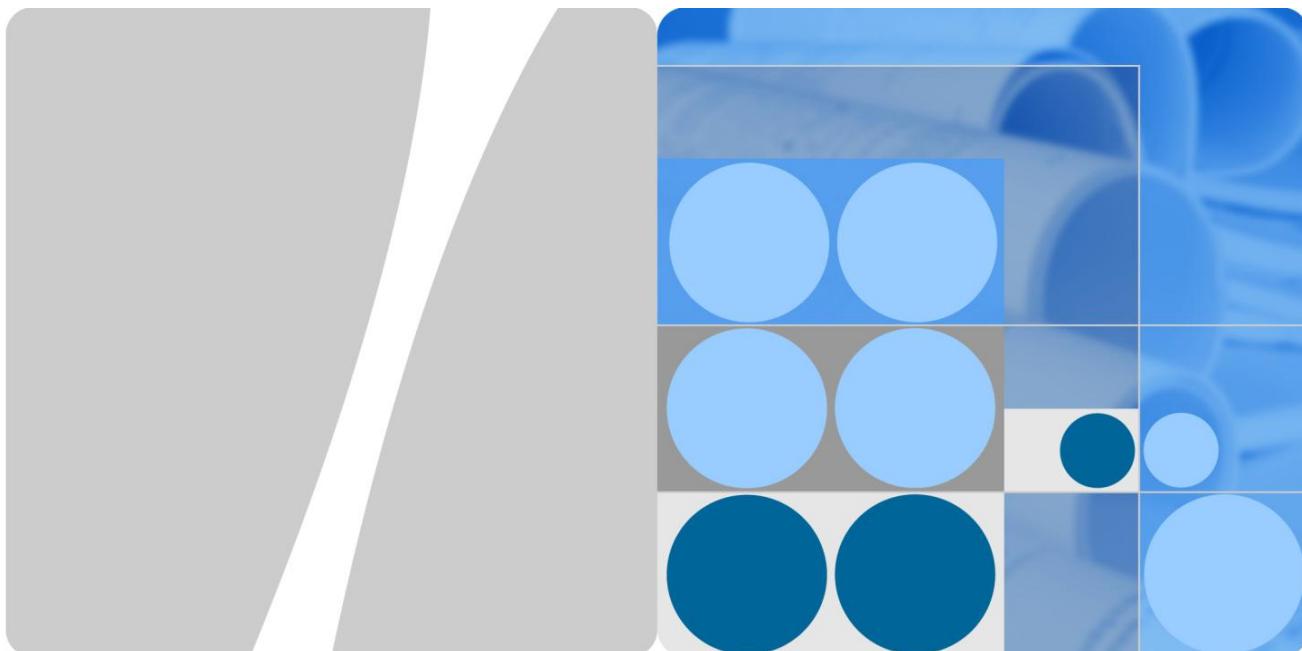


Part Number: 31010QPN



**NetCol5000-A020 Air Cooled In-row Precision Air
Conditioner
V100R002**

User Manual

Issue 01
Date 2014-06-30

HUAWEI TECHNOLOGIES CO., LTD.



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About This Document

Purpose

This document describes the NetCol5000-A020, an air cooled in-row precision air conditioner, in terms of its precautions, product description, installation guide, commissioning, operation and maintenance (O&M). It helps users rapidly learn the operation and maintenance (O&M) of the NetCol5000-A020.

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 in the following table.

Symbol	After the system is restarted, use the kmtune command to check the kernel parameters to ensure that the setting is valid.
 DANGER	Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.
 WARNING	Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.
 CAUTION	Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.

Symbol	After the system is restarted, use the kmtune command to check the kernel parameters to ensure that the setting is valid.
 NOTICE	Indicates a potentially hazardous situation which, if not avoided, could result in equipment damage, data loss, performance deterioration, or unanticipated results. NOTICE is used to address practices not related to personal injury.
 NOTE	Calls attention to important information, best practices and tips. NOTE is used to address information not related to personal injury, equipment damage, and environment deterioration.

Change History

Changes between document issues are cumulative. The latest document issue contains all the changes made in earlier issues.

Issue 01 (2014-06-30)

This issue is the first official release.

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1 Precautions

1.1 Safety Precautions

Declaration

Huawei does not take responsibilities for the following situations:

- Operation under severe environments which are not specified in this document.
- Usage under installation and operating environments which are not specified in related international specifications.
- Unauthorized product changes and software code modification.
- Operation ignoring safety precautions and operation guidance specified in this document.
- Damage caused by abnormal natural environments.

Overview

- To ensure safety of humans and the equipment, pay attention to the safety symbols on the equipment and all the safety instructions in this document.
- The "NOTICE", "CAUTION", "WARNING" and "DANGER" marks in this document do not represent all the safety instructions. They are only supplements to the safety instructions.

Local Safety Regulations

When operating Huawei equipment, you must follow the local laws and regulations. The safety instructions in this document are only supplements to the local laws and regulations.

Personal Requirements

Only trained and qualified personnel are allowed to install, operate, and maintain Huawei equipment, and they must understand basic safety precautions to avoid hazards.

- Only trained and qualified personnel are allowed to install, operate, and maintain Huawei equipment.
- Only personnel certified or authorized by Huawei are allowed to replace or change the equipment or components (including software).

- Any fault or error that might cause safety problems must be reported immediately to a supervisor.

Grounding Requirements

Equipment to be grounded must meet the following requirements:

- When installing the device, always make the ground connection first and disconnect it at the end.
- Do not damage the ground conductor.
- Do not operate the device in the absence of a properly installed ground conductor.
- The device must be connected permanently to the protection ground before an operation. Before operating the device, check the electrical connection of the device to ensure that it is securely grounded.

Human Safety

- This appliance not accessible to the general public.
- Before operating a device, wear electrostatic discharge (ESD) clothes, ESD gloves, and an ESD wrist strap. Remove conductive objects such as jewelry and watches to avoid electric shocks or burns.
- Ensure that tools are insulated.
- In the case of fire, immediately leave the building or the equipment room, and turn on the fire alarm bell or make an emergency call. Do not enter a building that is on fire.

Equipment Safety

- The device must be fixed securely on the floor or to other immovable objects such as walls and mounting racks before operation.
- Do not block the ventilation while the device is operating.
- Tighten the thumbscrews by using a tool after initial installation and subsequent access to the panel.
- After the installation, remove packing materials from the equipment area.

1.2 Electrical Safety

High Voltage



DANGER

- The high voltage power supply provides power for the device operation. Direct or indirect contact (through damp objects) with high voltage and alternating current (AC) mains supply may result in fatal danger.
 - Non-standard and improper high voltage operations may result in fire and electric shocks.
-

High Electrical Leakage



CAUTION

Ground the device before powering it on. Otherwise, personal injury or device damage may be caused by high leakage current.

- If a "high electrical leakage" tag is present on the power terminal of the device, you must ground the device before powering it on.
- Bind the bare parts of power cables with insulation tapes and properly place them.

Power Cable



DANGER

Do not install or remove power cables when the device is on. Transient contact between the core of the power cable and the conductor may generate electric arcs or sparks, which may cause fire or hurt human eyes.

- Before installing or removing the power cable, turn off the power switch.
- Before connecting a power cable, verify that the label on the power cable is correct.
- If the supply cord is damaged, it must be replaced by the manufacturer, its service agent or similarly qualified persons in order to avoid a hazard.
- The appliance should fit with means for disconnection from the supply mains having a contact separation in all poles that provide full disconnection under overvoltage category III conditions, and these means must be incorporated in the fixed wiring in accordance with the wiring rules.

Fuse



CAUTION

To ensure that the system runs safely, if a fuse is to be replaced, the new fuse must be of the same type and specifications.

1.3 Mechanical Safety

Drilling Holes



CAUTION

Do not drill the cabinet at will. Drilling holes without complying with the requirements affects the electromagnetic shielding performance of the cabinet and damages the cables inside the cabinet. In addition, if the scraps caused by drilling enter the cabinet, the printed circuit boards (PCBs) may be short circuited.

- Drill holes with approval of the customer, contractor, and Huawei.
- Before drilling holes on the rack, first remove the cables inside the rack.
- To protect your eyes from metal shavings, wear a pair of goggles when drilling holes.
- Before drilling holes, wear protective gloves.
- After drilling, clean up the metal shavings.

Sharp Objects



CAUTION

Before you hold or carry a device, wear protective gloves to avoid getting injured by sharp edges of the device.

Handling Fans

- When replacing a component, place the component, screws, and tools in a safe place. Otherwise, if any of them fall into the operating fans, the fans may be damaged.
- When replacing a component near fans, do not insert your fingers or boards into the operating fans until the fans are switched off and stops running.

Moving Heavy Objects



CAUTION

- Wear protective gloves when moving heavy objects.
- Be careful to prevent injury when moving heavy objects.
- To prevent injury, when moving the chassis outwards, be aware of unfixed or heavy objects on the chassis.
- At least two persons are required to move the chassis. When moving the chassis, ensure that it does not tilt at an angle that exceeds 15 degrees from the vertical direction.

- When moving or lifting the chassis, well protect the chassis to avoid scratches or crashes.
- When moving the chassis, do not use a part to support the body. Otherwise, the part may be damaged.

Welding Hazard

- At least two persons are required at the welding site.
- The operator must have licenses for welding.
- No flammable materials are allowed in the welding area.
- Ensure that fire extinguishers, wet cloths, and water containers are prepared.
- Do not place a flaming welding torch on parts or the ground. Do not put welding torch with residual acetylene and oxygen inside a metal container to avoid gas leakage and burning.
- Get the high-temperature pipe cooled down after welding.
- Do not perform welding and cutting on a container under pressure. Power off the device before any welding operation.

1.4 Running Safety

High Temperature and High Pressure

- Misoperations may cause over high pressure, which may result in crack and exploration of the refrigerating system.
- High-pressure parts: compressor and exhaust pipe.
- High-temperature parts: compressor, exhaust pipe, and electric heater.

Refrigerant Hazard

- Wear protective gloves when handling refrigerant to avoid injury from refrigerant leakage.
- Low-temperature part: evaporator.

High-Speed Running

High-speed running part: fan.

Others

Do not block the vents when the system running.

1.5 Others

Binding Signal Cables



NOTICE

Signal cables must be bound separately from strong electricity cables and high-voltage cables.

Laying Out Power Cables

When the temperature is very low, violent strike or vibration may damage the power cable sheathing. To ensure safety, comply with the following requirements:

- Power cables can be laid or installed only when the temperature is higher than 0 °C.
- Before laying out power cables which have been stored in a temperature lower than 0 °C, move the power cables to an environment of the ambient temperature and store them at the ambient temperature for at least 24 hours.
- Handle power cables with caution, especially at a low temperature. Do not drop the power cables directly from the vehicle.

Storage

- Ensure that devices are not exposed to direct sunlight or near heat sources.
- Keep devices, especially those with high-pressure nitrogen or refrigerant, away from fire or heat sources to avoid explosion or leakage.

Correct Disposal of This Product



This marking indicates that this product should not be disposed with other housed wastes throughout the EU. To prevent possible harm to the environment or human health from uncontrolled waste disposal, recycle it responsibly to promote the sustainable reuse of material resources. To return your used device, please use the return and collection systems or contact the retailer where the product was purchased. They can take this product for environmental safe recycling.

Lost the manual

If you lost this manual, please contact Huawei technical support to get the electronic document or download it from <http://support.huawei.com>.

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 for the NetCol5000-A

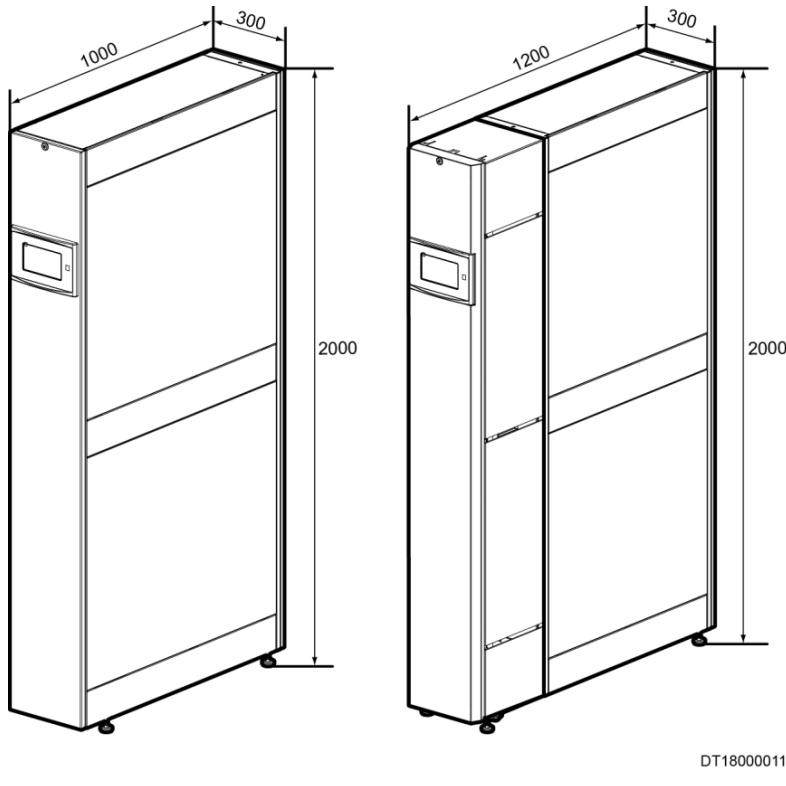
NetCol	5000	-	A	020	H	M	1	2	N	1	E	1	2	0	E	0
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1 Data Center Precision Air Conditioner																
2 Model Range	M- 380-415V,3PH,50Hz	7 Power Supply	8-R134a Dual System	13 Re-Heating												
2000- In-cabinet Precision Air Conditioner	N- 208-230V,3PH,60Hz	A- Chilled Water with Three Way Valve	0- None													
5000- In-row Precision Air Conditioner	P- 220-240V,3PH,50Hz	B- Chilled Water with Two Way Valve	1- Electric Heating 1 Level													
8000- In-room Precision Air Conditioner	Q- 380V,3PH,60Hz	C- Others	2- Electric Heating 2 Level													
3 Hyphen	R- 460-480V,3PH,60Hz	9 Fan Type	14 Monitoring													
4 System Type	S- 220-240V,1PH,50Hz	1- AC Fan	0- No Card													
A - Air Cooled	T- 208-230V,1PH,60Hz	2- EC Fan	1- Web Only													
W - Water Cooled	U- 277V,1PH,60Hz	3- DC Fan	2- 485 Only													
G - Glycol Cooled	D- 48VDC	10 Compressor Type	3-Web&485													
C - Chilled Water	1- 200-277V,1PH,50/60Hz	0- No Compressor	15 Sensors													
F - Free Cooling	2- 200-240V,1PH,50/60Hz	N- ON-OFF	0- None													
P - Air Cooled + Chilled Water	3- 200-240V,3PH,50/60Hz	D- DC Inverter	S- Smoke Temperature													
Q - Water Cooled + Chilled Water	4- 380-415V,3PH,50/60Hz	11 Filter Grade	F- High Temperature													
R - Glycol Cooled + Chilled Water	5- 380-480V,3PH,50/60Hz	0- None	B-Smoke & High Temperature													
T - Air Cooled + Loop Thermal Siphon	6- R410A Single System	1- G3	16 Packaging													
5 Cooling Capacity	7- R410A Dual System	2- G4	D- Domestic													
035 - Cooling Capacity 35kW	3- R407C Single System	3- F5	E- Export													
020 - Cooling Capacity 20kW	4- R407C Dual System	12 Humidifier	17 Order Special Features													
6 Air Discharge	5- R22 Single System	0- None	0- None													
U - Up Flow	6- R22 Dual System	R- Infrared Humidifier	1- Non-Standard Feature													
D - Down Flow	7- R134a Single System	E- Electrode Humidifier														
H - Horizontal Flow																

2.2 Composition of an Indoor Unit

Structure

The NetCol5000-A020 is in dimensions (H x W x D) of 2000 mm x 300 mm x 1000 mm in standard configurations, and 2000 mm x 300 mm x 1200 mm for expansion by adding frames. Figure 2-2 shows the dimensions of a NetCol5000-A020.

Figure 2-2 Structure dimensions (unit: mm)



DT18000011

Composition

The NetCol5000-A020 consists of a cabinet, a compressor, EC fans, an evaporator, air filters, expansion valves, a surge protection and filtering board, an electric heater (optional), and an electrode humidifier (optional).

- Compressor

The high-efficiency scroll compressor is used, which features good environment adaptability, high reliability, low noise, long service life, and easy installation. The R410A refrigerant is environmentally friendly.

- EC fan

The brand fans are used, featuring less power consumption, high efficiency, high power coefficient, optimal speed adjustment, and simple control. Compared with common fans, such fans are highly reliable with redundancy design and save 30% more energy.

- Evaporator

The highly efficient finned-pipe evaporator with threaded copper pipes and a zinc-plated layer adopts the computational fluid dynamics (CFD) to optimize the process design, which greatly improves the heat exchange efficiency.

- Air filter

G3 air filters are used, meeting requirements for equipment room cleanliness.

- Expansion valve

The external equalizer type thermostatic expansion valve automatically balances the refrigerant flow, ensuring efficient heat exchange and system reliability.

- Check valve
Check valve are deployed on discharge pipes, preventing return of refrigerant at high temperature, reducing pipe vibration.
- Liquid solenoid valve
Liquid solenoid valves are opened and closed to ensure smooth liquid circulation and prevent refrigerant migration or even liquid strike.
- Air bypass solenoid valve
The air bypass solenoid valve bypasses part refrigerant out of the compressor to the inlet of the evaporator to reduce refrigerant capacity and prevent frequent startup and shutdown of the compressor.
- Surge protection and filtering board
The surge protection and filtering board is used for surge protection and equipment voltage detection, enhancing equipment security.
- Electric heater
The PTC heater implements quick startup, large heating capacity, even heat dissipation, and automatic heat capacity adjustment, providing multiple protection mechanisms.
- Electrode humidifier
The electrode humidifier provides stepless adjustment of humidification capacity and precise control of humidity in equipment room.
- Controller
The 7-inch true color-sensitive LCD offers a user-friendly interface for you to perform query, settings, monitoring, and maintenance.

2.3 Monitoring function

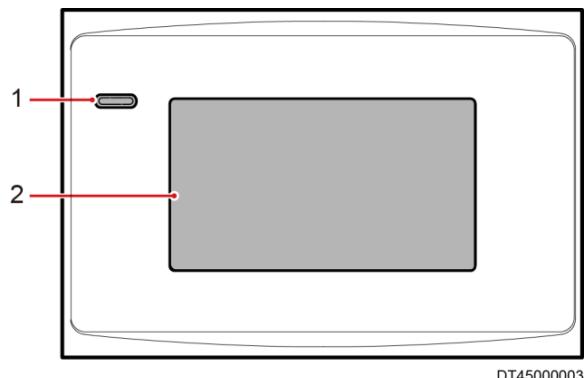
2.3.1 Controller

Appearance

The 7-inch true color-sensitive LCD offers a user-friendly interface for you to perform query, settings, monitoring, and maintenance.

[Figure 2-3](#) shows an LCD.

Figure 2-3 Appearance



(1) Indicator

(2) LCD

Functions

- If only one air conditioner is used, the controller provides logic control of components in the air conditioner to meet temperature and humidity requirements.
- By integrating a compressor frequency-converting drive, the controller adjusts the frequency of the DC frequency-converting compressor to adapt to load changes and enables you to query the settings and status of the compressor.
- The LCD on the controller allows you to set the parameters for the air conditioner and query its status.
- If multiple air conditioners are used, the controller optimally distributes the heat load to reduce power consumption and provides backup to improve reliability.

Features

- The controller provides a touchscreen with a user-friendly interface.
- The controller controls the air conditioner precisely and responds quickly.
- The multi-level password protection prevents misoperations.
- The controller protects the air conditioner against overvoltage, undervoltage, abnormal power failure, and water leaks, which ensures air conditioner reliability.
- The LCD on the controller displays the operating status and duration of the air conditioner components in real time.
- The fault diagnosis system automatically displays the information of the current fault, which facilitates the maintenance.
- The air conditioner provides abundant external ports such as RS232 ports, RS485 ports, fast Ethernet (FE) ports, and USB ports that are protected by a security mechanism.

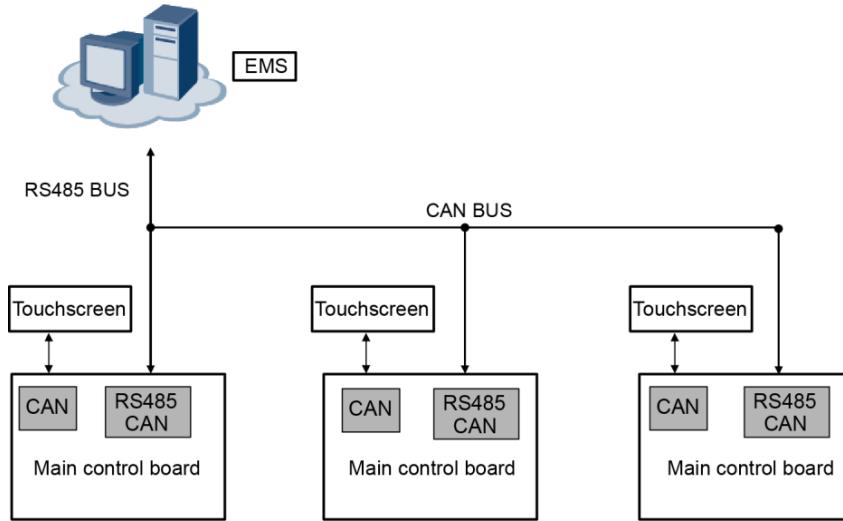
2.3.2 Monitoring System

The monitoring system provides logic control, data collection, control delivering, alarm reporting, data storage, user right management, and group control. The air conditioner can be connected to the monitoring system over a northbound port (RS485 or RS232) for remote management.

- The monitoring system implements monitoring on the equipment by communicating with the equipment over the RS485 port.
- A maximum of 32 air conditioners can be connected in group control mode. You can assign any air conditioner to be the master and connect the master to the monitoring network diagram.

Figure 2-4 shows the monitoring network diagram.

Figure 2-4 Networking diagram



2.4 Application Environment

Table 2-1 lists the environmental specifications, Table 2-2 lists the physical ports, Table 2-3 lists the installation requirements, Table 2-2 lists the water quality requirements.

Table 2-1 Environmental specifications

Item	Specifications
Operating temperature	18–45 °C
Operating humidity	20%–80% RH
Storage temperature	–40 °C to +70 °C
Storage humidity	5%–95% RH (non-condensing)
Altitude	0–1000 m, when the altitude is greater than 1000 m, the cooling performance is derated. ^a
Protection level	<ul style="list-style-type: none">• Indoor unit: IP20• Outdoor unit: IPX5

a: For the detailed derated data, contact Huawei.

Table 2-2 Physical ports

Item	Specifications
Refrigerant liquid pipe	Copper pipe, with an outer diameter of 0.5 inches and thickness of 0.75 mm, withstanding a pressure not smaller than 4.5 MPa, welding.
Refrigerant gas pipe	Copper pipe, with an outer diameter of 0.625 inches and thickness of 1.0 mm, withstanding a pressure not smaller than 4.5 MPa, welding.
Water injection pipe to the humidifier	Reserved interface: BSPP 0.75-inch thread connection.
Condensate drainpipe	Reserved interface: copper pipe, with an outer diameter of 0.75 inches.
Installation mode	Installed on an electrostatic discharge (ESD) floor.
Pipe and cable routing	The cabinet supports overhead and underfloor cabling.

Table 2-3 Installation requirements

Item	Specifications
Door	Width: not smaller than 0.9 m; height: not smaller than 2.3 m.
Floor	Bearing capacity not smaller than 350 kg/m ² ; for raised floors, height not smaller than 250 mm.
Length of one-way refrigerant pipes	≤ 25 m
Height difference between the indoor and outdoor units	<ul style="list-style-type: none"> If the outdoor unit is placed higher than the indoor unit, the maximum vertical distance between them is 10 m. If the indoor unit is placed higher than the outdoor unit, the maximum vertical distance between them is 5 m.
Thickness of the thermal insulation foam	≥ 13 mm
Water supply	<ul style="list-style-type: none"> Water supply pressure range: 0.1–0.7 MPa. Water supply temperature range: 1–40 °C. Transient water flow ≥ 0.6 L/min. Water quality must meet requirements specified in Table 2-4.
Drainage	Drainpipes can withstand high temperature (≥ 100°C, for units that are configured with a humidifier).
Power supply	Ground fault circuit interrupters are not recommended to be used on main circuit. If ground fault circuit interrupters are required by the customer or according to local regulations, use the residual current circuit breaker that is not sensitive to the

Item	Specifications
	single-phase DC pulse and transient current pulse.
Note: If some conditions are not met, please contact Huawei technical support.	

Table 2-4 Water quality requirements

Item	Requirement	Unit
Hydrogen ion	7–8.5	PH
Conductivity at 20 °C (σ_{20})	300–1250	$\mu\text{S}/\text{cm}$
Total dissolved solids	$0.93 \times \sigma_{20}$	mg/l
Dry residue at 180 °C	$0.65 \times \sigma_{20}$	mg/l
Total hardness	100–400	$\text{mg}/\text{l} (\text{CaCO}_3)$
Temporary hardness	60–300	$\text{mg}/\text{l} (\text{CaCO}_3)$
Iron+manganese	0–0.2	$\text{mg}/\text{l} (\text{Fe}+\text{Mn})$
Chloridum	0–30	ppm (Cl)
Anhydrous silicate	0–20	$\text{mg}/\text{l} (\text{SiO}_2)$
Residual chlorinum	0–0.2	$\text{mg}/\text{l} (\text{Cl})$
Calcium sulfate	0–100	$\text{mg}/\text{l} (\text{CaSO}_4)$
Metal matter	0	mg/l
Solvent, thinner, soap, and lubricant	0	mg/l
Visible impurities	None	N/A

2.5 Technical Specifications

Table 2-5 and Table 2-6 show the universal and optional parameters.

Table 2-5 Universal parameters

Item	Specifications
Cooling mode	Air cooled
Refrigerant	R410A
Air supply mode	Horizontal flow

Item	Specifications
Filter level	G3
Dimensions (H x W x D)	2000 mm x 300 mm x 1000 mm
Net weight/Gross weight	230 kg/275 kg



NOTICE

- If the equipment room does not have requirements for humidity, air conditioners that do not have humidification function or have partial humidification function are recommended.
- When the total load of servers is less than 30% load of a single air conditioner, the humidity might be relatively high. In this case, contact Huawei technical support.

Table 2-6 Optional parameters

Item	Specifications			
	NetCol5000-A020 HM13N10020 E0	NetCol5000-A020 HM13N1E120 E0	NetCol5000-A020 HQ13N10020 E0	NetCol5000-A020 HQ13N1E120 E0
Maximum current	16.5 A	23 A	16.5 A	23 A
Input power	380–415 V AC 50 Hz 3W + N + PE	380–415 V AC 50 Hz 3W + N + PE	380 V AC 60 Hz 3W + N + PE	380 V AC 60 Hz 3W + N + PE
Voltage tolerance ^a	Rated voltage $\pm 10\%$	Rated voltage $\pm 10\%$	Rated voltage $\pm 10\%$	Rated voltage $\pm 10\%$
Frequency tolerance	Rated frequency ± 3 Hz	Rated frequency ± 3 Hz	Rated frequency ± 3 Hz	Rated frequency ± 3 Hz
Heating	None	Configured	None	Configured
Humidification	None	Configured	None	Configured

a: Recommended to add the voltage regulator in the front end if the power exceeds this range. Otherwise, air conditioner will generate frequency alarms and cannot run.

3 Installation Guide

3.1 Installation Preparations

To ensure the optimal operating condition and longest service life, install the NetCol5000-A020 correctly as required.

3.1.1 Preparing Tools

Table 3-1 to Table 3-5 list the tools for installing the NetCol5000-A020. Add or delete tools as required.

Table 3-1 General tools

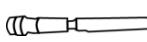
Appearance, Specifications, and Name			
Adjustable wrench (12#/19#)	Phillips screwdriver (M4, M6, and M8)	Flat-head screwdriver (M3/M4)	Socket wrench (18 mm)
			
Torque wrench (28 mm)	Fixed wrench (12#/13#/18#)	Hex key (6 mm)	Right angle
			
Needle-nose pliers	Diagonal pliers	Claw hammer	Protective gloves
			
Ladder (2 m)	Flashlight	Measuring tape	Hacksaw
			

Table 3-2 Transportation and unpacking tools

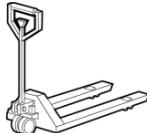
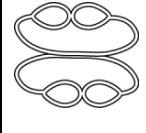
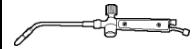
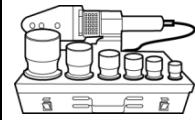
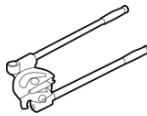
Appearance, Specifications, and Name			
Pallet Jack	Diesel pallet truck	Hanging rope (bearing weight equal to or larger than 400 kg)	Lever (bearing weight equal to or larger than 400 kg)
			

Table 3-3 Pipe installation tools

Appearance, Specifications, and Name			
Cutter	Waterproof sealant ^a	Welding torch	Copper-phosphorus brazing rod
			
Oxygen	Acetylene	Hot melt tool (for rigid pipes)	Nitrogen
			
Pipe bending tool	N/A	N/A	N/A
	N/A	N/A	N/A

a: The waterproof sealant must withstand high temperature higher than 85 °C and meet the following requirements:

- It applies to all pipe material.
- PTFE as filler the anaerobic metal pipe thread sealant.
- The glycol solution resistance and adapt to the thread size with pipeline.
- Maximum seal gap is less than 0.5mm.
- The maximum pressure is greater than 3Mpa.
- Conforms to JB/T7311-2008 "engineering mechanical the anaerobic adhesive application technology specification" profession standard.

Table 3-4 Electrical installation tools

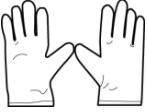
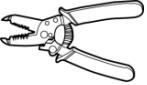
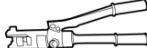
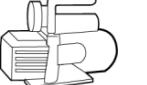
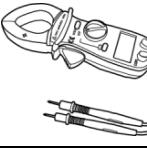
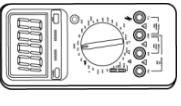
Appearance, Specifications, and Name			
ESD gloves	Insulation gloves	Wire stripper	Polyvinyl chloride (PVC) insulation tape
			
Heat gun	power cable crimping tool	N/A	N/A
		N/A	N/A

Table 3-5 Commissioning tools

Appearance, Specifications, and Name			
Pressure gauge (2 PCS) ^a	Charging hose (5 PCS) ^a	Vacuum pump	Thermocouple temperature sensor
			
Clamp meter	Electric balance	Protective gloves	Multimeter
			

a: Two pieces of the pressure gauge and the charging hoses must meet requirements of R410A refrigerant and the charging hoses can withstand pressure more than 4.0 MPa. Ensure that the charging hoses match with the 1/4 inch needle valves used in the system and configure connectors if required.

3.1.2 Material Preparations

Configuration

Materials are classified to Huawei-provided, self-purchased, and onsite prepared materials as follows.

- Mandatory: materials provided by Huawei, which can be found in the attached package.
- Optional: materials that can be purchased from Huawei or by yourself.
- Unconfigured: materials that are not provided by Huawei and need to be prepared by the customer.

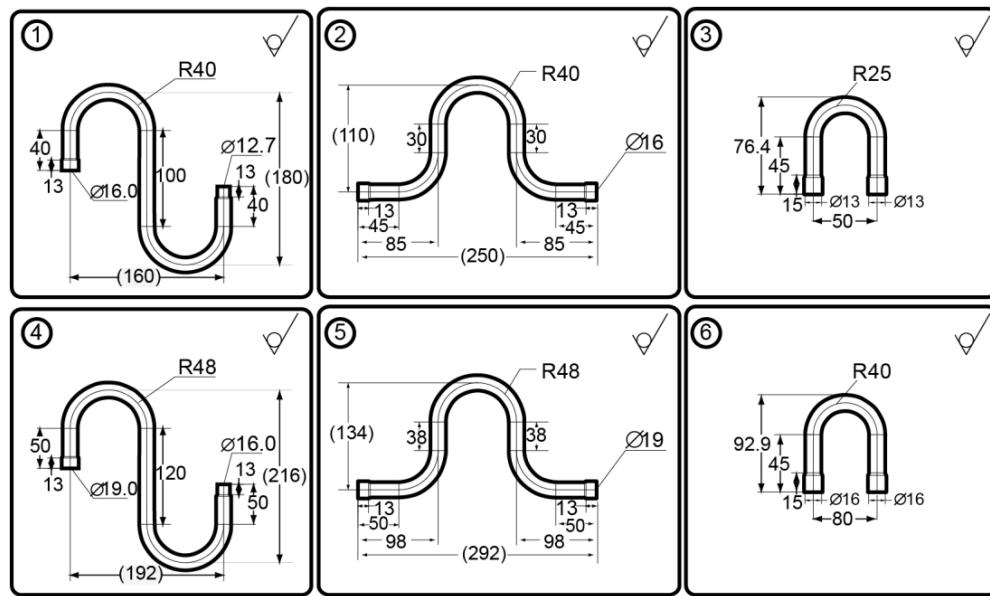
Oil Trap and Inverted Trap Preparations



NOTICE

The working pressure for copper pipes, oil trap, inverted trap and other pipes must be higher than 4.6 MPa.

Figure 3-1 Oil trap and inverted trap (unit: mm)



DT02000028

Table 3-6 Parameters of the oil trap and reverse U-shaped oil trap

NO.	Name	Configuration	Outer diameter and thickness of copper pipes (mm)	Specifications
1	Oil trap	Optional	16.0 mm x 1.0 mm	The flaring inner diameter of the copper pipe is 16.0 mm, and the necking outer diameter are 12.7 mm.
2	Gas pipe reverse	Optional	16.0 mm x 1.0 mm	The inner diameter of both large ends of the

NO.	Name	Configuration	Outer diameter and thickness of copper pipes (mm)	Specifications
	trap			copper pipes is 16.0 mm.
3	Liquid pipe reverse trap	Optional	12.7 mm x 0.75 mm	The inner diameter of copper lines is 13.0 mm.
4	Oil trap	Optional	19.0 mm x 1.2mm	The flaring inner diameter of the copper pipe is 19.0 mm, and the necking outer diameter are 16.0 mm.
5	Gas pipe reverse trap	Optional	19.0 mm x 1.2 mm	The inner diameter of both large ends of the copper pipes is 19.0 mm.
6	Liquid pipe reverse trap	Optional	16.0 mm x 1.0 mm	The inner diameter of copper lines is 16.0 mm.
<p>Note 1: No burr is allowed at the vents of copper pipelines, no dent or bulge is allowed on the surface after the pipeline bend.</p> <p>Note 2: The bend angle of unmarked parts is 90°.</p> <p>Note 3: The bend tolerance is ±1 mm.</p>				

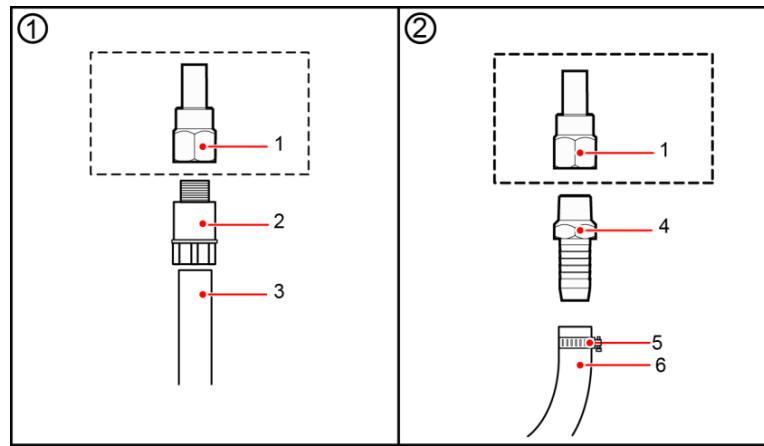
Materials Required for Humidifier Water Supply Pipe

Two humidifier water supply pipe modes are provided:

- Rigid pipe: Prepare rigid pipes and connectors same as parts 2 and 3 in ① of [Figure 3-2](#).
- Hose: Prepare hoses and pagoda connectors same as parts 4 and 6 in ② of [Figure 3-2](#).

Determine connection methods based on materials prepared onsite.

Figure 3-2 Water inlet pipe and connector for a humidifier



DT20000009

- | | |
|--|---|
| (1) Inner thread connector: BSPP, 3/4 inch | (2) Connector for rigid pipes: BSPT, 3/4 inch, outer thread connector |
| (3) Rigid pipe: PP-R or C-PVC | (4) Pagoda connector: BSPT, 3/4 inch, outer thread connector |
| (5) Hose clamp | (6) Hose: for example, EPDM |

 **NOTE**

Part 1 (in the dot-line box) is a port on the equipment. Part 5 (hose clamp) is mandatory. Other parts need to be configured.

Materials Required for Drainpipes

 **NOTICE**

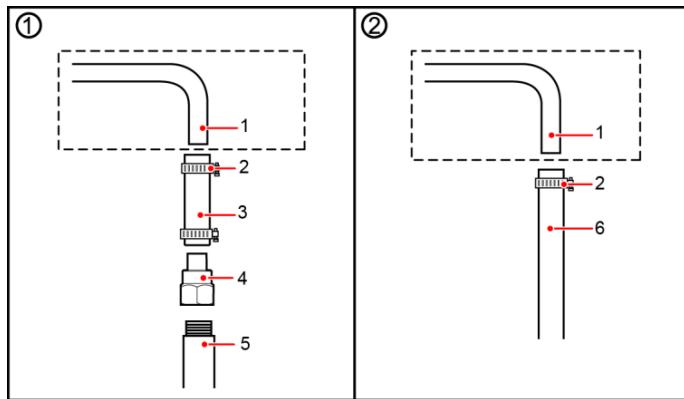
The drainpipe (for a humidifier) must withstand high temperature (higher than 100 °C). Otherwise, the drainpipe may be deformed due to high temperature.

Two drainpipe connection modes are provided:

- Rigid pipe: Fix one end of a hose to the inlet of the equipment using a hose clamp and the other end of the hose to a connector to connect to a rigid pipe with outer threads, as shown in ① of [Figure 3-3](#).
- Hose: Fix the hose to the inlet of the equipment as shown in ② of [Figure 3-3](#).

Determine connection methods based on materials prepared onsite.

Figure 3-3 Routing drainpipes



(1) Copper pipe with an outer diameter of 3/4 inch

(2) Hose clamp

(3) Hose with an inner diameter of 3/4 inch (for example, EPDM)

(4) Connector for rigid pipes, 3/4 inch copper pipe with 3/4 inch BSPP inner thread connector

(5) Rigid pipe, PP-R or C-PVC, with a 3/4 inch outer thread connector

(6) Hose with an inner diameter of 3/4 inch (for example, EPDM)

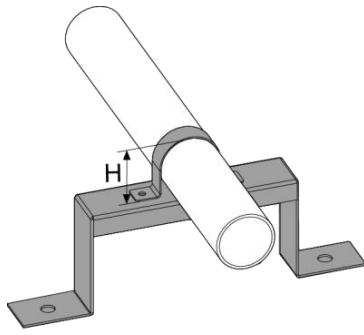
NOTE

Part 1 (in the dot-line box) is a port on the equipment. Parts 2 and 4 are mandatory. Other parts do not need to be configured.

Pipe Support Preparations

Figure 3-4 shows the support for refrigerant and water pipes. Determine detailed specifications based on onsite situation. Stainless steel 304 for pipe support and pipe clamp are recommended.

Figure 3-4 Pipeline support



 **NOTE**

- Height of the U-shaped clamp H = Pipe diameter (with thermal insulation foam) – 5 mm.
- The pipe support is not configured by default.

Cable Specifications

Table 3-7 lists specifications of power cables and cables to the host. The cables must be protected by a protective tube when connecting the power cables and the external signal cables.

Table 3-7 Cable specifications

Application Scenario	Name	Technical Specifications	Description	Remarks
Power cable to the indoor unit	Power cable (optional)	Power cable-600 V/1000 V-ZA-RVV-4 mm ² -32 A	L1/L2/L3/N/P E (5-core)	Length depending on the site survey result
	Power cable terminal (mandatory)	naked crimping terminal-single cord end terminal-4 mm ² -20 A-inserted depth 10 mm	L1/L2/L3/N/P E (cord end terminal)	10 pcs
Cable to the group control networking and host	Network cable (mandatory)	J73 of main control board to RS-485 port of EMS, 8 pin	5 m	1 pcs
Voltage jumper (mandatory)	N/A	N/A	N/A	1 pcs
Water sensor (optional)	Power cable -5 m-22AWG-(2*T0.5 ²)-(2*22UL1007)-(2*T0.5 ²)	N/A	N/A	1 pcs
Temperature and humidity (T/H) sensor (optional)	Standard networking cables, 6 pin	N/A	A maximum of six T/H sensors can be configured for a unit.	
General circuit breaker (unconfigured)	Rated working voltage: 400 V-Rated working current: 32 A-Interrupting capacity: 6 kA-Tripping characteristics: C-3 pole	External circuit breaker		1 pcs
Note: For specifications of outdoor unit power cables and signal cables to the indoor and outdoor units, see <i>NetCol500 Outdoor Unit User Manual</i> .				

Support Preparations

A support is optional for the air conditioner. You can configure a support in the following two ways:

- Prepare the support according to the drawings obtained from Huawei.
- Specify the support as a mandatory item for the air conditioner in the contract.

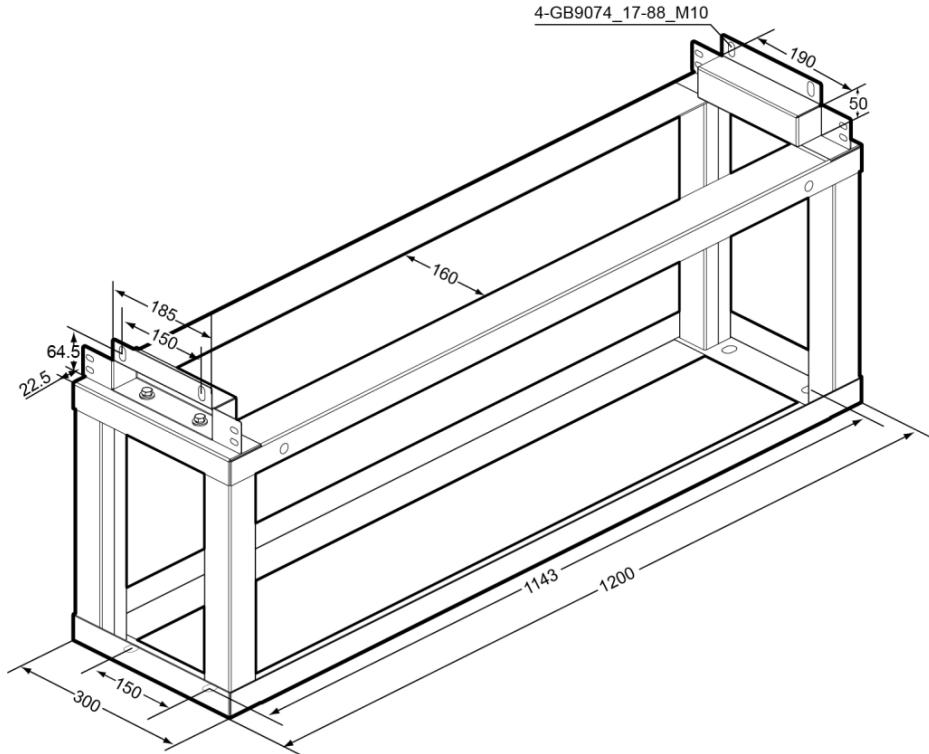
Adjust the height of the support according to the actual situation. [Figure 3-5](#) shows the support dimensions for reference.



NOTICE

- [Figure 3-5](#) shows the support dimensions of the air conditioner which installed the enclosure increasing the depth to 1200 mm.
- If not configured the enclosure. The size of the depth 1143 mm and 1200 mm all subtract 200 mm when making support.

Figure 3-5 Support dimensions (unit: mm)



DT18000041

Make supports by referring the following recommendations:

1. Recommended to use angle steel, square steel or channel steel, and width is 45–60 mm, thickness is 4–5 mm.

- a. When the width of angle steel is less than 60 mm or equal, do not consider avoiding.
- b. When the width of angle steel is more than 60 mm, it is interfering with the holes which routing cables, please cut out holes to avoid interfering.
2. In the top of the bracket is attached shock pad which is made of Ethylene-Propylene-Diene Monomer (EPDM), and the thickness is 5 mm.
3. Please note that to control the welding process and avoid excessive error.
4. Adjust the height of the support according to the actual situation.

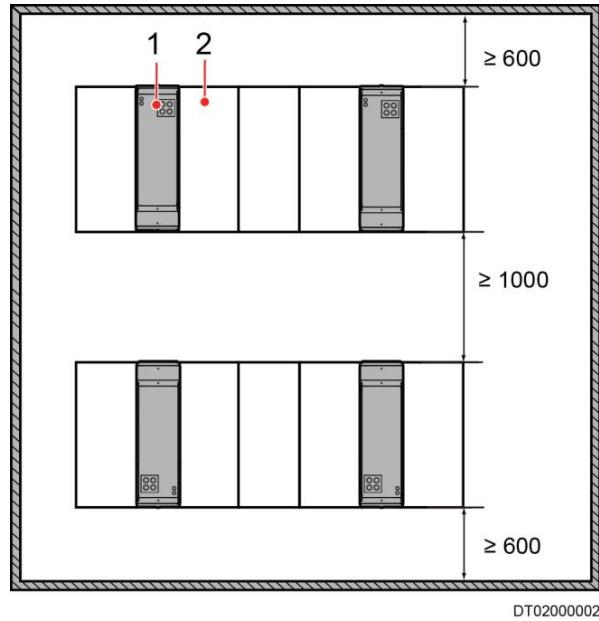
3.1.3 Installation Precautions

Before installing the NetCol5000-A020, read this section carefully and perform installation by strictly following the guidance in this section.

Precautions

- Before installation, check that the environment meets the requirements, and check whether reconstruction is needed for routing pipes and cables and constructing ventilation pipes.
- Install the NetCol5000-A020 according to the design drawing and reserve space for maintenance. Ensure that a minimum of 1000 mm maintenance clearance is reserved in either front or rear of the indoor unit. If a maintenance clearance of 1000 mm is reserved on a side of the indoor unit, ensure that a minimum of 600 mm maintenance clearance is reserved on the other side, as shown in [Figure 3-6](#).

Figure 3-6 Maintenance space requirements (unit: mm)



(1) NetCol5000-A020

(2) Equipment

- The shelter 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.
- To ensure good ventilation, do not place the indoor unit in the corner of a room or the end of a long-and-narrow room.
- During the NetCol5000-A020 operation, all doors and windows of the shelter or equipment room should be closed to reduce the additional load of the NetCol5000-A020.

Routing Refrigerant Pipes



NOTICE

Pipe length mentioned in this document is equivalent.

When selecting the refrigerant pipes, note the following:

- Avoid elbows and ensure that the indoor unit and the outdoor unit are connected by using shortest pipes.
- Calculate the number of the components that cause local resistance loss, for example, bends, and convert them into the equivalent length to straight pipes, as shown in [Table 3-8](#).
- The total length (L) of pipes connecting the indoor unit and outdoor unit equals the equivalent length of the straight pipes plus the length of the straight pipes connecting the indoor unit and outdoor unit.
- You are advised to select the pipes based on the total length of the pipes connecting the indoor unit and outdoor unit, because different pipe diameters influence the voltage drop and performance of the cooling system. For details, see [Table 3-9](#).

Table 3-8 Equivalent length of components

Outer Pipe Diameter (inch)	Equivalent Length (m)			
	45-degree Bend	90-degree Bend	180-degree Bend	T-shaped Connector
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 3-9 Recommended pipe specifications

Pipe Length (m)	Recommended Diameter for Gas Pipes (inch)	Recommended Diameter for Liquid Pipes (inch)
$L \leq 25$	5/8	1/2



NOTE

If L is longer than 25 m, contact Huawei technical support.

Electric Connection Precautions

- Ensure that connections of all power cables, control cables, and ground cables comply with the local electrical code and that the cable specifications comply with the local cable layout rules.
- For details about the currents in full load, see the NetCol5000-A020 nameplate.
- Only trained and qualified personnel are allowed to connect cables. Installation personnel must take protective measures, for example, wearing protective gloves.
- All precision air conditioners must be reliably grounded.

3.1.4 Installation Layout

Layout principles for installing the NetCol5000-A020 are as follows:

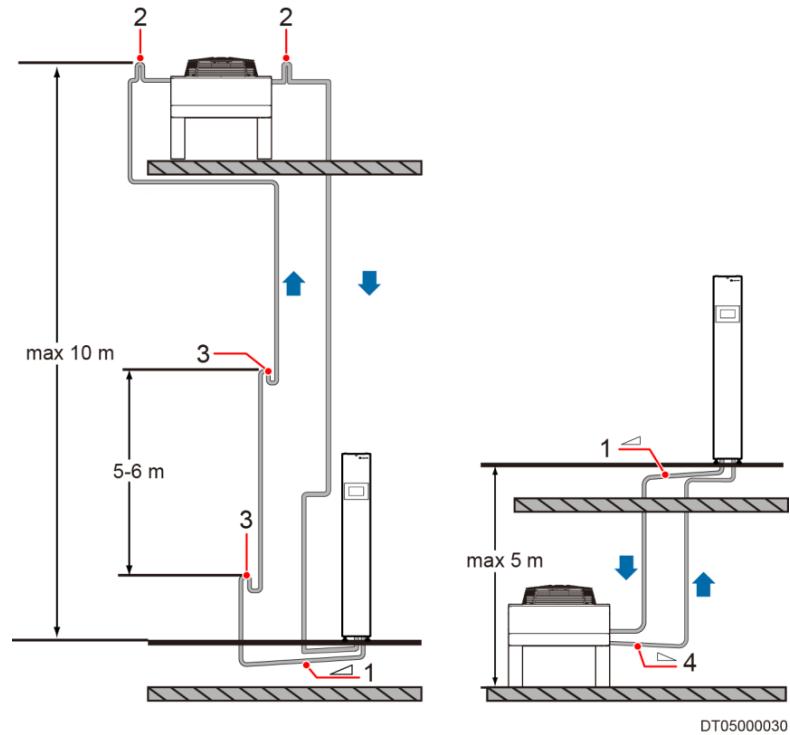
- If the outdoor unit is placed higher than the indoor unit, the maximum vertical distance between them is 10 m. To ensure system reliability, make an oil trap every 5 m to 6 m along pipes in the vertical direction. [Figure 3-1](#) shows positions of oil traps and inverted traps. For more specifications, see [Table 3-6](#).
- If the indoor unit is placed higher than the outdoor unit, the maximum vertical distance between them is 5 m.



NOTICE

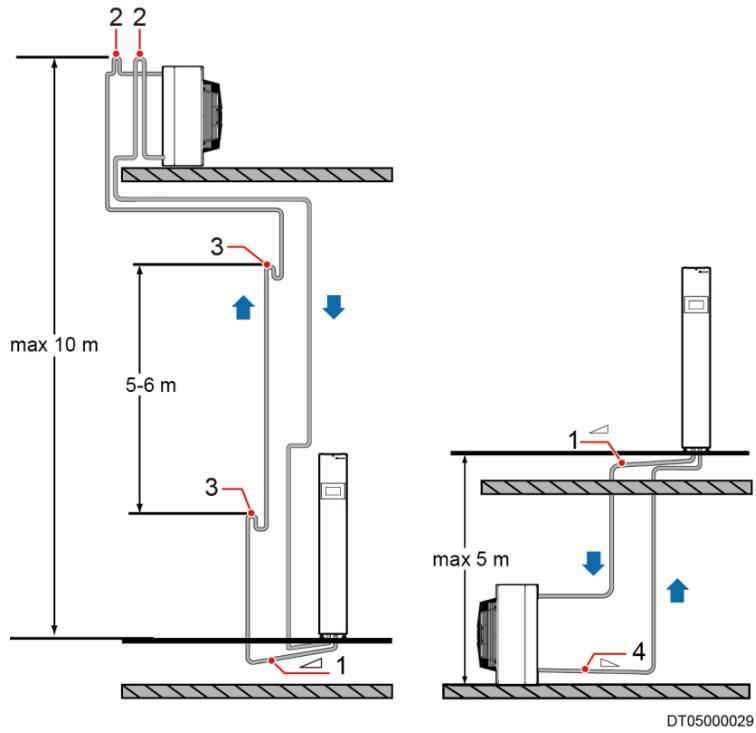
The inverted trap should be higher than the top copper pipe of the condenser in the outdoor unit.

Figure 3-7 Horizontal installation layouts of outdoor units



(1) Tilted gas pipeline (2) Inverted trap (3) Oil trap (4) Tilted liquid pipe

Figure 3-8 Vertical installation layouts of outdoor units



(1) Tilted gas pipeline (2) Inverted trap (3) Oil trap (4) Tilted liquid pipe

NOTE

- The specifications for oil trap inverted trap can be prepared by referring to [Oil Trap and Inverted Trap Preparations](#) in chapter [3.1.2 Material Preparations](#).
- 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.

3.2 Transportation and Unpacking

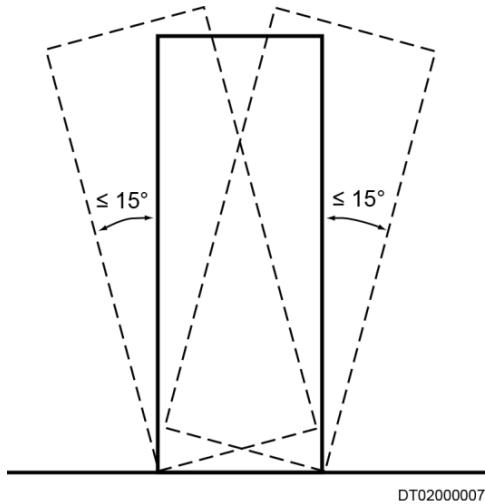
Prerequisites



NOTICE

- Only trained personnel are allowed to move the cabinet. Use a pallet truck to transport the cabinet secured to a wooden support to the installation position. Insert the forks of the pallet truck in the middle position to ensure balance.
- To prevent the cabinet from falling over, secure it to a pallet truck using ropes before moving it.
- When loading and unloading the cabinet, keep the gradient within 15 degrees, as shown in [Figure 3-9](#).
- To prevent shocks or falls, move the cabinet gently.
- After placing the cabinet in the installation position, unpack it and take care to prevent scratches. Keep the cabinet steady during unpacking.

Figure 3-9 Transportation Gradient



DT02000007

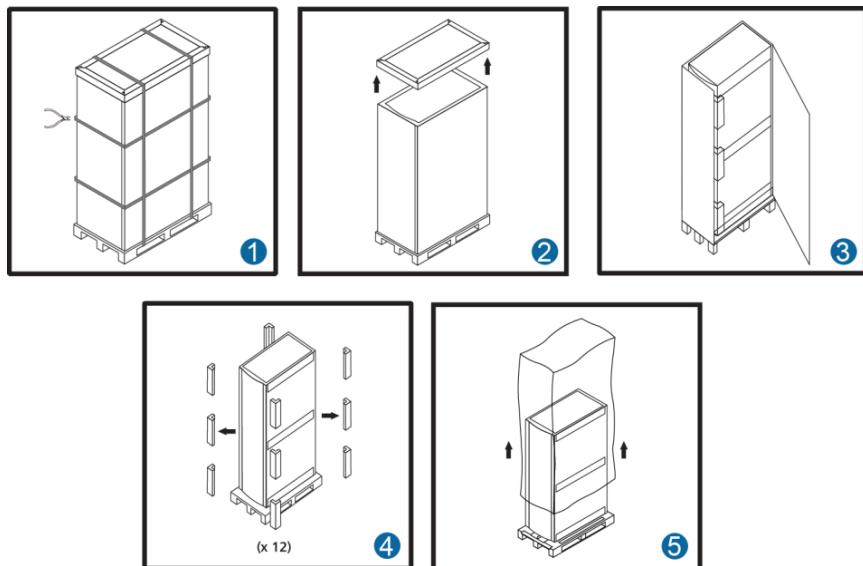
Procedure

Step 1 Visually inspect the outer packing for shipping damage. If any shipping damage is founded, report it to the carrier immediately.

Step 2 Unpack the package.

1. Remove the straps, top cover, outer packing, cushioning material, and adhesive tape, as shown in [Figure 3-10](#).

Figure 3-10 Unpacking



DT02000008

2. Visually inspect the cabinet appearance for shipping damage. If it is damaged, notify the carrier immediately.

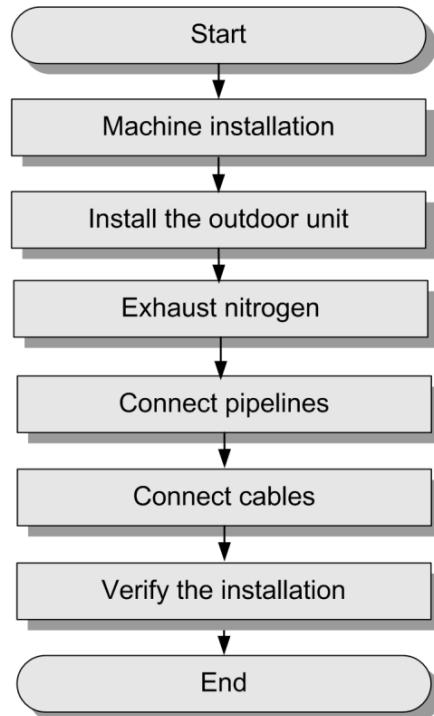
Step 3 Check that the fittings comply with the packing list. If some fittings are missing or do not comply with the packing list, record the information and contact your local Huawei immediately.

----End

3.3 Installation Flowchart

Figure 3-11 shows how to install the NetCol5000-A020.

Figure 3-11 Installation flowchart

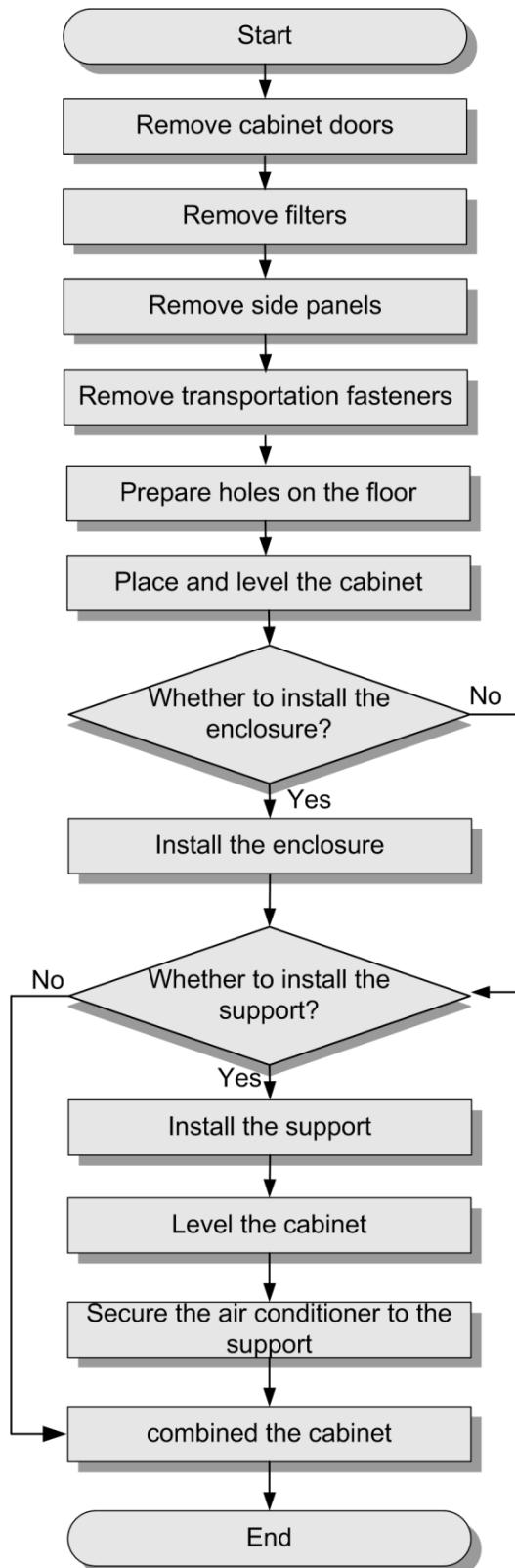


3.4 Mechanical Installation

Context

Figure 3-12 shows the mechanical installation process.

Figure 3-12 Mechanical installation flowchart





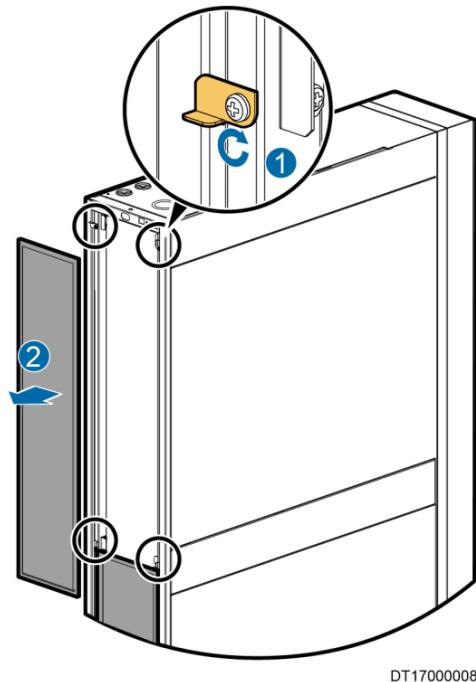
NOTICE

- When removing the front door, pay attention to the cables between the control panel and the cabinet to avoid damage.
- Take care to prevent the device from falling over when removing the device.
- Before installation, remove sheet metals fastening the cabinet and compressor during transportation (including two bottom corner metal parts and one mounting ear); otherwise, the equipment cannot work properly.

Procedure

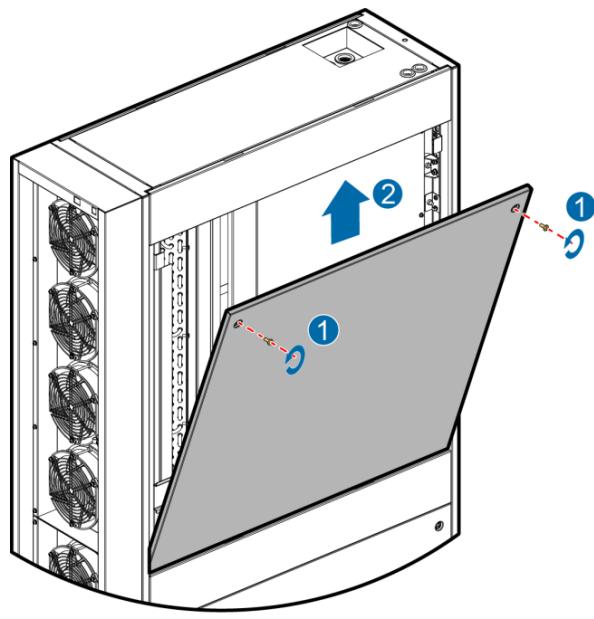
- Step 1** Open the door lock, hold both sides of the door, pull out the top end of the door 20 cm away from the cabinet, and remove cables to the controller panel and ground cables to the bottom of the door.
- Step 2** Rotate the six baffle plates fixing the upper and lower air filters and remove the air filters, as shown in [Figure 3-13](#).

Figure 3-13 Removing air filters



- Step 3** Take out the desiccant bag fixed near the compressor.
- Step 4** Remove the two screws from the side panel using a Phillips screwdriver, as shown in [Figure 3-14](#).

Figure 3-14 Removing a side panel

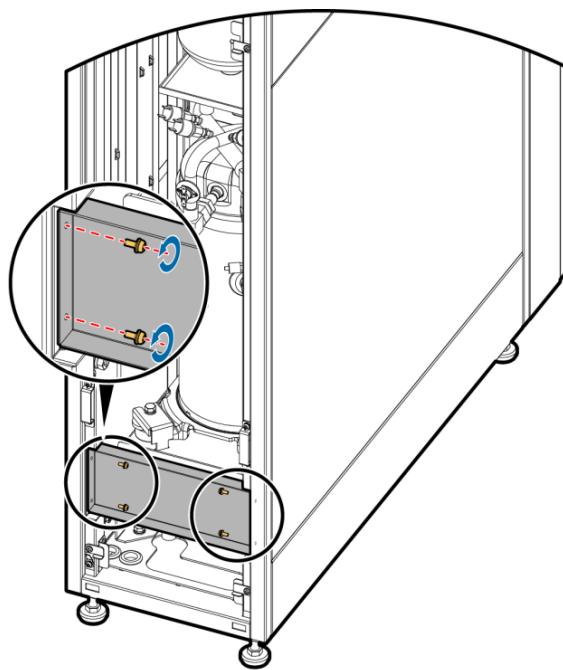


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Step 5 Removing transportation fasteners.

1. [Figure 3-15](#) shows how to remove the sheet metals for fastening the cabinet.

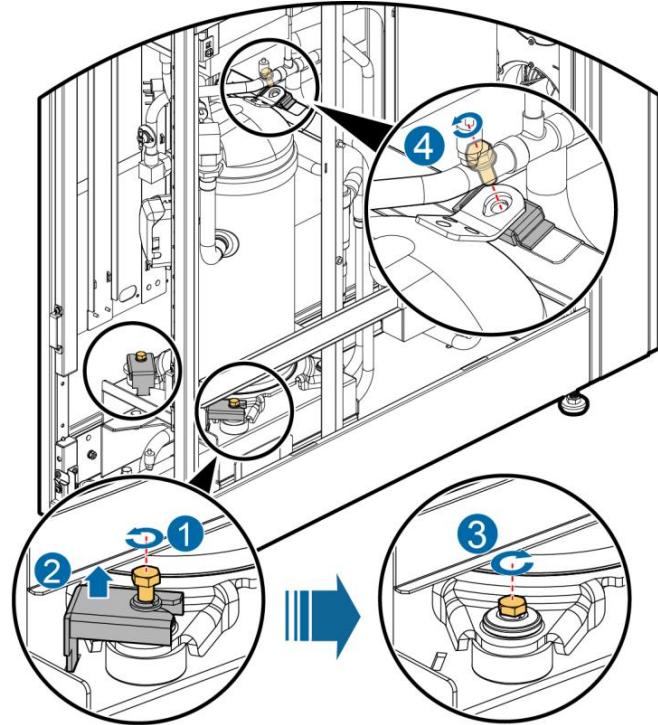
Figure 3-15 Removing the sheet metals for fastening the cabinet during transportation



DT02000036

2. Loosen the two bottom bolts for fastening the compressor using the 13# fixed wrench, pull out the sheet metal, and fasten the bolts using a wrench with a torque of 15 N·m as recommended, as shown in 1 to 3 of [Figure 3-16](#).
3. Remove the bolt fixing the mounting ear of the compressor using the 13# fixed wrench, and pull out the metal part, as shown in 4 of [Figure 3-16](#).

Figure 3-16 Removing the sheet metals for fastening the compressor during transportation



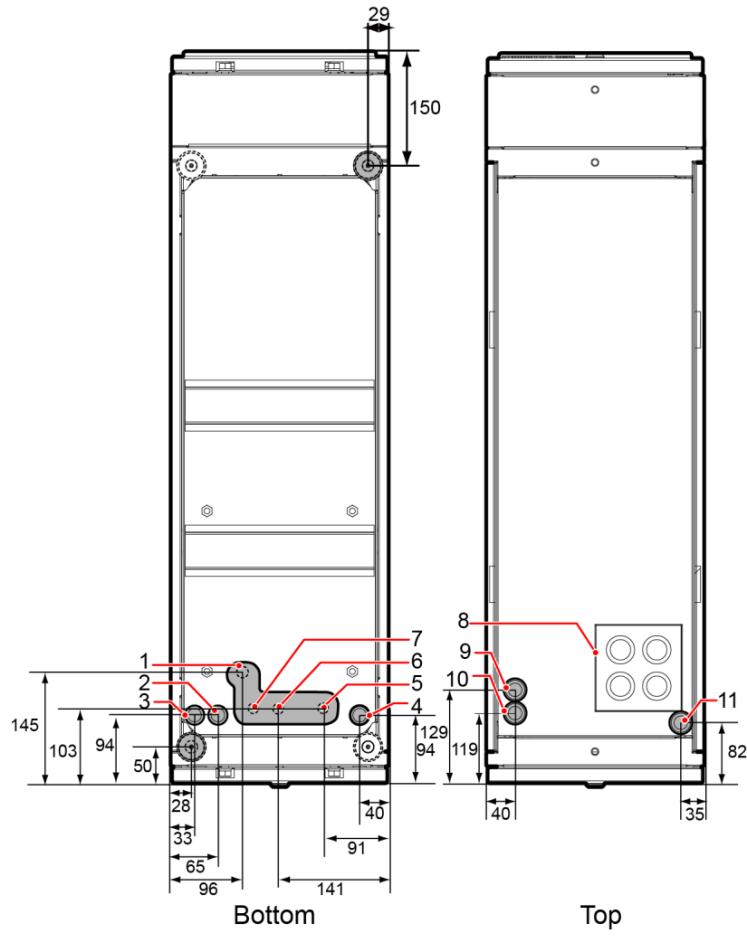
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 **NOTE**

Retain the removed sheet metals and bolts, and reinstall them for next device transportation.

Step 6 Mark holes for installing expansion bolts on the concrete floor by using a marker by referring to [Figure 3-17](#).

Figure 3-17 Holes on the bottom panel and top panel (unit: mm)



DT020E0016

- | | |
|---|--|
| (1) Hole for routing drainpipes | (2) Hole for routing cables in the bottom |
| (3) Hole for routing cables in the bottom | (4) Hole for routing cables to the T/H sensor |
| (5) Hole for routing the refrigerant liquid pipes | (6) Hole for routing the refrigerant gas pipes |
| (7) Hole for routing humidifier water supply | (8) Reserved hole |
| (9) Hole for routing cables in the top | (10) Hole for routing cables in the top |
| (11) Hole for routing cables to the T/H sensor | |

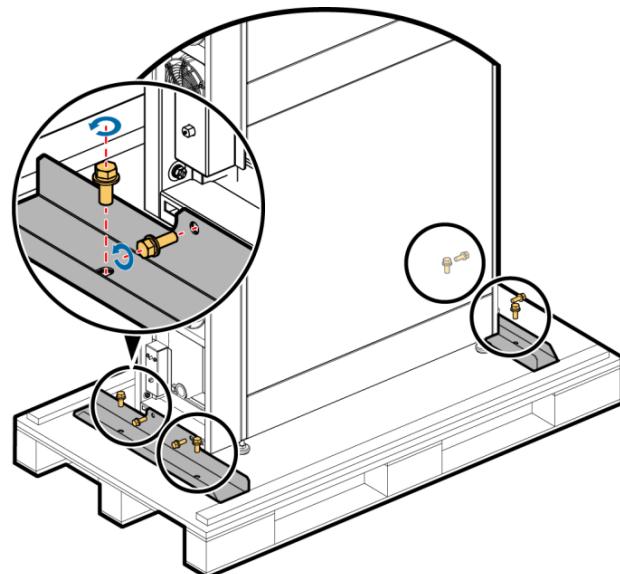
NOTE

- Inside diameter of the holes in the top and bottom with ring is 18.5 mm.
- Do not make holes for routing cables in the bottom when routing cables from the top.
- Do not make holes for routing cables to the T/H sensor (marked 4) in the bottom when routing cables from the bottom but do not connect the T/H sensor outside the cabinet.

Step 7 Place and level the cabinet.

1. Remove the screws from the fixing plate, as shown in [Figure 3-18](#).

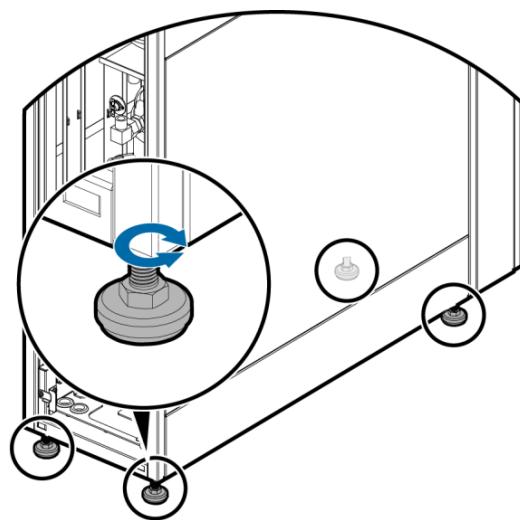
Figure 3-18 Removing the screws from the fixing plate



DT02000022

2. Install side panels.
3. At least four persons are required to lift the equipment from the pallet to the ground.
4. Adjust the leveling feet using an adjustable wrench, as shown in [Figure 3-19](#).

Figure 3-19 Leveling feet

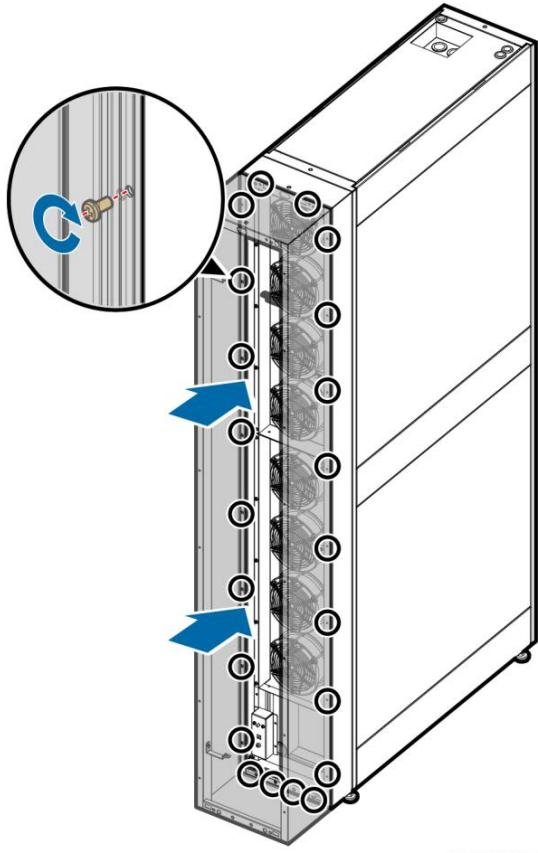


DT02000025

Step 8 Installing an enclosure frame (optional).

1. Fix enclosure frames onto the front door frame using twenty two M6 screws, as shown in [Figure 3-20](#).

Figure 3-20 Installing an enclosure frame



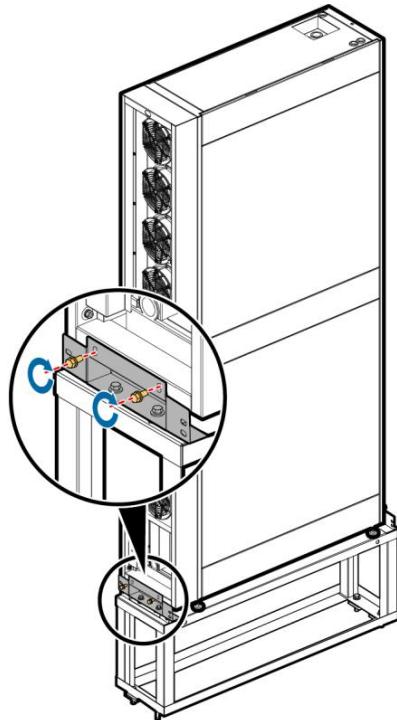
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2. Install the front door onto the enclosure frame, and connect the bottom ground cable of the front door to the enclosure frame.

Step 9 Install a support (optional).

1. Secure the support to the ground by using M12 expansion bolts.
2. Place the air conditioner to the support and secure it to the support by using M10 bolts after leveling the cabinet. [Figure 3-21](#) shows how to secure it.

Figure 3-21 Secure the air conditioner to the support



DT02000022

Step 10 Loosen the screws on the rear door column, secure the combining parts to the door by using bolts.

----End

3.5 Install the outdoor unit

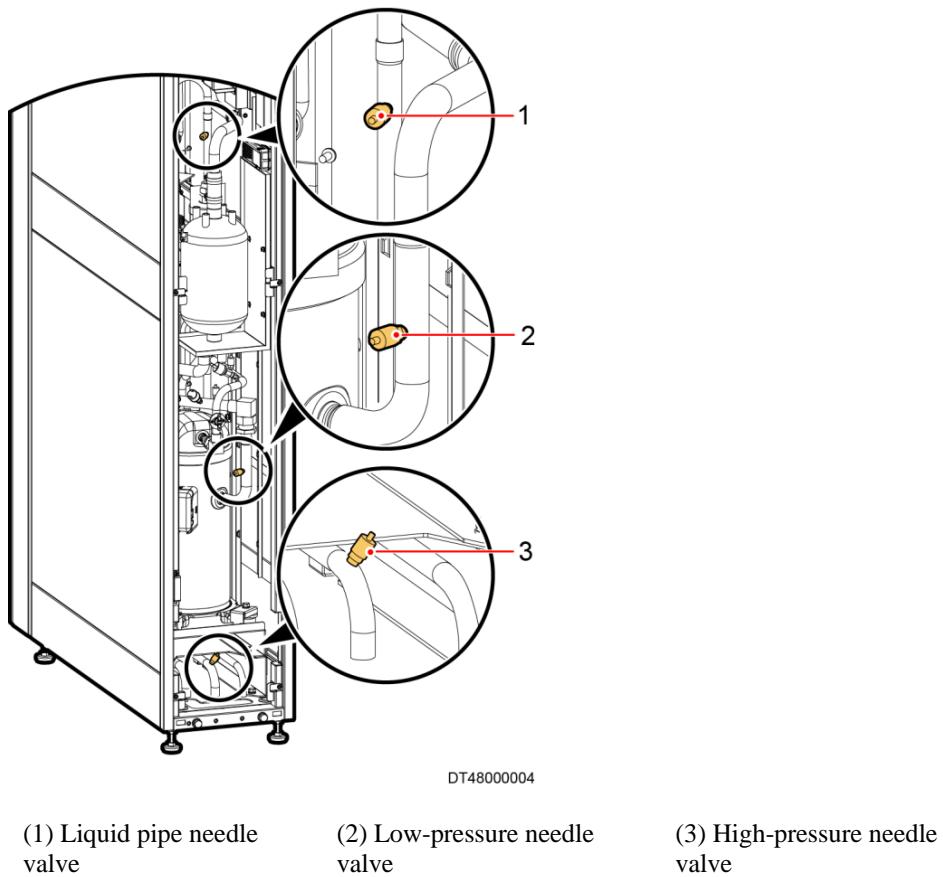
For details about how to install the outdoor unit, see *NetCol500 outdoor unit User Manual*.

3.6 Exhausting Nitrogen

Context

[Figure 3-22](#) shows the location of needle valves.

Figure 3-22 Location of needle valves



Procedure

Step 1 Remove the valve bonnet, and exhaust the nitrogen slowly.



You will hear a sound of strong air when exhausting.

Step 2 Reinstall the valve bonnet until no air exhausts from the needle valve.

----End

3.7 Connecting Pipelines



NOTICE

- The thickness of the thermal insulation foam for refrigerating and water cooling pipelines should be at least 13 mm.
- Ensure that the water pipelines with thermal insulation foam can pass through holes the on bottom plate. [Figure 3-17](#) shows specifications of the holes.

3.7.1 Routing Refrigerant Pipes

Prerequisites



DANGER

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



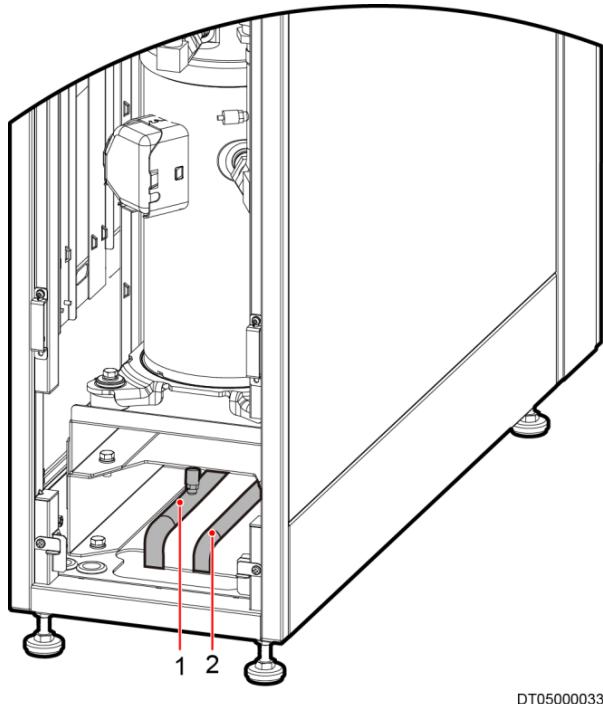
NOTICE

- Before welding the refrigerant pipes, take protective measures for needle valves 500 mm or near to the welding position (by taking out the valve plug or wrapping the valve with wet cloth).
- During the welding process, avoid burning the bottom plate, top plate, and side panels, especially the thermal insulation foam, labels, water pipes, and cables.
- During the welding process, do not expose the refrigerant pipes for over 15 minutes. Otherwise, system reliability may deteriorate.
- To avoid leakage of ventilation channels and damage to copper pipes, seal the holes after the pipes are routed. Seal the ends of the copper pipes to prevent foreign matter from entering the refrigerant pipes.
- The refrigerant pipes should be wrapped with thermal insulation foam.
- Avoid bends and ensure that the indoor and outdoor units are connected with shortest pipes.

Procedure

Step 1 Remove the two plugs from the pipes using a welding torch, as shown in [Figure 3-23](#).

Figure 3-23 Welding refrigerant pipes



(1) Discharge pipe

(2) Suction pipe

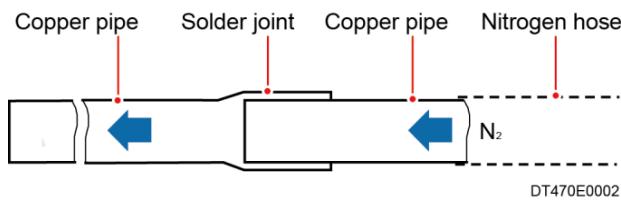


NOTICE

During the welding process, charge a little nitrogen into the pipes to avoid impurity caused by internal oxidation, as shown in [Figure 3-24](#).

- Slowly charge nitrogen into pipes through the high-pressure needle valve when welding gas pipes.
- Slowly charge nitrogen into pipes through the liquid needle valve when welding liquid pipes.

Figure 3-24 Welding schematic diagram

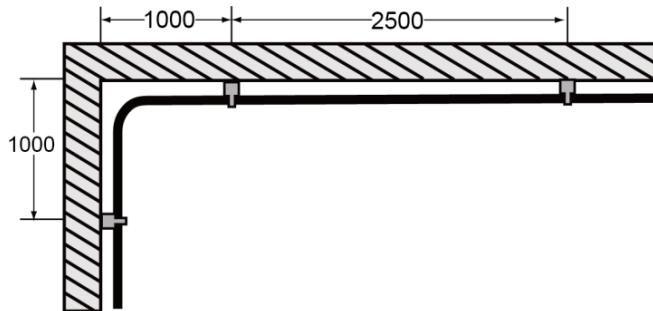


Step 2 Take out two straight pipes in the fitting bag, which are of an outer diameter of 5/8 inch and 1/2 inch respectively. Weld the straight pipes at the positions, as shown in [Figure 3-23](#)

Step 3 Install refrigerant pipes by referring to operations in [Figure 3-25](#).

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

Figure 3-25 Installing a refrigerant pipe (unit: mm)



DT05000022

NOTE

Onsite personnel prepare the required materials and install the supports. For details about the pipe support preparations, see [Oil Trap and Inverted Trap Preparations](#) in [3.1.2 Material Preparations](#).

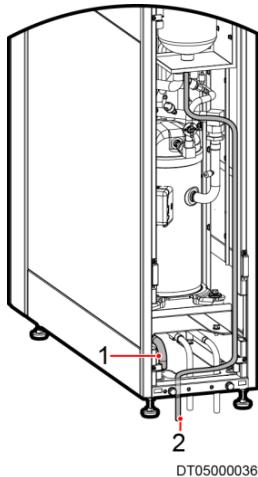
---End

3.7.2 Connecting Water Pipes

Context

[Figure 3-26](#) shows connection of humidifier water supply and drainpipe.

Figure 3-26 Connection of humidifier water supply and drainpipe



DT05000036

(1) Drainpipe (2) Water supply pipe (which is curled and bound for factory delivery)

Procedure

Step 1 Connect humidifier water supply by referring to [Figure 3-2](#), and seal thread connection points using waterproof sealant.

- Cut off cable ties on the water inlet hoses to the humidifier using diagonal pliers, pull the connectors of the pipes to the bottom of the equipment, and install the rigid pipes and their connectors. You are advised to wrap pipes out of the equipment with thermal insulation foam.
- Cut off bind straps on the water inlet hoses to the humidifier using diagonal pliers, pull the connectors of the pipes to the bottom of the equipment, and install the hoses and their connectors. You are advised to wrap pipes out of the equipment with thermal insulation foam.

Step 2 Connect drainpipe by referring to [Figure 3-3](#), and seal thread connection points with waterproof sealant.

- Remove the drainpipe plug on one end, install a hose (hose length depending on the operating environment) and fix the hose using a hose clamp at the connecting point. Take out the connector in the fitting bag, install the connector to the other end of the hose, and fix the connector using another hose clamp. Connect a rigid pipe to the connector. You are advised to wrap pipes out of the equipment using thermal insulation foam.
- Remove the drainpipe plug on one end, install a hose and fix the hose using a hose clamp. You are advised to wrap pipes out of the equipment using thermal insulation foam.

----End

3.7.3 Leak Checking

Context



NOTICE

- The measuring range of the pressure gauges must be larger than 4.0 MPa. The pipelines can withstand pressure of more than 4.0 MPa.
 - Do not remove the pipelines and pressure gauges when retaining pressure to avoid gas leakage.
-

Charge nitrogen using the low-pressure and high-pressure needle valves as shown in [Figure 3-22](#). You are advised to charge nitrogen using the liquid, low-pressure, and high-pressure valves as shown in [Figure 3-22](#), when the outdoor unit is disconnected.

Procedure

Step 1 Connect the pressure gauge, pipeline, and nitrogen steel vessel.

Step 2 Charge in nitrogen about 4.0 MPa to the steel vessel and remain the pressure for 24 hours. The system pressure should not decrease before and after nitrogen is charged in and remained for 24 hours at the same environment temperature. If the pressure decreases due to temperature changes, repeat preceding operations.

Step 3 If any welding problem occurs, find the leakage and weld it again. If pressure retainability meets requirements, reclaim nitrogen from the needle valves.

----End

3.8 Electrical Connection

3.8.1 Cable Installation

Operation Procedure



CAUTION

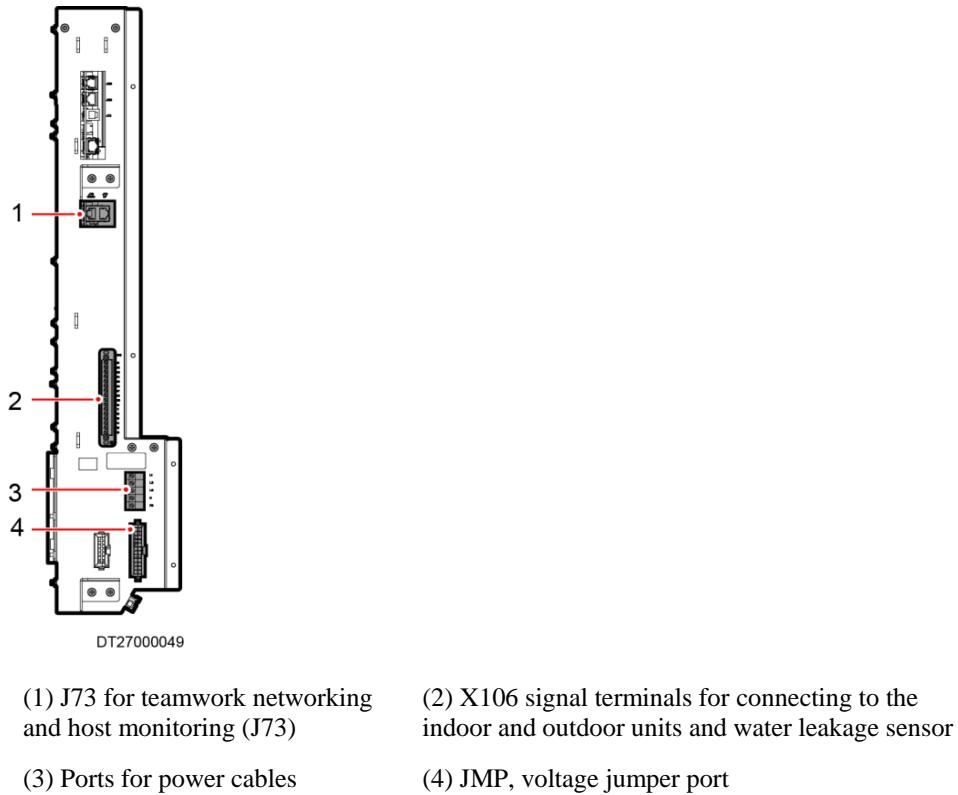
Keep cables away from the compressors, fans, and copper pipes (otherwise, take protective measures), and connect cables properly.

1. Connect power cables to the indoor unit.
2. Connect power cables to the outdoor unit. (See *NetCol500 Outdoor Unit User Manual*).
3. Install the voltage jumper.
4. Connect outdoor unit on/off signal cable and water sensor.
5. Connect Teamwork networking and host monitoring cable.
6. Install an T/H sensor.

For details about cable specifications, see [Table 3-7](#).

Port layout

Figure 3-27 Port layout on the electrical control box



3.8.2 Connecting Power Cables

Context

- Route power cables from the bottom or the top.
- For how to choose circuit breakers and cables, see [3.1.2 Material Preparations](#).

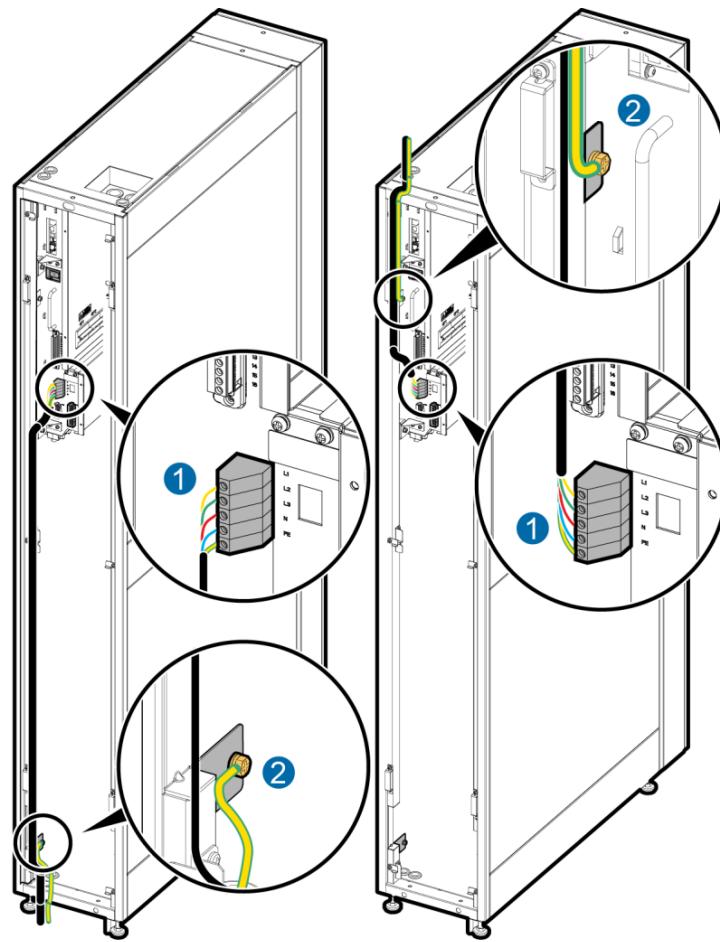
Procedure

- Step 1** Connect L1, L2, L3, N, and PE terminals to the corresponding power ports, as shown by 1 in [Figure 3-28](#).
- Step 2** Route a ground cable from the equipotential terminal of the indoor unit to the nearly ground bar of the equipment room, as shown by 2 in [Figure 3-28](#).

 **NOTE**

Ground cable must meet the local electrical specifications.

Figure 3-28 Routing power cables



Routing cables from the bottom

Routing cables from the top

DC030E0019

----End

3.8.3 Installing the Voltage Jumper

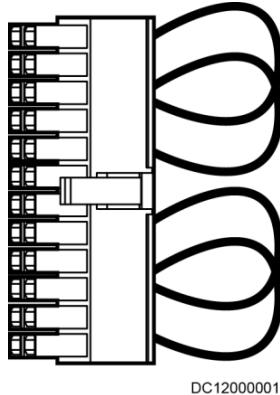


NOTICE

Before installing the voltage jumper, verify that the voltage jumper matches the mains line voltage.

Connect the voltage jumper to the JMP terminal of the electrical control box as shown by 4 in [Figure 3-27](#). [Figure 3-29](#) shows a voltage jumper.

Figure 3-29 Voltage jumper



3.8.4 Connecting the Signal Cables

3.8.4.1 Preparations Before Connection



NOTICE

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



NOTE

- You can obtain the signal cables from Huawei or purchase them by yourself.
- Before connecting the cables, ensure that choosing cables routing mode, top or bottom.

Figure 3-30 shows the zoomed-in view of the control terminal X106 port. The port is used for implementing the alarm on the main control board, outdoor unit startup and shutdown, remote startup and shutdown of the indoor unit, water leakage detection, smoke detection, and mains outage alarm.

Figure 3-30 Zoomed-in view of the control terminal X106 port

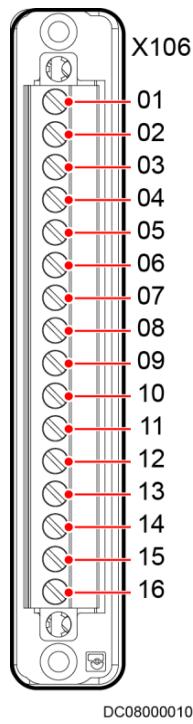


Table 3-10 describes the definitions and functions of control ports.

Table 3-10 Definitions and functions of control ports

Terminal	Definition	Function	Dry Contact Feature
01, 02	Port for reporting common alarm 1	Reserved	Reserved
03, 04	Port for reporting common alarm 2	Reserved	Reserved
05, 06	Port for the startup and shutdown of an outdoor unit	The signal output cables for controlling startup and shutdown of an outdoor unit are connected to terminals 05 and 06. (One indoor unit corresponds to one outdoor unit. Terminals 05 and 06 are connected to ports 1B/2B and 1A/2A of the outdoor unit respectively.)	N/A
07, 08	Port for the remote shutdown of an indoor unit	Terminals 07 and 08 can be set to remotely shut down an indoor unit. Specifically, the control signal cable is routed from the ports to the monitoring room	Can connect to the dry contact input, but cannot connect to active loads. The dry contact must be used

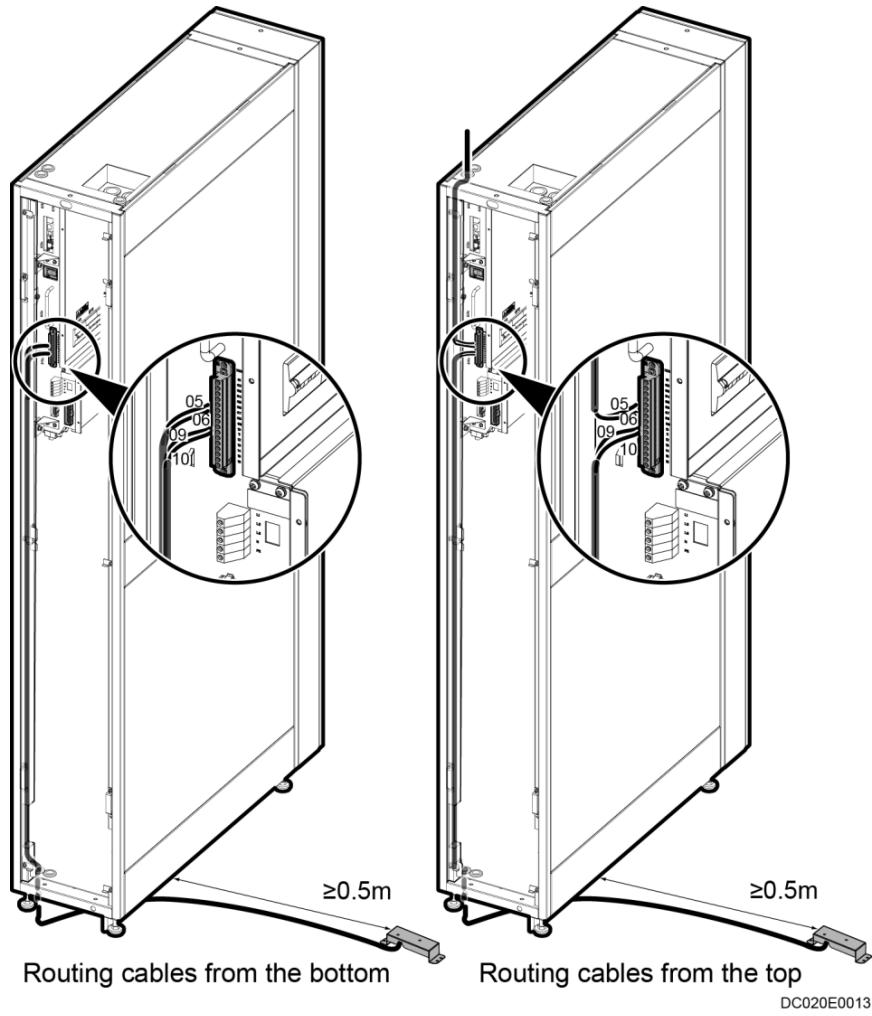
Terminal	Definition	Function	Dry Contact Feature
		and controls the shutdown of the indoor unit. Terminals 07 and 08 are disconnected before delivery ^a .	indoor only, and the usage range is within 100 meters.
09, 10	Water sensor port	The signal output cables for reporting Floor water overflow alarm are connected to terminals 09 and 10. ^b	N/A
11, 12	Smoke sensor port	The signal output cables for reporting smoke alarms are connected to terminals 11 and 12. After the smoke sensor is installed, the NetCol5000-A020 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.
13, 14	Port for reporting mains outage alarm	The signal output cables for reporting mains outage alarms are connected to terminals 13 and 14. The NetCol5000-A020 generates an alarm when mains outage occurs.	Can connect to the dry contact input, but cannot connect to active loads. The dry contact must be used indoor only, and the usage range is within 100 meters.
15, 16	Reserved	N/A	N/A

a: The emergency switch for remote shutdown should be steady on.

b: 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 water sensor far away from drain traps or floor drains in the equipment room and at least 0.5 m from the air conditioner.

Figure 3-31 shows routing of the signal cable and the location of the water sensor.

Figure 3-31 Routing signal cables for outdoor unit On/Off signal and water sensor



DC020E0013

3.8.4.2 Connecting Outdoor Unit On/Off Signal Cable

Procedure

- Step 1** Route the signal cables through the cable protecting ring on the top or at the bottom of the cabinet and the upper or lower cable hole on one side of the electrical control box.
- Step 2** Connect the terminals 05 and 06 on the control terminal X106 port and terminals 1B/2B and 1A/2A of the outdoor unit. [Figure 3-31](#) shows routing of the signal cable.
- Step 3** Fix the cables with cable ties.

----End

3.8.4.3 Connecting a Water Sensor

Context



NOTICE

Place the water sensor with the sheet metal upwards and detection board downwards.

Procedure

- Step 1** Connect one end of the signal cables to a water sensor.
- Step 2** Connect the other end of the signal cables to terminals 09 and 10 on the X106 terminal block of the electrical control box. [Figure 3-31](#) shows the location of the water sensor.
- Step 3** Use a cable tie to fix the cables on the cabinet.

----End

3.8.5 Teamwork Networking and Monitoring

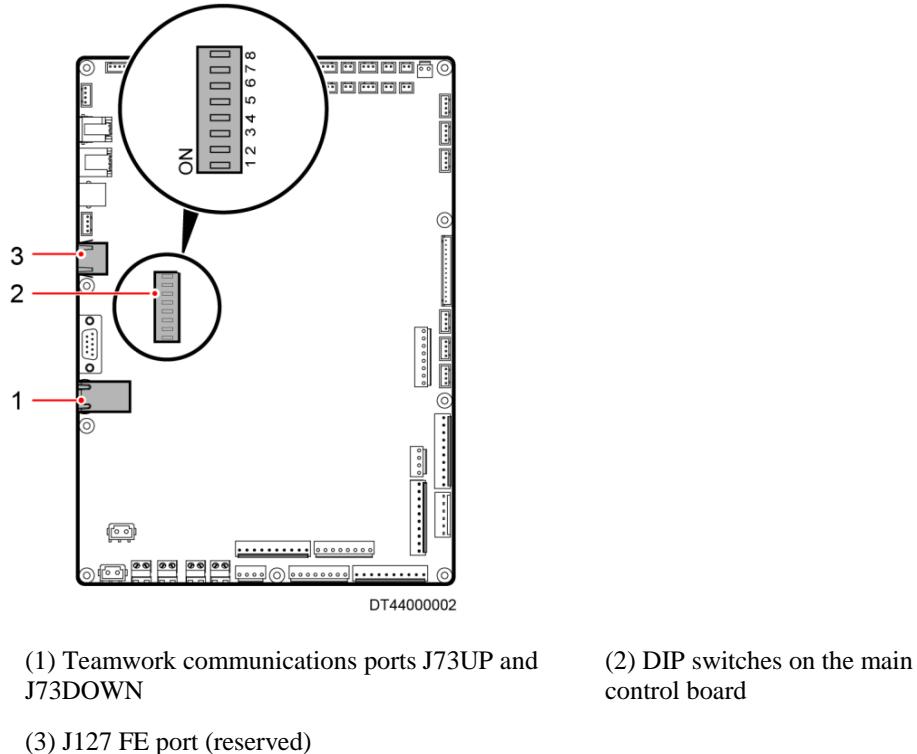
To implement teamwork networking and monitoring, you need to connect communications cables and set the DIP switch on the main control board.

Context

J73 teamwork networking ports J73UP and J73DOWN (as shown in [Figure 3-27](#)) on one side of the electrical control box enable CAN group control networking communication between cooling products, and communication between cooling products and the customer monitoring system connecting over the RS485 bus.

[Figure 3-32](#) shows positions of DIP switches on the main control board.

Figure 3-32 DIP switch position

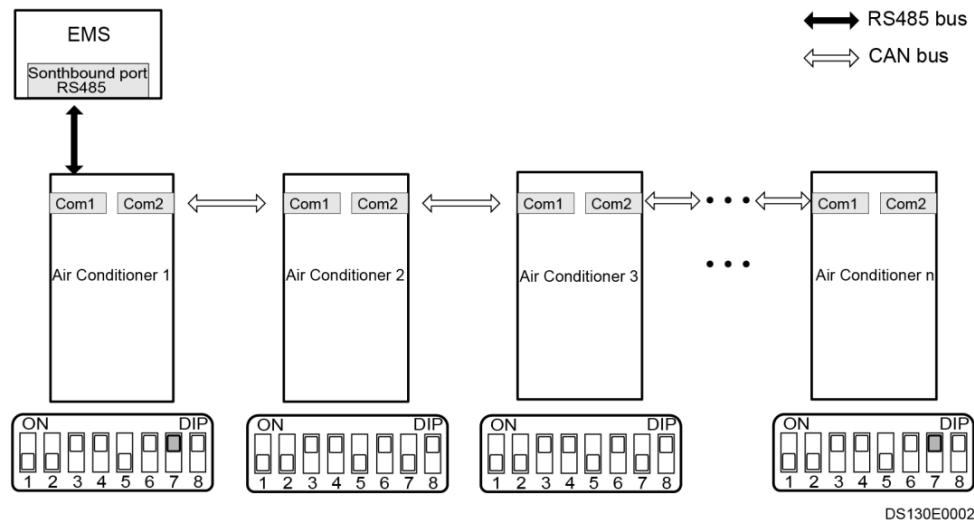


Procedure

Step 1 Connect the networked air conditioner, as shown in [Figure 3-33](#).

- When only teamwork networking is deployed, reserve J73UP on the first unit, connect J73DOWN of the unit to J73UP of the second unit, J73DOWN of the second unit to J73UP of the third unit. In this way, connect all units involved in teamwork networking, as shown by **CAN bus** in [Figure 3-33](#).
- When both teamwork networking and RS485 monitoring are deployed, connect J73UP of the first unit or J73DOWN of the last unit to the host over RS485, as shown by **RS-485 bus** in [Figure 3-33](#).

Figure 3-33 Network diagram for teamwork communication and monitoring



 **NOTE**

- The number of air conditioners in the preceding figure is less than or equal to 32.
- Com1 port is J73UP port, Com2 port is J73DOWN port.

Step 2 Set DIP switches on the main control board, as shown in [Table 3-11](#).



Set the position of switch 7 onsite based on the application scenarios and ensure that other DIP switches are in the default position, as shown in [Table 3-11](#).

Table 3-11 Operation of the switches on the main control board

Switch	Default Value	Description
1	OFF	Remaining in OFF.
2	OFF	Remaining in OFF.
3	ON	Remaining in ON.
4	ON	Remaining in ON.
5	OFF	Remaining in OFF.
6	ON	Remaining in ON.
7	OFF	<ul style="list-style-type: none"> • When teamwork mode is not deployed, remain in OFF. • When teamwork mode is deployed, toggle switches on the main control boards of the first and last units (such as air conditioner 1 and air conditioner n shown in Figure 3-33) to ON and other remains in OFF.

Switch	Default Value	Description
8	ON	Remaining in ON.

----End

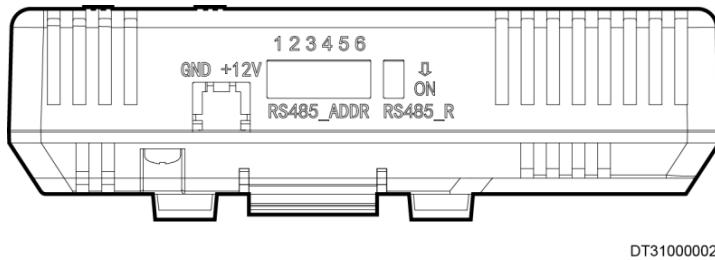
3.8.6 Installing T/H Sensors

To install the T/H sensors, you need to connect cables to the sensors and set DIP switches for the sensor.

Context

If more than one T/H sensor is connected to an air conditioner, the air conditioner must differentiate various T/H sensors based on DIP switch settings on the sensors that change their communications addresses. [Figure 3-34](#) shows an T/H sensor.

Figure 3-34 T/H sensor



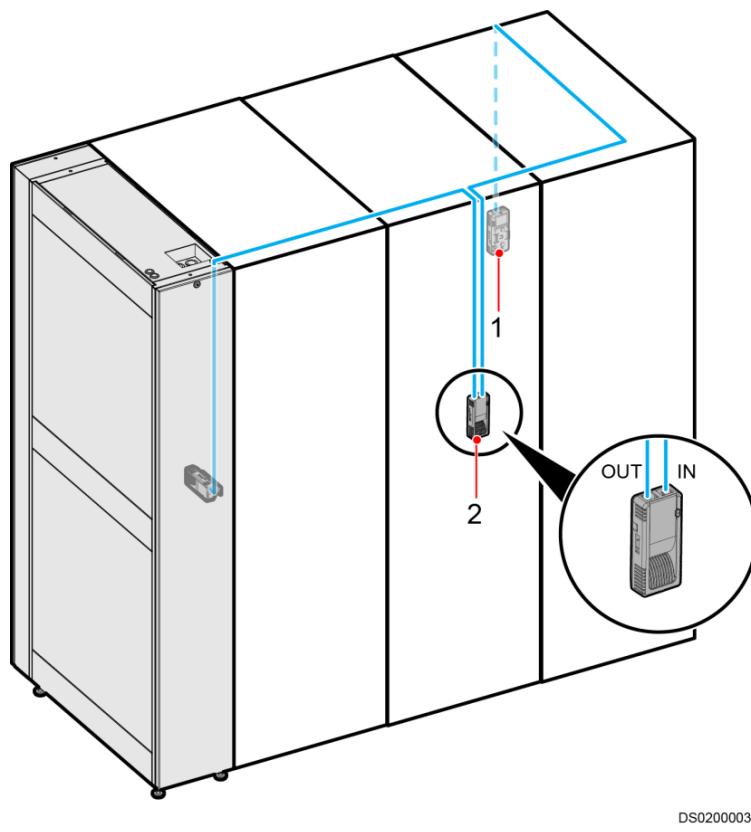
NOTICE

- Fix cables to the T/H sensor using cable ties.
- The T/H sensor is used to detect hot/cold aisle temperature. Determine the installation position of the T/H sensor based on the site situation. You are recommended to deploy the T/H sensor at a place where a heat point is most likely to appear in the hot or lack in cold aisle.

Procedure

- Step 1** Connect the RS485_OUT of the upstream sensor to RS485_IN of the downstream sensor.
[Figure 3-35](#) shows cable connection of T/H sensors.

Figure 3-35 Cables routed outside the cabinet



DS02000031

(1) Cold aisle side

(2) Hot aisle side

NOTE

- The T/H sensor should be placed at a place 1.5 m to the ground, and fixed securely using cable ties.
- A maximum of three T/H sensors can be connected in hot and cold aisle respectively.

Step 2 Set DIP switches of the T/H sensor, [Table 3-12](#) lists how to set.

Table 3-12 DIP switches of the T/H sensor

Position	Name	Address	DIP Switch Sequence					
			1	2	3	4	5	6
Return air	Return air T/H 1	1	ON	OFF	OFF	OFF	OFF	OFF
Cold aisle	Cold aisle T/H 1	11	ON	ON	OFF	ON	OFF	OFF
	Cold aisle T/H 2	12	OFF	OFF	ON	ON	OFF	OFF
	Cold aisle T/H 3	13	ON	OFF	ON	ON	OFF	OFF
Hot	Hot aisle T/H 1	21	ON	OFF	ON	OFF	ON	OFF

Position	Name	Address	DIP Switch Sequence					
			1	2	3	4	5	6
aisle	Hot aisle T/H 2	22	OFF	ON	ON	OFF	ON	OFF
	Hot aisle T/H 3	23	ON	ON	ON	OFF	ON	OFF

 **NOTE**

- By default, the address of an T/H sensor provided by Huawei is 1.
- No DIP switch operation is required for the last RS485_R port.
- After setting communications addresses for T/H sensors, choose **Settings > System Settings > T/H Sensor** from the main menu and enable the T/H sensor in the aisle. Otherwise, the sensor does not work.

----End

3.9 Connections Verification

Table 3-13, Table 3-14 and Table 3-15 list the items for connections verification. Record results in the table after verification.

Table 3-13 Check items on the indoor unit installation

Check Item	Expected Result	Check Result	Remark
Cabinet	The cabinet is installed properly, without any tilts.	<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
	The cabinet is secured to the support by using bolts.	<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
	The foreign matter inside the cabinet such as cable ties and stubs is cleaned up.	<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
LCD	The LCD is well connected.	<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
Electric heater	The electric heater is secured.	<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
	The electric heater protect probe is secured.	<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
EC fan	The fan is secured.	<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
	The fan has no foreign matter inside.	<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
	The fan blades rotate properly.	<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
Electrode humidifier	The water inlet pipes and drainpipes are securely connected without leakage.	<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
	The electrode humidifier is securely	<input type="checkbox"/> Passed <input type="checkbox"/> Failed	

Check Item	Expected Result	Check Result	Remark
	connected to its base.		
Compressor	The sheet metals and lifting bolts for transporting the compressors are removed.	<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
	The bolts on the compressor are tightened.	<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
	The float terminals are well connected and cables are fixed reliably.	<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
	The water level detection switch is securely installed.	<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
	The float for the water level detection switch can move smoothly.	<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
Air filter	The air filter is correctly installed according to the air flow direction on the frame.	<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
Differential pressure switch	The cable ties on the differential pressure tubes are secured.	<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
	There is no foreign matter in the differential pressure tubes. The differential pressure tubes are not seriously bent.	<input type="checkbox"/> Passed <input type="checkbox"/> Failed	

Table 3-14 Check items on the pipes

Expected Result	Check Result	Remark
Ports are connected properly. The pipelines have oil trap, inverted traps, gradients (of the refrigerant pipes), and supports.	<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
The hose clamp and cable ties of the condensate water pipes are secured.	<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
All pipelines are tightened reliably.	<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
All pipes are fastened with thermal insulation foam.	<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
The thread joint is sealed by using sealant.	<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
The needle valve plug is secured and equipped with a valve bonnet.	<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
The pipes are not hard bent.	<input type="checkbox"/> Passed <input type="checkbox"/> Failed	

Table 3-15 Check items on the electric

Expected Result	Check Result	Remark
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 ± 3 Hz).	<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
Cables are intact.	<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
No open or short circuits, or incorrect connections occur in electrical loops.	<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
The power cables to the indoor and outdoor units, the cables between the indoor and outdoor units, the communication cables, the voltage jumper and the T/H sensors are connected properly.	<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
The rated values of general circuit breakers are accord with request.	<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
All cables, connectors, and bolts are secured.	<input type="checkbox"/> Passed <input type="checkbox"/> Failed	
Units are properly grounded.	<input type="checkbox"/> Passed <input type="checkbox"/> Failed	

4 Power-On Commissioning

4.1 Tools

Tools for commissioning the NetCol5000-A020 are as follows:

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

4.2 Partially Charging in Refrigerant

4.2.1 Calculation Requirements of Chilled Oil and Refrigerant to Be Charged

Partially Charging in Refrigerant

If the length of one-way liquid pipeline is 7.5 m or shorter, **Table 4-1** shows the amount of refrigerant to be charged according to the different outdoor unit. The actual amount of refrigerant based on the commissioning onsite.

Table 4-1 Refrigerant configuration principle 1

Class	NetCol500-A0384C11E0	NetCol500-A0324C11E0
	-5°C to +52°C	-15°C to +45°C
Basic refrigerant charge	7 kg	5.7 kg

If the liquid pipe is longer than 7.5 m, charge in extra refrigerant excluding the basic refrigerant charge.

Table 4-2 shows the amount of extra refrigerant to be charged when connecting to NetCol500-A0324C11E0 T1 outdoor unit.

Table 4-2 Refrigerant configuration principle 2

Pipe length L (m)	Gas pipe diameter (mm)/Liquid pipe diameter (mm)	Extra refrigerant charge (kg)
$0 < L \leq 25$	$\Phi 15.88/\Phi 12.7$	Extended length of the liquid pipe (m) x 0.1 kg/m
$25 < L \leq 60$	$\Phi 19.05/\Phi 15.88$	Extended length of the liquid pipe (m) x 0.18 kg/m

 **NOTE**

- Extended length of the liquid pipe (m) = Length of the liquid pipe (m) – 7.5 m.
- If the length of one-way liquid pipeline is 30 m. The total amount of refrigerant charge (kg) = basic refrigerant charge (5.7 kg) + extra refrigerant charge [(30 m – 7.5 m) x 0.18 kg/m] = 9.75 kg.

Table 4-3 shows the amount of extra refrigerant to be charged when connecting to NetCol500-A0384C11E0 T3 outdoor unit.

Table 4-3 Refrigerant configuration principle 3

Pipe length L (m)	Gas pipe diameter (mm)/Liquid pipe diameter (mm)	Extra refrigerant charge (kg)
$0 < L \leq 25$	$\Phi 15.88/\Phi 12.7$	Extended length of the liquid pipe (m) x 0.1 kg/m

 **NOTE**

If the length of one-way liquid pipeline is 20 m. The total amount of refrigerant charge (kg) = basic refrigerant charge (7 kg) + extra refrigerant charge [(20 m – 7.5 m) x 0.1 kg/m] = 8.25 kg.

Charging in Refrigerant Oil

If the pipe connecting the indoor and outdoor units is equal to or shorter than 7.5 m, you do not need to charge refrigerant oil. If it is longer than 7.5 m, you need to charge extra refrigerant oil. The charging amount of extra refrigerant oil required can be calculated using the following formula:

$$\text{Amount of refrigerant oil (kg)} = \text{Extra refrigerant charge (kg)} \times 2.5\%$$

4.2.2 Charging Refrigerant Oil

Prerequisites

Check whether refrigerant oil needs to be added by referring to [Charging in Refrigerant Oil](#) in [4.2.1 Calculation Requirements of Chilled Oil and Refrigerant to Be Charged](#). If not, directly vacuumize the cooling system by referring to [4.2.3 Vacuumizing](#).

Context



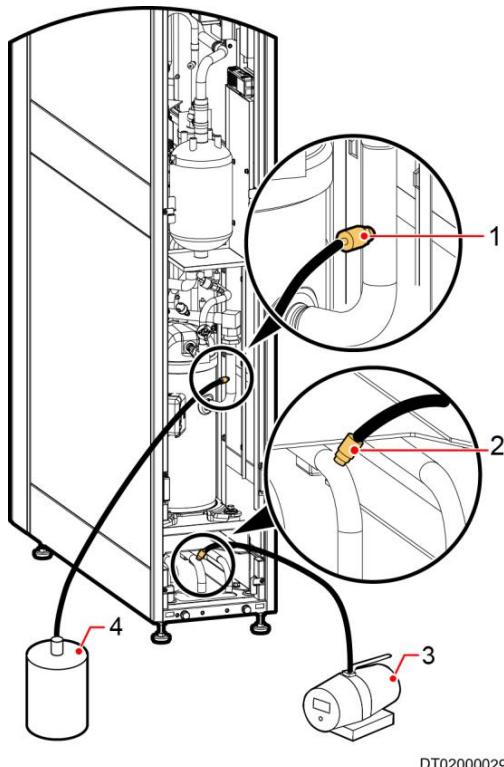
NOTICE

Ensure that the hose connectors are fastened before vacuumizing the cooling system.

Procedure

- Step 1** Connect the refrigerant oil bucket to the low-pressure needle valve and connect the vacuum pump to the high-pressure needle valve using hoses, as shown in [Figure 4-1](#).

Figure 4-1 Charging refrigerant oil



- (1) Low-pressure needle valve (2) High-pressure needle valve (3) Vacuum pump (4) Refrigerant oil bucket

- Step 2** Open the vacuum pump to charge refrigerant oil to the cooling system.

- Step 3** Close the vacuum pump and remove the chilled oil bucket and vacuum pump.

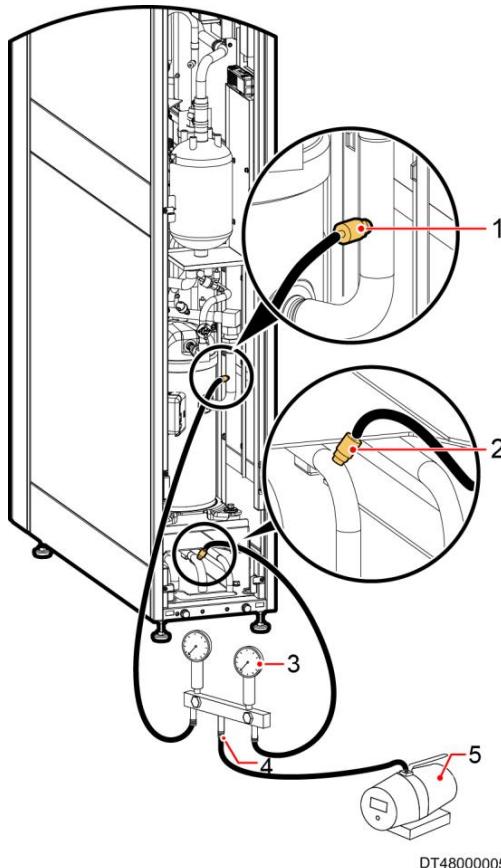
---End

4.2.3 Vacuumizing

Procedure

Step 1 Connect pressure gauges to the high-pressure needle valve, low-pressure needle valve, and vacuum pump, as shown in [Figure 4-2](#), and start vacuumizing from the two positions.

Figure 4-2 Vacuumizing



DT48000005

- (1) Low-pressure needle valve (2) High-pressure needle valve (3) Pressure gauge
(4) Nut (5) Vacuum pump

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

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

Step 4 Check that the time for vacuumizing is 80 minutes or longer after making sure that the cooling system does not leak, the pressure displayed on the vacuum pump is less than or equal to 60 Pa (absolute pressure), and the sight glass is dry (green).

Step 5 After vacuumizing, close valves of all pressure gauges, the vacuum pump (no disconnection is required), remain the pressure for 10 minutes, and ensure that the system pressure is equal to or smaller than 90 Pa (absolute pressure).

 **NOTE**

If the pressure gauge precision does not reach 60 Pa (absolute pressure), ensure that the pressure gauge pointers stay in the minimum scale. In addition, remain the pressure for one hour and check whether the pressure increases obviously.

----End

4.2.4 Partially Charging in Refrigerant

Prerequisites

Before refrigerant charging, ensure that the air is exhausted from the hose connecting to the steel vessel of the refrigerant.

Context



CAUTION

Wear protective gloves when handling refrigerant.



NOTICE

- Charge the refrigerant (R410A) after checking that the cooling system does not leak and the vacuum meets the requirements.
 - Charge refrigerant as required upon calculation shown in [4.2.1 Calculation Requirements of Chilled Oil and Refrigerant to Be Charged](#).
 - Charge refrigerant to the three needle valves shown in [Figure 4-2](#) simultaneously.
-

Procedure

Step 1 Replace the vacuum pump with the steel vessel of the refrigerant.

Step 2 Slightly release the valve of the steel vessel and the hose nut in [Figure 4-2](#) until you feel cold air at the nut. Fasten the nut and the steel vessel valve.

Step 3 Put the steel vessel on an electronic balance and clear the reading.

Step 4 Open valves of the pressure gauges and the steel vessel in [Figure 4-2](#) and start charging refrigerant.



NOTICE

Never move the hose or steel vessel during refrigerant charging. Otherwise, the value on the electronic balance is influenced.

Step 5 Refrigerant should be charged in liquid based on the calculated amount.

Step 6 Close the pressure gauges and the valve of the steel vessel after charging in refrigerant.

----End

4.3 Power-on Preparations

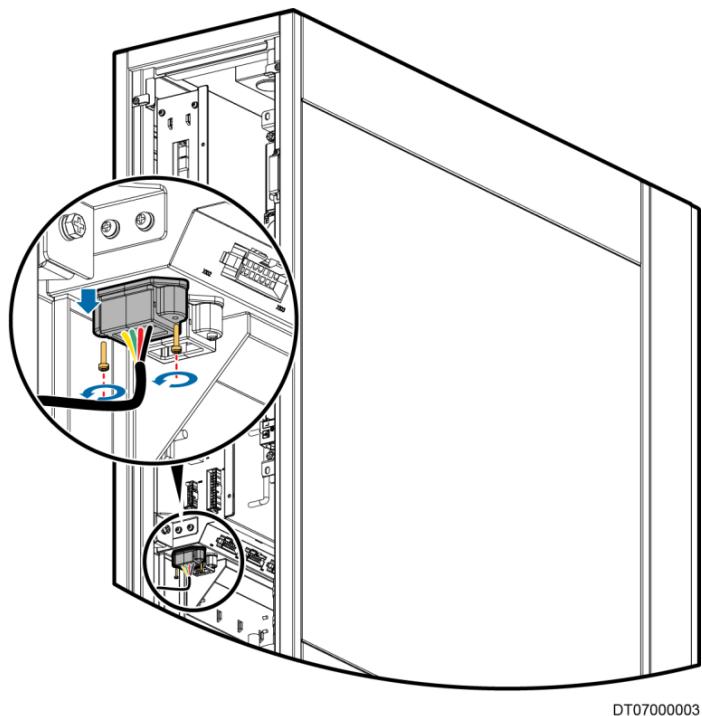
Prerequisites



CAUTION

In the container data center scenario, when the indoor unit is not connected to the outdoor unit before being powered on and no compressor needs to be configured, remove the screws fixing the X115 terminals below the electrical control box using a Philip screwdriver and plug out the terminals, as shown in [Figure 4-3](#). If the compressor is required, reinstall the X115 terminals. (Note that removing and installing terminals must be performed when the equipment is powered off.)

Figure 4-3 Removing cables from the compressor



DT07000003

Procedure

- Step 1** Check that the water inlet pipes and drainpipes of the humidifier are properly connected and outer thermal insulation foam is reliably fixed.
- Step 2** Check that the phase sequence of L1/L2/L3/N/PE cables to the indoor and outdoor units is correct. For details, see [3.8.2 Connecting Power Cables](#) and *NetCol500 Outdoor Unit User Manual*.
- Step 3** Check that the voltage distributor is properly connected. For details, see [3.8.3 Installing the Voltage Jumper](#).
- Step 4** Check that signal cables to the indoor and outdoor units are properly connected. For details, see [3.8.4.1 Preparations Before Connection](#).
- Step 5** Check that the water leakage sensor is installed into position. For details, see [3.8.4.3 Connecting a Water Sensor](#).
- Step 6** If group control networking is deployed, check that cables are correctly connected and DIP switches on the main control board are set properly. For details, see [3.8.5 Teamwork Networking and Monitoring](#).
- Step 7** Check that cables to the ambient temperature and humidity sensor are correctly connected and related DIP switches are set properly. For details, see [3.8.6 Installing T/H Sensors](#).
- Step 8** Check that refrigerant is charged in to the cooling system, pipelines to the humidifier cylinder are properly connected, and the manual drainage button on one side of the electrical control box is set to "O".

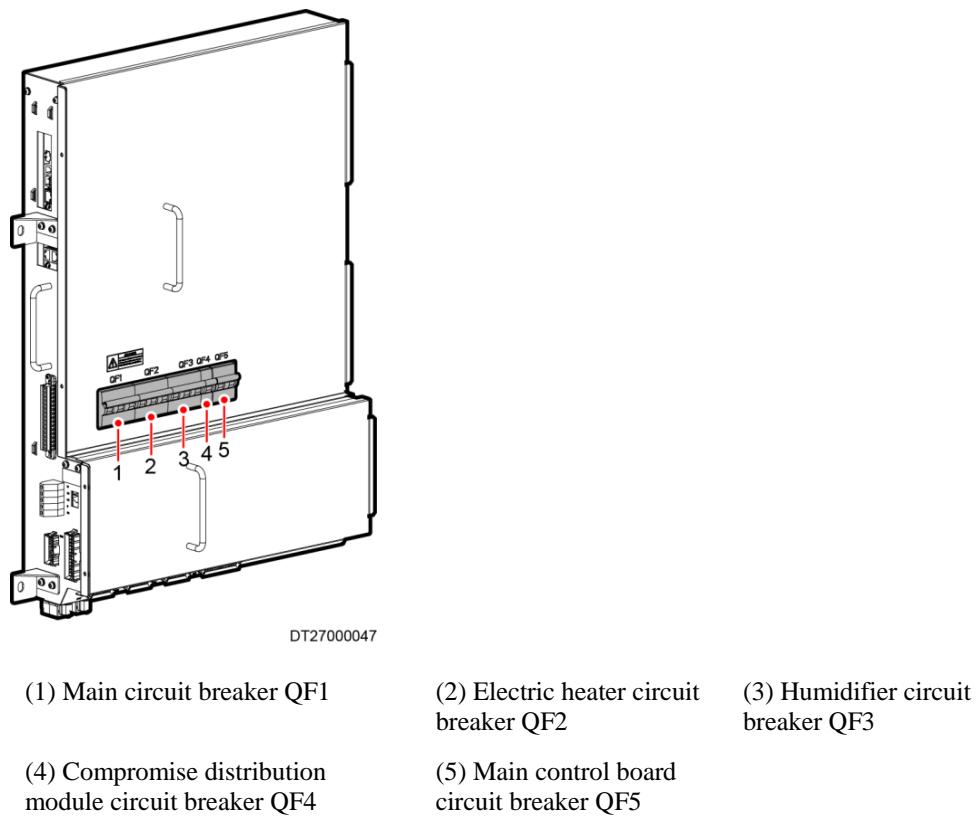
----End

4.4 Powering on the Equipment

Context

Figure 4-4 shows positions of various circuit breakers, which are necessary for system commissioning.

Figure 4-4 Switch position



Procedure

Step 1 Switch on the external general circuit breaker, main circuit breaker QF1 for the indoor unit, main control board circuit breaker QF5, and general circuit breaker for the outdoor unit in sequence.



NOTICE

After the main control board circuit breaker QF5 is switched on, the crankcase heat tape starts. Before starting the compressor, ensure that the crankcase heat tape has worked for over 12 hours. Otherwise, no maintenance operation is allowed.

Step 2 Choose **Basic Settings** on the main menu of the LCD and set following parameters by referring to *Advanced Cooling Controller User Manual*.

- Select the language: English or Chinese.
- Select the date & time settings: date format, date, time, and time zone.
- Select the monitoring mode.
- Check whether the voltage is correct.

 **NOTE**

For more operations about the controller, see *Advanced Cooling Controller User Manual*.

Step 3 Tap **Settings > System Settings > T/H Sensor** to enter the **T/H Sensor** screen. You can configure the T/H control type, temperature and humidity set point. For details, see the system settings in *Advanced Cooling Controller User Manual*.

Step 4 If onsite teamwork networking configuration is required. You need to configure the parameters.

---End

4.5 Commissioning Procedure

Prerequisites

Ensure that the outdoor unit has been powered on before the compressor is started.

Context

Table 4-4 describes the mapping relationship between the saturation temperature and pressure of R410A.

Table 4-4 Mapping relationship between the saturation temperature and pressure of R410A

Saturation Temperature (°C)	Pressure (kPa)	Saturation Temperature (°C)	Pressure (kPa)	Saturation Temperature (°C)	Pressure (kPa)
0	700.7	25	1557.4	41	2385.0
1	726.5	26	1602.0	42	2445.4
2	753.0	27	1647.5	43	2507.0
3	780.1	28	1693.8	44	2569.7
4	807.8	29	1741.1	45	2633.5
5	836.2	30	1789.3	46	2698.5
6	865.3	31	1838.5	47	2764.7
7	895.0	32	1888.6	48	2832.1
8	925.4	33	1939.7	49	2900.7
9	956.5	34	1991.8	50	2970.6

Saturation Temperature (°C)	Pressure (kPa)	Saturation Temperature (°C)	Pressure (kPa)	Saturation Temperature (°C)	Pressure (kPa)
10	988.4	35	2044.9	51	3041.7
11	1020.9	36	2098.9	52	3114.0
12	1054.1	37	2154.0	53	3187.7
13	1088.1	38	2210.2	54	3262.7
14	1122.9	39	2267.4	55	3339.1
15	1158.4	40	2325.6	N/A	N/A



NOTICE

- Remove the steel refrigerant vessel after confirming that refrigerant no longer needs to be supplemented.
- User types include **Admin** (preset password: 000001), **Engineer** (preset password: 000001), **Operator** (preset password: 000001), and Guest users (no preset password). The **Admin** user has the highest permission, followed by the **Engineer**, **Operator**, and **Guest** users. To enter **Diagnostic Mode**, you must have the **Admin** or **Engineer** rights.
- If any alarm is reported during commissioning, handle the alarm by referring to [5.4 Alarm Reference](#) and [5.5 Troubleshooting](#).
- If electric heater and electrode humidifier is not configured, skip the commissioning procedures for the electric heater and humidifier.

Procedure

Step 1 Switch on the electric heater circuit breaker QF2, humidifier circuit breaker QF3, and compromise distribution module circuit breaker QF4.

Step 2 Tap **Start** on the LCD, choose **Maint > Diagnostic mode > Enter** from the main menu.



NOTE

For detailed operations, see *Advanced Cooling Controller User Manual*. After the equipment is powered on, if no manual operation is performed within 25s, the equipment will automatically run following the preset logic, and other components like the compressor and indoor and outdoor fans will also start as required.

Step 3 Tap **On** of the outdoor fans in **Diagnostic mode**.

After that, check whether the OFF status of outdoor fans is cleared, the indicator of the phase sequence protector inside the outdoor electrical control box is on. If the indicator is not on, check whether the phase sequence works properly. For details, see *Advanced Cooling Controller User Manual*.

Step 4 Tap **Off** of the outdoor fans in **Diagnostic mode**.

Step 5 Tap **On** of the liquid solenoid valve in **Diagnostic mode**.

You will hear a loud sound from the liquid solenoid valve after its status turns to **On**.

Step 6 Tap **Off** of the liquid solenoid valve in **Diagnostic mode** and reset the liquid solenoid valve.

Step 7 Tap **On** of the hot gas bypass valve in **Diagnostic mode**.

You will hear a loud sound from the hot gas bypass valve after its status turns to **On**.

Step 8 Tap **Off** of the hot gas bypass valve in **Diagnostic mode** and reset the hot gas bypass valve.

Step 9 Enter 50% in indoor fan control, and tap **On** of the electric heater.

1. Check whether the indoor fans run properly and no false feedbacks and alarms exist.
2. Wait for a period until a hot air is exhausted by fans 6 and 7 (fan from top to bottom is 1 to 8), which indicates that the electric heater works properly. Tap **Off** of the electric heater, and enter 0% in indoor fan control.

Step 10 Enter 50% in humidifier control, and tap **On** of the compressor. The liquid solenoid valve and indoor fans start automatically. The outdoor fans start only when the condensate pressure reaches 2.26 MPa or higher.



NOTICE

After the compressor is powered on, start the crankcase heat tape and wait for 12 hours before starting the compressor.

1. Check whether the indicator of the power module is on.
2. The water inlet valve YV4 opens automatically (you can hear water flow sound) to fill water into the humidifier cylinder. When the water level reaches the preset threshold, YV4 closes automatically. The electrode in the humidifier cylinder heats the water and turns water into steam. In this process, check that whether any leakage is found on the water inlet pipes.
3. After confirming that the humidifier works properly, press the manual drainage button on one side of the electric control box to "I" to forcibly drain water out of the humidifier cylinder. In this process, ensure that no leakage is found on the drainpipes and the thermal insulation foam of the evaporator pan and pipe is fixed properly.
4. If no problem is found, press the manual drainage button to "O".
5. Charge refrigerant into the system from the low-pressure needle valve slowly according to the measured amount in [4.2.1 Calculation Requirements of Chilled Oil and Refrigerant to Be Charged](#).
6. Remove the refrigerant charge device and install the valve bonnet after commissioning.
7. After the commissioning, tap **Off** in **Diagnostic mode** to shut down the compressor. Enter 0% in humidifier control.

Step 11 After commissioning is complete, choose **Maint > Diagnostic mode > Exit** from the main menu, and tap **Shutdown** on the main screen.

---End

4.6 Powering off the Equipment

Procedure

Step 1 On the main menu, tap **Shutdown**.



NOTICE

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

Step 2 Switch off the front end circuit breaker and the main circuit breaker QF1.



NOTICE

- You must switch off the front end circuit breaker when replace or maintain the air conditioner components.
 - Only switch off the main circuit breaker QF1 when check whether the power-off function is normal.
-

Step 3 Install the air filters and the rear door.

----End

5 System Operation and Maintenance

5.1 Safety Precautions

- Only trained and qualified personnel are allowed to install and maintain the equipment in strict accordance with relevant regulations. Failing to follow this rule would lead to personal, environmental, and safety hazards.
- Most maintenance tasks can 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.
- Wear insulation gloves and shoes when make the electrical maintenance.
- The NetCol5000-A020 belongs to small-and medium-sized equipment. Exercise caution during professional maintenance. For details, contact Huawei technical support.
- For the maintenance items, see [5.2 Indoor Unit Maintenance Items](#).



NOTICE

Please strictly follow the instructions of each piece of equipment maintenance period. Otherwise, Huawei does not take responsibilities for the damage to the equipment.

5.2 Indoor Unit Maintenance Items

This section describes scheduled maintenance items of an indoor unit. Maintenance results shall be recorded in a table after each maintenance item is completed.

Table 5-1 Monthly maintenance items

Item	Operations	Troubleshooting	Result
Indoor fan	Check that the net covers of the indoor fans are not distorted.	Maintain or replace the net covers.	

Item	Operations	Troubleshooting	Result
	Check that the indoor fan blades are intact.	Replace the fan by referring to 5.6.2 Replacing an Indoor Fan .	
	Check that the indoor fans do not generate abnormal voice during operation.	Replace the fan by referring to 5.6.2 Replacing an Indoor Fan .	
	Check that the screws on the indoor fans are not loose or distorted.	Retighten the screws.	
Electric heater	Check that the electric heater and its switch are fixed reliably.	Retighten the electric heater and its switch.	
	Check that the electric heater surfaces are not eroded.	Replace the electric heater by referring to 5.6.5 Electric Heater .	
Float	Check that the float functions smoothly.	Replace the float by referring to 5.6.11 Replacing the Float .	
Air filters	Check that the filters are not blocked.	Clean the air filters (water cleaning is recommended).	
	Check that the filters are not damaged or distorted.	Replace air filters by referring to 5.6.1 Replacing Air Filters .	
Compressor	Check that the compressor is fastened properly.	Retighten the compressor screws.	
	Check that the refrigerant oil is not on the valve.	Clean the refrigerant oil on the valve.	
	Check that the sound of the compressor is properly.	Replace the compressor by referring to 5.6.3 Replacing the Compressor	
Evaporator	Check that no foreign matter exists on the evaporator surface.	Clean the foreign matter.	
Humidifier	Press the manual drainage button of the humidifier to "I" and check whether the water drainpipe works properly. Press the manual drainage button of the humidifier to "O" and check whether the water inlet works properly.	<ul style="list-style-type: none"> • Drainage is abnormal <ol style="list-style-type: none"> 1. Water outlet solenoid cannot open, replace it. 2. Drainpipe is blocked and need to be cleaned. • Water inlet is abnormal <ol style="list-style-type: none"> 1. Water inlet solenoid cannot open, replace it. 2. Water inlet pipe is blocked and need to be cleaned. 	
	Check that thermal	Replace the thermal insulation	

Item	Operations	Troubleshooting	Result
	insulation foams on the steam pipes are not damaged.	foams.	
	Check that solenoid valves of the water inlet and drainpipe to the electrode humidifier function properly.	Replace the solenoid valves.	
	Check the water scale in the humidifier cylinder.	Remove the humidifier cylinder, clean and brush the water scale inside the humidifier cylinder with 20% acetic acid or replace the humidifier cylinder by referring to 5.6.4 Replacing the Humidifier Cylinder .	
	Check the humidifier run overtime alarm is not reported.	Remove the humidifier cylinder, clean and brush the water scale inside the humidifier cylinder with 20% acetic acid or replace the humidifier cylinder by referring to 5.6.4 Replacing the Humidifier Cylinder .	
	After the humidifier starts, the current of each phase is less than 1.2 A.	Remove the humidifier cylinder, clean and brush the water scale inside the humidifier cylinder with 20% acetic acid or replace the humidifier cylinder by referring to 5.6.4 Replacing the Humidifier Cylinder .	
Pipes	Check that the thermal insulation foams on the refrigerant pipe are not damaged or corroded.	Evacuating the refrigerant, and repair the leak on the pipe. Wrap the thermal insulation foams.	
	Check that the refrigerant pipe support is intact and securely installed.	Replace the pipe support and tighten it.	

Table 5-2 Quarterly maintenance items

Item	Operations	Troubleshooting	Result
Air filters	Check that the filters are tidiness and not blocked.	Clean or replace the air filters by referring to 5.6.1 Replacing Air Filters .	
Condensate water pan	Check that no foreign matter exists on the	Clean the condensate water pan, water tank, and remove foreign	

Item	Operations	Troubleshooting	Result
and float	condensate water pan and float.	matter from the floats.	

Table 5-3 Semiannual maintenance items

Item	Operations	Troubleshooting	Result
Components in the electric control box (removing the electrical control box to maintain according to 5.6.7 Replacing Components in the Electric Control Box)	Check that all circuit breakers and fuses are working properly.	Replace the abnormal circuit breaker and fuse.	
	Check and fasten all circuit connections.	Fasten all circuit connections	
	Check that each input and output connector between the main control board and the display panel and between the main control board and the T/H sensor have proper contact.	Reconnect the abnormal terminals.	
	Check that each input and output connector between the main control board and contactors, solenoid valves, high-/low-pressure switches, electric heater temperature switch have proper contact.	Reconnect the abnormal terminals.	
	Check that various electric components, control components, and the surge protection and voltage test board are dirty.	Use a brush or compressed dry air to clean various electric components, control components, and the surge protection and voltage test board.	
	Check that the main control board, LCD, T/H sensor, and surge protection and voltage test board are not aging on the surface.	Replace the abnormal boards.	
	Perform static tests to check whether each contactor has a flexible pickup.	Replace the abnormal parts.	
	Check that the transformer is not intact and the output voltage is	Replace the transformer	

Item	Operations	Troubleshooting	Result
	within the normal range (24 V AC±10%).		
Cables	Check that the power cables and the cables connecting the indoor unit and outdoor unit are not aging.	Replace cables if necessary.	
T/H sensors	Check that the temperature and humidity readings are correct as measured.	Calibrated by a high-precision temperature and humidity meter.	
Water sensor	Check that the water leak sensor (optional) is securely installed and its probe is appropriately located.	Keep the water sensor far away from drain traps or floor drains in the equipment room and at least 0.5 m from the air conditioner.	

5.3 Other Cooling System Components

To ensure that the cooling system works properly, inspect it at least once a year. It is recommended that you inspect the cooling system at shorter intervals in adverse working environments.



NOTICE

Before measuring the temperature and pressure of discharge and suction, power off the device. Deploy thermocouples on the discharge and suction pipes, connect pressure gauges to the high-pressure and low-pressure needle valves, and power on the device. Wait for 30 minutes and measure the temperature and pressure of discharge and suction.

Discharge Pressure

Check the discharge pressure. Discharge pressure depends on load conditions and condenser efficiency. When discharge pressure reaches the high-pressure switch threshold, the switch reacts to stop the compressor. High-voltage switching action value is 4.25 MPa, recovery pressure value is 3.60 MPa.

Suction Pressure

Check the suction pressure. When suction pressure is below the low-pressure switch threshold, the switch reacts to stop the compressor. Excessive suction pressure would deteriorate the cooling performance of refrigerant on the compressor motor and damage the compressor. Suction pressure should range from 0.7 MPa to 1.2 MPa in the rated working environment.

(the indoor dry-bulb temperature is 37.8 °C, the wet-bulb temperature is 20.8 °C, and the outdoor temperature is 35 °C).

Suction Superheat Degree

A suction superheat degree has impact on the compressor service life. A compressor permanently running at a very low or no overheat degree due to liquid strike. An excessive superheat degree would affect system performance. The superheat degree should range from 6 °C to 13 °C.

Determine the suction superheat degree as follows:

1. Measure the pipe wall temperature at the sensing bulb of thermostatic expansion valve.
2. Measure the suction pressure and find out the saturation temperature by using the measured pressure as the reference pressure inside the evaporator.
3. Determine the difference between the temperature at the sensing bulb and the found temperature as the suction superheat degree.

Thermostatic Expansion Valve



NOTICE

Rotate the adjustment screw rod within one circle each time. About 30 minutes are required to achieve a new balance.

The thermostatic expansion valve adjusts the suction superheat degree. Perform maintenance on the thermostatic expansion valve as follows:

1. Check that the sensing bulb is securely installed.
2. Check that no fracture exists on the sensing bulb and valve capillary tubes.
3. Check that no crack exists at the welding points of the equalizer pipe.

It is not recommended that you adjust the thermostatic expansion valve onsite because it has been adjusted before delivery. If the superheat degree is too low or high, adjust the thermostatic expansion value as follows at your deliberation or after consulting Huawei technical support:

1. Unscrew the valve bonnet at the bottom.
2. Rotate the adjustment screw rod clockwise to increase the superheat degree. Rotate the adjustment screw rod counter-clockwise to decrease the superheat degree.

Sight Glass

To maintain the sight glass, perform the following steps:

1. Check the sight glass. If the ground color is yellow, the cooling system contains excessive water and requires maintenance. (You need to reclaim the refrigerant and vacuumize the system to drain out the water.)
2. If you find air bubbles with the sight glass, the cooling system lacks refrigerant. Adjust the expansion valve or charge in refrigerant.

5.4 Alarm Reference

Table 5-4 describes alarms for the air cooled in-row precision air conditioner NetCol5000-A020.

Table 5-4 Alarm reference

Alarm ID	Alarm Name	Alarm Severity	Impact	Possible Causes	Solution
a001	Return-air 1 temp invalid	Major	The alarm is generated.	1. Cables to the temperature sensor at return air vent 1 are loose or damaged. 2. The return air temperature sensor is faulty.	1. Check cables to the temperature sensor at return air vent 1. 2. Maintain or replace the temperature sensor at return air vent 1.
	Return-air 2 temp invalid	Major	The alarm is generated.	1. The T/H sensor at return air vent 2 fails to communicate with the main control board. 2. Dirt or water exists around the T/H sensor, which leads to a detection fault. 3. The T/H sensor at return air vent 2 is faulty.	1. Handle the Return air 2 temp invalid alarm. 2. Clean the T/H sensor at return air vent 2. 3. Maintain or replace the T/H sensor at return air vent 2.
a002	Return-air HT	Critical	The alarm is generated.	1. The return air high temperature alarm threshold is inappropriate for the working conditions. 2. The temperature displayed on the LCD is different from the actual temperature. 3. The refrigeration capacity of the NetCol5000-A020 is insufficient or the heat load is high. 4. The ambient temperature is higher than the upper alarm threshold.	1. Adjust the high temperature alarm threshold. 2. Calibrate or replace the T/H sensor. 3. Add more NetCol5000-A020 units. 4. Check the ambient temperature.
a003	Return-air LT	Warning	The alarm is generated.	1. The return air low temperature alarm threshold is inappropriate for the working conditions. 2. The temperature displayed on the LCD is different from the actual	1. Adjust the return air low temperature alarm threshold. 2. Calibrate or replace the T/H sensor. 3. Check the ambient temperature.

Alarm ID	Alarm Name	Alarm Severity	Impact	Possible Causes	Solution
				temperature. 3. The ambient temperature is lower than the lower alarm threshold.	
a004	Return-air 2 humid invalid	Major	The alarm is generated.	1. The T/H sensor at return air vent 2 fails to communicate with the main control board. 2. Dirt or water exists around the T/H sensor, which leads to a detection fault. 3. The T/H sensor is faulty.	1. Handle the Return air 2 humid invalid alarm. 2. Clean the T/H sensor. 3. Maintain or replace the T/H sensor at return air vent 2.
a007	Return-air 2 T/H brd comm fail	Major	The alarm is generated.	1. DIP switches of the T/H sensor are incorrectly set. 2. Cables to the T/H sensor are loose or damaged. 3. The T/H sensor is faulty.	1. Set the DIP switches of the T/H sensor by referring to C Electrical Ports . 2. Check cables connecting to the T/H sensor. 3. Maintain or replace the T/H sensor.
a008	Comp HP switch	Major	The alarm is generated, and the compressor shuts down forcibly.	1. Cables to the high pressure switch are loose or damaged. 2. The high pressure switch is faulty. 3. The solenoid valve is faulty. 4. Outdoor fans do not run properly. 5. The condenser is blocked. 6. The refrigerant is overcharged.	1. Check cables to the high pressure switch. 2. Maintain or replace the high pressure switch. 3. Maintain or replace the solenoid coil or solenoid valve. 4. Maintain or replace the outdoor fans. 5. Clean the condenser. 6. Reclaim some refrigerant.
a009	Comp HP switch lock	Critical	The alarm is generated, and the compressor is locked and not allowed to be started.	The Comp HP switch alarm is triggered for the compressor multiple times within a period.	Clear this alarm using the solutions for alarm a008. NOTE After the alarm is cleared, click Manual clear on the alarm page.
a010	Comp suction LP	Major	The alarm is generated, and the	1. Cables to the low pressure switch are loose or damaged. 2. The low pressure switch	1. Check cables to the low pressure switch. 2. Maintain or replace the low pressure

Alarm ID	Alarm Name	Alarm Severity	Impact	Possible Causes	Solution
			compressor shuts down forcibly.	<p>is faulty.</p> <p>3. The solenoid valve is faulty.</p> <p>4. The filter dryer is blocked.</p> <p>5. The expansion valve is blocked.</p> <p>6. The refrigerant leaks.</p>	<p>switch.</p> <p>3. Maintain or replace the solenoid coil or solenoid valve.</p> <p>4. Maintain or replace the filter dryer.</p> <p>5. Maintain or replace the expansion valve.</p> <p>6. Check and rectify any leakages. Charge refrigerant after maintenance or replacement.</p>
a011	Comp suction LP lock	Critical	The alarm is generated, and the compressor is locked and not allowed to be started.	The Comp suction LP alarm is triggered for the compressor multiple times within a period.	<p>Clear this alarm using the solutions for alarm a010.</p> <p>NOTE After the alarm is cleared, click Manual clear on the alarm page.</p>
a012	Comp dis HT	Major	The alarm is generated, and the compressor shuts down forcibly.	<p>1. Cables to the high temperature switch are loose or damaged.</p> <p>2. The high temperature switch is faulty.</p> <p>3. Outdoor fans are faulty.</p> <p>4. The condenser is blocked.</p> <p>5. The refrigerant leaks.</p> <p>6. The refrigeration capacity of the NetCol5000-A020 is insufficient or the heat load is high.</p>	<p>1. Check cables to the high temperature switch.</p> <p>2. Maintain or replace the temperature switch.</p> <p>3. Maintain or replace the outdoor fans.</p> <p>4. Clean the condenser.</p> <p>5. Check and rectify any leakages. Charge refrigerant after maintenance or replacement.</p> <p>6. Add more NetCol5000-A020 units.</p>
a013	Comp dis HT lock	Critical	The alarm is generated, and the compressor shuts down forcibly.	The Comp dig HT alarm is triggered for the compressor multiple times within a period.	<p>Clear this alarm using the solutions for alarm a012.</p> <p>NOTE After the alarm is cleared, click Manual clear on the alarm page.</p>
a014	Comp short period	Warning	The alarm is	1. The shortest running period and shortest	1. Adjust the shortest running period and

Alarm ID	Alarm Name	Alarm Severity	Impact	Possible Causes	Solution
			generated.	<p>shutdown period for the compressor are inappropriately set.</p> <p>2. This alarm is affected by other alarms.</p> <p>3. The T/H sensor is faulty.</p> <p>4. The load in the equipment room is low.</p>	<p>shortest shutdown period for the compressor.</p> <p>2. Clear other alarms.</p> <p>3. Maintain or replace the T/H sensor.</p> <p>4. Increase the temperature precision.</p> <p>NOTE After the alarm is cleared, click Manual clear on the alarm page.</p>
a015	Comp exceed runtime	Warning	The alarm is generated.	The accumulated runtime of the compressor exceeds the alarm threshold.	Maintain or replace the compressor. For details about how to replace a compressor, see 5.6.3 Replacing the Compressor . Clear the accumulated runtime.
a018	Indoor fan 1/2/3/4/5/6/7/8 exceed runtime	Warning	The alarm is generated.	The accumulated runtime of the fan exceeds the alarm threshold.	Maintain or replace the indoor fans. For details, see 5.6.2 Replacing an Indoor Fan . Clear the accumulated runtime.
a022	Humidifier exceed runtime	Warning	The alarm is generated.	The humidifier accumulated runtime exceeds the alarm threshold.	Maintain or replace the humidifier. For details about how to replace a humidifier, see 5.6.4 Replacing the Humidifier Cylinder . Clear the accumulated runtime.
a023	Elec heater HT	Major	The alarm is generated, and the electric heater shuts down forcibly.	<p>1. Cables to the temperature switch of the electric heater are loose or damaged.</p> <p>2. The temperature switch is faulty.</p> <p>3. The manual reset temperature switch is not reset.</p>	<p>1. Check cables to the temperature switch of the electric heater.</p> <p>2. Maintain or replace the temperature switch.</p> <p>3. Reset the manual temperature reset switch.</p>
a024	Elec heater exceed runtime	Warning	The alarm is generated.	The accumulated runtime of the electric heater exceeds the alarm threshold.	Maintain or replace the electric heater. For details about how to replace the electric heater, see 5.6.5 Electric Heater . Clear the accumulated runtime.
a026	Air filter	Warning	The alarm	The accumulated runtime of	Maintain or replace the

Alarm ID	Alarm Name	Alarm Severity	Impact	Possible Causes	Solution
	exceed runtime		is generated.	the air filters exceeds the alarm threshold.	air filters. For details about how to replace the air filters, see 5.6.1 Replacing Air Filters . Clear the accumulated runtime.
a027	Power loss	Warning	The alarm is generated.	The NetCol5000-A020 is disconnected.	Check power cable to the NetCol5000-A020.
a028	Power phase A overvolt	Major	The alarm is generated, and the system shuts down.	1. The power grid is unstable. 2. The surge protection and voltage test board is faulty.	1. Check the power grid. 2. Replace the surge protection and voltage test board.
a029	Power phase B overvolt	Major	The alarm is generated, and the system shuts down.	1. The power grid is unstable. 2. The surge protection and voltage test board is faulty.	1. Check the power grid. 2. Replace the surge protection and voltage test board.
a030	Power phase C overvolt	Major	The alarm is generated, and the system shuts down.	1. The power grid is unstable. 2. The surge protection and voltage test board is faulty.	1. Check the power grid. 2. Replace the surge protection and voltage test board.
a031	Power phase A undervolt	Major	The alarm is generated, and the system shuts down.	1. The power grid is unstable. 2. The surge protection and voltage test board is faulty.	1. Check the power grid. 2. Replace the surge protection and voltage test board.
a032	Power phase B undervolt	Major	The alarm is generated, and the system shuts down.	1. The power grid is unstable. 2. The surge protection and voltage test board is faulty.	1. Check the power grid. 2. Replace the surge protection and voltage test board.
a033	Power phase C undervolt	Major	The alarm is generated, and the system shuts down.	1. The power grid is unstable. 2. The surge protection and voltage test board is faulty.	1. Check the power grid. 2. Replace the surge protection and voltage test board.
a034	Power	Major	The alarm	1. The power grid is	1. Check the power grid.

Alarm ID	Alarm Name	Alarm Severity	Impact	Possible Causes	Solution
	overfreq		is generated, and the system shuts down.	unstable. 2. The surge protection and voltage test board is faulty.	2. Replace the surge protection and voltage test board.
a035	Power underfreq	Major	The alarm is generated, and the system shuts down.	1. The power grid is unstable. 2. The surge protection and voltage test board is faulty.	1. Check the power grid. 2. Replace the surge protection and voltage test board.
a036	Power phase loss	Critical	The alarm is generated, and the system shuts down.	1. The power grid is unstable. 2. The surge protection and voltage test board is faulty.	1. Check the power grid. 2. Replace the surge protection and voltage test board.
a037	Power phase reverse	Critical	The alarm is generated, and the system shuts down.	1. The power grid is unstable. 2. The surge protection and voltage test board is faulty.	1. Check the power grid. 2. Replace the surge protection and voltage test board.
a038	Liquid pipe temp sensor fault	Major	The alarm is generated.	1. The liquid pipe temperature sensor is faulty. 2. Cables to the liquid pipe temperature sensor are loose or damaged.	1. Maintain or replace the liquid pipe temperature sensor. 2. Check cables to the liquid pipe temperature sensor.
a042	Remote shutdown	Critical	The alarm is generated, and the system shuts down.	1. The remote shutdown switch has misoperations. 2. The remote shutdown switch is faulty, or cables to the remote shutdown switch are loose or damaged.	1. Check the status of the remote dry contact. 2. Check the shutdown button and cables of the remote dry contact.
a043	Floor water overflow	Critical	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.
a044	Smoke detected	Critical	The alarm is generated, and the	1. Smoke is generated in the equipment room. 2. Cables to the smoke sensor are loose or	1. Exhaust smoke from the equipment room and reset the smoke sensor.

Alarm ID	Alarm Name	Alarm Severity	Impact	Possible Causes	Solution
			system shuts down.	damaged. 3. The smoke sensor is faulty.	2. Check cables to the smoke sensor. 3. Maintain or replace the smoke sensor.
a045	Teamwork mode failed	Major	The alarm is generated, and a message "Networking failed" is displayed.	1. Check that the group control route is correct. 2. The master and slave NetCol5000-A020 units have the same address. 3. The master NetCol5000-A020 is not configured.	1. Repair the group control route. 2. Change the NetCol5000-A020 addresses. 3. Configure the master NetCol5000-A020.
a046	Comp freeze point protection	Critical	The alarm is generated, and the compressor shuts down forcibly.	1. Cables to the anti-freezing switch are loose or damaged. 2. The anti-freezing switch is faulty. 3. The solenoid valve is faulty. 4. The filter dryer is blocked. 5. The expansion valve is blocked. 6. The refrigerant leaks.	1. Check cables to the anti-freezing switch. 2. Maintain or replace the anti-freezing switch. 3. Maintain or replace the solenoid coil or solenoid valve. 4. Maintain or replace the filter dryer. 5. Maintain or replace the expansion valve. 6. Check and rectify any leakages. Charge refrigerant after maintenance or replacement. NOTE After the alarm is cleared, click Manual clear on the alarm page.
a048	Supply-air HT	Critical	The alarm is generated.	1. The supply air high temperature alarm threshold is inappropriate for the working conditions. 2. The temperature displayed on the LCD is different from the actual temperature. 3. The supply air temperature sensor is faulty. 4. The refrigeration capacity of the NetCol5000-A020 is insufficient or the heat	1. Adjust the supply air high temperature alarm threshold. 2. Calibrate or replace the supply air temperature sensor. 3. Check cables to the supply air temperature sensor. 4. Add more NetCol5000-A020 units. 5. Check the ambient temperature.

Alarm ID	Alarm Name	Alarm Severity	Impact	Possible Causes	Solution
				load is high. 5. The ambient temperature is higher than the upper alarm threshold.	
a049	Supply-air LT	Warning	The alarm is generated.	1. The supply air low temperature alarm threshold is inappropriate for the working conditions. 2. The temperature displayed on the LCD is different from the actual temperature. 3. The supply air temperature sensor is faulty. 4. The air filters are blocked. 5. The ambient temperature is below the alarm threshold for low ambient temperatures.	1. Adjust the supply air low temperature alarm threshold. 2. Calibrate or replace the supply air temperature sensor. 3. Check cables to the supply air temperature sensor. 4. Calibrate or replace the air filters. 5. Check the ambient temperature.
a050	Cold aisle HT	Critical	The alarm is generated.	1. The high temperature alarm threshold for the cold aisle is inappropriate for the working conditions. 2. The temperature displayed on the LCD is different from the actual temperature. 3. The refrigeration capacity of the NetCol5000-A020 is insufficient or the heat load is high. 4. The ambient temperature is higher than the upper alarm threshold.	1. Adjust the high temperature alarm threshold for the cold aisle. 2. Maintain or replace the T/H sensor. 3. Add more NetCol5000-A020 units. 4. Check the ambient temperature.
a051	Hot aisle HT	Critical	The alarm is generated.	1. The high temperature alarm threshold for the hot aisle is inappropriate for the working conditions. 2. The temperature displayed on the LCD is different from the actual temperature. 3. The refrigeration	1. Adjust the high temperature alarm threshold for the hot aisle. 2. Calibrate or replace the T/H sensor. 3. Add more NetCol5000-A020 units. 4. Check the ambient

Alarm ID	Alarm Name	Alarm Severity	Impact	Possible Causes	Solution
				capacity of the NetCol5000-A020 is insufficient or the heat load is high. 4. The ambient temperature is higher than the upper alarm threshold.	temperature.
a052	Supply-air 1 temp invalid Supply-air 2 temp invalid	Major	The alarm is generated.	1. The supply air temperature sensor is faulty. 2. Cables to the supply air temperature sensor are loose or damaged.	1. Maintain or replace the supply air temperature sensor. 2. Check cables to the supply air temperature sensor.
a076	Humidifier alarm	Major	The alarm is generated, and the humidifier shuts down.	1. The humidifier is faulty. 2. Cables to the humidifier are loose or damaged.	1. Maintain or replace the humidifier. Clear the accumulated runtime. 2. Check cables to the humidifier. NOTE After the alarm is cleared, click Manual clear on the alarm page.
a077	Indoor fan 1/2/3/4/5/6/7/8 fault	Major	The alarm is generated.	1. Cables to indoor fan are loose or damaged. 2. The indoor fan fuse is faulty. 3. Indoor fan is faulty.	1. Check cables to the indoor fan. 2. Change the fuse. 3. Maintain or replace the indoor fan.
a078	Full water	Critical	The alarm is generated, and the system shuts down.	1. The float is faulty or stuck. 2. Cables to the float are loose or damaged. 3. The condensate pump is faulty, or the drainage capacity of the condensate pump decreases. (If no condensate pump is configured, ignore this check item.) 4. The drainpipes to the condensate pump do not work properly. (If no condensate pump is configured, the drainpipes may be blocked or frozen.)	1. Maintain or replace the float or clear the obstacles. 2. Check cables to the float. 3. Maintain or replace the condensate pump. (If no condensate pump is configured, ignore this operation.) 4. Clean the drainpipes (by removing obstacles around or in the drainpipes).
a079	Drain	Major	The alarm is	1. The float is faulty or stuck.	1. Maintain or replace the float or clear the

Alarm ID	Alarm Name	Alarm Severity	Impact	Possible Causes	Solution
	abnormal		generated, and the system shuts down.	2. Cables to the float are loose or damaged. 3. The condensate pump is faulty, or the drainage capacity of the condensate pump decreases. (If no condensate pump is configured, ignore this check item.) 4. The drainpipes to the condensate pump do not work properly. (If no condensate pump is configured, the drainpipes may be blocked or frozen.) 5. Air penetrates the water pump pipe.	obstacles. 2. Check cables to the float. 3. Maintain or replace the condensate pump. (If no condensate pump is configured, ignore this operation.) 4. Clean the drainpipes (by removing obstacles around or in the drainpipes). 5. Exhaust air in the water pump pipe. NOTE After the alarm is cleared, click Manual clear on the alarm page.
a083	Surge protection board fault	Critical	The alarm is generated, and the system shuts down.	1. The surge protection and voltage test board is faulty. 2. Cables to the surge protection and voltage test board are loose or damaged.	1. Maintain or replace the surge protection and voltage test board. 2. Check cables to the surge protection and voltage test board.
a084	Power fault	Critical	The alarm is generated, and the system shuts down.	The NetCol5000-A020 connects to the incorrect voltage jumper.	Maintain or replace the voltage jumper.
a085	Route A fuse disconnect	Critical	The alarm is generated, and the system shuts down.	1. A device on circuit A is faulty. 2. The fuse on circuit A is loose, aged, or disconnected.	1. Maintain or replace the faulty device on circuit A. 2. Replace the fuse on circuit A.
a086	Route B fuse disconnect	Major	The alarm is generated, and the system shuts down.	1. A device on circuit B is faulty. 2. The fuse on circuit B is loose, aged, or disconnected.	1. Maintain or replace the faulty device on circuit B. 2. Replace the fuse on circuit B.
a087	Route C fuse disconnect	Critical	The alarm is generated, and the	1. A device on circuit C is faulty. 2. The fuse on circuit C is loose, aged, or	1. Maintain or replace the faulty device on circuit C. 2. Replace the fuse on

Alarm ID	Alarm Name	Alarm Severity	Impact	Possible Causes	Solution
			system shuts down.	disconnected.	circuit C.
a088	Route D fuse disconnect	Critical	The alarm is generated, and the system shuts down.	1. A device on circuit D is faulty. 2. The fuse on circuit D is loose, aged, or disconnected.	1. Maintain or replace the faulty device on circuit D. 2. Replace the fuse on circuit D.
a093	Return-air humid high	Warning	The alarm is generated.	1. The return air high humidity alarm threshold is inappropriate for the working conditions. 2. The humidity displayed on the LCD is different from the actual humidity.	1. Adjust the return air high humidity alarm threshold. 2. Calibrate or replace the T/H sensor.
a094	Return-air humid low	Warning	The alarm is generated.	1. The return air low humidity alarm threshold is inappropriate for the working conditions. 2. The humidity displayed on the LCD is different from the actual humidity.	1. Adjust the return air low humidity alarm threshold. 2. Calibrate or replace the T/H sensor.
a103	Indoor fan power alarm	Major	The alarm is generated, and the compressor shuts down.	1. The power module is faulty. 2. Cables to the power module are loose or damaged.	1. Maintain or replace the power module. 2. Check cables to the power module.
a105	Indoor fan failure	Critical	The alarm is generated, and the compressor shuts down.	1. Indoor fans are faulty. 2. Cables to indoor fans are loose or damaged.	1. Maintain or replace the indoor fans. 2. Check cables to indoor fans.
a107	Mains outage	Warning	The alarm is generated, and heating and humidification operations are prohibited.	1. Power supply circuits are disconnected. 2. The dry contact is faulty.	1. Check the power supply circuits. 2. Check the dry contact.
a108	Cold aisle 1/2/3 temp invalid	Major	The alarm is generated.	1. The T/H sensor in the cold aisle fails to communicate with the	1. Handle the Cold aisle 1/2/3 tem invalid alarm.

Alarm ID	Alarm Name	Alarm Severity	Impact	Possible Causes	Solution
				main control board. 2. Dirt or water exists around the board, which leads to a detection fault. 3. The temperature and humidity collection board is faulty.	2. Clean the temperature and humidity collection board in the cold aisle. 3. Maintain or replace the temperature and humidity collection board in the cold aisle.
a109	Cold aisle 1/2/3 humid invalid	Major	The alarm is generated.	1. The temperature and humidity collection board in the cold aisle fails to communicate with the main control board. 2. Dirt or water exists around the board, which leads to a detection fault. 3. The temperature and humidity collection board is faulty.	1. Handle the Cold aisle 1/2/3 humid invalid alarm. 2. Clean the temperature and humidity collection board in the cold aisle. 3. Maintain or replace the temperature and humidity collection board in the cold aisle.
a110	Cold aisle 1/2/3 T/H brd comm fail	Major	The alarm is generated.	1. DIP switches of the T/H sensor are incorrectly set. 2. Cables to the temperature and humidity collection board are loose or damaged. 3. The T/H sensor is faulty.	1. Set DIP switches by referring to 3.8.6 Installing T/H Sensors . 2. Check the temperature and humidity sensor and cables. 3. Maintain or replace the temperature and humidity collection board in the cold aisle.
a111	Hot aisle 1/2/3 temp invalid	Major	The alarm is generated.	1. The temperature and humidity collection board in the hot aisle fails to communicate with the main control board. 2. Dirt or water exists around the board, which leads to a detection fault. 3. The temperature and humidity collection board is faulty.	1. Handle the Hot aisle temp invalid alarm. 2. Clean the temperature and humidity collection board in the hot aisle. 3. Maintain or replace the temperature and humidity collection board in the hot aisle.
a112	Hot aisle 1/2/3 humid invalid	Major	The alarm is generated.	1. The temperature and humidity collection board in the hot aisle fails to communicate with the main control board.	1. Handle the Hot aisle humid invalid alarm. 2. Clean the temperature and humidity collection board in the hot aisle.

Alarm ID	Alarm Name	Alarm Severity	Impact	Possible Causes	Solution
				2. Dirt or water exists around the board, which leads to a detection fault. 3. The temperature and humidity collection board is faulty.	3. Maintain or replace the temperature and humidity collection board in the hot aisle.
a113	Hot aisle 1/2/3 T/H brd comm fail	Major	The alarm is generated.	1. DIP switches of the temperature and humidity collection board are incorrectly set. 2. Cables to the temperature and humidity collection board are loose or damaged. 3. The temperature and humidity collection board is faulty.	1. Set DIP switches by referring to 3.8.6 Installing T/H Sensors . 2. Check cables to the temperature and humidity collection board. 3. Maintain or replace the temperature and humidity collection board in the hot aisle.

5.5 Troubleshooting



DANGER

- Certain circuits in the NetCol5000-A020 have 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.

5.5.1 The NetCol5000-A020 Generates Abnormal Voice

Symptom

The NetCol5000-A020 generates abnormal voice.

Possible Causes

Compressors, fans, or pipes are loose.

Procedure

Step 1 Check whether the compressor fastening bolts are loose.

- If yes, tighten the bolts and check whether the fault is rectified.
 - If yes, troubleshooting is complete.
 - If no, go to [Step 2](#).
- If no, go to [Step 2](#).

Step 2 Check whether the fan fastening bolts are loose.

- If yes, tighten the bolts and check whether the fault is rectified.
 - If yes, troubleshooting is complete.
 - If no, go to [Step 3](#).
- If no, go to [Step 3](#).

Step 3 Check whether the pipe fastening bolts are loose.

- If yes, tighten the pipe support and check whether the fault is rectified.
 - If yes, troubleshooting is complete.
 - If no, go to [Step 4](#).
- If no, go to [Step 4](#).

Step 4 Contact Huawei technical support.

----End

5.5.2 A Compressor does not Work

Symptom

The compressor does not work.

Possible Causes

- The device generates the faulty alarms.
- A compressor does not need to start.
- Compressor power failure.
- A compressor is faulty.

Procedure

Step 1 Check whether the device generates the faulty alarms as follows: **Comp HP switch**, **Comp HP switch lock**, **Comp suction LP**, **Comp suction LP lock**, **Comp dis HT**, **Comp dis HT lock**, **Power phase A/B/C overvolt** or **Power phase A/B/C undervolt**, **Power overfreq** or **Power underfreq**, **Power phase loss**, **Power phase reverse**, **Remote shutdown**, **Floor water overflow**, **Comp freeze point protection**, **Full water**, **Surge protection board fault**, **Power fault**, **Route A/B/C/D fuse disconnect**, **Indoor fan failure**.

- If there is one or more, deal with it by referring to [5.4 Alarm Reference](#) and then check whether the fault is rectified.
 - If yes, troubleshooting is complete.
 - If no, go to [Step 2](#).
- If there are no alarms, go to [Step 2](#).

Step 2 Check for any startup requirement for compressor on the LCD.

- If no, the compressor does not need to start. It is not faulty, and troubleshooting is complete.
- If yes, go to [Step 3](#).

Step 3 Check the compressor input power supply.

Unplug the X115 compressor terminal, measuring the terminal voltage of the docking surface. If the voltage tolerance between 1 and 2, 2 and 3, 1 and 3 is $\pm 10\%$, judged the power supply is normal. [Figure 4-3](#) shows the X115 terminal position.

- If the power input is normal, the compressor is faulty. Replace it by referring to [5.6.3 Replacing the Compressor](#), and check whether the fault is rectified.
 - If yes, troubleshooting is complete.
 - If no, go to [Step 5](#).
- If the power input is faulty, go to [Step 4](#).

Step 4 Check the compressor power supply.

- If the power supply is faulty, check whether the compressor cable is normal and the compressor circuit breaker is switched on. If there is problem, check whether the fault is cleared after solution.
 - If yes, troubleshooting is complete.
 - If no, go to [Step 5](#).
- If the power supply is normal, go to [Step 5](#).

Step 5 Contact Huawei technical support.

---End

5.5.3 Compressor Generates Excessive Noises

Symptom

Compressor generates excessive noises.

Possible Causes

- The transport sheet metal is not removed from a compressor.
- The compressor starts and stops continuously.
- The compressor exists liquid strike.

Procedure

Step 1 Check whether the transport sheet metal is removed.

- If no, remove the sheet metal and then check whether the fault is rectified.
 - If yes, troubleshooting is complete.
 - If no, go to [Step 2](#).
- If yes, go to [Step 2](#).

Step 2 Check whether the compressor starts and stops continuously or the compressors has a dull noise.

- If the compressor starts and stops continuously, deal with it by referring to **Comp HP switch**, and then check whether the fault is rectified.
 - If yes, troubleshooting is complete.
 - If no, go to [Step 3](#).
- If the compressors has a dull noise, go to [Step 3](#).
- If the compressor does not start and stop continuously, go to [Step 3](#).

Step 3 Contact Huawei technical support.

---End

5.5.4 An Indoor Fan Fails to Start

Symptom

An indoor fan fails to start.

Possible Causes

- Indoor fan fault alarms exist.
- An indoor fan does not need to start.
- Either the general circuit breaker or the indoor fan circuit breaker is not switched on.
- Power to the indoor fan is abnormal.

Procedure

Step 1 Check whether there are indoor fan fault alarms.

- If yes, deal with it by referring to [5.4 Alarm Reference](#) and then check whether the fault is rectified.
 - If yes, troubleshooting is complete.
 - If no, go to [Step 2](#).
- If yes, go to [Step 2](#).

Step 2 Check for any startup requirement for fans on the LCD.

- Tap **Running > Status** to check the fan control, if it is 0%, meaning the indoor fans do not need to start, it is not faulty, troubleshooting is complete.
- If the fan control is greater than 0%, meaning the indoor fans need to start, go to [Step 3](#).

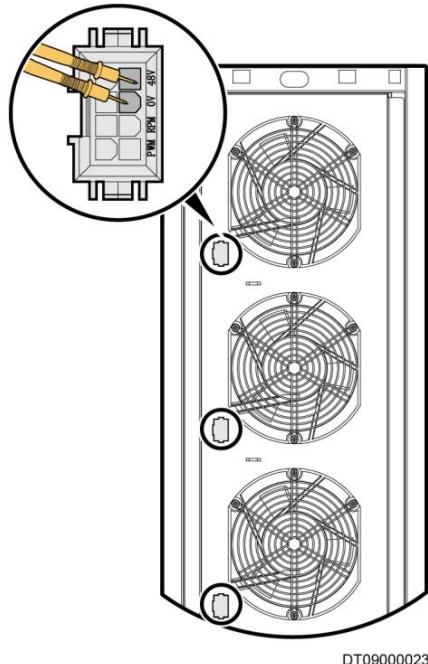
Step 3 Check whether the circuit breakers are switched on.

- If no, switch on the circuits and then check whether the fault is rectified.
 - If yes, troubleshooting is complete.
 - If no, go to [Step 4](#).
- If no, go to [Step 4](#).

Step 4 Check whether the indoor fan power supply is normal.

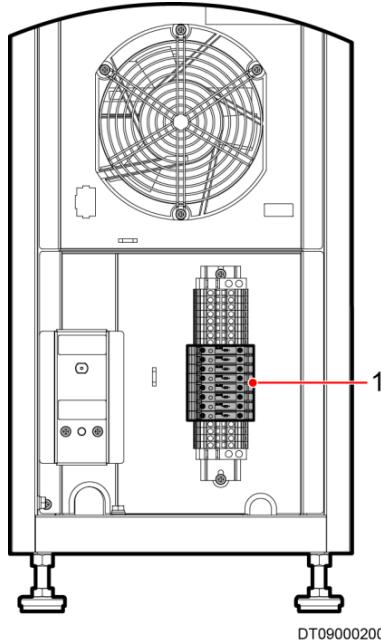
Unplug the faulty fan terminal, use multimeter to measure terminals between 0 V and 48 V terminals are about 48 V. If the voltage difference is too large, power supply is abnormal, [Figure 5-1](#) shows the measurement method.

Figure 5-1 Measuring the fan input terminals



- If the power supply is normal, judged indoor fan failure, replace the indoor fan and check whether the fault is rectified.
 - If yes, troubleshooting is complete.
 - If no, go to [Step 5](#).
- If the power supply is abnormal.
 1. Check whether the compromise distribution module circuit breaker QF4 is switched on. If switched on, go to [4.2](#).
 2. Open the front door, check whether the fan fuse on the bottom of the fan is blown (The fan fuses from top to bottom are FU9 to FU16, corresponding to fan 1 to fan 8). If it is faulty, replace the fan fuse. [Figure 5-2](#) shows the position of the fan fuse.

Figure 5-2 Fan fuse position



(1) Fan The fuses from top to bottom are FU9 to FU16, corresponding to fan 1 to fan 8
fuse

After treatment, check whether the fault is rectified. If yes, troubleshooting is complete.
If no, go to [Step 5](#).

Step 5 Contact Huawei technical support.

----End

5.5.5 Humidification Fails

Possible Causes

- Humidifier alarm exists.
- A humidifier does not need to start.
- Humidification function is not enabled.
- The humidifier circuit breaker is disconnected.
- The humidifier cylinder is damaged.

Procedure

Step 1 Check whether there are humidifier alarms.

- If yes, deal with it by referring to [5.4 Alarm Reference](#) and then check whether the fault is rectified.
 - If yes, troubleshooting is complete.

- If no, go to [Step 2](#).
- If there are no alarms, go to [Step 2](#).

Step 2 Check for any startup requirement for humidifier on the LCD.

Tap **Running > Status** to check whether the humidifier is started.

- If no, tap **Settings > System Settings > T/H Sensor**, set the humidify to environmental humidity + 5%, then the humidifier can run normally, troubleshooting is complete. If does not run, go to [Step 3](#).
- If yes, go to [Step 3](#).

Step 3 Check whether the humidification function is enabled.

- If no, tap **Settings > System Settings > System Control** to enable the humidification function and check whether the fault is rectified.
 - If yes, troubleshooting is complete.
 - If no, go to [Step 4](#).
- If yes, go to [Step 4](#).

Step 4 Check whether the circuit breakers are switched on.

- If no, switch on the circuit breakers and check whether the fault is rectified.
 - If yes, troubleshooting is complete.
 - If no, go to [Step 5](#).
- If yes, go to [Step 5](#).

Step 5 Check whether the humidifier cylinder is damaged.

- If yes, replace the humidifier cylinder by referring to [5.6.4 Replacing the Humidifier Cylinder](#) and then check whether the fault is rectified.
 - If yes, troubleshooting is complete.
 - If no, go to [Step 6](#).
- If no, go to [Step 6](#).

Step 6 Contact Huawei technical support.

----End

5.5.6 The Heating Function Is Unavailable

Possible Causes

- The electric heater alarm exists.
- An electric heater does not need to start.
- Electric heater function is not enabled.
- The electric heater temperature switch is being protected.
- The circuit breaker of electric heater is not switched on.
- An electric heater is burnt out.

Procedure

Step 1 Check whether there are electric heater alarms.

- If yes, deal with it by referring to [5.4 Alarm Reference](#) and then check whether the fault is rectified.
 - If yes, troubleshooting is complete.
 - If no, go to [Step 2](#).
- If there are no alarms, go to [Step 2](#).

Step 2 Check for any startup requirement for electric heater on the LCD.

Check whether the capacity of the heater is 100% on the main screen, or tap **Running > Status** to check whether the electric heater is started.

- If it is not 100% or no, tap **Settings > System Settings > T/H Sensor**, set the temperature to environmental temperature + 5 °C, then the electric heater can run normally, troubleshooting is complete. If does not run, go to [Step 3](#).
- If 100% or yes, go to [Step 3](#).

Step 3 Check whether the electric heater function is enabled.

- If no, tap **Settings > System Settings > System Control** to enable the electric heater function and check whether the fault is rectified.
 - If yes, troubleshooting is complete.
 - If no, go to [Step 4](#).
- If yes, go to [Step 4](#).

Step 4 Check whether the electric heater circuit breaker (QF2) is switched on.

- If no, switch on the circuit breakers and check whether the fault is rectified.
 - If yes, troubleshooting is complete.
 - If no, go to [Step 5](#).
- If yes, go to [Step 5](#).

Step 5 Check whether the temperature protective switch of the electric heater is damaged.

- If yes, replace the temperature protective switch and check whether the fault is rectified.
 - If yes, troubleshooting is complete.
 - If no, go to [Step 6](#).
- If no, go to [Step 6](#).

Step 6 Disconnect the power supply and check whether the electric heater is damaged by checking the electric heater resistance properties with an ohmmeter. The single electric heater resistance is about 500 Ω in normal conditions.

- If measuring short-circuit indicates the electric heater is damaged, replace it by referring to [5.6.5 Electric Heater](#), and then check whether the fault is rectified.
 - If yes, troubleshooting is complete.
 - If no, go to [Step 7](#).
- If measuring not short-circuit, go to [Step 7](#).

Step 7 Contact Huawei technical support.

---End

5.5.7 The Water Overflows the NetCol5000-A020

Possible Causes

- Drainpipes are not properly connected.
- The float is faulty.
- The inlet pipe and drainpipe leak.
- The drainpipe is blocked.

Procedure

Step 1 Check whether the drainpipes are connected properly.

- If no, connect the drainpipes and check whether the fault is rectified.
 - If yes, troubleshooting is complete.
 - If no, go to [Step 2](#).
- If yes, go to [Step 2](#).

Step 2 Check cables to the high and low water level floats, whether the water level floats are damaged or locked.

- If yes, replace or adjust the water level floats and check whether the fault is rectified.
 - If yes, troubleshooting is complete.
 - If no, go to [Step 3](#).
- If no, go to [Step 3](#).

Step 3 Check whether the inlet pipe and drainpipe leak.

- If yes, rectify any leakage and check whether the fault is rectified.
 - If yes, troubleshooting is complete.
 - If no, go to [Step 4](#).
- If no, go to [Step 4](#).

Step 4 Check whether the drainpipe is blocked by obstacles or water scale.

- If yes, close the water injection port and drain the water out from the water pan. After cleaning up the drain impurities to check whether the fault is rectified.
 - If yes, troubleshooting is complete.
 - If no, go to [Step 5](#).
- If no, go to [Step 5](#).

Step 5 Contact Huawei technical support.

----End

5.5.8 The T/H Sensor Cannot Detect the Humidity and Temperature

Possible Causes

- Parameter settings on the controller are incorrect.

- DIP switches of the T/H sensor are incorrectly set.
- The T/H sensor is faulty.

Procedure

Step 1 Tap **Settings > System Settings > T/H Sensor** to check whether the T/H sensor is enabled on the controller.

- If it is disabled, change it to enabled and check whether the fault is rectified.
 - If yes, troubleshooting is complete.
 - If no, go to [Step 2](#).
- If it is enabled, go to [Step 2](#).

Step 2 Check whether DIP switches of the T/H sensor is set correctly by referring to [3.8.6 Installing T/H Sensors](#).

- If no, set it correctly by referring to [3.8.6 Installing T/H Sensors](#) and check whether the fault is rectified.
 - If yes, troubleshooting is complete.
 - If no, go to [Step 3](#).
- If yes, go to [Step 3](#).

Step 3 Check whether the T/H sensor is faulty.

- If yes, replace it by referring to [5.6.9 Replacing an T/H Sensor](#) and check whether the fault is rectified.
 - If yes, troubleshooting is complete.
 - If no, go to [Step 4](#).
- If no, go to [Step 4](#).

Step 4 Contact Huawei technical support.

----End

5.5.9 The LCD does not Light

Symptom

The LCD does not light when powering on.

Possible Causes

- Main control board circuit breaker QF5 is not switched on.
- The transformer fuse is blown.
- The transformer is faulty.
- The main control board is faulty.
- The LCD connection is abnormal.
- The LCD is faulty.

Procedure

Step 1 Open the electric control box, check whether the main control board circuit breaker QF5 is switched on.

- If not switched on, switch on QF5 and check whether the fault is rectified.
 - If yes, troubleshooting is complete.
 - If not, go to [Step 2](#).
- If switched on, go to [Step 2](#).

Step 2 Check whether the indicator of the main control board is **ON**.

- If **ON**, go to [Step 3](#).
- If **OFF**, check whether the main control board terminals are secure, check whether the fault is rectified after securing terminals. If not rectified, check whether the transformer fuse is blown.
 - If the transformer fuse is blown, replace it and check whether the fault is rectified, if not, go to [Step 3](#).
 - If the transformer fuse is normal, check whether the transformer is faulty, if yes, replace it and check whether the fault is rectified, if not, go to [Step 3](#).

Step 3 Check the terminals on main control board and LCD are secured firmly.

- If the connection is not secured, fasten the cable connection and check whether the fault is rectified.
 - If yes, troubleshooting is complete.
 - If no, indicates the LCD is faulty, replace the LCD (see [5.6.12 Replacing the LCD](#)) and check whether the fault is rectified, if rectified, troubleshooting is complete, if not rectified, go to [Step 4](#).
- If the connection not secured, go to [Step 4](#).

Step 4 Contact Huawei technical support.

----End

5.6 Parts Replacement

5.6.1 Replacing Air Filters

Prerequisites

- The air filter needs to be replaced.
- A spare and functional component is available.

Context

An indoor unit has upper and lower air filters. The rear door is opened for rear-access maintenance.

Procedure

Step 1 Tap **Shutdown** on the main menu, switch off the front end circuit breaker.



NOTICE

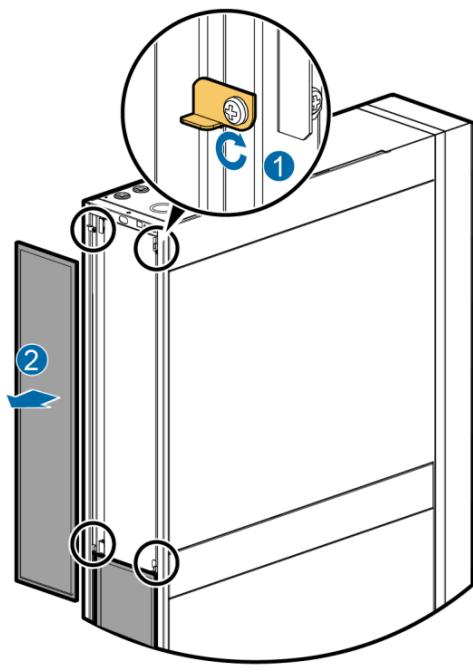
Exercise cautions when performing operations on the equipment because the equipment is under power.

Step 2 Remove the rear door.

Step 3 Turn the plates on both sides for fixing the upper air filter, as shown in step 1 of [Figure 5-3](#).

Step 4 Draw out the air filter, as shown in step 2 of [Figure 5-3](#).

Figure 5-3 Removing the air filter



Step 5 Draw out the lower air filter using the same way.

Step 6 Install new air filters following the air flow direction instruction on the air filter frame.

Step 7 Install the rear door.

----End

Follow-up Procedure

After powering on, choose **Maint > Performance Maint** on the main menu to clear the accumulated running time of the air filters.

5.6.2 Replacing an Indoor Fan

Prerequisites

- Recommended tools: protective gloves, a Phillips screw driver, diagonal pliers, cable ties, a torch.
- The indoor fan needs to be replaced.
- A spare and functional fan is available.

Context

The front door is opened for front-access maintenance.

Procedure

- Step 1** Tap **Shutdown** on the main menu, switch off the main circuit breaker QF1 and the front end circuit breaker.



NOTICE

- Exercise cautions when performing operations on the equipment because the equipment is under power.
 - Remove the rear door and the air filters when switch off the main circuit breaker QF1.
-

- Step 2** Remove the cables to the controller, and ground cables.



NOTICE

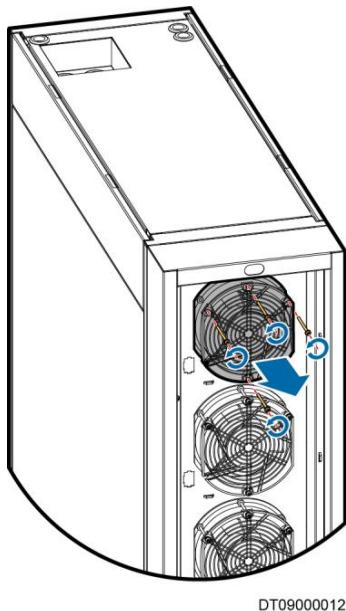
Pay attention to the fasteners when pushing the controller panel from the right or left side to prevent the controller panel from being damaged.

- Step 3** Remove the front door.

- Step 4** Cut off cable ties fixing cables to the faulty fan and remove terminals.

- Step 5** Remove four screws fixing the faulty fan using a Phillips screwdriver, and take out the fan and net cover, as shown in [Figure 5-4](#).

Figure 5-4 Removing bolts fastening the fan



Step 6 Install a new fan, properly connect cables to connectors, and fix cables using cable ties.

Step 7 Install and lock the front door, and properly connect control cables and ground cables.

Step 8 Power on the equipment. Tap **Startup** and enter **Maint > Diagnostic mode > Enter** on the main menu to check whether the fan works properly. If yes, exit diagnostic mode.

Step 9 Install the air filters and rear door if no problem is found.

----End

Follow-up Procedure

Choose **Maint > Performance Maintenance** on the main menu to clear the accumulated running time of the indoor fan.

5.6.3 Replacing the Compressor

Prerequisites

- Recommended tools: protective gloves, a Phillips screwdriver, a heat gun, sealant for sealing refrigerant pipelines, seal rings for angle valves, adjustable wrenches (30#/3 PCS and 36#/1 PCS), a 13# ratchet or fixed wrench, a cutter (for cutting copper pipes), a brazing tool, 45% silver brazing rod, a nitrogen steel vessel, hoses, a new compressor, and filter dryers.
- The compressor needs to be replaced.
- A spare and functional compressor is available.

Context

The rear door and side panel are opened for rear-access and side-access maintenance.

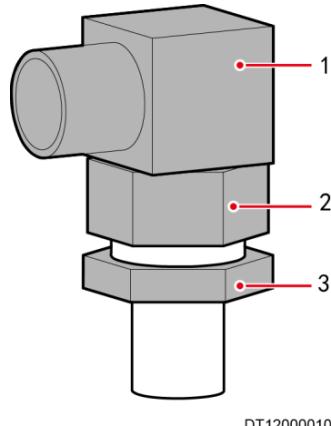


CAUTION

- Reclaim or dispose 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.

Figure 5-5 shows an angle valve.

Figure 5-5 Angle valve



DT12000010

(1) Nuts for fixing the angle valve (2) Adjustable nuts (3) Nuts for fixing pipelines

Procedure

Step 1 Tap **Shutdown** on the main menu, switch off the main circuit breaker QF1 and the front end circuit breaker.



NOTICE

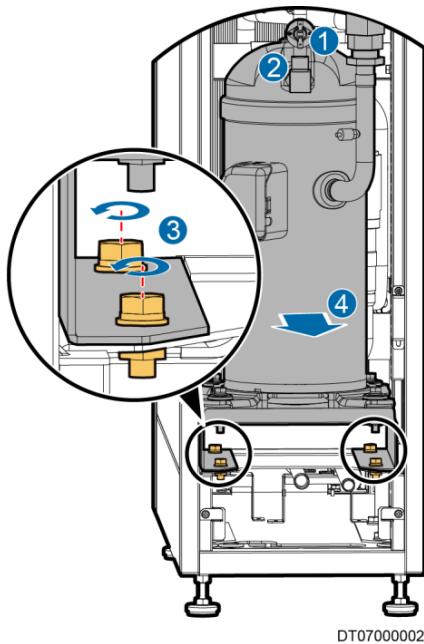
- Exercise cautions when performing operations on the equipment because the equipment is under power.
- Remove the rear door and the air filters when switch off the main circuit breaker QF1.

Step 2 Reclaim refrigerant by referring to reclaim position and connection methods in [4.2.2 Charging Refrigerant Oil](#).

Step 3 Remove the crankcase heat tape.

Step 4 Remove the compressor.

Figure 5-6 Removing the compressor



1. Heat thread connecting points of angle valves on the suction pipes using a heat gun, wait for about 10 minutes.
2. Fix nuts for fixing angle valves and pipes using two 30# adjustable wrenches (as shown in 1 of [Figure 5-6](#)), and loosen the adjustable nut using a 36# adjustable wrench to apart the suction pipes and angle valves. Then, seal the suction vent to ensure that the system is clean and does not draw in moisture.
3. Heat thread connecting points of angle valves on the suction pipes using a heat gun, wait for about 10 minutes.
4. Fix nuts for fixing angle valves and pipes using two 30# adjustable wrenches (as shown in 2 of [Figure 5-6](#)), and loosen the adjustable nut using a 30# adjustable wrench to apart the discharge pipes and angle valves. Then, seal the discharge vent to ensure that the system is clean and does not draw in moisture.
5. Remove four bolts under the compressor support using a 13# ratchet or fixed wrench (as shown in 3 of [Figure 5-6](#)), and take out the compressor and its support (as shown in 4 of [Figure 5-6](#)).

Step 5 Cut off power cable ties fixing cables to the compressor, open the terminal block cover using a Phillips screwdriver, and remove power cables to the compressor.

Step 6 Remove four bolts fixing the compressor and its support using the 13# ratchet or fixed wrench and take down the compressor.

Step 7 Remove angle valves on the air inlet and exhaust pipelines to the compressor and install them onto the new compressor using a welding torch.



NOTICE

During the welding process, do not expose the refrigerant pipes for over 15 minutes. Otherwise, system reliability may deteriorate.

Step 8 Replace seal rings inside the angle valves.

Step 9 Replace the dryer strainers using a 30# fixed or adjustable wrench.



NOTICE

When replacing the dryer strainers, take protective measures to prevent foreign matter entering the pipes.

Step 10 Connect the nitrogen steel vessel to the air exhaust vent and clean the pipes between the vent and dryer strainers.

Step 11 Fix the new compressor onto the support using a fixed wrench and install the heat tape of the crank case.

Step 12 Install the new compressor to the equipment.



NOTICE

- Seal the thread connecting points of pipes using sealant.
- Check the compressor input power phase sequence is consistent with the terminal after installing.

Step 13 Vacuumize the system and charge in refrigerant by referring to [4.2 Partially Charging in Refrigerant](#).

Step 14 Properly connect cables to the compressor and start the compressor if the power phase is right, choose **Maint > Diagnostic mode > Enter**, and charge refrigerant to the system based on the current system pressure and temperature value to ensure optimal system running status. (For details, see compressor commissioning operations in [4.5 Commissioning Procedure](#). Check whether the compressor works properly. If yes, exit the diagnosis mode.

Step 15 Install the air filters and rear door if no problem is found.

----End

Follow-up Procedure

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

5.6.4 Replacing the Humidifier Cylinder

Prerequisites

- Recommended tools: a Phillips screwdriver, an inner hexagon 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, switch off the main circuit breaker QF1 and the front end circuit breaker.

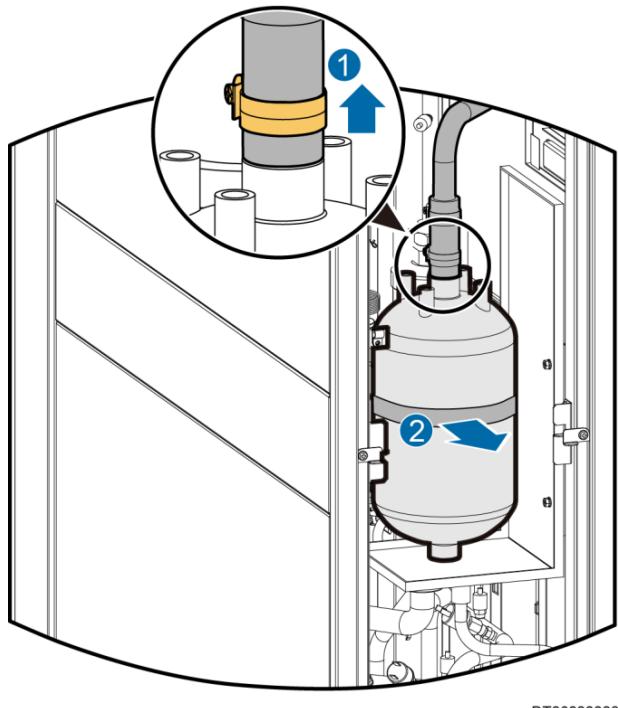


NOTICE

- Exercise cautions when performing operations on the equipment because the equipment is under power.
 - Remove the rear door and the air filters when switch off the main circuit breaker QF1.
-

- Step 3** Remove the hose clamp fixing hoses and steam hose above the humidifier cylinder in sequence as shown in 1 of [Figure 5-7](#).

Figure 5-7 Replacing the humidifier cylinder



DT06000008

- Step 4** Remove cables to the electrode and high water level sensor above the humidifier cylinder.
- Step 5** Untie the bind strap on the humidifier cylinder and remove the humidifier cylinder, as shown in 2 of [Figure 5-7](#).
- Step 6** Install a new humidifier cylinder by reversing operations in [Step 3](#) to [Step 5](#).
- Step 7** Fasten the tie on the humidifier cylinder.
- Step 8** Power on the humidifier, choose **Maint > Diagnosis 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 diagnosis 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 rear door if no problem is found.

----End

Follow-up Procedure

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

5.6.5 Electric Heater

Prerequisites

- Recommended tools: a Phillips screwdriver, diagonal pliers, waterproof adhesive, cable ties.
- The electric heater needs to be replaced.
- A spare and functional electric heater is available.

Context

The front door is opened for front-access maintenance.



CAUTION

Before replacing the electric heater, make sure that the electric heaters are not hot to touch.



NOTICE

- When removing the electric heaters, avoid dead bends on the capillary tube of the temperature switch.
 - The electric heater rack is inside the NetCol5000-A020. Exercise caution during maintenance to prevent internal components from scratches or damage
-

Procedure

Step 1 Tap **Shutdown** on the main menu, switch off the main circuit breaker QF1 and the front end circuit breaker.



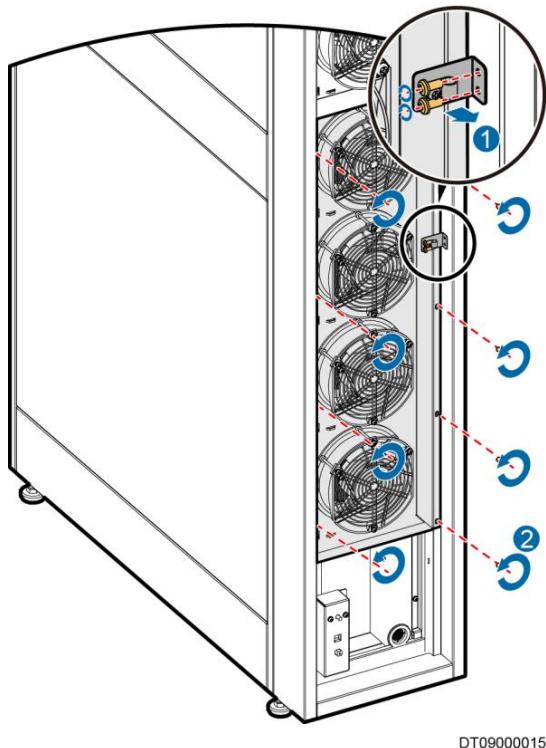
NOTICE

- Exercise cautions when performing operations on the equipment because the equipment is under power.
 - Remove the rear door and the air filters when switch off the main circuit breaker QF1.
-

Step 2 Remove the front door, control cables, ground cables, and connectors connecting to the bottom four fans.

Step 3 Remove screws fixing sheet metals of the air inlet temperature sensor probe at the bottom of the right column using a Phillips screwdriver, as shown in 1 of [Figure 5-8](#).

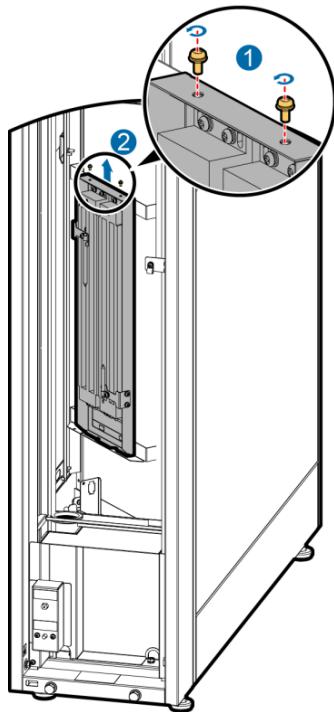
Figure 5-8 Removing fan supports



DT09000015

- Step 4** Cut off cable ties fixing cables on the right column and remove waterproof connectors from the upper air inlet temperature sensor.
- Step 5** Take out terminals of cables to the fans from the front side, the front position as shown in [Figure 5-1](#).
- Step 6** Remove the 10 screws fixing the bottom four fan supports using a Phillips screwdriver, as shown in 2 of [Figure 5-8](#). Pull out the fan supports.
- Step 7** Remove two screws fixing the electric heater support and cut off cable ties fixing capillary tubes to the sensing bulb, as shown in [Figure 5-9](#). Pull out the two electric heaters together with their supports and remove the connectors from the faulty electric heater.

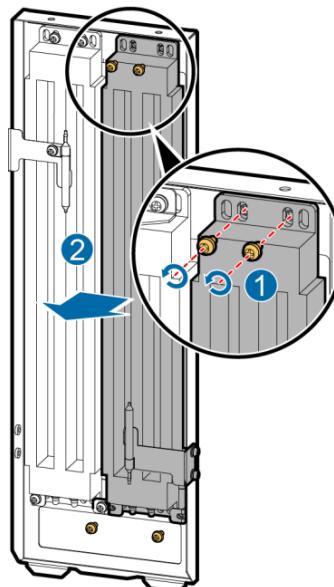
Figure 5-9 Removing the electric heater support



DT13000004

Step 8 Remove only the four screws fixing the electric heater, and take down the electric heater without removing the sensing bulb, as shown in [Figure 5-10](#).

Figure 5-10 Removing the electric heater



DT13000003

Step 9 Install the new electric heater, heater support, and fans in an inverse order.



NOTICE

- When installing the electric heater, fix the terminals on both sides of the electric heater using waterproof adhesive.
- When inserting fan terminals to the fan support, place the fan support in position, and fix the terminals onto the support from the opposite side. To facilitate operation, you are advised to remove the fan and install the fan terminals onto the support, as shown in [5.6.2 Replacing an Indoor Fan](#).

Step 10 Power on the equipment, choose **Maint > Performance Maintenance > Enter** on the main menu, manually start the electric heater and check whether the electric heater works properly. Exit the diagnostic mode if no problem is found.

Step 11 Install the air filters and rear door if no problem is found.

----End

Follow-up Procedure

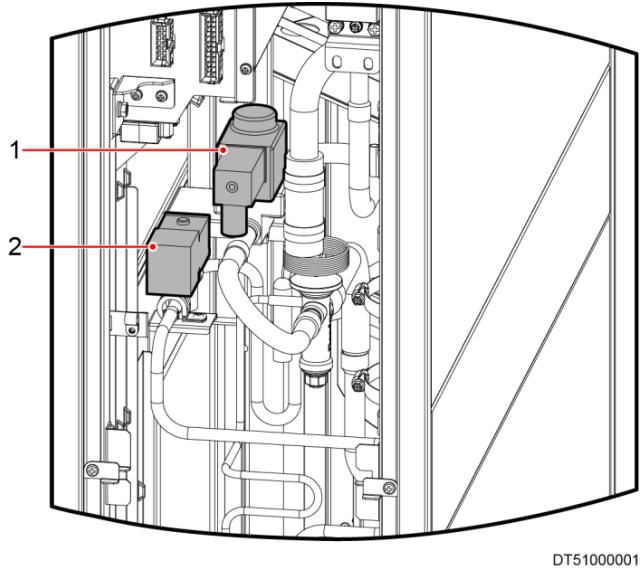
Choose **Maint > Performance Maintenance** on the main menu to clear the accumulated running time of the electric heater.

5.6.6 Replacing the Solenoid Coil

- Recommended tools: Phillips screwdriver, flat screwdriver, M8 fixed wrench, torch, two male cord terminals.
- The solenoid coil needs to be replaced.
- A spare and functional solenoid coil is available.

The rear door is opened for rear-access maintenance. [Figure 5-11](#) shows solenoid coil on the liquid solenoid valve and hot gas bypass valve.

Figure 5-11 Location of solenoid coils



(1) Solenoid coil on the liquid solenoid valve

(2) Solenoid coil on the hot gas bypass valve

5.6.6.1 Replacing the Solenoid Coil on the Liquid Solenoid Valve

Procedure

Step 1 Tap **Shutdown** on the main menu, switch off the main circuit breaker QF1 and the front end circuit breaker.



NOTICE

- Exercise cautions when performing operations on the equipment because the equipment is under power.
- Remove the rear door and the air filters when switch off the main circuit breaker QF1.

Step 2 Lever the solenoid coil in the liquid solenoid valve using the flat screwdriver, and pull the solenoid coil together with the junction box out of the cabinet.

Step 3 Remove bolts using the Phillips screwdriver and pull out the junction box. Install the new solenoid coil and secure bolts.

Step 4 Fix the solenoid coil onto the sleeve using bolts.

Step 5 Install the air filters and rear door if no problem is found.

---End

5.6.6.2 Replacing the Solenoid Coil on the Hot Gas Bypass Valve

Procedure

Step 1 Tap **Shutdown** on the main menu, switch off the main circuit breaker QF1 and the front end circuit breaker.



NOTICE

- Exercise cautions when performing operations on the equipment because the equipment is under power.
 - Remove the rear door and the air filters when switch off the main circuit breaker QF1.
-

Step 2 Remove the bolts fixing the solenoid coil and sleeve of the solenoid valve using the M8 fixed wrench.

Step 3 Open the junction box to the solenoid valve, disconnect male cord terminals of two power cables, and one PE ground cable, and take out the solenoid coil.

Step 4 Install the new solenoid coil and assemble the junction box by repeating preceding operations in a reverse manner.

Step 5 Fix the solenoid coil onto the sleeve using bolts.

Step 6 Install the air filters and rear door if no problem is found.

---End

5.6.7 Replacing Components in the Electric Control Box

Prerequisites

- Recommended tools: a Phillips screwdriver
- The spare parts need to be replaced (including the main control board, circuit breakers, an AC contactor, a transformer, fuse, and a fuse support).
- A spare and functional part is available.

Context

The rear door is opened for rear-access maintenance.

Procedure

Step 1 Tap **Shutdown** on the main menu, switch off the main circuit breaker QF1 and the front end circuit breaker.



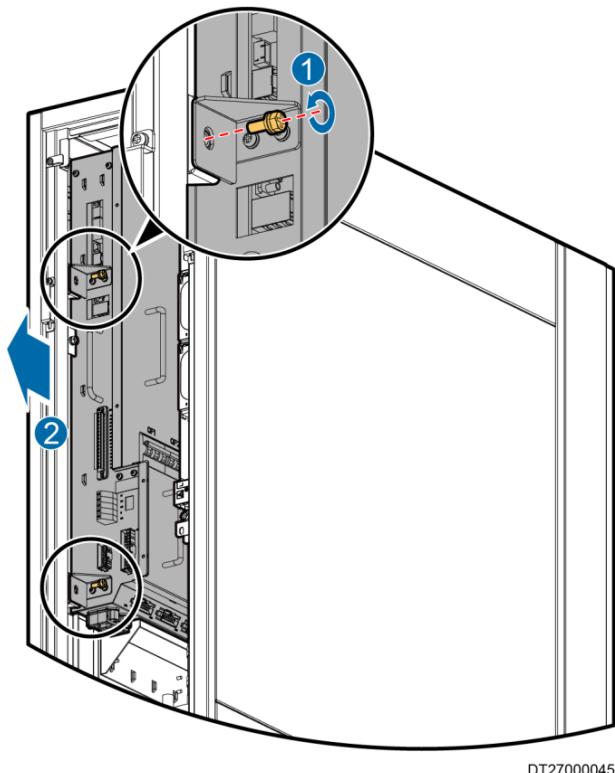
NOTICE

- Exercise cautions when performing operations on the equipment because the equipment is under power.
- Remove the rear door and the air filters when switch off the main circuit breaker QF1.

Step 2 Remove cables and connectors to side and bottom of the electrical control box.

Step 3 Remove two front bolts fixing the electrical control box (as shown in 1 of [Figure 5-12](#)), hold the handle, lift the electrical control box, pull out the electrical control box along the guide rails (as shown in 2 of [Figure 5-12](#)), and place it on the ground in a horizontal manner.

Figure 5-12 Dismantling the electric control box



DT27000045

Step 4 Remove screws on the cover of the electrical control box using the Phillips screwdriver, open the electrical control box, and replace faulty components in the electrical control box.



NOTE
This section uses replacing the main control board in the electrical control box as an example.

Step 5 After replacing the main control board, install the cover back to the electric control box.

Step 6 Place the electric control box back to the original place, and secure the electric control box.

Step 7 Connect cables and connectors to the electrical control box.

Step 8 Check whether cables are connected properly by referring to [D Electrical Schematic Diagram](#) and [E Schematic Diagram of the Main Control Board](#).

Step 9 Power on the equipment and check whether the equipment runs properly.

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

----End

Example

To replace the main control board inside the electrical control box, perform operations as follows:

1. Disconnect cables to the main control board by referring to [E Schematic Diagram of the Main Control Board](#).
2. Remove screws securing the main control board, and take out the main control board.
3. Set DIP switches on the new main control board by referring to [3.8.5 Teamwork Networking and Monitoring](#). (Ensure that the DIP switches are set the same as before.)
4. Install the main control board and connect cables.
5. Check that cables are connected properly by referring to [E Schematic Diagram of the Main Control Board](#).

5.6.8 Replacing the Return Air and Supply Air Temperature Sensor

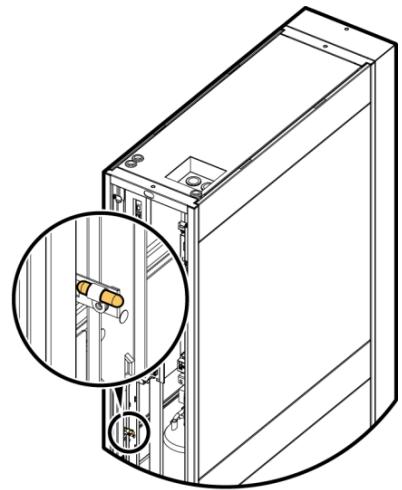
Prerequisites

- Recommended tools: diagonal pliers, cable ties.
- The temperature sensor needs to be replaced.
- A spare and functional temperature sensor is available.

Context

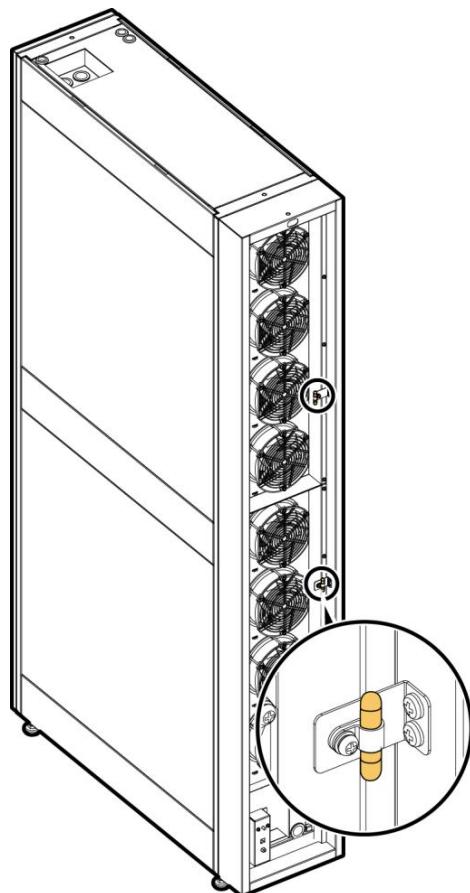
[Figure 5-13](#) and [Figure 5-14](#) show the probe position of the return air and exhaust temperature sensors. This section uses replacing the air exhaust temperature sensor as an example, because operations for replacing air inlet and exhaust temperature sensors are similar.

Figure 5-13 Probe position of the return air temperature sensor



DS03000010

Figure 5-14 Probe position of the supply air temperature sensor



DS03000011

Procedure

Step 1 Tap **Shutdown** on the main menu, switch off the main circuit breaker QF1 and the front end circuit breaker.



NOTICE

- Exercise cautions when performing operations on the equipment because the equipment is under power.
 - Remove the rear door and the air filters when switch off the main circuit breaker QF1.
-

Step 2 Remove the front door, cables to the controller, and ground cables.

Step 3 Remove the R-shaped cable ties fixing the temperature sensor on the front door column using a Phillips screwdriver, take down the supply air temperature sensor, and cut off the cable ties fixing cables to the sensor.

Step 4 Disconnect the waterproof connectors from the sensor cables 50 cm below the sensor.

Step 5 Install the new sensor probe and fix it using R-shaped cable ties.

Step 6 Connect the waterproof connectors to sensor cables.

Step 7 Install the front door and properly connect signal and ground cables.

Step 8 Install the air filters and the rear door if no problem is found.

----End

5.6.9 Replacing an T/H Sensor

Prerequisites

- The T/H sensor needs to be replaced.
- A spare and functional T/H sensor is available.

Context

The rear door is opened for rear-access maintenance.

Procedure

Step 1 Tap **Shutdown** on the main menu, switch off the main circuit breaker QF1 and the front end circuit breaker.

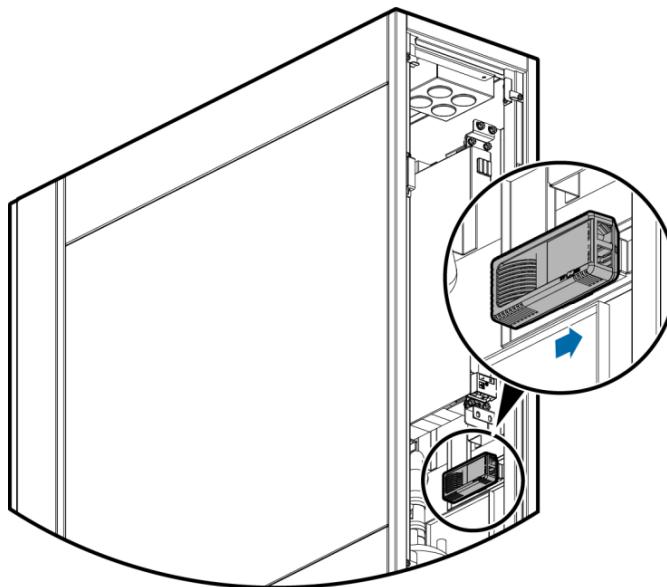
! NOTICE

- Exercise cautions when performing operations on the equipment because the equipment is under power.
- Remove the rear door and the air filters when switch off the main circuit breaker QF1.

Step 2 Remove terminals connecting to RS485_IN and RS485_OUT.

Step 3 Pull out the T/H sensor, as shown in [Figure 5-15](#).

Figure 5-15 Replacing an T/H sensor



DS02000030

Step 4 Install a new ambient temperature and humidity sensor and connect terminals to RS485_IN and RS485_OUT.

Step 5 Install the air filters and rear door if no problem is found.

----End

5.6.10 Replacing the Power Module

Prerequisites

- The power module needs to be replaced.
- A spare and functional power module is available.

Context

The rear door is opened for rear-access maintenance.

Procedure

Step 1 Tap **Shutdown** on the main menu, switch off the main circuit breaker QF1 and the front end circuit breaker.

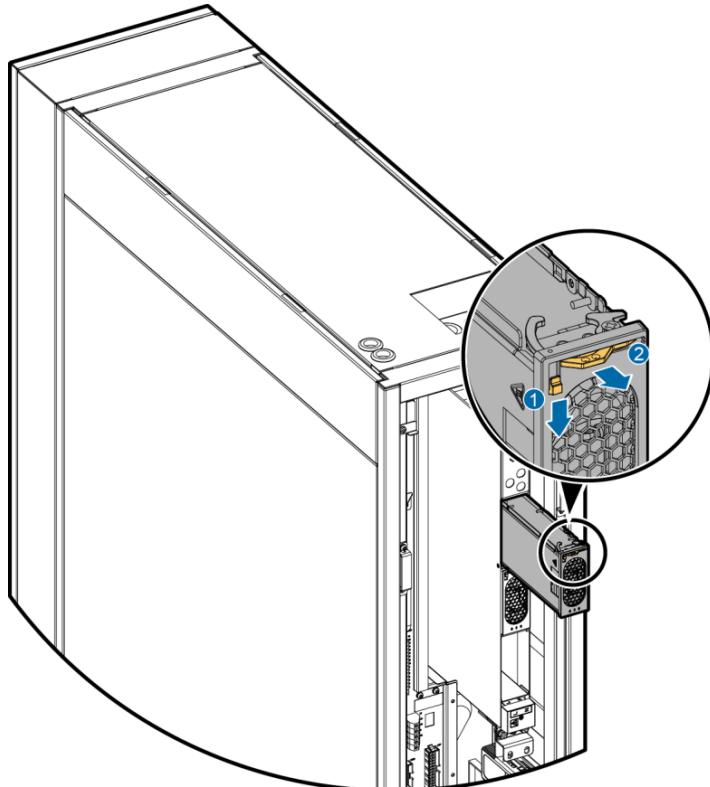


NOTICE

- Exercise cautions when performing operations on the equipment because the equipment is under power.
- Remove the rear door and the air filters when switch off the main circuit breaker QF1.

Step 2 Push down the buckle button on the power module, as shown in 1 of [Figure 5-16](#).

Figure 5-16 Removing the power module



DT27000046

Step 3 Pull out the buckle, as shown in 2 of [Figure 5-16](#), and then pull out the power module from plug-in frame.

Step 4 Push the spare power module to the plug-in frame and push upward the buckle button to lock the power module.

Step 5 Install the air filters and rear door if no problem is found.

----End

5.6.11 Replacing the Float

Prerequisites

- The float needs to be replaced.
- A spare and functional float is available.

Context

The front door is opened for front-access maintenance.

Procedure

Step 1 Tap **Shutdown** on the main menu, switch off the main circuit breaker QF1 and the front end circuit breaker.



NOTICE

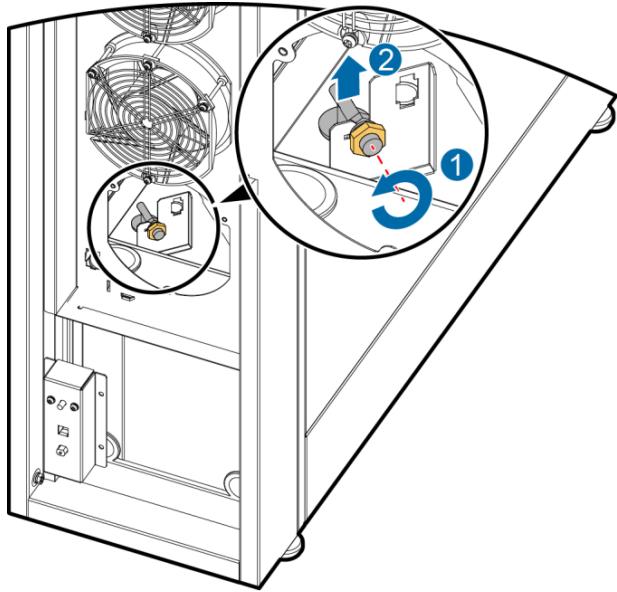
- Exercise cautions when performing operations on the equipment because the equipment is under power.
 - Remove the rear door and the air filters when switch off the main circuit breaker QF1.
-

Step 2 Remove the front door, cables to the controller, and ground cables.

Step 3 Remove the fan at the most bottom of the cabinet by referring to [5.6.2 Replacing an Indoor Fan](#).

Step 4 Remove the screw fixing the float, take out the float, and disconnect float cables from the connectors, as shown in 1 and 2 of [Figure 5-17](#).

Figure 5-17 Replacing the float



DT32000003

Step 5 Replace the float and connect the connectors.

Step 6 Install and fasten the screw to fix the float and ensure that the float is horizontal.

Step 7 Install the bottom fan and front door.

Step 8 Install the air filters and rear door if no problem is found.

----End

5.6.12 Replacing the LCD

Prerequisites

- Recommended tool: Phillips screwdriver.
- The LCD needs to be replaced.
- A spare and functional LCD is available.

Context

The front door is opened for front-access maintenance.

Procedure

Step 1 Tap **Shutdown** on the main menu, switch off the main circuit breaker QF1 and the front end circuit breaker.



NOTICE

- Exercise cautions when performing operations on the equipment because the equipment is under power.
- Remove the rear door and the air filters when switch off the main circuit breaker QF1.

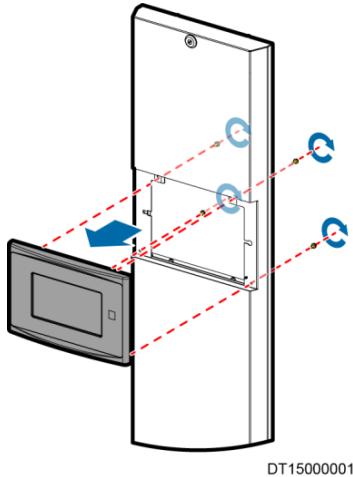
Step 2 Remove the front door, cables to the controller, and ground cables.



NOTICE

Do not use too much force; otherwise, the cables to the controller and communication port may be damaged.

Figure 5-18 Replacing the LCD



Step 3 Hold the LCD screen from the front and remove four screws on the back of the screen using a Phillips screwdriver, and remove the LCD screen, as shown in [Figure 5-18](#).

Step 4 Take a spare LCD screen and fix it onto the front door using a Phillips screwdriver.

Step 5 Connect control and signal cables to the LCD screen, and install and lock the front door.

Step 6 Install the air filters and rear door if no problem is found.

----End

A Acronyms and Abbreviations

A

ACC Advanced cooling controller

C

CFD Computational fluid dynamics

CAN Controller area network

D

DC Direct current

E

EC Electronic commutation

P

PTC Positive temperature coefficient

R

RCCB Residual current circuit breaker

T

TFT Thin film transistor

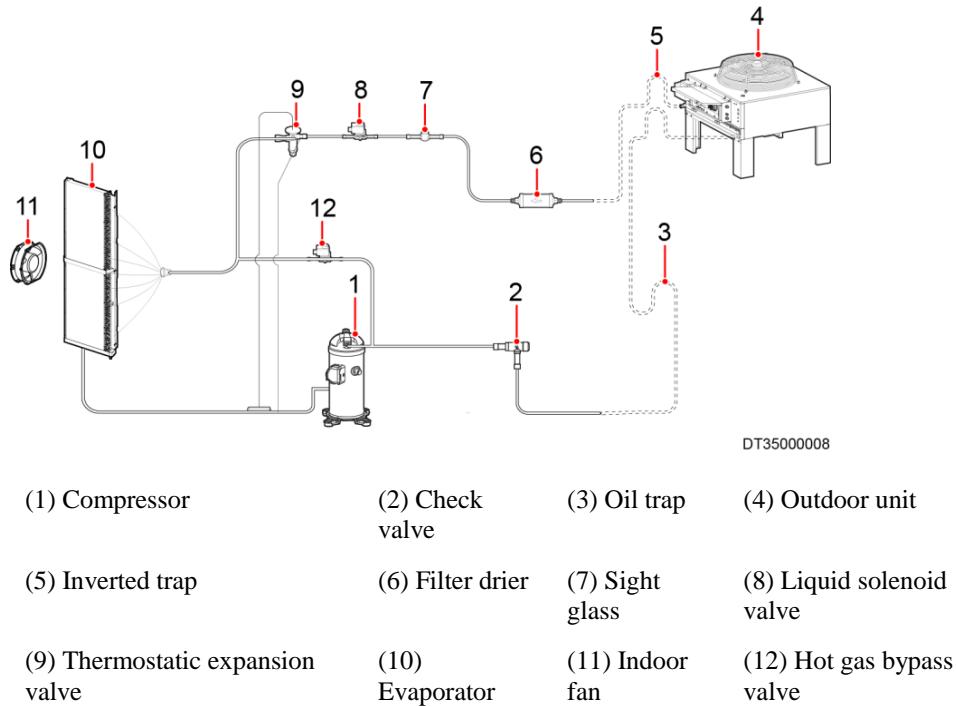
U

USB Universal Series Bus

B Laying out the Cooling System

A complete cooling system is composed of the indoor NetCol5000-A020 and outdoor NetCol500. [Figure B-1](#) shows the layout of various components of the cooling system.

Figure B-1 Laying out the Cooling System

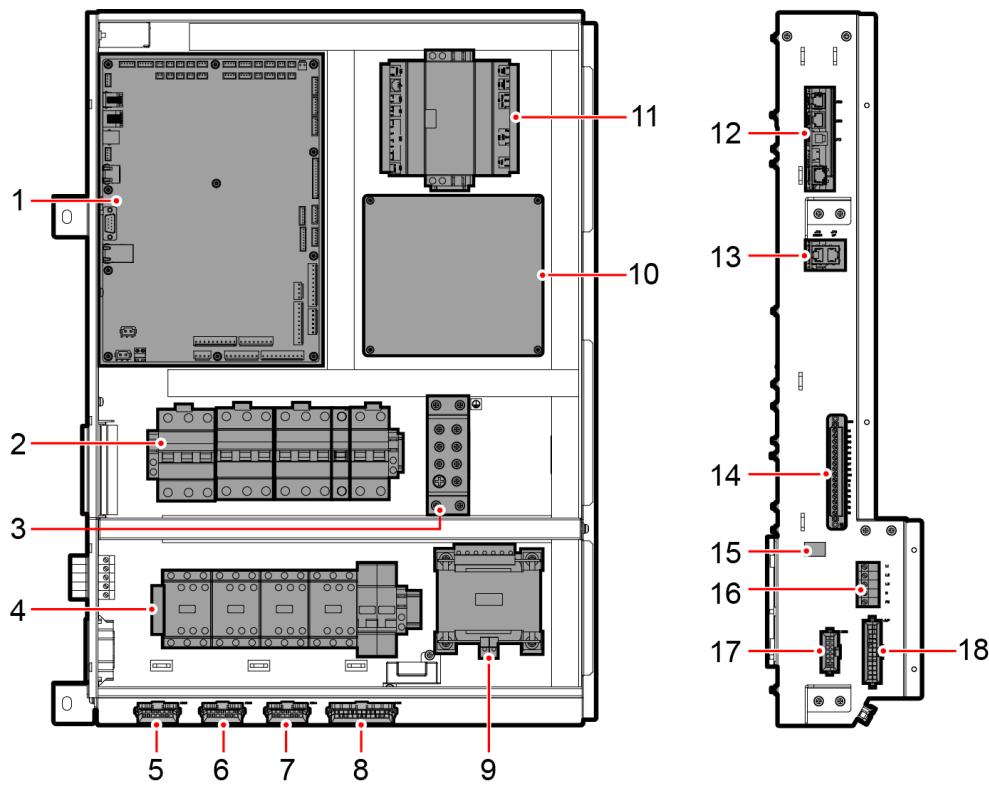


NOTE

- [Figure B-1](#) the pipelines in solid line are installed by Huawei before delivery.
- [Figure B-1](#) the pipelines in dashed line are to be routed onsite by technical personnel.
- Huawei does not provide the inverted traps (component 5) and oil traps (component 3). However, to ensure the normal operating and easy maintenance of the cooling system, it is recommended that you use these two components.

C Electrical Ports

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

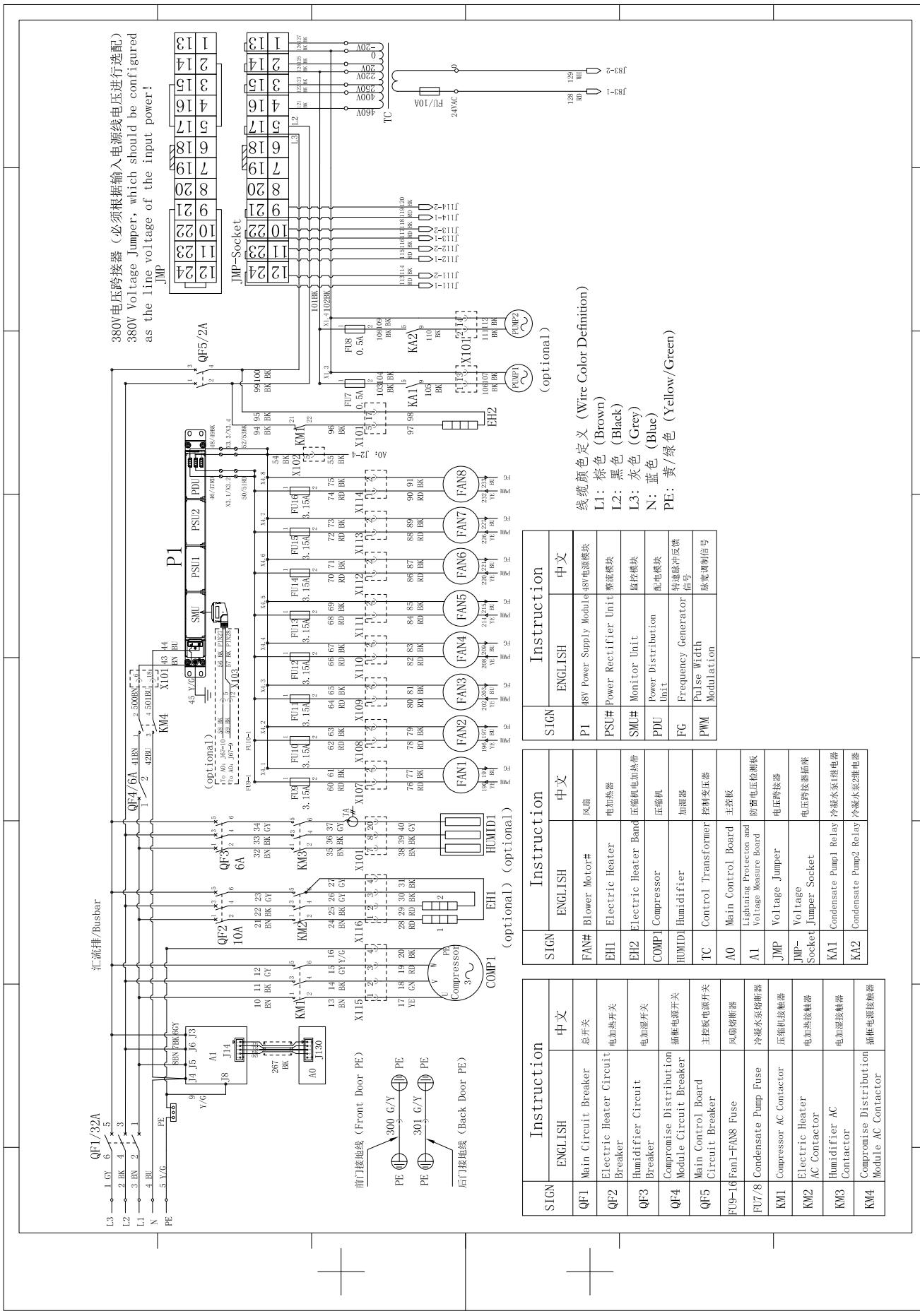


DT27000039

- (1) Main control board
- (2) Circuit breakers from left to right: main circuit breaker QF1, electric heater circuit breaker QF2, humidifier circuit breaker QF3, compromise distribution module circuit breaker QF4, and main control board circuit breaker QF5
- (3) PE ground cable
- (4) Contactor and relay (relay function is reserved). Contactor from left to right: compressor AC contactor KM1, electric heater AC contactor KM2, humidifier AC contactor KM3, compromise distribution module AC contactor KM4

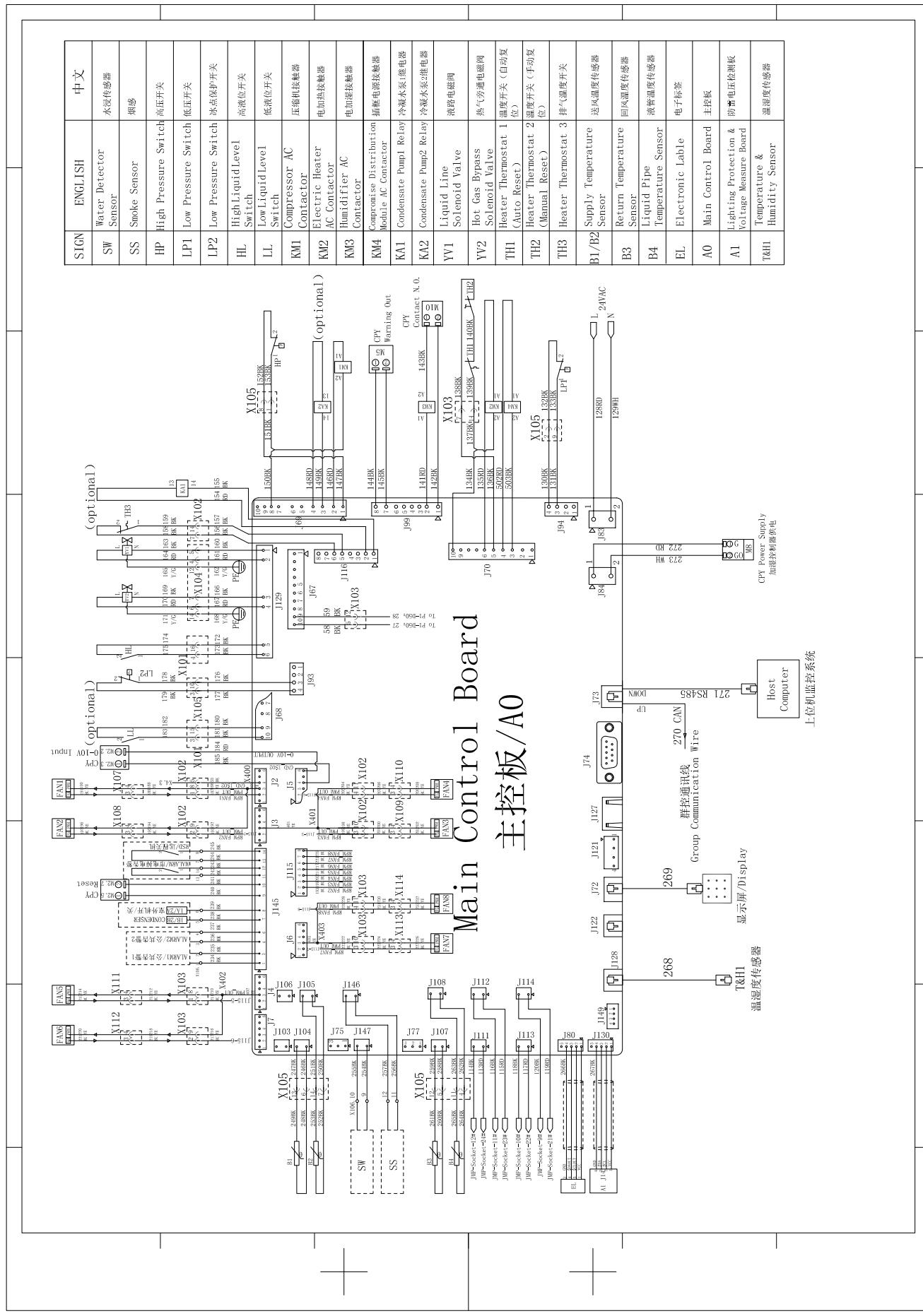
- (5) X102 signal terminals for 1-4 fan
- (6) X103 signal terminals for 5-8 fan
- (7) X104 signal terminals for solenoid valve
- (8) X101 signal terminals for humidifier and floats
- (9) 24 V AC transformer
- (10) Surge protection and voltage test board
- (11) Humidification controller
- (12) Main control board port
- (13) Teamwork communications port
- (14) External terminal block
- (15) Manual drainage of the humidifier
- (16) External power cable and PE port
- (17) Male socket of terminals
- (18) Voltage jumper

D Electrical Schematic Diagram



E Schematic Diagram of the Main Control Board

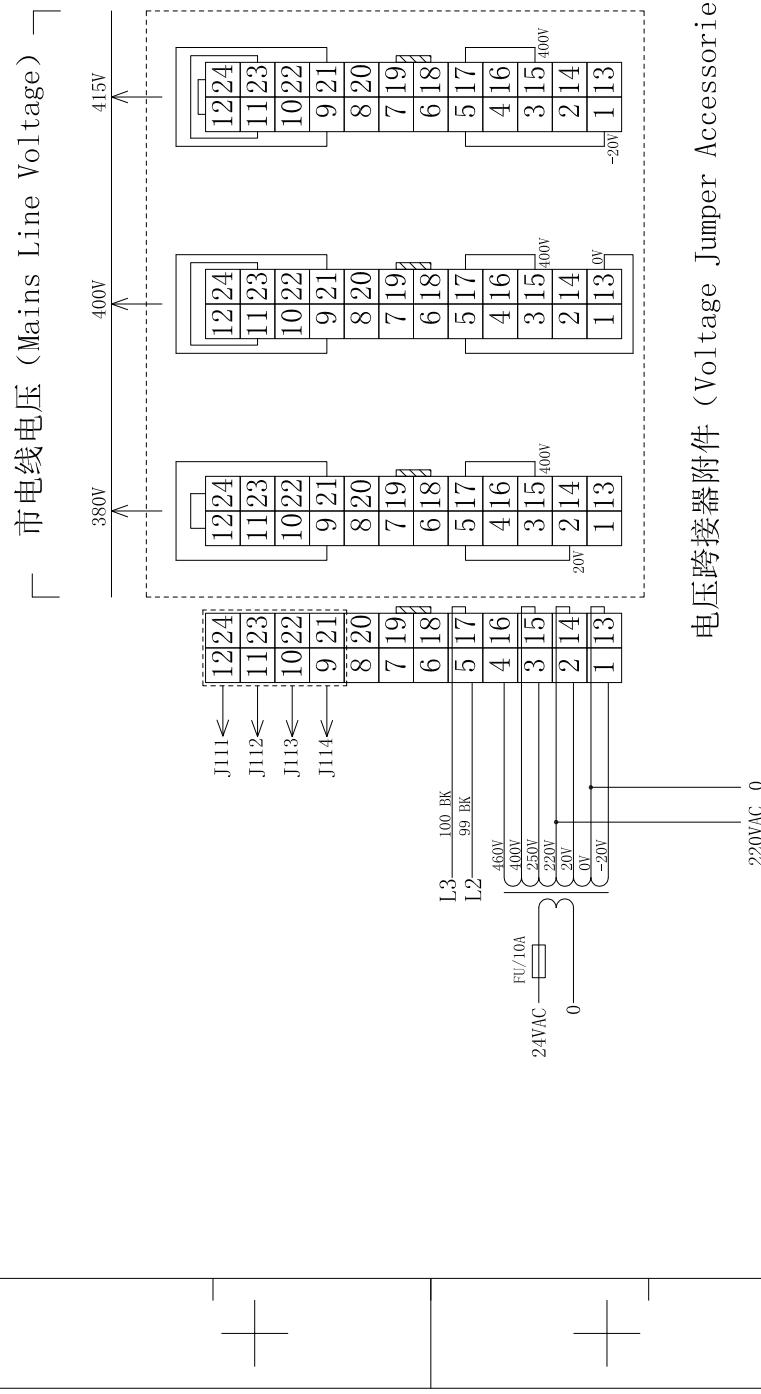
E Schematic Diagram of the Main Control Board



SIGN	ENGLISH	中文
SW	Water Detector Sensor	水浸传感器
SS	Smoke Sensor	烟感
HP	High Pressure Switch	高压开关
LP1	Low Pressure Switch	低压开关
LP2	Low Pressure Switch	冰点保护开关
HL	High Liquid Level Switch	高液位开关
LL	Low Liquid Level Switch	低液位开关
KM1	Compressor AC Contactor	压缩机接触器
KM2	Electric Heater AC Contactor	电加热接触器
KM3	Humidifier AC Contactor	加湿器接触器
KM4	Componaise Distribution Module AC Contactor	精控电能分配器
KA1	Condensate Pump 1 Relay	冷冻水泵继电器
KA2	Condensate Pump 2 Relay	冷冻泵2继电器
YV1	Liquid Line Solenoid Valve	液路启闭阀
YV2	Hot Gas Bypass Solenoid Valve	热气旁通电磁阀
TH1	Heater Thermostat 1 (Auto Reset)	温控开关(自动复位)
TH2	Heater Thermostat 2 (Manual Reset)	温控开关(手动复位)
TH3	Heater Thermostat 3	3号温度开关
B1/B2	Supply Temperature Sensor	送风温度传感器
B3	Return Temperature Sensor	回风温度传感器
B4	Liquid Pipe Temperature Sensor	液管温度传感器
EL	Electronic Lable	电子标签
AO	Main Control Board	主控板
A1	Lighting Protection & Voltage Measure Board	防雷电压检测板
T&H1	Temperature & Humidity Sensor	温湿度传感器

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F Schematic Diagram of the Voltage Jumper



G Control Schematic Diagram of the Humidifier Cylinder

