

FusionModule500 Smart Mini Data Center

User Manual (02116804)

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About This Document

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:

- Technical support engineers
- System engineers

Symbol Conventions

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

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

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1 Safety Information

Statement

Before transporting, storing, installing, operating, using, or maintaining the equipment, read this document, strictly follow the instructions provided herein, and follow all the safety instructions on the equipment and in this document. In this document, "equipment" refers to the products, software, components, spare parts, and/or services related to this document; "the Company" refers to the manufacturer (producer), seller, and/or service provider of the equipment; "you" refers to the entity that transports, stores, installs, operates, uses, and/or maintains the equipment.

The **Danger, Warning, Caution, and Notice** statements described in this document do not cover all the safety precautions. You also need to comply with relevant international, national, or regional standards and industry practices. **The Company shall not be liable for any consequences that may arise due to violations of safety requirements or safety standards concerning the design, production, and usage of the equipment.**

The equipment should be used in an environment that meets the design specifications. Otherwise, the equipment may be faulty, malfunctioning, or damaged, which is not covered under the warranty. The Company shall not be liable for any property loss, personal injury, or even death caused thereby.

Comply with applicable laws, regulations, standards, and specifications during transportation, storage, installation, operation, use, and maintenance.

Do not perform reverse engineering, decompilation, disassembly, adaptation, implantation, or other derivative operations on the equipment software. Do not study the internal implementation logic of the equipment, obtain the source code of the equipment software, violate intellectual property rights, or disclose any of the performance test results of the equipment software.

The Company shall not be liable for any of the following circumstances or their consequences:

- Equipment damage due to force majeure such as earthquakes, floods, volcanic eruptions, debris flows, lightning strikes, fires, wars, armed conflicts, typhoons, hurricanes, tornadoes, and extreme weather conditions
- Operation beyond the conditions specified in this document

- Installation or use in environments that do not comply with international, national, or regional standards
- Installation or use by unqualified personnel
- Failure to follow the operation instructions and safety precautions on the product and in the document
- Unauthorized modifications to the product or software code or removal of the product
- Damage caused during transportation by you or a third party authorized by you
- Storage conditions that do not meet the requirements specified in the product document
- Failure to comply with local laws, regulations, or related standards due to the materials and tools prepared by you
- Damage caused by your or a third party's negligence, intentional breach, gross negligence, or improper operations or damage not caused by the Company

1.1 Personal Safety

 **DANGER**

Do not work with power on during installation. Do not install or remove a cable with power on. Transient contact between the core of the cable and the conductor will generate electric arcs or sparks, which may cause a fire or personal injury.

 **DANGER**

Non-standard and improper operations on the energized equipment may cause fire or electric shocks, resulting in property damage, personal injury, or even death.

 **DANGER**

Before operations, remove conductive objects such as watches, bracelets, bangles, rings, and necklaces to prevent electric shocks.

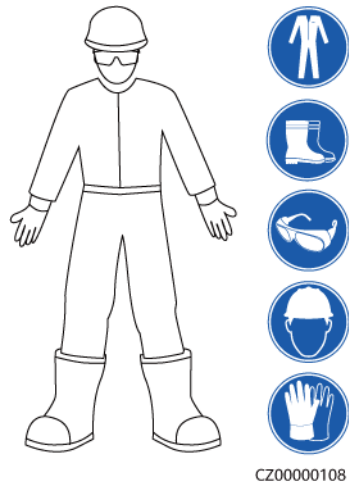
 **DANGER**

During operations, use dedicated insulated tools to prevent electric shocks or short circuits. The insulation and voltage resistance must comply with local laws, regulations, standards, and specifications.

WARNING

During operations, wear personal protective equipment such as protective clothing, insulated shoes, goggles, safety helmets, and insulated gloves.

Figure 1-1 Personal protective equipment



General Requirements

- Do not stop protective devices. Pay attention to the warnings, cautions, and related precautionary measures in this document and on the equipment.
- If there is a likelihood of personal injury or equipment damage during operations, immediately stop, report the case to the supervisor, and take feasible protective measures.
- Do not power on the equipment before it is installed or confirmed by professionals.
- Do not touch the power supply equipment directly or with conductors such as damp objects. Before touching any conductor surface or terminal, measure the voltage at the contact point to ensure that there is no risk of electric shock.
- Do not touch a running fan with your hands, components, screws, tools, or boards. Otherwise, personal injury or equipment damage may occur.
- In the case of a fire, immediately leave the building or the equipment area and activate the fire alarm or call emergency services. Do not enter the affected building or equipment area under any circumstances.

Personnel Requirements

- Only professionals and trained personnel are allowed to operate the equipment.
 - Professionals: personnel who are familiar with the working principles and structure of the equipment, 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 trained in technology and safety, 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

- Personnel who plan to install or maintain the equipment must receive adequate training, be able to correctly perform all operations, and understand all necessary safety precautions and local relevant standards.
- 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 perform special tasks such as electrical operations, working at heights, and operations of special equipment should possess the required local qualifications.
- Only authorized professionals are allowed to replace the equipment or components (including software).
- Only personnel who need to work on the equipment are allowed to access the equipment.

1.2 Electrical Safety

 **DANGER**

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

 **DANGER**

Non-standard and improper operations may result in fire or electric shocks.

 **DANGER**

Prevent foreign matter from entering the equipment during operations. Otherwise, equipment damage, load power derating, power failure, or personal injury may occur.

 **WARNING**

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.

 **CAUTION**

Do not route cables near the air intake or exhaust vents of the equipment.

 **CAUTION**

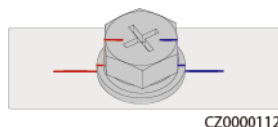
Do not directly connect aluminum cables to prevent electrochemical corrosion of copper and aluminum.

 **CAUTION**

Stay away from the equipment when preparing cables to prevent cable scraps from entering the equipment. Cable scraps may cause sparks and result in personal injury and equipment damage.

General Requirements

- Follow the procedures described in the document for installation, operation, and maintenance. Do not reconstruct or alter the equipment, add components, or change the installation sequence without permission.
- Install temporary fences or warning ropes and hang "No Entry" signs around the operation area to keep unauthorized personnel away from the area.
- Before installing or removing power cables, turn off the switches of the equipment and its upstream and downstream switches.
- If any liquid is detected inside the equipment, disconnect the power supply immediately and do not use the equipment.
- Before performing operations on the equipment, check that all tools meet the requirements and record the tools. After the operations are complete, collect all of the tools to prevent them from being left inside the equipment.
- Before installing power cables, check that cable labels are correct and cable terminals are insulated.
- When installing the equipment, use a torque tool of a proper measurement range to tighten the screws. When using a wrench to tighten the screws, ensure that the wrench does not tilt and the torque error does not exceed 10% of the specified value.
- Ensure that bolts are tightened with a torque tool and marked in red and blue after double-check. Installation personnel mark tightened bolts in blue. Quality inspection personnel confirm that the bolts are tightened and then mark them in red. (The marks should cross the edges of the bolts.)



- After the installation is complete, ensure that protective cases, insulation tubes, and other necessary items for all electrical components are in position to avoid electric shocks.

- If the equipment has multiple inputs, disconnect all the inputs before operating the equipment.
- Before maintaining a downstream electrical or power distribution device, turn off the output switch on the power supply equipment.
- During equipment maintenance, attach "Do not switch on" labels near the upstream and downstream switches or circuit breakers as well as warning signs to prevent accidental connection. The equipment can be powered on only after troubleshooting is complete.
- If fault diagnosis and troubleshooting need to be performed after power-off, take the following safety measures: Disconnect the power supply. Check whether the equipment is live. Install a ground cable. Hang warning signs and set up fences.
- Check equipment connections periodically, ensuring that all screws are securely tightened.
- Only qualified professionals can replace a damaged cable.
- Do not scrawl, damage, or block any labels or nameplates on the equipment. Promptly replace labels that have worn out.
- Do not use solvents such as water, alcohol, or oil to clean electrical components inside or outside of the equipment.

Grounding

- Ensure that the grounding impedance of the equipment complies with local electrical standards.
- Ensure that the equipment is connected permanently to the protective ground. Before operating the equipment, check its electrical connection to ensure that it is reliably grounded.
- Ensure that the protective ground point of the equipment is reliably connected to the ground screw of the metal enclosure (connection resistance: ≤ 0.1 ohm).
- Ensure that the ground resistance of the system for lightning protection is less than or equal to 10 ohms.
- Do not operate the equipment in the absence of a properly installed ground conductor.
- Do not damage the ground conductor.
- If high touch current may occur on the equipment, ground the protective ground terminal on the equipment enclosure before connecting the power supply; otherwise, electric shock as a result of touch current may occur.

Cabling

- When selecting, installing, and routing cables, follow local safety regulations and rules.
- The flame spread rating of cables should meet the UL 1581 VW-1 or IEC 60332-3-22 (ZB) or higher requirements.
- When routing power cables, ensure that there is no coiling or twisting. Do not join or weld power cables. If necessary, use a longer cable.
- Ensure that all cables are properly connected and insulated, and meet specifications.

- Ensure that the slots and holes for routing cables are free from sharp edges, and that the positions where cables are routed through pipes or cable holes are equipped with cushion materials to prevent the cables from being damaged by sharp edges or burrs.
- If a 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.
- Ensure that cables of the same type are bound together neatly and straight and that the cable sheath is intact. When routing cables of different types, ensure that they are at least 30 mm away from each other.
- If the external conditions (such as the cable layout or ambient temperature) change, verify the cable usage in accordance with the IEC-60364-5-52 or local laws and regulations. For example, check that the current-carrying capacity meets requirements.
- When routing cables, reserve at least 30 mm clearance between the cables and heat-generating components or areas. This prevents deterioration or damage to the cable insulation layer.
- 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. Otherwise, the cable performance may deteriorate due to cable damage, which affects the current-carrying capacity and temperature rise.

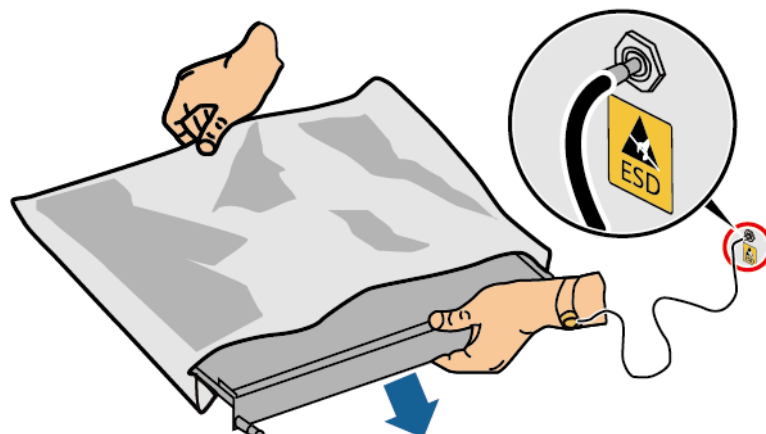
ESD

NOTICE

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

-
- When touching the equipment and handling boards, modules with exposed circuit boards, or application-specific integrated circuits (ASICs), observe ESD protection regulations and wear ESD clothing and ESD gloves or a well-grounded ESD wrist strap.

Figure 1-2 Wearing an ESD wrist strap



DC15000001

- When holding a board or a module with exposed circuit boards, hold its edge without touching any components. Do not touch the components with bare hands.
- Package boards or modules with ESD packaging materials before storing or transporting them.

1.3 Environmental Requirements

⚠ DANGER

Do not expose the equipment to flammable or explosive gas or smoke. Do not perform any operation on the equipment in such environments.

⚠ DANGER

Do not store any flammable or explosive materials in the equipment area.

⚠ DANGER

Do not place the equipment near heat sources or fire sources, such as smoke, candles, heaters, or other heating devices. Overheat may damage the equipment or cause a fire.

⚠ WARNING

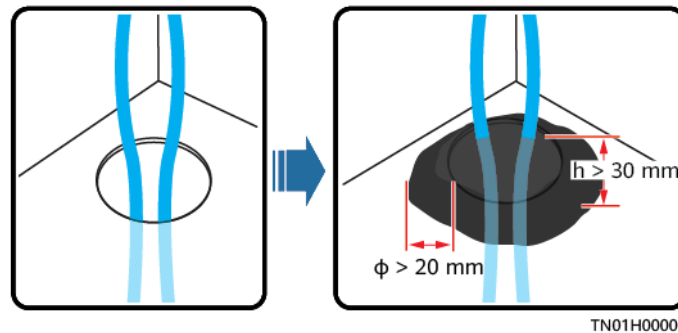
Install the equipment in an area far away from liquids. Do not install it under areas prone to condensation, such as under water pipes and air exhaust vents, or areas prone to water leakage, such as air conditioner vents, ventilation vents, or feeder windows of the equipment room. Ensure that no liquid enters the equipment to prevent faults or short circuits.

 **WARNING**

To prevent damage or fire due to high temperature, ensure that the ventilation vents or heat dissipation systems are not obstructed or covered by other objects while the equipment is running.

General Requirements

- Ensure that the equipment is stored in a clean, dry, and well ventilated area with proper temperature and humidity and is protected from dust and condensation.
- Keep the installation and operating environments of the equipment within the allowed ranges. Otherwise, its performance and safety will be compromised.
- 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, performing outdoor installation, and opening doors) in harsh weather conditions such as lightning, rain, snow, and level 6 or stronger wind.
- Do not install the equipment in an environment with direct sunlight, dust, smoke, volatile or corrosive gases, infrared and other radiations, organic solvents, or salty air.
- Do not install the equipment in an environment with conductive metal or magnetic dust.
- Do not install the equipment in an area conducive to the growth of microorganisms such as fungus or mildew.
- Do not install the equipment in an area with strong vibration, noise, or electromagnetic interference.
- Ensure that the site complies with local laws, regulations, and related standards.
- Ensure that the ground in the installation environment is solid, free from spongy or soft soil, and not prone to subsidence. The site must not be located in a low-lying land or an area prone to water accumulation, and the horizontal level of the site must be above the highest water level of that area in history.
- Before opening doors during the installation, operation, and maintenance of the equipment, clean up any water, ice, snow, or other foreign objects on the top of the equipment to prevent foreign objects from falling into the equipment.
- When installing the equipment, ensure that the installation surface is solid enough to bear the weight of the equipment.
- Ensure that the equipment room provides good heat insulation, and that the walls and floor are dampproof.
- Install rodent guards at the door of the equipment room to prevent rodents and insects from entering the room.
- All cable holes should be sealed. Seal the used cable holes with sealing putty. Seal the unused cable holes with the caps delivered with the equipment. The following figure shows the criteria for correct sealing with sealing putty.



- After installing the equipment, remove idle packing materials such as cartons, foam, plastics, and cable ties from the equipment area.

1.4 Mechanical Safety

DANGER

When working at heights, wear a safety helmet and safety harness or waist belt and fasten it to a solid structure. Do not mount it on an insecure moveable object or a metal object with sharp edges. Make sure that the hooks will not slide off.

WARNING

Ensure that all necessary tools are ready and inspected by a professional organization. Do not use tools that have signs of scratches or fail to pass the inspection or whose inspection validity period has expired. Ensure that the tools are secure and not overloaded.

WARNING

Before installing equipment in a cabinet, ensure that the cabinet is securely fastened with a balanced center of gravity. Otherwise, tipping or falling cabinets may cause bodily injury and equipment damage.

WARNING

When pulling equipment out of a cabinet, be aware of unstable or heavy objects in the cabinet to prevent injury.

 **WARNING**

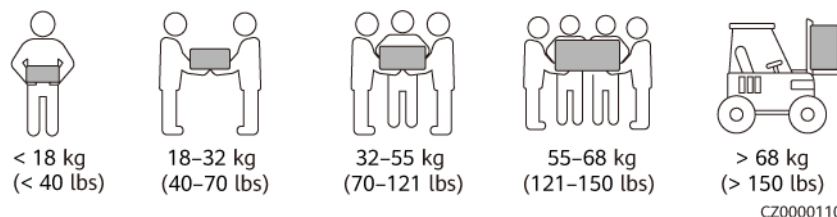
Do not drill holes into the equipment. Doing so may affect the sealing performance and electromagnetic containment of the equipment and damage components or cables inside. Metal shavings from drilling may short-circuit boards inside the equipment.

General Requirements

- Repaint any paint scratches caused during equipment transportation or installation in a timely manner. Equipment with scratches cannot be exposed for an extended period of time.
- Do not perform operations such as arc welding and cutting on the equipment without evaluation by the Company.
- Do not install other devices on the top of the equipment without evaluation by the Company.
- When performing operations over the top of the equipment, take measures to protect the equipment against damage.
- Use correct tools and operate them in the correct way.

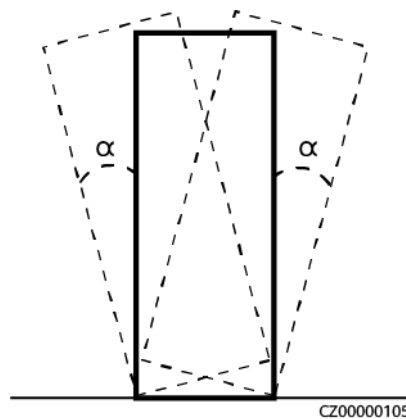
Moving Heavy Objects

- Be cautious to prevent injury when moving heavy objects.



- If multiple persons need to move a heavy object together, determine the manpower and work division with consideration of height and other conditions to ensure that the weight is equally distributed.
- If two persons or more move a heavy object together, ensure that the object is lifted and landed simultaneously and moved at a uniform pace under the supervision of one person.
- Wear personal protective gears such as protective gloves and shoes when manually moving the equipment.
- To move an object by hand, approach to the object, squat down, and then lift the object gently and stably by the force of the legs instead of your back. Do not lift it suddenly or turn your body around.
- Move or lift the equipment by holding its handles or lower edges. Do not hold the handles of modules that are installed in the equipment.
- Do not quickly lift a heavy object above your waist. Place the object on a workbench that is half-waist high or any other appropriate place, adjust the positions of your palms, and then lift it.
- Move a heavy object stably with balanced force at an even and low speed. Put down the object stably and slowly to prevent any collision or drop from scratching the surface of the equipment or damaging the components and cables.

- When moving a heavy object, be aware of the workbench, slope, staircase, and slippery places. When moving a heavy object through a door, ensure that the door is wide enough to move the object and avoid bumping or injury.
- When transferring a heavy object, move your feet instead of turning your waist around. When lifting and transferring a heavy object, ensure that your feet point to the target direction of movement.
- When transporting the equipment using a forklift truck, ensure that the forks are properly positioned so 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 sea or roads in good conditions for transportation. Do not transport batteries by railway or air. Avoid tilt or jolt during transportation.
- Ensure that tilt angle of the cabinet meets the requirements shown in the figure. The tilt angle α of the packed cabinet must be less than or equal to 15° . After the cabinet is unpacked, its tilt angle α must be less than or equal to 10° .



Working at Heights

- Any operations performed 2 meters or higher above the ground should be supervised properly.
- Only trained and qualified personnel are allowed to work at heights.
- Do not work at heights when steel pipes are wet or other risky situations exist. After the preceding conditions no longer exist, the safety owner and relevant technical personnel need to check the involved equipment. Operators can begin working only after safety is confirmed.
- Set a restricted area and prominent signs for working at heights to warn irrelevant personnel away.
- Set guard rails and warning signs 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 stay or pass under the area involving working at heights.
- Carry operation machines and tools properly to prevent equipment damage or personal injury caused by falling objects.
- 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 slings, hanging baskets, highline trolleys, or cranes.

- Do not perform operations on the upper and lower layers at the same time. If unavoidable, install a dedicated protective shelter between the upper and lower layers or take other protective measures. Do not pile up tools or materials on the upper layer.
- Dismantle the scaffolding from top down after finishing the job. Do not dismantle the upper and lower layers at the same time. When removing a part, ensure that other parts will not collapse.
- Ensure that personnel working at heights strictly comply with the safety regulations. The Company is not responsible for any accident caused by violation of the safety regulations on working at heights.
- Behave cautiously when working at heights. Do not rest at heights.

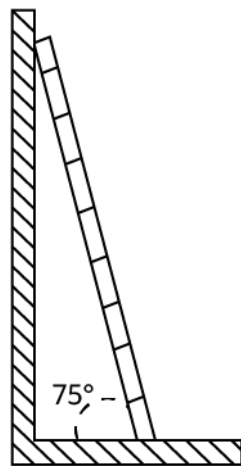
Using Ladders

- Use wooden or insulated ladders when you need to perform live-line working at heights.
- Platform ladders with protective rails are preferred. Single ladders are not recommended.
- 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 and held firm.



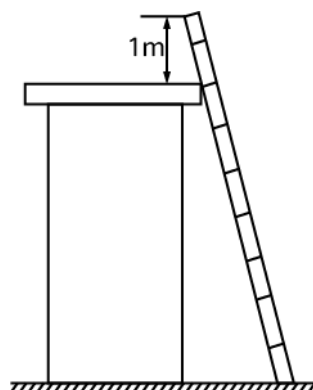
CZ00000107

- When climbing up the ladder, keep your body stable and your center of gravity between the side rails, and do not overreach to the sides.
- When a step ladder is used, ensure that the pull ropes are secured.
- If a single ladder is used, the recommended angle for the ladder against the floor is 75 degrees, as shown in the following figure. A square can be used to measure the angle.



PI02SC0008

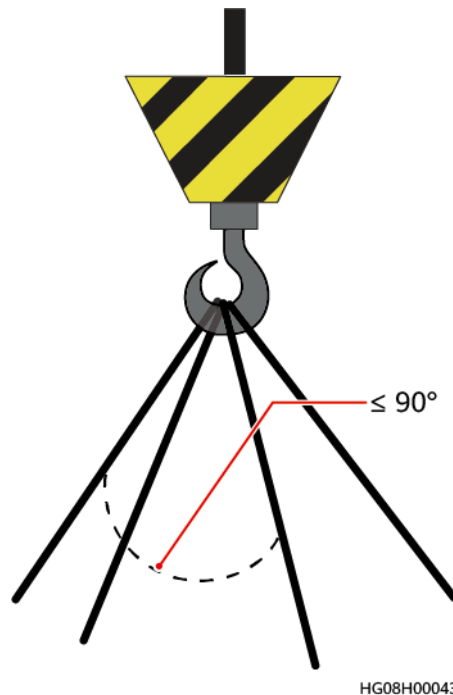
- If a single ladder is used, ensure that the wider end of the ladder is at the bottom, and take protective measures to prevent the ladder from sliding.
- If a single ladder is used, do not climb higher than the fourth rung from the top.
- If you use a single ladder to climb up to a platform, ensure that the ladder is at least 1 m higher than the platform.



PI02SC0009

Hoisting

- Only trained and qualified personnel should perform hoisting operations.
- Install temporary warning signs or fences to isolate the hoisting area.
- Ensure that the foundation where hoisting is performed meets the load-bearing requirements.
- Before hoisting objects, ensure that hoisting tools are firmly secured onto a fixed object or wall that meets the load-bearing requirements.
- During hoisting, do not stand or walk under the crane or the hoisted objects.
- Do not drag steel ropes and hoisting tools or bump hoisted objects against hard objects during hoisting.
- Ensure that the angle between two hoisting ropes is no more than 90 degrees, as shown in the following figure.



Drilling Holes

- Obtain consent from the customer and contractor before drilling holes.
- Wear protective equipment such as safety goggles and protective gloves when drilling holes.
- To avoid short circuits or other risks, do not drill holes into buried pipes or cables.
- When drilling holes, protect the equipment from shavings. After drilling, clean up any shavings.

Welding

- A welder must have a work permit. Obtain consent from the customer before welding.
- Ensure that at least two persons are present onsite for welding and that fire extinguishers, wet cloth, and water containers are available.
- Ensure that the welding site is free from inflammables.
- Do not weld or cut on pressurized containers or pipes. Electric devices must be powered off before welding.
- 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.

1.5 Equipment Safety

1.5.1 UPS Safety

General Requirements

NOTICE

This is a category C2 UPS product. In a residential environment, this product may cause radio interference, in which case the user may be required to take additional measures.

- The UPS is used for commercial and industrial purposes only. It cannot be used as a power supply for life support devices.
- For power supply systems that are critical to significant economic interests or public order, such as the national computing center, emergency command center, railway signal system and control center, civil aviation and air traffic control center, airport command center, financial clearing center, and transaction center, the Tier 4 or 3 power architecture specified in TIA-942 must be used. That is, two power supplies must be used to supply power to loads.
- The UPS operating environment must meet the requirements for the climate indicator, mechanically active substance indicator, and chemically active substance indicator in ETSI EN 300 019-1 class 3.6.
- The UPS must not be located in non-confined environments near the ocean (0–3.7 km) or indoor or semi-indoor environments where the temperature and humidity are not controllable, such as simple equipment rooms, civil houses, garages, corridors, and direct ventilation cabinets near the ocean; or houses with only roofs, railway station platforms, gymnasiums, and aquariums.
- The UPS should be powered on as soon as possible after it is unpacked.
- The UPS can be used to serve resistive-capacitive loads, resistive loads, and micro-inductive loads. It is recommended that the UPS not be used for pure capacitive loads, pure inductive loads, or half-wave rectification loads. The UPS does not apply to regeneration loads.
- The UPS can be configured with a backfeed protection dry contact to work with an external automatic circuit breaker, preventing the voltage from flowing back to input terminals over static bypass circuits. If the installation and maintenance personnel do not need backfeed protection, attach labels on external mains and bypass input switches, informing that the UPS is connected to a backfeed protection card. Disconnect the backfeed protection card from the UPS before operating the UPS.
- The upstream power distribution of the UPS should meet the requirements of protection against electric shock specified in IEC 60364-4-41.
- For the equipment that uses a three-pin socket, ensure that the ground terminal in the socket is connected to the protective ground point.
- A circuit breaker equipped with a residual current device (RCD) is not recommended.
- If the root mean square (RMS) of a phase voltage of the utility power exceeds 320 V AC, the UPS may be damaged.

- To ensure power supply to loads during UPS upgrade, set the output to maintenance bypass mode. To avoid power failure or load damage, ensure that the bypass input is within the specified power supply range.
- Exercise caution when manually shutting down the UPS inverter for transferring to bypass mode, or when adjusting the UPS output voltage level or output frequency. Doing so may affect the power supply to equipment.

1.5.2 Cooling System Safety

High Temperature and Pressure


- 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.
- 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.

Recycling



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 sustainability. To recycle an old device, use a recycling collection system or contact the supplier.

1.5.3 Battery Safety

 DANGER

Do not connect the positive and negative poles of a battery or battery string together. Otherwise, the battery may be short-circuited. Battery short circuits can generate high instantaneous current and releases a large amount of energy, which may cause battery leakage, smoke, flammable gas release, thermal runaway, fire, or explosion. To avoid battery short circuits, do not maintain batteries with power on.

 **DANGER**

Do not expose batteries at high temperatures or around heat sources, such as scorching sunlight, fire sources, transformers, and heaters. Battery overheating may cause leakage, smoke, flammable gas release, thermal runaway, fire, or explosion.

 **DANGER**

Protect batteries from mechanical vibration, falling, collision, punctures, and strong impact. Otherwise, the batteries may be damaged or catch fire.

 **DANGER**

To avoid leakage, smoke, flammable gas release, thermal runaway, fire, or explosion, do not disassemble, alter, or damage batteries, for example, insert sundries into batteries, squeeze batteries, or immerse batteries in water or other liquids.

 **DANGER**

There is a risk of fire or explosion if the model of the battery in use or used for replacement is incorrect. Use a battery of the model recommended by the manufacturer.

 **DANGER**

Battery electrolyte is toxic and volatile. Do not get contact with leaked liquids or inhale gases in the case of battery leakage or odor. In such cases, stay away from the battery and contact professionals immediately. Professionals must wear safety goggles, rubber gloves, gas masks, and protective clothing, power off the equipment, remove the battery, and contact technical engineers.

 **DANGER**

A battery is an enclosed system and will not release any gases under normal operations. If a battery is improperly treated, for example, burnt, punctured, squeezed, struck by a lightning, overcharged, or subject to other adverse conditions that may cause battery thermal runaway, the battery may be damaged or an abnormal chemical reaction may occur inside the battery, resulting in electrolyte leakage or production of gases such as CO and H₂. To prevent fire or device corrosion, ensure that flammable gas is properly exhausted.

 **DANGER**

The gas generated by a burning battery may irritate your eyes, skin, and throat. Take protective measures promptly.

 **WARNING**

Install batteries in a dry area. Do not install them below areas prone to water leakage, such as air conditioner vents, ventilation vents, feeder windows of the equipment room, or water pipes. Ensure that no liquid enters the equipment to prevent faults or short circuits.

 **WARNING**

Before installing and commissioning batteries, prepare fire extinguishing facilities, such as fire fighting sands and carbon dioxide fire extinguishers, according to construction standards and regulations. Before putting the battery room into operation, ensure that it is equipped with a fire extinguishing system that complies with local laws and regulations, has been constructed and commissioned, and can work in automatic and manual control modes.

 **WARNING**

Before unpacking, storage, and transportation, ensure that the packing cases are intact and correctly placed according to the labels on the packing cases. Do not place a battery upside down or vertically, lay it on one side, or tilt it. Stack the batteries according to the stacking requirements on the packing cases. Ensure that the batteries do not fall or get damaged. Otherwise, they will need to be scrapped.

 **WARNING**

After unpacking batteries, place them in the required direction. Do not place a battery with its front panel facing upwards, put it upside down, tilt it, or stack it. Ensure that the batteries do not fall or get damaged. Otherwise, they will need to be scrapped.

 **WARNING**

Tighten the screws on copper bars or cables to the torque specified in this document. Periodically confirm whether the screws are tightened, check for rust, corrosion, or other foreign objects, and clean them up if any. Loose screw connections will result in excessive voltage drops and batteries may catch fire when the current is high.

 **WARNING**

After batteries are discharged, charge them in time to avoid damage due to overdischarge.

 **WARNING**

If the electrolyte leaks, absorb and neutralize the electrolyte immediately. Exercise caution when moving or handling a lead-acid battery with electrolyte leakage to avoid electrolyte hazards.

 **WARNING**

Lead-acid batteries in use emit flammable gas. Ensure that batteries are installed in a well-ventilated area and fireproof measures are taken.

 **WARNING**

Do not use unsealed lead-acid batteries.

Statement

The Company shall not be liable for any damage or other consequences to the batteries it provides due to the following reasons:

- Batteries are damaged due to force majeure such as earthquakes, floods, volcanic eruptions, debris flows, lightning strikes, fires, wars, armed conflicts, typhoons, hurricanes, tornadoes, and extreme weather conditions.
- Batteries are damaged because the onsite equipment operating environment or external power parameters do not meet the environment requirements for normal operation, for example, the actual operating temperature of batteries is too high or too low, or the power grid is unstable and experiences outages frequently.
- Batteries are damaged, fall, leak, or crack due to improper operations or incorrect connection.
- After being installed and connected to the system, the batteries are not powered on in time due to your reasons, which causes damage to the batteries due to overdischarge.
- Batteries are damaged because they are not accepted in time due to your reasons.
- You set battery operating parameters incorrectly.
- You use batteries of different types together, causing acceleration of capacity attenuation. For example, you use our batteries together with batteries of other vendors or with batteries of different rated capacity.

- Batteries are frequently overdischarged due to your improper maintenance, you expand the load capacity without notifying us, or have not fully charge batteries for a long time.
- You do not perform battery maintenance based on the operation guide, such as failure to check battery terminals regularly.
- Batteries are damaged because you do not store them in accordance with storage requirements (for example, in an environment that is damp or prone to rain).
- Batteries are not charged as required during storage due to your reasons, resulting in capacity loss or other irreversible damages to the batteries.
- Batteries are damaged due to your or a third party's reasons, for example, relocating or reinstalling the batteries without complying with the Company's requirements.
- You change the battery use scenarios without notifying the Company.
- You connect extra loads to the batteries.
- The battery storage period has exceeded the upper limit.
- The battery warranty period has expired.

General Requirements

NOTICE

This is a category C2 battery product. In a residential environment, this product may cause radio interference, in which case the user may be required to take additional measures.

NOTICE

To ensure battery safety and battery management accuracy, use batteries provided by the Company. The Company is not responsible for any battery faults caused by batteries not provided by it.

- Before installing, operating, and maintaining batteries, read the battery manufacturer's instructions and comply with their requirements. The safety precautions specified in this document are highly important and require special attention. For additional safety precautions, see the instructions provided by the battery manufacturer.
- Use batteries within the specified temperature range. When the ambient temperature of the batteries is lower than the allowed range, do not charge the batteries to prevent internal short circuits caused during low-temperature charging.
- Do not reversely connect the positive and negative battery terminals. Otherwise, a battery alarm will be generated and batteries may be damaged.
- Before unpacking batteries, check whether the packaging is intact. Do not use batteries with damaged packaging. If any damage is found, notify the carrier and manufacturer immediately.

- In an indoor scenario, you are advised to power on a battery within seven days after unpacking. If the battery cannot be powered on in time, place it in a dry indoor environment without corrosive gas.
- Do not use a damaged battery (such as damage caused when a battery is dropped, bumped, bulged, or dented on the enclosure), because the damage may cause electrolyte leakage or flammable gas release. In the case of electrolyte leakage or structural deformation, contact the installer or professional O&M personnel immediately to remove or replace the battery. Do not store the damaged battery near other devices or flammable materials and keep it away from non-professionals.
- Before working on a battery, ensure that there is no irritant or scorched smell around the battery.
- When installing batteries, do not place installation tools, metal parts, or sundries on the batteries. After the installation is complete, clean up the objects on the batteries and the surrounding area.
- If a battery is accidentally exposed to water, do not install it. Move it to a safe place for isolation and contact technical engineers in a timely manner.
- Check whether the positive and negative battery terminals are grounded unexpectedly. If so, disconnect the battery terminals from the ground.
- Do not perform welding or grinding work around batteries to prevent fire caused by electric sparks or arcs.
- If batteries are left unused for a long period of time, store and charge them according to the battery requirements.
- Do not charge or discharge batteries by using a device that does not comply with local laws and regulations.
- Keep the battery loop disconnected during installation and maintenance.
- Monitor damaged batteries during storage for signs of smoke, flame, electrolyte leakage, or heat.
- If a battery is faulty, its surface temperature may be high. Do not touch the battery to avoid scalds.

Short-Circuit Protection

- When installing and maintaining batteries, wrap the exposed cable terminals on the batteries with insulation tape.
- Avoid foreign objects (such as conductive objects, screws, and liquids) from entering a battery, as this may cause short circuits.

Leakage Handling

NOTICE

Electrolyte overflow may damage the equipment. It will corrode metal parts and boards, and ultimately damage the boards.

Electrolyte is corrosive and can cause irritation and chemical burns. Should you come into direct contact with the battery electrolyte, do as follows:

- Inhalation: Evacuate from contaminated areas, get fresh air immediately, and seek immediate medical attention.
- Eye contact: Immediately wash your eyes with water for at least 15 minutes, do not rub your eyes, and seek immediate medical attention.
- Skin contact: Wash the affected areas immediately with soap and water and seek immediate medical attention.
- Intake: Seek immediate medical attention.

Special requirements for lead-acid batteries:

NOTICE

When the battery temperature exceeds 60°C, check whether the electrolyte leaks. If the electrolyte leaks, take proper measures promptly.

NOTICE

If the electrolyte leaks, follow the instructions of the battery manufacturer or use sodium bicarbonate (NaHCO_3) or sodium carbonate (Na_2CO_3) to neutralize the electrolyte.

Recycling

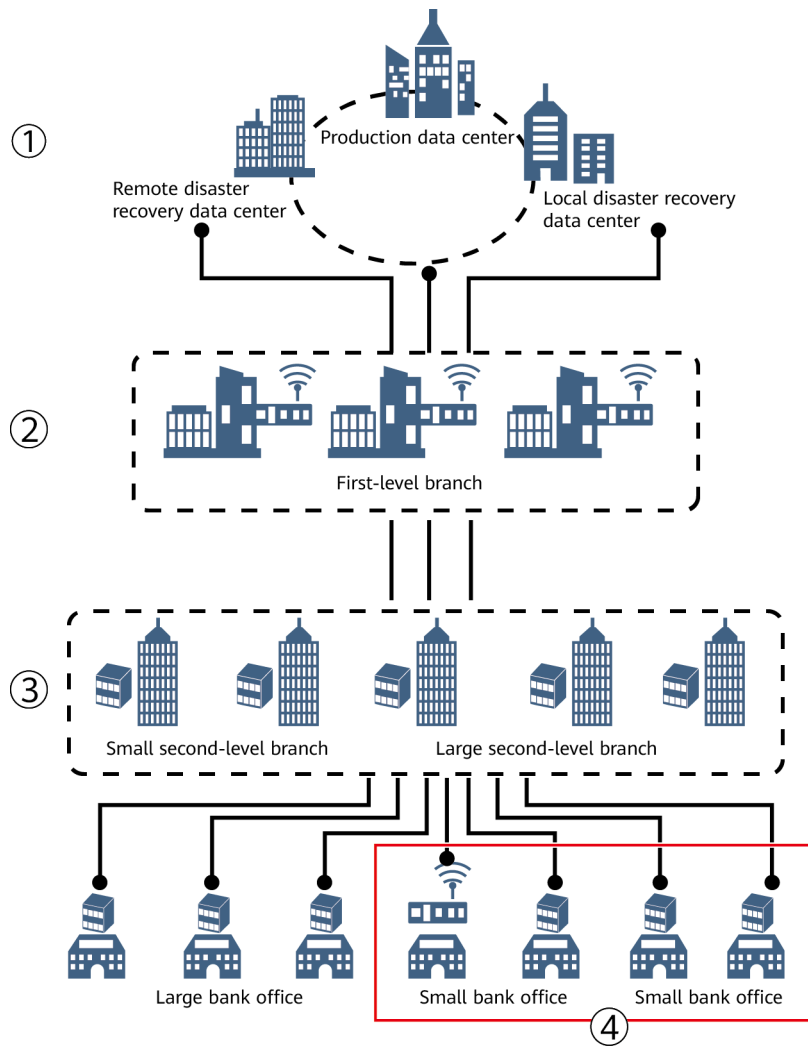
- Dispose of waste batteries in accordance with local laws and regulations. Do not dispose of batteries as household waste. Improper disposal of batteries may result in environmental pollution or an explosion.
- If a battery leaks or is damaged, contact technical support or a battery recycling company for disposal.
- If batteries are out of service life, contact a battery recycling company for disposal.
- Do not expose waste batteries to high temperatures or direct sunlight.
- Do not place waste batteries in environments with high humidity or corrosive substances.

2 Overview

2.1 Positioning

To meet the requirements for customers' growing services, the Company launches the FusionModule500 that can be rapidly deployed and flexibly expanded. The FusionModule500 is positioned as a small edge data center solution and occupies about 10 m². 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

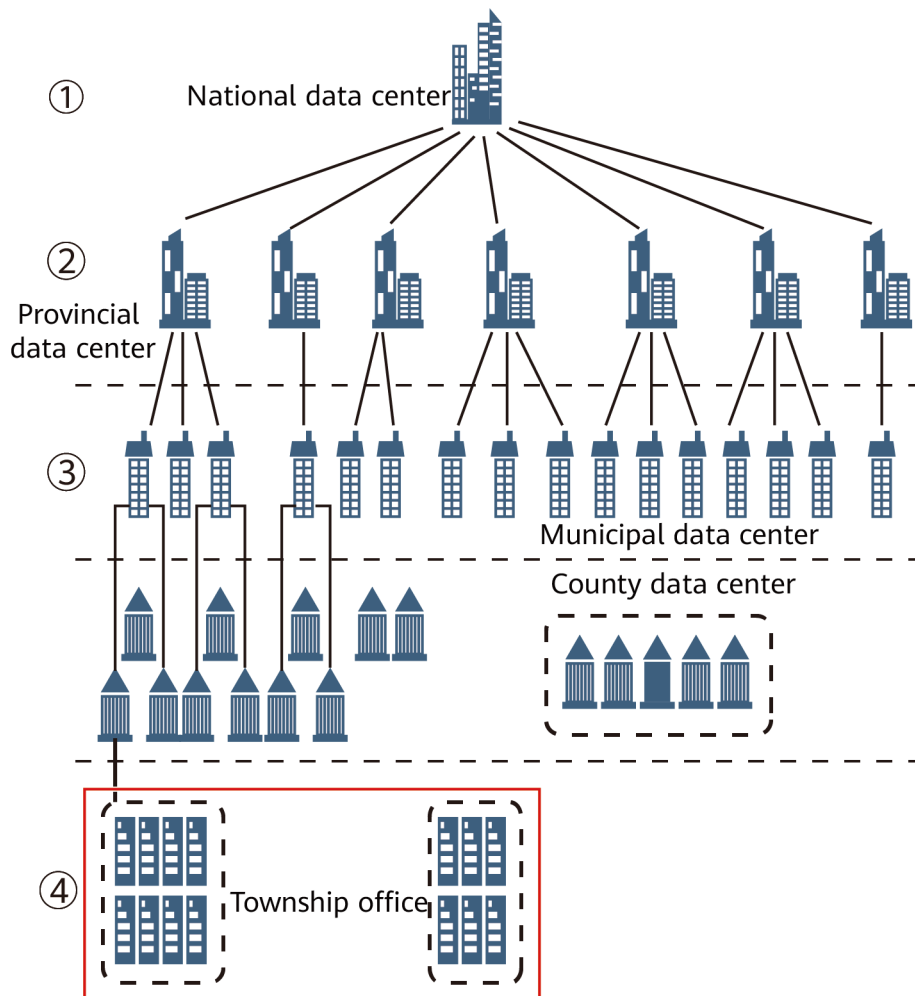


DM00N00002

- (1) FusionModule5000
- (3) FusionModule800

- (2) FusionModule2000
- (4) FusionModule500

Figure 2-2 Position of the FusionModule500 for governments



DM00N00001

- (1) FusionModule5000
- (3) FusionModule800

- (2) FusionModule2000
- (4) FusionModule500

2.2 Features

High Integration

The smart module provides a comprehensive solution by integrating the cabinet structure system, power supply and distribution system, cooling system, management system, fire extinguishing system, and surge protection and grounding system.

High Safety and Reliability

- The Converged Cabinet incorporates the UPS, monitoring, power distribution, and cooling devices that are designed in modular manner, delivering high safety and reliability.
- The powerful monitoring system allows you to master the infrastructure status anytime and improves the cabinet protection capability.

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

- The smart module provides various sensors to monitor the functional modules.
- The smart module provides a display to easily manage the functional modules locally.

2.3 Typical Application Scenarios and Configurations

2.3.1 Typical Scenarios

The solution is mainly used in network access rooms of bank business outlets, small- and medium-sized enterprises, and government departments. It is mainly sold in the following regions:

- Asia, Europe, and Africa: China, Asia Pacific, Africa, Europe, and Middle East. The solution supports the 220 V/230 V/240 V, 1 Ph, 50/60 Hz power systems.
- Latin America: The solution supports the 208 V, 2 Ph, 60 Hz power system.

2.3.2 Typical Configurations

Figure 2-3 Converged Cabinet (02116804)

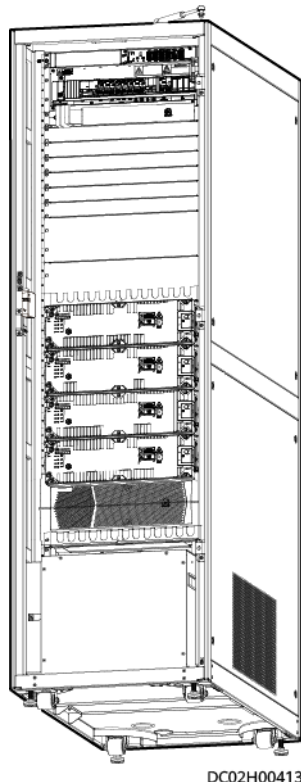


Table 2-1 Typical configurations

Item	Converged Cabinet Specifications
BOM number	02116804
Model	FusionModule500-U61A21SL
Cabinet dimensions (H x W x D)	2000 mm x 600 mm x 1100 mm
Cooling	3.5 kW integrated air conditioner
Power distribution	UPS2000-H, lead-acid battery, rPDU, and transformer
Backup time	60–240 minutes
Monitoring	ECC800, T/H sensor, smoke detector, water sensor, PAD, cabinet electronic clasp lock, WiFi module, and NetEco (optional)
Fire extinguishing system	Rack-mounted integrated fire extinguishing device (optional)

3 System Architecture

3.1 Structural System

The cabinet possesses the following features:

- The cabinet houses standard 19-inch wide devices.
- rPDUs are 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

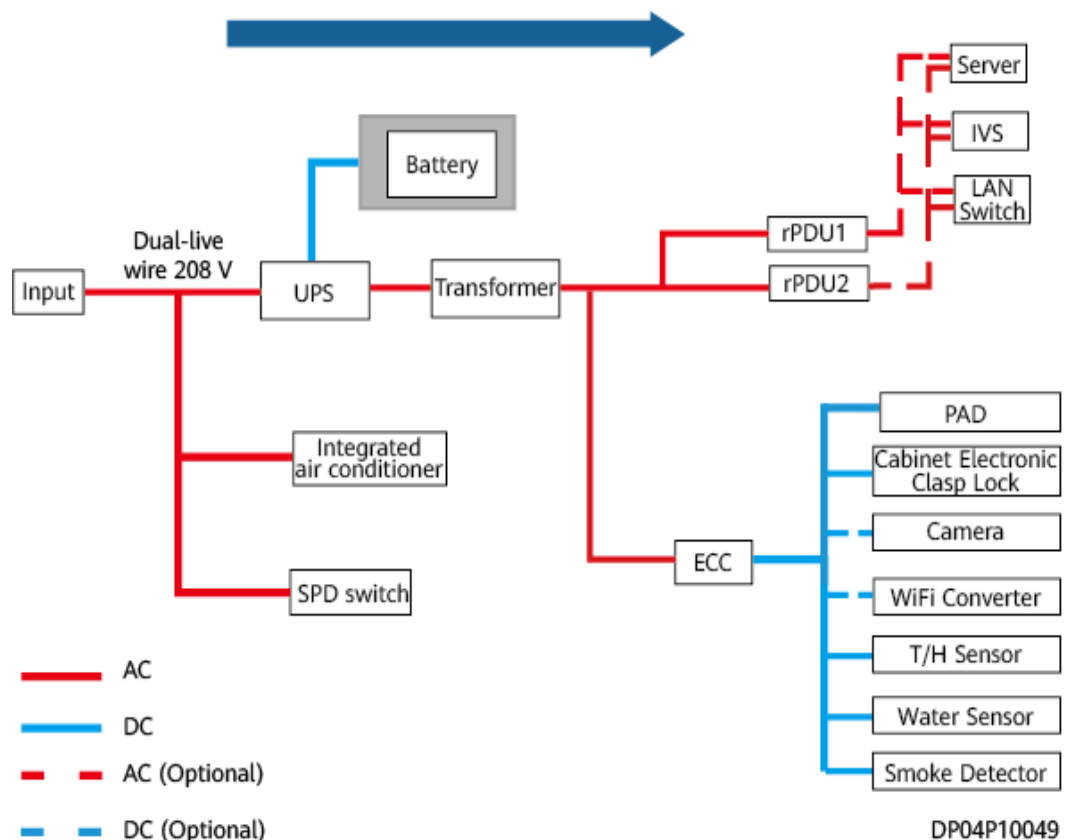
Item	Specifications
Color	Black
Material	High-intensity class A carbon cold rolled steel plate and zinc-coated steel plate
Air channel	Cold and hot aisle containment
Installation mode	Installed on a concrete floor or electrostatic discharge (ESD) floor
Static load	2400 kg
Dynamic load	1000 kg
IP rating	IP20

3.2 Power Supply and Distribution System

3.2.1 Overview

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

Figure 3-1 Power distribution diagram in Latin America (02116804)



3.2.2 Power Distribution Subrack

Table 3-2 Technical specifications

Item	Specifications (Latin America)
Maximum input current	63 A
Number of phases	Dual-live wire
Input frequency	60 Hz
Input voltage	208 V
Output frequency	60 Hz

Item	Specifications (Latin America)
General input	-
UPS input	63 A/2P
UPS output	63 A/2P
UPS bypass	63 A/2P
Output branch	4 x 40 A/1P
Battery output	125 A/2P
Smart cooling switch	16 A/2P
Dimensions (H x W x D)	130 mm x 442 mm x 450 mm

3.2.3 Transformer

Figure 3-2 Transformer



DC02W00154

Table 3-3 Transformer technical specifications

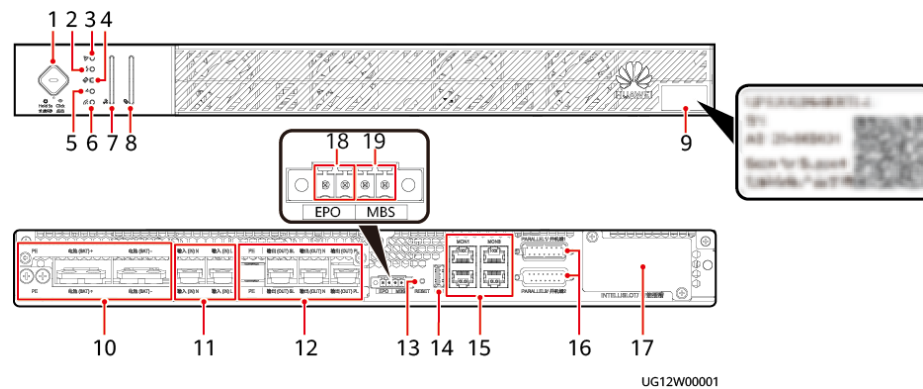
Item	Specifications
Rated operating voltage	208 V
Rated insulation voltage	250 V
Rated frequency	60 Hz
Rated operating current	63 A
Power frequency withstand voltage for 1 minute	1500 V
Dimensions (H x W x D)	430 mm x 650 mm x 130 mm
Cabling mode	Routed in and out from the rear
Installation mode	Installed in a 19-inch rack

3.2.4 UPS2000-H-6 kVA

The UPS2000-H system can form a minimum uninterruptible power supply system. The UPS contains main power circuits such as rectifier circuit, inverter circuit, and bypass circuit, as well as extra-low voltage (ELV) circuits such as the monitoring circuit and parallel control circuit. Its external ports include power input and output terminals, parallel ports, communications ports, and communications slots.

UPS Appearance

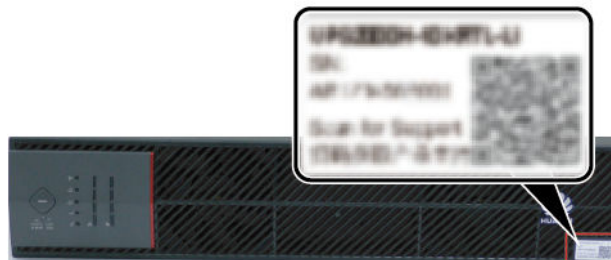
Figure 3-3 Front and rear views of a 6 kVA UPS



- | | | | |
|--|----------------------|---|---------------------------|
| (1) Button (power-on/off, WiFi on/off, and battery cold start) | (2) Bypass indicator | (3) Fault indicator | (4) Battery indicator |
| (5) Inverter indicator | (6) WiFi indicator | (7) Load rate indicator | (8) Battery SOC indicator |
| (9) Label ^a | (10) Battery ports | (11) AC input ports | (12) AC output ports |
| (13) RESET button | (14) USB port | (15) CAN communications ports (COM & MON1-MON3) | (16) Parallel ports |
| (17) Optional card slot | (18) EPO port | (19) Maintenance bypass port (MBS) | |

NOTE

- Optional card slot: Houses the SNMP card and dry contact card.
- RESET button: To restore the initial WiFi password and user password, hold down the RESET button on the UPS rear panel for 10s using a sharp object.
- a: Scan the SN and QR code to download the app, connect to the WiFi network, and view documents such as user manual, quick guide, and video. The information on the label is for reference only. The actual parameters may vary.









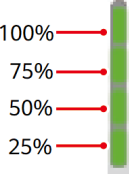
UPS Button Functions


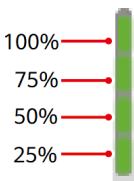
Table 3-4 UPS button functions

Function	Description
Starting the inverter	When the UPS works in bypass mode (the bypass indicator is on), hold down the button on the UPS panel for more than 5s. Release the button when the inverter indicator blinks and you hear a beep sound. Do not press any button during inverter startup. When the startup command is successfully delivered, and the inverter indicator is steady on, the UPS enters normal mode.
Shutting down the inverter	When the UPS works in inverter mode, hold down the button on the UPS panel for more than 5s. Release the button when the inverter indicator blinks and you hear a beep sound. Do not press any button during inverter shutdown. When the shutdown command is successfully delivered, and the inverter indicator is off, the UPS shuts down the inverter output and enters bypass mode.
Enabling WiFi	When the WiFi is disabled, hold down the button for 0.5s to enable the WiFi (the WiFi indicator is on).
Disabling WiFi	When the WiFi is enabled, hold down the button for 0.5s to disable the WiFi (the WiFi indicator is off).

Indicators

Table 3-5 Indicator description

Icon	Indicator	Color	Status	Description
	Fault indicator	Green	Steady on	The UPS is normal.
		Red	Blinking	A minor alarm is generated.
			Steady on	A critical alarm is generated.
	Bypass indicator	Yellow	Steady on	Bypass mode
			Off	Non-bypass mode
	Battery indicator	Yellow	Steady on	Battery mode
			Off	Non-battery mode
	Inverter indicator	Green	Steady on	Inverter mode
			Off	Non-inverter mode
	WiFi indicator	Green	Steady on	WiFi enabled
			Blinking	The mobile phone is connected to the WiFi network of the UPS.
			Off	WiFi disabled
	Battery SOC indicator	Green		When the battery SOC is 0%, the four indicators are off. 0% < Battery SOC < 25% 25% indicator: blinking Other indicators: off
				25% ≤ Battery SOC < 50% 25% indicator: steady on 50% indicator: When the battery SOC is 25%, the indicator is off. When the battery SOC is greater than 25%, the indicator blinks. Other indicators: off

Icon	Indicator	Color	Status	Description
				<p>50% ≤ Battery SOC < 75%</p> <p>25% indicator: steady on</p> <p>50% indicator: steady on</p> <p>75% indicator: When the battery SOC is 50%, the indicator is off. When the battery SOC is greater than 50%, the indicator blinks.</p> <p>100% indicator: off</p>
				<p>75% ≤ Battery SOC < 100%</p> <p>25% indicator: steady on</p> <p>50% indicator: steady on</p> <p>75% indicator: steady on</p> <p>100% indicator: When the battery SOC is 75%, the indicator is off. When the battery SOC is greater than 75%, the indicator blinks.</p> <p>Battery SOC: 100%</p> <p>The four indicators are steady on.</p>
	Load rate indicator	Green		<p>When the load rate is 0%, the four indicators are off.</p> <p>0% < Load rate < 25%</p> <p>25% indicator: blinking</p> <p>Other indicators: off</p>

Icon	Indicator	Color	Status	Description
				<p>25% ≤ Load rate < 50%</p> <p>25% indicator: steady on</p> <p>50% indicator: When the load rate is 25%, the indicator is off. When the load rate is greater than 25%, the indicator blinks.</p> <p>Other indicators: off</p>
				<p>50% ≤ Load rate < 75%</p> <p>25% indicator: steady on</p> <p>50% indicator: steady on</p> <p>75% indicator: When the load rate is 50%, the indicator is off. When the load rate is greater than 50%, the indicator blinks.</p> <p>100% indicator: off</p>
				<p>75% ≤ Load rate < 100%</p> <p>25% indicator: steady on</p> <p>50% indicator: steady on</p> <p>75% indicator: steady on</p> <p>100% indicator: When the load rate is 75%, the indicator is off. When the load rate is greater than 75%, the indicator blinks.</p> <p>Load rate ≥ 100%</p> <p>The four indicators are steady on.</p>

Table 3-6 Functions of CAN communications ports

Silk Screen	Function
COM	Used for battery communication
MON1	Used for ECC800 communication
MON2	<ul style="list-style-type: none"> The Modbus-RTU communications protocol supported Used for communication between parallel UPSs
MON3	

NOTE

The MON1, MON2, and MON3 ports can be connected to the NMS that supports only one protocol at a time.

3.2.5 rPDU

3.2.5.1 Non-intelligent rPDU

The rPDU is a basic socket which does not support monitoring functions.

Figure 3-4 Horizontal rPDU

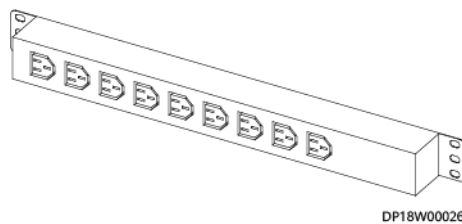


Table 3-7 rPDU technical specifications

Item	Specifications (Horizontal 1 U rPDU)
Rated current	16 A
Input frequency	50 Hz/60 Hz
Input port	Cord end terminal, no input cable
Output port configuration	IEC: 8 x C13 GB: seven sockets that comply with Chinese national standards
Rated output current	16 A

3.2.5.2 Intelligent rPDU

The intelligent rPDU accurately and effectively monitors the real-time status changes of the current, voltage, power, and electric energy of electrical devices in the data center.

Figure 3-5 Horizontal rPDU

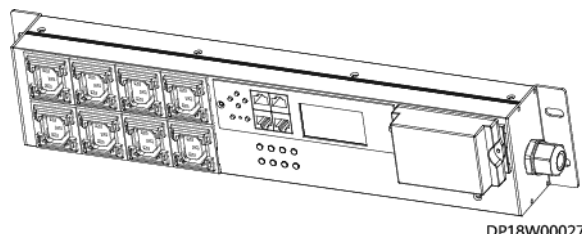


Table 3-8 rPDU technical specifications

Item	Specifications (Horizontal 2 U rPDU)
Dimensions (H x W x D)	56 mm x 89 mm x 476 mm
Rated current	16 A
Input frequency	50 Hz/60 Hz
Input port	Cord end terminal
Output port configuration	8 x C13
Rated output current	16 A
Monitoring function	Monitors the input power, voltage, current, power factor, and electric energy.

3.2.6 Lead-Acid Battery

3.2.6.1 Battery Pack

- The battery pack is a lead-acid battery. It is built in the cabinet as required and occupies 3 U space.
- The battery pack provides 9 Ah power supply.

Appearance

Figure 3-6 Battery pack



DP24W00001

Technical Specifications

Table 3-9 Battery pack specifications

Battery Pack Specifications	Dimensions (L x W x H)	Weight
9 Ah	685 mm x 430 mm x 130 mm	69 kg

3.2.6.2 Battery

- Lead-acid batteries are placed in the battery cabinet.
- A battery cabinet provides space for installing batteries and routing battery cables in a data center. The battery cabinet can be deployed inside or outside the smart module. A maximum of two battery cabinets can be deployed inside the smart module.
- Battery cabinets are classified into master cabinets and slave cabinets. Conversion copper bars are required for the input and output of circuit breakers in the master cabinet.
- The required battery backup time is 15 minutes or 30 minutes.

Figure 3-7 Battery cabinet



Table 3-10 Battery cabinet technical specifications

Item	Technical Specifications
Dimensions (H x W x D)	<ul style="list-style-type: none"> Deployed inside the smart module: 2000 mm x 600 mm x 1350 mm Deployed outside the smart module: 2000 mm x 600 mm x 1100 mm
Color	Black
Material	High-intensity class A carbon cold rolled steel plate and zinc-coated steel plate
Air channel	Front and rear air channels
Installation space	42 U available space
Installation mode	Installed on a concrete floor or ESD floor
Weight (excluding batteries)	<ul style="list-style-type: none"> Deployed inside the smart module: 160 kg Deployed outside the smart module: 140 kg
Static load	1500 kg
Dynamic load	1000 kg
IP rating	IP20

Table 3-11 Battery tray specifications

Item	Technical Specifications
Dimensions (W x D)	421 mm x 930 mm

Table 3-12 Lead-acid battery specifications

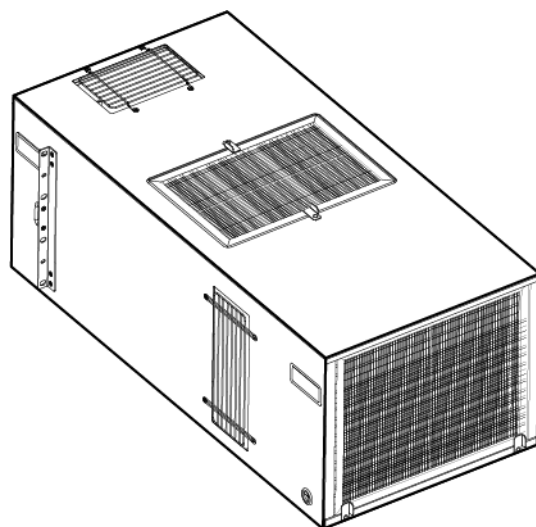
Battery Specifications	Battery Vendor and Model	Battery Weight	Battery Dimensions (H x W x D)
26 Ah	Shoto 6-GFM-26	10.0 kg	172 mm x 125 mm x 165 mm
40 Ah	Shoto 6-GFM-40	14.0 kg	172 mm x 165 mm x 197 mm
65 Ah	Shoto 6-GFM-65	22.0 kg	214 mm x 168 mm x 258 mm
100 Ah	Shoto 6-GFM-100	30.0 kg	222 mm x 174 mm x 330 mm

Table 3-13 Maximum number of batteries inside a battery cabinet

Battery Specifications	Maximum Number of Batteries Inside a Battery Cabinet
26 Ah	40
40 Ah	
65 Ah	20
100 Ah	

3.3 Cooling System

Figure 3-8 Integrated air conditioner



3.3.1 Application Conditions

Operating Environment

Table 3-14 Operating environment

Item	Integrated Air Conditioner
Operating temperature	0–40°C
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 at above 1000 m For details about derating coefficients, see Table 3-15 .

Table 3-15 Derating coefficients

Altitude (m)	0	1000	1500	2000	2500	3000	3500	4000
Air volume coefficient	1	0.887	0.835	0.785	0.737	0.692	0.649	0.608
Cooling capacity coefficient	1	0.940	0.909	0.878	0.846	0.815	0.784	0.753

3.3.2 Technical Specifications

Table 3-16 Technical specifications

Item	Integrated Air Conditioner
Power system	208–240 V AC, 50 Hz/60 Hz, 1 Ph
Refrigerant	R410A
Cooling capacity	3.5 kW ^a
Air supply mode	Front flow or front upflow
Dimensions (H x W x D)	355 mm x 442 mm x 930 mm

Item	Integrated Air Conditioner
Net weight	≤ 60 kg
IP rating	IP20
a: The cooling capacity is obtained when the cabinet internal dry bulb temperature is 37°C, the cabinet internal wet bulb temperature is 24°C, and the cabinet external dry bulb temperature is 35°C. The actual cooling capacity varies depending on the ambient temperatures and relative humidity inside and outside the cabinet.	

3.4 Management System

3.4.1 Overview

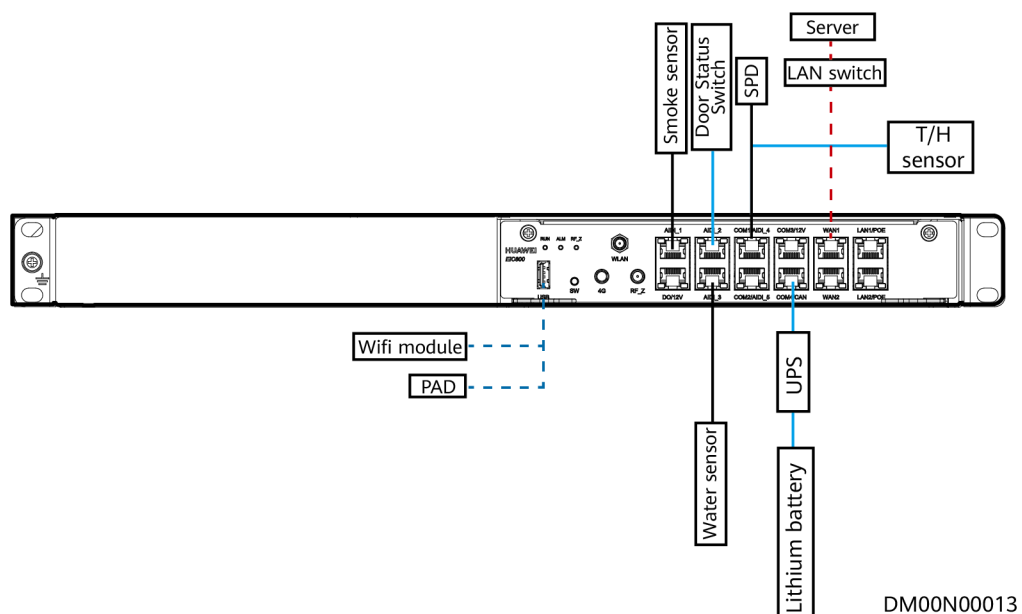
The smart module monitoring solution consists of the collector and monitoring components. The ECC800 functions as the collector.

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.

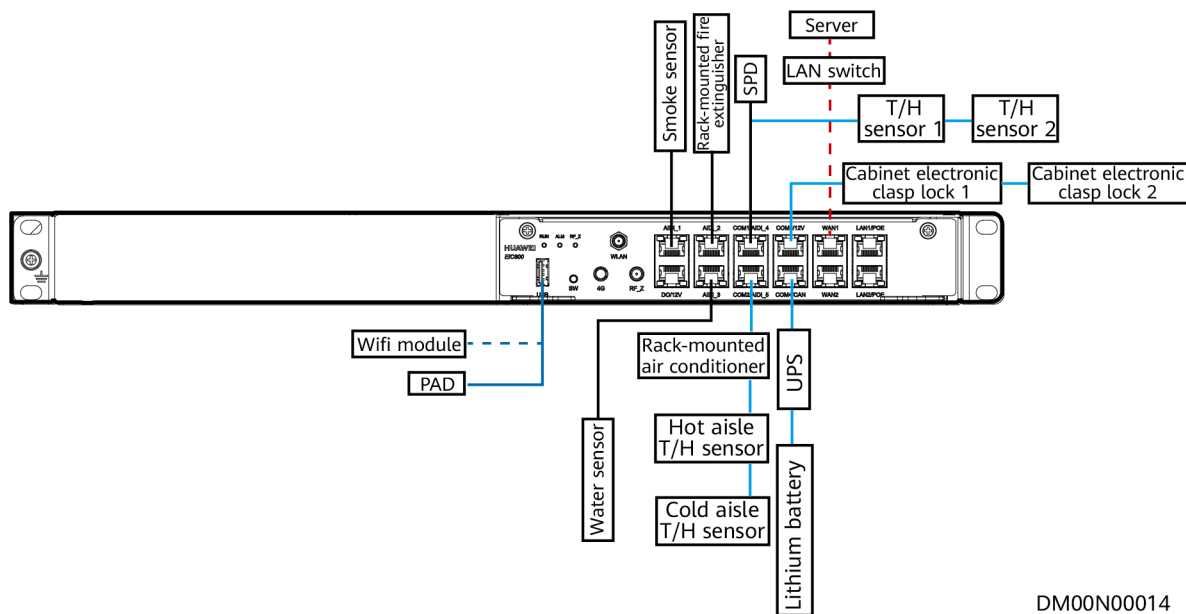
The ECC800 manages the real-time status, alarms, and configuration information about the devices inside the smart module. It also provides a graphical user interface (GUI) for ease of operating and maintaining devices inside the smart module.

Figure 3-9 System networking diagram (02116804)



DM00N00013

Figure 3-10 System networking diagram (0211641 & 02116412)



DM00N00014

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; provides real-time alarm signals.
- 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. Monitors the supply and return air temperatures in real time.
 - b. Allows you to set the return air temperature setpoint for a single product.
 - c. Monitors and displays the fan speed, and displays the running percentage.
 - d. Monitors and displays the compressor running status.

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 power resource usage (displayed only when the intelligent power distribution module is configured) and ambient temperature and humidity in the smart module are displayed on the home screen of the app.

- Allows you to view the power resource usage of the smart module and each cabinet (only when the intelligent power distribution module is configured).
- Displays the real-time status monitoring data and alarms of the aisle temperature and humidity on the floor plan.
- 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 query: 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 query: 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 and certain 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

Aisle smoke alarms cannot trigger the customer's fire extinguishing system. Only dry contact alarm signals are provided.

- Supports the aisle emergency ventilation linkage logic. The cabinet doors are opened by default under linkage.
- If the protected area of the fire extinguishing system is inside the smart module, when a smoke alarm is generated, the door of the linked cabinet does not open. If the door is opened, an alarm (door open 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.

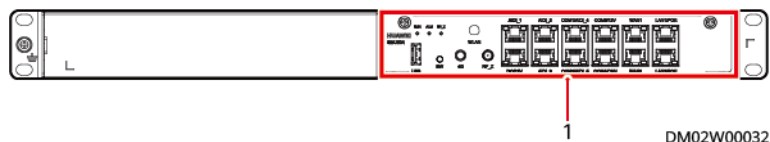
3.4.3 Key Hardware Devices

3.4.3.1 ECC800

3.4.3.1.1 Product Configuration

The ECC800 data center controller monitors the devices and environment inside the smart module.

Figure 3-11 ECC800 collector



(1) Main control module

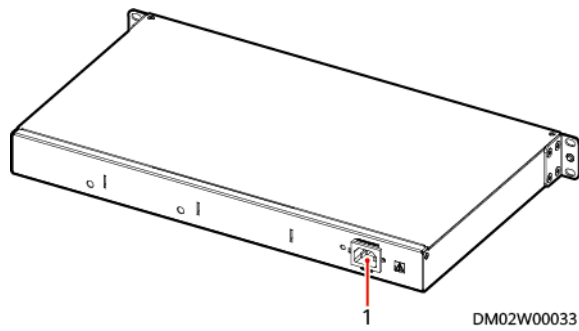
Table 3-17 ECC800 environmental specifications

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 3-18 ECC800 structural specifications

Item	Specifications
Dimensions (L x W x H)	442 mm x 330 mm x 43.6 mm
Color	Black
Installation requirements	Can be installed in a 1 U space in a standard 19-inch cabinet
Environmental protection	RoHS5, REACH, WEEE

Figure 3-12 ECC800 (rear view)



(1) AC_INPUT

Power Ports

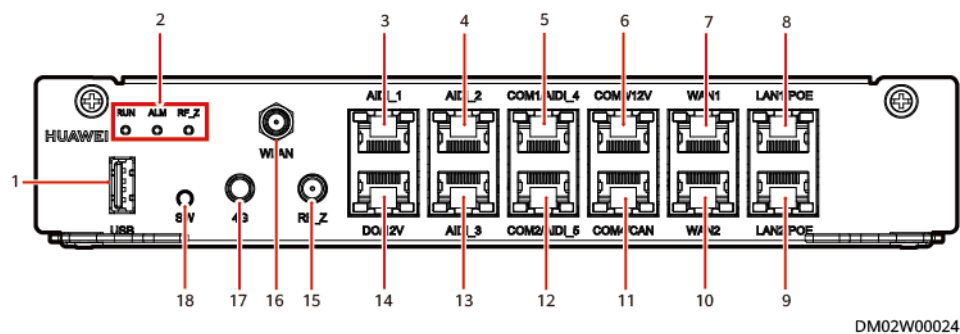
The ECC800 provides one single-phase AC input port (AC_INPUT). [Table 3-19](#) lists the pin definitions.

Table 3-19 Port pin definitions

Port Type	Pin sequence	Description
AC	Pin 1	L
	Pin 2	PE
	Pin 3	No

3.4.3.1.2 Main Control Module

Figure 3-13 ECC800 main control module

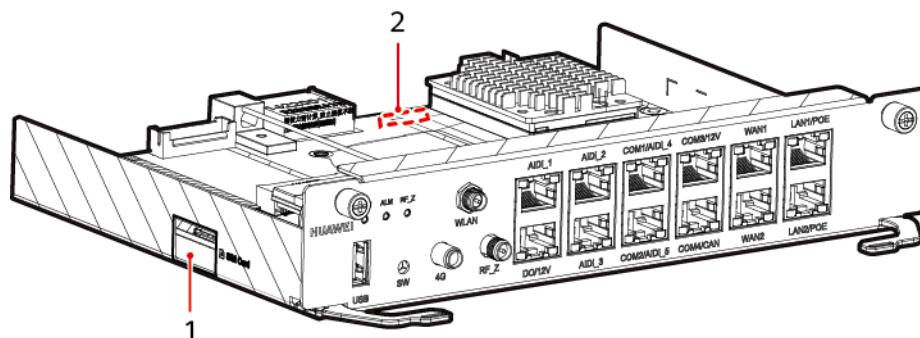


- (1) USB
- (2) Status indicator
- (3) AIDI_1
- (4) AIDI_2
- (5) COM1/AIDI_4
- (6) COM3/12V
- (7) WAN1
- (8) LAN1/POE
- (9) LAN2/POE
- (10) WAN2
- (11) COM4/CAN
- (12) COM2/AIDI_5
- (13) AIDI_3
- (14) DO/12V
- (15) RF_Z (802.15.4)
- (16) WLAN (reserved)
- (17) 4G port
- (18) SW button

NOTE

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

Figure 3-14 ECC800 main control module (side view)



DM02W00025

(1) SIM card slot

(2) Micro SD card slot (reserved)

Technical Specifications

Table 3-20 Technical specifications of the ECC800 main control module

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

Item	Specifications
RS485 serial port expansion	<ul style="list-style-type: none"> ● Output voltage: 13–15 V DC (rated voltage: 14.5 V DC) ● Four RS485 ports with the default communications rate of 9600 bit/s ● COM1–COM3 ports provide 12 V DC power. ● The power supply can be switched on or off and is on by default.
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"> ● Output voltage: 13–15 V DC (rated voltage: 14.5 V DC) ● 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. ● The power supply can be switched on or off and is on by default.
DO expansion (RJ45)	<ul style="list-style-type: none"> ● Output voltage: 13–15 V DC (rated voltage: 14.5 V DC) ● Supports one active DO port. ● The power supply can be switched on or off and is on by default.
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: AIDI_1 and DO/12V ports Group 2: AIDI_2, COM1/AIDI_4, and COM3/12V ports Group 3: 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"> China: 2G and 4G networks support China Unicom or China Mobile SIM cards, and 3G networks support only China Unicom SIM cards. Outside China: Select SIM cards according to the following wireless modes and frequency bands: <ul style="list-style-type: none"> 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) <p>NOTE</p> <ul style="list-style-type: none"> The prerequisite for using a SIM card is that the site has signal coverage. Due to the performance limitation of the wireless module, China Telecom SIM cards are not supported.
USB	<ul style="list-style-type: none"> Supports USB 2.0 and 5 V, 1 A power supply. After installing the WiFi module, connect the WiFi module to the ECC800 using the app on the PAD to view the basic information about the smart module, such as layout, resources, energy efficiency, environment, and alarms. You can insert a USB flash drive to export historical data and configuration files and import configuration files.
SW button	<ul style="list-style-type: none"> Restores the default IP address, factory settings, and user information. RF_Z (802.15.4) networking

Table 3-21 ECC800 RF_Z parameters

Item	Specifications
RF_Z operation frequency	2405–2480 MHz
RF_Z EIRP power (max.)	8 dBm

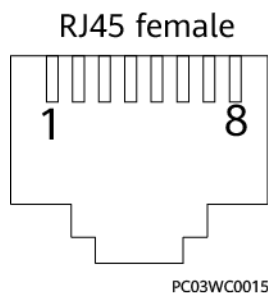
Table 3-22 ECC800 4G parameters

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 power (max.)	23 dBm

Communications Ports

The ECC800 provides the following communications ports. [Figure 3-15](#) shows the pins of the RJ45 port.

Figure 3-15 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 3-23 GE port pin definitions

Item	Description	
Pin sequence	Pin 1	GE1+
	Pin 2	GE1-
	Pin 3	GE2+
	Pin 4	GE3+
	Pin 5	GE3-
	Pin 6	GE2-
	Pin 7	GE4+
	Pin 8	GE4-

Item		Description
Indicator	Green indicator	Linked, steady on
	Yellow indicator	ACT data communication, blinking

Table 3-24 COM1/AIDI_4, COM2/AIDI_5 port pin definitions

Item		Description
Pin sequence	Pin 1	RS485+
	Pin 2	RS485-
	Pin 3	12 V DC_OUT
	Pin 4	RS485+
	Pin 5	RS485-
	Pin 6	DI-
	Pin 7	DI+
	Pin 8	GND
Indicator	Green indicator	Power output indicator <ul style="list-style-type: none"> ● Steady on: The 12 V DC output is normal. ● Off: No 12 V DC output is provided.

Table 3-25 COM3/12V port pin definitions

Item		Description
Pin sequence	Pin 1	RS485+
	Pin 2	RS485-
	Pin 3	12 V DC_OUT
	Pin 4	RS485+
	Pin 5	RS485-
	Pin 6	-
	Pin 7	-
	Pin 8	GND

Item		Description
Indicator	Green indicator	Power output indicator <ul style="list-style-type: none"> Steady on: The 12 V DC output is normal. Off: No 12 V DC output is provided.

Table 3-26 COM4/CAN port pin definitions

Item		Description
Pin sequence	Pin 1	RS485+
	Pin 2	RS485-
	Pin 3	-
	Pin 4	RS485+
	Pin 5	RS485-
	Pin 6	-
	Pin 7	CAN_H
	Pin 8	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 3-27 AIDI_1, AIDI_2 and AIDI_3 ports pin definitions

Item		Description
Pin sequence	Pin 1	Type_1
	Pin 2	Type_2
	Pin 3	12 V DC
	Pin 4	Type_3
	Pin 5	Type_4
	Pin 6	DI-
	Pin 7	DI+

Item		Description
	Pin 8	GND
Indicator	Green indicator	Power output indicator <ul style="list-style-type: none"> Steady on: The 12 V DC output is normal. Off: No 12 V DC output is provided.

Table 3-28 DO/12V port pin definitions

Item		Description
Pin sequence	Pin 1	-
	Pin 2	-
	Pin 3	12 V DC_OUT
	Pin 4	-
	Pin 5	-
	Pin 6	DO_OUT+
	Pin 7	DO_OUT-
	Pin 8	GND
Indicator	Green indicator	Power output indicator <ul style="list-style-type: none"> Steady on: The 12 V DC output is normal. Off: No 12 V DC output is provided.

Table 3-29 USB port pin definitions

Item		Description
Pin sequence	Pin 1	5V
	Pin 2	DM
	Pin 3	DP
	Pin 4	GND

Indicators

Table 3-30 Indicators on the ECC800 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.
			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 3-31 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.

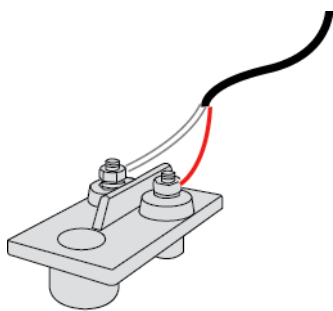
Function Description	Operation Description	Indicator Status
	In wireless network (802.15.4) pairing mode, press and hold down the button for 3s to 5s to exit the pairing mode; or the system automatically exits the pairing mode after 30 minutes without pressing the button.	The RF_Z indicator is blinking at long intervals.
	Press and hold down the button for more than 8s to clear network parameters.	The RF_Z indicator is steady on.
WLAN enabling	Press and hold down the button for 1s to enable WLAN.	None
Restoring the default IP address, factory settings, and user information	Press and hold down the button for 1 minute.	None

3.4.3.2 Environment Monitoring System

3.4.3.2.1 Electrode Water Sensor

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

Figure 3-16 Electrode water sensor



PO01WC0769

Table 3-32 Technical specifications of the electrode water sensor

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

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

3.4.3.2.2 T/H Sensor

Figure 3-17 Appearance



The T/H sensor provides RJ45 ports.

NOTE

The appearance of the T/H sensor delivered onsite may vary.

Figure 3-18 RJ45 port pins

RJ45 female

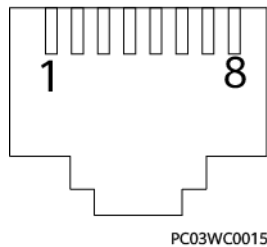


Table 3-33 RJ45 port pin definitions

Pin	Description
Pin1 or Pin4	A
Pin2 or Pin5	B
Pin 3	V+
Pin 6 or Pin 8	V-
Pin 7	Disconnected

Table 3-34 T/H sensor specifications

Item	Specifications
Temperature measuring range	-20°C to +70°C
Temperature precision	±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

3.4.3.2.3 Smoke Detector

A smoke detector detects smoke around cabinets.

Figure 3-19 Smoke detector

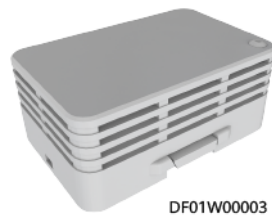


Table 3-35 Smoke detector technical specifications

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 Camera

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

Figure 3-20 C3220 camera



Table 3-36 C3220 camera technical specifications

Item	Specifications
Image sensor	1/2.7" two-megapixel progressive scan CMOS
Minimum illumination	<ul style="list-style-type: none"> • Color: 0.002 lux (F1.2, AGC ON, 1/30s shutter speed) • Black/White: 0.0005 lux (F1.2, AGC ON, 1/30s shutter speed); 0 lux (infrared illuminator enabled)
Wide dynamic range	120 dB
Focal length	2.8–12 mm
Video compression standard	H.265/H.264/MJPEG
Maximum resolution	1920 x 1080
Power supply	12 V DC, PoE
IP rating	IP67
Vandal resistant rating	IK10

3.4.3.3.2 IVS1800

Figure 3-21 Appearance



Table 3-37 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
Platform performance	IP cameras connected	16 cameras to one IVS1800	64 cameras to one IVS1800

Table 3-38 Hardware specifications

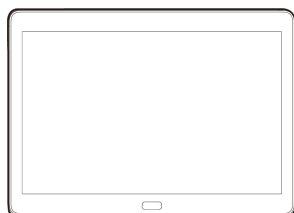
Category	Item	Specifications
Storage capacity	Hard disk quantity	8
	Hard disk port	SATA3.0

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

3.4.3.4 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 on the app.

Figure 3-22 PAD



DM26000026

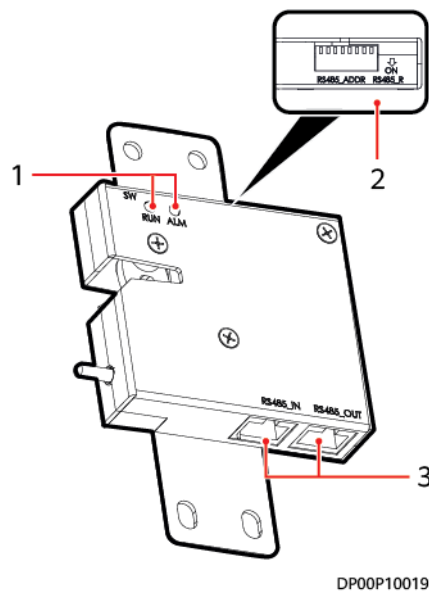
Table 3-39 PAD structural specifications

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

3.4.3.5 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 3-23 Cabinet electronic clasp lock



- (1) LED indicator
- (2) DIP switch
- (3) RJ45 power port

Table 3-40 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	-	-

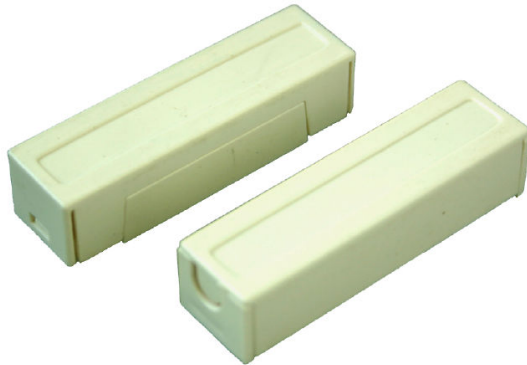
No.	Pin Description	Description
8	Ground	GND

Table 3-41 LED indicator status

Indicator	Color	Name	Operation	Status	Description
RUN	Green	Module running indicator	-	Blinking	<ul style="list-style-type: none"> 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). 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).
				Off	The power supply is abnormal.
			Press SW.	Blinking intermittently at super short intervals	<ul style="list-style-type: none"> The indicator blinks at super short intervals for 0.5s, and then off for 0.5s. 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.
ALM	Red	Alarm indicator	-	Steady on	A system failure alarm is generated.
				Off	The system is normal.

3.4.3.6 Door Status Switch

Figure 3-24 Door status switch



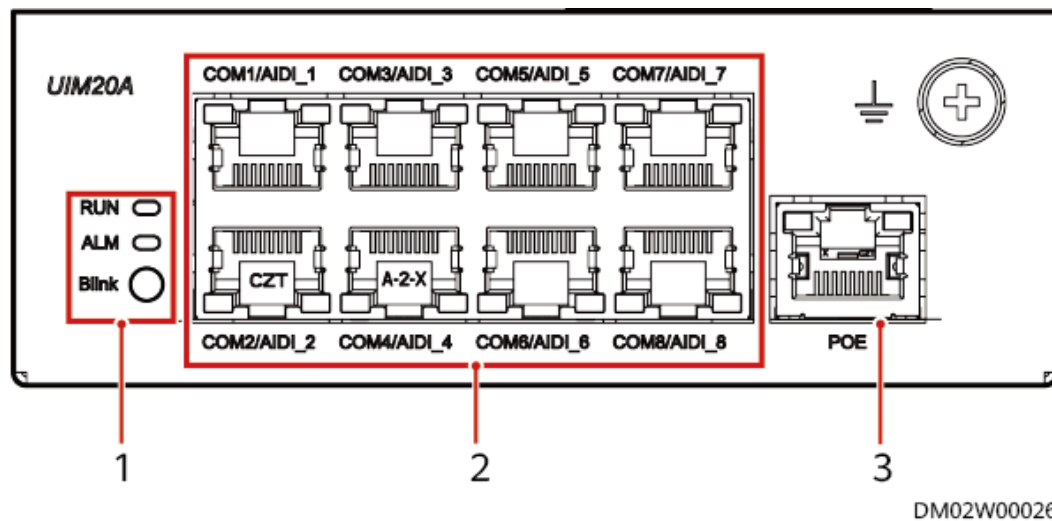
DM82000012

Table 3-42 Technical specifications of the door status switch

Item	Specifications
Connection method	Using wiring terminals
Rated current	500 mA
Opening distance	25 mm ≤ Opening distance ≤ 45 mm
Rated power	10 W
Securing mode	Using screws
Distance between mounting holes	40 mm ±0.8 mm
Open-circuit voltage	100 V DC (maximum)
Contact withstand voltage	150 V DC (maximum)
Impedance	0.3 ohm
Switch status	Normally open
Outer material	White acrylonitrile butadiene styrene (ABS) engineering plastic

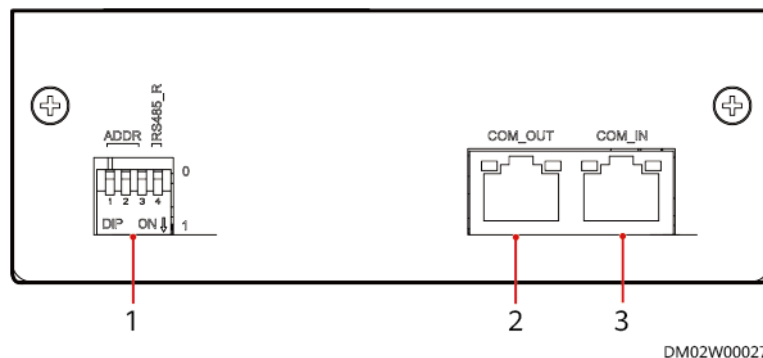
3.4.3.7 (Optional) UIM20A Expansion Module

Figure 3-25 Front panel of the UIM20A expansion module



- (1) Indicators and button (2) COM1/AI/DI_1-COM8/AI/DI_8 (3) PoE

Figure 3-26 UIM20A expansion module rear panel



- (1) DIP switch (reserved) (2) COM_OUT (reserved) (3) COM_IN (reserved)

Table 3-43 UIM20A expansion module specifications

Item	Specifications
Width	120 mm
Depth	200 mm
Height	43 mm
Operating temperature	-30°C~+65°C
Installation requirements	Installed in a 19-inch rack

Item	Specifications
Environmental protection	RoHS5

Specifications

Table 3-44 UIM20A technical specifications

Item	Specifications
Power input	Supports the RS485 or PoE power supply.
COM/AIDI (RJ45)	<ul style="list-style-type: none"> Supports eight RS485 or AI/DI signal inputs. Can connect to sensors such as the smoke detector, water sensor, door status sensor, and infrared sensor. Each port can supply power. Two RJ45 ports share one 12 V DC power supply that is controlled independently. The maximum output current is 900 mA when the voltage is 12 V. (COM1/AIDI_1 and COM2/AIDI_2 form a group, COM3/AIDI_3 and COM4/AIDI_4 form a group, COM5/AIDI_5 and COM6/AIDI_6 form a group, and COM7/AIDI_7 and COM8/AIDI_8 form a group). The 12 V DC power supply can be switched on or off and is on by default.
PoE	Connects to the ECC800 through the PoE port.
E-label 4.0	Supported

Communications Port

The following table describes the pin assignment for ports COM1/AIDI_1 to COM8/AIDI_8.

Table 3-45 Pin assignment for ports COM1/AIDI_1 to COM8/AIDI_8

Item	Description	
Pin sequence	Pin 1	RS485+
	Pin 2	RS485-
	Pin 3	12V
	Pin 4	RS485+
	Pin 5	RS485-

Item		Description
	Pin 6	D-
	Pin 7	D+
	Pin 8	GND

The following table describes the pin assignments for the COM_IN and COM_OUT ports.

Table 3-46 Pin assignment for the COM_IN and COM_OUT ports

Item		Description
Pin sequence	Pin 1	RS485+
	Pin 2	RS485-
	Pin 3	12 V (input power, supplying power to the module)
	Pin 4	RS485+
	Pin 5	RS485-
	Pin 6	-
	Pin 7	-
	Pin 8	GND

Indicators and Buttons

Table 3-47 UIM20A indicators

Indicator	Status	Description
RUN	Steady on	A board application is being loaded.
	Off	The board is not running.
	Blinking slowly	The module successfully registers with the ECC800 and the software runs properly (the indicator blinks at 0.5 Hz, on for 1s and then off for 1s).
	Blinking fast	The communication is interrupted or the ECC800 is unsuccessfully registered (blinking at 2.5 Hz, on for 0.2s and then off for 0.2s).

Indicator	Status	Description
	Blinking	Blinking at super short intervals for 0.5s and then off for 0.5s; last 10s (blinking at super short intervals: 10 Hz, on for 0.05s and then off for 0.05s)
ALM	Steady on	A system fault alarm is raised.
	Off	The system is normal.

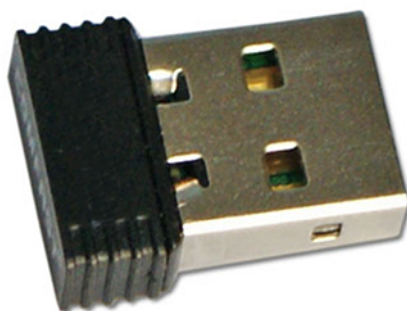
Table 3-48 BLINK button description

Function Description	Operation Description	Indicator Status
Blinking	Press the button for less than 2s.	The RUN indicator blinks at super short intervals for 0.5s and then off for 0.5s; last 10s (blinking at super short intervals for 10 Hz, on for 0.05s and then off for 0.05s).

3.4.3.8 (Optional) WiFi Module

The WiFi module provides WiFi signals for equipment such as PADs to interact with the host computer.

Figure 3-27 WiFi module



DC02W00272

Table 3-49 Technical specifications of a WiFi module

Item	Specifications
Wireless standard	IEEE 802.11n, IEEE 802.11g, and IEEE 802.11b

Item	Specifications
Network bandwidth	<ul style="list-style-type: none"> • 11n: up to 150 Mbit/s • 11g: up to 54 Mbit/s • 11b: up to 11 Mbit/s
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)
Power	< 0.8 W

3.4.4 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 network management systems (NMSs). The system can be customized to support other protocols for the access from different devices.

3.4.4.2 Server

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

Table 3-50 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 3-51 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

3.4.5 DC Manager

The DC Manager monitors the status of the entire network on the GIS home page. After an abnormal site is detected, you can double-click it to access the site monitoring page. Information about environment, energy consumption, key devices, alarm, and security monitoring is provided on the site monitoring page without requiring additional hardware.

- Environment monitoring: Monitors the temperature, humidity, water, and smoke.

- Key device monitoring: Monitors the UPSs, smart cooling products, and related power distribution devices in real time, and displays the energy flow diagram and smart cooling product link diagram.
- Alarm monitoring: Displays site alarm information in real time and quickly locates device faults.
- Security monitoring: Monitors the cabinet door status and cameras in sites.

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 mm².

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 mm².
- 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 mm².

3.6 Fire Extinguishing System

A rack-mounted integrated fire extinguishing module can be configured for the cabinet.

- If the cabinet is equipped with a rack-mounted integrated fire extinguishing module, use the module to put out the fire when a fire extinguishing signal is detected.
- If no rack-mounted integrated fire extinguishing module is configured, the cabinet door is automatically opened when a smoke signal is detected in the cabinet. Then the fire extinguishing system of the building is used to put out the fire.

Table 3-52 Technical specifications of the integrated rack-mounted fire extinguishing module

Item		Specifications
Storage pressure (at 20°C)		≤ 1.6 MPa
Operating environment	Operating temperature	0–50°C
	Storage temperature	–40°C to +70°C (excluding the glass bulb)
	Humidity	≤ 95% RH (non-condensing)
Startup mode		Glass ball: 68°C
		Pipe blasting: 90–110°C
Alarming mode		Dry contact signal feedback
Dimensions		≤ 1 U (height) x 700 mm (depth)

3.7 Integrated Cabling System

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 3-28 Cable tray



Table 3-53 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


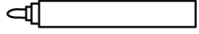
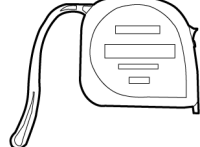
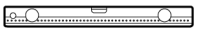

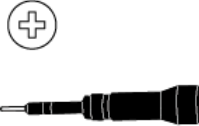
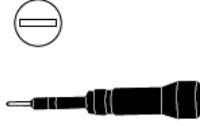
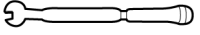
4 Installation Guide


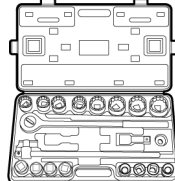

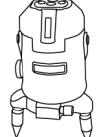
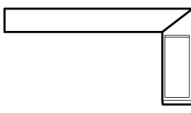
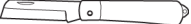


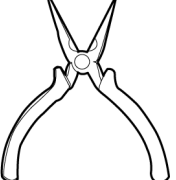
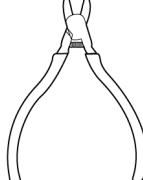
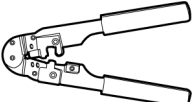
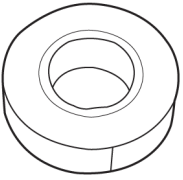
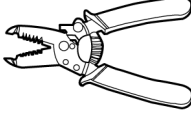

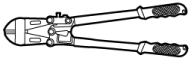
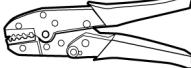
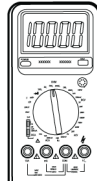



4.1 Installation Preparations

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 insulated torque screwdriver (M4/M6/M8)	Flat-head insulated torque screwdriver (2-5 mm)	Torque wrench
			
Adjustable wrench (6")	Socket wrench (M6/M8/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	-

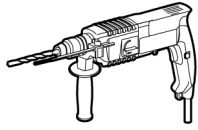
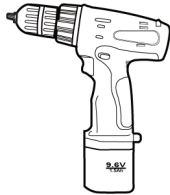
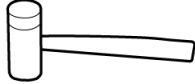
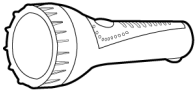
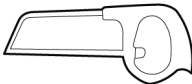
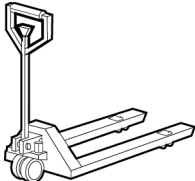
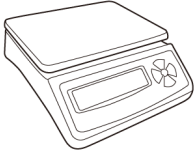
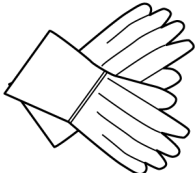
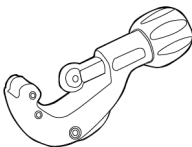
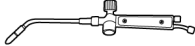
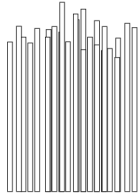

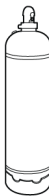
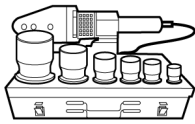
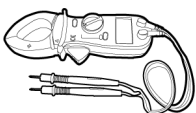
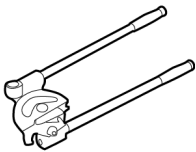
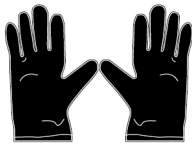
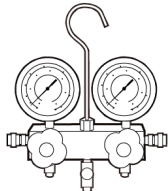
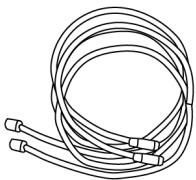

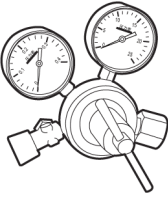
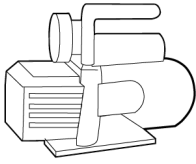
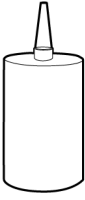
Name, Specifications, and Appearance			
			-

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

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

Name, Specifications, and Appearance			
			
<p>a. Pressure gauge and rubber hose: dedicated for R410A. The measuring range of the pressure gauges must be at least 4.0 MPa, and the rubber hoses must withstand a pressure of at least 4.5 MPa. Ensure that the rubber 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"> • Applicable to all pipe materials • Anaerobic metal pipe thread sealant with PTEF as the padding • Maximum gap: 0.5 mm • Pressure resistance: above 1.6 MPa • Compliant with the industry standard JB/T7311-2008 <i>Technical Specification for the Application of Anaerobic Glue in Engineering Machinery</i> 			

4.1.2 Installation Environment Check

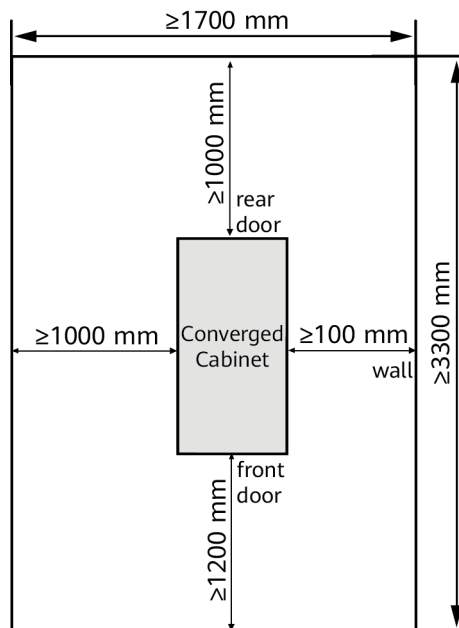
Ensure that the installation environment meets the requirements before installation.

Table 4-3 Installation environment checklist

Check Item	Specifications	Actual 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

Check Item	Specifications	Actual Result
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
Floor levelness	Allowed deviation: 3 mm/2000 mm	<input type="checkbox"/> Passed <input type="checkbox"/> Failed
Equipment room net height	≥ 2.6 m	<input type="checkbox"/> Passed <input type="checkbox"/> Failed
Equipment room area	≥ 10.15 m ²	<input type="checkbox"/> Passed <input type="checkbox"/> Failed
Equipment room maintenance clearance	At least 1200 mm, 1000 mm, and 1000 mm maintenance clearance should be reserved from the front door, rear, and side of the cabinet, respectively. At least 100 mm clearance should be reserved from the wall.	<input type="checkbox"/> Passed <input type="checkbox"/> Failed
Power system	208–240 V, 1-phase, 50 Hz/60 Hz	<input type="checkbox"/> Passed <input type="checkbox"/> Failed
Water port	Condensate drain outlet: Drains condensate from the smart cooling product.	<input type="checkbox"/> Passed <input type="checkbox"/> Failed

Figure 4-1 Space requirements



DC00500804

 **NOTE**

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

Table 4-4 Recommended circuit breakers

load	Recommended Cable and Circuit Breaker Specifications	Upstream Power Supply	Terminal Specifications
≤ 2.4 kW (Latin America)	Circuit breaker specifications	63 A/2P	-
	Input power cable specifications	3 x 8 AWG (L/N/PE)	10 mm ² cord end terminal
≤ 3 kW (Asia, Africa, and Europe)	Circuit breaker specifications	63 A/2P	-
	Input power cable specifications	3 x 8 AWG (L/N/PE)	10 mm ² cord end terminal

 **NOTE**

The customer needs to purchase power cables based on site requirements.

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 Internal Layout

Figure 4-2 Cabinet internal layout (02116804)

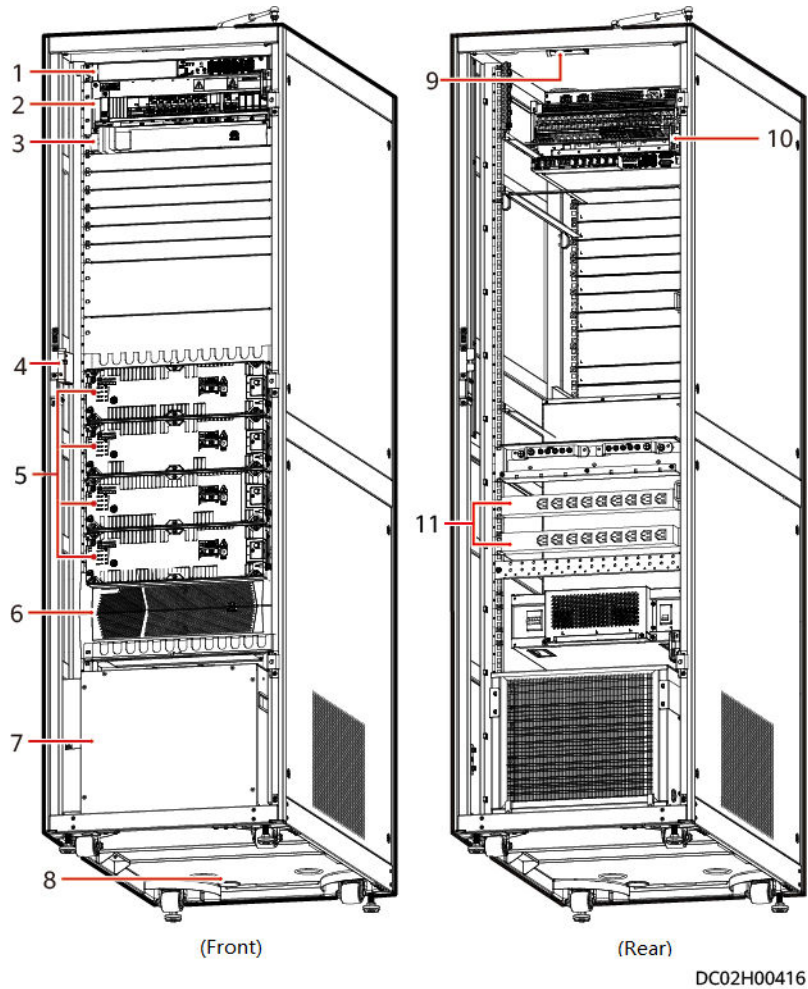


Table 4-5 Cabinet components (02116804)

No.	Component
(1)	ECC800
(2)	Power distribution subrack
(3)	UPS
(4)	Electronic clasp lock
(5)	Battery
(6)	Transformer
(7)	Integrated air conditioner

No.	Component
(8)	Water sensor
(9)	Smoke detector
(10)	T/H sensor
(11)	rPDU

 **NOTE**

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

4.1.5 Configuration Scenario

Table 4-6 Configuration scenario (02116804)

Item	Mandatory or Not	Install Onsite or Not	Connect Onsite or Not	Commission Onsite or Not
ECC800	Yes	No	No	No
Power distribution subrack	Yes	No	No	-
UPS2000-H-6 kVA	Yes	No	No	No
Battery	Yes	Yes	Yes	Yes
Transformer	N	Yes	Yes	No
Smart cooling product	Yes	No	No	No
rPDU	Yes	Yes	Yes	No
4G antenna	Yes	Yes	Yes	Yes
WiFi module	Yes	No	No	No
Smoke detector	Yes	No	No	No
T/H sensor	Yes	Yes	Yes NOTE Cables have been laid out.	No
Electronic clasp lock	Yes	No	No	No
Water sensor	Yes	Yes	Yes	No

Item	Mandatory or Not	Install Onsite or Not	Connect Onsite or Not	Commission Onsite or Not
PAD	Yes	Yes	Yes	Yes
Camera	No	Yes	Yes	Yes
IVS1800	No	Yes	Yes	Yes
Rack-mounted integrated fire extinguishing module	No	Yes	Yes	Yes

4.1.6 Personnel Requirements

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

 **CAUTION**

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

The requirements are as follows:

- Technical personnel from the customer must be trained and understand the installation and operation methods.
- 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

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

NOTICE

- Only trained personnel are allowed to move the cabinet. Use a forklift to remove the packed cabinet from the pallet.
 - To prevent the equipment from falling over, secure it to a pallet truck using ropes before moving it. Move the equipment with caution to avoid bumping or falling, which may damage the equipment.
 - After placing the equipment in the installation position, unpack it and take care to prevent scratches. Keep the equipment stable during unpacking.
 - After unpacking, check whether the fastening components and removable components are loose. If they are loose, notify the carrier and manufacturer immediately.
 - Do not tear down the transparent film from the glass door during transportation or unpacking. The film will be removed after the entire module is installed.
 - If the installation environment is poor, take dustproof and anti-condensation measures (for example, use a dust cover, plastic film, or fabric cloth) after unpacking the equipment to prevent condensation and dust buildup, which may corrode the equipment.
-

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.

 **NOTE**

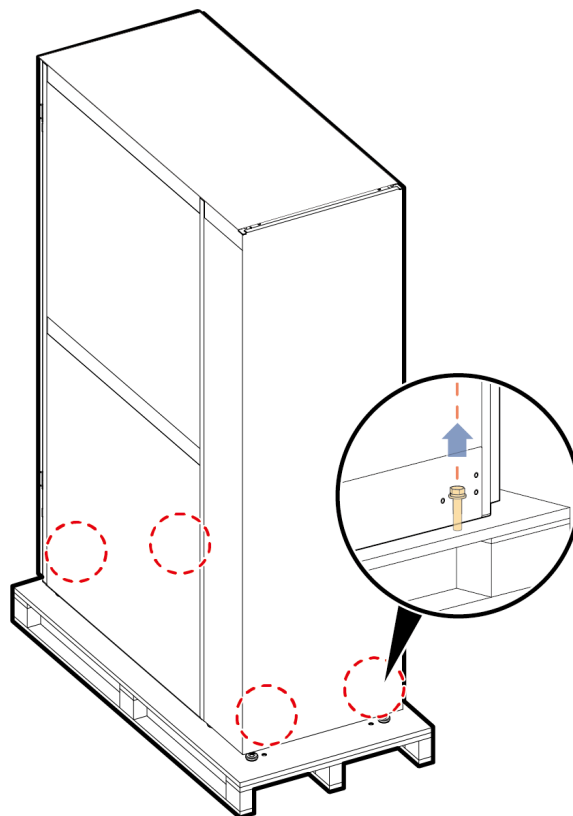
Ordinary cabinets include IT cabinets, battery cabinets, and network cabinets.

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 the local branch office of your supplier immediately.
4. After checking that the cabinet is intact, remove the screw assemblies that secure the cabinet to the pallet, as shown in [Figure 4-3](#).

NOTICE

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

Figure 4-3 Removing an ordinary cabinet



DM14000018

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.

Step 5 Remove the pallet from the Converged Cabinet.

1. Remove the plastic bag and take out the fitting box, ramps, and sliders.

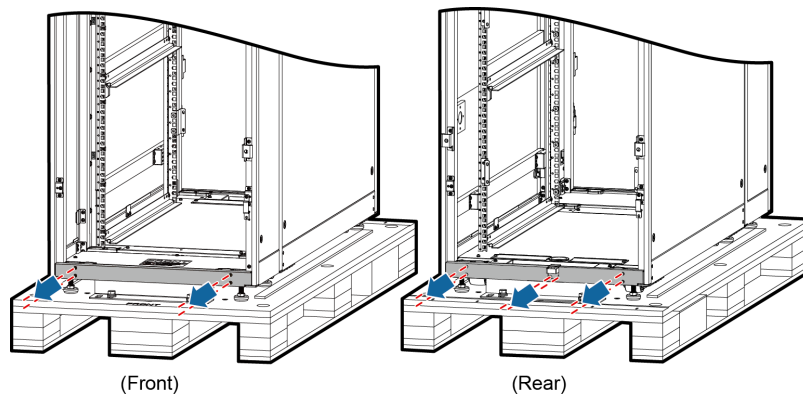
NOTE

Obtain the paper documents about the UPS from 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 the local branch office of your supplier immediately.
4. After checking that the Converged Cabinet is intact, remove the L-shaped brackets that secure the cabinet to the pallet.
 - a. Open the front and rear doors of the cabinet, and remove the cabinet lower sealing plates.

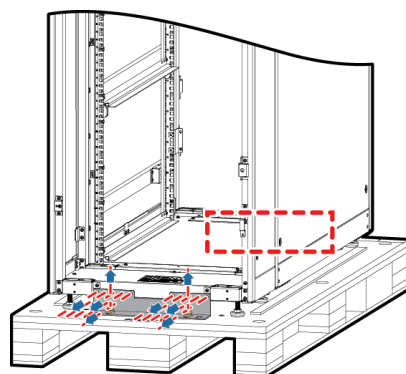
- b. Remove the L-shaped brackets.
- c. Reinstall the cabinet lower sealing plates, and close the front and rear doors of the cabinet.

Figure 4-4 Removing the cabinet lower sealing plates



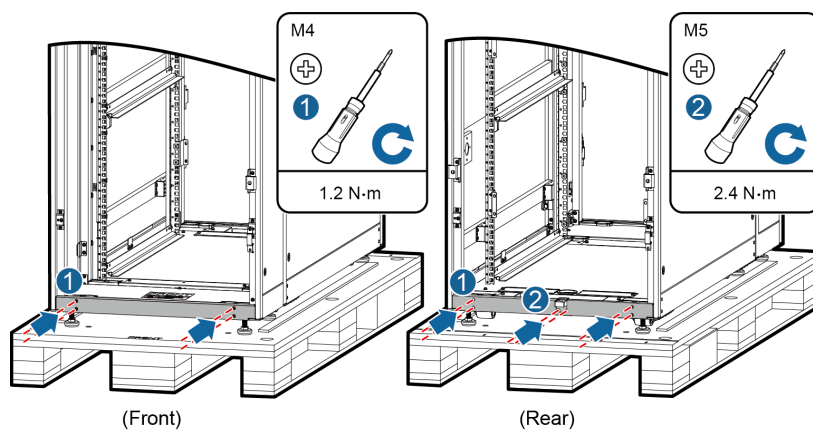
DC02H00115

Figure 4-5 Removing the L-shaped brackets



DC02H00116

Figure 4-6 Installing the cabinet lower sealing plates



DC02H00117

NOTE

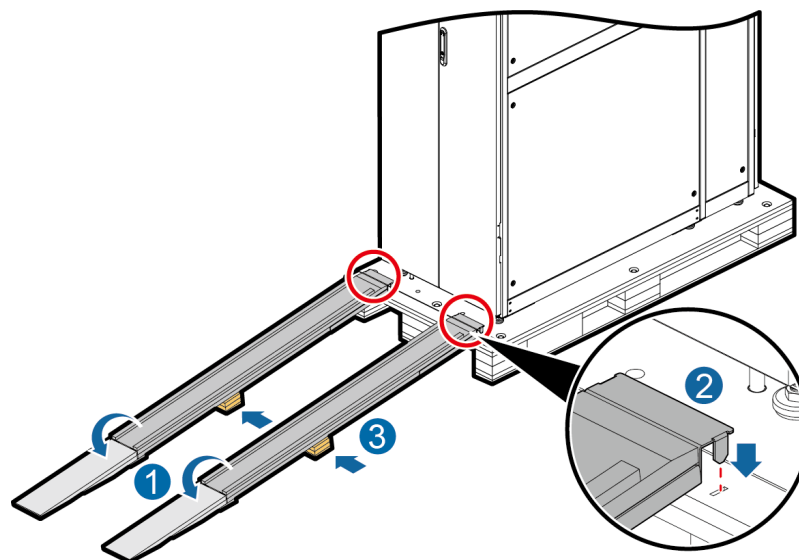
The middle two screws in the cabinet rear are used to secure the latch.

5. Connect the ramps to the rear door side of the pallet and extend the ramps, and then clamp the sliders at the bottom of the ramps, as shown in **Figure 4-7**.

 **NOTE**

No ramps are configured for the Converged Cabinet BC1.

Figure 4-7 Installing ramps



DD00000104

6. Raise the six leveling feet to the highest point using an adjustable wrench, and push the cabinet to the installation position over castors.

 **CAUTION**

Close the front and rear doors of the cabinet before moving it from the pallet.

----End

4.2.2 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.

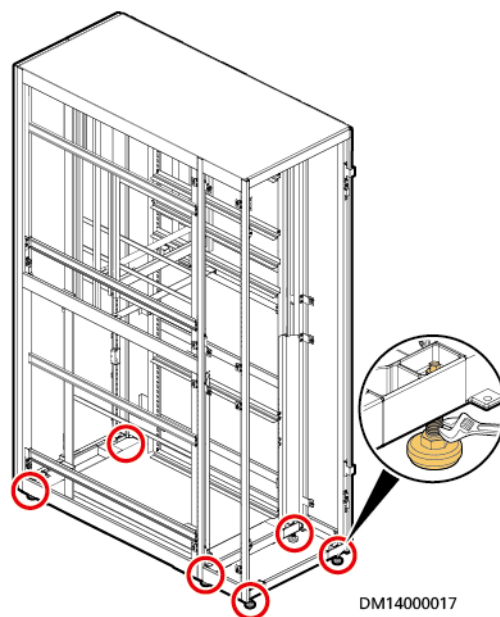
NOTICE

- 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



----End

4.2.3 Installing Smart Cooling Product Components

This section applies to 02116411 and 0211642 cabinets.

4.2.3.1 Installing a Drainage Pipe for the Smart Cooling Product

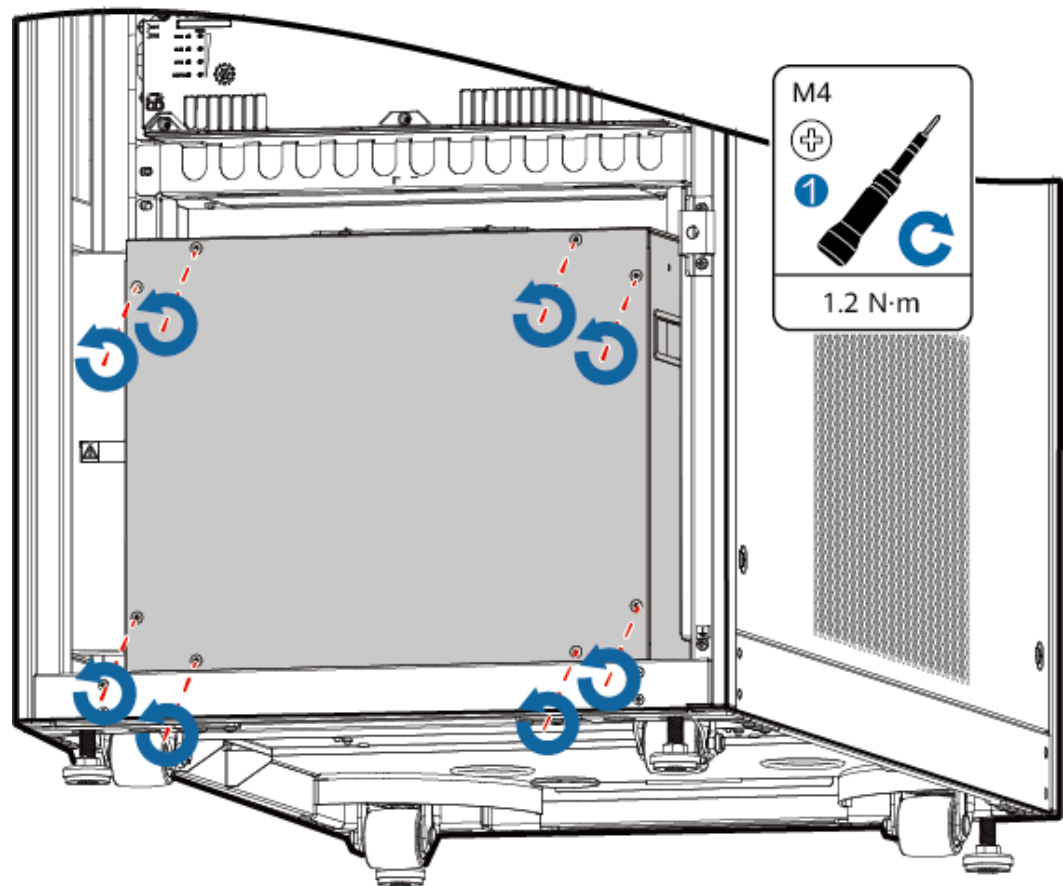
Context

The condensate drainpipe has been installed on the smart cooling product before delivery. You need to route the drainpipe from the bottom onsite.

Procedure

Step 1 Remove the baffle plate from the smart cooling product.

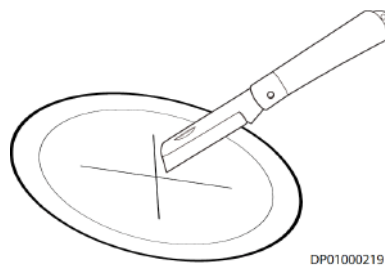
Figure 4-9 Removing the baffle plate



DC02H00385

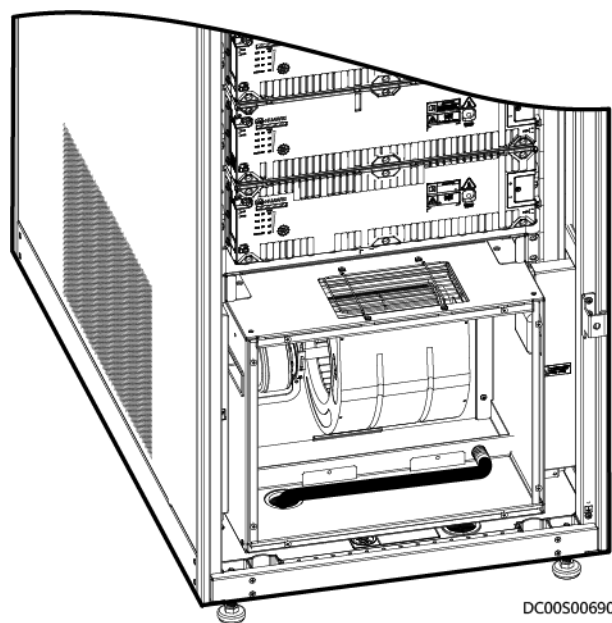
Step 2 Use an electrician's knife to cut a cross in the middle of the rubber plug for the water pipe hole at the bottom of the cabinet.

Figure 4-10 Cutting the rubber plug



Step 3 Route the drainpipe.

Figure 4-11 Drainpipe routed from the bottom



NOTICE

- After routing the water pipe, secure it to the pipe assembly using cable ties, and seal the cable hole using firestop putty.
 - After connecting the drainpipe, check whether the drainage is normal.
-

Step 4 Install the baffle plate for the smart cooling product.

----End

Follow-up Procedure

Before removing the smart cooling product, remove the upper baffle plate and the side panels on both sides of the cabinet.

4.2.3.2 Installing Remote T/H Sensors for the Smart Cooling Product

Context

The T/H sensors need to be installed on the right post of the 33 U position on the front door and 10 U position on the rear door.

Procedure

Step 1 Install T/H sensors.

1. Open the front and rear doors of the cabinet.
2. Unpack two T/H sensors and attach them to the cabinet posts.

 **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 4-7 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.

Step 3 Insert the pre-routed cables into the ports on the T/H sensors on the front and rear doors.

----End

4.2.4 Installing Power Supply and Distribution Devices

4.2.4.1 Installing Batteries and Battery Cables

Install batteries at the bottom of the Converged Cabinet.

NOTICE

- If no smart cooling product is installed in the Converged Cabinet, install batteries from bottom to top starting from the 1 U position above the cabinet bottom.
- If a smart cooling product is installed in the Converged Cabinet, install batteries from bottom to top starting from the 12 U position above the cabinet bottom.

4.2.4.1.1 (Optional) Installing Battery Packs

If battery packs are configured, perform the following steps to install them.

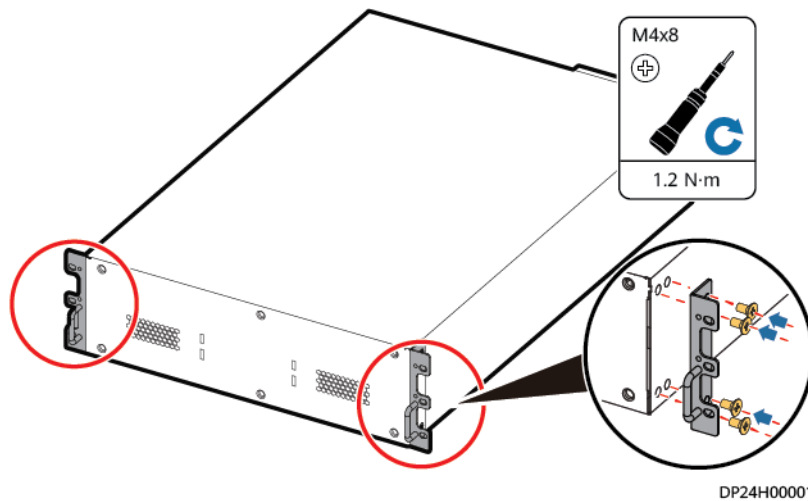
Context

The battery pack is installed at the bottom of the IT cabinet adjacent to the Converged Cabinet.

Procedure

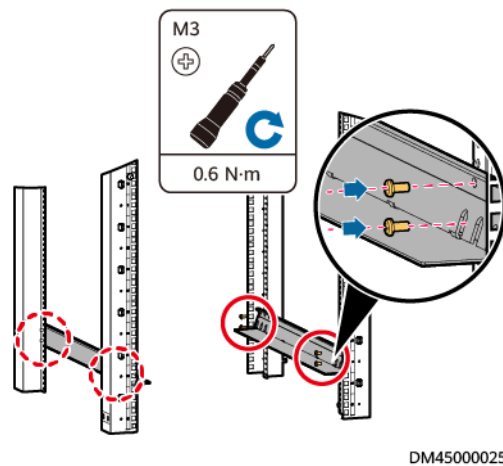
- Step 1** Take out mounting ears from the battery pack fitting bag, and install them on the battery pack using eight M4 screws, as shown in [Figure 4-12](#).

Figure 4-12 Installing mounting ears



- Step 2** Install floating nuts at the battery pack installation position.
- Step 3** (Optional) Install heavy duty guide rails at the battery pack installation position, as shown in [Figure 4-13](#).

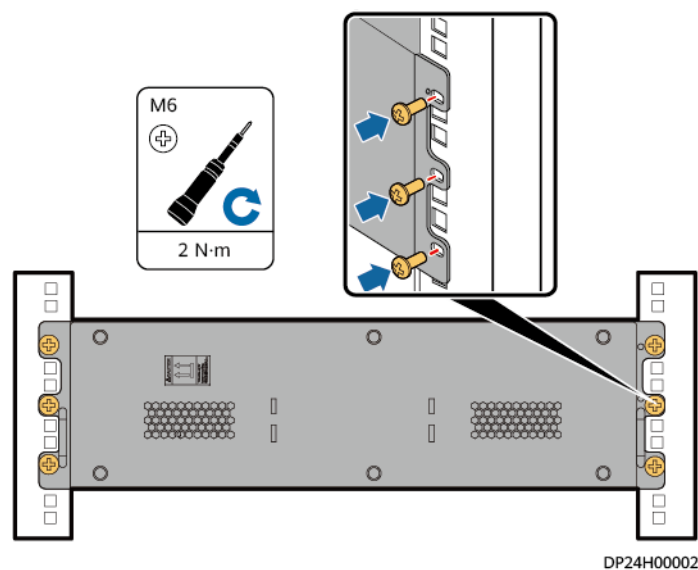
Figure 4-13 Installing heavy duty guide rails



Step 4 (Optional) Remove the battery power cables secured beside the guide rails from the cable ties.

Step 5 Push the battery back onto the guide rails, and secure the battery pack to the cabinet rack rails using mounting ears and screws, as shown in [Figure 4-14](#).

Figure 4-14 Installing a battery pack



Step 6 Install the protective cover for the battery pack.

Step 7 Install other battery packs in the same way.

----End

4.2.4.1.2 (Optional) Installing Batteries

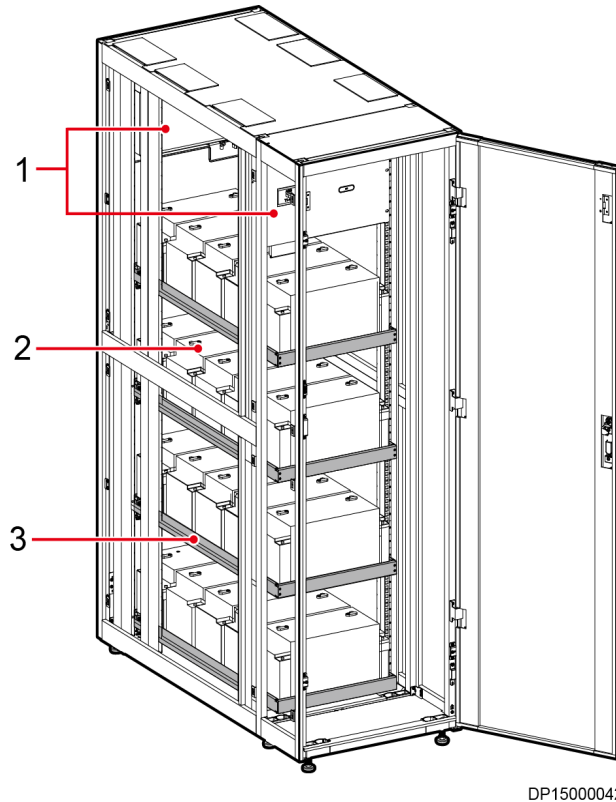
If batteries are configured, perform the following steps to install them.

Battery Cabinet Overview

NOTICE

The battery appearance and layout shown in the figure are for reference only. The actual battery appearance and battery wiring diagram may vary.

Figure 4-15 Battery cabinet



(1) Circuit breakers

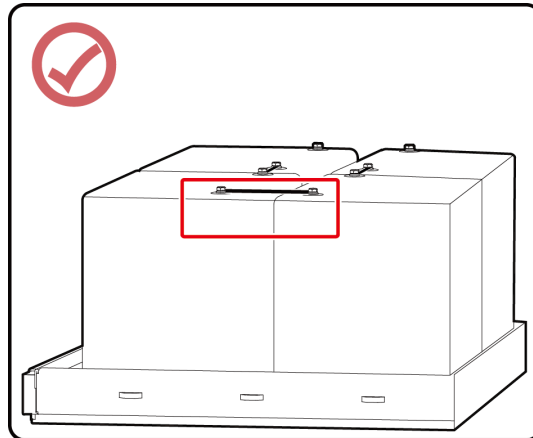
(2) Battery

(3) Tray

Correct Method for Connecting Battery Cables

- If the length of a battery cable equals the distance between two battery terminals, connect the cable straight through.

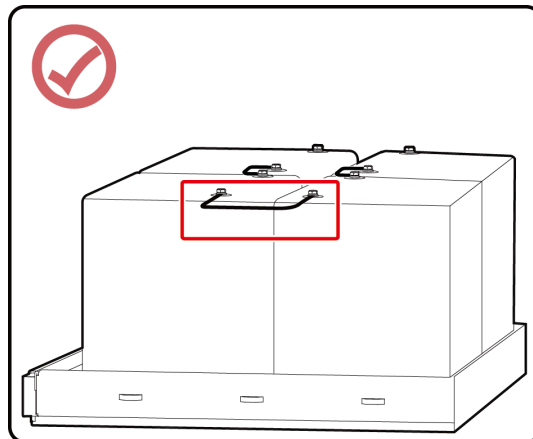
Figure 4-16 Directly connecting two batteries



DP16000046

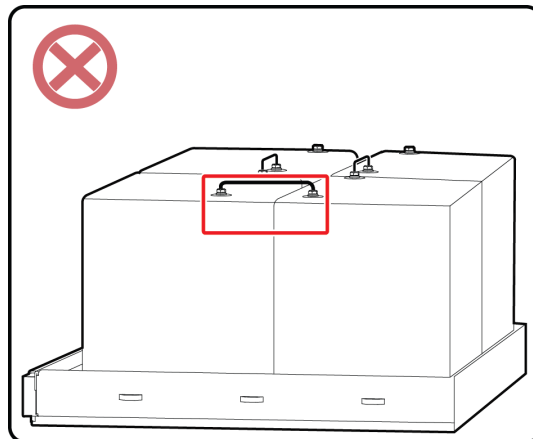
- When the length of a battery cable is longer than the distance between two battery terminals, connect the cable in the way shown in [Figure 4-17](#). To prevent misshaping battery terminals, do not connect the cable in the way shown in [Figure 4-18](#).

Figure 4-17 Correct battery cable connection method



DP16000044

Figure 4-18 Incorrect battery cable connection method



DP16000045

Precautions for Connecting Battery Cables

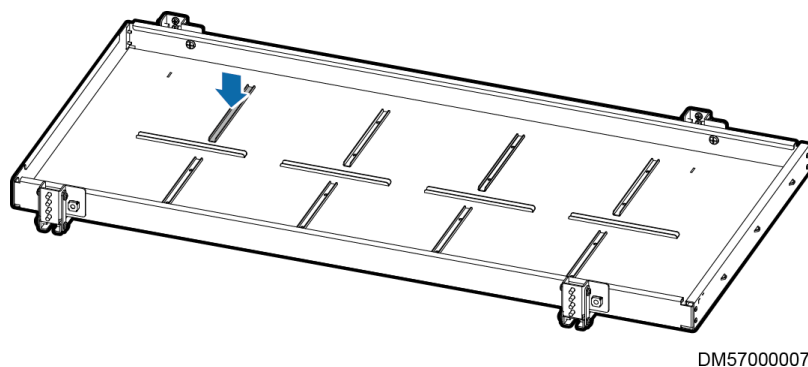
- For details about how to connect battery cables, see the battery cable connection diagram delivered with the cables.
- Battery trays consist of supports and trays, with space reserved between supports and trays on adjacent layers for operation. If the battery trays need to be removed, perform the following operations:
 - a. Remove the battery trays from top to bottom.
 - b. Install batteries and connect cables from bottom to top.

NOTICE

When installing batteries, install battery trays at first, then place batteries onto the trays, and connect cables. Do not move all the batteries into the cabinet after placing the batteries on the trays and connecting cables.

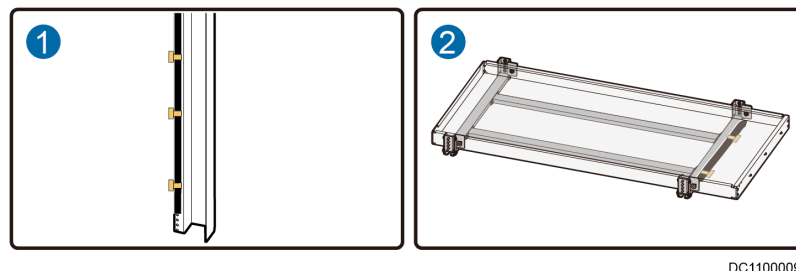
- When placing batteries, install separators between adjacent batteries, as shown in the figure. If the battery capacity is 65 Ah or more, there is no need to install a separator in the depth direction of the battery cabinet.

Figure 4-19 Installing a partition plate



- Route and secure cables between layers along the rack rail in the vertical direction, as shown by (1) in the figure.
- Route and secure cables between layers along the tray supporting beam in the horizontal direction, as shown by (2) in the figure.

Figure 4-20 Cable routes



- (Optional) When battery cabinets are installed adjacent to each other, remove the upper side panels from the battery cabinets for routing cables to the corresponding ports.

Battery Layout

Table 4-8 Maximum number of batteries inside a battery cabinet

Battery Specifications	Maximum Number of Batteries Inside a Battery Cabinet
26 Ah	40
40 Ah	
65 Ah	20
100 Ah	

Table 4-9 Configuration scenarios

Battery Specifications	Battery Cabinet	Number of Cabinet Layers	Number of Batteries				
			40	38	36	34	32
-	-	-	40	38	36	34	32
26 Ah/40 Ah	Battery cabinet 1	Layer 1	10	10	8	8	8
		Layer 2	10	9	10	9	8
		Layer 3	10	10	10	10	8
		Layer 4	10	9	8	7	8

Table 4-10 Configuration scenarios

Battery Specifications	Battery Cabinet	Number of Cabinet Layers	Number of Batteries				
			40	38	36	34	32
-	-	-	40	38	36	34	32
65 Ah/100 Ah	Battery cabinet 1	Layer 1	5	4	5	5	4
		Layer 2	5	5	5	4	4
		Layer 3	5	5	4	4	4
		Layer 4	5	5	4	4	4
	Battery	Layer 1	5	5	5	5	4

Batter y Specif icati ons	Batt ery Cabi net	Number of Cabinet Layers	Number of Batteries				
	cabin et 2	Layer 2	5	5	5	4	4
		Layer 3	5	5	4	4	4
		Layer 4	5	4	4	4	4

NOTICE

- Evenly arrange batteries from the front to rear and from the bottom to top of the battery cabinets. Adjust them according to the actual situation.
 - A maximum of ten 26 Ah/40 Ah batteries or five 65 Ah/100 Ah batteries can be deployed on a single layer.
-
- The following figures show single-layer battery layouts (one blue box indicates one battery).

Figure 4-21 7/8/9/10 batteries (26/40 Ah) on a single layer

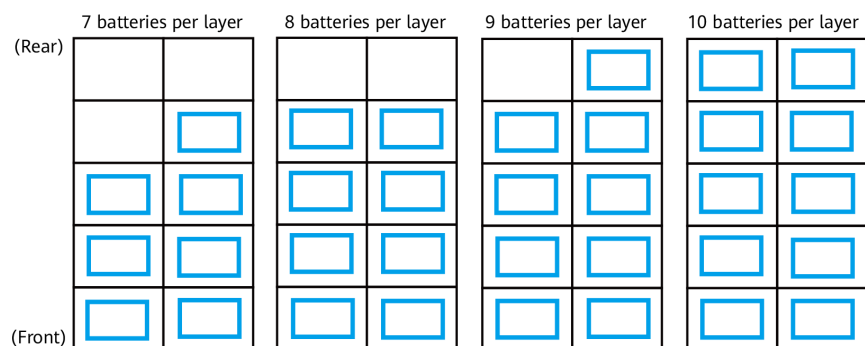
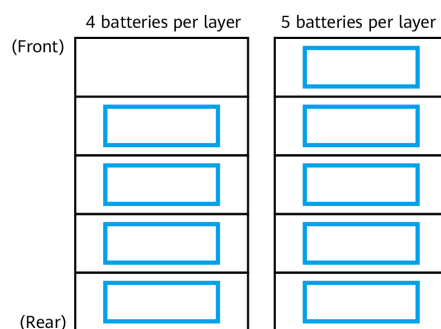
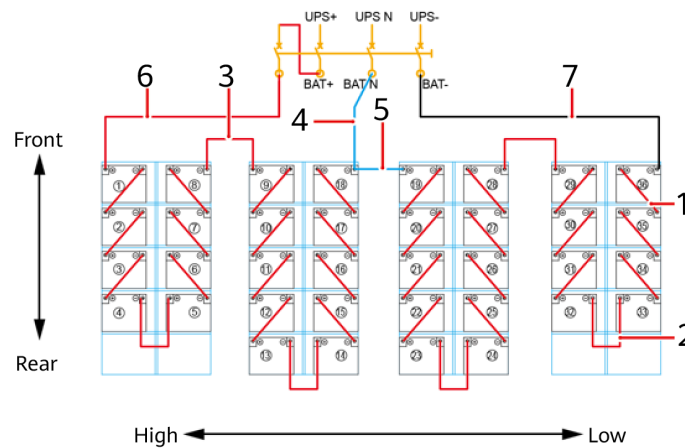


Figure 4-22 4/5 batteries (65/100 Ah) on a single layer



- The following figure shows the layout and cable connections for 36 batteries (26/40 Ah).

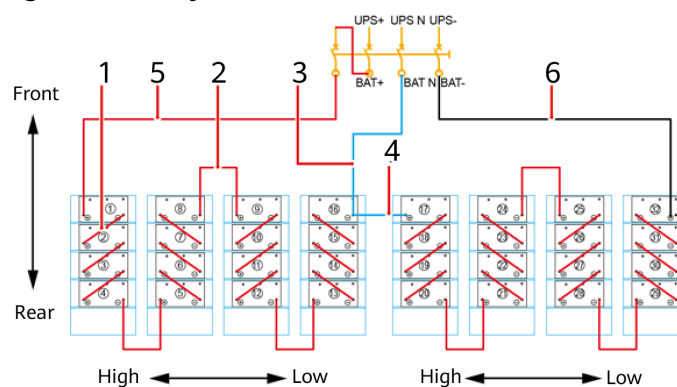
Figure 4-23 Layout and cable connections for 36 batteries (26/40 Ah)



- (1) Cables for series connection within a layer 1
- (2) Cables for series connection within a layer 2
- (3) Cables for series connection between layers
- (4) Neutral wire for series connection 1
- (5) Neutral wire for series connection 2
- (6) Output power cable+
- (7) Output power cable-

- The following figure shows the layout and cable connections for 32 batteries (65/100 Ah).

Figure 4-24 Layout and cable connections for 32 batteries (65/100 Ah)



- (1) Cables for series connection within a layer
- (2) Cables for series connection between layers
- (3) Neutral wire for series connection 1
- (4) Neutral wire for series connection 2
- (5) Output power cable+
- (6) Output power cable-

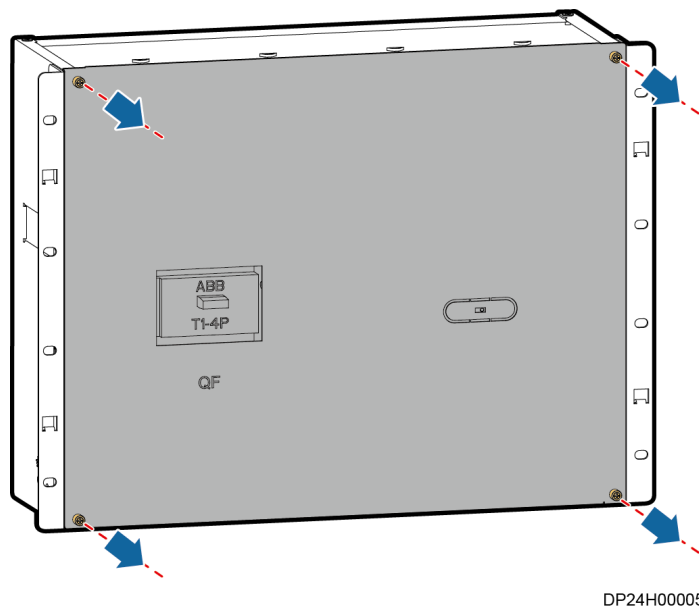
Connecting Cables to Circuit Breaker 1 in a Battery Cabinet

CAUTION

Before connecting cables, ensure that the circuit breaker is OFF.

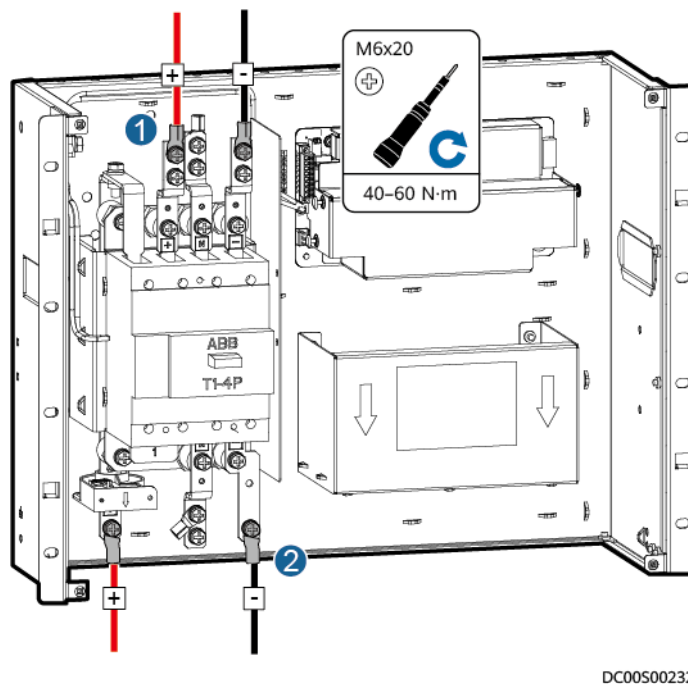
1. Remove the panel from the BCB box.

Figure 4-25 Removing the panel from the BCB box



2. Connect the +, N, and - cables to the UPS terminals, as shown by (1) in the figure.
3. Connect the +, N, and - cables to the battery terminals, as shown by (2) in the figure.

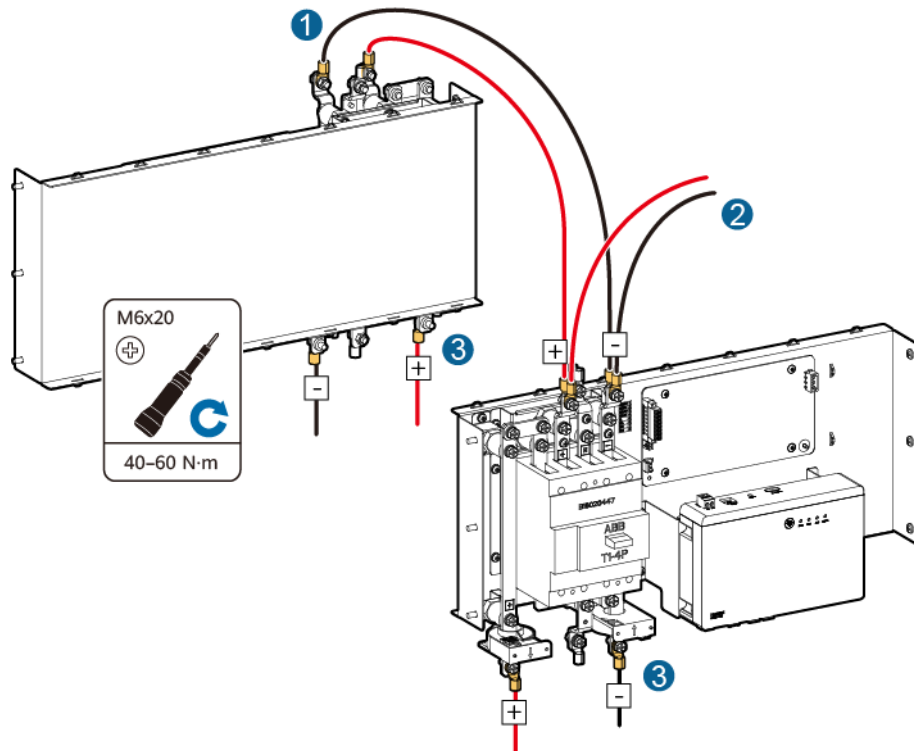
Figure 4-26 Connecting cables (10 kVA UPS)



4. (Optional) If two battery strings are configured, connect cables from the UPS terminals + and - of one battery string to the UPS terminals + and - of the other battery string, as shown by (1) in the figure. Connect cables to the UPS

terminals, as shown by (2) in the figure. Connect cables to the battery terminals, as shown by (3) in the following figure.

Figure 4-27 Connecting cables (10 kVA UPS)



DC00S00233

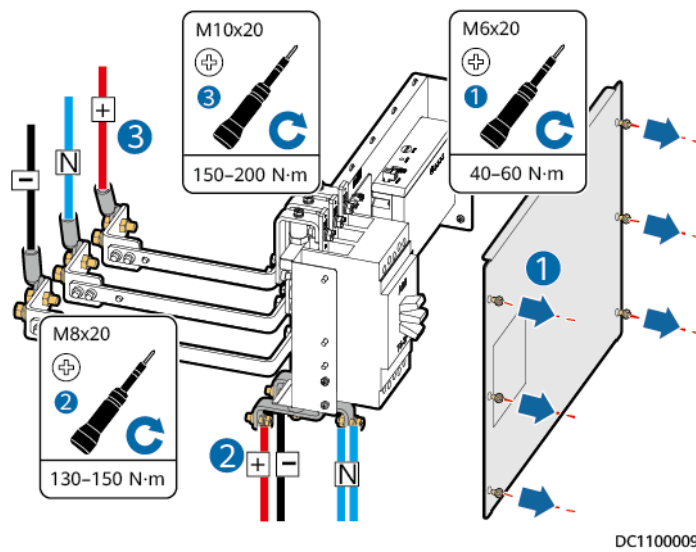
Connecting Cables to Circuit Breaker 2 in a Battery Cabinet

CAUTION

Before connecting cables, ensure that the circuit breaker is OFF.

1. Remove the circuit breaker panel.
2. Connect cables to battery terminals +, N, and -.
3. Connect cables to UPS terminals +, N, and -.
4. (Optional) If two battery strings are deployed, connect the UPS terminals +, N, and - for one battery string to the UPS terminals +, N, and - for the other battery string.

Figure 4-28 Connecting power cables to the circuit breaker



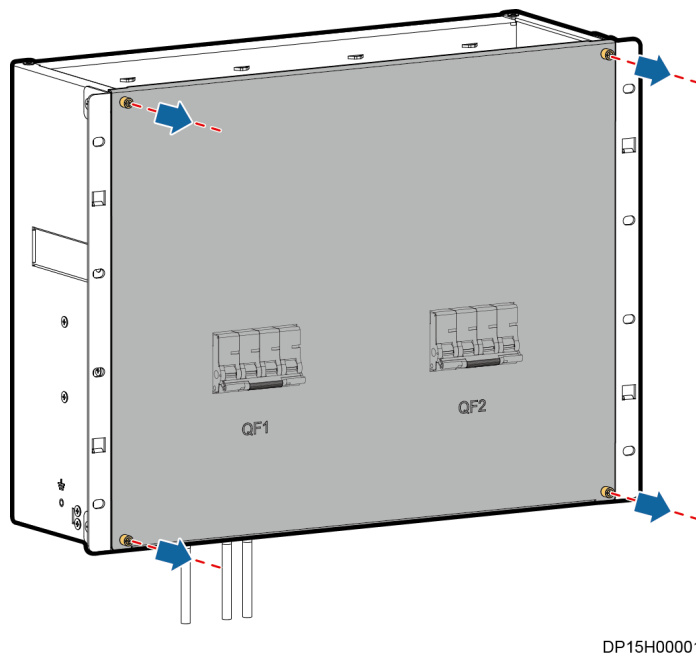
Connecting Cables to the MCB in a Battery Cabinet

CAUTION

Before connecting cables, ensure that the miniature circuit breaker (MCB) is OFF.

1. Remove the front panel from the BCB box.

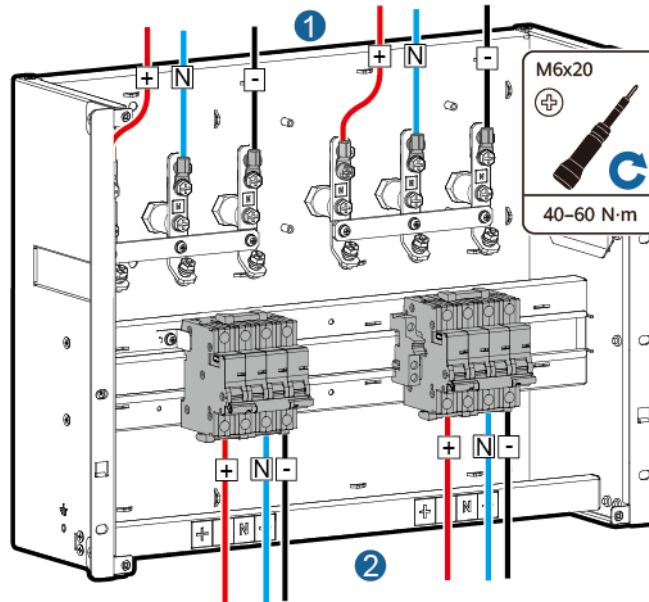
Figure 4-29 Removing the front panel from the BCB box



2. Connect the +, N, and - cables to the UPS terminals, as shown by (1) in the figure.

3. Connect the +, N, and - cables to the battery terminals, as shown by (2) in the figure.

Figure 4-30 Connecting cables (10 kVA UPS)

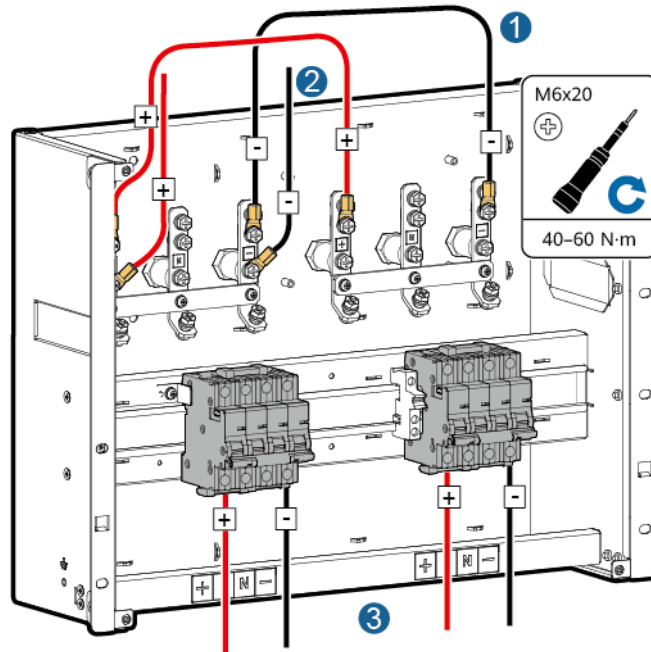


DC00500199

NOTE

- If a 10 kVA UPS is configured, do not connect the N cable.
4. (Optional) If two battery strings are configured, connect cables from the UPS terminals + and - of one battery string to the UPS terminals + and - of the other battery string, as shown by (1) in the figure. Connect cables to the UPS terminals, as shown by (2) in the figure. Connect cables to the battery terminals, as shown by (3) in the following figure.

Figure 4-31 Connecting cables (10 kVA UPS)



DC00500200

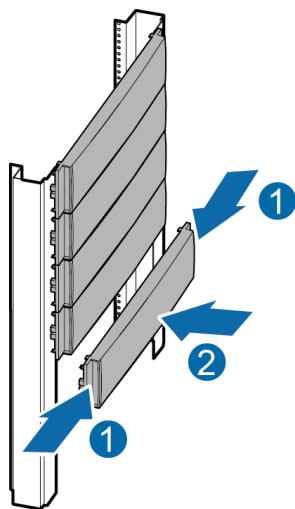
Installing Panels

1. Reinstall the circuit breaker panel.
2. Secure filler panels to the rack rails on the rear door.

NOTE

Install filler panels according to the U position markings on the cabinet. Ensure that filler panels fully cover the rack rails.

Figure 4-32 Installing filler panels



DM44000010

4.2.4.1.3 Connecting Battery Cables

Prerequisites

Battery packs have been installed.

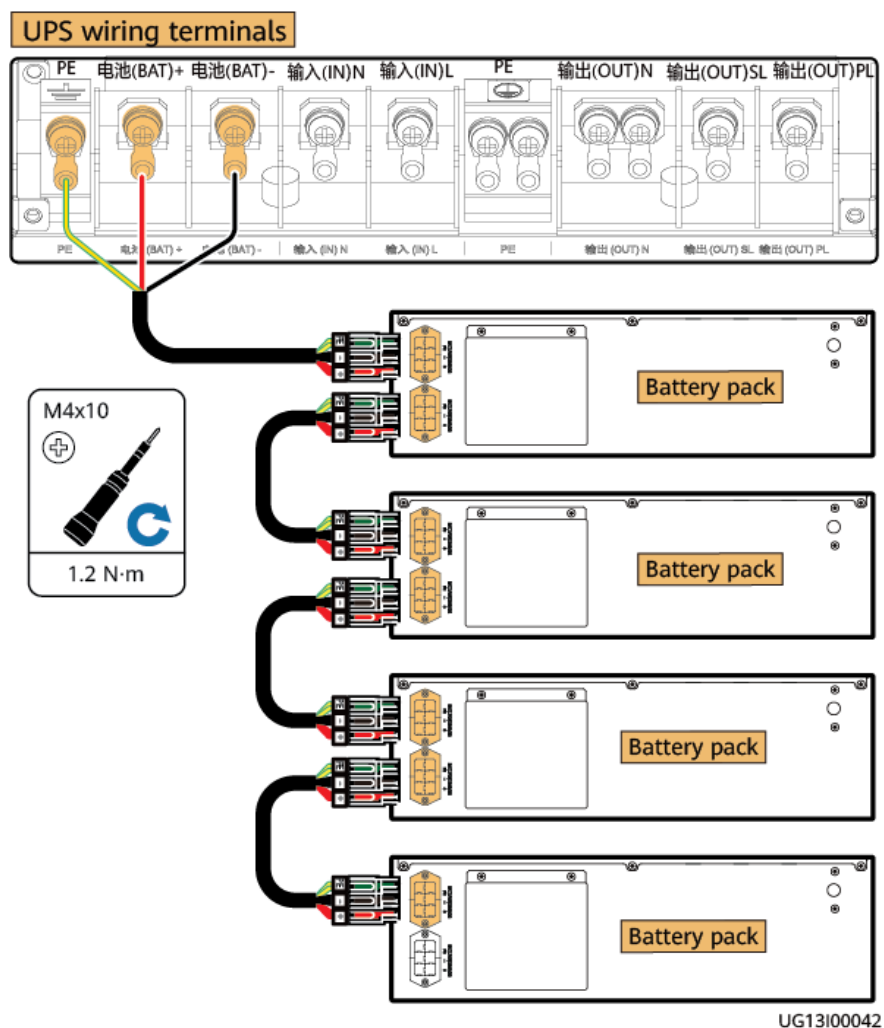
Context

A single UPS with four battery strings is used as an example to describe the cable connections.

Procedure

- Step 1** Remove the battery terminal covers.
- Step 2** If lead-acid batteries are configured, connect cables between battery packs and between batteries and the UPS, as shown in the following figure.

Figure 4-33 Connecting cables in the lead-acid battery pack scenario



- Step 3** Tighten the screws at both ends of the battery terminals.

Step 4 Reinstall the covers for the UPS wiring ports.

----End

4.2.4.2 Installing rPDUs

Context

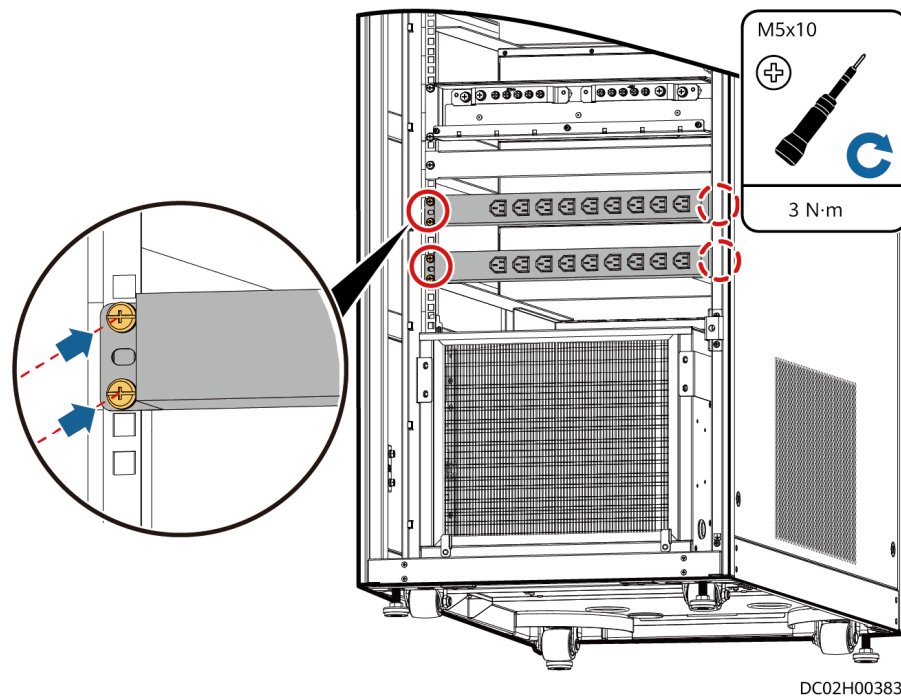
For the 02116804 cabinet, two horizontal non-intelligent rPDUs are installed at the 16 U and 18 U positions at the rear of the cabinet.

Procedure

Step 1 (Optional) Open the rear door of the cabinet and install floating nuts in the rPDU installation position.

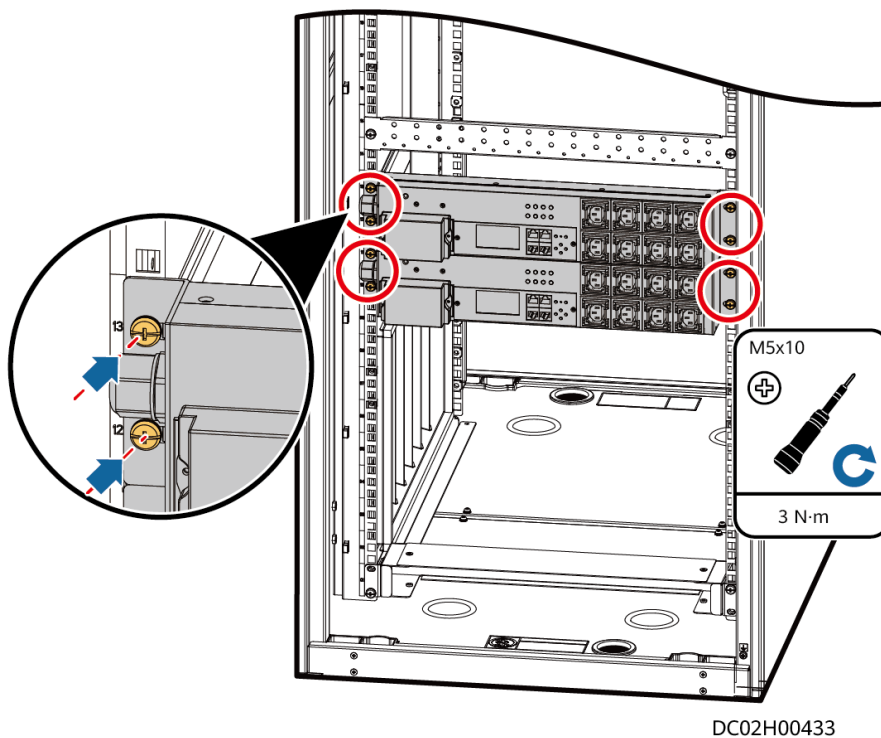
Step 2 Secure the rPDU using screws.

Figure 4-34 Installing horizontal non-intelligent rPDUs (02116804)



DC02H00383

Figure 4-35 Installing horizontal intelligent rPDUs (02116804)



NOTE

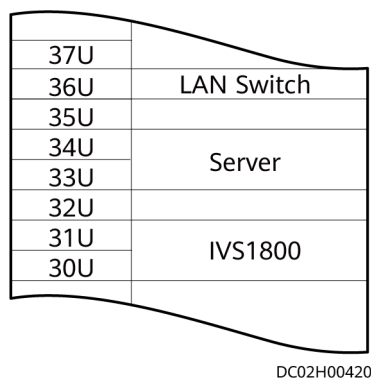
This step describes only the installation method. The actual appearance and cabinet interior layout may vary.

----End

4.2.5 Installing Monitoring Devices

4.2.5.1 Device Layout

Figure 4-36 Monitoring device layout



NOTE

You can adjust the installation position based on site requirements.

4.2.5.2 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.

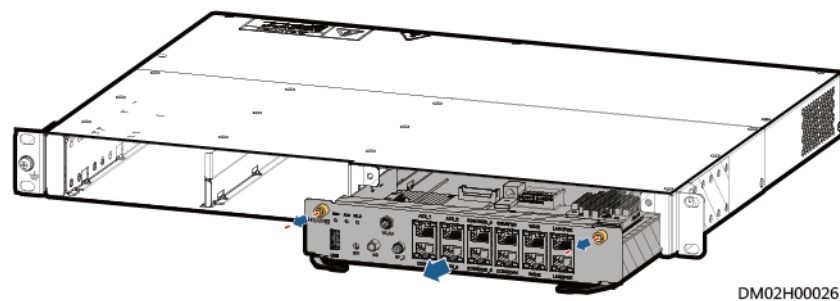
Procedure

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

 **NOTE**

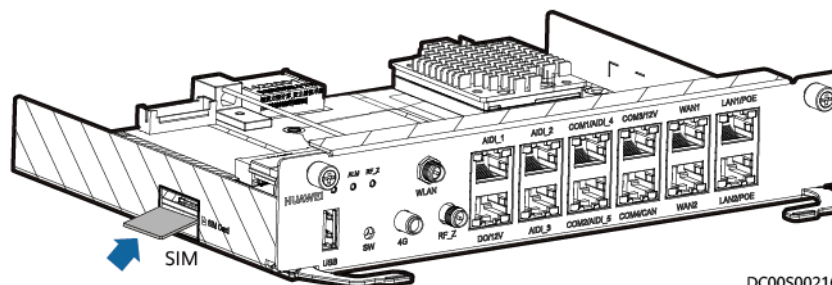
The SIM card needs to support LTE, WCDMA, or GSM.

Figure 4-37 Removing the ECC800 main control module



DM02H00026

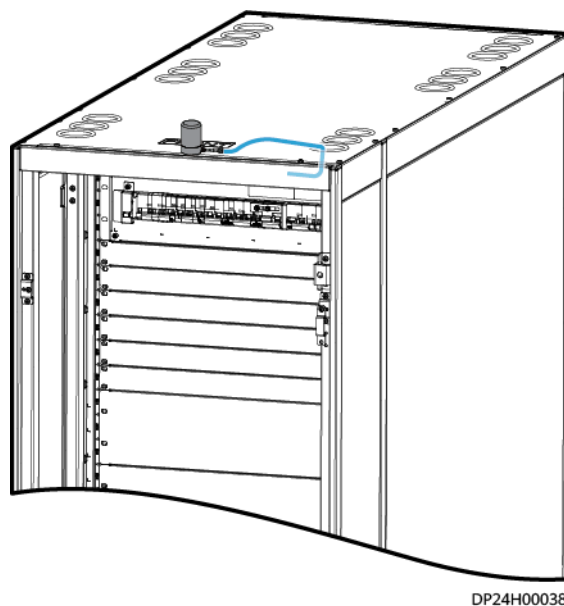
Figure 4-38 Installing a SIM card



DC00S00216

- Step 3** Reconnect the signal cable to the panel of the ECC800 main control module based on the recorded position.
- Step 4** Install an 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.
 3. Connect the antenna cable to the antenna port on the ECC800.

Figure 4-39 Connecting the antenna cable



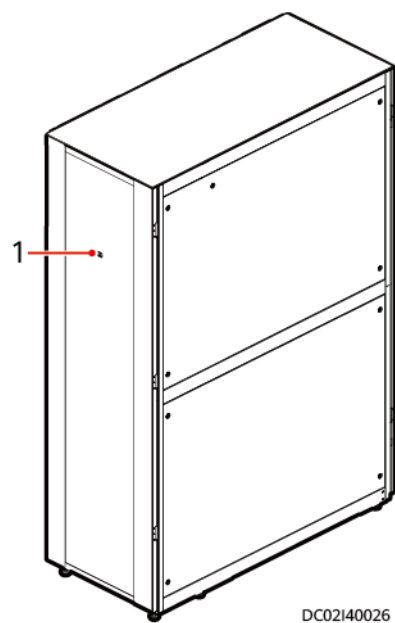
----End

4.2.5.3 Installing a PAD

Context

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

Figure 4-40 PAD installation position

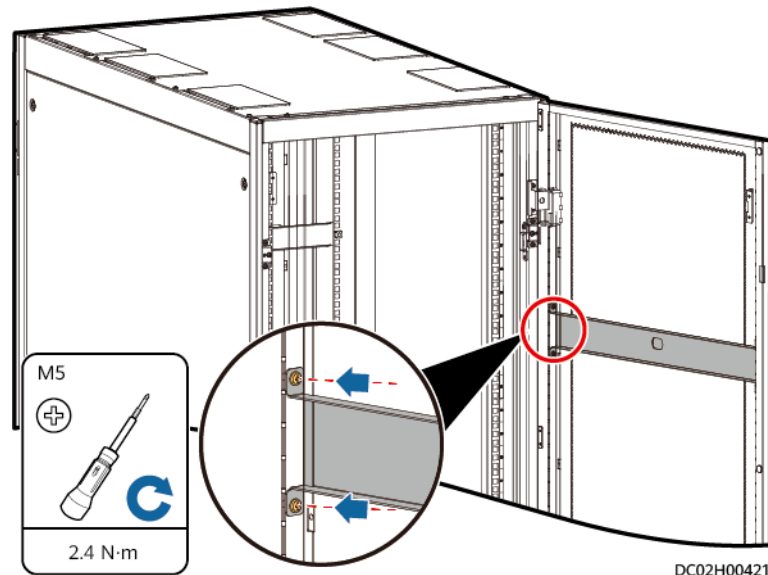


(1) PAD installation position

Procedure

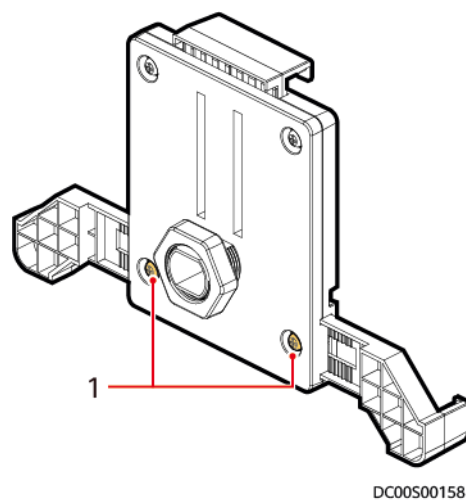
- Step 1** (Optional) Remove the baffle plate from the front door of the Converged Cabinet.
- Step 2** (Optional) Install the PAD support fastener on the back of the front door of the Converged Cabinet.

Figure 4-41 Installing the PAD support fastener



- Step 3** Adjust the width and height of the PAD support to match the dimensions of the PAD to be installed.

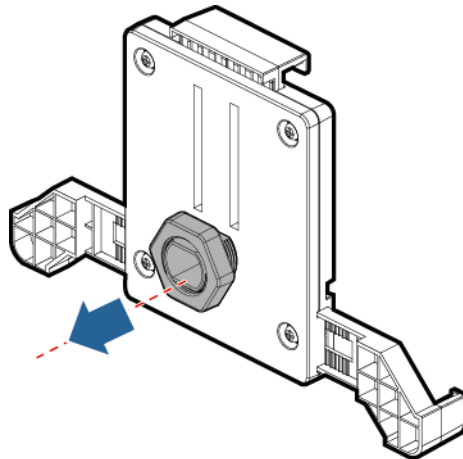
Figure 4-42 Adjusting screws



(1) Adjustment screws

- Step 4** 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 4-43 Removing the nut



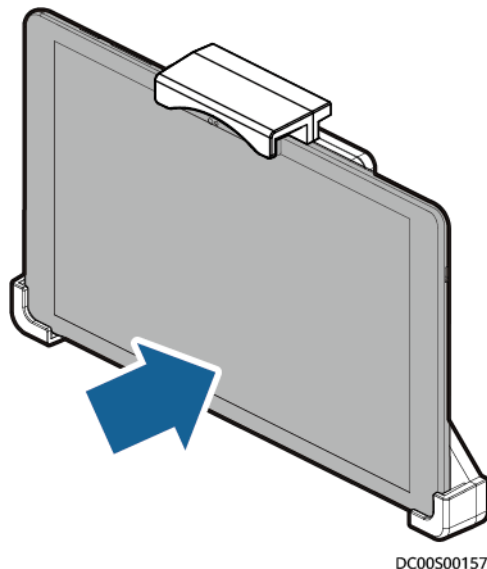
Step 5 Route the PAD power cable to the cable hole in the PAD support and connect the cable to the PAD.

Step 6 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 4-44 Installing a PAD



DC00500157

Step 7 Connect the cable from the USB port on the ECC800 to the charging port on the PAD.

NOTICE

The PAD does not support screen-on for a long time.

----End

4.2.5.4 Installing Cabinet T/H Sensors

Context

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

Procedure

- Step 1** Unpack T/H sensors and attach them to the cabinet posts.
- For the 02116804 cabinet, a T/H sensor is installed on the right post of the 40 U position on the front door of the cabinet.
- Step 2** Set the DIP switches on the T/H sensors.
- For the 02116804 cabinet, set the DIP switch address of the T/H sensor on the front door to 2.

Table 4-11 DIP switch settings on T/H sensors

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

- Step 3** Insert the pre-routed cable into the port on the T/H sensor.
- For the 02116804 cabinet, insert the pre-routed cable into the port on the T/H sensor.

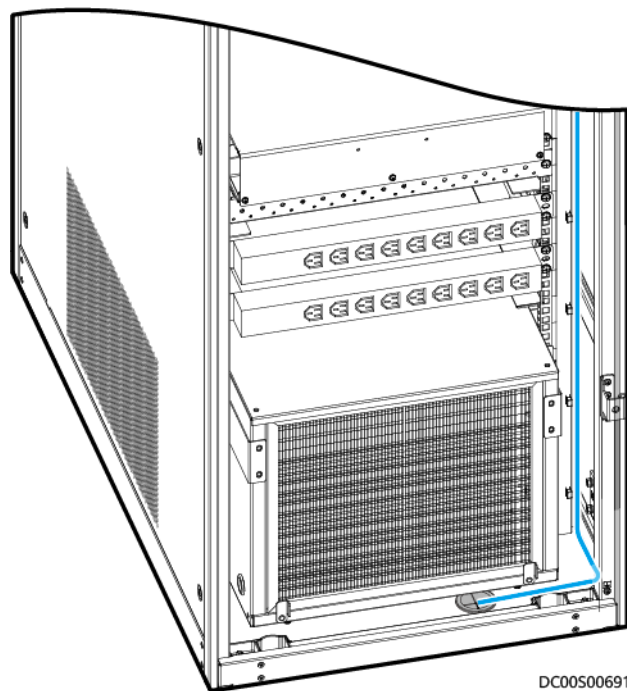
----End

4.2.5.5 Installing an Electrode Water Sensor

Procedure

- Step 1** Place the water sensor on the floor under the cabinet.
- Step 2** Use an electrician's knife to cut a cross in the rubber plug for the cable hole at the bottom of the cabinet.
- Step 3** Route the water sensor cable through the cable hole at the bottom of the cabinet, and connect the cable to the water sensor cable connected to the ECC800.

Figure 4-45 Routing a signal cable



NOTE

This step shows only the cable route. The actual cabinet layout may vary.

----End

4.2.5.6 (Optional) Installing a UIM20A Expansion Module

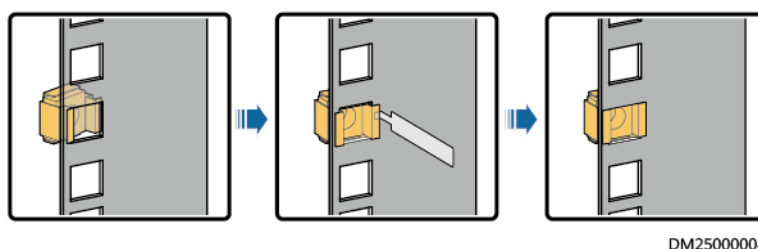
Context

- If the intelligent rPDU is configured, install the UIM20A expansion module.
- It is recommended that the UIM20A expansion module be installed at the 37 U position at the rear of the cabinet.

Procedure

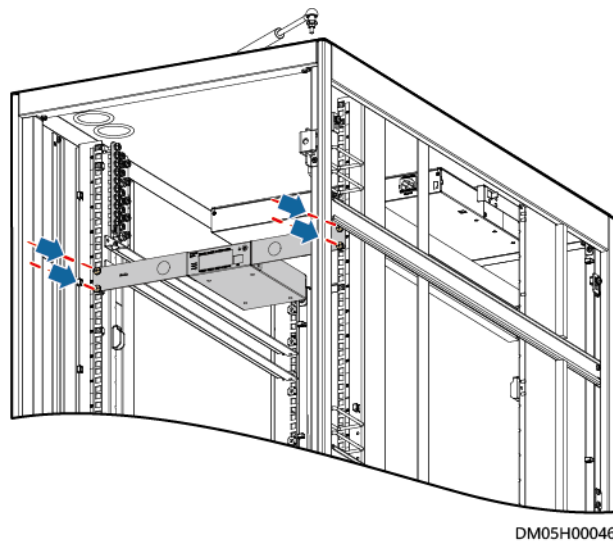
Step 1 Install floating nuts in the mounting holes on the UIM20A expansion module.

Figure 4-46 Installing floating nuts



Step 2 Secure the UIM20A expansion module to the cabinet by tightening the screws on the left and right mounting ears clockwise.

Figure 4-47 Installing a UIM20A expansion module



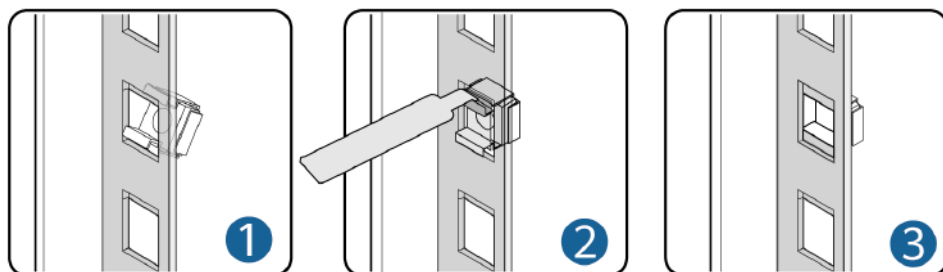
----End

4.2.5.7 (Optional) Installing a Server

Procedure

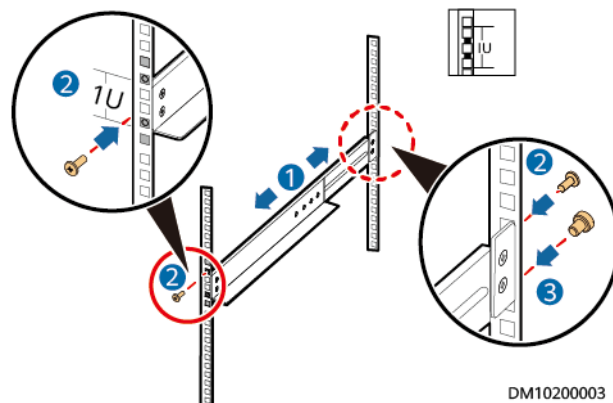
- Step 1** Determine the installation position of the server and check whether floating nuts are installed. If not, install them first.

Figure 4-48 Installing a floating nut



- Step 2** Install guide rails.

Figure 4-49 Installing guide rails

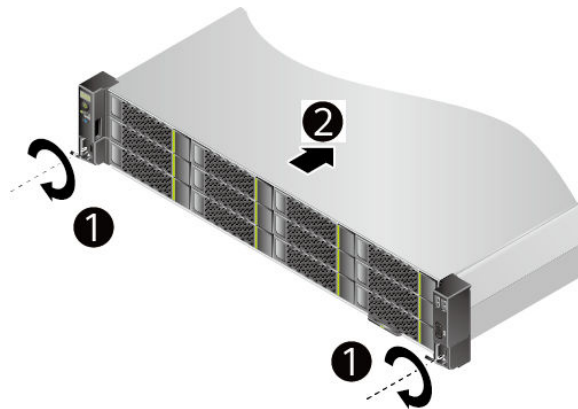


1. Place a guide rail horizontally at the installation position in the cabinet.
2. Tighten the screws to secure the guide rail.
3. Repeat the preceding steps to install the other guide rail.

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.

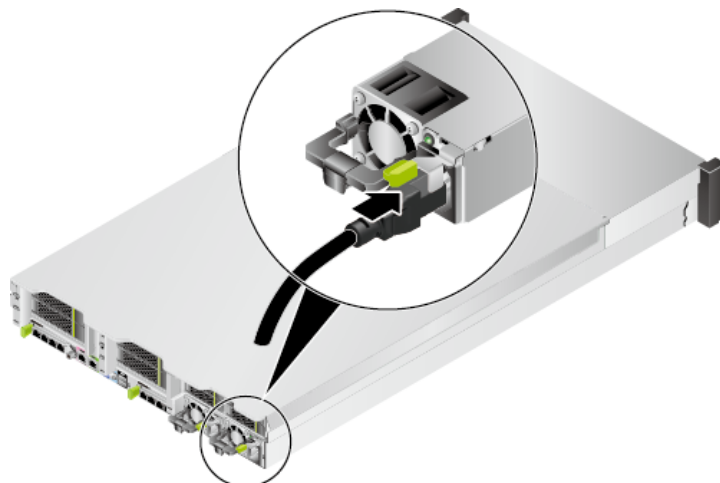
Figure 4-50 Installing a server



Step 5 Connect the server power cable.

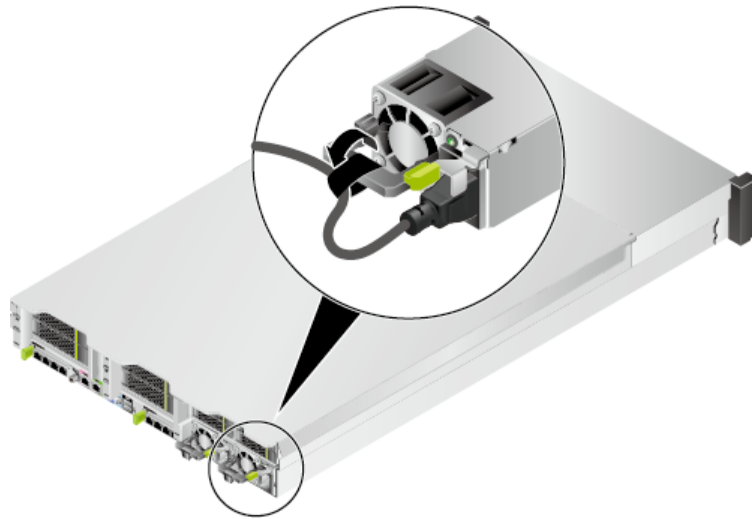
1. Wear an ESD wrist strap or ESD gloves.
2. Connect one end of the power cable to the cable port on the AC power module of the server.

Figure 4-51 Connecting the power cable



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

Figure 4-52 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

4.2.5.8 (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

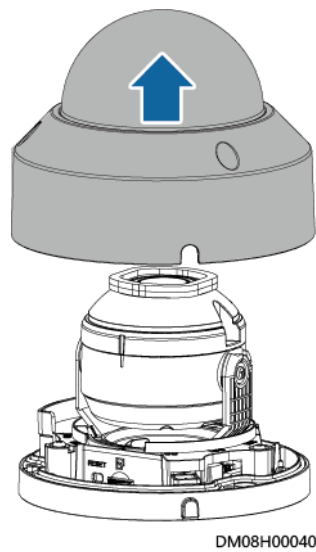
Materials: SD card, camera

Procedure

Step 1 (Optional) Install an SD card.

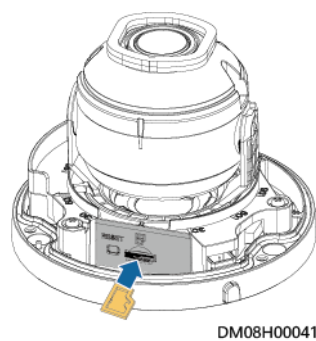
1. Remove the transparent cover using a Phillips screwdriver.

Figure 4-53 Removing the transparent cover



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

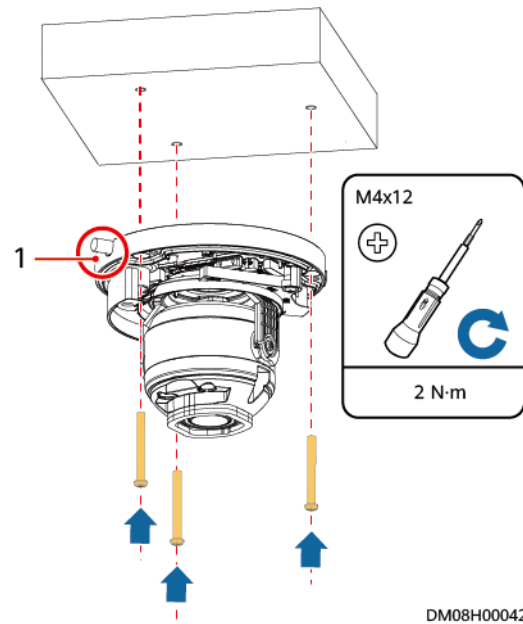
Figure 4-54 Installing an SD card



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.

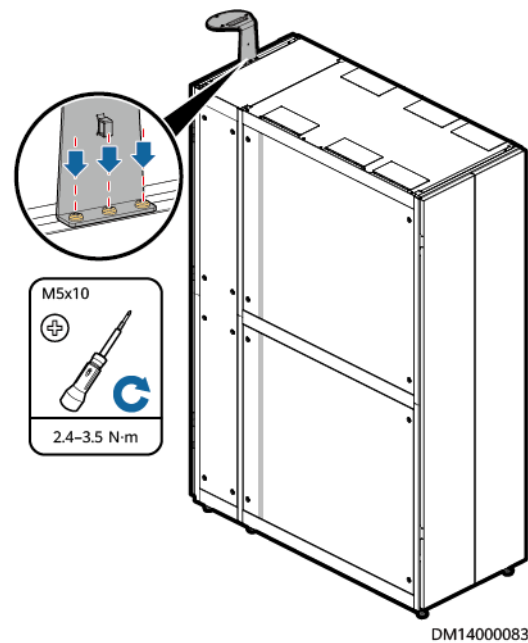
Figure 4-55 Installing a camera base



(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 4-56](#).

Figure 4-56 Installing the camera mounting plate

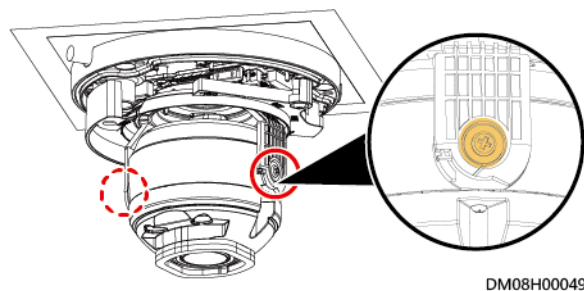


Step 5 Use a Phillips screwdriver to loosen the screws on both sides of the lens, adjust the surveillance angle, and tighten the screws to 0.6 N·m.

Figure 4-57 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.

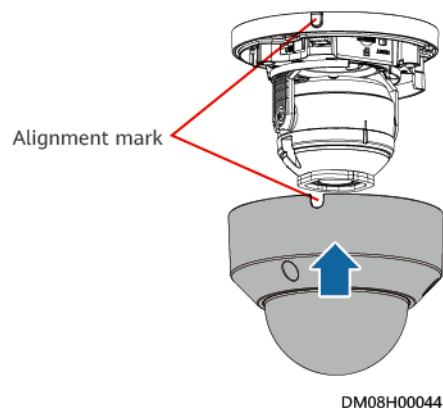


NOTE

The camera features a three-axis design. The camera can be adjusted by -175° to $+180^{\circ}$ horizontally, and the lens can rotate -175° to $+180^{\circ}$ and be adjusted by 0° to 65° 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 4-58 Installing the transparent cover



- Step 7** Connect the camera monitoring cable. Connect one end of the network cable to the network port on the camera and the other end to the LAN2/POE port on the ECC800.

NOTE

Other cables of the camera do not need to be connected but should be insulated.

----End

4.2.5.9 (Optional) Installing a LAN Switch

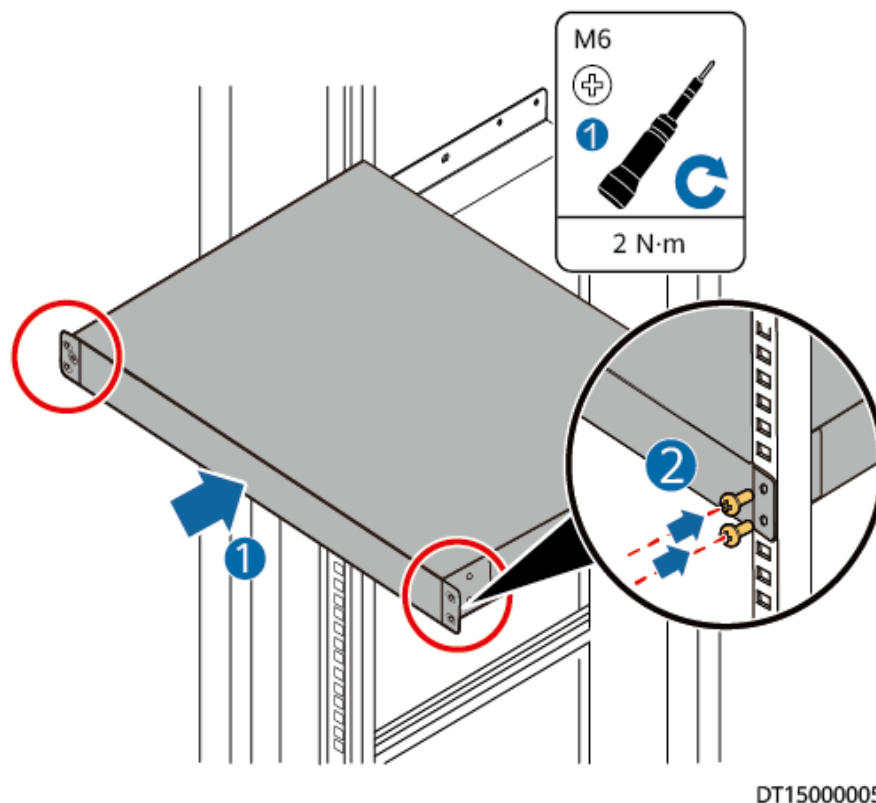
Procedure

- 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**

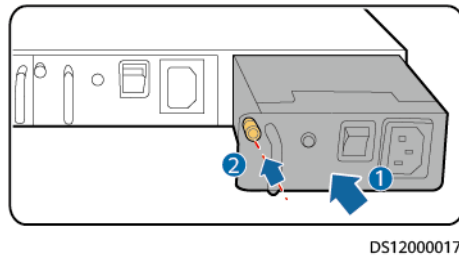
This section describes only the installation method. The actual product appearance may vary.

Figure 4-59 Installing a LAN switch



- Step 3** Connect the LAN switch power cable to the rPDU.
- Step 4** Connect a port on the LAN switch to the WAN1 port on the ECC800 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 4-60 Installing a power module for a LAN switch



----End

4.2.5.10 Installing an IVS1800

Context

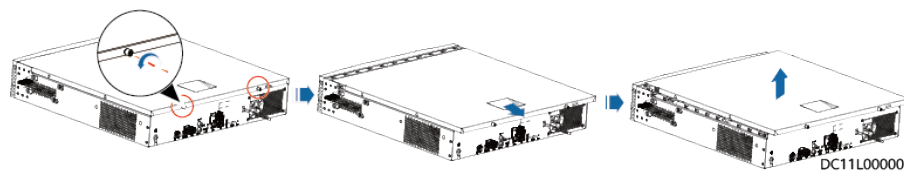
By default, the IVS1800 is delivered without disks. After the IVS1800 is delivered to the site, install hard disks as required and then install the IVS1800 in the cabinet.

Procedure

Step 1 Install hard disks.

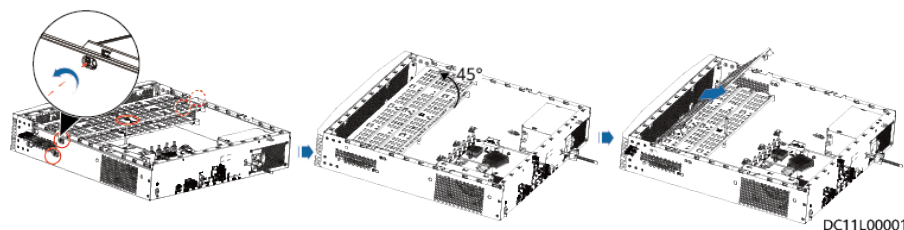
1. Use a PH2 screwdriver to remove the two black screws on the rear of the chassis cover, and take off the chassis cover.

Figure 4-61 Removing the chassis cover



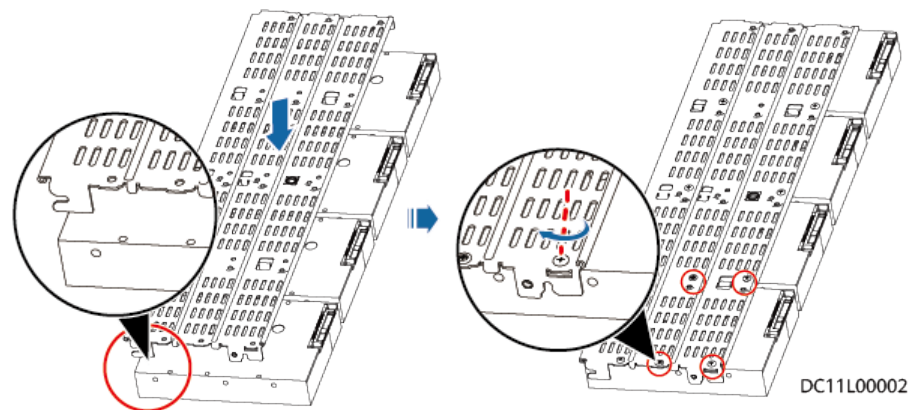
2. Remove two black screws on each side of the chassis and the silvery white one on top of the hard disk tray, raise the hard disk tray by 45 degrees, and take out the upper and then lower layers of hard disk tray.

Figure 4-62 Removing the hard disk tray



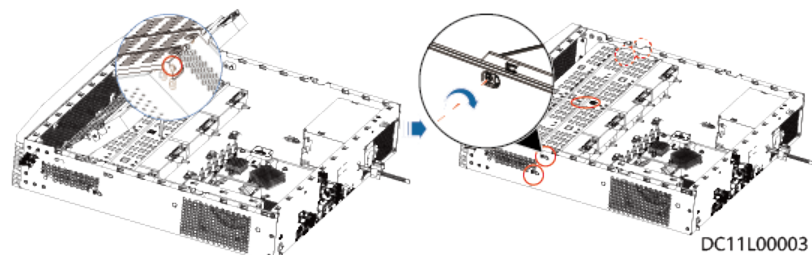
3. Place the hard disks with ports facing upwards and align the screw holes on the hard disk tray with the hard disks and fasten the screws. Before the installation, ensure that the fastener of the hard disk tray is on a different side from the hard disk port, as shown in the lower left figure.

Figure 4-63 Installing hard disks



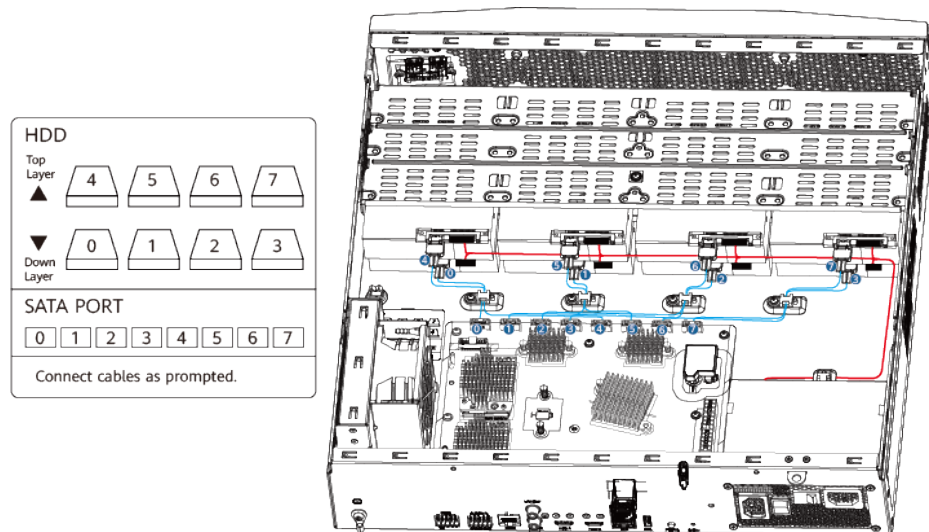
4. Insert the hard disk tray back at 45 degrees with the opening of its locking buckle facing downwards, hold the screw in the red-framed part to lower the hard disk tray until it is level, and fasten the black screws on the left and right sides and the white screw on the top.

Figure 4-64 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 0–3 to hard disks on the lower-layer hard disk tray and ports 4–7 to hard disks on the upper-layer, as shown in the lower left figure.

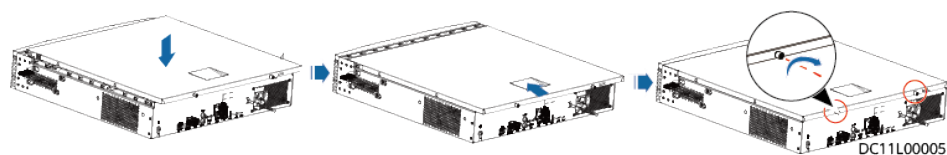
Figure 4-65 Connecting data and power cables to hard disks



DC11L00004

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

Figure 4-66 Closing the chassis cover



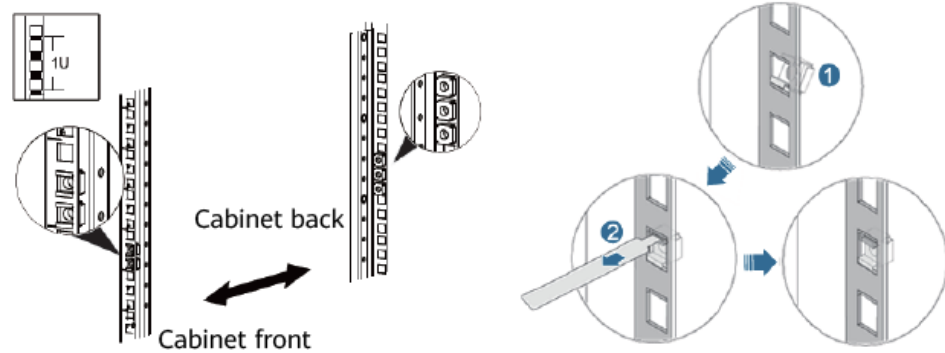
DC11L00005

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.
 - Guide rails that can be adjusted from 500 mm to 800 mm are provided for additional purchase if required for IVS1800 installation.
 - Do not attach rubber feet on the IVS1800 to save space during cabinet installation.
1. Install cage nuts (two at the front and three at the back) to fix the guide rail at the proper position in the cabinet, as shown in the lower left figure. The lower right figure shows how to install cage nuts. 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. Use a mounting bar to pull the cage nut until it clamps the upper frame of the square hole.

Figure 4-67 Installing a cage nut



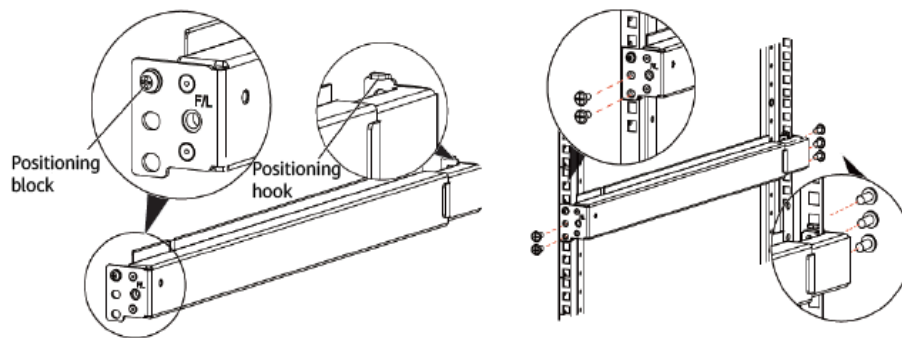
DC11L00011

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.

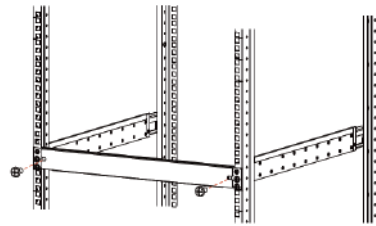
Figure 4-68 Installing a guide rail



DC11L00012

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

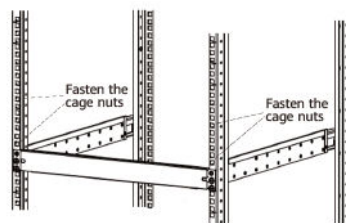
Figure 4-69 Installing a filler panel for guide rails



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.

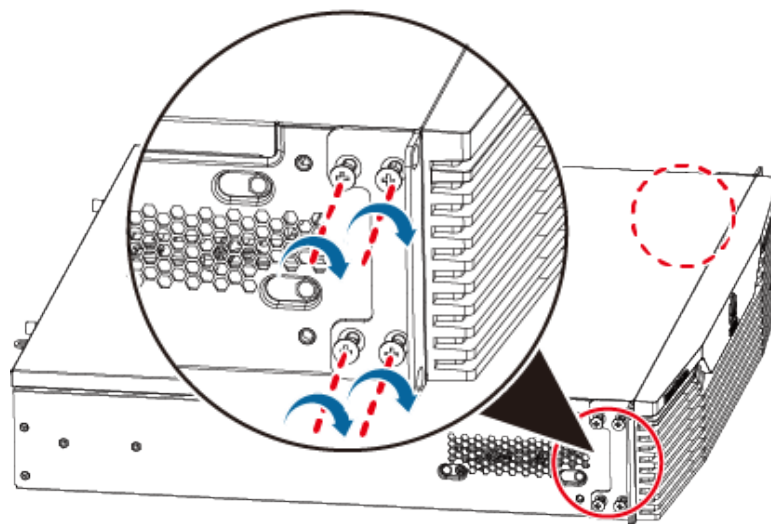
Figure 4-70 Installing cage nuts



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 4-71 Installing mounting ears

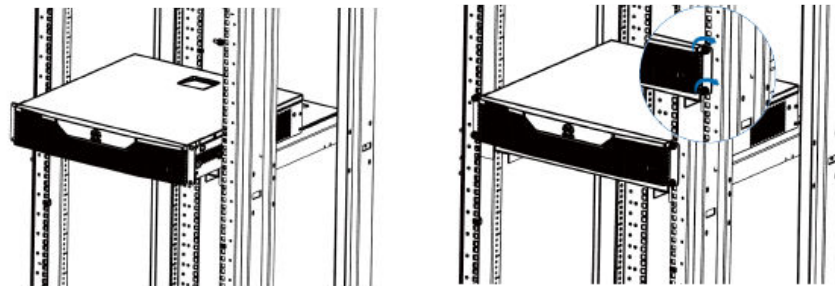


DC11L00015

6. Install the IVS1800 in the cabinet. Lift the device from both sides and carefully position it at the front of the cabinet. 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 4-72 Securing the device



DC11L00016

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

4.2.6 (Optional) Installing a Rack-mounted Integrated Fire Extinguishing Module

Context

For the 02116804 cabinet, configure a rack-mounted integrated fire extinguishing module.

Procedure

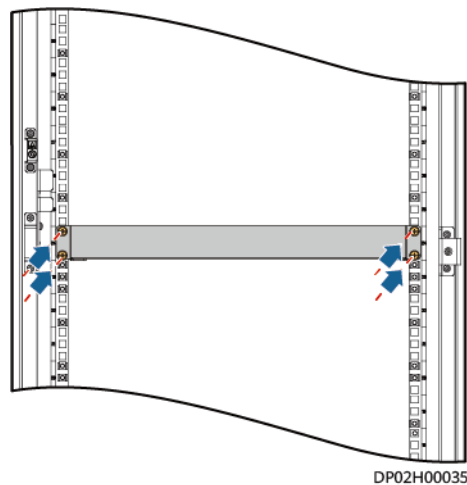
Step 1 (Optional) Move the guide rail to the installation position of the rack-mounted integrated fire extinguishing module.

 **NOTE**

- Guide rails have been installed at the 24 U position of the cabinet.
- Perform this operation when the rack-mounted integrated fire extinguishing module is not installed at the 24 U position.

Step 2 Secure the rack-mounted integrated fire extinguishing module.

Figure 4-73 Installing a rack-mounted integrated fire extinguishing module



Step 3 Connect the communications cable of the rack-mounted integrated fire extinguishing module to AIDI_2 on the ECC800.

----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.

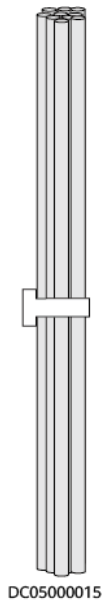
Attach labels to both ends of a cable.

Requirements for Neatly Routing and Binding Cables

To route and bind cables in an appealing way, follow these rules:

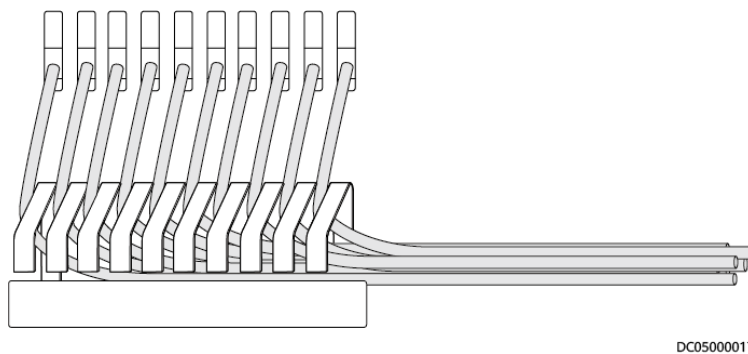
1. Neatly organize exterior cables in a large bundle of cables and prevent cable tangles that are avoidable, as shown in [Figure 4-74](#).

Figure 4-74 Neatly organizing cables



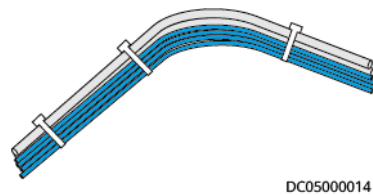
2. Keep a large number of cables neat and appealing in a cabinet by using cable organizers. Move the excess parts of cables in unnoticeable positions, as shown in [Figure 4-75](#).

Figure 4-75 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 4-76](#). 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 4-76 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

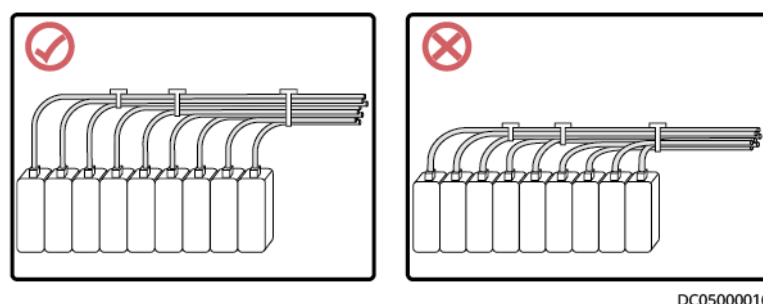
1. Unless otherwise specified in a design file, ensure that the bend radius (R) of a cable meets the following requirements:
 - Common cable: $R \geq 3d$
 - Optical cable: $R \geq 40 \text{ mm}$

NOTE

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

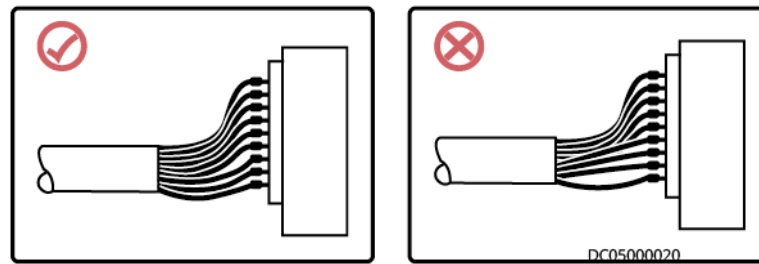
2. Reserve slack at cable connection positions to facilitate connection and disconnection and to prevent stress. Do not leave the cables tight and prevent connector misalignment, as shown in [Figure 4-77](#).

Figure 4-77 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 4-78](#).

Figure 4-78 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

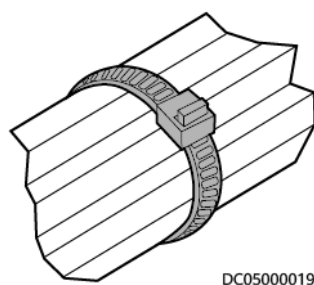
Bind cables reliably along the route and ensure that the binding interval meets the requirements in [Table 4-12](#).

Table 4-12 Cable binding interval

Cable Diameter (mm)	Binding Interval (mm)
< 10	150
10–30	200
> 30	300

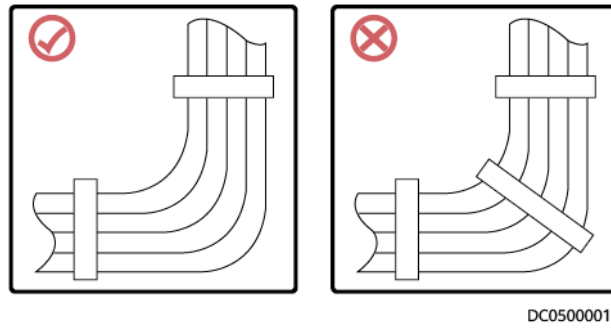
1. Bind cables with a moderate force and ensure that cables are not misshapen to prevent compromising the signal quality.
2. After binding cables, cut off the excess parts of cable ties and trim away any burrs, as shown in [Figure 4-79](#).

Figure 4-79 Cutting off the excess part of a cable tie



3. Do not use cable ties at a place where the cables are bent. Otherwise, the cable cores may break due to strong stress, as shown in [Figure 4-80](#).

Figure 4-80 Binding cables in a bending area



4. Ensure that the cable ties are wrapped and secured in the same direction and do not generate interference with subsequent operations, as shown in **Figure 4-81**.

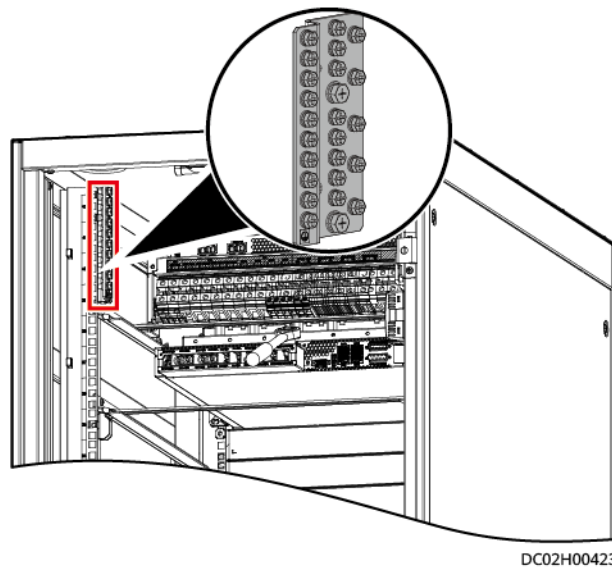
Figure 4-81 Direction for securing cable ties



4.3.2 Grounding the Smart Module

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

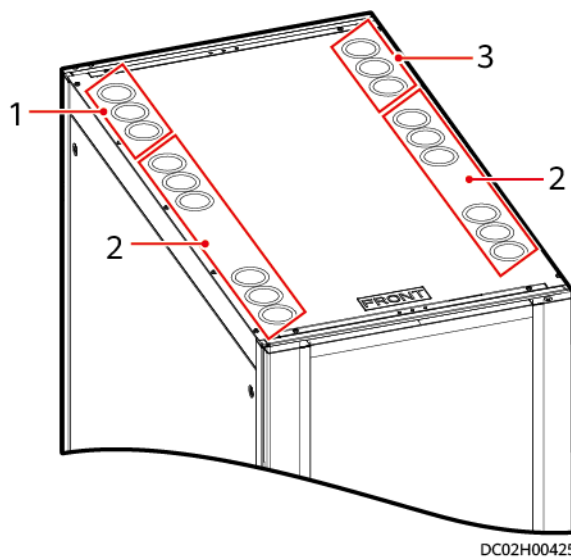
Figure 4-82 Cabinet main copper bar for grounding (02116804)



4.3.3 Cable Connections to the Power Supply and Distribution System

4.3.3.1 Cable Routing Description

Figure 4-83 Cable holes at the top of the cabinet (02116804)



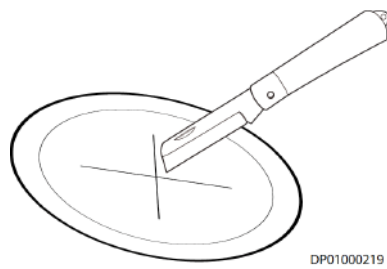
(1) Holes for pipes of smart cooling products

(2) Signal cable holes

(3) Power cable hole

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 4-84](#).

Figure 4-84 Cutting a cross in a wire bushing



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

4.3.3.2 Connecting Cabinet Input Power Cables

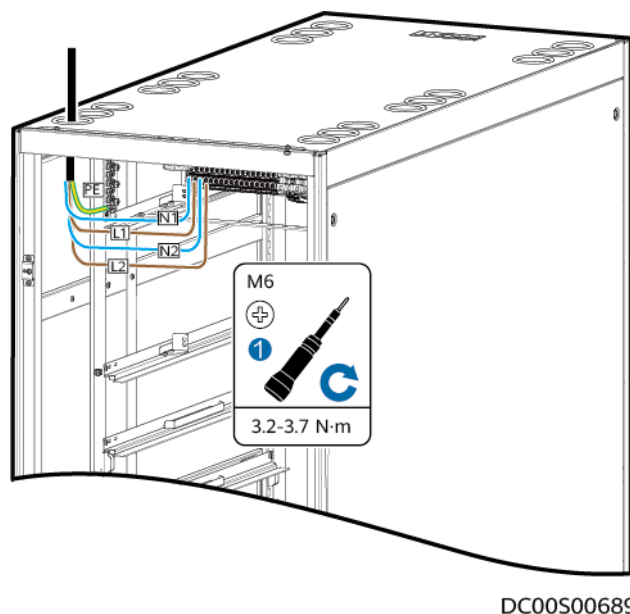
Context

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

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 4-85 Connecting input power cables to the PDU (02116804)



----End

4.3.3.3 Connecting rPDU Cables

4.3.3.3.1 Connecting rPDU Power Cables

Context

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

Preparations

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

Material: cable tie

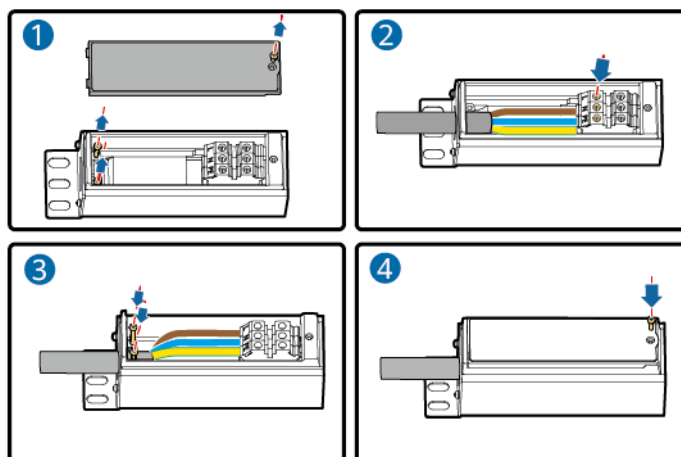
Procedure

Step 1 Connect the rPDU cables.

NOTICE

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

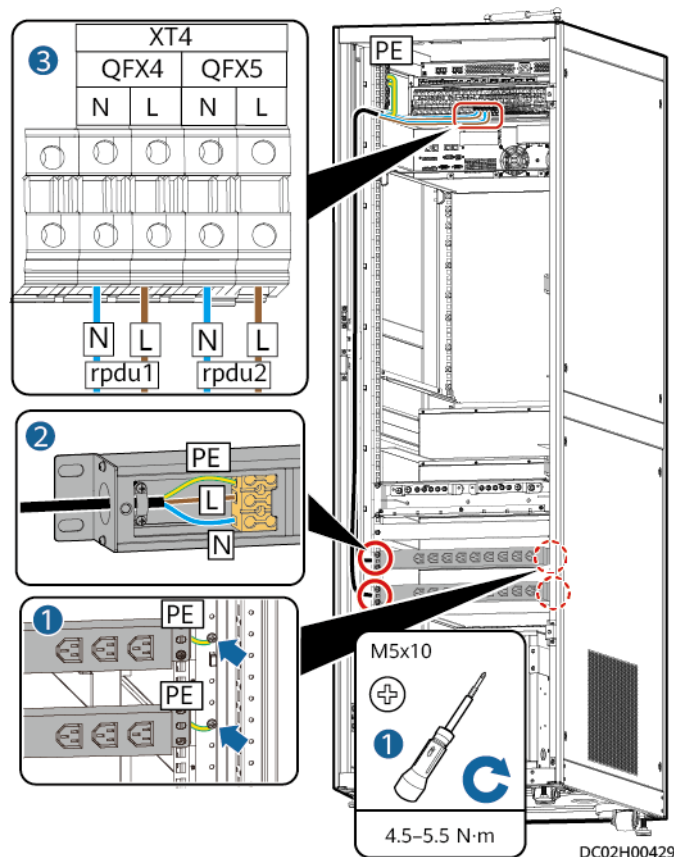
Figure 4-86 Connecting rPDU cables



DP18100001

Step 2 Take out the rPDU cables and connect the cord end terminals of the power cables to the ports in the power distribution subrack.

Figure 4-87 Connecting power cables to horizontal non-intelligent rPDUs (02116804)



NOTE

- This step shows only the cable routes. The actual appearance and cabinet interior layout prevail.
- If the cabinet is equipped with an intelligent rPDU, refer to the cable connections for a horizontal non-intelligent rPDU.

Step 3 Connect other rPDU power cables in the same way.

----End

Follow-up Procedure

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

4.3.3.3.2 Connecting rPDU Signal Cables

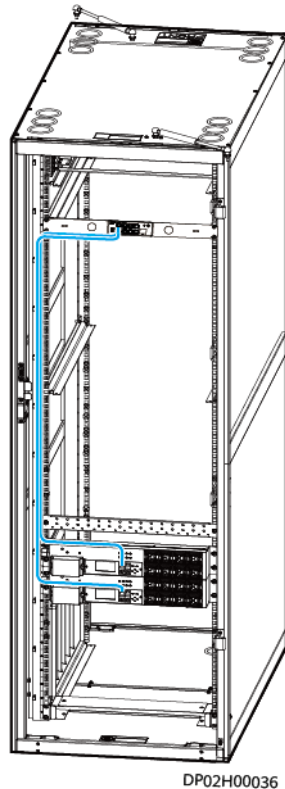
If the cabinet is equipped with an intelligent rPDU, refer to this section.

Procedure

Step 1 Connect the LAN1 port on the ECC800 to the PoE port on the UIM.

- Step 2** Connect the signal cables of the intelligent rPDU to the COM1/AIDI_4 and COM2/AIDI_5 ports on the UIM20A expansion module.

Figure 4-88 Connecting rPDU signal cables



----End

4.3.4 Connecting IVS Cables

Prerequisites

The required cables have been prepared.

Procedure

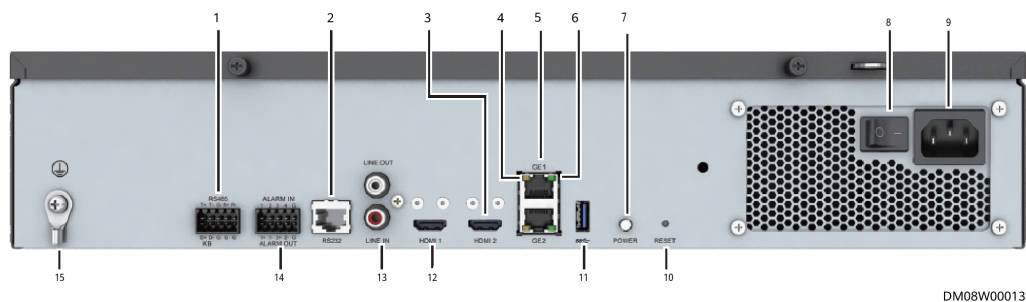
- Step 1** Connect one end of the ground cable to the ground terminal on the device and the other end to the ground point on the cabinet. A Phillips screwdriver and M4 screws are required.

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 4-89 IVS rear panel



DM08W00013

(1) RS485 port	(2) Serial port	(3) HDMI 2.0 port	(4) Network port ACT indicator	(5) GE network port
(6) Network port LINK indicator	(7) Power button	(8) Power switch	(9) Power port	(10) Reset button
(11) USB 3.0 port	(12) HDMI 1.4 port	(13) Audio input/output port	(14) Alarm input/output port	(15) Ground terminal

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

NOTE

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

----End

4.4 Verifying the Installation

Cabinet Installation Check

Table 4-13 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

No.	Check That	Check Result
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 4-14 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
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 4-15 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 ± 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	Batteries are free from damage and cracks.	<input type="checkbox"/> Passed <input type="checkbox"/> Failed
8	Batteries are neat and clean, and do not leak electrolyte.	<input type="checkbox"/> Passed <input type="checkbox"/> Failed
9	Battery terminals are upright and free from damage, break, and acid leakage.	<input type="checkbox"/> Passed <input type="checkbox"/> Failed
10	Battery cables are correctly connected.	<input type="checkbox"/> Passed <input type="checkbox"/> Failed
11	DIP switches on devices are correctly set.	<input type="checkbox"/> Passed <input type="checkbox"/> Failed

5 Power-On Commissioning for the Power Supply and Distribution System

5.1 Checking Before Powering On the UPS

- AC power cable colors comply with local electrical regulations.
- No short circuits occur in inputs and outputs.
- Cables are securely connected.
- Battery cables are correctly connected to battery terminals. The battery voltage meets the requirements.
- Cables are properly connected between the UPS and batteries.
- Input circuit breakers and load circuit breakers are OFF.
- Power cables and signal cables are correctly identified.
- The input phase sequence is correct.
- Cables are neatly routed and securely bound.
- Devices are installed and cables are routed in ways that facilitate modification, capacity expansion, and maintenance.
- Parallel cables are properly connected.
- The UPS is properly grounded.
- The voltage between the neutral wire and the ground cable is less than 5 V AC.
- The input voltage rang for the mains to start the UPS is 120–280 V AC (or 80–280 V AC after the UPS powers on). The battery voltage range is (Number of batteries x 10.8)–280 V DC.

5.2 Powering On the Power Supply and Distribution System

Prerequisites

You have completed the checks after installation and before power-on.

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 indicator of an SPD module is green, the SPD module is running properly. If the indicator is red, the SPD module is faulty and must be promptly replaced.

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

 **NOTE**

If the green power indicator on the cabinet front panel lights up, the cabinet is powered on properly.

Step 3 Turn on the general input switch in the Converged Cabinet.

Step 4 Start the UPS power-on commissioning. This section describes only the general procedure. For details, see [5.3 UPS Power-On Commissioning \(Single UPS\)](#) and [5.4 UPS Power-On Commissioning \(Parallel System\)](#).

1. Turn on the UPS input switch.
2. After the UPS starts, set parameters based on site requirements, start the inverter, and switch on the UPS output circuit breaker.

Step 5 Power on the ECC800-Pro.

Step 6 (Optional) Switch on the rPDU output circuit breaker on the power distribution module and then the rPDU circuit breaker at the rear of the cabinet to power on the corresponding device.

NOTICE

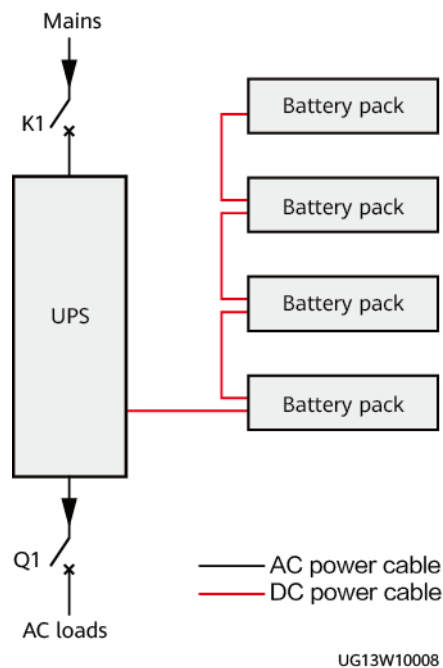
When switching on the circuit breakers, observe whether there is any abnormal phenomenon, such as sparks.

Step 7 Switch on the smart cooling product circuit breaker on the PDU to power on the smart cooling product.

----End

5.3 UPS Power-On Commissioning (Single UPS)

Figure 5-1 Conceptual diagram (one UPS + four battery packs)



5.3.1 Power-On

Procedure

- Step 1** Switch on the external battery circuit breaker (if any) or connect battery cables.
- Step 2** Switch on the mains AC input circuit breaker K1 of the UPS. When the mains is normal, the UPS works in bypass mode. The SL terminal outputs bypass voltage, and the PL terminal has no voltage output.

NOTE

When the mains is abnormal, the bypass output is disabled. As a result, the UPS SL terminal has no output voltage.

----End

5.3.2 Initial Startup

5.3.2.1 Installing the App

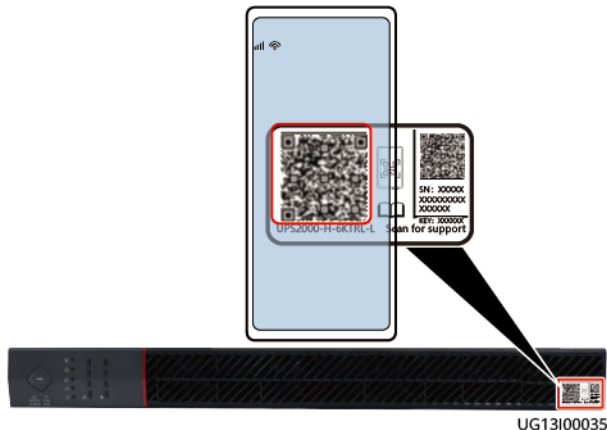
Prerequisites

- A mobile phone running Android 8.0, Harmony 2.0, or iOS 9.0 or later is available.
- The mobile phone can connect to the Internet.
- The mobile phone is within 10 m of the UPS.

Procedure

Step 1 Scan the QR code on the UPS panel using the mobile phone.

Figure 5-2 Scanning the UPS QR code



Step 2 (Optional) Select a display language.

Step 3 Download and install the app using either of the following methods.

- Download and install the **NetEco** app using a web browser.
- Download and install the **NetEco** app from Huawei AppGallery.

----End

5.3.2.2 Logging In to the App

NOTE

- A maximum of two mobile phones can be connected to the WiFi network, and only one mobile phone can be used to log in to the app.
- When logging in to the app, select **Allow** for all permission dialog boxes displayed on the mobile phone.
- When connecting the mobile phone to the WiFi network of the UPS, it is recommended that you disable the WLAN+ function on the phone. Enabling the WLAN+ function will let the mobile phone automatically connect to the network with the strongest signal, which may result in UPS WiFi connection failure.
- GPS should be enabled on the mobile phone to obtain the WiFi name.
- For the first login, you need to enter the WiFi password.
- After the UPS is powered on, the WiFi indicator turns on, and WiFi is enabled by default.

Step 1 Enable WiFi on your phone. (The WiFi icon turns on.)

Figure 5-3 Enabling WiFi



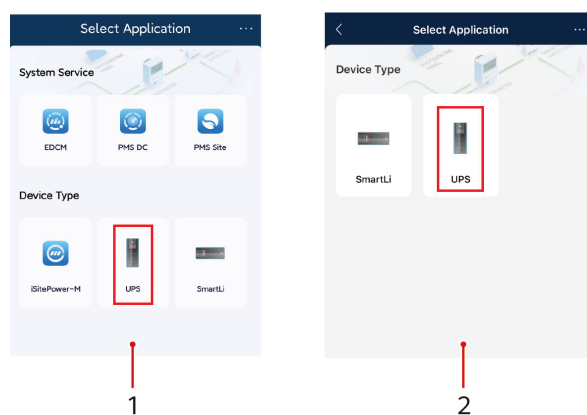
Step 2 Disable mobile data on your phone. (The mobile data icon turns gray.)

Figure 5-4 Disabling mobile data



Step 3 Open the **NetEco** app on the mobile phone. The **Select Application** screen is displayed.

Figure 5-5 Select Application screen

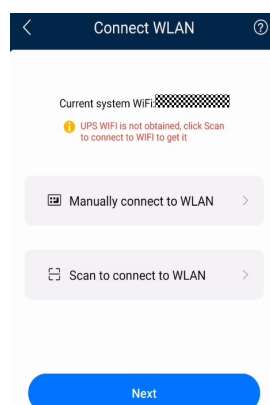


(1) Android or HarmonyOS

(2) iOS

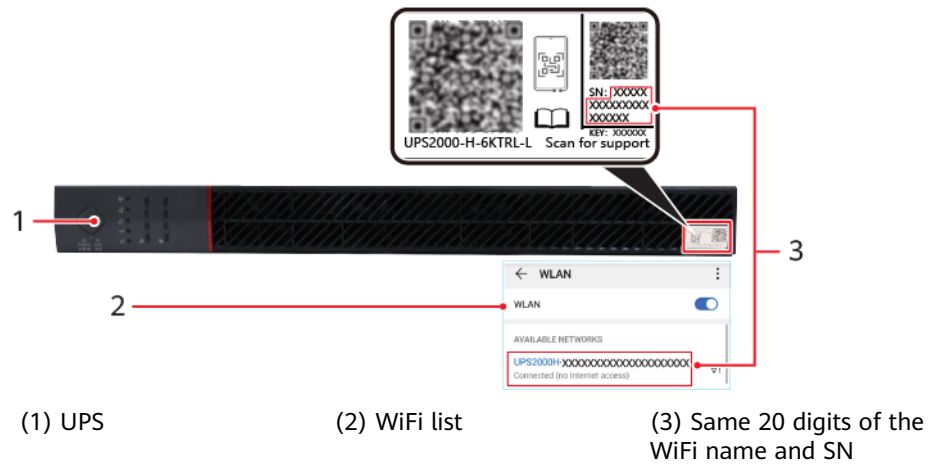
Step 4 Tap **UPS**. The **Connect WLAN** screen is displayed. Use either of the following methods to connect to the WiFi network.

Figure 5-6 Connect WLAN screen



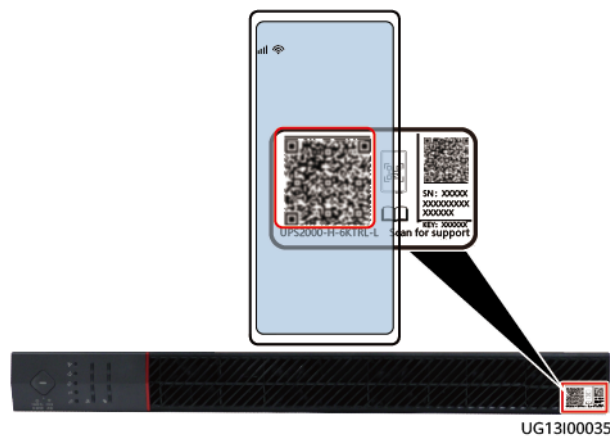
- **Manually connect to WLAN**
 - a. Tap **Manually connect to WLAN**. The **Select WLAN network** screen is displayed.
 - b. Select the UPS WiFi name whose last 20 digits are the same as the SN.

Figure 5-7 Manually connecting to WLAN



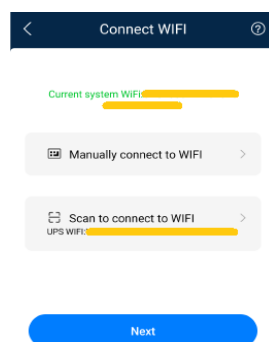
- c. Enter the WiFi password. (The preset WiFi password is **Changeme.**)
- **Scan to connect to WLAN**
 - a. Tap **Scan to connect to WLAN.**
 - b. Scan the QR code on the UPS panel.

Figure 5-8 Scanning the UPS QR code



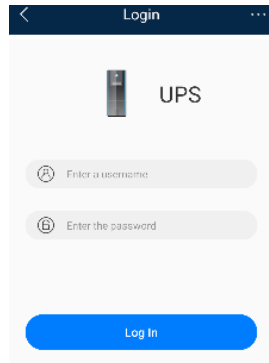
Step 5 After the WiFi connection is set up, the last 20 digits of the UPS WiFi name displayed on the app are the same as the SN on the UPS panel label. Tap **Next** to enter the UPS login screen.

Figure 5-9 WiFi connected successfully



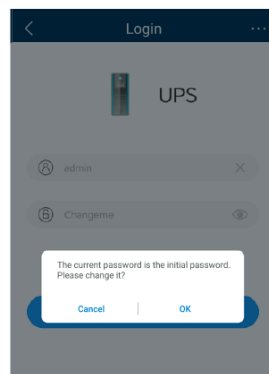
- Step 6** Enter the user name and password and tap **Log In**. (The preset user name is **admin** and the preset password is **Changeme**.)

Figure 5-10 Login screen



- Step 7** Tap **OK** as prompted. The **Change Password** screen is displayed. After the preset password is changed successfully, use the new password to log in to the app.

Figure 5-11 Changing password prompt



CAUTION

- After the initial login, change the password in time to improve account security and prevent data tampering.
- Hold down the RESET button on the UPS rear panel for about 10s to restore the preset WiFi password, preset user password, and SNMP card (if any) IP address. Other parameters will not be restored.

----End

5.3.2.3 Quick Settings

- Step 1** After the login is successful, set parameters on the displayed **Quick Settings** screen.
1. Verify the voltage level and frequency level based on site requirements.
 2. Set the battery type, single battery voltage, number of batteries in a battery string, single battery capacity, and number of battery strings based on site requirements.

Figure 5-12 Quick Settings



Step 2 Tap **OK**. The app home screen is displayed.

----End

5.3.3 Starting the Inverter

Prerequisites

1. The UPS has been powered on.
2. You have installed and logged in to the app.

Procedure

Step 1 If the alarm indicator on the UPS panel is blinking, view the alarm details on the app and handle the alarm.

Step 2 Choose **Config > Quick Settings**.

- Set the voltage level and frequency level based on site requirements.
- Set the battery type, single battery voltage, number of batteries in a battery string, single battery capacity, and number of battery strings based on site requirements.

Figure 5-13 Quick Settings




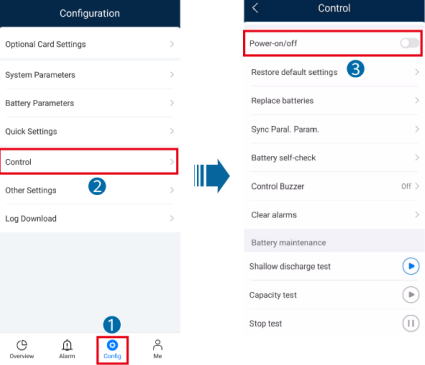
Table 5-1 Quick Settings

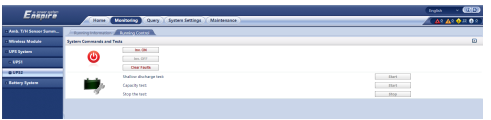
Item	Description	Setting	Value Range
Voltage level(V)	Specifies the system output voltage level. This parameter is configurable only after the inverter is shut down.	Set as required.	220, 230, and 240. The default value is 220.
Frequency level(Hz)	Specifies the system output frequency level. This parameter is configurable only after the inverter is shut down.	Set as required.	50, 60, and automatic. The default value is 50.
System time	Synchronizes the system time to the UPS.	-	-
Battery type	Specifies the type of batteries connected to the UPS.	VRLA batt.	VRLA batt., Lithium batt. The default value is VRLA batt.
Single battery voltage (V)	Specifies the voltage of each battery in a battery string connected in series. Set this parameter based on the actual configuration. This parameter is configurable in non-battery mode.	Set as required.	2, 6, and 12. The default value is 0.

Item	Description	Setting	Value Range
Batteries in a battery string	Specifies the number of batteries in a battery string. Set this parameter based on the actual configuration. This parameter is configurable in non-battery mode.	Set as required.	The value range depends on the voltage of a single battery. The default value is 0.
Single battery capacity (Ah)	Specifies the capacity of each battery in a battery string connected in series. This parameter is configurable in non-battery mode.	Set as required.	7-1000. The default value is 0.
Number of battery strings	Specifies the number of battery strings connected in parallel. This parameter is configurable in non-battery mode.	Set as required.	1-4. The default value is 0.

Step 3 Start the UPS in normal mode using one of the following methods.

Table 5-2 Startup methods

Startup Method	Figure
<p>Method 1: When the UPS works in bypass mode, hold down the button on the UPS panel for more than 5s. Release the button when the inverter indicator blinks and you hear a beep sound. Do not press any button during inverter startup. When the startup command is successfully delivered, and the inverter indicator is steady on, the UPS enters normal mode.</p>	 <p>Button</p>
<p>Method 2: In bypass mode, choose Config > Control > Power-on/off on the app to start the UPS. After successful startup, the UPS enters normal mode.</p>	

Startup Method	Figure
<p>Method 3: On the WebUI, choose Monitoring > UPS > Running Control to start the UPS.</p>	

NOTE

- Method 3 is used only when the SNMP card is configured.
- For details about how to start the UPS on the WebUI, see the *EN83CTLA SNMP Card User Manual*.

----End

5.3.4 Powering On Loads

Procedure

- Step 1** When the UPS runs properly, switch on the UPS AC output circuit breaker Q1 to supply power to loads.

NOTE

To prevent triggering overload protection, start the loads with higher power and then loads with lower power.

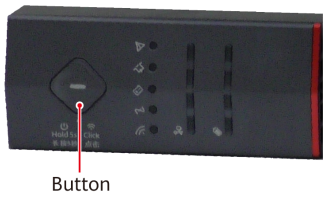
----End

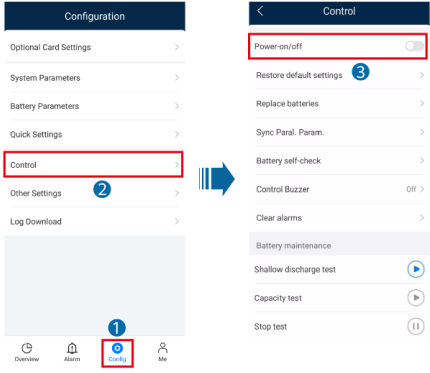
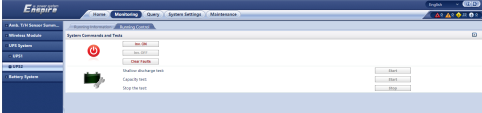
5.3.5 Shutting Down the UPS

Shutting Down the Inverter to Transfer the UPS to Bypass Mode

- Step 1** Shut down the inverter to transfer the UPS to bypass mode using one of the following methods.

Table 5-3 Shutdown methods

Shutdown Method	Figure
<p>Method 1: Hold down the button on the UPS panel for more than 5s. Release the button when the inverter indicator blinks and you hear a beep sound. Do not press any button during inverter shutdown. When the shutdown command is successfully delivered, and the inverter indicator is off, the UPS shuts down the inverter output and enters bypass mode.</p>	

Shutdown Method	Figure
<p>Method 2: Choose Config > Control > Power-on/off on the app to shut down the inverter. After successful shutdown, the UPS enters bypass mode. For details about how to install and log in to the app, see sections "Installing the App" and "Logging In to the App."</p>	 <p>The figure shows two screenshots from a mobile application. The left screenshot is the 'Configuration' screen with a red box around the 'Control' option in the 'Other Settings' section. A blue arrow points to the right screenshot, which is the 'Control' screen. In the 'Control' screen, the 'Power-on/off' button is highlighted with a red box. Other options include 'Restore default settings', 'Replace batteries', 'Sync Paral. Param.', 'Battery self-check', 'Control Buzzer', 'Clear alarms', and 'Battery maintenance'.</p>
<p>Method 3: On the WebUI, choose Monitoring > UPS System > Running Control to shut down the UPS.</p>	 <p>The figure shows a screenshot of the WebUI interface. The 'Monitoring' tab is selected, and the 'UPS System' section is expanded to show 'Running Control'.</p>

NOTE

- Method 3 is used only when the SNMP card is configured.
- For details about how to shut down the UPS on the WebUI, see the *EN83CTLA SNMP Card User Manual*.

----End

Shutting Down the Inverter to Transfer the UPS to the No Output State

- Step 1** Shut down loads.
- Step 2** Select one method from [Table 5-3](#) to shut down the inverter.
- Step 3** Switch off the external battery circuit breaker (if any) or disconnect battery cables.
- Step 4** Switch off the mains AC input circuit breaker K1 and output circuit breaker Q1 of the UPS. After all indicators turn off and fans stop, the UPS shuts down, and the loads are powered off.

----End

5.3.6 Cold-Starting the UPS Using Batteries

Procedure

- Step 1** Switch on the external battery circuit breaker (if any) or connect battery cables.
- Step 2** Hold down the UPS button for 3s (the bypass indicator, battery indicator, and inverter indicator are on at the same time), and the UPS is powered on. After the UPS initialization is complete (about 10s), the indicator status changes and the UPS enters the standby state (the WiFi indicator is on and the fault indicator blinks). Hold down the UPS button for more than 5s, and the UPS enters battery mode.

Step 3 When the UPS runs properly, switch on the UPS AC output circuit breaker Q1 to supply power to loads.

NOTE

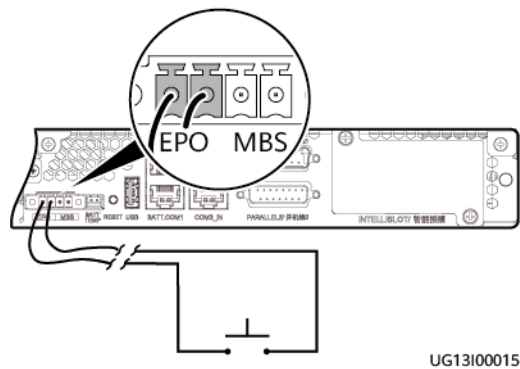
To prevent triggering overload protection, start the loads with higher power and then loads with lower power.

----End

5.3.7 Performing EPO

Turn on the EPO switch (provided by the customer). The UPS enters the EPO state. That is, the UPS shuts down the inverter, and does not transfer to bypass mode.

Figure 5-14 EPO cable connection on a single UPS

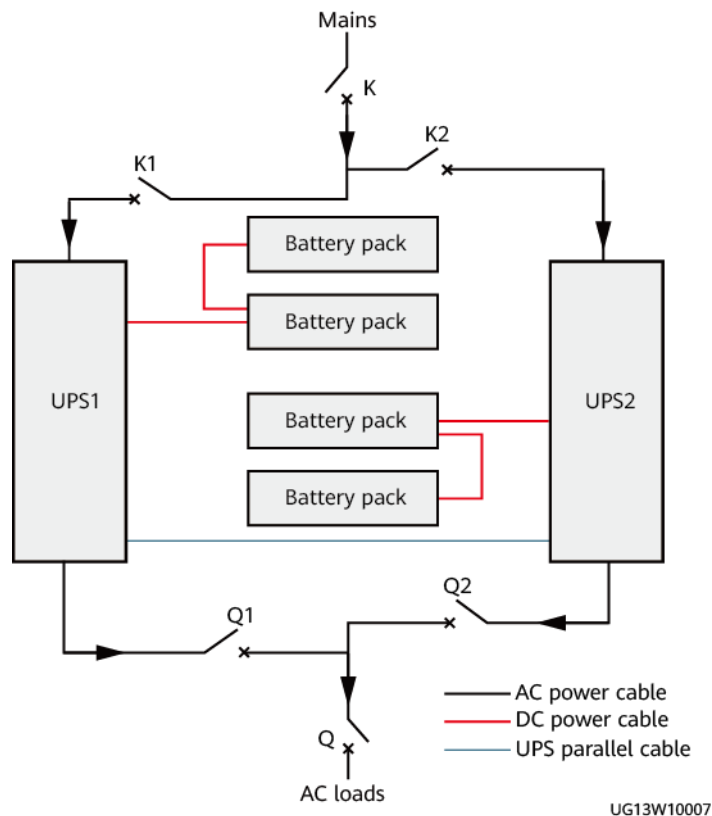


NOTE

- Connect an external switch to the EPO ports of the UPS. After you turn on the switch in the case of emergency, the inverter stops and the UPS does not transfer to bypass mode. In this way, the UPS stops supplying power through the output terminals immediately.
- The external EPO switch (switch or dry contact signal controlled by a switch) is provided by the customer.

5.4 UPS Power-On Commissioning (Parallel System)

Figure 5-15 Conceptual diagram (two parallel UPSs + four battery packs)



5.4.1 Power-On

Prerequisites

The checking before power-on is complete.

Procedure

- Step 1** Switch on the external battery circuit breaker (if any) or connect battery cables.
- Step 2** Switch on the UPS mains AC input circuit breakers K1 and K2, and the general mains AC input circuit breaker K. The parallel system has no output.

----End

5.4.2 Starting the Inverter

Prerequisites

1. The UPSs have been powered on.
2. You have installed and logged in to the app.

Procedure

Step 1 If the alarm indicator on the UPS panel is blinking, view the alarm details on the app and handle the alarm.

Step 2 Choose **Config > Quick Settings**.

1. Set the voltage level and frequency level based on site requirements.
2. Set the battery type, single battery voltage, number of batteries in a battery string, single battery capacity, and number of battery strings based on site requirements.

Figure 5-16 Quick Settings



Table 5-4 Quick Settings

Item	Description	Setting	Value Range
Voltage level(V)	Specifies the system output voltage level. This parameter is configurable only after the inverter is shut down.	Set as required.	220, 230, and 240. The default value is 220.
Frequency level(Hz)	Specifies the system output frequency level. This parameter is configurable only after the inverter is shut down.	Set as required.	50, 60, and automatic. The default value is 50.
System time	Synchronizes the system time to the UPS.	-	-
Battery type	Specifies the type of batteries connected to the UPS.	VRLA batt.	VRLA batt., Lithium batt. The default value is VRLA batt.

Item	Description	Setting	Value Range
Single battery voltage (V)	Specifies the voltage of each battery in a battery string connected in series. Set this parameter based on the actual configuration. This parameter is configurable in non-battery mode.	Set as required.	2, 6, and 12. The default value is 0.
Batteries in a battery string	Specifies the number of batteries in a battery string. Set this parameter based on the actual configuration. This parameter is configurable in non-battery mode.	Set as required.	The value range depends on the voltage of a single battery. The default value is 0.
Single battery capacity (Ah)	Specifies the capacity of each battery in a battery string connected in series. This parameter is configurable in non-battery mode.	Set as required.	7-1000. The default value is 0.
Number of battery strings	Specifies the number of battery strings connected in parallel. This parameter is configurable in non-battery mode.	Set as required.	1-4. The default value is 0.

Step 3 The parallel configuration parameters are adaptive. Choose **Config > System Parameters > Parallel system** to manually set the parameters as required.

Figure 5-17 System Parameters

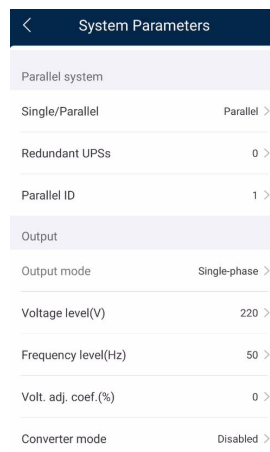
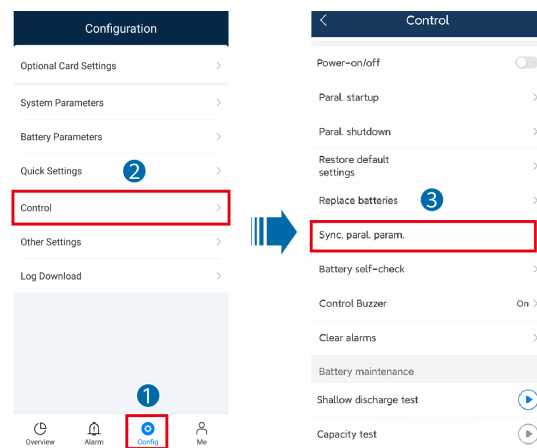


Table 5-5 Parallel system settings

Item	Description	Setting	Value Range
Single/Parallel	Specifies whether the UPS works in single mode or parallel mode. This parameter is configurable only after the inverter is shut down.	Parallel	Single, parallel. The default value is Single.
Redundant UPSs	Set this parameter based on load capacity and redundancy requirements. This parameter is configurable only after the inverter is shut down.	Set as required.	0–3. The default value is 0.
Parallel ID	Specifies the parallel IDs.	Set as required.	1–4. The default value is 1.

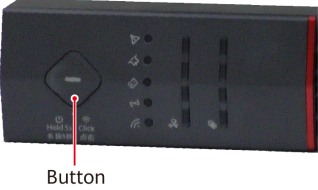
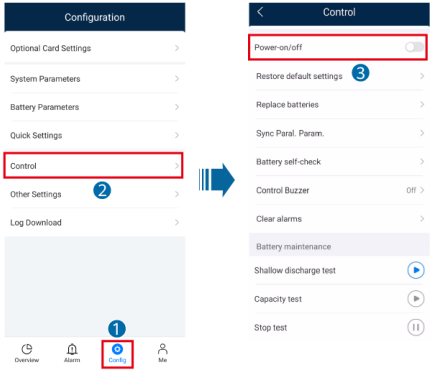
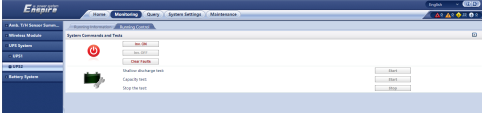
Step 4 Check that parameters of the current UPS are automatically synchronized to the other UPSs in the parallel system.

Figure 5-18 Synchronizing parallel parameters



Step 5 Start the inverters on each UPS one by one using one of the following methods, and then shut down the inverters to check that the output PL terminal has output voltage.

Table 5-6 Startup methods

Startup Method	Figure
<p>Method 1: When the UPS works in bypass mode, hold down the button on the UPS panel for more than 5s. Release the button when the inverter indicator blinks and you hear a beep sound. Do not press any button during inverter startup. When the startup command is successfully delivered, and the inverter indicator is steady on, the UPS enters normal mode.</p>	 <p>Button</p>
<p>Method 2: In bypass mode, choose Config > Control > Power-on/off on the app to start the UPS. After successful startup, the UPS enters normal mode.</p>	
<p>Method 3: On the WebUI, choose Monitoring > UPS > Running Control to start the UPS.</p>	

NOTE

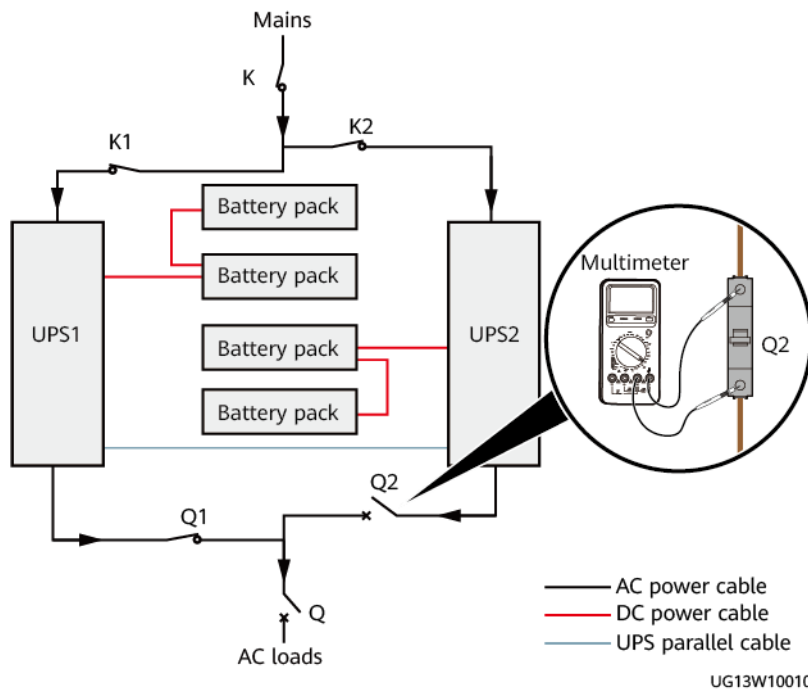
- Method 3 is used only when the SNMP card is configured.
- For details about how to start the UPS on the WebUI, see the *EN83CTLA SNMP Card User Manual*.

Step 6 Switch on output circuit breaker Q1 (provided by the customer), switch off output circuit breaker Q2 (provided by the customer), and check that the voltage difference between the two ends of output circuit breaker Q2 does not exceed 2 V.

NOTE

If the voltage difference between the two ends of the output circuit breaker Q2 exceeds 2 V, the input or output wire sequence is incorrect.

Figure 5-19 Measuring the voltage of circuit breaker Q2



Step 7 Switch on the output circuit breaker Q2.

Step 8 Perform the startup operation on each UPS. The UPS parallel system transfers to normal mode.

----End

5.4.3 Powering On Loads

Procedure

Step 1 When the parallel system runs properly, switch on the general output circuit breaker Q (provided by the customer), and start loads one by one.

NOTE

To prevent triggering overload protection, start the loads with higher power and then loads with lower power.

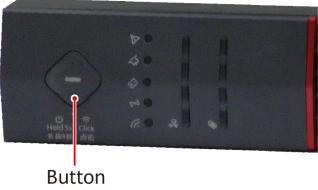
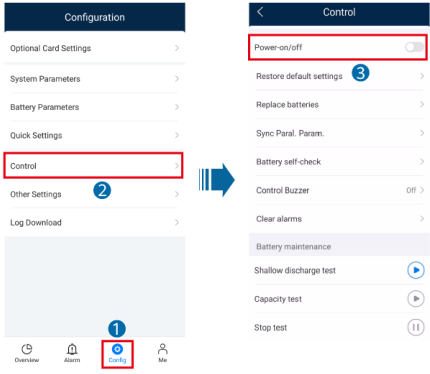
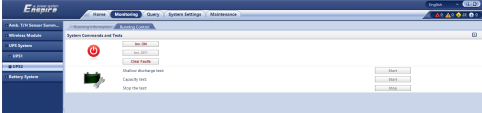
----End

5.4.4 Shutting Down the UPS

Shutting Down a Single UPS in the Parallel System

Step 1 Shut down the UPS using one of the following methods. After you shut down a UPS in the parallel system, the UPS has no output, and another UPS continues to work.

Table 5-7 Shutdown methods

Shutdown Method	Figure
<p>Method 1: Hold down the button on the UPS panel for more than 5s. Release the button when the inverter indicator blinks and you hear a beep sound. Do not press any button during inverter shutdown. When the shutdown command is successfully delivered, and the inverter indicator is off, the UPS shuts down the inverter output and enters bypass mode.</p>	
<p>Method 2: Choose Config > Control > Power-on/off on the app to shut down the inverter. After successful shutdown, the UPS enters bypass mode. For details about how to install and log in to the app, see sections "Installing the App" and "Logging In to the App."</p>	
<p>Method 3: On the WebUI, choose Monitoring > UPS System > Running Control to shut down the UPS.</p>	

NOTE

- Method 3 is used only when the SNMP card is configured.
- For details about how to shut down the UPS on the WebUI, see the *EN83CTLA SNMP Card User Manual*.
- When one UPS in the parallel system is shut down while another UPS is still working, the UPS that has been shut down has no output.

Step 2 Switch off the AC input circuit breaker K1 and AC output circuit breaker Q1 for the UPS. After all indicators turn off and fans stop, the UPS shuts down.

Step 3 Exit the UPS from the parallel system.

NOTE

To shut down a UPS without removing it from the system, perform only step 1.

----End

Transferring the Parallel System to Bypass Mode

Step 1 Select one method from [Table 5-7](#). After the UPSs shut down one by one, all inverters shut down at the same time and the UPSs transfer to bypass mode.

----End

Transferring the Parallel System to No Output State

Step 1 Shut down loads.

Step 2 Select one method from [Table 5-7](#). After the UPSs shut down one by one, all inverters shut down at the same time and the UPSs transfer to bypass mode.

Step 3 Switch off the external battery circuit breaker (if any) or disconnect battery cables.

Step 4 Switch off the mains AC input circuit breakers K1 and K2 and the general mains AC input circuit breaker K for the UPS system. Switch off the UPS AC output circuit breakers Q1 and Q2 and the general AC output circuit breaker Q for the UPS system. After all indicators turn off and fans stop, the UPS shuts down, and the loads are powered off.

----End

5.4.5 Cold-Starting the UPS Using Batteries

Procedure

Step 1 Switch on the external battery circuit breaker (if any) or connect battery cables.

Step 2 Hold down the button of the UPSs in the parallel system for 3s (the bypass indicator, battery indicator, and inverter indicator are on at the same time), and the UPS is powered on. After the UPS initialization is complete (about 10s), the indicator status changes and the UPS enters the standby state (the WiFi indicator is on and the fault indicator blinks). Hold down the UPS button for more than 5s, and the UPS enters battery mode.

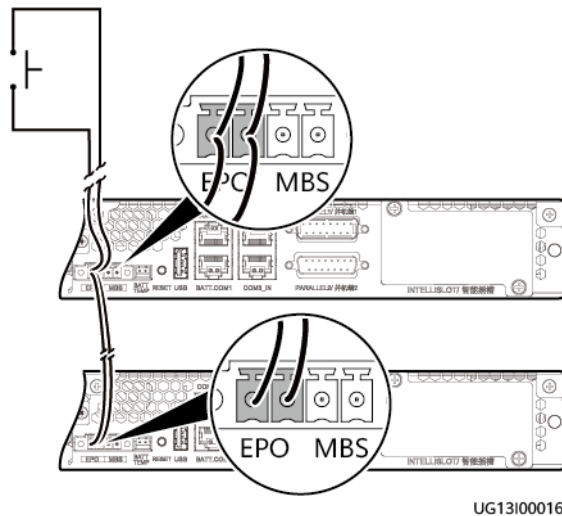
Step 3 When the parallel system runs properly, switch on the AC output circuit breakers Q1 and Q2, and the general output circuit breaker Q (provided by the customer), and start loads one by one.

----End

5.4.6 Performing EPO

Turn on the EPO switch (provided by the customer). The UPS system enters the EPO state. That is, the UPS system shuts down the inverters, and does not transfer to bypass mode.

Figure 5-20 EPO cable connection in a parallel system



NOTE

- Connect an external switch to the EPO ports of the UPS. After you turn on the switch in the case of emergency, the inverter stops and the UPS does not transfer to bypass mode. In this way, the UPS stops supplying power through the output terminals immediately.
- The external EPO switch (switch or dry contact signal controlled by a switch) is provided by the customer.

6 Power-On Commissioning for the Cooling System

Prerequisites

Before powering on the outdoor unit, check and upgrade the indoor unit software version to SmartDC V100R021C10SPC430 (APP:V1.21.10.754) or later. Search for **5000-A013.tar.gz** on the technical support website, download the software of the corresponding model and the *ACC Software Upgrade Guide*, and upgrade the software on the PAD or ECC800-Pro.

6.1 Powering on Devices

Prerequisites

- Check that the drainpipe is correctly connected, the external thermal insulation foam is secured, and refrigerant has been filled in the system.
- Check that the smart cooling product circuit breaker in the upstream PDB is OFF.
- Check that the power cable is correctly connected and that the input voltage meets requirements.
- Check that the smart cooling product control unit and the ECC800 are correctly connected.

Procedure

Step 1 Switch on the smart cooling product circuit breaker 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 performed.

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

 **NOTE**

Perform [6.2.1 Preparations and Management System Login](#) during the preheating time.

----End

6.2 Initial Configuration

You need to log in to the management system before configuring the cooling system which is commissioned and managed through the ECC800-Pro.

6.2.1 Preparations and Management System Login

6.2.1.1 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 32, 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 6-1 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 (FusionModule500/800)
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 WAN2 port is 192.168.248.10. The default value may vary.
- The WAN port supports Internet access and the LAN port supports LAN 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.

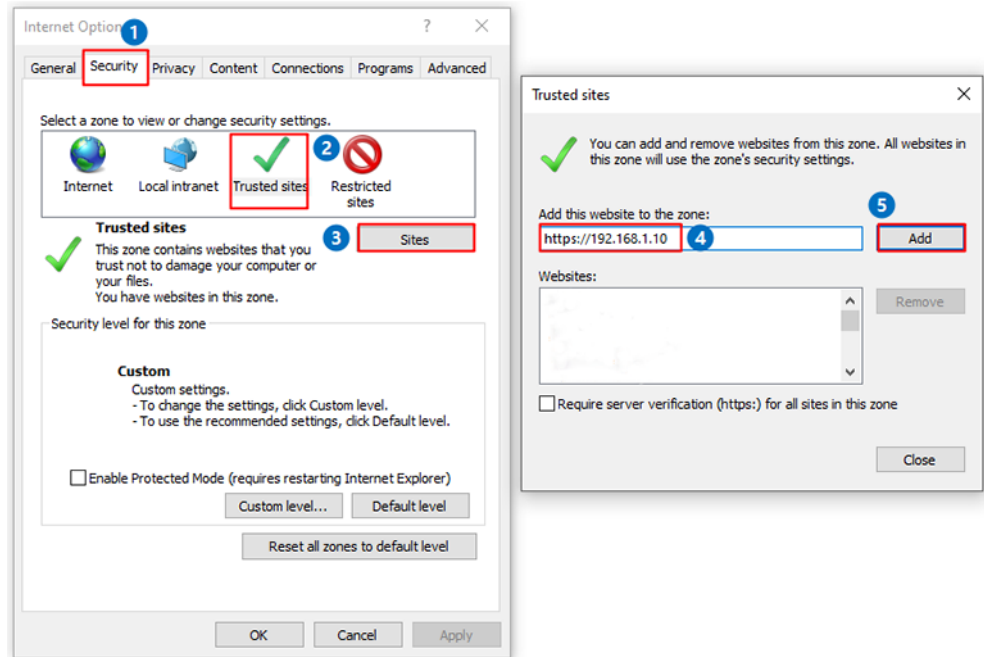
NOTE

- 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 TLS 1.2** and **Use TLS 1.3**.
 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.

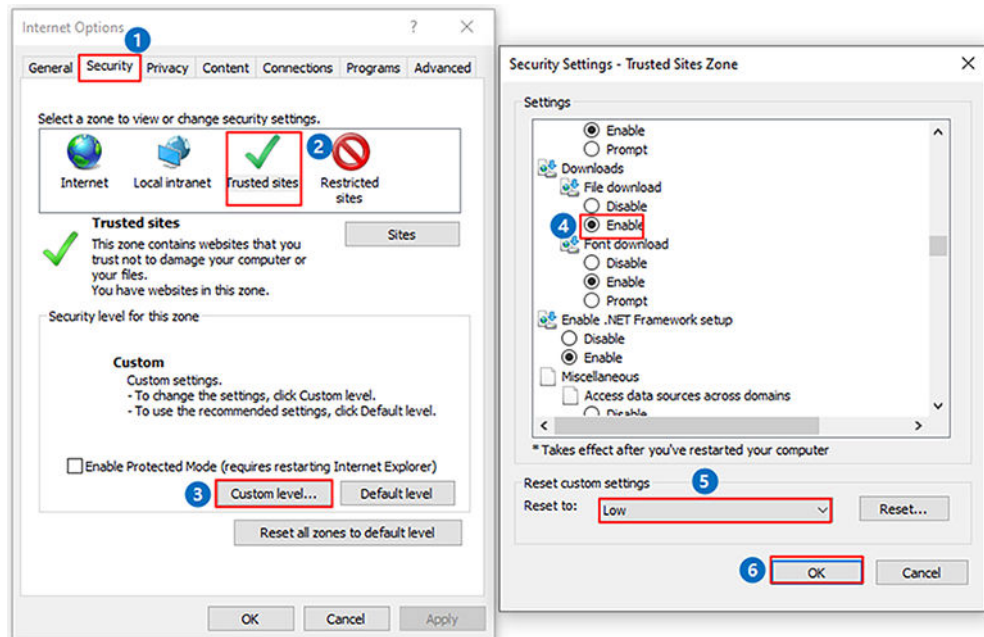
1. When you use Internet Explorer for access, set Internet Explorer to ensure the normal display of and operations on the WebUI. Choose **Tools > Compatibility View**, and add the web access address to the compatibility view.
2. Choose **Tools > Internet Options > Security**, and add the ECC800-Pro access address to the list of trusted sites.

Figure 6-1 Adding an address



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

Figure 6-2 Setting parameters



 **NOTE**

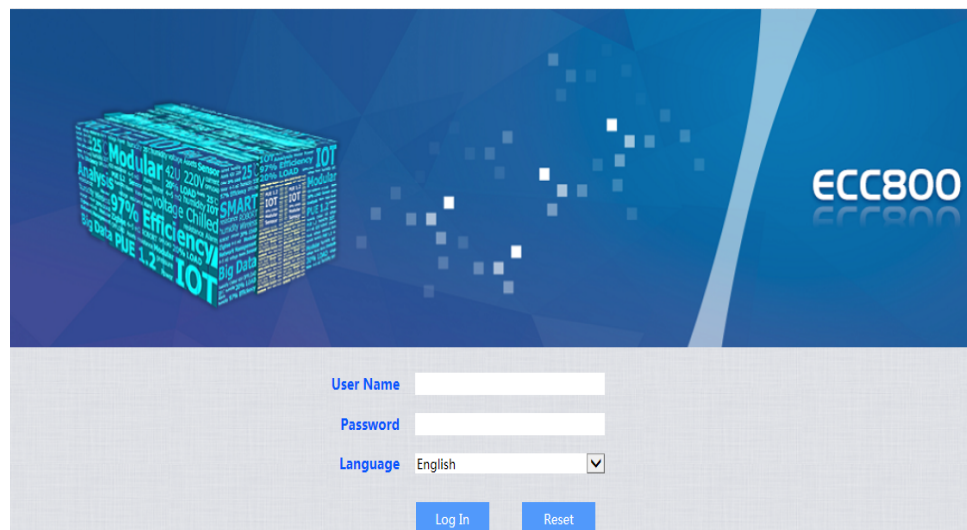
When switching between different versions of the ECC800-Pro on your PC, you are advised to clear the historical Internet Explorer cache. Failing to do so may cause some information missed or exception after login. The following provides the details:

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 **https://192.168.8.10**) in the address box of the browser, and then press **Enter** to access the WebUI login page.

Figure 6-3 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. The Company 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

6.2.1.2 How Can I Prepare and Log in the App?

Prerequisites

App operating environment requirements:

- The mobile device runs Android 6.0 or later and the operating system is not rooted.
- 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 for WebUI login.

Procedure


Step 1 Download and install the FusionModule app from Huawei AppGallery.

NOTE

Before the installation, ensure that the PAD is connected to the Internet and the network is running properly.

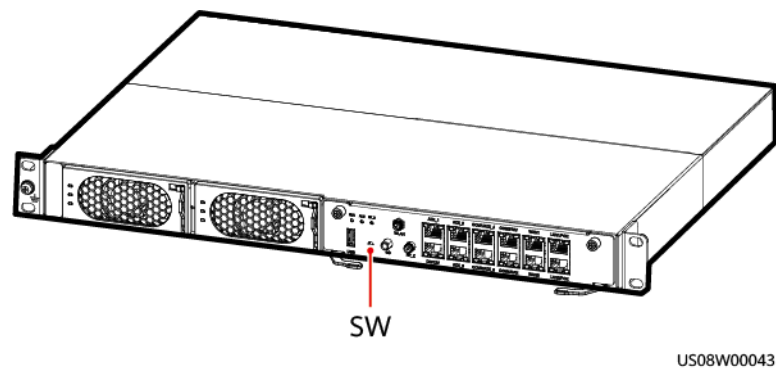
- Huawei AppGallery installed on the PAD
Log in to the Huawei AppGallery client, search for **FusionModule**, and tap **Install**. Huawei AppGallery is preinstalled on Huawei PAD by default.
- Huawei AppGallery not installed on the PAD

Table 6-2 Operation methods for the scenario where Huawei AppGallery is not installed on the PAD

Method	Procedure	Installation Verification
Install the app from the Huawei AppGallery official website.	<ol style="list-style-type: none"> 1. Log in to Huawei AppGallery (https://appgallery.huawei.com/), search for FusionModule, and tap Install. 2. In the Tip dialog box, tap Install AppGallery. 3. The Huawei AppGallery installation file is displayed on the screen. Download and install the Huawei AppGallery as prompted. 4. On the Huawei AppGallery client, search for FusionModule, and tap Install. 	<p>Check that the app icon  exists on the PAD desktop.</p>

Step 2 Hold down the SW button on the ECC800-Pro for 1s to enable the WiFi function.

Figure 6-4 Button position



NOTE

- The preset password is **Changeme**. 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 WiFi is enabled by pressing the button, the app prompts the user to change the preset password when logging in on the PAD.
- 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 into last time.
- The WiFi function is disabled by default. When you 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 over time. Change the WiFi password periodically (recommended: once half a year).

Step 3 (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. When you 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 over time. Change the WiFi password periodically (recommended: once half a year).
7. Enter the password currently used for logging in to the WebUI and click **Submit**.

Step 4 Log in to the app.

1. Start the 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 > Communication IP Settings**, and ensure that the IP address is **192.168.245.10**.
3. The user name and password for logging in to the app are the same as those for logging in to the ECC800-Pro WebUI. Specify the user name and password, and tap **Login**.

 **NOTE**

- After the first login, change the preset password in time to ensure system access security.
- A password that has been used for a long time is more likely to be stolen or cracked. The risk increases over time. Change the password once every three months.
- It is recommended that you use different user accounts to log in to the ECC800-Pro WebUI and app concurrently. Otherwise, either of them will be logged out.

----End

6.2.1.3 Authenticating the Initial Startup Password

When the system type is FusionModule500/800, perform the following configurations.

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 again 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 FusionModule500/800, the startup password needs to be authenticated again.

Procedure

Step 1 Authenticate the startup password on the WebUI.

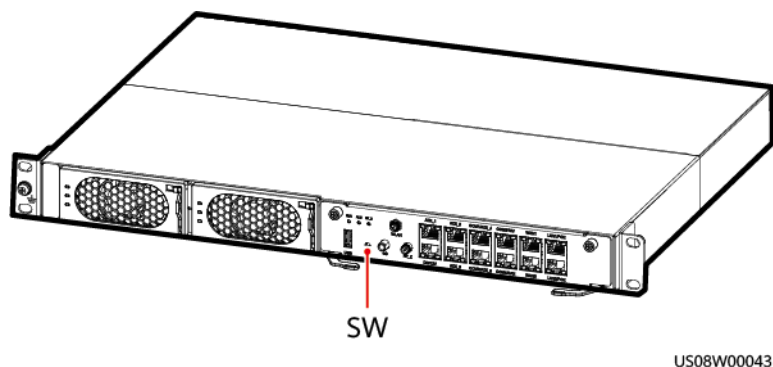
1. Log in to the ECC800-Pro WebUI as an administrator.
2. Record the values of **Barcode** and **Verify Code** in the displayed **Startup Password** dialog box.
3. Within 24 hours, inform the authorized service engineer of **Barcode** and **Verify Code** to obtain the password. After obtaining the password, 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, the verification code is automatically updated. You can also click to update the verification code.
- Authorized service engineers can obtain the service authorization code through the app. For details, see *Data Center Facility Deployment Guide*.

Step 2 Hold down the SW button on the ECC800-Pro for 1s to enable the WiFi function.

Figure 6-5 Button position



 NOTE

- The preset password is **Changeme**. 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 WiFi is enabled by pressing the button, the mobile phone app prompts the user to change the preset password upon log-in.
- 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 into last time.
- The WiFi function is disabled by default. When you 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 over time. Change the WiFi password periodically (recommended: once half a year).

----End

6.2.1.4 (Optional) Cloud Service Access

The ECC can connect to the NetEco only after NetEco communications parameters are set on the ECC WebUI.

Prerequisites

- You have obtained the IP address of the ECC as well as the user name and password used for WebUI login.

Procedure

Step 1 Enter **https://monitoring 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 a language, and click **Log In**.

 **NOTE**

- If you do not perform any operation within 10 minutes after logging in to the system, you will be logged out due to timeout.
- A maximum of three users can log in to the ECC WebUI concurrently.

Step 3 Set parameters.

1. Sites where devices have been powered on:
 - a. Cloud access through 4G:
 - i. Choose **System Settings > System Parameters**. In the **Mobile Data** area in the right pane, change **Disable** of **Mobile data control** to **Enable**.
 - ii. Choose **System Settings > NMS Application**. On the **NetEco** tab page, set parameters in the **Communication Parameters** area, such as **Address type**, **NetEco domain name**, and **Port number**, and click **Submit**.
 - b. Cloud access through FE:
 - i. Choose **System Settings > System Parameters**. In the right pane, click the **Monitor IP** tab and enter the DNS server address.
 - ii. Choose **System Settings > NMS Application**. On the **NetEco** tab page, set parameters in the **Communication Parameters** area, such as **Address type**, **NetEco domain name**, and **Port number**, and click **Submit**.
 - c. After setting the parameters, check whether the dial-up connection is successful. Choose **Home > Mobile Data Info.**, and check whether the dial-up connection is set up successfully and check the signal strength.
2. Sites where devices have not been powered on:
 - a. Cloud access through 4G:
 - i. Complete the first startup password authentication on the WebUI. The **Cloud service access** page is displayed.
 - ii. Set **Cloud service access** to **Enable** and set **Cloud service access mode** to **4G**.
 - b. Cloud access through FE:
 - i. Complete the first startup password authentication on the WebUI. The **Cloud service access** page is displayed.
 - ii. Set **Cloud service access** to **Enable** and set **Cloud service access mode** to **FE**.
 - iii. On the WebUI, choose **System Settings > System Parameters > Monitor IP**. Set the DNS server address.

----End

6.2.2 Performing Initial Configuration

Prerequisites

One end of the straight-through cable has been connected to the communications port on the FusionCol5000, and the other end has been connected to the COM2 port on the ECC800.

Procedure

Step 1 Add the FusionCol5000-A0031.

1. Log in to the ECC800 WebUI as an administrator.
2. Adding the FusionCol5000-A0031

Table 6-3 Adding a smart cooling product

Path	Parameter	Setting
Choose System Settings > Device Management and click Add Device .	Device Attribute	Select Air Conditioner from the drop-down list.
	Device Type	Select FusionCol-M from the drop-down list.
	Connect To	Select ECC800 from the drop-down list.
	Communications Port	Select COM2 from the drop-down list. NOTE The setting example indicates that the FusionCol5000-A0031 is connected to the COM2 port on the ECC800. If the FusionCol5000-A0031 is connected to another port, set the number of the connected port.
	Device Address	Enter the actual device address of the FusionCol5000-A0031 during operations. The default address is 1 .

3. Click **Test Connect** to check whether the FusionCol5000-A0031 connects to the ECC800 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, whether the device and the ECC800 are running properly, and whether the parameter settings are consistent with the device parameters.

Step 2 Set the running parameters and control parameters for the FusionCol5000-A0031 on the WebUI.

1. Log in to the ECC800 WebUI as an administrator.
2. Choose **Monitoring > Cooling > FusionCol5000-A0031**.

3. On the **Running Parameters** tab page, set smart cooling product running parameters.

 **NOTE**

On the **Running Parameters** tab page, you are advised to set **Temperature setpoint** to 23°C, **Humidity setpoint** to 50% RH, **Control mode** to **Cold aisle average value control**, and **Cold aisle T/H sensor fault enable** and **Hot aisle T/H sensor fault enable** to **Enable**.

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

6.3 Commissioning the Cooling System

Prerequisites

Check that the smart cooling product is properly 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.

Context

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 ≥ 4.0 MPa), rubber hose (withstand pressure ≥ 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 6-4](#).

Table 6-4 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
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/cm²

NOTICE

Users include **admin** (preset password: **Changeme**) and **operator** (preset password: **Changeme**). To enter the diagnostic mode, log in as user **admin**.

Procedure

Step 1 Log in to the ECC800 WebUI as user **admin**. Choose **Monitoring > Cooling > FusionCol5000-A0031**. 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 internal and external circulation fans will also run according to the environment.

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

----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

7 Management System Power-On Commissioning

Prerequisites

- The management system has passed the initial startup password authentication and can be logged in to properly.
- If the login and password authentication have not been performed for the first time, see [6.2.1 Preparations and Management System Login](#).

7.1 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**. Set **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. Set **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

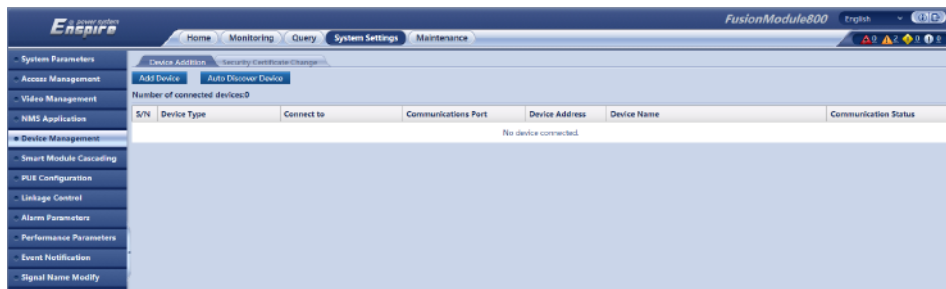
7.2 Adding a Southbound Device

Procedure

Step 1 Choose **System Settings > Device Management > Add Device**.

Step 2 After you add a device based on the site requirements or click **Auto Discover Device**, the details about the device connected to the smart module are displayed.

Figure 7-1 Adding a device



----End

7.3 Creating a Smart Module Plan View

Procedure

- Step 1** Log in to the ECC800-Pro WebUI as an administrator.
- Step 2** Choose **Home > Plan View**, create a smart module in **Smart Module View** and set the layout and device quantity based on the actual smart module scenario.

Figure 7-2 Creating a view

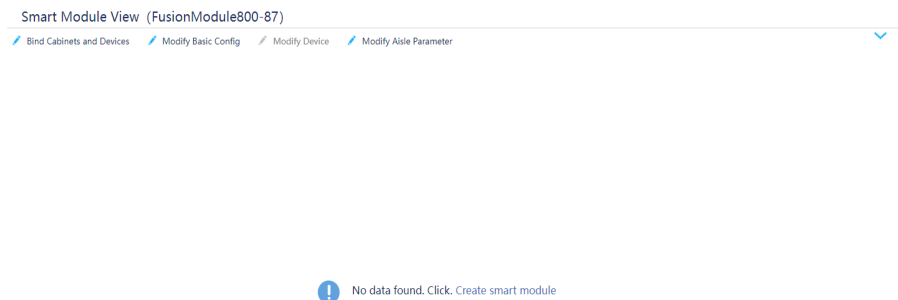


Figure 7-3 Setting the layout

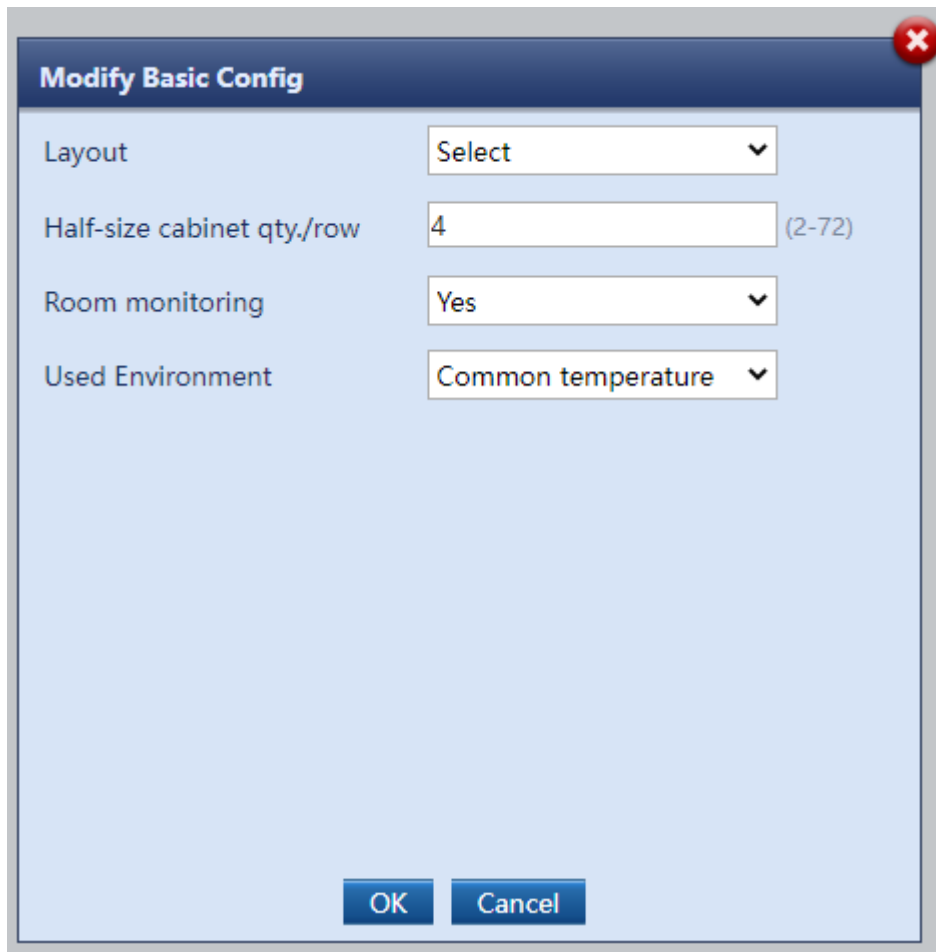


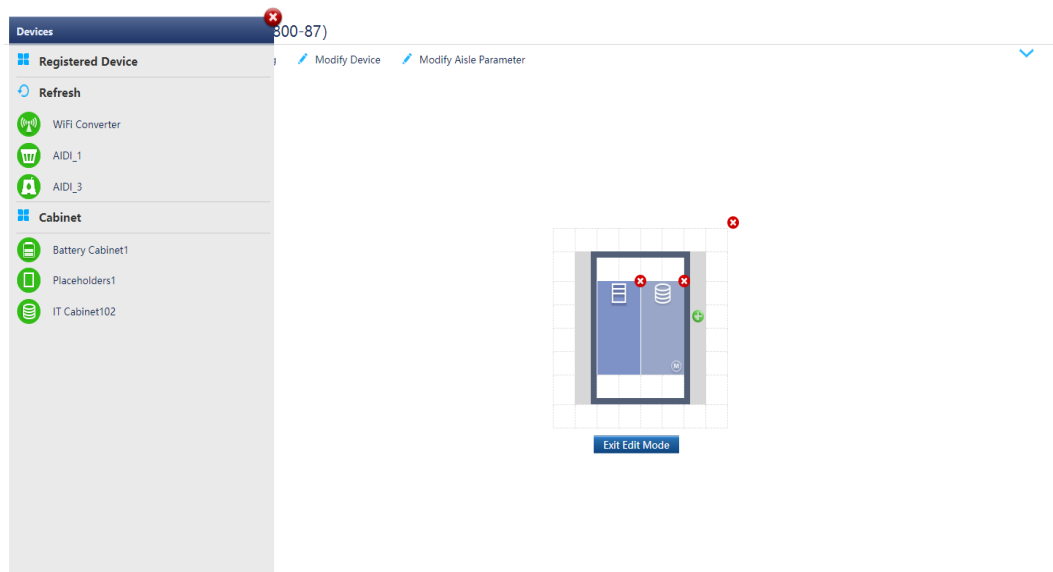
Table 7-1 Basic configuration parameters

Parameter	Drop-Down List	Description
Layout	Narrow aisle 1	The aisle is located at the rear door of the cabinet.
	Narrow aisle 2	The aisle is located at the front door of the cabinet.
	Single-row dual-aisle (recommended)	Aisles are located at both the front and rear doors of the cabinet.
	No layout	No need to lay out the smart module view.
Half-size cabinet qty./row		Each cabinet has two configuration positions. Number of half-size cabinets in each row = Number of cabinets x 2

Parameter	Drop-Down List	Description
Used Environment	Common temperature (default)	This option is suitable for most application scenarios.
	High temperature	The cabinet is used in high-temperature scenarios.
	Low temperature	The cabinet is used in low-temperature scenarios.

Step 3 Drag the icons of registered devices and devices on the cabinet list to appropriate positions in the layout to create a smart module plan view.

Figure 7-4 Setting the smart module plan view layout



----End

7.4 Commissioning Sensors

7.4.1 Setting and Adding a Smoke Detector

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 WebUI as an administrator.
2. Choose **System Settings > Signal Name Modify**. The **Batch Signal Configuration** page is displayed.
3. Set **Device type** to **ECC800** and **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**.
7. Set **Smoke sensor type** to **Smoke sensor**, click **Submit**.

Step 2 Check the monitoring functions of smoke detector.

Table 7-2 Function check

Check Method	Normal Connection Status	Alarm Clearance Method
Simulate a smoky environment under the smoke detector.	Smoke DI alarm 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

7.4.2 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 COM1 port on the ECC800.

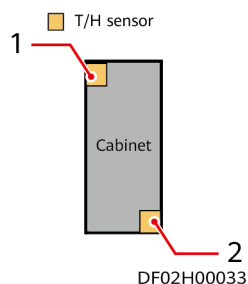
Procedure

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 7-5 DIP switch definitions for T/H sensors



NOTE

The numbers 1 and 2 indicate the DIP switch settings of the T/H sensors.

Table 7-3 Setting a device address

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
3	ON	ON	OFF	OFF	OFF	OFF
4	OFF	OFF	ON	OFF	OFF	OFF

Step 2 Add a T/H sensor.

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

Table 7-4 Adding a T/H sensor

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

3. Click **Connect Test** to check whether the T/H sensor connects to the ECC800 properly.

- If the connection is normal, click **Confirm**. The device connection information is displayed in the **Number of connected devices** list.
- If the connection is abnormal, check whether the device is properly connected to the ECC800, whether the device and the ECC800 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 7-5 Function check

Check Method	Normal Connection Status
Check the running information about the T/H sensor on the WebUI.	Choose Monitoring > Aisle > T/H Sensor Group > T/H Sensor n > Running Information , and view the current cabinet temperature and humidity.
Set T/H sensor alarm thresholds.	Choose Monitoring > Aisle > T/H Sensor Group > T/H Sensor n > Running Parameters and set High Temperature Alarm Threshold, Low Temperature Alarm Threshold, High Humidity Alarm Threshold, and Low Humidity Alarm Threshold as required. NOTE The default values of High Temperature Alarm Threshold, Low Temperature Alarm Threshold, High Humidity Alarm Threshold, and Low Humidity Alarm Threshold are 30.0°C, 5.0°C, 85.0% RH, and 15.0% RH respectively.

----End

7.4.3 Commissioning an Electrode Water Sensor

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 preinstalled, only check its settings.
- The actual value may vary. 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_3 port on the ECC800.

1. Log in to the ECC800 WebUI as an administrator.
2. Choose **System Settings > Signal Name Modify**. The **Batch Signal Configuration** page is displayed.
3. Set **Device type** to **ECC800** and **Device name** to **ECC800**, and click **OK**.
4. On the query result tab page, set the new signal name of **AI/DI_3** to **Leak** and click **Submit**.
5. Choose **Monitoring > System > ECC800 > Running Parameters > AI/DI_3 Port Settings**.
6. Set **Leak sensor** to **Enable** and click **Submit**.
7. Set **Leak sensor type** to **Leak sensor(Electroc)** and click **Submit**.
8. Click **Unhide All Advanced Signals**, and click **Power Supply Parameters**. Ensure that **II power supply enable(AIDI_3/COM2/AIDI_5)** is **Yes**.

Step 2 Check the function of the water sensor.

Table 7-6 Function check

Check Method	Normal Connection Status	Alarm Clearance Method
Immerse the two contacts of the electrode water sensor in water.	Leak DI alarm 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

7.5 Commissioning a Cabinet Electronic Clasp Lock

This section applies to 02116411 and 0211642 cabinets.

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.

Table 7-8 Adding a cabinet electronic clasp lock

Path	Parameter	Setting
Choose System Settings > Device Management and click Add Device .	Device Attribute	Cabinet Electronic Clasp Lock
	Device Type	Cabinet Electronic Clasp Lock
	Connect To	ECC800
	Communications Port	COM3
	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 connects the ECC800 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, whether the device and the ECC800 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 7-9 Function check

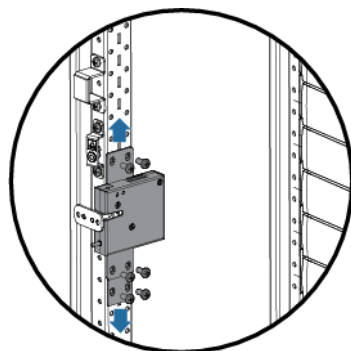
Function	Path	Operation
View cabinet electronic clasp lock information	Choose Monitoring > Cabinet > Global cabinet > Cabinet Electronic Clasp Lockn .	Click the Running Info tab.
Change the cabinet electronic clasp lock name.		Click the Running Parameters tab.

Function	Path	Operation
Remotely open a cabinet electronic clasp lock		Click the Controls tab.
Open cabinet electronic clasp locks in batches	Choose Monitoring > Cabinet and click the Controls tab.	Select Open front door or Open back door from the Open the door drop-down list box, select the setting, and click Submit . 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.

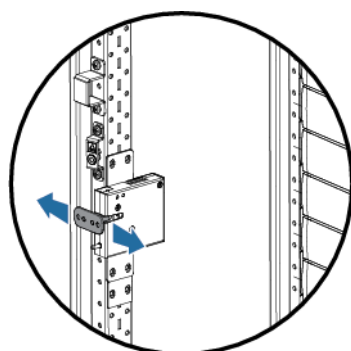
Figure 7-7 Adjusting the position of a clasp lock



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.

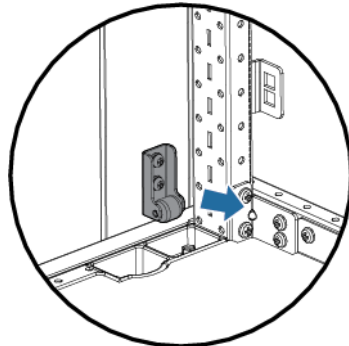
Figure 7-8 Adjusting the position of a lock tongue



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 7-9 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

7.6 Commissioning a Cabinet Door Status Sensor

This section applies to the 02116804 cabinet.

Context

The door status sensor is installed before delivery. You only need to check the settings.

Procedure

- Step 1** Set the cabinet door status sensor parameters.
1. Log in to the ECC800 WebUI as an administrator.
 2. Choose **System Settings > Signal Name Modify**. The **Batch Signal Configuration** page is displayed.
 3. Set **Device type** to **ECC800** and **Device name** to **ECC800**, and click **OK**.
 4. On the query result tab page, set the new signal name of **AI/DI_2** to **Door1** and click **Submit**.
 5. Choose **Monitoring > System > ECC800 > Running Parameters > AI/DI_2 Port Settings**.
 6. Set **Door1 sensor** to **Enable** and click **Submit**.
 7. Set **Door1 sensor type** to **Door sensor** and click **Submit**.

Step 2 Check the door status sensor functions.

Table 7-10 Function check

Check Method	Normal Connection Status
Open the cabinet door.	Door1 DI alarm is generated on the active alarm page of the app or WebUI.

----End

7.7 Commissioning an Intelligent rPDU

If an intelligent rPDU is required, perform the following steps to configure it.

Prerequisites

One end of the straight-through cable has been connected to the COM port on the rPDU and the other end has been connected to the COM port on the ETH converter.

Procedure

Step 1 Add an rPDU.

1. Log in to the ECC800 WebUI as an administrator.
2. Add an rPDU.

Table 7-11 Adding an rPDU

Path	Parameter	Value
Choose System Settings > Device Management and click Add Device . The parameters for adding devices are displayed.	Device attribute	Select PDU from the drop-down list box.
	Device Type	Select rPDU-MPDU , rPDU-PN , or rPDU from the drop-down list box based on the actual device.
	Connect To	ECC800
	Communications Port	COM1/COM2
	Device Address	Enter the actual device address of the rPDU.

3. Click **Test Connect** to check whether the rPDU is properly connected to the ECC800.
 - 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 cable is properly connected to the device, whether the device is running properly, and whether the parameter settings are consistent with the device parameters.

----End

7.8 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 notifications can be displayed.

Prerequisites

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

- The ECC800 is equipped with a 4G module and supports standard SIM card access.
- The ECC800 is connected to a network with an email server through a WAN port. Both the Internet and LAN are supported.

NOTE

To use the WeChat notification function, connect the ECC800 to the EDCM system. For details, see the user guide of the EDCM system.

Procedure

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

Step 2 Set the 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 function. 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 mailbox server requires CA certificate verification. If it is required, download the CA certificate from the receiver's mailbox website and upload it in the **Mailbox Certificate** area.

Figure 7-10 Mailbox setting page

NOTE

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

Table 7-12 Main parameters on the outbox configuration page

Mailbox Type	Mailbox Server Domain Name	Mailbox Server IP Address	Encryption Mode and SMTP Port	Remarks
Sina Mail	smtp.sina.com	How to obtain: 1. Click Start on the PC, enter cmd in the Running area, and press Enter to access the administrator window. 2. Enter ping email server domain name 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"> The mailbox server must comply with the standard SMTP protocol to ensure that the email sending and receiving functions are normal. Enter the mailbox client authorization password at Password for 163 Mail, 126 Mail, and QQ Mail.
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	

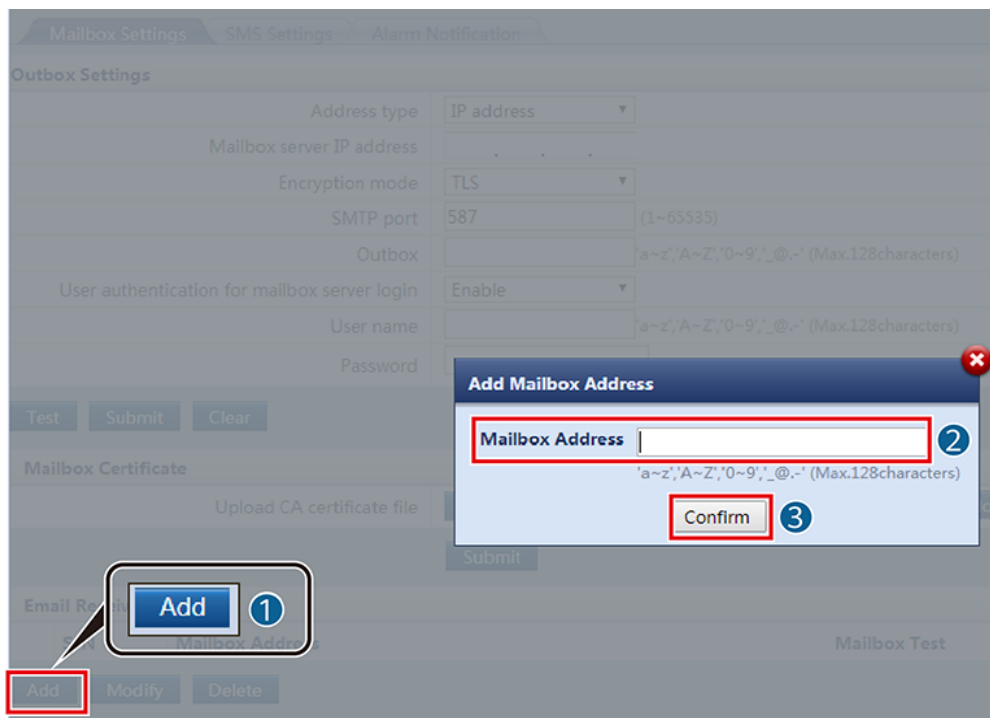
Mailbox Type	Mailbox Server Domain Name	Mailbox Server IP Address	Encryption Mode and SMTP Port	Remarks
Hotmail	smtp-mail.outlook.com		TLS encryption: 587	<ul style="list-style-type: none"> If the mailbox type is not in the list, set parameters by referring to the help information of the mailbox type.
189 Mail	smtp.189.com		Non-encryption: 25	

Step 3 Add a mailbox address to receive emails.

NOTE

The mailbox 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 to ensure that the personal data of users is fully protected.

Figure 7-11 Adding a mailbox address to receive emails



DM25H00130

 NOTE

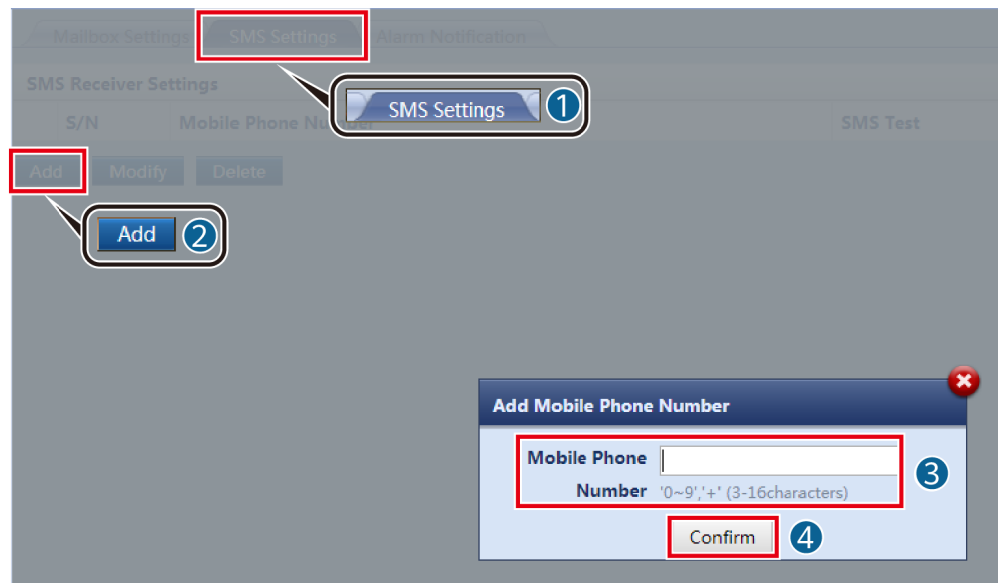
Click **Test** to check whether the added mailbox is available. If it is available, **Successfully to send the test email.** is displayed. If it is unavailable, **Failed to send the test email.** is displayed. Check whether the receiver's mailbox parameters for receiving emails are correctly set.

Step 4 Add a mobile phone 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 to ensure that the personal data of users is fully protected.

Figure 7-12 Adding a mobile phone number



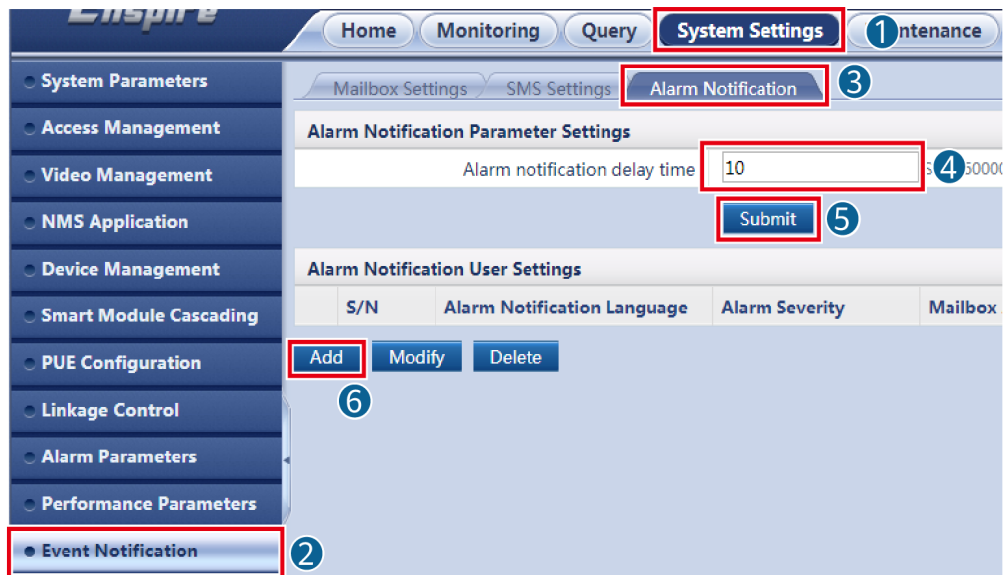
DM25H00131

 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.

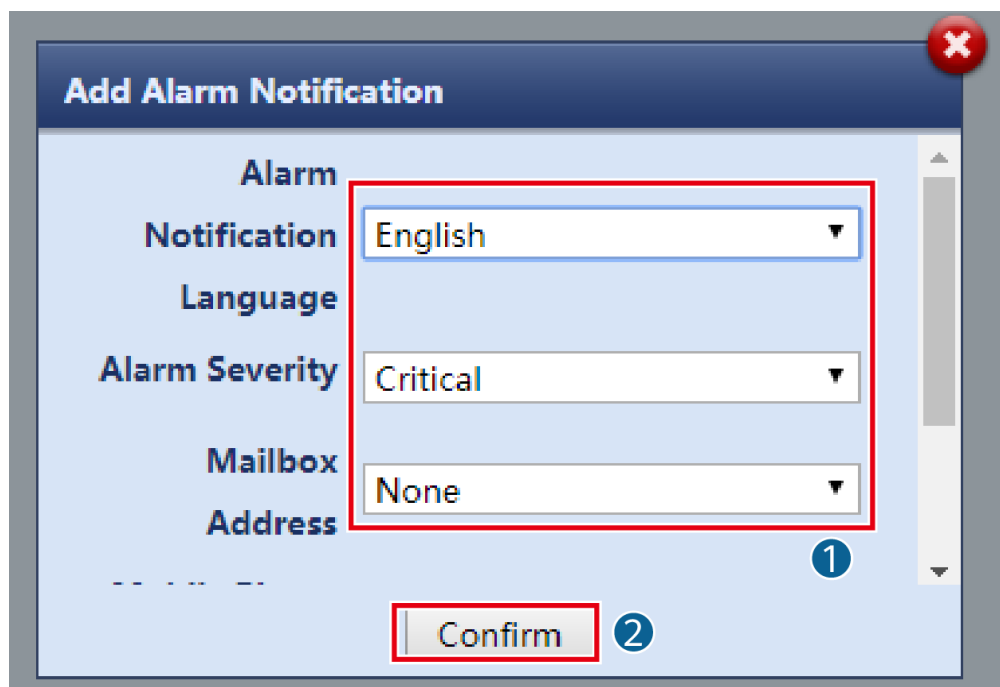
Step 5 Set the alarm notification delay time and add alarm notification parameters.

Figure 7-13 Setting the alarm notification parameters



DM25H00132

Figure 7-14 Adding alarm notification



DM25H00133

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 configured mailbox address or mobile phone number, click **Modify** or **Delete**.

If the email address fails to be set, rectify the fault based on the handling suggestions of the error codes listed in the following table. If an error code is not listed in the following table, provide the ECC run log and contact the customer technical support.

Table 7-13 Mailbox error codes

Type	Error Code	Suggestion
Failed to resolve the domain name.	2	<ol style="list-style-type: none">1. Check whether the address of the DNS server is correctly configured.2. Check whether the domain name of the email server is correctly configured.3. Check whether the network communication between the monitoring module and the DNS server is normal.
	3	<ol style="list-style-type: none">1. Try again later.2. Check whether the domain name of the email server is correctly configured.
	5	Check whether the IP address corresponding to the domain name of the email server is configured.
	11	<ol style="list-style-type: none">1. Check whether the address of the DNS server is correctly configured.2. Check whether the domain name of the email server is correctly configured.
Failed to connect to the email server.	22	<ol style="list-style-type: none">1. Try again later. This issue occurs when the domain name is just configured and the domain name resolution is not complete.2. Check whether the address of the DNS server is correctly configured.3. Check whether the domain name of the email server is correctly configured.
	100	Check whether the local network cable is properly connected and whether the network adapter is activated. Ensure that the local network connection is normal.

Type	Error Code	Suggestion
	101	Check the firewall and router configurations between the ECC and the email server to ensure that the ECC communicates with the email server properly.
	110	<ol style="list-style-type: none"> 1. Verify that the communication link between the ECC and the email server is normal. 2. Check whether the service port of the email server is enabled.
	111	Check whether the email server is running properly and whether the service port is started properly.
	112	Check whether the email server is running properly.
	113	Check the firewall and router configurations between the ECC and the email server to ensure that the ECC communicates with the email server properly.
Failed to establish a secure connection.	1	<ol style="list-style-type: none"> 1. Import the CA certificate that matches the email server certificate. 2. Check the validity period of the certificate and replace it with a valid CA certificate. 3. Provide monitoring run logs and contact the service center.
Failed to send the test email.	504	Check whether the outbox address matches the user name for logging in to the email server.
	535	<ol style="list-style-type: none"> 1. Log in to the email box of the email sender and start the SMTP service. 2. Check whether the user name and password for logging in to the email server are correct. 3. Log in to the email box of the email sender and start the third-party client license code function.
	553	Check whether the outbox address matches the user name for logging in to the email server.
	530	On the outbox configuration page, set Encryption mode to SSL .

Type	Error Code	Suggestion
	554	<ol style="list-style-type: none"> 1. Log in to the email server or contact the personnel of the third-party email server to modify the spam setting rule. 2. Provide ECC run logs and contact the service center.
	550	<ol style="list-style-type: none"> 1. Log in to the email server or contact the third-party email server personnel to add the IP address to the whitelist. 2. Provide ECC run logs and contact the service center.
	421	Reduce the email sending speed or contact the third-party email server personnel to increase the email server configuration limit.
	450	Contact the personnel of the third-party mail server to add the sender address to the whitelist and do not limit the sending rate.
	451	Provide ECC run logs and contact the service center to reduce the email sending frequency.
	534	Log in to the sender's mailbox client and enable the access to the insecure applications.

7.9 Linkage Control

Prerequisites

- You have obtained the IP address of the ECC800 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, and the PC is connected to the WAN_1 port on the ECC800.
- Ensure that **Enable linkage control function** is **Yes**.

Linkage Grouping

Table 7-14 Linkage grouping

Linkage Category	Default Status	Function
Link emergency ventilation with clasp lock open	Off	<p>When this linkage status is set to on:</p> <ul style="list-style-type: none"> • 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. • 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. • 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.
Link smoke alarm with clasp lock open	Off	<p>When this linkage status is set to on:</p> <ul style="list-style-type: none"> • If a smoke alarm is generated, the rear cabinet door is opened. • If the cabinet door is opened, the ECC800 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. • If the emergency heat dissipation control logic conflicts with the smoke alarm control logic, the smoke alarm control logic takes precedence. <p>NOTE If the fire extinguishing system is installed inside the smart module, the linkage function is not enabled.</p>

Linkage Category	Default Status	Function
Link fire control with clasp lock open	Off	<p>When this linkage status is set to on:</p> <ul style="list-style-type: none"> • If a fire alarm (dry contact alarm) is generated, the rear door of the cabinet is opened. • If the cabinet door is opened, the ECC800 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. • If the emergency heat dissipation control logic conflicts with the fire control logic, the fire control logic takes precedence. <p>NOTE If the fire extinguishing system is installed inside the smart module, the linkage function is not enabled.</p>

7.9.1 Linking the Smoke Alarm with Cabinet Electronic Clasp Lock Open

Context

In this example, the smoke sensor connects to port AI/DI_1. The actual port may vary.

Procedure

Step 1 Log in to the ECC800 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** page is displayed.
2. Set **Device type** to **ECC800** and **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.

7.9.2 Linking the Fire Control with Cabinet Electronic Clasp Lock Open

Context

In this example, the fire extinguishing system connects to port AI/DI_2. The actual port may vary.

Procedure

Step 1 Log in to the ECC800 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_2 signal name.

1. Log in to the ECC800 WebUI as an administrator.
2. Choose **System Settings > Signal Name Modify**. The **Batch Signal Configuration** page is displayed.
3. Set **Device type** to **ECC800** and **Device name** to **ECC800**, and click **OK**.
4. In the query result area, set the new signal name of **AI/DI_2** to **Fire extinguishing device** and click **Submit**.

Step 6 Enable the AI/DI device.

1. Choose **Monitoring > System > ECC800 > Running Parameters > AI/DI_2 Port Settings**.

2. Set **Fire sensor** to **Enable**. Click **Submit** to access the AI/DI_2 setting page.
3. Select **Fire sensor type** and set it to **Normal Open** or **Normal Close** as required.
4. Click **Unhide All Advanced Signals**, then click **Power Supply Parameters**. Ensure that **I power supply enable(AIDI_2/COM1/AIDI_4/COM3)** 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.

7.9.3 Linking the Emergency Ventilation with Cabinet Electronic Clasp Lock Open

Context

In this example, the smart cooling product connects to port COM3. The actual port may vary.

Procedure

- Step 1** Log in to the ECC800 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 emergency ventilation with clasp lock open** to **on**.

NOTE

Select **Link emergency ventilation 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.

----End

Follow-up Procedure

After the alarm is cleared, you need to manually close the door. After the door is closed, the door open alarm is cleared.

7.10 (Optional) Commissioning a C3220 (SD Card Configured)

Context

If the 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 browser and press **Enter**.
2. Set the password as prompted upon the first login. Then use the new password to 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 7-15 Setting the IP address of the camera

The screenshot shows a configuration page for setting the IP address of the camera. It includes the following fields and controls:

- IPv4 address assignment:** A dropdown menu with the option "Use the following IP address" selected.
- IPv4 address:** A text input field with a search icon on the right, containing three dots as placeholders.
- IPv4 subnet mask:** A text input field containing three dots as placeholders.
- IPv4 gateway:** A text input field containing three dots as placeholders.
- Primary DNS:** A text input field containing three dots as placeholders.
- Secondary DNS:** A text input field containing three dots as placeholders.
- Save:** A rounded button at the bottom of the form.

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 7-16 Setting audio and video parameters

Stream type	Primary, Secondary 1
Mirror mode	Disable
Full frame rate	25Hz
Watermark	<input type="checkbox"/>
Dynamic bit rate (kbit/s)	<input type="checkbox"/> 512 8192 4096
Dynamic frame rate	<input type="checkbox"/> 25

Primary stream		Secondary stream 1
Intelligent encoding	<input type="checkbox"/> 1 5 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)	512 8192 4096	
Frame rate	25	
Image quality	Supreme	
I-frame interval	1 500 50	
Layered encoding	<input type="checkbox"/>	

NOTE

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

Table 7-15 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. Import the motion detection algorithm package. Search for the algorithm package **SDC-C16_9.0.0.SPC307_beh.zip** on the technical support website, download the package, and decompress it. Go back to the web system, choose **Maintenance > Software-defined Camera**, and upload the algorithm package in the **Perimeter** firmware area.
6. Choose **Settings > Intelligent Analysis > Common Intelligence**. Select **Enable**, click **Add**, add motion detection areas, set motion detection parameters, and click **Save**.
7. Configure the device alert deployment and alarm linkage policy. Choose **Service > Alarm Service > Alarm Input**. Click **Intelligent Alarms** to access the **Motion** page. On the page that is displayed, you can configure **Device Alert Deployment** and **Alarm Linkage Policy**.

Figure 7-17 Configuring the device alert deployment

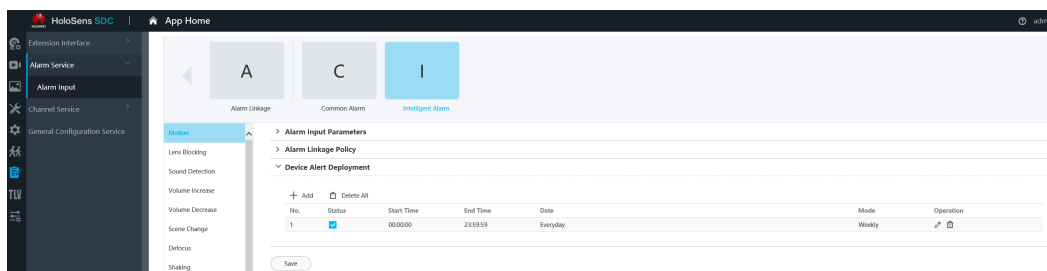
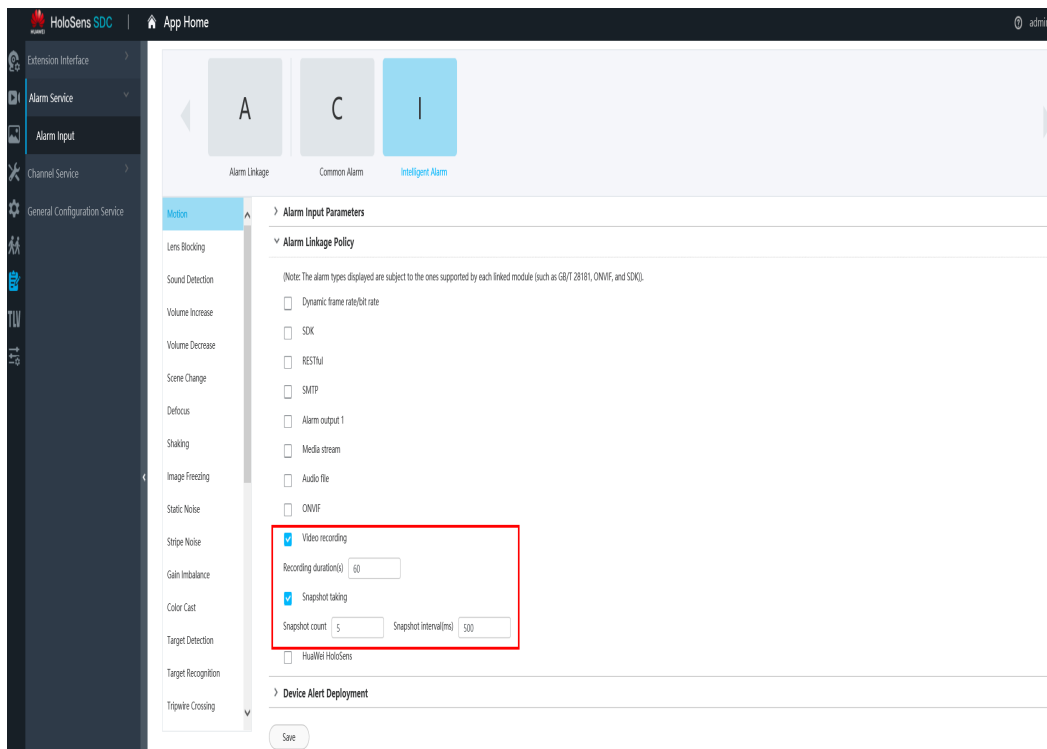


Figure 7-18 Configuring the alarm linkage policy



----End

7.11 (Optional) Commissioning a C3220 Camera (SD Card Not Configured)

Prerequisites

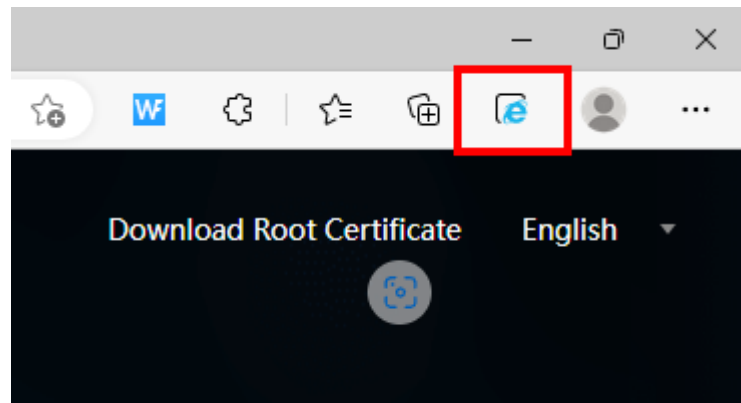
If the IVS1800 is configured and no SD card is chosen, perform the following procedure.

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 Microsoft Edge and press **Enter**.
 - a. When you open Microsoft Edge for the first time, choose **Settings > Default browser**, set **Allow sites to be reloaded in Internet Explorer mode (IE mode)** to **Allow**, restart the browser, go to the **Appearance** page, and click **Internet Explorer mode (IE mode) button**. After the setting is complete, open Microsoft Edge again, enter the IP address in the address bar, and click the IE mode button in the upper right corner of the page to log in. To use the IE mode, click the IE mode button on the toolbar.

Figure 7-19 IE mode button



2. Set the password as prompted upon the first login. Then use the new password to log in.

NOTE

- To prevent security risks, the system prompts you to set the password of the **admin** user when you log in to the system for the first time.
- If you enter incorrect passwords for five consecutive times, the account will be locked for 5 minutes by default.
- To prevent security risks, periodically log in to the system as the **admin** user, click the drop-down list in the upper right corner, and click **Change Password** to change the administrator password.

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 7-20 Setting the IP address

IPv4 address assignment

IPv4 address

IPv4 subnet mask

IPv4 gateway

Primary DNS

Secondary DNS

Table 7-16 IP address parameters

Parameter	Description
IPv4 address assignment	Method for obtaining the IP address. The options are Obtain IP address automatically and Use the following IP address . The default value is Obtain IP address automatically .
IPv4 address	Camera IP address. This parameter is available only when IPv4 address assignment is set to Use the following IP address . Enter the planned IP address, for example, 192.168.1.161 . 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 192.168.0.1 .
IPv4 subnet mask	Subnet mask of the network where the camera is located. The default value is 255.255.255.0 .
Primary DNS	Primary DNS IP address. The default value is 0.0.0.0 .
Secondary DNS	Secondary DNS IP address. The default value is 0.0.0.0 .

3. 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 7-21 Setting primary stream parameters

The screenshot shows a configuration window for video encoding parameters. It has two tabs: 'Primary stream' (selected) and 'Secondary stream 1'. The 'Intelligent encoding' checkbox is unchecked. A slider for ROI is set to 3, with a note stating that ROI and stream smoothing are disabled when intelligent encoding is enabled. Other parameters are set via dropdown menus: H.265, Main profile, 1280 * 720, Variable bit rate, 2048 kbit/s, 25 frame rate, Supreme quality, and 50 I-frame interval. Layered encoding is also unchecked.

Parameter	Value
Intelligent encoding	<input type="checkbox"/>
ROI	3
Encoding protocol	H.265
Encoding complexity	Main profile
Resolution	1280 * 720
Bit rate type	Variable bit rate
Max. bit rate (kbit/s)	2048
Frame rate	25
Image quality	Supreme
I-frame interval	50
Layered encoding	<input type="checkbox"/>

Figure 7-22 Setting secondary stream 1 parameters

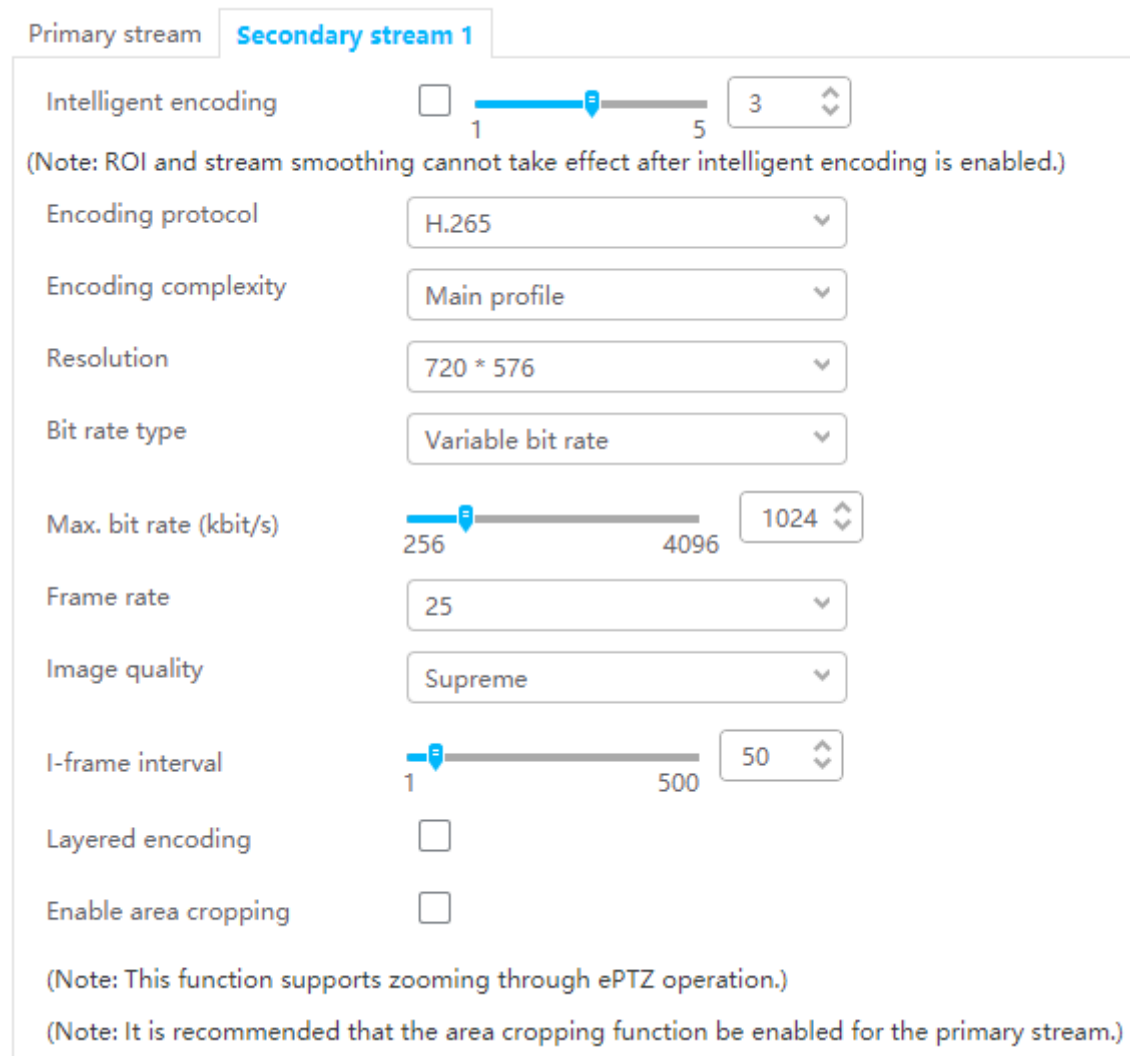


Table 7-17 Video stream parameters

Parameter	Description
Primary stream/ Secondary stream	<p>Set the stream type based on the site requirements.</p> <ul style="list-style-type: none"> – Primary stream: The primary streams feature high bit rate, definition, and bandwidth consumption. They are applicable to local storage. – Secondary stream: The secondary streams provide smooth video, occupy small bandwidth, and are applicable to data transmission over low-bandwidth networks. <p>NOTE SD card recording supports only primary streams.</p>

Parameter	Description
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 Encoding protocol to H.264.</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>
Encoding protocol	<p>Set the coding protocol based on the site requirements. The options are as follows:</p> <ul style="list-style-type: none"> - H.264: The H.264 protocol requires relatively small bandwidth to ensure video quality. - MJPEG: 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. - H.265: The H.265 protocol is bandwidth-conserving compared with the H.264 protocol.
Encoding complexity	<p>The options of H.264 profiles include Base profile, Main profile, and High profile. 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>

Parameter	Description
Bit rate type	<p>This parameter is available only when you set Encoding protocol to H.264 or H.265.</p> <p>The bit rate is measured by data bits transmitted in a unit of time.</p> <ul style="list-style-type: none"> - Variable bit rate: 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. - Constant bit rate: 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.
Max. bit rate	<p>This parameter is available only when you set Bit rate type to Variable bit rate.</p> <p>The bit rate range depends on the selected resolution.</p>
Bit rate value	<p>Average bit rate when Bit rate type is set to Constant bit rate.</p> <p>The bit rate range depends on the selected resolution.</p>
Bit rate control mode	<p>This parameter is available only when you set Bit rate type to Constant bit rate. The options are as follows:</p> <ul style="list-style-type: none"> - Frame rate priority: Ensure the smoothness of the video image. - Image quality priority: Ensure the quality of the video image.
Frame rate	<p>The frame rate is measured by the number of frames displayed in a second.</p> <p>A higher frame rate indicates clearer and smoother images and higher bandwidth consumption.</p>
Image quality	<p>This parameter is available only when you set Encoding protocol to H.264 or H.265 and Bit rate type to Variable bit rate.</p> <p>Better image quality requires higher bandwidth. Therefore, select proper image quality based on the site requirements.</p>
I-frame interval	<p>This parameter is available only when you set Encoding protocol to H.264 or H.265.</p> <p>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.</p>

Parameter	Description
Layered encoding	This parameter is available only when you set Encoding protocol to H.264 or H.265 . To enable layered encoding, select Layered encoding .
JPEG quality	This parameter is available only when you set Encoding protocol to MJPEG . A larger value indicates higher image quality.

----End

7.12 (Optional) Commissioning the IVS1800

7.12.1 Setting Parameters on the IVS1800 WebUI

Context

A default IP address has been configured for the IVS1800 before delivery. Modify the IP address based on the actual network plan.

NOTICE

- The parameter setting method varies according to the IVS1800 software version.
- This section uses IVS1800 9.1.0 as an example to describe how to set parameters. For details, see the IVS1800 product documentation of the corresponding software version.

Procedure

- Step 1** Check whether the network connection between the PC for logging in to the OMU portal and the IVS1800 is normal.

If the device is just delivered or has just been restored to factory settings, ensure that the PC for logging in to the OMU portal is directly connected to the IVS1800 and is in the same network segment as the IVS1800.

For the device that is just delivered or has just been restored to factory settings, its network information is as follows:

- IP address: 192.168.3.111
- Subnet mask: 255.255.255.0
- Gateway address: 192.168.3.1

- Step 2** Enter **https://IP address:8443** in the address box, and press **Enter**.

In the URL, **IP address** indicates the IP address of the IVS1800.

Step 3 Log in to the OMU portal. Set the service system and operating system passwords at the first login.

1. Set the password for user **admin** of the service system.
2. Set the password for user **admin** of the operating system.
3. Set the password for user **root** of the operating system.
4. Use the configured service system password to log in to the OMU portal again.

Step 4 Configure disk initialization.

 **NOTE**

Recording data can be stored only after you install and initialize the disks.

1. Choose **Storage > Disks** and click **Forcibly Format**.
2. Configure disk initialization.

Figure 7-23 Disk initialization (RAID 5 economical configuration by default)

Data Storage Mode RAID High Reliability NON-RAID
Configuration Mode RAID5 Recommended RAID5 Economical

Tips:

1. RAID5 Recommended: Only one RAID group is configured, but one hot spare disk is configured to ensure high security.

2. RAID5 Economical: Only one RAID group is created. Capacity is large, but no hot spare disk is available, resulting in low reliability and security.

Start

NOTICE

- If one or two hard disks are configured, select **NON-RAID**.
 - If three or more hard disks are configured, confirm with the product manager whether to configure the RAID function.
 - To configure the RAID function, select **RAID High Reliability** and then **RAID5 Economical**.
 - If the RAID function is not configured, select **NON-RAID**.
-

Table 7-18 RAID mode description

Parameter Name	Description
RAID High Reliability	<ul style="list-style-type: none"> - RAID5 Recommended Four or more hard disks are required, and one hard disk is used as the hot spare disk. - RAID5 Economical Three or more hard disks are required, and one hard disk is used as the hot spare disk.
NON-RAID	<ul style="list-style-type: none"> - Each recording file is stored on only one hard disk. The disk usage is high, but the data storage reliability is lower than that in RAID 5 mode. - When the number of hard disks is greater than or equal to 7, the system automatically uses the three hard disks with the smallest slot numbers to form a RAID 1 group, in which one hard disk functions as the hot spare disk. Every four of the remaining hard disks form a RAID 10 group. If the number of remaining hard disks is less than 4, the disks do not form a RAID 10 group.

Step 5 Modify the IP address for the IVS1800.

1. Choose **System > Network Configuration**. Set the service IP address (internal IP address of the IVS1800), time zone, and time according to the site requirements.

Figure 7-24 Network adapter settings (single address by default)

Network Adapter Settings

*Mode Single address Double address

Connection status eth0 eth1

Name

*Service IP Address

*Subnet Mask

*Gateway IP Address

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 values may vary.

- 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.

Step 6 Configure NAT on the IVS1800.

- Configure the PUBLIC module.
 - Choose **System > Advanced Configuration**, set **Module** to **PUBLIC**, and click **Search**.
 - Click **Edit** in the record where the value of **Parameter Name** is **NNatIP**, set the external IP address of the IVS1800, and click **Save**.

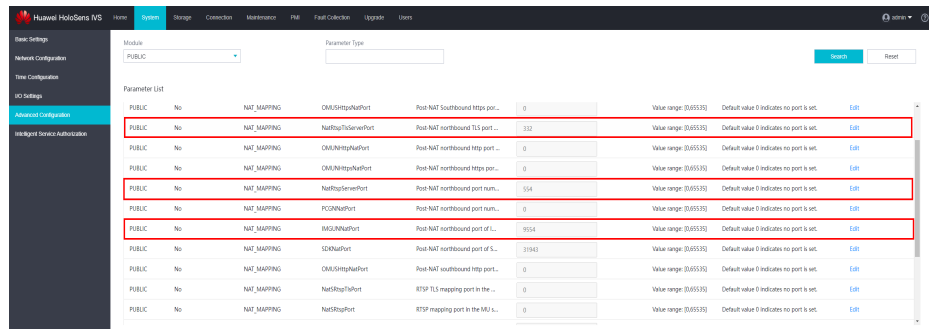
Figure 7-25 Setting the external IP address of the module

Module	Parameter Name	Parameter Type	Value	Default Value	Remarks
PUBLIC	IMGUNNatPort	Post NAT northbound port of L...	9554	Value range: [0,65535]	Default value 0 indicates no port is set.
PUBLIC	SOXNATPort	Post NAT northbound port of S...	31943	Value range: [0,65535]	Default value 0 indicates no port is set.
PUBLIC	OMUHttpPort	Post NAT northbound http port...	0	Value range: [0,65535]	Default value 0 indicates no port is set.
PUBLIC	NatHttpPort	HTTP-TLS mapping port in the ...	0	Value range: [0,65535]	Default value 0 indicates no port is set.
PUBLIC	NatHttpsPort	HTTPS-TLS mapping port in the ...	0	Value range: [0,65535]	Default value 0 indicates no port is set.
PUBLIC	SOXNATPort	Southbound NAT port of SOX...	0	Value range: [0,65535]	Default value 0 indicates no port is set.
PUBLIC	NNatIP	Northbound post-NAT IP address...	104.43.102.27	IP address	Default value 127.0.0.1 indicates no IP address.
PUBLIC	NNatIP	Southbound NAT IP address, wh...	104.43.102.27	IP address	Default value 127.0.0.1 indicates no IP address.
PUBLIC	OCG_NAT_LIST	NAT subnet list. Use webconso...		Network address	NAT subnet list, which is used to determine...
PUBLIC	OCG_NAT_LIST	NAT subnet list, used by differe...		IP address and netwo...	OCG enterprises NAT scenario for VMC or th...
PUBLIC	System attribute	Language	en CN	The value is en_CN or ...	Modifying this parameter will expose the syst...

- Click **Edit** in the row where the value of **Parameter Name** is **IMGUNNatPort**, and set the NAT port number of the IMGU. Ensure that the setting is the same as the NAT mapped port number configured on the firewall. Click **Save**.

- d. Click **Edit** in the row where the value of **Parameter Name** is **NatRtspServerPort**, and set the NAT port number of the MU. Ensure that the setting is the same as the NAT mapped port number configured on the firewall. Click **Save**.
- e. Click **Edit** in the row where the value of **Parameter Name** is **NatRtspTlsServerPort**, and set the NAT port number of the MU. Ensure that the setting is the same as the NAT mapped port number configured on the firewall. Click **Save**.

Figure 7-26 Setting the external IP address of the module



- 2. Set other parameters based on the site requirements by referring to the preceding steps.

Table 7-19 Parameter description

Module Name	Parameter Name	Setting
PUBLIC	NNatIP	Northbound IP address of the IVS1800, which must be the same as the NAT-mapped IP address configured on the firewall.
	IMGUNNatPort	NAT port number of the IVS1800 IMGU, which must be the same as the NAT-mapped port number configured on the firewall. The default port number of the IMGU before mapping is 9554.
	NatRtspServerPort	NAT port number of the IVS1800 MU, which must be the same as the NAT mapped port number configured on the firewall. The default port number of the MU before mapping is 554.

Module Name	Parameter Name	Setting
	NatRtspTlsServerPort	TLS NAT port number of the IVS1800 MU, which must be the same as the NAT mapped port number configured on the firewall. The default TLS port number of the MU before mapping is 322.

Step 7 (Optional) Configure the IVS1800 to synchronize time with the NTP server. Choose **System > Time Configuration** and configure the server time.

Table 7-20 Parameter description

Parameter	Setting
The NTP clock source server	Indicates whether the NTP clock source server is specified for time synchronization. <ul style="list-style-type: none"> • Select Yes if an NTP server is configured onsite. • Select No if no NTP server is configured onsite.
NTP server IP	Indicates the IP address of the NTP clock source server. After this parameter is specified, the server synchronizes the time to this clock source.

- If an NTP server is configured onsite, synchronize the time with the NTP server.
- If no NTP server is configured onsite, manually configure the server time: Change **Timezone config** and **Time config** based on the time of the source server to be synchronized.

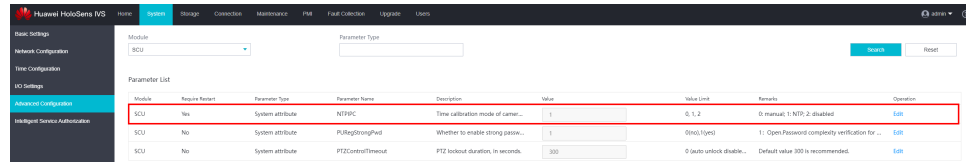
Step 8 Configure cameras to synchronize time with the IVS1800.

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 on the server, cameras will automatically synchronize time with the server.

1. Log in to the OMU portal as user **admin**.
2. Choose **System > Advanced Configuration**.
3. Set **Module Name** to **SCU** and click **Search**.
4. In the search results, click **Edit** in the row where **Parameter Name** is **NTPIPC** and set **Value** to **1**.

- 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 7-27 Configuring camera NTP synchronization



Step 9 Create a user.

When connecting to the IVS1800 on the NetEco, you need to log in as a non-admin user.

- Log in to the OMU portal as user **admin**.
- Choose **Users > Manage User > 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.

- Set **Multi-point logins** to a value greater than 2.
- On the **User List** page, click **Permission Settings** next to the new user, select the cameras to be browsed and queried, set other parameters, and click **Save**.

----End

7.12.2 Setting Parameters on the iClient S100

Prerequisites

- The network communication between the IVS1800 and the camera is normal.
- The network communication between the PC where the iClient S100 is installed and the device is normal.

NOTICE

- The parameter setting method varies according to the software version of the iClient S100.
- This section uses iClient S100 V2.3.0 as an example to describe how to set parameters. For details, see the iClient S100 user manual of the corresponding software version.

Procedure

Step 1 Obtain the client installation package from the **HOLOWITS**.

- Register an account, log in to the **HOLOWITS** (<https://www.hollowits.com.sg/documentation>), and enter **iClient** in the search box.

2. Select **iClient S100** in the search result and select **V2.3.0** to download the installation package. If the installation package of the required version is unavailable, download the latest version, install it, and commission the iClient S100 by referring to the iClient S100 user manual of the required version.

 **NOTE**

- Use your mobile number to register a Huawei Cloud account, complete real-name authentication, and then log in to the **HLOWITS**.
- Before installing the iClient S100, you are advised to disable the antivirus software installed on your computer or preinstalled on the Windows operating system, to prevent environment check failures. You can ignore any antivirus software exception detected during the environment check.
- The check takes a few seconds.

Step 2 Right-click the client installation program and choose **Run as administrator** from the shortcut menu. Select a language during the installation and click **OK**.

Step 3 Select an installation mode (for example, server+client) and click **Next**.

Two installation modes are available: server+client and client. Choose the installation mode based on site requirements. For details, see the following table.

Table 7-21 Installation modes

Installation Mode	Scenario and Restriction
Server+Client	<ul style="list-style-type: none"> • An iClient S100 system requires at least one iClient S100 server. • When only one client is required for service configuration and operations, you only need to complete the installation in this mode. • In this mode, if you log in to the local iClient S100 server, enter 127.0.0.1 as the server IP address. If you log in to other iClient S100 servers, enter the IP address of the peer PC as the server IP address.
Client	<ul style="list-style-type: none"> • When configuring services and performing operations on multiple clients, select the client mode on other computers in addition to the server+client mode on the local computer. • Currently, one iClient S100 server can connect to a maximum of 16 clients (including the one installed on the computer in server+client mode). • In this mode, enter the IP address of the iClient S100 server after logging in, that is, the IP address of the PC where the existing server is installed.

Step 4 Select **I accept this agreement (A)** and click **Next**.

Step 5 Set parameters such as the server port and click **Next**.

 **NOTE**

- The default values of **Web Port** and **Adms Port** are **8098** and **8088** respectively. If the ports are occupied, manually change the port number. Use a port number that is not in use and that is not the database port number **5442** or Redis port number **6390**, **21**, or **80**.
- Select **Add exception to the firewall** to prevent the Windows firewall from blocking the program.

Step 6 Select the installation directory and click **Next**.

 **NOTE**

The default installation path is **C:\Program Files\iClient S100**. You can also click **Browse** to specify the installation path. Ensure that the selected installation path has sufficient disk space as prompted.

Step 7 Select the path for saving the backup files and click **Next**.

 **NOTE**

By default, the system scans all disks, locates the disk with the largest available space, and creates the **SecurityDBBack** folder. You can also click **Browse** to specify the path for storing the backup files.

Step 8 Click **Install** to start the installation.

Step 9 A message is displayed at the end of installation, asking whether to restart the computer immediately (the default option is **Yes**). If **Yes** is selected, after you click **Finish**, the computer automatically restarts to complete the installation.

 **NOTE**

After the software is installed, it takes about 2 minutes to start services. Wait until all services are started and then perform operations.

Step 10 Connect to the iClient S100.

Step 11 Start the client.

- On Windows 7, double-click the **iClient S100** icon. The login page is displayed.
- On Windows 10, right-click the **iClient S100** icon, choose **Properties > Compatibility**, select **Run as an administrator**, and click **OK**. Then double-click the **iClient S100** icon. The login page is displayed.

Step 12 Log in to the iClient S100.

Figure 7-28 Logging in to the client

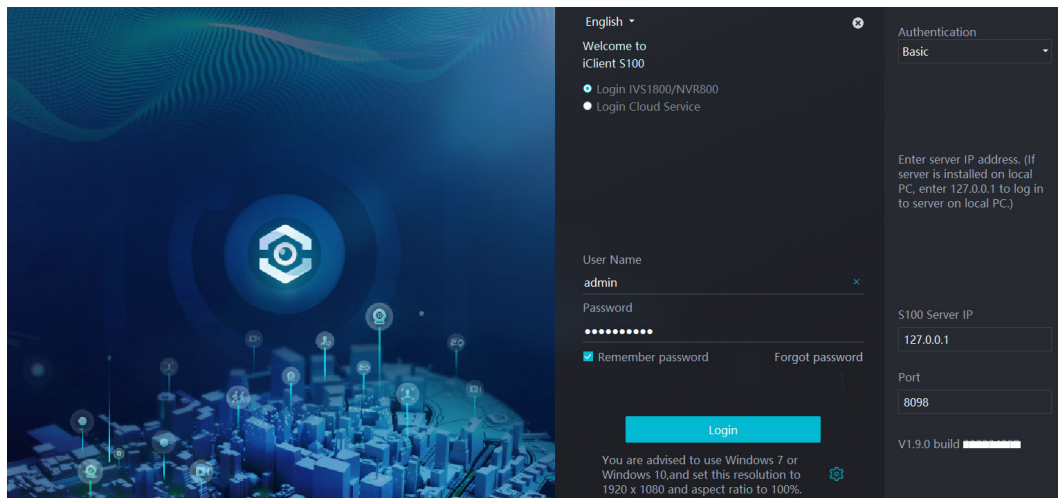




Table 7-22 Parameter description

Parameter	Description
Chinese/ English	Select a display language for the iClient S100.
User Name/ Password	<p>Enter the user name and password of the administrator or a new user.</p> <p>For details about how to add a new user, see Comprehensive Services > Authority Management > Adding a User in iClient S100 User Manual.</p> <p>NOTE</p> <ul style="list-style-type: none"> You need to set the password upon the first login. Click  to clear the password. Hold the mouse button down on  to view the current password.
Remember password	If you select this option, the password of the user used for the last login is saved.
Forgot password	<p>If you have bound your account to an email address, you can retrieve your password using your email address.</p> <p>For details about how to bind your email address, see Comprehensive Services > Authority Management > Adding a User in iClient S100 User Manual.</p> <p>For details about how to configure the mailbox parameters, see FAQs > Comprehensive Services > Basic Management > How Can I Configure Support for Sending Emails? in iClient S100 User Manual.</p>

Parameter	Description
Port	<p>Port number</p> <p>NOTE The default values of Web Port and Adms Port are 8098 and 8088 respectively.</p> <p>If the ports are occupied, manually change the port number. Use a port number that is not in use and that is not the database port number 5442 or Redis port number 6390, 21, or 80.</p>
S100 Server IP	<ul style="list-style-type: none"> • Server+client installation: <ul style="list-style-type: none"> - If a local server is used, the server IP address is the local IP address 127.0.0.1. - If you want to log in to another server, enter the IP address of the PC where the server is located. • Client installation: Enter the IP address of the PC where the server to be connected is located. <p>CAUTION Ensure that the PC where the iClient S100 server is installed is started and the network is normal. Otherwise, service operations on the client that logs in to the server may fail.</p>

Step 13 On the iClient S100 home page, choose **Maintenance Management > Video Device > Device List**.

Step 14 Click **Add** in the upper right corner. You can select **IP Access** or **Search Access**. The following table describes the parameters on the page of adding a device.

Table 7-23 Adding a device

Parameter/Button	Description
Device Type	Specifies the type of the device to add (IVS1800).
Name	Specifies the device name.
Address	Specifies the device address. The format is xxx.xxx.xxx.xxx, for example, 192.168.1.10.
Port	Specifies the device port. The default port number is 18531.
User Name	<ul style="list-style-type: none"> • You are advised to create a user to access the iClient S100. For details, see 1. After configuration, the user can directly access the iClient S100. The iClient S100 allows the user to change the password upon the first login. <p>If the user password is changed on the OMU portal, right-click the device on the iClient S100, choose Edit from the shortcut menu, enter the new password, and log in to the iClient S100 again.</p>

Parameter/Button	Description
Password	<ul style="list-style-type: none"> If the default user admin (with a custom password) logs in to the IVS1800 for the first time, the page for changing the password is displayed. You are advised not to use this user to log in to the iClient S100.

Step 15 Add cameras. The following describes the general process. For details, see related sections in the *IVS1800 9.1.0 Product Documentation*.

1. On the iClient S100 home page, choose **Maintenance Management > Video Device > Device List > Main Devices**.
2. Right-click an IVS1800 and choose **Camera Access**.
3. Select **Auto Batch Access** and click **Start**.
4. Set the IP address segment according to the following table.

Table 7-24 Parameter description

Parameter	Setting
Drive	Select HWSDK .
IP address segment	<p>Enter the start and end IP addresses of the camera. You are advised to set the IP address segment accurately to minimize the search time.</p> <ul style="list-style-type: none"> - The system supports multiple IP address segments (including different VLANs). - If you do not set the IP address segment, only cameras whose IP addresses are in the same subnet as the IP address of the local server can be found in the system.

5. Verify the account. Select **IP Address**, enter the user name and password, click **Batch Verify**, and click **Next**.

 **NOTE**

The user name and password are the ones used for registering the camera with the HWSDK protocol.

6. Click **Finish**.

Step 16 Set the camera type.

1. Choose **System Management > Devices > Device Management > Micro Edge**.
2. Select an IVS1800.
3. Right-click the camera for which you want to set the intelligent attribute and choose **Configure** from the shortcut menu.
4. Choose **Video Channel > Video**.
5. Set the checkpoint camera type.

----End

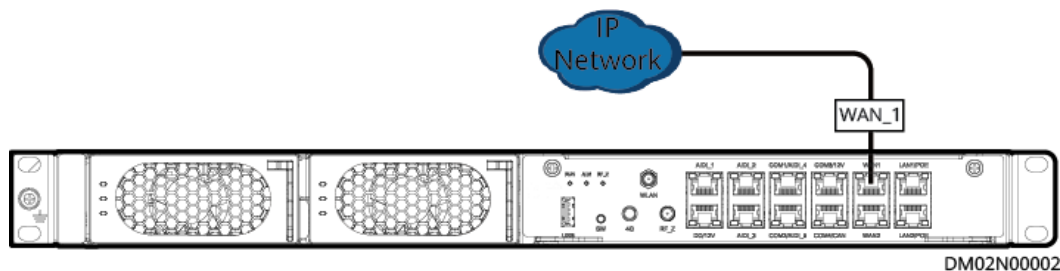
7.13 (Optional) NetEco Management

7.13.1 Connecting a Communications Cable

Networking Through the WAN1 Port

Step 1 Connect the communications cable to the WAN1 port on the ECC800-Pro.

Figure 7-29 Connecting a communications cable

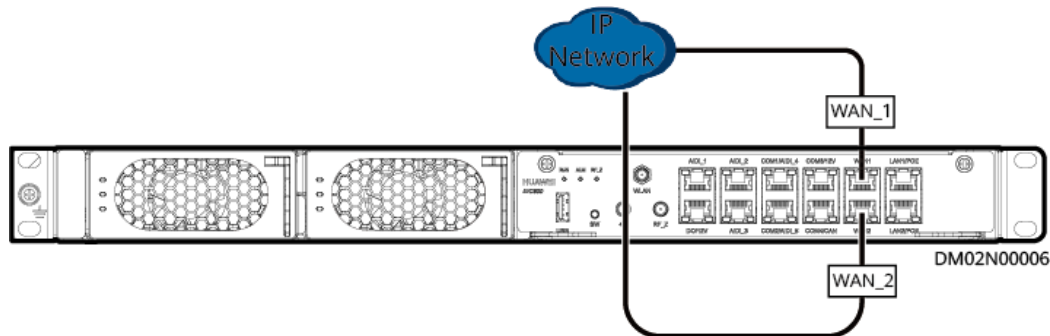


----End

Networking Through the WAN1 and WAN2 Ports

Step 1 Connect the communications cable to the WAN1 and WAN2 ports on the ECC800-Pro.

Figure 7-30 Connecting communications cables



 **NOTE**

When the same NetEco is accessed through the WAN1 and WAN2 ports, the WAN1 and WAN2 ports back up each other.

For example, when the WAN1 is disconnected from the NetEco, the ECC800-Pro establishes a link with the NetEco through the WAN2.

- In this scenario, select **WAN_1/WAN_2** when configuring the network port for link setup.
- In this scenario, the MAC addresses of the WAN1 and WAN2 ports are the same by default. You need to configure a static route for the WAN2 by referring to the method of configuring dual MAC addresses and static routes.

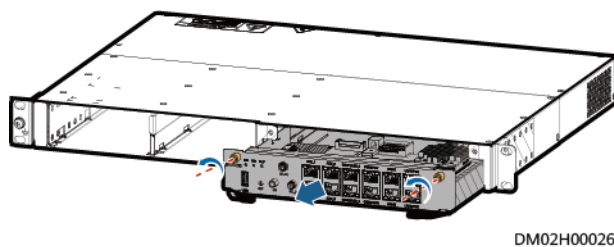
----End

4G Networking

4G communication can be used to access the NetEco management system that has a public IP address.

- Step 1** Loosen the screws on both sides of the panel of the ECC800-Pro main control module.
- Step 2** Pull the handles on both sides of the panel of the ECC800-Pro main control module, and remove the module.

Figure 7-31 Removing the ECC800-Pro main control module



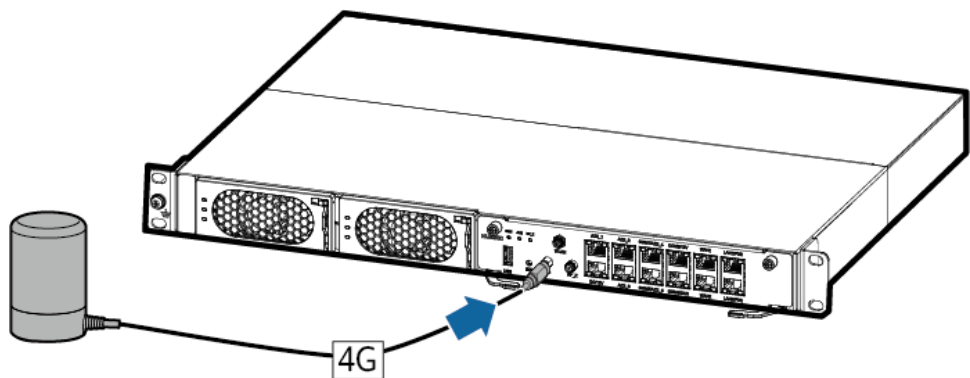
- Step 3** Install the SIM card.

 **NOTE**

The monthly traffic of the SIM card is not less than the total traffic of all networked devices. It is recommended that the monthly traffic of the SIM card be greater than or equal to the total number of networked devices multiplied by 20 MB.

- Step 4** Insert the ECC800-Pro main control module into the slot.
- Step 5** Tighten the screws on both sides of the panel of the ECC800-Pro main control module.
- Step 6** Install a 4G antenna.

Figure 7-32 Installing a 4G antenna



DM02H00029

----End

7.13.2 Setting NetEco Parameters

Procedure

- Step 1** Apply for a fixed IP address to the equipment room network administrator.
- Step 2** Set ECC800-Pro communications parameters.
 - (WAN1 port networking) On the ECC800-Pro WebUI, set the IP address, subnet mask, and default gateway, and click **Submit**.

Table 7-25 IP parameters

Path	Parameter	Default Value	Setting
System Settings > System Parameters > Monitor IP > WAN_1	IP	192.168.8.10	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.

- (4G networking) Set mobile data parameters on the ECC800-Pro WebUI.

Table 7-26 Mobile data

Path	Parameter	Default Value	Setting
Choose System Settings > System Parameters > Mobile Data.	Mobile data control	Disable	Set this parameter to Enable and click Submit .

Step 3 Click **Submit**.

Step 4 Set NetEco communications parameters and authentication password on the ECC800-Pro WebUI.

Table 7-27 NetEco parameters

Path	Parameter	Default Value	Setting
System Settings > NMS Application > NetEco > Communication Parameters	Server IP	192.168.8.11	IP address of the primary NetEco server NOTE 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 7-28 Setting an 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. NOTE 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

7.13.3 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 for **iMaster NetEco License Application Guide**, and apply for the license of the NetEco software by referring to the guide.
- For carriers:
 - a. Log in to Huawei's carrier support website <https://support.huawei.com>.
 - b. Browse or search for **iMaster NetEco License Application Guide**, and apply for the license of the NetEco software by referring to the guide.

7.13.4 Obtaining the Adapter Software Installation Packages

Obtaining the Adapter Software Installation Packages

This section describes how to obtain the adapter software installation package.

- For enterprise users:
 - a. [Log in to the iMaster NetEco Huawei enterprise technical support website.](#)
 - b. Obtain the **iMaster NetEco V600R021C10SPCXXX ReleaseDoc_EN (Data Center).zip**, **DP_V600R021C10SPCXXX_XXAdapters.zip**, and **DP_V600R021C10SPCXXX_DomainAdapters.zip** packages, decompress the packages, and search for the adapter software installation package in the **DP_V600R021C10SPCXXX_XXAdapters** based on the NE types and versions in the *iMaster NetEco V600R021C10XXX Version Mapping (Data Center)*.
- For carriers:
 - a. [Log in to the iMaster NetEco Huawei technical support website.](#)
 - b. Obtain the **iMaster NetEco V600R021C10SPCXXX ReleaseDoc_EN (Data Center).zip**, **DP_V600R021C10SPCXXX_XXAdapters.zip**, and **DP_V600R021C10SPCXXX_DomainAdapters.zip** packages, decompress the packages, and search for the adapter software installation package in the **DP_V600R021C10SPCXXX_XXAdapters** based on the NE types and versions in the *iMaster NetEco V600R021C10XXX Version Mapping (Data Center)*.

On the **Software** tab page, download the NetEco software and digital signature files.

Verifying Software Packages

To prevent software packages from being maliciously tampered with during transmission or storage, you need to download the corresponding signature file during the software package download for integrity verification.

After the software package is downloaded, verify its PGP digital signature according to the *OpenPGP Signature Verification Guide*. If the software package fails to pass the verification, do not use the software package and contact Huawei technical support.

Before a software package is used in installation, its digital signature also needs to be verified according to the *OpenPGP Signature Verification Guide* to ensure that the software package is not tampered with.

- For carrier users, visit <https://support.huawei.com/carrier/digitalSignatureAction>.
- For enterprise users, visit <https://support.huawei.com/enterprise/en/tool/pgp-verify-TL100000054>.

7.13.5 Powering On a Server

This topic describes how to power on a server.

Procedure

- Step 1** Check that the power cables and ground cables of the upstream components of the server are securely connected with correct polarity and in good contact.
- Step 2** Ensure that the upstream input power supply is not connected. Use a multimeter to measure the resistance between the upstream output power supplies and between the working ground and the protection ground. It is required that short circuits not occur between power outputs or between the working ground and protective ground.
- Step 3** Turn on the switch for the upstream power supply of the server.
- Step 4** 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 displayed green.

Figure 7-33 Power button on the 2288X V5 server



Figure 7-34 TaiShan 200 server power button



----End

7.13.6 Logging In to the NetEco Client

This section describes how to log in to the NetEco client using a web browser.

Prerequisites

- The network connection between your PC and the client IP address of the NetEco is normal and the function of the O&M plane are running properly.
- You have obtained the user name and password for login.

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.
- Latest Chrome (Stable Channel) and Firefox (ESR Release) are recommended.
- You are advised to set the display resolution as 1920 x 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. The relevant party will 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

7.13.7 Loading the NetEco Software 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

7.13.8 Installing NE Adapters

Install the NE adapters on the NetEco.

Prerequisites

You have obtained the adapter software installation packages.

Procedure

1. Choose **Device Management > Configuration > Device Integration**.
2. In the navigation tree on the left, choose **Adapter Management** and click **Upload**.
3. On the page that is displayed, click + to select the file to be uploaded.
4. Click **Upload** to upload the files.
5. Select the NE adapter packages to be installed on the **Adapter Management** page, and click **Install**. Then, click **Yes** in the displayed dialog box.

The time required for the installation is related to the number of adapters. Wait for the installation to complete.

7.13.9 Adding a Management Domain

7.13.9.1 General Operation: Adding a Management Domain

This section describes how to create a management domain.

Prerequisites

The management domain adapter 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 subordinate relationship between management domains and devices before performing operations.
- The NetEco is preconfigured with management domains such as cabinets, battery cabinets, buildings, containers, floors, FusionModule500, smart modules, NetEco sites, parks, PDUs, equipment rooms, and subnets. To use more management domains, you need to install the corresponding adapter software package on the NetEco.

Procedure

Step 1 Log in to the NetEco client.


Step 2 On the main menu, choose **Device Management > Configuration > Planning Configuration**.

Step 3 Choose the upper-layer node of the management domain to be added in the navigation tree on the left.

Step 4 In the **Domain** area on the lower left of the page, drag a management domain icon to the required position in the planning configuration area.

NOTE

You can adjust the shape of **Room, Room-ShapeNode, Building-ShapeNode, Floor-ShapeNode, Container-ShapeNode, and NetecoSite** by:

1. Hold down **Shift** and click the frame to add a yellow dot.
2. Click and move the yellow dot to design an irregular polygon.
3. To delete a management domain, click the domain icon and select **Delete** under .

Step 5 In the right side of the view area, set **Management Info**.

NOTE

You can configure **Management Info, Electricity Info, and Refrigeration Info** for the equipment room management domain.

Step 6 Click  on the toolbar to save the settings.

Step 7 Repeat steps **Step 3** to **Step 6** until the configuration is complete.

----End

7.13.9.2 Example: Adding a Smart Module

This section describes how to create a module in the root node, subnet, equipment room, container, or site management domain.

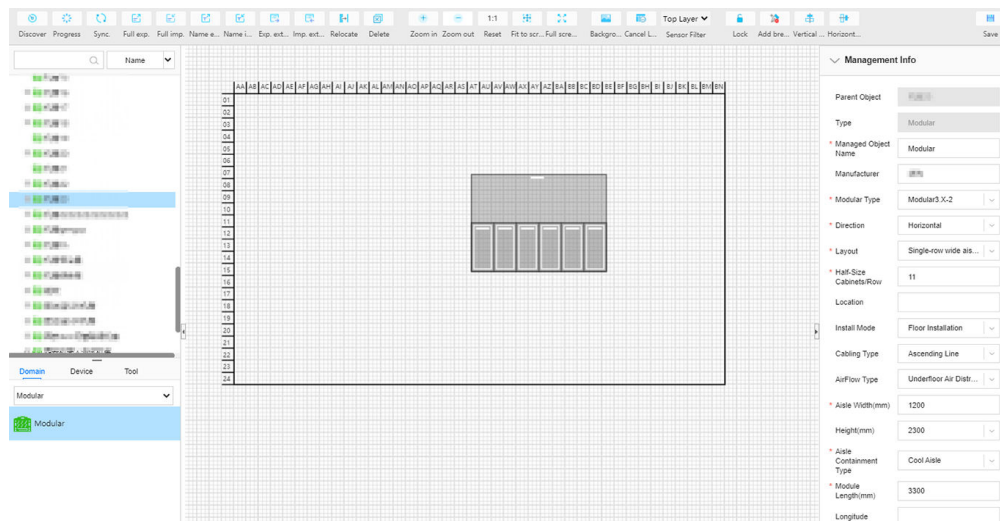
Prerequisites

You have created management domains in **Planning Configuration**.


Procedure

- Step 1** Log in to the NetEco client.
- Step 2** On the main menu, choose **Device Management > Configuration > Planning Configuration**.
- Step 3** Choose the management domain where you want to add a smart module from the navigation tree on the left.
- Step 4** In the **Domain** area on the lower left of the page, select **Modular** from the drop-down list box.
- Step 5** Select the **Modular** to be added and drag the modular icon to the management domain area.

Figure 7-35 Adding the smart module in the room area





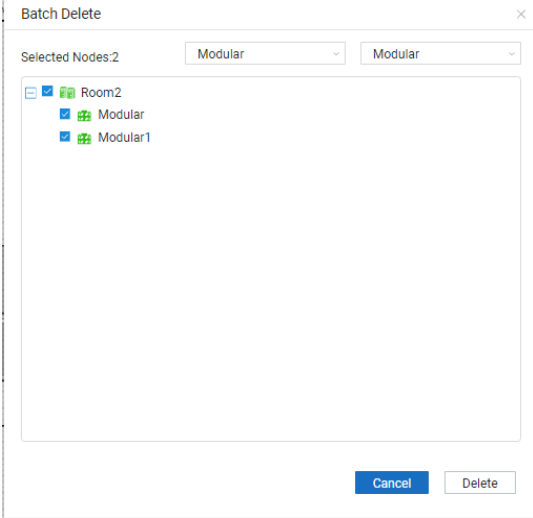

- Step 6** Modify **Management Info** of the smart module as required or retain the default values.

- Step 7** Click  on the toolbar to save the settings.

----End

Follow-up Procedure

Perform the following operations on the **Planning Configuration** page as required.

Related Operations	Procedure
Delete modules	<p>You can delete one module or multiple modules in batches on the current page.</p> <p>NOTE If a module contains subdevices, you cannot delete it. You can delete the module only after you delete subdevices in the module.</p> <ul style="list-style-type: none"> • Delete one module. <ol style="list-style-type: none"> 1. Right-click Modular and click Delete under . 2. In the displayed Confirm dialog box, click Yes. • Delete multiple modules in batches. <ol style="list-style-type: none"> 1. Click  on the toolbar. The Batch Delete dialog box is displayed. <p>Figure 7-36 Deleting multiple modules in batches</p>  <ol style="list-style-type: none"> 2. In the filter box, set filter criteria to filter required modules. 3. Select the smart module to be deleted and click Delete. 4. In the displayed Confirm dialog box, click Yes.
Add tools	<ol style="list-style-type: none"> 1. Select the module for which you want to add a pillar. 2. In the lower-left corner of the current page, click Tool. 3. Select the Pillar component to be added and drag it to the planning configuration area. <p>NOTE After the component is added, you can set attributes for the component in the Component Info list in the right pane. The system automatically displays values for Parent Name and Control Type, and you do not need to manually set them, you only need to set Name.</p> <ol style="list-style-type: none"> 4. In the upper area of the current page, click .

7.13.10 Creating an ECC800-Pro on the NetEco

Prerequisites

- You have logged in to the NetEco client using a web browser.
- You have created a smart module in **Planning Configuration**.

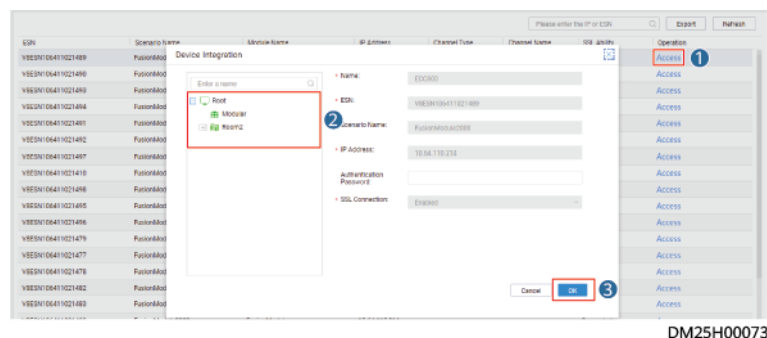
Context

For detailed operations, see *iMaster NetEco Device Installation and Commissioning Guide (Data Center)* of the corresponding version.

Procedure

1. On the main menu, choose **Device Management > Configuration > Planning Configuration**. The **Planning Configuration** page is displayed.
2. On the **Planning Configuration** page, click **Discover** in the upper left corner.
3. Click **Access** to access the **Device Integration** page. You can add an ECC800-Pro device to the specified smart module on the page.

Figure 7-37 Adding an ECC800-Pro device to the smart module



NOTE

Click **OK**, and you can view the task information, including **Type**, **Device Name**, **Management Domain**, **Progress**, **Status**, **Start Time**, **End Time**, and **Detailed Information** in the displayed window.

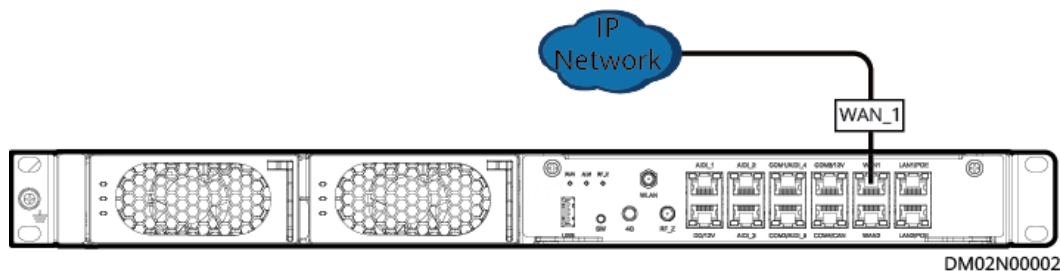
7.14 (Optional) Third-party NMS Management (over SNMP)

7.14.1 Connecting a Communications Cable

Procedure

- Step 1** Connect a communications cable to the WAN1 port on the ECC800-Pro.

Figure 7-38 Connecting a communications cable



----End

7.14.2 Setting SNMP Management Parameters

Prerequisites

Before setting SNMP parameters, obtain the information listed as follows from the NMS.

Table 7-29 Information obtained from the NMS

Item	Default Value	Description
SNMP version	SNMPv3	SNMP version and port number used by the ECC800-Pro and NMS. The SNMP versions include SNMPv1, SNMPv2c, and SNMPv3.
SNMP port number	161	
<ul style="list-style-type: none"> Read community name Write community name 	-	If you use SNMPv1 or SNMPv2c, enter the read and write community names that comply with the NMS. Otherwise, the ECC800-Pro will not connect to the NMS. The read community name must be different from the write community name.
<ul style="list-style-type: none"> User name MD5/SHA password DES/AES password 	-	To enhance the security, you need a user name and password for authentication if you use SNMPv3. After the authentication succeeds, the ECC800-Pro can communicate with the NMS.
Trap target address	-	IP address of the NMS server.
Trap port	162	Port defined by the user.

Context

- SNMPv3 parameters should be set before connecting the ECC800-Pro to the NMS. These parameters are required for setting up the ECC800-Pro on the NMS.
- SNMPv1 and SNMPv2c are insecure. Therefore, **SNMPv3** is recommended. This section uses **SNMPv3** as an example.

Procedure

Step 1 Apply to the equipment room network administrator for a fixed IP address.

Step 2 Set the IP address, subnet mask, and default gateway on the ECC800-Pro WebUI.

Table 7-30 IP parameters

Path	Parameter	Default Value	Setting
System Settings > System Parameters > Monitor IP > WAN_1	IP	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 Set SNMP parameters.

1. Choose **System Settings > NMS Application > SNMP**.
2. Set **SNMP Version** to **SNMPv3** and set **SNMP port number** to the required port number or retain its default value **161**.
3. Click **Submit** under **SNMP**.
4. Click **Add** under **SNMPv3**.
5. Set **User name**, set **Authentication protocol** to **SHA** or **MD5**, set **Privacy protocol** to **AES** or **DES**, and specify **MD5/SHA password**, **Confirm MD5/SHA password**, **DES/AES password**, and **Confirm DES/AES password**.

 **NOTE**

- Set **User name**, **MD5/SHA password**, and **DES/AES password** to any character strings that meet the system requirements. Note that **MD5/SHA password** and **DES/AES password** must be set to different values. Record the settings.
 - MD5 and DES are insecure protocols. Therefore, you are advised to set **Authentication protocol** to **SHA** or set **Privacy protocol** to **AES**.
6. Set **Password validity period** and **Advance expiration notification (days)**.
 7. After setting the parameters, click **Confirm**.
 8. Click **Add** under **SNMP Trap**.
 9. Set **Trap target address** and **Trap port**, set **SNMP version** to **SNMPv3**, and specify **SNMPv3 user name**. Set **Trap target address** to the IP address of the NMS server and set **Trap port** to the port defined by the user.
 10. After setting the parameters, click **Confirm**.
 11. Click **Export** in the **Mib File** pane, export the MIB file, and send it to the development engineers of the NMS.

----End

7.15 (Optional) DC Manager

For details about DC Manager access configuration, see [6.2.1.4 \(Optional\) Cloud Service Access](#).

7.15.1 Connecting a Device (Through the App)

You can use an app to connect a device to the NetEco for management. This method is recommended because it is more convenient.

7.15.1.1 Installing the NetEco App

This section describes the operating environment requirements of the NetEco app and the method for downloading and installing the NetEco app.

App Running Environment Requirements

- Device: Only Android mobile phones are supported.
- Operating system: Android 8.0 or later. The system cannot be rooted. The system memory is 1 GB or above/larger.
- The device supports a web browser and can connect to the Internet at a rate of 500 kbit/s or higher.
- Enough space is available for installing new applications.
- The battery power is sufficient.

NOTE

The device supports display at mainstream resolutions, such as 1920 x 1080 and 2340 x 1080. To ensure the stability of each function, 1920 x 1080 is recommended. It is strongly recommended that Android mobile phones provided by global mainstream vendors, such as SAMSUNG and HUAWEI, be used.

Installing the App

NOTE

Currently, the NetEco app can be installed only on Android mobile phones.

- Obtaining the software installation package from the Huawei AppGallery and installing the app
 - a. Go to **Huawei AppGallery** (<https://appgallery.huawei.com>) and search for **NetEco**.
 - b. Tap **Download** to obtain the app installation package.
 - c. Install the app as prompted.

After the installation is complete, the NetEco app icon is displayed on the desktop of the mobile phone.

- Installing the NetEco app by scanning the QR code


On the NetEco screen, tap  in the upper left corner and use your mobile phone to scan the QR code in the lower right corner.

Figure 7-39 NetEco app QR code



7.15.1.2 (Optional) Replacing the App Certificate on a Mobile Device

This section describes how to replace the preset security certificate in the NetEco app on a mobile device. Preset Huawei certificates apply only to commissioning scenarios. For security purposes, apply for certificates from the certification authority (CA) and use them to replace the preset certificates. Using the same certificate for a long time increases the probability of being cracked. Replace the current certificate periodically.

Prerequisites

- The NetEcoapp has been installed.
- You have applied for a new certificate file **server.cer** from the CA.

NOTE

server indicates the name of the certificate file, which can be renamed.

Procedure


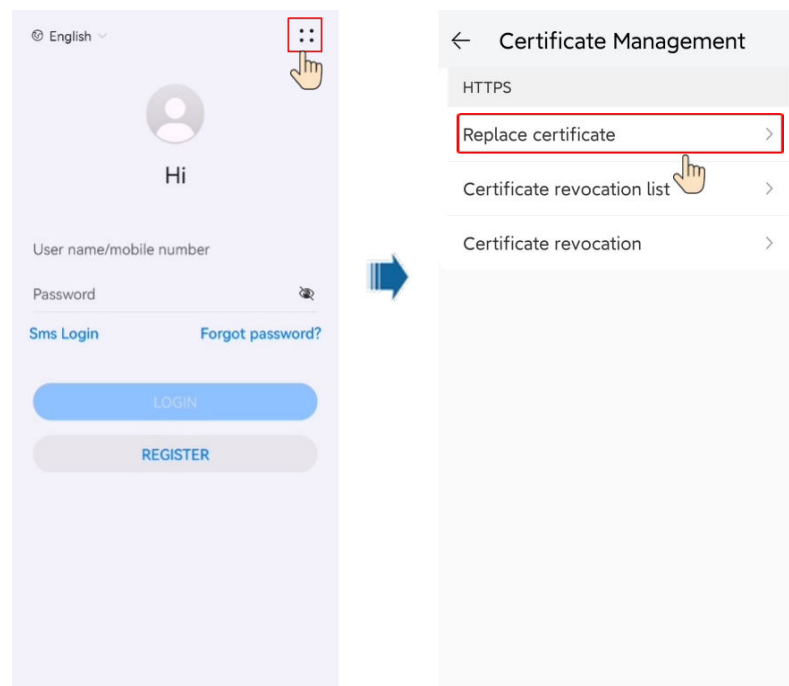
- Step 1** Import the obtained digital certificate to the **cer** directory in the NetEco folder of the mobile device.
- Step 2** On the **Login** screen, tap  in the upper right corner.
- Step 3** On the **Certificate Management** screen, click **Replace certificate**.
- Step 4** On the **Replace certificate** screen, select the new certificate. On the displayed screen, tap **Yes**.

Figure 7-40 Replacing a certificate



----End

7.15.1.3 Registering a NetEco App Account

After the app is correctly installed on a mobile device, you can register an account through the app.

Prerequisites

- The device has connected to a WiFi or mobile network.
- The NetEco app has been installed. For details about how to install it, see [7.15.1.1 Installing the NetEco App](#).

Procedure

- Step 1** On the mobile device, tap the NetEco app icon.
- Step 2** On the login screen, tap **REGISTER**.
- Step 3** On the registration screen, set the user name, email address, password, and verification code, and tap **REGISTER**.
- Step 4** After an account is successfully registered, use the registered email address and password to log in to the NetEco app.

----End

7.15.1.4 Logging In to the NetEco App

After the app is installed on a mobile device, you can log in to the NetEco server using the app.

Prerequisites

- The device has connected to a WiFi or mobile network.
- The NetEco app has been installed. For details about how to install it, see [7.15.1.1 Installing the NetEco App](#).
- You have registered a NetEco app account. For details, see [7.15.1.3 Registering a NetEco App Account](#).

Procedure

Step 1 On the mobile device, tap the NetEco app icon.

Step 2 On the **Login** screen, enter the registered mobile number, verification code, or password.

Step 3 Tap **Log In**.

After logging in to the NetEco app, enable or disable the **Push notifications** function as prompted. For details, see [7.15.3.1 How Do I Enable or Disable the Message Push Function](#).

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.

If a Huawei phone is used, the push notification function is enabled for the NetEco app by default.

----End

7.15.1.5 Connecting a Device

Connect devices to the NetEco using the NetEco app.

Prerequisites

- You have logged in to the NetEco.
- You have set NetEco communications parameters on the ECC800-Pro.

Procedure

Step 1 On the **Home** screen of the NetEco app, tap  in the upper right corner.

Step 2 On the **Device creation** screen, enter device information as prompted.

Figure 7-41 Adding a device

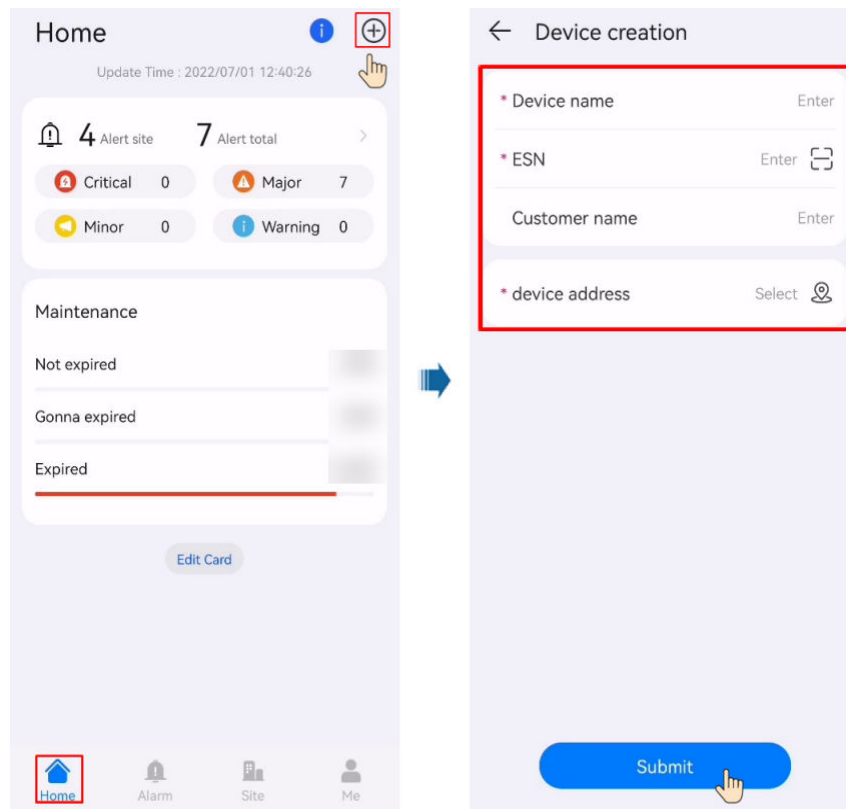



Table 7-31 Parameter description

Parameter	Description
Device name	Name of the device.
ESN	ESN of the ECC controller. NOTE Tap  to scan the QR code on the ECC controller to obtain the ESN. If there is no ESN label or QR code on the device, you can view the ESN on the WebUI of the ECC controller.
Customer name	Customer name.
Device address	Address of the device.

Step 3 Tap **Submit**.

----End

7.15.2 Logging In to or Logging Out of the NetEco

This section describes the operating environment requirements of the NetEco client and provides guidance for users to log in to or log out of the NetEco client.




7.15.2.1 Operating Environment Requirements


To ensure that users can browse and perform operations on the NetEco WebUI, the PC must meet certain requirements.

Table 7-32 lists the requirements for the operating environment.

Table 7-32 Operating environment requirements

Configuration Item	Basic Configuration Requirement
CPU	I5-7500 or later
Memory	8 GB
Operating system	Windows 10 Professional 64-bit

Configuration Item	Basic Configuration Requirement
Browser	<p>You are advised to use the Chrome browser (stable channel edition) or Firefox browser (ESR edition) of the latest version.</p> <ul style="list-style-type: none"> If the user accesses the NetEco server through a proxy server, configure the proxy server as follows: For Chrome: <ol style="list-style-type: none"> Click  in the upper right corner of the browser and choose Settings. On the Settings page, click Advanced, and then click Open proxy settings under System. In the Internet Properties dialog box, click LAN settings. In the Proxy server dialog box, select Use a proxy server for your LAN, set Address and Port, and click OK. Close the Settings tab page. For Firefox: <ol style="list-style-type: none"> Click  in the upper right corner of the browser and choose Options. On the Options page, click Advanced, and then click Settings under Network. In the displayed Connection Settings dialog box, select Manual proxy configuration, set HTTP proxy and Port, and click OK. Close the Options tab page. <p>NOTE To ensure that the proxy server can access the NetEco server, the network bandwidth must meet the following requirements: Uplink (from the browser to the NetEco server) data rate: ≥ 100 kbit/s; downlink (from the NetEco server to the browser) data rate: ≥ 100 Mbit/s.</p> <ul style="list-style-type: none"> To set exceptions for pop-up windows of the browser, perform the following steps: For Chrome: <ol style="list-style-type: none"> Click  in the upper right corner of the browser and choose Settings. On the Settings page, click Privacy and security under Advanced, and click Pop-ups and redirects under Site settings in sequence. In the Pop-ups and redirects dialog box, click Add. In the Add a site dialog box, enter https://server IP address:server port number (https://10.10.10.1:31943 for example), and click Add. Close the Settings tab page.

Configuration Item	Basic Configuration Requirement
	<p>For Firefox:</p> <ol style="list-style-type: none">1. Click  in the upper right corner of the browser and choose Options.2. On the Options page, click Content and Exceptions under Pop-ups in sequence.3. In the Allowed Sites dialog box, set Address of website to https://server IP address:server port number (https://10.10.10.1:31943 for example), click Allow, and then click Save Changes.4. Close the Options tab page.

7.15.2.2 Logging In to the NetEco (Through Huawei Cloud)

Log in to the NetEco through Huawei Cloud.

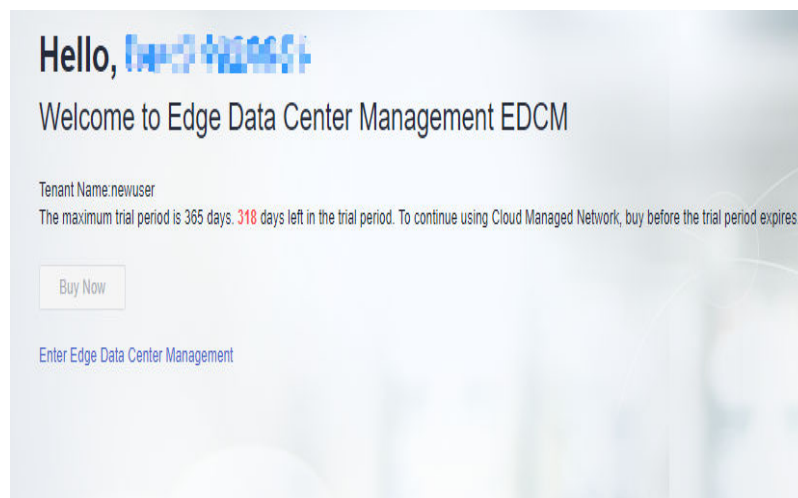
Prerequisites

- You have created a free trial order or purchased an official business package open beta testing (OBT) trial order.
- The mobile number entered by the tenant has received the NetEco organization, password, and address.

Procedure

Step 1 Click **Enter Edge Data Center Management** to access the NetEco.

Figure 7-42 Edge Data Center Management page



Step 2 Enter **Organization**, **User Name**, and **Password**, and click **Log In**.

 **NOTE**

- When you log in to the system for the first time, **Organization** is the same as **User Name** and is the tenant name entered during tenant creation, that is, the initial user name of Huawei Cloud. This user is the administrator of the tenant and has the highest operation rights. After the first login, you need to change the password to ensure access security.
- 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 administrator.
- If you enter incorrect passwords for three consecutive times, a verification code is required at the fourth time. If you enter incorrect passwords for five consecutive times, the account or IP address will be locked for 10 minutes.

----End


7.15.2.3 Logging Out of the NetEco

This section describes how to log out of the NetEco.

Prerequisites

You have logged in to the NetEco.

Procedure

Step 1 Move the pointer to the  icon in the upper right corner of the home page and click **Log Out**.

Step 2 In the **Log Out** dialog box, click **Yes**.

The account is logged out, and the login page is displayed.

----End

7.15.3 DC Manager FAQ

7.15.3.1 How Do I Enable or Disable the Message Push Function

You can enable or disable the real-time alarm notification function as required.


Prerequisites

You have logged in to the NetEco app.

Procedure

Step 1 Enable or disable the **Push notifications** function as required.

Table 7-33 Setting the **Push notifications** function

Operation	Description	Procedure
Enabling the Push notifications function	If the Push notifications function is disabled and you need to view the real-time alarm information pushed by the NetEco app on the mobile phone, perform this operation.	<ul style="list-style-type: none"> • Method 1 <ol style="list-style-type: none"> 1. When the system displays a message asking you whether to enable the Push notifications function, tap OK. 2. Follow the onscreen instructions to enable the Push notifications function. • Method 2 <ol style="list-style-type: none"> 1. On the home screen of the NetEco app, tap Me. 2. On the Me screen, tap  to access the Setting screen. 3. On the Setting screen, tap Push notifications. 4. Follow the onscreen instructions to enable the Push notifications function. <p>NOTE</p> <ul style="list-style-type: none"> • If a Huawei phone is used, the Push notifications function is enabled for the NetEco app by default. • If a third-party mobile phone is used, you need to manually enable the Push notifications function and ensure that the HMS Core process is not cleared. If the HMS Core process is cleared, messages will be delayed or cannot be received. In this case, you need to restart the app to receive pushed messages.


Operation	Description	Procedure
Disabling the Push notifications function	If you do not need to view the real-time alarms pushed by the NetEco app on a mobile phone, perform this operation.	<ul style="list-style-type: none"> • Method 1 When the system displays a message asking you whether to enable the Push notifications function, tap Cancel. • Method 2 <ol style="list-style-type: none"> 1. On the home screen of the NetEco app, tap Me. 2. On the Me screen, tap  to access the Setting screen. 3. On the Setting screen, tap Push notifications. 4. Follow the onscreen instructions to disable the Push notifications function.

Table 7-34 Obtaining addresses involved in the **Push notifications** function online

Address	Description
https://oauth-login.cloud.huawei.com	Huawei access token address
https://push-api.cloud.huawei.com	Push message address

----End

7.15.3.2 What Do I Do If the Browser Displays a Certificate Error or Security Risk

Symptom

- When Google Chrome is used to log in to the NetEco, the system displays a connection error message, as shown in [Figure 7-43](#).
- When Mozilla Firefox is used to log in to the NetEco, the system displays a connection error message, as shown in [Figure 7-44](#).

Figure 7-43 Connection error message (Chrome)

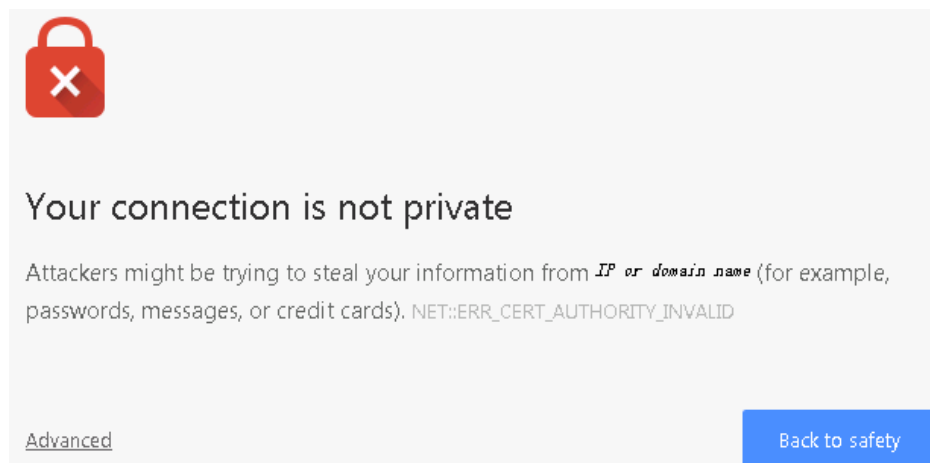
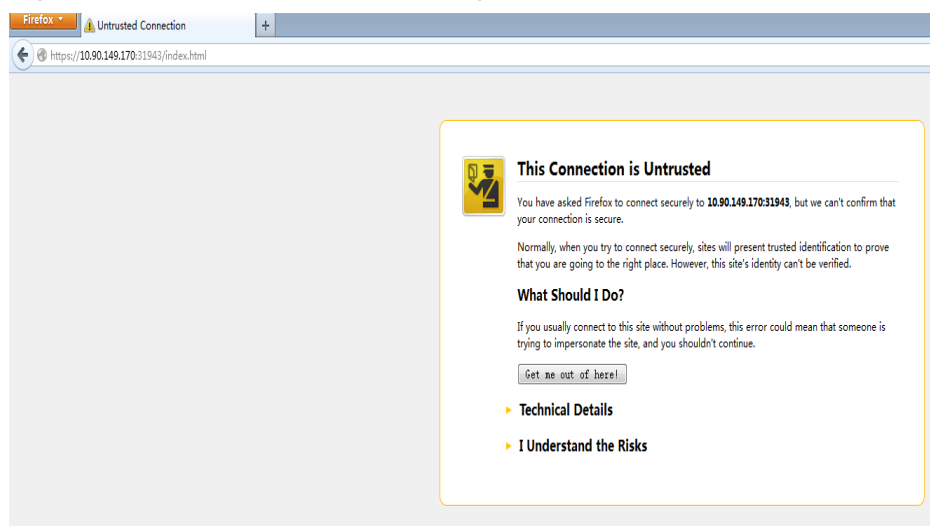


Figure 7-44 Connection error message (Firefox)

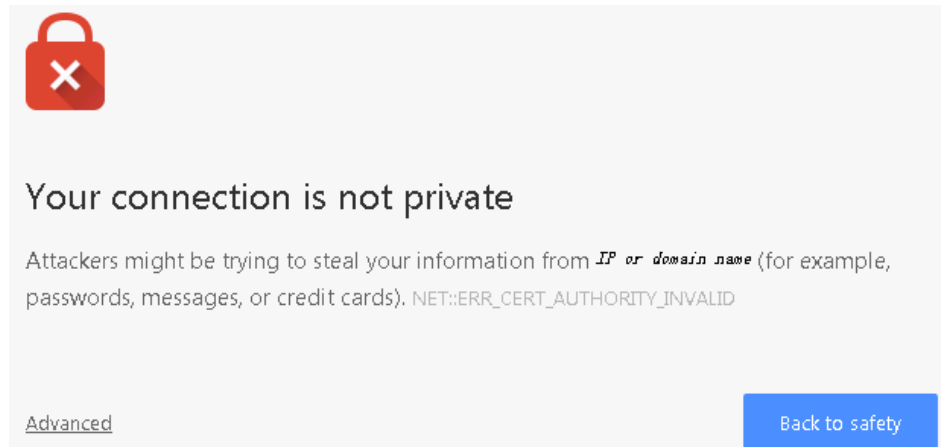


Procedure

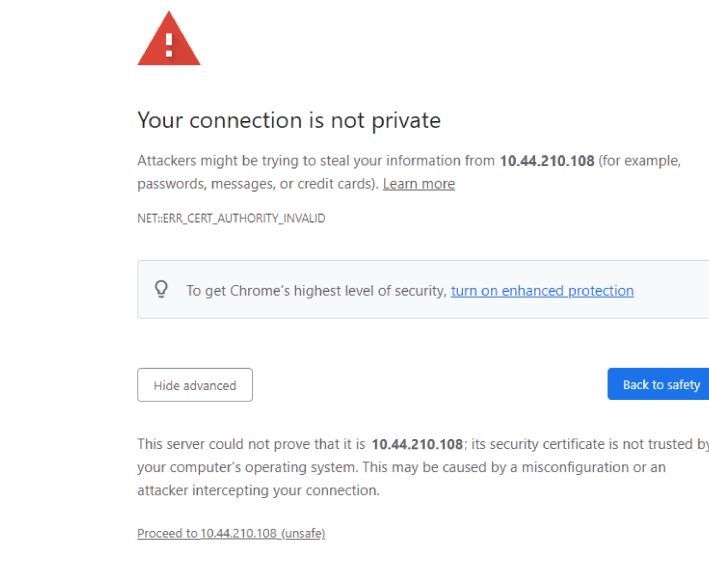
NOTE

Operations on the browser may vary depending on browser versions but are similar to the examples in the following steps. You are advised to perform the operations based on actual situations.

- Google Chrome:
 - a. Click **Advanced**.

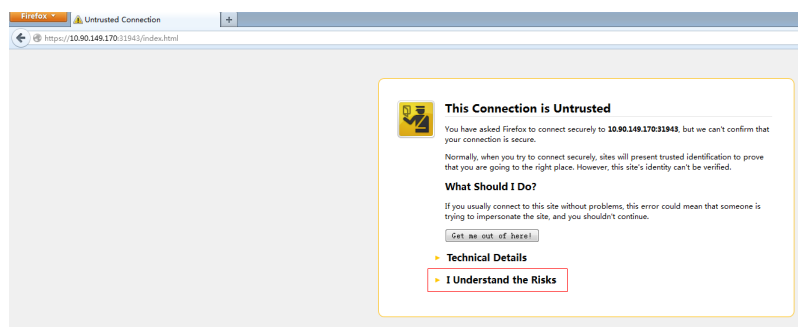


- b. Click **Proceed to XX.XX.XX.XX (unsafe)**.



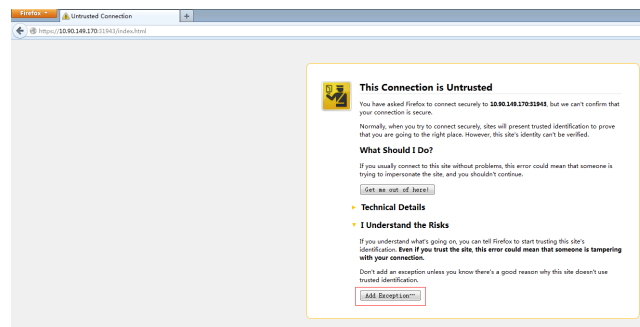
- Add an exception in the Firefox browser.
 - a. Click **I Understand the Risks**, as shown in **Figure 7-45**.

Figure 7-45 Clicking I Understand the Risks



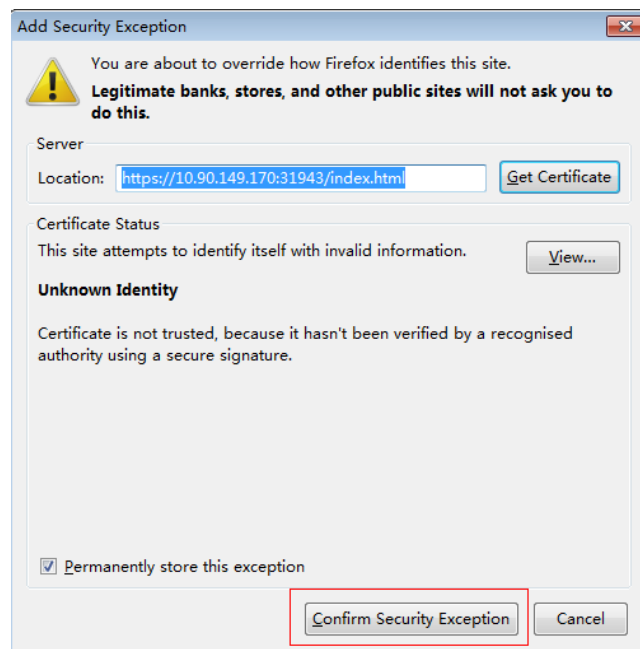
- b. In the expanded area, click **Add Exception**, as shown in **Figure 7-46**.

Figure 7-46 Adding an exception



- c. Click **Confirm Security Exception**, as shown in **Figure 7-47**.

Figure 7-47 Confirming security exceptions



8 O&M

8.1 Routine Maintenance

8.1.1 Monthly Maintenance

Table 8-1 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">The surge protection module indicator is steady green.The MCB is switched on.	<ul style="list-style-type: none">If the surge protection module indicator is red, replace the surge protection module.If the MCB is off, switch it on.

Maintenance Area	Maintenance Item	Operation	Expected Result	Troubleshooting
UPS	Operating environment	-	<ul style="list-style-type: none"> Ambient temperature: 0–40°C Humidity: 0%–95% RH (non-condensing) 	<ul style="list-style-type: none"> If the temperature or humidity is abnormal, check the smart cooling product status. If the input voltage is abnormal, check the power grid status and input cable connection.
	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.
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"> The surface is clean and tidy without stains. The battery terminals are intact. Batteries are free from damage and cracks. Batteries are free from acid leakage. Batteries are not deformed or bulged. 	If the battery appearance is abnormal, contact Huawei technical support.

Maintenance Area	Maintenance Item	Operation	Expected Result	Troubleshooting
	Battery operating temperature	-	<ol style="list-style-type: none"> Battery operating temperature: 0–45°C (charging); –20°C to +45°C (discharging) Battery charge and discharge conditions meet the requirements specified in the battery specifications. 	<ol style="list-style-type: none"> Identify the cause of an abnormal battery operating temperature. If the fault persists, contact Huawei technical support.
ECC800	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"> Ambient temperature: –20°C to +65°C Humidity: 0%–95% RH (non-condensing) 	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 8.2.2 Management System Troubleshooting 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 8.3 Alarm References and 8.2.2 Management System Troubleshooting 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 WebUI, choose System Settings > Video Management to enter the video information page. Click an address under Link to enter the camera web page.	The monitoring page is properly displayed after you click View .	If the monitoring page is not displayed after you click View , check that the IP address is correctly set, and check cable connections or replace the camera. For details, see 8.4.4.4 Replacing a Camera .
Intelligent 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.

8.1.2 Quarterly Maintenance

Table 8-2 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"> The surge protection module indicator is steady green. The MCB is switched on. 	<ul style="list-style-type: none"> If the surge protection module indicator is red, replace the surge protection module. If the MCB is off, switch it on.
UPS	Operating environment	-	<ul style="list-style-type: none"> Ambient temperature: 0°C to 40°C Humidity: 0%–95% RH (non-condensing) 	<ul style="list-style-type: none"> If the temperature or humidity is abnormal, check the smart cooling product status. If the input voltage is abnormal, check the power grid status and input cable connection.
	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"> • Replace damaged cables. • Secure output terminals.
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"> The surface is clean and tidy without stains. The battery terminals are intact. Batteries are free from damage and cracks. Batteries are free from acid leakage. Batteries are not deformed or bulged. 	If the battery appearance is abnormal, contact Huawei technical support.
	Battery operating temperature	-	<ol style="list-style-type: none"> Battery operating temperature: 0–45°C (charging); –20°C to +45°C (discharging) Battery charge and discharge conditions meet the requirements specified in the battery specifications. 	<ol style="list-style-type: none"> Identify the cause of an abnormal battery operating temperature. If the fault persists, contact Huawei technical support.
	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"> • Equalized charging voltage: 53.5 V DC • Float charging voltage: 53.4 V DC 	<ol style="list-style-type: none"> 1. Check whether the equalized charging voltage and float charging voltage of a battery are normal. 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. 3. If the fault persists, contact Huawei technical support.

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"> 1. Locate the cause when an exception is identified. 2. If the fault persists, contact Huawei technical support.
ECC800	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"> • Ambient temperature: –20°C to +65°C • Humidity: 0%–95% RH (non-condensing) 	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 8.2.2 Management System Troubleshooting 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 8.3 Alarm References and 8.2.2 Management System Troubleshooting 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 WebUI, choose System Settings > Video Management to enter the video information page. Click an address under Link to enter the camera web page.	The monitoring page is properly displayed after you click View .	If the monitoring page is not displayed after you click View , check that the IP address is correctly set, and check cable connections or replace the camera. For details, see 8.4.4.4 Replacing a Camera .
Intelligent 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.

8.1.3 Yearly Maintenance

Table 8-3 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"> The surge protection module indicator is steady green. The MCB is switched on. 	<ul style="list-style-type: none"> If the surge protection module indicator is red, replace the surge protection module. If the MCB is off, switch it on.
	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 panel 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"> Ambient temperature: 0°C to 40°C Humidity: 0%–95% RH (non-condensing) 	<ul style="list-style-type: none"> If the temperature or humidity is abnormal, check the smart cooling product status. If the input voltage is abnormal, check the power grid status and input cable connection.
	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"> Replace damaged cables. Secure output terminals.
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"> The surface is clean and tidy without stains. The battery terminals are intact. Batteries are free from damage and cracks. Batteries are free from acid leakage. Batteries are not deformed or bulged. 	If the battery appearance is abnormal, contact Huawei technical support.
	Battery operating temperature	-	<ol style="list-style-type: none"> Battery operating temperature: 0–45°C (charging); –20°C to +45°C (discharging) Battery charge and discharge conditions meet the requirements specified in the battery specifications. 	<ol style="list-style-type: none"> Identify the cause of an abnormal battery operating temperature. If the fault persists, contact Huawei technical support.

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"> • Equalized charging voltage: 53.5 V DC • Float charging voltage: 53.4 V DC 	<ol style="list-style-type: none"> 1. Check whether the equalized charging voltage and float charging voltage of a battery are normal. 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. 3. If the fault persists, contact Huawei technical support.
	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"> 1. Locate the cause when an exception is identified. 2. If the fault persists, contact Huawei technical support.

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"> 1. Locate the cause when an exception is identified. 2. If the fault persists, contact Huawei technical support.
	Battery connection	-	<ol style="list-style-type: none"> 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. 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. 	<ol style="list-style-type: none"> 1. Rectify any abnormal connection. 2. If the fault persists, contact Huawei technical support.

Maintenance Area	Maintenance Item	Operation	Expected Result	Troubleshooting
ECC800	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"> Ambient temperature: –20°C to +65°C Humidity: 0%–95% RH (non-condensing) 	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 8.2.2 Management System Troubleshooting 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 8.3 Alarm References and 8.2.2 Management System Troubleshooting 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 WebUI, choose System Settings > Video Management to enter the video information page. Click an address under Link to enter the camera web page.	The monitoring page is properly displayed after you click View .	If the monitoring page is not displayed after you click View , check that the IP address is correctly set, and check cable connections or replace the camera. For details, see 8.4.4.4 Replacing a Camera .
Intelligent 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.

8.2 Troubleshooting

8.2.1 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 8-4 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"> • The switch trips abnormally. • The UPS is faulty. 	<ul style="list-style-type: none"> • Use a multimeter to check whether there is a short circuit. Turn on the switch again, and check whether the system is overloaded. • Restart the UPS. If the UPS is faulty, replace it.

Symptom	Possible Cause	Measure
The surge protection function fails.	<ul style="list-style-type: none"> The SPD circuit breaker is OFF. The SPD ground cable is not connected. The surge protection module is abnormal. The SPD window is red. 	<ul style="list-style-type: none"> 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. Check whether the SPD ground cable is properly connected. Replace the surge protection module. For details, see 8.4.2.1 Replacing a Surge Protection Module.
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"> The UPS communications cable is not properly connected. The UPS parallel cable is not properly connected. The UPS is deleted on the ECC800 WebUI. 	<ul style="list-style-type: none"> Reconnect the UPS communications cable. Reconnect the UPS parallel cable. Remove the network cable from the MON1 port on the UPS, reinstall the cable, and add the UPS on the ECC800 WebUI.
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.
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.

Symptom	Possible Cause	Measure
	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"> The UPS will soon shut down due to insufficient battery reserve, and loads will be powered off. The number of batteries and battery capacity are incorrectly set. 	<ul style="list-style-type: none"> Save load data immediately and shut down primary loads to avoid data loss or damage. Connect the UPS input to the backup AC power supply immediately. Verify that the number of batteries and battery capacity are correctly set based on the actual configuration.

Symptom	Possible Cause	Measure
The user forgot the password.	None	<ul style="list-style-type: none"> 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. If the user forgot the LCD password and feature code, contact your local Huawei technical support.

8.2.2 Management System Troubleshooting

Table 8-5 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"> The ambient temperature exceeds the upper threshold. Increase the cooling capacity of the smart cooling product. The air channel is blocked. Unblock it.
	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 subrack.

Symptom	Possible Cause	Measure
The alarm indicator (red) is steady on.	Output overvoltage protection	<ul style="list-style-type: none"> 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. If multiple PSUs are locked out, remove all PSUs and reinstall them one by one to locate the faulty ones. Then replace faulty PSUs.
	No output due to a PSU fault	Replace the faulty PSU.

Table 8-6 Common faults and troubleshooting for the monitoring module

No.	Symptom	Possible Cause	Measure
1	The running 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.

8.3 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 WebUI.

Table 8-7 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"> The mains has experienced a transient high voltage. The output carries special loads such as the inductive and rectification loads. The output carries the transformer load but the transformer mode is not enabled. The hardware is damaged. 	<ul style="list-style-type: none"> Rectify the fault, and power on the UPS again. Check that the load types are supported by the UPS. Enable the transformer mode. Contact Huawei technical support.
	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.
Intelligent 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"> The battery has discharged to the end-of-discharge (EOD) threshold. The battery circuit breaker (BCB) box is manually disconnected. There is a security risk in the battery loop. 	Identify the alarm cause, rectify the fault, and switch on the BCB box.
	Single Batt. terminal off	Critical	<ul style="list-style-type: none"> A battery terminal screw is not tightened. The battery terminal is not properly connected to the connector. 	<ul style="list-style-type: none"> Check that battery terminal screws are tightened. Check that battery terminals are properly connected to connectors.
	Single Batt. Exception	Critical	<ul style="list-style-type: none"> The battery shell is broken, resulting in electrolyte and electricity leakage. The battery loop cable is broken and short-circuited to the ground, resulting in electricity leakage. 	<ul style="list-style-type: none"> Check whether the appearances of abnormal batteries are intact, and replace abnormal batteries. Check whether battery loop cables are deteriorated or broken, and replace faulty cables.

8.4 Parts Replacement

8.4.1 Replacing Structural System Components

8.4.1.1 Replacing a Cabinet Electronic Clasp Lock

Prerequisites

- Tool: Phillips screwdriver
- Material: A spare cabinet electronic clasp lock is available and functional.

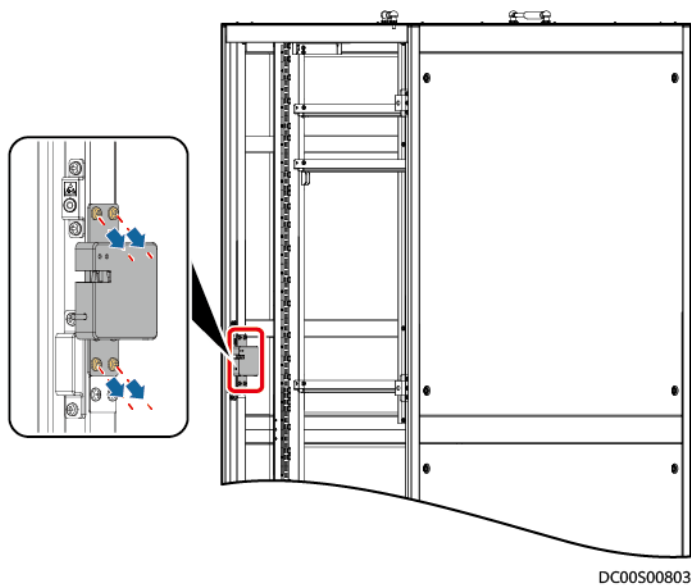
Context

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 8-1 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

8.4.1.2 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.

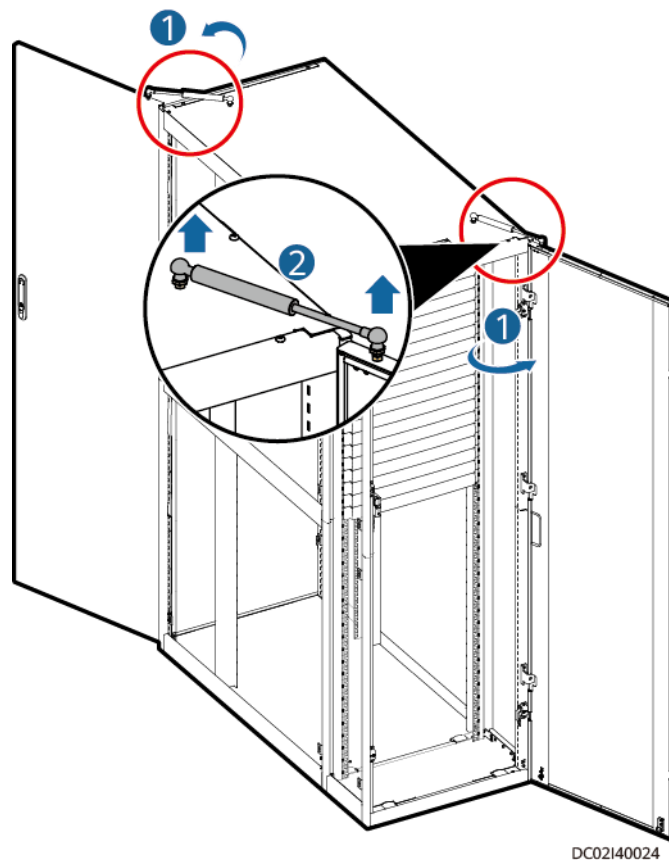
Procedure

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 8-2 Removing a gas spring



Step 4 Tighten the new air spring using an adjustable wrench.

----End

8.4.2 Replacing Power Supply and Distribution System Components

⚠ 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.
-

8.4.2.1 Replacing a Surge Protection Module

Prerequisites

⚠ DANGER

- Do not replace a surge protection module during a thunderstorm.
- Before replacing a surge protection module, wear insulation gloves.

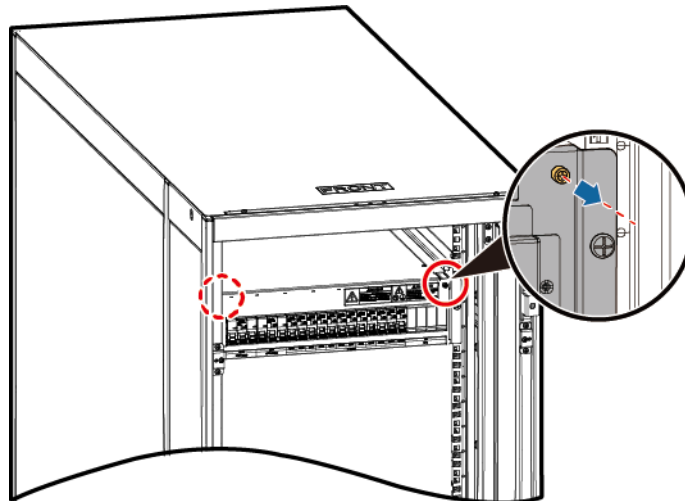
- Tools: protective insulation gloves, electroprobe
- Material: A new surge protection module of the same model is available and functional.

Procedure

Step 1 Switch the SPD circuit breaker to OFF.

Step 2 Remove the protective panel from the SPD.

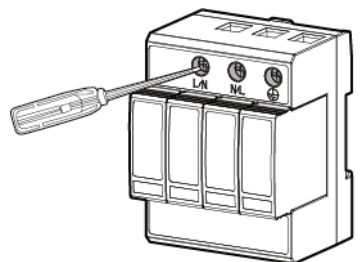
Figure 8-3 Removing the protective panel



DC02H00352

Step 3 Detect the L/N and N/L voltages to the PE using an electroprobe, as shown in [Figure 8-4](#). Verify that the faulty SPD has no voltage before replacing the faulty surge protection module.

Figure 8-4 Measuring voltage



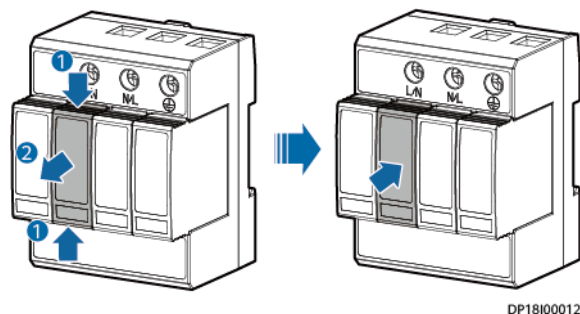
DP18I00011

Step 4 Hold the faulty surge protection module and pull it out, as shown in [Figure 8-5](#).

⚠ DANGER

During replacement, do not touch the energized components in the power distribution subrack.

Figure 8-5 Replacing a surge protection module



Step 5 Install the new surge protection module.

Step 6 Reinstall the protective panel for the SPD, and switch on the SPD circuit breaker.

Step 7 Check whether there are alarms on the ECC800. If there is no alarm, the surge protection module is functional.

----End

8.4.2.2 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.

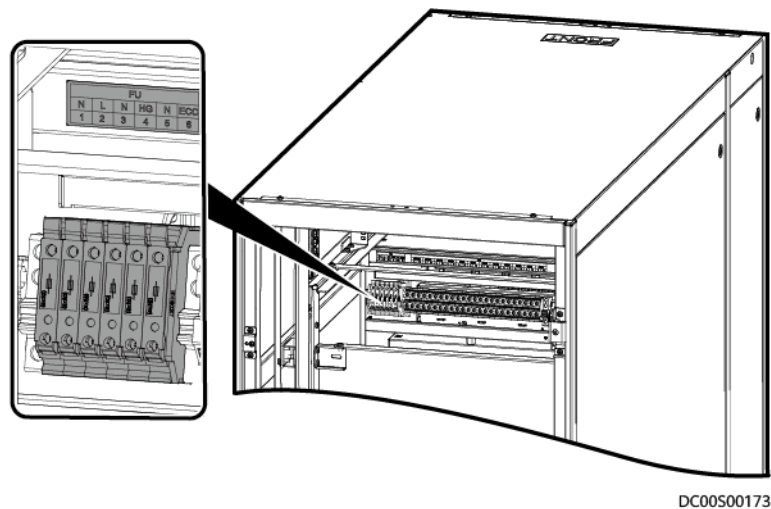
Procedure

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 8-6 Opening the fuse terminal block



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

8.4.2.3 Replacing an rPDU

Prerequisites

- Tools: Phillips screwdriver, step ladder
- Material: A spare rPDU of the same model is available and functional.

Context

An rPDU 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 rPDU. Disconnect the power cables and signal cables from the rPDU terminal block.

Step 3 Remove the bolts that secure the rPDU using a Phillips screwdriver.

Step 4 Secure the new rPDU to the rear door of the cabinet.

Step 5 Reconnect the power cables or signal cables to the rPDU, and switch on the circuit breaker of the power distribution subrack.

----End

8.4.2.4 Replacing a Transformer

Prerequisites

- Tools: electroprobe, insulation gloves, Phillips screwdriver, multimeter
- Material: A spare transformer of the same model is available and functional.
- The transformer is damaged or faulty and cannot work.

Procedure

Step 1 Open the front and rear doors of the Converged Cabinet.

Step 2 Switch off all circuit breakers in the cabinet and the mains input circuit breaker.

NOTICE

This step results in service interruptions.

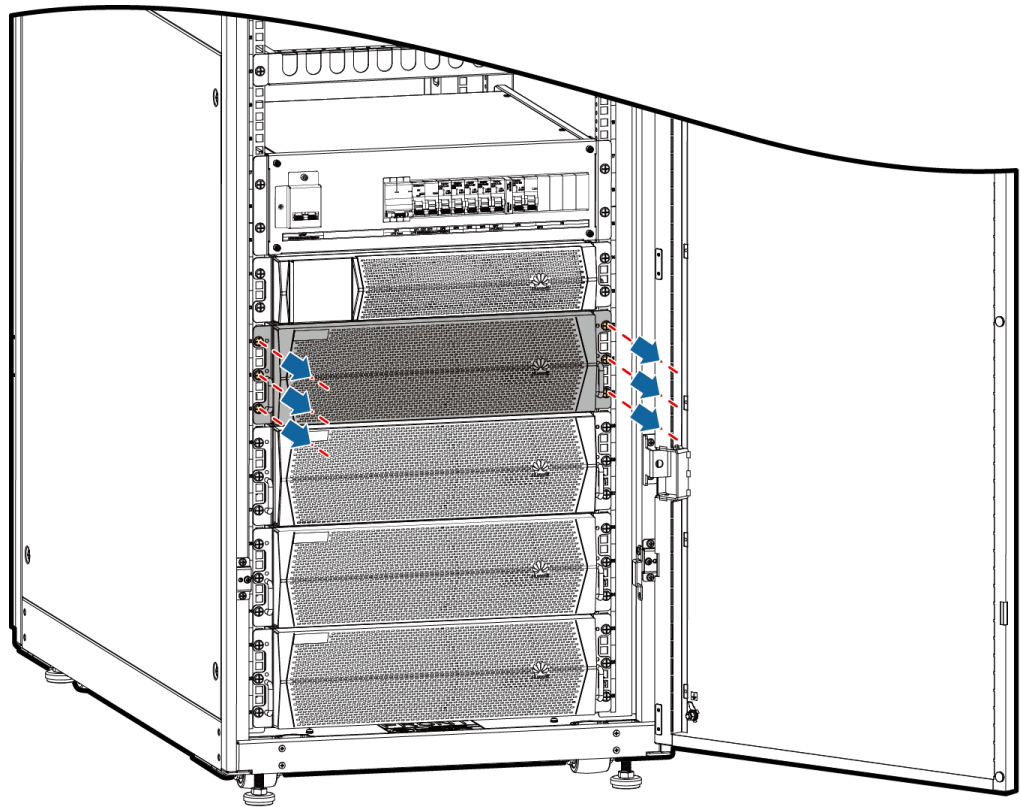
Step 3 Remove the EPO signal cable connected to the UPS, and then remove the cables of the transformer.

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 4 Remove the screws at the front of the transformer.

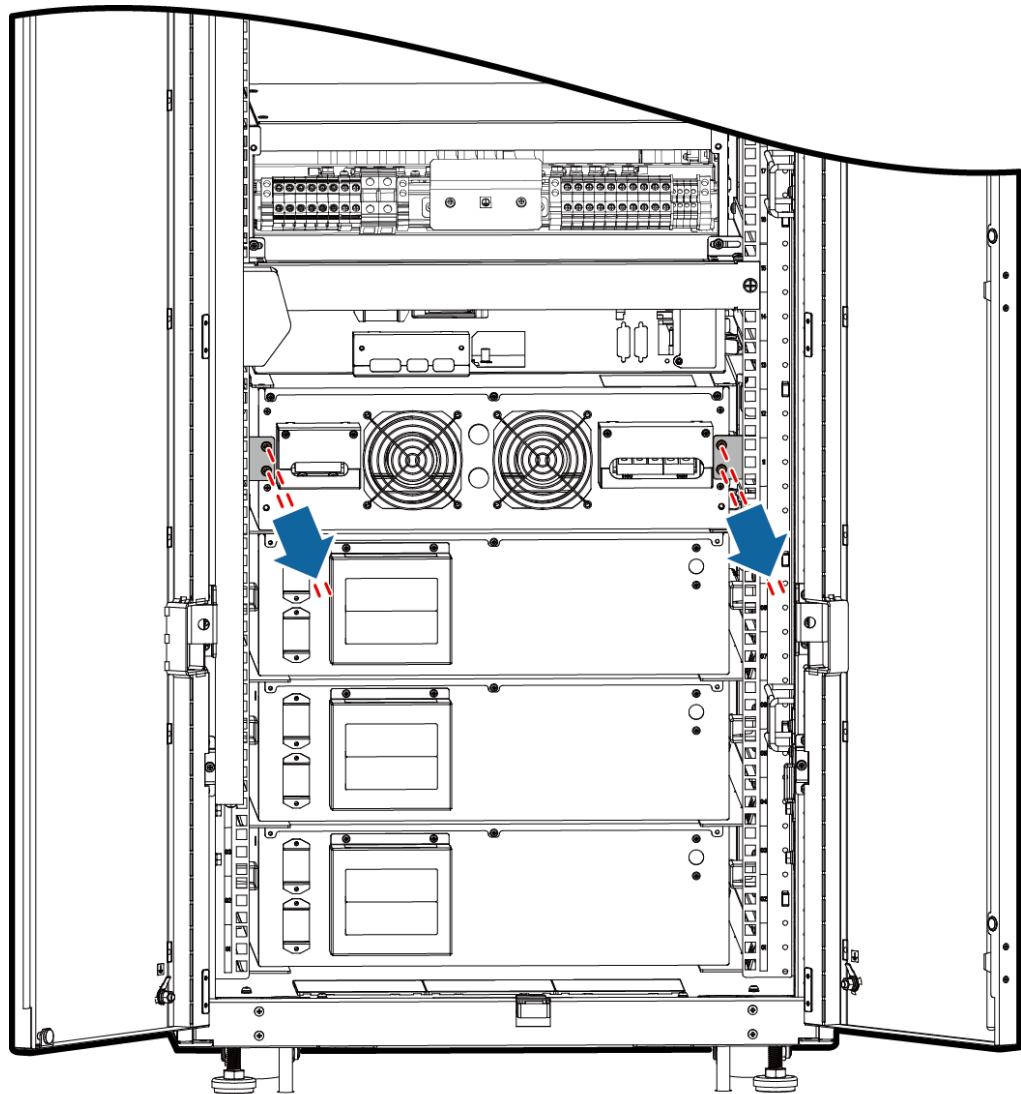
Figure 8-7 Removing screws at the front of the transformer



DP19H00001

Step 5 Remove the screws at the rear of the transformer and pull out the old transformer.

Figure 8-8 Removing screws at the rear of the transformer



DP19H00002

- Step 6** Install the new transformer and secure it to the cabinet using screws.
- Step 7** Connect the cables of the transformer in sequence. Check whether the cable labels are consistent with the marks on the wiring terminals and whether all cables are connected.
- Step 8** Switch on the mains input circuit breaker.
- Step 9** Switch on the UPS input circuit breaker and the SPD circuit breaker.
- Step 10** Start the UPS and the inverter, and then turn on the UPS output switch.
- Step 11** Switch on the load circuit breaker.
- Step 12** Check whether the UPS generates abnormal alarms. If there is any alarm, clear it and start the UPS.

----End

8.4.2.5 Replacing a UPS2000-H

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.

Step 1 Ensure that the TN system is reliably grounded, and that the main ground cable of the smart module is reliably connected.

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 Turn off the battery switch, or remove the wiring terminal between the battery and the faulty UPS.

Step 3 Open the front door of the cabinet, remove the protective panel from the maintenance bypass switch, and manually turn on the maintenance bypass switch. (The UPS automatically transfers to the static bypass mode, and an alarm is generated, indicating that the maintenance bypass switch is turned on.)

Step 4 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 5 Remove the rear cover from the UPS, and remove the input and output power cables, battery cables (or battery pack cables), and signal cables.

NOTICE

Wrap the exposed cable with insulation tape.

Step 6 Remove screws from the UPS front panel, and pull out the UPS.

Step 7 Install the new UPS and screw it to the cabinet.

Step 8 Connect the output power cables, signal cables, 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.

NOTICE

Do not connect the manual bypass switch (MBS) signal cable to the UPS rear at present.

Step 9 Start the UPS and set related parameters.

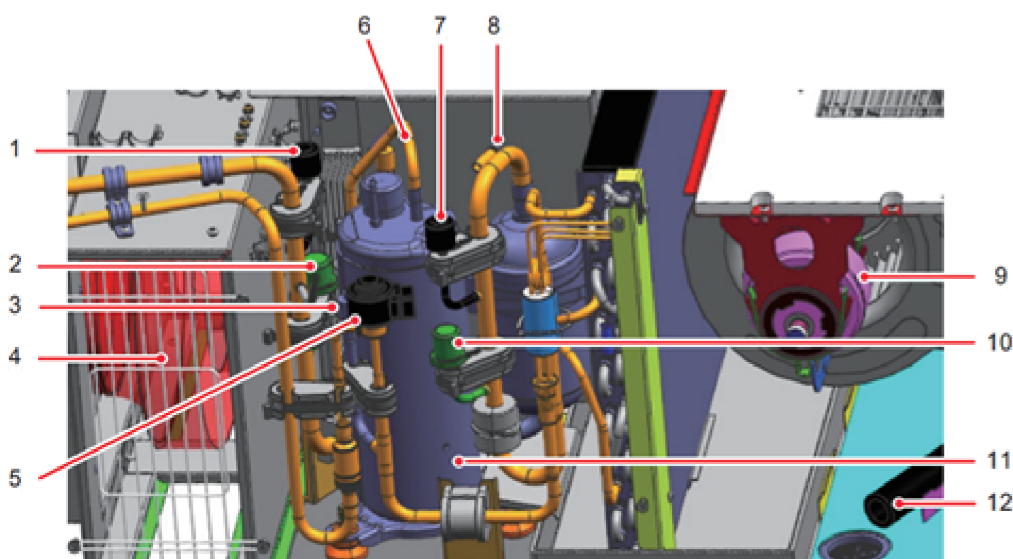
- Step 10** Turn on the UPS input switch. When the output switch is off, start the inverter. After checking that the UPS starts normally, shut down the inverter. The UPS transfers to static bypass mode at this moment. After that, turn on the UPS output switch, and turn off the manual maintenance bypass switch. Then the loads are energized by the UPS bypass.
- Step 11** Install the protective cover, and connect the MBS signal cable to the UPS rear.
- Step 12** Check whether the UPS generates abnormal alarms. If there are alarms, clear them and start the UPS.
- Step 13** Connect the battery cables (or battery pack cables) and turn on the battery switch.

----End

8.4.3 Replacing Cooling System Components

The following figure shows the cooling system components.

Figure 8-9 Cooling system components



- | | | | |
|--------------------------------------|--------------------------|-------------------------|------------------------------|
| (1) High pressure sensor | (2) High pressure switch | (3) Pressure gauge | (4) External circulation fan |
| (5) Electronic expansion valve (EEV) | (6) Liquid pipe | (7) Low pressure sensor | (8) Gas pipe |
| (9) Internal circulation fan | (10) Low pressure switch | (11) Compressor | (12) Drainpipe |

8.4.3.1 Replacing an Internal Circulation Fan

Prerequisites

- Tools: Phillips screwdriver, diagonal pliers or scissors
- An internal circulation fan needs to be replaced.

- A spare internal circulation fan of the same model is available and functional.

Context

The fan is maintained from the top.

Procedure

Step 1 Shut down the smart cooling product.

- Method 1: Log in to the ECC800 PAD app as user **admin**.
 - a. Choose **Home**.
 - b. Choose **Settings** and enable **High-Risk Permission**.
 - c. In the smart module view, tap the cabinet where the smart cooling product is located.
 - d. Tap the smart cooling product to be set in the cabinet layout diagram.
 - e. Choose **Real-time Data > OFF**.
- Method 2: Log in to the ECC800 WebUI as user **admin**. Choose **Monitoring > Cooling > NetCol5000 > Controls > Control Information**, choose **Power on/off > Off**, and then click **Submit**.

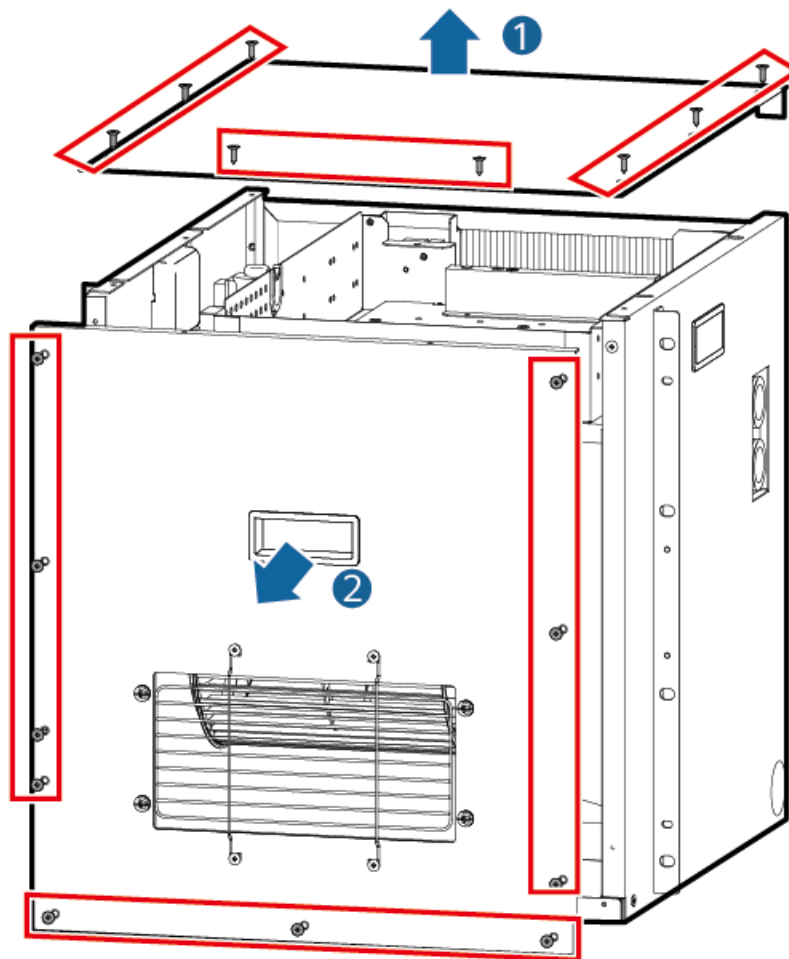
NOTE

The last digit of the model displayed on the screen is variable and subject to change with the smart cooling product connection sequence. The displayed value is the actual one.

Step 2 Disconnect the power supply from the smart cooling product control unit after the smart cooling product is shut down.

Step 3 Remove the screws that secure the top panel using a Phillips screwdriver, and remove the top panel.

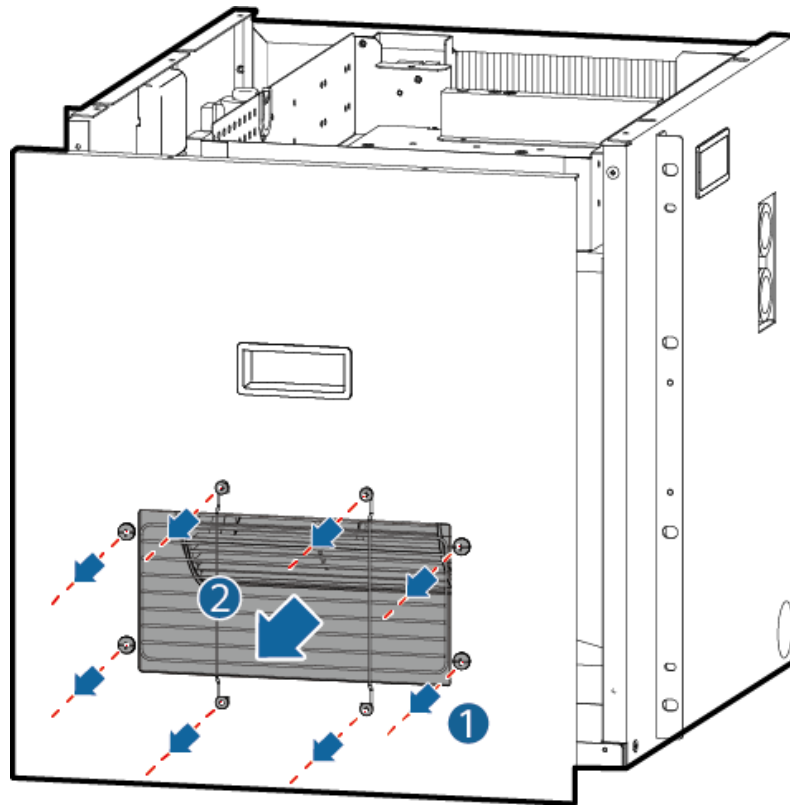
Figure 8-10 Removing screws from the top panel



NH15I40014

- Step 4** Remove the four M4 screws from the fan baffle plate using a Phillips screwdriver, and remove the fan baffle plate.
- Step 5** (Optional) Cut the cable tie securing the NTC sensor on the fan top panel using scissors or diagonal pliers, and remove the NTC sensor.
- Step 6** Cut the cable tie securing the fan terminal using scissors or diagonal pliers and pull out the fan terminal.
- Step 7** Remove the sheet metal fastener bolts from the fan support using a socket wrench, remove the nuts from the fan using an adjustable wrench, and remove the fan.

Figure 8-11 Removing the fan



NH15I40015

- Step 8** Install the new fan in the original position by performing the preceding steps in reverse order.
- Step 9** After powering on the smart cooling product, log in to the ECC800 WebUI as user **admin**, choose **Monitoring > Cooling > NetCol5000 > Controls > Control Information**, set **Startup/Shutdown control** to **ON**, and click **Submit**.
- Step 10** Choose **Monitoring > Cooling > Running Parameters > Parameter Setting**, tap **Advanced**, set **Diagnostic Mode** to **Open**, and click **Submit**.
- Step 11** Set **Diagnostic Indoor Fan** to **50%** and click **Submit**. If the internal circulation fan works properly and there is no alarm, the internal circulation fan is functional. Set **Diagnostic Indoor Fan** to **0%** and click **Submit**.
- Step 12** Choose **Controls > Control Information**, set **Power on/off** to **Off**, and click **Submit**.
- End

8.4.3.2 Replacing a PSU, Rectifier, or Main Control Module

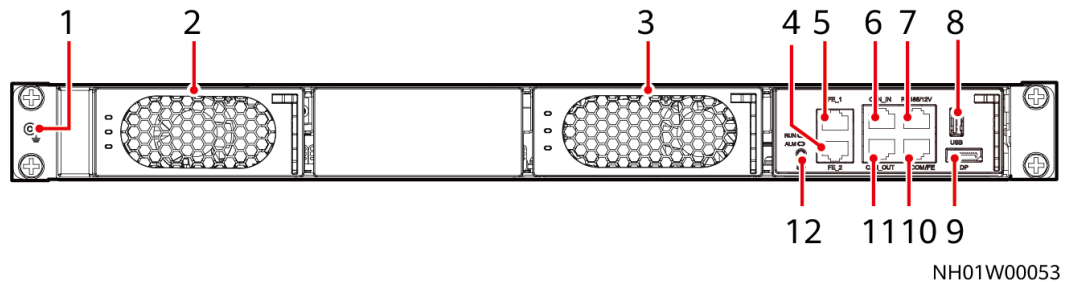
Prerequisites

- A PSU, rectifier, or main control module needs to be replaced.
- A spare PSU, rectifier, or main control module of the same model is available and functional.

Context

- The PSU, rectifier, and main control module can be replaced in the same way. This section describes how to replace a PSU.
- To replace the main control module, download the software and *ACC Software Upgrade Guide* from Huawei websites, and upgrade it on the PAD or ECC.
- **Figure 8-12** shows the front panel of a smart cooling product control unit.

Figure 8-12 Front panel of the smart cooling product control unit



(1) Ground point	(2) Rectifier	(3) PSU
(4) FE_2	(5) FE_1	(6) CAN_IN (input port of the teamwork CAN and northbound RS485 port)
(7) RS485/12 V port for connecting the T/H sensor	(8) USB port	(9) DP (display port)
(10) COM/FE (northbound RS485 port and FE port)	(11) CAN_OUT (output port of the teamwork CAN and northbound RS485 port)	(12) Main control module

Procedure

Step 1 Shut down the smart cooling product.

- Method 1: Log in to the ECC800-Pro PAD app as user **admin**.
 - Choose **Home**.
 - Choose **Settings** and enable **High-Risk Permission**.
 - In the smart module view, tap the cabinet where the smart cooling product is located.
 - Tap the smart cooling product to be set in the cabinet layout diagram.
 - Choose **Real-time Data > OFF**.
- Method 2: Log in to the ECC800-Pro WebUI as user **admin**. Choose **Monitoring > Cooling > NetCol5000-A1 > Controls > Control Information**, choose **Startup/Shutdown control > OFF**, and then click **Submit**.

NOTE

1 in **NetCol5000-A1** is variable and subject to change with the smart cooling product connection sequence. The displayed value is the actual one.

Step 2 Disconnect the power supply from the smart cooling product control unit after the smart cooling product is shut down.

- Method 1: Log in to the ECC800 PAD app as user **admin**.
 - a. Choose **Home**.
 - b. Choose **Settings** and enable **High-Risk Permission**.
 - c. In the smart module view, tap the cabinet where the smart cooling product is located.
 - d. Tap the smart cooling product to be set in the cabinet layout diagram.
 - e. Choose **Real-time Data > OFF**.
- Method 2: Log in to the ECC800 WebUI as user **admin**. Choose **Monitoring > Cooling > NetCol5000 > Controls > Control Information**, choose **Startup/Shutdown control > OFF**, and then click **Submit**.

 **NOTE**

The last digit of the model displayed on the screen is variable and subject to change with the smart cooling product connection sequence. The displayed value is the actual one.

- Step 2** Disconnect the power supply from the smart cooling product control unit after the smart cooling product is shut down.
- Step 3** Remove the top panel and air filter.
- Step 4** Remove the interconnection terminal from the NTC temperature sensor.
- Step 5** Use a Phillips screwdriver to loosen the NTC cable clip and remove the NTC temperature sensor.
- Step 6** Install the new NTC temperature sensor in the original position by performing the preceding steps in reverse order, and install the top panel and air filter.
- Step 7** After powering on the smart cooling product, log in to the ECC800 WebUI as user **admin**, choose **Monitoring > Cooling > NetCol5000 > Controls > Control Information**, set **Startup/Shutdown control** to **ON**, and click **Submit**.
- Step 8** Choose **Monitoring > Cooling > NetCol5000 > Running Information**, click **Advanced** and check whether the value of **Supply air temperature** is appropriate.
- End

8.4.3.4 Replacing a Low Pressure Sensor

Prerequisites

- Tools: an 11# solid wrench and a 27# solid wrench (or two adjustable wrenches), Phillips screwdriver, diagonal pliers or scissors, refrigerant retrieval device (required based on local conditions), nitrogen injection and pressure preservation tool, vacuumization tool, refrigerant injection tool, cable tie, sealant
- A low pressure sensor needs to be replaced.
- A spare low pressure sensor of the same model is available and functional.

Context

The low pressure sensor is maintained from the top.

Procedure

Step 1 Shut down the smart cooling product.

- Method 1: Log in to the ECC800 PAD app as user **admin**.
 - a. Choose **Home**.
 - b. Choose **Settings** and enable **High-Risk Permission**.
 - c. In the smart module view, tap the cabinet where the smart cooling product is located.
 - d. Tap the smart cooling product to be set in the cabinet layout diagram.
 - e. Choose **Real-time Data > OFF**.
- Method 2: Log in to the ECC800 WebUI as user **admin**. Choose **Monitoring > Cooling > NetCol5000-A1 > Controls > Control Information**, choose **Startup/Shutdown control > OFF**, and then click **Submit**.

NOTE

1 in **NetCol5000-A1** is variable and subject to change with the smart cooling product connection sequence. The displayed value is the actual one.

Step 2 Disconnect the power supply from the smart cooling product control unit after the smart cooling product is shut down.

Step 3 Reclaim the refrigerant.

Step 4 Remove the interconnection terminal from the low pressure sensor.

Step 5 Use diagonal pliers to cut off the cable ties that secure the low pressure sensor cable, and remove the low pressure sensor cable.

Step 6 Remove the low pressure sensor using adjustable wrenches.

1. When replacing the low pressure sensor, use one adjustable wrench to fix the bottom needle valve of the sensor, and use another adjustable wrench to rotate the sensor counter-clockwise.

NOTE

If it is difficult to remove the sensor, use a heat gun to heat the threads.

2. After removing the sensor, clear the sealant remaining on the threads.

Step 7 Apply sealant to the threads to be connected. Install a new low pressure sensor in the original position using an adjustable wrench and connect the cable.

Step 8 Install the interconnection terminal of the low pressure sensor, and secure the low pressure sensor cable using cable ties.

Step 9 Inject nitrogen and preserve the pressure. After checking that the low pressure sensor and system do not leak, perform vacuumization and inject refrigerant.

Step 10 After powering on the smart cooling product, log in to the ECC800 WebUI as user **admin**, choose **Monitoring > Cooling > NetCol5000-A1 > Controls > Control Information**, set **Startup/Shutdown control** to **ON**, and click **Submit**.

Step 11 Choose **Controls > Control Information**, set **Diagnostic mode** to **Enter**, and click **Submit**

Step 12 Choose **Running Parameters > Diagnostic Mode Parameters**, set **Comp manual control** to **3000 rpm**, and click **Submit**. Choose **Running Info > Compressor**

Information, and read the value of **Suction pressure**. Check whether the suction pressure of the compressor is within the proper range. The proper range of the air suction pressure is 0.7–1.6 MPa.

Step 13 Set **Comp manual control** to **0 rpm** and click **Submit**.

Step 14 Choose **Controls > Control Information**, set **Diagnostic mode** to **Exit**, and click **Submit**.

----End

8.4.3.5 Replacing a Contactor

Prerequisites

- Tools: Phillips screwdriver, small-sized flat-head screwdriver.
- A contactor needs to be replaced.
- A spare contactor of the same model is available and functional.

Context

The contactor is maintained from the rear.

Procedure

Step 1 Shut down the smart cooling product.

- Method 1: Log in to the ECC800 PAD app as user **admin**.
 - a. Choose **Home**.
 - b. Choose **Settings** and enable **High-Risk Permission**.
 - c. In the smart module view, tap the cabinet where the smart cooling product is located.
 - d. Tap the smart cooling product to be set in the cabinet layout diagram.
 - e. Choose **Real-time Data > OFF**.
- Method 2: Log in to the ECC800 WebUI as user **admin**. Choose **Monitoring > Cooling > NetCol5000-A1 > Controls > Control Information**, choose **Startup/Shutdown control > OFF**, and then click **Submit**.

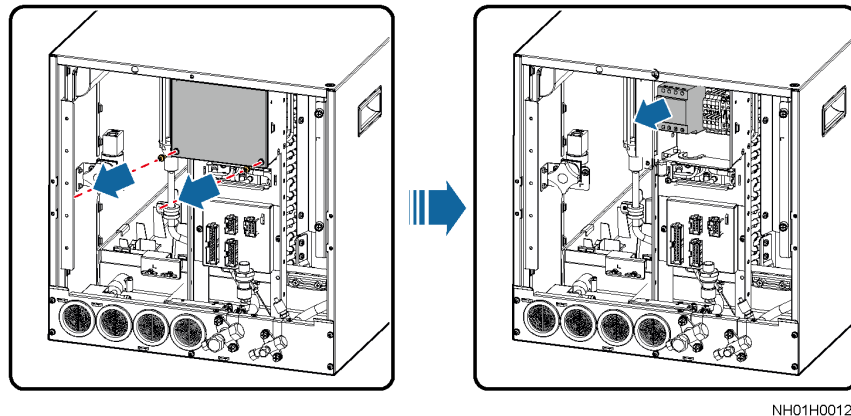
NOTE

1 in **NetCol5000-A1** is variable and subject to change with the smart cooling product connection sequence. The displayed value is the actual one.

Step 2 Disconnect the power supply from the smart cooling product control unit after the smart cooling product is shut down.

Step 3 Remove the cover from the electric control box using a Phillips screwdriver, remove the cable from the contactor using a small-sized flat-head screwdriver, and remove the contactor, as shown in **Figure 8-14**.

Figure 8-14 Removing a contactor



- Step 4** Install a new contactor in the original position by performing the preceding steps in reverse order, and connect the cable.
- Step 5** After powering on the smart cooling product, log in to the ECC800 WebUI as user **admin**, choose **Monitoring > Cooling > NetCol5000-A1 > Controls > Control Information**, set **Startup/Shutdown control** to **ON**, and click **Submit**.
- Step 6** Choose **Controls > Control Information**, set **Diagnostic mode** to **Enter**, and click **Submit**.
- Step 7** Choose **Running Parameters > Diagnostic Mode Parameters**, set **Elec heater manual control** to **ON**, and click **Submit**. If hot air blows out from the air exhaust vent of the fan after a period of time, the electric heater runs properly. Set **Elec heater manual control** to **Closed** and click **Submit**. No hot air blows out after a period of time.
- Step 8** Choose **Controls > Control Information**, set **Diagnostic mode** to **Exit**, and click **Submit**.

----End

8.4.3.6 Replacing an EEV and Coil

Prerequisites

- Tools: flat-head screwdriver, welding tool, refrigerant retrieval device (required based on local conditions), nitrogen injection and pressure preservation tool, vacuumization tool, refrigerant injection tool.
- An EEV and its coil need to be replaced.
- A spare EEV and a coil of the same model are available and functional.

Context

- The EEV and coil are maintained from the rear.
- The silk screen of the electronic expansion valve is **EEV**.

Procedure

Step 1 Shut down the smart cooling product.

- Method 1: Log in to the ECC800 PAD app as user **admin**.
 - a. Choose **Home**.
 - b. Choose **Settings** and enable **High-Risk Permission**.
 - c. In the smart module view, tap the cabinet where the smart cooling product is located.
 - d. Tap the smart cooling product to be set in the cabinet layout diagram.
 - e. Choose **Real-time Data > OFF**.
- Method 2: Log in to the ECC800 WebUI as user **admin**. Choose **Monitoring > Cooling > FusionCol5000-A1 > Controls > Control Information**, choose **Startup/Shutdown control > OFF**, and then click **Submit**.

NOTE

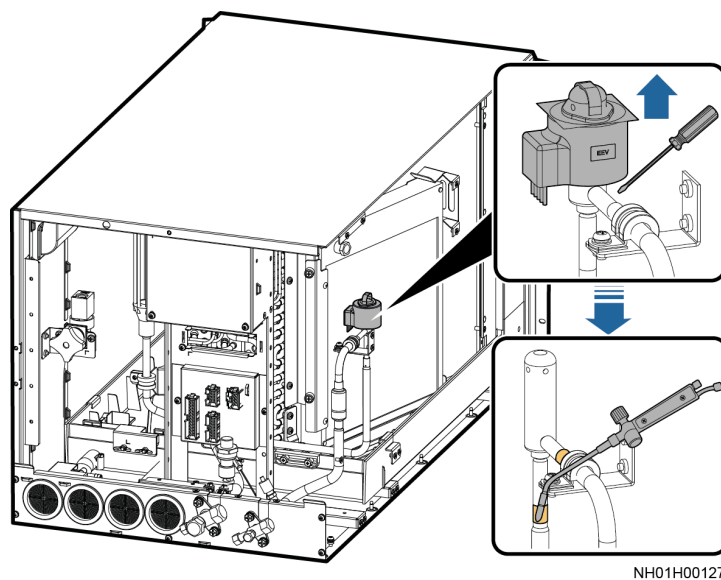
1 in **FusionCol-A1** is variable and subject to change with the smart cooling product connection sequence. The displayed value is the actual one.

Step 2 Disconnect the power supply from the smart cooling product control unit after the smart cooling product is shut down.

Step 3 Reclaim the refrigerant.

Step 4 Pry the EEV coil off using a flat-head screwdriver, as shown in [Figure 8-15](#).

Figure 8-15 Removing the EEV and coil



Step 5 Weld the two ends of the EEV using a welding torch. Then, remove the EEV.

Step 6 Weld a new EEV, and install the coil for the EEV.

NOTICE

Protect the surrounding components during the welding process.

- Step 7** Inject nitrogen and preserve the pressure. After checking that the EEV and system do not leak, perform vacuumization and inject refrigerant.
- Step 8** After powering on the smart cooling product, log in to the ECC800 WebUI as user **admin**, choose **Monitoring > Cooling > FusionCol5000 > Controls > Control Information**, set **Startup/Shutdown control** to **ON**, and click **Submit**.
- Step 9** Choose **Monitoring > Cooling > FusionCol5000 > Running Parameters > Parameter Setting**, click **Advanced**, set **Diagnostic Mode** to **Open**, and click **Submit**. Set **Diagnostic Compressor** to 3600 rpm.
- Step 10** Choose **Running Information**, click **Advanced**, read **Suction pressure** and **Discharge pressure**, and check whether the suction pressure and discharge pressure of the compressor are within the proper ranges. Choose **Running Info > Temperature and Humidity Parameters**, click **Advanced**, and check whether the value of **EEV suct superheat** is within the proper range.

 **NOTE**

- The proper range of the suction pressure is 0.7–1.6 MPa, and the pressure ratio (discharge pressure to suction pressure) is greater than 1.4.
- The proper range of the suction superheat degree is 4°C to 15°C.

Table 8-8 Proper discharge pressure range

Outdoor Ambient Temperature	Discharge Pressure Range
< 15°C	1.5–2.5 MPa
15–35°C	1.5–3.1 MPa
35–45°C	2.5–3.8 MPa
> 45°C	3.1–4.0 MPa

- Step 11** Set **Comp manual control** to **0 rpm** and click **Submit**.
- Step 12** Choose **Controls > Control Information**, set **Diagnostic mode** to **Exit**, and click **Submit**.

----End

8.4.3.7 Replacing an External Circulation Fan

Prerequisites

- An external circulation fan needs to be replaced.
- A spare external circulation fan of the same model is available and functional.

Context

- Tools: Phillips screwdriver, small wrench, cable tie, diagonal pliers.
- Preparation: Power off the smart cooling product.

Procedure

Step 1 Shut down the smart cooling product.

- Method 1: Log in to the ECC800 PAD app as user **admin**.
 - a. Choose **Home**.
 - b. Choose **Settings** and enable **High-Risk Permission**.
 - c. In the smart module view, tap the cabinet where the smart cooling product is located.
 - d. Tap the smart cooling product to be set in the cabinet layout diagram.
 - e. Choose **Real-time Data > OFF**.
- Method 2: Log in to the ECC800 WebUI as user **admin**. Choose **Monitoring > Cooling > NetCol5000-A1 > Controls > Control Information**, choose **Startup/Shutdown control > OFF**, and then click **Submit**.

NOTE

1 in **NetCol5000-A1** is variable and subject to change with the smart cooling product connection sequence. The displayed value is the actual one.

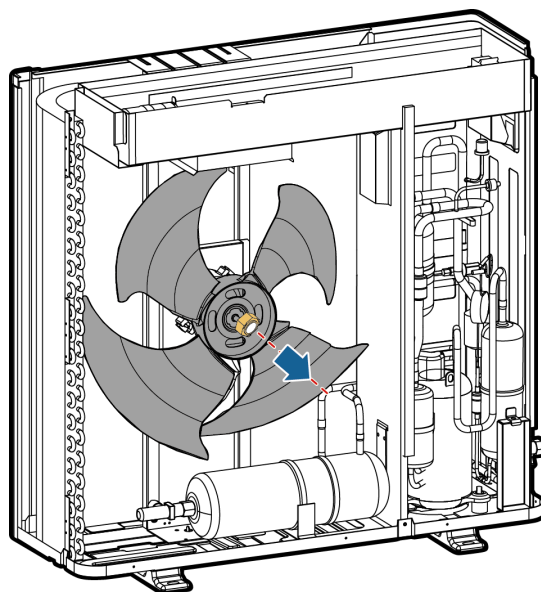
Step 2 Disconnect the power supplies from the smart cooling product control unit and the outdoor unit after the smart cooling product is shut down.

Step 3 Use a Phillips screwdriver to open the top and side panels.

Step 4 Cut the cable ties on the fan cable using diagonal pliers and take out the external circulation fan cable from the electric control box.

Step 5 Remove the screw from the fan using a small wrench, and remove the external circulation fan blades, as shown in [Figure 8-16](#).

Figure 8-16 Removing the external circulation fan blades



NH01H00014

- Step 6** Install the new external circulation fan by performing the preceding steps in reverse order, and connect the fan cable to the corresponding position in the electric control box.
- Step 7** Secure the external circulation fan cable using cable ties.
- Step 8** Install the top cover, front panel, and left front panel.
- Step 9** After powering on the smart cooling product, log in to the ECC800 WebUI as user **admin**, choose **Monitoring > Cooling > NetCol5000-A1 > Controls > Control Information**, set **Startup/Shutdown control** to **ON**, and click **Submit**.
- Step 10** Choose **Controls > Control Information**, set **Diagnostic mode** to **Enter**, and click **Submit**.
- Step 11** Choose **Running Parameters > Diagnostic Mode Parameters**, set **Outdoor fan output man ctrl** to **50%**, and click **Submit**. If the external circulation fan works properly and there is no alarm, the external circulation fan is functional. Set **Outdoor fan manual control** to **0%** and click **Submit**.
- Step 12** Choose **Controls > Control Information**, set **Diagnostic mode** to **Exit**, and click **Submit**.
- Step 13** Clear up the external circulation fan total runtime.
- Method 1: Log in to the ECC800 PAD app as user **admin**.
 - a. Choose **Home**.
 - b. In the smart module view, tap the cabinet where the smart cooling product is located.
 - c. Tap the smart cooling product to be set in the cabinet layout diagram.
 - d. Choose **Real-time Data > Controls > Performance Maintenance Control**, and clear up the internal circulation fan total runtime.
 - Method 2: Log in to the ECC800 WebUI as user **admin**. Choose **Monitoring > Cooling > NetCol5000-A1 > Controls > Performance Maintenance Control**, and clear up the external circulation fan total runtime.
- End

8.4.3.8 Replacing a Compressor

Prerequisites

- Tools: diagonal pliers or scissors, Phillips screwdriver, 8 mm and 13 mm socket wrenches, welding tool, refrigerant retrieval device (required based on local conditions), nitrogen injection and pressure preservation tool, vacuumization tool, refrigerant injection tool, protective gloves.
- A compressor needs to be replaced.
- A spare compressor of the same model is available and functional.

Context

- Before replacing the compressor, disconnect the power supply and discharge refrigerant from the system.

- After the replacement, perform the leakage test with nitrogen, then vacuumize again and charge refrigerant.
- Reclaim or dispose of the refrigerant in accordance with the local laws and regulations.
- Remove the left front panel and left rear panel from the outdoor unit when replacing the compressor.

Procedure

Step 1 Shut down the smart cooling product.

- Method 1: Log in to the ECC800-Pro PAD app as user **admin**.
 - a. Choose **Home**.
 - b. Choose **Settings** and enable **High-Risk Permission**.
 - c. In the smart module view, tap the cabinet where the smart cooling product is located.
 - d. Tap the smart cooling product to be set in the cabinet layout diagram.
 - e. Choose **Real-time Data > OFF**.
- Method 2: Log in to the ECC800 WebUI as user **admin**. Choose **Monitoring > Cooling > NetCol5000-A1 > Controls > Control Information**, choose **Startup/Shutdown control > OFF**, and then click **Submit**.

NOTE

1 in **NetCol5000-A1** is variable and subject to change with the smart cooling product connection sequence. The displayed value is the actual one.

Step 2 Disconnect the power supplies from the smart cooling product control unit and the outdoor unit after the smart cooling product is shut down.

Step 3 Reclaim all the refrigerant from the system using a refrigerant reclaiming device to ensure that there is no pressure inside the system.

NOTE

Discharge the refrigerant if the local laws and regulations allow.

Step 4 Remove the left front panel and right rear panel, and remove the thermal insulation cover to expose the compressor completely.

Step 5 Remove the nut from the connection box on top of the compressor using an 8 mm socket wrench, and disconnect the cable.

Step 6 Remove the inductor cable and oil heating belt from the compressor.

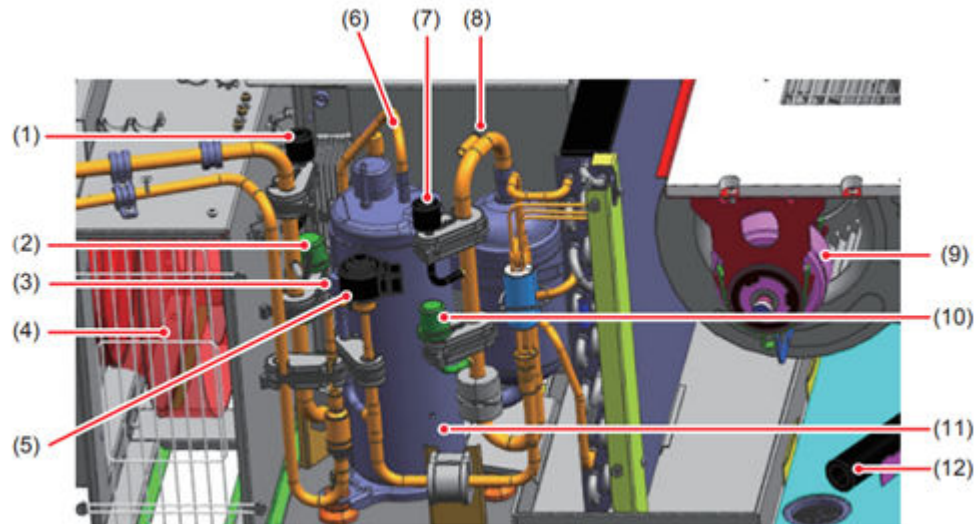
Step 7 Weld from the suction and discharge pipe welding points shown in [Figure 8-17](#). Remove the discharge pipe that connects the compressor to the oil separator, and then remove the suction pipe.

NOTICE

To avoid burning the internal components, other pipes, thermal insulation foam, power cables, and labels, take protective measures, such as spreading wet cloth, around the welding position.

- Step 8** Remove the three bolts from the compressor base using a 13 mm socket wrench, and remove the compressor.

Figure 8-17 Position of the compressor



(1) High pressure sensor	(2) High pressure switch	(3) Pressure gauge	(4) External circulation fan
(5) EEV	(6) Liquid pipe	(7) Low pressure sensor	(8) Gas pipe
(9) Internal circulation fan	(10) Low pressure switch	(11) Compressor	(12) Drainpipe

- Step 9** Remove the rubber plugs from the suction and discharge pipes of the new compressor, and use a 13 mm socket wrench to tighten the bolts on the base to secure the new compressor bound with an oil heating belt to the base.

- Step 10** Weld the suction and discharge pipes again using a welding tool and reconnect the compressor cable and ground cable.

NOTICE

The connection box cover is marked U, V, and W. Connect cables according to the cable sequence and color (red for U, black for V, and blue for W).

- Step 11** Reinstall the oil heating belt, secure it using cable ties, and put a thermal insulation cover on the compressor.
- Step 12** Perform a leakage test with nitrogen again. After checking that the smart cooling product does not leak, vacuumize the smart cooling product and charge refrigerant.
- Step 13** Reinstall the left front panel and right rear panel.
- Step 14** After powering on the smart cooling product, log in to the ECC800 WebUI as user **admin**, choose **Monitoring > Cooling > NetCol5000-A1 > Controls > Control Information**, set **Startup/Shutdown control** to **ON**, and click **Submit**.

Step 15 Choose **Controls > Control Information**, set **Diagnostic mode** to **Enter**, and click **Submit**.

Step 16 Choose **Running Parameters > Diagnostic Mode Parameters**, set **Comp manual control** to **3000 rpm**, and click **Submit**. Choose **Running Info > Compressor Information**, and read the suction pressure and discharge pressure. Check whether the suction and discharge pressures of the compressor are within the proper ranges. Choose **Running Info > Electronic Expansion Valve Information**. Check that the **EEV suction overheating degree** is within the proper range.

 **NOTE**

- The proper range of the suction pressure is 0.7–1.6 MPa, and the pressure ratio (discharge pressure to suction pressure) is greater than 1.4.
- [Table 8-9](#) lists the proper ranges of discharge pressure.
- The proper range of the suction superheat degree is 4°C to 15°C.

Table 8-9 Proper discharge pressure range

Outdoor Ambient Temperature	Discharge Pressure Range
< 15°C	1.5–2.5 MPa
15–35°C	1.5–3.1 MPa
35–45°C	2.5–3.8 MPa
> 45°C	3.1–4.0 MPa

Step 17 Set **Comp manual control** to **0 rpm** and click **Submit**.

Step 18 Choose **Controls > Control Information**, set **Diagnostic mode** to **Exit**, and click **Submit**.

Step 19 Clear up the compressor total runtime.

- Method 1: Log in to the ECC800-Pro PAD app as user **admin**.
 - a. Choose **Home**.
 - b. In the smart module view, tap the cabinet where the smart cooling product is located.
 - c. Tap the smart cooling product to be set in the cabinet layout diagram.
 - d. Choose **Real-time Data > Controls > Performance Maintenance Control**, and clear up the internal circulation fan total runtime.
- Method 2: Log in to the ECC800 WebUI as user **admin**. Choose **Monitoring > Cooling > NetCol5000-A1 > Controls > Performance Maintenance Control**, and clear up the compressor total runtime.

----End

8.4.3.9 Replacing a High Pressure Sensor

Prerequisites

- A high pressure sensor needs to be replaced.
- A spare high pressure sensor of the same model is available and functional.

Context

- Tools: Phillips screwdriver, refrigerant retrieval device (required based on local conditions), nitrogen injection and pressure preservation tool, vacuumization tool, refrigerant injection tool, adjustable wrench, sealant.
- Preparation: Power off the outdoor unit.

Procedure

Step 1 Shut down the smart cooling product.

- Method 1: Log in to the ECC800 PAD app as user **admin**.
 - a. Choose **Home**.
 - b. Choose **Settings** and enable **High-Risk Permission**.
 - c. In the smart module view, tap the cabinet where the smart cooling product is located.
 - d. Tap the smart cooling product to be set in the cabinet layout diagram.
 - e. Choose **Real-time Data > OFF**.
- Method 2: Log in to the ECC800 WebUI as user **admin**. Choose **Monitoring > Cooling > NetCol5000-A1 > Controls > Control Information**, choose **Startup/Shutdown control > OFF**, and then click **Submit**.

NOTE

1 in **NetCol5000-A1** is variable and subject to change with the smart cooling product connection sequence. The displayed value is the actual one.

Step 2 Disconnect the power supplies from the smart cooling product control unit and the outdoor unit after the smart cooling product is shut down.

Step 3 Open the top cover and right rear panel.

Step 4 Cut the cable ties on the high pressure sensor cable using diagonal pliers and take out the high pressure sensor cable from the electric control box.

Step 5 Reclaim all the refrigerant from the system using a refrigerant reclaiming device to ensure that there is no pressure inside the system.


NOTE

Discharge the refrigerant if the local laws and regulations allow.

Step 6 Remove the high pressure sensor using an adjustable wrench.

Step 7 Apply sealant to the threads of the new high pressure sensor. Install a new high pressure sensor in the original position using an adjustable wrench and connect the cable.

Step 8 Secure the high pressure sensor cable using cable ties.

- Step 9** Perform a leakage test with nitrogen again. After checking that the smart cooling product does not leak, vacuumize the smart cooling product and charge refrigerant.
- Step 10** Reinstall the right rear panel and top cover.
- Step 11** After powering on the smart cooling product, log in to the ECC800 WebUI as user **admin**, choose **Monitoring > Cooling > NetCol5000-A1 > Controls > Control Information**, set **Startup/Shutdown control** to **ON**, and click **Submit**.
- Step 12** Choose **Controls > Control Information**, set **Diagnostic mode** to **Enter**, and click **Submit**.
- Step 13** Choose **Running Parameters > Diagnostic Mode Parameters**, set **Comp manual control** to **3000 rpm**, and click **Submit**. Choose **Running Info > Compressor Information**, and read the suction pressure and discharge pressure. Check whether the suction and discharge pressures of the compressor are within the proper ranges. Choose **Running Info > Electronic Expansion Valve Information**. Check that the **EEV suction overheating degree** is within the proper range.
-  **NOTE**
- The proper range of the suction pressure is 0.7–1.6 MPa, and the pressure ratio (discharge pressure to suction pressure) is greater than 1.4.
 - For details about the proper range of the discharge pressure, see [8.4.3.6 Replacing an EEV and Coil](#).
 - The proper range of the suction superheat degree is 4°C to 15°C.
- Step 14** Set **Comp manual control** to **0 rpm** and click **Submit**.
- Step 15** Choose **Controls > Control Information**, set **Diagnostic mode** to **Exit**, and click **Submit**.
- End

8.4.3.10 Replacing a Pneumatic Switch

Prerequisites

- The pneumatic switch needs to be replaced.
- A spare pneumatic switch of the same model is available and functional.

Context

- This section describes how to replace a high pressure switch or a low pressure switch at the outdoor side. Identify and replace the switch that is damaged.
- Tools: Phillips screwdriver, flat-head screwdriver, socket wrench, diagonal pliers, welding tool, refrigerant retrieval device (required based on local conditions), nitrogen injection and pressure preservation tool, vacuumization tool, refrigerant injection tool.
- Preparation: Power off the outdoor unit and retrieve the refrigerant in the system.

Procedure

Step 1 Shut down the smart cooling product.

- Method 1: Log in to the ECC800 PAD app as user **admin**.
 - a. Choose **Home**.
 - b. Choose **Settings** and enable **High-Risk Permission**.
 - c. In the smart module view, tap the cabinet where the smart cooling product is located.
 - d. Tap the smart cooling product to be set in the cabinet layout diagram.
 - e. Choose **Real-time Data > OFF**.
- Method 2: Log in to the ECC800 WebUI as user **admin**. Choose **Monitoring > Cooling > NetCol5000-A1 > Controls > Control Information**, choose **Startup/Shutdown control > OFF**, and then click **Submit**.

NOTE

1 in **NetCol5000-A1** is variable and subject to change with the smart cooling product connection sequence. The displayed value is the actual one.

Step 2 Disconnect the power supplies from the smart cooling product control unit and the outdoor unit after the smart cooling product is shut down.

Step 3 Reclaim all the refrigerant from the system using a refrigerant reclaiming device to ensure that there is no pressure inside the system.

NOTE

Discharge the refrigerant if the local laws and regulations allow.

Step 4 Open the top cover and right rear panel.

Step 5 Cut the cable ties on the pneumatic switch cable using diagonal pliers and take out the pneumatic switch cable from the electric control box.

Step 6 Remove the pneumatic switch using a welding torch.

NOTICE

To avoid burning the internal components, other pipes, thermal insulation foam, power cables, and labels, take protective measures, such as spreading wet cloth, around the welding position.

Step 7 Weld the new pneumatic switch using a welding torch and connect cables.

Step 8 Secure the pneumatic switch cable using cable ties.

Step 9 Perform a leakage test with nitrogen again. After checking that the smart cooling product does not leak, vacuumize the smart cooling product and charge refrigerant.

Step 10 Reinstall the right rear panel and top cover.

Step 11 After powering on the smart cooling product, log in to the ECC800 WebUI as user **admin**, choose **Monitoring > Cooling > NetCol5000-A1 > Controls > Control Information**, set **Startup/Shutdown control** to **ON**, and click **Submit**.

Step 12 Choose **Controls > Control Information**, set **Diagnostic mode** to **Enter**, and click **Submit**.

Step 13 Choose **Running Parameters > Diagnostic Mode Parameters**, set **Comp manual control** to **3000 rpm**, and click **Submit**. Choose **Running Info > Compressor Information**, and read the suction pressure and discharge pressure. Check whether the suction and discharge pressures of the compressor are within the proper ranges. Choose **Running Info > Electronic Expansion Valve Information**. Check that the **EEV suction overheating degree** is within the proper range.

 **NOTE**

- The proper range of the suction pressure is 0.7–1.6 MPa, and the pressure ratio (discharge pressure to suction pressure) is greater than 1.4.
- For details about the proper range of the discharge pressure, see [8.4.3.6 Replacing an EEV and Coil](#).
- The proper range of the air suction superheat degree is 4°C to 15°C.

Step 14 Set **Comp manual control** to **0 rpm** and click **Submit**.

Step 15 Choose **Controls > Control Information**, set **Diagnostic mode** to **Exit**, and click **Submit**.

----End

8.4.4 Replacing Management System Components

1. After replacing components, log in to the WebUI and choose **Maintenance > Parameter Sync** to access the parameter synchronization page.
2. Click **Device type** and select the component type from the drop-down list.
3. Select the failure device in **Source Device**, select the reserved device in **Target Device**, and click **Submit** to synchronize the configuration parameters of the failure device to the reserved device.
4. On the **Monitoring > System > ECC800 > Controls** tab page, select **Delete device with communication failure** and click **Submit**, add the reserved device to the smart module view.

8.4.4.1 Replacing an ECC800 Main Control Module

Prerequisites

NOTICE

- The ECC800 main control module is hot-swappable.
- Before disconnecting cables from the ECC800 main control module, label the cables based on the corresponding ports.

-
- Tools: ESD wrist strap, ESD gloves, Phillips screwdriver, labels, marker
 - Materials: a new undamaged and undeformed ECC800 main control module of the appropriate model

Procedure

- Step 1** Log in to the ECC800 WebUI as an administrator.
- Step 2** Use the **Back Up Current Settings** function to record the ECC800 configuration information or manually record the information.

Path: **Maintenance > Configuration File > Back Up Current Settings**

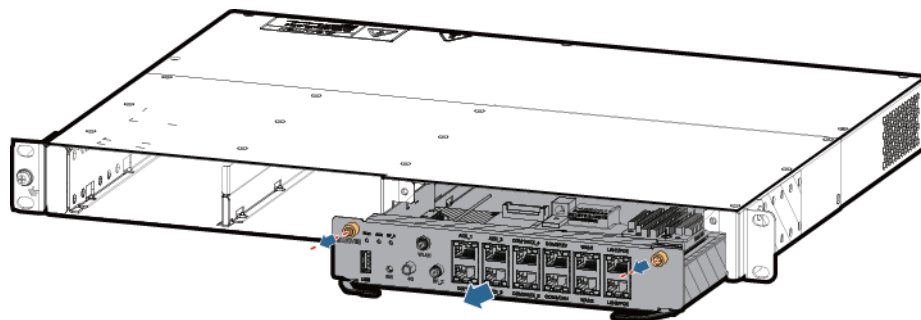
NOTE

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.

The following information cannot be backed up: monitoring module IP address parameters, smart module certificate, NetEco certificate, NetEco second-challenge password, time configuration parameters, access user management, access permission management, device access certificate, log, and user configuration information.

- Step 3** Label each cable and antenna based on the corresponding ports on the ECC800 main control module.
- Step 4** Remove cables, USB flash drive, USB-to-WiFi module, and antennas from the ECC800 main control module.
- Step 5** Remove the captive screws on the panel of the old ECC800 main control module, and pull the handle outward to remove the module from the subrack.

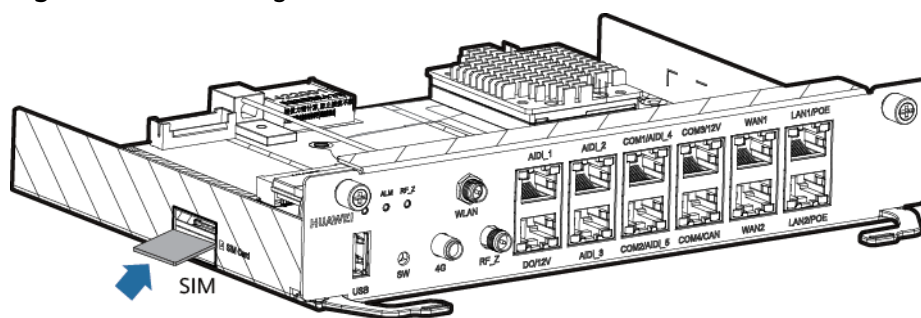
Figure 8-18 Removing the ECC800 main control module



DM02H00026

- Step 6** (Optional) Remove the SIM card from the corresponding slots of the ECC800 main control module.
- Step 7** (Optional) Install the removed SIM card in the corresponding slot of the new ECC800 main control module.

Figure 8-19 Installing a SIM card



DM25H00150

- Step 8** Install the spare ECC800 main control module in the ECC800 subrack and tighten the screws on both sides of the ECC800 main control module.
- Step 9** Connect the communications cables and antennas to the ECC800 main control module.
- Step 10** Choose **Maintenance > Configuration File** and import the backup configuration file, or set parameters for the devices that connect to the ECC800 to ensure normal communication.
- End

8.4.4.2 Replacing an ECC800 Antenna

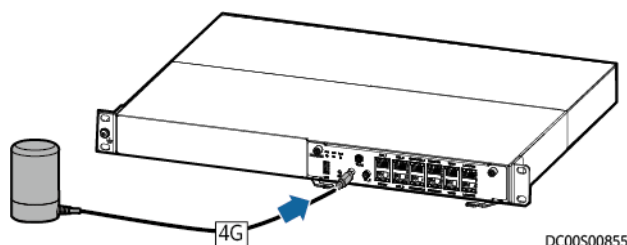
Prerequisites

- Tools: ESD wrist strap, ESD gloves
- Materials: A spare ECC800 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.

Figure 8-20 Replacing an antenna



----End

8.4.4.3 Replacing a SIM Card

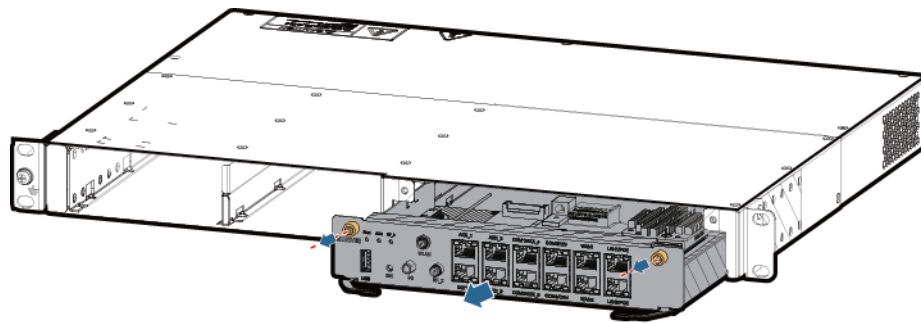
Prerequisites

- 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 main control module, and then disconnect the signal cables.
- Step 2** Loosen the screws on both sides of the panel of the ECC800 main control module.
- Step 3** Pull the handles on both sides of the panel of the ECC800 main control module, and remove the main control module.

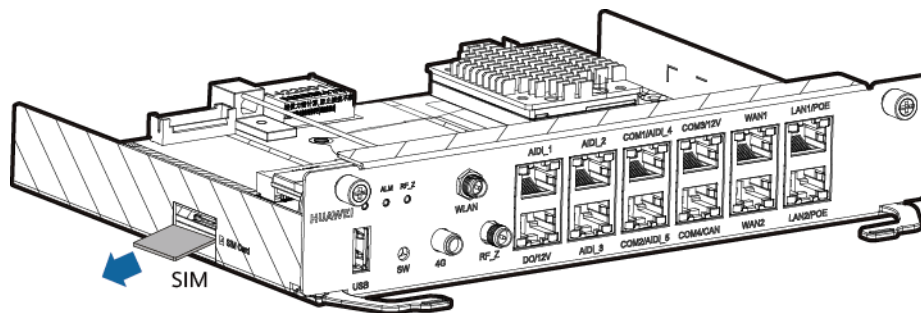
Figure 8-21 Removing the ECC800 main control module



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Step 4 Remove the SIM card from the card slot.

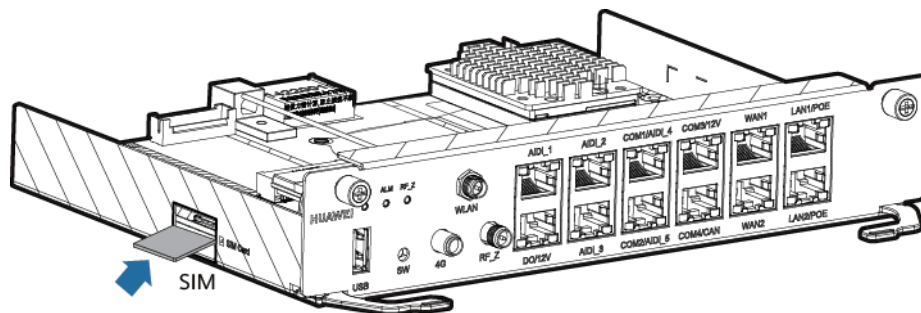
Figure 8-22 Removing a SIM card



DM25H00151

Step 5 Insert the spare SIM card into the card slot.

Figure 8-23 Installing a SIM card



DM25H00150

Step 6 Insert the ECC800 main control module into the slot.

Step 7 Tighten the screws on both sides of the panel of the ECC800 main control module.

Step 8 Connect the signal cables to the panel of the new ECC800 main control module based on the recorded information.

----End

8.4.4 Replacing a Camera

Impact on the System

The operation of the video surveillance system will be interrupted.

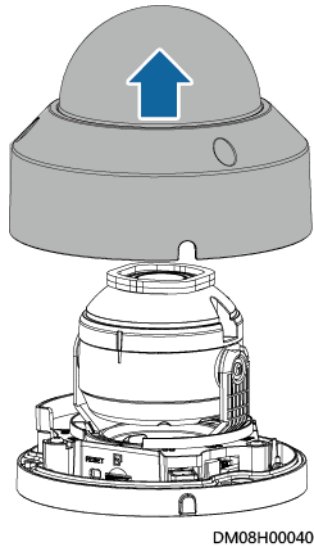
Preparations

- Tools: ESD wrist strap, ESD gloves, step ladder, label, marker, Phillips screwdriver
- Material: camera

Procedure

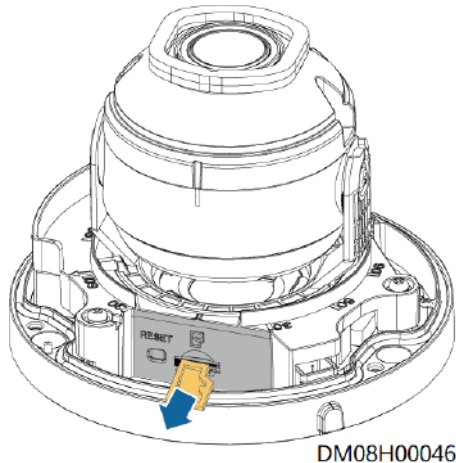
Step 1 Remove the transparent cover using a Phillips screwdriver.

Figure 8-24 Removing the transparent cover



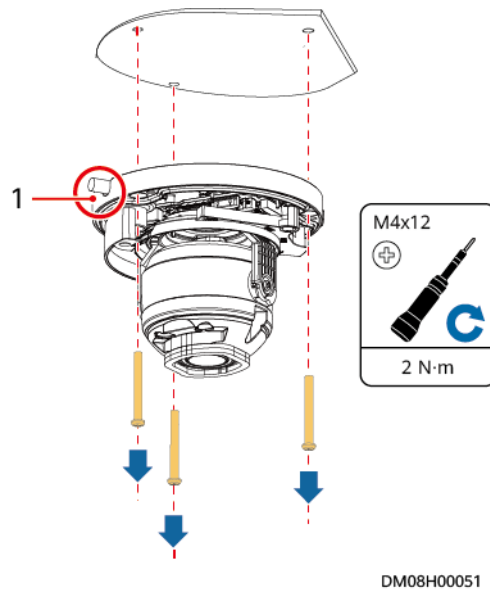
Step 2 Remove the SD card.

Figure 8-25 Removing an SD card



Step 3 Remove the monitoring network cable from the camera and remove the camera.

Figure 8-26 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

8.4.4.5 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

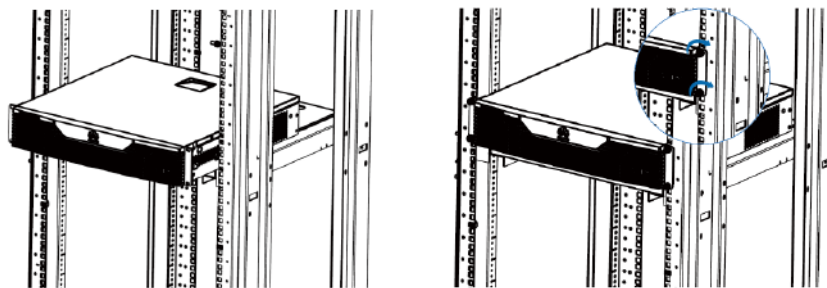
- Step 1** Turn off the power switch of the IVS1800, disconnect the power supply of the IVS1800, remove the cables from the IVS1800, label the cables, and record the original connection positions of the cables.

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 8-27 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

8.4.4.6 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).

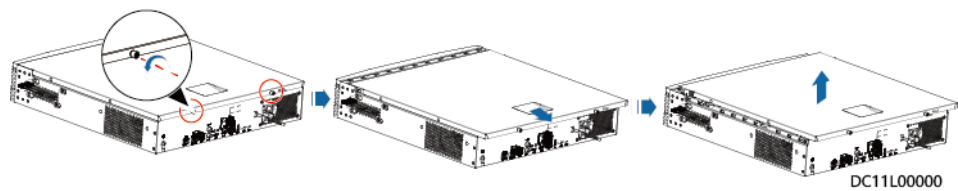
Procedure

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.

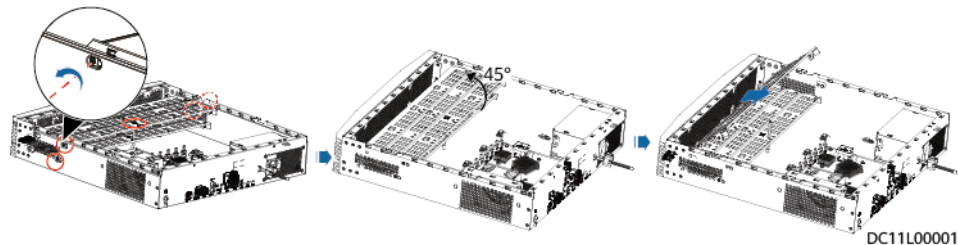
1. Use a PH2 screwdriver to remove the two black screws on the rear of the chassis cover, and take off the chassis cover.

Figure 8-28 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.

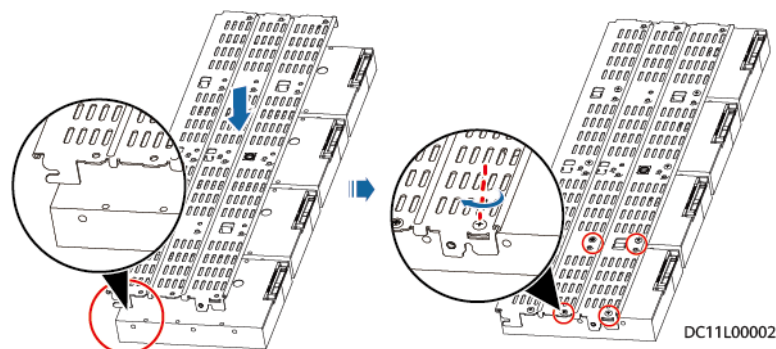
Figure 8-29 Removing the hard disk tray



Step 3 Install a new hard disk.

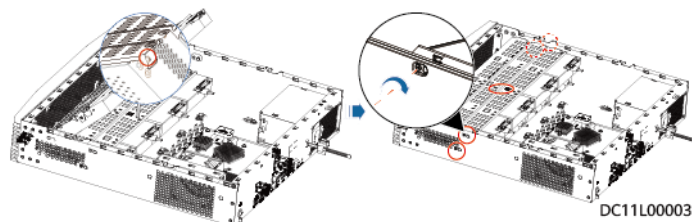
1. Place the hard disk with ports facing upwards and align the screw holes on the hard disk tray with the hard disk and fasten the screws. Before the installation, ensure that the fastener of the hard disk tray is on a different side from the hard disk port, as shown in the lower left figure.

Figure 8-30 Installing hard disks



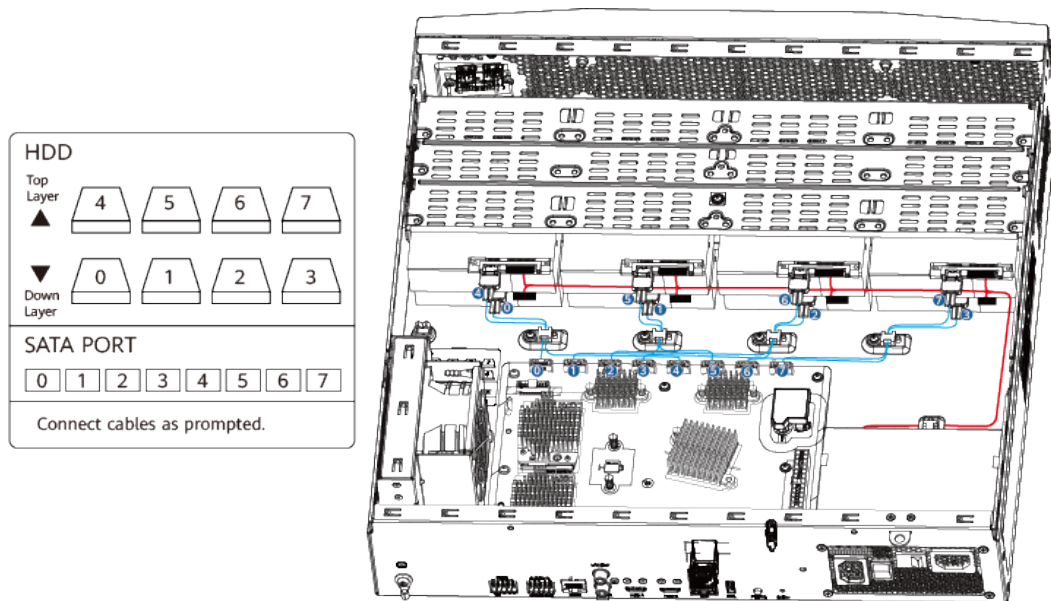
2. Insert the hard disk tray back at 45 degrees with the opening of its locking buckle facing downwards, hold the screw in the red-framed part to lower the hard disk tray until it is level, and fasten the black screws on the left and right sides and the white screw on the top.

Figure 8-31 Fastening the screw on the panel and the screws on the hard disk tray



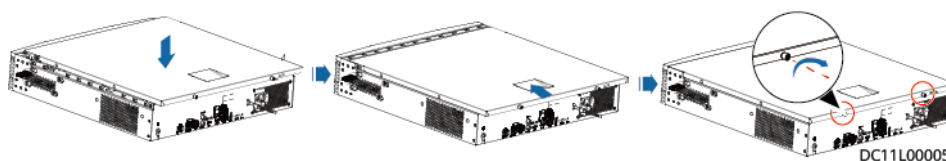
3. Connect data and power cables to hard disks. Connect hard disk cable ports 0–3 to hard disks on the lower-layer hard disk tray and ports 4–7 to hard disks on the upper-layer, as shown in the lower left figure.

Figure 8-32 Connecting data and power cables to hard disks



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

Figure 8-33 Closing the chassis cover



Step 4 Observe the hard disk indicator to check whether the hard disk works properly.

----End

Follow-up Procedure

If the new hard disk is not running properly, contact technical support.

8.4.4.7 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** Remove the cables from the T/H sensor.
- Step 2** Remove the faulty T/H sensor.
- Step 3** Attach the new T/H sensor to an appropriate position on the cabinet door frame based on the site requirements.
- Step 4** 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

8.4.4.8 Replacing a Smoke Detector

Prerequisites

- Recommended tools and materials: Phillips screwdriver, insulation tape, step ladder (2 m)
- A spare smoke detector of the same model is available and functional.

Procedure

- Step 1** Remove the faulty 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

8.4.4.9 Replacing an Electrode Water Sensor

Prerequisites

- Recommended tools and materials: Phillips screwdriver and crimping tool
- The water sensor needs to be replaced.
- A spare water sensor of the same model is available and functional.

Procedure

Step 1 Disconnect the cable between the water sensor and the ECC800.

Step 2 Remove the faulty water sensor.

Step 3 Place the new water sensor in the correct position.

Step 4 Connect it to the water sensor cable connected to the ECC800.

----End

8.4.4.10 Replacing a Door Status Sensor

Prerequisites

- Tools: Phillips screwdriver, insulation tape, step ladder
- Material: A spare door status sensor of the same model is available and functional.

Procedure

Step 1 Remove the cover from the door status sensor.

Step 2 Remove the communications cable using a Phillips screwdriver and insulate the cable.

NOTICE

- When removing cables, label the cables with corresponding terminal ports for later connection.
- When removing cables, wrap bare cables with insulation tape to avoid hazards.

Step 3 Remove the door status sensor from the conversion bracket on the cabinet door using a screwdriver.

Step 4 Install the new door status sensor on the conversion bracket of the cabinet door, and connect cables to the sensor.

Step 5 Reinstall the cover on the door status sensor.

----End

9 Technical Specifications

Table 9-1 Key technical specifications

Item	Specifications
Cabinet dimensions (H x W x D) (mm)	2000 x 600 x 1100
Power system	Asia, Africa, and Europe: 220 V/230 V/240 V, 1 Ph, 50 Hz/60 Hz Latin America: 208 V, 2 Ph, 60 Hz
Voltage range	220–240 V
Voltage frequency range	50 Hz/60 Hz (±3 Hz)
Maximum power of a single cabinet	≤ 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"> • Pipes are routed from the top or bottom. • 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. • Signal cables can be routed out from the top or bottom.
Operating temperature	Indoor: 0–40°C
	Outdoor: -20°C to +45°C
Storage temperature	-40°C to +70°C

Item	Specifications
Storage humidity	≤ 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/m³ (sea level +15°C).

Table A-1 Derating coefficients of the UPS2000-H

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

AC	alternate current
ATS	Auto Transformer Switch
ATSE	Auto Transformer Switch Equipment

B

BIM	Battery Interface Module
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C

CIM	Communication Interface Module
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D

DC	direct current
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I

IEC	International Electrotechnical Commission
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M

MCB	miniature circuit breaker
------------	---------------------------

S

SNMP	Simple Network Management Protocol
SPD	surge protective device
SOC	State Of Charge
SOH	State Of Health

U

UPS uninterruptible power system