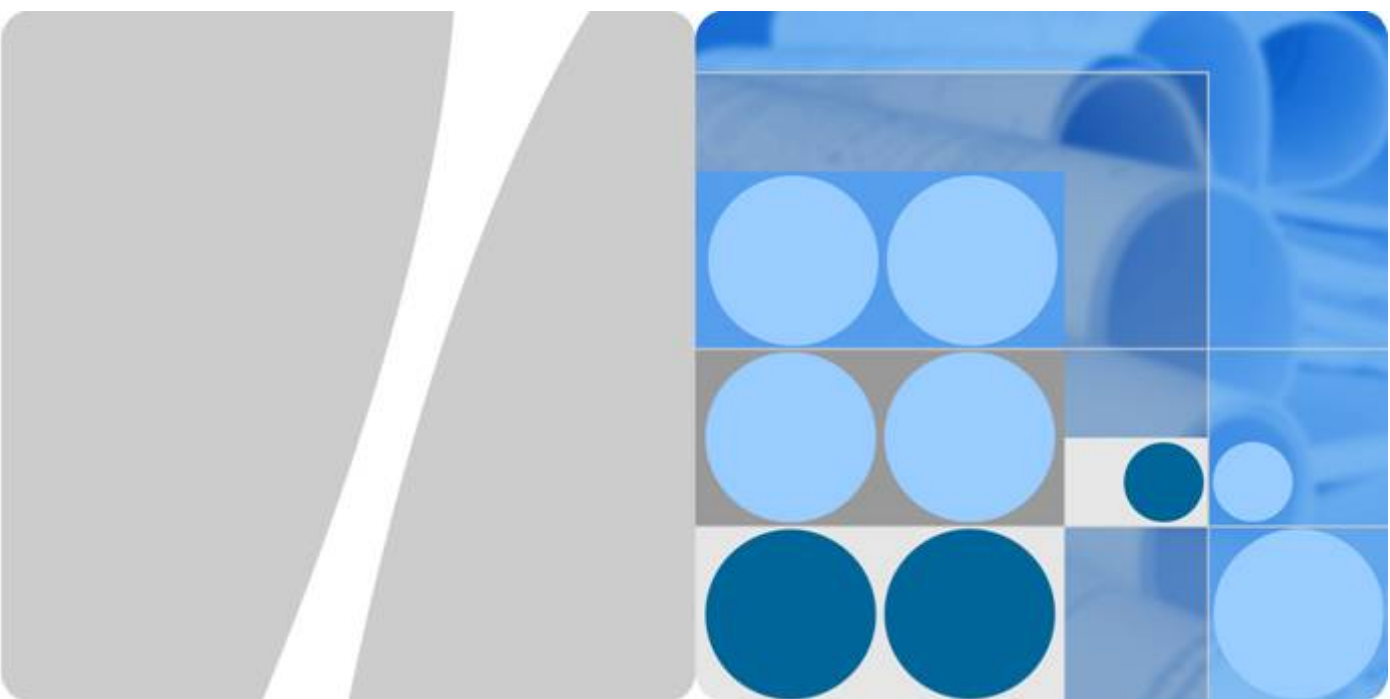




NetCol5000-A(025, 035) In-row Air Cooled Smart Cooling Product

User Manual (600 mm Width)

Issue 16
Date 2020-12-10

HUAWEI TECHNOLOGIES CO., LTD.



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About This Document

Purpose

This document applies to the following NetCol5000-A series in-row air cooled smart cooling product:

- NetCol5000-A035: NetCol5000-A035 in-row smart cooling product
- NetCol5000-A025: NetCol5000-A025 in-row smart cooling product
- NetCol5000-A: both of NetCol5000-A025 and NetCol5000-A035

This document describes the NetCol5000-A, an in-row air cooled smart cooling product, in terms of its product description, installation guide, commissioning, and operation and maintenance (O&M).

The figures provided in this document are for reference only.

Intended Audience

This document is intended for:

- Sales personnel
- Technical support personnel
- System engineers
- Hardware installation personnel
- Commissioning engineers
- Data configuration engineers
- Maintenance personnel

Symbol Conventions

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

Symbol	Description
	Indicates a hazard with a high level of risk which, if not avoided, will result in death or serious injury.

Symbol	Description
	Indicates a hazard with a medium level of risk which, if not avoided, could result in death or serious injury.
	Indicates a hazard with a low level of risk which, if not avoided, could result in minor or moderate injury.
	Indicates a potentially hazardous situation (for device or environment safety) 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.
	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

Updated the method of restoring the controller to factory settings.

Issue 16 (2020-12-10)

Added section "Replacing the High Pressure Switch."

Issue 15 (2020-05-18)

Updated the method of restoring the controlsafety information.

Issue 14 (2020-01-10)

Updated the safety information.

Issue 13 (2019-01-15)

Updated the manual name and so on.

Issue 12 (2018-08-05)

- Modified the section of working conditions.
- Modified the section of alarm reference.

Issue 11 (2018-03-23)

Added a base drawing.

Issue 10 (2017-05-28)

Modified descriptions about the teamwork networking and monitoring.

Issue 09 (2016-09-15)

Modified the name of the needle.

Issue 08 (2016-06-30)

Added the cable connections for teamwork control in the smart ETH gateway scenario.

Modified descriptions about the leather hose tolerance range and the pipe support.

Issue 07 (2016-04-15)

Added the refrigerant charging requirement of NetCol500-A036.

Modified descriptions about the teamwork networking and monitoring, installing enclosure frames and upper frames, and connecting signal cables.

Issue 06 (2015-07-02)

Modified the requirement of leak checking, vacuuming, and partially charging refrigerant.

Issue 05 (2014-11-27)

Added reducing valve requirement when leak checking.

Issue 04 (2014-10-30)

Modified the following expressions:

- Added table 5-9.
- A cold aisle temperature and humidity sensor was configured in section 3.1.2.

Issue 03 (2014-09-09)

Modified the expression frame of section 5.

Issue 02 (2014-07-07)

Modified some note descriptions in section 4.4.2.

Issue 01 (2014-05-30)

This issue is the first official release.

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1 Safety Information

1.1 General Safety

Statement

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

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

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

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

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

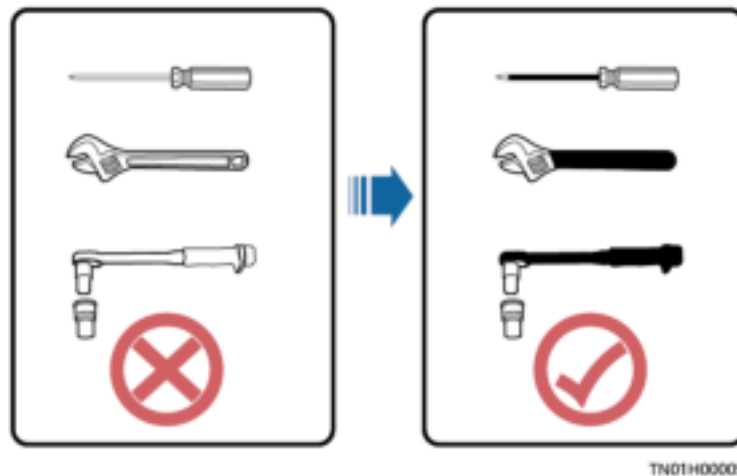
- Operation beyond the conditions specified in this document
- Installation or use in environments which are not specified in relevant international or national standards
- Unauthorized modifications to the product or software code or removal of the product
- Failure to follow the operation instructions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

General Requirements

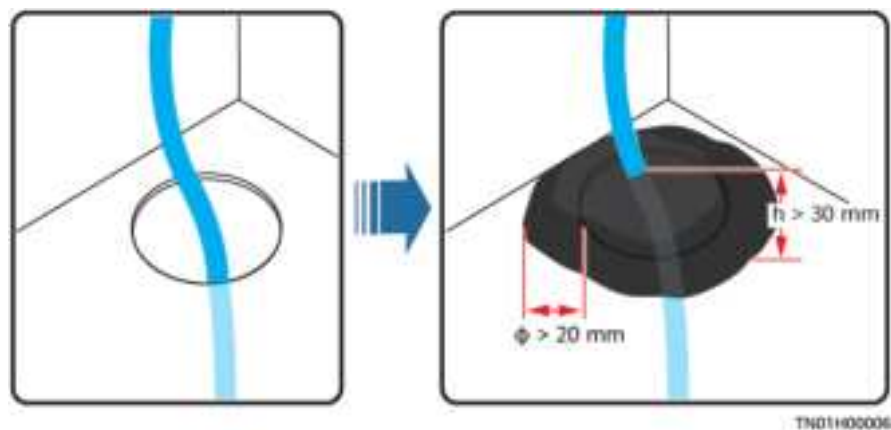
- Do not install, use, or operate outdoor equipment and cables (including but not limited to moving equipment, operating equipment and cables, inserting connectors to or removing connectors from signal ports connected to outdoor facilities, working at heights, and performing outdoor installation) in harsh weather conditions such as lightning, rain, snow, and level 6 or stronger wind.
- Before installing, operating, or maintaining the equipment, remove any conductive objects such as watches or metal jewelry like bracelets, bangles, and rings to avoid electric shock.
- When installing, operating, or maintaining the equipment, wear personal protective equipment such as insulation gloves, goggles, and safety clothing, helmet, and shoes, as shown in the following figure.



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



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



- Do not scrawl, damage, or block any warning label on the equipment.
- When installing devices, use a torque wrench with a proper measurement range to tighten bolts. Ensure that the wrench is not skewed and the torque error does not exceed 10%.
- Do not work with power on during installation.
- Repaint any paint scratches caused during equipment transportation or installation in a timely manner. Equipment with scratches cannot be exposed to an outdoor environment for a long period of time.
- Before operations, ensure that the equipment is firmly secured to the floor or other solid objects, such as a wall or an installation rack.
- Do not use water to clean electrical components inside or outside of a cabinet.
- Do not change the structure or installation sequence of equipment without permission.
- Do not touch a running fan with your fingers, components, screws, tools, or boards before the fan is powered off or stops running.

Personal Safety

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

1.2 Personnel Requirements

- Personnel who plan to install or maintain Huawei equipment must receive thorough training, understand all necessary safety precautions, and be able to correctly perform all operations.
- Only qualified professionals or trained personnel are allowed to install, operate, and maintain the equipment.
- Only qualified professionals are allowed to remove safety facilities and inspect the equipment.
- Personnel who will operate the equipment, including operators, trained personnel, and professionals, should possess the local national required qualifications in special operations such as high-voltage operations, working at heights, and operations of special equipment.
- Professionals: personnel who are trained or experienced in equipment operations and are clear of the sources and degree of various potential hazards in equipment installation, operation, maintenance
- Trained personnel: personnel who are technically trained, have required experience, are aware of possible hazards on themselves in certain operations, and are able to take protective measures to minimize the hazards on themselves and other people
- Operators: operation personnel who may come in contact with the equipment, except trained personnel and professionals
- Only professionals or authorized personnel are allowed to replace the equipment or components (including software).

1.3 Electrical Safety

Grounding

- For the equipment that needs to be grounded, install the ground cable first when installing the equipment and remove the ground cable last when removing the equipment.
- Do not damage the ground conductor.
- Do not operate the equipment in the absence of a properly installed ground conductor.
- Ensure that the equipment is connected permanently to the protective ground. Before operating the equipment, check its electrical connection to ensure that it is securely grounded.

General Requirements

Use dedicated insulated tools when performing high-voltage operations.

AC and DC Power

DANGER

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

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

Cabling

- When routing cables, ensure that a distance of at least 30 mm exists between the cables and heat-generating components or areas. This prevents damage to the insulation layer of the cables.
- Do not route cables behind the air intake and exhaust vents of the equipment.
- Ensure that cables meet the VW-1 or ZB flame spread rating requirements or higher.
- Bind cables of the same type together. When routing cables of different types, ensure that they are at least 30 mm away from each other.
- If an AC input power cable is connected to the cabinet from the top, bend the cable in a U shape outside the cabinet and then route it into the cabinet.
- When the temperature is low, violent impact or vibration may damage the plastic cable sheathing. To ensure safety, comply with the following requirements:
 - Cables can be laid or installed only when the temperature is higher than 0°C. Handle cables with caution, especially at a low temperature.
 - Cables stored at subzero temperatures must be stored at room temperature for at least 24 hours before they are laid out.

- Do not perform any improper operations, for example, dropping cables directly from a vehicle.
- When selecting, connecting, and routing cables, follow local safety regulations and rules.

ESD

NOTICE

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

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

Figure 1-1 Wearing an ESD wrist strap



Neutral-Ground Voltage

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

1.4 Installation Environment Requirements

- To prevent fire due to high temperature, ensure that the ventilation vents or heat dissipation system are not blocked when the equipment is running.
- Install the equipment in an area far away from liquids. Do not install it under areas prone to condensation, such as under water pipes and air exhaust vents, or areas prone to water leakage, such as air conditioner vents, ventilation

vents, or feeder windows of the equipment room. Ensure that no liquid enters the equipment to prevent faults or short circuits.

- If any liquid is detected inside the equipment, immediately disconnect the power supply and contact the administrator.
- Do not expose the equipment to flammable or explosive gas or smoke. Do not perform any operation on the equipment in such environments.
- Ensure that the equipment room provides good heat insulation, and the walls and floor are dampproof.
- Install a rat guard at the door of the equipment room.

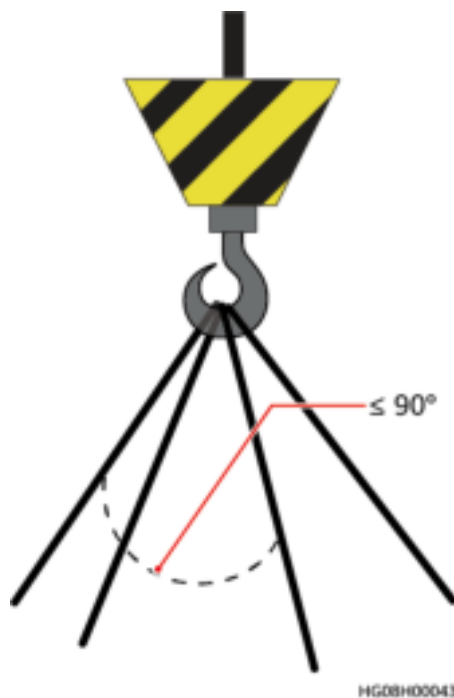
Installation at Heights

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

1.5 Mechanical Safety

Hoisting Devices

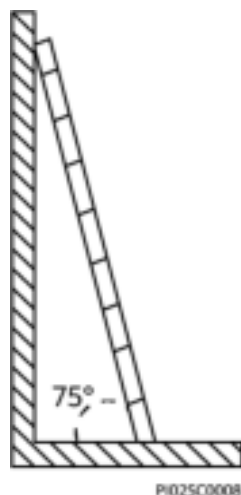
- Do not walk under hoisted objects.
- Only trained and qualified personnel should perform hoisting operations.
- Check that hoisting tools are available and in good condition.
- Before hoisting objects, ensure that hoisting tools are firmly secured onto a load-bearing object or wall.
- Ensure that the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



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

Using Ladders

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



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

Drilling Holes

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

NOTICE

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

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

Moving Heavy Objects

DANGER

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

- Be cautious to avoid injury when moving heavy objects.



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

1.6 Cooling System Safety

Welding

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

High Temperature and Pressure

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

Refrigerant Frostbite

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

Storage and Recycling

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



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

1.7 Others

Exercise caution when shutting down the smart cooling product. Doing so may cause equipment and room overheating, which will damage the equipment.

2 Product Description

2.1 Model Description

Figure 2-1 shows the naming rule for the NetCol5000-A series products.

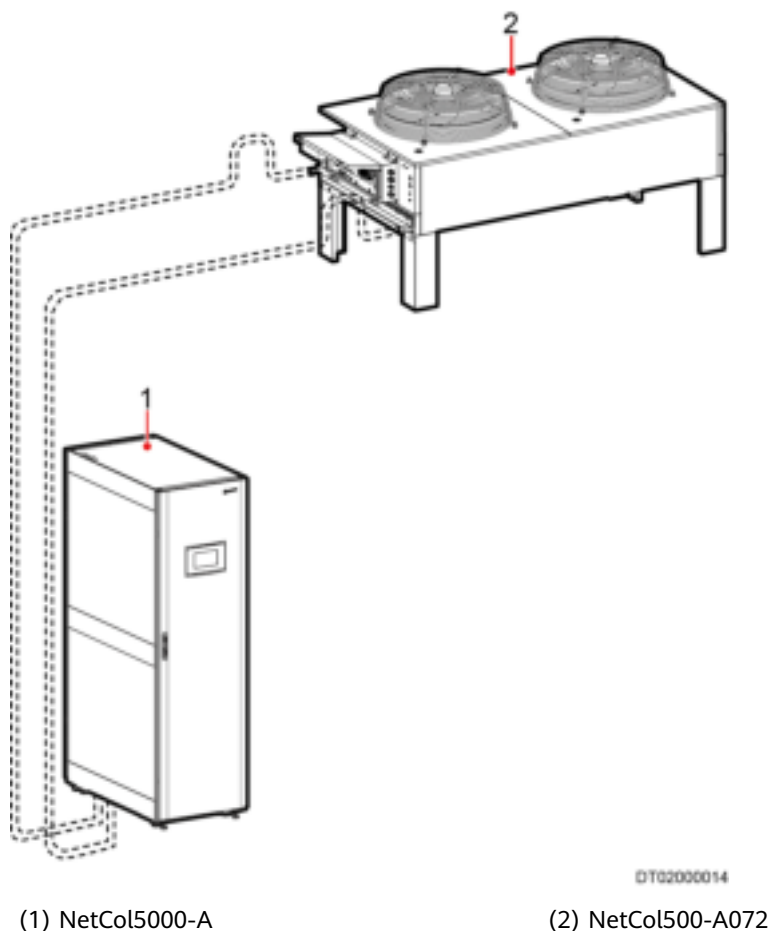
Figure 2-1 Naming rule

NetCol	5000	-	A	035	H	5	1	2	D	2	E	1	2	0	E	1
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1 Data Center Smart Cooling Product				N - 208-230 V, 3 PH, 60 Hz								11 Filter Grade				
2 Model Range				P - 220-240 V, 3 PH, 50 Hz								0 - None				
2000 - In-cabinet Smart Cooling Product				Q - 380 V, 3 PH, 60 Hz								1 - G3				
5000 - In-row Smart Cooling Product				R - 460-480 V, 3 PH, 60 Hz								2 - G4				
8000 - In-room Smart Cooling Product				S - 220-240 V, 1 PH, 50 Hz								12 Humidifier				
3 Hyphen				T - 208-230 V, 1 PH, 60 Hz								0 - None				
4 System Type				D - 48 V DC								R - Infrared Humidifier				
				1 - 200-277 V, 1PH, 50/60 Hz								E - Electrode Humidifier				
				2 - 200-240 V, 1PH, 50/60 Hz								13 Re-Heating				
				3 - 200-240 V, 3PH, 50/60 Hz								0 - None				
A - Air Cooled				4 - 380-415 V, 3PH, 50/60 Hz								1 - Electric Heating 1 Level				
C - Chilled Water				5 - 380-480 V, 3PH, 50/60 Hz								2 - Electric Heating 2 Level				
F - Free Cooling				6 - 220 V, 1 PH, 50/60 Hz								14 Monitoring				
G - Glycol Cooled				7 - 220-240V,1PH,50/60Hz								0 - No Card				
H - Water Cooled + Chilled Water				8 - 208-240 V, 1PH, 50/60 Hz								1 - Web Only				
T - Air Cooled + Loop Thermal Siphon				8 Cooling System								2 - 485 Only				
5 Mode Code				1 - R410A Single System								3 - Web&485				
020 - Mode Code 020				2 - R410A Dual System								15 Sensors				
021 - Mode Code 021				3 - R407C Single System								0 - None				
025 - Mode Code 025				4 - R407C Dual System								S - Smoke Temperature				
030 - Mode Code 030				A - Chilled Water with Three Way Valve								F - High Temperature				
035 - Mode Code 035				B - Chilled Water with Two Way Valve								B - Smoke & High Temperature				
040 - Mode Code 040				C - Others								16 Packaging				
050 - Mode Code 050				9 Fan Type								D - Domestic				
070 - Mode Code 070				1 - AC Fan								E - Export				
6 Air Discharge				2 - EC Fan								17 Order Special Features				
				3 - DC Fan								0 - None				
				10 Compressor Type								1 - Condensate Pump				
				0 - No Compressor												
				N - ON-OFF												
				D - DC Inverter												

2.2 Composition

The NetCol5000-A operates as follows: Fans absorb indoor hot air that then moves to the evaporator with heat transmitted to the refrigerant. The refrigerant is discharged to the outdoor unit by the compressor, releasing heat to the outdoor environment. The indoor unit and outdoor condenser are interconnected and circulate using the refrigerant pipes in a sealing manner. The NetCol5000-A consists of an indoor unit and an outdoor unit (the NetCol500-A072 is used as an example), as shown in [Figure 2-2](#).

Figure 2-2 Product components



2.2.1 Indoor Unit

Appearance

[Figure 2-3](#) shows the NetCol5000-A indoor unit.

Figure 2-3 Appearance



Table 2-1 describes the four optional dimensions of the NetCol5000-A indoor unit.

Table 2-1 Dimensions

Dimensions	H x W x D
Standard configuration	2000 mm x 600 mm x 1100 mm
Expansion mode 1	2000 mm x 600 mm x 1200 mm
Expansion mode 2	2200 mm x 600 mm x 1100 mm
Expansion mode 3	2200 mm x 600 mm x 1200 mm

Components

The indoor unit consists of a compressor, EC fan, evaporator, air filter, electric heater (optional), electrode humidifier (optional), and condensate pump (optional).

- Compressor
The indoor unit uses the advanced DC frequency-converting scroll compressor to adapt to broad working conditions. The compressor features good environment adaptability, stepless frequency adjustment, precise temperature control, energy conservation, high reliability, low noise, long service timlife, and easy installation. The R410A refrigerant used is environmentally friendly.

- **EC fan**
The indoor curves EC retroverted centrifugal fan from a high-end German brand conserves 40% more energy than common fans and features redundancy design, high reliability, and long service life.
- **Evaporator**
The highly efficient finned-tube evaporator is made of threaded copper tubes and a hydrogen-plated layer and adopts the computational fluid dynamics (CFD) to improve heat exchange efficiency.
- **Air filter**
The G4 air filter meets requirements for equipment room cleanness.
- **Electric heater**
The positive temperature coefficient (PTC) heater automatically adjusts heating capacity and provides multiple protection mechanisms to ensure operating security and reliability. The electric heater features quick start, large heating capacity, and even heating.
- **Electrode humidifier**
The electrode humidifier provides stepless adjustment of humidification capacity and precise control of humidity in the equipment room.
- **Condensate pump**
The condensate pump is made of thermostable materials which ensure that the condensate water and hot water from the humidifier are exhausted efficiently. The pump lift is 3.5 m. Two floats are used to improve reliability.

2.2.2 Outdoor Unit

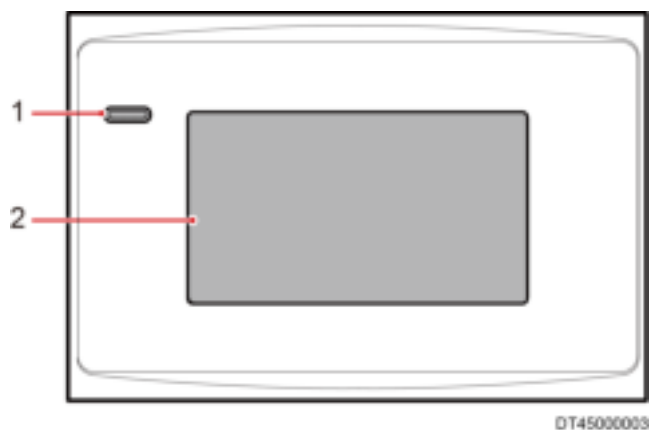
For details about the outdoor unit, see the *NetCol500 Variable-frequency Drive Outdoor Unit User Manual*.

2.2.3 Controller

LCD

The 7-inch true color-sensitive LCD with thin film transistor (TFT) offers a user-friendly interface for you to perform query, settings, monitoring, and maintenance.

Figure 2-4 LCD



(1) Indicator

(2) Screen

Functions

- The controller logically controls the temperatures and humidity for components inside a single smart cooling product.
- The LCD on the controller allows you to set the parameters of the smart cooling product and query the status information.
- When multiple smart cooling products work cooperatively, the controller optimally distributes the heat load, greatly lowers the power consumption, provides backup, and improves the reliability.
- You can use the remote control system purchased from Huawei to realize monitoring and managing one or more smart cooling products by Simple Network Management Protocol (SNMP) or Modbus protocol.

Features

The controller has the following features:

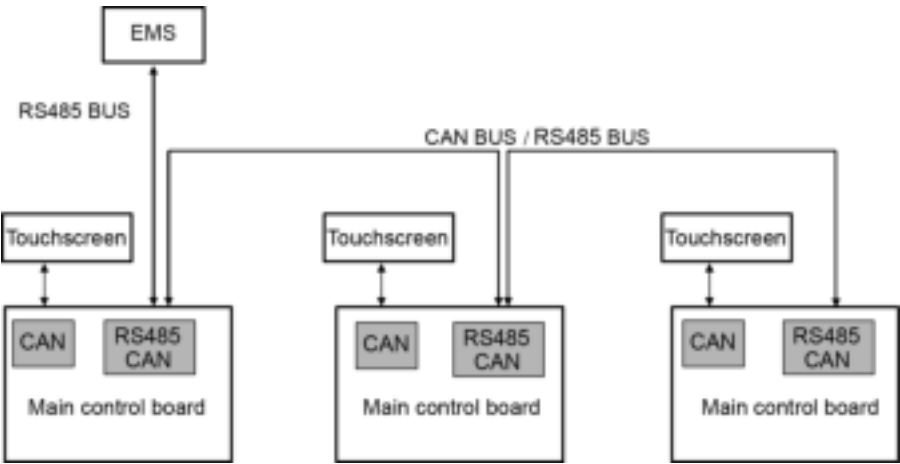
- The controller provides a touchscreen with a user-friendly interface.
- The controller controls the smart cooling product precisely and responds quickly.
- The multi-level password protection prevents misoperations.
- The controller provides multiple protection functions, such as chilled water valve exception feedback, abnormal power-off self-recovery, and water leakage detection, ensuring system reliability.
- The LCD on the controller displays the operating status and duration of the smart cooling product components in real time.
- The fault diagnosis system automatically displays the information of the current fault, which facilitates the maintenance.
- The smart cooling product provides abundant external ports such as RS232 port, RS485 port, fast Ethernet (FE) port, and USB port that are protected by a security mechanism.
- 500 historical alarms can be stored.

2.2.4 Monitoring System

The monitoring system provides logic control, data collection, control command delivery, alarm reporting, data storage, user right management, and teamwork control. The smart cooling product can be connected to the monitoring system over an RS485 northbound communications port for remote management. A maximum of 32 smart cooling products can be connected in teamwork control mode. To use this mode, set any one of the smart cooling products as the master unit and connect the master unit to the monitoring network.

Figure 2-5 shows a diagram of the monitoring network.

Figure 2-5 Networking diagram



2.3 Working Conditions

Environmental Specifications

 NOTE

Do not install the smart cooling product near a noise-sensitive place such as an office or a conference room.

Table 2-2 Operation conditions

Item	Specifications
Operating temperature	18°C to 45°C
Operating humidity	20% RH to 80% RH

Item	Specifications
Ambient temperature of NetCol5000-A025	- Connecting with NetCol500-A032: -20°C to +45°C (If low-temperature component is used, the lowest temperature is -40°C.) - Connecting with NetCol500-A036: -20°C to +52°C - Connecting with NetCol500-A038: -20°C to +55°C
Ambient temperature of NetCol5000-A035	- Connecting with NetCol500-A036: -20°C to +45°C (If low-temperature component is used, the lowest temperature is -40°C.) - Connecting with NetCol500-A038: -20°C to +45°C - Connecting with NetCol500-A072: -20°C to +55°C
Protection level	- Indoor unit: IP20 - Outdoor unit: IPX5
Altitude	0 to 1000 m (If the altitude is greater than 1000 m, the cooling performance deteriorates. Table 2-4 describes the derating coefficients.)

Table 2-3 Storage conditions

Item	Specifications
Storage temperature	-40°C to +70°C
Storage humidity	5% RH to 95% RH (non-condensing)

Table 2-4 Derating coefficients

Altitude	0 m	1000 m	1500 m	2000 m	2500 m	3000 m	3500 m	4000 m
Density coefficient	1	0.887	0.835	0.785	0.737	0.692	0.649	0.608
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
The sensible heat ratio is all 100%.								

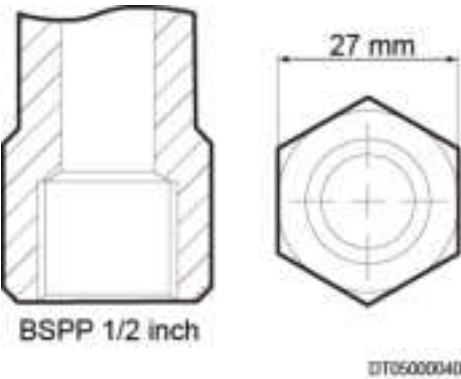
Ports

Table 2-5 describes the ports on the NetCol5000-A.

Table 2-5 Ports

Port	Description
Refrigerant liquid pipe	Flaring copper pipe inner diameter: 5/8 inch, soldered.
Refrigerant gas pipe	Flaring copper pipe inner diameter: 7/8 inch, soldered.
Pump drainpipe	Reserved: 1/2 inch BSPP (British Standard Pipe Parallel) screw thread connector, as shown in Figure 2-6.
Humidifier water supply pipe	Reserved: 1/2 inch BSPP screw thread connector, as shown in Figure 2-6.
Condensate self-drainpipe	Reserved: 1/2 inch BSPP screw thread connector, as shown in Figure 2-6.

Figure 2-6 Screw thread connector



NOTE

BSPP 1/2 inch: Large diameter: 20.955 mm; medium diameter: 19.793 mm; small diameter: 18.631 mm; medium diameter tolerance: 0–0.142 mm; small diameter tolerance: 0–0.541 mm.

Installation requirements

Table 2-6 describes the installation requirements of NetCol5000-A.

NOTICE

When the total load of servers, relative to a single smart cooling product, is less than 10 kW, the humidity might be relatively high. It has no relationship with product quality, and you are recommended to install a dehumidifier.

Table 2-6 Installation requirements

Name	Specifications
Room	The room can be sealed well.
	Width ≥ 0.9 m; height ≥ 2.3 m.
	Load bearing capacity ≥ 350 kg/m ² ; height of underfloor ≥ 250 mm.
Installation mode	Installed on a concrete floor or an raised floor.
Pipe and cable routing	Overhead or underfloor piping and cabling bottom. Self-drainpipe only supports underfloor piping.
Length of one-way refrigerant pipes	≤ 60 m.
Vertical distance between indoor unit and outdoor unit	• If the outdoor unit is placed higher than the indoor unit, the maximum vertical distance between them is 20 m. • If the indoor unit is placed higher than the outdoor unit, the maximum vertical distance between them is 5 m.
Water Supply	• Water pressure ranges from 0.1 MPa to 0.7 MPa. (A reducing valve must be installed if the inlet water pressure exceeds 0.7 MPa.) • Water temperature ranges from 1°C to 40°C. • Transient flow is greater than or equal to 0.6 L/min. • The quality of supplied water must meet the requirements listed in Table 2-7.
Drain Water	• The upper drainage height of the condensate pump should be 3.5 meters at most. • Self-drainpipe inner diameter ≥ 19 mm, self-drainage leveling tube length ≤ 2 m. • The hose can be used in a environment whose temperature is higher than 85°C. (The requirement is only for the units with a humidifier.)
Power requirements	• 380–480 V 50 Hz or 60 Hz 3W+PE (Voltage jumpers are used to confirm the rate voltage. The compatible voltage jumpers include 380 V 50 Hz or 60 Hz, 400 V 50/60 Hz, 415 V 50 Hz or 60 Hz, 440 V 60 Hz, 460 V 60 Hz, and 480 V 60 Hz.) • Tolerance: rated voltage $\pm 10\%$; rated frequency ± 3 Hz (Recommended to add a voltage regulator in the front end if the power exceeds this range. Otherwise, smart cooling product will generate frequency alarms and cannot run.)

Name	Specifications
Power requirements	Earth leakage circuit breakers are not recommended for mains. If earth leakage circuit breakers are required by the customer or according to local regulations, use the residual current circuit breaker (RCCB) that is not sensitive to the single-phase DC pulse and transient current pulse.
Note: If the requirements are not met, contact Huawei technical support for an optimized plan.	

Water Quality Requirements

NOTICE

If the inlet water contains large granules, install a water filtering device at the inlet port to prevent pipe blockage.

Table 2-7 describes NetCol5000-A water quality requirements.

Table 2-7 Water quality requirements

Name	Specifications	Unit
Hydrogenion	7–8.5	pH
Conductivity rate at 20°C (σ_{20}) ^a	300–1250	$\mu\text{S}/\text{cm}$
a: When σ_{20} is less than 300 $\mu\text{S}/\text{cm}$, the first vapor exhausting duration of the humidifier is long; when σ_{20} greater than 1250 $\mu\text{S}/\text{cm}$, the humidifier service life is affected.		

2.4 Technical Specifications

Table 2-8 General Parameters

Item	NetCol5000-A035	NetCol5000-A025
Cooling Mode	Air cooled	Air cooled
Refrigerant	R410A	R410A
Cooling capacity ^a	35 kW	25 kW
Air supply mode	Horizontal air supply	Horizontal air supply

Item	NetCol5000-A035	NetCol5000-A025
Airflow	6800 m ³ /h	4600 m ³ /h
Air filter	G4 filter	G4 filter
Dimensions (H x D x W) ^b	2000 mm x 600 mm x 1100 mm	2000 mm x 600 mm x 1100 mm
a: Indoor dry-bulb temperature: 37.8°C. Wet-bulb temperature: 20.8°C. Condensing temperature: 45°C. b: Frames can be used to expand the depth to 1200 mm, while top supports can be used to top frame to 2200 mm.		

NOTICE

- When the total load of servers, relative to a single smart cooling product, is less than 10 kW, smart cooling products that have heating and humidification functions or partial heating and humidification functions are recommended.
- The condensate pump is mandatory for scenarios where pipes are routed from the top or if it is required by the customer.

Table 2-9 Optional Parameters of NetCol5000-A035

Item	NetCol5000-A035H512D2 E120E1	NetCol5000-A035H512D2 E120E0	NetCol5000-A035H512D2 0020E1	NetCol5000-A035H512D2 0020E0
Max Current	32 A	32 A	26 A	26 A
Condensate pump	Yes	No	Yes	No
Reheat	Yes	Yes	No	No
Humidify	Yes	Yes	No	No
Reheating capacity	6.0 kW	6.0 kW	N/A	N/A
Humidifying capacity	3.0 kg/h	3.0 kg/h	N/A	N/A

Table 2-10 Optional Parameters of NetCol5000-A025

Item	NetCol5000-A025H512D2 E120E1	NetCol5000-A025H512D2 E120E0	NetCol5000-A025H512D2 0020E1	NetCol5000-A025H512D2 0020E0
Max Current	29 A	29 A	23 A	23 A
Condensate pump	Yes	No	Yes	No
Reheat	Yes	Yes	No	No
Humidify	Yes	Yes	No	No
Reheating capacity	6.0 kW	6.0 kW	N/A	N/A
Humidifying capacity	3.0 kg/h	3.0 kg/h	N/A	N/A

3 Installation Guide

3.1 Installation Preparation

To ensure the optimal operating condition and longest service life, install the NetCol5000-A in strict accordance with requirements.

3.1.1 Tools

The following tables list the tools for installing the NetCol5000-A. Add or delete tools as required.

Table 3-1 General tools

Appearance, specifications, and name			
Adjustable wrench	Phillips screwdriver (M4, M6, and M8)	Flat-head screwdriver (M3 and M4)	Socket wrench (18 mm)
			
Torque wrench (28 mm)	Solid wrench (18 mm and 13 mm)	Box-end wrench	Diagonal pliers
			

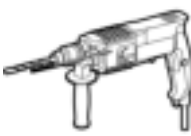
Appearance, specifications, and name			
Combination pliers	Needle-nose pliers	Sealant or seal tape (for thermal insulation foam) ^a	Right angle
			
Step ladder (2 m)	Torch	Measuring tape	Hammer drill
			
Marker	Protective glove	N/A	N/A
		N/A	N/A
a: The sealant or seal tape for thermal insulation foam must be able to withstand temperatures higher than 85°C.			

Table 3-2 Translating tools

Appearance, specifications, and name			
Manual pallet truck	Electrical pallet truck	Lifting rope (bearing at least 400 kg)	Lever (bearing at least 400 kg)
			

Table 3-3 Pipe connection tools

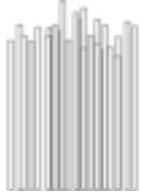
Appearance, specifications, and name			
Cutter	Sealant or seal tape (for screw threads) ^a	Welding torch	Copper-phosphorus brazing rod (containing 5% silver)
			
Oxygen	Acetylene	Subterrene	Nitrogen
			
a: The specifications of the sealant or seal tape for screw threads are as follows: • The sealant or seal tape for screw threads must be able to withstand temperatures higher than 85°C. • The sealant or seal tape should apply to all pipe material. • Anaerobic metal pipe thread sealant with polytetrafluorethylene (PTFE for short) as the filler. • The glycol solution resistance and adapt to the thread size with pipeline. • Maximum seal gap is less than 0.5 mm. • The maximum pressure is greater than 3 MPa. • Conforms to JB/T7311-2008 "engineering mechanical the anaerobic adhesive application technology specification" profession standard.			

Table 3-4 Connecting cable tools

Appearance, specifications, and name			
ESD gloves	Insulation gloves	Wire stripper	Polyvinyl chloride (PVC) insulation tape

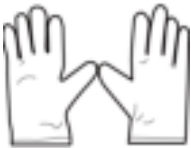
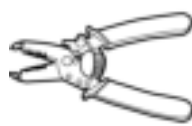
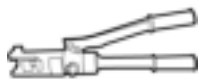
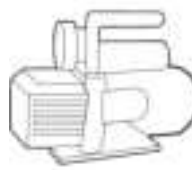
Appearance, specifications, and name			
			
Heat gun	Crimping plier	N/A	N/A
		N/A	N/A

Table 3-5 Commissioning tools

Appearance, specifications, and name			
Pressure gauge (2PCS) ^a	Leather hose (5PCS) ^a	Vacuum pump ^b	Nitrogen ^c
			
Clamp meter	Electronic balance	Antifreeze gloves	Reducing valve ^d
			
a: The pressure gauge and leather hose should be used especially for R410A, the measurement range of the pressure gauge must be greater than or equal to 4.0 MPa, and the tolerance range of the leather hose must be greater than or equal to 4.5 MPa. The size of needle valve in the unit is 1/4 inch. Purchase a conversion adapter if you have a different size of valve on leather hoses. b: The rate flow between 2 L/s (7.2 m³/h) and 4 L/s (14.4 m³/h) is recommended. Absolute vacuum ≤ 60 Pa. c: Dry nitrogen. d: A reducing valve needs to install to the outlet of the nitrogen steel vessel, and the reducing valve range ≥ 4.0 MPa.			

3.1.2 Material Preparations

This section describes optional components. If you have not purchased such optional components from Huawei, prepare the following materials: pipe components and supports, humidifier water supply/drainage components, and cables.

Indications of "Mandatory", "Optional", and "Engineering purchasing" in this document are as follows:

- **Mandatory:** mandatory configuration. This material is provided by Huawei and can be found in delivered fittings.
- **Optional:** This material can be purchased from Huawei or prepared by yourself.
- **Engineering purchasing:** This material is not configured by Huawei and must be prepared by yourself.

Table 3-6 Material configuration

Configuration	Pipe components and supports	Humidifier water supply/drainage components	Cables and electric device
Mandatory	N/A	Hose clamp	L1, L2, L3 and PE terminals (18 PCS), voltage jumper (6 PCS), water sensor (1 PCS), teamwork networking cable (1 PCS), humidity and temperature sensor (1 PCS)
Optional	Pipe components (including R410A copper pipes, thermal insulation foam, oil traps and inverted traps)	N/A	Indoor unit power cable, outdoor unit power cable, outdoor unit on/off signal cable, humidity and temperature sensor
Engineering purchasing	Pipe supports	Conversion adapter, rigid pipe or hose	N/A

3.1.2.1 (Optional) Refrigerant R410A

CAUTION

Do not use low-quality refrigerant. Huawei is not responsible for any damage caused by low-quality refrigerant.

Follow these suggestions to choose high-quality refrigerant:

1. Contact the refrigerant producer to confirm the refrigerant authenticity.
2. Check the refrigerant by following the steps shown in **Figure 3-1**: Keep the refrigerant indoors at a constant temperature and humidity for 24 hours. Use a thermometer to measure the external surface temperature of the refrigerant container, and connect a pressure gauge to the container to measure its internal pressure. Determine the saturation pressure that corresponds to the measured external surface temperature according to **Table 3-7** and calculate the deviation from the measured internal pressure. If the deviation is more than 0.2 MPa, the refrigerant is not qualified and should be replaced.

Figure 3-1 Checking refrigerant

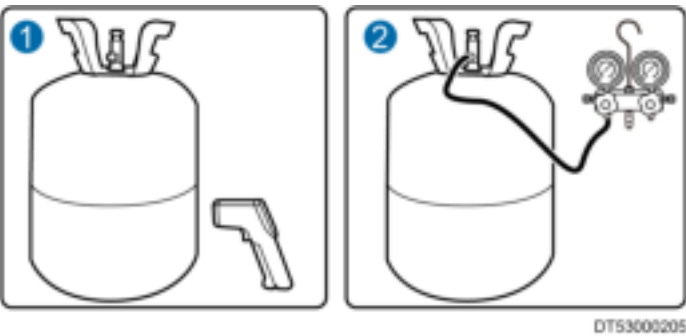


Table 3-7 Mapping between temperatures and R410A saturation pressure

Temperature (°C)	Saturation Pressure- Surface Pressure (MPa)	Temperatur e (°C)	Saturatio n Pressure- Surface Pressure (MPa)	Temperatu re (°C)	Saturati on Pressur e- Surface Pressur e (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

Temperature (°C)	Saturation Pressure-Surface Pressure (MPa)	Temperature (°C)	Saturation Pressure-Surface Pressure (MPa)	Temperature (°C)	Saturation Pressure-Surface Pressure (MPa)
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	N/A	N/A

3.1.2.2 Refrigerant Oil

The recommended refrigerant oil is Danfoss 160SZ. You can purchase it from Huawei, or purchase it by yourself after being confirmed by Huawei.

NOTE

If the low-temperature component is connected, additional refrigerant oil. If not, ignore the refrigerant oil.

3.1.2.3 Pipe Components

Pipe components are optional and include:

- Liquid pipe: copper pipe (for R410A) external diameter: 5/8 inch; thickness: 1.0 mm; pressure tolerance range: ≥ 4.5 MPa.
- Gas pipe: copper pipe (for R410A) external diameter: 7/8 inch; thickness: 1.2 mm; pressure tolerance range: ≥ 4.5 MPa.
- Thermal insulation foam: thickness ≥ 13 mm.
- Oil traps and inverted traps: To ensure the NetCol5000-A reliability, make an oil trap every 5 m to 6 m along pipes in the vertical direction and make an inverted trap respectively at the intake vent and exhaust vent of the outdoor unit. [Figure 3-2](#) shows the specifications for the oil traps and inverted traps.

Figure 3-2 Oil trap and inverted traps (unit: mm)

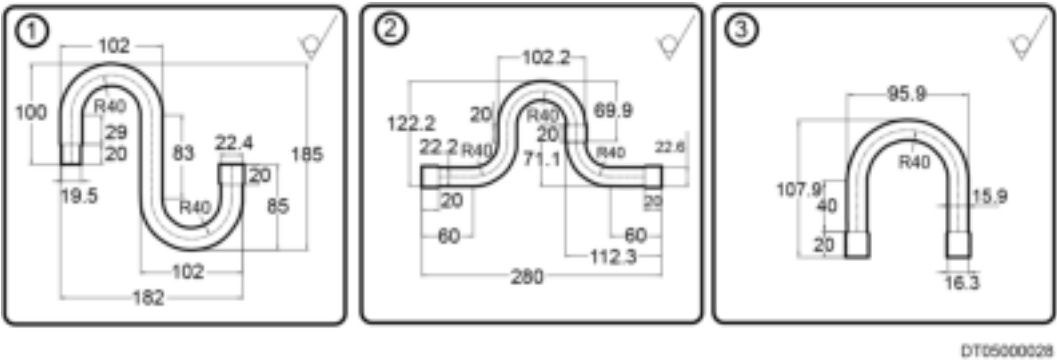


Table 3-8 Specifications for oil traps and inverted traps

No.	Name	Copper Pipe Outer Diameter and Thickness	Technical Requirements
1	Oil trap	22.2 mm x 1.2 mm	The flaring inner diameter of the copper pipe is 22.4 mm, and the necking outer diameter is 19.5 mm.
2	Gas pipe inverted trap	22.2 mm x 1.2 mm	The flaring inner diameters at both ends of the copper pipe are 22.6 mm.
3	Liquid pipe inverted trap	15.9 mm x 1.0 mm	The flaring inner diameters at both ends of the copper pipe are 16.3 mm.
Note: After the traps are made, verify that the surface is smooth and even.			

3.1.2.4 Humidifier Water Inlet Pipe, Pump Drainpipe, and Automatic Drainpipe

NOTICE

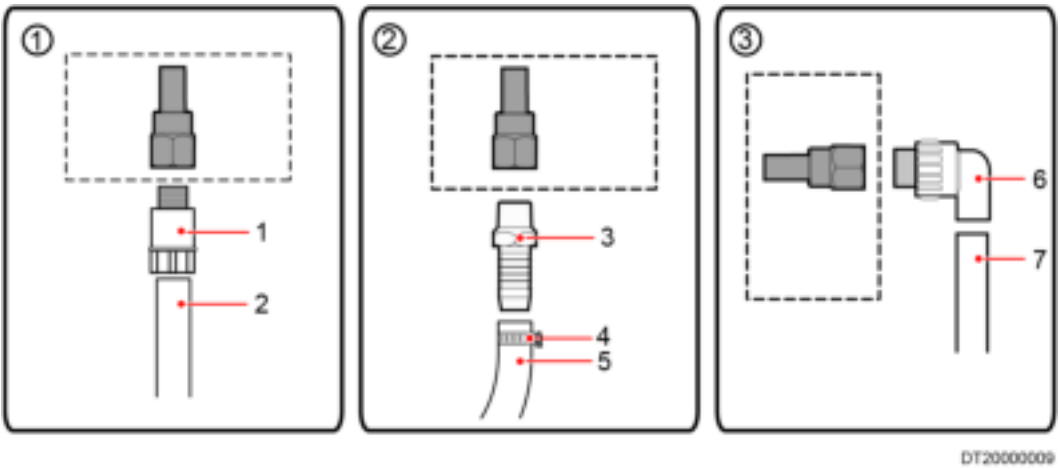
Drainpipes must be able to withstand temperatures higher than 85°C. Otherwise, the pipes may be deformed. This notice is for the equipment configured with a humidifier.

Table 3-9 and Figure 3-3 describe how to install the humidifier water inlet pipe, pump drainpipe, and automatic drainpipe.

Table 3-9 Pipe connection methods

Method	Application Scenario	Material
No. 1 in Figure 3-3	Humidifier water inlet pipe, and pump drainpipe	Conversion adapter and rigid pipe
No. 2 in Figure 3-3	Humidifier water inlet pipe, and pump drainpipe	Pagoda connector, hose, and hose clamp
No. 3 in Figure 3-3	Automatic drainpipe	Conversion adapter and rigid pipe

Figure 3-3 Connecting water pipes



- (1) Conversion adapter: BSPT 1/2 inch, connected to a rigid pipe with external threads
- (2) Rigid pipe: made of PP-R, C-PVC, or other materials
- (3) Pagoda connector: as shown in Figure 3-4
- (4) Hose clamp
- (5) Hose: a hose with an inner diameter of 3/4 inch and made of EPDM or other materials
- (6) Conversion adapter: BSPT 1/2 inch, connected to a rigid pipe with external threads
- (7) Rigid pipe: made of PP-R, C-PVC, or other materials

NOTE

Components inside the dash-line boxes are ports on the equipment, with the dimension of BSPP 1/2 inch and internal threads.

Table 3-10 Cable specifications

Name	Specifications	Quantity	Remarks
Indoor unit power cable	Four-core cable ^a : electrical power cable-600 V/1000 V-ZA-RVV-6 mm ² -46 A	1 PCS (The length is determined in presale survey.)	Optional
	L1, L2, and L3 terminals: common terminal-single cord end terminal-6 mm ² -0.02 m-30 A-inserted depth 12 mm	6 PCS	Mandatory
	PE terminals: naked crimping terminal-OT-6 mm ² -M6-50 A-tin plated-12 AWG to 10 AWG	2 PCS	Mandatory
Outdoor unit power cable	For detail cable specifications, see the outdoor unit user manual.	1 PCS	Optional
Voltage jumper	Six voltage jumpers are available in the fitting bag. Select one for use.	1 PCS	Mandatory
Outdoor unit on/off signal cable	For details about the cable specifications, see the outdoor unit user manual.	1 PCS	Optional
Water sensor signal cable	Power cable-5m-22AWG-(2 x T0.5 ²)-(2 x 22UL1007)-(2 x T0.5 ²)	1 PCS	Mandatory
Teamwork networking cable	It also can be used for host monitoring.	1 PCS (10m)	Mandatory
Humidity and temperature sensor and its cable	N/A	Max 6 PCS	Optional
a: If you use a five-core cable, do not install the neutral wire (blue). Instead, cut off it and properly wrap PVC insulation tape around the cutting place. Purchase indoor unit power cables with qualified diameters (16.8–18 mm). Otherwise, the power cables will fail to be routed through the clip.			

3.1.3 Deployment Principles

Precautions

- Check cabinets comprehensively and handle problems immediately.
- Before installation, check that the environment meets requirements and check whether reconstruction is needed for routing pipes and cables and constructing ventilation pipes.
- Install the NetCol5000-A according to the design drawing and reserve space for maintenance. Ensure that a minimum of 600 mm maintenance clearance is reserved in front and rear of the indoor unit.
- The equipment room should have good heat insulation, and the walls and floor should be protected against moisture.
- Take care to prevent the components and cables from damage.
- Check that the area, height, and ground bearing capacity of the installation position meet requirements.
- To ensure good ventilation, do not place the indoor unit in the corner of a room or at the end of a long-and-narrow room.
- During the NetCol5000-A operation, all doors and windows of the equipment room should be closed to reduce the additional load of the NetCol5000-A.
- Take appropriate thermal insulation and antifreeze measures for outdoor water pipes to avoid poor drainage and insufficient water supply caused by freezing.

Installation Layout Principles

Layout principles for installing the NetCol5000-A are as follows:

- If the outdoor unit is placed higher than the indoor unit, the maximum vertical distance between them is 20 m. To ensure the NetCol5000-A reliability, make an oil trap every 5 m to 6 m along pipes in the vertical direction. For the specifications for oil traps and inverted traps, see [3.1.2.3 Pipe Components](#).
- If the indoor unit is placed higher than the outdoor unit, the maximum vertical distance between them is 5 m.

NOTICE

- When calculating the height difference, the compressor base is regarded as the baseline for the indoor unit.
 - The inverted trap should be higher than the top copper pipe of the condenser.
 - In the figure,  is a sign of a tilt, indicating that the scale of the pipe tilting is at least 1:200. The pipe tilting direction should be consistent with the hypotenuse of the right triangle.
 - If the indoor unit is placed higher than or equal to the outdoor unit, inverted traps or oil traps are not needed.
-

Figure 3-6 Routing pipes from the bottom

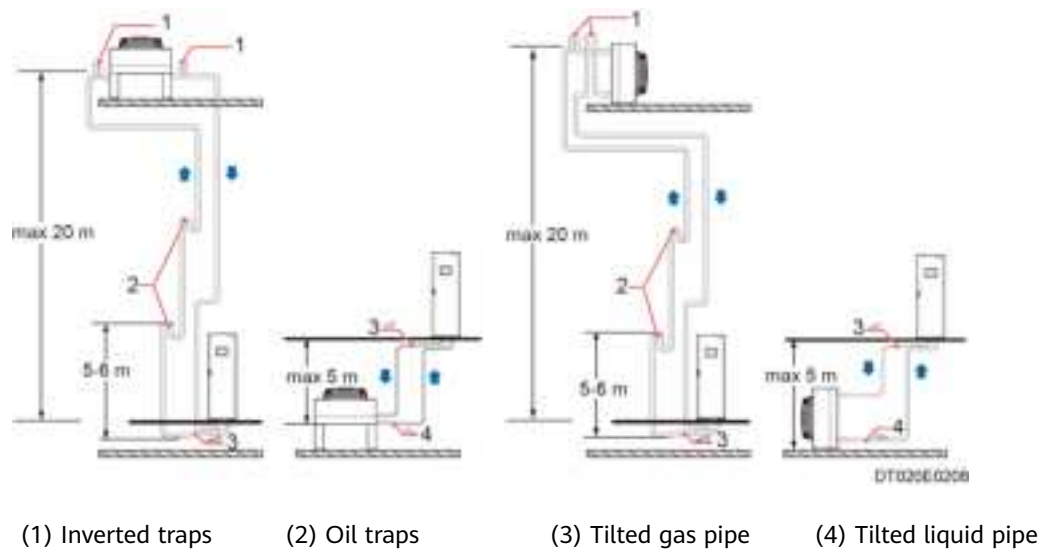
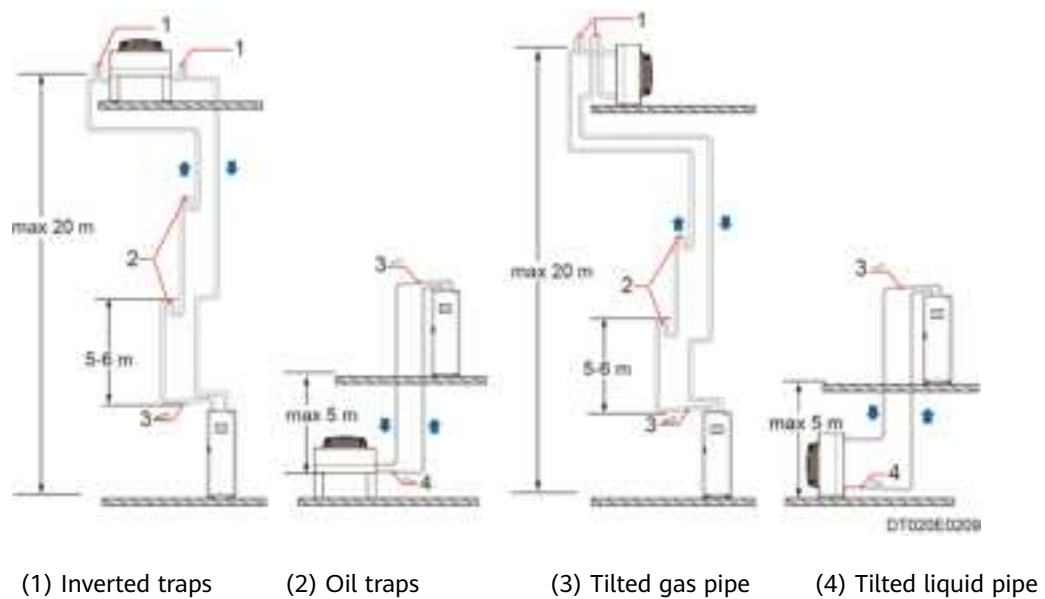


Figure 3-7 Routing pipes from the top

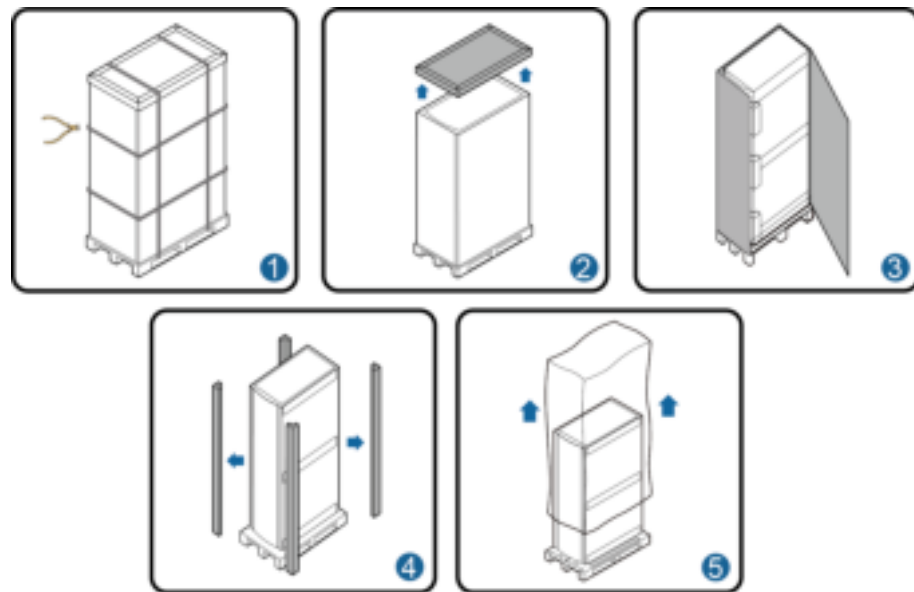


3.2 Unpacking

Procedure

- Step 1** Inspect the outer packing for signs of damage. If any damage is found, contact the shipping company immediately.
- Step 2** Unpack the product.
1. Remove the straps, top cover, outer packing, cushioning materials, and then plastic film, as shown in [Figure 3-8](#).

Figure 3-8 Unpacking



NH07H00003

2. Inspect the cabinet exterior for signs of collision or scratches. If any damage is found, contact the shipping company immediately.

Step 3 Check the type and quantity of fittings against the packing list. If fittings are missing or inconsistent with those in the packing list, record the information and contact your local Huawei office immediately.

----End

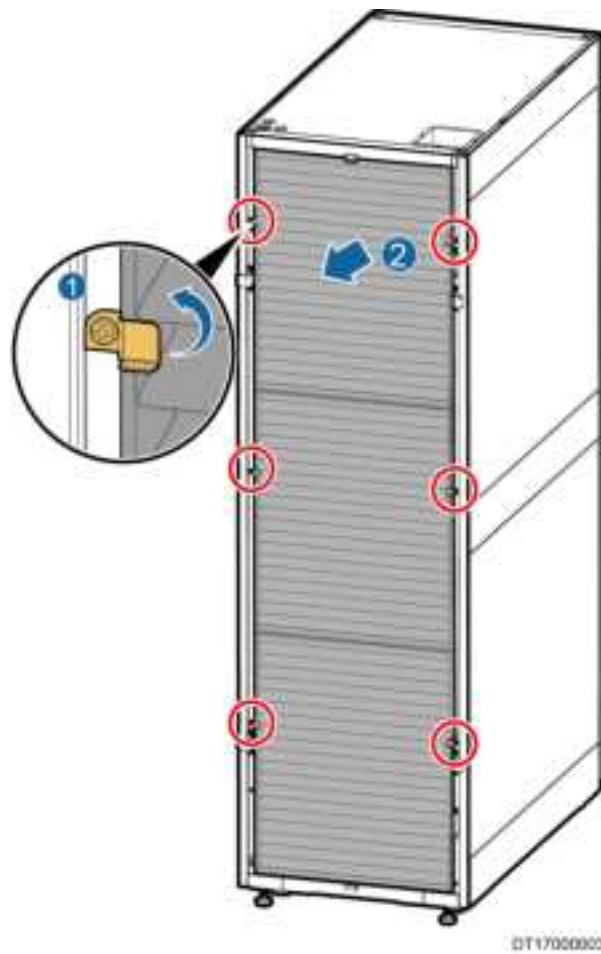
3.3 Checking the Air Pressure

Procedure

Step 1 Open the rear door.

Step 2 Unfasten the rotating baffle plates in the air filters and remove the air filters, as shown in [Figure 3-9](#).

Figure 3-9 Removing air filters

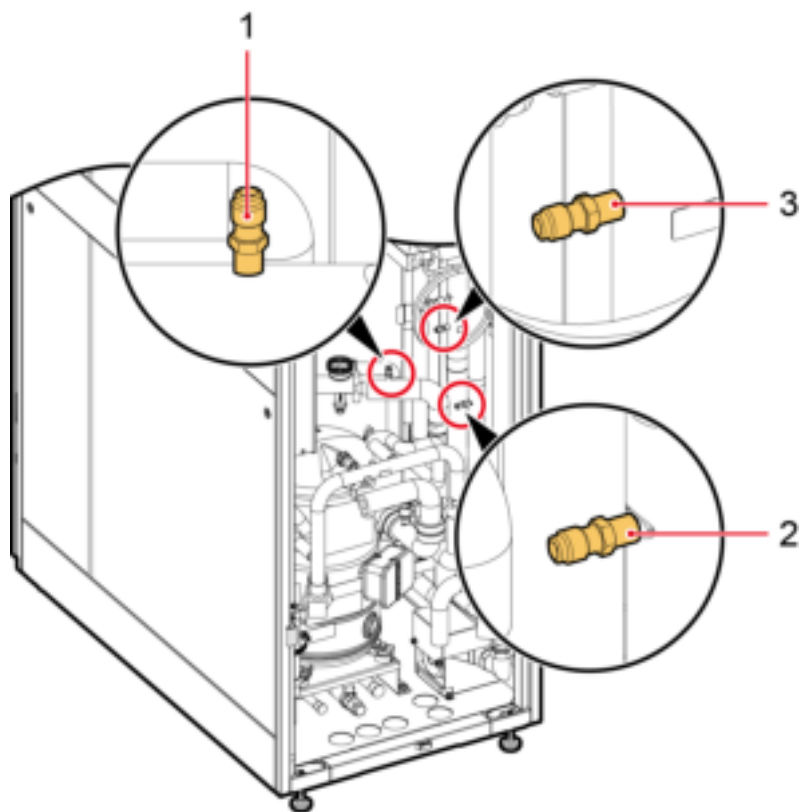


Step 3 Take out the desiccant bag.

Step 4 Check whether the needle valve bonnets shown in [Figure 3-10](#) exist.

1. If they do not exist, contact Huawei technical support.
2. If they exist, remove each valve bonnet and use it to press the valve plugs in turn. If air is exhausted, the system is working properly. If no air is exhausted, contact Huawei technical support.

Figure 3-10 Needle valves



NH05W0002

- (1) Low-pressure needle valve (2) Liquid pipe needle valve (3) Discharge pipe needle valve

----End

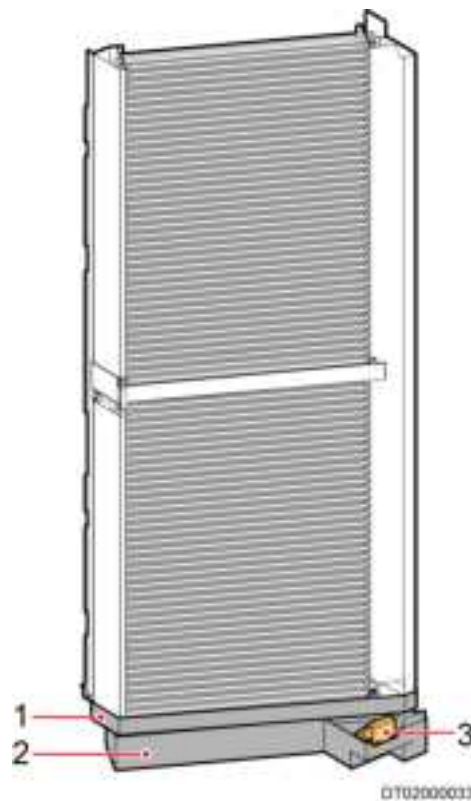
3.4 Removing the Transport Fixing Sheet Metals

3.4.1 Removing the Transport Fasteners from Floats

Context

The water tank is right under the evaporator and the floats (also called liquid level switches) are on the right side of the water tank, as shown in [Figure 3-11](#).

Figure 3-11 Position of the water tank

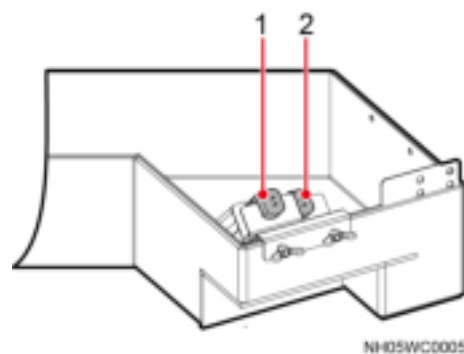


(1) Water pan

(2) Water tank

(3) High and low floats

Figure 3-12 Positions of high and low floats



(1) High floats

(2) Low floats

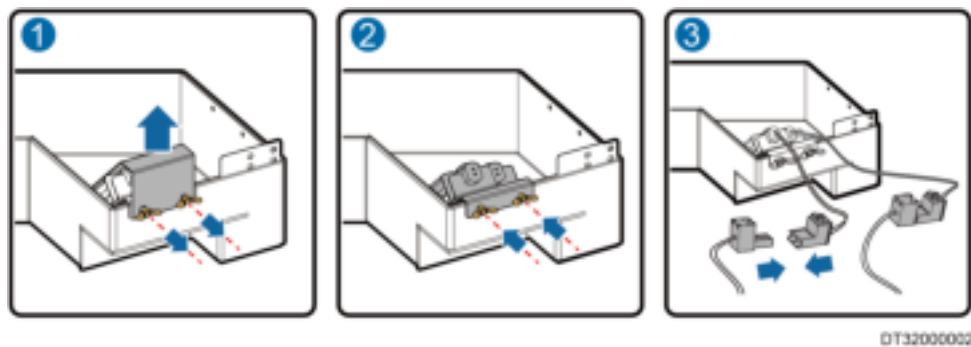
Procedure

- Step 1** Loosen the two butterfly nuts from the high and low floats in the water tank, and remove the transport fasteners for the floats.
- Step 2** Secure the butterfly nuts.
- Step 3** Connect the wiring terminals to the high float. The wiring terminals must be fixed higher than the water pan. Otherwise, water may drop into the wiring terminals.

CAUTION

The wiring terminals must stay in good contact with the floats. Otherwise, the condensate pump cannot start properly.

Figure 3-13 Removing the transport fasteners from the floats and connecting the wiring terminals



NOTE

- The wiring terminal to the low float has been factory installed.
- Put away the removed rubber fixing objects. If the container is to be transported again, remove the wiring terminal from the high float and reinstall them.

----End

3.4.2 Removing the Transport Fasteners from the Compressor

Context

CAUTION

When removing transport fasteners, do not remove the fuel return solenoid valve. Otherwise, the solenoid valve might be burnt due to improper reinstallation.

Procedure

- Step 1** Loosen the three bolts on the compressor using a 13# solid wrench, as shown in [Figure 3-14](#).

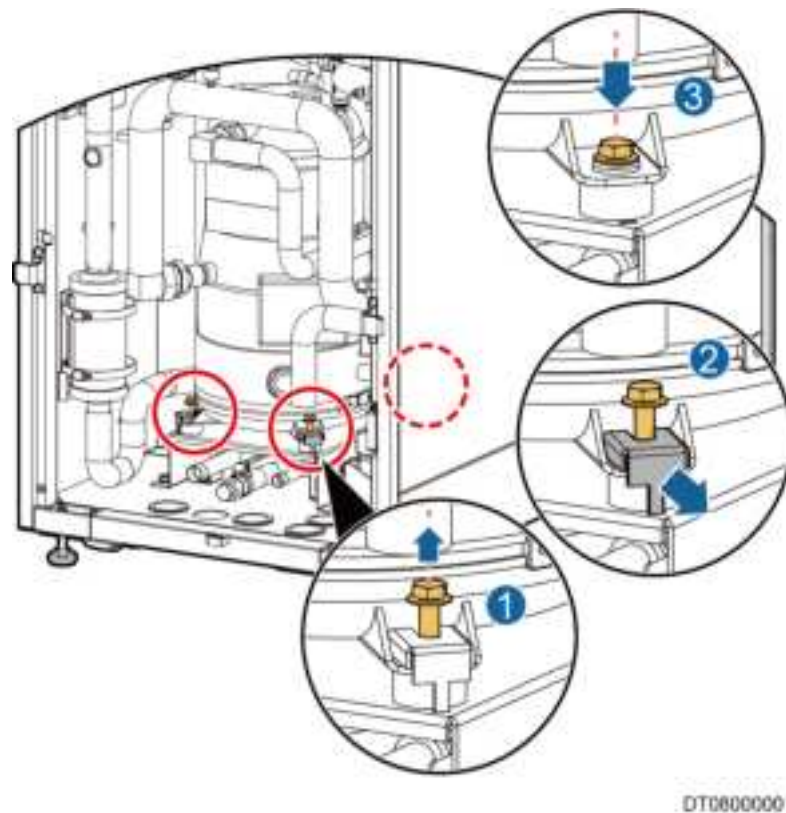
NOTICE

Do not directly take the bolts out.

- Step 2** Remove the transport fasteners.

Step 3 Retighten the bolts on the compressor.

Figure 3-14 Removing the transport fasteners from the compressor



NOTE

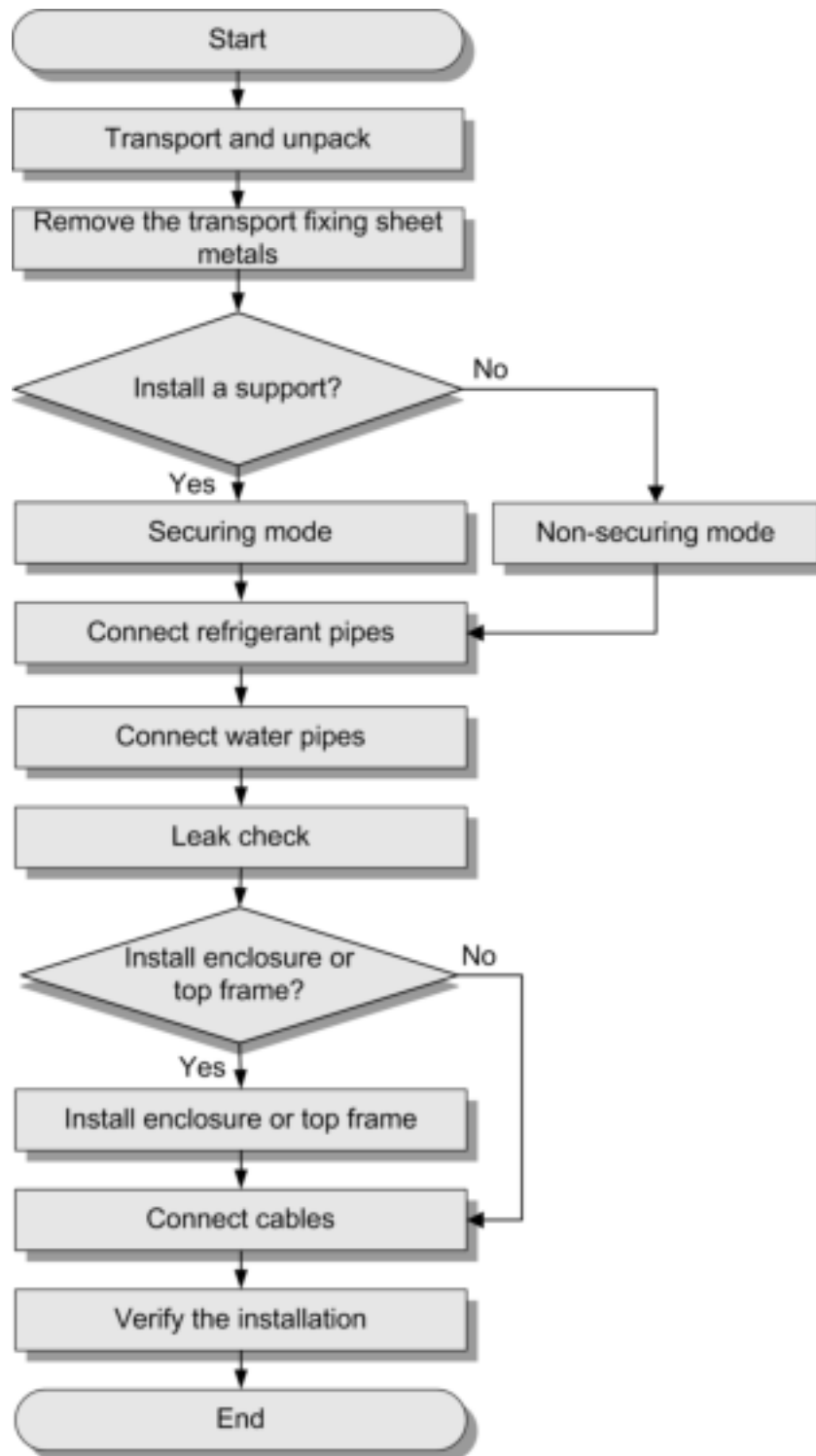
Put away the removed transport fasteners so that you can reinstall them if the indoor unit is to be transported again in the container scenario.

----End

3.5 Install Process

Figure 3-15 shows the process for installing an indoor unit.

Figure 3-15 Process for installing an indoor unit



3.6 Installing Indoor Units

3.6.1 Installing an Indoor Unit in Securing Mode

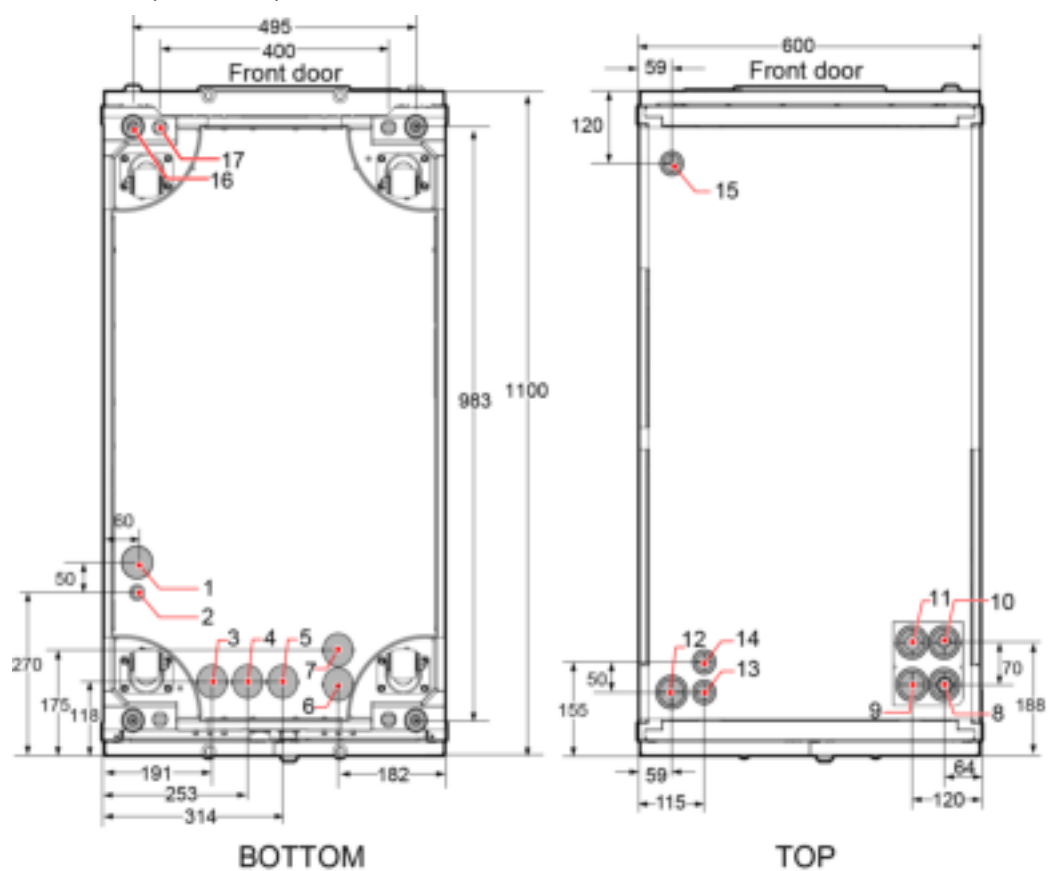
Prerequisites

A base or a raised floor is available in the room where the indoor unit is to be installed.

Context

[Figure 3-16](#) and [Figure 3-17](#) show the ports on the bottom and top panels of the indoor unit.

Figure 3-16 Ports on the bottom and top panels for the codes of 52272131 and 52272132 (unit: mm)



DTG020E0234

Figure 3-17 Ports on the bottom and top panels for other codes (unit: mm)

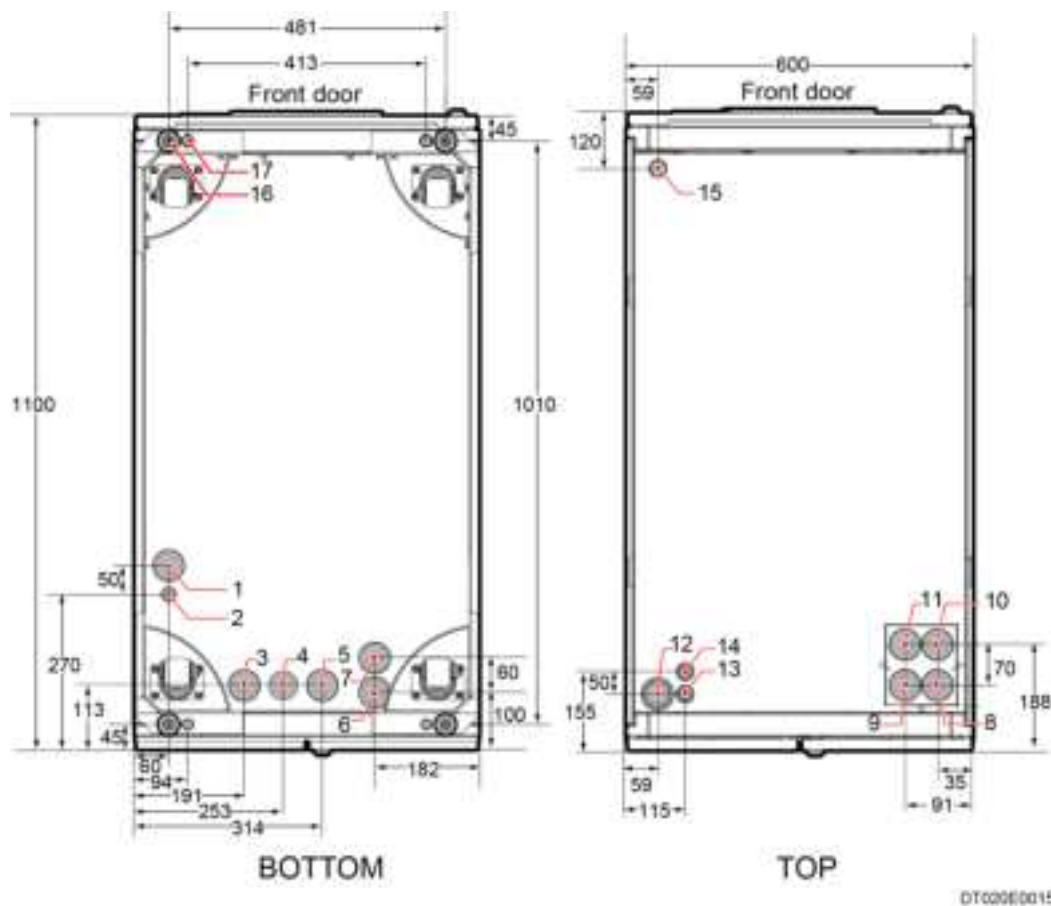


Table 3-11 Pipeline port parameters

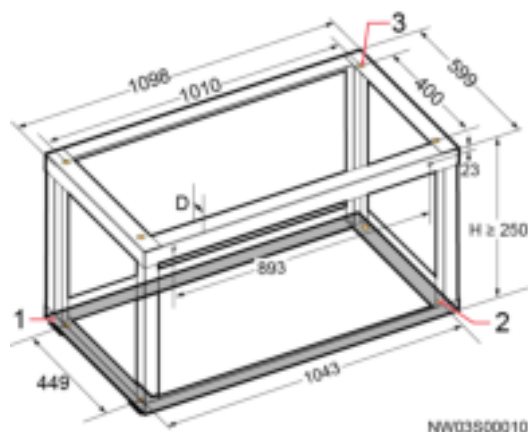
Number	Port	Inner Diameter of Port
1	Lower strong electricity cable port (including ground cable)	Φ43 mm
2	Lower weak electricity cable port	Φ18 mm
3	Lower liquid pipe port	Φ50 mm
4	Water self-drainpipe outlet port	Φ50 mm
5	Lower gas pipe port	Φ50 mm
6	Lower condensate pump drainpipe port	Φ50 mm
7	Lower humidifier inlet pipe port	Φ50 mm
8	Upper condensate pump drainpipe port	Φ43 mm
9	Upper humidifier inlet pipe port	Φ43 mm

Number	Port	Inner Diameter of Port
10	Upper liquid pipe port	Φ43 mm
11	Upper gas pipe port	Φ43 mm
12	Upper strong electricity cable port (for ground cables also)	Φ43 mm
13	Upper weak electricity cable port	Φ18 mm
14	Upper weak electricity cable port	
15	Remote upgrade cable port	Φ18 mm
16	Leveling foot	4 x Φ35 mm
17	Screw port	4 x Φ18 mm

Procedure

Step 1 Install the base. [Figure 3-18](#) or [Figure 3-19](#) show the base.

Figure 3-18 Base for the codes of 52272131 and 52272132 (unit: mm)

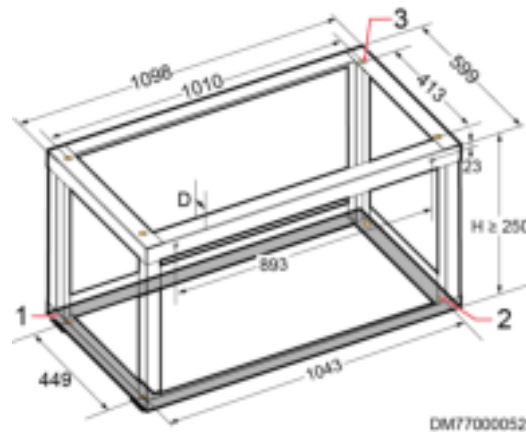


(1) Shock absorbing bar: 5 mm thick, made of EPDM rubber

(2) 4 - M12x60 expansion screw mounting hole

(3) 4 - M12x80 assembly screw mounting hole

Figure 3-19 Base for other codes (Unit: mm)



(1) Shock absorbing bar: 5 mm thick, made of EPDM rubber
(2) 4 - M12x60 expansion screw mounting hole

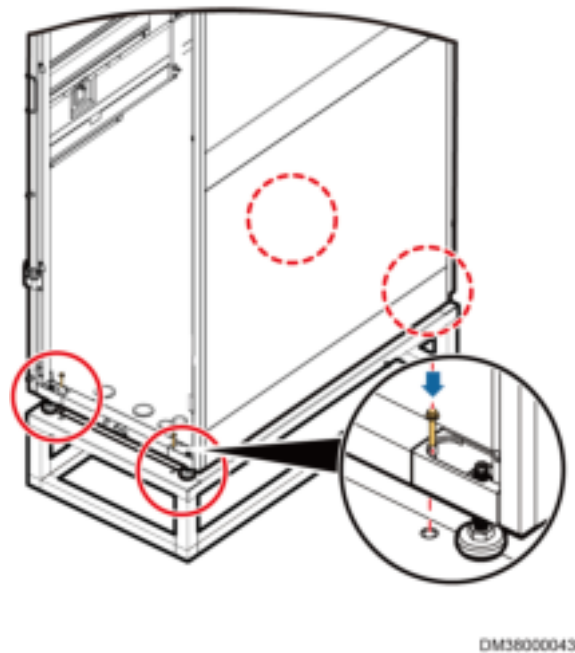
(3) 4 - M12x80 assembly screw mounting hole

NOTE

- You are advised to use angle steel, square steel or channel steel. Width of 60 mm and thickness of 4 mm to 5 mm is recommended.
- When the width of angle steel is more than 60 mm, it is interfering with the cable routing holes. Cut out the part on the angle steel to avoid interfering. If the width is less than or equal to 60 mm, skip this step.
- Control the welding process and avoid excessive error.
- The base is applicable to the scenario with enclosure frames. After enclosure frames are installed, holes for the screws installed to secure the rack and unit do not change.

- Step 2** Mark holes for installing expansion bolts on the concrete floor by using a marker.
- Step 3** Remove the base, and drill holes in the marks by using a hammer drill with a $\Phi 16$ drill bit. The hole depth is the sum of the length of an expansion tube and an expansion bolt and must range from 52 mm to 60 mm.
- Step 4** Move back the base, and secure the base onto the floor using four M12x60 expansion bolts.
- Step 5** Drill holes on the ground under the smart cooling product to facilitate pipe routing based on hole parameters shown in [Figure 3-17](#).
- Step 6** Place the cabinet, as shown in [Figure 3-20](#).

Figure 3-20 Placing the cabinet



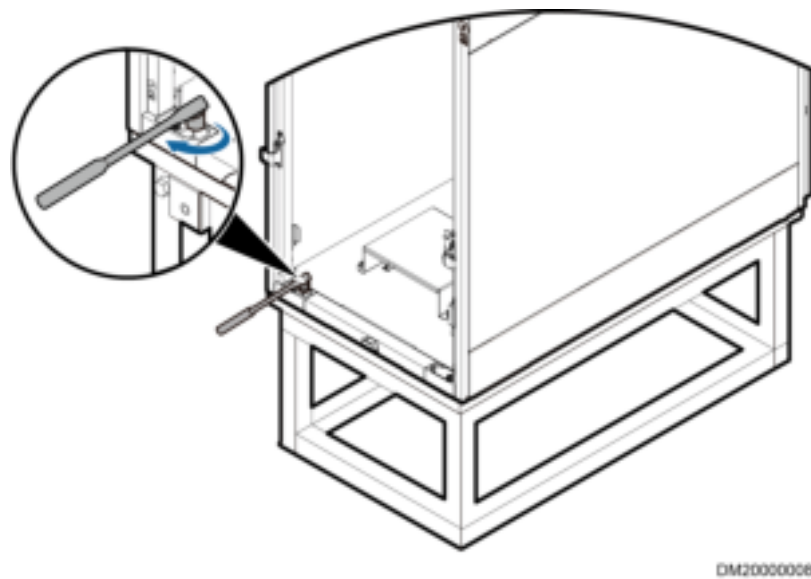
1. Place the cabinet on the base and align the mounting holes in the cabinet with those in the base.
2. Insert the M12x80 assembly bolts into the holes in the cabinet and base, and partially tighten the bolts, as shown in [Figure 3-20](#).

Step 7 Adjust the levelness and verticality of the cabinet by raising or lowering the leveling feet.

Step 8 Secure the cabinet.

1. Install the spring washer, large flat washer, and insulation tube on each bolt properly.
2. Use the torque wrench (M20) to tighten the four bolts to a torque of 45 N m in diagonal order, as shown in [Figure 3-21](#).

Figure 3-21 Securing the cabinet



----End

3.6.2 Installing an Indoor Unit in Non-securing Mode

Prerequisites

Non-securing mode applies to scenarios where the indoor unit is to be installed on a floor while no base is available.

Procedure

Step 1 Place the cabinet.

1. Determine the installation position according to the plan.
2. Move the cabinet to the installation position.

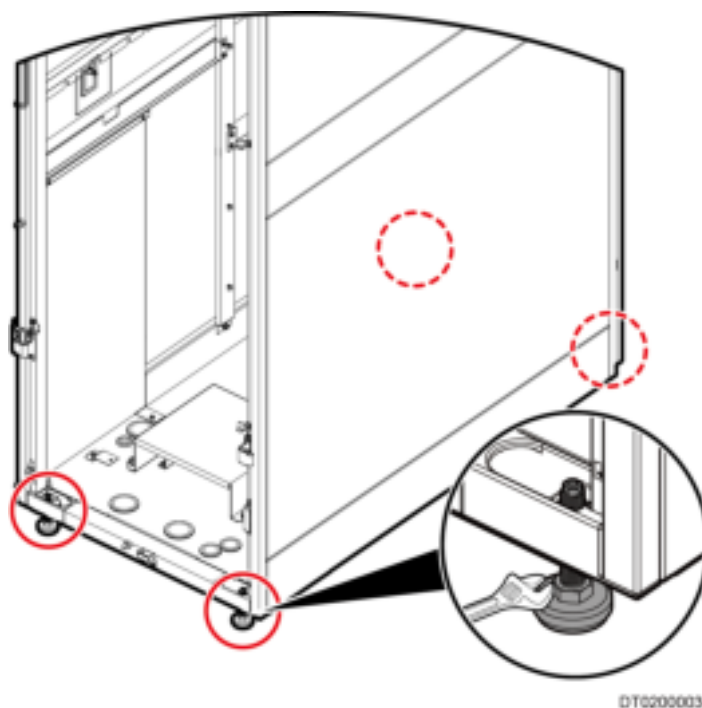
Step 2 Level the cabinet.

1. Raise the cabinet by adjusting the leveling feet using a wrench, as shown in [Figure 3-22](#). Ensure that the leveling feet contact the floor and the castors hang in the air.

 NOTE

Spin the castors. If the castors rotate freely, they are hanging in the air.

Figure 3-22 Leveling the cabinet



2. Use a measuring tape or right angle to check that the heights measured from the front, rear, right, and left of the cabinet are the same.

----End

3.7 Installing an Outdoor Unit

For the details about how to install the outdoor unit, see the outdoor unit user manual.

3.8 Exhausting Nitrogen

Context

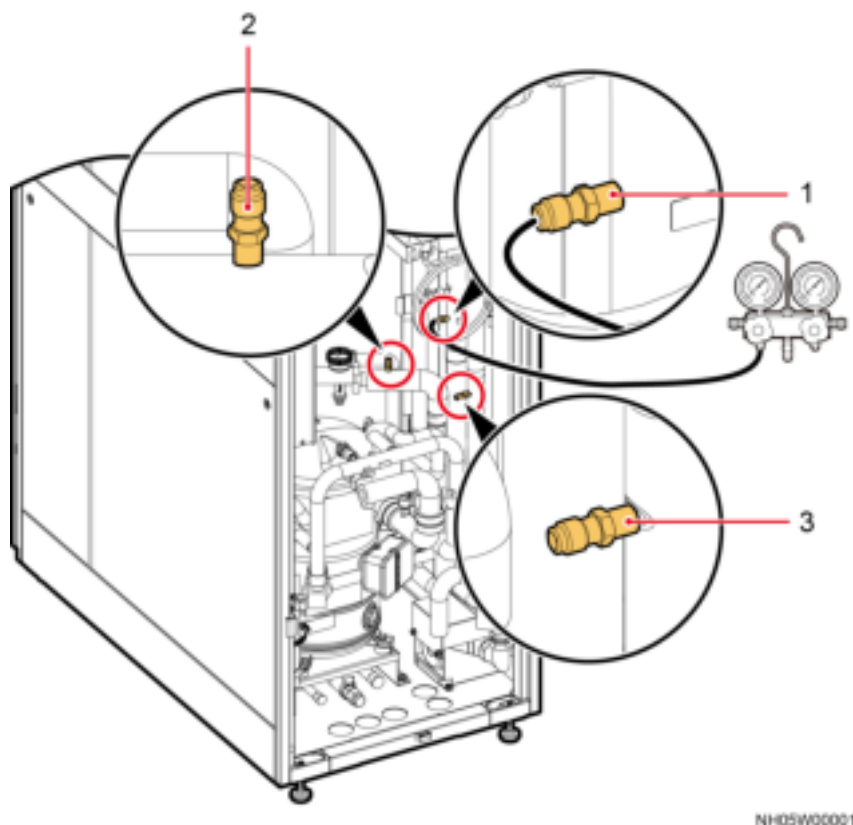


Before welding refrigerant pipes, fully exhaust nitrogen from the refrigerant pipes to avoid explosion and injuries.

Procedure

- Step 1** Remove the valve bonnet of discharge pipe needle valve, as shown in [Figure 3-23](#). Connect the needle valves using rubber tubes with pressure gauge.

Figure 3-23 Exhausting nitrogen



(1) Discharge pipe needle valve (2) Low-pressure needle valve (3) Liquid pipe needle valve

- Step 2** Open the pressure gauge valve. Loud noises of air flow are generated at first and then disappear gradually.
- Step 3** After the air is exhausted, remove the pressure gauge and install the valve bonnet.
- Step 4** Exhaust nitrogen from liquid pipe low-pressure needle valve by following [Step 1](#) to [Step 3](#).

----End

3.9 Connecting Pipelines

NOTICE

- The thickness of heat insulation cottons should not be less than 13 mm.
- When purchasing water pipes, ensure that the water pipe with thermal insulation foam warped can go through the ports on the bottom and top boards.

3.9.1 Connecting Refrigerant Pipes

Context

Refrigerant pipes can be routed from the top or the bottom. Select a routing mode based on the actual situation.

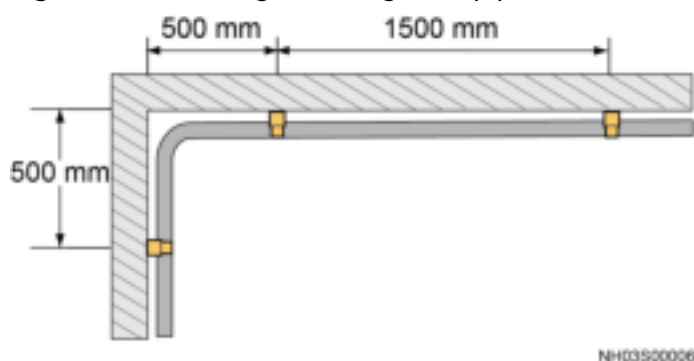
NOTICE

- When connecting the indoor unit to the outdoor unit, you are advised to weld pipes for the outdoor unit first. If the pipes have been exposed for over 15 minutes, seal the pipes to prevent dust and water from entering them.
- During the welding process, avoid burning the bottom panel, top panel, side panels, other pipes, thermal insulation foam, cables, and labels. Take preventive measures properly, for example, lay wet cloth around the welding position.
- During or after welding, avoid exposing the refrigerant pipes for over 15 minutes. Otherwise, system reliability is affected.
- To avoid leakage of ventilation channels and damage to copper pipes, seal the holes after the pipes are routed. Seal the terminals of the copper pipes to prevent foreign matter from entering the refrigerant pipes.
- If the welded copper pipes are excessively long or with bends, clean the foreign matter inside the pipes with nitrogen.
- The refrigerant pipes should be wrapped with thermal insulation foam.

To minimize the noise due to vibration, perform the following operations. [Figure 3-24](#) shows the two cases.

- When the direction of the refrigerant pipe is changed, add a support (as described in [3.1.2.5 Pipe Support](#)) at the position that is 500 mm away from the changing point.
- When the refrigerant pipe is straight, add a support every 1500 mm.

Figure 3-24 Routing the refrigerant pipe



NOTE

Onsite personnel prepare the required materials and install the supports.

When selecting the refrigerant pipes, note the following:

1. Avoid elbows and ensure that the indoor unit and the outdoor unit are connected by using shortest pipes.
2. Calculate the number of the components (such as elbows) that cause local resistance loss, and convert them into the equivalent length to straight pipes, as described in [Table 3-12](#).
3. The total length of pipes connecting the indoor unit and the outdoor unit equals to the equivalent length for the local resistance loss plus the length of the straight pipes connecting the indoor unit and the outdoor unit.
4. You are advised to select the pipes based on the total length of the pipes connecting the indoor unit and the outdoor unit, because different pipe diameters influence the pressure drop and performance of the cooling system. For details, see [Table 3-13](#).
5. Pipe length mentioned in this document is equivalent.

Table 3-12 Equivalent length of components

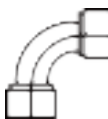
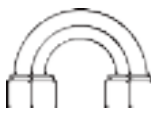
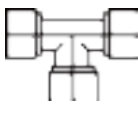
Pipe Outer Diameter (in)	45-Degree Bends(m)	90-Degree Bends(m)	180-Degree Bends(m)	3-Way(m)
				
3/8	0.12	0.2	0.4	0.6
1/2	0.14	0.25	0.5	0.65
5/8	0.17	0.3	0.6	0.7
3/4	0.2	0.35	0.7	0.8
7/8	0.24	0.42	0.8	1.2
1	0.28	0.5	1	1.3
1-1/8	0.32	0.6	1.2	1.4

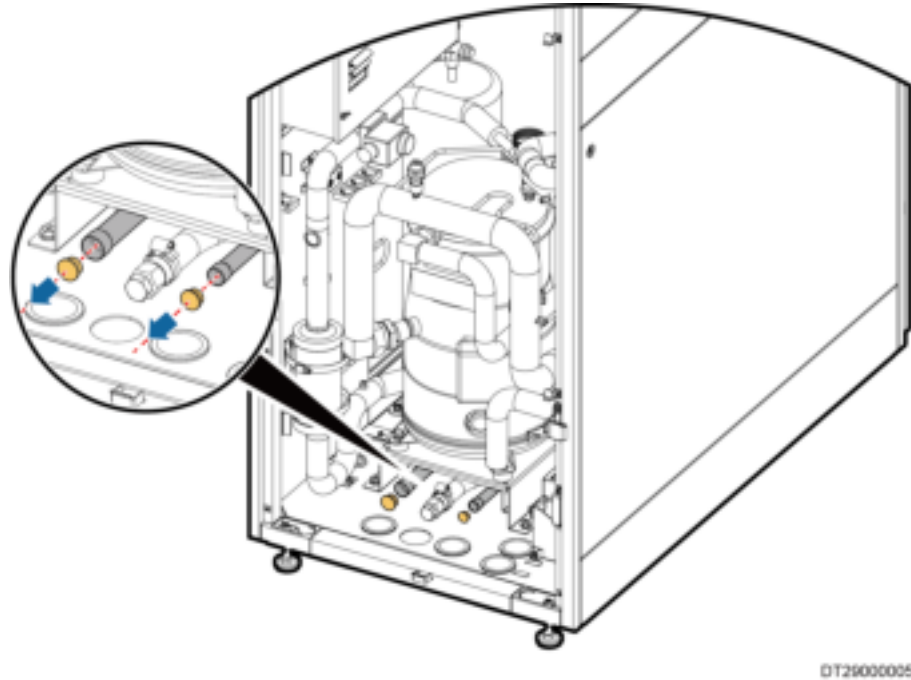
Table 3-13 Recommended pipe specifications

Pipe Length (m)	Recommended Diameter for Discharge Pipes (inch)	Recommended Diameter for Liquid Pipes (inch)
$L \leq 60$	7/8	5/8
Note: If the pipe is longer than 60 m, contact Huawei technical support.		

Procedure

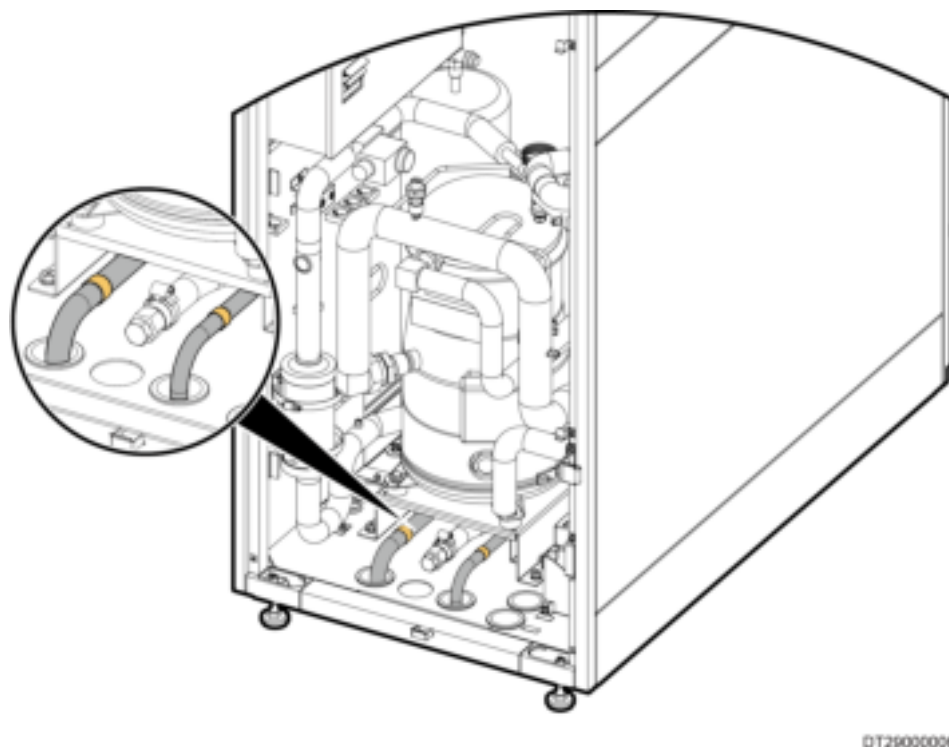
- Step 1** Remove the two plugs from the pipes using a welding torch, as shown in [Figure 3-25](#).

Figure 3-25 Routing pipes from the bottom



- Step 2** Take two 90° bent copper pipes among the fittings.
- Step 3** Weld the two pipes with the bent ends facing downwards, as shown in [Figure 3-26](#).

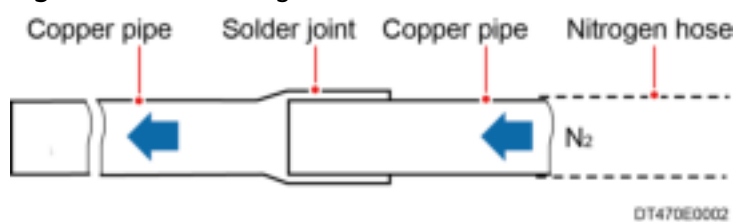
Figure 3-26 Welding the copper pipes



NOTICE

Charge nitrogen with a small pressure to protect pipes from oxidation while you weld the copper pipes, as shown in [Figure 3-27](#).

Figure 3-27 Soldering



----End

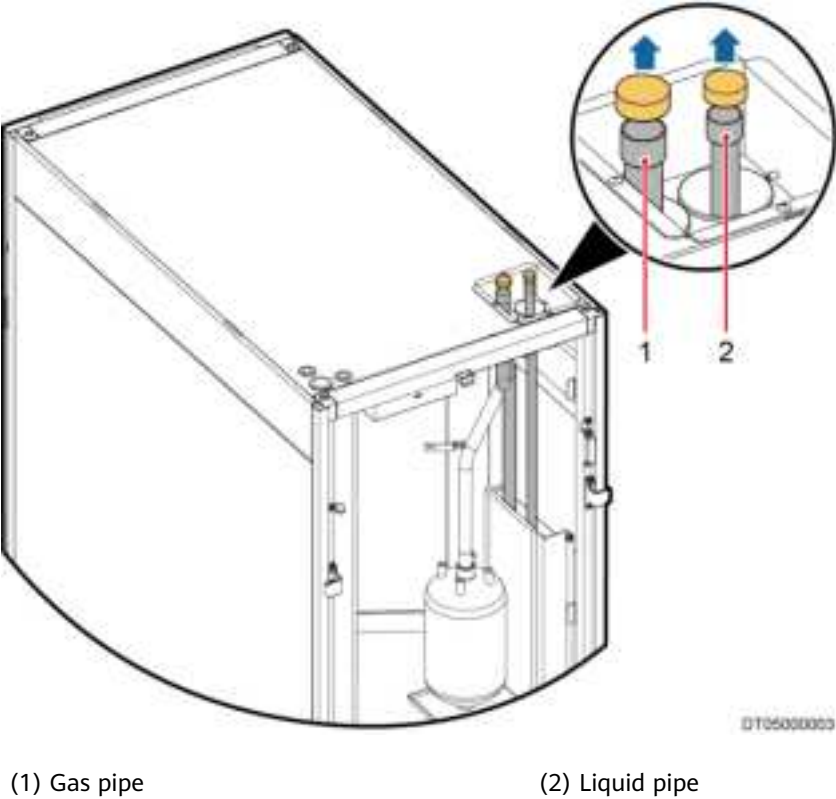
Example

⚠ CAUTION

When routing pipes from the top, do not route the refrigerant pipe over servers, avoiding the impact brought by refrigerant leakage on the servers.

When you route pipes from the top, remove the two upper plugs, connect discharge pipe to the air outlet pipe of the outdoor unit, and connect liquid pipe to the liquid inlet pipe of the outdoor unit, as shown in [Figure 3-28](#).

Figure 3-28 Routing pipes from the top



3.9.2 Connecting Water Pipes

Context

The pipes to be connected are the humidifier water inlet pipe, condensate pump drainpipe, and self-drainpipe. Determine the pipe to be connected based on condensate pumps, heaters, and humidifiers, as described in [Table 3-14](#).

Table 3-14 Overview

Configuration	Pipes to Be Connected
Condensate pump, heater, and humidifier	Humidifier water inlet pipe, condensate pump drainpipe, and self-drainpipe (optional) NOTE Optional: If there are raised floors or bases, connect the self-drainpipe. Otherwise, you are not required to connect the self-drainpipe. Condensate pump drainpipe and self-drainpipe should not be connected together to avoid water in the self-drainpipe flowing back to the pump.

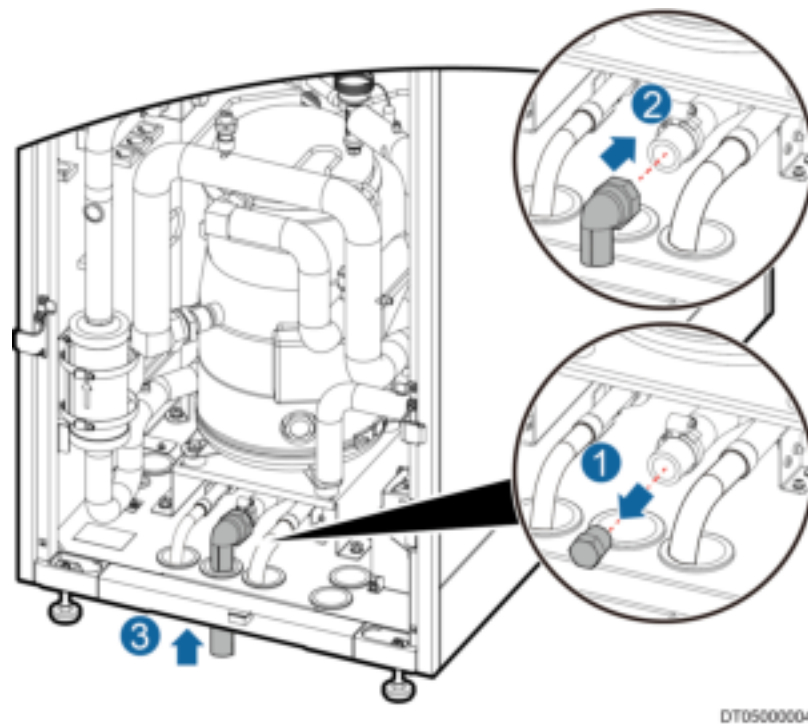
Configuration	Pipes to Be Connected
Condensate pump. No heater or humidifier	Condensate pump drainpipe and self-drainpipe (optional) NOTE Optional: If there are raised floors or bases, connect the self-drainpipe. Otherwise, you are not required to connect the self-drainpipe. Condensate pump drainpipe and self-drainpipe should not be connected together to avoid water in the self-drainpipe flowing back to the pump.
Heater and humidifier. No condensate pump	Humidifier water inlet and self-drainpipe
No condensate pump, heater or humidifier	Self-drainpipe

The following describes how to install a self-drainpipe. For details about how to connect humidifier water inlet pipe and water pump drainpipe, see the method of connecting the self-drainpipe.

Procedure

Step 1 Remove plugs from the pipe, as shown by 1 in [Figure 3-29](#).

Figure 3-29 Connecting self-drainpipe



Step 2 Install the pipe adapter and seal the adapter using sealant, as shown by 2 in [Figure 3-29](#).

Step 3 Wrap the pipe with heat insulation cotton and install the pipe and hoop, as shown by 3 in [Figure 3-29](#).

----End

Example

A humidifier water inlet pipe and a condensate pump drainpipe are routed from the bottom or top. You can route the pipes based on site requirements.

CAUTION

When routing pipes from the top, do not route the pipes over servers. If unavoidable, take protective measures to protect the servers from being affected by pipe leakage.

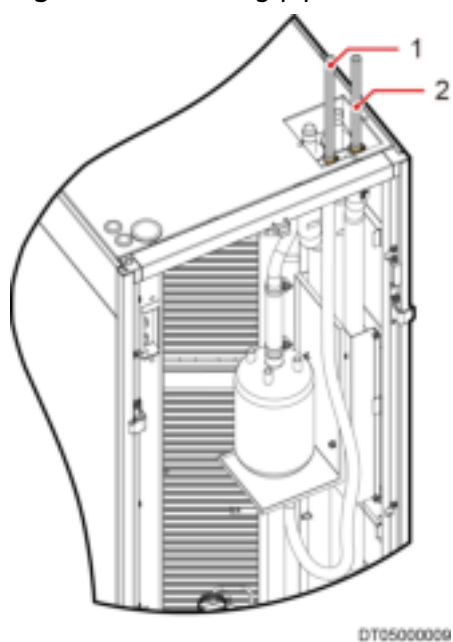
NOTICE

Do not remove the humidifier water inlet pipe to prevent sealing fault between water inlet pipe and the humidifier cylinder.

The humidifier water inlet pipe is a hose installed under the humidifier. When connecting the hose, straighten the hose and secure it with cable ties.

The top and bottom pipe routing methods are the same with that of self-drainpipes. [Figure 3-30](#) and [Figure 3-31](#) respectively show top and bottom pipe routing.

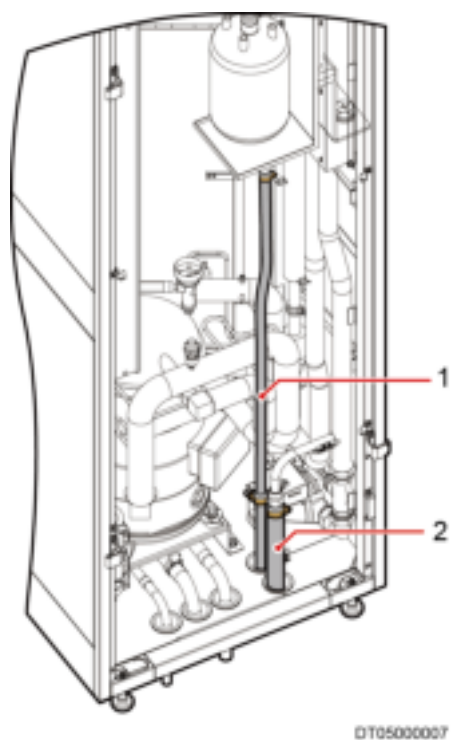
Figure 3-30 Routing pipes from the top



(1) Humidifier water inlet

(2) Condensate pump drainpipe

Figure 3-31 Routing pipes from the bottom



(1) Humidifier water inlet

(2) Condensate pump drainpipe

3.9.3 Leak Checking

Prerequisites

NOTICE

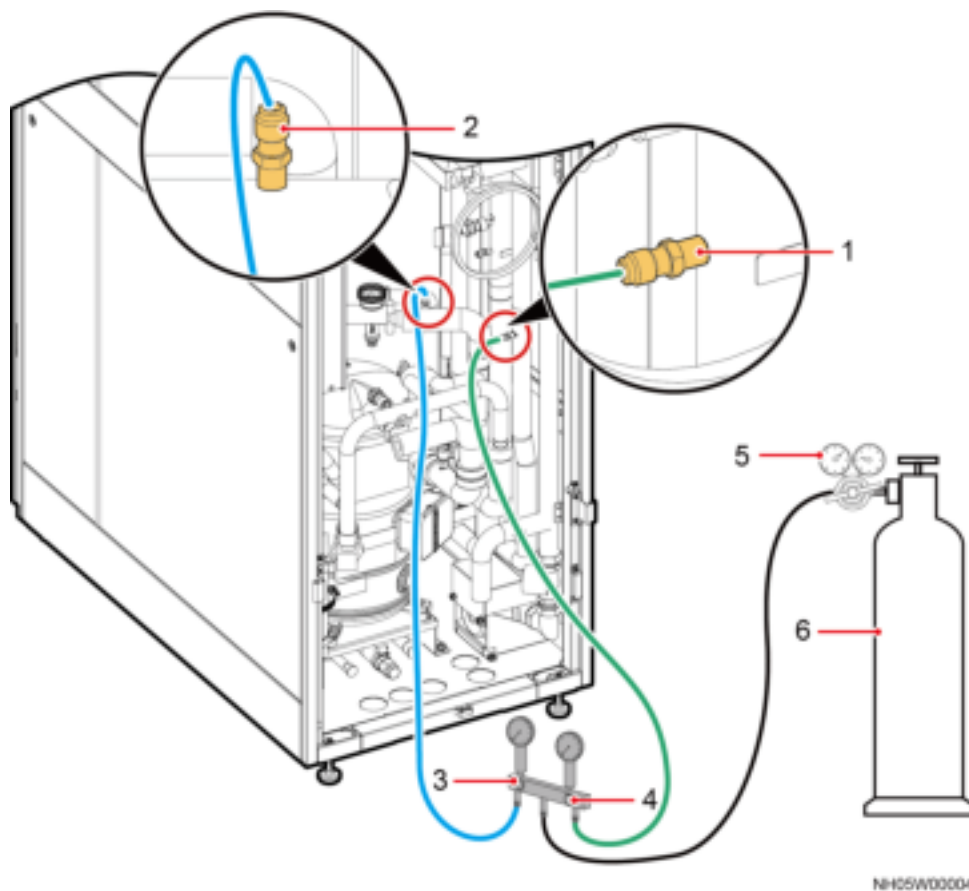
- Pipes from indoor unit and outdoor unit have been soldered properly.
 - The measuring range of the pressure gauge must be greater than or equal to 4.0 MPa, and the tolerance range of the leather hose must be greater than or equal to 4.5 MPa.
 - Do not remove the pressure gauge and the leather hose when charging nitrogen to retain the pressure to prevent the nitrogen from leaking.
 - Before leak checking, make sure that the needle valve plugs are tightened.
 - Only nitrogen is allowed when leak checking.
-

Procedure

Step 1 Connect the pressure gauge, hose, reducing valve, and the nitrogen to the device. The pressure gauge valves and reducing valve should be closed.

- If low-temperature component is not configured, charge nitrogen from (1) and (2), as shown in [Figure 3-32](#).

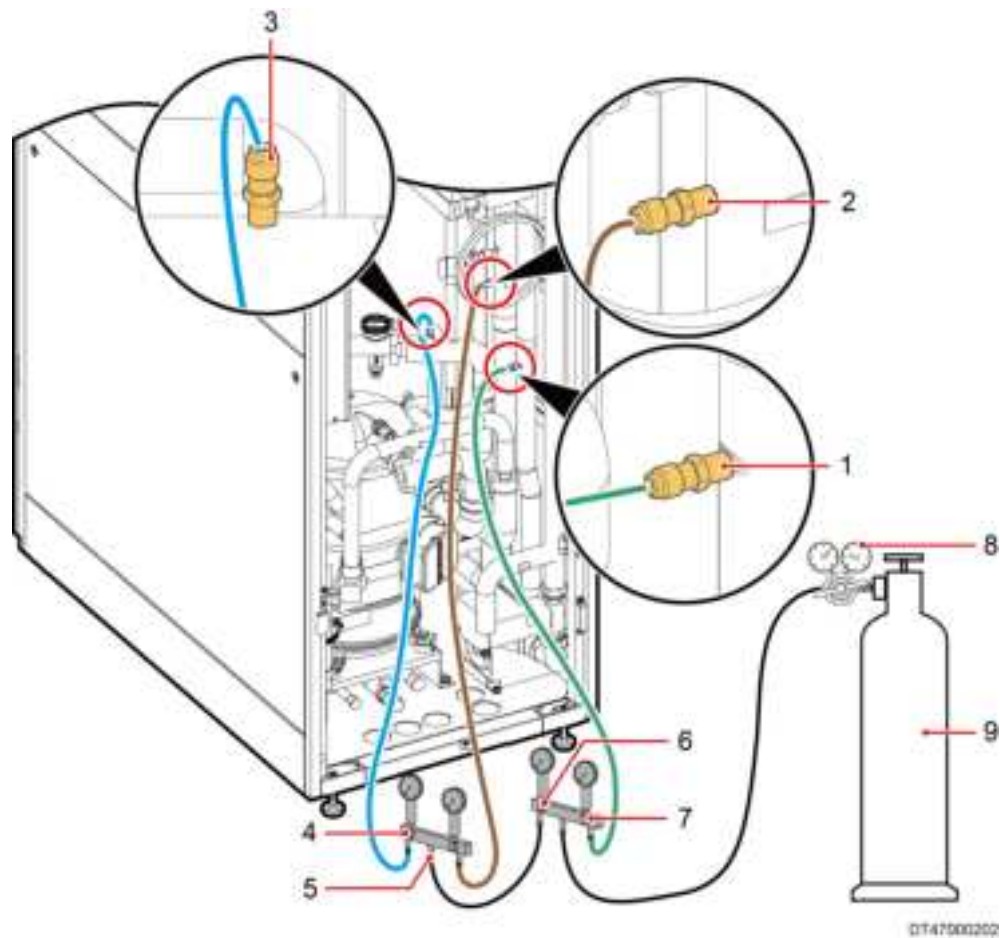
Figure 3-32 Charging nitrogen to pipes without configuring low-temperature component



- | | | |
|------------------------------|-------------------------------|---------------------------|
| (1) Liquid pipe needle valve | (2) Low-pressure needle valve | (3) Low pressure valve |
| (4) High pressure valve | (5) Reducing valve | (6) Nitrogen steel vessel |

- If low-temperature component is configured and installed, charge nitrogen from (1), (2), and (3), as shown in [Figure 3-33](#).

Figure 3-33 Charging nitrogen to pipes with installing low-temperature component



- | | | |
|------------------------------|---------------------------------|-------------------------------|
| (1) Liquid pipe needle valve | (2) Discharge pipe needle valve | (3) Low-pressure needle valve |
| (4) Low pressure valve 1 | (5) High pressure valve 1 | (6) Low pressure valve 2 |
| (7) High pressure valve 2 | (8) Reducing valve | (9) Nitrogen steel vessel |

Step 2 Open the pressure gauge valves and reducing valve to charge nitrogen into the pipes to preserve the pressure at 3.5 MPa for 24 hours. The system pressure should not decrease before and after pressure preservation provided that the ambient temperature is stable. If the pressure varies due to ambient temperature changes, conduct the pressure preservation test again.

NOTICE

The outlet pressure must be no more than 3.5 MPa. If the outlet pressure is more than 3.5 MPa, some parts of the system may be damaged.

Step 3 If the pressure decreases, find out and repair the leakage point by using soap bubbles or a halogen leak detector. If the pressure is preserved properly, exhaust nitrogen from the three positions shown in [Figure 3-23](#).

 NOTE

For scenarios where a container is transported without refrigerant, keep 0.3 to 0.4 MPa of nitrogen in the pipe.

----End

3.10 Installing Cabinet Accessories

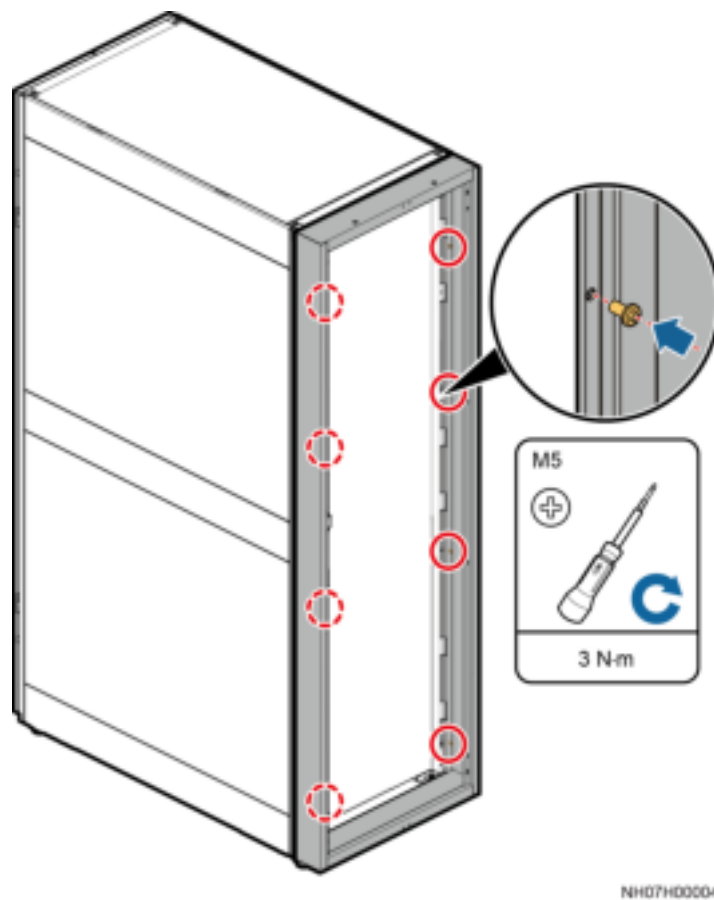
To expand an indoor unit to 1200 mm deep, install an enclosure frame. To expand an indoor unit to 2200 mm high, install an top frame.

3.10.1 (Optional) Installing an Enclosure Frame

Procedure

- Step 1** Open the front door. Remove the power cable of the display screen and the ground cable for the front door. Then pull the front door upwards and remove it.
- Step 2** Remove one bolt fixing plate, two connection plates, and two hinges.
- Step 3** Move the enclosure frame to the front door, and adjust the anchor bolts of the enclosure frame to ensure that the enclosure frame has the same height with the cabinet.
- Step 4** Secure the enclosure frame to the front door using eight M5 screws, as shown in [Figure 3-34](#).

Figure 3-34 Installing an enclosure frame

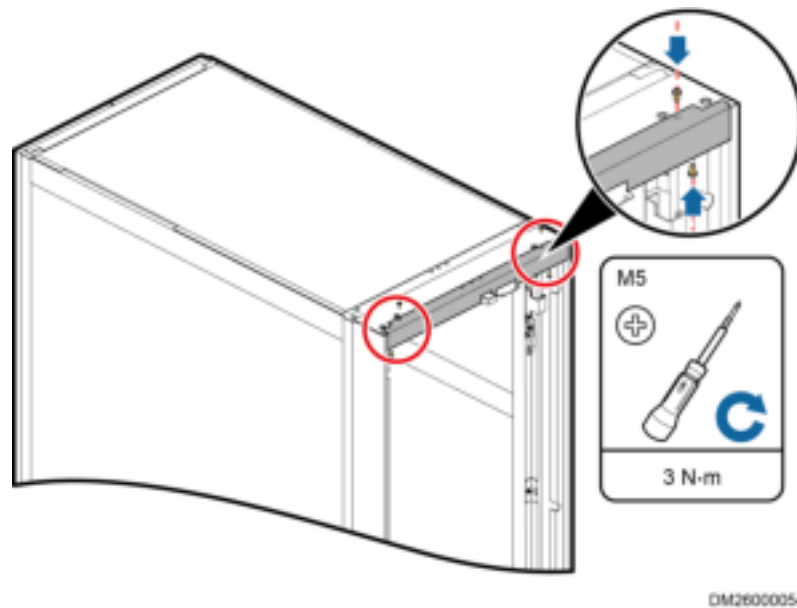


NOTE

The positions of the bolt fixing plate, hinges, and connecting plates vary depending on the cabinet model.

Step 5 (Optional; only for units whose BOM numbers are 52272131 or 52272132) Secure the top sealing plate of the enclosure frame to the enclosure frame using four M5 tapping screws.

Figure 3-35 Installing the top sealing plate



- Step 6** Install the hinges and connecting plates removed in [Step 2](#) on the corresponding positions on the enclosure frame.
- Step 7** Install the cabinet front door on the enclosure frame.
- Step 8** Install the power cable for the display screen. Connect the ground cable under the front door to the enclosure frame according to the label on the enclosure frame.
- Step 9** After installing the enclosure frame, the power cable for the display screen may be not long enough to open the door completely. Cut off the cable ties, which fastening the power cable, to make sure the front door can rotate smoothly.

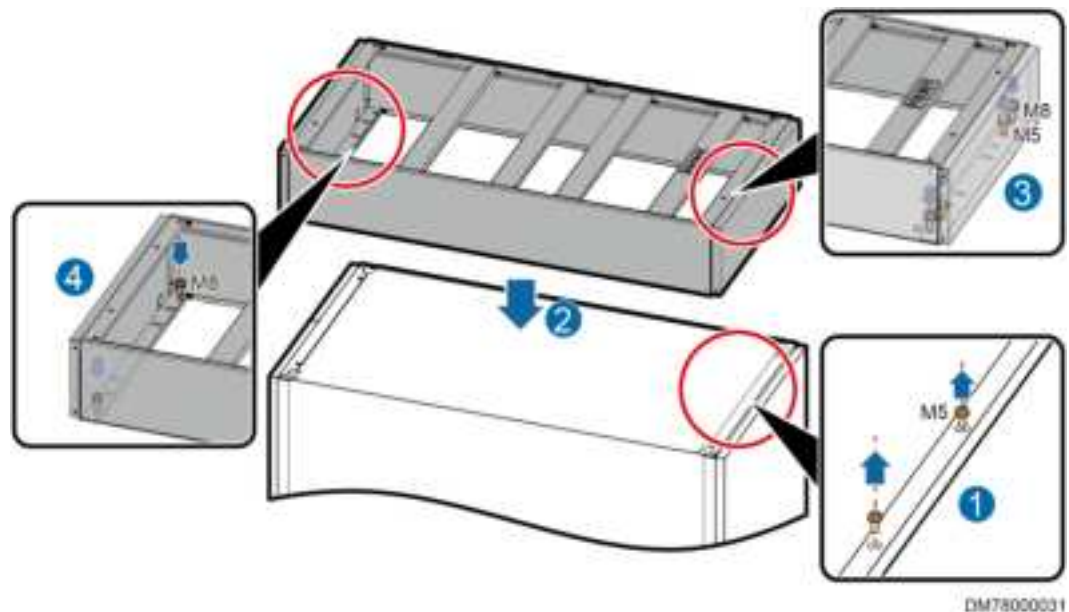
----End

3.10.2 (Optional) Installing the Top Frame

Bottom Pipe Routing

- Step 1** Remove the two M5x10 tapping screws that secure the front door sealing plate on the top of the cabinet, as shown by (1) in [Figure 3-36](#).

Figure 3-36 Installing a top frame



Step 2 Place the top frame, with the side with **FRONT** facing upwards and the end with **FRONT** facing the cabinet front door, as shown by (2) in [Figure 3-36](#).

Step 3 Secure the top frame.

1. Use the four M8x20 screw assemblies to secure the top frame to the cabinet, as shown by (3) and (4) in [Figure 3-36](#).
2. Install two M5x10 tapping screws at the front of the top frame to set up equipotential bonding between the cabinet and the top frame, as shown by (3) in [Figure 3-36](#).

----End

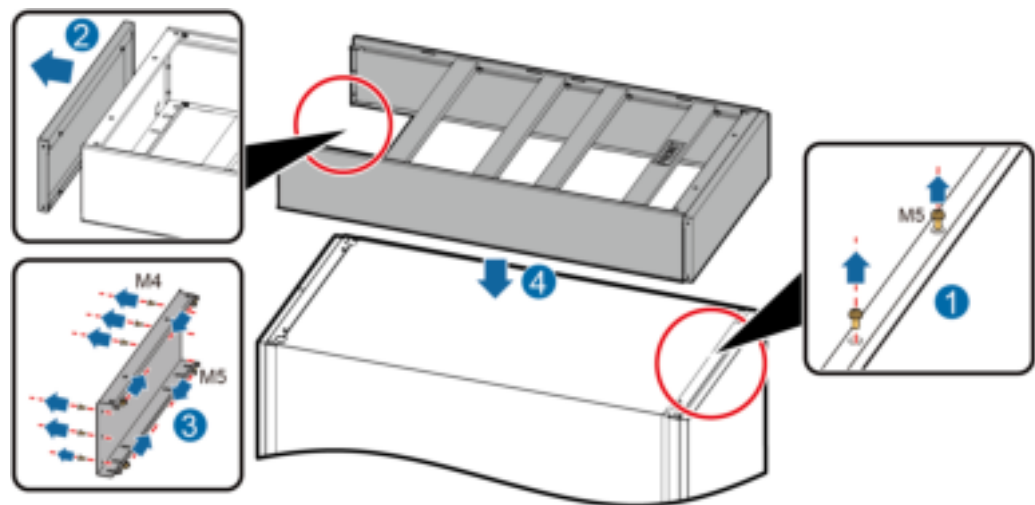
Overhead Pipe Routing

Step 1 Remove the two M5x10 tapping screws that secure the front door sealing plate on the top of the cabinet, as shown by (1) in [Figure 3-37](#).

Step 2 Remove the rear decorative plate for the top frame, and then remove the four M5x10 tapping screws and the six M4x10 countersunk screws from the rear plate of the top frame, as shown by (2) and (3) in [Figure 3-37](#).

Step 3 Place the top frame, with the side with **FRONT** facing upwards and the end with **FRONT** facing the cabinet front door, as shown by (4) in [Figure 3-37](#).

Figure 3-37 Placing a top frame

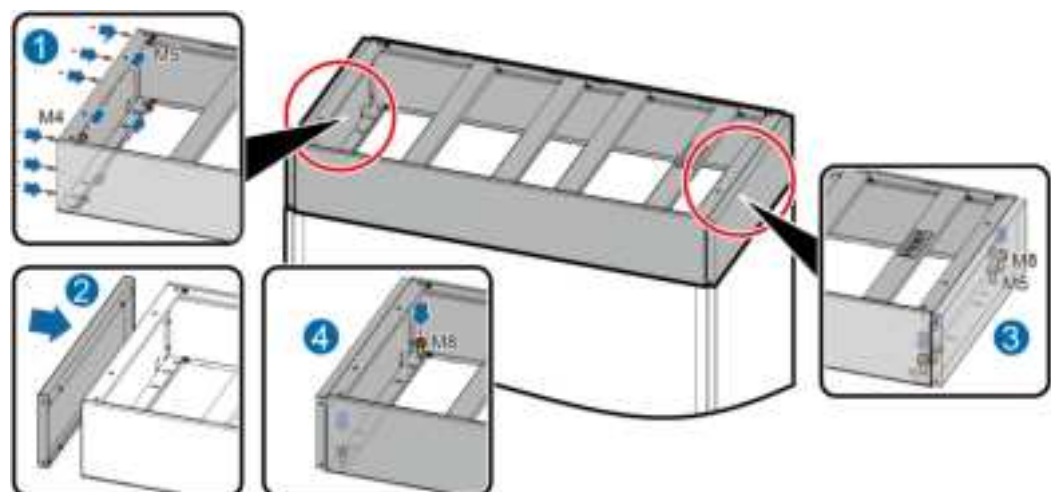


DM78000032

Step 4 Secure the top frame.

1. Use the four M5x10 tapping screws and the six M4x10 countersunk screws to secure the rear plate to the top frame, and clamp the rear plate, as shown by (1) and (2) in [Figure 3-38](#).
2. Use the four M8x20 screw assemblies to secure the top frame to the cabinet, as shown by (3) and (4) in [Figure 3-38](#).
3. Install two M5x10 tapping screws at the front of the top frame to set up equipotential bonding between the cabinet and the top frame, as shown by (3) in [Figure 3-38](#).

Figure 3-38 Securing the top frame



DM78000033

-----End

3.11 Connecting Cables

3.11.1 Preparations and Precautions

Preparation

- Remove the six butterfly nuts from the top cover of the electric control box, remove the top cover, and open the electric control box.

CAUTION

Do not drop the screws into the indoor unit and mind the fins when open the front board.

- The following items must be installed onsite: power cable to the indoor unit, external signal cable to the indoor unit, voltage jumper of the indoor unit. The following items are optional for onsite connection: teamwork networking and monitoring cables, water sensor, humidity and temperature (T/H) sensor outside the cabinet, and SNMP monitoring cable.

Precautions

- Connections of all power cables, control cables, and ground cables must comply with the local electrical code, and the cable specifications should comply with the local cabling specifications.
- Only trained and qualified personnel are allowed to connect cables, and protective articles are needed to be worn, such as ESD gloves.
- For details about the currents in full load, see the NetCol5000-A nameplate.
- All the NetCol5000-As are grounded.
- Keep cables away from the compressor, fans, and copper pipes (otherwise, take protective measures), and connect cables properly.

3.11.2 Connecting the Power Cable to an Indoor Unit

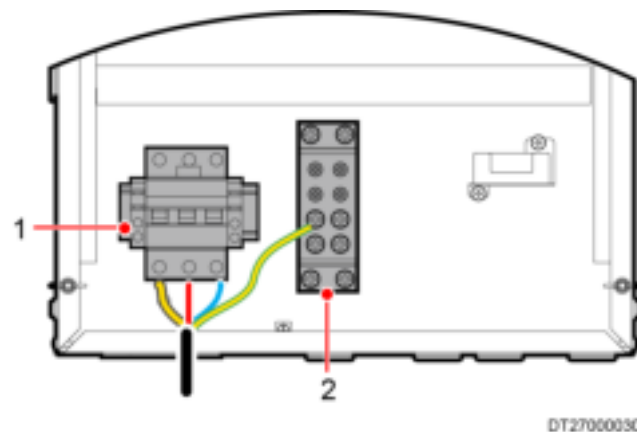
CAUTION

To ensure that the NetCol5000-A is effectively grounded, route a PE cable from the PE ground bar of the indoor unit to the ground bar of the equipment room.

Figure 3-39 shows the zoomed-in view of the indoor unit power ports. L1, L2, L3, and PE bar connect to the corresponding power ports.

Select the cable model based on the maximum running current of the indoor unit, which shows in [2.4 Technical Specifications](#).

Figure 3-39 Connecting the power cable



(1) Power cable ports (connecting to L1, L2, L3, (2) PE wiring terminal from left to right)

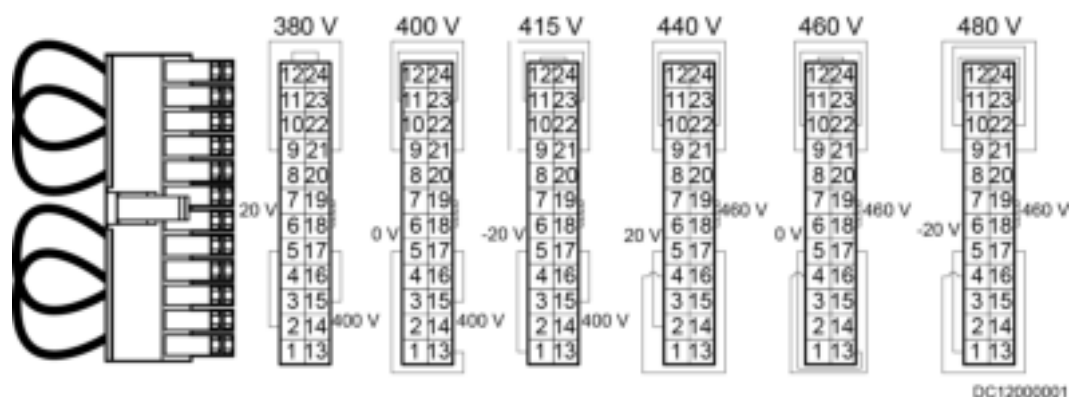
3.11.3 Installing the Voltage Jumper

NOTICE

Before connecting the voltage jumper, ensure that the power distributor matches the mains voltage.

Figure 3-40 shows six voltage jumpers. Select one jumper that matches the local power voltage and connect the jumper to 11 in **A Electrical Ports of an Indoor Unit**.

Figure 3-40 Voltage jumpers



3.11.4 Connecting the Signal Cables

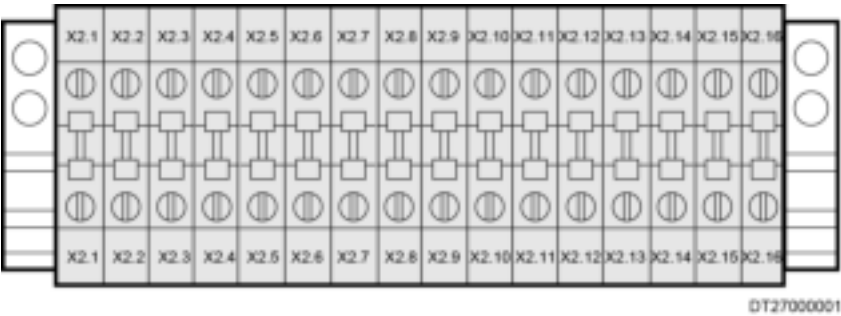
 CAUTION

Before connecting signal cables to an outdoor unit, take effective ESD protection measures.

Ports

Figure 3-41 shows the zoomed-in view of the control terminal XT2 ports, including ports for reporting common alarms 1 and 2, port for the outdoor unit on/off signal cable, port for the remote shutdown of an indoor unit, water sensor port, smoke sensor port, and port for reporting mains outage alarm.

Figure 3-41 Zoomed-in view of the control terminal XT2 ports



 NOTE

For the actual terminal layout, refer to the site layout. This figure is for reference only.

Table 3-15 describes the definitions and functions of control ports.

Table 3-15 Definitions and functions of control ports

Port Name	Definition	Function	Port Feature
X2.1, X2.2	Port for reporting common alarm 1	Alarm dry contact output. When DO associated alarm is set to Critical ALM , the smart cooling product issues an alarm if a major alarm occurs.	NO signal dry contact output. Connection to an outdoor device is forbidden.

Port Name	Definition	Function	Port Feature
X2.3, X2.4	Port for reporting common alarm 2	Alarm dry contact output. When DO associated alarm is set to Smoke only , the smart cooling product issues an alarm if a smoke or water alarm occurs. Alarm dry contact output. When DO associated alarm is set to Critical ALM , the smart cooling product issues an alarm if a critical alarm occurs.	NO signal dry contact output. Connection to an outdoor device is forbidden.
X2.5, X2.6	Port for the outdoor unit on/off signal cable	Terminals X2.5 and X2.6 are control signal input terminals of an outdoor unit.	N/A
X2.7, X2.8	Port for the remote shutdown of an indoor unit	Terminals X2.7 and X2.8 can be set to remotely shut down an indoor unit. Specifically, the control signal cable is routed from the ports to the monitoring room and control the shutdown of the indoor unit. They are disconnected before delivery. The emergency switch for remote shutdown should be steady on.	DI input. Can connect to the dry contact input. Normally open in normal status and normally closed when a fault occurs. The dry contact must be used indoor only, and the usage range is within 100 meters. Do not connect two or more units to one outside dry contact.
X2.9, X2.10	Water sensor port	The water sensor is connected to terminals X2.9 and X2.10. After the water sensor is installed, the NetCol5000-A generates an alarm when water leak occurs.	The Huawei product is recommended.

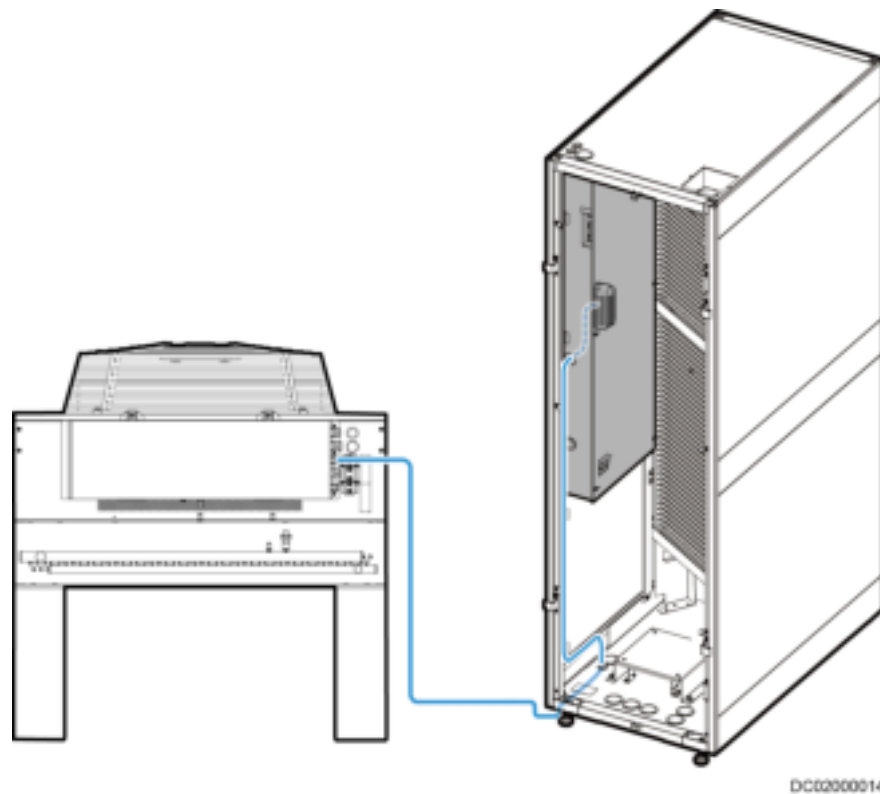
Port Name	Definition	Function	Port Feature
X2.11, X2.12	Smoke sensor port	The signal output cables for reporting smoke alarms are connected to terminals X2.11 and X2.12. After the smoke sensor is installed, the NetCol5000-A generates an alarm when a fire occurs.	- Dry contact port type: normally open in normal status and normally closed when a fault occurs. - Current type: 12 V DC operating voltage. An alarm is generated when the operating voltage is greater than or equal to 3 mA. The Huawei product is recommended.
X2.13, X2.14	Port for reporting mains outage alarm	The signal output cables for reporting mains alarms are connected to terminals X2.13 and X2.14. When mains outage occurs, the NetCol5000-A generates an alarm.	DI input. Can connect to the dry contact input. Normally open in normal status and normally closed when a fault occurs. The dry contact must be used indoor only, and the usage range is within 100 meters. Do not connect two or more units to one outside dry contact.
X2.15, X2.16	Reserved	N/A	N/A

3.11.4.1 Connecting the Outdoor Unit On/Off Signal Cable

Procedure

- Step 1** Determine cable routing mode (from the top or the bottom) based on site requirements.
- Step 2** Route the cables into the cabinet through the holes at the top or the bottom of the cabinet. Route them into the control boxes through the holes at the top of the control boxes, along the side of control boxes.
- Step 3** Connect control ports X2.5 and X2.6 of an indoor unit in [Figure 3-41](#) to port 1 and port 2 of the outdoor unit respectively, as shown in [Figure 3-42](#).

Figure 3-42 Connecting the outdoor unit on/off signal cable



Step 4 Fasten the cables by cable ties.

----End

3.11.4.2 Connecting Water Sensor

Context

A water sensor monitors resistance changes at terminals to check whether the floor is watery. The resistance at the terminals becomes small if the terminals detect water or any other conductive liquid. Keep the sensor far away from drain traps or floor drains.

Procedure

Step 1 Connect one end of the water sensor cable to the water sensor.

Step 2 Route the other end of the sensor cable through the hole at the bottom of the cabinet and the hole (the higher one) at the side of the electric control box and connect the two terminals to the terminal block (X2.9 and X2.10 positions) of the electric control box, as shown in [Figure 3-41](#).

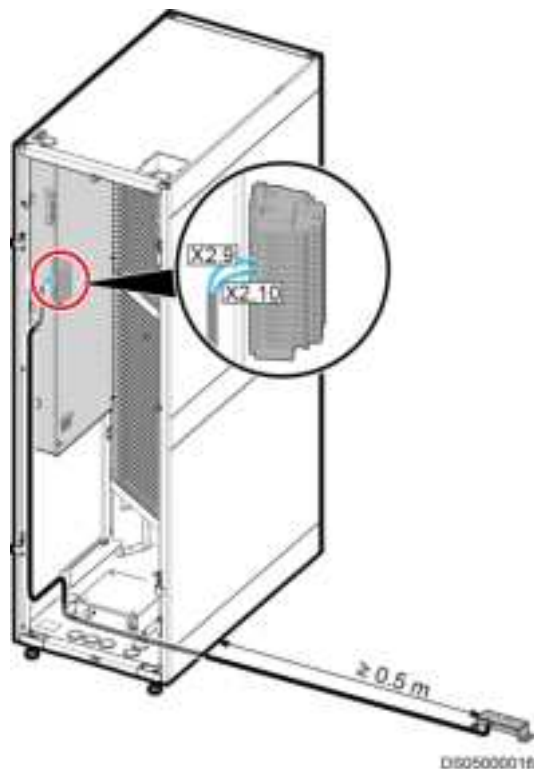
Step 3 Secure the water sensor cable to the cabinet with cable ties.

[Figure 3-43](#) shows the water sensor installation position.

NOTICE

Place the sheet metal of the water sensor upwards and its detection board downwards on the ground.

Figure 3-43 Routing cables of water sensor (unit: m)



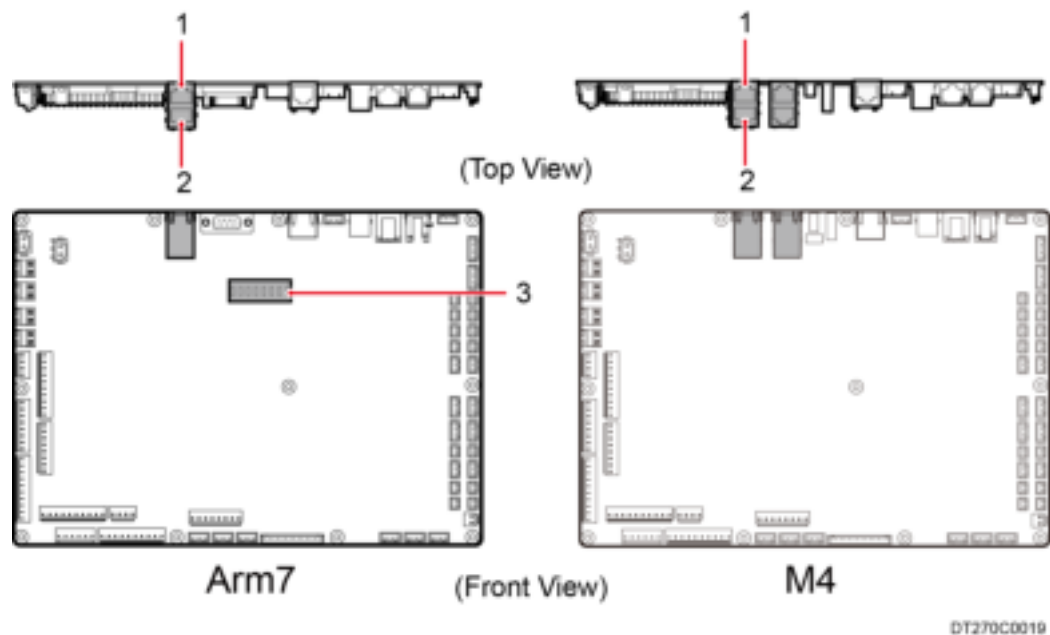
----End

3.11.5 Teamwork Networking and Monitoring

Context

Teamwork communication ports 1 and 2 are used to enable the teamwork networking communication over CAN and EMS monitoring communication over RS485. [Figure 3-44](#) shows the communications cable ports on the main control board.

Figure 3-44 Ports on the two main control boards



(1) Teamwork communications port 1

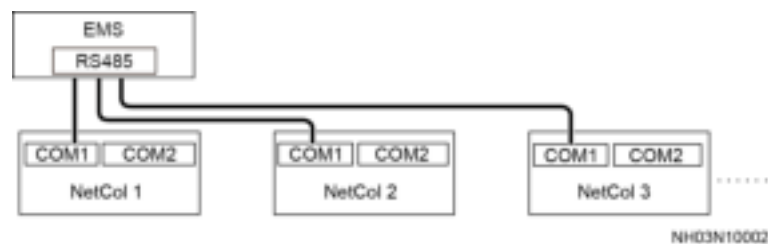
(2) Teamwork communications port 2

(3) DIP switch

EMS Monitoring

Connect the RS485 cable from the EMS to the teamwork communication port 1 or 2 of the smart cooling product, as shown in [Figure 3-45](#).

Figure 3-45 EMS monitoring



Teamwork Networking

If only teamwork communication is required, reserve the teamwork communication port 1 of the first unit, connect the teamwork communication port 2 of the unit to the teamwork communication port 1 of the second unit, and connect the teamwork communication port 2 of the second unit to the teamwork communication port 1 of the third unit. All units that require teamwork can be connected in this way, as shown in [Figure 3-46](#).

NOTICE

- All smart cooling products in a teamwork group must be of the same model.
- Do not directly connect the first and the last smart cooling products to form a ring network.

Figure 3-46 Teamwork networking



NOTE

- The number (n) of smart cooling products in this figure should be less than or equal to 32.
- The teamwork cable between two adjacent smart cooling products must not exceed 10 m in a network.

Teamwork Networking and EMS Monitoring

If both teamwork networking and ESM monitoring are required, the smart cooling product requires a Y-split cable for collecting and transferring information. [Figure 3-47](#) shows a Y-split cable. [Figure 3-48](#) defines the pins of a Y-split cable. [Figure 3-49](#) shows the Y-split cable connection for teamwork control.

Figure 3-47 Y-split cable

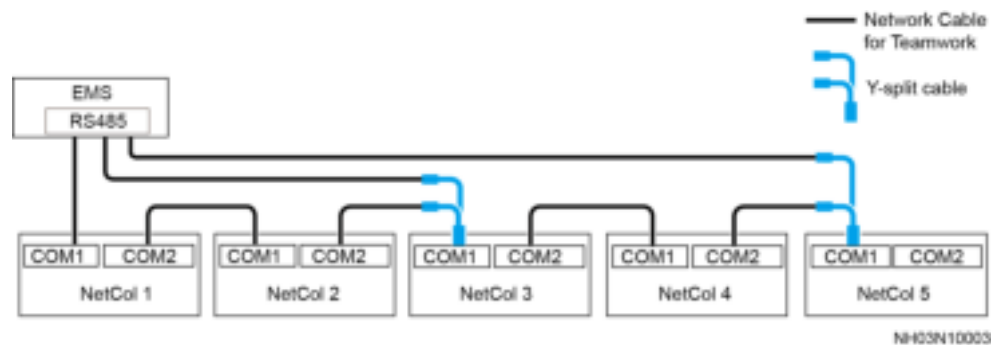


Figure 3-48 Pin definition of a Y-split cable

	PIN	Color	Signal Attribute	Y-split Cable Connector
	1	white-orange	RS-485 T+(D+)	RS485 connector
	2	orange	RS-485 T-(D-)	
	3	white-green	N/A	
	4	blue	RS-485 R+	
	5	white-blue	RS-485 R-	CAN connector
	6	green	GND	
	7	white-brown	CANH	
	8	brown	CANL	

NH02Z10003

Figure 3-49 Y-split cable connection for teamwork control



NOTE

- **Figure 3-49** shows the scenario where every two smart cooling products connect to the EMS over a Y-split cable. Determine the number of Y-split cables used for grouped monitoring based on performance requirements.
- When the EMS monitors smart cooling products using the RS485 protocol, the time needed for collecting all data from a single smart cooling product is 3 seconds. In the teamwork mode of cascading using an RS485 bus for monitoring, it takes the host 3 seconds multiplied by N to collect data from N smart cooling products in the group. For example, the time needed for collecting data from four smart cooling products is 12 seconds. If the host needs more time to collect data from all smart cooling products than what the EMS performance requires, use the Y-split cable connection scheme shown in **Figure 3-49**.

Setting the DIP Switch

NOTE

Method of distinguishing the two types of main control boards:

- The Arm7 main control board has two DIP switches, while the M4 main control board has only one DIP switch.
- The software version of the Arm7 main control board is ACC V100R001CxxSPCxxx, while that of the M4 main control board is ACC V100R002C00SPCxxx.

NOTICE

- The Arm7 main control board has the DIP switch, whereas the M4 does not have. If the Arm7 main control board is used, set the DIP switch. If the M4 main control board is used, skip this step because there is no DIP switch.
- You need to set only the seventh toggle switch based on site requirements and leave the rest of toggle switches in their default status listed in **Table 3-16**.

Table 3-16 Operation description of the toggle switches

Toggle Switch	Default Value	Operation
1	OFF	Remaining "OFF".

Toggle Switch	Default Value	Operation
2	OFF	Remaining "OFF".
3	ON	Remaining "ON".
4	ON	Remaining "ON".
5	OFF	Remaining "OFF".
6	ON	Remaining "ON".
7	OFF	• Non-teamwork situations: remaining "OFF". • For teamwork situations, set toggle switch 7 of the first and last smart cooling products to "ON" and toggle switch 7 of other units to "OFF".
8	ON	Remaining "ON".

3.11.6 Installing a Humidity and Temperature Sensor Outside the Cabinet

To install a humidity and temperature sensor, route the humidity and temperature sensor cable and set the DIP switch on the humidity and temperature sensor.

Routing the Humidity and Temperature Sensor Cable

NOTICE

1. Do not route the ambient T/H sensor cables from the bottom of the electrical control box because strong electricity cables have been routed here.
2. Secure the weak electricity cables, such as the ambient T/H sensor cables and signal cables with cable ties.

The humidity and temperature sensor is configured to detect the temperatures of cold and hot aisles. It can be flexibly installed on the server cabinet based on onsite situation. The humidity and temperature sensor should be installed in the central of heat source in the hot aisle, or in the cold aisle areas where the cooling capacity is probably the minimum. Do not install the T/H sensor at the air exhaust vent of other smart cooling products. Place the T/H sensor near the smart cooling product in case of lacking air.

The humidity and temperature sensor inside the cabinet is secured to the return air side. [Figure 3-50](#) shows the position and cable route of an internal humidity and temperature sensor. The IN port of the internal humidity and temperature sensor has been connected to the main control board. When connecting external humidity and temperature sensors, connect the sensors in series and make sure that the OUT port on the previous sensor connects to the IN port on the following

sensor. **Figure 3-51** shows the positions and cable routes for external humidity and temperature sensors. The sensors can be secured to the cabinet using cable ties or two M4 screws through sheet metal holes.

Figure 3-50 Position and cable route of an internal humidity and temperature sensor

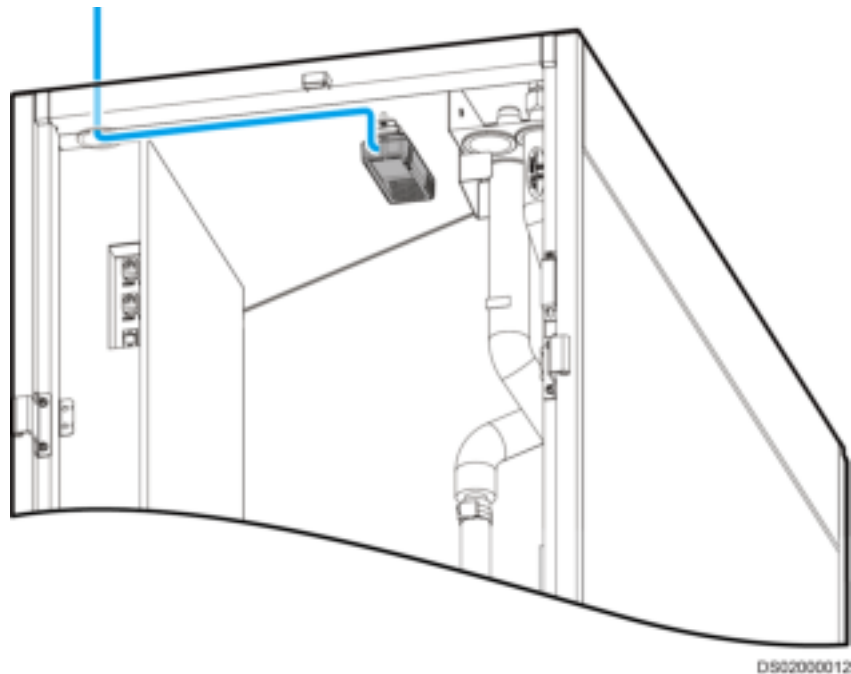
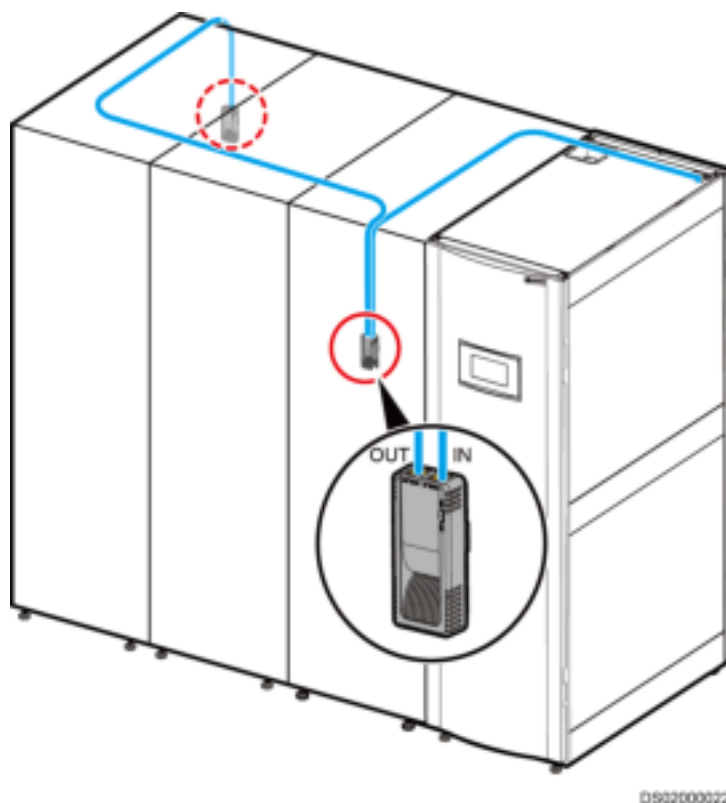


Figure 3-51 Position and cable routing out of the unit



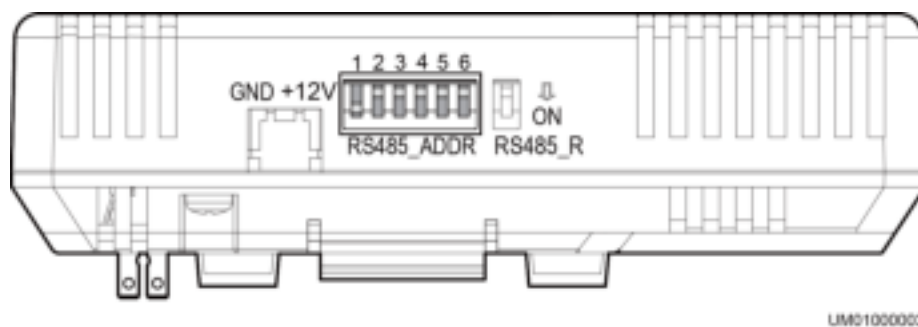
NOTE

- A humidity and temperature sensor should be installed 1.5 m above the floor.
- Each smart cooling product supports three cold aisle humidity and temperature sensors and three hot aisle humidity and temperature sensors at most.

Setting the DIP Switch on the Humidity and Temperature Sensor

Figure 3-52 shows the DIP switch on a humidity and temperature sensor.

Figure 3-52 DIP switch



You need to set the DIP switch to change the communications address of sensors.
Table 3-17 describes the operation description.

NOTICE

- RS485_R must be switched to OFF.
- After the address is set, choose **Settings > System Settings > T/H Sensor** on the home page after power-on and set the sensors in the aisle corresponding to the address to **Enable**. Otherwise, the sensors will not work.

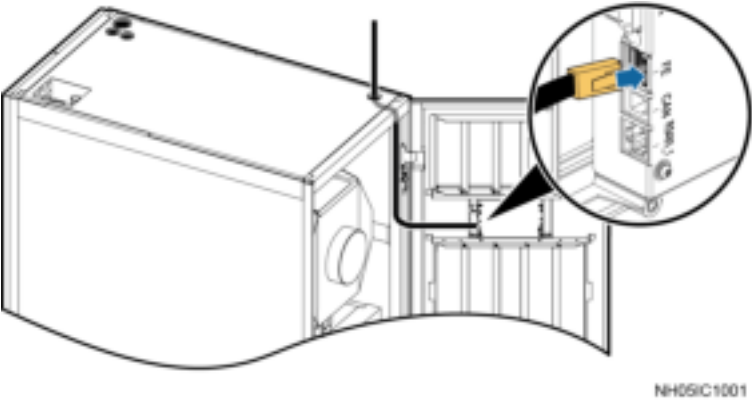
Table 3-17 DIP switch operation description

Position	Name	Address	DIP Switch ID					
			1	2	3	4	5	6
Return air side	Temperature and humidity 1 at the return air vent	1	ON	OFF	OFF	OFF	OFF	OFF
Cold aisle	Temperature and humidity 1 at the cold aisle	11	ON	ON	OFF	ON	OFF	OFF
	Temperature and humidity 2 at the cold aisle	12	OFF	OFF	ON	ON	OFF	OFF
	Temperature and humidity 3 of the cold aisle	13	ON	OFF	ON	ON	OFF	OFF
Hot aisle	Temperature and humidity 1 at the hot aisle	21	ON	OFF	ON	OFF	ON	OFF
	Temperature and humidity 2 at the hot aisle	22	OFF	ON	ON	OFF	ON	OFF
	Temperature and humidity 3 at the hot aisle	23	ON	ON	ON	OFF	ON	OFF

3.11.7 Connecting Monitoring Cable from FE Port

When remote upgrade is needed, connect one end of the monitoring cable (standard network cable, prepared by yourself) to the FE port in the display panel, as shown in [Figure 3-53](#). Connect the other end to the monitoring device.

Figure 3-53 Connecting monitoring cable



3.12 Connections Verification

[Table 3-18](#), [Table 3-19](#), and [Table 3-20](#) list the items for connections verification.

Table 3-18 Check items on the indoor unit

Check Item	Expected Result	Actual Result
Cabinet	The cabinet is installed properly, without any tilts.	☐ Passed. ☐ Failed.
	The cabinet is secured to the base by using bolts.	☐ Passed. ☐ Failed.
	The foreign matter inside the cabinet such as cable ties and stubs is cleaned up.	☐ Passed. ☐ Failed.
Electric heater	The electric heater is secured.	☐ Passed. ☐ Failed.
	The electric heater probe is secured.	☐ Passed. ☐ Failed.
EC fan	The fan is secured.	☐ Passed. ☐ Failed.
	The fan has no foreign matter inside.	☐ Passed. ☐ Failed.
	The fan blades rotate properly.	☐ Passed. ☐ Failed.

Check Item	Expected Result	Actual Result
Electrode humidifier	The water inlet pipes and drainpipes are securely connected without leakage.	☐ Passed. ☐ Failed.
	The electrode humidifier is securely connected to its base.	☐ Passed. ☐ Failed.
Compressor	The sheet metal for transporting the compressor is removed.	☐ Passed. ☐ Failed.
	The valve rod of the compressor fuel return solenoid valve is inserted in the solenoid valve coil bottom.	☐ Passed. ☐ Failed.
	The bolts on the compressor are tightened.	☐ Passed. ☐ Failed.
Condensate pump	The water inlet pipes and drainpipes are securely connected without leakage.	☐ Passed. ☐ Failed.
	The condensate pump is securely connected to its base.	☐ Passed. ☐ Failed.
Water level detection switch	The detection switch bands are removed.	☐ Passed. ☐ Failed.
	The detection switch terminals are connected and the cables are fixed.	☐ Passed. ☐ Failed.
	The water level detection switch is securely installed.	☐ Passed. ☐ Failed.
	The detection switch for the water level detection switch can move smoothly.	☐ Passed. ☐ Failed.
Air filter	The air filter is correctly installed according to the air flow direction on the frame.	☐ Passed. ☐ Failed.
Differential pressure switch	The cable ties on the differential pressure tubes are secured.	☐ Passed. ☐ Failed.
	There is no foreign matter in the differential pressure tubes. The differential pressure tubes are not seriously bent.	☐ Passed. ☐ Failed.

Table 3-19 Pipeline checklist

Expected Result	Actual Result
Ports are connected correctly. The pipelines have oil trap, inverted traps, gradients (of refrigerant pipes), and bases.	☐ Passed. ☐ Failed.
The hose clamp and cable ties of the condensate water pipes are secured.	☐ Passed. ☐ Failed.

Expected Result	Actual Result
All pipes and solenoid valve on liquid pipe are secured.	☐ Passed. ☐ Failed.
All pipes are wrapped with thermal insulation foam.	☐ Passed. ☐ Failed.
The water pipe joints are sealed by sealant.	☐ Passed. ☐ Failed.
Check that the needle valve plug is secured (torque of $0.45 \pm 0.05 \text{ N}\cdot\text{m}$), and valve bonnet is tightened.	☐ Passed. ☐ Failed.
The pipes are not seriously bent.	☐ Passed. ☐ Failed.

Table 3-20 Electrical checklist

Expected Result	Actual Result
The input voltage is within the range of the rated voltage displayed on the voltage jumper (tolerance $\pm 10\%$). The input frequency is within the range of the rated frequency (tolerance $\pm 3 \text{ Hz}$).	☐ Passed. ☐ Failed.
Cables are intact.	☐ Passed. ☐ Failed.
No open or short circuits, or incorrect connections occur in electrical loops.	☐ Passed. ☐ Failed.
The power cables for the indoor and outdoor units, the voltage jumper, the outdoor unit on/off signal cable, the teamwork communications cables, and the cables for external humidity and temperature sensors are installed properly.	☐ Passed. ☐ Failed.
The rated value of the general circuit breaker meets the highest current requirement.	☐ Passed. ☐ Failed.
All cables, connectors, and screws are secured.	☐ Passed. ☐ Failed.
Devices are properly grounded.	☐ Passed. ☐ Failed.

4 ACC Introduction

4.1 Appearance

The controller has a 7-inch true color touch-sensitive LCD that provides a user-friendly interface for you to perform query, settings, monitoring, and maintenance.

The indicator on the panel displays operating status of the smart cooling product. [Figure 4-1](#) shows the location of the indicator. [Table 4-1](#) lists the relationship of the alarm status, indicator, and buzzer. If critical alarms, major alarms, and warning alarms are generated simultaneously, the indicator and buzzer show the status of the alarm with the highest severity level.

Figure 4-1 Location of the indicator

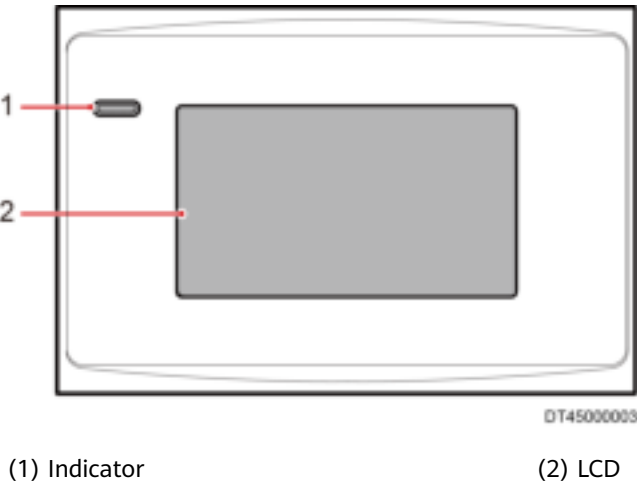


Table 4-1 Indicator and buzzer status description

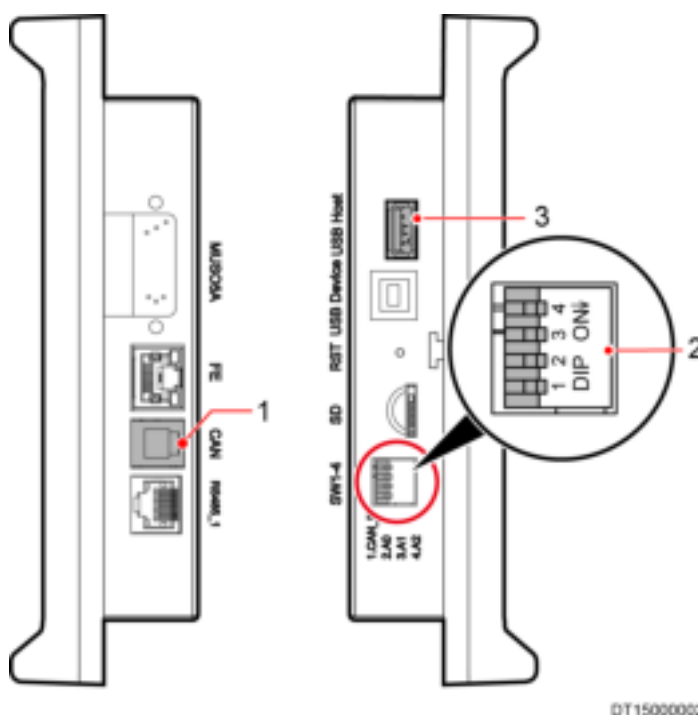
Alarm Status	Indicators	Buzzer
The device is operating properly, or a warning alarm occurs.	Green	Silent

Alarm Status	Indicators	Buzzer
A major alarm occurs.	Yellow	Beeping intermittently
A critical alarm occurs.	Red	Beeping continuously

4.2 Controller Ports

Figure 4-2 shows the ports on the two sides of the controller.

Figure 4-2 Ports on the controller sides



- (1) Communications port for the main control board and LCD^a
(2) Dual in-line package (DIP) switch on LCD^a
(3) USB port

NOTE

a: The first toggle switch DIP status is **ON**, and the second, third, fourth toggle switch DIP status are non **ON**.

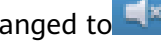
4.3 Home Screen

You can tap the menu items, buttons, or icons on the screen to enter related screens or perform operations, such as **Running**, **Alarms** and **Settings**. The controller main screen is shown in Figure 4-3.

Figure 4-3 Home screen



Table 4-2 Note for the page

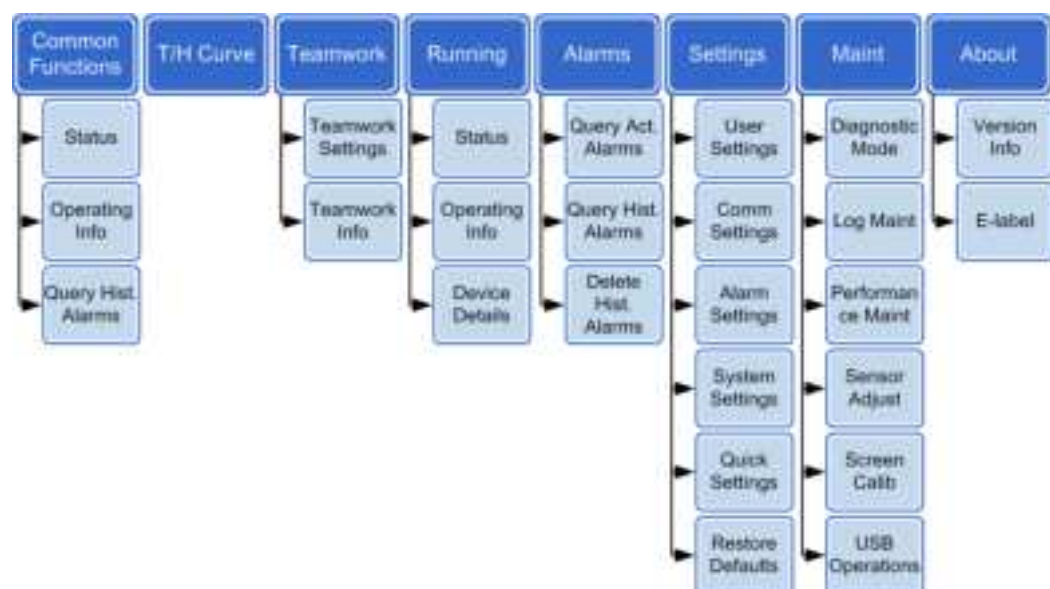
No.	Items	Note
1	Communication status between the display panel and the main control board	 in the status bar indicates that the display panel communicates properly with the main control board. If  is displayed in this position in the status bar, the communication fails.
2	USB status	 in the status bar indicates that the USB flash drive is successfully connected to the display panel.
3	Diagnostic mode	 in the status bar indicates that the smart cooling product is in diagnostic mode. Click to icon to exit from the diagnostic mode.
4	The buzzer status	You can tap  in the status bar to quickly mute the buzzer. Or, you can tap  in the alarm bar to enter the active alarm screen to mute the buzzer. If you are already in the alarm screen, the buzzer cannot be muted even if you tap  .  is changed to  after the buzzer is muted.
5	The current critical alarm signals and their quantity	 refers to the current critical alarm signals and their quantity.

No.	Items	Note
6	The current major alarm signals and their quantity	 refers to the current major alarm signals and their quantity.
7	The current warning signals and their quantity	 refers to the current warning alarm signals and their quantity.
8	The status bar	N/A
9	The alarm bar	You can tap    in the alarm bar to enter the active alarm screen that displays all active alarms.
10	Logout button	 indicates that you have logged in to the system as Admin , Engineer , or Operator , and can tap the icon to log out.

4.4 Menu Hierarchy

Figure 4-4 shows the hierarchy of the controller menu.

Figure 4-4 Hierarchy of the controller menu



The functions of the menus are described as follows:

- **Common Functions**
Indicates the component status, system parameters, and historical alarms of the smart cooling product.

- **T/H Curve**
Indicates curves for recent (time optional) temperature and humidity changes.
- **Teamwork**
Sets and checks teamwork control information based on the requirements of the smart cooling product.
- **Running**
Checks the component status, system parameters, and the name, control and operating status, and other related information of the components in the current smart cooling product system.
- **Alarms**
Checks the active and historical alarms of the smart cooling product, and deletes the historical alarms.
- **Settings**
Sets the involved parameters for the operation of the smart cooling product.
- **Maint**
Checks or deletes the logs or component total runtime/run factor, manually diagnoses each component, calibrates the sensor and touch screen, exports data, and upgrades the system.
- **About**
Checks the model, manufacturer, monitoring version, detail version information, and electronic label of the ACC.

4.5 Power-On Commissioning

4.5.1 Quick Settings

Prerequisites

After the system is powered on, the LCD is started, and the progress bar in the startup screen is full:

- For initial power-on, the system enters the quick setting screen. Set the parameters by following the instructions in this section.
- For non-initial power-on, the LCD automatically enters the home screen.

Procedure

Step 1 Set the language and tap **Next**.

Step 2 Set the time and date and tap **Next**.

Step 3 Set system parameters and tap **Finish**.

Step 4 The system displays a dialog box for confirming the rated voltage. Tap **OK** after confirmation.

----End

4.5.2 Initial Configuration

NOTICE

- When configuring the temperature and humidity parameters, do not place the cursor between the decimal point and the following digit of the value. Otherwise, the decimal point cannot be deleted, and the parameter value fails to be configured.
- To ensure the security of user information, you need to import a certificate and key before using the controller, and periodically update the certificate and key. For details about how to import a certificate and key, see [4.7.13 Importing a Certificate and Key](#).

4.5.2.1 User Right Authentication

To enhance security, before a user attempts to perform setting and maintenance operations, the user needs to enter the user name and password for right authentication. [Figure 4-5](#) shows the setting login screen for an example.

Figure 4-5 Screen for logging in to the settings screen



- Users include Admin, Engineer, Operator, and Guest. The Admin users have the highest permission, followed by the Engineer, Operator, and Guest users. The initial passwords for the Admin, Engineer, and Operator users are all 000001. The Guest user does not have an initial password.
- To prevent misoperation, log in as Operator users first before modifying parameters. Obtain permission from Huawei before modifying any parameter that you are not allowed to modify, otherwise, Huawei will not be liable for any consequences of the modification.
- To ensure system security, a user needs to change the initial password after initial login. For the password change method, see [4.7.3 How to Change a Password](#). If the login password is forgotten, refer to [4.7.4 Restoring Factory Settings](#) to restore the initial password.
- After login to the system using a user name, the user right is valid when you touch the screen all the time. If you do not touch the screen, the user right is

only valid for 3 minutes. To ensure security, manually log out by tapping  at the right corner of the home screen.

- A Guest user can only be used for querying information. Log in as other types of users if attempting to set parameters or perform maintenance.

4.5.2.2 Start and Shutdown

Context

Tap the **Start** or **Shutdown** buttons on the home screen to start or shut down the smart cooling product.

Procedure

- Step 1** Tap **Start** or **Shutdown** on the home screen. A warning is displayed, indicating whether to start or shut down the smart cooling product, as shown in [Figure 4-6](#). Tap **Yes**. If the device is successfully started or shut, the system displays a message, indicating that the command is successfully triggered.

Figure 4-6 Start and shutdown



NOTE

- If a power failure occurs and the smart cooling product is powered on again, the smart cooling product automatically restores to the original state (start or shutdown) before the power failure.
- The hardware port for controlling the status of the **remote dry contact** or **On/Off status on remote** is reserved on the ACC. The status of the **remote dry contact** and **On/Off status on remote** is on by default.
- The operations that start the smart cooling product successfully by the LCD button or by element management system (EMS) is effective only when the **remote dry contact** or **On/Off status on remote** is on the status of on.
- In start mode, the **Start** button is green (unavailable) and the **Shutdown** button is gray (available).
- In shutdown mode, the **Shutdown** button is green (unavailable) and the **Start** button is gray (available).

----End

4.5.2.3 Setting Temperature and Humidity Values

Context

To set **T/H control type**, **Temp control mode**, cold aisle sensors 1, 2, and 3, and hot aisle sensors 1, 2, and 3, log in as the **Admin** or **Engineer** user. To set other parameters, log in as the **Admin**, **Engineer**, or **Operator** user.

Procedure

- Step 1** On the home screen, choose **Settings** > **System Settings** > **T/H Sensor**. [Figure 4-7](#) is displayed.

Figure 4-7 Setting temperature and humidity values



- Step 2** Set the parameters by referring to [Table 4-3](#).

NOTE

You are not recommended to modify the parameters not listed in [Table 4-3](#).

Table 4-3 Parameter description

Parameter	Description	Configuration Principle
T/H control type	Sets Cold-aisle , Hot-aisle , Return-air , or Supply-air as required. The temperature and humidity set points correspond to the selected control type can be set.	• Return-air: For a hot aisle, select Return-air to control the temperature and humidity around the air return vent of the smart cooling product. • Supply-air: For a cold aisle, select Supply-air to control the temperature and humidity around the air supply vent of the smart cooling product. • Cold-aisle: For a cold aisle, select Cold-aisle to control the temperature and humidity of the aisle. The temperature and humidity values come from the humidity and temperature sensor in the aisle. • Hot-aisle: For a hot aisle, choose Hot-aisle to control the temperature and humidity of the aisle. The temperature and humidity values come from the humidity and temperature sensor in the aisle.
Temp control mode	Controls the temperature inside the room or aisles based on the Average , Maximum , or Minimum of the temperatures collected by each sensor.	• Average: Select Average if the temperature is to be controlled based on the averaged data value collected by the collector. • Maximum: Select Maximum if the temperature is to be controlled based on the maximum data value collected by the collector. • Minimum: Select Minimum if the temperature is to be controlled based on the minimum data value collected by the collector.
Supply-air temp set point, Supply-air humid set point	Sets the required humidity and temperature in a room or aisle.	The ACC controls the temperature and humidity based on the set value. For example, if Temp control type is set to Return-air , Return-air temp set point is set to 30.0 , and Return-air humid set point is set to 25.0 , the ACC will control the temperature and humidity around the return-air vent of the smart cooling product to a temperature of 30°C and humidity of 25% RH.
Return-air temp set point, Return-air humid set point		

Parameter	Description	Configuration Principle
Cold-aisle temp set point, Cold-aisle humid set point		
Hot-aisle temp set point, Hot-aisle humid set point		
Cold aisle sensor 1, 2, 3	Sets the sensors in cold aisles to Enable .	Enable the corresponding humidity and temperature sensor installed in the cold aisle.
Hot aisle sensor 1, 2, 3	Sets the sensors in hot aisles to Enable .	Enable the corresponding humidity and temperature sensor installed in the hot aisle.

----End

4.5.2.4 Setting Communications Parameters (IP Address Settings)

Context

- When the smart cooling product monitoring system connects to the ECC800, you do not manually set the IP address and skip the operations in this section.
- To set communications parameters, log in as the **Admin**, or **Engineer** user.

Procedure

- Step 1** On the home screen, choose **Settings > Comm Settings > IP Settings**. [Figure 4-8](#) is displayed.

Figure 4-8 Setting the IP address, subnet mask, and gateway address



- Step 2** Set the parameters by referring to [Table 4-4](#).

Table 4-4 IP address settings

Parameter	Setting Method
IP address	Set according to the actual plan
Subnet mask	Set according to the actual plan
Gateway	Set according to the actual plan

----End

4.5.2.5 Setting Communications Parameters (ModBus Settings)

Context

- When the smart cooling product monitoring system connects to the ECC800, you do not manually set the Modbus and skip the operations in this section.
- To set communications parameters, log in as the **Admin** or **Engineer** user.
- If **Connection mode** is set to **Server**, one smart cooling product can be accessed by a maximum of two element management system (EMS) clients at the same time. If **Connection mode** is set to **Client**, a smart cooling product can be connected only to an EMS with a specific ID address. If **Connection mode** is set to **Server+client**, one smart cooling product can be accessed by a maximum of two EMS clients and connect to an EMS with a specific ID address at the same time.

Procedure

- Step 1** Choose **Settings > Comm Settings > Modbus Settings** on the home page. The page shown in [Figure 4-9](#) is displayed.

Figure 4-9 Setting Modbus communications parameters



- Step 2** Set the parameters by following instructions in [Table 4-5](#).

Table 4-5 Modbus parameter settings

Parameter	Specification	Setting Method
Protocol	Modbus RTU, Modbus TCP	- Modbus RTU: If a smart cooling product needs to connect to an EMS using an RS485 cable, set Protocol to Modbus RTU. - Modbus TCP: If a smart cooling product needs to connect to an EMS through an IP address network, set Protocol to Modbus TCP.
Baud rate	9600, 19200	Set the baud rate as required. The value should be consistent with that at the EMS side. This parameter is configurable when Protocol is set to Modbus RTU .
Comm address	1–255	Set the address of the smart cooling product. The EMS communicates with the smart cooling product through this address, and the addresses of two smart cooling products connected to the same EMS must be unique. This parameter is configurable when Protocol is set to Modbus RTU .
Connection mode	Server, Client, Server+client	This parameter is configurable when Protocol is set to Modbus TCP. - Server: If the smart cooling product and EMS do not need to access the Internet (the smart cooling product and the EMS are in the same LAN), set Connection mode to Server. - Client: If the smart cooling product and EMS need to access the Internet, set Connection mode to Client. - Server+client: This option provides functions of both the Server and Client options.
EMS IP address	-	Enter the actual IP address of the EMS. IP addresses of the display panel, client EMS, and server EMS must be unique. This parameter is configurable when Connection mode is set to Client .
EMS port	-	It is recommended that you retain the default value 16100. If you need to change the value, enter a value as required. This parameter is configurable when Connection mode is set to Client .

----End

4.5.2.6 Setting Communications Parameters (SNMP Settings)

Context

- To set communications parameters, log in as the **Admin** or **Engineer** user.
- This section is suitable only for SNMP. Skip this section if you use Modbus.
- Record the values entered in this section. They will be used when you access a smart cooling product to an EMS (element management system).
- One smart cooling product supports concurrent access of up to 10 EMSs through SNMP.

Procedure

- Step 1** On the home screen, choose **Settings > Comm Settings > SNMP Settings**. **Figure 4-10** is displayed.

Figure 4-10 Setting SNMP communications parameters



- Step 2** Set **SNMP Version** based on site requirements, and then tap **Submit**.
- If you set **SNMP Version** to **ALL** or **SNMPv1&v2c**, you can set **Read Community** and **Write Community**. You can modify the settings by following instructions provided in **Step 3**.
 - If you set **SNMP Version** to **ALL** or **SNMPv3**, you can add SNMPv3 users by performing **Step 4**.
- Step 3** Set **Read Community** and **Write Community**.
1. Tap the text box after **Read Community**, as shown in **Figure 4-11**. Set **Read Community** as planned, tap , and then tap **Submit**.

Figure 4-11 Setting read community



2. Tap the text box after **Write Community**, as shown in [Figure 4-12](#). Set **Write Community** as planned, tap , and then tap **Submit**.

Figure 4-12 Setting write community



Step 4 Add an SNMPv3 user.

1. Tap **Add** under **SNMP V3**.
2. Enter a planned value for **User Name**, select values for **Auth. Protocol** and

Prop. Protocol from drop-down list boxes, and tap , as shown in [Figure 4-13](#).

MD5 and DES protocols are not secure. It is recommended that you set **Auth. Protocol** to **SHA**, and set **Prop. Protocol** to **AES**. The following operations use the recommended settings as an example.

Figure 4-13 Setting the protocol type



NOTICE

Passwords of an authentication protocol and proprietary protocol must comply with the following policies:

- The password must consist of 8–15 characters and contain at least two types of characters among uppercase letters (A–Z), lowercase letters (a–z), and digits (0–9).
- A password must be different from the corresponding user name or inverted user name.
- A password must not be a string containing duplicate sections, such as **12a12a12a**.

3. Set **SHA Password** and **Confirm Password**, and tap , as shown in [Figure 4-14](#).

Figure 4-14 Setting an SHA password



4. Set **AES Password** and **Confirm Password**, and tap , as shown in [Figure 4-15](#).

Figure 4-15 Setting an AES password



5. Tap **Submit**.

Step 5 Tap the text box after **SNMP Port**, as shown in [Figure 4-16](#). Set **SNMP Port** to the actual port number, tap , and then tap **Submit**.

Figure 4-16 Setting SNMP port



NOTE

SNMP Port is set to **161** by default.

If you modify **SNMP Port** and tap **Submit**, a warning is displayed, indicating that the monitoring system will restart, as shown in [Figure 4-17](#).

Figure 4-17 Changing an SNMP port



Step 6 Tap **Next Page**.

Step 7 Set SNMP trap parameters.

1. Tap **Add** under **SNMP Trap**.
2. Set **Trap Address** as planned and **Trap Port** to the actual port number.

 NOTE

Trap Port is set to **162** by default.

3. Select the **SNMP Version**. If an SNMPv3 user is configured, it is recommended that **SNMP Version** be set to **SNMPv3**.
4. If **SNMP Version** is set to **SNMPv3**, select an **SNMPv3 user name**, and then tap , as shown in **Figure 4-18**.

Figure 4-18 Setting SNMP trap parameters



5. Tap **Submit** under **SNMP Trap**.

----End

Follow-up Procedure

After a USB flash drive has been inserted into the controller USB port and successfully identified, tap **Export File** under **MIB File** to export the MIB file to the USB flash drive for the customer's use in accessing a third-party EMS. **Figure 4-19** shows successful file export.

NOTICE

Before using a USB flash drive, ensure that its data has been scanned by antivirus software and is secure.

Figure 4-19 Exporting an MIB file successfully



4.5.2.7 Setting Teamwork Control Parameters

Prerequisites

Assign teamwork control numbers and addresses for the teamwork controlled smart cooling products as follows:

- Teamwork group no: Group the smart cooling products in adjacent areas as one, that is, assign one teamwork control number for them. At most four teamwork control groups can be assigned (1–4).
- Teamwork unit address: The address for the smart cooling product in the same group cannot be the same (address range: 1–32). The smart cooling product addressed 1 is the master one that collects, processes, and delivers data. Set the unit address numbers from one to the number of units in this group. If the address of a device exceeds the range, the device cannot enter the teamwork control. If the address of any unit amid the range is unavailable, the teamwork topology shows that this device is offline.

Context

- The figures and parameters in this section are for reference only. Set actually parameter values as required.
- To change alarm settings, log in as the **Admin** or **Engineer** user.

Procedure

- Step 1** On the home screen, tap  > **Teamwork Settings**. The screen as shown in [Figure 4-20](#) is displayed.

Figure 4-20 Teamwork settings screen



Step 2 Set teamwork control parameters.

You can set all the teamwork control parameters on the master smart cooling product but only **Teamwork group no.**, **Teamwork unit address**, and **Teamwork function** on a slave smart cooling product. [Table 4-6](#) describes how to set the parameters.

Table 4-6 Teamwork settings

Parameter	Description	Configuration Principle	Default Value
Teamwork group no.	The number of the teamwork controlled group, which is the same for all the devices in the group	Set the assigned teamwork control number.	1
Teamwork unit address	Only one device in each group can be set to 1. Other device addresses should be different from each other.	Set the assigned unit address.	NA
Teamwork function	Disable or enable the teamwork function. If the teamwork function is disabled, this device is operating according to its own control. If the teamwork function is enabled, this device works in harmony with others that in the same group.	Set this parameter based on the onsite device heat distribution.	Disable

Parameter	Description	Configuration Principle	Default Value
Teamwork mode	Set the teamwork mode. The options include Smart and iCooling.	Determine whether to enable the iCooling mode based on onsite heat load variations. If the heat load varies greatly, it is recommended that you enable the iCooling mode. The parameter can only be modified on the ECC WebUI and cannot be modified on the smart cooling product screen.	Smart
Enable L1/L2 linkage	Enable or disable L1/L2 linkage.	Set this parameter based on site requirements. The parameter can only be modified on the ECC WebUI and cannot be modified on the smart cooling product screen.	Disable
Network	Networking mode for the teamwork.	Networked over CAN.	Over CAN
Total number of units	Number of the smart cooling products in this group (1 to 32 can be set).	Total number of the smart cooling products in this group.	3
Number of running units	Number of running units in a group. The value ranges from 1 to Total number of units .	The master unit assigns the devices to be active units by the device number, beginning with the address 1 until to Number of running units . The rest will become the standby ones.	2
Rotation	Disable or enable the active and standby smart cooling products to change identity after a certain time, maximizing their service life.	This function is recommended when the heat is even.	Disable
Rotation period	Rotation days (1-30).	7 by default.	7 days
Rotation time	24 hours in a day (0-23)	0 by default.	0

Parameter	Description	Configuration Principle	Default Value
Forced rotation	Forced rotation specifies whether to enable a forcible rotation on the group before the specified rotation time. After a forced rotation, the accumulated time is recalculated.	This item is set to No by default. If forced rotation is required, the function is set to Yes .	No
Requirement control	Enable or disable the requirement control for the master device. - When the requirement control is Enable, the master device synchronizes data (the temperature and humidity control type and set points of the master device) to the slave device, and all the smart cooling products in the group refer to the mode delivered by the master device. - When the requirement control is Disable, the master device does not synchronize data to the slave device, and all the smart cooling products operate based on their own requirements, not referring to the mode delivered by the master device.	The requirement control function is recommended for the following scenario: In one teamwork, the temperature and humidity control type and temperature and humidity set point of units are the same, and device heat loads are distributed evenly.	Disable
Cascade	After the requirement control is enabled, you can configure Cascade. The cascade function starts standby smart cooling products if the active one cannot meet the refrigerating requirements.	If the heat load to the device increases, the cascade function is recommended.	Disable
Large ring cooling capacity P	Proportion coefficient in L1/L2 linkage PID control.	You are not recommended to change the value.	0.10

Parameter	Description	Configuration Principle	Default Value
Large ring cooling capacity I	Integration coefficient in L1/L2 linkage PID control.	You are not recommended to change the value.	350s
Large ring cooling capacity D	Differential coefficient in L1/L2 linkage PID control.	You are not recommended to change the value.	10s
Cooling capacity adjustment period	Adjustment period in L1/L2 linkage PID control.	You are not recommended to change the value.	5s
L1/L2 linkage cooling stop ref.temp	Reference temperature at which the smart cooling product stops cooling in the cooling mode in L1/L2 linkage.	Set this parameter based on the lowest temperature allowed onsite. Normally you are not recommended to change the value.	18.0°C
L1/L2 linkage dehumid stop ref.temp	Reference temperature at which the smart cooling product stops dehumidification in the dehumidification mode in L1/L2 linkage.	Set this parameter based on the lowest temperature allowed onsite. Normally you are not recommended to change the value.	18.0°C
L1/L2 linkage cooling stop delay	Duration within which the device is still cooling when the cooling stop condition is met in L1/L2 linkage.	Set this parameter based on the lowest temperature allowed onsite. Normally you are not recommended to change the value.	180s
L1/L2 linkage fastest temp rise	Maximum temperature rise rate when the temperature rises rapidly caused by sudden load power increase.	Set this parameter based on the micro-module size and maximum load power. The smaller the module and the higher the load power, the greater the temperature rise rate is.	4.0°C/min
L1/L2 linkage temperature	Temperature setpoint in L1/L2 linkage.	Target temperature controlled in the micro-module. The parameter can only be modified on the ECC WebUI and cannot be modified on the smart cooling product screen.	24.0°C

Parameter	Description	Configuration Principle	Default Value
L1/L2 linkage humidity	Humidity setpoint in L1/L2 linkage.	Target humidity controlled in the micro-module. The parameter can only be modified on the ECC WebUI and cannot be modified on the smart cooling product screen.	45.0%RH
Note: In the ACC V100R002C00 software versions, DIP switch is replaced by the Teamwork CAN resistor enable parameter. If teamwork is not set onsite, remain the parameter in OFF . If teamwork is set, change the parameters of the first and last units to ON , and remain the others in OFF .			

Step 3 Complete the teamwork settings for all the smart cooling products by performing [Step 1](#) and [Step 2](#).

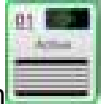
Step 4 On the home screen of any teamwork controlled smart cooling product, tap . If the teamwork control succeeds, the teamwork topology of the smart cooling product in the group is displayed, as shown in [Figure 4-21](#). [Table 4-7](#) describes the note for the screen.

Figure 4-21 Teamwork topology



Table 4-7 Note for the screen

No.	Parameters	Note
1	On/Off/NA	On indicates the smart cooling product is started and Off indicates the opposite. NA indicates the smart cooling product is offline.
2	01, 02, 03	Indicates the device address. 01 is the master one and the rest are all slave ones. NOTE If the master one offline, the teamwork networking failed.

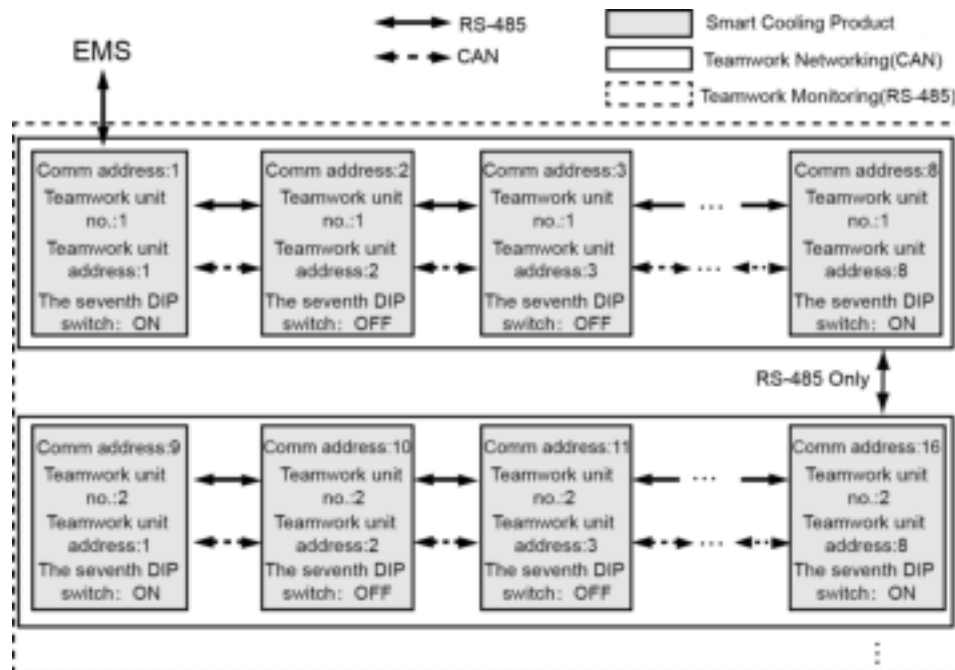
No.	Parameters	Note
3	Active/Standby	Active: properly responds to the requirement control. Standby: responds to the requirement control when Active is faulty (critical alarms, shutdown, and offline) or Active cannot meet cooling requirements.
4	Frame: green/non-green	A device with green frame indicates the device itself, as shown in  .
		A non-green frame indicates the other device in the group, as shown in  .
5	Ground color: red, bright gray, dark gray	Red indicates that a critical alarm is generated, as shown in  .
		Bright gray indicates that the device is operating without any critical alarms, as shown in  .
		Dark gray indicates that the device is off-line, as shown in  .

----End

Example

Figure 4-22 shows how to configure 16 smart cooling products as two CAN teamwork groups, each group containing eight smart cooling products.

Figure 4-22 Teamwork configuration reference



NOTE

RS485 only: Units under CAN teamwork must be free from CAN cables in between. You need to prepare cables that support only RS485 communication. For how to make cable crimp terminals, refer to the section of teamwork networking and monitoring.

Follow-up Procedure

After you have completed the settings, check whether the teamwork networking is successful by performing the following steps:

1. Check whether the device number on the topology is the same as the actual device number.
 - If yes, go to **2**.
 - If no, check the cable connection and the settings of teamwork control parameters.
2. Check whether the number of the running devices on the topology is the same as the actual device number.
 - If yes, go to **3**.
 - If no, check the cable connection and the settings of teamwork control parameters.
3. Check whether the number of backup devices on the topology is the same as the actual device number.
 - If yes, go to **4**.
 - If no, check the cable connection and the settings of teamwork control parameters.
4. Check whether the number of online devices on the topology is the same as the actual device number.

- If yes, the check is complete.
- If no, check the cable connection and the settings of teamwork control parameters.

4.5.2.8 (Optional) Setting Alarm Parameters

Prerequisites

Before setting the alarm parameters, get familiar with the relationship among each parameter.

Configurations of temperature and humidity alarms and main board alarms for the air cooled devices comply with the following relationships:

- Power underfreq alarm threshold < Power overfreq alarm threshold
- Supply-air HT alarm threshold + 5°C ≤ Return-air HT alarm threshold
- Supply-air HT alarm threshold + 5°C ≤ Hot aisle HT alarm threshold
- Cold aisle HT alarm threshold + 5°C ≤ Hot aisle HT alarm threshold
- Cold aisle HT alarm threshold + 5°C ≤ Return-air HT alarm threshold
- Supply-air LT alarm threshold + 5°C ≤ Return-air LT alarm threshold

Configurations of temperature and humidity alarms and main board alarms for the chilled water devices comply with the following relationships:

- Power underfreq alarm threshold < Power overfreq alarm threshold
- Supply-air HT alarm threshold + 5°C ≤ Return-air HT alarm threshold
- Supply-air HT alarm threshold + 5°C ≤ Hot aisle HT alarm threshold
- Cold aisle HT alarm threshold + 5°C ≤ Hot aisle HT alarm threshold
- Cold aisle HT alarm threshold + 5°C ≤ Return-air HT alarm threshold
- Supply-air LT alarm threshold + 5°C ≤ Return-air LT alarm threshold
- Supply-air LT alarm threshold + 5°C ≤ Hot aisle LT alarm threshold
- Cold aisle LT alarm threshold + 5°C ≤ Hot aisle LT alarm threshold
- Cold aisle LT alarm threshold + 5°C ≤ Return-air LT alarm threshold

Context

- The content described in this section is optional. To set whether to report an alarm, or set the time delay duration or threshold, follow the instructions in this section. The enabling functions include the following three choices:
 - Allow
Alarms are reported to the EMS. Active alarms are displayed on the LCD and the system performs related protection actions.
 - Block
New alarms are not reported to the EMS. The EMS can detect alarms that are generated before the blocking. Active alarms are displayed on the LCD and the system performs related protection actions.
 - Disallow
Alarms are not generated and no protection actions are performed.

- The method for setting each alarm is the same. This section describes how to set **Delay** of **Supply-air HT** to 5.
- If you need to change alarm settings, log in as the **Admin** or **Engineer** user.

NOTICE

Be careful when configuring alarms. Only professional maintenance personnel can change alarm settings.

Procedure

Step 1 Choose **Settings > Alarm Settings > T/H Sensor** on the home screen. [Figure 4-23](#) is displayed.

Figure 4-23 Setting alarm parameter 1



Step 2 Tap **Delay** following **Supply-air HT**.

Step 3 Set the value to 5 and tap , as shown in [Figure 4-24](#).

Figure 4-24 Setting alarm parameter 2



----End

4.5.3 Commissioning Guide

4.5.3.1 Entering Diagnostic Mode

Context

- On the diagnostic mode screen, you can turn on or off components, and control their output ratio.
- If you need to manually turn on or off system components in diagnostic mode, log in as the **Admin** or **Engineer** user. Ensure that the smart cooling product is started before operation.

Procedure

Step 1 Choose **Maint > Diagnostic Mode > Enter > Yes**. [Figure 4-25](#) is displayed.

Figure 4-25 Entering the diagnostic mode



NOTE

The screen for entering the diagnostic mode:

- Components are interlocked. Therefore, buttons for turning on or off certain components are in gray, indicating that operations of the components are not allowed.
- To ensure system security, a component may not promptly respond to operations performed on this screen. For example, the compressor does not respond promptly after the Off (On) button is tapped if the shortest running (shutdown) time is not met.
- To exit the diagnostic mode, tap  on the status bar.
- The system automatically exits diagnostic mode when it reaches the maximum diagnostic mode duration.

----End

4.5.3.2 Commissioning Smart Cooling Product Components

Context

NOTICE

For safe system operation, when smart cooling product components are started, the following coupling relationships are presented:

- When the compressor (including fixed frequency and frequency-converting) is started, the indoor fans, outdoor fans, and the liquid solenoid valve automatically start.
 - When the electric heater is started, the corresponding indoor fan automatically starts.
 - When the electrode humidifier is started, the corresponding indoor fan automatically starts.
 - When the infrared humidifier is started, the corresponding indoor fan and water supply valve automatically start.
-
- If you need to manually turn on or off system components in diagnostic mode, log in as the **Admin** or **Engineer** user. Ensure that the smart cooling product is started before operation.
 - For details about the parameters and specifications to be set, see the commissioning chapter in the user manual of each smart cooling product.
 - This chapter describes how to commission smart cooling product components, using the electric heater as an example.

Procedure

Step 1 Enter diagnostic mode.

Step 2 Tap **On** for **Electric heater**, as shown in [Figure 4-26](#).

Figure 4-26 Starting up the electric heater



After the electric heater is started, the **Off** following the **Electric heater** turns into **On**.

----End

4.6 Maintenance Guide

4.6.1 Querying Parameters

4.6.1.1 Querying Temperature and Humidity Curves

Context

The **T/H Curve** screen displays temperature and humidity curves showing the recent temperature and humidity changes. You can choose to display the curves showing data changes of recent one hour, one day, seven days, or 30 days.

Procedure

Step 1 On the home screen, tap **T/H Curve**. **Figure 4-27** is displayed.

Figure 4-27 T/H curve screen



NOTE

- The temperature curve (upper) and the humidity curve (lower) are displayed on the same screen. The abscissa shows time. The temperature set point is the midpoint temperature on the upper ordinate while the humidity set point is the midpoint humidity on the lower ordinate.
- The temperature and humidity curves show the current average temperature and humidity of the control type.
- You can tap  and  to zoom in or out the range of the temperature and humidity ordinate. The midpoint temperature is the temperature set point and the midpoint humidity is the humidity set point after the ordinate range is zoomed in or out.
- You can view the temperatures from (temp set point - 3°C) to (temp set point + 3°C) at least and from (temp set point - 30°C) to (temp set point + 30°C) at most.
- You can view the humidity from (humidity set point - 5%) to (humidity set point + 5%) at least, and from (humidity set point - 50%) to (humidity set point + 50%) at most. Specific humidity fluctuation range displayed varies according to different models of smart cooling products.

----End

4.6.1.2 Querying Alarms

Context

On the alarm querying screen, you can query active alarms and historical alarms.

- The active alarm screen displays active alarms.
- The historical alarm screen displays the historical alarms. You can query historical alarms by choosing **Common Functions > Query Hist. Alarms** or **Alarms > Query Hist. Alarms**.

Procedure

- To query the active alarm, choose **Alarms > Query Act. Alarms**. **Figure 4-28** is displayed.

Figure 4-28 Active alarms screen



NOTE

- Active alarms are displayed in chronological order. The latest generated alarm is displayed in the uppermost row.
- If active alarms exist, they are displayed on the alarm bar one by one.
- You can query an alarm on the alarm list in related user manual for smart cooling product based on the alarm ID to view causes of the alarm and methods used to clear the alarm.

Click each alarm to open the **Details** page, which contains **Alarm Name, Severity, Location, Cause ID, SN, Possible Causes, and Procedure** for the alarm, as shown in **Figure 4-29**.

Figure 4-29 Details



- If the  icon is not displayed on the **Details** screen, the alarm can be automatically cleared after the fault is rectified.
- If the  icon is displayed on the **Details** screen, the alarm can be manually cleared by tapping the **Clear** button after the fault is rectified. The alarm clearance type (automatic or manual) varies with smart cooling products. Some of the alarms can either be cleared automatically or manually. Perform operations as required.

For details about how to manually clear an alarm, see [4.7.7 How to Manually Clear Alarms](#).

- To query historical alarms, choose **Common Functions > Query Hist. Alarms** or **Alarms > Query Hist. Alarms** on the home screen. [Figure 4-30](#) is displayed.

Figure 4-30 Querying historical alarms



	Severity	Alarm Name	ID	Location	Generated On	Cleared On
1	Alarm	Comp HP	4008	Compressor	12/04/2024 10:10:43	12/04/2024 10:11:04
2	Major	Comp HP	4008	Compressor	12/04/2024 10:10:37	12/04/2024 10:10:38
3	Major	Comp HP	4008	Compressor	12/04/2024 10:10:31	12/04/2024 10:10:32
4	Major	Comp HP	4008	Compressor	12/04/2024 10:10:25	12/04/2024 10:10:26
5	Major	Comp HP	4008	Compressor	12/04/2024 10:10:19	12/04/2024 10:10:20
6	Critical	Stroke Detected	4044	Main Board	12/04/2024 09:47:58	12/04/2024 09:47:58

 NOTE

Historical alarms are displayed in chronological order. The latest cleared alarm is displayed in the uppermost row.

4.6.1.3 Querying Logs

Context

- Logs record operations on the system. Maintenance and technical service engineers can query logs to locate operations on the system.
- To query logs, log in as the **Admin**, **Engineer**, or **Operator** user.

Procedure

- Step 1** On the home screen, choose **Maint > Log Maint > Query Logs**. **Figure 4-31** is displayed.

Figure 4-31 Query logs screen

Item	Value	Location	Source	Date & Time	User Name
Indoor fan 1 temp installed action	Disable	T/H sensor	Local	2014/05/05 11:47:17	Admin
Indoor fan 1 temp installed action	Block	T/H sensor	Local	2014/05/05 11:47:48	Admin
Indoor fan 1 temp installed action	Allow	T/H sensor	Local	2014/05/05 11:48:52	Admin
Diagnosis	Sub	Cooling system	Local	2014/05/05 11:49:08	Admin
Diagnosis	Enter	Cooling system	Local	2014/05/05 11:49:40	Admin
Reheated 1 temp installed action	Disable	T/H sensor	Local	2014/05/05 11:49:52	Admin

Total: 42 1/7

----End

4.6.1.4 Querying Device Runtime

Procedure

- Step 1** On the home screen, choose **Maint > Performance Maint**. **Figure 4-32** is displayed.

Figure 4-32 Performance maint screen

Item	Value	Unit	Operation
Compressor total runtime:	0	h	Refresh
Indoor fan 1 total runtime:	0	h	Refresh
Indoor fan 2 total runtime:	0	h	Refresh
Electric heater total runtime:	0	h	Refresh
Humidifier total runtime:	0	h	Refresh
Air filter total runtime:	0	h	Refresh

----End

4.6.1.5 Querying Component Status

Context

You can query component status in the following two ways.

- Enter the **Status** screen. The control or running status of major components such as the compressor, indoor fan, outdoor fan, electric heater, humidifier, and chilled water valve is displayed.
- Enter the **Device Details** screen and then enter the menu of a specific component. All parameters for the component are displayed.

Procedure

- When viewing the component status through **Status**, choose **Common Functions** > **Status** or **Running** > **Status** on the home screen. The general component status screen is displayed. [Figure 4-33](#) shows the screen displayed after choosing **Running** > **Status**.

Figure 4-33 General status



NOTE

The actual number of devices is displayed on the screen. If two indoor fans are used, indoor fan 1 and indoor fan 2 are displayed. This is also the case for other devices.

- When querying component status through **Device Details** (using the compressor as an example), choose **Running** > **Device Details** > **Compressor** on the home screen to query the status of the compressor and solenoid valve, as shown in [Figure 4-34](#).

Figure 4-34 Compressor running status



4.6.1.6 Querying System Parameters

Context

You can query the system parameters through two ways.

- Enter the **Operating Info** screen that displays the major system parameters such as the current detected temperature, humidity, voltage.
- Enter the **Device Details** screen and then enter the menu of a specific component. All parameters for the component are displayed.

Procedure

- When querying system parameters through **Operating Info**, choose **Common Functions > Operating Info**, or **Running > Operating Info** on the home screen, the related screen is displayed. [Figure 4-35](#) shows the screen displayed after choosing **Running > Operating Info**.

Figure 4-35 Operating info



- When viewing system parameters through **Device Details** (using the compressor as an example), choose **Running > Device Details > Compressor** on the home screen to view the compressor parameters, as shown in [Figure 4-36](#).

Figure 4-36 Compressor parameters



4.6.1.7 Querying Version Details

Procedure

- Step 1** On the home screen, select **About**.
- Step 2** On the **About** screen, tap **Version Info** or **E-label**. [Figure 4-37](#) is displayed.

Figure 4-37 Version info and E-label



NOTE

- The **Version Info** screen includes the version details of the display panel, control board, temperature and humidity collection board, and compressor drive board. The **E-label** screen displays electronic labels of the entire system, control board, display panel, temperature and humidity collection board, compressor drive board, and so on.
- When some T/H boards of the cold or hot aisles are enabled, **T/H Board** on the **About > Version Info** screen, or **T/H Board** on the **About > E-label** screen shows the information of these T/H boards.
- When some T/H boards of the cold or hot aisles are disabled, **T/H Board** on the **About > Version Info** screen, or **T/H Board** on the **About > E-label** screen does not show the information of these T/H boards.

----End

4.6.2 Changing Parameters

4.6.2.1 Deleting Historical Alarms

Context

To delete historical alarms, log in as the **Admin** user.

NOTICE

Exercise caution when deleting all historical alarms. Because this operation may cause clearance of all historical alarms and affects device maintenance.

Procedure

- Step 1** On the home screen, choose **Alarms > Delete Hist. Alarms** to enter the **Delete Hist. Alarms** screen shown in [Figure 4-38](#).

Figure 4-38 Delete hist. alarms screen



- Step 2** Tap **Yes** to delete all historical alarms.

 NOTE

After alarms are deleted, the operation is recorded in logs.

----End

4.6.2.2 Deleting Logs

Context

- Logs can be deleted in a one-click manner.
- To delete logs, log in as the **Admin** user.

NOTICE

If you perform this operation, all logs will be deleted, and device maintenance will be affected. Exercise caution when doing this operation.

Procedure

- Step 1** On the home screen, choose **Maint > Log Maint > Delete Logs > Yes** to delete all the logs.

 NOTE

After logs are deleted, the log deletion operation is recorded in the first log that is displayed.

----End

4.6.2.3 Exporting Data

Context

Active alarms, historical alarms, logs, configurations, and run logs can be exported. The export method for the five data is the same. This section uses how to exporting active alarms as an example to explain the operation method.

Table 4-8 lists USB flash drives with good compatibility. You are advised to use these USB flash drives to perform data export.

Table 4-8 Recommended USB flash drives

Model	Capacity
Netac U188	4 GB
Kingston DT101G2	8 GB

NOTICE

Before using a USB flash drive, ensure that its data has been scanned by antivirus software and is secure.

NOTE

- Before exporting active alarms, historical alarms, logs, and configurations, ensure that the USB flash drive has been successfully identified. The position of the USB port is shown in [Figure 4-2](#).
- If the USB flash drive has been successfully identified,  is displayed at the status bar.
- If the USB flash drive is not properly connected, the system will notify that **the USB flash drive is not detected**.

Procedure

- Step 1** Tap **Maint > USB Operations > Export Act. Alarms** to enter the **Select Path** screen, as shown in [Figure 4-39](#).

Figure 4-39 Select path



Step 2 Tap the file where the user saves active alarms in the **Select Path** dialog box and tap **Next**. Then tap **Yes** in the displayed dialog box shown in [Figure 4-40](#). Enter the **Processing Info** screen shown in [Figure 4-41](#).

Figure 4-40 Warning dialog box



Figure 4-41 Processing info



Step 3 After the data is successfully exported, [Figure 4-42](#) is displayed. Click **OK**.

Figure 4-42 Screen showing that data export has succeeded



Step 4 Click **Maint > USB Operations > Remove USB** to remove the USB flash drive in safe mode.

----End

4.6.2.4 Clearing the Runtime

Context

To clear the runtime of the smart cooling product, log in as the **Admin** or **Engineer** user.

NOTICE

Performance value clearance can be performed only after component maintenance. Otherwise the component may run overtime and degrade performance.

Procedure

Step 1 On the home screen, choose **Maint > Performance Maint**. [Figure 4-43](#) is displayed.

Figure 4-43 Performance maint screen



Item	Value	Unit	Operation
Compressor total runtime:	0	h	Clear
Indoor fan 1 total runtime:	0	h	Clear
Indoor fan 2 total runtime:	0	h	Clear
Gas heater total runtime:	0	h	Clear
Humidifier total runtime:	0	h	Clear
Air filter total runtime:	0	h	Clear

Step 2 Tap **Clear** of a specific performance parameter to clear its runtime.

----End

4.6.2.5 Calibrating a Sensor

Context

- Calibrate a sensor if the displayed temperature or humidity on the sensor deviates from the actual value. For example, if the return air temperature measured by other temperature detection devices at the return air detection point is 20°C while the value measured by the sensor is 22°C, the sensor has an error of 2°C, and the calibration value should be set to -2°C.

- To calibrate a sensor, log in as the **Admin** or **Engineer** user.

Procedure

Step 1 On the home screen, choose **Maint > Sensor Adjust**. **Figure 4-44** is displayed.

Figure 4-44 Sensor adjust screen



Step 2 Fill the calibration value based on the measured error.

----End

4.6.2.6 Calibrating the Screen

Context

- You can calibrate for touching point deviation on the touchscreen.
- You can calibrate the screen by tapping the screen on the **Screen Calib** page or by DIP switch.
 - Tapping the screen on the screen calib page: The program of the display board works normally; the deviation between the touching point and the responding point is small; the **Maint > Screen Calib** page can be entered over the screen.
 - Calibrating the screen by DIP switch: The display board works normally; the deviation between the touching point and the responding point is unfavorably big; or the screen does not respond when being tapped.
- To calibrate the touchscreen, log in as the **Admin** or **Engineer** user.

NOTICE

- You can calibrate the screen by DIP switch only when the system enters **Quick Settings** page after the first power-on or when the system is on the home screen.
- Touch the LCD screen firmly if you are using your fingertips. It is recommended that you use the pen tip for accurate selection and quick response.
- After the DIP switch is calibrated, flip toggle switch 1 to **ON**, and others to the opposite position.

Procedure

- When calibrating the screen by tapping the screen, tap **Maint > Screen Calib** to enter the following screen, as shown in [Figure 4-45](#). [Figure 4-46](#) is displayed when the screen calibration is complete.

Figure 4-45 Screen calibration page



Figure 4-46 Screen displayed when the calibration is complete



- Calibrating the screen by DIP switch.
 - Flip toggle switch 1 for the LCD to **ON**, and others to the opposite position, and wait for 3 seconds before calibrating. [Figure 4-2](#) shows the toggle switches for the screen.
 - Flip the fourth toggle switch to **ON** and others remain unchanged, the screen calibration function is triggered.

After 15 seconds, a dialog box indicating **Are you sure you want to calibrate the screen? If you do not click Yes or No, calibration will start automatically 10 seconds later.** is displayed, as shown in [Figure 4-47](#).

Figure 4-47 Confirming to calibrate the screen



- c. Wait for 10 seconds or tap **Yes**. [Figure 4-45](#) is displayed. Tap the screen. When [Figure 4-46](#) is displayed, the adjustment is complete.
- d. Flip toggle switch 1 for the LCD to **ON**, and others to the opposite position.

 NOTE

You need to manually operate the operation again from [a](#) to trigger the touchscreen calibration function after the calibration failure.

4.7 FAQ

4.7.1 How to Perform Quick Settings

Context

- On the quick settings screen, you can set the language, time, date, and system.
- The **Guest** user can perform quick settings only during the initial power-on. If you need to perform quick settings in other scenarios, log in as the **Admin**, **Engineer**, or **Operator** user.

Procedure

Step 1 Choose **Settings > Quick Settings** on the home screen. The quick settings screen is displayed, as shown by (1), (2), (3) and (4) in [en-us_topic_0215649694.xml#EN-US_TOPIC_0215649694/en-us_task_0023265369_mmccppss_fig_01](#).

----End

4.7.2 How to Set the Language, Date, or Time

Context

- Enter the **User Settings** screen to set the **Language**, **Date**, or **Time**. You can also set **Time zone**, **Password**, **LCD contrast**, **LCD saturation**, and **LCD brightness** on the screen.

- To set the preceding parameters, log in as the **Admin, Engineer, or Operator** user.

Procedure

Step 1 On the home screen, choose **Settings > User Settings**. **Figure 4-48** is displayed.

Figure 4-48 User settings screen



Step 2 Tap the parameter to be set.

-----End

4.7.3 How to Change a Password

Prerequisites

- To change a password, log in as the **Admin, Engineer, or Operator** user.
- You can only change the password of the current user.

Procedure

Step 1 On the home screen, choose **Settings > User Settings** to enter the **User Settings** screen, as shown in **Figure 4-49**.

Figure 4-49 User settings screen



- Step 2** Tap **Password** to enter the password changing screen, as shown in [Figure 4-50](#).
The password consists of six digits and not supports letters or special characters.

Figure 4-50 Changing the password



NOTE

If you forget the password, restore the initial password by referring to [4.7.4 Restoring Factory Settings](#).

----End

4.7.4 Restoring Factory Settings

Context

If you have forgotten the password or need to delete system information, you can restore factory settings using DIP switch S2 on the main control board.

NOTICE

- If you restore factory settings, all system data will be restored to the state before delivery, including login passwords, operation logs, parameter configurations, alarms, and performance statistics. Perform this operation with caution as it may affect other users.
- To ensure device security, operate the DIP switch after powering off the power supply of the device.
- To ensure information security and prevent malicious password reset, you must keep the cabinet keys securely. If any abnormal operation is found, check the information in the equipment room access control system and monitoring system.

Procedure

Step 1 Tap Shutdown on the screen and wait for the system to shut down.

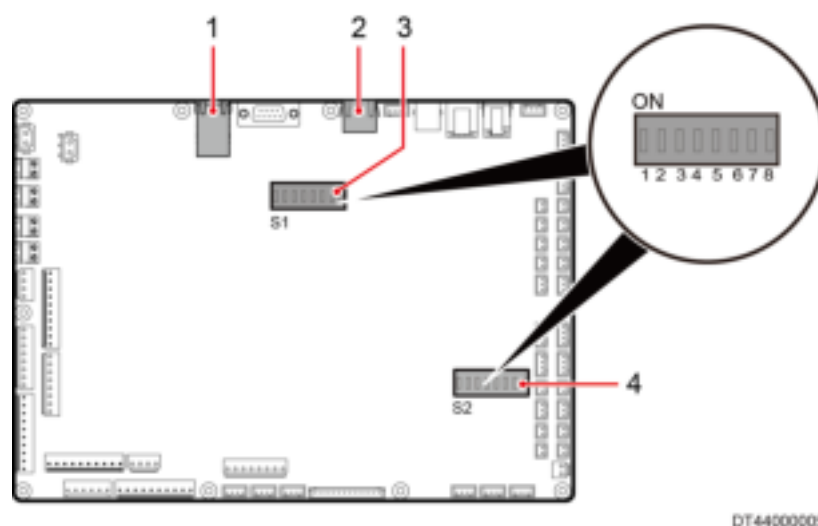
Step 2 Disconnect the power supply of the device.

Step 3 Arm7 main control board: Switch the first and second toggles of DIP switch S2 to ON, and switch the third and fourth toggles to OFF on the main control board.

M4 main control board: Switch the first and third toggles of DIP switch S2 to ON, and switch the second and fourth toggles to OFF on the main control board.

Figure 4-51 shows positions of DIP switches on the main control board.

Figure 4-51 DIP switch position



(1) Teamwork communication 1&2

(2) J127 FE port (reserved)

(3) DIP switch S1 of the main control board
(M4 main control boards have no S1.)

(4) DIP switch S2 of the main control board

Step 4 Connect the power supply of the device.

- Step 5** After the restart completes, the LCD displays a dialog box asking you to confirm the operation of restoring factory settings. To continue restoring factory settings, tap Yes; otherwise, tap No. If you do not confirm the operation within 30s, the dialog box disappears, and the process of restoring factory settings is terminated.
- Step 6** Disconnect the power supply of the device.
- Step 7** Switch the first to fourth toggles of the S2 DIP switch on the main control board to the default value OFF.
- Step 8** Connect the power supply of the device.
- Step 9** After the restart completes, the LCD displays the setup wizard screen for setting parameters.

 NOTE

After the system is restored to factory settings, the user password is also reset to the preset password, and must be promptly modified to ensure information security and normal system running.

----End

4.7.5 How to Troubleshoot the Fault When the System Is in Upgrade Mode

Context

The system will display the following information and enter upgrade mode when the model cannot be identified or does not match, or the software versions of the display board and control board are incompatible.

- **The model cannot be identified. Entering upgrade mode...**
- **The model does not match. Entering upgrade mode...**
- **Failed to obtain the version information. Entering upgrade mode...**
- **The display board and control board software versions are incompatible. Entering the upgrade mode...**

In the upgrade mode, you can only query the system version information. In this case, perform the following steps for troubleshooting.

Procedure

- Step 1** After you have entered the home screen, choose **Maint > USB Operations > Software Upgrade**, and check whether you can perform the upgrade.
- If yes, upgrade the system version by referring to the software upgrade guide.
 - If no, proceed to [Step 2](#) by following instructions of system prompts.
- Step 2** If **The e-label board is not connected or the e-label is incorrect. Please connect or replace the e-label board.** is displayed, power off the system, reconnect or replace the E-label board, and then power on the system.
- Step 3** If the fault persists, contact Huawei technical support.

----End

4.7.6 How to Fast Shut Down an Smart Cooling Product

Procedure

Step 1 On the home screen of the ACC, tap **Shutdown**.

The compressor stops running and the fan is shut down after the time delay.

Step 2 Disconnect the power supply from the smart cooling product.

NOTE

If the power supply is disconnected when the device is on, the following situation may occur after the device is powered on again:

- A power loss alarm is displayed on the ACC and automatically cleared in 10s.
- The system retains the **Start** status before the power disconnection.

----End

4.7.7 How to Manually Clear Alarms

Context

- This topic uses the Comp HP switch lock alarm as an example to describe how to manually clear alarms.
- If you need to manually clear alarms, log in as the **Admin** or **Engineer** user.

Procedure

Step 1 Tap **Alarms > Query Act. Alarms > Comp HP lock** on the home screen. The alarm information is displayed, as shown in [Figure 4-52](#).

Figure 4-52 Manually clearing the alarm



Step 2 Tap **Clear**, a dialog box for confirming clearance is displayed.

Step 3 Tap **Yes**, the **Command triggered successfully.** message is displayed.

Step 4 Tap **OK**.

----End

4.7.8 How to Enable a Humidity and Temperature Sensor

Context

- A humidity and temperature sensor needs to be enabled after it is installed in an aisle.
- To enable a sensor, log in as the **Admin** or **Engineer** user.
- This section describes how to enable sensors 1 and 2 in cold aisles.

Procedure

- Step 1** On the home screen, choose **Settings** > **System Settings** > **T/H Sensor**.
- Step 2** Set the value following **Cold-aisle sensor 1** and **Cold-aisle sensor 2** to **Enable**, as shown in [Figure 4-53](#).

Figure 4-53 Enabling a humidity and temperature sensor



----End

4.7.9 How to Check Teamwork Control Information

Procedure

- Step 1** On the home screen, choose  > . The teamwork control information is displayed, as shown in [Figure 4-54](#).

Figure 4-54 Teamwork control information screen



 NOTE

- **Master/Slave** and **Active/Standby** indicate the information of this single unit. Other information is about the teamwork control information of the group.
- Required cooling capacity: indicates the total cooling/heating requirements of the group and is used as a reference for enabling the cooling/heating mode by the master device. If the cascade function is enabled, the capacity is used as a reference for determining whether to start a standby unit.
- Required humidity: indicates the total dehumidification and humidification requirements of the group and is used as a reference for enabling the dehumidification and humidification mode by the master device.

----End

4.7.10 Which Parameters Are Restored to Default Values After Default Settings Are Operated

After choosing **Settings > Restore Defaults > Yes**, the following parameters are displayed:

- All parameters displayed on **Settings > System Settings**.
- All parameters displayed on **Settings > Alarm Settings**.
- All parameters displayed on **Settings > Comm Settings**.
- Date format and time zone settings displayed on **Settings > User Settings**.
- All parameters displayed on **Maint > Sensor Adjust**.

NOTICE

To prevent loss of important data, record all parameter values before restoring default settings. After restoring default settings, change the parameter values to the recorded values.

 NOTE

After default settings are restored, all communication addresses are changed to 1 and the communication between all devices and the EMS is disconnected. The communication addresses must be reset to recover the communication.

4.7.11 How to Change the SSH Access Password

Context

 CAUTION

- SSH is used only for advanced maintenance.
- Change the preset password in your first login to the controller over SSH.
- Except for password changes, do not perform any other operations. Otherwise, the controller cannot work properly.
- Except for password changes, operations resulting in controller faults are beyond the warranty scope.
- Remember the new password.

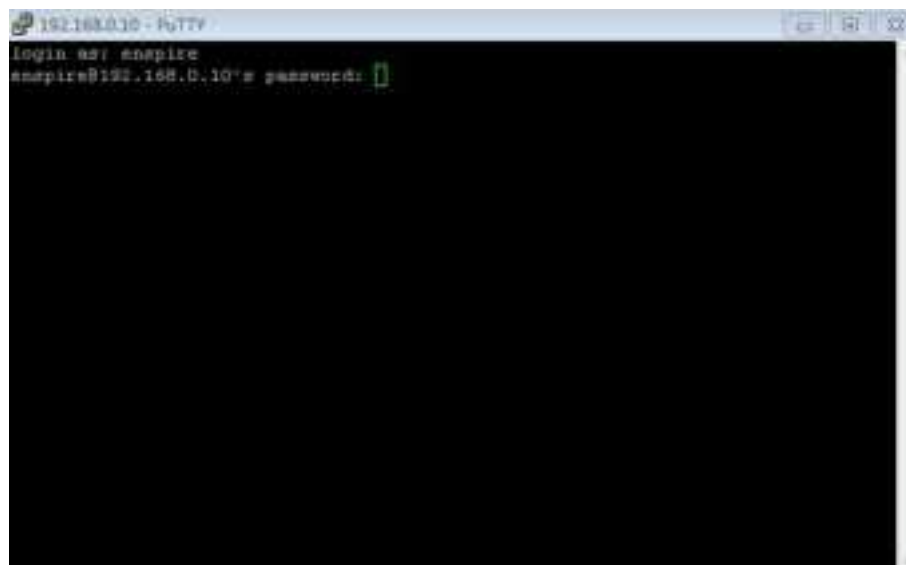
 NOTE

When Windows accesses the controller over SSH, you need to use client software such as PuTTY.

Procedure

- Step 1** Log in to the controller over SSH.
- Step 2** Specify **User name** and **Password**. The preset user name and password are **enspire** and **Changeme** respectively, as shown in [Figure 4-55](#).

Figure 4-55 Entering the user name and password



NOTICE

The new password should meet the following requirements:

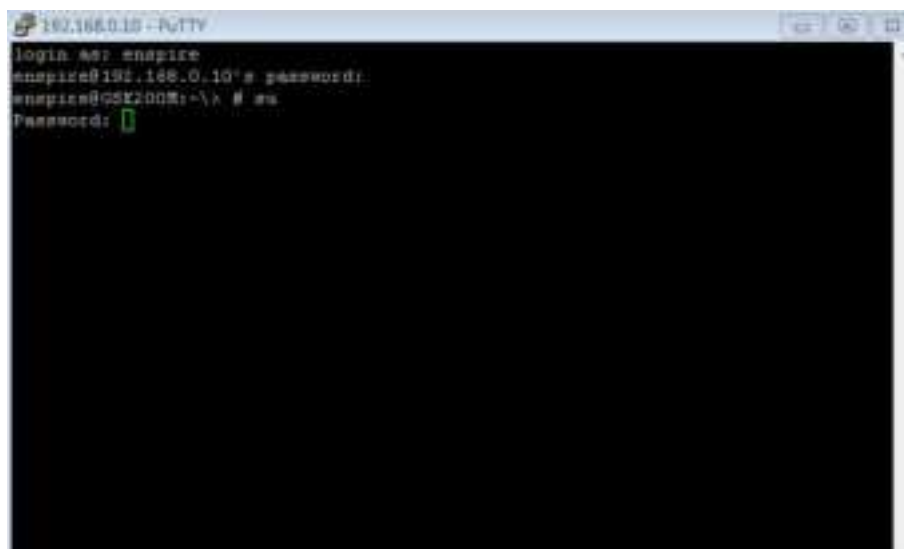
- Contains at least eight characters.
- Contains at least two types of characters: lowercase letter, uppercase letter, digit, space, and special character (~!@#\$%^&*()-_+=\|[]{};:'",<.>/?).
- Be different from the user name or user name in its inverted order.

NOTE

If a user enters incorrect passwords for five times, the user's account will be locked for 10 minutes.

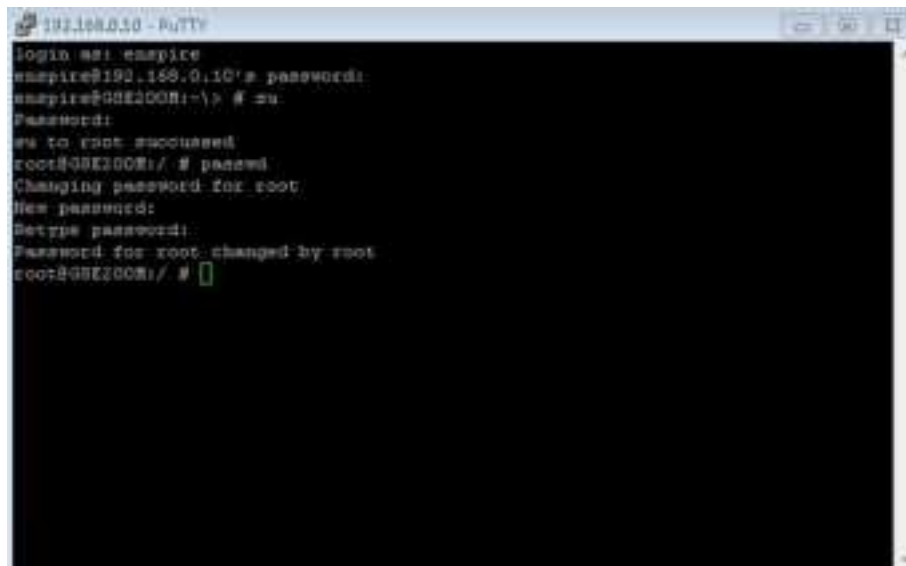
Step 3 After successful login, enter **su** and **Changeme** to switch to the root user, as shown in [Figure 4-56](#).

Figure 4-56 Switching to the root user



Step 4 Enter **passwd** (the password change command) to change the password. In the displayed window, enter a new password and confirm it, as shown in [Figure 4-57](#).

Figure 4-57 Changing the password



 NOTE

The new password must meet complexity requirements. When you are changing the password, you can press **Ctrl + C** to stop this operation.

----End

4.7.12 Rectifying Faults of the E-label Identification Board

Context

If strong electromagnetic interference exists, the E-label identification board is abnormal, or the E-label identification board is not properly connected, an exception may occur during E-label identification.

- If the information shown in [Figure 4-58](#) is displayed on the controller LCD, the smart cooling product can run properly. To remove this tip, perform [Step 1](#).

Figure 4-58 Message 1



- If the information shown in **Figure 4-59** is displayed on the controller LCD, the smart cooling product cannot run properly. Perform **Step 2** and subsequent steps.

Figure 4-59 Message 2



NOTE

In the **Figure 4-59** the ACC V100R001C20SPC300 version is used as an example to describe the WebUI prompt messages. During actual operations, the version in use prevails.

Procedure

- Step 1** Check whether strong electromagnetic interference exists around the E-label identification board.
- If yes, contact Huawei technical support.
 - If no, continue with **Step 2**.
- Step 2** Disconnect the power supply of the smart cooling product.
- Step 3** Check whether the E-label identification board is properly connected.
- If no, reconnect the board properly and continue with **Step 5**.
 - If yes, continue with **Step 4**.
- Step 4** Check whether cables are properly connected.
- If yes, contact Huawei technical support to replace the E-label identification board.
 - If no, reconnect or replace cables and perform **Step 5**.
- Step 5** Reconnect the power supply of the smart cooling product.
- Step 6** If the fault persists, contact Huawei technical support.

----End

4.7.13 Importing a Certificate and Key

Prerequisites

You have copied **CA certificate file**, **local certificate file**, and **key file** into a USB disk that is connected to the USB controller port shown in [Figure 4-2](#) and has been recognized.

NOTICE

- Ensure that the key file has been encrypted using AES128.
- Before using a USB flash drive, ensure that its data has been scanned by antivirus software and is secure.

Procedure

- Step 1** On the home page, choose **Maint > USB Operations > Import Certificate**, as shown in [Figure 4-60](#).

Figure 4-60 Import certificate



- Step 2** Click **Browse...** next to **Upload CA certificate file**.
- Step 3** Select the CA certificate file to be imported.
- Step 4** Upload local certificate file and key file in turn in the same way.
- Step 5** Enter **Key password** and **Confirm key password**.
- Step 6** Click **Submit**.

----End

4.7.14 Powering Off and Maintaining a Smart Cooling Product in iCooling Linkage Mode

Context

- When a chiller and micro modules work in iCooling linkage mode, the power-off maintenance for a smart cooling product under a micro module must be performed in a specific way to avoid impacts on the entire chiller linkage.
- This section uses maintaining smart cooling product No. 3 under a micro module that has five smart cooling products as an example to describe the operation procedure.
- [Step 2](#) and [Step 4](#) are optional for NetCol5000C-030 smart cooling products.

Procedure

- Step 1** On the **Teamwork Settings** screen, reduce the values of **Total number of units** and **Number of running units** by 1 respectively.
- Step 2** Respectively change the values of **Teamwork unit address** to **3** and **4** for smart cooling products No. 4 and No. 5.
- Step 3** Power off and maintaining smart cooling product No. 3.
- Step 4** Respectively change the values of **Teamwork unit address** back to **4** and **5** for smart cooling products No. 4 and No. 5.
- Step 5** On the **Teamwork Settings** screen, increase the values of **Total number of units** and **Number of running units** by 1 respectively.
- Step 6** Power on smart cooling product No. 3.

NOTICE

The following alarms may be reported during the above operations, and will disappear after the operations are complete:

- Smart cooling products inside a micro module report the "Teamwork networking failed" alarm.
- The master unit inside a micro module reports the "iCooling linkage A/C abnormal" alarm, which triggers the "L0/L1 linkage abnormal" alarm in the NMS.
- The master units inside other micro modules report the "iCooling linkage condition not met" alarm.

----End

5 Power-On Commissioning

5.1 Commissioning Tools

The following lists the tools for commissioning the NetCol5000-A. Add or delete tools as required.

- Wrench: adjustable wrench.
- Vacuumization and charging tools: pressure gauge (scale ≥ 4.0 MPa), leather hose (bearing pressure ≥ 4.5 MPa), and vacuum pump.
- Measuring tools: multimeter, clamp meter, and electric balance.
- Protective tools: insulation gloves, boots, and antifreeze gloves.
- Others: torch.

5.2 Vacuumizing and Charging in Refrigerant



Wear protective gloves when handling refrigerant to avoid injury from refrigerant leakage.

5.2.1 Calculation about the Charged the Refrigerant and Refrigerant Oil

Refrigerant

Calculate the total one-way length of pipes connecting the indoor unit and the outdoor unit by referring to [Table 3-12](#). L is short for the length.

The refrigerant is R410A. [Table 5-1](#) and [Table 5-2](#) show the refrigerant to be charged.

Table 5-1 Refrigerant for NetCol5000-A025

Total One-way Length	Item	NetCol500-032	NetCol500-032 (including low-temperature component)	NetCol500-036	NetCol500-038
$L \leq 10$ m	Refrigerant charge (kg) = Standard refrigerant charge (kg)	15	33	14	19
$L > 10$ m	Refrigerant charge (kg) = Standard refrigerant charge + Additional refrigerant charge	$= 15 + 0.14 \times (L-10)$	$= 33 + 0.14 \times (L-10)$	$= 14 + 0.14 \times (L-10)$	$= 19 + 0.14 \times (L-10)$

Table 5-2 Refrigerant for NetCol5000-A035

Total One-way Length	Item	NetCol500-036	NetCol500-036 (including low-temperature component)	NetCol500-038	NetCol500-072
$L \leq 10$ m	Refrigerant charge (kg) = Standard refrigerant charge (kg)	14	35	19	16
$L > 10$ m	Refrigerant charge (kg) = Standard refrigerant charge + Additional refrigerant charge	$= 14 + 0.14 \times (L-10)$	$= 35 + 0.14 \times (L-10)$	$= 19 + 0.14 \times (L-10)$	$= 16 + 0.14 \times (L-10)$

Refrigerant Oil

The refrigerant oil, Danfoss 160SZ, is recommended.

- If the indoor unit code is one of 52270741, 52270742, 52270743, 52270744, 52270745, 52270746, 52270747, and 52270748, additional refrigerant oil = additional refrigerant charge x 2.5%.
- If no, charge refrigerant oil as follows:
 - If the low-temperature component is not connected, do not add refrigerant oil.
 - If the low-temperature component is connected, and $L \leq 10$ m, do not add refrigerant oil.
 - If the low-temperature component is connected, and $L > 10$ m, additional refrigerant oil = additional refrigerant charge x 4%.

5.2.2 (Optional) Charging in Refrigerant Oil

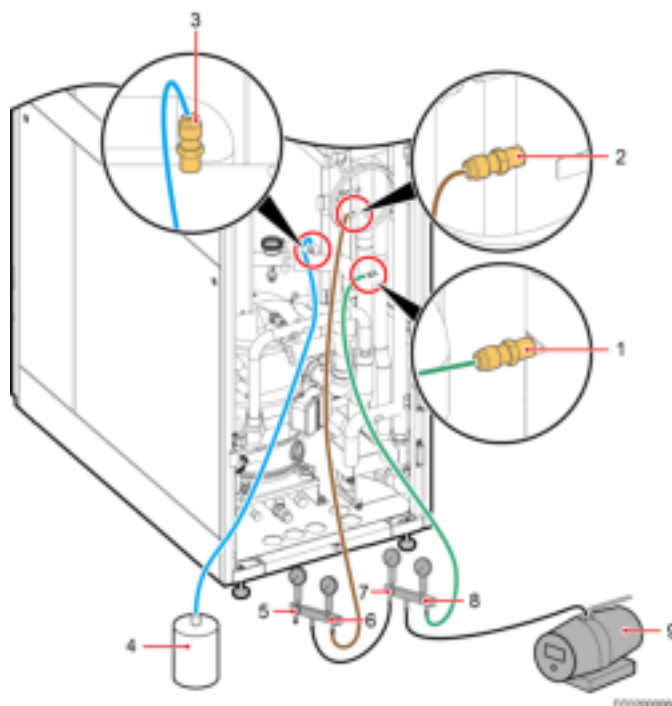
Prerequisites

Refrigerant oil is prepared by referring to [5.2.1 Calculation about the Charged the Refrigerant and Refrigerant Oil](#).

Procedure

- Step 1** Connect the refrigerant oil bucket, pressure gauge, and vacuum pump to the device, as shown in [Figure 5-1](#).

Figure 5-1 Charging in refrigerant oil



- | | | |
|--------------------------------|---------------------------------|---------------------------------|
| (1) Liquid pipe needle valve | (2) Discharge pipe needle valve | (3) Low-pressure needle valve |
| (4) Refrigerant oil bucket | (5) Low pressure gauge 1 valve | (6) High pressure gauge 1 valve |
| (7) Low pressure gauge 2 valve | (8) High pressure gauge 2 valve | (9) Vacuum pump |

Step 2 Close Low pressure gauge 1 valve, and open other pressure gauge valves.

Step 3 Open the vacuum pump to charge refrigerant oil to the cooling system. Close the vacuum pump when the charging is done.

----End

5.2.3 Vacuumizing

Prerequisites

NOTICE

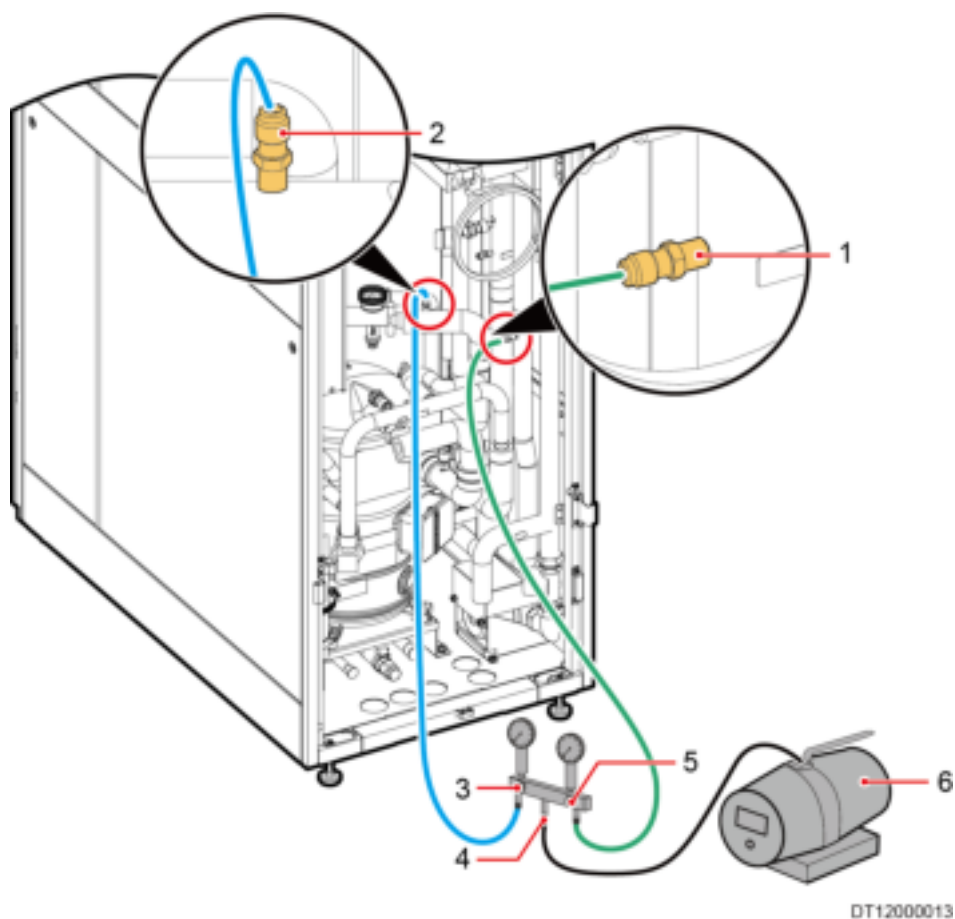
- Before vacuumizing the cooling system, ensure that the refrigerant pipes have passed the air tightness test and do not leak.
- Before vacuumizing the cooling system, ensure that all connectors are secured.
- System high pressure may occur if the cooling system is not vacuumized or is not thoroughly vacuumized. Ensure that the cooling system is thoroughly vacuumized before refrigerant is charged.

Procedure

Step 1 Check whether the low-temperature component is connected.

- If the low-temperature component is not connected, vacuumize the cooling system from the two positions (liquid pipe needle valve and low-pressure needle valve) at the same time, as shown in [Figure 5-2](#).

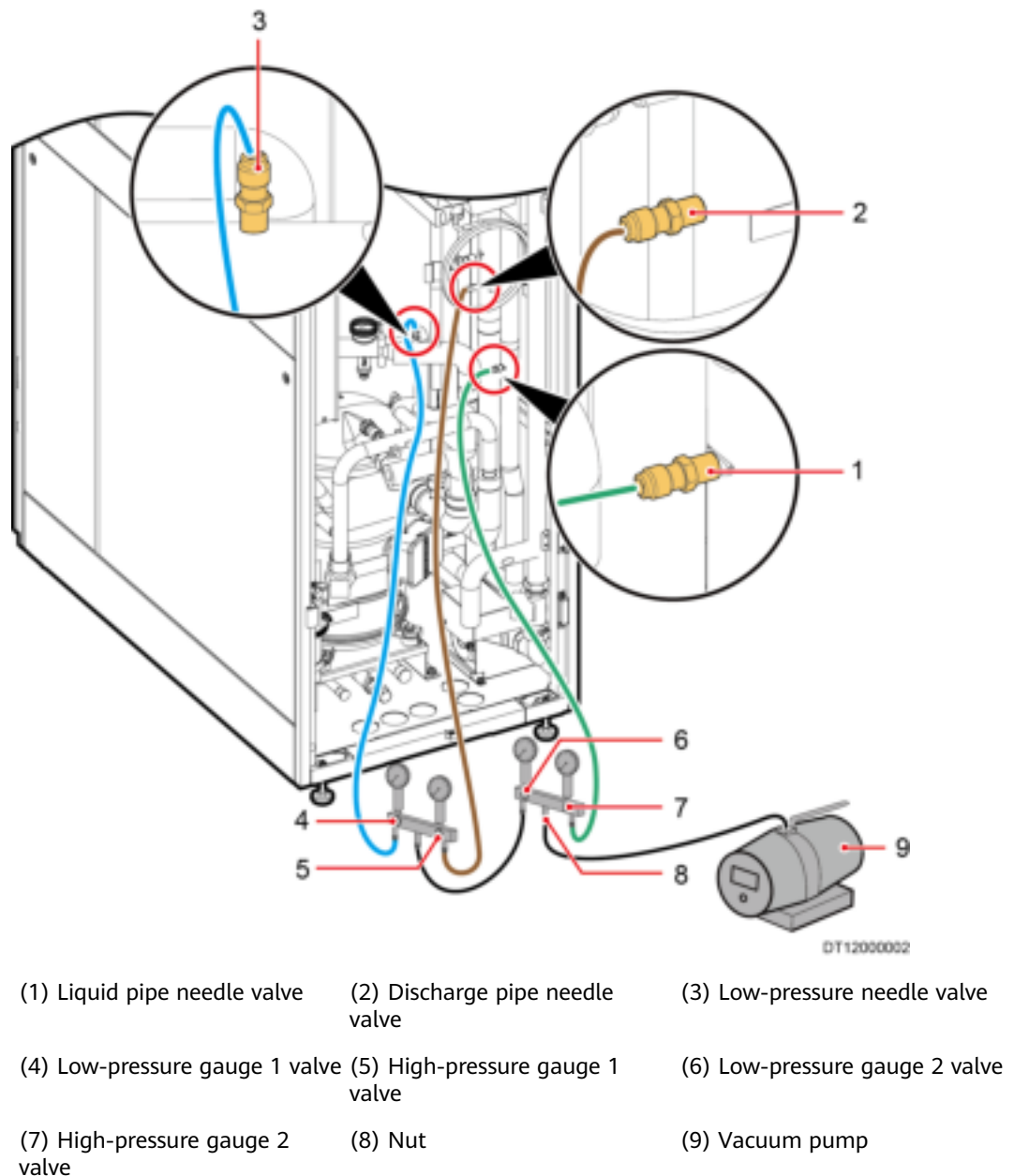
Figure 5-2 Vacuumizing the cooling system without configuring low-temperature component



- | | | |
|------------------------------|-------------------------------|------------------------------|
| (1) Liquid pipe needle valve | (2) Low-pressure needle valve | (3) Low-pressure gauge valve |
| (4) Nut | (5) High-pressure gauge valve | (6) Vacuum pump |

- If the low-temperature component is connected, vacuumize the cooling system from the three positions (liquid pipe needle valve, low-pressure needle valve, and discharge pipe needle valve) at the same time, as shown in [Figure 5-3](#).

Figure 5-3 Vacuumizing the cooling system with low-temperature component



Step 2 In the beginning, the vacuum pump makes loud noise and exhausts white smoke from the exhaust vent. After 10 minutes, if it still exhausts white smoke, observe it for another 10 minutes because the cooling system may not be sealed properly or there may be too much refrigerant or water residues in the cooling system.

Step 3 After 20 minutes, the pressure gauge pointer should be in the negative area and the vacuum pump makes small noise. Close and open the pressure gauge alternatively for several times. The position of the pressure gauge pointer and the sound made by the vacuum pump do not obviously change. Otherwise, the cooling system may not be sealed properly.

Step 4 Vacuumize the cooling system for at least 80 minutes after checking that the cooling system does not leak. The pressure displayed on the vacuum pump should be less than or equal to 60 Pa (absolute pressure). When the pressure stops

dropping, pump for another 10 minutes. The indication of sight glass is dry (green).

- Step 5** Close all the pressure gauge valves, and the vacuum pump after vacuumizing the cooling system. Preserve the pressure for 10 minutes without disconnecting the connection. The pressure should be lower than and equal to 90 Pa (absolute pressure).

 NOTE

If the precision of the pressure gauge is too low to display 60 Pa (absolute pressure), ensure that the pressure gauge pointer stayed at the minimum scale while vacuumizing the cooling system, preserve the pressure for 1 hour, and check whether the displayed pressure increases obviously.

----End

5.2.4 Partially Charging Refrigerant

Prerequisites

NOTICE

- Charge refrigerant (R410A) right after checking that the cooling system does not leak and the vacuum level meets the requirements.
 - Calculate the refrigerant amount to be charged by referring to [5.2.1 Calculation about the Charged the Refrigerant and Refrigerant Oil](#).
 - Before charging refrigerant, ensure that the air is exhausted from the hose connecting to the refrigerant steel vessel.
-

Procedure

- Step 1** Take off the vacuum pump from the vacuumizing equipment, and replace the vacuum pump with a refrigerant steel vessel.
- Step 2** Partially open the refrigerant steel vessel valve and rubber tube nut shown in [Figure 5-3](#). Tighten the nut when you feel cold air coming out from the nut.
- Step 3** Put the refrigerant steel vessel upside down on an electric balance. Clear the reading on the balance.

NOTICE

If the R410A refrigerant is provided by Huawei, put the refrigerant steel vessel upside down when charging in the refrigerant. If the refrigerant is not provided by Huawei, check with the refrigerant provider whether the steel vessel has a siphon. If the vessel has a siphon, put it upside up when charging in refrigerant. If the vessel has no siphon, put it upside down when charging in refrigerant. These measures ensure that the refrigerant is charged in the liquid form.

- Step 4** Open pressure gauge valves and the refrigerant steel vessel valve shown in [Figure 5-3](#) to charge refrigerant.

NOTICE

Do not move the pipe or steel vessel when charging refrigerant. Otherwise, the value on the electric balance is influenced.

- Step 5** Charge at least another 10 kg refrigerant (15 kg for a unit with a low-temperature unit). The amount injected must not be more than the total injection amount. The rest refrigerant is to be charged during power-on and commissioning.

- Step 6** After refrigerant charging, close pressure gauge valves and the refrigerant steel vessel valve.

 NOTE

After the injection is completed, tighten the needle valve bonnet, and check whether the needle valve leaks by applying soap bubbles to the valve vent or using a halogen leak detector. If the valve leaks, contact Huawei technical support.

----End

5.3 Commissioning Preparations

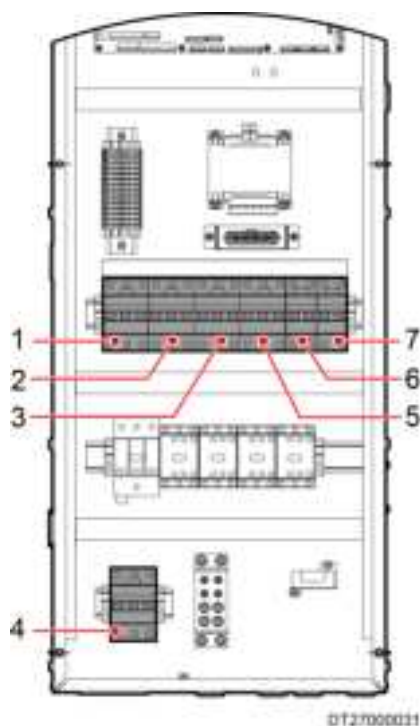
5.3.1 Checking Before Power-on

1. The installation verification has been performed by referring to [3.12 Connections Verification](#).
2. The input voltage and frequency of the power source are within the nominal ranges, and the phase sequence is correct.
3. The inlet and outlet air for the outdoor unit is smooth.
4. Make sure that the doors, windows, floor, and ceiling of the datacenter room/container environment are sealed well.

5.3.2 Circuit Breakers

Before commissioning the NetCol5000-A, familiarize yourself with the names and positions of all circuit breakers, as shown in [Figure 5-4](#).

Figure 5-4 Breakers



- | | | |
|---|---|--|
| (1) Compressor circuit breaker QF3 | (2) Electric heater circuit breaker QF4 | (3) Humidifier circuit breaker QF5 |
| (4) General circuit breaker QF1 | (5) Fan circuit breaker QF6 | (6) Main control board power circuit breaker QF8 |
| (7) Condensate pump circuit breaker QF9 | | |

5.3.3 Power-On

Context

All circuit breakers are set to OFF before delivery. If the preset status has been changed, restore the preset status before any operation.

Procedure

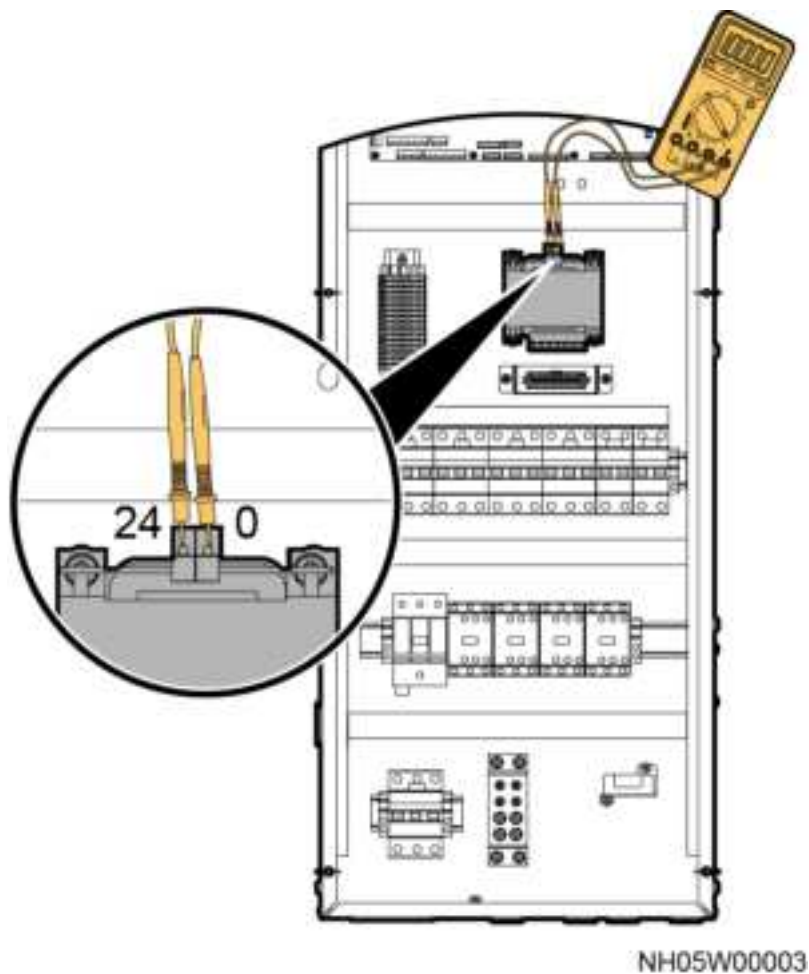
- Step 1** Subsequently switch on main control board power circuit breaker QF8 and general circuit breaker QF1.

NOTE

Alarms and LCD buzzer noise may occur if the compressor and fan circuit breakers are not switched on. The alarms and buzzer noise disappear when the switches are closed.

- Step 2** Measure the controller loop voltage by using a voltmeter, as shown in [Figure 5-5](#). Ensure that the control voltage is within the range of 24 V AC (tolerance $\pm 10\%$). If the voltage is not within the range, check whether the voltage jumper matches the mains, or whether the current input voltage meets normal voltage requirements.

Figure 5-5 Measuring the controller loop voltage



----End

5.4 Initial Configuration

See [4.5.2 Initial Configuration](#).

5.5 Commissioning Procedure

Prerequisites

1. Ensure that the outdoor unit circuit breaker has been switched on before starting the compressor.
2. Remove the refrigerant steel vessel after checking that no more refrigerant is required.
3. Users are classified into **Admin**, **Engineer**, **Operator**, and **Guest**. The Admin user has the highest permission, followed by Engineer, Operator, and Guest. The preset passwords are 000001 for Admin, Engineer, and Operator and no password is needed for Guest. You need to enter **Diagnostic Mode** as Admin

or Engineer. Tap **Settings** > **User Settings** to change the passwords for security after you first entering the system.

4. If the actual server total load, relative to a single smart cooling product, is less than 10 kW, the humidity might be relatively high. You are recommended to install a dehumidifier.

Context

CAUTION

The crankcase heat tape starts to work when the general circuit breaker QF1 and main control board power circuit breaker QF8 are on. Ensure that the crankcase heat tape has been preheated for over 12 hours before starting the compressor. Otherwise, the compressor will be damaged. Huawei will not be liable for any consequences.

Procedure

- Step 1** Switch on fan circuit breaker QF6, electric heater circuit breaker QF4, humidifier circuit breaker QF5, condensate pump circuit breaker QF9, outdoor unit general circuit breaker, and compressor circuit breaker QF3 in turn.
- Step 2** Tap **Start** on the main screen, and then choose **Maint** > **Diagnostic Mode** > **Enter** to enter the diagnostic mode.
- Step 3** Start the electric heater on the diagnostic mode page. Check that:

CAUTION

Do not touch the electric heater surface directly to avoid empyrosis.

1. The indoor fan rotates smoothly.
 2. The electric heater generates heat.
- Step 4** Close the electric heater on the diagnostic mode page. Adjust the compressor rotation speed to 3000 rpm and adjust the humidifier input to 50%.
- Step 5** Adjust the compressor.
1. Open valve 3 shown in [Figure 5-2](#) (or valves 4 and 6 shown in [Figure 5-3](#)) and charge refrigerant only from the low-pressure needle valve. Ensure that the refrigerant is charged in small amount or charged discontinuously. The total charging amount must meet the calculation requirements in [5.2.1 Calculation about the Charged the Refrigerant and Refrigerant Oil](#).
 2. On the main screen, tap **Run** > **Device Details** > **Compressor** to read the suction and discharge pressure. Check whether the suction and discharge pressure of the compressor are within reasonable ranges. (Normal suction pressure range: 0.7–1.2 MPa; normal discharge pressure range: listed in [Table 5-3](#).)

Table 5-3 Normal discharge pressure ranges

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	3.1–4.15 MPa

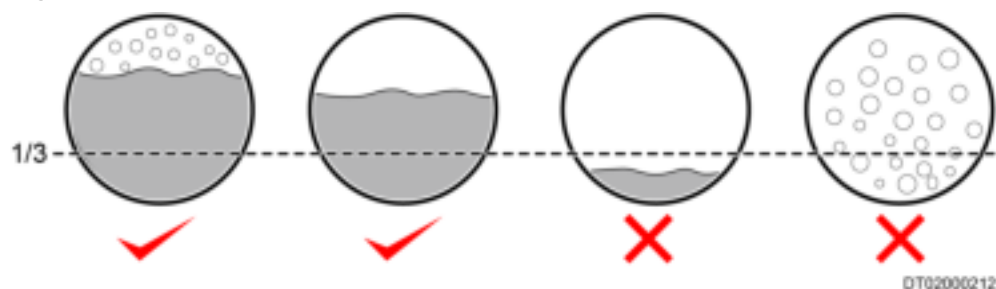
- If possible, check that the subcooling degree is within the range of 4–6°C, and check that there are no bubbles in the refrigerant seen from the sight glass. Recharge or discharge refrigerant if necessary.

NOTE

Discharge refrigerant from the discharge pipe needle valve.

- After twenty minutes, check that the oil level is stably above 1/3 of the oil sight glass and that no impurity or muddy, as shown in [Figure 5-6](#).

Figure 5-6 Oil level



Step 6 Adjust the humidifier and condensate pump.

NOTICE

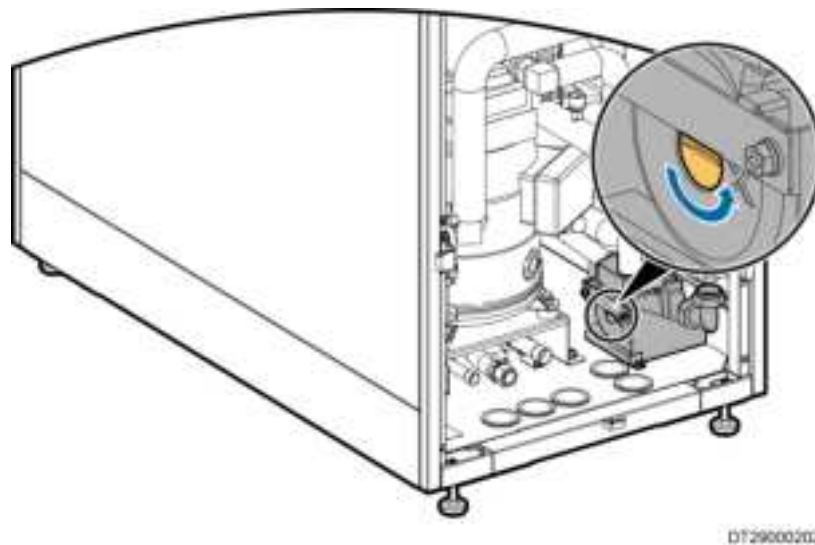
- During initial commissioning, gently open the front valve and empty air out of the water inlet pipe. Otherwise, water may spout out of the top of the humidifier cylinder.
- Before enabling humidification, turn on the humidifier switch QF5 and flip the drainage switch to **O: Normal humidifying**. Otherwise, water will not be injected into the humidifier cylinder.
- Do not turn off the humidifier switch QF5 when the humidifier is running. Otherwise, the humidifier neither works nor generates alarms. To rectify the fault, disconnect the power supply to the entire system and then power it on.

- After the humidifier is started, the water supply solenoid valve leads to a higher liquid level in the humidifier cylinder. Water supply is smooth and the water pipe is free from leakage. After 10 minutes, the water inside the humidifier cylinder is with bubbles or boils. (The water boiling time is relevant

with water supply electrical conductivity. The lower the electrical conductivity, the longer it takes the water to boil.)

2. Press the humidifier manual drainage switch on the electric control box side panel, and ensure that the water drainage solenoid valve generates a bang. The water level in the humidifier cylinder decreases. Water is drained smoothly, and the pipe is free from leakage.
3. Switch the plug screw, as shown in [Figure 5-7](#), until water flows out of the plug screw.

Figure 5-7 Discharging air



4. If the condensate pump does not react during the water charging or drainage, you can recharge and drain the pump to make the low float floating for a period of time. After the condensate pump is started, check that the pump drains properly and the pipe is free from leakage.

NOTICE

If the condensate pump does not react, you can directly charge the water tank with water to ensure that the condensate pump can start and operate; If self-drainage is connected or slow water charging speed occurs, the condensate pump may not react, which requires water keeping on charging.

Step 7 Go outside to verify that the rotation direction of the outdoor fan is consistent with that shown on the label, and the outdoor fan rotates smoothly. If the outdoor fan does not rotate, check that:

- Whether the light of the phase sequence protector is on. If it is off, the phase sequence may be incorrect or the indoor unit signal cable is improperly connected. You can rectify the fault by referring to the outdoor unit user manual.
- Whether the signal cable for the indoor and outdoor units is properly connected.

 NOTE

- The normal start pressure of the fan is 2.26 MPa which can be read on the LCD of the outdoor unit rotational speed controller. You can acquire the pressure reading from the screen of outdoor unit to get the discharge pressure.
- When the outdoor fans are double wind turbines and the outdoor ambient temperature is below 27°C, one of the fans may not rotate.

Step 8 Adjust the compressor and humidifier input into 0. Exit the diagnostic mode.

Step 9 If high humidity alarm occurs, the following steps are recommended.

1. On the main screen, tap **Settings** > **System Settings** > **System Control**, and change **Heat mode** to **Dehumid<**.
2. On the main screen, tap **Settings** > **System Settings** > **T/H Sensor**, and change **T/H control type** to **Return-air** or **Cold aisle**.
3. Shut down the fresh air system. In modular datacenter, open the modular doors and ceilings, or open some false panel on the IT rack.

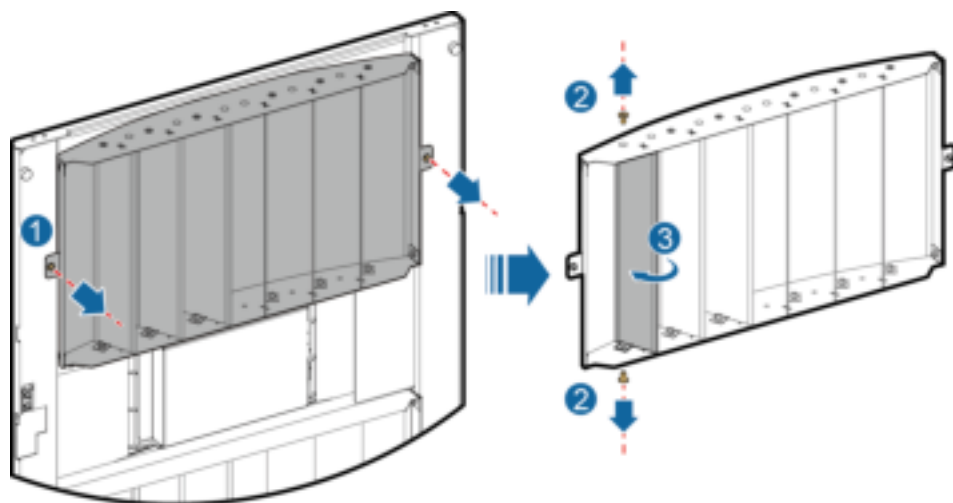
----End

Follow-up Procedure

If you need to adjust the air flow direction, adjust the air deflector by performing the following steps:

1. Remove screws from both sides of the air deflector to be adjusted using a Phillips screwdriver and remove the air deflector, as shown by 1 in **Figure 5-8**.
2. Remove the upper and lower screws from the air deflector using a Phillips screwdriver, as shown by 2 in **Figure 5-8**.
3. Put the air deflector upside down and rotate it to the opposite direction of the slot, as shown by 3 in **Figure 5-8**.
4. Reinstall the air deflector using a Phillips screwdriver.

Figure 5-8 Adjusting the air deflector



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5.6 Checking After Commissioning

Table 5-4 lists the commissioning checklist.

Table 5-4 Commissioning checklist

Check Item	Actual Result
The controller exits the diagnostic mode.	☐ Passed. ☐ Failed.
The temperature and humidity are properly set.	☐ Passed. ☐ Failed.
All circuit breakers are on.	☐ Passed. ☐ Failed.
The drainage button on the electrical control box is in the position of normal humidifying.	☐ Passed. ☐ Failed.
No oil stain exists on the copper pipe thermal insulation foam or bottom plate, or it has been cleaned.	☐ Passed. ☐ Failed.

5.7 Power Off

Procedure

Step 1 On the home page, tap **Shutdown**.

NOTICE

Exercise caution during operation because the unit is still live.

Step 2 Switch off the main circuit breaker QF1.

Step 3 If the smart cooling product needs to be maintained in power-off mode or long-term power-off, switch off the smart cooling product external circuit breaker.

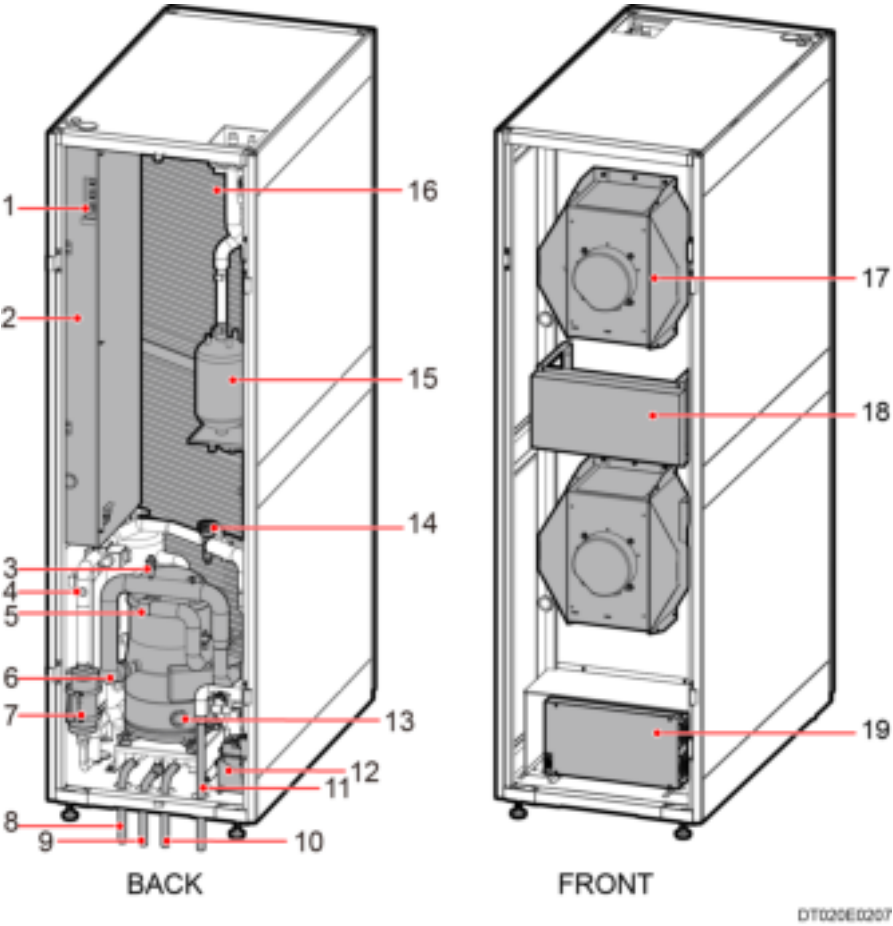
----End

6 System Operation and Maintenance

6.1 Maintenance Components

Figure 6-1 shows the positions of the components to be maintained.

Figure 6-1 Components



- | | | | |
|-------------------------------|-----------------------------------|--------------------------|--------------------------------|
| (1) Manual water drain button | (2) Electric control box | (3) High pressure switch | (4) Sight glass |
| (5) Compressor angle valve | (6) Compressor angle valve | (7) Dryer filter | (8) Refrigerant pipe |
| (9) Self-drainpipe | (10) Refrigerant pipe | (11) Condensate pump | (12) Condensate pump drainpipe |
| (13) Oil glass | (14) Thermostatic expansion valve | (15) Humidifier cylinder | (16) Evaporator |
| (17) Fan | (18) Electric heater | (19) Compressor drive | |

6.2 Routine Maintenance

6.2.1 Routine Maintenance Overview

Definition

Routine maintenance refers to preventive and periodic check and maintenance carried out to promptly identify and handle alarms and potential faults during the normal operation of the equipment.

Precautions

- Routine maintenance is critical to the normal operation of equipment. Perform routine maintenance regularly. Read the precautions and product documentation before performing routine maintenance.
- Follow local laws and safety instructions to minimize the risk of personal injury and damage to equipment.
- The "NOTICE", "CAUTION", "WARNING", and "DANGER" statements in this document do not represent all safety instructions. They are only supplements to the safety instructions.
- Personnel who will install, operate, and maintain Huawei equipment must receive thorough training, understand all necessary safety precautions, and be able to correctly perform all operations.
- Pay attention to the safety symbols on the equipment and all safety instructions in this document. The safety precautions given in this document do not cover all safety precautions. Huawei will not be liable for any consequence caused by violation of the safety operation regulations and design, production, and usage standards.
- Most maintenance tasks should be performed only after the power supply is disconnected from the equipment. Do not connect the power supply during maintenance. If you need to perform maintenance tasks such as measuring the current, voltage, and temperature when the equipment is operating, connect the power supply only after you have finished all equipment connections. Disconnect the power supply when you finish maintenance.
- Take protective measures during electrical maintenance, such as wearing insulation gloves and shoes.
- Exercise caution when performing professional maintenance tasks. For details, consult Huawei technical support.
- During component replacement, do not lean any material against the cabinet.

6.2.2 Maintenance Tools

Table 6-1 lists the tools required for maintenance.

Table 6-1 Maintenance tools

Tool Name and Appearance			
Marker	13# solid wrench	Fin brush	Socket wrench
			
Water pipe sealant	Phillips screwdriver	Flat-head screwdriver	Protective gloves

Tool Name and Appearance			
			
Flashlight	Insulation gloves	N/A	N/A
		N/A	N/A

NOTE

For parts replacement, see the appropriate section for information about the required tools.

6.2.3 Data Record

Before performing monthly maintenance, record data in [Table 6-2](#).

Table 6-2 Recording table

Menu Item	Parameter	Record
Choose Settings > System Settings > T/H Sensor .	T/H control type	
	Temp set point	
	Humid set point	
Choose Common Functions > Operating Info , or tap Running > Operating Info .	Current temperature	
	Current humidity	
	Rated power voltage	
	Measured power voltage	
Choose Running > Device Details > Compressor .	Discharge temp	
	Discharge pressure	
	Suction pressure	
Tap Teamwork .	Teamwork function	
Choose Teamwork > Teamwork Settings .	Total number of units	

Menu Item	Parameter	Record
	Number of active units	

6.2.4 Monthly Maintenance

Table 6-3 lists monthly maintenance items for the indoor unit. If parts replacement is required, contact Huawei technical support to obtain spare parts.

Table 6-3 Monthly maintenance checklist

Component	Item	Troubleshooting
Air filter	The air filter surface is free of accumulated dust, damage, and deformation.	Replace the air filter. Huawei recommends replacing the air filter once every six months. See 6.5.1 Replacing Filters for the replacement method.
Compressor	The compressor generates no abnormal noises, such as metal friction noise.	Slightly shake the compressor and touch the four anchor bolt to check whether they are loose. If they are loose, tighten them using a 13# solid wrench. If the problem persists, contact Huawei technical support.
	Run the indoor unit and check that the oil level is stably above 1/3 of the oil sight glass and that no dense white bubbles cover the entire glass surface.	Add refrigerant oil. For details, contact Huawei technical support.
Humidifier	The humidifier cylinder interior wall is free from large quantity of water scale.	Replace the humidifier cylinder by referring to 6.5.7 Replacing Humidifier Cylinder . Huawei recommends replacing the humidifier cylinder once every six months.

Component	Item	Troubleshooting
Pipe	The color of the sight glass (as shown in Figure 6-1) is near green, or not completely turns yellow.	If the sight glass completely turns yellow, water is too much in the pipe. To solve the problem, empty refrigerant out of the pipe, vacuumize the pipe, drain out water, and then charge new refrigerant. NOTE If the sight glass does not obviously turn green, use a blow drier to blow wind to the filter until the sight glass is green.
	Touch the compressor angle valves (as shown in Figure 6-1), needle valves, and welding spots of the refrigerant pipe with your hands protected by a pair of protective gloves to check for oil stains.	If there is an oil stain, check whether the suction and exhaust pressure of the compressor is within the normal ranges. (For the proper ranges of suction and exhaust pressure of the compressor, see 5.5 Commissioning Procedure .) If the pressure is beyond the normal range, contact Huawei technical support.
	No water exists under the water pipe or on the thermal insulation foam.	- If drops of water are evenly distributed, wipe off them with a dry cloth. - If there are large water marks, close the water inlet sluice and process the leak points. If the thermal insulation foam is damaged or missing, lay out new thermal insulation foam.
	The thermal insulation foam is properly laid out along the pipe.	Replace the thermal insulation form if it is damaged or missing.
Indoor fan	The indoor fan guard is not deformed, and the fan blades are not damaged.	Replace the fan by referring to 6.5.2 Replacing a Indoor Fan .
	The indoor fan runs smoothly.	Take out the foreign matter.
	The screws on the indoor fan are not loose or distorted.	Tighten the screws using a 10# socket wrench.
Electric heater	The electric heater surface is not eroded, dirtied, or blocked.	Replace the electric heater by referring to 6.5.8 Replacing Electric Heater .

Component	Item	Troubleshooting
Humidity and temperature sensor	Humidity and temperature sensors in smart cooling products and aisles are securely installed.	Secure the sensors again by referring to 3.11.6 Installing a Humidity and Temperature Sensor Outside the Cabinet .
Water sensor	The water sensor is secure, and the two downward metal conductive plates do not interfere with each other or corrode.	Replace the water sensor by referring to 3.11.4 Connecting the Signal Cables .

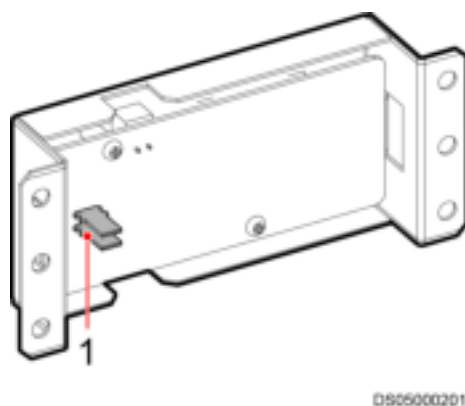
Compressor Oil Level

You can view the refrigerant oil status from the oil sight glass of the compressor. [Figure 5-6](#) shows the normal and abnormal refrigerant oil states.

Water Sensor

When the pair of terminals of the water sensor detect water or other conductive liquid, resistance between the two terminals decreases. During the maintenance, check that the two detection terminals, as shown in [Figure 6-2](#), are free from corrosion, foreign matter, and connection in between.

Figure 6-2 Water sensor detection terminals



(1) Detection terminals

6.2.5 Quarterly Maintenance

[Table 6-4](#) lists quarterly maintenance items for the indoor unit.

Table 6-4 Quarterly maintenance checklist

Component	Item (on the Basis of Monthly Maintenance)	Troubleshooting
Monitoring	Export smart cooling product logs, alarms, temperatures, humidity, the operating status of the compressor, fan, electric heater, electric humidifier, and water pump, and time from the monitoring system. View the historical alarms generated in this quarter and select the most common five ones. (If no monitoring system is available, skip this item.)	Rectify the fault or contact Huawei technical support.
Humidifier	Start the indoor unit, choose Maint > Diagnostic Mode > Enter from the main screen, and set Humidifier to 50% . Water injection is smooth.	• Check that the water inlet sluice is open. • Disconnect the humidifier water injection hose and clear the blockage in the hose.
	(Following the preceding step) Set Humidifier to 0%, and press the manual water drain button on the side of the electric control box to check whether water drainage is normal. After the check is complete, set the manual drainage button on the side of the electric control box to normal humidification. NOTE 1. Ensure that the manual drainage button on the side of the electric control box is set to "O: Normal humidifying" after the check ends. Otherwise, the humidifier will not be filled with water when it is running. 2. If the humidifier cylinder is dirty and the water level exceeds 4/5 during the quarterly maintenance, replace the cylinder.	Disconnect the drainpipe from the device, and use a rubber mallet to knock the drainpipe to remove foreign matter or impurities from the drainpipe. Then remove the water pump and clean up impurities from the water pump. If the impurities are too much to be cleared, replace the water pump. NOTE • When installing a pipe, seal screw thread joints using water sealant and ensure that no water leaks. • If the fault persists after the maintenance, see section 6.4 Troubleshooting for further processing.

Component	Item (on the Basis of Monthly Maintenance)	Troubleshooting
Electric heater	Start the indoor unit, choose Maint > Diagnostic Mode > Enter from the main screen, and set Electric heater to On. Check that the electric heater generates heat. NOTE To avoid burns, do not touch the electric heater surface with bare skin.	Replace the electric heater by referring to section 6.5.8 Replacing Electric Heater .

6.2.6 Yearly Maintenance

[Table 6-5](#) lists yearly maintenance items for the indoor unit.

NOTICE

Calculate the total cooling capacity and total server load of running indoor units. If the total load exceeds 80% of the total cooling capacity of the smart cooling product, Huawei recommends increasing the number of smart cooling products.

Table 6-5 Yearly maintenance checklist

Component	Item (on the Basis of Quarterly Maintenance)	Troubleshooting
Sensors	Use a high-precision humidity and temperature sensor to calibrate the humidity and temperature sensors inside and outside the cabinet.	If the temperature deviation is greater than 1°C or humidity deviation is greater than 5%, calibrate or replace the humidity and temperature sensor. For the calibration method, see the 4.6.2.5 Calibrating a Sensor .
Evaporator	The evaporator fins are not pushed down.	Use a fin brush to organize the fins that are pushed down.
Welding spot and needle valve	Check that the welding spots and needle valves do not leak using soapy water, or check that they are free from oil stains.	If leaking points are found, retrieve the refrigerant and weld the leaking points again. For details, contact Huawei technical support.

6.3 Alarm Reference

NOTICE

If the **Clear** icon is displayed on the **Details screen**, the alarm can be manually cleared by tapping the **Clear** button after the fault is rectified. The alarm clearance type (automatic or manual) varies with smart cooling products. Alarms can be cleared are a025, a058, a061, a062, a064, a076, a079, a095.

Table 6-6 Alarm description

Alarm ID	Alarm	Alarm Severity	Default Value	Impact	Possible Cause	Solution
a001	Return-air 1 temp invalid	Major	N/A	The alarm is generated.	1. The cables to the temp sensor are loose or damaged. 2. The temp sensor is faulty.	1. Check the cables to the temp sensor. 2. Maintain or replace the temp sensor.
	Return-air 2 temp invalid	Major	N/A	The alarm is generated.	1. Dirt or water exists around the T/H sensor, which leads to a detection fault. 2. The T/H sensor is faulty.	1. Remove dirt or water from the T/H sensor. 2. Maintain or replace the T/H sensor.

Alarm ID	Alarm	Alarm Severity	Default Value	Impact	Possible Cause	Solution
a002	Return-air HT	Critical	45°C	The alarm is generated, and the rotational speed of the compressor increases.	1. The load is high or the refrigeration capacity is insufficient. 2. The return air temp is higher than the return-air HT alarm thres during startup. 3. The ambient temp is high. 4. The return-air HT alarm thres is inappropriate. 5. The temp displayed is different from the actual temp.	1. Add more smart cooling product units. 2. Check other causes if the alarm persists after startup. 3. Check the ambient temp. 4. Adjust the return-air HT alarm thres. 5. Calibrate or replace the abnormal temp sensors.
a003	Return air LT	Warning	15°C	The alarm is generated.	1. The load is low. 2. The ambient temp is low. 3. The return-air LT alarm thres is inappropriate. 4. The temp displayed is different from the actual temp.	1. Please consult Huawei technical support. 2. Check the ambient temp. 3. Adjust the return-air LT alarm thres. 4. Calibrate or replace the abnormal temp sensors.
a004	Return-air 3 humid invalid	Major	N/A	The alarm is generated.	1. The cables to the temp sensor are loose or damaged. 2. The temp sensor is faulty.	1. Check the cables to the temp sensor. 2. Maintain or replace the temp sensor.

Alarm ID	Alarm	Alarm Severity	Default Value	Impact	Possible Cause	Solution
a007	Return-air 3 T/H board communication failed	Major	N/A	The alarm is generated.	1. The cables to the T/H sensor are loose or damaged. 2. The DIP switch of the T/H sensor is set incorrectly. 3. The T/H sensor is faulty. 4. The communication port of the control board is faulty.	1. Check the cables to the T/H sensor. 2. Set the DIP switch of the T/H sensor correctly. 3. Maintain or replace the T/H sensor. 4. Maintain or replace the control board.
a008	Compressor HP	Major	4.25 MPa	The alarm is generated, and the compressor shuts down forcibly.	1. The power supply to the outdoor unit is lost, or a phase is open or error. 2. The on/off signal cables of the outdoor unit are disconnected. 3. The condenser fins are blocked. 4. The outdoor fan or fan driver is damaged. 5. The cables to the high pressure switch are loose or damaged. 6. The high pressure switch is faulty. 7. The solenoid valve is faulty. 8. The refrigerant is overfilled.	1. Check the power supply of the outdoor unit. 2. Check the on/off signal cables of the outdoor unit. 3. Clean the condenser fins. 4. Maintain or replace the outdoor unit or unit driver. 5. Check the cables to the high pressure switch. 6. Maintain or replace the high pressure switch. 7. Maintain or replace the solenoid coil or the solenoid valve. 8. Decrease certain amount of refrigerant.

Alarm ID	Alarm	Alarm Severity	Default Value	Impact	Possible Cause	Solution
a009	Comp HP lock	Critical	4.25 MPa	The alarm is generated, and the compressor is locked and not allowed to be started.	The a008 comp HP alarm is generated frequently.	Reference to the solutions for the a008 comp HP alarm.
a010	Comp LP	MAJOR	-	The alarm is generated, and the compressor shuts down forcibly.	1. The refrigerant leaks. 2. The solenoid valve is faulty. 3. The cables to the low press switch are loose or damaged. 4. The low press switch is faulty. The dryer filter is blocked. 5. The expansion valve is blocked. 6. The indoor fans are faulty.	1. Check for any leakages. Fill refrigerant after maintenance or replacement. 2. Maintain or replace the solenoid coil or the solenoid valve. 3. Check the cables to the low press switch. 4. Maintain or replace the low press switch. 5. Maintain or replace the dryer filter. 6. Maintain or replace the expansion valve. 7. Maintain or replace the indoor fans.

Alarm ID	Alarm	Alarm Severity	Default Value	Impact	Possible Cause	Solution
a011	Comp LP lock	CRITICAL	-	The alarm is generated, and the compressor shuts down forcibly.	The a010 comp LP alarm is generated frequently.	Reference to the solutions for the a010 comp LP alarm.
a012	Comp discharge HT	Major	125°C	The alarm is generated, and the compressor shuts down forcibly.	1. The refrigerant leaks. 2. The condenser fins are blocked. 3. The ambient temp is high. 4. The temp displayed is different from the actual temp. 5. The discharge temp sensor is faulty. 6. Outdoor fans are faulty.	1. Check for any leakages. Fill refrigerant after maintenance or replacement. 2. Clean the condenser fins. 3. Check the ambient temp. 4. Calibrate or replace the temp sensor. 5. Maintain or replace the temp sensor. 6. Maintain or replace the outdoor fans.
a013	Comp discharge HT lock	Critical	125°C	The alarm is generated, and the compressor shuts down forcibly.	The a012 comp discharge HT alarm is generated frequently.	Reference to the solutions for the a012 comp discharge HT alarm.

Alarm ID	Alarm	Alarm Severity	Default Value	Impact	Possible Cause	Solution
a014	Comp short period	MAJOR	-	The alarm is generated.	1. The comp starts and stops frequently, affected by other alarms. 2. The load is low, which leads to the comp starting and stopping frequently.	1. Clear other alarms. 2. Please consult Huawei technical support.
a015	Comp exceeded runtime	Warning	30000 hours	The alarm is generated.	The accumulated runtime of the compressor exceeds the alarm thres.	Maintain or replace the comp. Tap Maint > Performance Maint to clear the accumulated runtime.
a018	Indoor fan 1 exceeded runtime Indoor fan 2 exceeded runtime	Warning	40000 hours	The alarm is generated.	The accumulated runtime of the fan exceeds the alarm thres.	Maintain or replace the indoor fan. Tap Maint > Performance Maint to clear the accumulated runtime.
a022	Humidifier exceeded runtime	Warning	3000 hours	The alarm is generated.	The accumulated runtime of the humidifier exceeds the alarm thres.	1. Maintain or replace the humidifier. 2. Tap Maint > Performance Maint to clear the humidifier total runtime.

Alarm ID	Alarm	Alarm Severity	Default Value	Impact	Possible Cause	Solution
a023	Electric heater HT	Major	N/A	The alarm is generated, and the electric heater shuts down forcibly.	1. The temp switch probes are located inappropriately. 2. The cables to the temp switch of the electric heater are loose or damaged. 3. The temp switch is faulty. 4. The manual reset temp switch is not reset. 5. The indoor fans are faulty.	1. Adjust the positions of the temp switch probes. 2. Check the cables to the temp switch of the electric reheat. 3. Maintain or replace the temp switch. 4. Reset the manual reset temp switch. 5. Maintain or replace the indoor fans.
a024	Electric heater exceeded runtime	Warning	30000 hours	The alarm is generated.	The accumulated runtime of the electric reheat exceeds the alarm thres.	Maintain or replace the electric heater. Tap Maint > Performance Maint to clear the accumulated runtime.
a025	Air filter blocked	Warning	N/A	The alarm is generated.	1. Air filters are blocked. 2. The differential press switch is faulty. 3. The differential press switch is set inappropriately. 4. The press tube is blocked or cracked, or is located in an inappropriate position. 5. The cables to the differential press switch are loose or damaged.	1. Maintain or replace the air filters. 2. Replace the differential press switch. 3. Adjust the thres of the differential press switch. 4. Maintain or replace the press tube. 5. Check the cables to the differential press switch.

Alarm ID	Alarm	Alarm Severity	Default Value	Impact	Possible Cause	Solution
a026	Air filter exceeded runtime	Warning	4320 hours	The alarm is generated.	The accumulated runtime of the air filters exceeds the alarm thres.	Maintain or replace the air filters. Tap Maint > Performance Maint to clear the accumulated runtime.
a027	Power loss	Warning	N/A	The alarm is generated.	The supply power is cut off.	Check the power supply cables.
a028	Power phase A overvoltage	MAJOR	-	The alarm is generated, and the system shuts down.	1. The power supply voltage is higher than the power overvoltage alarm thres. 2. If a voltage jumper is used, possibly it is incorrectly connected. 3. If a toggle switch is used, possibly it is incorrectly set.	1. Check the power supply voltage. 2. Maintain or replace the voltage jumper. 3. Correctly set the toggle switch.
a029	Power phase B overvoltage	MAJOR	-	The alarm is generated, and the system shuts down.	1. The power supply voltage is higher than the power overvoltage alarm thres. 2. If a voltage jumper is used, possibly it is incorrectly connected. 3. If a toggle switch is used, possibly it is incorrectly set.	1. Check the power supply voltage. 2. Maintain or replace the voltage jumper. 3. Correctly set the toggle switch.

Alarm ID	Alarm	Alarm Severity	Default Value	Impact	Possible Cause	Solution
a030	Power phase C overvoltage	MAJOR	-	The alarm is generated, and the system shuts down.	1. The power supply voltage is higher than the power overvoltage alarm threshold. 2. If a voltage jumper is used, possibly it is incorrectly connected. 3. If a toggle switch is used, possibly it is incorrectly set.	1. Check the power supply voltage. 2. Maintain or replace the voltage jumper. 3. Correctly set the toggle switch.
a031	Power phase A undervoltage	MAJOR	-	The alarm is generated, and the system shuts down.	1. The power supply voltage is lower than the power undervoltage alarm threshold. 2. If a voltage jumper is used, possibly it is incorrectly connected. 3. If a toggle switch is used, possibly it is incorrectly set.	1. Check the power supply voltage. 2. Maintain or replace the voltage jumper. 3. Correctly set the toggle switch.
a032	Power phase B undervoltage	MAJOR	-	The alarm is generated, and the system shuts down.	1. The power supply voltage is lower than the power undervoltage alarm threshold. 2. If a voltage jumper is used, possibly it is incorrectly connected. 3. If a toggle switch is used, possibly it is incorrectly set.	1. Check the power supply voltage. 2. Maintain or replace the voltage jumper. 3. Correctly set the toggle switch.

Alarm ID	Alarm	Alarm Severity	Default Value	Impact	Possible Cause	Solution
a033	Power phase C undervolt	MAJOR	-	The alarm is generated, and the system shuts down.	1. The power supply voltage is lower than the power undervolt alarm thres. 2. If a voltage jumper is used, possibly it is incorrectly connected. 3. If a toggle switch is used, possibly it is incorrectly set.	1. Check the power supply voltage. 2. Maintain or replace the voltage jumper. 3. Correctly set the toggle switch.
a034	Power overfreq	MAJOR	-	The alarm is generated, and the system shuts down.	1. The power supply frequency is too high. 2. The SPD three-phase test board is faulty.	1. Check the power supply frequency. 2. Replace the SPD three-phase test board.
a035	Power underfreq	MAJOR	-	The alarm is generated, and the system shuts down.	1. The power supply frequency is too low. 2. The SPD three-phase test board is faulty.	1. Check the power supply frequency. 2. Replace the SPD three-phase test board.

Alarm ID	Alarm	Alarm Severity	Default Value	Impact	Possible Cause	Solution
a036	Power phase loss	Critical	N/A	The alarm is generated, and the system shuts down.	1. The power grid is unstable. 2. The surge protection board is faulty if configured. 3. The main power supply or the comp driver supply is connected improperly.	1. Check the power grid. 2. Maintain or replace the surge protection board. 3. Check the main power supply or cables to the comp driver.
a037	Power phase reverse	CRITICAL	-	The alarm is generated, and the system shuts down.	1. The power grid is unstable. 2. The surge protection board is faulty.	1. Check the power grid. 2. Maintain or replace the surge protection board.
a038	Liquid pipe temp sensor or fault	MAJOR	-	The alarm is generated.	1. Cables to the liquid pipe temp sensor are not properly connected. 2. The liquid pipe temp sensor is faulty.	1. Maintain or replace the liquid pipe temp sensor. 2. Check cables to the liquid pipe temp sensor.
a039	Control point sensor disabled	Major	N/A	The alarm is generated, and the system shuts down.	All the T/H sensors of the control point are disabled.	Enable the T/H sensors of the control point or change the control point.

Alarm ID	Alarm	Alarm Severity	Default Value	Impact	Possible Cause	Solution
a041	Cond pump fault	MAJOR	-	The alarm is generated.	1. The cables to the cond pump are loose or damaged. 2. The cond pump is faulty. 3. The fuse or relay of the cond pump is faulty. 4. The drainage capacity of the cond pump decreases, or the drainpipe is blocked.	1. Check the cables to the cond pump. 2. Replace the cond pump. 3. Replace the fuse or relay of the cond pump. 4. Replace the cond pump or remove the dirt from the drainpipe.
a042	Remote shutdown	Critical	N/A	The alarm is generated, and the system shuts down.	1. The remote shutdown dry contact is triggered. 2. The cables to the remote shutdown dry contact is faulty.	1. Check the status of the remote shutdown dry contact. 2. Check the cables to the remote shutdown dry contact.
a043	Floor water overflow	Critical	N/A	The alarm is generated, and the system shuts down.	1. Water exists on the floor. 2. The water sensor is faulty.	1. Check and clean the water. 2. Maintain or replace the water sensor.

Alarm ID	Alarm	Alarm Severity	Default Value	Impact	Possible Cause	Solution
a044	Smoke detected	Critical	N/A	The alarm is generated, and the system shuts down.	1. Smoke is generated in the equipment room. 2. The cables to the smoke sensor are loose or damaged. 3. The smoke sensor is faulty.	1. Exhaust smoke in equipment room and reset the smoke sensor. 2. Check cables to the smoke sensor. 3. Maintain or replace the smoke sensor.
a045	Teamwork networking failed	Major	N/A	The alarm is generated, and a message "Networking failed" is displayed.	1. The DIP switch is set incorrectly for teamwork. 2. The teamwork cables are loose or damaged. 3. Any two smart cooling product units have the same address. 4. No smart cooling product unit is configured as the master unit. 5. The master unit is powered off.	1. Set the DIP switch correctly for teamwork. 2. Check the teamwork cables. 3. Change the addresses of the smart cooling product units. 4. Configure one smart cooling product unit as the master unit. 5. Power on the master unit, or configure another unit as the master unit.

Alarm ID	Alarm	Alarm Severity	Default Value	Impact	Possible Cause	Solution
a046	Compressor freeze protection	Major	N/A	The alarm is generated, and the compressor shuts down forcibly.	1. The refrigerant leaks. 2. The solenoid valve is faulty. 3. The cables to the low pressure sensor are loose or damaged. 4. The low pressure sensor is faulty. 5. The filter dryer is blocked. 6. The expansion valve is blocked.	1. Check for any leakages. Fill refrigerant after maintenance or replacement. 2. Maintain or replace the solenoid coil or the solenoid valve. 3. Check the cables to the low pressure sensor. 4. Maintain or replace the low pressure sensor. 5. Maintain or replace the filter dryer. 6. Maintain or replace the expansion valve.
a048	Supply-air HT	Critical	40°C	The alarm is generated, and the rotational speed of the compressor increases.	1. The load is high, or the refrigeration capacity is insufficient. 2. The supply air temperature is higher than the supply-air HT alarm threshold during startup. 3. The ambient temperature is high. 4. The supply-air HT alarm threshold is inappropriate. 5. The temperature displayed is different from the actual temperature.	1. Add more smart cooling product units. 2. Check other causes if the alarm persists after startup. 3. Check the ambient temperature. 4. Adjust the supply-air HT alarm threshold. 5. Calibrate or replace the abnormal sensors.

Alarm ID	Alarm	Alarm Severity	Default Value	Impact	Possible Cause	Solution
a049	Supply-air LT	Warning	5°C	The alarm is generated.	1. The load is low. 2. The ambient temp is low. 3. The supply-air LT alarm thres is inappropriate. 4. The temp displayed is different from the actual temp. 5. The air filters are blocked.	1. Please consult Huawei technical support. 2. Check the ambient temp. 3. Adjust the supply-air LT alarm thres. 4. Calibrate or replace the abnormal sensors. 5. Maintain or replace the air filters.
a050	Cold-aisle HT	Critical	40°C	The alarm is generated, and the rotational speed of the compressor increases.	1. The cold-aisle T/H sensors are located in inappropriate position. 2. The ambient temp is high. 3. The cold-aisle HT alarm thres is inappropriate. 4. The temp displayed is different from the actual temp. 5. The load is high or the refrigeration capacity is insufficient.	1. Adjust the position of the cold-aisle T/H sensors. 2. Check the ambient temp. 3. Adjust the cold-aisle HT alarm thres. 4. Calibrate or replace the abnormal T/H sensors. 5. Add more smart cooling product units.

Alarm ID	Alarm	Alarm Severity	Default Value	Impact	Possible Cause	Solution
a051	Hot-aisle HT	Critical	45°C	The alarm is generated, and the rotational speed of the compressor increases.	1. The hot-aisle T/H sensors are located in inappropriate position. 2. The ambient temp is high. 3. The hot-aisle HT alarm thres is inappropriate. 4. The temp displayed is different from the actual temp. 5. The load is high or the refrigeration capacity is insufficient.	1. Adjust the position of the hot-aisle T/H sensors. 2. Check the ambient temp. 3. Adjust the hot-aisle HT alarm thres. 4. Calibrate or replace the abnormal T/H sensors. 5. Add more smart cooling product units.
a052	Supply-air 1 temp invalid Supply-air 2 temp invalid Supply-air 3 temp invalid	Major	N/A	The alarm is generated.	1. The cables to the temp sensor are loose or damaged. 2. The temp sensor is faulty.	1. Check the cables to the temp sensor. 2. Maintain or replace the temp sensor.
a055	Discharge temp sensor fault	Major	N/A	The alarm is generated.	1. The cables to the temp sensor are loose or damaged. 2. The temp sensor is faulty.	1. Check the cables to the temp sensor. 2. Maintain or replace the temp sensor.

Alarm ID	Alarm	Alarm Severity	Default Value	Impact	Possible Cause	Solution
a056	Discharge pressure sensor fault	Major	N/A	The alarm is generated.	1. The cables to the press sensor are loose or damaged. 2. The press sensor is faulty.	1. Check the cables to the press sensor. 2. Replace the press sensor.
a057	Comp discharge HP	Major	4.25 MPa	The alarm is generated, and the compressor shuts down.	1. The power supply to the outdoor unit is lost, or phase is open or error. 2. The on/off signal cables of the outdoor unit are disconnected. 3. The condenser fins are blocked. 4. The outdoor unit or unit driver is damaged. 5. The press displayed is different from the actual press. 6. The solenoid valve is faulty. 7. The refrigerant is overfilled.	1. Check the power supply of the outdoor unit. 2. Check the on/off signal cables of the outdoor unit. 3. Clean the condenser fins. 4. Maintain or replace the outdoor unit or unit driver. 5. Calibrate or replace the press sensor. 6. Maintain or replace the solenoid coil or the solenoid valve. 7. Decrease certain amount of refrigerant.

Alarm ID	Alarm	Alarm Severity	Default Value	Impact	Possible Cause	Solution
a058	Comp discharge HP lock	Critical	4.25 MPa	The alarm is generated, and the compressor is locked. Can not start the locked compressor.	The a057 comp discharge HP alarm is generated frequently.	Reference to the solutions for the a057 comp discharge HP alarm.
a059	Suction press sensor fault	Major	N/A	The alarm is generated.	1. The cables to the press sensor are loose or damaged. 2. The press sensor is faulty.	1. Check the cables to the press sensor. 2. Replace the press sensor.

Alarm ID	Alarm	Alarm Severity	Default Value	Impact	Possible Cause	Solution
a060	Compressor LP	Major	0.25 MPa	The alarm is generated, and the compressor shuts down.	1. The refrigerant leaks. 2. The solenoid valve is faulty. 3. The cables to the press sensor are loose or damaged. 4. The press displayed is different from the actual press. 5. The dryer filter is blocked. 6. The expansion valve is blocked. 7. The indoor fans are faulty.	1. Check for any leakages. Fill refrigerant after maintenance or replacement. 2. Maintain or replace the solenoid coil or the solenoid valve. 3. Check the cables to the press sensor. 4. Calibrate or replace the press sensor. 5. Maintain or replace the dryer filter. 6. Maintain or replace the expansion valve. 7. Maintain or replace the indoor fans.
a061	Compressor LP lock	Critical	0.25 MPa	The alarm is generated, and the compressor is locked. Can not start the locked compressor.	The a060 comp LP alarm is generated frequently.	Refer to the solutions for the a060 comp LP alarm.

Alarm ID	Alarm	Alarm Severity	Default Value	Impact	Possible Cause	Solution
a062	Comp drive alarm	Major	N/A	The alarm is generated, and the compressor shuts down.	1. The comp driver is faulty. 2. The comp is faulty.	1. Maintain or replace the comp driver. 2. Maintain or replace the comp.
a063	Comp drive com failed	Critical	N/A	The alarm is generated, and the compressor shuts down.	1. The cables to the comp driver are loose or damaged. 2. The comp driver is faulty.	1. Check the cables to the comp driver. 2. Maintain or replace the comp driver.
a064	Comp drive lock	Critical	N/A	The alarm is generated.	The comp shuts down due to the driver fault for multiple times.	Check whether other alarms of the comp driver are generated.
a065	Comp drive DC overvoltage	Major	N/A	The alarm is generated.	1. The power supply voltage is high. 2. The comp driver is faulty. 3. The comp is faulty.	1. Check the power supply voltage. 2. Maintain or replace the comp driver. 3. Maintain or replace the comp.

Alarm ID	Alarm	Alarm Severity	Default Value	Impact	Possible Cause	Solution
a066	Comp drive DC undervolt	Major	N/A	The alarm is generated.	1. The power supply voltage is low. 2. The comp driver is faulty. 3. The comp is faulty. 4. The main power supply is faulty or the cables to the comp driver are loose or damaged.	1. Check the power supply voltage. 2. Maintain or replace the comp driver. 3. Maintain or replace the comp. 4. Reconnect the main power supply or the cables to the comp driver.
a067	Comp drive overload	Major	N/A	The alarm is generated.	1. The comp is in lack of oil. 2. The condenser fins are blocked. 3. The outdoor units do not run properly. 4. The solenoid valve is faulty. 5. The refrigerant is overfilled. 6. The comp is faulty.	1. Fill oil to the comp. 2. Clean the condenser fins. 3. Maintain or replace the outdoor units. 4. Maintain or replace the solenoid coil or the solenoid valve. 5. Decrease certain amount of refrigerant. 6. Maintain or replace the comp.

Alarm ID	Alarm	Alarm Severity	Default Value	Impact	Possible Cause	Solution
a068	Comp drive overcurrent	Major	N/A	The alarm is generated.	1. The comp is in lack of oil. 2. The condenser fins are blocked. 3. The outdoor units do not run properly. 4. The solenoid valve is faulty. 5. The refrigerant is overfilled. 6. The comp is faulty.	1. Fill oil to the comp. 2. Clean the condenser fins. 3. Maintain or replace the outdoor units. 4. Maintain or replace the solenoid coil or the solenoid valve. 5. Decrease certain amount of refrigerant. 6. Maintain or replace the comp.
a069	Comp start failed	Major	N/A	The alarm is generated.	1. The comp is in lack of oil. 2. The comp driver is faulty. 3. The comp is faulty.	1. Fill oil to the comp. 2. Maintain or replace the comp driver. 3. Maintain or replace the comp.
a070	Comp drive fan fault	Major	N/A	The alarm is generated.	The fans in the comp driver are faulty.	Check the fans in the comp driver.
a071	Comp drive module overheat	Major	N/A	The alarm is generated.	1. The fans in the comp driver are faulty. 2. Dirt exists in the air vents of the fans in the comp driver.	1. Check the fans in the comp driver. 2. Clean the air vents of the fans in the comp driver.

Alarm ID	Alarm	Alarm Severity	Default Value	Impact	Possible Cause	Solution
a072	Comp drive U phase loss	Critical	N/A	The alarm is generated.	1. The cables to phase U of the comp driver are loose or damaged. 2. The comp driver is faulty.	1. Check the cables to the comp driver. 2. Maintain or replace the comp driver.
a073	Comp drive V phase loss	Critical	N/A	The alarm is generated.	1. The cables to phase V of the comp driver are loose or damaged. 2. The comp driver is faulty.	1. Check the cables to the comp driver. 2. Maintain or replace the comp driver.
a074	Comp drive W phase loss	Critical	N/A	The alarm is generated.	1. The cables to phase W of the comp driver are loose or damaged. 2. The comp driver is faulty.	1. Check the cables to the comp driver. 2. Maintain or replace the comp driver.
a075	Comp phase current alarm	Major	32 A	The alarm is generated, and the compressor shuts down.	1. The comp is in lack of oil. 2. The condenser fins are blocked. 3. The outdoor units do not run properly. 4. The solenoid valve is faulty. 5. The refrigerant is overfilled. 6. The comp is faulty.	1. Fill oil to the comp. 2. Clean the condenser fins. 3. Maintain or replace the outdoor units. 4. Maintain or replace the solenoid coil or the solenoid valve. 5. Decrease certain amount of refrigerant. 6. Maintain or replace the comp.

Alarm ID	Alarm	Alarm Severity	Default Value	Impact	Possible Cause	Solution
a076	Humidifier alarm	Major	N/A	The alarm is generated, and the humidification operation stops.	1. Water of the humidifier is insufficient. 2. The humidifier is faulty. 3. The cables to the humidifier are loose or damaged.	1. Solve the water insufficiency problem. 2. Maintain or replace the humidifier and tap Maint > Performance Maint to clear the humidifier total runtime. 3. Check the cables to the humidifier. Power off the entire system and then power it on.
a077	Indoor fan 1 fault Indoor fan 2 fault	Critical	N/A	The alarm is generated. Can not start the compressor, humidifier, and electric heater.	1. The power supply to the indoor fan is abnormal. 2. The cables to the indoor fan are loose or damaged. 3. The indoor fan is faulty.	1. Check the power supply to the indoor fan. 2. Check the cables to the indoor fan. 3. Maintain or replace the indoor fan.

Alarm ID	Alarm	Alarm Severity	Default Value	Impact	Possible Cause	Solution
a078	Full water	Critical	N/A	The alarm is generated, and the system shuts down.	1. The cables to the high float are loose or damaged. 2. The high float is faulty or stuck. 3. The cond pump is faulty, or the drainage capacity decreases if configured. 4. The drainpipe of the cond pump is blocked if the cond pump is configured. 5. The internal drainpipe or the pipeline is blocked if no cond pump is configured.	1. Check the cables to the high float. 2. Maintain or replace the high float or clear the obstacles. 3. Maintain or replace the cond pump. 4. Clear the obstacles in the drainpipe of the cond pump. 5. Clear the internal drainpipe.

Alarm ID	Alarm	Alarm Severity	Default Value	Impact	Possible Cause	Solution
a079	Drain abnormal	Major	N/A	The alarm is generated.	1. The cables to the float are loose or damaged. 2. The float is faulty or stuck. 3. The cond pump is faulty, or the drainage capacity decreases if configured. 4. The drainpipe of the cond pump is blocked if the cond pump is configured. 5. The internal drainpipe or the pipeline is blocked if no cond pump is configured. 6. Air penetrates the water pump pipe if the cond pump is configured.	1. Check the cables to the float. 2. Maintain or replace the float or clear the obstacles. 3. Maintain or replace the cond pump. 4. Clear the obstacles in the drainpipe of the cond pump. 5. Clear the internal drainpipe. 6. Exhaust air in the water pump pipe.
a081	Power undervolt	Major	86%	The alarm is generated, and the system shuts down.	1. The power supply voltage is lower than the power undervolt alarm thres. 2. The voltage jumper connected to the smart cooling product unit is incorrect.	1. Check the power supply voltage. 2. Maintain or replace the voltage jumper.

Alarm ID	Alarm	Alarm Severity	Default Value	Impact	Possible Cause	Solution
a082	Power overvoltage	Major	114%	The alarm is generated, and the system shuts down.	1. The power supply voltage is higher than the power overvoltage alarm threshold. 2. The voltage jumper connected to the smart cooling product unit is incorrect.	1. Check the power supply voltage. 2. Maintain or replace the voltage jumper.
a083	Surge protection board fault	Major	N/A	The alarm is generated.	1. The SPD is faulty. 2. The cables to the SPD are loose or damaged. 3. The port of the control board is faulty.	1. Maintain or replace the SPD. 2. Check the cables to the SPD. 3. Maintain or replace the control board.
a084	Power fault	Critical	N/A	The alarm is generated, and the system shuts down.	1. No voltage jumper is connected to the smart cooling product unit. 2. The voltage jumper is faulty.	1. Connect a correct voltage jumper to the smart cooling product unit. 2. Maintain or replace the voltage jumper.
a085	Route A fuse disconnect	Critical	N/A	The alarm is generated, and the system shuts down.	1. A device on loop A is faulty. 2. The loop A fuse is loose, aged, or disconnected.	1. Maintain or replace the faulty device on loop A. 2. Maintain or replace the fuse.

Alarm ID	Alarm	Alarm Severity	Default Value	Impact	Possible Cause	Solution
a086	Route B fuse disconnect	Critical	N/A	The alarm is generated, and the system shuts down.	1. A device on loop B is faulty. 2. The loop B fuse is loose, aged, or disconnected.	1. Maintain or replace the faulty device on loop B. 2. Maintain or replace the fuse.
a087	Route C fuse disconnect	Critical	N/A	The alarm is generated, and the system shuts down.	1. A device on loop C is faulty. 2. The loop C fuse is loose, aged, or disconnected.	1. Maintain or replace the faulty device on loop C. 2. Maintain or replace the fuse.
a088	Route D fuse disconnect	Critical	N/A	The alarm is generated, and the system shuts down.	1. A device on loop D is faulty. 2. The loop D fuse is loose, aged, or disconnected.	1. Maintain or replace the faulty device on loop D. 2. Maintain or replace the fuse.
A089	Comp speed limit	Major	N/A	The alarm is generated.	1. The comp is in lack of oil. 2. The refrigerant leaks.	1. Fill oil to the comp. 2. Check for any leakages. Fill refrigerant after maintenance or replacement.
a090	Cond pump exceeded runtime	Warning	40000 hours	The alarm is generated.	The accumulated runtime of the cond pump exceeds the alarm thres.	Maintain or replace the cond pump. Tap Maint > Performance Maint to clear the accumulated runtime.

Alarm ID	Alarm	Alarm Severity	Default Value	Impact	Possible Cause	Solution
a093	High humidity	Warning	85%	The alarm is generated.	1. The load is low. 2. The T/H sensors are located in inappropriate positions. 3. The ambient humidity is high. 4. The high humidity alarm thres is inappropriate. 5. The humidity displayed is different from the actual humidity.	1. Please consult Huawei technical support. 2. Adjust the positions of the T/H sensors. 3. Check the ambient humidity. 4. Adjust the high humidity alarm thres. 5. Calibrate or replace the abnormal T/H sensors.
a094	Low humidity	Warning	10%	The alarm is generated.	1. The T/H sensors are located in inappropriate positions. 2. The ambient humidity is low. 3. The low humidity alarm thres is inappropriate. 4. The humidity displayed is different from the actual humidity.	1. Adjust the positions of the T/H sensors. 2. Check the ambient humidity. 3. Adjust the low humidity alarm thres. 4. Calibrate or replace the abnormal T/H sensors.
a095	Comp drive short period	Critical	N/A	The alarm is generated.	The comp driver is faulty for multiple times, or the faulty lasts for a long time.	Maintain or replace the comp driver.

Alarm ID	Alarm	Alarm Severity	Default Value	Impact	Possible Cause	Solution
a103	Indoor fan power alarm	MAJOR	-	The alarm is generated.	The cables to the power module of the indoor fan are loose or damaged.	Check the cables to the dry contact of the power module.
a105	Indoor fan failure	CRITICAL	-	The alarm is generated.	1. The indoor fan is faulty. 2. The cables to the indoor fan are loose or damaged.	1. Maintain or replace the indoor fan. 2. Check the cables to the indoor fan.
a107	Main outage	Warning	N/A	The alarm is generated, and heating and humidification operations are prohibited.	1. The supply power is cut off. 2. The dry contact is faulty.	1. Check the power supply cables. 2. Check the dry contact.

Alarm ID	Alarm	Alarm Severity	Default Value	Impact	Possible Cause	Solution
a108	Cold-aisle 1 temp invalid Cold-aisle 2 temp invalid Cold-aisle 3 temp invalid	Major	N/A	The alarm is generated.	1. Dirt or water exists around the T/H sensor, which leads to a detection fault. 2. The T/H sensor is faulty.	1. Remove dirt or water from the T/H sensor. 2. Maintain or replace the T/H sensor.
a109	Cold-aisle 1 humid invalid Cold-aisle 2 humid invalid Cold-aisle 3 humid invalid	Major	N/A	The alarm is generated.	1. Dirt or water exists around the T/H sensor, which leads to a detection fault. 2. The T/H sensor is faulty.	1. Remove dirt or water from the T/H sensor. 2. Maintain or replace the T/H sensor.

Alarm ID	Alarm	Alarm Severity	Default Value	Impact	Possible Cause	Solution
a110	Cold aisle 1 T/H brd com m faile d Cold aisle 2 T/H brd com m faile d Cold aisle 3 T/H brd com m faile d	Major	N/A	The alarm is generated.	1. The cables to the T/H sensor are loose or damaged. 2. The DIP switch of the T/H sensor is set incorrectly. 3. The T/H sensor is faulty. 4. The communication port of the control board is faulty.	1. Check the cables to the T/H sensor. 2. Set the DIP switch of the T/H sensor correctly. 3. Maintain or replace the T/H sensor. 4. Maintain or replace the control board.
a111	Hot-aisle 1 temp invali d Hot-aisle 2 temp invali d Hot-aisle 3 temp invali d	Major	N/A	The alarm is generated.	1. Dirt or water exists around the T/H sensor, which leads to a detection fault. 2. The T/H sensor is faulty.	1. Remove dirt or water from the T/H sensor. 2. Maintain or replace the T/H sensor.

Alarm ID	Alarm	Alarm Severity	Default Value	Impact	Possible Cause	Solution
a112	Hot-aisle 1 humid invalid Hot-aisle 2 humid invalid Hot-aisle 3 humid invalid	Major	N/A	The alarm is generated.	1. Dirt or water exists around the T/H sensor, which leads to a detection fault. 2. The T/H sensor is faulty.	1. Remove dirt or water from the T/H sensor. 2. Maintain or replace the T/H sensor.

Alarm ID	Alarm	Alarm Severity	Default Value	Impact	Possible Cause	Solution
a113	Hot-aisle 1 T/H brd com m faile d Hot-aisle 2 T/H brd com m faile d Hot-aisle 3 T/H brd com m faile d	Major	N/A	The alarm is generated.	1. The cables to the T/H sensor are loose or damaged. 2. The DIP switch of the T/H sensor is set incorrectly. 3. The T/H sensor is faulty. 4. The communication port of the control board is faulty.	1. Check the cables to the T/H sensor. 2. Set the DIP switch of the T/H sensor correctly. 3. Maintain or replace the T/H sensor. 4. Maintain or replace the control board.
a116	iCooling communication fault	Major	N/A	The alarm is generated.	1. The communication cable is faulty between the A/C master and EMS in this MDC. 2. The EMS is faulty.	1. Check the communication cable between the A/C master and EMS. 2. Check the EMS power supply.

Alarm ID	Alarm	Alarm Severity	Default Value	Impact	Possible Cause	Solution
a117	Group units number not match	Major	N/A	The alarm is generated.	1. Slave unit's Teamwork Settings are incorrect. 2. Master unit's Teamwork Settings are incorrect. 3. Slave unit dropped.	1. Modify slave unit's Teamwork Settings, join the Teamwork Group. 2. Modify the master unit's Total number of units according the actual number. 3. Check slave unit's Teamwork Wire connection and Running Condition.

Alarm ID	Alarm	Alarm Severity	Default Value	Impact	Possible Cause	Solution
a119	L1/L2 linkage condition not met	Major	N/A	Cables to the temp sensor in the cabinet are not properly connected.	1. The cables to the cabinet temp sensor are loose or damaged. 2. The cabinet temp sensor is faulty. 3. The monitoring host (ECC) is faulty. 4. The rack environment unit is faulty. 5. The temp sensor configuration is incorrect in the monitoring host (ECC). 6. The smart cooling product configuration is incorrect. 7. Teamwork settings are incorrect for the master unit.	1. Maintain or replace the cables to the temp sensor, rack environment unit, and the monitoring host (ECC). 2. Maintain or replace the temp sensor of cabinets. 3. Check or maintain the monitoring host (ECC). 4. Check or maintain the rack environment unit. 5. Check that the configuration between the temp sensor and the cabinet is correct. 6. Check that the configuration of the monitoring host (ECC) is correct. 7. Set total number of units on the master unit to the actual number of units.

Alarm ID	Alarm	Alarm Severity	Default Value	Impact	Possible Cause	Solution
a120	A/C abnormal L1/L2 disconnect	Major	N/A	The alarm is generated.	1. Teamwork settings are incorrect for slave units. 2. Teamwork settings are incorrect for the master unit. 3. A slave unit is power off or offline. 4. The ETH converter is faulty. 5. The smart socket is faulty. 6. The cables are faulty between the smart cooling product and the smart socket or monitoring host.	1. Modify teamwork settings for slave units to enable slave units to join the teamwork group. 2. Set total number of units on the master unit to the actual number of units. 3. Check the cable connection and running conditions of the slave units. 4. Maintain or replace the ETH converter. 5. Maintain or replace the smart socket. 6. Maintain or replace the cables between the smart cooling product and the smart socket or monitoring host.

Alarm ID	Alarm	Alarm Severity	Default Value	Impact	Possible Cause	Solution
a175	L1/L2 linkage humidity not met	Major	N/A	The alarm is generated.	1. The cabinet T/H sensor is faulty. 2. The cables to the cabinet T/H sensor are loose or damaged. 3. The aisle T/H sensor of an smart cooling product is faulty. 4. The cables to the aisle T/H sensor of an smart cooling product are loose or damaged. 5. The DIP switch of the T/H sensor is set incorrectly. 6. The communications port of the control board is faulty. 7. The ETH converter is faulty. 8. The smart socket is faulty.	1. Maintain or replace the cabinet T/H sensor. 2. Maintain or replace the cables to the temp sensor, rack environment unit, and monitoring host (ECC). 3. Maintain or replace the T/H sensor of the smart cooling product. 4. Maintain or replace the cables between the T/H sensor and the control board. 5. Set the DIP switch correctly for the T/H sensor. 6. Maintain or replace the control board. 7. Maintain or replace the ETH converter. 8. Maintain or replace the smart socket.

Alarm ID	Alarm	Alarm Severity	Default Value	Impact	Possible Cause	Solution
a177	Humidity invalid L1/L2 interrupt	Major	N/A	The alarm is generated.	1. All cabinet T/H sensors are faulty. 2. All cables to the cabinet T/H sensors are loose or damaged. 3. All aisle T/H sensors of smart cooling products are faulty. 4. All cables to the aisle T/H sensors of smart cooling products are loose or damaged. 5. All DIP switches of the T/H sensors are set incorrectly. 6. All communications ports of the control board are faulty. 7. The ETH converter is faulty. 8. The smart socket is faulty.	1. Maintain or replace the cabinet T/H sensors. 2. Maintain or replace the cables to the temp sensors, rack environment units, and monitoring host (ECC). 3. Maintain or replace the T/H sensors of smart cooling products. 4. Maintain or replace the cables between the T/H sensors and the control board. 5. Set the DIP switches correctly for T/H sensor. 6. Maintain or replace the control board. 7. Maintain or replace the ETH converter. 8. Maintain or replace the smart socket.

6.4 Troubleshooting

NOTICE

- Certain circuits in the NetCol5000-A has lethal voltage. Only professional technicians are allowed to perform maintenance.
- Exercise caution during live-line troubleshooting.
- If jumpers are used for troubleshooting, remove them after troubleshooting. Connected jumpers may affect control functions and damage equipment.

Table 6-7 describes how to troubleshoot the NetCol5000-A.

Table 6-7 Troubleshooting

Symptom	Possible Cause	Solution
The unit generates abnormal voice.	Compressor, fans, or pipes are loose.	Check the fixing structure and ensure that all components are securely installed.
A compressor does not work.	The high-pressure switch reacts.	Check the high-pressure switch status.
	Circuit breakers, fuses, or cables are disconnected.	Check the main circuit breaker, compressor circuit breakers, fuses, and cables.
	A compressor motor is damaged.	Replace the motor.
	A compressor does not need to start.	Check for any startup requirement on the LCD.
The compressor exhaust temperature is too high.	The refrigerant loop or a component is blocked.	Check whether the refrigerant loop or a component is blocked.
	The outdoor unit is installed in an inappropriate position. (The outdoor unit should not be exposed to direct sunlight and must be installed at a specified spacing according to the installation guide.)	Install the outdoor unit in a correct position, without exposure to direct sunlight and with an appropriate spacing.
	Air exists in the cooling system.	Exhaust air, and examine and repair the pipeline.
	Heat dissipation is poor because of blockages in the condenser.	Clean the condenser fins.

Symptom	Possible Cause	Solution
	An outdoor fan fails.	Check whether the outdoor fan works.
	Refrigerant is insufficient.	Increase the amount of refrigerant filled.
The compressor exhaust temperature is too low.	The outdoor fan speed controller fails.	Replace the speed controller.
	Refrigerant is leaking.	Check the pipeline for any leakage.
The compressor suction temperature is too low or liquid returns.	The refrigerant filled is insufficient.	Add the refrigerant.
	The indoor temperature is too low.	Change the temperature setting.
	Filters are clogged with dirt.	Replace the filters.
	The superheat degree that is set with the thermostatic expansion valve is inappropriate.	Adjust the thermostatic expansion valve to an optimal degree.
	The sensing bulb is disconnected from the thermostatic expansion valve.	Check whether the thermometer bulb is disconnected from the thermostatic expansion valve.
	The external excess pressure is too high, and air decreases.	Check whether the air duct is blocked.
	The condensing pressure is too low.	Check the condenser.
Compressor generate excessive noises.	Liquid returns in a compressor.	Check whether the oil temperature and exhaust temperature are within a normal range.
	The lubricant is insufficient.	Add the lubricant.
	The transport sheet metal is not removed from a compressor.	Remove the sheet metal.
An indoor fan fails to start.	Either the main circuit breaker or the indoor fan circuit breaker is not switched on.	Check the circuit breaker status.

Symptom	Possible Cause	Solution
	An indoor fan contactor has an abnormal pickup.	Check whether the main control board sends signals to the indoor fan contactor and whether the contactor is damaged.
	An indoor fan is damaged.	Replace the indoor fan.
The heating function is unavailable.	The electric heater temperature switch is being protected.	Check whether the temperature switch is faulty. Replace the faulty switch.
	The electric heater circuit breaker is off.	Check the electric heater circuit breaker status.
	An electric heater is burnt out.	Disconnect the power supply and check whether the electric heater is damaged by checking the electric heater resistance properties with an ohmmeter.
The water overflows the NetCol5000-A.	The drainpipe does not connect to the pump, or the lift between the drainpipe and the water chiller is set to an appropriate value.	Ensure that the drainpipe correctly connect to the pump, and ensure that the lift of the drainpipe is shorter than 3.5 m.
	The general circuit breaker or water pump circuit breaker is disconnected.	Check the status of the circuit breakers.
	The water pump is faulty.	Check the alarms displayed on the LCD, cables to the pump, whether the water pump runs properly, and replace the water pump if necessary. Switch the plug screw, as shown in Figure 5-7 , to discharge air, then switch off it.

Symptom	Possible Cause	Solution
	Water level floats are faulty.	Check alarms displayed on the LCD, cables to the high and low water level floats, whether the water level floats are damaged, and replace the water level floats if necessary.
	The inlet pipe and drainpipe leak.	Check the inlet pipe and drainpipe and the connectors. Rectify any leakage and fasten the connectors.
	The self-drainpipe is blocked.	Check that no blocks and frost in the self-drainpipe.
The humidity of the computer room is high, or condensate water generates.	The total load of servers, relative to a single smart cooling product, is less than 10 kW.	• Make sure that the doors, windows, floor, and ceiling of the datacenter room/ container environment are sealed well. • If the outside environment humidity is too high, shut down the fresh air system. • In modular datacenter, open the modular doors and ceilings, or open some false panel on the IT rack.

Table 6-8 Humidifier Faults

No.	Symptom	Possible Cause	Measures
1	Water spouts when it is charged into the humidifier cylinder for the first time.	Bubbles exist in the water inlet pipe when water is charged into the humidifier for the first time.	During the initial power-on commissioning, gently open the front valve.

No.	Symptom	Possible Cause	Measures
2	In the commissioning or running period, humidification is enabled, but the humidifier neither humidifies nor generates alarms.	The mains fail, or the manual drainage switch is not turned to "O: Normal humidifying".	In the commissioning or running period, switch on the humidifier circuit breaker and flip the manual drainage switch to "O: Normal humidifying".
3	The water inlet pipe or drainpipe leaks.	The water inlet pipe or drainpipe is not secured or is broken.	Repair leaking parts.
4	Water is continuously charged into the humidifier cylinder.	The water inlet solenoid valve fails and cannot be closed.	Manually start the humidifier several times. If the problem persists, replace the water inlet solenoid valve.
5	The humidifier circuit breaker trips automatically.	The actual current exceeds the upper threshold, which causes the current transformer to fail. The detected current is incorrect.	Start the humidifier and check the humidifier current. The appropriate current is less than 4 A. If the current exceeds 6 A, the current breaker will shutdown automatically. If the current is reasonable, check the current transformer and its cable.
6	The water level decreases gradually, but the humidifier cylinder does not work and no manual drainage is ongoing.	The drainage valve leaks.	Manually start the drainage valve several times. If the problem persists, replace the drainage valve.
7	The humidifier cylinder overflows.	Poor water quality brings severe water scale at the bottom of the cylinder. The drainpipe or drain outlet is blocked, and the high water level sensor is faulty.	Clean the drain outlet and check the high water level sensor cable is properly connected.

No.	Symptom	Possible Cause	Measures
8	Water fails to come into the humidifier cylinder.	1. There is no front water supply or the water supply is not sufficient. 2. The water intake solenoid valve of the humidifier cylinder is faulty. 3. The humidifier controller is faulty.	1. Check that the front water supply valve is open. 2. Check that the water intake solenoid valve is open when humidification is enabled. 3. Replace the humidifier controller.

 NOTE

If the fault does not restore, contact Huawei technical support.

6.5 Parts Replacement

After replacing any part, verify that the new part works properly.

6.5.1 Replacing Filters

Prerequisites

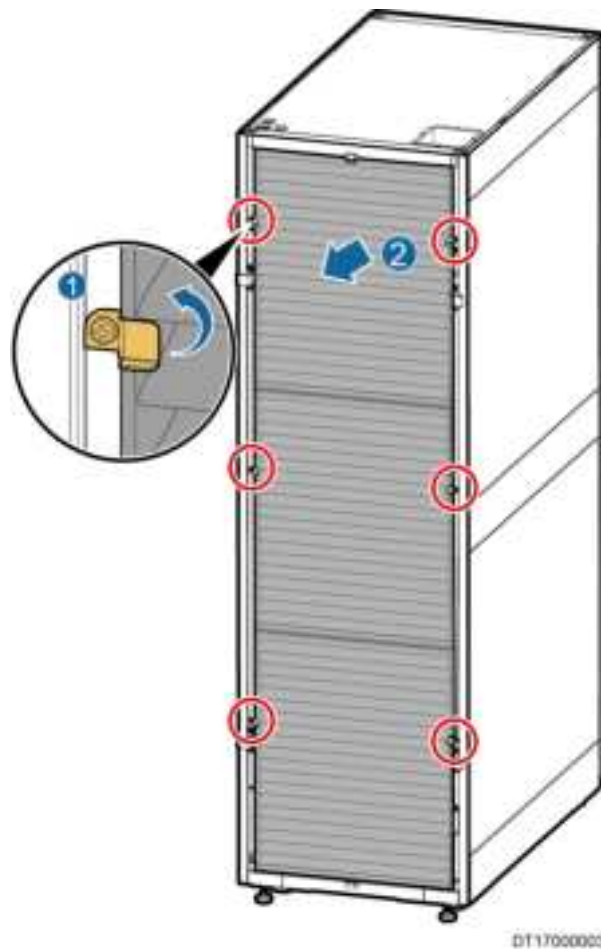
- Recommended materials: new filters
- Preparations: open the rear door.

Figure 6-3 shows the positions of air filters in the indoor unit. They are located at the top, middle, and bottom of an indoor unit.

Procedure

- Step 1** Open the rear door of the cabinet and twist the cards at the left and right sides of the air filter at the top, as shown by 1 in **Figure 6-3**.
- Step 2** Drag the air filter out, as shown by 2 in **Figure 6-3**.

Figure 6-3 Replacing air filters



Step 3 Drag the air filter in the middle and bottom out using the same way.

Step 4 Install a new air filter in an inverse order.

NOTICE

Precautions for replacing an air filter are as follows:

- Install a new air filter based on the instruction on the label.
 - Correctly connect the differential pressure tube.
-

Step 5 Tap **Maint > Performance Maint** to clear the air filter total runtime.

----End

6.5.2 Replacing a Indoor Fan

Prerequisites

NOTICE

- When removing or installing a fan, use a ladder for high-position performance. Do not step on the protective cover of the converter.
 - Install cables for the fan strictly based on the cable labels and the electrical conceptual diagram.
-
- Recommended materials: flat-head screwdriver, Phillips screwdriver, 10# socket wrench, 10# solid wrench, diagonal pliers, ties, and new fans.
 - Preparations: Switch off the outside main power input.

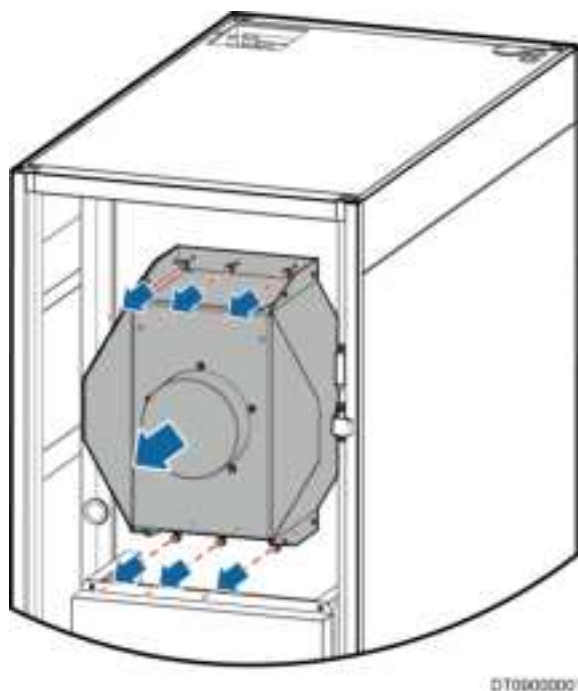
Procedure

- Step 1** Open the rear door. Remove the filters, and switch off the general power input breaker QF1 and fan breaker QF6.
- Step 2** Open the front door.
- Step 3** Use a Phillips screwdriver to open the fan cable protective cover, remove the cable terminals, and cut the cable tie using diagonal pliers.
- Step 4** Use a 10# socket wrench to remove the bolts that fasten the indoor fan, as shown in [Figure 6-4](#).

NOTE

At least two personnel are needed. One removes the bolts and the other rises the fan by hand.

Figure 6-4 Removing bolts that fasten the indoor fan

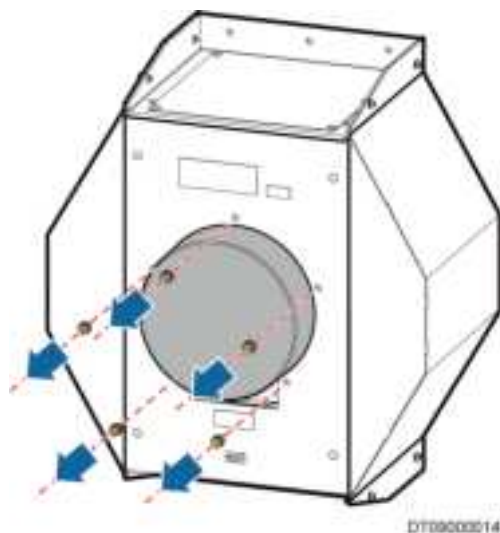


DT06000001

Step 5 Drag the indoor fan out of the unit. Two personnel are needed.

Step 6 Use a 10# solid wrench to remove the five screws connecting the fan and air baffle and drag the fan out of the air baffle, as shown in [Figure 6-5](#).

Figure 6-5 Removing air baffle



Step 7 Install a new indoor fan in an inverse order.

Step 8 Power on the fan and tap **Maint > Diagnostic Mode > Enter** to set the input speed of the indoor fan to 30%. Ensure they work properly. Exit the diagnostic mode.

Step 9 Tap **Maint > Performance Maint** to clear the corresponding indoor fan total runtime.

----End

6.5.3 Replacing a Compressor

Prerequisites

- Recommended materials: Phillips screwdriver, two 45# adjustable wrenches, 45# and 50# torque wrenches, 13# and 30# solid wrenches or socket wrenches, new compressor, dryer filter, refrigerant reclaiming devices, refrigerant charging devices, R410A refrigerant.
- Preparations: Switch off the outside main power input.

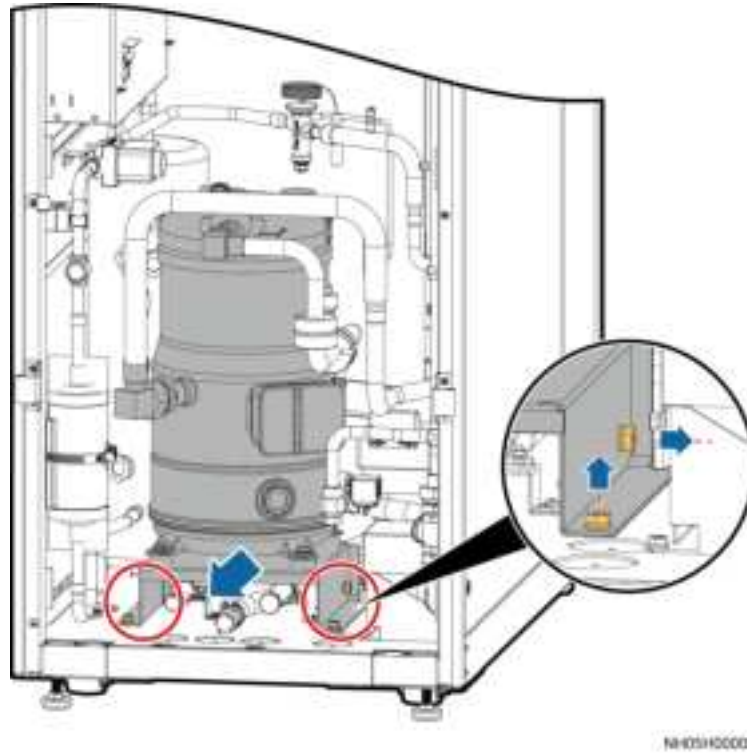
 CAUTION

- Reclaim or dispose of the refrigerant in accordance with local laws and regulations. Do not discharge the refrigerant to the atmosphere.
 - When replacing a compressor, avoid skin contact with the refrigerant or lubricant to prevent frostbite or burns.
 - Do not tilt the compressor during replacement to prevent lubricant leakage.
 - Install a new compressor immediately after you remove the rubber plugs of the suction inlet and exhaust outlet to prevent the moisture.
-

Procedure

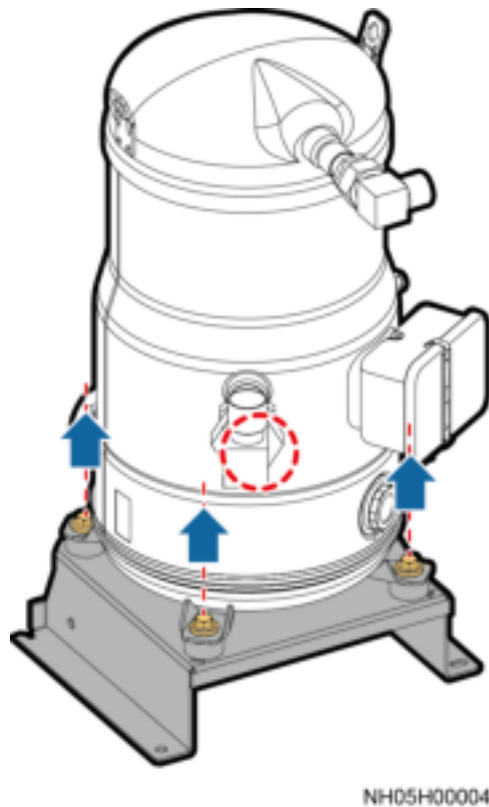
- Step 1** Open the rear door. Remove the filters, and switch off the general power input breaker QF1 and compressor circuit breaker QF3.
- Step 2** Reclaim the refrigerant by referring to the position and methods for vacuumizing in 5.2.3 Vacuumizing.
- Step 3** Remove the compressor heat tape.
- Step 4** Use a Phillips screwdriver to open the outer cover of the power distribution box. And remove the cables from the compressor.
- Step 5** Clamp the suction corner valve with 45# adjustable wrench, and use other two adjustable wrenches (50# and 45#) to remove the suction pipe from the compressor. Seal the suction openings to ensure that the system is clean and does not draw in moisture.
- Step 6** Clamp the discharge corner valve with 45# adjustable wrench, and use other two 45# adjustable wrenches to remove the discharge pipe from the compressor. Seal the discharge openings to ensure that the system is clean and does not draw in moisture.
- Step 7** Use a 13# solid wrench or socket wrench to remove the four bolts from the compressor base and remove the base and compressor, as shown in [Figure 6-6](#).

Figure 6-6 Removing the base and compressor



Step 8 Use a 13# solid wrench or socket wrench to remove the four bolts to separate the compressor and its base, as shown in [Figure 6-7](#).

Figure 6-7 Removing the compressor



Step 9 Blow away dirt with nitrogen.

Step 10 Replace the dryer filter.

 CAUTION

When replacing the dryer filter, take measures to protect pipes from foreign matter.

Step 11 Install a new compressor, crankcase heat tape, and dryer filter in the steps of [Step 10](#) to [Step 1](#). Vacuumize the system and partially charge the system with refrigerant. For details, see section 5.2 Vacuumizing and Charging in Refrigerant.

 CAUTION

Install and tighten the corner valve on discharge pipe to a torque of 100 N m with a torque wrench, and tighten the corner valve on suction pipe to a torque of 120 N m.

Step 12 Connect the compressor cable and check that the phase sequences are correct. Then choose **Maint > Diagnostic Mode > Enter** to check the system pressure and temperature and ensure the refrigerant is charged with an optimal system status (see 5.5 Commissioning Procedure).

Step 13 On the main screen, choose **Maint > Performance Maint**, clear up the compressor running time.

----End

6.5.4 Replacing the High Pressure Switch

Prerequisites

- The high pressure switch needs to be replaced.
- A spare high pressure switch of the same model is available and functional.
- Tools: gloves, Two adjustable wrenchs, thread sealant

Context

The high pressure switch can be maintained only from the rear.

 NOTE

The procedure for replacing a high or low pressure sensor is similar to that for replacing the high pressure switch.

Procedure

Step 1 On the controller home screen, tap Shutdown, and turn off the smart cooling product switch in the upstream PDC.

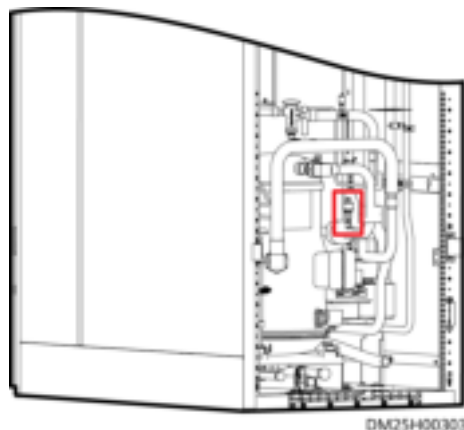
NOTICE

Exercise caution because the device is still energized after it is shut down on the controller home screen.

Step 2 Open the rear door and remove the air filter.

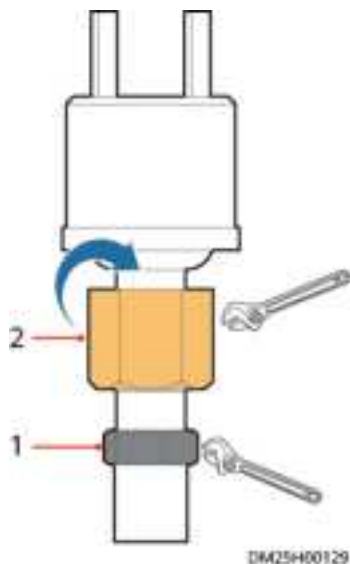
Step 3 Remove the cables from the high pressure switch.

Figure 6-8 Position of the high pressure switch



Step 4 Secure the pipe nut using an adjustable wrench, and loosen the adjustable nut using another adjustable wrench until the high pressure switch is removed.

Figure 6-9 Removing a high pressure switch



(1) Pipe nut

(2) Adjustable nut

⚠ WARNING

Exercise caution when removing the high pressure switch because a small amount of refrigerant will be sprayed when you remove the switch.

Step 5 Apply sealant on the outer side of the air valve connected to the pipe nut.

Step 6 Install the new high pressure switch and connect cables.

Step 7 Install the air filter and close the rear door.

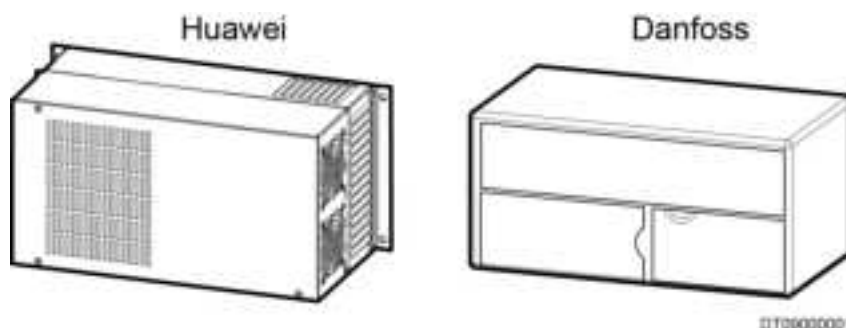
Step 8 Power on the device and tap **Startup** on the home screen. Ensure that the smart cooling product is running normally without any alarms.

----End

6.5.5 Replacing Compressor Drive

Two compressor drives, named "Huawei" and "Danfoss", are shown in [Figure 6-10](#).

Figure 6-10 Compressor drives



6.5.5.1 Replacing a Huawei Compressor Drive

Prerequisites

- Recommended tools and materials: a Phillips screwdriver, a flat-head screwdriver (2 mm and 5 mm), diagonal pliers, cable ties, and a new compressor drive. (The two mounting brackets in the fittings are preinstalled.)
- Before the replacement: The circuit breaker for the external power supply has been switched off.

DANGER

Before checking and maintaining the NetCol5000-A, ensure that the power supply to the NetCol5000-A is disconnected and the drive has been placed without primary power supply for 10 minutes. Otherwise, electric shocks may occur.

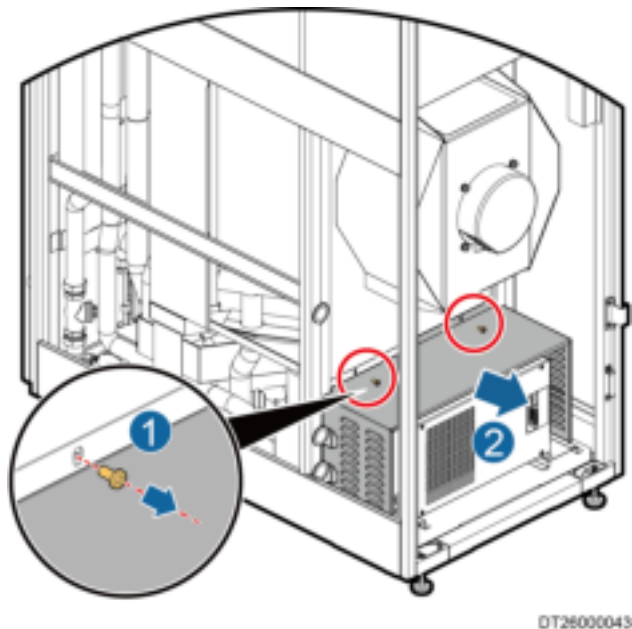
Procedure

Step 1 Open the rear door, remove the air filter, and switch off main circuit breaker QF1 for the NetCol5000-A.

Step 2 Open the front door.

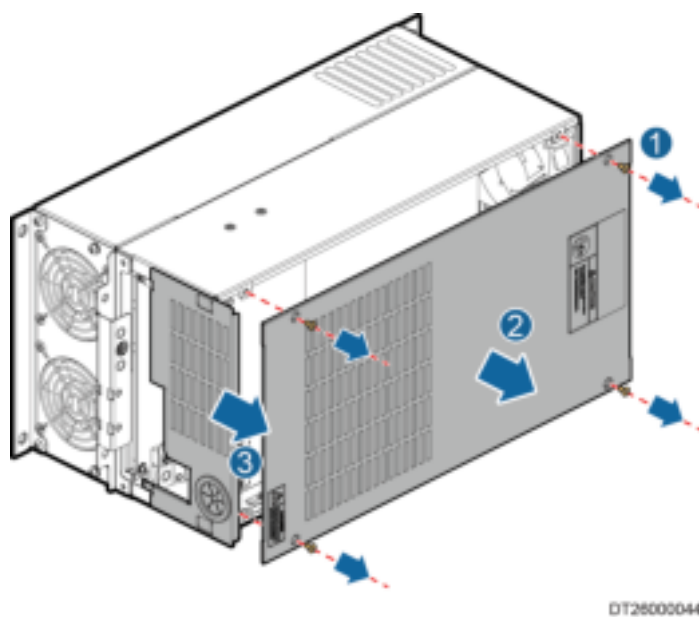
- Step 3** Remove the mounting bracket screws on the U-shaped cover using a Phillips screwdriver, and draw out the U-shaped cover in the horizontal direction, as shown in [Figure 6-11](#).

Figure 6-11 Removing the drive cover



- Step 4** Remove the drive top cover and the baffle plate of the upper chassis, as shown in [Figure 6-12](#).

Figure 6-12 Removing the drive top cover and the baffle plate of the upper chassis

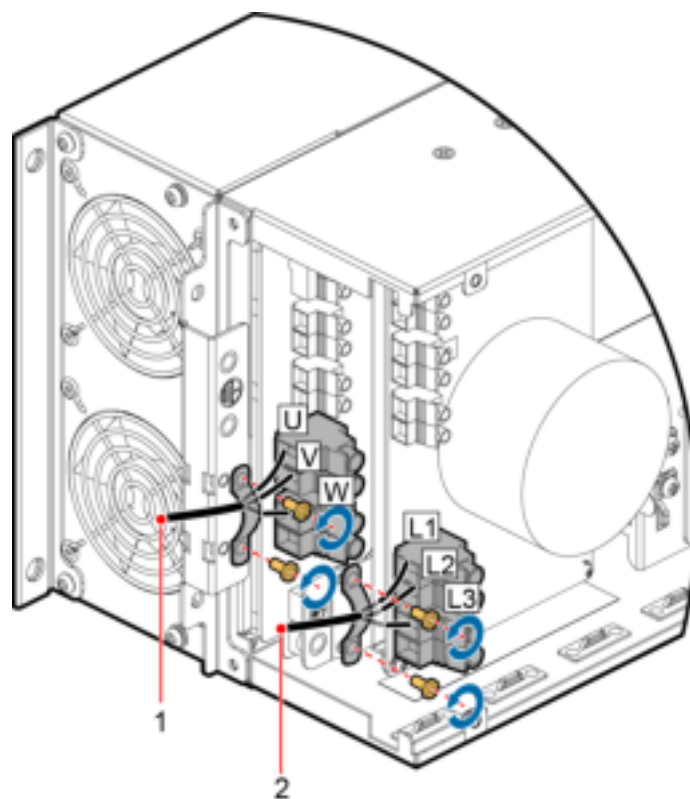


1. Remove the four screws for securing the drive top cover, as shown by 1 in [Figure 6-12](#).

2. Remove the drive top cover, as shown by 2 in [Figure 6-12](#). Cut off the cable ties using a pair of diagonal pliers, record the installation positions of the relay wiring terminals and cable shield layer, and remove relay wiring terminals 01, 02, 03, and communications terminals 61, 68, 69. Remove the cable shield layer from the drive fixing plate at the shield point and replace the control terminal with a new male connector from the drive fittings.
3. Extract the baffle plate of the upper chassis in the direction shown by 3 in [Figure 6-12](#) and draw out the cables.

Step 5 Remove the clamp for fixing the power cables on the input and output sides, loosen the screws for securing the wiring terminals of the power cables using a Phillips screwdriver, and draw out the power cables, as shown in [Figure 6-13](#).

Figure 6-13 Removing input and output power cables



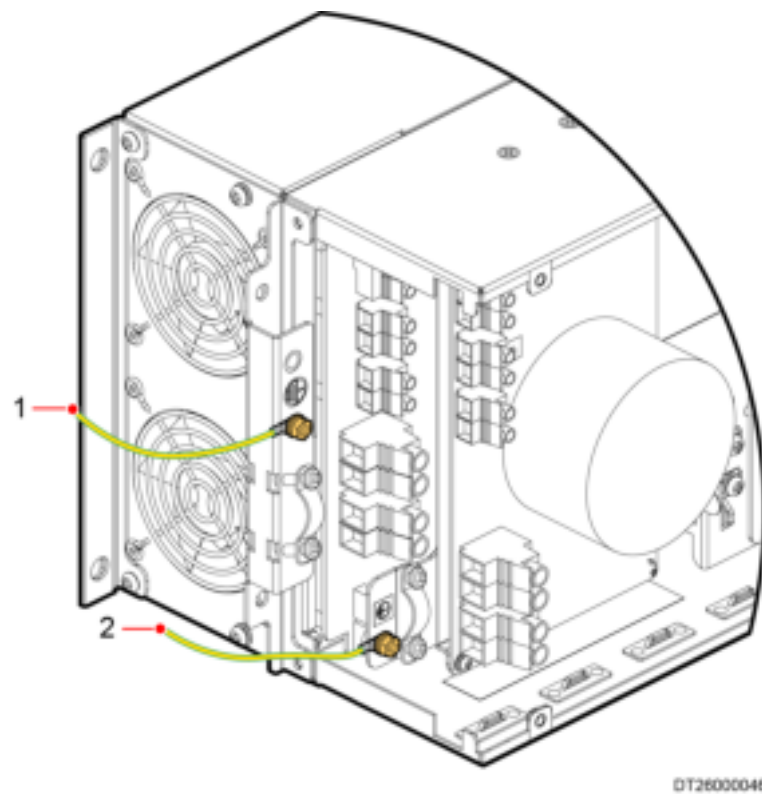
DT26000045

(1) Power cables on the output side

(2) Power cables on the input side

Step 6 Remove the drive ground cables on the input and output sides using a Phillips screwdriver, as shown in [Figure 6-14](#).

Figure 6-14 Removing ground cables on input and output sides

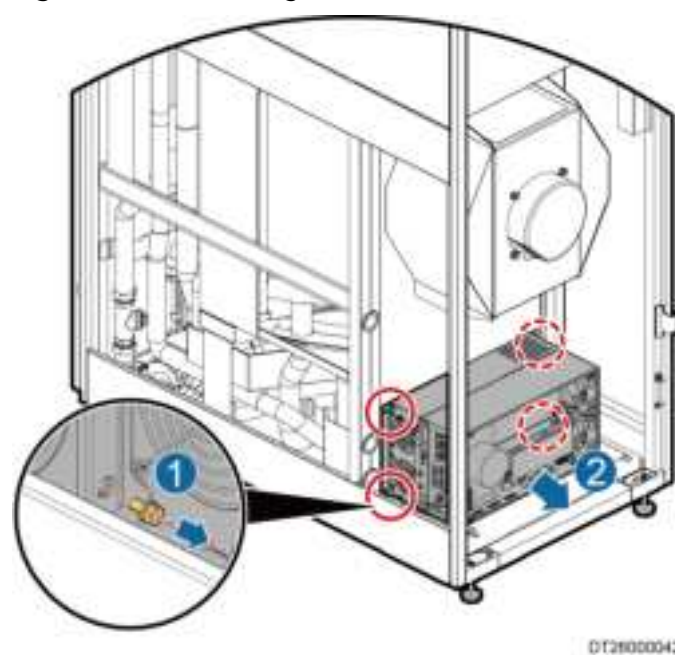


(1) Ground cables on the output side

(2) Ground cables on the input side

Step 7 Remove the screws at the four angles of the drive using a Phillips screwdriver and move the drive out, as shown in [Figure 6-15](#).

Figure 6-15 Removing the drive



Step 8 Reinstall the drive by performing [Step 3](#) to [Step 7](#) in a reverse order.

Step 9 Power on the NetCol5000-A, choose **Maint > Diagnostic Mode > Enter** on the home page, start the compressor, and check that the compressor works properly. Then exit the diagnostic mode.

----End

6.5.5.2 Replacing a Danfoss Compressor Drive

Prerequisites

 DANGER

Before checking and maintaining the NetCol5000-A, ensure that the power supply to the NetCol5000-A is disconnected and the drive has been placed without primary power supply for 10 minutes. Otherwise, electric shocks may occur.

- Recommended materials: Flat-head screwdriver, Phillips screwdriver, socket wrench (M3 and M6), diagonal pliers, coils, new compressor drive.
- Preparations: Switch off the outside main power input.

Procedure

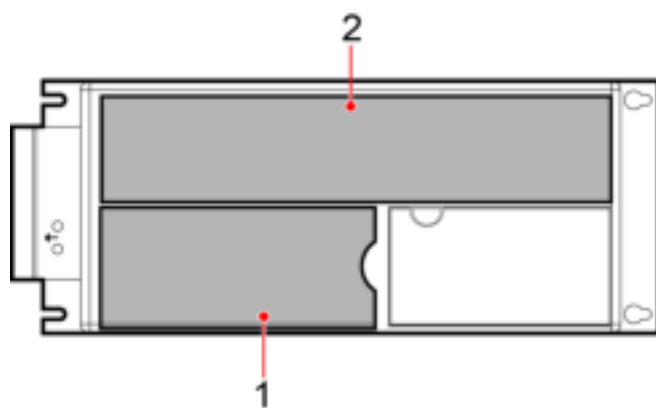
Step 1 Open the rear door. Remove the filters, and switch off the general power input breaker QF1 and compressor circuit breaker QF3.

Step 2 Open the front door.

Step 3 Open the U-shaped protection sheet metals of the compressor drive by using Phillips screwdriver and take it out.

Step 4 Undo the buckle at the groove of the lower baffle plate (shown by 1 in [Figure 6-16](#)) using a flat-head screwdriver. Remove the baffle plate and control communications terminals (terminals with jumpers 12-27 and 12-37 respectively).

Figure 6-16 Compressor Drive Board



DT2600002

(1) Lower baffle plate

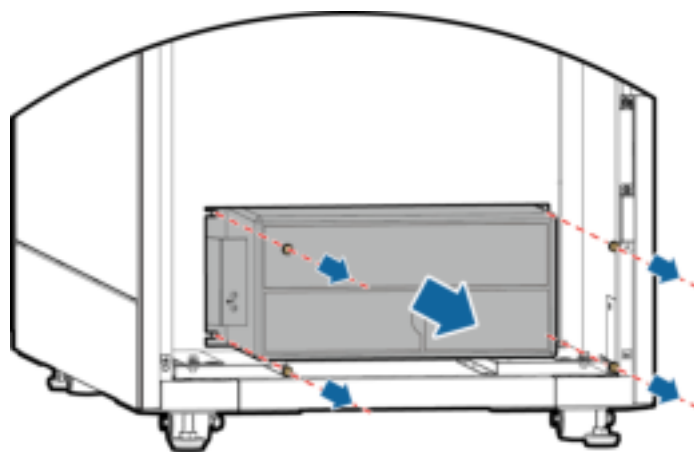
(2) Upper baffle plate

Step 5 Push the buckle of the upper baffle plate on the right of the drive inwards using a flat-head screwdriver until the part of the upper baffle plate (shown by 2 in [Figure 6-16](#)) on the right is free from the buckle. Then move the baffle plate to the right until it is free from the two buckles on the left. Draw out the baffle plate. Remove the power cables and output signal cables using a M3 and M6 box-end hex key.

Step 6 Remove the fastener of the input and output cables of the drive.

Step 7 Remove the screws at the four corners of the compressor drive and drag the compressor drive out, as shown in [Figure 6-17](#).

Figure 6-17 Removing a compressor drive



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Step 8 Install a new compressor drive in an inverse order.

Step 9 Power on the unit and tap **Maint > Diagnostic Mode > Enter** to set a speed of the compressor. Make sure the compressor work properly. Exit the diagnostic mode.

----End

6.5.6 Replacing Condensate Pump

Prerequisites

- Recommended materials: Phillips screwdriver, 45# adjustable wrench, heat gun, and new condensate pump.
- Preparations: Switch off the outside main power input.

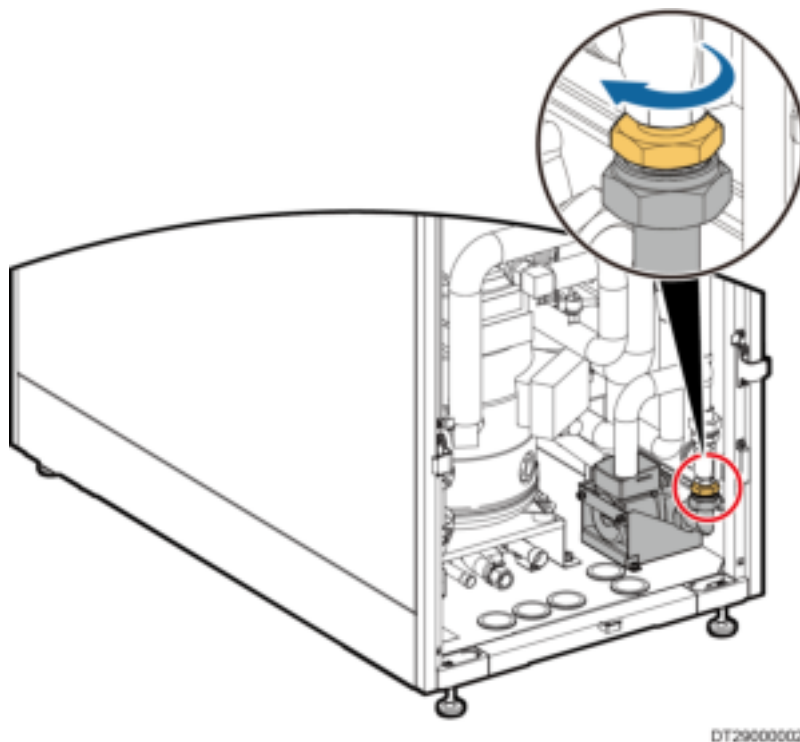
NOTICE

Before replacing a pump, drain the internal water out the pump.

Procedure

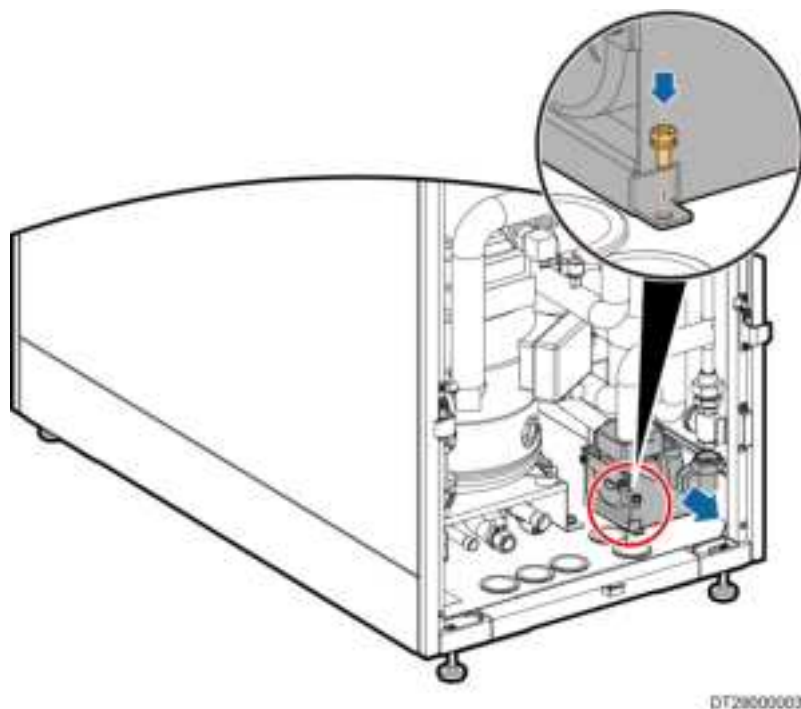
- Step 1** Open the rear door. Remove the filters, and switch off the general power input breaker QF1 and condensate pump breaker QF9.
- Step 2** Open the pump terminal block and disconnect the terminals from the L, N, and PE cables.
- Step 3** Heat the thread adhesive on the plug using a heat gun for 10 minutes. Then loose the water pipe adapter by using 45# adjustable wrench, as shown in [Figure 6-18](#).

Figure 6-18 Loosening the water pipe adapter



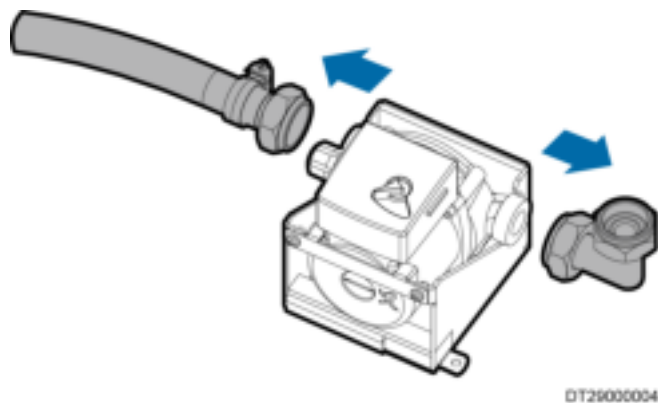
- Step 4** Remove the screws that fasten the pump sheet metals and drag the pump and sheet metals out of the cabinet, as shown in [Figure 6-19](#).

Figure 6-19 Removing the pump



Step 5 Open the fastener and remove two conversion connectors by using adjustable wrench, as shown in [Figure 6-20](#).

Figure 6-20 Removing the conversion connectors



NOTICE

When removing the hose, prepare a container for storing condensate because some condensate may be drained.

Step 6 Open the sheet metals of the pump to drag the pump out.

Step 7 Install a new pump in an inverse order.

 NOTE

Ensure that all water bump pipe joints are sealed with sealant.

Step 8 Power on the condensate pump and test it referring to [5.5 Commissioning Procedure](#). Ensure that the condensate pump works properly and no water leaks.

Step 9 Tap **Maint > Performance Maint** to clear the condensate pump total runtime.

----End

6.5.7 Replacing Humidifier Cylinder

Prerequisites

- Recommended tools: flat-head screwdriver and 10# socket wrench.
- The humidifier cylinder needs to be replaced.
- A spare and functional humidifier cylinder is available.

Context

The rear door is opened for rear-access maintenance.

 CAUTION

After the equipment is powered off, wait for a period and replace the humidifier tank until the pipeline temperature is approximate to the room temperature to avoid scald.

Procedure

Step 1 Press down the drainage button to "I" on one side of the electrical control box to drain the water out of the humidifier cylinder.

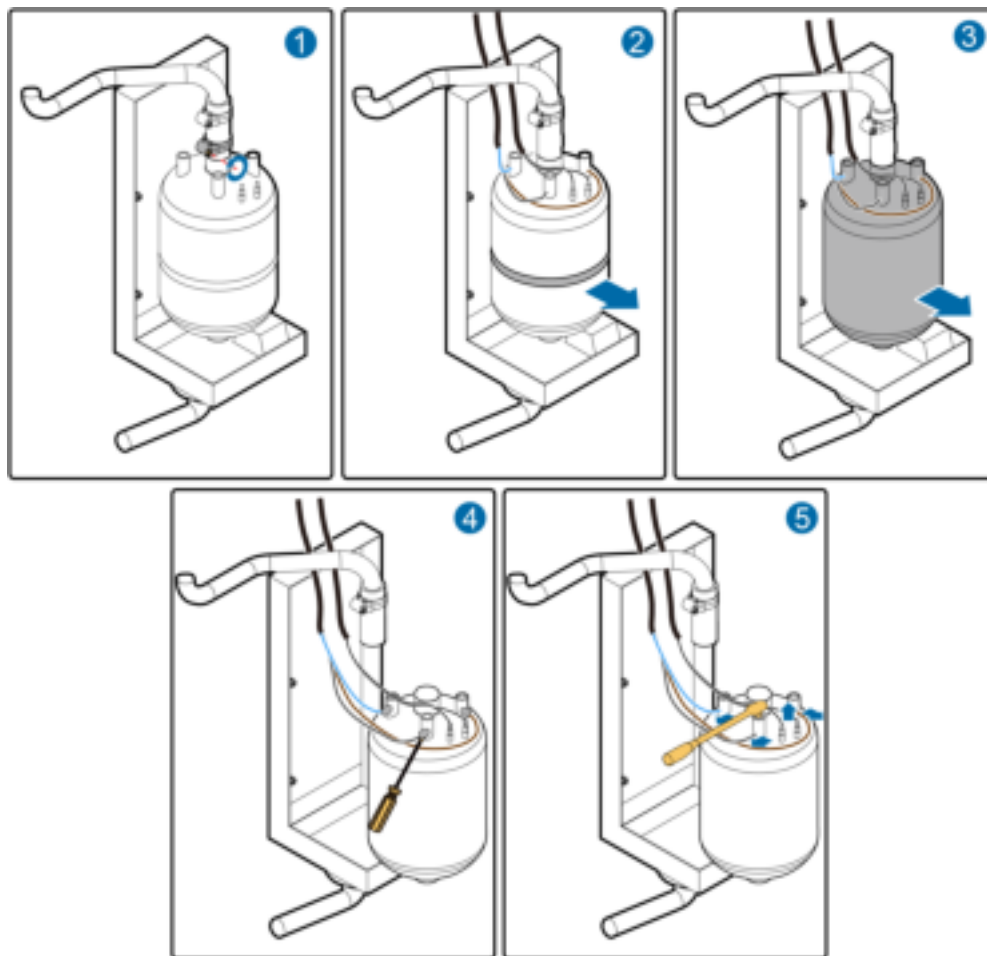
Step 2 Tap **Shutdown** on the main menu. Open the rear door and remove the air filters. Switch off the main circuit breaker QF1 and the front end circuit breaker.

NOTICE

Exercise cautions when performing operations on the screen because the equipment is under power.

Step 3 Loosen the hose clamp above the humidifier cylinder using the flat-head screwdriver, and remove the vapor hose from the humidifier cylinder, as shown by (1) in [Figure 6-21](#).

Figure 6-21 Replacing the humidifier cylinder



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- Step 4** Loosen the belt around the humidifier cylinder and remove the cylinder, as shown by (2) and (3) in [Figure 6-21](#).
- Step 5** Open the rubber pad on the cable port, and clear the glue on the port using a flat-head screwdriver, as shown by (4) in [Figure 6-21](#).
- Step 6** Remove the screws from the electrode cable connection terminals above the humidifier cylinder using the 10# socket wrench, remove the cable connection terminals, and remove the cable from the high water level sensor, as shown by (5) in [Figure 6-21](#).
- Step 7** Install a new humidifier cylinder by performing [Step 3](#) to [Step 6](#) in the reverse order, and start the humidifier.

NOTE

When replacing the humidifier cylinder, you do not need to apply glue to the cable connection port again.

- Step 8** Power on the humidifier, choose **Maint > Diagnostic mode** on the main menu, and enter 100%. The water is injected to the humidifier. Check whether the humidifier works properly. If yes, exit the diagnostic mode.

Step 9 Drain the water from the humidifier cylinder by following the instructions provided in [Step 1](#).

Step 10 Install the air filters and close the rear door if no problem is found.

Step 11 Choose **Maint > Performance Maint** on the main menu, and clear the accumulated running time of the humidifier.

----End

6.5.8 Replacing Electric Heater

Prerequisites

- Recommended materials: Phillips screwdriver, new electric heater.
- Preparations: Switch off the outside main power input.



CAUTION

Before replacing the electric heater, make sure that the electric heaters are not hot to touch after powering off, in order to avoid burns.

NOTICE

- Prevent screws from falling into the fan when you loosen the screws on the electric heater rack.
 - When removing the electric heater, avoid hard bends on the capillary tube of the temperature switch.
 - The electric heater rack is inside the NetCol5000-A. Exercise caution during maintenance to prevent internal components from scratches or damage.
-

Procedure

Step 1 Open the rear door. Remove the filters, and switch off the general power input breaker QF1 and electric heater circuit breaker QF4.

Step 2 Open the front door. Remove the protective net cover of the electric heater and sensing bulbs of two temperature switches.

Step 3 Disconnect the cables from the electric heater.

Step 4 Remove screws that fasten the electric heater and drag the electric heater out.

Step 5 Install a new electric heater in an inverse order.

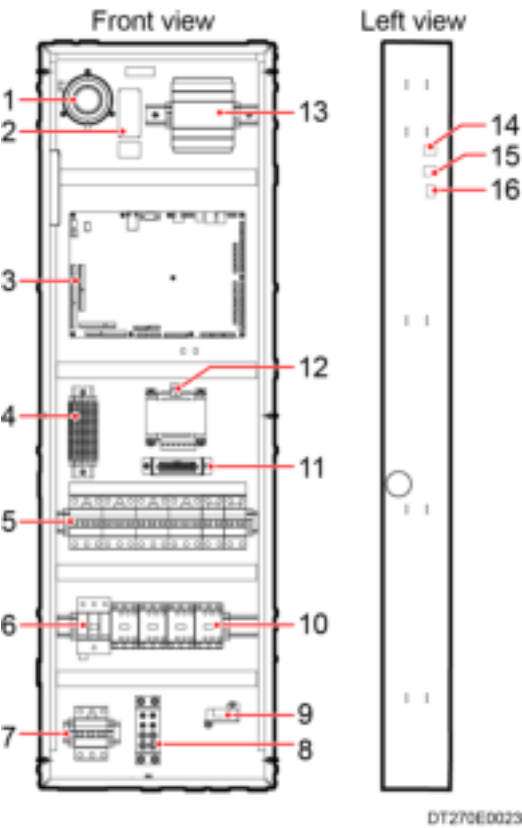
Step 6 Power on the unit and tap **Maint > Diagnostic Mode > Enter** to open the electric heater. Make sure they work properly. Exit the Diagnostic Mode.

Step 7 Tap **Maint > Performance Maint** to clear the electric heater total runtime.

----End

A Electrical Ports of an Indoor Unit

Figure A-1 Components and external ports of the electrical control box



External ports of the electric control box

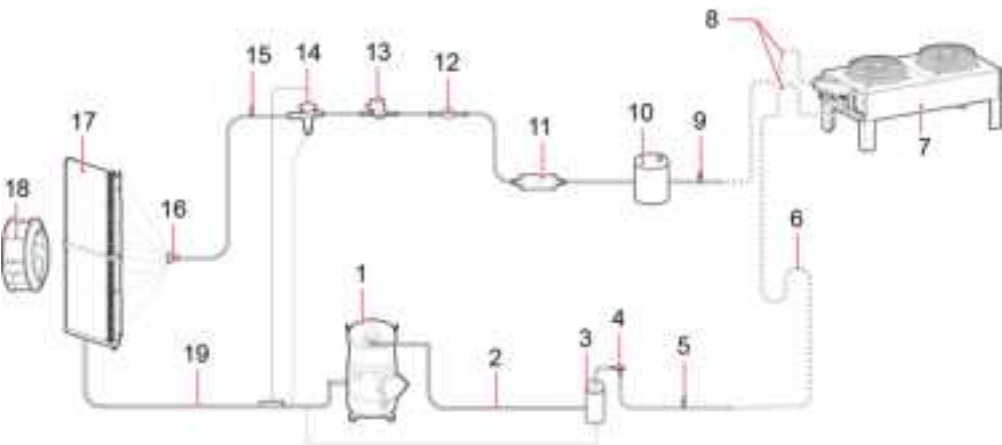
No.	Description
(1)	Differential pressure switch
(2)	Electronic label
(3)	Main control board

No.	Description
(4)	XT2 user wiring ports (including ports for reporting common alarms 1 and 2, port for the startup and shutdown of an outdoor unit, port for the remote shutdown of an indoor unit, water leak sensor port, smoke sensor port, and port for reporting mains outage alarm)
(5)	Circuit breakers from left to right: compressor circuit breaker QF3, electric heater circuit breaker QF4, electric humidifier circuit breaker QF5, two fans circuit breaker QF6, upper-level circuit breaker QF8 of the transformer and water pump circuit breaker QF9
(6)	SPD
(7)	General power circuit breaker QF1 for L1, L2, and L3
(8)	PE
(9)	Current Transformer
(10)	Electric heater contactor KM1, electric humidifier contactor KM2, water pump contractor KM3, and crankcase heater contactor KM4
(11)	Voltage jumper
(12)	24 V AC transformer
(13)	Humidifier controller
(14)	J73 teamwork communications port 2 on the main control board
(15)	J73 teamwork communications port 1 on the main control board
(16)	Manual water drain switch for the humidifier cylinder

B General Layout

The NetCol5000-A consists of an indoor unit and an outdoor unit that are connected over refrigerant pipes. [Figure Cooling component layout](#) shows the cooling component layout.

Figure B-1 Cooling component layout



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- | | | | |
|---------------------------------|-----------------------------------|--------------------------------|-------------------|
| (1) Compressor | (2) Discharge pipe | (3) Oil separator | (4) Check valve |
| (5) Discharge pipe needle valve | (6) Oil trap | (7) Outdoor unit | (8) Inverted trap |
| (9) Needle valve on liquid pipe | (10) Liquid storage tank | (11) Dry filter | (12) Sight glass |
| (13) Solenoid valve | (14) Thermostatic expansion valve | (15) Low-pressure needle valve | (16) Distributor |
| (17) Evaporator | (18) Indoor fan | (19) Suction pipe | |

 NOTE

- In [Figure B-1](#), the pipes in real line are installed by Huawei before delivery; the pipes in dotted line are to be routed onsite by technical personnel.
- The pipe fittings provided by Huawei include the oil trap (component 6) and inverted trap (component 8). If you do not purchase pipe fittings from Huawei, you need to prepare such components by yourself because they ensure the normal operating and easy maintenance of the NetCol5000-A.

C Acronyms and Abbreviations

A

AC alternating current

C

CFD Computational Fluid Dynamics

CAN Controller Area Network

D

DC Direct Current

E

EC Electronic Commutation

EMS Element Management System

L

LCD liquid crystal display

LUI local user interface

P

PUE Power Usage Effectiveness

R

RCCB Residual Current Circuit Breaker

T

TFT Thin Film Transistor

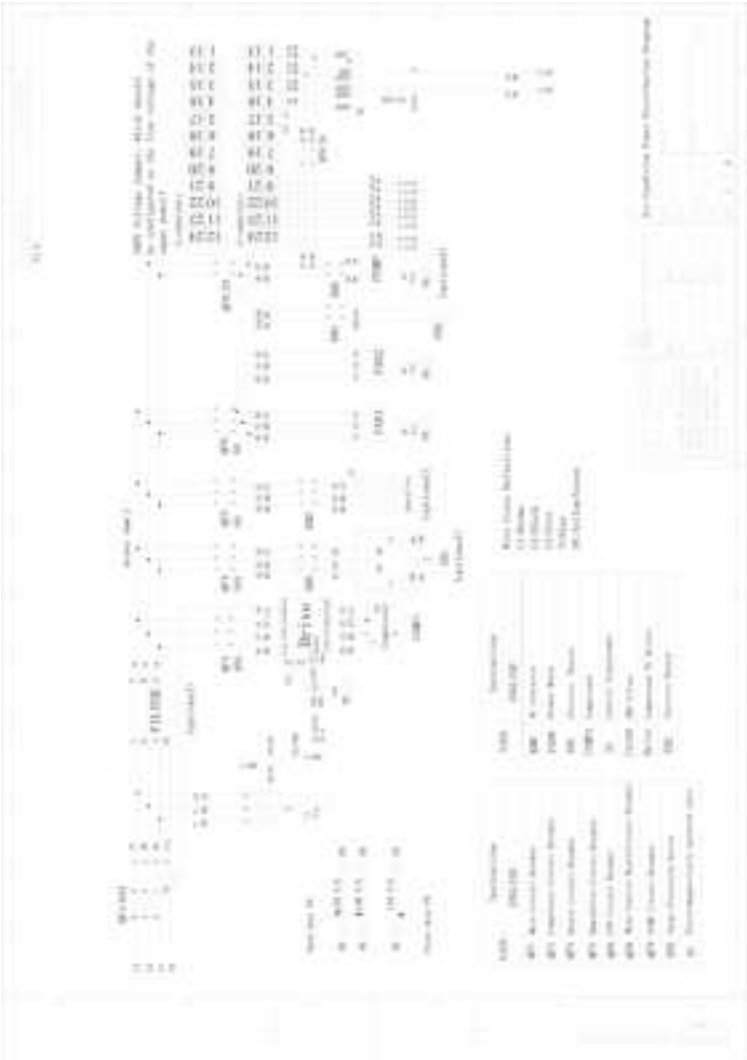
U

USB

Universal Series Bus

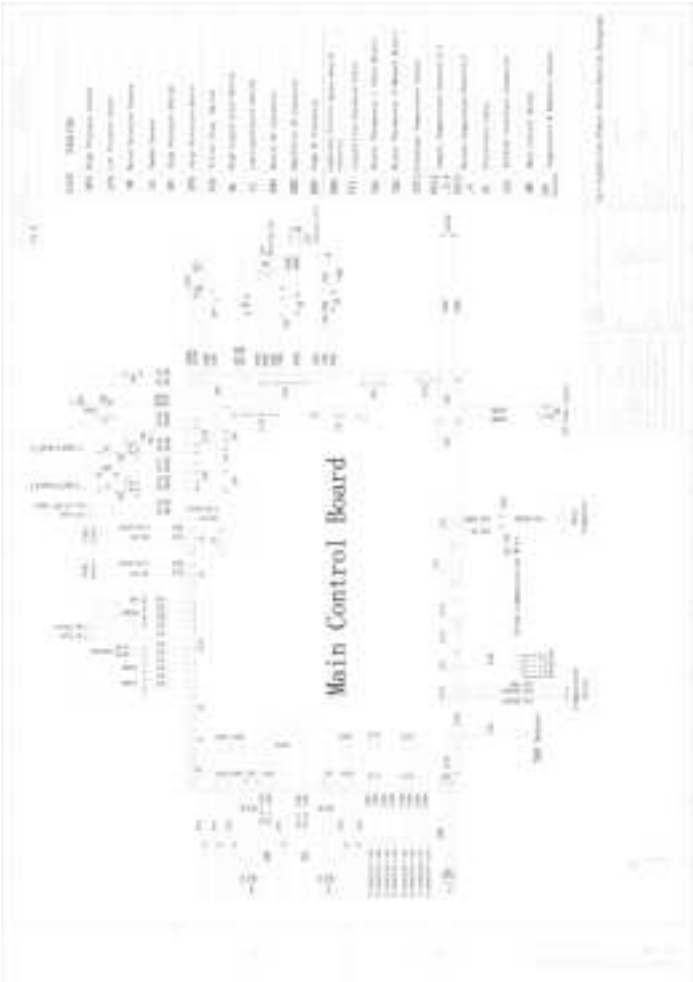
D Electric Diagram

Figure D-1 Electric diagram



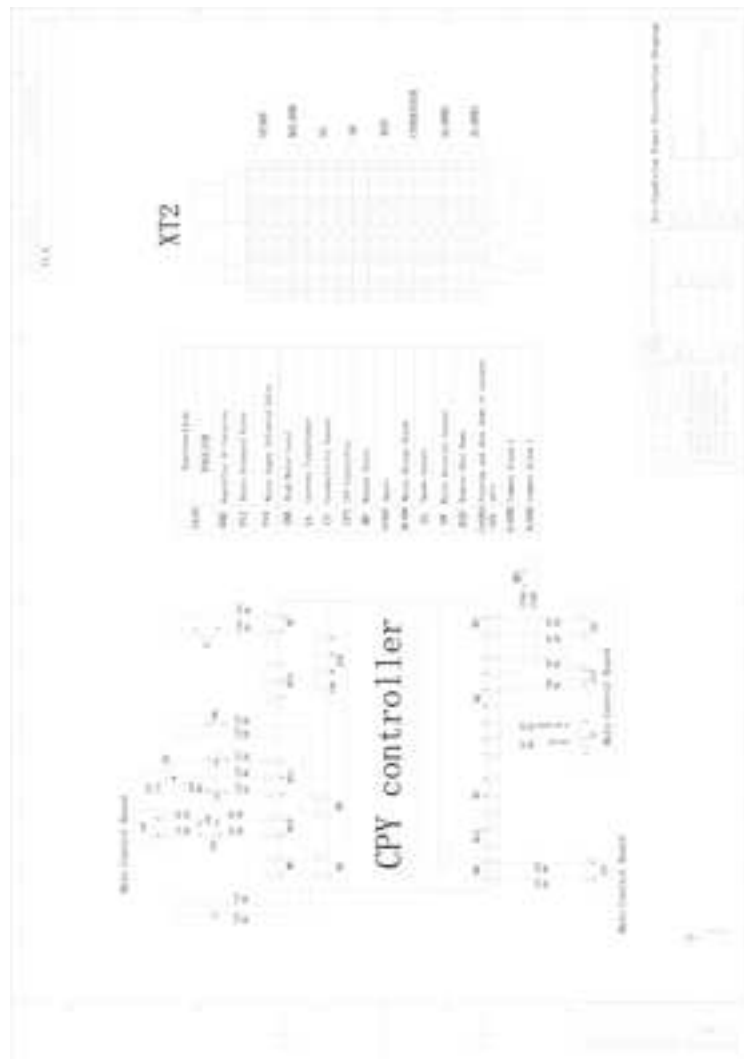
E Main Control Board Diagram

Figure E-1 Main control board diagram



F Humidifier Control Diagram

Figure F-1 Humidifier control diagram



G Controller Menu Structure

Figure G-1 Controller menu structure

