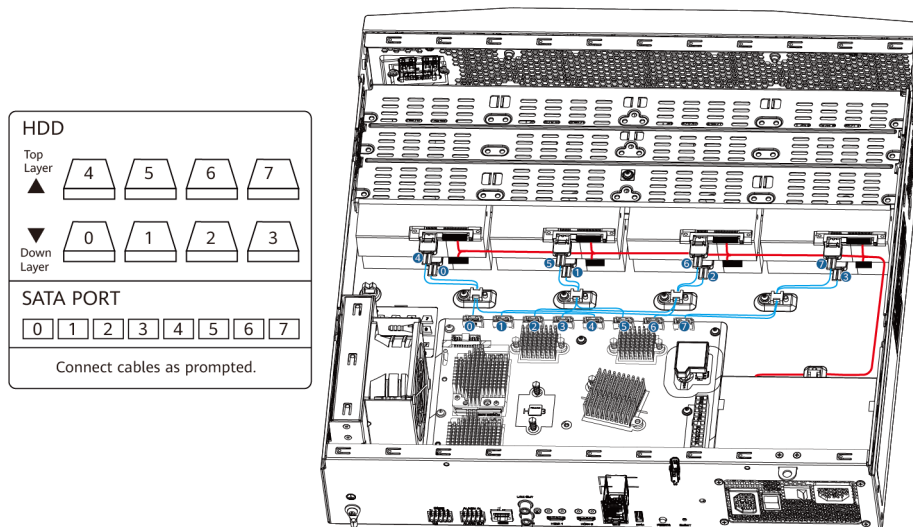
4. Insert the hard disk tray back at 45 degrees with the opening of its locking buckle facing downwards, hold the screw in the red-framed part to lower the hard disk tray until it is level, and fasten the black screws on the left and right sides and the white screw on the top.

**Figure 4-85** Fastening the screw on the panel and the screws on the hard disk tray



5. Connect data and power cables to hard disks. Connect hard disk cable ports P0-P3 to hard disks on the lower-layer hard disk tray and ports P4-P7 to hard disks on the upper-layer, as shown in the lower left figure.

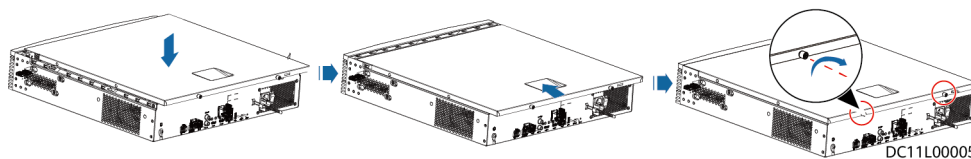
**Figure 4-86** Connecting data and power cables to hard disks



DC11L00004

6. Close the chassis cover, and use a PH2 screwdriver to fasten the rear screws.

**Figure 4-87** Closing the chassis cover



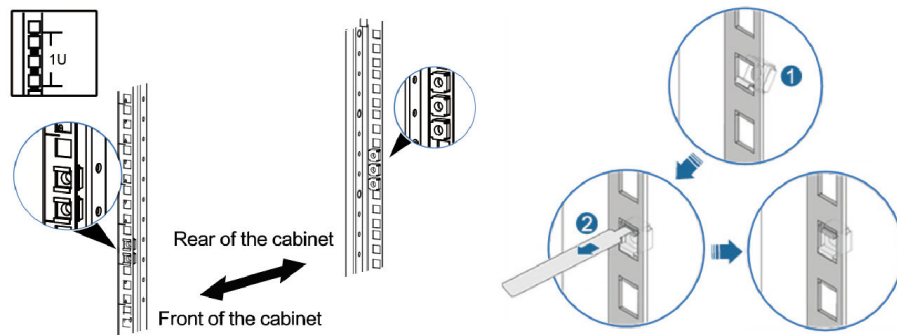
DC11L00005

**Step 2** Install the device.

**NOTE**

- Before installing the IVS1800 in a cabinet, install guide rails to hold the device. If guide rails have been installed in the cabinet, check whether they match the device and whether they block the air intake or exhaust vents of the chassis as the fan is located on the side. If the vents are blocked, change the guide rails.
  - Huawei provides guide rails that can be adjusted from 500 mm to 800 mm for additional purchase if required for IVS1800 installation.
  - Do not attach rubber feet on the IVS1800 to save space during cabinet installation.
1. Confirm the installation location of guide rails in the cabinet. Install cage nuts (two at the front and three at the back on each side) to secure the guide rails at the proper position in the cabinet, as shown in the lower left figure. The lower right figure shows how to install cage nuts.
    1. Insert a cage nut into the square hole from the inside of the cabinet and clamp it to the lower frame of the square hole.
    2. Use a mounting bar to pull the cage nut until it clamps the upper frame of the square hole.

**Figure 4-88** Installing a cage nut



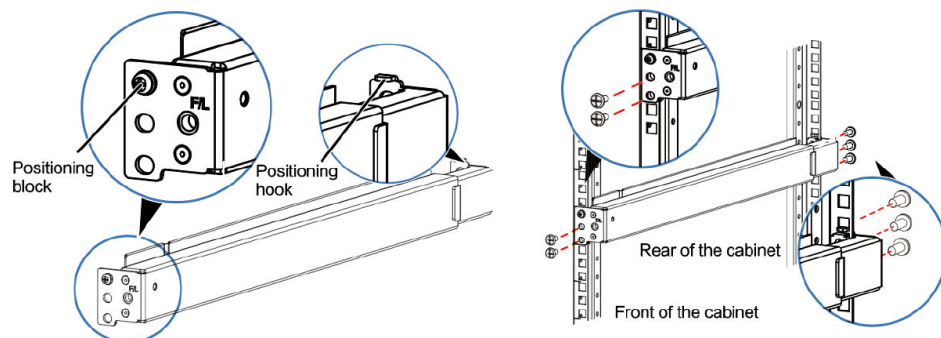
DC11L00018

2. Install guide rails. Horizontally place a guide rail to the installation location through the positioning block at the front of the guide rail and the positioning hook at the rear of the guide rail. Fasten four M6 screws (two on each side) to fix the front end and six M6 screws (three on each side) to fix the rear end, as shown in the lower right figure.

**CAUTION**

Before installing a guide rail, check the (F/L, F/R) labels on the guide rail to identify whether it is for the left or right and which part is the front or rear. F/L indicates the front end of the left guide rail, and F/R indicates the front end of the right guide rail.

**Figure 4-89** Installing a guide rail

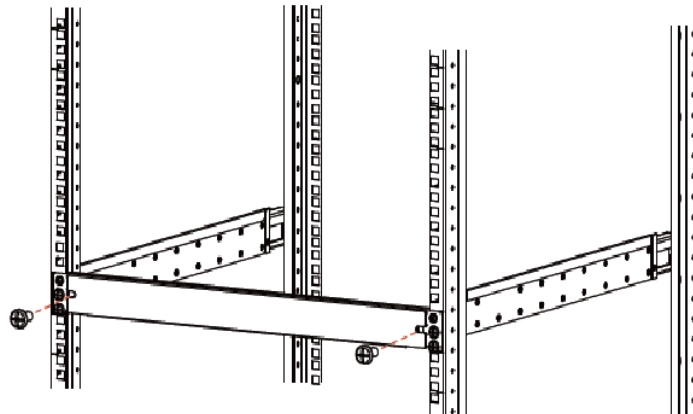


DC11L00019

3. Install a filler panel for guide rails. Fasten the M6 screws to install the filler panel for the guide rails.



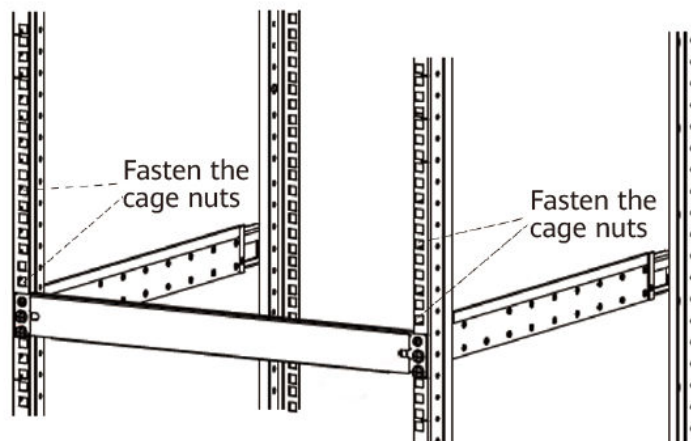
**Figure 4-90** Installing a filler panel for guide rails



DC11L00013

4. Install the cage nuts that secure the IVS1800. The cage nut installation locations are the first and sixth holes along the guide rails, as shown in the following figure.

**Figure 4-91** Installing a cage nut

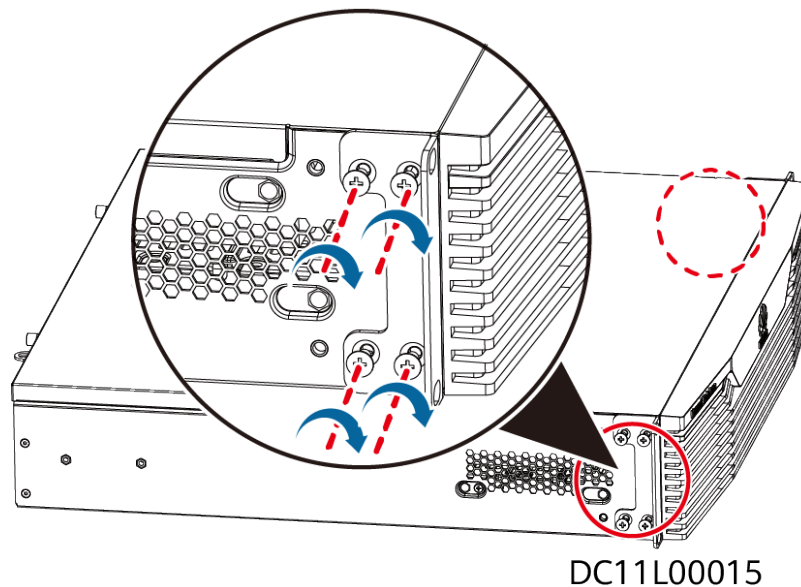


DC11L00020

5. Install mounting ears. Use a PH2 screwdriver to secure the mounting ears to both sides of the front panel of the device with four screws on each side. When the device is near the front door of the cabinet, fasten screws in hole groups 1 and 2; when the device is near the rear door, fasten screws in hole groups 2 and 3.



**Figure 4-92** Installing mounting ears



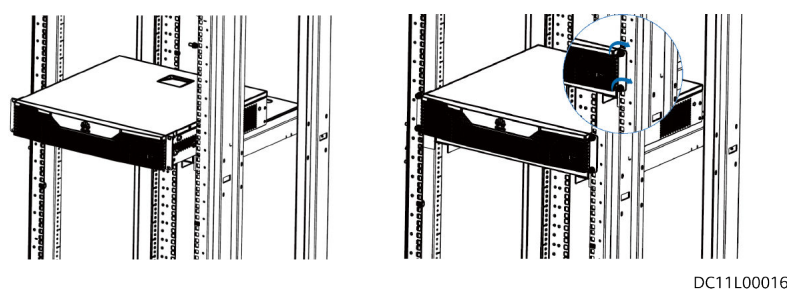
6. Install the IVS1800 in the cabinet.

1. Lift the device from both sides and carefully position it at the front of the cabinet.

2. Lift the device slightly above the guide rails, gently place it on the guide rails, and then slide it into the cabinet until the mounting ears of the subrack contact the mounting bars at the front of the cabinet.

7. Thread M6 screws (prepared by the customer) through two slotted holes on each mounting ear. Fasten the M6 screws using a Phillips screwdriver to fix the mounting ears on the front mounting bars of the cabinet, as shown in the lower right figure.

**Figure 4-93** Securing the device



**Step 3** Power on the device.

1. Turn on the power switch.
2. Check the indicators on the front panel of the device for its running status.

----End

## 4.3 Cable Routing

## 4.3.1 System Cabling Rules

### Attaching Cable Labels

---

**NOTICE**

A cable label must be consistent with the corresponding 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.

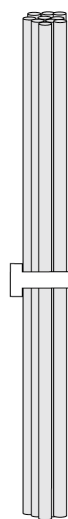
Attach labels to both ends of a cable.

### 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 4-94](#).

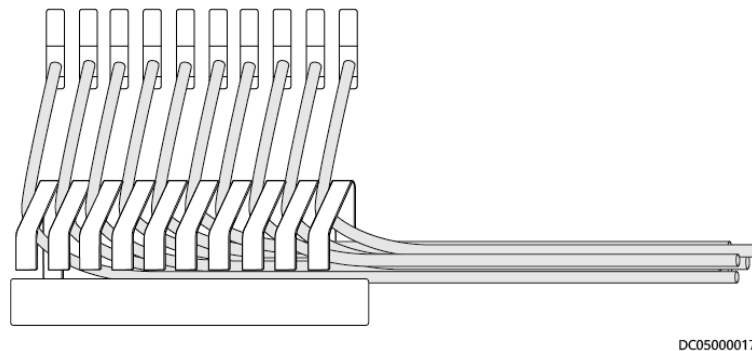
**Figure 4-94** Neatly organizing cables



DC05000015

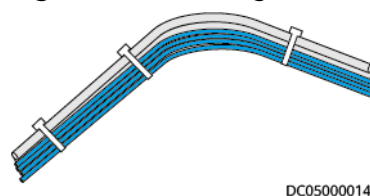
2. Keep a large number of cables neat and appealing in a cabinet by using cable organizers. Move the excess parts of cables in unnoticeable positions, as shown in [Figure 4-95](#).

**Figure 4-95** 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 4-96](#). 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 4-96** 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. You are advised to route network cables and optical cables separately.

## Safety and Reliability Requirements for Routing and Binding Cables

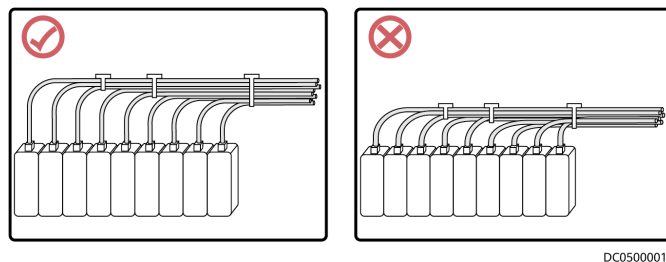
1. Unless otherwise specified in a design file, ensure that the bend radius (R) of a cable meets the following requirements:
  - Common cable:  $R \geq 3d$
  - Optical cable:  $R \geq 40 \text{ mm}$

### NOTE

R indicates the bend radius, and d indicates the cable diameter.

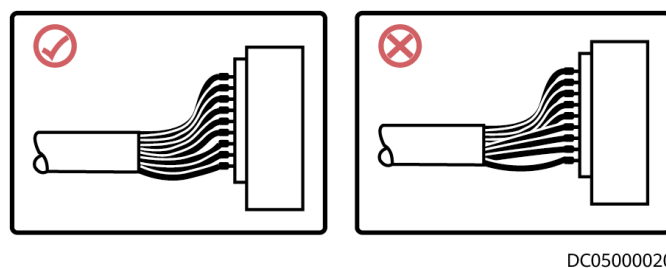
2. Reserve slack at cable connection positions to facilitate connection and disconnection and to prevent stress. Do not leave the cables tight and prevent connector misalignment, as shown in [Figure 4-97](#).

**Figure 4-97** 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 4-98](#).

**Figure 4-98** 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 4-14](#).

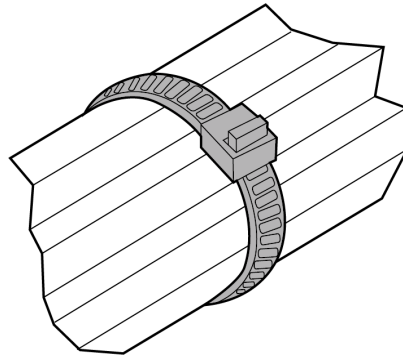
**Table 4-14** Cable binding interval

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 4-99**.

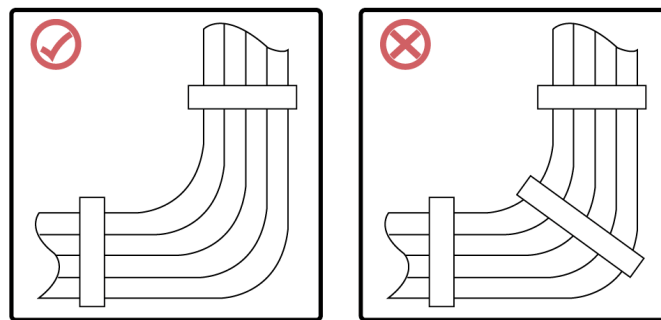
**Figure 4-99** Cutting off the excess part of a cable tie



DC05000019

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 4-100**.

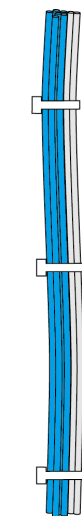
**Figure 4-100** Binding cables in a bending area



DC05000018

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 4-101**.

**Figure 4-101** Direction for securing cable ties

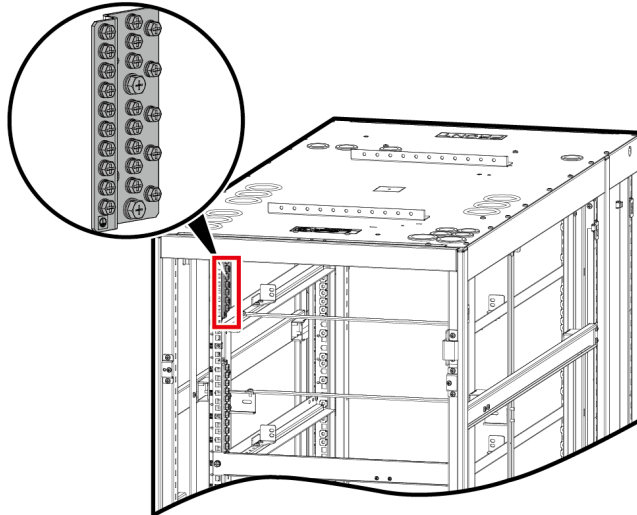


DC05000013

## 4.3.2 Grounding the Smart Module

1. Connect the ground point in the cabinet to the general ground bar.
2. Connect the general ground bar in the cabinet to the floor ground bar or collective ground bar.

Figure 4-102 General ground bar



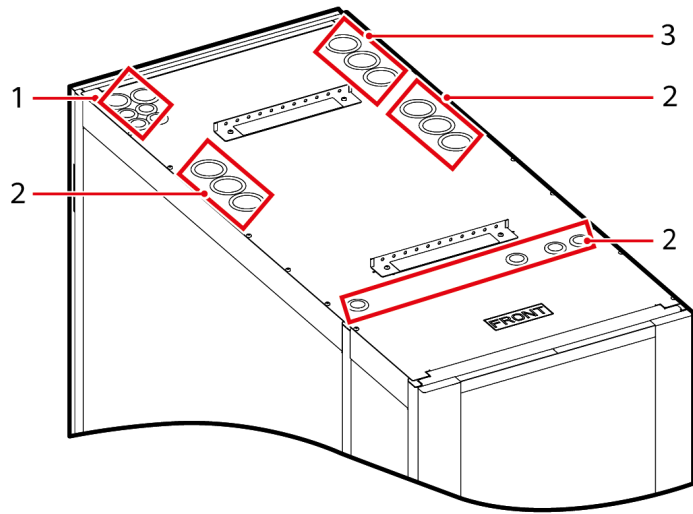
DC00S00165

## 4.3.3 Cable Connections to the Power Supply and Distribution System

### 4.3.3.1 Top Cable Routing

### 4.3.3.1.1 Cable Routing Description

**Figure 4-103** Holes for routing cables through the top of the cabinet



DC00S00164

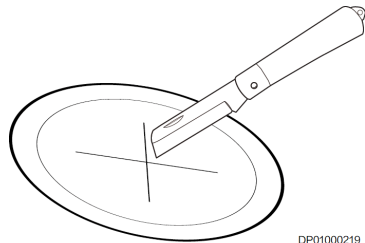
(1) Holes for pipes of smart cooling products

(2) Signal cable holes

(3) Input power cable holes

Wire bushings are installed at the cable outlets of the cabinet for ease of cable routing. Cut a cross in the middle of a wire bushing using an electrician's knife, as shown in [Figure 4-104](#).

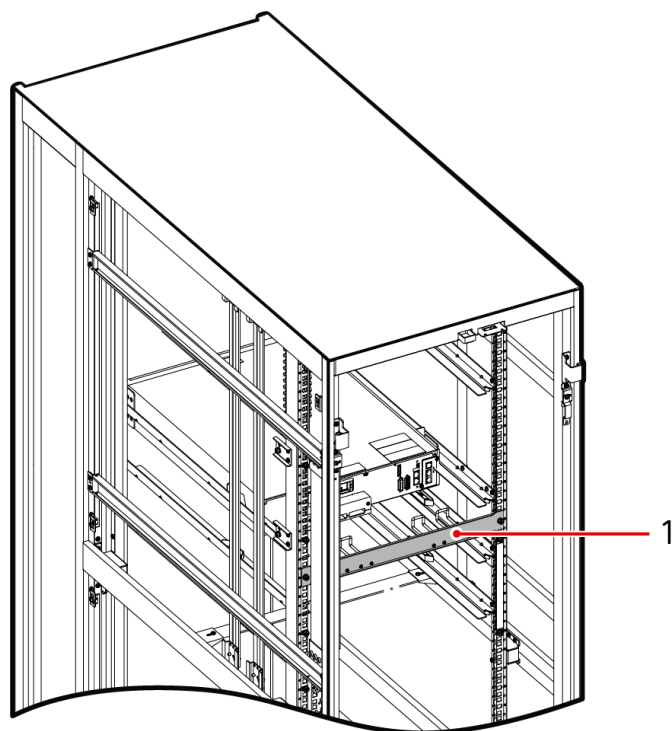
**Figure 4-104** Cutting a cross in a wire bushing



DP01000219

Cables can be bound to the side panels and mounting bars of the cabinet.

**Figure 4-105** Position for binding cables routed across the cabinet interior



DC00500166

(1) Position for binding cables routed across the cabinet interior

### 4.3.3.1.2 Connecting Cabinet Input Power Cables

#### Context

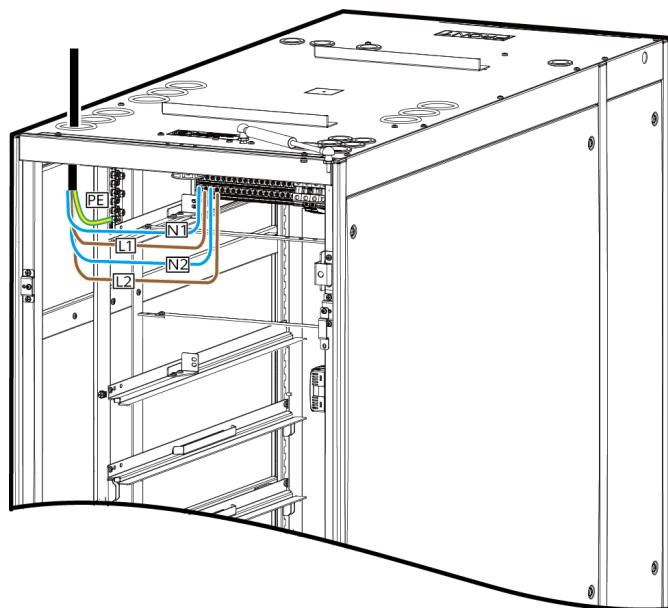
The power distribution subrack position in the cable connection description is for reference only. The actual position prevails.

#### Procedure

- Step 1** (Optional) Connect input power cables to the PDU.
1. (Optional) Remove the transparent protective panel at the rear of the PDU.
  2. Connect input power cables to the PDU.



**Figure 4-106** Connecting input power cables to the PDU



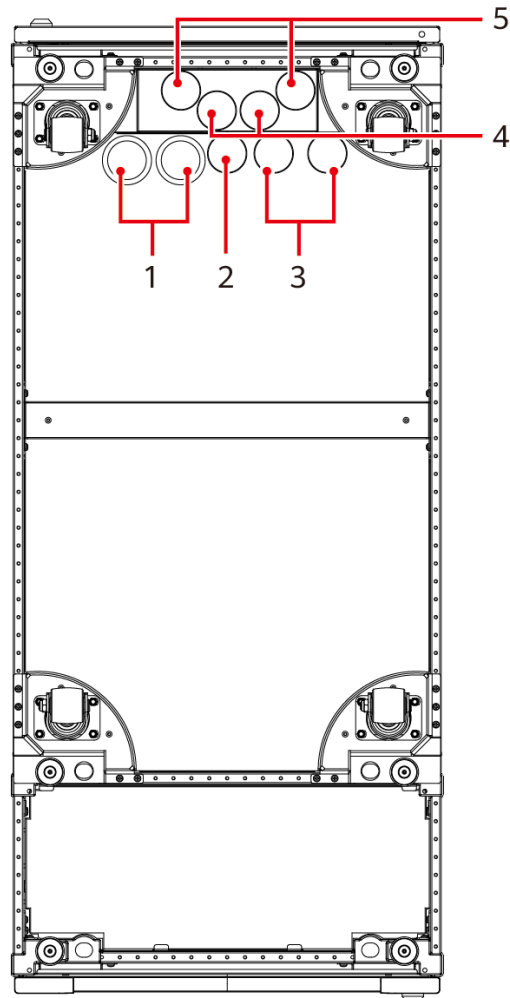
DC00S00438

----End

### 4.3.3.2 Bottom Cable Routing

Cables connect to the same positions on the power distribution subrack irrespective of whether cables are routed through the top or bottom of the cabinet, but the cable routes inside the cabinet are different.

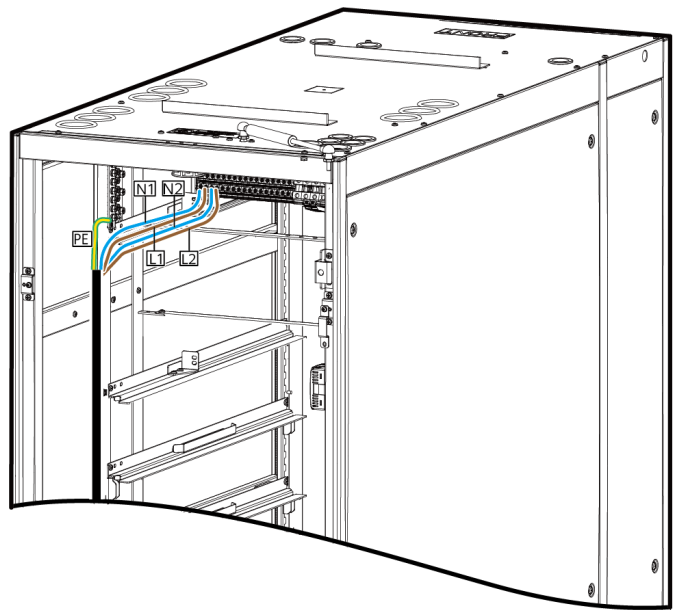
**Figure 4-107** Holes for routing cables through the bottom of the cabinet



DC00S00176

- |  |  |
|--|--|
| (1) Smart cooling product water inlet pipe and drainpipe holes     | (2) Hole for the signal cable and water sensor cable   |
| (3) Hole for the input power cable and battery cabinet power cable | (4) Smart Cooling Product refrigerant liquid pipe hole |
| (5) Smart Cooling Product refrigerant gas pipe hole                |  |

**Figure 4-108** Cable route example in the bottom cable routing scenario



DC00S00439

### 4.3.3.3 Connecting PDU2000 Power Cables

#### Context

If the PDU2000 is not configured with industrial connectors, connect the PDU2000 cables.

#### Preparations

Tools: Phillips screwdriver, flat-head screwdriver, diagonal pliers, protective gloves

Material: cable tie

#### Procedure

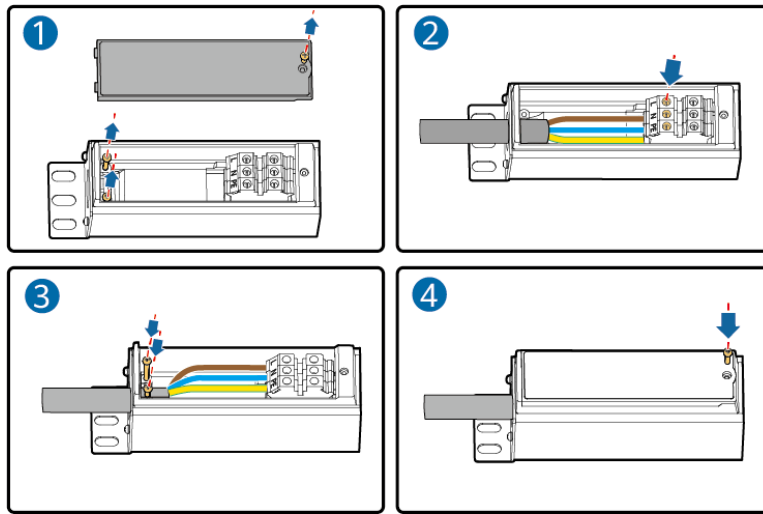
**Step 1** Connect the PDU2000 cables.

---

#### NOTICE

- If PDU2000 cables have been connected onsite, go to [Step 2](#).
  - Connect cables to the PDU2000 based on the type of the PDU2000 and the silk screen on the wiring port. The following cable connection is for reference only.
-

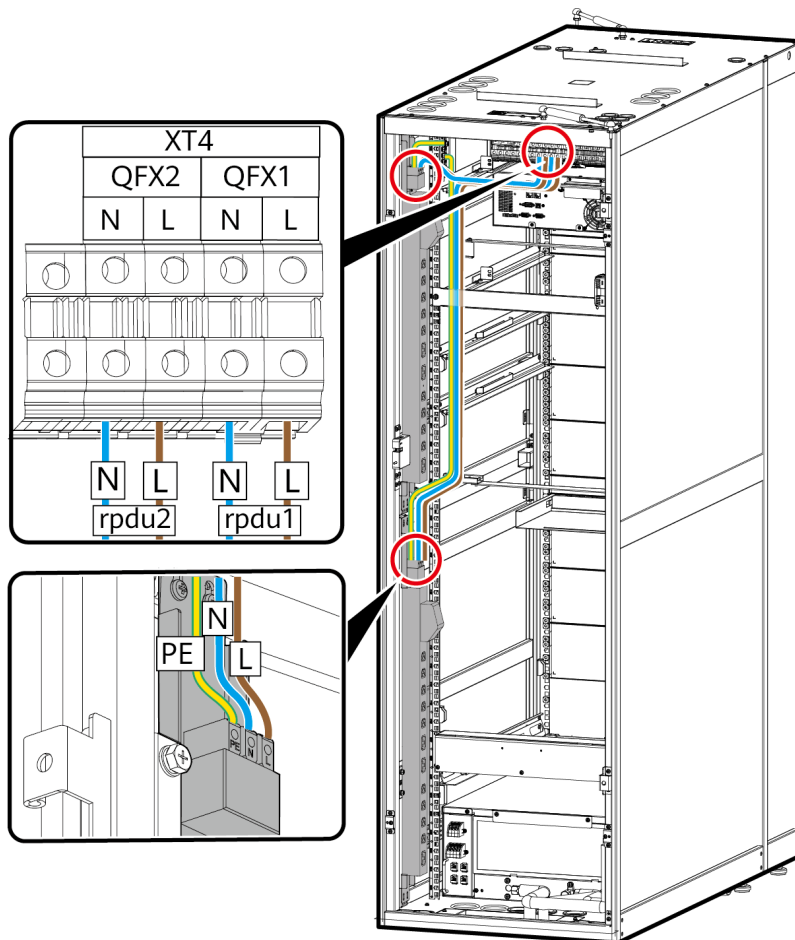
**Figure 4-109** Connecting PDU2000 cables



DP18100001

**Step 2** Take out the PDU2000 cables and connect the cord end terminals of the power cables to the PDU2000 wiring ports, as shown in [Figure 4-110](#).

**Figure 4-110** Connecting the PDU2000 power cable



----End

## Follow-up Procedure

Before connecting the power plug of a device to the PDU2000, loosen the locking device on the PDU2000. After connecting the power plug, tighten the locking device.

### 4.3.3.4 Connecting Cables Between the Lithium Battery and the UPS

#### Context

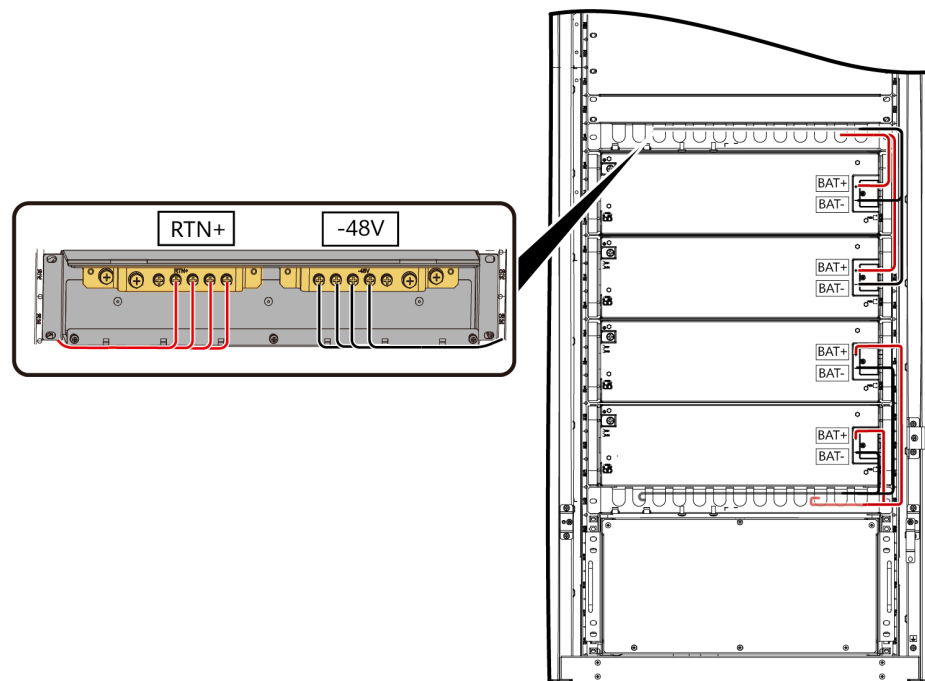
- The busbars, batteries, power distribution unit (PDU), and UPS have been installed.
- If only one battery is configured onsite, battery cables have been preinstalled in the battery position. If more than one battery is configured onsite, connect battery cables.
- The actual number of batteries depends on the onsite configuration.

#### Procedure

**Step 1** Connect power cables between lithium batteries and the UPS.

1. Connect the positive battery terminal to the RTN+ port on the busbar and the negative battery terminal to the -48 V port on the busbar.

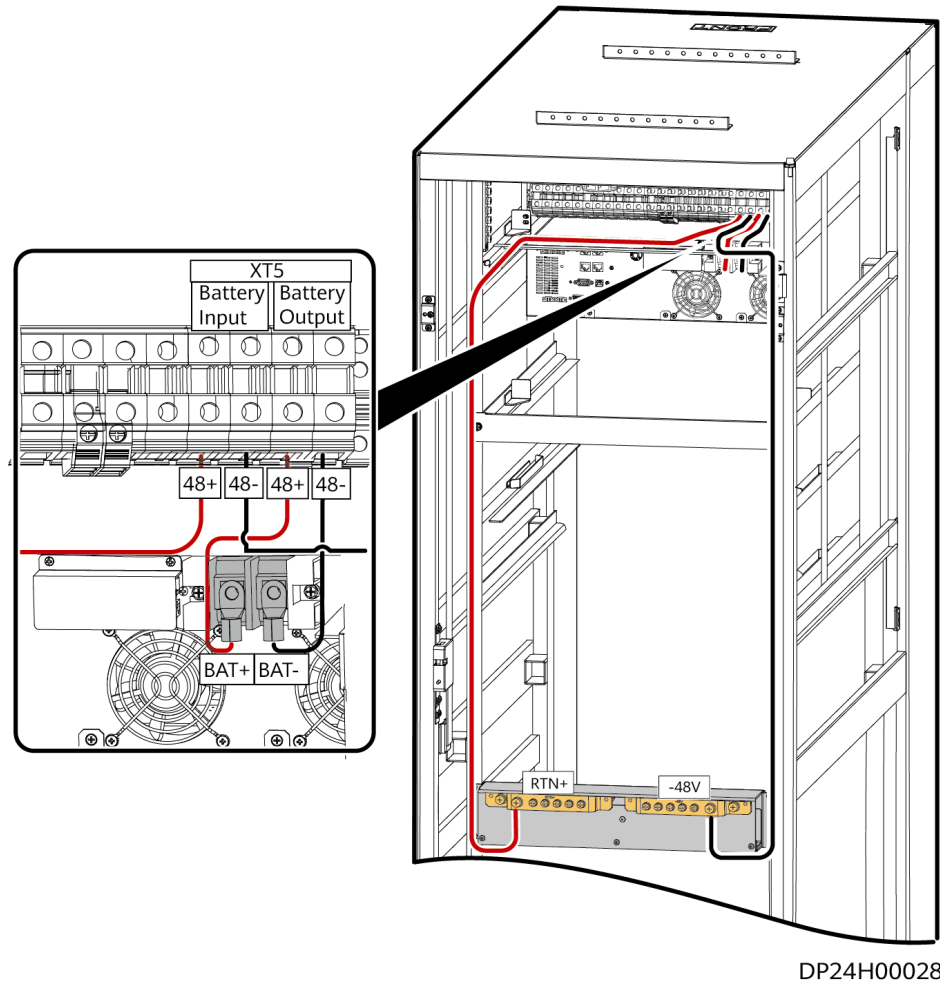
**Figure 4-111** Connecting cables between lithium batteries and busbars



DP24H00027

2. Connect cables between the busbars and the PDU.
3. Connect cables between the PDU and the UPS.

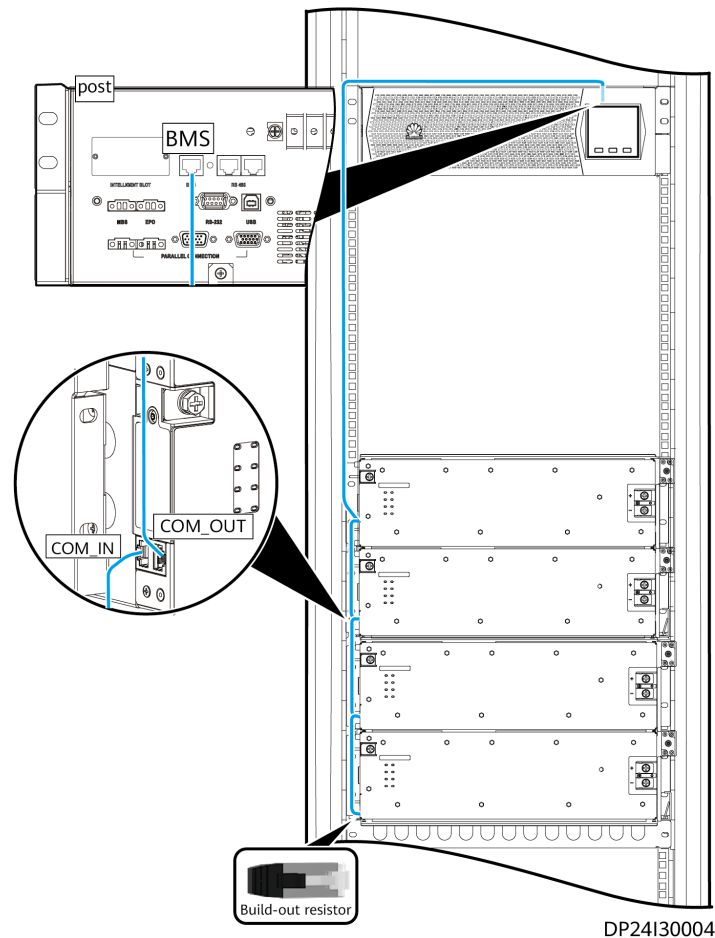
Figure 4-112 Connecting cables between the busbars, PDU, and UPS



**Step 2** Connect communications cables between lithium batteries and the UPS.

1. After lithium batteries are connected in parallel, connect a signal cable to the BMS port of the UPS.
2. A build-out resistor needs to be installed at the COM-OUT port of the lithium battery at the end.

**Figure 4-113** Connecting communications cables between lithium batteries and the UPS



----End

## 4.3.4 Management System Cable Connection

### 4.3.4.1 Connecting Cabinet Electronic Clasp Lock Cables

#### Prerequisites

The cabinet electronic clasp locks have been installed.

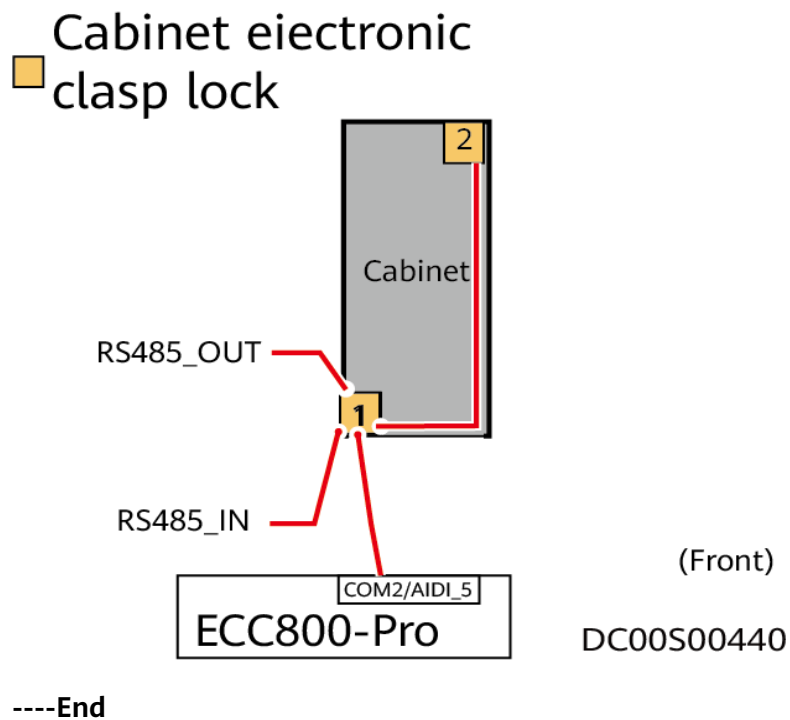
#### Procedure

- Step 1** Install cabinet electronic clasp lock cables according to the cabinet electronic clasp lock layout.

#### NOTE

Connect one end of a network cable to the RS485\_IN port on the electronic clasp lock on the front door of the cabinet, and connect the other end to the COM3 port on the ECC800-Pro. Connect one end of another network cable to the OUT port on the electronic clasp lock on the front door of the cabinet, and connect the other end of the network cable to the RS485\_IN port on the electronic clasp lock on the rear door of the cabinet.

**Figure 4-114** Connecting cabinet electronic clasp lock cables



#### 4.3.4.2 Connecting Cabinet T/H Sensor Cables

##### Prerequisites

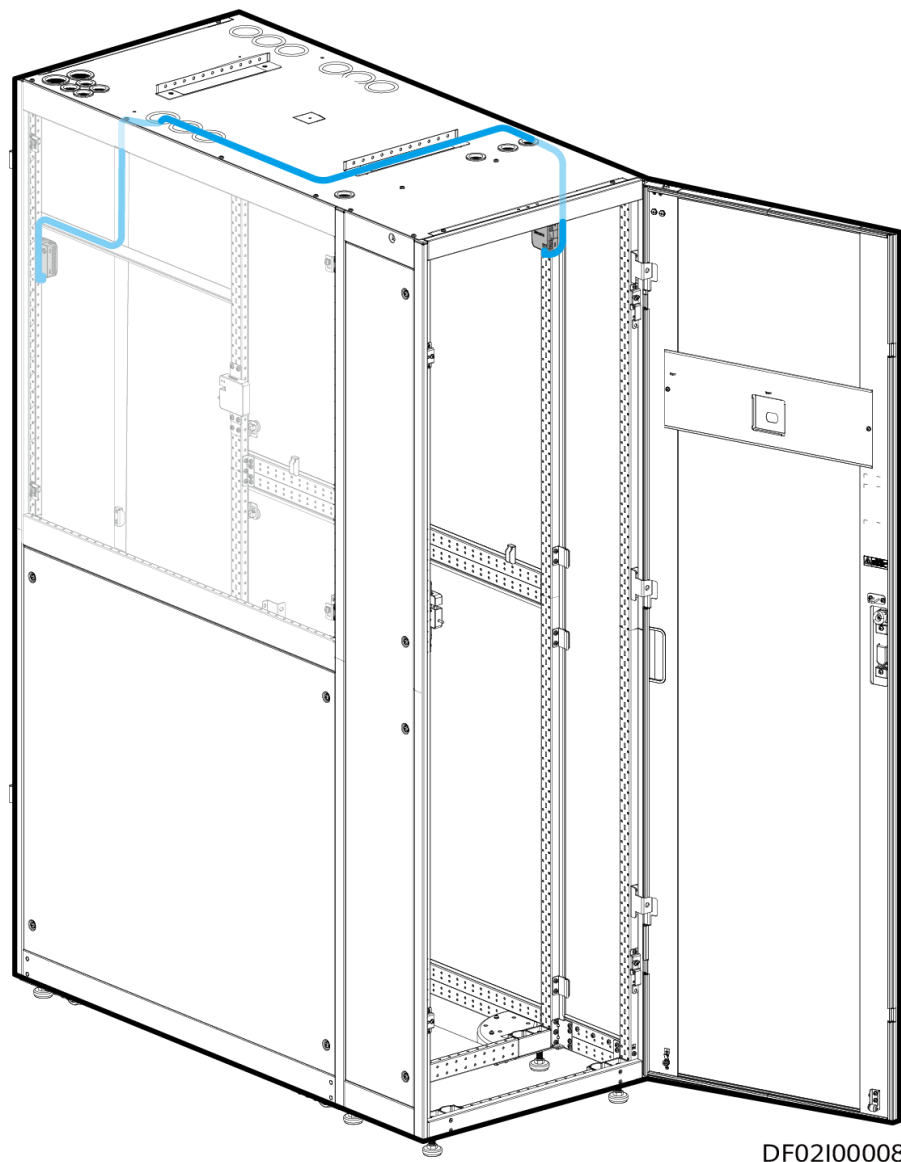
The required cables have been prepared.

##### Procedure

- Step 1** Connect the OUT port on the T/H sensor on the front door to the RS485\_IN port on the T/H sensor on the rear door in series.



Figure 4-115 T/H sensor cable route



----End

### 4.3.4.3 Connecting VCN Cables

#### Prerequisites

Cables have been prepared.

#### Procedure

- Step 1** Connect one end of the ground cable to the ground terminal on the device and the other end to the ground point on the cabinet. A Phillips screwdriver and M4 screws are required. The ground cable is a yellow-and-green cable of 16–18 AWG.

#### NOTE

The customer needs to prepare the ground cable.

**Step 2** Connect one end of the network cable to any GE network port on the VCN.

**Figure 4-116** Ports on the VCN



- (1) Ground terminal
- (2) GE1 port
- (3) GE2 port
- (4) Power button
- (5) Power port

**Step 3** Connect one end of the power cable to the input power port on the power module and the other end to the PDU2000 in the cabinet.

**NOTE**

After connecting the power cable, turn on the power switch on the panel to start the device.

----End

### 4.3.4.4 Connecting IVS1800 Cables

#### Prerequisites

Cables have been prepared.

#### Procedure

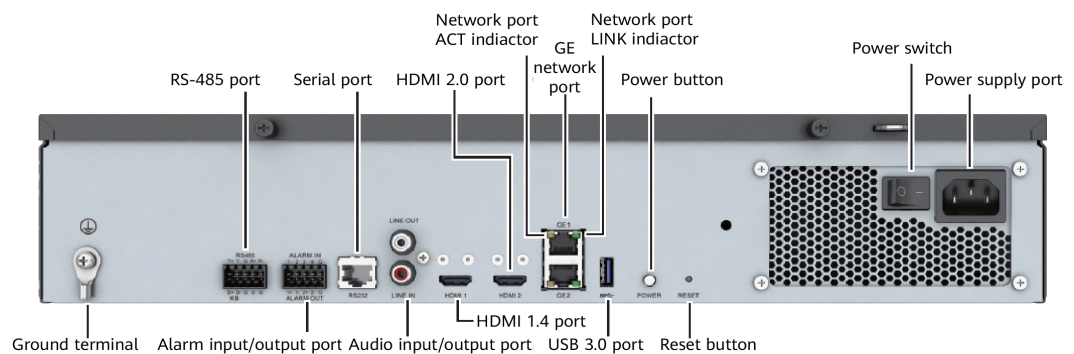
**Step 1** Connect one end of the ground cable to the ground terminal on the device and the other end to the ground point on the cabinet. A Phillips screwdriver and M4 screws are required.

**NOTE**

The customer needs to prepare the ground cable.

**Step 2** Connect one end of the network cable to any GE network port on the IVS.

**Figure 4-117** IVS Rear panel



**Step 3** Connect one end of the power cable to the input power port on the power module and the other end to the PDU2000 in the cabinet.

**NOTE**

After connecting the power cable, turn on the power switch on the panel to start the device.

----End

### 4.3.4.5 Connecting a Cable to the WLDS900 Water Sensor

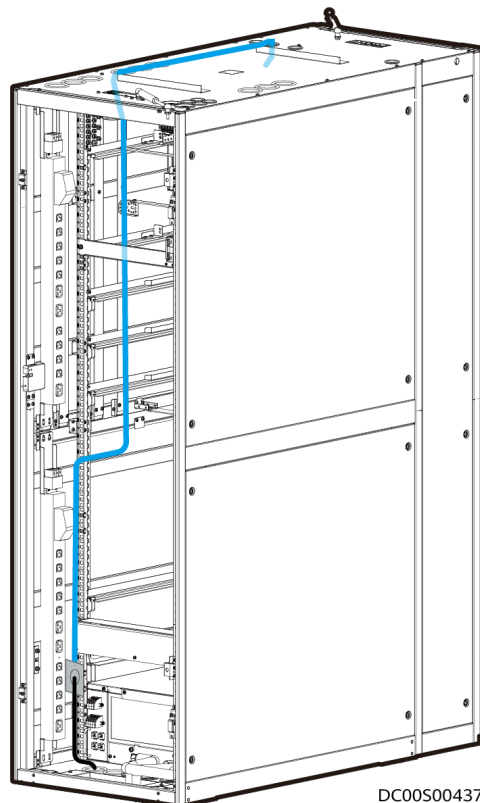
#### Prerequisites

- Water sensor cables have been routed.
- The monitoring cables to be connected have been prepared.

#### Procedure

**Step 1** Connect one end of the network cable that has been routed to the water detector to the AIDI\_2 port on the ECC800-Pro.

**Figure 4-118** Routing a signal cable



DC00S00437

----End

## 4.4 Verifying the Installation

### Cabinet Installation Check

**Table 4-15** Cabinet installation check items

No.	Check That	Check Result
1	The cabinet position is consistent with the equipment room layout diagram.	<input type="checkbox"/> Passed <input type="checkbox"/> Failed
2	All bolts are tightened, especially the bolts used for electric connection. Flat washers and spring washers are installed properly.	<input type="checkbox"/> Passed <input type="checkbox"/> Failed
3	The cabinet is clean and free of dust and other materials.	<input type="checkbox"/> Passed <input type="checkbox"/> Failed
4	The cabinet is clean and complies with dustproof requirements.	<input type="checkbox"/> Passed <input type="checkbox"/> Failed
5	The paint on the cabinet exterior is intact. Promptly repaint the cabinet exterior if necessary to prevent corrosion.	<input type="checkbox"/> Passed <input type="checkbox"/> Failed
6	The cabinet door and lock work properly.	<input type="checkbox"/> Passed <input type="checkbox"/> Failed
7	All labels are correct, clear, and complete.	<input type="checkbox"/> Passed <input type="checkbox"/> Failed
8	The cabinet has no waste tape, cable ties, paper, or packing materials around it.	<input type="checkbox"/> Passed <input type="checkbox"/> Failed
9	All components are properly installed and no component is left onsite.	<input type="checkbox"/> Passed <input type="checkbox"/> Failed
10	Block empty cable holes using plugs or lids.	<input type="checkbox"/> Passed <input type="checkbox"/> Failed

### Cable Installation Check

**Table 4-16** Cable installation check items

No.	Check That	Check Result
1	All cable joints are secured properly, especially the cable joints between network cables.	<input type="checkbox"/> Passed <input type="checkbox"/> Failed
2	Exposed parts near the wiring terminals and lugs are wrapped in PVC insulation tape or heat shrinking tubing.	<input type="checkbox"/> Passed <input type="checkbox"/> Failed

No.	Check That	Check Result
3	The flat washers and spring washers of all wiring terminals are securely installed.	<input type="checkbox"/> Passed <input type="checkbox"/> Failed
4	Cables are bound neatly and cable ties are secured evenly and properly.	<input type="checkbox"/> Passed <input type="checkbox"/> Failed
5	Routed cables should be convenient for future maintenance and expansion.	<input type="checkbox"/> Passed <input type="checkbox"/> Failed
6	All labels at the cable ends are clear.	<input type="checkbox"/> Passed <input type="checkbox"/> Failed
7	The excess section of a cable strip is cut evenly.	<input type="checkbox"/> Passed <input type="checkbox"/> Failed
8	There is no unnecessary adhesive tape or cable tie on cables.	<input type="checkbox"/> Passed <input type="checkbox"/> Failed

## Electrical Installation Check

**Table 4-17** Electric installation check items

No.	Check That	Check Result
1	All ground cables are copper cables. Cable diameters are correct. No switches or fuses are installed on the cables and no short circuit occurs.	<input type="checkbox"/> Passed <input type="checkbox"/> Failed
2	The ground cable, AC power cables, and internal cables are correctly connected and screws are secured. No short circuit occurs during power input or output.	<input type="checkbox"/> Passed <input type="checkbox"/> Failed
3	The smart cooling product input voltage is within the range of rated voltage $\pm 10\%$ , and the input frequency is within the range of rated frequency $\pm 3$ Hz.	<input type="checkbox"/> Passed <input type="checkbox"/> Failed
4	The length of ground cables and power cables is correct.	<input type="checkbox"/> Passed <input type="checkbox"/> Failed
5	Lugs for power cables and PGND cables are soldered or crimped securely.	<input type="checkbox"/> Passed <input type="checkbox"/> Failed
6	Power cables and PGND cables are routed and bundled separately from other cables.	<input type="checkbox"/> Passed <input type="checkbox"/> Failed
7	Lithium batteries are intact, free from damage, cracks, and bulges.	<input type="checkbox"/> Passed <input type="checkbox"/> Failed
8	Lithium batteries are neat and clean, and do not leak electrolyte.	<input type="checkbox"/> Passed <input type="checkbox"/> Failed

No.	Check That	Check Result
9	Lithium battery terminals are upright and free from damage, break, and acid leakage.	<input type="checkbox"/> Passed <input type="checkbox"/> Failed
10	Lithium battery cables are connected correctly.	<input type="checkbox"/> Passed <input type="checkbox"/> Failed
11	DIP switches on devices are correctly set.	<input type="checkbox"/> Passed <input type="checkbox"/> Failed

Customer Sign:

Check Data:

# 5 Power-On Commissioning

---

## 5.1 Power-On Commissioning for the Power Supply and Distribution System

### Prerequisites

The installation has been checked.

---

#### NOTICE

Configure an upstream protective device that meets the overload and short-circuit protection requirements for the cabinet. If one power input is overloaded or short-circuited, the system can switch to the other power input automatically.

---

### Procedure

**Step 1** Switch on all SPD circuit breakers.

 **NOTE**

If the surge protection module indicator is green, the SPD is running properly. If the surge protection module indicator is red, the surge protection module is faulty and must be replaced immediately.

**Step 2** Switch on the power input circuit breaker outside the cabinet to power on the cabinet.

**Step 3** Switch on the UPS input circuit breaker.

**Step 4** After the UPS starts, set parameters such as the battery capacity based on the site requirements, start the inverter, and switch on the UPS output circuit breaker.

**Step 5** Switch on the rPDU circuit breakers.

**NOTICE**

When switching on the circuit breakers, observe whether there is any abnormal phenomenon, such as sparks.

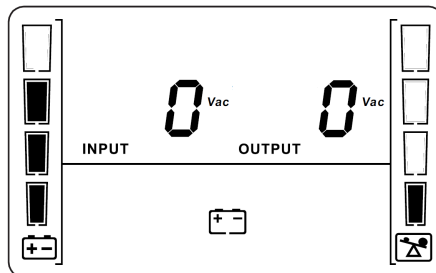
----End

### 5.1.1 UPS Power-On Commissioning

**Step 1** Switch on the external battery circuit breaker (if any).

**Step 2** Press **ON/MUTE** to start the UPS. The UPS will enter the standby mode. Press and hold **SELECT** for 1s on a non-setting screen to access the login screen for parameter settings. The initial password is **001**. Enter the correct password to enter the UPS setting mode.

**Figure 5-1** Standby mode




**Step 3** Setting the output voltage based on site requirements

Output Voltage	Description
	<p>You need to shut down the inverter before changing the output voltage.</p> <p><b>220:</b> indicates that the output voltage is 220 V AC.</p> <p><b>230:</b> indicates that the output voltage is 230 V AC (default value).</p> <p><b>240:</b> indicates that the output voltage is 240 V AC.</p>

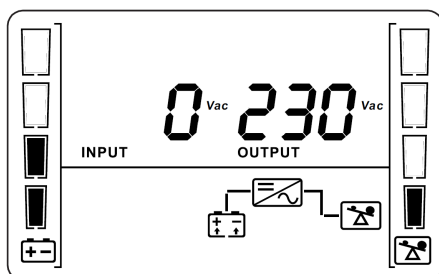
**Step 4** Set the battery capacity.



Battery Capacity	Description
	<ul style="list-style-type: none"> <li>• Default value: 100 Ah</li> <li>• Value range: 50–2400 Ah. The value increases by 50 Ah each time you press <b>SELECT</b>.</li> </ul>

**Step 5** Press and hold **ON/MUTE** for more than 5s. Release the button when you hear a beep sound. The UPS starts to work in battery mode.

**Figure 5-2** Battery mode



**Step 6** After you ensure that the UPS runs properly, switch on the AC output circuit breaker Q for the UPS to start the load.

----End

## 5.1.2 Connecting the Lithium Battery Supply

### Procedure

**Step 1** Switch on the lithium battery circuit breakers.

**Step 2** Check whether the lithium batteries communicate properly. If the running indicator on a lithium battery is steady on, the lithium battery communicates properly with the SMU. If the indicator blinks fast (4 Hz), the communication is interrupted. In this case, check that the communications cable is properly connected.

**Step 3** Observe the lithium batteries for 15 minutes. The batteries are running properly if the alarm indicators are off.

**Step 4** Hold down the MANUAL ON/OFF buttons on the lithium battery panels for more than 5s and less than 15s to activate the lithium batteries.

----End

## 5.2 Power-On Commissioning for the Cooling System

## 5.2.1 Powering on Devices

### Prerequisites

- Check that the humidifier water inlet pipe and drainpipe are correctly connected, that the thermal insulation foam is intact, and that refrigerant has been charged.
- Check that the cables to the indoor and outdoor units are correctly connected and that the L, N, and ground cables are correctly connected.
- Check that the smart cooling product circuit breaker in the upstream PDB is OFF.
- Check that the indoor unit power cable is correctly connected and that the input voltage meets requirements.
- Check that the smart cooling product control unit and the ECC800-Pro are correctly connected.

### Context

The outdoor unit circuit breaker is ON by default. The stop valve on the gas pipe for the outdoor unit is open.

### Procedure

- Step 1** Switch on the circuit breakers for the indoor and outdoor units in the upstream PDB.

---

**NOTICE**

The electric heating belt of the crankcase starts working. Before starting the compressor, ensure that the electric heating belt of the crankcase has been preheated for more than 12 hours. Otherwise, maintenance is not guaranteed.

---

- Step 2** Commission the system after the electric heating belt of the crankcase has been preheated for 12 hours.

----End

## 5.2.2 Performing Initial Configuration

### Prerequisites

One end of the straight-through cable has been connected to the communications port on the rack-mounted HR04A, and the other end has been connected to the COM port on the ECC800-Pro.

### Procedure

- Step 1** Add a rack-mounted HR04A.

1. Log in to the ECC800-Pro WebUI as an administrator.
2. Add a rack-mounted HR04A.

**Table 5-1** Adding a smart cooling product (rack-mounted HR04A)

Path	Parameter	Setting
Choose <b>System Settings &gt; Device Management</b> and click <b>Add Device</b> . The parameters for adding a device are displayed.	Device attribute	Select <b>Air Conditioner</b> from the drop-down list box.
	Device Type	Select <b>Rack-mounted air conditioner HR04A</b> from the drop-down list box.
	Connect To	Select <b>ECC800</b> from the drop-down list box.
	Communications Port	Select <b>COM3</b> from the drop-down list box. <b>NOTE</b> The setting example indicates that the rack-mounted HR04A is connected to the COM3 port on the ECC800. If the HR04A is connected to another port, enter the number of the connected port.
	Device Address	Enter the actual device address of the rack-mounted HR04A during operations. The default address is <b>1</b> .

3. Click **Test Connect** to check whether the rack-mounted HR04A is properly connected to the ECC800-Pro.
  - If the connection is normal, click **Confirm**. The connected devices are displayed in the **Number of connected devices** list.
  - If the connection is abnormal, check whether the device is properly connected to the ECC800-Pro, whether the device and the ECC800-Pro are running properly, and whether the parameter settings are consistent with the device parameters.

**Step 2** Set the running parameters and control parameters of the rack-mounted HR04A on the WebUI.

1. Log in to the ECC800-Pro WebUI as an administrator.
2. Choose **Monitoring > Cooling > Rack-mounted air conditioner HR04A1**.
3. On the **Running Parameters** tab page, set smart cooling product running parameters.

 **NOTE**

You are advised to set **Supply air temperature settings** to **20°C**, **Return air temperature settings** to **30°C**, and **Dehumidification settings** to **50% RH**.

4. On the **Controls** tab page, set the smart cooling product control parameters (such as on/off control parameters).

**CAUTION**

After the smart cooling product is shut down, the temperature of the smart module increases and data running is affected. Exercise caution when performing this operation.

----End

## 5.2.3 Commissioning the Cooling System

### Prerequisites

Check that the indoor and outdoor units have been powered on.

**NOTICE**

Before starting the compressor after power-on, ensure that the electric heating belt of the crankcase has been preheated for more than 12 hours.

- If the one-way indoor unit pipe is longer than 10 m, you need to charge refrigerant during commissioning.
- Before charging refrigerant, ensure that air is exhausted from the gas pipe connected to the refrigerant cylinder.

### Context

Convert the components that cause partial resistance loss such as elbows into the length equivalent to that of straight pipes, and add the equivalent length to the length of the straight pipe between the indoor and outdoor units to obtain the total one-way pipe length (L). L should be less than or equal to 60 m. If L exceeds 60 m, contact Huawei technical support.

**Table 5-2** Equivalent length of pipe components

Pipe Outer Diameter	90-degree Bend	180-degree Bend
3/8 inch (9.52 mm)	0.3 m	0.6 m
2/9 inch (6 mm)	0.2 m	0.4 m

For a 5 U rack-mounted smart cooling product with a low-temperature component, the amount of refrigerant to be filled is the amount of refrigerant to be filled for a 5 U rack-mounted smart cooling product without a low-temperature component plus 2 kg.

If the pipe between the indoor unit and outdoor unit is longer than 10 m, add refrigerant to the system to ensure normal system operation. The following table lists the amount of refrigerant to be added for each 1 m increase in the length of the pipe connecting the indoor and outdoor units.

**Table 5-3** Amount of refrigerant to be added

Liquid Pipe Diameter (mm)	Amount of Refrigerant to Be Added (kg/m)
6	0.009
9.52	0.04
12.7	1

High-quality refrigerant R410A is recommended.

 **CAUTION**

Wear antifreeze gloves when performing refrigerant related operations.

The following are the tools used for commissioning and refrigerant charging:

- Charging tools: pressure gauge (measuring range  $\geq 4.0$  MPa), rubber hose (withstand pressure  $\geq 4.5$  MPa), vacuum pump
- Measurement tool: electronic balance
- Protective tools: insulation gloves, antifreeze gloves, and insulation shoes.
- Other tools: flashlight

To learn the mapping between the saturation pressure and the saturation temperature of the R410A refrigerant, see [Table 4-5](#).

**NOTICE**

- Remove the refrigerant cylinder after ensuring that no refrigerant is required.
- Users include **admin** (preset password: **Changeme**) and **operator** (preset password: **Changeme**). To enter the diagnostic mode, log in as user **admin**.
- If a smart cooling product is not configured with a heater or humidifier, skip the commissioning steps related to the electric heater and wet film humidifier.
- The heater and humidifier do not work at the same time.

## Procedure

- Step 1** Log in to the ECC800-Pro WebUI as user **admin**. Choose **Monitoring > Cooling > Rack-mounted air conditioner HR04A1**. The page for commissioning smart cooling products is displayed.

 **NOTE**

If no manual operation is performed within 25 seconds after you click **On**, the device will automatically run following the preset logic, and the compressor and indoor and outdoor fans will also run according to the environment.

**Step 2** Choose **Controls > Control Information**, set **Power on/off** to **ON**, and click **Submit**.

**Step 3** To add refrigerant, perform the following steps:

1. Close the high-pressure valve and low-pressure valve of the pressure gauge.
2. Take off the vacuum pump and install the liquid refrigerant cylinder.
3. Slightly open the refrigerant cylinder valve and slightly loosen the connection nut of the pressure gauge. Tighten the nut when cold air escapes out of the nut.
4. Put the refrigerant cylinder upside down on the electronic balance. Clear the reading on the balance.
5. Start the compressor and let it run for 10 minutes.
6. Open the low-pressure gauge valve and refrigerant steel cylinder valve at the joint of the gas pipe needle valve, and then charge refrigerant at the gas pipe needle valve.

---

**NOTICE**

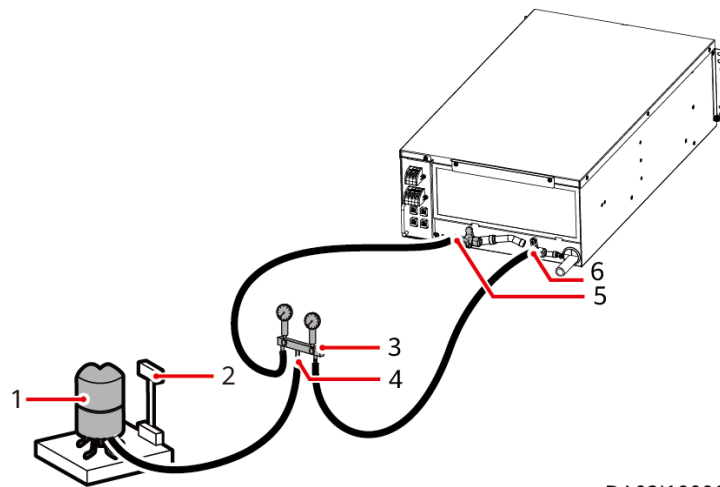
Do not move the hose or refrigerant cylinder when charging refrigerant. Otherwise, the reading on the electronic balance will be affected.

- 
7. Charge liquid refrigerant based on the amount provided in **Amount of refrigerant to be added**.
  8. After the refrigerant is charged, close all pressure gauge valves and the refrigerant cylinder valve.
  9. Remove the refrigerant charging device and install the needle valve nut.

** NOTE**

Tighten the needle valve nut when the charge is complete. Check whether a needle valve leaks by applying soapy water to the valve vent or using a halogen leak detector. If it leaks, contact Huawei technical support.

**Figure 5-3** Charging refrigerant



DA02110006

- |                          |                           |                              |
|--------------------------|---------------------------|------------------------------|
| (1) Refrigerant cylinder | (2) Electronic balance    | (3) Pressure gauge           |
| (4) Connection nut       | (5) Gas pipe needle valve | (6) Liquid pipe needle valve |

----End

## Exception Handling

**Step 1** Check that the T/H control mode and T/H set point are properly set.

**Step 2** Check that the current time is correctly set.

**Step 3** Check that the return air filter is installed in the correct direction.

----End

## 5.3 Management System Power-On Commissioning

### 5.3.1 Preparations and WebUI Login

#### Prerequisites

- Supported operating system: Windows 7 and later versions
- It is recommended that the screen resolution be 1366 x 768 or higher.
- Browser: Chrome, Firefox, Internet Explorer 11 or later

#### Procedure

**Step 1** Connect a network cable between the PC network port and the WAN1 port (protected by a security mechanism) on the ECC800-Pro.

**Table 5-4** Default IP addresses for the WAN and LAN ports on the ECC800-Pro

Port	Default IP Address
WAN1	192.168.8.10
WAN2	192.168.0.10 192.168.248.10
LAN1 and LAN2	192.168.248.10

**NOTICE**

- In ECC800 V100R002C10 and earlier versions, the default IP address of port WAN\_1 is 192.168.1.10.
- The WAN1 port IP address cannot be set to an IP address in any of the following network segments: 192.168.0.x, 192.168.245.x, 192.168.246.x and 192.168.248.x.
- IP addresses for the WAN1 and WAN2 ports should not be set in the same network segment.
- In some customized scenarios, the default IP address for the WAN\_2 port is 192.168.248.10. The default value prevails.
- WAN ports support the Internet access and LAN ports support the intranet access. Connect the PC network port to the WAN1 port or LAN port on the ECC800-Pro based on the access network.

**Step 2** Configure the PC IP address and the WAN1 IP address in the same network segment.

If the WAN1 port IP address is 192.168.8.10, subnet mask is 255.255.255.0, and default gateway is 192.168.8.1, set the PC IP address to 192.168.8.12, subnet mask to 255.255.255.0, and default gateway to 192.168.8.1.

**Step 3** Set LAN parameters.

 **NOTE**

- If the ECC800-Pro connects to a LAN and a proxy server has been selected, perform [Step 3.3](#) and [Step 3.4](#).
  - If the ECC800-Pro connects to the Internet, and the PC in a LAN accesses the Internet over a proxy server, do not perform [Step 3.3](#) and [Step 3.4](#). Otherwise, you will fail to access the ECC800-Pro.
1. Open the Internet Explorer and choose **Tools > Internet Options**.
  2. Click the **Advanced** tab and select **Use TLS1.1** and **Use TLS1.2**.
  3. (Optional) Click the **Connections** tab and select **LAN settings**.
  4. (Optional) On **Proxy server**, clear **Use a proxy server for your LAN**.
  5. Click **OK**.

**Step 4** Set Internet Explorer parameters.

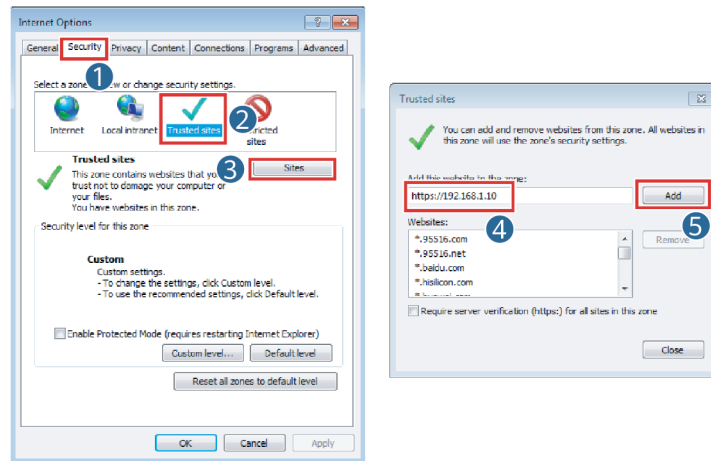
1. When you use Internet Explorer for access, set Internet Explorer to ensure the normal display of and operations on the WebUI. Choose **Tools >**



**Compatibility View**, and add the web access address to the compatibility view.

2. Choose **Tools > Internet options > Security**, choose **Add the ECC800-Pro IP address** to the list of trusted sites.

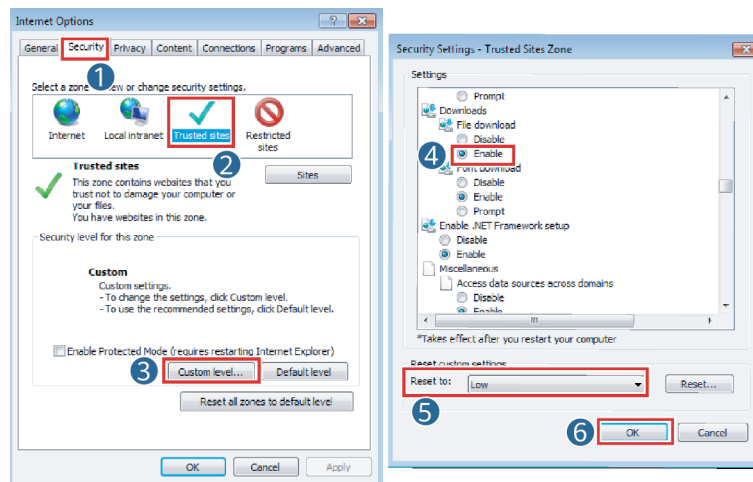
Figure 5-4 Adding an address



DM25H00070

3. Enable file download and set the security level of the trusted site to low.

Figure 5-5 Setting parameters



DM25H00071

**NOTE**

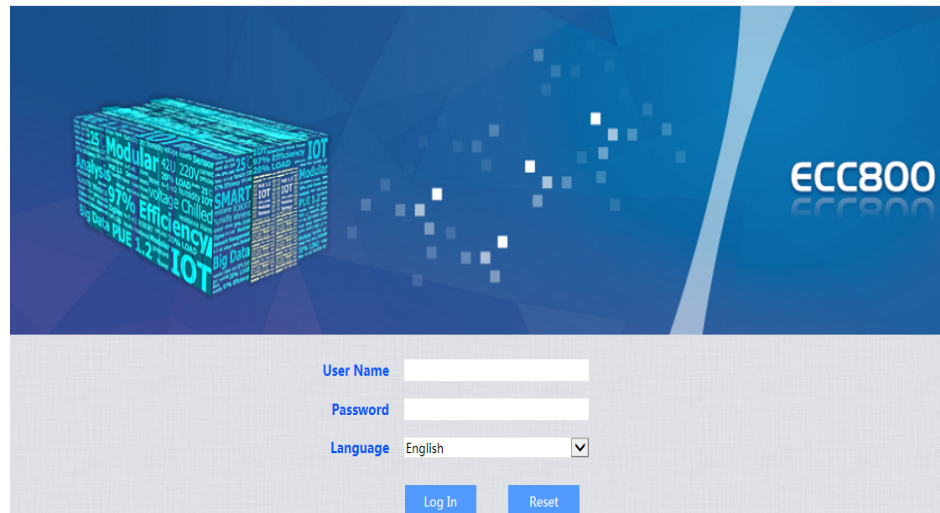
When switching between different versions of the ECC800-Pro on your PC, you are advised to clear the historical Internet Explorer cache. Failing to do so may cause some information missed or exception after login. The following provides the details:

1. Open Internet Explorer and choose **Tools > Internet Options > General**.
2. Select **Delete browsing history on exit** and click **Delete**.
3. In the **Delete Browsing History** dialog box, select all options except **Password**, and click **Delete**.

**Step 5** Log in to the ECC800-Pro WebUI.

1. Enter **https://monitoring IP address** (such as monitoring IP address **https://192.168.8.10**) in the address box of the browser, and then press **Enter** to enter the WebUI login page.

**Figure 5-6** WebUI login page



2. On the login page, enter the preset user name **admin** and preset password **Changeme**, set the language, and click **Log In**.

**NOTE**

- After the first login, change the password in time to ensure account security and prevent unauthorized network attacks, such as data tampering. Huawei will not be liable for any security issues caused by your failure to change the preset password in time or password loss after changing.
- Change the password of the user account periodically.
- Record and keep the password properly. If you forgot the password, you will be unable to log in to the WebUI.
- When the event notification is configured and the password retrieval mode is configured under user management, the password can be retrieved.
- An account is logged out due to timeout if no operation is performed within 10 minutes after system login.
- A maximum of three users can log in to the ECC800-Pro WebUI at the same time.

----End

## 5.3.2 Preparations and App Login

### Prerequisites

App operating environment requirements:

- The mobile device must run Android 4.0 or later and is not root operating system (the operating system is not flashed).
- The mobile device has sufficient battery reserve.
- You have obtained the IP address of the ECC800-Pro as well as the user name and password used for WebUI login.

- A PC with an IP address in the same network segment as that of the ECC800-Pro is prepared, and the PC has connected to port WAN1 on the ECC800-Pro.

## Procedure

**Step 1** Download and obtain the app installation package using any of the following three methods:

- Log in to Huawei AppGallery (<https://a.vmall.com/>), search for **FusionModule**, and tap **Download**.
  - a. (Optional) Set the pad language to **English**.
  - b. Open the browser on the pad, enter [www.baidu.com](http://www.baidu.com) in the address box, search for **Huawei AppGallery**, select **Ordinary Download**, and tap **Save**.
  - c. Install the Huawei AppGallery. If the downloaded file exists in the drop-down list box, tap the file to install the Huawei AppGallery. If the downloaded file does not exist in the drop-down list box, choose **File > Local** on the desktop, find the **Download** folder, and click the Huawei AppGallery installation package.

---

### NOTICE

After you open the Huawei AppGallery, select **NOT NOW** if "New Version" is displayed.

---

- Log in to the ECC800-Pro WebUI using a PC. Choose **Maintenance > App Obtaining**, scan QR code, and save the app installation package to the PC or a path on the mobile storage device. Then, copy the app installation package to a mobile phone or pad.
- When the WiFi is enabled, enter <https://192.168.245.10> in the address bar of the Firefox browser (version 41.0 or later) on a mobile phone or pad, and press **Enter** to access the ECC800-Pro WebUI. Choose **Maintenance > App Obtaining** and scan QR code to save the app package to the mobile phone or pad.

**Step 2** Install the app.

By default, the Android operating system forbids the installation of apps not obtained from the Android market. Therefore, before installing the app, set the mobile phone so that it allows the installation of apps from unknown sources.

1. Tap the app installation file for installation. After the installation is complete,



check that the app icon is displayed on the home screen of the mobile phone or pad.

**Step 3** Hold down the SW button on the ECC800-Pro for less than 3s to enable the WiFi function.

 **NOTE**

- The initial password is **Changeme** after the WiFi function is enabled. The password is valid only after you hold down the button for the first time to enable the WiFi function. If you enable the WiFi function on the WebUI, there is no preset password.
- After the WiFi function is enabled, the password for a mobile phone to connect to the WiFi network is **Changeme**. When you log in to the app using a tablet, the system prompts you to change the password.
- After you disable the WiFi hotspot function on the WebUI and press the button again, the WiFi function is still enabled. In this case, the WiFi password is the one you changed last time.
- The WiFi function is disabled by default. If you need to enable the WiFi function, change the WiFi password to ensure connection security.
- A password that has been used for a long time is more likely to be stolen or cracked. The risk increases along with the time of use. Change the WiFi password periodically (recommended: once half a year).

**Step 4** (Optional) Enable the WiFi function on the ECC800-Pro WebUI.

1. Log in to the ECC800-Pro WebUI as an administrator.
2. Choose **Monitoring > System > WiFi Converter** and click **WiFi Management**.
3. Set **Enable WiFi** to **Enable** and click **Submit**.
4. If this is the first time you enable the WiFi function, set **WiFi Password** and click **OK**.
5. Enter the password currently used for logging in to the WebUI and click **Submit**.
6. Specify **WiFi SSID** and **WiFi Password** and click **Submit** to change the SSID and password.

 **NOTE**

- If you have set a password when enabling WiFi for the first time, you do not need to set the password again.
  - The WiFi function is disabled by default. If you need to enable the WiFi function, change the WiFi password to ensure connection security.
  - A password that has been used for a long time is more likely to be stolen or cracked. The risk increases along with the time of use. Change the WiFi password once half a year.
7. Enter the password currently used for logging in to the WebUI and click **Submit**.

**Step 5** Log in to the app.

1. Start the mobile phone or pad app, choose **Settings > Network Connection** on the login screen, select **WiFi SSID** specified on the WebUI, and enter the value of **WiFi Password** specified on the WebUI for login.
2. On the login screen, choose **Settings > Server IP Settings**, and ensure that the IP address is **192.168.245.10**.
3. The user name and login password for the app are the same as those for the ECC800-Pro WebUI. Specify the user name and password, and tap **Login**.

 **NOTE**

- After the first login, change the password in time to ensure system access security.
- When the mobile phone app connects to the monitoring system, the WiFi function of the monitoring system is disabled by default. Before connecting the mobile phone app to the monitoring system, enable the WiFi function on the WebUI. For security, you are advised to disable the WiFi function when the app is not in use.
- A password that has been used for a long time is more likely to be stolen or cracked. The risk increases along with the time of use. Change the password once three months.
- You are advised to use a mobile phone that has not been rooted to reduce the risk of information leakage.
- It is recommended that you use different user names to log in to both the ECC800-Pro WebUI and app at the same time. If you use the same user name to log in to the WebUI and app at the same time, either of them will be forcibly logged out.
- If an exception in network or an unexpected exit from the app occurs, the original user can log in immediately and the newly-added user need to wait 5 more minutes to log in.

----End

### 5.3.3 Performing Startup Password Authentication

#### Context

- The initial startup password authentication is required only during initial power-on commissioning. If the authentication has been performed successfully, no authentication is required afterward.
- The startup password needs to be authenticated when you restore the default settings on the WebUI or by pressing keys.
- If the startup password authentication is not complete, the ECC800-Pro WebUI and app cannot be used for commissioning.
- When the system type is changed to FusionModule800, the startup password needs to be authenticated again.

#### Procedure

**Step 1** Authenticate the startup password on the WebUI.

1. Log in to the ECC800-Pro WebUI as an administrator.
2. Record the values of **Barcode** and **Verify Code** in the displayed **Startup Password** dialog box.
3. Within 24 hours, inform Huawei technical support of **Barcode** and **Verify Code** to obtain the password. After obtaining the password, enter the password in the **Password** text box and click **Submit** to complete the authentication of the startup password.

 **NOTE**

The verification code is valid for 24 hours by default. After the validity period expires, the verification code is automatically updated. You can also click to update the verification code.

**Step 2** Use the Service Expert app to authenticate the startup password.

1. Download and obtain the app installation package.

Log in to **Huawei AppGallery** (<https://a.vmall.com/>), search for **Service Expert**, and tap **Download** to obtain the installation package.

- a. Open the browser on the pad, enter [www.baidu.com](http://www.baidu.com) in the address box, search for **Huawei AppGallery**, select **Ordinary Download**, and tap **Save**.
  - b. Install the **Huawei AppGallery**. If the downloaded file exists in the drop-down list box, tap the file to install the **Huawei AppGallery**. If the downloaded file does not exist in the drop-down list box, choose **File > Local** on the desktop, find the **Download** folder, and tap the **Huawei AppGallery** installation package.
2. Install the app.

By default, the Android operating system forbids the installation of apps not obtained from the Android market. Therefore, before installing the app, set the mobile phone so that it allows the installation of apps from unknown sources.

Tap the app installation file for installation. After the installation is complete,



check that the app icon is displayed on the home screen of the mobile phone or pad.

3. Hold down the SW button on the ECC800-Pro for less than 3s to enable the WiFi function.

 **NOTE**

- The initial password is **Changeme** after WiFi is enabled. The initial password is valid only when you press the button for the first time to enable WiFi after delivery. If you enable WiFi on the WebUI, there is no default password.
  - After the WiFi function is enabled, the password for a mobile phone to connect to the WiFi network is **Changeme**. When you log in to the app using a pad, the system prompts you to change the password.
  - After you disable the WiFi hotspot function on the WebUI and press the button again, the WiFi function is still enabled. In this case, the WiFi password is the one you changed last time.
  - The WiFi function is disabled by default. If you need to enable the WiFi function, change the WiFi password to ensure connection security.
  - If a password is used for a long time, it may be stolen or cracked. The longer it is used, the higher the risk of theft and cracking. Change the WiFi password once half a year.
4. Use the Service Expert app to authenticate the startup password.
- a. Open the mobile phone app or pad app, and log in to the FusionModule800 device login page using the administrator account.  
Ensure that the IP address is **192.168.245.10**, the default administrator name is **admin**, and the default password is **Changeme**.
  - b. If the message displayed on the page is changed from "Initial startup password authentication" to "Activated", the startup password authentication is complete.

 **NOTE**

- After the first login, change the password in time to ensure system access security.
- When the mobile phone app connects to the monitoring system, the WiFi function of the monitoring system is disabled by default. Before connecting the mobile phone app to the monitoring system, enable the WiFi function on the WebUI. For security, you are advised to disable the WiFi function when the app is not in use.
- If a password is used for a long time, it may be stolen or cracked. The longer it is used, the higher the risk of theft and cracking. Change the password once three months.
- You are advised to use a mobile phone that has not been rooted to reduce the risk of information leakage.
- It is recommended that you use different user names to log in to both the ECC800-Pro WebUI and app at the same time. If you use the same user name to log in to the WebUI and app at the same time, either of them will be forcibly logged out.
- The iDCService app supports only the Android system.
- The iDCService app is available only in Chinese.

----End

## 5.3.4 How Can I Set the Date and Time?

### Procedure

- Step 1** Choose **System Settings > System Parameters > Time**.
- Step 2** Set the time zone, date, and time, or click **Obtain local time**. Then, click **Submit**.
- Step 3** (Optional) If you want to use the NTP server for time synchronization, select **NTP server sync**. Enter **NTP primary server IP**, **Whether the NTP master server is authenticated**, **Key ID**, and **Key**, and click **Test** to check whether the test is successful. Enter **NTP backup server IP**, **Whether the NTP backup server is authenticated**, **Key ID**, and **Key**, and click **Test** to check whether the test is successful. Enter **Port number** and **Sync interval (min)**, and click **Submit**.

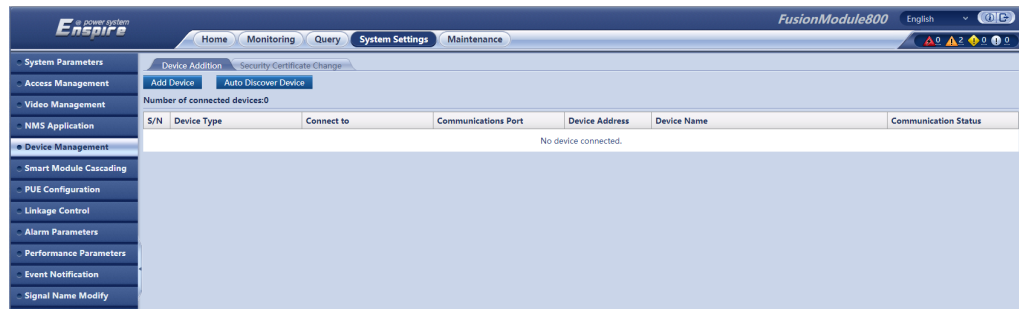
----End

## 5.3.5 Adding a Southbound Device

### Procedure

- Step 1** Choose **System Settings > Device Management > Add Device**.
- Step 2** After you add a device, date, and time based on the site requirements or click **Auto Discover Device**, the details about the device connected to the smart module are displayed.

Figure 5-7 Adding a device



----End

### 5.3.6 Creating a Micro-module Plan View

#### Procedure

- Step 1** Choose **Home > Plan View**, create a micro-module in **Micro-Module View** and set the layout and device quantity based on the actual micro-module scenario.
- Step 2** Drag the icons of registered devices and devices on the cabinet list to appropriate positions in the layout to create a micro-module plan view.

----End

### 5.3.7 Adding a UPS2000G

#### Prerequisites

One end of the straight-through cable has been connected to the RS485 port on the UPS2000G, and the other end has been connected to the COM4 port on the ECC800-Pro.

#### Procedure

- Step 1** Add a UPS2000G-L.
  1. Log in to the ECC800-Pro WebUI as an administrator.
  2. Add a UPS2000G-L.

Table 5-5 Adding a UPS2000G-L

Path	Parameter	Setting
Choose <b>System Settings &gt; Device Management</b> and click <b>Add Device</b> . The parameters for adding	Device attribute	Select <b>UPS</b> from the drop-down list box.
	Device Type	Select <b>UPS2000G-L</b> from the drop-down list box.
	Connect To	Select <b>ECC800</b> from the drop-down list box.



Path	Parameter	Setting
devices are displayed.	Communications Port	Select <b>COM4</b> from the drop-down list box. <b>NOTE</b> The setting example indicates that the UPS2000G is connected to the COM4 port on the ECC800-Pro. If the UPS2000G is connected to another port, enter the number of the connected port.
	Device Address	In this example, <b>Device Address</b> is set to <b>1</b> . During actual configuration, set the device address for the UPS2000G-L based on the actual situation.

3. Click **Test Connect** to check whether the UPS2000G-L connects to the ECC800-Pro properly.
  - If the connection succeeds, click **Confirm**. The connected devices are displayed in the **Number of connected devices** list.
  - If the connection fails, check whether the device is properly connected to the ECC800-Pro, whether the device and ECC800-Pro are running properly, and whether the parameter settings are consistent with the device parameters.

----End

## 5.3.8 Commissioning Sensors

### 5.3.8.1 Setting and Adding a Smoke Detector (Connected to an AI/DI Port on the ECC800-Pro)

If a smoke detector is installed, perform the following steps to configure it.

#### Context

If the detector is prefabricated, only check its settings.

#### Procedure

- Step 1** Set smoke detector parameters.
1. Log in to the ECC800-Pro WebUI as an administrator.
  2. Choose **System Settings > Signal Name Modify**. The **Batch Signal Configuration** tab page is displayed.
  3. Set **Device type** to **ECC800**, set **Device name** to **ECC800**, and click **OK**.
  4. On the query result tab page, set the new signal name of **AI/DI\_1** to **Smoke** and click **Submit**.
  5. Choose **Monitoring > System > ECC800 > Running Parameters > AI/DI\_1 Port Settings**.
  6. Set **Smoke sensor** to **Enable** and click **Submit**.

**Step 2** Check the monitoring functions of smoke detector.

**Table 5-6** Commissioning the detector

Check Method	Normal Connection Status	Alarm Clearance Method
Simulate a smoky environment under the smoke detector.	<b>Smoke DI alarm</b> is displayed on the active alarm page of the app or WebUI.	Disconnect the smoke detector cable and then reconnect it to clear the alarm.

----End

### 5.3.8.2 Commissioning a T/H Sensor

#### Prerequisites

One end of the straight-through cable has been connected to the RS485\_IN port on the T/H sensor, and the other end has been connected to the COM port on the ECC800-Pro.

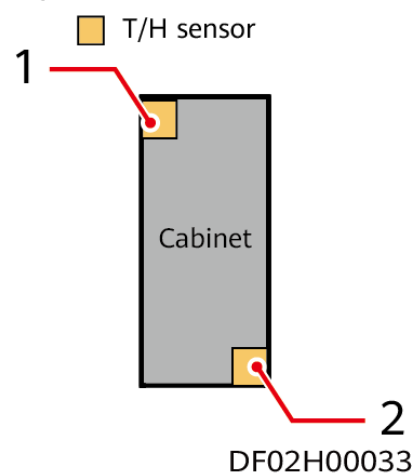
#### Procedure

**Step 1** Set a device address for the T/H sensor.

Operate the DIP switch on the T/H sensor to set the device address for the sensor.

Toggle switches 1 to 6 specify the device address in binary mode. **ON** indicates **1**, and **OFF** indicates **0**.

**Figure 5-8** DIP switch definitions for T/H sensors



#### NOTE

Numbers 1 and 2 indicate the DIP switch settings of T/H sensors. The DIP switch of the T/H sensor on the front door is set to 2, and that of the T/H sensor on the rear door is set to 1.

**Table 5-7** Setting device addresses

Address	Toggle Switch 1	Toggle Switch 2	Toggle Switch 3	Toggle Switch 4	Toggle Switch 5	Toggle Switch 6
1	ON	OFF	OFF	OFF	OFF	OFF
2	OFF	ON	OFF	OFF	OFF	OFF

**Step 2** Add a T/H sensor.

1. Log in to the ECC800-Pro WebUI as an administrator.
2. Add a T/H sensor.

**Table 5-8** Adding a T/H sensor

Path	Parameter	Setting
Choose <b>System Settings &gt; Device Management</b> and click <b>Add Device</b> .	Device Attribute	Select <b>Sensor</b> from the drop-down list box.
	Device Type	Select <b>T/H sensor</b> from the drop-down list box.
	Connect To	Select <b>ECC800</b> from the drop-down list box.
	Communications Port	Select <b>COM1</b> from the drop-down list box.
	Device Address	In this example, <b>Device Address</b> is set to <b>1</b> . During actual configuration, set the device address for the T/H sensor based on the actual situation.

3. Click **Test Connect** to check whether the T/H sensor connects to the ECC800-Pro properly.
  - If the connection is normal, click **Confirm**. The connected devices are displayed in the **Number of connected devices** list.
  - If the connection is abnormal, check whether the device is properly connected to the ECC800-Pro, whether the device and the ECC800-Pro are running properly, and whether the parameter settings are consistent with the device parameters.

**Step 3** Check the function of the T/H sensor.

**Table 5-9** Function check

Check Method	Normal Connection Status
Check the running information about the T/H sensor on the WebUI.	Choose <b>Monitoring &gt; Aisle &gt; T/H Sensor Group &gt; T/H Sensor n &gt; Running Info</b> , and view the current cabinet temperature and humidity.

Check Method	Normal Connection Status
Set T/H sensor alarm thresholds.	<p>Choose <b>Monitoring &gt; Aisle &gt; T/H Sensor Group &gt; T/H Sensor n &gt; Running Parameters</b> and set <b>High temperature alarm threshold, Low temperature alarm threshold, High humidity alarm threshold, and Low humidity alarm threshold</b> as required.</p> <p><b>NOTE</b> The default values of <b>High temperature alarm threshold, Low temperature alarm threshold, High humidity alarm threshold, and Low humidity alarm threshold</b> are <b>35.0°C, 5.0°C, 85.0% RH, and 15.0% RH</b> respectively.</p>

----End

### 5.3.8.3 Commissioning the WLDS900 Water Sensor

If a water sensor is installed, perform the following steps to configure it.

#### Prerequisites

One end of the straight-through cable has been connected to the RJ45 port on the WLDS900 water sensor, and the other end has been connected to the AI/DI\_2 port on the ECC800-Pro.

#### Context

- To use the AI/DI sensor, enable the corresponding AI/DI port and name the sensor. The specific alarm then can be reported.
- If the sensor is prefabricated, only check its settings.
- The actual value prevails. Only the method of the parameter settings is described.

#### Procedure

**Step 1** Set water sensor parameters.

 **NOTE**

The default alarm severity of the AI/DI port is **Minor**. If you want to change the alarm severity, see **How Should I Configure Alarm Parameters**.

1. Log in to the ECC800-Pro WebUI as an administrator.
2. Choose **System Settings > Signal Name Modify**. The **Batch Signal Configuration** tab page is displayed.
3. Set **Device type** to **ECC800**, set **Device name** to **ECC800**, and click **OK**.
4. On the query result tab page, set the new signal name of **AI/DI\_2** to **Leak** and click **Submit**.
5. Choose **Monitoring > System > ECC800 > Running Parameters > AI/DI\_2 Port Settings**.

6. Set **Leak sensor** to **Enable** and click **Submit**.
7. Confirm that **Leak sensor type** is automatically identified as **Leak sensor(Rope)**.

**Step 2** Check the function of the water sensor.

Check Method	Normal Connection Status	Alarm Clearance Method
Immerse the water detection cable in water.	<b>Leak DI alarm</b> is displayed on the active alarm page of the app or WebUI.	Wipe dry the water detection cable. The alarm disappears automatically.

----End

### 5.3.8.4 Commissioning the Electrode Water Sensor

If a water sensor is installed, perform the following steps to configure it.

#### Prerequisites

One end of the network cable has been stripped, core wires 7 and 8 have been connected to the cable delivered with the electrode water sensor, and the other end of the network cable has been connected to the AI/DI port on the rack environment unit.

#### Context

- To use the AI/DI sensor, enable the corresponding AI/DI port and name the sensor. The specific alarm then can be reported.
- If the sensor is prefabricated, only check its settings.
- The actual value prevails. Only the method of the parameter settings is described.

#### Procedure

**Step 1** Set water sensor parameters.

##### NOTE

The following describes how to connect a water sensor to the AI/DI\_2 port on the ECC800-Pro.

1. Log in to the ECC800-Pro WebUI as an administrator.
2. Choose **System Settings > Signal Name Modify**. The **Batch Signal Configuration** page is displayed.
3. Set **Device type** to **ECC800**, set **Device name** to **ECC800**, and click **OK**.
4. On the query result tab page, set the new signal name of **AI/DI\_2** to **Leak** and click **Submit**.
5. Choose **Monitoring > System > ECC800 > Running Parameters > AI/DI\_2 Port Settings**.

6. Set **Leak sensor** to **Enable** and click **Submit**.
7. Set **Leak sensor type** to **Leak sensor(Electroc)** and click **Submit**.

**Step 2** Check functions of water sensors.

**Table 5-10** Function check

Check Method	Normal Connection Status	Alarm Clearance Method
Immerse the two contacts of the electrode water sensor in water.	<b>Leak DI alarm</b> is generated on the active alarm screen of the app or on the WebUI.	Wipe dry the two contacts of the water sensor. The alarm disappears automatically.

----End

### 5.3.9 Commissioning a Cabinet Electronic Clasp Lock

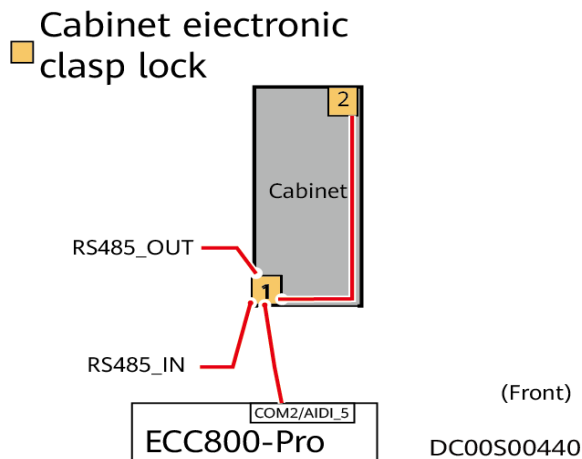
#### Prerequisites

The cabinet door can be opened and closed properly. If the cabinet door cannot be opened and closed properly, adjust the position of the cabinet electronic clasp lock by performing steps 1 and 2.

#### Procedure

- Step 1** (Optional) Check whether the cabinet door lock is leveled to 2000 (+3) mm. If not, adjust it.
- Step 2** (Optional) If the cabinet door still cannot be opened after step 1 is performed, adjust the position of the cabinet electronic clasp lock by using the slotted holes until the cabinet door can be opened and closed properly.
- Step 3** Set device addresses for cabinet electronic clasp locks.
  - A cabinet electronic clasp lock is installed at the front and rear doors of the cabinet respectively. The address for the cabinet electronic clasp lock on the front door is an odd number, and that for the cabinet electronic clasp lock on the rear door is an even number.
  - Set a device address for a cabinet electronic clasp lock by operating the toggle switch on the cabinet electronic clasp lock. Toggle switches 1 to 6 specify the device address in binary mode. **ON** indicates **1**, and **OFF** indicates **0**.

**Figure 5-9** Toggle switch addresses of the cabinet electronic locks



**NOTICE**

The number indicates the DIP switch setting of the electronic clasp lock.

**Table 5-11** Setting device addresses

Address	Toggle Switch 1	Toggle Switch 2	Toggle Switch 3	Toggle Switch 4	Toggle Switch 5	Toggle Switch 6
1	ON	OFF	OFF	OFF	OFF	OFF
2	OFF	ON	OFF	OFF	OFF	OFF

**Step 4** Add the cabinet electronic clasp locks.

1. Log in to the ECC800-Pro WebUI as an administrator.
2. Create a cabinet view in **Smart Module View** on the home page.
3. Add a cabinet electronic clasp lock.

**Table 5-12** Adding a cabinet electronic clasp lock

Path	Parameter	Setting
Choose <b>System Settings</b> > <b>Device Management</b> and click <b>Add Device</b> .	Device Attribute	Cabinet Electronic Clasp Lock
	Device Type	Cabinet Electronic Clasp Lock
	Connect To	ECC800-Pro
	Communications Port	COM2
	Device Address	Enter the actual device address of the cabinet electronic clasp lock.

4. Click **Test Connect** to check whether the connection between the cabinet electronic clasp lock and the ECC800-Pro is normal.
  - If the connection is normal, click **Confirm**. The connected devices are displayed in the **Number of connected devices** list.
  - If the connection is abnormal, check whether the device is properly connected to the ECC800-Pro, whether the device and the ECC800-Pro are running properly, and whether the parameter settings are consistent with the device parameters.
5. Repeat [Step 4.3](#) and [Step 4.4](#) to connect other cabinet electronic clasp locks.

**Step 5** Commission the cabinet electronic clasp locks.

**Table 5-13** Function check

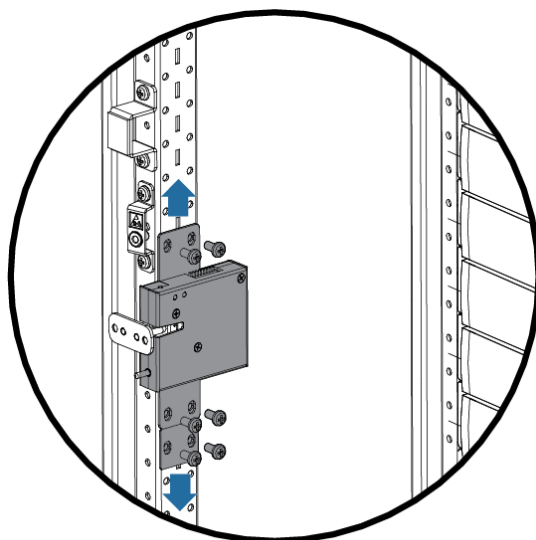
Function	Path		Operation
View cabinet electronic clasp lock information	Choose <b>Monitoring &gt; Cabinet &gt; Global cabinet &gt; Cabinet Electronic Clasp Lockn.</b>	Click the <b>Running Info</b> tab.	View the running information about cabinet electronic clasp lock 1 on the WebUI.
Change the cabinet electronic clasp lock name.		Click the <b>Running Parameters</b> tab.	Change the cabinet electronic clasp lock name.
Remotely open a cabinet electronic clasp lock		Click the <b>Controls</b> tab.	Select <b>Open the door on Controls</b> , and click <b>Submit</b> to remotely open the door.
Open cabinet electronic clasp locks in batches	Choose <b>Monitoring &gt; Cabinet</b> and click the <b>Controls</b> tab.		Select <b>Open front door</b> or <b>Open back door</b> from the <b>Open the door</b> drop-down list box, select the setting, and click <b>Submit</b> . The cabinet electronic clasp locks unlock the doors in batches based on the signal value.
a: Cabinet electronic clasp lock 1 is used as an example.			

**Step 6** When closing the door, rotate the lock handle vertically downward. If the door cannot be opened or closed properly, locate the fault.

1. Check whether there is friction between the lock tongue and the cabinet electronic clasp lock. If so, adjust the installation position of the clasp lock.



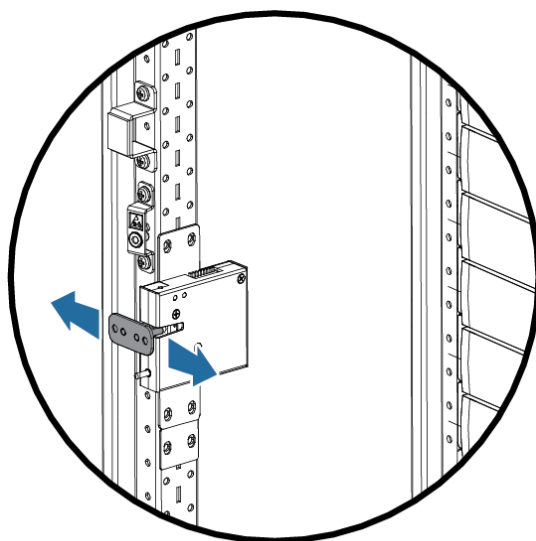
**Figure 5-10** Adjusting the position of a clasp lock



DC01H00356

2. Check whether there is interference between the lock tongue and the cabinet column. If so, adjust the installation position of the lock tongue.

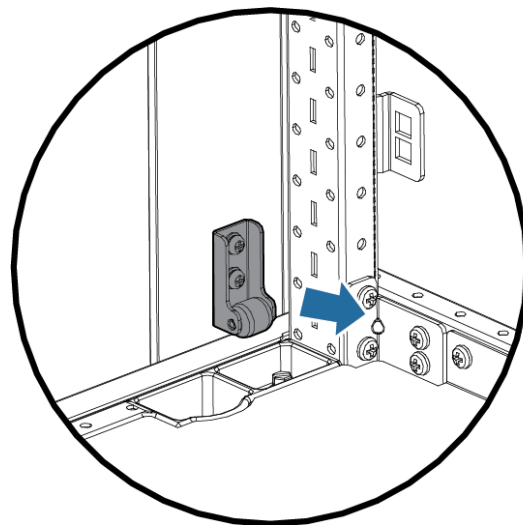
**Figure 5-11** Adjusting the position of a lock tongue



DC01H00357

3. Check whether there is interference between the castors and the door sill at the bottom of the cabinet. If so, remove the fasteners that secure the castors.

Figure 5-12 Removing the fastener



DC01H00355

#### NOTICE

If the door still cannot be opened or closed properly, check the following items:

- Whether cables are connected correctly
- Whether the DIP switch setting is correct

----End

### 5.3.10 Configuring Event Notification

You can set alarm notification by email or SMS as required. Information about a maximum of 20 users who will receive alarm notification can be displayed.

#### Prerequisites

To implement alarm notification by SMS, the following conditions must be met:

- The ECC800-Pro is configured with a 4G module and supports 2G/3G/4G SIM card access.

#### NOTE

1. The ECC800-Pro supports only SMS notification service but not data service by using the 4G module.
2. China: 2G and 4G networks support China Unicom or China Mobile SIM cards, and 3G networks support only China Unicom SIM cards.
3. Outside China: Select SIM cards according to the following wireless modes and frequency bands:
  - 4G: wireless mode (FDD-LTE and TDD-LTE), coverage frequency band (B1, B3, B5, B7, B8, and B20)
  - 3G: wireless mode (WCDMA), coverage frequency bands (B38, B40, and B41)
  - 2G: wireless mode (GSM), coverage frequency band (900/1800 MHz)

- The ECC800-Pro is connected to a network with an email server through a WAN port. Both the Internet and local area network (LAN) are supported.

## Procedure

**Step 1** Choose **System Settings > Event Notification**.

**Step 2** Set related outbox parameters.

1. Set related parameters in the **Outbox Settings** area on the **Mailbox Settings** page. If the address type of the outbox is **Domain name**, choose **System Settings > System Parameters**, and set related parameters in the **DNS Server Address** area on the **Monitor IP** page.

### NOTE

The DNS server address is provided by the local network operator.

2. Click **Test** to check the email sending. If an email fails to be sent, check the outbox settings and **DNS Server Address**. If the email is sent successfully, click **Submit**.

### NOTICE

If **Test email sending failed** is displayed, check whether the receiver's email server requires CA certificate verification. If it is required, download the CA certificate from the receiver's email website and upload it in the **Mailbox Certificate** area.

**Figure 5-13** Email setting page

The screenshot displays the 'Mailbox Settings' configuration page. It is divided into three main sections:

- Outbox Settings:** Includes fields for Address type (set to IP address), Mailbox server IP address, Encryption mode (set to TLS), SMTP port (set to 587), Outbox (with a placeholder), User authentication for mailbox server login (set to Enable), User name, and Password. Below these fields are buttons for 'Test', 'Submit', and 'Clear'.
- Mailbox Certificate:** Features an 'Upload CA certificate file' section with a 'Select File' button, an 'Upload' button, and a note: 'Upload files that are less than 1MB.' A 'Submit' button is located below.
- Email Receiving Settings:** Contains a table with columns for S/N, Mailbox Address, and Mailbox Test. One entry is visible with S/N '1' and Mailbox Address 'xj\*\*\*\*\*u@huawei.com'. A 'Test' button is positioned to the right of the entry. Below the table are 'Add', 'Modify', and 'Delete' buttons.

### NOTE

The following email addresses are for reference only (the actual parameters apply) and are used only for configuring the email function.

**Table 5-14** Main parameters on the outbox configuration page

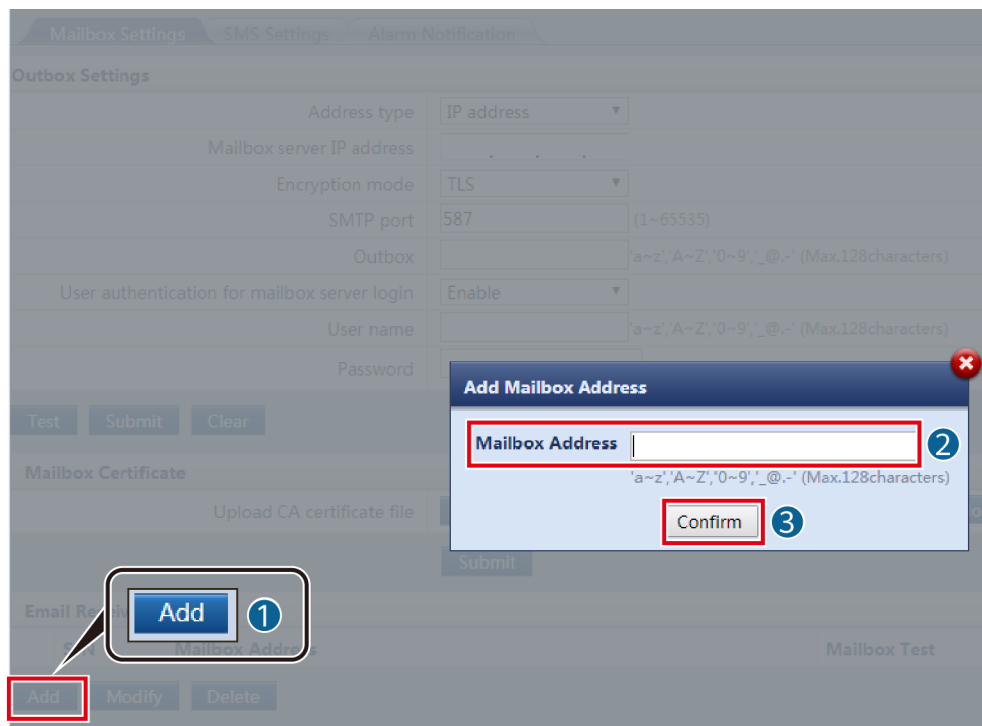
Email Type	Email Server Domain Name	Mailbox Server IP Address	Encryption Mode and SMTP port	Remarks
Sina Mail	smtp.sina.com	How to obtain: 1. Click <b>Start</b> on the PC, enter <b>cmd</b> in <b>Running</b> area, and press <b>Enter</b> to access the administrator page. 2. Enter <b>ping email server domain name</b> at the position of the blinking cursor and press Enter to obtain email server IP addresses.	Non-encryption: 25	<ul style="list-style-type: none"> <li>The email server must comply with the standard SMTP protocol to ensure that the email sending and receiving functions are normal.</li> <li>Enter the email client authorization password at <b>Password</b> for 163 Mail, 126 Mail, and QQ Mail.</li> <li>If the email type is not in the list, set parameters by referring to the help information of the email type.</li> </ul>
163 Mail	smtp.163.com		Non-encryption: 25; SSL encryption: 465	
126 Mail	smtp.126.com		Non-encryption: 25; SSL encryption: 465	
QQ Mail	smtp.QQ.com		SSL encryption: 465	
Sohu Mail	smtp.sohu.com		Non-encryption: 25	
139 Mail	smtp.139.com		Non-encryption: 25	
Hotmail	smtp-mail.outlook.com		TLS encryption: 587	
189 Mail	smtp.189.com		Non-encryption: 25	

**Step 3** Add an email address to receive emails.

 **NOTE**

The email address is used only for configuring the email function and is not used for other purposes. The address is encrypted during transmission in the ECC800-Pro to ensure that the personal data of users is fully protected.

Figure 5-14 Adding an email address to receive emails



DM25H00130

**NOTE**

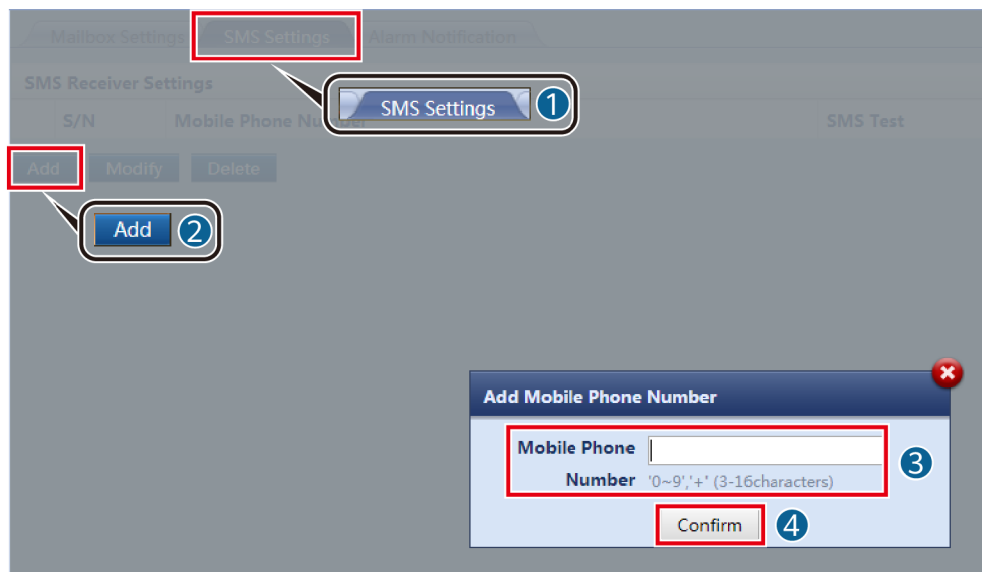
Click **Test** to check whether the added mailbox is available. If it is available, **Successfully to send the test email.** is displayed. If it is unavailable, **Failed to send the test email.** is displayed. Check whether the receiver's mailbox parameters for receiving emails are correctly set.

**Step 4** Add a mobile number to receive event notifications.

**NOTE**

The mobile phone number is used only for configuring the SMS function and is not used for other purposes. The phone number is encrypted during transmission in the ECC800-Pro to ensure that the personal data of users is fully protected.

Figure 5-15 Adding a mobile number



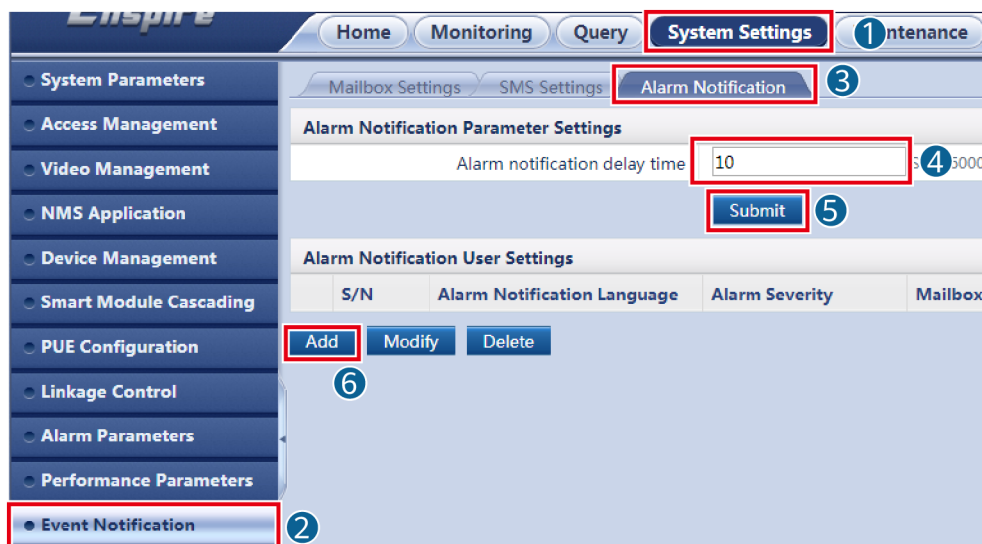
DM25H00131

NOTE

Click **Test** to check whether the added mobile phone number is available. If it is available, **Successfully to send the test short message.** is displayed. If it is unavailable, **Failed to send the test short message.** is displayed. Check whether the mobile phone number is correctly set.

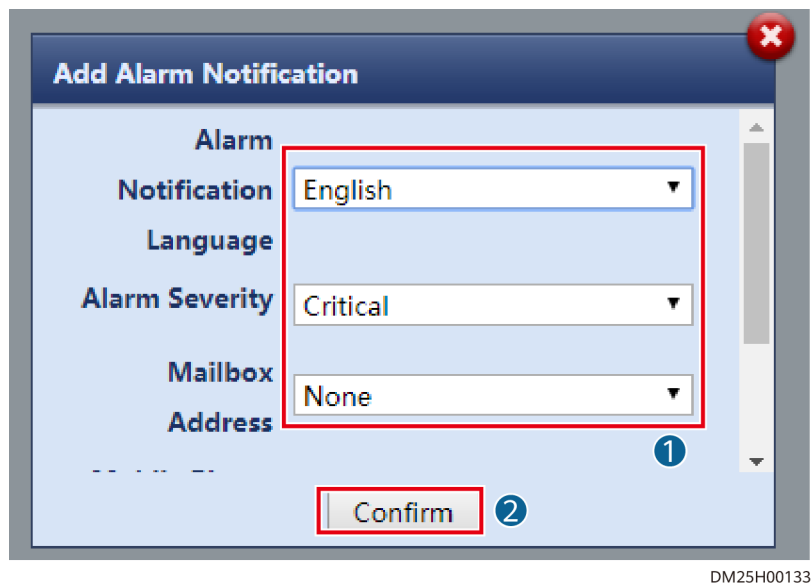
- Step 5** Set the alarm notification delay parameter and the new alarm notification parameter.

Figure 5-16 Setting the alarm notification parameters



DM25H00132

Figure 5-17 Adding alarm notification



**NOTICE**

**Mailbox Address** in **Alarm Notification** can be selected after it is added in **Mailbox Settings**. **Mobile Phone Number** can be selected after it is added in **SMS Settings**.

**Step 6** Click **Confirm** to access the re-authentication page. Enter **Login password** and click **Submit**.

----End

**Follow-up Procedure**

To modify or delete the email parameter settings, click **Modify** or **Delete**.

**5.3.11 Video Management**

**5.3.11.1 Preparing Documentation**

Before commissioning a camera, prepare the following documents in addition to this document.

**Table 5-15** Documentation for commissioning preparation

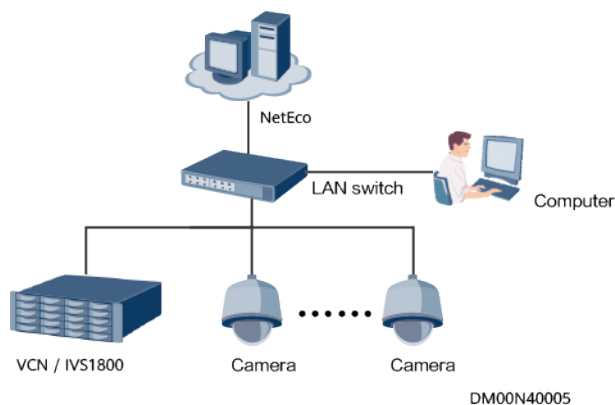
Component	Document
C3220	Huawei C Series SDC 8.0.1 Product Documentation
VCN510	VCN510&VCN520&VCN540 Product Documentation
IVS1800	IVS1800 8.1.0 Product Documentation

## 5.3.11.2 Networking Scenario

### LAN Switch Networking Scenario

If there are multiple VCNs or IVS1800s for multiple smart modules, you are advised to evenly distribute the cameras to each VCN or IVS1800.

**Figure 5-18** Camera + VCN or IVS1800 connecting to the LAN switch



## 5.3.11.3 Commissioning Cameras (LAN Switch Networking Scenario)

### 5.3.11.3.1 Commissioning a C3220 Camera

#### Prerequisites

If multiple cameras are accessed, retain the connection of one camera and disconnect connections from other cameras. After commissioning the connected camera, commission other cameras in the same way.

#### Procedure

##### Step 1 Log in to the camera WebUI.

1. Configure the PC IP address and the camera IP address in the same network segment. Enter the camera IP address (192.168.0.120 by default) in the address bar of the Internet Explorer and press **Enter**.

#### NOTE

The following lists the requirements for the operating system and browser of the camera WebUI:

- Supports Windows 7: Internet Explorer 10/11, Chrome 38+, FireFox 35-51
  - Supports Windows 8: Internet Explorer 10/11, Chrome 38+, FireFox 35-51
  - Supports Windows 10: Internet Explorer 11, Chrome 38+, FireFox 35-51
  - The Internet Explorer tab plugin needs to be installed for Google Chrome 45 and later versions.
  - Only 32-bit browsers are supported.
2. Enter the preset user name **admin** and the preset password **HuaWei123**, and click **Log In**.



 **NOTE**

You need to set Internet Explorer before accessing the camera WebUI for the first time.

**Table 5-16** Internet Explorer settings

Settings	Procedure
Disable the proxy server.	<ol style="list-style-type: none"> <li>1. Choose <b>Tools &gt; Internet Options</b>. The <b>Internet Options</b> dialog box is displayed.</li> <li>2. Click the <b>Connections</b> tab.</li> <li>3. Click <b>LAN Settings</b>.</li> <li>4. Deselect <b>Use a proxy for your LAN</b>.</li> <li>5. Click <b>OK</b>.</li> </ol>
Enable the ActiveX controls and plug-ins or set them to the prompt mode.	<ol style="list-style-type: none"> <li>1. Choose <b>Tools &gt; Internet Options</b>. The <b>Internet Options</b> dialog box is displayed.</li> <li>2. Click the <b>Security</b> tab.</li> <li>3. Select <b>Internet</b>.</li> <li>4. Click <b>Custom level</b>. The <b>Security Settings-Internet Zone</b> dialog box is displayed.</li> <li>5. Set <b>Automatic prompting for ActiveX controls</b> to <b>Enable</b>, and set <b>Download unsigned ActiveX controls</b> and <b>Initialize and script ActiveX controls not marked as safe for scripting</b> to <b>Prompt</b>.</li> <li>6. Click <b>OK</b>.</li> </ol>
Enable TLS 1.1 or TLS 1.2.	<p><b>NOTE</b> You must enable TLS 1.1 or TLS 1.2 when the HTTPS protocol is used to access the camera. Otherwise, the camera WebUI cannot be opened.</p> <ol style="list-style-type: none"> <li>1. Choose <b>Tools &gt; Internet Options</b>. The <b>Internet Options</b> dialog box is displayed.</li> <li>2. Click the <b>Advanced</b> tab.</li> <li>3. Select <b>Use TLS 1.1</b> or <b>Use TLS 1.2</b>.</li> <li>4. Click <b>OK</b>.</li> </ol>

Settings	Procedure
Set <b>Use Pop-up Blocker</b> to <b>Disable</b> .	<ol style="list-style-type: none"> <li>1. Choose <b>Tools &gt; Internet Options</b>. The <b>Internet Options</b> dialog box is displayed.</li> <li>2. Click the <b>Security</b> tab.</li> <li>3. Select <b>Internet</b>.</li> <li>4. Click <b>Custom level</b>. The <b>Security Settings-Internet Zone</b> dialog box is displayed.</li> <li>5. Set <b>Use Pop-up Blocker</b> to <b>Disable</b>.</li> <li>6. Click <b>OK</b>.</li> </ol>

**Step 2** Commission cameras and set parameters for them. For details, see the delivered documents.

1. Preview the site situation in real time and check the camera coverage through videos. Adjust the lens if necessary.
2. On the **View** tab page, click the **Network/Time** tab to access the **Network/Time** tab page.

**Figure 5-19** Setting the IP address

IPv4 address assignment

IPv4 address

IPv4 subnet mask

IPv4 gateway

Primary DNS

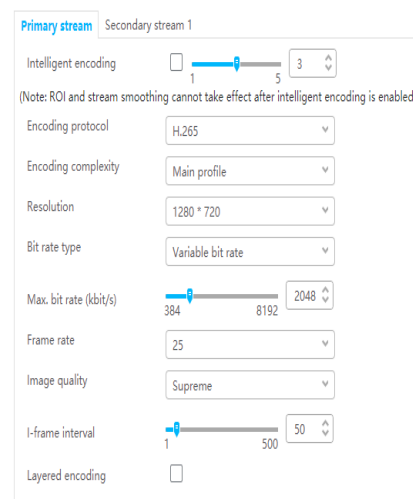
Secondary DNS

**Table 5-17** IP address parameters

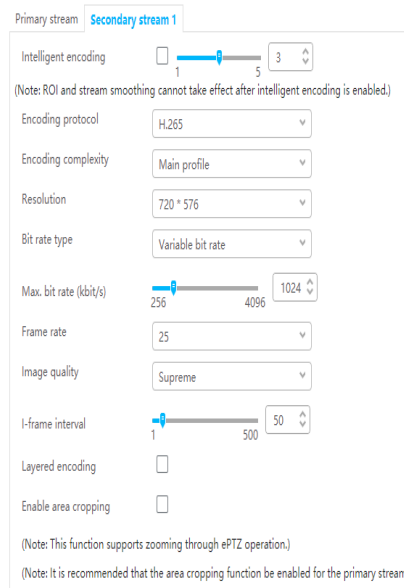
Parameter	Description
IPv4 address assignment	Method for obtaining the IP address. The options are <b>Obtain IP address automatically</b> and <b>Use the following IP address</b> . The default value is <b>Obtain IP address automatically</b> .
IPv4 address	Camera IP address. This parameter is available only when <b>IPv4 address assignment</b> is set to <b>Use the following IP address</b> . Enter the planned IP address, for example, <b>192.168.1.161</b> . IP addresses starting with 127 are invalid. You must enter an IP address starting with a value that ranges from 1 to 223.
IPv4 gateway	Gateway IP address of the network where the camera is located. The default value is <b>192.168.0.1</b> .
IPv4 subnet mask	Subnet mask of the network where the camera is located. The default value is <b>255.255.255.0</b> .
Primary DNS	Primary DNS IP address. The default value is <b>0.0.0.0</b> .
Secondary DNS	Secondary DNS IP address. The default value is <b>0.0.0.0</b> .

- On the **View** tab page, click the **General** tab to access the **General** tab page. Select **Video** and set the parameters, as shown in the following figures.

**Figure 5-20** Setting primary stream parameters



**Figure 5-21** Setting secondary stream 1 parameters



**Table 5-18** Video stream parameters

Parameter	Description
Primary stream/ Secondary stream	<p>Set the stream type based on the site requirements.</p> <ul style="list-style-type: none"> <li>– <b>Primary stream:</b> The primary streams feature high bit rate, definition, and bandwidth usage. They are applicable to local storage.</li> <li>– <b>Secondary stream:</b> The secondary streams provide smooth video, occupy small bandwidth, and are applicable to data transmission over low-bandwidth networks.</li> </ul> <p><b>NOTE</b> SD card recording supports only primary streams.</p>
Intelligent encoding	<p>After intelligent encoding is enabled, a camera can automatically adapt to scenarios to reduce the bit rate and save the storage space.</p> <p>A higher intelligent encoding level indicates more significant reduction of the bit rate, which however may lead to image quality deterioration.</p>
Slice	<p>This parameter is available only when you set <b>Encoding protocol</b> to <b>H.264</b>.</p> <p>Multi-slice encoding indicates that video streams are divided into multiple segments. Each segment forms a slice. The encoding process of each slice is independent of each other. Therefore, the camera can encode and decode multiple slices in parallel, improving encoding and decoding performance. This parameter is selected by default.</p>

Parameter	Description
Encoding protocol	<p>Set the coding protocol based on the site requirements. The options are as follows:</p> <ul style="list-style-type: none"> <li>- <b>H.264:</b> The H.264 protocol requires relatively small bandwidth to ensure video quality.</li> <li>- <b>MJPEG:</b> The MJPEG protocol decodes and displays each frame independently without referring to the previous and next frames. This protocol has a small compression ratio and requires large bandwidth to ensure video quality. This protocol is suitable for video editing.</li> <li>- <b>H.265:</b> The H.265 protocol is bandwidth-conserving compared with the H.264 protocol.</li> </ul>
Encoding complexity	<p>The options of H.264 profiles include <b>Base profile</b>, <b>Main profile</b>, and <b>High profile</b>. Among these profiles, the baseline profile has the lowest encoding compression performance and lowest requirements on hardware decoding performance, while the high profile has the highest.</p>
Resolution	<p>A higher resolution indicates clearer images and higher bandwidth consumption.</p>
Bit rate type	<p>This parameter is available only when you set <b>Encoding protocol</b> to <b>H.264</b> or <b>H.265</b>.</p> <p>The bit rate is measured by data bits transmitted in a unit of time.</p> <ul style="list-style-type: none"> <li>- <b>Variable bit rate:</b> The bit rate varies depending on the image complexity to ensure the clarity of images with great dynamic changes. The bit rate is low if the image is simple or static. The variable bit rate is recommended.</li> <li>- <b>Constant bit rate:</b> The constant bit rate remains the same. The upper limit of the instantaneous bit rate is set to 110%. If the bit rate is incorrectly configured for images with great dynamic changes, the images will be unclear.</li> </ul>
Max. bit rate	<p>This parameter is available only when you set <b>Bit rate type</b> to <b>Variable bit rate</b>.</p> <p>The bit rate range depends on the selected resolution.</p>
Bit rate value	<p>Average bit rate when <b>Bit rate type</b> is set to <b>Constant bit rate</b>.</p> <p>The bit rate range depends on the selected resolution.</p>

Parameter	Description
Bit rate control mode	This parameter is available only when you set <b>Bit rate type</b> to <b>Constant bit rate</b> . The options are as follows: <ul style="list-style-type: none"> <li>- <b>Frame rate priority</b>: Ensure the smoothness of the video image.</li> <li>- <b>Image quality priority</b>: Ensure the quality of the video image.</li> </ul>
Frame rate	The frame rate is measured by the number of frames displayed in a second. A higher frame rate indicates clearer and smoother images and higher bandwidth consumption.
Image quality	This parameter is available only when you set <b>Encoding protocol</b> to <b>H.264</b> or <b>H.265</b> and <b>Bit rate type</b> to <b>Variable bit rate</b> . Better image quality requires higher bandwidth. Therefore, select proper image quality based on the site requirements.
I-frame interval	This parameter is available only when you set <b>Encoding protocol</b> to <b>H.264</b> or <b>H.265</b> . An I frame is an intra-coded frame that represents a fixed image independent of other picture types. Each group of pictures (GOP) begins with this type of frame. A smaller I-frame interval indicates better video quality and higher bandwidth consumption.
Layered encoding	This parameter is available only when you set <b>Encoding protocol</b> to <b>H.264</b> or <b>H.265</b> . To enable layered encoding, select <b>Layered encoding</b> .
JPEG quality	This parameter is available only when you set <b>Encoding protocol</b> to <b>MJPEG</b> . A larger value indicates higher image quality.

----End

## Follow-up Procedure

Commission other cameras by referring to this section.

### 5.3.11.3.2 Commissioning a C3220 Camera (SD Card Configured)

#### Context

If the VCN or IVS1800 is not configured and an SD card is chosen, perform the following procedure.

## Procedure

### Step 1 Log in to the Huawei camera WebUI.

1. Configure the PC IP address and the camera IP address in the same network segment. Enter the camera IP address (192.168.0.120 by default) in the address bar of the Internet Explorer and press **Enter**.
2. Enter the preset user name **admin** and the preset password **HuaWei123**, and click **Log In**.

### Step 2 For details about how to commission the camera and set parameters, see the documents delivered with the device or the documents obtained by referring to the "Preparing Documentation" section.

1. Preview the site situation in real time and check the camera coverage through videos. Adjust the lens if necessary.
2. Set **IPv4 address**, **IPv4 subnet mask**, and **IPv4 gateway address** to the planned values.

**Figure 5-22** Setting the IP address of the camera

IPv4 address assignment

IPv4 address

IPv4 subnet mask

IPv4 gateway

Primary DNS

Secondary DNS

3. Format the SD card.
  - a. Choose **Settings > System Configuration > Storage Management**.
  - b. The **Storage Management** page is displayed. Format the SD card.
4. Set the camera stream type and primary stream parameters. Path: **Settings > Video/Audio/Image > Video Settings**.

**Figure 5-23** Setting audio and video parameters

The screenshot shows a configuration interface with the following settings:

- Stream type: Primary, Secondary 1
- Mirror mode: Disable
- Full frame rate: 25Hz
- Watermark:
- Dynamic bit rate (kbit/s):  (Slider: 512 to 8192, value: 4096)
- Dynamic frame rate:  (value: 25)

**Primary stream** / Secondary stream 1

- Intelligent encoding:  (Slider: 1 to 5, value: 3)  
(Note: ROI and stream smoothing cannot take effect after intelligent encoding is enabled.)
- Encoding protocol: H.265
- Encoding complexity: Main profile
- Resolution: 1920 \* 1080
- Bit rate type: Variable bit rate
- Max. bit rate (kbit/s):  (Slider: 512 to 8192, value: 4096)
- Frame rate: 25
- Image quality: Supreme
- I-frame interval:  (Slider: 1 to 500, value: 50)
- Layered encoding:

**NOTE**

If longer-time video storage is required, set camera parameters according to the following table.

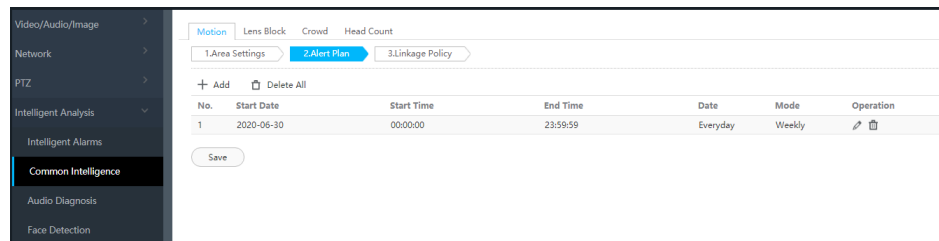
**Table 5-19** Camera configuration parameters

Condition				Result	
Encoding Protocol	Resolution	Frame Rate	I-Frame Interval	Minimum Bit Rate Required	Supported Video Storage Duration (h)
H.265	1080P	25	50	1 Mbit/s	66
H.264	1080P	25	50	1 Mbit/s	66
H.265	720P	25	50	0.8 Mbit/s	75
H.264	720P	25	50	1 Mbit/s	66
H.265	720P	25	50	0.6 Mbit/s	105
H.264	720P	25	50	0.8 Mbit/s	75



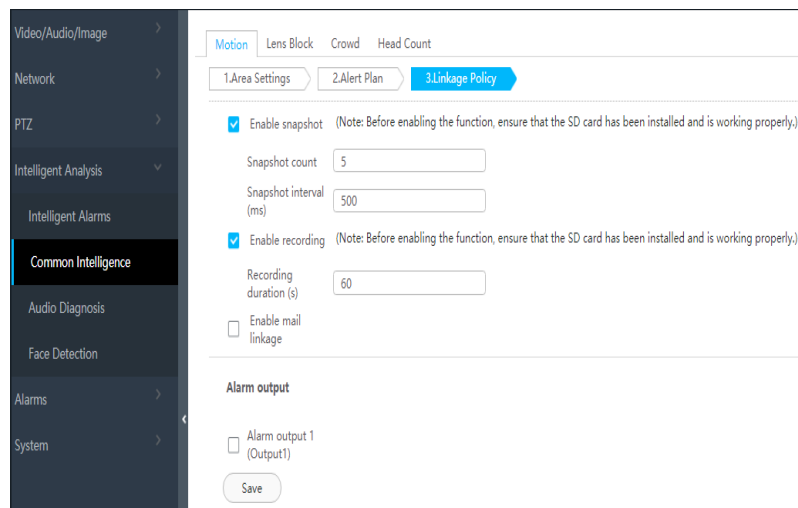
5. Choose **Settings > Intelligent Analysis > Common Intelligence**. Select **Enable**, click **Add**, add motion detection areas, set motion detection parameters, and click **Save**.
6. Set the deployment policy.

**Figure 5-24** Setting the deployment policy



7. Set the alarm linkage policy.

**Figure 5-25** Setting the alarm linkage policy



----End

### 5.3.11.4 Commissioning a Network Video Recorder (VCN Scenario)

#### 5.3.11.4.1 Logging In to the OMU Portal

#### Prerequisites

The default IP address of the VCN is configured before delivery. You need to configure the IP address of the PC in the same network segment as the IP address of the VCN. The version number is subject to the *Quick Start* delivered with the VCN.

#### Procedure

- Step 1** Enter the OMU portal address (the default address for VCN500 is <https://192.168.1.100:8443>; the default address for VCN510/VCN520/VCN540 is <https://192.168.2.101:8443>) in the address bar of the Internet Explorer and press **Enter**.

 **NOTE**

The OMU portal supports Internet Explorer 8.0 and later versions.

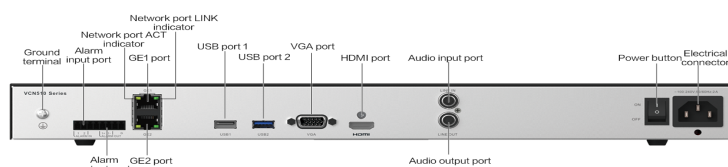
**Step 2** On the login page, enter the user name **admin** and preset password **Change\_Me**, and click **Log In** to enter the OMU portal page. A message is displayed upon the first login indicating that you should change the password. After changing the password, keep it properly.

 **NOTE**

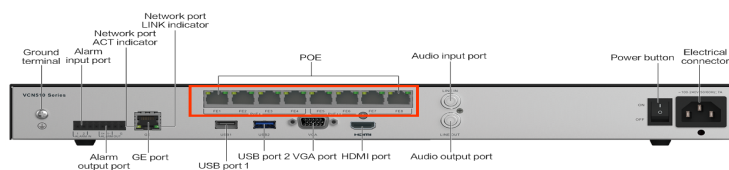
- If the device is VCN510, distinguish the VCN510-8 from the VCN510-16P. The VCN510-8 does not have eight PoE ports, and the VCN510-16P has PoE ports.

The default user name of the VCN510-8 is **Admin**, and that of the VCN510-16P is **admin**.

**Figure 5-26 VCN510-8 rear view**



**Figure 5-27 VCN510-16P rear view**



- If the device is not VCN510 and the software version is V100R003 or later, the default user name is **admin**. If the software version is V100R002 or earlier, the default user name is **Admin**.

----End

### 5.3.11.4.2 Initializing Hard Disks

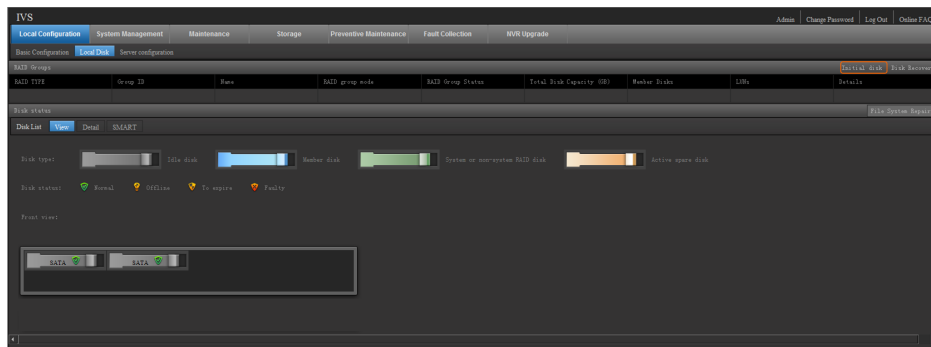
#### Context

When the VCN510 is delivered to the site, recording data can be stored only after you install and initialize the disks.

#### Procedure

- Step 1** Log in to the OMU portal of the VCN.
- Step 2** Choose **Local Configuration > Local Disk**.
- Step 3** In the upper-right corner of the **RAID Groups** area, click **Initial disk**.

**Figure 5-28** Initializing disks



**Step 4** Choose whether to create a RAID group. To set disks as a RAID group, select **RAID1**. To set disks to work independently, select **NON-RAID**.

**NOTE**

The VCN510 supports only **RAID1** or **NON-RAID**. If only one disk is configured, the VCN510 supports only **NON-RAID**. This section assumes that two disks are configured for the VCN510.

**Table 5-20** Disk modes

RAID Mode	Description
RAID1	Two disks are required in RAID 1 mode. If RAID 1 is used, disks back up each other. After recording data is stored in a disk, the data will be simultaneously backed up to another disk, ensuring high data storage reliability. However, the disk usage of RAID 1 is lower than that of disks that work independently.
NON-RAID	If disks work independently, recording data is stored into two disks in sequence, ensuring high disk usage. However, the data storage reliability of disks that work independently is lower than that of RAID 1.

**Step 5** Click **Start**. A risk warning is displayed.

**Step 6** Click **OK**. The system starts to initialize the disks.

**NOTE**

The server will be restarted during the initialization of disks. The process takes about 5 to 10 minutes.

----End

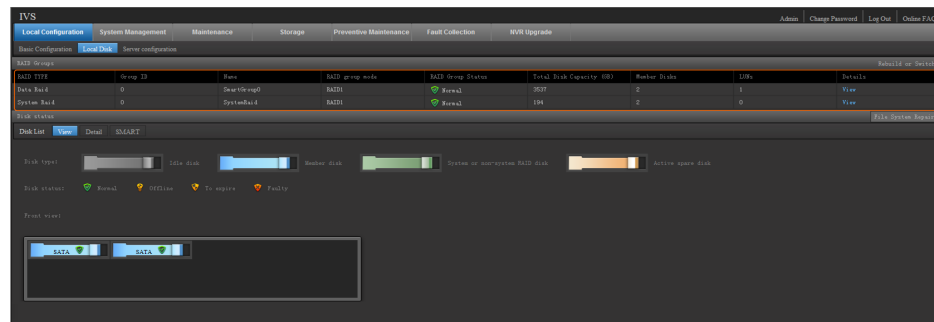
**Verification**

**Step 1** Choose **Local Configuration > Local Disk**.

**Step 2** View the RAID group status in the **RAID Groups** area.

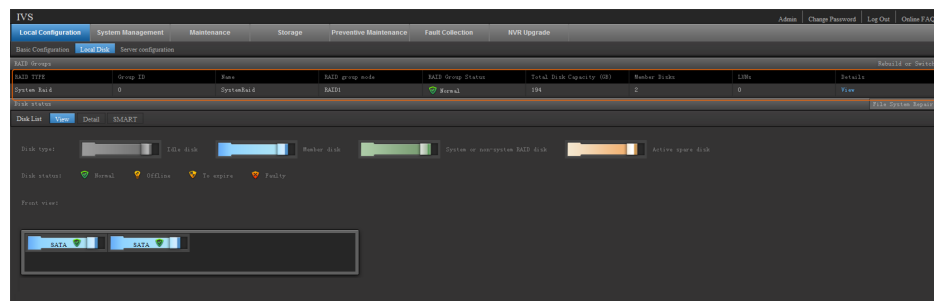
If **RAID1** is selected for the disks, RAID 1 is created for both the system partition (used to store system data) and data partition (used to store recordings).

Figure 5-29 RAID group status of RAID 1



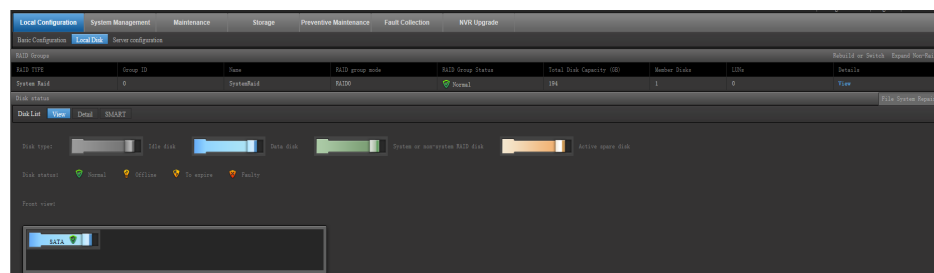
When two disks are configured, if **NON-RAID** is selected for the disks, RAID 1 is created for the system partition.

Figure 5-30 RAID group status of disks that work independently (two disks)



If only one disk is configured, RAID 0 is created for the system partition after disks are initialized.

Figure 5-31 RAID group status of disks that work independently (one disk)



**NOTE**

- After a RAID 1 is created for the system partition, the system partition's RAID group is in data restoration state. At this time, one disk is synchronizing data in the system partition to the system partition of another disk. The synchronization process takes about 20 hours, which does not impact services. During this process, do not remove and insert disks.
- If the OMU portal stays at the **Local Disk** tab page, even if users do not perform any operation for a long period of time, the OMU portal will not automatically return to the login page. For service security reasons, if users do not perform any operation for a long period of time, the OMU portal will return to the login page or does not stay at the **Local Disk** tab page.

----End

### 5.3.11.4.3 Setting Parameters on the VCN WebUI

#### Prerequisites

The description and links in this section are for reference only. For detailed configuration, see the *Configuration Guide*. For details, see the documentation delivered with the device or obtain the documentation by referring to the "Reference Documentation" section.

#### Context

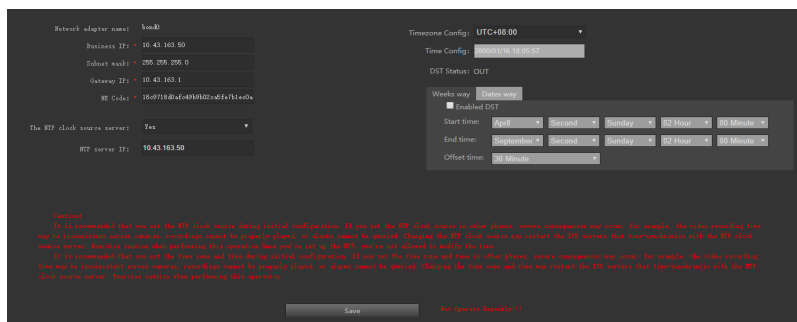
After the VCN is delivered to the site, you need to reset the IP address, system time zone, and time based on the actual network plan.

#### Procedure

##### Step 1 Modify the IP address for the VCN.

1. Log in to the OMU portal of the VCN.
2. Choose **Local Configuration > Server configuration**. Set the service IP address (internal IP address of the VCN), time zone, and time according to the site requirements.

Figure 5-32 Configuring the server



#### NOTE

Set **Business IP** to XXX.XXX.XXX.XXX, **Subnet mask** to 255.255.255.0, and **Gateway IP** to XXX.XXX.XXX.XXX. The values here are examples. The actual value prevails.

The VCN automatically restarts after the IP address is modified. The restart takes about 5 minutes. After the restart, use the new IP address to access the VCN.

3. Modify the IP address for the PC. Ensure that the PC IP address is in the network segment of the new VCN IP address. Then, enter the VCN IP address in the address box of the Internet Explorer and log in to the OMU portal system.
4. (Optional) Configure the NTP synchronization function. After setting **The NTP clock source server** to **Yes**, set the IP address of the NTP server.

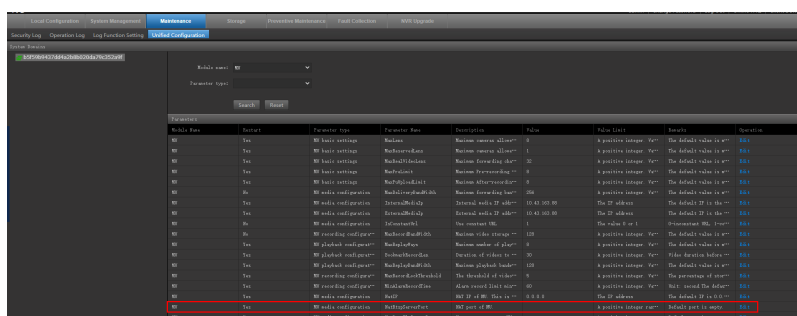
**NOTE**

Currently, the VCN and NTP source server must be in the same LAN for NTP synchronization. For details, see [Step 2](#).

If the VCN and the NTP source server are not in the same LAN, you need to manually set the time as follows: Choose **Local Configuration > Server configuration** and change **Timezone config** and **Time config** based on the time of the source server to be synchronized.

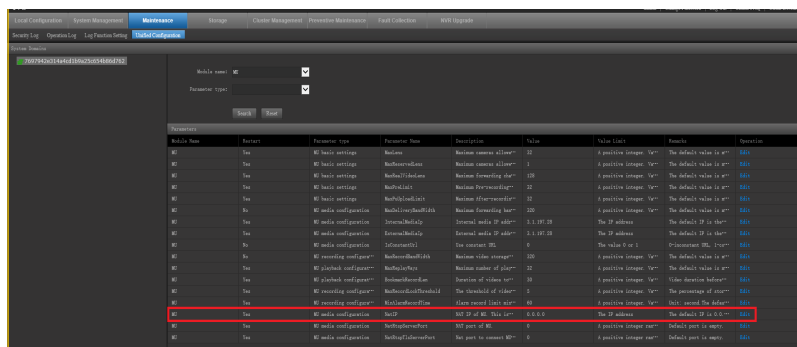
5. Choose **Maintenance > Unified Configuration**, set **Module Name** to **MU**, and click **Search**.
6. (Skip this step for a device that is not VCN510-16P.) In the search result, click **Edit** in the row where **Parameter Name** is **NatRtspServerPort**, delete the parameter value **0** from **Value**, leave the value empty, and click **Save**.

**Figure 5-33** Setting the NAT port number for the MU



7. In the search result, click **Edit** in the row where the value of **Parameter Name** is **NatIP** and set **Value** to the external IP address of the VCN. Click **Save**.

**Figure 5-34** Setting the external IP address of the MU

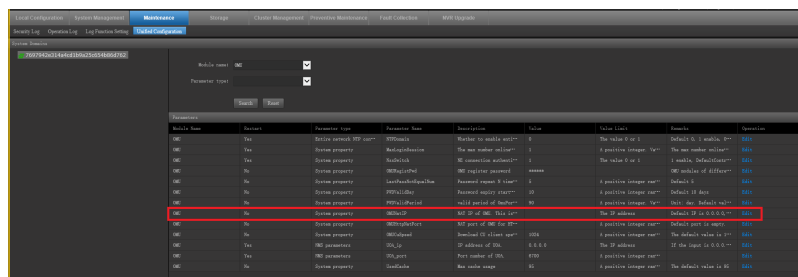


**NOTE**

Set **NatIP** to the external IP address of the VCN, which is the same as the external IP address mapped by the VCN on the ECC800-Pro.

8. Set **Module name** to **OMU** and click **Search**.
9. In the search result, click **Edit** in the row where **Parameter Name** is **OMUNatIP** and set **Value** to the NAT IP address of the MU. Click **Save**.

Figure 5-35 Setting the external IP address of the OMU

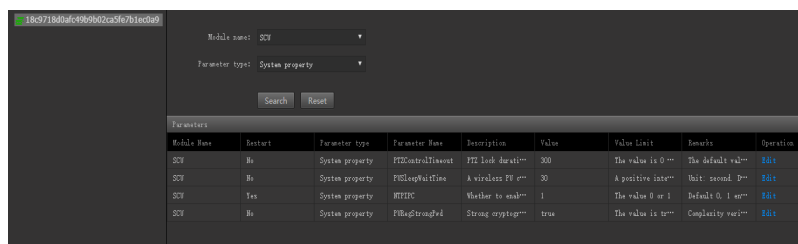


**Step 2** Enable camera NTP synchronization.

The camera NTP synchronization function for the server is disabled by default. The camera NTP synchronization function needs to be enabled for the server that connects to the camera. After the camera NTP synchronization function is enabled, cameras will automatically time-synchronize from their access servers.

1. Log in to the OMU portal of the VCN as user **admin**.
2. Choose **Maintenance > Unified Configuration**.
3. Select the server that the camera needs to access, set **Module name** to **SCU** and **Parameter type** to **System property**, and click **Search**.

Figure 5-36 Configuring camera NTP synchronization



4. In the search results, click **Edit** in the row where **Parameter Name** is **NTPICP** and set **Value** to **1**.
5. Click **Save**. After the camera NTP synchronization function is enabled, the camera, after being connected to the server, will automatically synchronize time with the server.

----End

**Follow-up Procedure**

- (Optional) Set up a VCN stack. For details, log in to the <https://e.huawei.com/>, search for the VCN product documentation, open the documentation, and see the section **(Optional) Deploying IVS in Stack Mode**.
- (Optional) Create a VCN cluster. For details, log in to the <https://e.huawei.com/>, search for the VCN product documentation, open the documentation, and see the section **(Optional) Deploying MPUs in Cluster Mode**.

**NOTE**

For the VCN500, search for **VCN500 Product Documentation**. For the VCN510&VCN520&VCN540, search for **VCN510&VCN520&VCN540 Product Documentation**.

### 5.3.11.4.4 Setting Parameters on the VCN IVS Client

#### Prerequisites

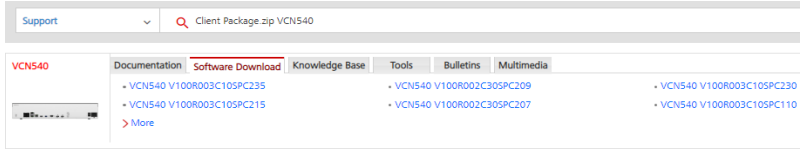
The network communication between the VCN and the camera is normal.

#### Procedure

**Step 1** Install the VCN IVS client.

1. Download the VCN IVS client.

You can obtain the VCN IVS in either of the following ways:

Method 1:	Obtain the <b>HW_IVS_Client.exe</b> file from the software CD-ROM delivered with the VCN.
Method 2	<ol style="list-style-type: none"> <li>1. Log in to the VCN OMU Portal, choose <b>Local Configuration &gt; Basic Configuration</b>, and view <b>Current version</b>.</li> <li>2. Log in to <a href="https://support.huawei.com/enterprise/">https://support.huawei.com/enterprise/</a>, and search for <b>Client Package.zip</b> followed by the VCN model (<b>Client Package.zip VCN540</b> for example). In the search result, click the <b>Software Download</b> tab, click the version and patch number corresponding to the current version, and download the <b>Client Package.zip</b> software package.</li> </ol> <p><b>Figure 5-37</b> Client Package search result</p> 

2. Right-click **HW\_IVS\_Client.exe** and choose **Run as administrator** from the shortcut menu. Use the default installation mode until the installation is complete.
3. Right-click the client program and choose **Run as administrator** from the shortcut menu. The login page is displayed, enter the user name **admin** and preset password **Change\_Me**, and set **Server address** to the actual service IP address (VCN IP address) and **Port** to 9900.

**NOTE**

If the VCN IVS and VCN are deployed in the same LAN, set **Server IP address** to the VCN internal IP address (192.168.248.55, for example). If the VCN IVS is on an extranet and the VCN is on a LAN, set **Server IP address** to the VCN external IP address.



4. Click **Log In** to access the client home page. A message is displayed upon the first login indicating that you should modify the password. After modifying the password, keep it properly.

**Step 2** Add a camera. For details, see the documentation delivered with the equipment or obtain the documentation by referring to the "Preparing Documentation" section. View the corresponding section.

 **NOTE**

The driver protocol of IPC6325 and C3220 cameras is HWSDK.

1. In the **Quick Setup** area on the VCN IVS home page, double-click **Add Camera**.
2. Click + in the lower left corner on the **Search criteria** page, setting the parameters according to the following table, and click **Next**.

**Table 5-21** Setting search criteria

Item	Value
Start IP Address and End IP Address	IP address range
Drive	HWSDK
Access domain	Select the domain that cameras need to access
Mount server	Select the server that cameras need to access

 **NOTE**

If there are multiple VCNs for multiple smart modules, you are advised to evenly distribute the cameras to each VCN.

3. Click **Search**, in each camera record, enter the user name and password in the text boxes and click **Verify**. If the camera is verified successfully, select cameras to add and click **Next**.
4. Preview live video images, click the camera in the camera list on the left, and adjust camera parameters to optimize the image effect. Then click **Next**.
5. (Optional) Group the cameras and click **Next** after grouping.
6. Click **Finish** to finish adding a camera.

**Step 3** Configure a video recording plan.

1. In the **Quick Setup** area on the VCN IVS home page, double-click **Server Recording Plan**.
2. Select the camera on the **Cameras** list and click **Next**.
3. (Optional) Set recording parameters, and click **Next**.
4. Set recording plan parameters in the **Time settings**. Drag the timeline to select the time segment for implementing video recording.

**NOTE**

If you set the recording plan policy is to **All**, you do not need to set the recording plan time.

5. Click **Next** to complete the recording plan setting. When **●** is displayed in the status bar, the recording plan has been set successfully.
6. Click **Finish**.

**Step 4** Create a user.

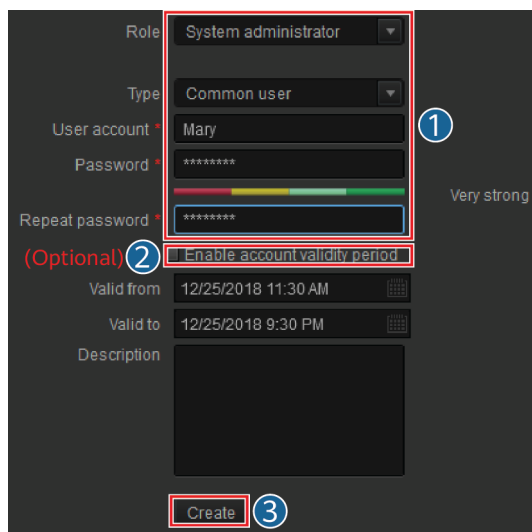
When connecting to the VCN on the NetEco, you need to log in to the VCN as a non-admin user.

1. Log in to the VCN IVS as user **admin**.
2. On the VCN IVS home page, double-click **Add User**, create a user, and click **Next**. The **Assign Rights** page is displayed.

**NOTE**

When creating a user, you can select **Enable account validity period** and set **Valid from** and **Valid to** to set the account validity period for the created user.

**Figure 5-38** Creating a user



DM25H00137

3. Set **Multi-point logins** to a value greater than 2.
4. In the **Assign Device View Rights** area, select the cameras to be browsed and queried by the user. Set other parameters based on the documentation delivered with the equipment or the documentation obtained by referring to the **Preparing Documentation** section, and click **Finish**.

----End

**5.3.11.5 Commissioning a Network Video Recorder (IVS1800 Scenario)**

### 5.3.11.5.1 Setting Parameters on the IVS1800 WebUI

#### Prerequisites

For details about the IVS1800 hardware description and installation, see the Quick Start in the corresponding IVS1800 product documentation. For details about the IVS1800 configuration, see the Configuration Guide. For details, see the documentation delivered with the device or obtain the documentation by referring to the "Reference Documentation" section.

#### Context

A default IP address has been configured for the IVS1800 before delivery. Modify the IP address based on the actual network plan.

#### Procedure

**Step 1** Enter **https://IP address.8443** in the address box, and press **Enter**.

In the URL, *IP address* indicates the IP address of the IVS1800. The default IP address is 192.168.3.111.

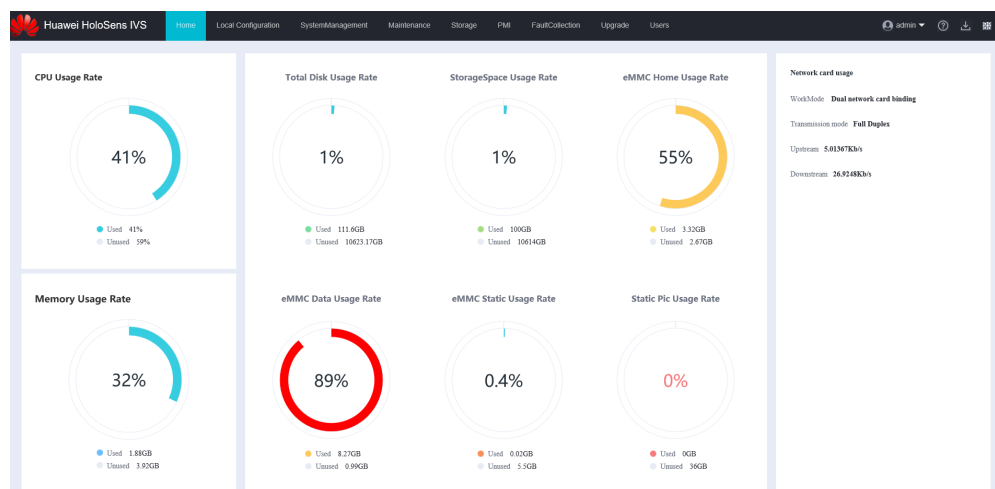
#### NOTE

The OMU portal supports Internet Explorer 10.0 and later versions.

**Step 2** Log in to the OMU portal. Set the service system and operating system passwords at the first login.

1. Setting the password for the **admin** user of the service system
2. Setting the password for the **admin** user of the operating system
3. Setting the password for the **root** user of the operating system
4. Enter the user name and password to log in to the OMU portal again. The following figure shows the home page after a successful login.

**Figure 5-39** OMU portal home page



**Step 3** Configure disk initialization.

 **NOTE**

Recording data can be stored only after you install and initialize the disks.

1. Choose **Local Configuration > Local Disk**.
2. In the upper right corner of the **RAID Groups** area, click **Initial Disk**
3. Configure disk initialization.

**Figure 5-40** Disk initialization (RAID 5 economical configuration by default)



**Step 4** Modify the IP address for the IVS1800.

1. Choose **Local Configuration > Server configuration**. Set the service IP address (internal IP address of the IVS1800), time zone, and time according to the site requirements.

**Figure 5-41** Configuring the server (Single Mode by default)

**NetworkConfig**

\*NIC Mode  Single Mode  Double Mode

Network adapter name bond0

\*Business IP

\*Subnet mask

\*Gateway IP

 **NOTE**

Set **Business IP** to XXX.XXX.XXX.XXX, **Subnet mask** to 255.255.255.0, and **Gateway IP** to XXX.XXX.XXX.XXX. The values here are examples. The actual value prevails.

2. Change the PC IP address to an address in the network segment of the new IVS1800 IP address, enter the IVS1800 IP address in the address box of the Internet browser, and log in to the OMU portal system.

- (Optional) Configure the NTP synchronization. After setting **The NTP clock source server** to **Yes**, set the IP address of the NTP server.

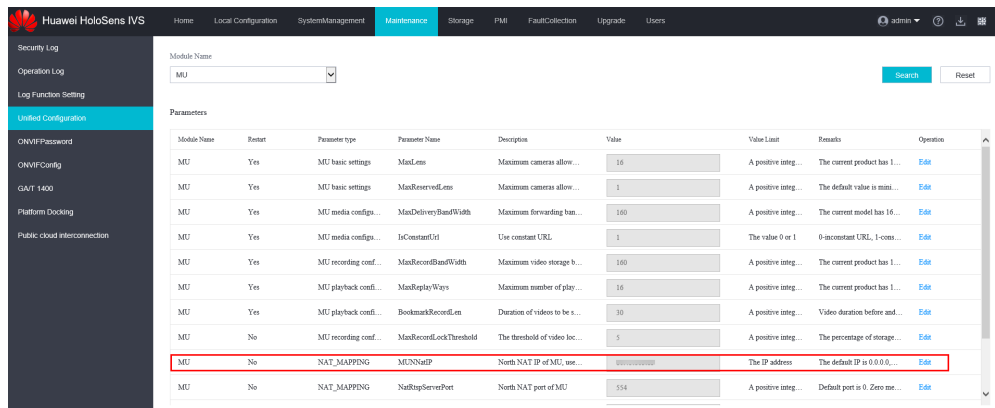
**NOTE**

Currently, the IVS1800 and NTP source server must be in the same LAN for NTP synchronization. For details, see 5.

If the IVS1800 and the NTP source server are not in the same LAN, you need to manually set the time as follows: Choose **Local Configuration > Server configuration** and change **Timezone config** and **Time config** based on the time of the source server to be synchronized.

- Choose **Maintenance > Unified Configuration**, set **Module Name** to **MU**, and click **Search**.
- In the search result, click **Edit** in the row where the value of **Parameter Name** is **MUNNatiP** and set **Value** to the external IP address of the IVS1800. Click **Save**.

Figure 5-42 Setting the external IP address of the MU

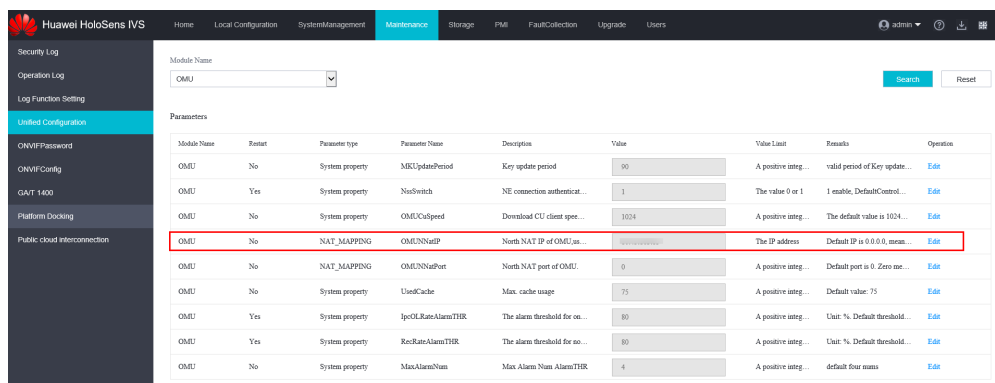


**NOTE**

Set **MUNNatiP** to the external IP address of the IVS1800, which is the same as the external IP address mapped by the IVS1800 on the ECC800-Pro.

- Set **Module Name** to **OMU** and click **Search**.
- In the search result, click **Edit** in the row where the value of **Parameter Name** is **OMUNNatiP** and set **Value** to the **MUNNatiP** address of the MU. Click **Save**.

Figure 5-43 Setting the external IP address of the OMU

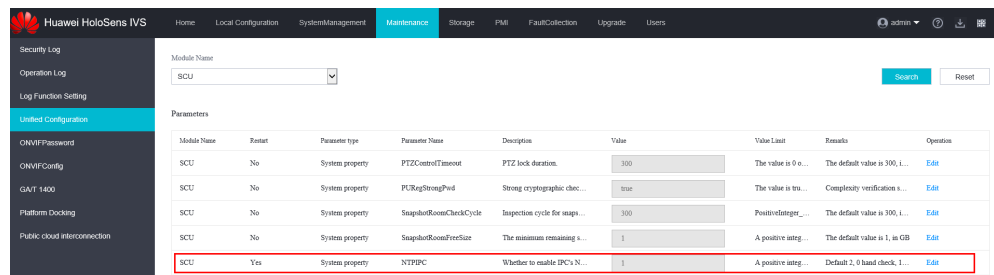


**Step 5** Enable camera NTP synchronization.

The camera NTP synchronization function for the server is disabled by default. The camera NTP synchronization function needs to be enabled for the server that connects to the camera. After the camera NTP synchronization function is enabled, cameras will automatically time-synchronize from their access servers.

1. Log in to the OMU portal as the **admin** user.
2. Choose **Maintenance > Unified Configuration**.
3. Set **Module Name** to **SCU** and **Parameter type** to **System property**, and click **Search**.
4. In the search results, click **Edit** in the row where **Parameter Name** is **NTPIPC** and set **Value** to **1**.
5. Click **Save**. After the camera NTP synchronization function is enabled, the camera, after being connected to the server, will automatically time-synchronize with the server.

**Figure 5-44** Configuring camera NTP synchronization



**Step 6** Create a user.

When connecting to the IVS1800 on the NetEco, you need to log in to the VCN as a non-admin user.

1. Log in to the OMU portal as the **admin** user.
2. Choose **User Management > Add User**.

**NOTE**

When creating a user, you can select **Enable account validity period** and set **Valid from** and **Valid to** to set the account validity period for the created user.

3. Set **Multi-point logins** to a value greater than 2.
4. On the **User List** page, click **Permission Settings** next to the new user, select the cameras to be browsed and queried, obtain the documents delivered with the device or by referring to the "Reference Documentation" section, set other parameters, and click **Save**.

----End

**5.3.11.5.2 Setting Parameters on the iClient**

**Prerequisites**

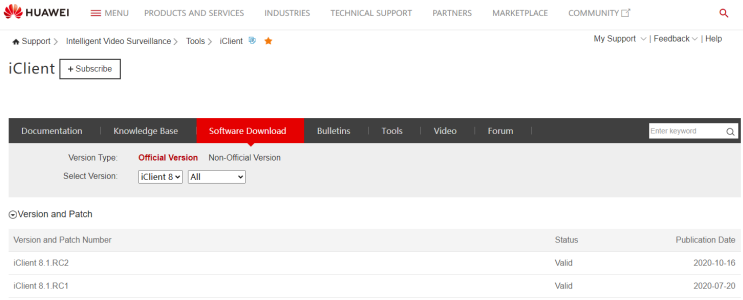
The network communication between the IVS1800 and the camera is normal.

## Procedure

### Step 1 Install the iClient.

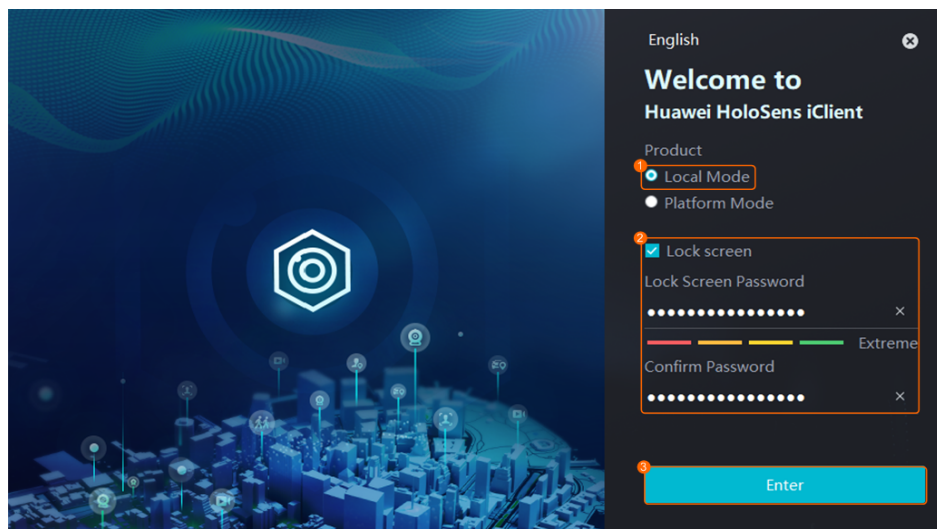
1. Download the iClient.

You can obtain the iClient in either of the following ways:

Method 1:	Obtain the iClient installation program from the OMU portal. Log in to the OMU portal, click <b>Client Download</b> in the upper right corner, and save the installation program to a local directory.									
Method 2	<ol style="list-style-type: none"> <li>1. Log in to the OMU portal, choose <b>Local Configuration &gt; Basic Configuration</b>, and view <b>Current version</b>.</li> <li>2. Log in to <a href="https://support.huawei.com/enterprise/">https://support.huawei.com/enterprise/</a>, and search for and choose <b>iClient</b>. In the search result, click the <b>Software Download</b> tab, click the version and patch number corresponding to the current version, and download the software package.</li> </ol> <p><b>Figure 5-45</b> iClient software package search result</p>  <table border="1" data-bbox="635 1198 1380 1272"> <thead> <tr> <th>Version and Patch Number</th> <th>Status</th> <th>Publication Date</th> </tr> </thead> <tbody> <tr> <td>iClient 8.1 RC2</td> <td>Valid</td> <td>2020-10-16</td> </tr> <tr> <td>iClient 8.1 RC1</td> <td>Valid</td> <td>2020-07-20</td> </tr> </tbody> </table>	Version and Patch Number	Status	Publication Date	iClient 8.1 RC2	Valid	2020-10-16	iClient 8.1 RC1	Valid	2020-07-20
Version and Patch Number	Status	Publication Date								
iClient 8.1 RC2	Valid	2020-10-16								
iClient 8.1 RC1	Valid	2020-07-20								

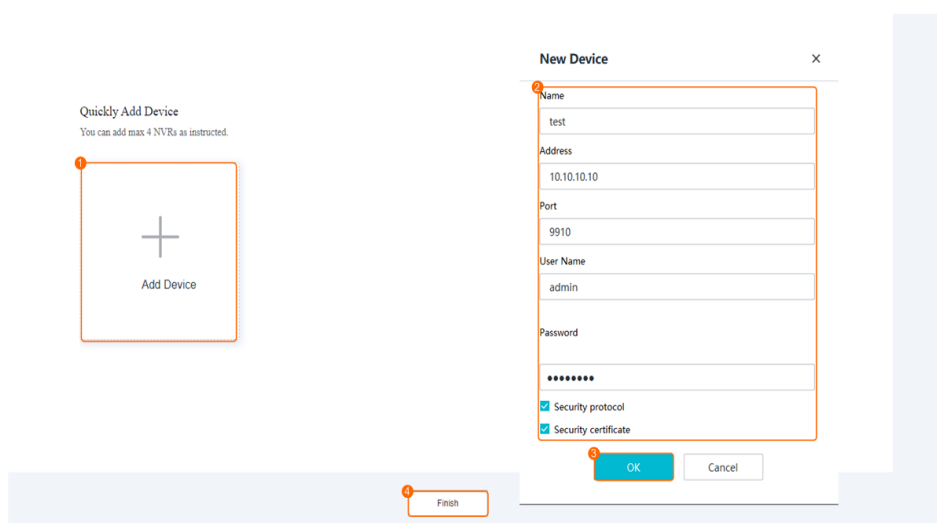
2. Decompress the software package, double-click the installation program, and complete the installation as prompted.
3. Right-click the client program and choose **Run** as administrator from the shortcut menu. The login page is displayed.

**Figure 5-46** Logging in to the iClient



4. Select **Micro Edge Access**.
5. Add an IVS1800.

**Figure 5-47** Adding a device



**NOTE**

- If the iClient and IVS1800 are deployed in the same LAN, set **Address** to the internal IP address of the IVS1800. If the iClient is installed on an external network and the IVS1800 is deployed in the LAN, set **Address** to the external IP address of the IVS1800.
- When the IVS1800 is added to the iClient by the **admin** user, the iClient checks whether the login password of the **admin** user has been set. If the password is not set, log in to the OMU portal to set the password.

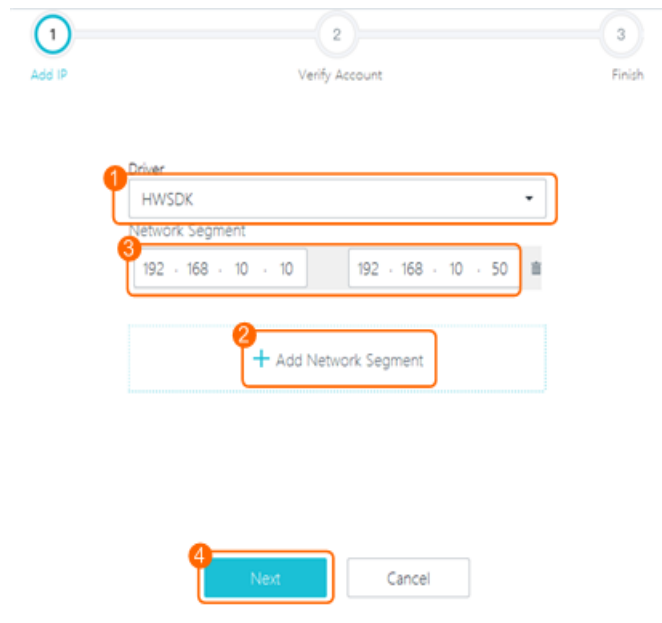
6. Click **Finish** to go to the iClient.

**Step 2** Add a camera. For details, see the documentation delivered with the device or obtain the documentation by referring to the "Reference Documentation" section. View the corresponding section.



1. On the home page of the iClient, choose **System Management > Device Management > Device Management > Micro Edge**.
2. Right-click an IVS1800 and choose **Camera Access**.
3. Select **Auto Batch Access** and click **Start**.
4. Set the IP address segment.

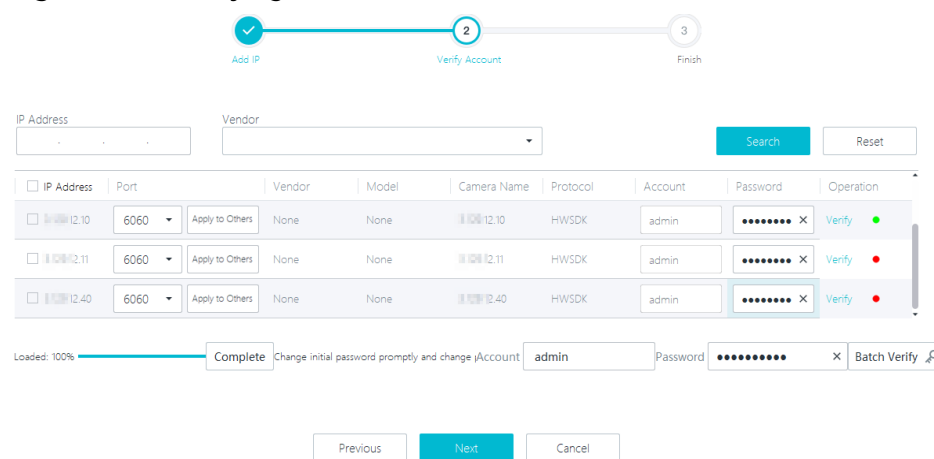
**Figure 5-48** Setting an IP network segment



**NOTE**

- The driver protocol of IPC6325 and C3220 cameras is HWSDK.
  - The IP address segment indicates the start and end IP addresses of cameras.
5. You can use **IP Address** and **Vendor** to filter the required cameras in the camera search result and select the required cameras. Alternatively, you can directly select the required cameras in the camera list. Then verify accounts. The default password of the HWSDK protocol is **HuaWei123**.

**Figure 5-49** Verifying accounts



 **NOTE**

If there are multiple IVS1800s for multiple smart modules, you are advised to evenly distribute the cameras to each IVS1800.

6. Select the cameras to be added and click **Next**.
7. Click **Finish**.
8. Preview live video. On the iClient home page, click **Live** and drag a camera to the live video pane. If the live video can be properly played, the camera is successfully connected.

**Step 3** Configure a video recording plan.

1. Choose **System Management > Device Management > Micro Edge** on the iClient home page.
2. Right-click an IVS1800 and choose **Storage Management**.
3. Click the **Server Recording** tab. The tab page for configuring a server-based recording plan is displayed.
4. Configure a video recording plan.

 **NOTE**

If you set the recording plan policy to **All**, you do not need to set the recording plan time.

5. Click **Save**.

----End

## 5.3.12 Linkage Control

### Prerequisites

- You have obtained the IP address of the ECC800-Pro as well as the user name and password used for WebUI login.
- You have prepared a PC with an IP address in the same network segment as that of the ECC800-Pro, and the PC is connected to the WAN\_1 port on the ECC800-Pro.
- Ensure that **Enable linkage control function** is **Yes**.

## Linkage Grouping

Table 5-22 Linkage grouping

Linkage Category	Default Status	Function
Link emergency ventilation with clasp lock open	off	<p>Set this linkage status to <b>on</b>:</p> <ul style="list-style-type: none"> <li>• If the smart cooling product communicates properly but does not provide the cooling function, and the temperature in the cold aisle is greater than or equal to the preset value (30°C by default), the rear door of the cabinet automatically opens.</li> <li>• If all smart cooling products fail to communicate, and the temperature in the cold aisle is greater than or equal to the preset value (30°C by default), the rear door of the cabinet automatically opens.</li> <li>• If the rear door of the cabinet is open and the temperature in the cold aisle is higher than the preset value (35°C by default), the front door of the cabinet automatically opens.</li> </ul>
Link smoke alarm with clasp lock open	off	<p>When this linkage status is set to <b>on</b>:</p> <ul style="list-style-type: none"> <li>• If a smoke alarm is generated, the rear cabinet door is opened.</li> <li>• If the cabinet door is opened, the ECC800-Pro generates a door open alarm. After the smoke alarm is cleared, you need to manually close the door. After the door is closed, the door open alarm is cleared.</li> <li>• If the emergency heat dissipation control logic conflicts with the smoke alarm control logic, the smoke alarm control logic takes precedence.</li> </ul> <p><b>NOTE</b> If the fire extinguishing system is installed inside the smart module, the linkage function is not enabled.</p>
Link fire control with clasp lock open	off	<p>When this linkage status is set to <b>on</b>:</p> <ul style="list-style-type: none"> <li>• If a fire alarm (dry contact alarm) is generated, the rear door of the cabinet is opened.</li> <li>• If the cabinet door is opened, the ECC800-Pro generates a door open alarm. After the fire alarm is cleared, you need to manually close the cabinet door. After the door is closed, the door open alarm is cleared.</li> <li>• If the emergency heat dissipation control logic conflicts with the fire control logic, the fire control logic takes precedence.</li> </ul> <p><b>NOTE</b> If the fire extinguishing system is installed inside the smart module, the linkage function is not enabled.</p>

### 5.3.12.1 Unlocking the Cabinet Electronic Clasp Lock When a Smoke Alarm Is Generated

#### Context

In this example, the smoke sensor connects to port AI/DI\_1. The actual port prevails.

#### Procedure

**Step 1** Log in to the ECC800-Pro WebUI as an administrator.

**Step 2** Choose **System Settings > Linkage Control**.

**Step 3** Ensure that **Enable linkage control function** is **Yes**.

**Step 4** On the **Linkage Group** tab page, set **Link smoke alarm with clasp lock open** to **on**.

 **NOTE**

Select **Link smoke alarm with clasp lock open** under **Linkage Group**. If its value is **on**, the corresponding logic configurations under **Linkage Logic List** are available. If its value is **off**, the corresponding logic configurations under **Linkage Logic List** are unavailable.

**Step 5** Modify the AI/DI\_1 signal name.

1. Choose **System Settings > Signal Name Modify**. The **Batch Signal Configuration** tab page is displayed.
2. Set **Device type** to **ECC800**, set **Device name** to **ECC800**, and click **OK**.
3. On the query result tab page, set the new signal name of **AI/DI\_1** to **Smoke** and click **Submit**.

**Step 6** Enable the AI/DI device.

1. Choose **Monitoring > System > ECC800 > Running Parameters > AI/DI\_1 Port Settings**.
2. Set **Smoke sensor** to **Enable** and click **Submit**.
3. Confirm that **Smoke sensor type** is automatically identified as **Smoke sensor** or **Smoke sensor(NC)**.
4. Click **Unhide All Advanced Signals**, and click **Power Supply Parameters**. Ensure that **III power supply enable(AIDI\_1/DO)** is **Enable**.

----End

#### Follow-up Procedure

After the smoke alarm is cleared, you need to manually close the door. After the door is closed, the door open alarm is cleared.

## 5.3.12.2 Unlocking the Cabinet Electronic Clasp Lock When a Fire Alarm Is Generated

### Context

In this example, the fire extinguishing system connects to port AI/DI\_3. The actual port prevails.

### Procedure

**Step 1** Log in to the ECC800-Pro WebUI as an administrator.

**Step 2** Choose **System Settings > Linkage Control**.

**Step 3** Ensure that **Enable linkage control function** is **Yes**.

**Step 4** On the **Linkage Group** tab page, set **Link fire control with clasp lock open** to **on**.

 **NOTE**

Select **Link fire control with clasp lock open** under **Linkage Group**. If its value is **on**, the corresponding logic configurations under **Linkage Logic List** are available. If its value is **off**, the corresponding logic configurations under **Linkage Logic List** are unavailable.

**Step 5** Modify the AI/DI\_3 signal name.

1. Log in to the ECC800-Pro WebUI as an administrator.
2. Choose **System Settings > Signal Name Modify**. The **Batch Signal Configuration** tab page is displayed.
3. Set **Device type** to **ECC800**, set **Device name** to **ECC800**, and click **OK**.
4. On the query result tab page, set the new signal name of **AI/DI\_3** to **Fire** and click **Submit**.

**Step 6** Enable the AI/DI device.

1. Choose **Monitoring > System > ECC800 > Running Parameters > AI/DI\_3 Port Settings**.
2. Set **Fire sensor** to **Enable**. Click **Submit** to access the AI/DI\_3 setting page.
3. Select **Fire sensor type** and set it to **Normal Open** or **Normal Close** as required.
4. Click **Unhide All Advanced Signals**, and click **Power Supply Parameters**. Ensure that **II power supply enable(AIDI\_3/COM2/AIDI\_5)** is **Enable**.
5. Click **Submit**.

----End

### Follow-up Procedure

After the fire alarm is cleared, you need to manually close the cabinet door. After the door is closed, the door open alarm is cleared.

## 5.3.13 (Optional) NetEco Management

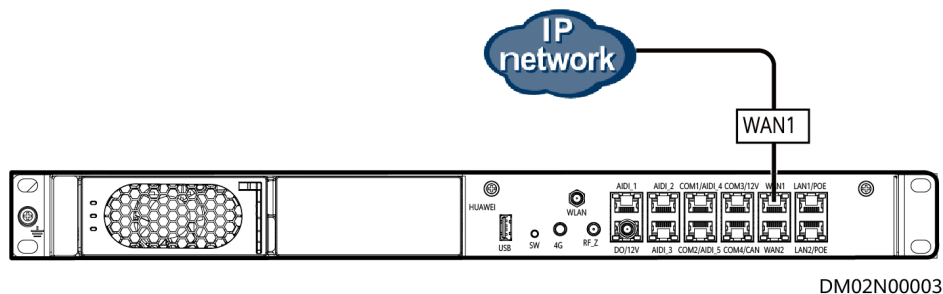
### 5.3.13.1 NetEco6000 Management

#### 5.3.13.1.1 Connecting a Communications Cable

##### Procedure

**Step 1** Connect the communications cable to the WAN1 port on the ECC800-Pro.

**Figure 5-50** Connecting the communications cable



----End

#### 5.3.13.1.2 Setting NetEco Parameters

When the smart module can be connected to the NetEco, perform the following steps to configure parameters.

##### Procedure

- Step 1** Apply for a fixed IP address to the equipment room network administrator.
- Step 2** Set the IP address, subnet mask, and default gateway on the ECC800-Pro WebUI.

**Table 5-23** IP parameters

Path	Parameter	Default Value	Setting
System Settings > System Parameter s > Monitor IP > WAN_1	IP address	192.168.8.1 0	Set this parameter based on the IP address assigned by the network administrator.
	Subnet mask	255.255.255.0	Set this parameter based on the subnet mask assigned by the network administrator.
	Default gateway	192.168.8.1	Set this parameter based on the default gateway address assigned by the network administrator.

- Step 3** Click **Submit**.
- Step 4** Set the NetEco communication parameters and authentication password on the ECC800-Pro WebUI.

**Table 5-24** NetEco parameters

Path	Parameter	Default Value	Setting
System Settings > NMS Application > NetEco > Communication Parameters	NetEco Location	Local	Set this parameter based on the type of the connected NetEco management system. Local: NetEco Cloud: CloudOpera NetEco
	Server IP	192.168.8.11	IP address of the primary NetEco server <b>NOTE</b> The NetEco IP address and the ECC800-Pro IP address must be configured in the same network to ensure normal connection between the NetEco and the ECC800-Pro.
	Port number	31220	31220

**Table 5-25** Setting the authentication password

Path	Parameter	Default Value	Setting
System Settings > NMS Application > NetEco > Set Authentication Password	Authentication password	Modifyme_123	Set this parameter based on customer requirements. <b>NOTE</b> Requirements for setting passwords: 'a~z','A~Z','0~9','~!@#^*_={};,./?-`\$'(8-32 characters that include at least three of the following types: lowercase letters, uppercase letters, digits, and special characters)
	Confirm authentication password	—	—

**Step 5** Click **Submit**.

----End

### 5.3.13.1.3 Obtaining the NetEco Software License

The NetEco software license is not provided together with software to the customer. Therefore, obtain the NetEco software license in advance.

Obtain the license from the Huawei's enterprise support website.

- For enterprise users:

- a. Log in to Huawei's enterprise support website <https://support.huawei.com/enterprise>.
  - b. Browse or search the **iManager NetEco 6000 License Application Guide** or obtain the *iManager NetEco 6000 License Application Guide* from **Technical Support > Product Support > Network Energy > Modular Data Center > iManager NetEco 6000**. Then, apply for the license of the NetEco software by referring to the guide.
- For carrier users:
    - a. Log in to Huawei's carrier support website <https://support.huawei.com>.
    - b. Browse or search **iManager NetEco 6000 License Application Guide**, obtain *iManager NetEco 6000 License Application Guide* from **Support > Product Support > NetWork Energy > Data Center Facility > Fusion Modular Data Center > iManager NetEco 6000** at <https://support.huawei.com> and apply for the license of the NetEco software by referring to the guide.

### 5.3.13.1.4 Powering On a Server

This section describes how to check and power on the NetEco server.

#### Procedure

- Step 1** Ensure that the power cables and ground cables are securely connected with correct polarity and good contact.
- Step 2** Ensure that the input power supply of the PDB is off. Use a multimeter to test the resistance between the power outputs of the PDF and between the working ground and protective ground. It is required that short circuit not occur between power outputs or between the working ground and protective ground.
- Step 3** Turn on the power switch for the rack.
- Step 4** Switch on the circuit breaker of the PDB in the rack. The power supply for equipment in the rack is available.
- Step 5** Press the power button on the chassis of the server to power on the server.

#### NOTE

After the server is started properly, the button/indicator of its power switch is green.

**Figure 5-51** Power button on the TaiShan 200 server



----End

### 5.3.13.1.5 Logging In to the NetEco Client

The NetEco uses the browser/server (B/S) working mode. You can log in to the NetEco using a web browser.



## Prerequisites

Valid user name and password are available.

## Procedure

**Step 1** In the browser address bar, enter https://IP address of the NetEco server:31943, and then press **Enter**.

### NOTE

- 192.168.8.11 is the default IP address of the NetEco.
- Firefox ESR 52, Chrome 57 or later is supported.
- You are advised to set the display resolution as 1920\*1080 or higher.
- Make sure that the IP address of the NetEco server is not contained in the compatibility view website.

**Step 2** Enter the **User Name, Password**, and click **Login**.

### NOTE

- The preset user of NetEco is admin, the preset password is Changeme\_123. This user has all the operation rights on the managed objects. After the first login, change the password in time to ensure account security and prevent unauthorized network attacks, such as data tampering. Huawei will not be liable for any security issues caused by your failure to change the preset password in time or password loss after changing.
- If the number of online users reaches the maximum number supported by the system, a message is displayed, indicating that you cannot log in. In this case, contact the system administrator.
- After you enter the incorrect password for three consecutive times, you must enter the verification code upon the fourth login. After you enter the incorrect password for five consecutive times, the user account or the IP address is locked for 10 minutes.

----End

### 5.3.13.1.6 Loading a NetEco License

The NetEco license file is used to control the functions and management capabilities of the NetEco. Before using NetEco, you need to load a commercial license.

## Prerequisites

- You have obtained a license.
- You have logged in to the NetEco client using a web browser.

## Procedure

**Step 1** Click **Import License file** when you log in to the NetEco at the first time.

**Step 2** Click  next to the **License** text box and select a license file.

**Step 3** Click **Upload**.

The information about the imported license file is displayed.

**Step 4** Click **Apply**.

----End

### 5.3.13.1.7 Installing the NE Mediation

#### Prerequisites

- You have logged in to the NetEco client using a browser.
- You have obtained the NE mediation software package.

#### Procedure

**Step 1** Obtain the installation package of the mediation software.

- For enterprise users:
  - a. Log into Huawei's enterprise support website <https://support.huawei.com/enterprise>.
  - b. Browse or search **iManager NetEco 6000 V600R009 Version Mapping**, obtain *iManager NetEco 6000 V600R009 Version Mapping* from **Support > Documentation > Network Energy > Fusion Modular Data Center > iManager NetEco 6000**. Based on the actual NE types and versions to download the mediation software installation package.
- For carrier users:
  - a. Log into Huawei's carrier support website <https://support.huawei.com>.
  - b. Browse or search **iManager NetEco 6000 V600R009 Version Mapping**, obtain *iManager NetEco 6000 V600R009 Version Mapping* from **Support > Software > Network Energy > Data Center Facility > Fusion Modular Data Center > iManager NetEco 6000**. Based on the actual NE types and versions to download the mediation software installation package.

**Step 2** Choose **System > Configuration > Adapter Management** from the main menu.

**Step 3** Click **Upload**. On the displayed **Upload Adapter Package** page, click + and select the files to be uploaded.

#### NOTE

A maximum of 50 adapter packages can be uploaded at one time.

**Step 4** Click **Upload** to upload the files.

**Step 5** Select the NE mediation packages to be installed on the **Adapter Management** page and click **Install**. Then click **Yes** in the displayed dialog box. The length of time used for the installation is related to the number of adaptation layers. Please wait patiently for the installation to complete.

----End

### 5.3.13.1.8 Adding a Management Domain

This section describes how to configure managed domains.

## Prerequisites

- You have logged in to the NetEco client by web browser.
- The management domain adaptation layer has been preconfigured or installed.

## Context

The management domains include **Park, Building, Room, ContainerDC, Subnet, NetecoSite, FusionModule500, Modular, Room-ShapeNode**, and **Building-ShapeNode**. You are advised to plan the affiliation before configuring the managed domains.

To create management domain, note that:


- You can create **Park, Building, ContainerDC, Room, Subnet, NetecoSite, FusionModule500, Modular, Room-ShapeNode**, and **Building-ShapeNode** under **Root**.
- You can create **Building, Building-ShapeNode, ContainerDC, Room** and **Room-ShapeNode** under **Park**.
- You can create only **Floor-ShapeNode** under **Building**.
- You can create **DDF, Battery Cabinet, Rack, Modular, Power Cabinet, Fire Protection Cabinet** and **Rack Custom** under **Room**
- You can create **Container** and **Container-ShapeNode** under **ContainerDC**.
- You can create **Modular, Park, NetecoSite, FusionModule500** and under **Subnet**.
- You can create **DDF, Battery Cabinet, Rack, Modular, Power Cabinet**, and **Fire Protection Cabinet** and **Rack Custom** under **NetecoSite**
- You can create **DDF, Battery Cabinet, Rack, Power Cabinet, Fire Protection Cabinet** and **Rack Custom** under **Modular**.
- You can create **DDF, Battery Cabinet, Rack, Modular, Power Cabinet, Fire Protection Cabinet** and **Rack Custom** under **Room-ShapeNode**.
- You can create **Floor-ShapeNode** under **Building-ShapeNode**.
- You can create **Room** and **Room-ShapeNode** under **Floor-ShapeNode**.

## Procedure

- Step 1** Choose **System > Configuration > Data Center Planning** from the main menu. The **Data Center Planning** window is displayed.
- Step 2** Add managed domains.
  1. In the navigation tree, choose the father node where you want to add a managed domain.
  2. In the **Domain** area which is below the navigation tree, drag a managed domain icon to the required position in the view.

 **NOTE**

You can adjust the shape of **Room**, **Building-ShapeNode**, **Floor-ShapeNode**, **Container-ShapeNode**, and **NetecoSite**. Holding down the **Shift** key and the left mouse button and then clicking on the corresponding lines can increase the small yellow dot. You can drag the small yellow dot to adjust the shape of the managed domain icon.

To delete a domain, click the domain icon and select **Delete** under .

3. In the right side of the view area, set Management Info. Configure parameters as required. The parameters marked with asterisks (\*) are mandatory.

 **NOTE**

You can configure **Management Info**, **Electricity Info**, and **Refrigeration Info** for the equipment room management domain.

4. Click  on the toolbar.

Repeat steps [Step 2.1](#) to [Step 2.4](#) until the configuration is complete.

- Step 3** Click  on the toolbar.

----End

### 5.3.13.1.9 Adding a Smart Module

This section describes how to create a smart module in the root node, subnet, equipment room, container, or site management domain.

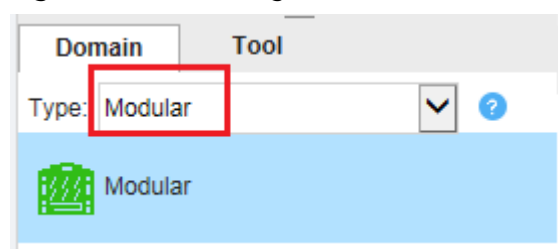
#### Prerequisites

- You have logged in to the NetEco client using a web browser.
- You have created management domains in **Data Center Planning**. For detailed operations, see *Creating a Domain*.

#### Procedure

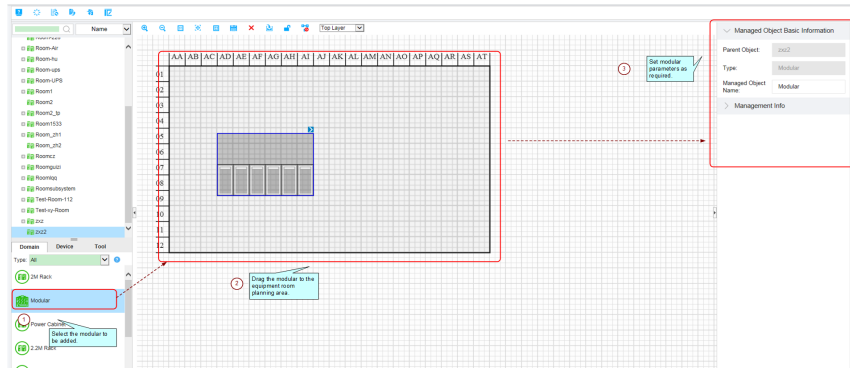
- Step 1** Choose **System > Configuration > Data Center Planning** from the main menu. The **Data Center Planning** page is displayed.
- Step 2** Choose the management domain where you want to add a smart module from the navigation tree on the left.
- Step 3** Click **Domain**. The infrastructure area is displayed.
- Step 4** Select **Modular** from the **Type** drop-down list.


**Figure 5-52** Selecting Modular



**Step 5** Select the **Modular** to be added and drag the module icon to the **Room** area.

**Figure 5-53** Adding a smart module in the room area



**Step 6** Modify **Management Info** of the smart module or retain the default values, and then click .

---

### NOTICE


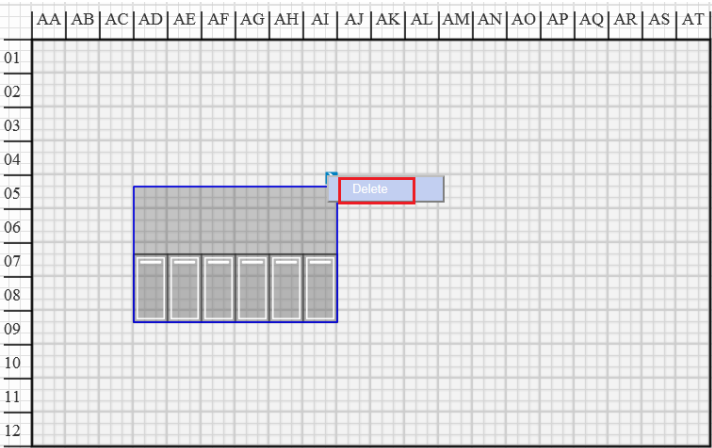

The parameters with \* are mandatory.

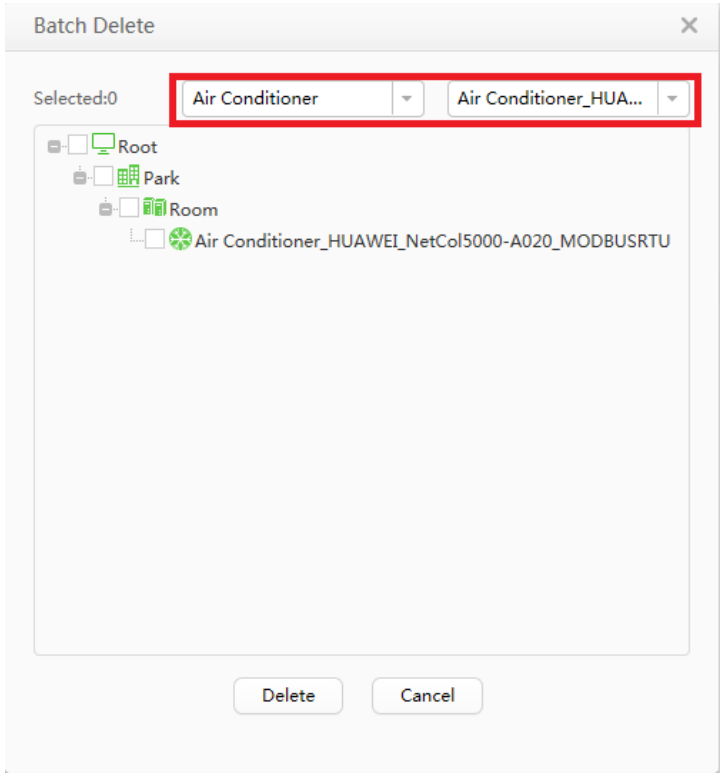
---


----End

### Follow-up Procedure

Perform the following operations in the **Data Center Planning** page as required.

If You Need To...	Then...
Delete smart modules	<p>You can delete one smart module or multiple smart modules in batches on the current page.</p> <p><b>NOTE</b> If a smart module contains subdevices, you cannot delete it. You can delete the smart module only after you delete subdevices in the module.</p> <ul style="list-style-type: none"> <li>Delete one smart module.           <ol style="list-style-type: none"> <li>Select <b>Modular</b> and click <b>Delete</b> under , as shown in <a href="#">Figure 5-54</a>.</li> </ol> <p style="text-align: center;"><b>Figure 5-54</b> Deleting one smart module</p>  <ol style="list-style-type: none"> <li>In the displayed <b>Confirm</b> dialog box, click <b>Yes</b>.</li> </ol> </li> <li>Delete multiple smart modules in batches.           <ol style="list-style-type: none"> <li>Click  on the toolbar to display the <a href="#">Figure 5-55</a> page.</li> </ol> </li> </ul>

If You Need To...	Then...
	<p><b>Figure 5-55</b> Deleting multiple smart modules in batches</p>  <p>The screenshot shows a 'Batch Delete' dialog box. At the top, it says 'Selected:0'. Below this, there are two dropdown menus. The first dropdown is set to 'Air Conditioner' and the second is set to 'Air Conditioner_HUA...'. A red box highlights these two dropdown menus. Below the dropdowns is a tree view showing a hierarchy: 'Root' (with a monitor icon), 'Park' (with a building icon), and 'Room' (with a building icon). Under 'Room', there is an item 'Air Conditioner_HUAWEI_NetCol5000-A020_MODBUSRTU' (with a green recycling icon). At the bottom of the dialog are two buttons: 'Delete' and 'Cancel'.</p>

If You Need To...	Then...
	<div data-bbox="624 360 1342 1128" style="border: 1px solid #ccc; padding: 10px; margin-bottom: 10px;"> <p style="text-align: right;">Batch Delete <span style="float: right;">✕</span></p> <hr/> <p>Selected: 0 <span style="border: 2px solid red; padding: 2px;">Modular</span> <span style="border: 2px solid red; padding: 2px;">Select the device m...</span></p> <div style="border: 1px solid #ccc; padding: 5px; margin-bottom: 5px;"> <p><span>☐</span> <span>☐</span> <span>🏠</span> Room</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> <span>🏠</span> 2M Rack</li> <li><input type="checkbox"/> <span>🏠</span> Modular</li> <li><input type="checkbox"/> <span>📄</span> point</li> <li><input type="checkbox"/> <span>📄</span> point</li> <li><input type="checkbox"/> <span>📄</span> point</li> <li><input type="checkbox"/> <span>📄</span> point</li> </ul> </div> <div style="text-align: right; margin-top: 10px;"> <span>Delete</span> <span>Cancel</span> </div> </div> <p>2. Add filter conditions, select multiple smart modules, and click <b>Delete</b>.</p> <p>3. In the displayed <b>Confirm</b> dialog box, click <b>Yes</b>.</p>
Add tools	<p>1. Select the smart module for which you want to add a pillar.</p> <p>2. In the lower left corner of the current page, click <b>Tool</b>.</p> <p>3. Select the <b>Pillar</b> component to be added.</p> <p><b>NOTE</b> After the component is added, you can set attributes for the component in the <b>Component Info</b> list in the right pane. The system automatically displays values for <b>Parent Name</b> and <b>Control Type</b>, and you do not need to manually set them, you only need to set <b>Name</b>.</p> <p>4. In the upper area of the current page, click .</p>

### 5.3.13.10 Creating an ECC800-Pro on the NetEco

#### Prerequisites

- You have logged in to the NetEco client using a web browser.




- You have created modules in **Data Center Planning**.

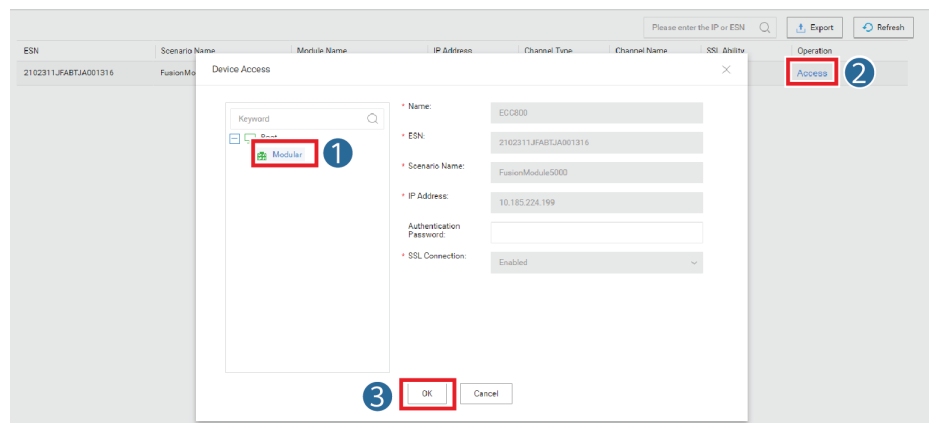
## Context

For detailed operations, see *iManager NetEco 6000 Device Installation and Commissioning Guide* of the corresponding version.

## Procedure

- Choose **System > Configuration > Data Center Planning** from the main menu. The **Data Center Planning** window is displayed.
- On the **Data Center Planning** page, click  in the upper left corner.
- Click **Access** to access the **Add Device** page. You can add an ECC800-Pro device to the specified smart module on the page.

**Figure 5-56** Adding an ECC800-Pro device to the smart module



DM25H00142

### NOTE

Click **OK**, and you can view the task information, including **Type**, **Device Name**, **Region**, **Progress**, **Status**, **Start Time**, **End Time**, and **Information** in the displayed **Progress** window.

## 5.3.13.2 CloudOpera NetEco Management

### 5.3.13.2.1 Logging In to the EDCM (Using a Web Client)

#### Prerequisites

- You have obtained a valid user name and password.
- You have created a free trial order or purchased an official business package.

#### Procedure

- Step 1** In the browser address box, enter `https://IP address of the NetEco server:31943`, and then press **Enter**.

 NOTE

- 192.168.8.11 is the default IP address of the NetEco server.
- Firefox ESR 52, Chrome 57 or later is supported.
- You are advised to set the display resolution as 1920\*1080 or higher.
- Make sure that the IP address of the NetEco server is not contained in the compatibility view website.

**Step 2** Enter the **User Name, Password**, and click **Login**.

 NOTE


- The preset user of NetEco is admin, the preset password is Changeme\_123. This user has all the operation rights on the managed objects. After the first login, change the password in time to ensure account security and prevent unauthorized network attacks, such as data tampering. Huawei will not be liable for any security issues caused by your failure to change the preset password in time or password loss after changing.
- If the number of online users reaches the maximum number supported by the system, a message is displayed, indicating that you cannot log in. In this case, contact the system administrator.
- After you enter the incorrect password for three consecutive times, you must enter the verification code upon the fourth login. After you enter the incorrect password for five consecutive times, the user account or the IP address is locked for 10 minutes.

----End

### 5.3.13.2.2 Installing the EDCM App

Use a mobile phone to scan the QR code to download and install the EDCM app.

#### Procedure

**Step 1** On the EDCM page, click  in the upper left corner, and use your mobile phone to scan the QR code in the lower right corner.

 NOTE

Currently, only the Android edition of the EDCM app is available.

**Figure 5-57** QR code of the EDCM app



**Step 2** Download and install the EDCM app.

----End

### 5.3.13.2.3 Allowing a User to Log in to the EDCM on a Mobile Device

#### Prerequisites

You have logged in to the EDCM.

#### Procedure

- Step 1** Choose **System > System Management > User Management**.
- Step 2** Choose **User** from the navigation pane and click the name of the target user.
- Step 3** On the **Basic Information** tab page, click **Modify** in the upper right corner.
- Step 4** In the **Advanced Settings** area, select **Allow login on mobile terminals** and click **Yes**.

----End

### 5.3.13.2.4 (Optional) Replacing the App Certificate on a Mobile Device


#### Prerequisites

- You have downloaded and installed the EDCM app.
- You have applied for a new certificate file **server.cer** from the CA.

#### NOTE

Here, **server** indicates the name of the certificate file, which can be renamed.

#### Procedure

- Step 1** Import the obtained digital certificate to the **cer** directory of the EDCM folder on the mobile client.
- Step 2** On the mobile client, tap the icon of the EDCM app. The login screen of the app is displayed.
- Step 3** Tap  to access the **Settings** screen.
- Step 4** Tap **Replace the certificate** to access the **Cert Change** screen.
- Step 5** Select the new certificate and tap **Yes** in the displayed dialog box to replace the certificate.

----End

### 5.3.13.2.5 Logging In to the EDCM App

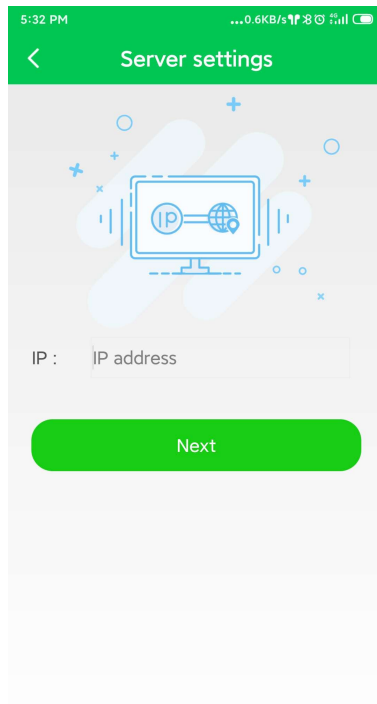
#### Prerequisites

- You have obtained the tenant name, user name, and password for logging in to the EDCM app and have changed the initial password.
- You have obtained the IP address of the EDCM server.
- The **Allow login on mobile terminals** function is enabled for the user who needs to log in to the EDCM app.


## Procedure

### Step 1 Set the IP address of the EDCM server.

1. When you log in to the app for the first time, the **Server Settings** screen is automatically displayed.
2. Enter the server IP address and tap **Next**.



#### NOTE

In the lower right corner of the login screen, choose  > **Server settings** to update the server IP address.

### Step 2 Open the EDCM app, and enter the **Organization**, **Username**, and **Password**.

#### NOTE

- **Organization** and **Username** are the tenant name registered on HUAWEI CLOUD.
- If you fail to log in for three consecutive times, the system automatically displays **Verification code**.

### Step 3 Tap **Log In**.

#### NOTE

If no data is displayed on the screen or a message indicating a network error is displayed, check whether the mobile device has properly connected to a WiFi or mobile network. If the network is normal, check whether you have been forcibly logged out on the NetEco.

----End

### 5.3.13.2.6 Setting EDCM Communication Parameters on the ECC800-Pro

The ECC800-Pro can connect to the EDCM only after EDCM communication parameters are set on the ECC800-Pro WebUI.

## Prerequisites

- You have obtained the IP address of the ECC800-Pro as well as the user name and password used for WebUI login.
- You have obtained the IP address of the EDCM server.

## Procedure

**Step 1** Enter `https://ECC800-Pro IP address` (such as `https://192.168.1.10`) in the address box of the browser, and then press **Enter** to enter the WebUI login page.

**Step 2** On the login page, enter the user name and password, select the desired language, and click **Log In**.

### NOTE

- An account is logged out due to a timeout if no operation is performed within 10 minutes after system login.
- A maximum of three users can log in to the ECC800-Pro WebUI at the same time.

**Step 3** Choose **System Settings > NMS Application**.

**Step 4** Select the **NetEco** tab. In the **Communication Parameters** area, set parameters such as **NetEco Deployment Location**, **Server IP**, and **Port Number**, and click **Submit**.

**Table 5-26** EDCM parameters

Parameter	Setting
NetEco Location	Local
Server IP	Specifies the IP address of the EDCM server. <b>NOTE</b> The IP address of the EDCM server must be on the same network as the IP address of the ECC800-Pro to ensure normal interconnection between the EDCM app and the ECC800-Pro.
Port Number	31220

----End


### 5.3.13.2.7 Connecting to the Network

Connect the network to the CloudOpera NetEco through the CloudOpera NetEco app.

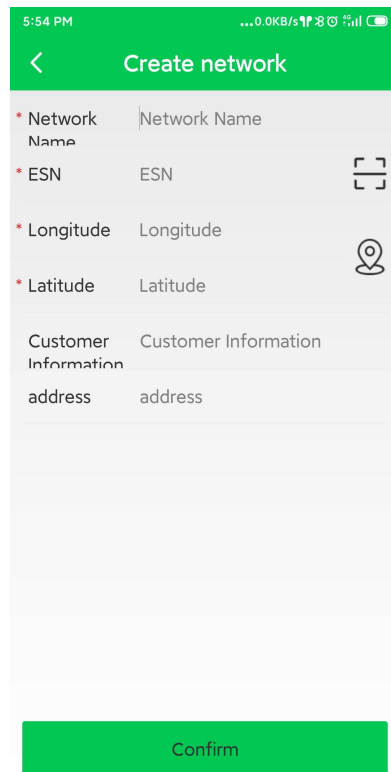
## Prerequisites

- You have logged in to the EDCM app.
- You have set EDCM communication parameters on the ECC800-Pro.



## Procedure

- Step 1** On the CloudOpera NetEco app, tap  in the upper right corner.
- Step 2** On the **Create network** screen, enter network information as prompted and tap **Confirm**.

**Figure 5-58** Creating a network



**Table 5-27** Parameter description

Parameter	Description
Network Name	Name of the network.
ESN	ESN of the ECC controller. <b>NOTE</b>  Tap  to scan the QR code on the ECC controller to obtain the ESN.
Longitude	Longitude of the network. You can manually enter the value or use GPS to locate.
Latitude	Latitude of the network. You can manually enter the value or use GPS to locate.
Customer Information	Customer information.

Parameter	Description
Address	Address of the network.

----End

# 6 O&M

## 6.1 Routine Maintenance

### 6.1.1 Monthly Maintenance

**Table 6-1** Monthly preventive maintenance table

Maintenance Area	Maintenance Item	Operation	Expected Result	Troubleshooting
Power supply and distribution system	Operating status of the surge protection module	Check the surge protection module indicator and miniature circuit breaker (MCB) status.	<ul style="list-style-type: none"> <li>The surge protection module indicator is steady green.</li> <li>The MCB is switched on.</li> </ul>	<ul style="list-style-type: none"> <li>If the surge protection module indicator is red, replace the surge protection module.</li> <li>If the MCB is off, switch it on.</li> </ul>



Maintenance Area	Maintenance Item	Operation	Expected Result	Troubleshooting
UPS	Operating environment	-	<ul style="list-style-type: none"> <li>Ambient temperature: 0–40°C</li> <li>Humidity: 0%–95% RH (non-condensing)</li> </ul>	<ul style="list-style-type: none"> <li>If the temperature or humidity is abnormal, check the smart cooling product status.</li> <li>If the input voltage is abnormal, check the power grid status and input cable connection.</li> </ul>
	Liquid crystal display (LCD)	-	According to the status icons on the LCD, all units are operating properly. No fault or alarm information is found in the active and historical alarm records.	If an alarm is present, rectify the fault by checking the device status and parameters.
Lithium battery	Battery management alarm	-	No battery management alarm is generated.	Identify the cause of an alarm based on the alarm information.

Maintenance Area	Maintenance Item	Operation	Expected Result	Troubleshooting
	Battery appearance	-	<ol style="list-style-type: none"> <li>1. The surface is clean and tidy without stains.</li> <li>2. The battery terminals are intact.</li> <li>3. Batteries are free from damage and cracks.</li> <li>4. Batteries are free from acid leakage.</li> <li>5. Batteries are not deformed or bulged.</li> </ol>	If the battery appearance is abnormal, contact Huawei technical support.
	Battery operating temperature	-	<ol style="list-style-type: none"> <li>1. Battery operating temperature: 0–45°C (charging); –20°C to +45°C (discharging)</li> <li>2. Battery charge and discharge conditions meet the requirements specified in the battery specifications.</li> </ol>	<ol style="list-style-type: none"> <li>1. Identify the cause of an abnormal battery operating temperature.</li> <li>2. If the fault persists, contact Huawei technical support.</li> </ol>
ECC800-Pro	AC input	-	Input voltage: 200–240 V AC Frequency: 45–55 Hz	If the input voltage is abnormal, check the power grid status and input cable connection.
	Output voltage	-	Output voltage: 53.5 V DC±5%	If the output voltage is abnormal, check the load power and cable connection.

Maintenance Area	Maintenance Item	Operation	Expected Result	Troubleshooting
	Indicator	-	The indicator on the power module is steady green.	Check the output voltage and determine whether the power module is faulty. If the power module is faulty, replace it.
	Fan	-	No abnormal noise is generated.	If abnormal noise is generated, clean the fan.
	Operating environment	-	<ul style="list-style-type: none"> <li>Ambient temperature: -20°C to +65°C</li> <li>Humidity: 0%–95% RH (non-condensing)</li> </ul>	If the temperature or humidity is abnormal, check the smart cooling product status.
	Monitoring module indicator	-	The monitoring module indicator is steady green or blinking green.	If the indicator is off or any abnormal condition occurs, see <a href="#">6.2.2 Management System Troubleshooting</a> to rectify the fault.
	Network interface indicator	-	The green indicator is steady on, and the yellow indicator is blinking.	If the indicator status is abnormal, check the network cable connection.

Maintenance Area	Maintenance Item	Operation	Expected Result	Troubleshooting
	Monitor interface (network management system or WebUI)	-	Export smart cooling product logs, alarms, temperature, humidity, as well as the operating status and time of the water sensor, door status sensor, temperature sensor, and smoke sensor from the management system. View the historical alarms generated in this quarter and select the most common five ones.	If an alarm is generated, handle the alarm by referring to <a href="#">6.3 Alarm References</a> and <a href="#">6.2.2 Management System Troubleshooting</a> or contacting Huawei technical support.
	Cable connection	-	The cable connection is secure.	Secure loose cables.
		-	Cables are not damaged.	Replace damaged cables.
Camera	Camera availability	On the ECC800-Pro WebUI, choose <b>Maintenance &gt; Manage Video &gt; Video Info</b> to enter the video view page. Type the camera name or IP address to find the camera, and click <b>View</b> to view the real-time monitoring page.	The monitoring page is properly displayed after you click <b>View</b> .	If the monitoring page is not displayed after you click <b>View</b> , check that the IP address is correctly set, and check cable connections or replace the camera. For details, see <a href="#">6.4.3.5 Replacing a Camera</a> .

Maintenance Area	Maintenance Item	Operation	Expected Result	Troubleshooting
Intelligent lithium battery monitoring system	Battery management alarm	-	No battery management alarm is generated.	Identify the cause of an alarm based on the alarm information.
	Cleanliness	-	Wipe the battery surface using a piece of white paper and the paper does not turn black.	Remove dust.
	Battery connection	-	Battery terminals and cables are in good contact.	Locate poor contact points between battery terminals and cables.
	Measurement of the ambient temperature of the intelligent battery monitoring system	-	The ambient temperature of the intelligent battery monitoring system is lower than 45°C.	Locate the cause of an abnormal temperature.
Water sensor and water detection cable	Functions of the water sensor and water detection cable	Place the water detection cable into the water and check whether a water leakage alarm is generated by the water sensor.	A water leakage alarm is generated.	If a water leakage alarm is not generated, replace the water detection cable.

## 6.1.2 Quarterly Maintenance

**Table 6-2** Quarterly preventive maintenance table

Maintenance Area	Maintenance Item	Operation	Expected Result	Troubleshooting
Power supply and distribution system	Operating status of the surge protection module	Check the surge protection module indicator and MCB status.	<ul style="list-style-type: none"> <li>The surge protection module indicator is steady green.</li> <li>The MCB is switched on.</li> </ul>	<ul style="list-style-type: none"> <li>If the surge protection module indicator is red, replace the surge protection module.</li> <li>If the MCB is off, switch it on.</li> </ul>
UPS	Operating environment	-	<ul style="list-style-type: none"> <li>Ambient temperature: 0°C to 40°C</li> <li>Humidity: 0%–95% RH (non-condensing)</li> </ul>	<ul style="list-style-type: none"> <li>If the temperature or humidity is abnormal, check the smart cooling product status.</li> <li>If the input voltage is abnormal, check the power grid status and input cable connection.</li> </ul>
	LCD	-	According to the status icons on the LCD, all units are operating properly. No fault or alarm information is found in the active and historical alarm records.	If an alarm is present, rectify the fault by checking the device status and parameters.

Maintenance Area	Maintenance Item	Operation	Expected Result	Troubleshooting
	Cleanliness	-	Wipe the cabinet surface using a white paper and the paper does not turn black.	Remove the dust, especially from the air filter on the front door, or replace the air filter.
	Parameter configuration	-	The configuration of the output voltage grade, frequency, number of batteries, and battery capacity meets requirements.	Reset the parameters.
	Power cables and terminals (between the UPS and the power distribution subrack)	-	The insulation layer of cables is intact and terminals are free from noticeable sparks.	<ul style="list-style-type: none"> <li>• Replace damaged cables.</li> <li>• Secure output terminals.</li> </ul>
Lithium battery	Battery management alarm	-	No battery management alarm is generated.	Identify the cause of an alarm based on the alarm information.

Maintenance Area	Maintenance Item	Operation	Expected Result	Troubleshooting
	Battery appearance	-	<ol style="list-style-type: none"> <li>1. The surface is clean and tidy without stains.</li> <li>2. The battery terminals are intact.</li> <li>3. Batteries are free from damage and cracks.</li> <li>4. Batteries are free from acid leakage.</li> <li>5. Batteries are not deformed or bulged.</li> </ol>	If the battery appearance is abnormal, contact Huawei technical support.
	Battery operating temperature	-	<ol style="list-style-type: none"> <li>1. Battery operating temperature: 0–45°C (charging); –20°C to +45°C (discharging)</li> <li>2. Battery charge and discharge conditions meet the requirements specified in the battery specifications.</li> </ol>	<ol style="list-style-type: none"> <li>1. Identify the cause of an abnormal battery operating temperature.</li> <li>2. If the fault persists, contact Huawei technical support.</li> </ol>
	Battery management parameter settings	-	Check that the settings of battery management parameters meet the requirements in the user manual.	Set parameters correctly.



Maintenance Area	Maintenance Item	Operation	Expected Result	Troubleshooting
	Battery bolts	-	The location of the signs marked on battery terminal bolts indicating tight connections does not change.	Take photos from multiple angles and contact Huawei technical support.
	Cables between batteries	-	No cable deteriorates and the insulation layer does not crack.	Replace the faulty cable.
	Battery voltage	-	<ul style="list-style-type: none"> <li>• Equalized charging voltage: 53.5 V DC</li> <li>• Float charging voltage: 53.4 V DC</li> </ul>	<ol style="list-style-type: none"> <li>1. Check whether the equalized charging voltage and float charging voltage of a battery are normal.</li> <li>2. If the charging voltage of a battery exceeds the specifications requirement, perform a complete forcible equalized charging for the battery, and check again whether the voltage is normal.</li> <li>3. If the fault persists, contact Huawei technical support.</li> </ol>

Maintenance Area	Maintenance Item	Operation	Expected Result	Troubleshooting
	Shallow discharge test (recommended)	-	Conduct a shallow discharge test when the UPS is backed up to verify that the batteries can discharge properly.	<ol style="list-style-type: none"> <li>1. Locate the cause when an exception is identified.</li> <li>2. If the fault persists, contact Huawei technical support.</li> </ol>
ECC800-Pro	AC input	-	Input voltage: 200–240 V AC Frequency: 45–55 Hz	If the input voltage is abnormal, check the power grid status and input cable connection.
	Output voltage	-	Output voltage: 53.5 V DC±5%	If the output voltage is abnormal, check the load power and cable connection.
	Indicator	-	The indicator on the power module is steady green.	Check the output voltage and determine whether the power module is faulty. If the power module is faulty, replace it.
	Fan	-	No abnormal noise is generated.	If abnormal noise is generated, clean the fan.
	Operating environment	-	<ul style="list-style-type: none"> <li>• Ambient temperature: –20°C to +65°C</li> <li>• Humidity: 0%–95% RH (non-condensing)</li> </ul>	If the temperature or humidity is abnormal, check the smart cooling product status.

Maintenance Area	Maintenance Item	Operation	Expected Result	Troubleshooting
	Monitoring module indicator	-	The monitoring module indicator is steady green or blinking green.	If the indicator is off or any abnormal condition occurs, see <a href="#">6.2.2 Management System Troubleshooting</a> to rectify the fault.
	Network interface indicator	-	The green indicator is steady on, and the yellow indicator is blinking.	If the indicator status is abnormal, check the network cable connection.
	Monitor interface (network management system or WebUI)	-	Export smart cooling product logs, alarms, temperature, humidity, as well as the operating status and time of the water sensor, door status sensor, temperature sensor, and smoke sensor from the management system. View the historical alarms generated in this quarter and select the most common five ones.	If an alarm is generated, handle the alarm by referring to <a href="#">6.3 Alarm References</a> and <a href="#">6.2.2 Management System Troubleshooting</a> or contacting Huawei technical support.
	Cable connection	-	The cable connection is secure.	Secure loose cables.
		-	Cables are not damaged.	Replace damaged cables.

Maintenance Area	Maintenance Item	Operation	Expected Result	Troubleshooting
Camera	Camera availability	On the ECC800-Pro WebUI, choose <b>Maintenance &gt; Manage Video &gt; Video Info</b> to enter the video view page. Type the camera name or IP address to find the camera, and click <b>View</b> to view the real-time monitoring page.	The monitoring page is properly displayed after you click <b>View</b> .	If the monitoring page is not displayed after you click <b>View</b> , check that the IP address is correctly set, and check cable connections or replace the camera. For details, see <a href="#">6.4.3.5 Replacing a Camera</a> .
Intelligent lithium battery monitoring system	Battery management alarm	-	No battery management alarm is generated.	Identify the cause of an alarm based on the alarm information.
	Cleanliness	-	Wipe the battery surface using a piece of white paper and the paper does not turn black.	Remove dust.
	Battery connection	-	Battery terminals and cables are in good contact.	Locate poor contact points between battery terminals and cables.
	Measurement of the ambient temperature of the intelligent battery monitoring system	-	The ambient temperature of the intelligent battery monitoring system is lower than 45°C.	Locate the cause of an abnormal temperature.

Maintenance Area	Maintenance Item	Operation	Expected Result	Troubleshooting
Water sensor and water detection cable	Functions of the water sensor and water detection cable	Place the water detection cable into the water and check whether a water leakage alarm is generated by the water sensor.	A water leakage alarm is generated.	If a water leakage alarm is not generated, replace the water detection cable.

## 6.1.3 Yearly Maintenance

**Table 6-3** Yearly preventive maintenance table

Maintenance Area	Maintenance Item	Operation	Expected Result	Troubleshooting
Power supply and distribution system	Operating status of the surge protection module	Check the surge protection module indicator and MCB status.	<ul style="list-style-type: none"> <li>The surge protection module indicator is steady green.</li> <li>The MCB is switched on.</li> </ul>	<ul style="list-style-type: none"> <li>If the surge protection module indicator is red, replace the surge protection module.</li> <li>If the MCB is off, switch it on.</li> </ul>
	Dust inside the power distribution subrack	Check whether there is dust on the power distribution subrack panel.	The white paper that you use to wipe the PDC panels is clean.	If the white paper is dirty, clean the power distribution subrack.
	Bolts between power cables and the busbar	Tighten all bolts regularly using an adjustable wrench after powering off the device.	The bolts are secured.	Tighten a bolt if it is loose.

Maintenance Area	Maintenance Item	Operation	Expected Result	Troubleshooting
	Circuit breaker	Switch on or off the circuit breaker after powering off the device.	The circuit breaker is switched on and off smoothly for five times.	If the circuit breaker cannot be switched on or off smoothly and there is a spare circuit breaker, connect cables to the spare one.
	Cable insulation performance	Measure the insulation resistance using an insulation tester after power-off.	The insulation resistance is greater than or equal to 5 megohms.	If the cable insulation does not meet the requirement, replace the power cable.
	Insulation performance of the power distribution subrack	Measure the insulation resistance using an insulation tester after power-off.	The insulation resistance is greater than or equal to 10 megohms.	If the insulation performance is poor, check and maintain the components in the power distribution subrack, such as internal cables and circuit breakers.
	Insulation resistance of the secondary loop	Measure the insulation resistance using an insulation tester after power-off.	The insulation resistance is greater than or equal to 2 megohms.	If the insulation performance is poor, check and maintain the signal cable and smart ETH gateway.

Maintenance Area	Maintenance Item	Operation	Expected Result	Troubleshooting
UPS	Operating environment	-	<ul style="list-style-type: none"> <li>Ambient temperature: 0–40°C</li> <li>Humidity: 0%–95% RH (non-condensing)</li> </ul>	<ul style="list-style-type: none"> <li>If the temperature or humidity is abnormal, check the smart cooling product status.</li> <li>If the input voltage is abnormal, check the power grid status and input cable connection.</li> </ul>
	LCD	-	According to the status icons on the LCD, all units are operating properly. No fault or alarm information is found in the active and historical alarm records.	If an alarm is present, rectify the fault by checking the device status and parameters.
	Cleanliness	-	Wipe the cabinet surface using a white paper and the paper does not turn black.	Remove the dust, especially from the air filter on the front door, or replace the air filter.
	Parameter configuration	-	The configuration of the output voltage grade, frequency, number of batteries, and battery capacity meets requirements.	Reset the parameters.

Maintenance Area	Maintenance Item	Operation	Expected Result	Troubleshooting
	Power cables and terminals (between the UPS and the power distribution subrack)	-	The insulation layer of cables is intact and terminals are free from noticeable sparks.	<ul style="list-style-type: none"> <li>Replace damaged cables.</li> <li>Secure output terminals.</li> </ul>
Lithium battery	Battery management alarm	-	No battery management alarm is generated.	Identify the cause of an alarm based on the alarm information.
	Battery appearance	-	<ol style="list-style-type: none"> <li>The surface is clean and tidy without stains.</li> <li>The battery terminals are intact.</li> <li>Batteries are free from damage and cracks.</li> <li>Batteries are free from acid leakage.</li> <li>Batteries are not deformed or bulged.</li> </ol>	If the battery appearance is abnormal, contact Huawei technical support.
	Battery operating temperature	-	<ol style="list-style-type: none"> <li>Battery operating temperature: 0–45°C (charging); –20°C to +45°C (discharging)</li> <li>Battery charge and discharge conditions meet the requirements specified in the battery specifications.</li> </ol>	<ol style="list-style-type: none"> <li>Identify the cause of an abnormal battery operating temperature.</li> <li>If the fault persists, contact Huawei technical support.</li> </ol>



Maintenance Area	Maintenance Item	Operation	Expected Result	Troubleshooting
	Battery management parameter settings	-	Check that the settings of battery management parameters meet the requirements in the user manual.	Set parameters correctly.
	Battery bolts	-	The location of the signs marked on battery terminal bolts indicating tight connections does not change.	Take photos from multiple angles and contact Huawei technical support.
	Cables between batteries	-	No cable deteriorates and the insulation layer does not crack.	Replace the faulty cable.

Maintenance Area	Maintenance Item	Operation	Expected Result	Troubleshooting
	Battery voltage	-	<ul style="list-style-type: none"> <li>• Equalized charging voltage: 53.5 V DC</li> <li>• Float charging voltage: 53.4 V DC</li> </ul>	<ol style="list-style-type: none"> <li>1. Check whether the equalized charging voltage and float charging voltage of a battery are normal.</li> <li>2. If the charging voltage of a battery exceeds the specifications requirement, perform a complete forcible equalized charging for the battery, and check again whether the voltage is normal.</li> <li>3. If the fault persists, contact Huawei technical support.</li> </ol>
	Shallow discharge test (recommended)	-	Conduct a shallow discharge test when the UPS is backed up to verify that the batteries can discharge properly.	<ol style="list-style-type: none"> <li>1. Locate the cause when an exception is identified.</li> <li>2. If the fault persists, contact Huawei technical support.</li> </ol>

Maintenance Area	Maintenance Item	Operation	Expected Result	Troubleshooting
	Capacity test (recommended)	-	When the UPS is backed up, discharge a battery to the undervoltage alarm threshold, to refresh the capacity of the battery.	<ol style="list-style-type: none"> <li>1. Locate the cause when an exception is identified.</li> <li>2. If the fault persists, contact Huawei technical support.</li> </ol>
	Battery connection	-	<ol style="list-style-type: none"> <li>1. When battery strings are powered off, check the reliability of each connection point from positive terminals to negative terminals. Check that all points are connected reliably.</li> <li>2. Use a torque wrench to check the tightening torque for each battery screw. The torque meets the requirements of the battery manufacturer. After checking that the battery screws meet the requirements, mark the screws for later check.</li> </ol>	<ol style="list-style-type: none"> <li>1. Rectify any abnormal connection.</li> <li>2. If the fault persists, contact Huawei technical support.</li> </ol>

Maintenance Area	Maintenance Item	Operation	Expected Result	Troubleshooting
ECC800-Pro	AC input	-	Input voltage: 200–240 V AC Frequency: 45–55 Hz	If the input voltage is abnormal, check the power grid status and input cable connection.
	Output voltage	-	Output voltage: 53.5 V DC±5%	If the output voltage is abnormal, check the load power and cable connection.
	Indicator	-	The indicator on the power module is steady green.	Check the output voltage and determine whether the power module is faulty. If the power module is faulty, replace it.
	Fan	-	No abnormal noise is generated.	If abnormal noise is generated, clean the fan.
	Operating environment	-	<ul style="list-style-type: none"> <li>Ambient temperature: –20°C to +65°C</li> <li>Humidity: 0%–95% RH (non-condensing)</li> </ul>	If the temperature or humidity is abnormal, check the smart cooling product status.
	Monitoring module indicator	-	The monitoring module indicator is steady green or blinking green.	If the indicator is off or any abnormal condition occurs, see <a href="#">6.2.2 Management System Troubleshooting</a> to rectify the fault.

Maintenance Area	Maintenance Item	Operation	Expected Result	Troubleshooting
	Network interface indicator	-	The green indicator is steady on, and the yellow indicator is blinking.	If the indicator status is abnormal, check the network cable connection.
	Monitor interface (network management system or WebUI)	-	Export smart cooling product logs, alarms, temperature, humidity, as well as the operating status and time of the water sensor, door status sensor, temperature sensor, and smoke sensor from the management system. View the historical alarms generated in this quarter and select the most common five ones.	If an alarm is generated, handle the alarm by referring to <a href="#">6.3 Alarm References</a> and <a href="#">6.2.2 Management System Troubleshooting</a> or contacting Huawei technical support.
	Cable connection	-	The cable connection is secure.	Secure loose cables.
		-	Cables are not damaged.	Replace damaged cables.

Maintenance Area	Maintenance Item	Operation	Expected Result	Troubleshooting
Camera	Camera availability	On the ECC800-Pro WebUI, choose <b>Maintenance &gt; Manage Video &gt; Video Info</b> to enter the video view page. Type the camera name or IP address to find the camera, and click <b>View</b> to view the real-time monitoring page.	The monitoring page is properly displayed after you click <b>View</b> .	If the monitoring page is not displayed after you click <b>View</b> , check that the IP address is correctly set, and check cable connections or replace the camera. For details, see <a href="#">6.4.3.5 Replacing a Camera</a> .
Intelligent lithium battery monitoring system	Battery management alarm	-	No battery management alarm is generated.	Identify the cause of an alarm based on the alarm information.
	Cleanliness	-	Wipe the battery surface using a piece of white paper and the paper does not turn black.	Remove dust.
	Battery connection	-	Battery terminals and cables are in good contact.	Locate poor contact points between battery terminals and cables.
	Measurement of the ambient temperature of the intelligent battery monitoring system	-	The ambient temperature of the intelligent battery monitoring system is lower than 45°C.	Locate the cause of an abnormal temperature.

Maintenance Area	Maintenance Item	Operation	Expected Result	Troubleshooting
Water sensor and water detection cable	Functions of the water sensor and water detection cable	Place the water detection cable into the water and check whether a water leakage alarm is generated by the water sensor.	A water leakage alarm is generated.	If a water leakage alarm is not generated, replace the water detection cable.

## 6.2 Troubleshooting

### 6.2.1 Power Supply and Distribution System Troubleshooting

Except mains outage, power supply and distribution faults are caused by the damage or failure of one or more components. Rectify the faults based on fault location and fault type.

#### NOTICE




- When a UPS is faulty, alarm information is displayed on the LCD. Critical alarms must be handled before powering on the UPS again. Otherwise, the fault may be extended, or the UPS may be damaged.
- If the fault is not rectified, contact Huawei technical support.

**Table 6-4** Power supply and distribution system troubleshooting

Symptom	Possible Cause	Measure
The power input to the downstream device is abnormal.	<ul style="list-style-type: none"> <li>• The switch trips abnormally.</li> <li>• The UPS is faulty.</li> </ul>	<ul style="list-style-type: none"> <li>• Use a multimeter to check whether there is a short circuit. Turn on the switch again, and check whether the system is overloaded.</li> <li>• Restart the UPS. If the UPS is faulty, replace it.</li> </ul>

Symptom	Possible Cause	Measure
The surge protection function fails.	<ul style="list-style-type: none"> <li>The SPD circuit breaker is OFF.</li> <li>The SPD ground cable is not connected.</li> <li>The surge protection module is abnormal. The SPD window is red.</li> </ul>	<ul style="list-style-type: none"> <li>Check that the SPD circuit breaker is turned on. The power distribution subrack (monitoring type) will prompt an alarm indicating that the SPD circuit breaker is not turned on.</li> <li>Check whether the SPD ground cable is properly connected.</li> <li>Replace the surge protection module. For details, see <a href="#">6.4.2.1 Replacing a Surge Protection Module</a>.</li> </ul>
The general switch is ON, the LCD displays no information, and the system does not perform self-check.	The input power supply is not connected.	Check the UPS input power cable connection.
	The input voltage is less than the lower threshold or greater than the upper threshold.	Use a voltmeter to check whether the UPS input voltage meets requirements.
The mains is normal, but the AC input indicator is off. The UPS works in battery mode.	The UPS mains switch is OFF.	Turn on the UPS mains switch.
	The input cable is not properly connected.	Check the UPS input power cable connection.
The UPS fails to communicate.	<ul style="list-style-type: none"> <li>The UPS communications cable is not properly connected.</li> <li>The UPS parallel cable is not properly connected.</li> <li>The UPS is deleted on the ECC800-Pro WebUI.</li> </ul>	<ul style="list-style-type: none"> <li>Reconnect the UPS communications cable.</li> <li>Reconnect the UPS parallel cable.</li> <li>Remove the network cable from the MON1 port on the UPS, reinstall the cable, and add the UPS on the ECC800-Pro WebUI.</li> </ul>
The UPS does not report a fault but has no output voltage.	The output cable is not properly connected.	Check the output power cable connection.



Symptom	Possible Cause	Measure
The UPS does not start after you press  .	 is not pressed long enough.	Press  for more than 5 seconds until you hear a beep sound.
	The UPS is overloaded.	Shut down all loads, and restart the UPS.
The mains indicator is off.	The mains voltage or frequency exceeds the UPS input range.	Use a multimeter to verify that the input voltage and frequency meet specifications.
The battery discharge time is obviously shorter than the standard time.	Batteries are not fully charged.	Charge batteries for more than 8 hours when the mains is normal. Test the discharge time again.
	The battery performance deteriorates.	Contact your local Huawei technical support to replace batteries.
Abnormal noise or smell is generated in the UPS cabinet.	The UPS is faulty.	Shut down the UPS and cut off the power input immediately. Contact your local Huawei technical support.
The battery indicator blinks. The buzzer buzzes 1 second and then stops 1 second. The battery reserve is insufficient. The UPS is about to shut down.	<ul style="list-style-type: none"> <li>The UPS will soon shut down due to insufficient battery reserve, and loads will be powered off.</li> <li>The number of batteries and battery capacity are incorrectly set.</li> </ul>	<ul style="list-style-type: none"> <li>Save load data immediately and shut down primary loads to avoid data loss or damage.</li> <li>Connect the UPS input to the backup AC power supply immediately.</li> <li>Verify that the number of batteries and battery capacity are correctly set based on the actual configuration.</li> </ul>

Symptom	Possible Cause	Measure
The user forgot the password.	None	<ul style="list-style-type: none"> <li>If the user forgot only the LCD password (the preset password is 000001), use the feature code (the preset feature code is 999999) to activate the LCD password.</li> <li>If the user forgot the LCD password and feature code, contact your local Huawei technical support.</li> </ul>

## 6.2.2 Management System Troubleshooting

**Table 6-5** Common faults and troubleshooting for PSUs

Symptom	Possible Cause	Measure
The Power indicator (green) is off.	No AC input	Check whether the AC input is abnormal.
	PSU fault	Replace the PSU.
The Alarm indicator (yellow) is steady on.	Overtemperature protection	<ul style="list-style-type: none"> <li>The ambient temperature exceeds the upper threshold. Increase the cooling capacity of the smart cooling product.</li> <li>The air channel is blocked. Unblock it.</li> </ul>
	AC input overvoltage or undervoltage protection	Check whether the AC input is abnormal.
The Alarm indicator (yellow) is blinking.	PSU communication failure	1. Clean the connector in the rear of the faulty PSU.
	Monitoring module communication failure	2. If the fault persists, replace the ECC800-Pro subrack.

Symptom	Possible Cause	Measure
The Alarm indicator (red) is steady on.	Output overvoltage protection	<ul style="list-style-type: none"> <li>If a single PSU is locked out, disconnect the AC input from the PSU, and then power on the PSU again after the indicator turns off. If the fault persists, replace the PSU.</li> <li>If multiple PSUs are locked out, remove all PSUs and reinstall them one by one to locate the faulty ones. Then replace faulty PSUs.</li> </ul>
	No output due to a PSU fault	Replace the faulty PSU.

**Table 6-6** Common faults and troubleshooting for the monitoring module

No.	Symptom	Possible Cause	Measure
1	The Run indicator (green) is off.	There is no AC input.	If the green indicators on PSUs are steady on, the power input to the system is normal. Otherwise, rectify power grid faults.
		The monitoring module is faulty or not securely installed.	Reinstall the monitoring module. If the fault persists, replace the monitoring module.
2	RJ45 power output indicators turn off (involved ports: AIDI_1 - AIDI_5, COM1-COM4, and DO).	The corresponding power ports have no output.	Energize corresponding power ports over the WebUI or network management system.
		The corresponding power ports are short-circuited.	Check whether the connected load is short-circuited. If yes, eliminate the short circuit.

No.	Symptom	Possible Cause	Measure
3	The ALM indicator (red) is steady on.	Faults and alarms are generated.	View active alarms on the WebUI and clear them one by one.

## 6.3 Alarm References

 NOTE

This chapter provides only measures to clear major and critical alarms for certain components. For details about other alarms, see the ECC800-Pro WebUI.

**Table 6-7** Alarm list

Component	Alarm Name	Alarm Severity	Possible Cause	Measures
Surge protective device (SPD)	SPD fault	Major	A surge protection module is damaged or the SPD circuit breaker has tripped.	Replace the surge protection module or switch on the SPD circuit breaker.
UPS	Rectifier fault	Critical	<ul style="list-style-type: none"> <li>The mains has experienced a transient high voltage.</li> <li>The output carries special loads such as the inductive and rectification loads.</li> <li>The output carries the transformer load but the transformer mode is not enabled.</li> <li>The hardware is damaged.</li> </ul>	<ul style="list-style-type: none"> <li>Rectify the fault, and power on the UPS again.</li> <li>Check that the load types are supported by the UPS.</li> <li>Enable the transformer mode.</li> <li>Contact Huawei technical support.</li> </ul>
	Internal fault	Critical	The bypass input cable connection does not match the output system.	Correct the bypass input cable connection so that it matches the output system.
	Fan fault	Critical	The fan is abnormal.	Clean up foreign matter around the fan. If the fault persists, contact Huawei technical support.

Component	Alarm Name	Alarm Severity	Possible Cause	Measures
	Inverter fault	Critical	The inverter output short-circuits.	Eliminate the short circuit at the output port cable connection, and then power on and start the inverter again. If the fault persists, contact Huawei technical support.
	Output short circuit <b>NOTE</b> The system immediately disconnects the power output.	Critical	The load or cable is short-circuited.	Locate and rectify the short circuit.
Intelligent lithium battery monitoring system	Communication Failure	Critical	The network cable communication is interrupted.	Check the cable connection to the smart ETH gateway.
	BCB Tripping	Critical	<ul style="list-style-type: none"> <li>The battery has discharged to the end-of-discharge (EOD) threshold.</li> <li>The battery circuit breaker (BCB) box is manually disconnected.</li> <li>There is a security risk in the battery loop.</li> </ul>	Identify the alarm cause, rectify the fault, and switch on the BCB box.
	Single Batt. terminal off	Critical	<ul style="list-style-type: none"> <li>A battery terminal screw is not tightened.</li> <li>The battery terminal is not properly connected to the connector.</li> </ul>	<ul style="list-style-type: none"> <li>Check that battery terminal screws are tightened.</li> <li>Check that battery terminals are properly connected to connectors.</li> </ul>

Component	Alarm Name	Alarm Severity	Possible Cause	Measures
	Single Batt. Exception	Critical	<ul style="list-style-type: none"> <li>The battery shell is broken, resulting in electrolyte and electricity leakage.</li> <li>The battery loop cable is broken and short-circuited to the ground, resulting in electricity leakage.</li> </ul>	<ul style="list-style-type: none"> <li>Check whether the appearances of abnormal batteries are intact, and replace abnormal batteries.</li> <li>Check whether battery loop cables are deteriorated or broken, and replace faulty cables.</li> </ul>

## 6.4 Parts Replacement

### 6.4.1 Replacing Structural System Components

#### 6.4.1.1 Replacing a Cabinet Electronic Clasp Lock

##### Prerequisites

- Tool: Phillips screwdriver
- Material: A spare cabinet electronic clasp lock is available and functional.

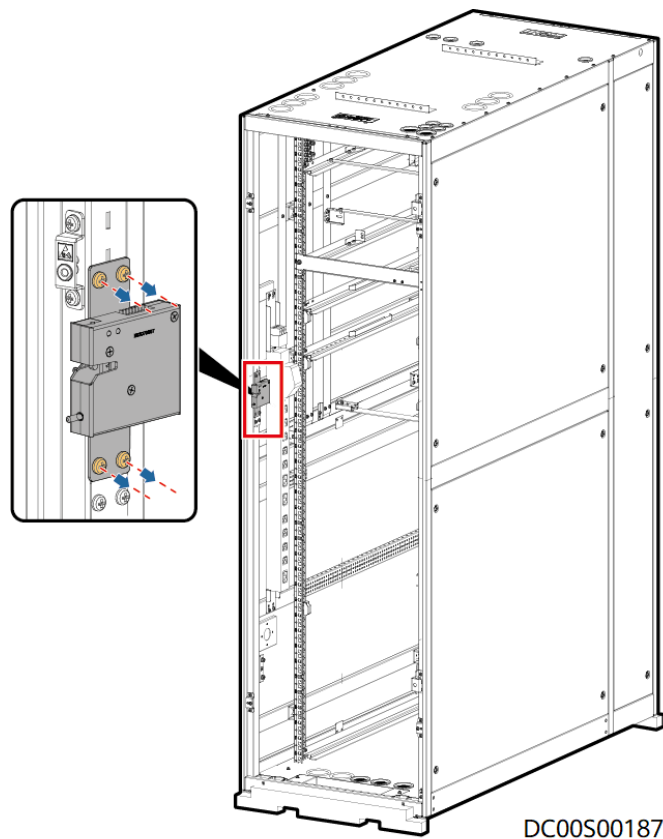
##### Context

cabinet electronic clasp locks are installed at the front and rear doors of a cabinet.

##### Procedure

- Step 1** Open the front or rear door of the cabinet.
- Step 2** Remove the signal cables from the cabinet electronic clasp lock.
- Step 3** Remove the cabinet electronic clasp lock bolts using a Phillips screwdriver.

**Figure 6-1** Removing a cabinet electronic clasp lock



**Step 4** Install the new cabinet electronic clasp lock at the front or rear door of a cabinet.

**NOTE**

- Before removing a cabinet electronic clasp lock, remember the DIP switch settings on the cabinet electronic clasp lock. Ensure that the DIP switch settings on the new cabinet electronic clasp lock are the same as those on the old cabinet electronic clasp lock.
- The mounting holes for the new cabinet electronic clasp lock are slotted holes. If the door cannot be properly closed after installation, adjust the lock height based on site requirements.

**Step 5** Reconnect the cables to the cabinet electronic clasp lock.

----End

### 6.4.1.2 Replacing a Gas Spring

#### Prerequisites

- Tools: Phillips screwdriver, step ladder
- Material: A spare gas spring is available and functional.

#### Context

Gas springs are installed on the top of a cabinet.

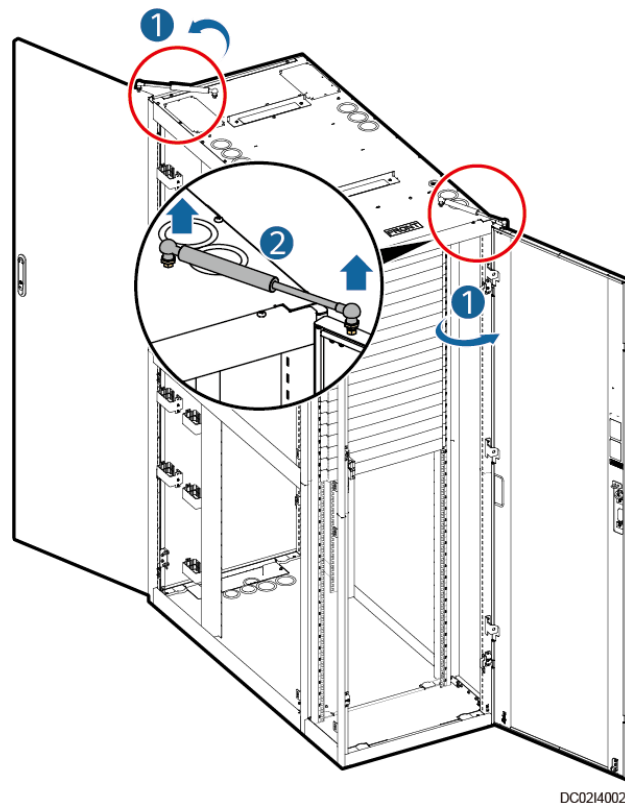
## Procedure

**Step 1** Open the front or rear door of the cabinet.

**Step 2** Remove the nuts from the gas spring using an adjustable wrench.

**Step 3** Remove the gas springs.

**Figure 6-2** Removing a gas spring



**Step 4** Tighten the new air spring using an adjustable wrench.

----End

### 6.4.1.3 Replacing a PDU2000

#### Prerequisites

- Tools: Phillips screwdriver, step ladder
- Material: A spare PDU2000 of the same model is available and functional.

#### Context

A PDU2000 is installed at the rear door of a cabinet.

#### Procedure

**Step 1** Open the rear door of the cabinet.



- Step 2** Switch off the output circuit breaker of the power distribution subrack for the PDU2000. Disconnect the power cables and signal cables from the PDU2000 terminal block.
- Step 3** Remove the bolts that secure the PDU2000 using a Phillips screwdriver.
- Step 4** Secure the new PDU2000 to the rear door of the cabinet.
- Step 5** Reconnect the power cables or signal cables to the PDU2000, and switch on the circuit breaker of the power distribution subrack.
- End

## 6.4.2 Replacing Power Supply and Distribution System Components

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 **DANGER**

- Only qualified personnel can replace components of the power supply and distribution system.
  - Wear protective tools such as insulation gloves and shoes before replacing a power supply and distribution component.
  - Power off the upper-level equipment before replacing a power supply and distribution component.
  - Use a multimeter and electrical tester pen to check whether the front and rear ends of the component to be replaced are powered off after the component is powered off.
- 

### 6.4.2.1 Replacing a Surge Protection Module

#### Prerequisites

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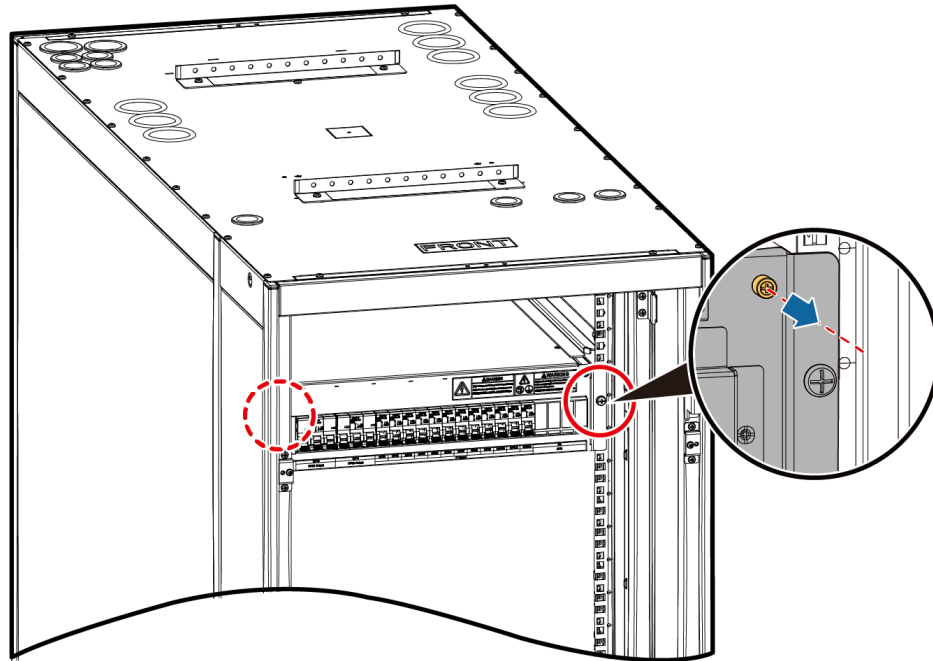
 **DANGER**

- Do not replace a surge protection module during a thunderstorm.
  - Before replacing a surge protection module, wear insulation gloves.
- 
- Tools: insulation protective gloves, electroprobe
  - Material: A new surge protection module of the same model is available and functional.

#### Procedure

- Step 1** Switch the SPD circuit breaker to OFF.
- Step 2** Remove the protective panel from the SPD.

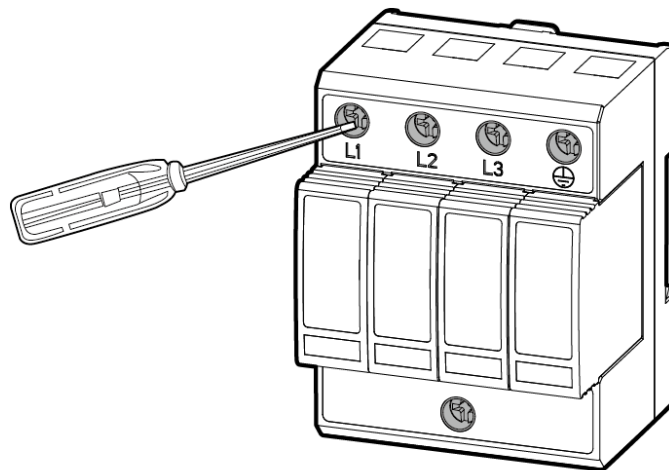
**Figure 6-3** Removing the protective panel



DC02H00352

**Step 3** Measure the L1, L2, L3, and N voltages to PE using an electroprobe, as shown in [Figure 6-4](#), and verify that the faulty SPD has no voltage before replacing the faulty surge protection module.

**Figure 6-4** Measuring voltages



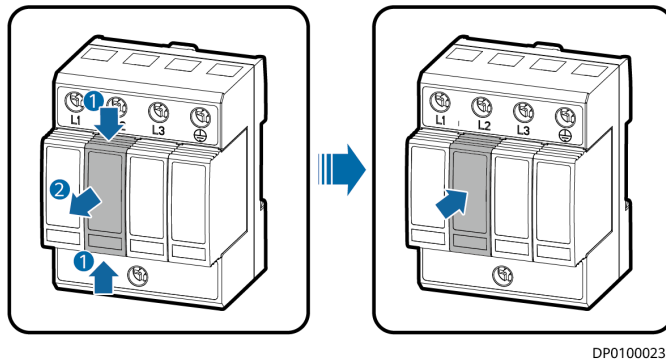
DP01000233

**Step 4** Hold the faulty surge protection module and pull it out, as shown in [Figure 6-5](#).

**⚠ DANGER**

During replacement, do not touch the energized components in the power distribution subrack.

**Figure 6-5** Replacing a surge protection module



**Step 5** Install the new surge protection module.

**Step 6** Reinstall the protective panel for the SPD, and switch the SPD circuit breaker to ON.

**Step 7** Check whether there are alarms on the ECC800-Pro. If there is no alarm, the surge protection module is functional.

----End

## 6.4.2.2 Replacing a Fuse

### Prerequisites

---

**CAUTION**

When replacing a fuse, wear insulation gloves and do not touch the input copper bar.

---

- Tool: insulation gloves
- Material: The new fuse of the same model is available and functional.

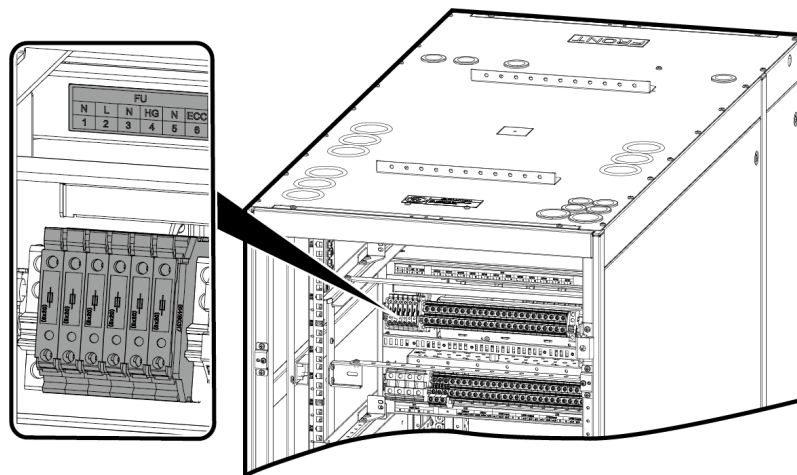
### Procedure

**Step 1** Shake the fuse terminal block gently, pull it out, and push it outwards.

**NOTE**

Fuses can be replaced in a similar way. The following figure is for reference only.

**Figure 6-6** Opening the fuse terminal block



DC00S00173

**Step 2** Reinstall the fuse terminal block in the power distribution subrack.

**Step 3** Close the fuse terminal block.

**Step 4** Observe the indicator. If the indicator is on, the fuse is functional.

----End

### 6.4.2.3 Replacing a UPS2000-G

#### Prerequisites

- Tools: electroprobe, insulation gloves, Phillips screwdriver, multimeter
- Materials: A spare UPS of the same model is available and functional.
- The UPS is damaged or faulty and cannot work.

---

#### NOTICE

- Ensure that the main ground cable of the smart module is securely connected.
  - After removing cables, wrap exposed terminals with insulation tape and do not block cable labels. If cable labels are blocked, cables may be connected incorrectly later.
- 

**Step 1** Turn off the battery switch, or remove the wiring terminal between the battery and the faulty UPS.

**Step 2** Turn off the corresponding UPS input and output switches. Use a multimeter to check whether the UPS input and output terminals and battery terminals are de-energized.

**Step 3** Remove the rear cover from the UPS, and remove the input and output power cables, battery cable, and signal cable.

---

**NOTICE**

Wrap the exposed cable with insulation tape.

---

- Step 4** Remove screws from the UPS front panel, and pull out the UPS.
- Step 5** Install the new UPS and screw it to the cabinet.
- Step 6** Connect the output power cables, signal cable, and UPS input power cables in sequence. Check whether the cable labels are consistent with the silk screens on the UPS, and whether all cables are connected.
- Step 7** Switch on the external battery circuit breaker to start the UPS. You can set the battery capacity based on the site requirements.
- Step 8** Press and hold **ON/MUTE** for more than 5s. Release the button when you hear a beep sound. The UPS starts to work in normal mode.
- Step 9** After you ensure that the UPS runs properly, switch on the AC output circuit breaker Q for the UPS to start the load.

----End

## 6.4.2.4 Replacing a Lithium Battery

### Prerequisites

- Tools: insulation gloves, Phillips screwdriver, socket wrench
- Material: A new battery module is intact.
- The gyroscope function is disabled.

---

**NOTICE**

Before the replacement, ensure that the load services are not affected or obtain written consent from the customer.

---

### Procedure

- Step 1** Switch the BAT- battery circuit breaker on the power system to OFF or remove the battery fuse.
- Step 2** Use the Manual ON/OFF button on the battery to turn off the battery output.
- Step 3** Disconnect the cables from the old battery. Insulate each cable and label it immediately after disconnecting it.
- Step 4** Loosen the screws on the panel and remove the battery.
- Step 5** Install the new battery and tighten the screws.
- Step 6** Hold down the Manual ON/OFF button for 15s for the battery to enter the maintenance mode. In this mode, all indicators blink, the battery board is activated, but the battery is not charged or discharged.

- Step 7** Connect the cables to the new battery based on the cable labels.
- Step 8** Switch the BAT- battery circuit breaker in the power system to ON or reinstall the battery fuse using a fuse extracting unit.
- Step 9** Hold down the Manual ON/OFF button for 15s for the battery to exit the maintenance mode. The battery is automatically activated and connects to the power system.
- End

## 6.4.3 Replacing Management System Components

After replacing a component of the management system, set parameters for the new component to ensure normal communication.

### 6.4.3.1 Replacing an ECC800-Pro Main Control Module

#### Prerequisites

---

#### NOTICE

- The ECC800-Pro main control module is hot-swappable.
  - Before disconnecting cables from the ECC800-Pro main control module, label the cables based on the corresponding ports.
- 
- Tools: ESD wrist strap, ESD gloves, Phillips screwdriver, labels, marker
  - Material: A spare undamaged and undeformed ECC800-Pro main control module of the same model is available.

#### Procedure

- Step 1** Use the **Back Up Current Settings** function to record the ECC800-Pro configuration information or manually record the information.

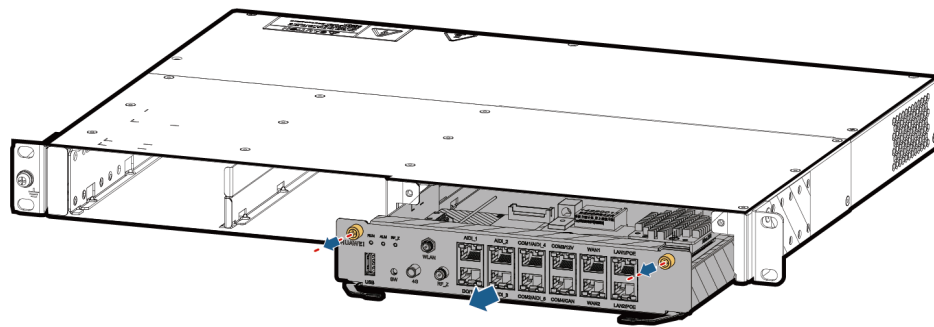
Path: **Maintenance > Configuration File > Back Up Current Settings**

#### NOTE

If the main control module is damaged, you may fail to log in to the ECC800-Pro. In this case, you cannot back up the settings.

- Step 2** Label each cable and antenna based on the corresponding ports on the ECC800-Pro main control module.
- Step 3** Remove the cables and antenna from the ECC800-Pro main control module.
- Step 4** Loosen the captive screws on both sides of the ECC800-Pro main control module and pull the handles on both sides of the module to remove the module.

**Figure 6-7** Removing the ECC800-Pro main control module

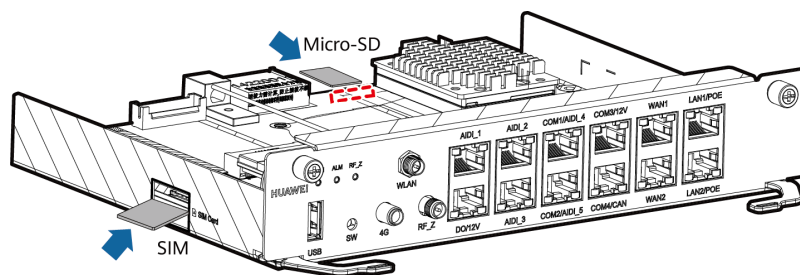


DM02H00026

**Step 5** (Optional) Remove the Micro SD card and SIM card from the corresponding slots of the ECC800-Pro main control module.

**Step 6** (Optional) Install the removed Micro SD and SIM card in the corresponding slots of the new ECC800-Pro main control module.

**Figure 6-8** Installing the Micro SD and SIM card



DM02H00023

**Step 7** Install the spare ECC800-Pro main control module in the ECC800-Pro subrack and tighten the screws on both sides of the ECC800-Pro main control module.

**Step 8** Connect the communications cables and antennas to the ECC800-Pro main control module.

**Step 9** Choose **Maintenance > Configuration File** and import the backup configuration file, or set parameters for the devices that connect to the ECC800-Pro to ensure normal communication.

----End

### 6.4.3.2 Replacing an ECC800-Pro PSU

#### Prerequisites

**⚠ DANGER**

Do not touch the terminals in the rear of a removed PSU to avoid electric shocks.

- Tool: insulation gloves

- Materials: a reserved undamaged and undeformed PSU of the appropriate model.

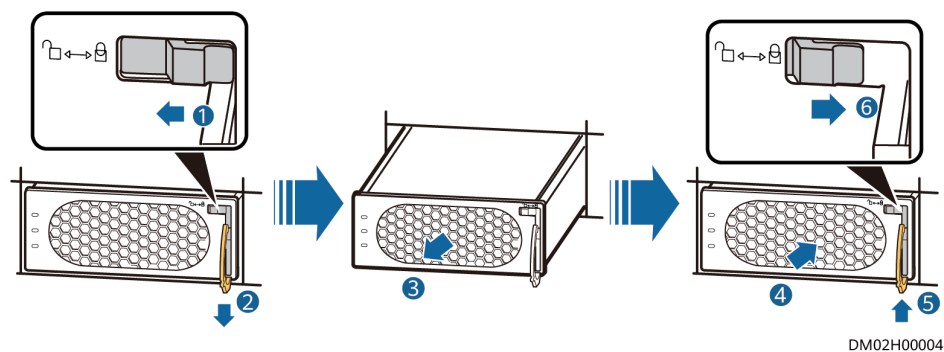
## Context

The PSU is hot-swappable.

## Procedure

- Step 1** Push the locking latch in the upper right corner of the PSU panel leftward.
- Step 2** Pull out the handle of the PSU to remove the PSU from the subrack.
- Step 3** Gently push the reserved PSU into the subrack along guide rails, and push the locking latch rightwards to secure the handle.

**Figure 6-9** Replacing a PSU



----End

### 6.4.3.3 Replacing an ECC800-Pro Antenna

#### Prerequisites

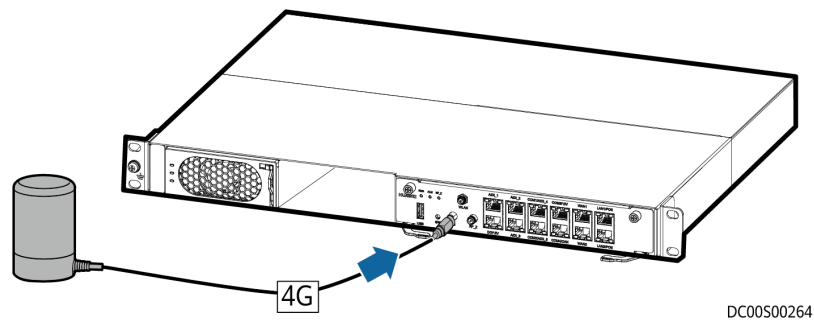
- Tools: ESD wrist strap, ESD gloves
- Materials: A spare ECC800-Pro antenna of the same model is available and functional.

#### Procedure

- Step 1** Remove the 4G antenna.
- Step 2** Install the spare 4G antenna in the original position and connect it to the ECC800-Pro.



**Figure 6-10** Replacing an antenna



----End

### 6.4.3.4 Replacing a SIM Card

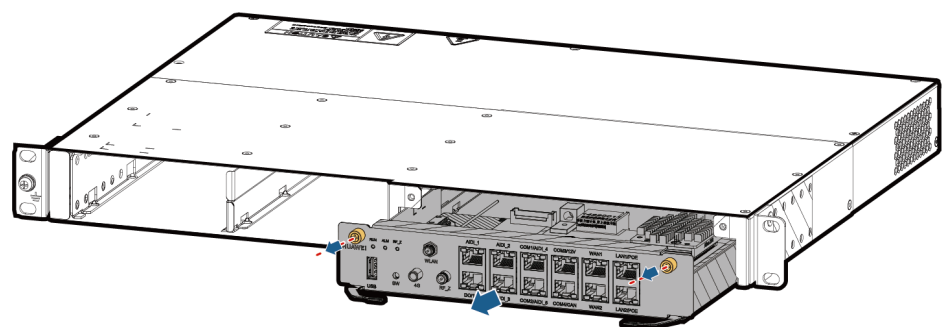
#### Prerequisites

- Tools: ESD wrist strap, ESD gloves
- Materials: A spare SIM card of the same model is available and functional.

#### Procedure

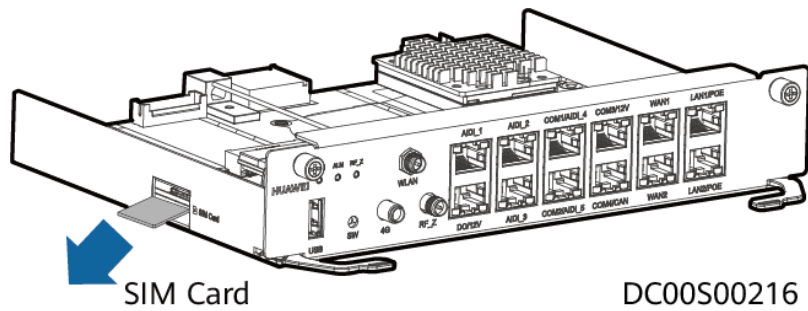
- Step 1** Record the positions of the signal cables connected to the panel of the ECC800-Pro main control module, and then disconnect the signal cables.
- Step 2** Loosen the screws on both sides of the panel of the ECC800-Pro main control module.
- Step 3** Pull the handles on both sides of the panel of the ECC800-Pro main control module, and remove the main control module.

**Figure 6-11** Removing the ECC800-Pro main control module



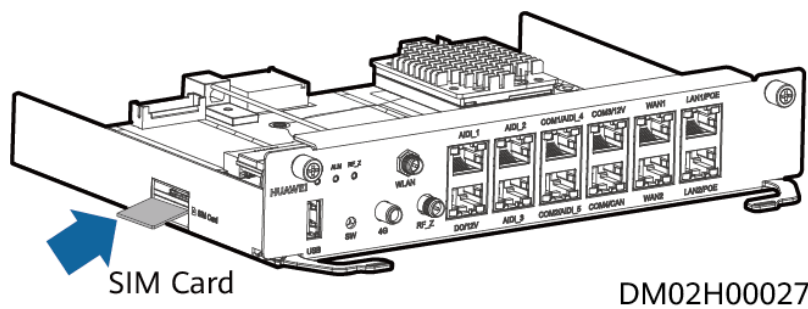
- Step 4** Remove the SIM card from the card slot.

**Figure 6-12** Removing a SIM card



**Step 5** Insert the new SIM card into the card slot.

**Figure 6-13** Installing a SIM card



**Step 6** Insert the ECC800-Pro main control module into the slot.

**Step 7** Tighten the screws on both sides of the panel of the ECC800-Pro main control module.

**Step 8** Connect the signal cables to the panel of the new ECC800-Pro main control module based on the recorded information.

----End

### 6.4.3.5 Replacing a Camera

#### Impact on the System

The operation of the video surveillance system will be interrupted.

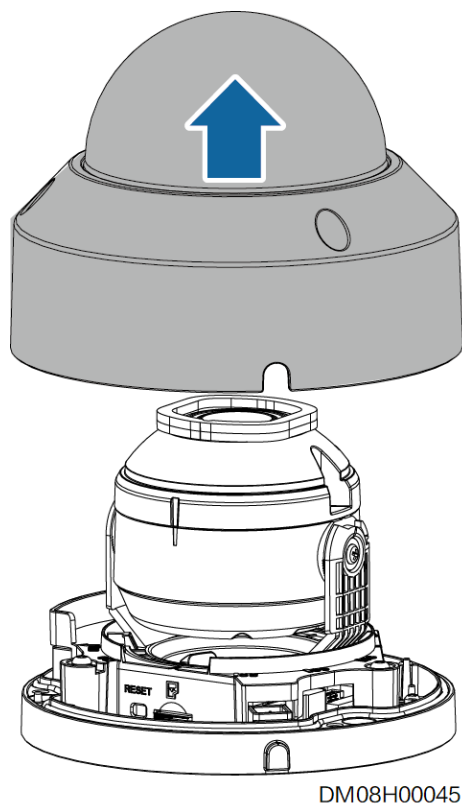
#### Preparations

- Tools: ESD wrist strap, ESD gloves, step ladder, label, marker, Phillips screwdriver
- Material: camera

#### Procedure

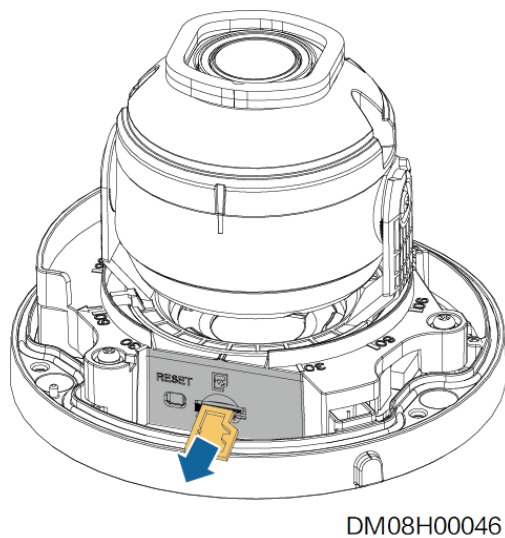
**Step 1** Remove the transparent cover using a Phillips screwdriver.

**Figure 6-14** Removing the transparent cover



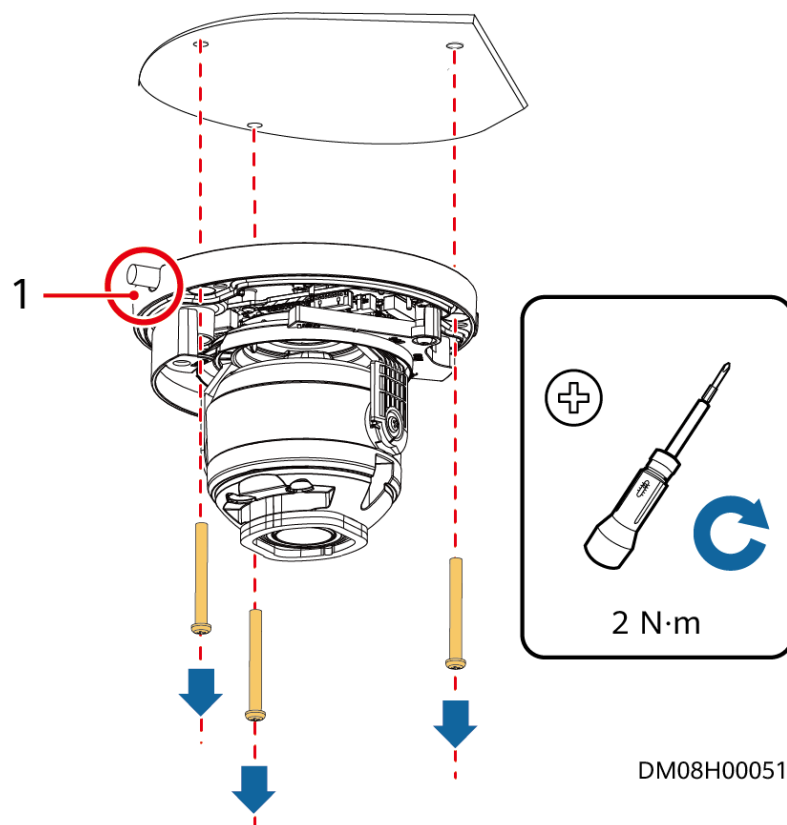
**Step 2** Remove the SD card.

**Figure 6-15** Removing an SD card



**Step 3** Remove the monitoring network cable from the camera and remove the camera.

**Figure 6-16** Removing the camera



**Step 4** Install the new camera and SD card, reconnect the network cable, and secure the camera to the base using screws.

**Step 5** Commission the camera by referring to the ECC800-Pro user manual of the appropriate version.

**Step 6** Check that the camera functions properly.

----End

### 6.4.3.6 Replacing a VCN510

#### Prerequisites

- Recommended tool: Phillips screwdriver
- A VCN510 needs to be replaced.
- A spare VCN510 of the same model is available and functional.

#### Context

---

**NOTICE**

Videos cannot be recorded during the replacement of the VCN510.

---

**⚠ DANGER**

Do not operate with power on. Take appropriate insulation measures.

## Procedure

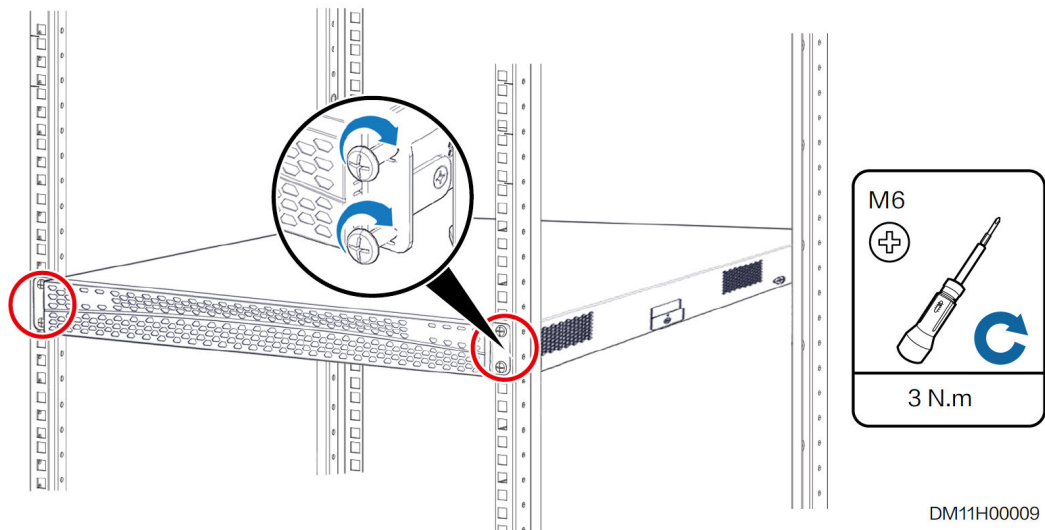
- Step 1** Turn off the power switch of the VCN510, disconnect the power supply of the VCN510, remove the cables from the VCN510, label the cables, and record the original connection positions of the cables.

**NOTICE**

After removing cables, wrap exposed terminals with insulation tape and do not block cable labels. If cable labels are blocked, cables may be connected incorrectly later.

- Step 2** Remove the faulty VCN510 from the cabinet.
- Step 3** 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 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 6-17** Installing the device



- Step 4** Reconnect the cables to the new VCN510.
- Step 5** Turn on the power switch of the VCN510.
- Step 6** Commissioning the VCN510. If the video recording function works properly after commissioning, the VCN510 is functional.

----End

### 6.4.3.7 Replacing an IVS1800

#### Prerequisites

- Recommended tool: Phillips screwdriver
- An IVS1800 needs to be replaced.
- A spare IVS1800 of the same model is available and functional.

#### Context

---

##### NOTICE

Videos cannot be recorded during the replacement of the IVS1800.

---

##### DANGER

Do not operate with power on. Take appropriate insulation measures.

---

#### Procedure

- Step 1** Turn off the power switch of the IVS1800, disconnect the power supply of the IVS1800, remove the cables from the IVS1800, label the cables, and record the original connection positions of the cables.
- 

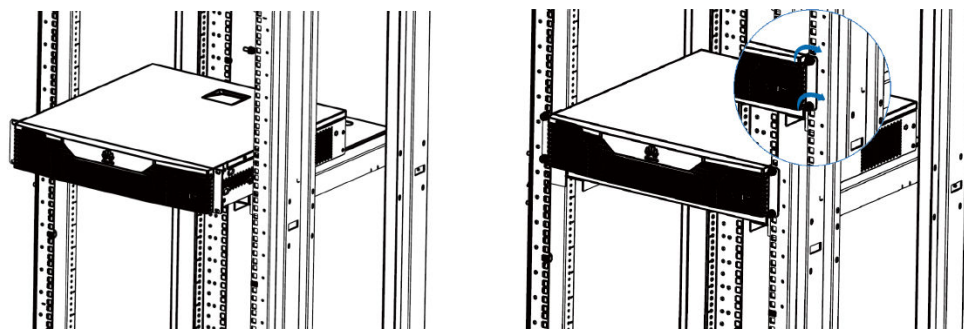
##### NOTICE

After removing cables, wrap exposed terminals with insulation tape and do not block cable labels. If cable labels are blocked, cables may be connected incorrectly.

---

- Step 2** Remove the faulty IVS1800 from the cabinet.
- Step 3** Carry the device to the cabinet. Ensure that the mounting ears at both sides of the device are tightly attached to the mounting bars in front of the cabinet. Use one hand to hold the device. Use the other hand to thread M6 screws through the slotted holes on the mounting ears. Use a Phillips screwdriver to tighten the M6 screws on the mounting ears. Each mounting ear uses two M6 screws.

**Figure 6-18** Installing a device



DC11L00016

- Step 4** Reconnect the cables to the new IVS1800.
- Step 5** Turn on the power switch of the IVS1800.
- Step 6** Commissioning the IVS1800. If the video recording function works properly after commissioning, the IVS1800 is functional.

----End

### 6.4.3.8 Replacing a Hard Disk for the IVS1800

#### Prerequisites

- A hard disk needs to be replaced.
- Data in the hard disk has been backed up.
- A spare hard disk of the same model is available and functional.
- Before replacing a faulty disk, ensure that the power switch on the rear panel is off and disconnect the power cable to power off the device.

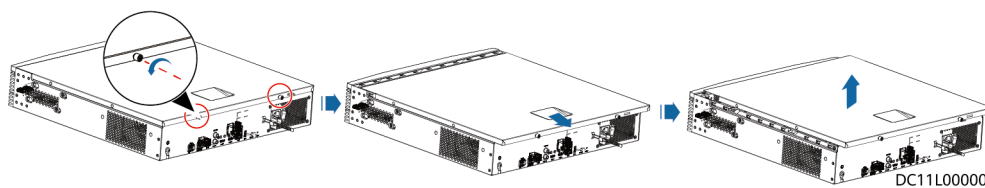
#### Context

Recommended tools and materials: Phillips screwdriver, ESD wrist strap (or ESD gloves).

#### Procedure

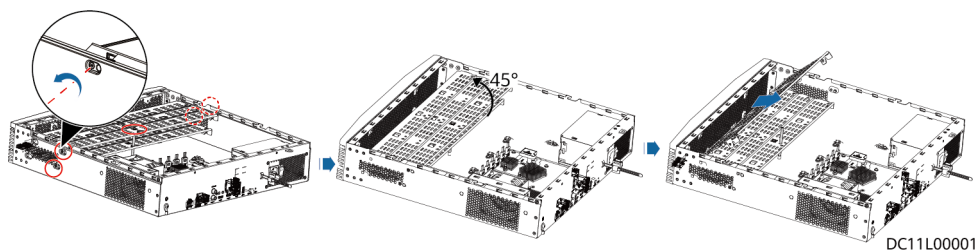
- Step 1** Put on an ESD wrist strap (or ESD gloves) and insert the ground terminal into the ESD jack in the cabinet.
- Step 2** Remove the faulty hard disk.
  1. Use a PH2 screwdriver to remove the two black screws on the rear of the chassis cover, and take off the chassis cover.

**Figure 6-19** Removing the chassis cover



2. Remove two black screws on each side of the chassis and the silvery white one on top of the hard disk tray, raise the hard disk tray by 45 degrees, and take out the upper and then lower layers of hard disk tray.

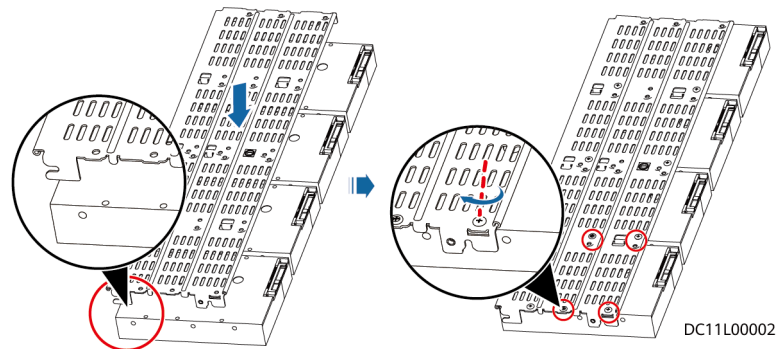
**Figure 6-20** Removing the hard disk tray



**Step 3** Install a new hard disk.

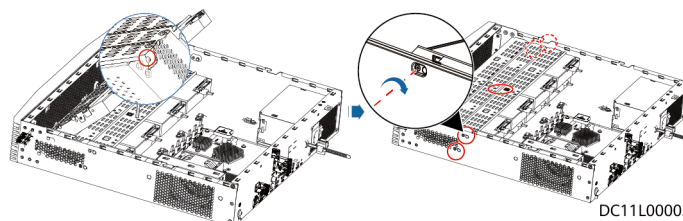
1. Place the hard disk with ports facing upwards and align the screw holes on the hard disk tray with the hard disk and fasten the screws. Before the installation, ensure that the fastener of the hard disk tray is on a different side from the hard disk port, as shown in the lower left figure.

**Figure 6-21** Installing hard disks



2. Insert the hard disk tray back at 45 degrees with the opening of its locking buckle facing downwards, hold the screw in the red-framed part to lower the hard disk tray until it is level, and fasten the black screws on the left and right sides and the white screw on the top.

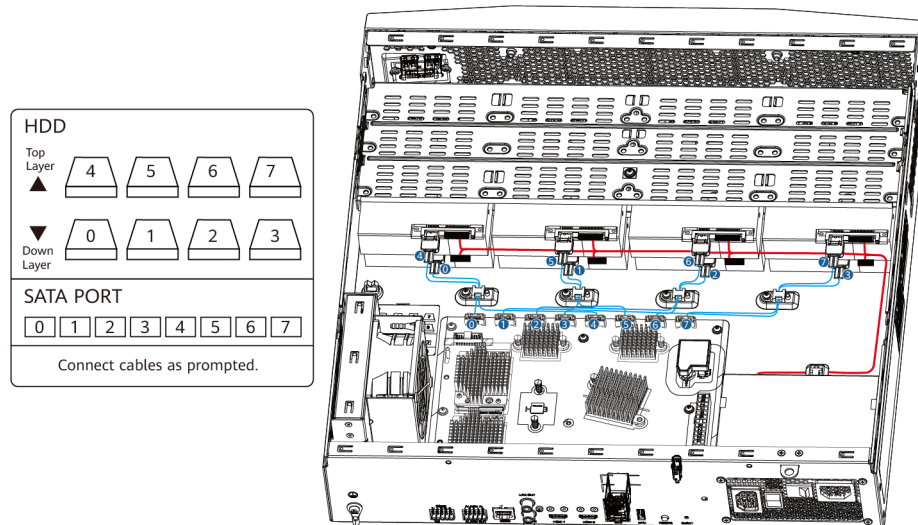
**Figure 6-22** Fastening the screw on the panel and the screws on the hard disk tray



3. Connect data and power cables to hard disks. Connect hard disk cable ports P0–P3 to hard disks on the lower-layer hard disk tray and ports P4–P7 to hard disks on the upper-layer.



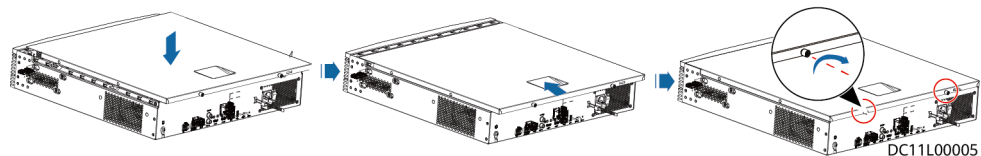
**Figure 6-23** Connecting data and power cables to hard disks



DC11L00004

4. Close the chassis cover, and use a PH2 screwdriver to fasten the rear screws.

**Figure 6-24** Closing the chassis cover



DC11L00005

- Step 4** Observe the hard disk indicator to check whether the hard disk works properly.

----End

## Follow-up Procedure

If the hard disk works abnormally, contact Huawei technical support.

### 6.4.3.9 Replacing a T/H Sensor (33010516)

#### Prerequisites

- A T/H sensor needs to be replaced.
- A spare T/H sensor of the same model is available and functional.

#### Procedure

- Step 1** Tap **Shutdown** on the controller home screen.

---

#### NOTICE

Exercise caution because the device is still energized after it is shut down on the controller home screen.

---

**Step 2** Remove the cables from the T/H sensor.

---

**NOTICE**

After removing cables, wrap exposed terminals with insulation tape and do not block cable labels. If cable labels are blocked, cables may be connected incorrectly later.

---

**Step 3** Remove the faulty T/H sensor.

**Step 4** Attach the new T/H sensor to an appropriate position on the cabinet door frame based on the site requirements.

**Step 5** Reinstall the cable removed from the T/H sensor.

 **NOTE**

Before removing a T/H sensor, remember the DIP switch setting on it. When you install a new T/H sensor, you need to set the same DIP switch setting for the new one.

----End

### 6.4.3.10 Replacing a Smoke Detector

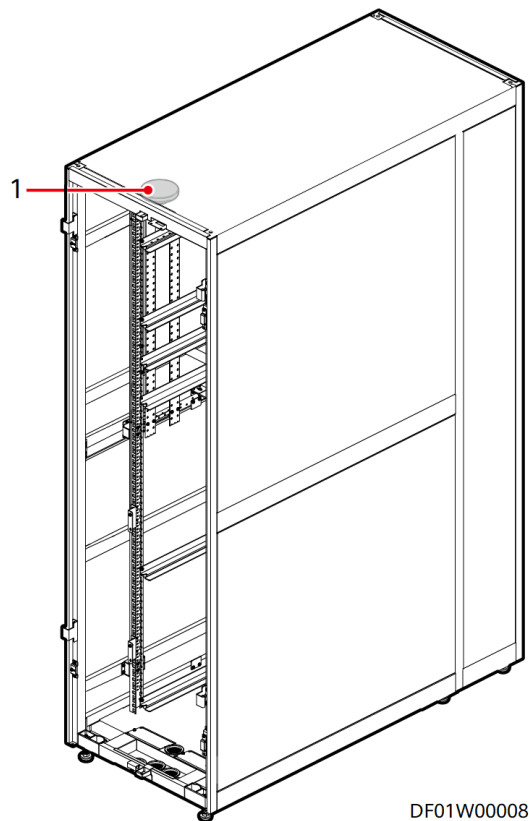
#### Prerequisites

- Recommended tools and materials: Phillips screwdriver, insulation tape, step ladder (2 m)
- A smoke detector needs to be replaced.
- A spare smoke detector of the same model is available and functional.

#### Context

The smoke detector is installed on the top of the cabinet, as shown by (1) in [Figure 6-25](#).

Figure 6-25 Detector position



DF01W00008

(1) Smoke detector

## Procedure

- Step 1** Remove the smoke detector from the base.
- Step 2** Remove the cables from the smoke detector and apply insulation measures such as wrapping the cables with insulation tape to avoid hazards.
- Step 3** Install the new smoke detector and reconnect the cables to the new smoke detector.
- Step 4** Install the smoke detector on the base.
- Step 5** Blow smoke toward the smoke detector using a smoke pistol until the smoke detector indicator changes from blinking once every 6s to steady on. If a smoke detector fire alarm is triggered, the smoke detector is functional.

----End

### 6.4.3.11 Replacing a WLDS900 Water Sensor and Water Detection Rope

#### Prerequisites

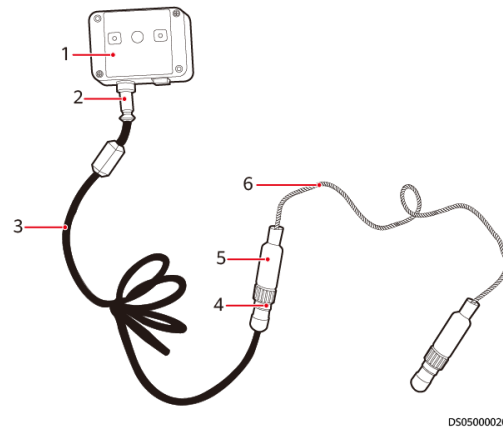
- Recommended tools and materials: Phillips screwdriver, crimping tool
- A water sensor needs to be replaced.
- A spare water sensor of the same model is available and functional.

## Context

The water detector is installed in the cabinet and bound to the rack rail using cable ties. The binding position is 5 U away from the cabinet bottom.

A water sensor consists of a water detection cable, water detector, and conversion cable. The water detection cable is laid out on the floor, connecting to the water detector placed near the collector by the conversion cable.

**Figure 6-26** Water sensor components



(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

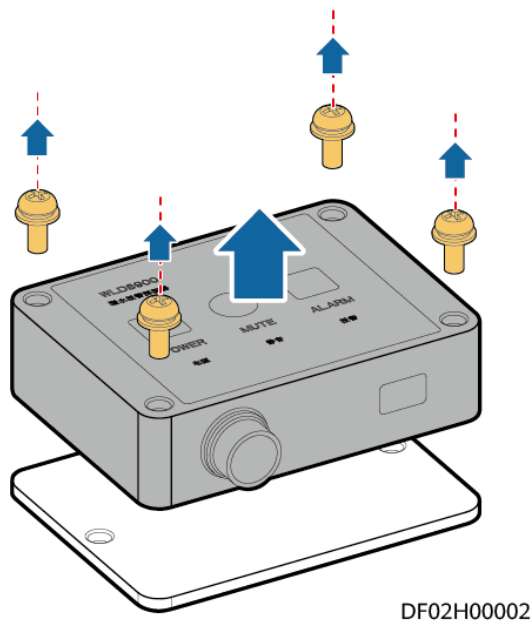
## Procedure

### Step 1

Replace the water detector.

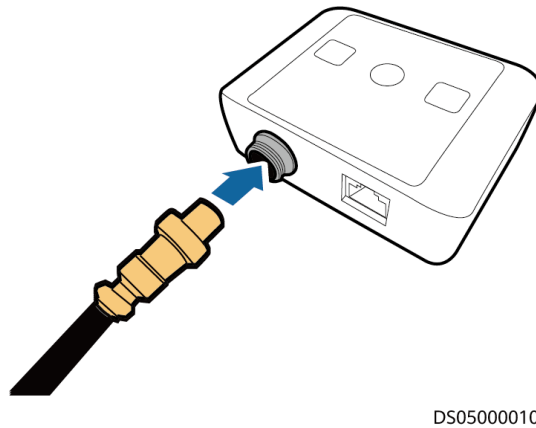
1. Remove the conversion cable at the conversion port for the water detector and conversion cable.
2. Remove the cover from the water detector.

**Figure 6-27** Removing the cover from the water detector



3. Remove the bottom plate of the water detector from the binding position in the cabinet.
4. Install a new water detector in the cabinet by referring to the preceding steps.
5. Connect the new water detector to the conversion cable.

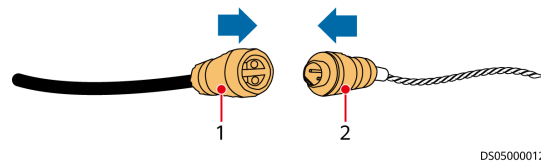
**Figure 6-28** Connecting a conversion cable to a water detector



**Step 2** Replace a water detection cable.

1. Remove the faulty water detection cable from the port.
2. Install a new water detection cable.

**Figure 6-29** Connecting a new water detection cable



(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 3** Connect the network cable between the water detector and ECC800-Pro, immerse the water detection cable in water, and check whether an alarm is generated. If an alarm is generated, the component is functional.

----End

### 6.4.3.12 Replacing an Electrode Water Sensor

#### Prerequisites

- Recommended tools and materials: Phillips screwdriver, crimping tool
- A water sensor needs to be replaced.
- A spare water sensor is available.

#### Procedure

**Step 1** Disconnect the cable between the water sensor and the ECC800-Pro.

**Step 2** Remove the faulty water sensor.

**Step 3** Place the new water sensor in the correct position.

**Step 4** Connect the water sensor cable connected to the ECC800-Pro to the new water sensor.

----End

# 7 Technical Specifications

**Table 7-1** Key technical specifications

Item	Specifications
Module dimensions (H x W x D) (mm)	Fully enclosed indoor cabinet: 2000 x 600 x 1350
Number of cabinets	1 PCS
Power system	220 V/230 V/240 V, 1 Ph, 50 Hz/60 Hz
Voltage range	220–240 V
Voltage frequency range	50/60 Hz ( $\pm 3$ Hz)
Maximum power of a single cabinet	$\leq 3$ kW
IP rating	IP20
Altitude	0–4000 m (derated when the altitude exceeds 1000 m)
Installation mode	Installed on a concrete floor or an ESD floor
Cable and pipe routing	<ul style="list-style-type: none"><li>• Pipes are routed from the top or bottom.</li><li>• Input power cables of the cabinet can be routed in from the top or bottom, and other power cables can be routed out from the top.</li><li>• Signal cables can be routed out from the top or bottom.</li></ul>
Operating temperature	Indoor: 0–40°C
	Outdoor: –20°C to +45°C
Storage temperature	–40°C to +70°C
Storage humidity	$\leq 95\%$ RH (non-condensing)

# A Equipment Derating Coefficients

## NOTE

The coefficients listed in the [Table A-1](#) are based on the dry air density being 1.225 kg/m<sup>3</sup> (sea level +15°C).

**Table A-1** Derating coefficients of the UPS2000-G

Altitude (Unit: m)	Derating Coefficients
1000	1.0
1500	0.95
2000	0.91
2500	0.86
3000	0.82
3500	0.78
4000	0.74
4500	0.7
5000	0.67



---

# B Acronyms and Abbreviations

---

## A

<b>AC</b>	alternate current
<b>ATS</b>	Auto Transformer Switch
<b>ATSE</b>	Auto Transformer Switch Equipment

## B

<b>BIM</b>	Battery Interface Module
------------	--------------------------

## C

<b>CIM</b>	Communication Interface Module
------------	--------------------------------

## D

<b>DC</b>	direct current
-----------	----------------

## I

<b>IEC</b>	International Electrotechnical Commission
------------	---

## M

<b>MCB</b>	miniature circuit breaker
------------	---------------------------

## S

<b>SNMP</b>	Simple Network Management Protocol
<b>SPD</b>	surge protective device
<b>SOC</b>	State Of Charge
<b>SOH</b>	State Of Health

## U

**UPS**                      uninterruptible power system