

NetCol5000-A(025, 035) In-row Air Cooled Smart Cooling Product (300 mm Width)

User Manual

Issue 08
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About This Document

Purpose

This document describes the NetCol5000-A025/A035 in-row air cooled smart cooling product (NetCol5000-A for short) in terms of its safety precautions, product overview, installation, power-on commissioning, and system operation and maintenance (O&M).

If the system does not provide heating, humidification, and water pump functions, skip the installation, commissioning, and maintenance of the electric heater, humidifier, and water pump.

Intended Audience

This document is intended for:

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

Symbol Conventions

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

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

Symbol	Description
 NOTICE	Indicates a potentially hazardous situation which, if not avoided, could result in equipment damage, data loss, performance deterioration, or unanticipated results. NOTICE is used to address practices not related to personal injury.
 NOTE	Supplements the important information in the main text. NOTE is used to address information not related to personal injury, equipment damage, and environment deterioration.

Change History

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

Issue 08 (2022-07-15)

- Optimized the description about the outdoor unit environment in section "Technical Specifications."
- Added the description about the environment requirements for installing the indoor unit when the inlet water pressure is low.
- Optimized the cable requirements.
- Optimized the compressor nut installation diagram.
- Added the requirements for tilting drainpipes and wrapping thermal insulation foam when installing drainpipes.
- Updated the software version to V100R021C10SPC350, the options in system settings after power-on, and the descriptions about communications parameter settings, wizard-based startup, and WebUI preparation and login.
- Updated the recommended values for temperature and humidity setpoints.
- Added examples for setting temperature and humidity setpoints.
- Deleted the description about pressure difference control setting because the setting is not supported.
- Added related sections because FE teamwork control is supported.
- Moved the section "Alarm Reference" to the *FusionCol and NetCol Smart Cooling Product Alarm Reference*.
- Updated the description about reclaiming refrigerant.
- Updated the procedure for replacing an outdoor fan.

Issue 07 (2021-07-27)

- Added the net weights of outdoor units and the parameters of the temperature control intelligent monitoring board.

- Added equipotential cable specifications.
- Updated [Power Cable Filter for an Outdoor Unit](#).
- Updated [Space requirements for installing an air baffle](#).
- Adjusted the document structure.
- Updated the description about class A, B, C, and D environments.
- Updated [4.8.8 Installing the Outdoor Unit Signal Cable](#).

Issue 06 (2020-12-10)

- Updated [4.2.2.6 Cables](#).
- Updated [11.2 Replacing an Indoor Fan](#).
- Adjusted the document structure.

Issue 05 (2020-10-22)

Added the section "Replacing a High Pressure Switch."

Issue 04 (2020-08-28)

Added the encryption operation CBC switch.

Issue 03 (2020-06-30)

- Added two NetCol5000-A025 models.
- Added the NetCol500-A040/A080 model.

Issue 02 (2020-04-30)

- Optimized the section "Preparations and WebUI Login."
- Added the description about how to replace components such as the compressor and filter dryer.
- Added the description about installing the low temperature component and outdoor unit NetCol500-A120.

Issue 01 (2019-12-30)

This issue is the first official release.

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1 Safety Information

1.1 General Safety

Statement

Before installing, operating, and maintaining the equipment, carefully read this document and observe all safety instructions provided herein and written on the equipment itself.

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

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

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

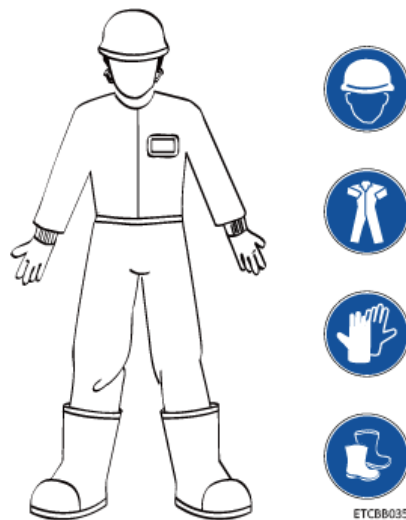
The Company will not be liable for any consequences of the following circumstances:

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

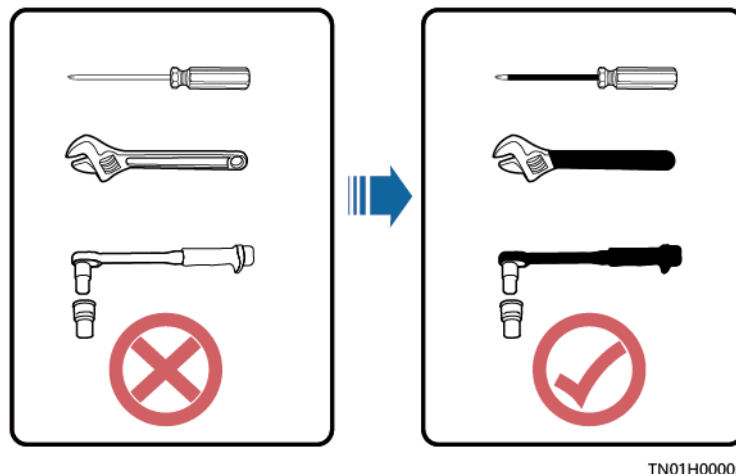
- Damage caused during transportation by the customer
- Storage conditions that do not meet the requirements specified in this document

General Requirements

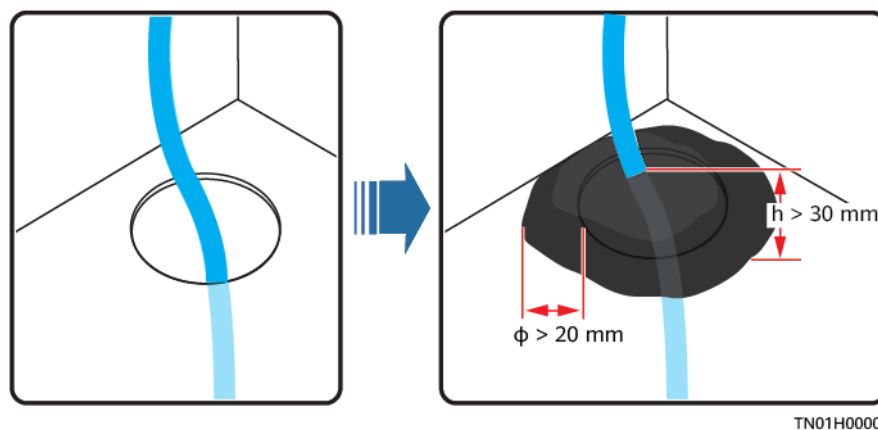
- Do not install, use, or operate outdoor equipment and cables (including but not limited to moving equipment, operating equipment and cables, inserting connectors to or removing connectors from signal ports connected to outdoor facilities, working at heights, and performing outdoor installation) in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



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



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



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

Personal Safety

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

1.2 Personnel Requirements

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

1.3 Electrical Safety

Grounding

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

General Requirements

Use dedicated insulated tools when performing high-voltage operations.

AC and DC Power

DANGER

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

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

Cabling

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

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

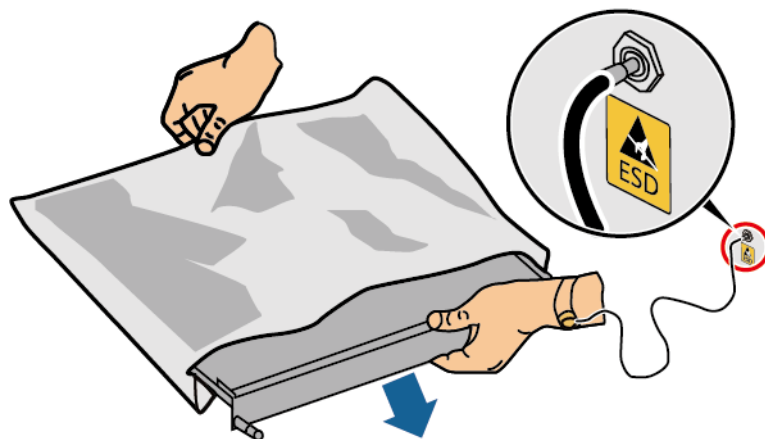
ESD

NOTICE

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

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

Figure 1-1 Wearing an ESD wrist strap



DC15000001

Neutral-Ground Voltage

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

1.4 Installation Environment Requirements

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

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

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

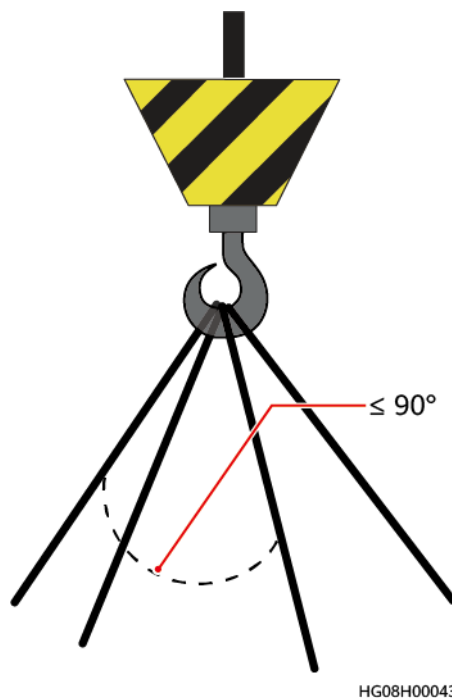
Installation at Heights

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

1.5 Mechanical Safety

Hoisting

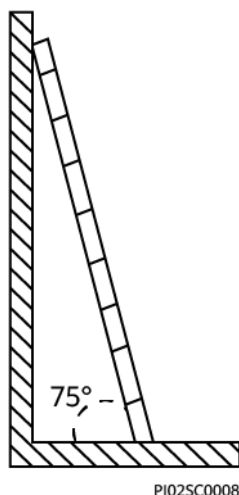
- Do not walk under hoisted objects.
- Only trained and qualified personnel should perform hoisting operations.
- Check that hoisting tools are available and in good condition.
- Before hoisting objects, ensure that hoisting tools are firmly secured onto a load-bearing object or wall.
- Ensure that the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



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

Using Ladders

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



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

Drilling Holes

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

NOTICE

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

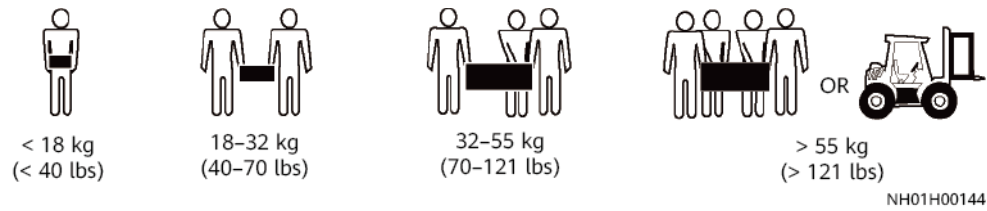
- Obtain consent from the customer and contractor before drilling holes.
- Wear goggles and protective gloves when drilling holes.
- When drilling holes, protect the equipment from shavings. After drilling, clean up any shavings that have accumulated inside or outside the equipment.

Moving Heavy Objects

DANGER

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

- Be cautious to avoid injury when moving heavy objects.



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

1.6 Cooling System Safety

Welding

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

High Temperature and Pressure

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

Refrigerant Frostbite

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

Storage and Recycling

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



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

1.7 Others

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

2 Product Description

2.1 Overview

Fans absorb indoor hot air that moves to the evaporator with heat transmitted to the refrigerant. The refrigerant is exhausted to the outdoor air-cooled condenser using the compressor, releasing heat to outdoor environments. The indoor unit and outdoor condenser are connected by a circular and hermetic pipeline. The NetCol500-A060 outdoor unit is used as an example.

Figure 2-1 Product composition 1

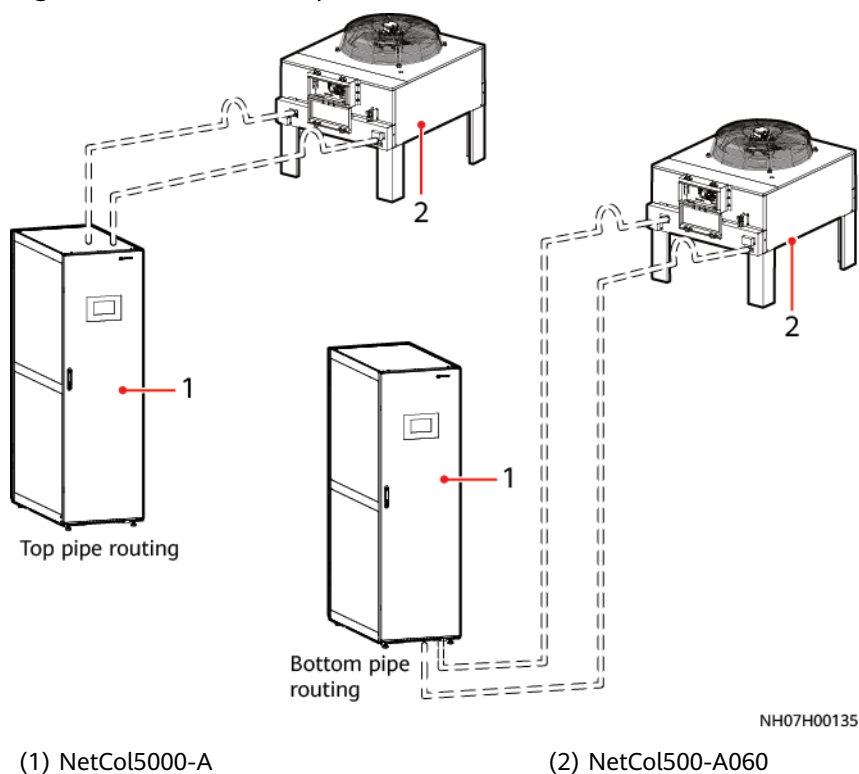
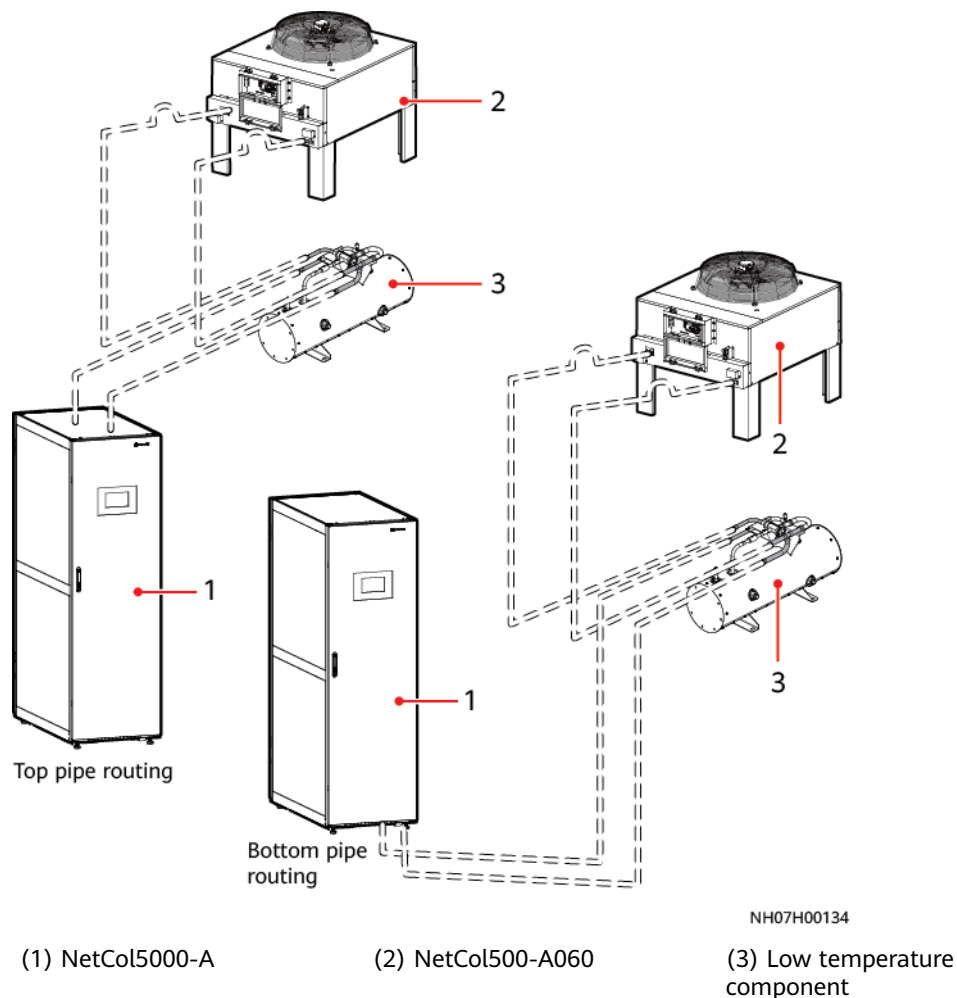


Figure 2-2 Product composition 2



2.2 Model Number Description

Indoor Unit Model Number Description

This document involves the following product models:

- NetCol5000-A035H4WE0
- NetCol5000-A035H40E0
- NetCol5000-A035H4WE2
- NetCol5000-A035H40E2
- NetCol5000-A025H4WE2
- NetCol5000-A025HNWE2

Figure 2-3 NetCol5000 model number

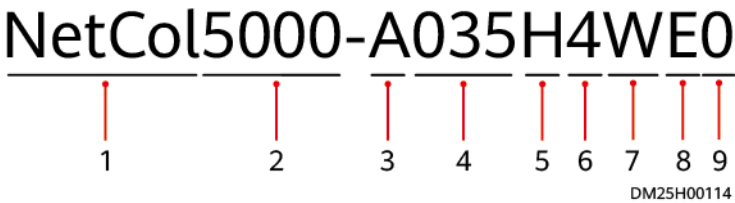


Table 2-1 NetCol5000 model number description

No.	Meaning	Description
1	Data center smart cooling	NetCol: data center smart cooling
2	Model series	5000: in-row smart cooling
3	Cooling mode	A: air cooled
4	Model code	035: model code 035 025: model code 025
5	Air supply	H: horizontal flow
6	Power supply	4: 380–415 V, 3 PH, 50/60 Hz N: 208–220 V, 3 PH, 60 Hz
7	Heater and humidifier types	0: None W: level-1 electric heater and wet film humidifier
8	Packaging type	E: package for international markets
9	Special identifier for orders	0: none 2: condensate pump and dual power supplies

Outdoor Unit Model Number Description

This document involves the following product models:

- NetCol500-A040MS1E0
- NetCol500-A060MC1D0
- NetCol500-A060MS1E0
- NetCol500-A080MC1D0
- NetCol500-A120MC1D0

Figure 2-4 NetCol500 model number

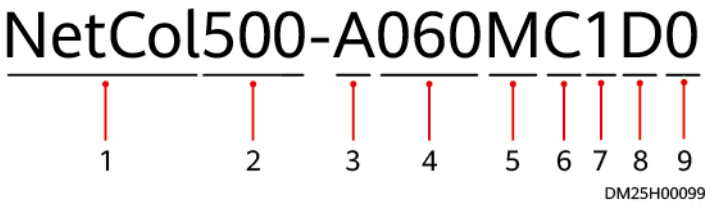


Table 2-2 NetCol500 model number description

No.	Meaning	Description
1	Data center smart cooling	NetCol: data center smart cooling
2	Model series	500: outdoor unit
3	Cooling mode	A: air cooled
4	Model code	040: model code 040 060: model code 060 080: model code 080 120: model code 120
5	Power supply	M: 380–415 V, 3 PH, 50 Hz
6	Climate type	C: common non-corrosive environment S: common harsh environment (class C)
7	Fan type	1: AC fan
8	Packaging type	D: package for Chinese markets E: package for international markets
9	Special identifier for orders	0: none

2.3 Components

2.3.1 Indoor Unit

Appearance

Figure 2-5 shows the indoor unit of the NetCol5000-A in-row smart cooling product.

Figure 2-5 Appearance



Table 2-3 Dimensions of the NetCol5000-A035 indoor unit

Dimensions	H x W x D (mm)	Expansion Method
Standard configuration	2000 x 300 x 1200	-
Expansion configuration	2200 x 300 x 1200	Install a top frame.

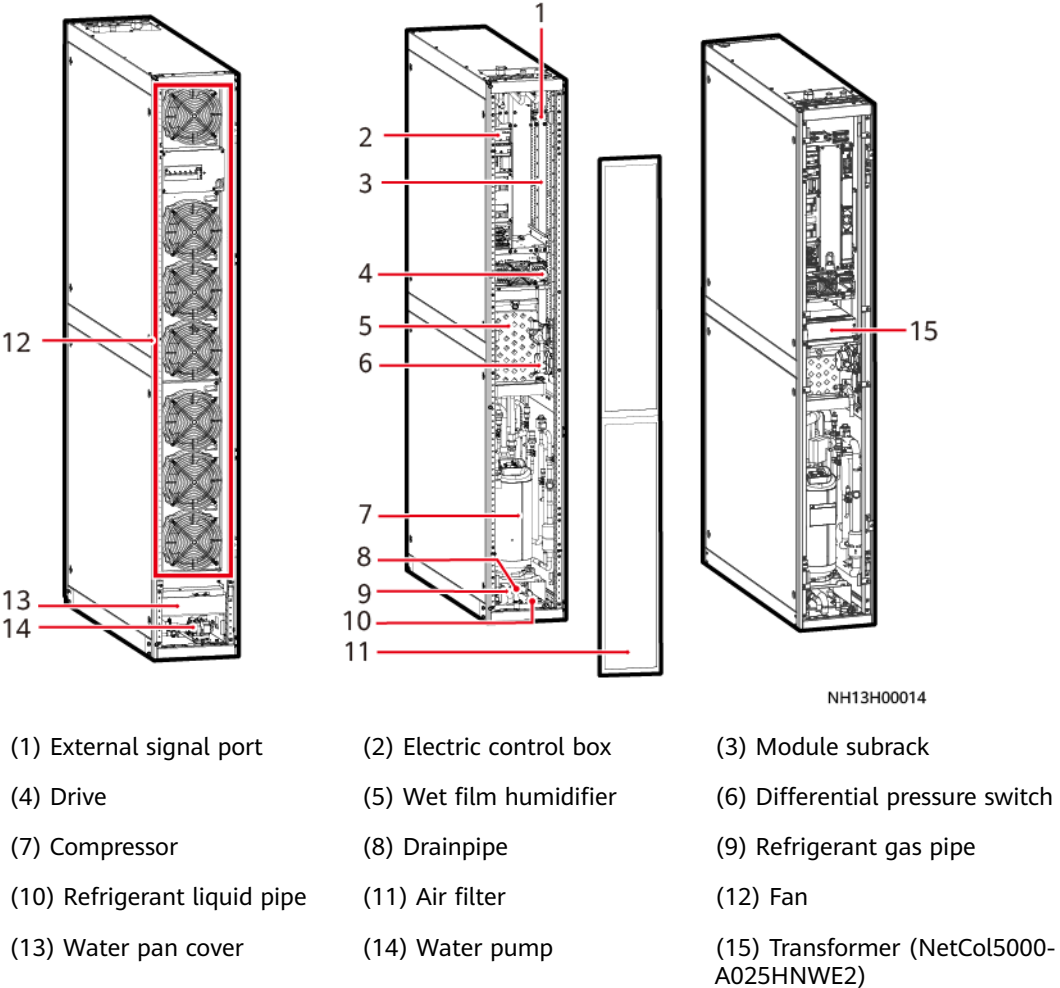
Table 2-4 Dimensions of the NetCol5000-A025 indoor unit

Dimensions	H x W x D (mm)	Expansion Method
Standard configuration	2000 x 300 x 1100	-

Components

The NetCol5000-A indoor unit mainly consists of a compressor, oil separator, fan, heat exchanger, electronic expansion valve (EEV), check valve, filter dryer, sight glass, electric heater (optional), wet film humidifier (optional), water pump (optional), and display module.

Figure 2-6 Components



- Compressor
The smart cooling product uses a DC variable-frequency compressor that features compact size, light weight, a long service life, low noise, easy installation, high reliability, stability, and energy efficiency.

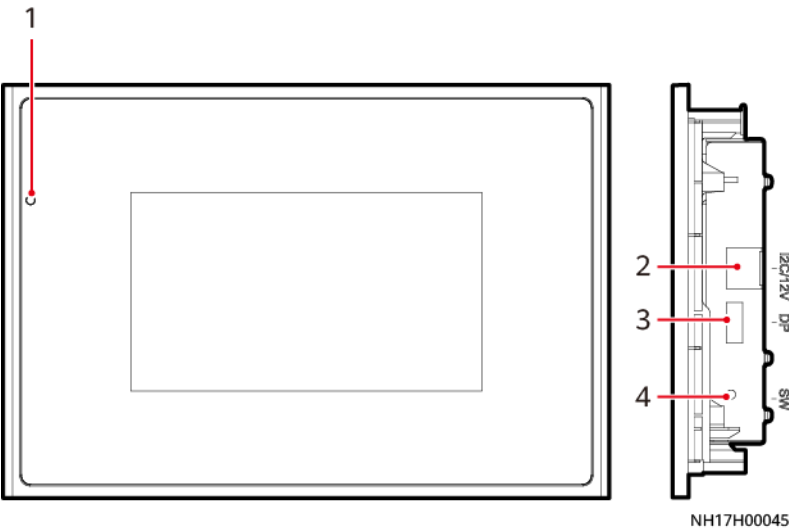
- Oil separator
The oil separator separates the lubricant brought out due to discharge of the compressor and brings back the separated lubricant to the compressor.
- Fan
The energy-efficient EC fan that supports stepless speed adjustment is used to reduce the fan energy consumption. Each fan is light and easy to maintain. The system will not shut down if a single fan fails.
- Evaporator
The finned-tube evaporator with a high cooling efficiency adopts the synergy field principle and computational fluid dynamics (CFD) to optimize the flow path design, which greatly improves the heat exchange efficiency.
- EEV
The throttling device uses a miniature controller to control the operation of the step motor, thereby changing the pass-through area of the EEV to regulate the flow of refrigerant.
- Check valve
The valve effectively prevents gas or liquid backflow.
- Filter dryer
The filter dryer absorbs water from the refrigerant pipes and filters out the foreign matter, which reduces component damage rates and improves operating efficiency and reliability.
- Sight glass
The sight glass allows you to observe the refrigerant flow and the content of gas and liquid for easy maintenance and optimization.
- Electric heater
The positive temperature coefficient (PTC) electric heater features quick start, large heating capacity, and even heat dissipation. It has multiple protection mechanisms to ensure the safe and stable running of the equipment.
- Humidifier
The humidifier controls the humidity in an equipment room.
- Water pump
The water pump provides power for drainage.
- Display module
The indoor unit provides a 7-inch color touchscreen and man-machine interfaces for query, setting, monitoring, and maintenance.

2.3.2 Display Module

Appearance

The display module provides a 7-inch true-color touchscreen that provides man-machine interfaces for query, setting, management, and maintenance.

Figure 2-7 Display module



- (1) Indicator
- (2) I2C/12V (reserved)
- (3) DP port (display port), connected to the main control module
- (4) SW (reserved)

Table 2-5 Indicator and buzzer status description

Indicator	Buzzer	Running Status
Green	No buzzing	The unit is operating properly, or there is a warning.
Yellow	Intermittent buzzing	There is an unacknowledged major alarm.
Red	Constant buzzing	There is an unacknowledged critical alarm.
Note: Hold down the SW button on the main control module for about 1s. In all the preceding states, the indicator blinks at 1 Hz (on for 0.5s and off for 0.5s).		

Functions

Function	Description
Single unit control	Each unit has an independent control system to ensure normal and high-precision operation.
Operations	Users can set parameters and query status on the 7-inch true-color touchscreen.

Function	Description
Four remote functions	The module supports the four remote functions when it connects to the NMS. • Telemetry: measures the supply air temperature, return air temperature, supply air humidity, return air humidity, and working status of the unit. • Teleadjust: adjusts the temperature, humidity, and alarm threshold. • Teleindication: generates alarms for the startup/shutdown, overvoltage/undervoltage, high/low return air temperature, high/low return air humidity, air filter normal/blocked, and fan normal/faulty state. • Telecontrol: controls startup/shutdown.
Teamwork	When multiple units work cooperatively, the controller optimally distributes the heat load to reduce energy consumption and provides backup to improve reliability. • Backup: When a unit in the group is faulty, the backup unit starts to operate automatically, improving system reliability. • Rotation: Each unit enters the active mode one by one periodically. • On-demand operation: The number of operating units varies depending on the thermal load power in the data center to meet requirements promptly, eliminate hot spots, and save energy. • Anti-competitive running: A mechanism is adopted to prevent multiple units in the same equipment room operating in opposite status to save energy. • Independent teamwork control: If a communications cable in the teamwork network is disconnected, two teamwork networks are formed. A unit in the network without a master unit can automatically become the master unit to continue teamwork control.
Remote management	Users can remotely manage the operating status of one or more units.
Storage	• A large number of fault alarm records can be stored. Alarms can be managed by severity. A maximum of 500 historical alarms can be stored for each severity. That is, a maximum of 1500 historical alarms can be stored. • The controller displays up to 30 days of temperature and humidity in colored curves. O&M personnel can view the operating status of the device onsite.
Log backtracking	Access logs can be backtracked. Up to 1000 historical operation logs recording login and setting can be stored.

Function	Description
Power management	Supports alarm reporting, fault diagnosis, and alarm recording for reverse phase, open phase, overvoltage, undervoltage, high frequency, and low frequency; provides functions such as automatic protection, recovery, and restart.

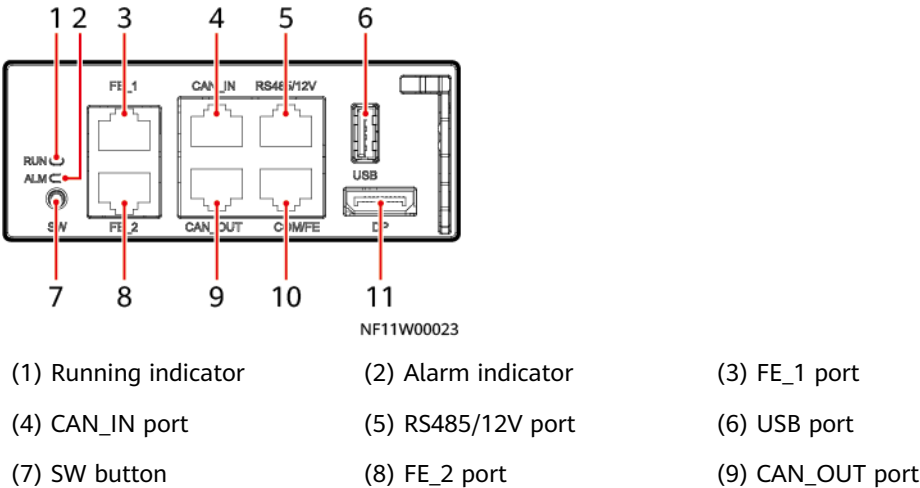
Features

- The display panel provides a touchscreen with a user-friendly interface.
- The controller is highly precise and responsive.
- The display panel is protected by a multi-level password protection mechanism to avoid misoperation.
- The password is verified each time the system is started or shut down to ensure system operation security.
- The controller provides functions such as automatic recovery after power failure and water leakage detection, improving the system reliability.
- The module displays the operating status, time, and other parameters of components in real time.
- Multiple display languages are supported.
- O&M personnel can export fault records in one-click mode, making it easy to operate the device and know the running status of the device.
- The device supports communications protocols such as Modbus RTU, Modbus TCP, and SNMP, facilitating connection to the network management system.
- The display panel intelligently identifies abnormal parameter settings (incorrect commands) and rejects them automatically.

2.3.3 Main Control Module

Appearance

Figure 2-8 Main control module



(10) COM/FE port

(11) DP port

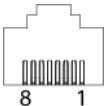
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Indicators

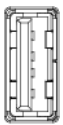
Indicator	Status	Description
Running indicator (RUN) 	Off	The unit is shut down.
	Blinking green	The unit is started.
Alarm indicator (ALM) 	Off	There is no alarm, or a warning or minor alarm is generated.
	Steady red	There is a major or critical alarm.

Communications Ports

- FE_1 and FE_2 ports: reserved for connecting FE (MAC_CAN) teamwork communications cables.
- CAN_IN and CAN_OUT ports: connect CAN teamwork and RS485 monitoring cascading communications cables.
- RS485/12V port: connects a temperature and humidity (T/H) sensor.
- COM/FE port: connects a monitoring communications cable.

Appearance	Port		FE_1 and FE_2	CAN_IN and CAN_OUT	RS485/12V Port	COM/FE Port
	Pin	PIN1	FE TX+	RS485 T+ (+)	RS485 HT+	FE TX+
		PIN2	FE TX-	RS485 T- (-)	RS485 HT-	FE TX-
		PIN3	FE RX+	-	12V	FE RX+
		PIN4	-	RS485 R+	RS485 HT+	RS485+
		PIN5	-	RS485 R-	RS485 HT-	RS485-
		PIN6	FE RX-	-	-	FE RX-
		PIN7	-	CANH	-	-
		PIN8	-	CANL	GND	-

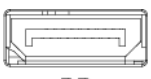
- USB port: connects a WiFi module or USB flash drive.

Appearance	USB Port
 USB	• Connects the WiFi module to the unit over the Service Expert app. You can obtain the service authorization code when the unit is powered on for the first time, and view or obtain the running information about the unit during inspection. The user must be an authorized service engineer. To ensure security, remove the WiFi module immediately after use. • Connects a USB flash drive to export data, import and export configuration files, import certificates and keys, and upgrade the version.

NOTE

This port is protected by a security mechanism.

- DP port: connects to the display module.

Appearance	DP Port
 DP	Connects to the display module for communication and power supply.

Button

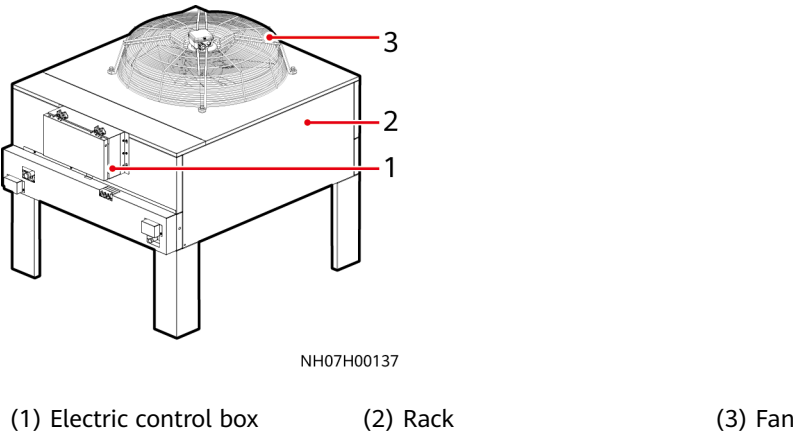
Appearance	SW Button
 SW	When the smart cooling product is shut down and the admin user has logged in, if you hold down the button for more than 10s, a red frame is added to the button that involves a risky operation on the display module within 5 minutes. You can press and hold down the button for 10s to enter the risky operation screen. Exercise caution because a risky operation may affect system data.

2.3.4 Outdoor Unit

Components

A NetCol500 outdoor unit mainly consists of an electric control box, a condenser, a rack, and fans. The following, uses NetCol500-A060 as an example, describes the components and configuration.

Figure 2-9 Outdoor unit components



Features

- The outdoor unit is equipped with a high-efficiency variable-frequency drive axial fan to implement big air volume, low noise, and high efficiency.
- The outdoor unit has good waterproof performance and meets IPX5 requirements.
- The outdoor unit adopts the variable-frequency drive. The speed adjustment of the outdoor fan ranges from 10% to 100%. The minimum operating frequency of the fan is less than or equal to 5 Hz. The outdoor unit is running more steadily at low loads.
- The outdoor unit adopts the galvanized sheet and surface phosphatization + powder coating techniques, the outdoor unit adapts to harsh environments with its sound rigidity and anticorrosion performance.
- Pressure preservation is performed on the condenser before delivery, and the pipe ports are properly sealed to prevent foreign matter from entry.

2.3.5 Physical Ports

Table 2-6 shows the physical ports on the NetCol5000-A in-row smart cooling product.

Table 2-6 Physical ports

Item		Specifications
Indoor unit	Refrigerant liquid pipe	Copper pipe, external diameter 5/8 in., pressure resistance ≥ 4.5 MPa, welding
	Refrigerant gas pipe	Copper pipe, external diameter 3/4 in., pressure resistance ≥ 4.5 MPa, welding
	Humidifier water inlet pipe	Reserved port: G 1/2 in.; internal threaded connection
	Top drainpipe	Reserved port: BSPP 1/2 in.; thread connection

Item		Specifications
	Bottom drainpipe	Reserved port: copper pipe with an outer diameter of 5/8 in.; you are advised to use a hose with an inner diameter of 14 mm for connection.
Outdoor unit	Refrigerant liquid pipe	Copper pipe; outer diameter: 5/8 in.; pressure resistance ≥ 4.35 MPa; welding
	Refrigerant gas pipe (NetCol500-A060/A080/A120)	Copper pipe; outer diameter: 7/8 in.; pressure resistance ≥ 4.35 MPa; welding
	Refrigerant gas pipe (NetCol500-A040)	Copper pipe; outer diameter: 3/4 in.; pressure resistance ≥ 4.35 MPa; welding
Low temperature component (optional component)	Port for the indoor unit liquid pipe	Outer diameter of 5/8 inch (15.88 mm), welding
	Port for the indoor unit gas pipe	Outer diameter of 7/8 inch (22.22 mm), welding
	Port for the outdoor unit liquid pipe	Outer diameter of 5/8 inch (15.88 mm), welding
	Port for the outdoor unit gas pipe	Outer diameter of 7/8 inch (22.22 mm), welding

3 Technical Specifications

Table 3-1 and **Table 3-2** list the technical specifications of the NetCol5000-A in-row smart cooling product.

Table 3-1 Generic specifications

Item	Specifications
Cooling mode	Air cooled
Refrigerant	R410A
Cooling capacity	NetCol5000-A035: 35 kW (T3) NetCol5000-A025: 25 kW
Air volume	6000 m ³ /h
Air supply mode	Horizontal flow
Cooling capacity test condition: return air dry-bulb temperature 37°C/return air relative humidity 20%, outdoor temperature 35°C.	

Table 3-2 Indoor unit specifications

Item	NetCol5000-A035H4WE0	NetCol5000-A035H4E0	NetCol5000-A035H4WE2	NetCol5000-A035H4E2	NetCol5000-A025H4WE2	NetCol5000-A025HNWE2
Power supply	Single power supply		Dual power supplies			

Item	NetCol5000-A035H4WE0	NetCol5000-A035H4E0	NetCol5000-A035H4WE2	NetCol5000-A035H4E2	NetCol5000-A025H4WE2	NetCol5000-A025HNWE2
Power specifications	380–415 V, 3W+N+PE, 50 Hz/60 Hz					208–220 V, 3W+N+PE, 60 Hz
Voltage	Rated voltage±10%, frequency±3 Hz. If upstream voltage fluctuation exceeds the range, you are advised to add a voltage regulator. Otherwise, the smart cooling product will generate alarms frequently and fail to work properly.					
Heating function	Yes	No	Yes	No	Yes	Yes
Humidifying function	Yes	No	Yes	No	Yes	Yes
Pipe routing	Bottom pipe routing		Top and bottom pipe routing			
Condensate pump	No		Yes			
Water pump lift	-		4 m			
a: In the preceding table, No indicates that the corresponding model does not provide the function.						

Figure 3-1 Appearance and dimensions

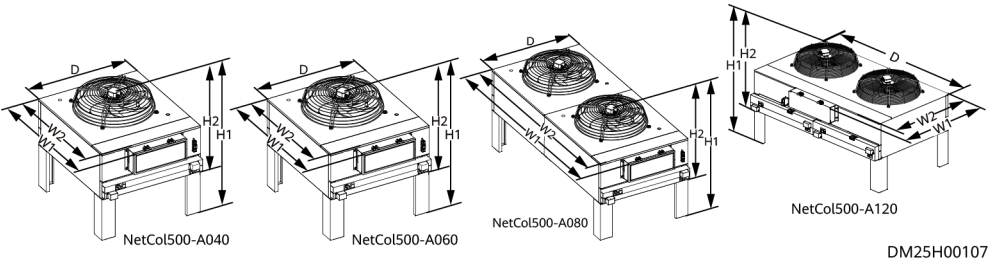


Table 3-3 Outdoor unit technical specifications

Item	NetCol500-A040	NetCol500-A060	NetCol500-A080	NetCol500-A120
Power supply	Powered by the indoor unit			
Indoor unit model	NetCol5000-A025	NetCol5000-A025 NetCol5000-A035	NetCol5000-A035	NetCol5000-A025 NetCol5000-A035
Temperature control intelligent monitoring board	52274285-002: available	52273539: available 52273539-005: unavailable 52273539-006: available	52273541-005: unavailable	52273755-002: unavailable
Operating temperature range	-20°C to +55°C (-40°C to +45°C with a low temperature component)	35 kW: -20°C to +45°C (-40°C to +45°C with a low temperature component) 25 kW: -20°C to +55°C (-40°C to +45°C with a low temperature component)	-5°C to +55°C	35 kW: -20°C to +45°C (-40°C to +45°C with a low temperature component) 25 kW: -20°C to +55°C (-40°C to +45°C with a low temperature component)
Fan speed range	10%–100%			
Number of fans	1		2	
Dimensions H1 (H2) x W1 (W2) x D (mm)	52274285-002: 1096 (665) x 1120 (984) x 1094	52273539: 1107 (677) x 1356 (1217) x 1094 52273539-005: 1107 (655) x 1356 (1217) x 1094 52273539-006: 1156 (703) x 1356 (1217) x 1094	52273541-005: 1107 (655) x 2186 (2047) x 1094	52273755-002: 1107 (655) x 1356 (1217) x 2189

Item	NetCol500-A040	NetCol500-A060	NetCol500-A080	NetCol500-A120
Net weight	52274285-002: 155 kg	52273539: 122 kg 52273539-005: 121 kg 52273539-006: 154 kg	52273541-005: 200 kg	52273755-002: 234 kg
Storage temperature	-40°C to +70°C			
Storage humidity	5%–95% RH (non-condensing)			
IP rating	IPX5			
Altitude	0–4000 m, derated at above 1000 m. For details about derating data, contact Huawei technical support.			

Table 3-4 Application environment

Type	Description
Class A (controlled environment)	Indoor environments where the temperature and humidity are controlled, including rooms where human beings live
Class B (uncontrolled environment)	Indoor environment where the ambient temperature and humidity are not controlled or outdoor environments (with simple shielding measures) where the humidity can reach 100%.

Type	Description
Class C (harsh environment)	Sea environments or outdoor land environments (with simple shielding measures) near pollution sources. Pollution sources refer to the following areas: • Areas within 3.7 km away from saline water areas such as the ocean and saline lakes • Areas within 3 km of serious pollution sources, such as metallurgic plants, coal mines, and heat and power plants • Areas within 2 km away from medium pollution sources, such as chemical factories, rubber plants, and electroplating factories • Areas within 1 km away from light pollution sources, such as food factories, tanneries, and heating boilers
Class D (marine environment)	Areas within 500 m away from the seashore.

 NOTE

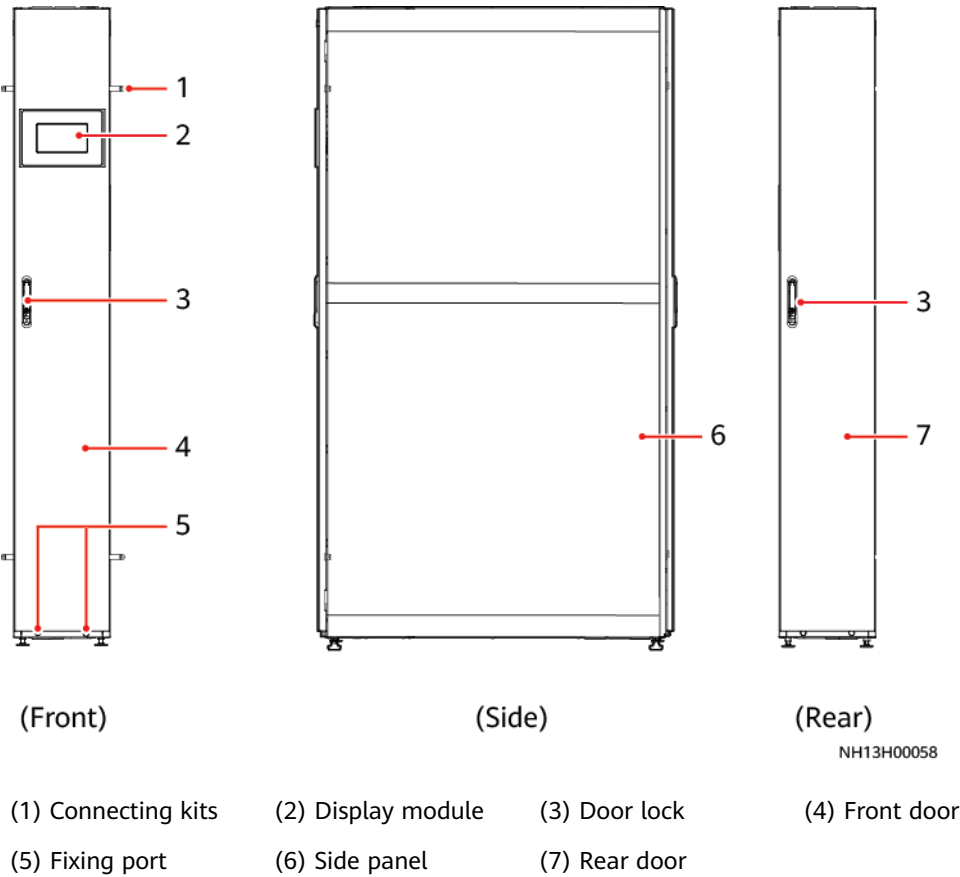
- If an outdoor unit needs to be used at a site 3.7–10 km away from the coast in a class B environment, it is recommended that the unit be installed in a shielded area, such as a podium building, ground, or building rear, to prevent mechanical parts from being corroded by sea wind (the functionality and reliability of the system must not be affected). Alternatively, use an outdoor unit that supports class C environments to avoid corrosion. If the site is more than 10 km away from the coast, the unit can be properly installed.
- The NetCol500-A060MS and NetCol500-A040MS outdoor units cannot be used in class D environments. Other outdoor units cannot be used in class C or class D environments.

4 Installation

Before installing the smart cooling product, read this section carefully and perform installation by strictly following the guidance in this section.

Figure 4-1 shows the structural specifications of the device.

Figure 4-1 External structure (unit: mm)



4.1 Installation Requirements

4.1.1 Layout Principles

The layout principles are as follows:

- If the outdoor unit is placed higher than the indoor unit, the vertical distance between them should be less than or equal to 30 m. An oil trap should be installed every 5 m to 6 m in the vertical direction along the gas pipe to ensure system reliability.
- If the indoor unit is placed higher than the outdoor unit, the vertical distance between them should be less than or equal to 8 m.

NOTICE

- During the calculation of height difference, the compressor base is regarded as the baseline for the indoor unit.
- The inverted U-shaped trap should be higher than the top copper pipe of the condenser.
- In the figures,  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.
- An inverted U-shaped trap should be added if the indoor unit is lower than the outdoor unit.
- Pipes through the wall or floor of the equipment room should be routed in tubes, between which sealing measures (firestop putty recommended) are taken.

Figure 4-2 Bottom pipe routing

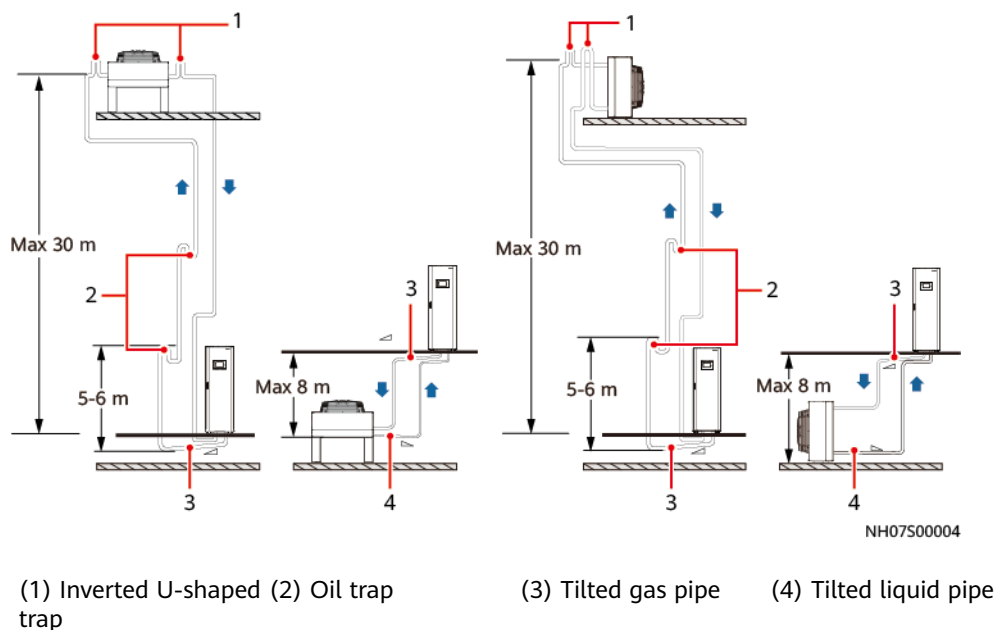
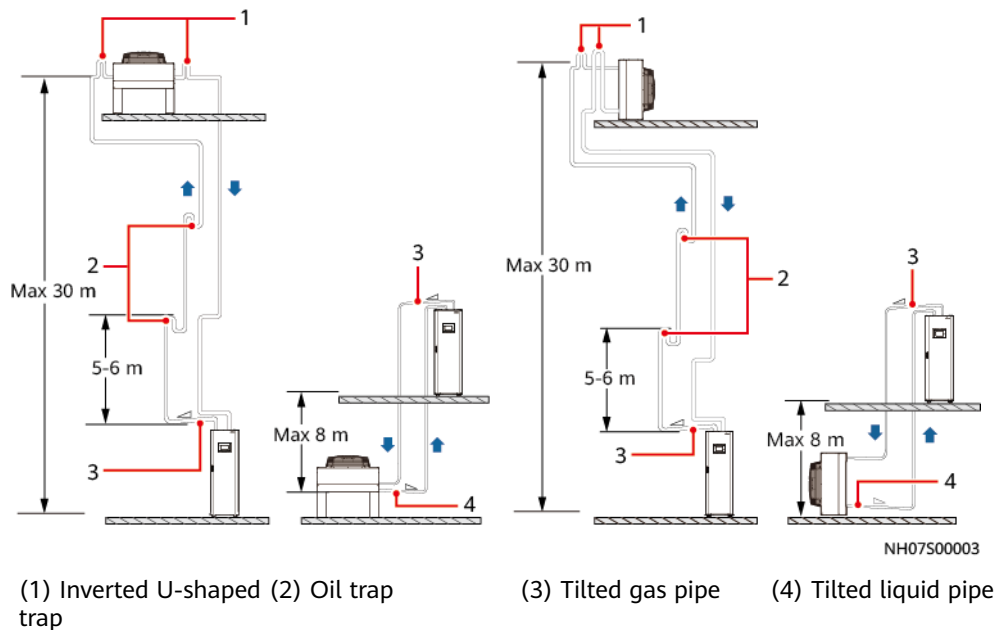


Figure 4-3 Top pipe routing



4.1.2 Indoor Unit Installation Requirements

NOTICE

- If the actual total load of servers corresponding to a single smart cooling product is less than 20% of the rated cooling capacity of the smart cooling product or the equipment room is not properly sealed, the humidity in the equipment room may be too high. This is not a product quality issue and should be dealt with by adding a dehumidifier.
- Do not install smart cooling products near noise-sensitive places such as offices and meeting rooms.

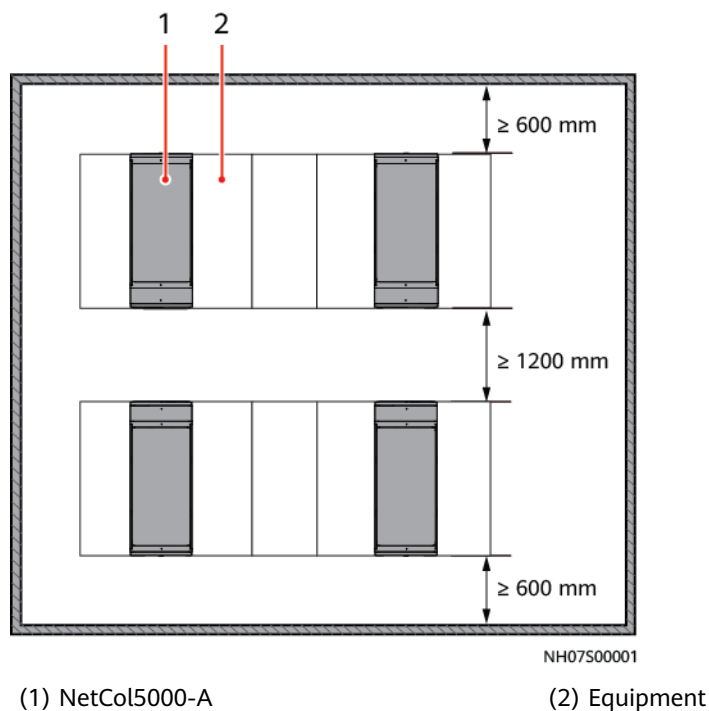
Table 4-1 Installation requirements

Item	Specifications
Equipment room door	Width: ≥ 1.2 m; height: ≥ 2.3 m
Floor	Floor bearing capacity: ≥ 530 kg/m ²
Equivalent length of one-way pipe	≤ 100 m

Item	Specifications
Vertical difference between the indoor and outdoor units	• Outdoor unit higher than indoor unit: ≤ 30 m • Outdoor unit lower than indoor unit: ≤ 8 m
Water supply	The inlet water pressure should be in the range of 0.1–0.7 MPa. If the inlet water pressure exceeds 0.7 MPa, install a reducing valve for the humidifier water inlet. If the inlet water pressure is lower than 0.1 MPa, install a check valve for the humidifier water inlet. The temperature should be in the range of 1–40°C. The water should meet the following requirements: • Non-freezing and nephelometric turbidity units (NTU): < 3 • No visible substances • $6.5 \leq \text{pH value} \leq 8.5$ • Total hardness (in CaCO_3): ≤ 450 mg/L
Drainage	The distance between the top drainage of the water pump and the cabinet installation floor should not exceed 4 m.
Power distribution	Leakage circuit breakers are not recommended for the general power input. If leakage circuit breakers are required by the customer or by local regulations, use the residual current circuit breaker (RCCB) that is not sensitive to the single-phase DC pulses and transient current pulses.

- Check cabinets comprehensively and handle problems immediately.
- Before installation, check that the environment meets requirements and check whether reconstruction is needed for routing pipes and cables and constructing ventilation pipes.
- Ensure that the equipment room provides good heat insulation, and that the walls and floor are dampproof.
- Avoid damaging cabinet components and cables during cabinet transportation.
- Check that the area, height, and ground bearing capacity of the installation position meet requirements.
- To ensure good ventilation, do not place the indoor unit in the corner of a room or at the end of a long-and-narrow room.
- Check that all doors and windows of the equipment room are closed. Gaps between the room and the external environment should be minimized to avoid extra load of the smart cooling product during operation.
- Take appropriate thermal insulation and antifreeze measures for outdoor water pipes to avoid poor drainage and insufficient water supply caused by freezing.

Figure 4-4 Maintenance space requirements (unit: mm)



4.1.3 Preparing Knock-out Holes for the Indoor Unit

Procedure

- Step 1** Mark cable holes on the floor based on the hole sizes at the bottom of the indoor unit shown in [Figure 4-6](#), and drill holes in the floor.

NOTICE

- Do not drill holes in the floor when routing cables from the top.
- Drill holes at the bottom of the raised floor if it is used.
- Drill holes based on the actual situation. This prevents mice from entering unnecessary holes, causing damage to the equipment.
- Electric cables and ELV cables must be separately routed.

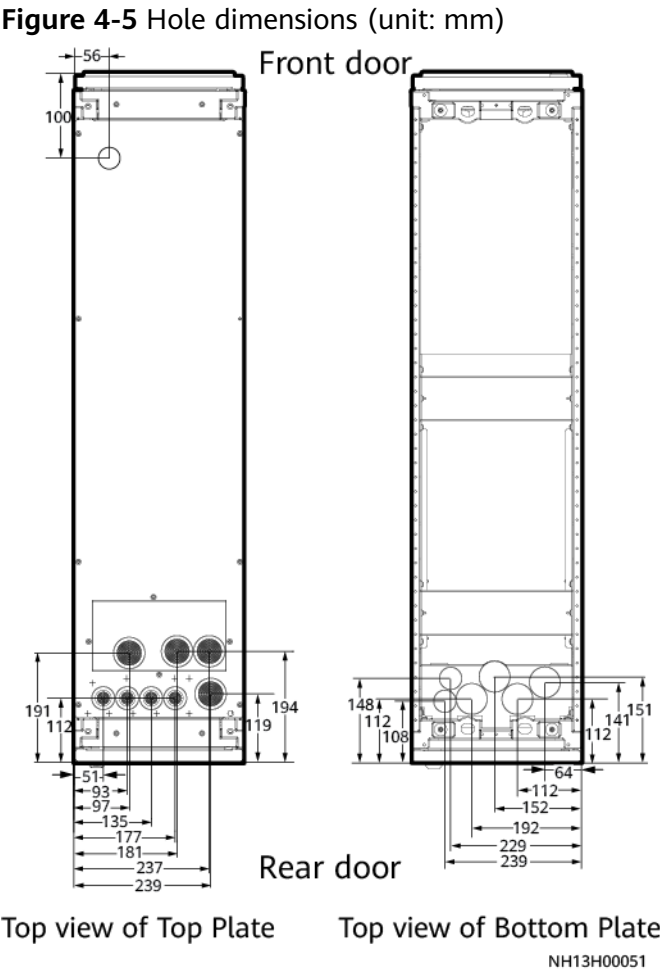
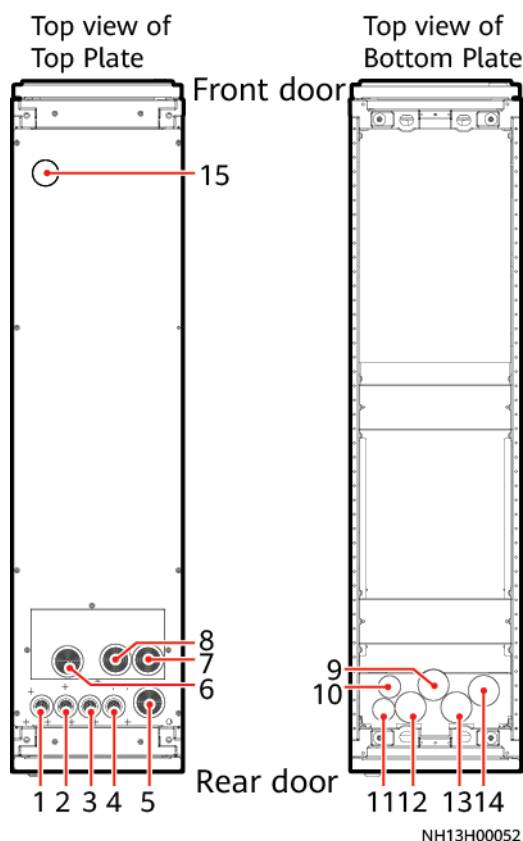


Figure 4-6 Hole position layout (unit: mm)



- | | |
|---|---|
| (1) Active power AC1 cable hole on the top | (2) Standby power AC2 cable hole on the top |
| (3) Outdoor unit AC3 cable hole on the top | (4) Signal cable hole on the top |
| (5) Humidifier water inlet pipe hole on the top | (6) Drainpipe hole on the top |
| (7) Refrigerant gas pipe hole on the top | (8) Refrigerant liquid pipe hole on the top |
| (9) Drainpipe hole at the bottom | (10) Standby power AC2 cable hole at the bottom |
| (11) Active power AC1 cable hole at the bottom | (12) Refrigerant gas pipe hole at the bottom |
| (13) Refrigerant liquid pipe hole at the bottom | (14) Humidifier water inlet pipe hole at the bottom |
| (15) Skylight signal cable hole on the top | |

----End

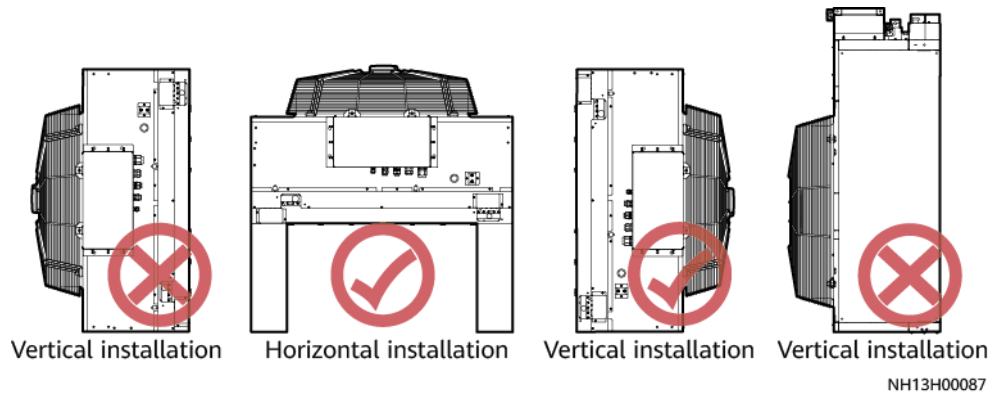
4.1.4 Outdoor Unit Installation Requirements

Precautions

- Ensure that air smoothly flows into and out of the condenser. Install an outdoor unit in clean areas that are away from residential areas.
- Wrap thermal insulation layers for pipes connecting the indoor unit and outdoor unit.

- Do not use the copper pipe or electric control box as a weight-bearing point when moving the outdoor unit, and keep the fins intact.
- When routing pipes for the condenser, ensure that the pipes are routed in from the top and out from the bottom.
- The horizontal or vertical error should not be more than $\pm 5^\circ$ when the outdoor unit is installed horizontally or vertically. When the outdoor unit is vertically installed, the electric control box and its waterproof connector cannot face upward. The installation modes are as follows.

Figure 4-7 Installation modes (for NetCol500-A060)



Special Environmental Requirements

- Monsoon: If you install the outdoor unit vertically, ensure that the directions of air flowing into and out of the fan are not opposite to the monsoon direction.
- Direct sunlight: In high-temperature areas, avoid exposing the outdoor unit to direct sunlight.
- Wind and sands: Prevent sands from entering the condenser in deserts and the windy and sandy areas.

Space Requirements

The NetCol500 outdoor units can be installed horizontally, vertically, or compactly.

NOTE

The shaded parts in the figures are obstacles. The distances marked are the minimum distances required between an outdoor unit and obstacles.

Figure 4-8 Space requirements for horizontal installation (NetCol500-A060/A040)
(unit: mm)

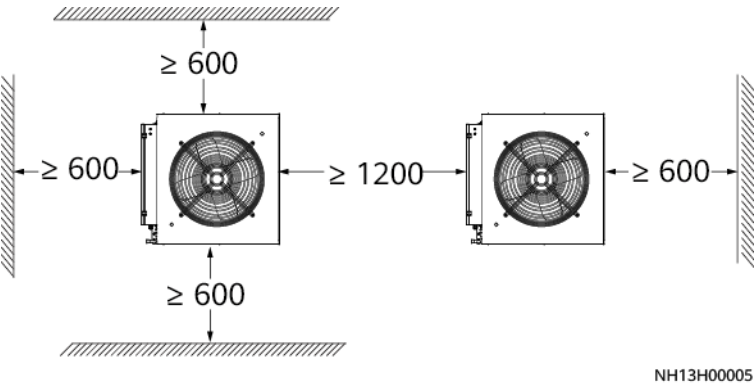


Figure 4-9 Space requirements for horizontal installation (NetCol500-A080/A120)
(unit: mm)

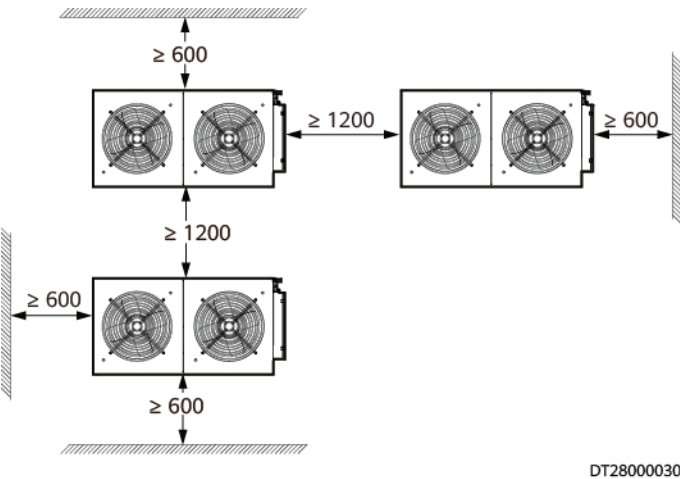


Figure 4-10 Space requirements for vertical installation (NetCol500-A060/A040)
(unit: mm)

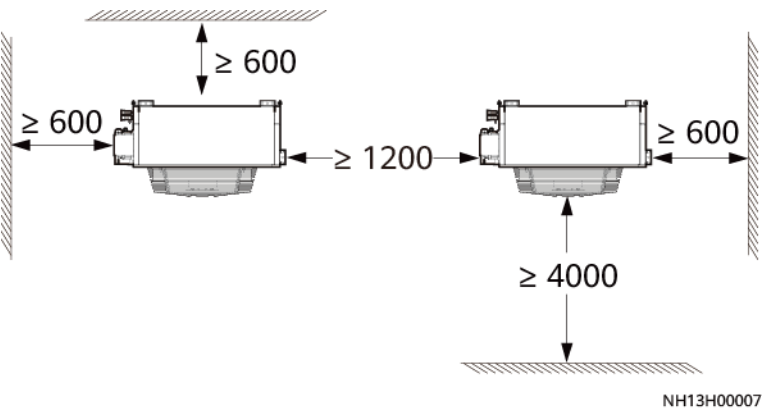


Figure 4-11 Space requirements for vertical installation (NetCol500-A080/A120)
(unit: mm)

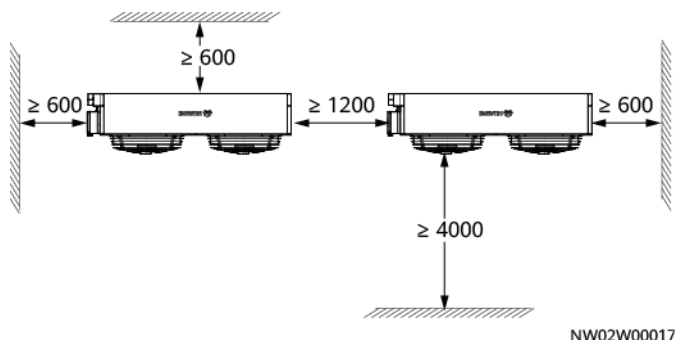
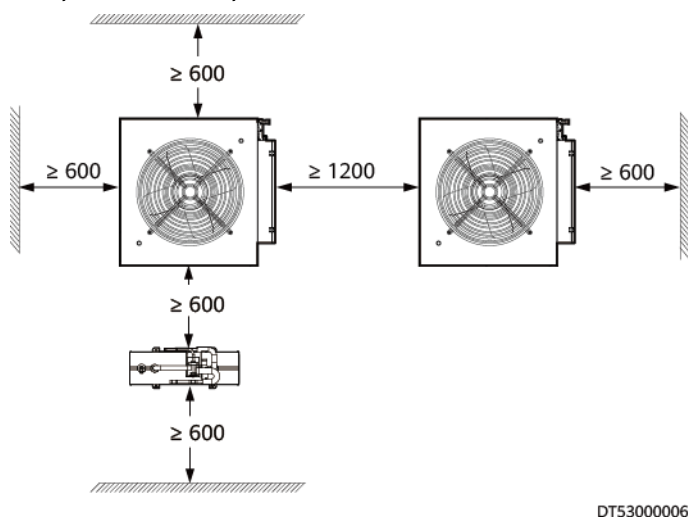


Figure 4-12 Horizontal installation space for an outdoor unit with a low temperature component (for NetCol500-A060) (unit: mm)



NOTE

1. The low temperature component must be within 2 m from the outdoor unit.
2. When the outdoor unit is vertically installed, do not place the low temperature component at the air outlet.
3. When the outdoor unit is horizontally installed, the outdoor unit and low temperature component must be placed on bases or concrete platforms of the same height. When the outdoor unit is vertically installed, the outdoor unit can be 1.5 m higher than the low temperature component at most and cannot be lower than the low temperature component.

Figure 4-13 Top view of compact installation if the quantity is ≤ 12 (NetCol5000-A040/A060)

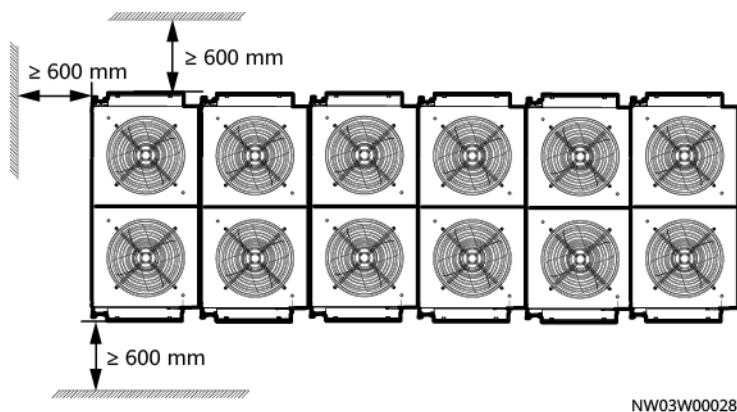
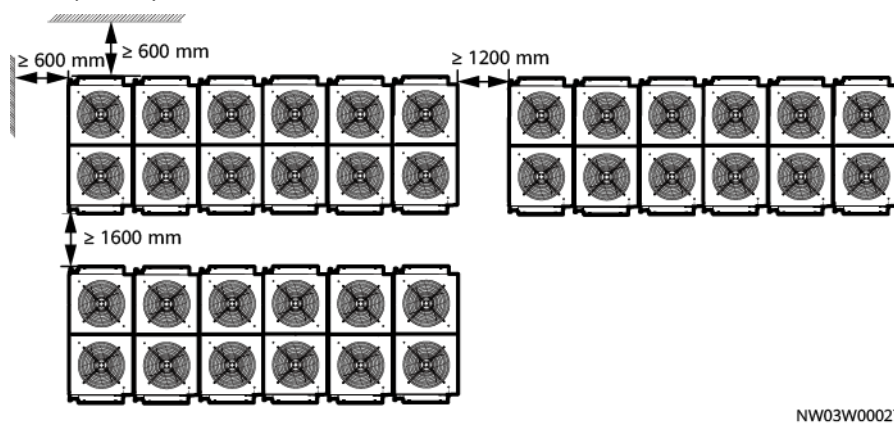


Figure 4-14 Top view of compact installation if the quantity is > 12 (NetCol5000-A040/A060)



NOTE

If necessary, you can increase the height of the base. The height of the base can be obtained based on the BOM number or prepared based on the NetCol500-A060 base installation drawing shown in [D.2 Outdoor Unit Base Drawings](#).

- When the quantity is 12 or less, if the guard rail height is 0 mm, the base height is 0 mm. If the guard rail height is 1000 mm or lower, the base height is 500 mm or higher.
- When the quantity is more than 12, if the guard rail height is 0 mm, the base height is 500 mm or higher. If the guard rail height is 1000 mm or lower, the base height is 1000 mm or higher.

Figure 4-15 Top view of compact installation if the quantity is ≤ 6 (NetCol500-A080/A120)

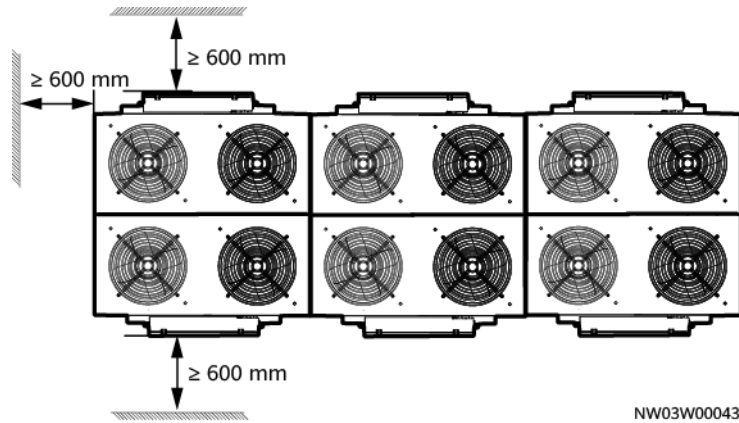
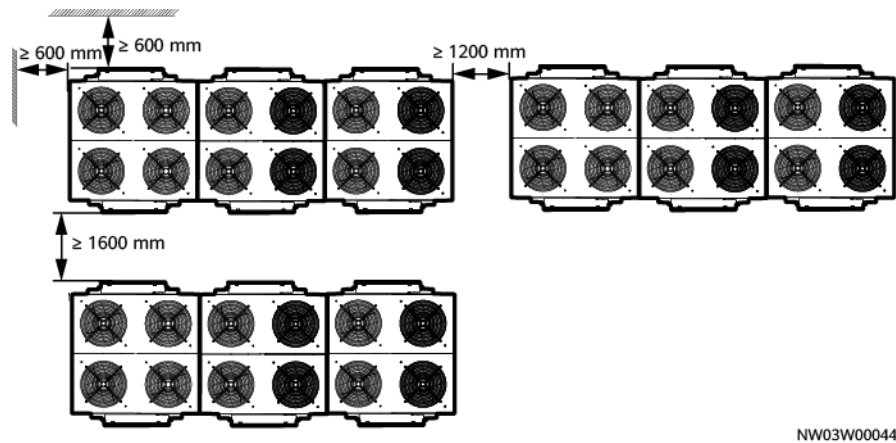


Figure 4-16 Top view of compact installation if the quantity is > 6 (NetCol500-A080/A120)

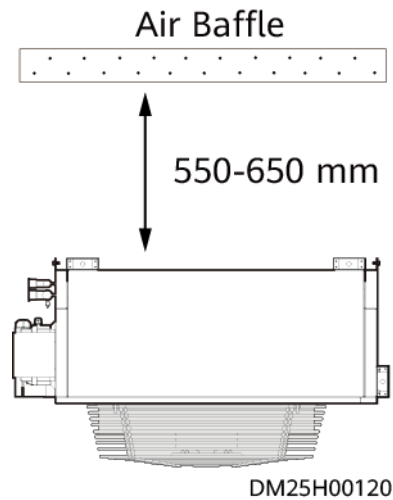


NOTE

If necessary, you can increase the height of the base. The height of the base can be obtained based on the BOM number. You can also refer to the NetCol500-A120 base installation drawing in the appendix [D.2 Outdoor Unit Base Drawings](#). Take the NetCol500-A0120 as an example.

- When the quantity is 6 or less, if the wall height is 0 mm, the base height is 0 mm. If the wall height is 1000 mm or lower, the base height is 500 mm or higher.
- When the quantity is more than 6, if the wall height is 0 mm, the base height is 500 mm or higher. If the wall height is 1000 mm or lower, the base height is 1000 mm or higher.

Figure 4-17 Space requirements for installing an air baffle



NOTE

The air baffle must be 5 mm higher than the outdoor unit frame.

If a pair of indoor and outdoor units listed in the following are used together, the site does not allow for installation against a wall, and the local outdoor temperature is below -15°C , an air baffle needs to be placed on the air intake side of the side-mounted outdoor unit.

- NetCol5000-A025 + NetCol500-A060
- NetCol5000-A025 + NetCol500-A040
- NetCol5000-A035 + NetCol500-A060

Concrete Platform Requirements

The concrete platforms for horizontal and vertical installation have different dimensions. The specific construction requirements are as follows:

- The horizontal gradient of the concrete platforms cannot exceed 5° .
- The concrete platform drains water smoothly without residual water.

Concrete Platform Requirements for Horizontal Installation

For details about how to make concrete platforms to horizontally install an outdoor unit, see [Figure 4-18](#).

Figure 4-18 Concrete platform dimensions

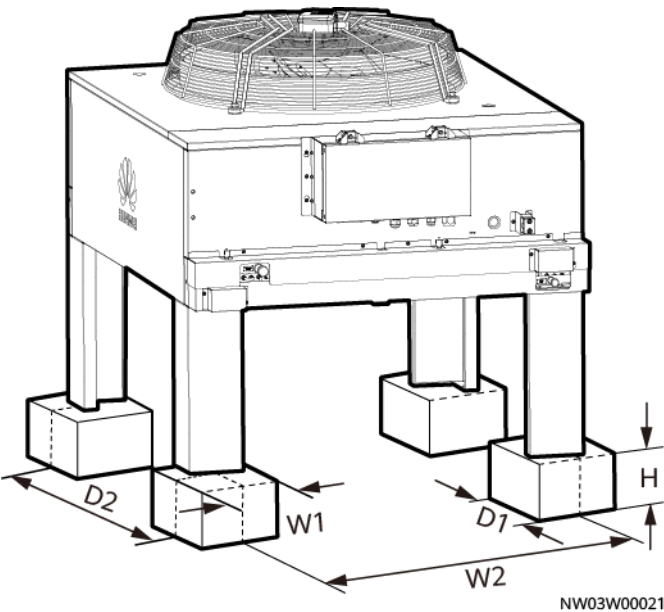


Table 4-2 Concrete platform dimensions (unit: mm)

Model	Block Width (W1)	Block Depth (D1)	Block Height (H)	Center Distance (W2)	Center Distance (D2)
NetCol500-A040	$W1 \geq 250$	$D1 \geq 250$	150-250	924	814
NetCol500-A060	$W1 \geq 250$	$D1 \geq 250$	150-250	924	1047
NetCol500-A080	$W1 \geq 250$	$D1 \geq 250$	150-250	924	1877
NetCol500-A120	$W1 \geq 250$	$D1 \geq 250$	150-250	2018	1047

A in [Figure 4-19](#) shows the mounting holes between the outdoor unit and the concrete floor. The mounting holes are long round holes and must be secured using eight M8x80 stainless expansion bolts.

Figure 4-19 Outdoor unit mounting hole

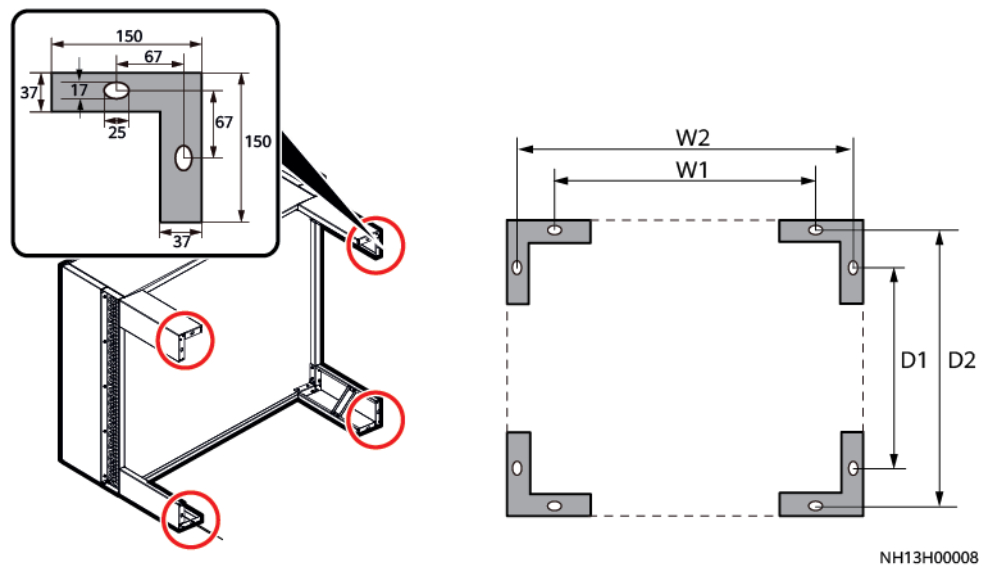


Table 4-3 Port dimensions (unit: mm)

Model	W1	W2	D1	D2
NetCol500-A040	924	1058	814	948
NetCol500-A060	1047	1181	924	1058
NetCol500-A080	1877	2011	924	1058
NetCol500-A120	1047	1181	2018	2152

Concrete Platform Requirements for Vertical Installation

For details about how to make concrete platforms to vertically install an outdoor unit, see [Figure 4-20](#). An outdoor unit must be secured to the ground or base using four M8x80 stainless expansion bolts and angle brackets.

Figure 4-20 Concrete platform dimensions

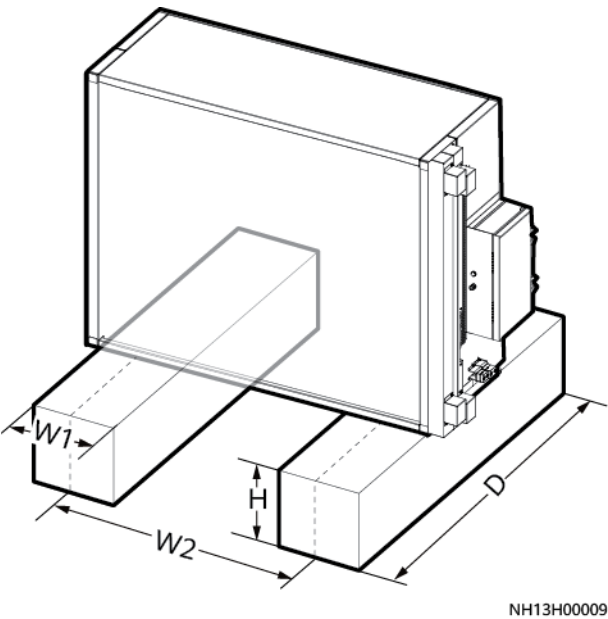


Table 4-4 Concrete platform dimensions (unit: mm)

Model	Block Width (W1)	Block Depth (D)	Block Height (H)	Center Distance (W2)
NetCol500-A040	$W1 \geq 250$	$D \geq 500$	150-250	1024
NetCol500-A060 (Class B)	$W1 \geq 250$	$D \geq 500$	150-250	1036.5
NetCol500-A060 (Class C)	$W1 \geq 250$	$D \geq 500$	150-250	977
NetCol500-A080	$W1 \geq 250$	$D \geq 500$	150-250	1744.5
NetCol500-A120 ^a	$W1 \geq 250$	$D \geq 500$	150-250	2011

a: You need to use the base to secure the installation. For details about vertical installation, see [Vertical Installation Scenario \(NetCol500-A120\)](#).

[Figure 4-21](#) shows the mounting hole for outdoor unit vertical installation.

Figure 4-21 Outdoor unit mounting hole

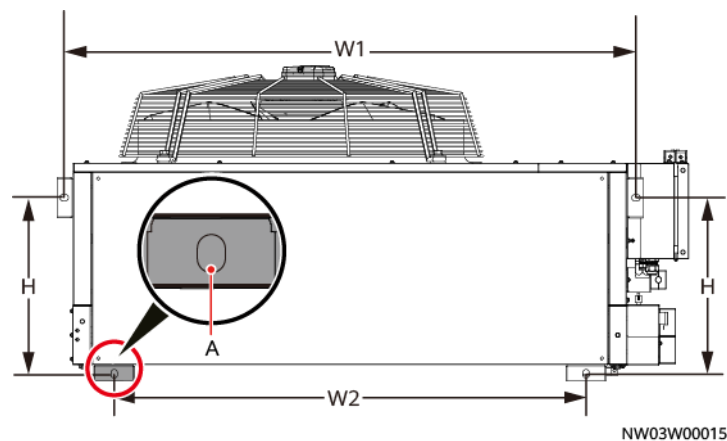


Table 4-5 Port dimensions (unit: mm)

Model	W1	W2	H	A
NetCol500-A040	1024	682	386.5	19 x 14
NetCol500-A060 (Class B)	1257	1036.5	387	Φ12
NetCol500-A060 (Class C)	1260	977	447	Φ14
NetCol500-A080	2090	1744.5	387	Φ12
NetCol500-A120	1257	1036.5	387	Φ12

(Optional) Space Dimensions for a Low temperature Component

Low temperature components can only be installed horizontally. Before installing, prepare concrete platforms and drill holes by referring to the instructions in [Figure 4-22](#).

Figure 4-22 Dimensions of the concrete platform for horizontally installing low temperature components

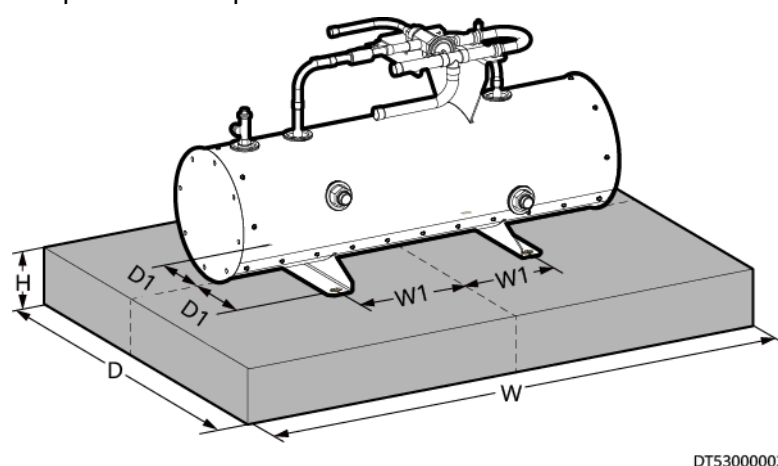


Table 4-6 Dimensions of the concrete platform for low temperature components
(unit: mm)

Block Width (W)	Block Depth (D)	Block Height (H)	W1	D1
$W \geq 600$	$D \geq 400$	150–250	223	130

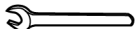
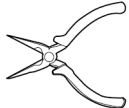
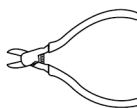
4.2 Installation Preparations

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

4.2.1 Tools

[Table 4-7](#) to [Table 4-11](#) list the tools for installing the NetCol5000-A. Add or delete tools as required.

Table 4-7 General tools

Appearance, Specifications, and Name			
Adjustable wrench (12#/19#)	Phillips screwdriver (M4/M6/M8)	Flat-head screwdriver (M3/M4)	Socket wrench (10 mm/18 mm)
			
Torque wrench (28 mm)	Solid wrench (12#/13#/18#)	Hex key (6 mm)	Right angle
			
Needle-nose pliers	Diagonal pliers	Claw hammer	Protective gloves
			
Step ladder (2 m)	Torch	Measuring tape	Hacksaw

Appearance, Specifications, and Name			
			
Thermometer	-	-	-
	-	-	-

Table 4-8 Transportation and unpacking tools

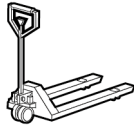
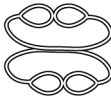
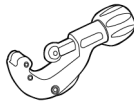
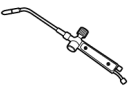
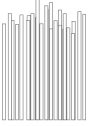
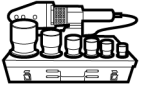
Appearance, Specifications, and Name			
Pallet Jack	Diesel pallet truck	Lifting rope (bearing capacity ≥ 400 kg)	Lever (bearing capacity ≥ 400 kg)
			

Table 4-9 Pipe installation tools

Appearance, Specifications, and Name			
Cutter	Water pipe thread sealant	Welding torch	5% silver solder
			
Oxygen	Acetylene	Hot melt tool (for rigid pipes)	Nitrogen
			
Pipe bending tool	-	-	-

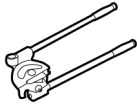
Appearance, Specifications, and Name			
	–	–	–

Table 4-10 Electrical installation tools

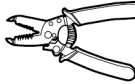
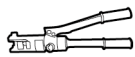
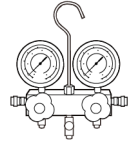
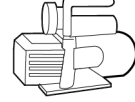
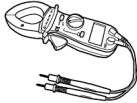
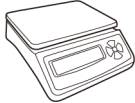
Appearance, Specifications, and Name			
ESD gloves	Insulation gloves	Wire stripper	Insulation tape
			
Heat gun	Crimping tool	–	–
		–	–

Table 4-11 Commissioning tools

Appearance, Specifications, and Name			
Pressure gauge (2 PCS) ^a	Rubber hose (5 PCS) ^a	Vacuum pump ^b	Thermocouple temperature sensor
			
Clamp meter	Electric balance (measurement range ≥ 25 kg, precision ≤ 50 g)	Antifreeze gloves	Multimeter
			

Appearance, Specifications, and Name			
Nitrogen ^c	Reducing valve ^d	-	-
		-	-
a: The pressure gauges and rubber hoses must be dedicated for R410A. The measuring range of the pressure gauges must be at least 4.0 MPa, and the rubber hoses must withstand a pressure of at least 4.5 MPa. Ensure that the rubber hoses match the 1/4 inch needle valves inside the unit. If necessary, prepare needle valve adapters. When charging refrigerant, you are advised to use a safety valve to prevent refrigerant leakage during the removal of a rubber hose, which may cause frostbite. b: The airflow between 7.2 m³/h and 14.4 m³/h is recommended. Absolute vacuum ≤ 60 Pa. c: Dry nitrogen. d: A reducing valve is required at the outlet of the nitrogen cylinder, and the reducing valve range ≥ 4.0 MPa.			

4.2.2 Material Preparations

Item	Description	Category
Standard material	This type of materials is provided by Huawei, and you can find them in the fittings delivered with the equipment.	Materials in the packing list
Auxiliary material	Customers can purchase this type of materials from Huawei or other vendors.	Refrigerant, refrigerant oil, pipe component, and cable
Optional material	Customers can purchase this type of materials from Huawei based on application scenarios.	Low temperature component, T/H sensor, water sensor, and smoke sensor
Engineering procurement material	This type of materials is not configured by Huawei. Customers need to prepare them by themselves.	Drainpipe, pipe support, and equipotential ground cable

4.2.2.1 R410A Refrigerant

CAUTION

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

Follow these suggestions to choose high-quality refrigerant:

- 1. Contact the refrigerant producer to confirm the refrigerant authenticity.
- 2. As shown in [Figure 4-23](#), place the refrigerant in an indoor place with constant temperature and humidity for 24 hours. Then, use a thermometer to measure the temperature of the refrigerant tank outer surface and connect a pressure gauge to the pressure tank to measure the internal pressure. Find the saturation pressure corresponding to the measured outer surface temperature from [Table 4-12](#). If the deviation between the saturation pressure and the measured internal pressure is greater than 0.2 MPa, the refrigerant does not meet the requirements and needs to be replaced.

Figure 4-23 Checking refrigerant

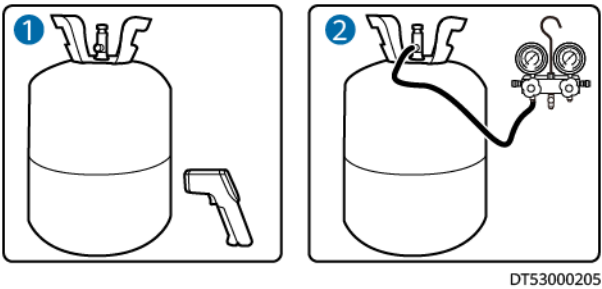


Table 4-12 Mapping between temperatures and R410A saturation pressure

Temperature (°C)	Saturation Pressure - Gauge Pressure (MPa)	Temperature (°C)	Saturation Pressure - Gauge Pressure (MPa)	Temperature (°C)	Saturation Pressure - Gauge Pressure (MPa)
0	0.7	19	1.31	38	2.21
1	0.73	20	1.35	39	2.27
2	0.75	21	1.39	40	2.33
3	0.78	22	1.43	41	2.39
4	0.81	23	1.47	42	2.45
5	0.84	24	1.51	43	2.51
6	0.87	25	1.56	44	2.57

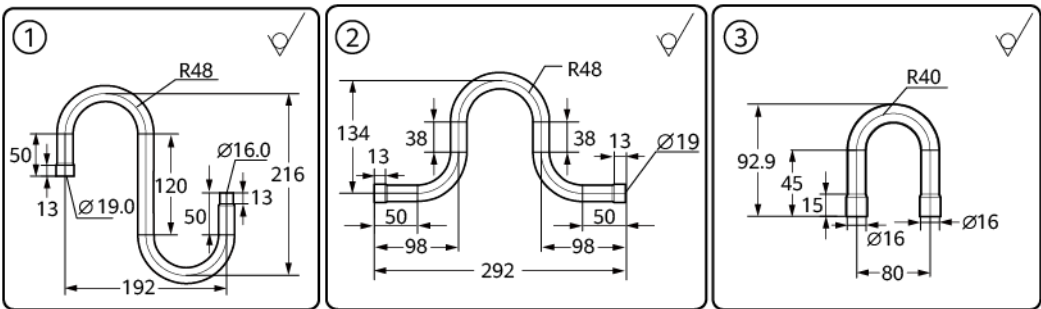
Temperature (°C)	Saturation Pressure - Gauge Pressure (MPa)	Temperature (°C)	Saturation Pressure - Gauge Pressure (MPa)	Temperature (°C)	Saturation Pressure - Gauge Pressure (MPa)
7	0.9	26	1.60	45	2.63
8	0.93	27	1.65	46	2.7
9	0.96	28	1.69	47	2.76
10	0.99	29	1.74	48	2.83
11	1.02	30	1.79	49	2.9
12	1.05	31	1.84	50	2.97
13	1.09	32	1.89	51	3.04
14	1.12	33	1.94	52	3.11
15	1.16	34	1.99	53	3.19
16	1.19	35	2.04	54	3.26
17	1.23	36	2.1	55	3.34
18	1.27	37	2.15	-	-

4.2.2.2 Oil Trap and Inverted Trap

NOTICE

The operating pressure of the copper pipe, oil trap, and inverted trap should be greater than 4.5 MPa.

Figure 4-24 Oil trap and inverted traps (unit: mm)



DT02000051

Table 4-13 Specifications for oil traps and inverted traps

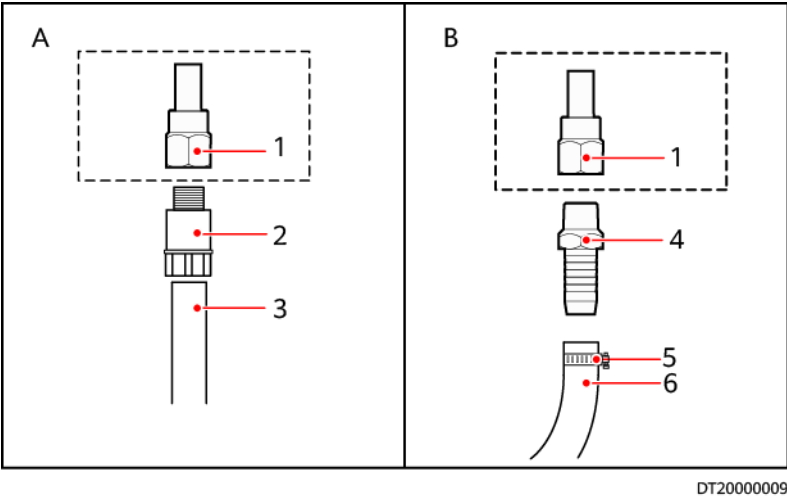
No.	Name	Copper Pipe Outer Diameter and Thickness	Technical Requirements
1	Oil trap	19.1 mm x 1.2 mm	Inner diameter at the two expanded ends of the copper pipe: 19.1 mm; outer diameter of the shrunk end: 16.0 mm
2	Gas pipe inverted trap	19.1 mm x 1.2 mm	Inner diameters at the two expanded ends of the copper pipe: 19.1 mm
3	Liquid pipe inverted trap	16.0 mm x 1.0 mm	Inner diameters at the two expanded ends of the copper pipe: 16.0 mm
NOTE • After the traps are made, verify that the surface is smooth and even, and that there is no bur at the pipe ends. • Pipe bends not marked in the figure are 90°. • The bend tolerance is ± 1 mm.			

4.2.2.3 Humidifier Water Inlet Pipe

Humidifier water inlet pipes are not required by the models without heating or humidification functions.

The humidifier water inlet pipe can be connected using a hose or a rigid pipe.

Figure 4-25 Connecting a water inlet pipe



- | | | |
|---|--|---|
| (1) Internal thread connector: G 1/2 inch; internal thread connector delivered with the water inlet pipe of the smart cooling product | (2) Rigid pipe conversion adapter: G 1/2 inch; connected to a rigid pipe with external threads | (3) Rigid pipe: made of PP-R or other materials |
| (4) Pagoda connector: G 1/2 inch; connected to a pipe with external threads | (5) Hose clamp | (6) Hose: made of EPDM or other materials |

NOTE

The object shown in the dotted line box is the water inlet pipe connector with internal screw threads delivered with smart cooling products. The hose clamp as shown by (5) in the preceding figure is provided in standard configuration. Other parts are not provided and need to be purchased.

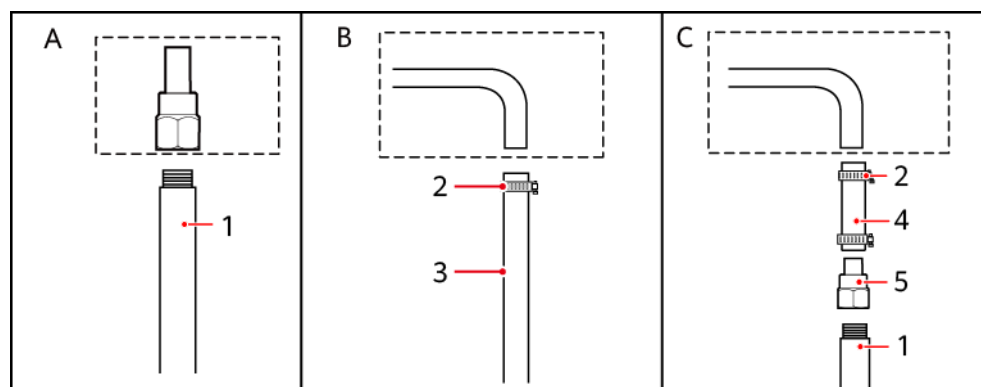
4.2.2.4 Drainpipe

A drainpipe can be connected in two ways:

- Top pipe routing: For the connection method of the water pump drainpipe, see method A in [Figure 4-26](#).
- Bottom pipe routing: See methods B and C in [Figure 4-26](#).

Determine a pipe connection method based on site pipe materials.

Figure 4-26 Connecting a drainpipe



DT06000002

(1) Rigid pipe: 1/2-inch BSPT, external thread, (2) Hose clamp
made of PP-R, C-PVC, or other materials

(3) Hose: inner diameter of 14 mm, made of EPDM (4) Hose delivered with the fittings

(5) Rigid pipe conversion adapter: 5/8-inch
outer diameter, adapting for 1/2-inch BSPP
internal thread connection

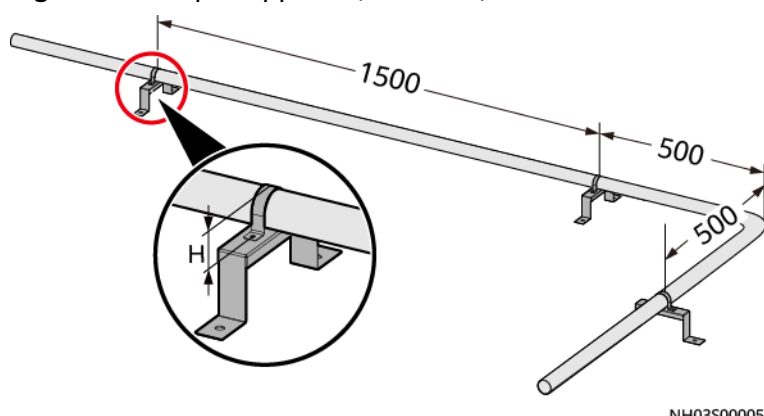
NOTE

Components 2, 4, and 5 in the dotted box are standard components, and other components are purchased.

4.2.2.5 Pipe Support

Figure 4-27 shows supports for refrigerant pipes and water pipes. The actual appearance of the supports will be different based on onsite situations.

Figure 4-27 Pipe supports (unit: mm)



NH03S00005

NOTE

- The height of the U-shaped pipe clamp is 5 mm less than the pipe diameter (including the thermal insulation foam). Pipe supports are subject to engineering procurement.
- It is recommended that pipe supports and pipe clamps be made of 304 stainless steel.
- Install a support every 1500 mm for the straight sections of pipes, and 500 mm away from each bending point in turning sections.

4.2.2.6 Cables

NOTE

The cable flame spread rating must be at least VB.

When selecting, connecting, and routing cables, follow local safety regulations and rules.

When the external conditions such as cable layout or ambient temperatures change, perform verification in accordance with the IEC-60364-5-52 or the local regulations.

The recommended cables are applicable only when the following requirements are met:

- Routing mode: The cables are routed over a tray or bracket in a single layer (E or F in IEC 60364-5-523).
- The AC voltage loss is less than 3%.
- Single- or multi-core 90°C-resistant copper flexible cables are used.

NOTICE

- The signal cable between the indoor and outdoor units is mandatory if the outdoor unit is equipped with a temperature control intelligent monitoring board.
- The shielding layer of the signal cable must be grounded.
- Shielded cables cannot be used as power cables for outdoor units.

Table 4-14 Cable specifications

Item		NetCol5000-A035	NetCol5000-A025H4WE2	NetCol5000-A025HNWE2
Active power cable for the indoor unit	Maximum current	37 A	28 A	46 A
	Recommended circuit breaker	50 A/3P (characteristic C)	40 A/3P (characteristic C)	63 A/3P (characteristic D)
	Recommended cable	5 x 6 mm ²	5 x 6 mm ²	5 x 16 mm ²
Standby power cable for the indoor unit	Maximum current	37 A	28 A	46 A
	Recommended circuit breaker	50 A/3P (characteristic C)	40 A/3P (characteristic C)	63 A/3P (characteristic D)

Item		NetCol5000-A035	NetCol5000-A025H4WE2	NetCol5000-A025HNWE2
	Recommended cable	5 x 6 mm ²	5 x 6 mm ²	5 x 16 mm ²
Outdoor unit power cable	Recommended cable	5 x 2.5 mm ² (The neutral wire is not used at the customer's site.)	5 x 2.5 mm ² (The neutral wire is not used at the customer's site.)	5 x 2.5 mm ² (The neutral wire is not used at the customer's site.)
Teamwork control network cable (mandatory for teamwork networking)	Recommended cable	8-pin standard network cable	8-pin standard network cable	8-pin standard network cable
Outdoor unit communications cable (mandatory when the outdoor unit is equipped with an intelligent temperature monitoring board)	Recommended cable	3 x 1.5 mm ² shielded outdoor cable (Electrical power cable, 300 V, SJTW, 3 x 16 AWG, black (three cores: black, white, and green), 10 A, shielded outdoor cable, UL)	3 x 1.5 mm ² shielded outdoor cable (Electrical power cable, 300 V, SJTW, 3 x 16 AWG, black (three cores: black, white, and green), 10 A, shielded outdoor cable, UL)	3 x 1.5 mm ² shielded outdoor cable (Electrical power cable, 300 V, SJTW, 3 x 16 AWG, black (three cores: black, white, and green), 10 A, shielded outdoor cable, UL)
Power cable for the low temperature component (mandatory when a low temperature component is configured)	Recommended cable	2 x 1.5 mm ²	2 x 1.5 mm ²	2 x 1.5 mm ²
Equipotential ground cable	Recommended cross-sectional area	6 mm ² outdoor copper cable	6 mm ² outdoor copper cable	6 mm ² outdoor copper cable

4.3 Unpacking and Acceptance

Procedure

- Step 1** Inspect the outer packing for signs of damage. If any damage is found, contact the shipping company immediately.
- Step 2** Unpack the product.
1. Remove the straps, top cover, outer packing, cushioning materials, and then plastic film.
 2. Inspect the cabinet exterior for signs of collision or scratches. If any damage is found, contact the shipping company immediately.
- Step 3** Check the type and quantity of fittings against the packing list. If fittings are missing or inconsistent with those in the packing list, record the information and contact your local Huawei office immediately.

----End

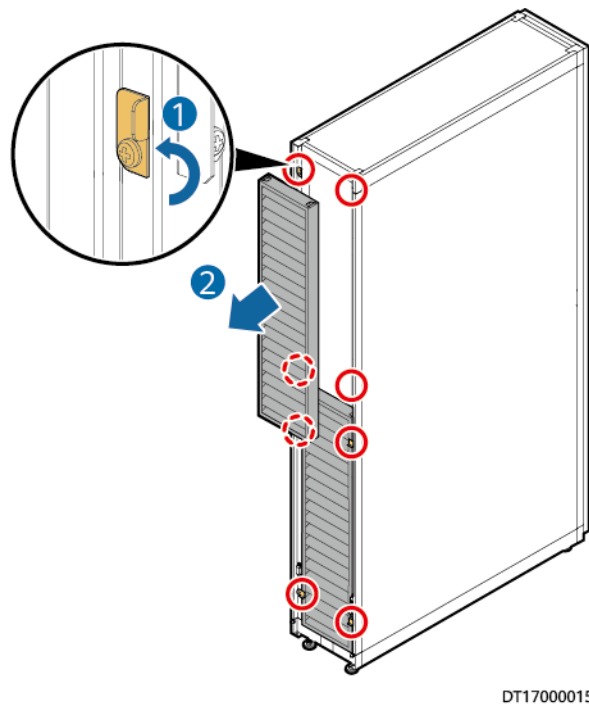
4.4 Installing the Indoor Unit

4.4.1 Checking the Nitrogen Pressure

Procedure

- Step 1** Open the rear door.
- Step 2** Unfasten the rotating baffle plates in the air filters and remove the air filters.

Figure 4-28 Removing air filters

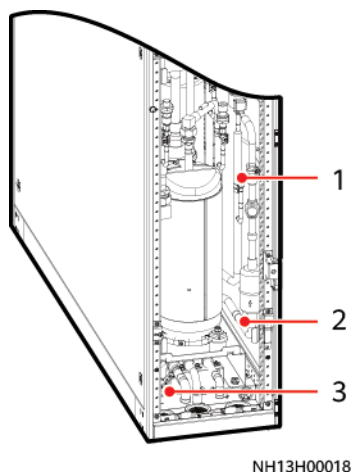


Step 3 Take out the desiccant bags.

Step 4 Check whether the needle valve bonnets shown in [Figure 4-29](#) exist.

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

Figure 4-29 Needle valves



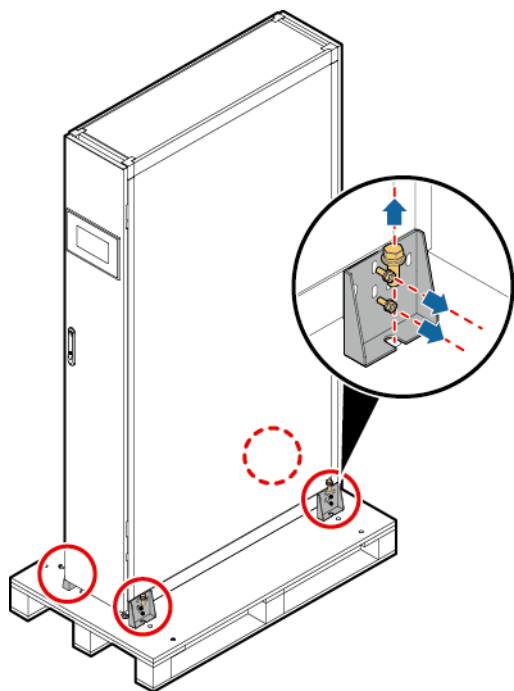
(1) Low-pressure needle valve (2) Liquid pipe needle valve (3) Discharge pipe needle valve

-----End

4.4.2 Removing the Pallet

Use a 10# socket wrench to remove the eight M6x16 bolts securing the sheet metal fasteners to the cabinet, and use an 18# socket wrench to remove the four M12x35 bolts securing the sheet metal fasteners to the pallet, as shown in [Figure 4-30](#).

Figure 4-30 Removing bolts from the cabinet sheet metal fasteners



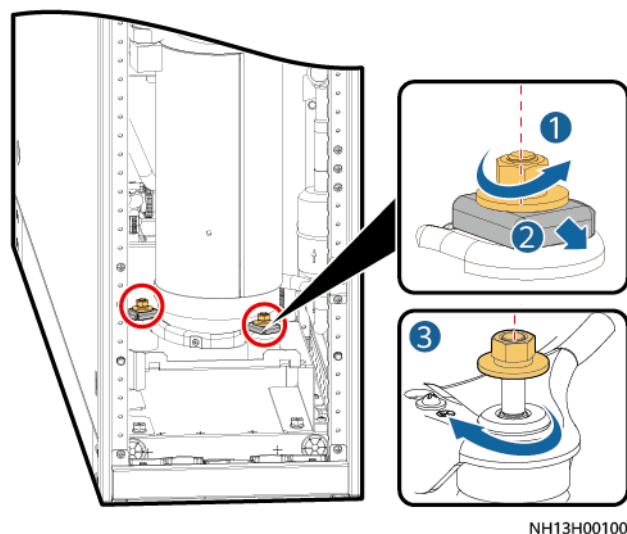
NH13H00017

4.4.3 Removing the Transport Fasteners from the Compressor

Procedure

- Step 1** Loosen the two bolts on the compressor transport fasteners using a 13# solid wrench.

Figure 4-31 Removing the transport fasteners from the compressor



NOTE

- Do not remove the bolts directly.
- Put away the removed transport fasteners so that you can reinstall them if the indoor unit is to be transported again in the container scenario.

Step 2 Remove the transport fasteners.

Step 3 Tighten the bolts on the compressor to a torque of 12 N·m.

----End

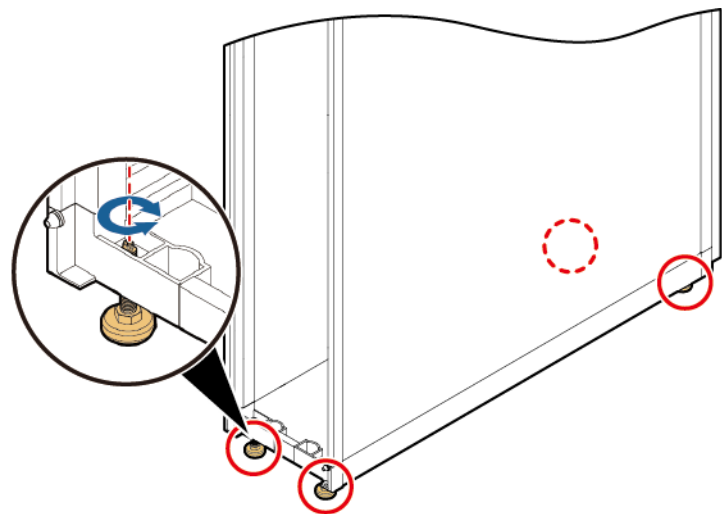
4.4.4 Leveling the Cabinet

Use an adjustable wrench to raise or lower the leveling feet, as shown in [Figure 4-32](#).

NOTICE

- Wrench an anchor bolt clockwise to elevate a cabinet, wrench an anchor bolt counterclockwise to lower a cabinet. The leveling feet can be adjusted within a range of 0–8 mm.
- To prevent damage caused by cabinet tilt, adjust all the leveling feet at the four corners instead of one foot.
- Before leveling the cabinet, use a measuring tape to check that the vertical distance between the top of the cabinet and the floor is 2000 ± 3 mm.
- Do not remove the leveling feet as the reinstallation can be difficult when you need to use them.

Figure 4-32 Leveling feet

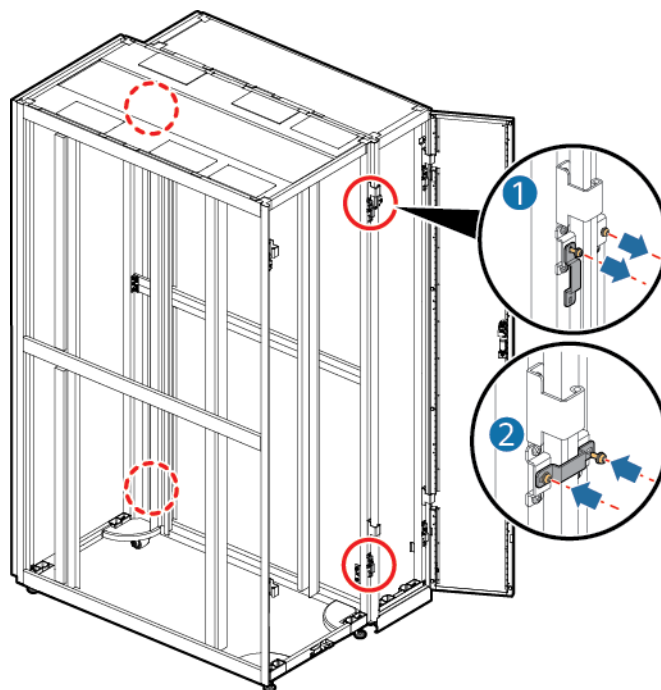


NH03H00001

4.4.5 Combining Cabinets

Loosen the screws on the cabinet connecting plates on the rear door side post, and combine the smart cooling product and IT cabinet using cabinet connecting plates.

Figure 4-33 Combining cabinets



DM30000025

4.4.6 Securing the Indoor Unit

If there is a base, secure the indoor unit to the base. If there is no base, secure the indoor unit to the floor.

Figure 4-34 Distance between mounting holes (35 kW)

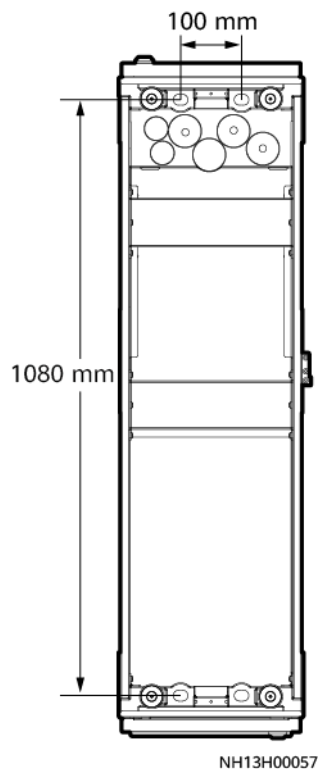
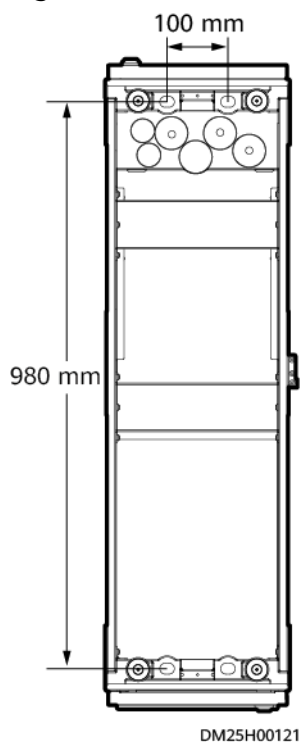


Figure 4-35 Distance between mounting holes (25 kW)



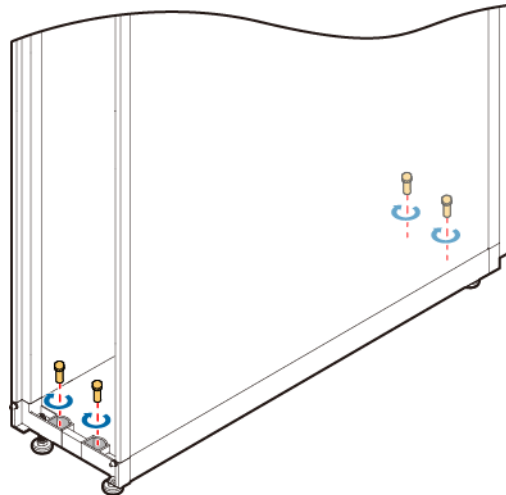
Prerequisites

Before installing the bolts, remove the rodent-proof rubber plugs in the mounting holes if there are any.

Scenario with a Base

- Step 1** Secure the base to the floor using four M12 expansion bolts.
- Step 2** Place the cabinet onto the base, and secure the cabinet to the base using four M12x45 bolts available in the fitting bag, as shown in [Figure 4-36](#).

Figure 4-36 Securing an indoor unit to a base



DM54000032

NOTE

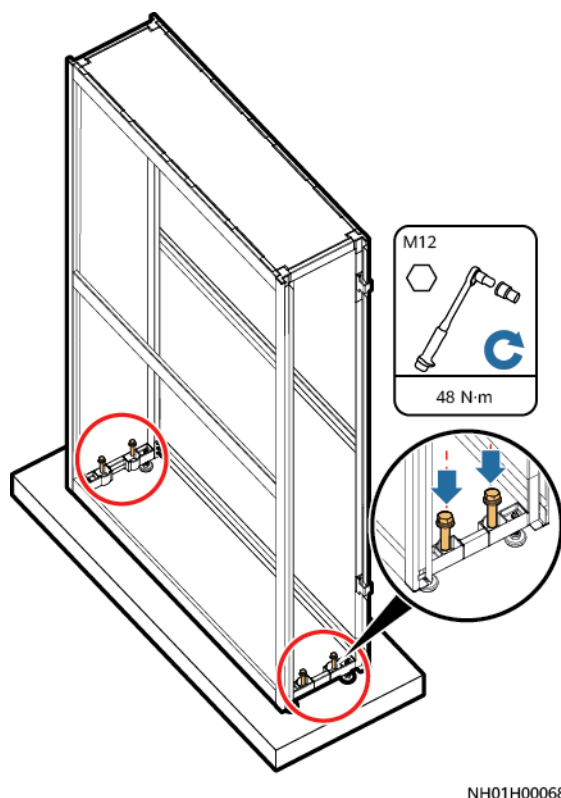
[Figure 4-36](#) shows only how the cabinet is secured to the base. Secure the base based on site requirements.

----End

Scenario Without a Base

- Step 1** Drill holes in the floor based on the hole distances shown in [Figure 4-34](#).
- Step 2** Place the cabinet at the designated position and secure it to the floor using four M12 bolts, as shown in [Figure 4-37](#).

Figure 4-37 Securing an indoor unit to a floor



----End

4.5 Installing the Outdoor Unit

4.5.1 Checking the Nitrogen Pressure

Context

Before delivery, outdoor units are injected with nitrogen to 0.2–0.6 MPa. Before connecting pipes, the nitrogen inside pipes must be discharged.



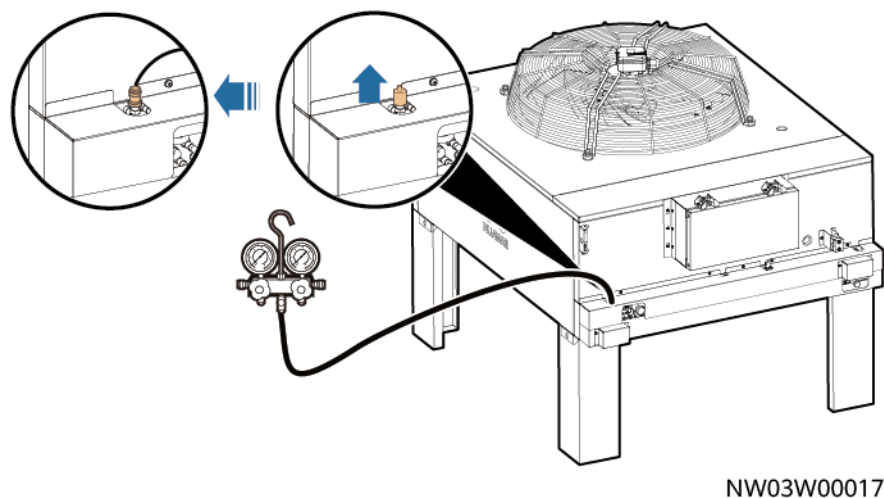
CAUTION

Nitrogen must be discharged; otherwise, air jets emitted during pipe welding may cause bodily injuries.

Procedure

- Step 1** Connect the hose to the pressure gauge, and tighten all pressure gauge valves.
- Step 2** Remove the needle valve bonnet from the outdoor unit, and connect the other end of the hose to the outdoor unit needle valve, as shown in [Figure 4-38](#).

Figure 4-38 Checking the outdoor unit pressure



- If the pressure gauge reading is no less than 0.2 MPa, the unit is airtight. Then open the pressure gauge valve where the hose is connected to discharge nitrogen. After the discharge is complete, remove the hose and reinstall the valve bonnet.
- If the pressure gauge reading is less than 0.2 MPa, pipes have leakage points, and you need to contact Huawei technical support.

----End

4.5.2 Removing the Pallet

Context

NOTICE

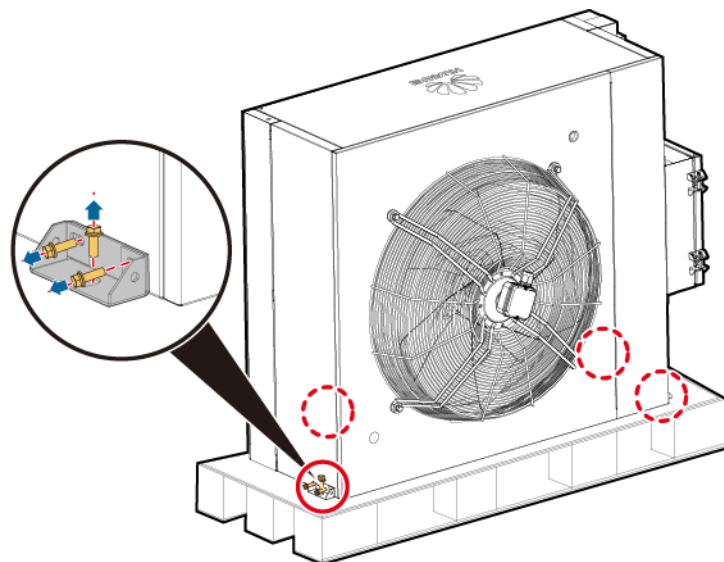
- Wear protective gloves when unpacking the device.
- Choose railways, sea, or a road with good conditions during transportation. No excessive tilt or jolt is allowed during transportation.
- Use a pallet truck to transport the cabinet secured to a wooden base to the installation position. Insert the forks of the pallet truck in the middle position to ensure balance.
- 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.

Procedure

- Step 1** Remove the packing materials such as the carton, stretch wrap, foam, condenser protection cardboard, and plastic bags.
- Step 2** Check the accessories against the accessory list.

- Step 3** Remove the three bolts from each of the four corner fittings (one bolt for connecting the corner fitting to the pallet). Then remove the outdoor unit from the pallet, as shown in [Figure 4-39](#).

Figure 4-39 Removing the bolts from the pallet



NW03W00019

----End

4.5.3 Securing an Outdoor Unit

4.5.3.1 Horizontal Installation Scenario

Context

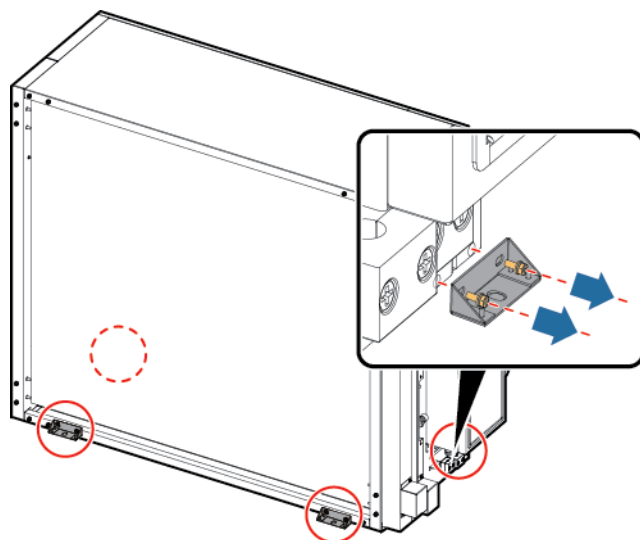
NOTICE

When installing the outdoor unit, fully tighten the six stainless steel bolts for each leg and the two stainless steel bolts that secure the outdoor unit to the ground.

Procedure

- Step 1** Remove the four angle brackets from the side panels of the outdoor unit by removing the two M6x16 stainless bolts from each angle bracket, as shown in [Figure 4-40](#).

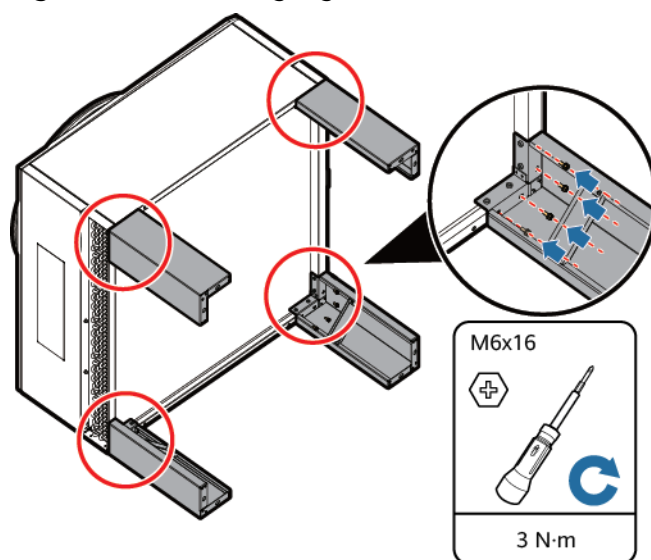
Figure 4-40 Removing the bolts from the angle brackets



NH13H00011

Step 2 Install four legs on the four corners of the condenser by using sixteen stainless M6x16 bolts (four stainless bolts for installing one leg), as shown in [Figure 4-41](#).

Figure 4-41 Installing legs



DM25H00122

Step 3 Put the four legs to the ground to lay the outdoor unit horizontally.

NOTICE

When turning the outdoor unit, do not hold it by using two legs. Otherwise, the outdoor unit is damaged.

Step 4 Secure the four outdoor unit legs to the concrete platform or base using M8x80 stainless steel expansion bolts.

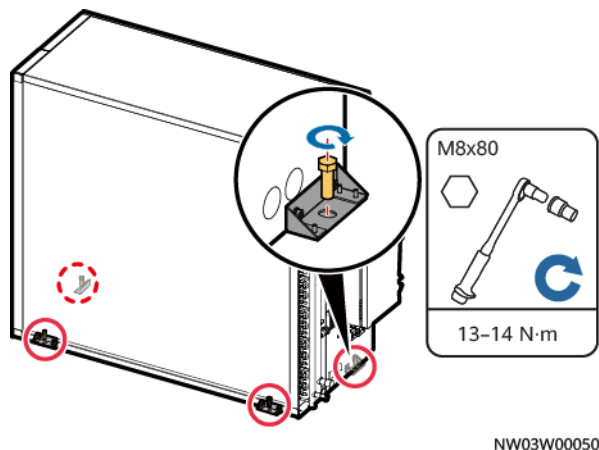
----End

4.5.3.2 Vertical Installation Scenario (NetCol500-A040/A060/A080)

Securing an Outdoor Unit to the Concrete Platform

- Step 1** Secure the outdoor unit to the concrete platform through the four angle brackets on the side panels using M8x80 stainless expansion bolts, as shown in [Figure 4-42](#).

Figure 4-42 Securing an outdoor unit



----End

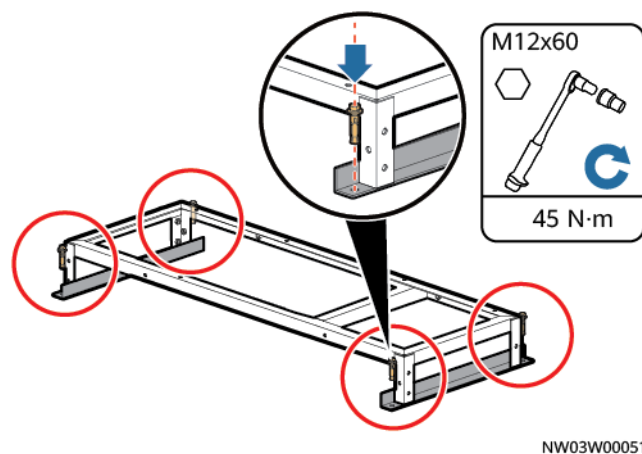
Securing an Outdoor Unit to the Base

NOTICE

The following takes the two-layer installation of outdoor units as an example. For the single-layer installation, perform only [Step 1](#) and [Step 3](#).

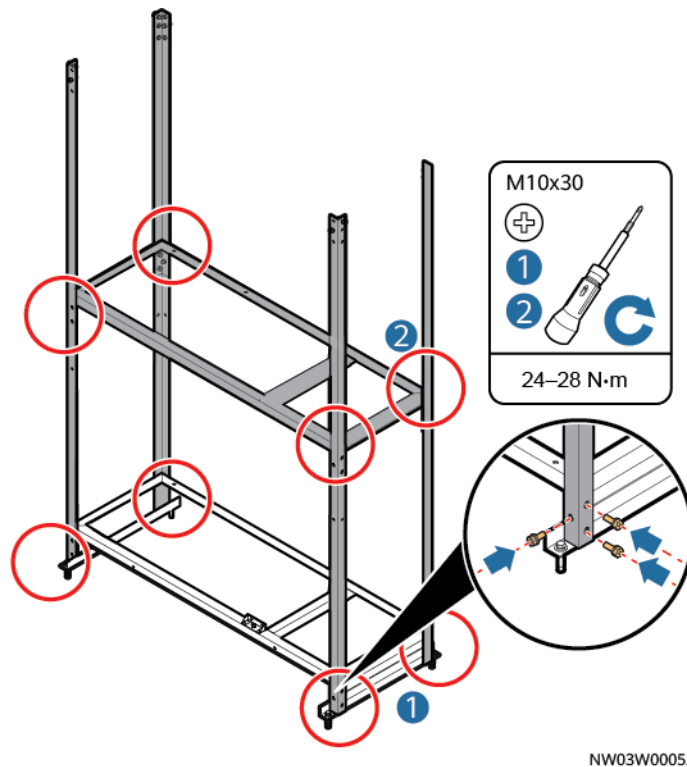
- Step 1** Secure the first layer of base to the ground using four M12x60 stainless expansion bolts, as shown in [Figure 4-43](#).

Figure 4-43 Securing a base



Step 2 Secure the four columns.

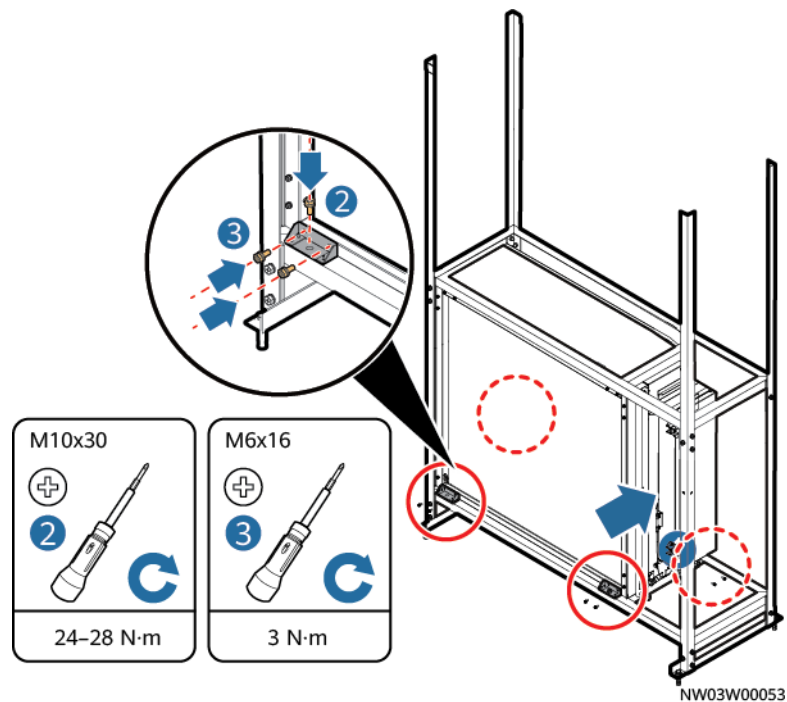
Figure 4-44 Securing columns



1. Secure the four columns to the first layer of base using twelve M10x30 stainless steel bolts, as shown by (1) in [Figure 4-44](#).
2. Secure the second layer of base to the middles of the four columns using twelve M10x30 stainless steel bolts, as shown by (2) in [Figure 4-44](#).

Step 3 Secure an outdoor unit onto the first layer of base.

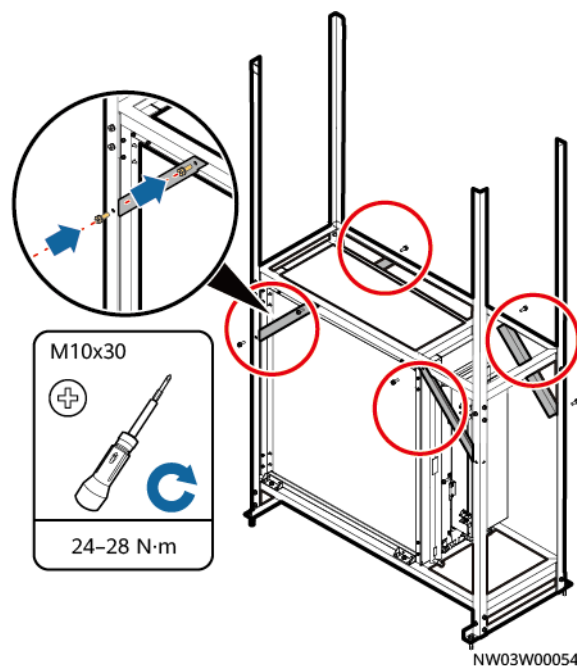
Figure 4-45 Installing an outdoor unit on the first layer



1. Lift the outdoor unit from the front onto the first layer of base, as shown by (1) in **Figure 4-45**.
2. Secure the outdoor unit to the base using four angle brackets on the side panels. One M10x30 stainless steel bolt is used on the base side, and two M6x16 stainless steel bolts are used on the outdoor unit side, as shown in **Figure 4-45**.

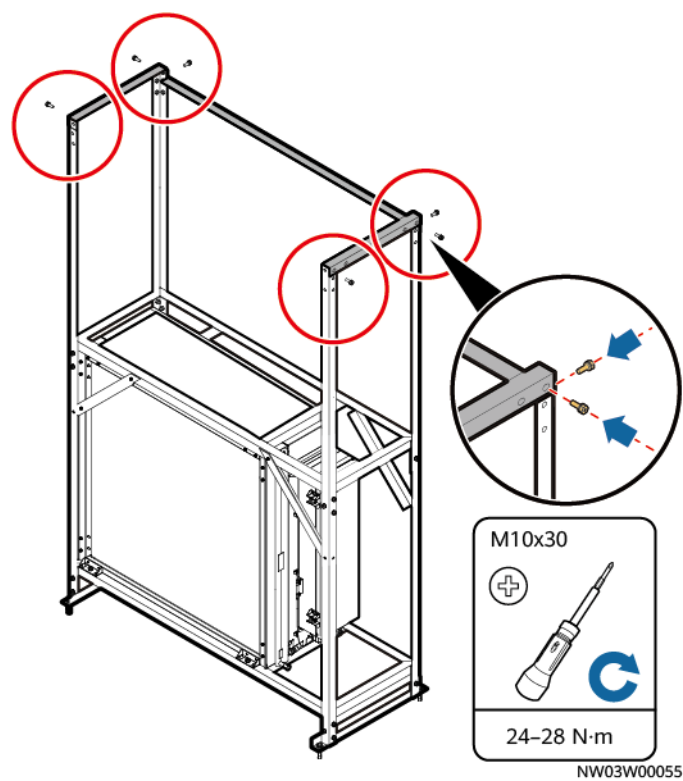
Step 4 Secure four slanting beams to the base using eight M10x30 stainless steel bolts, as shown in **Figure 4-46**.

Figure 4-46 Installing slanting beams



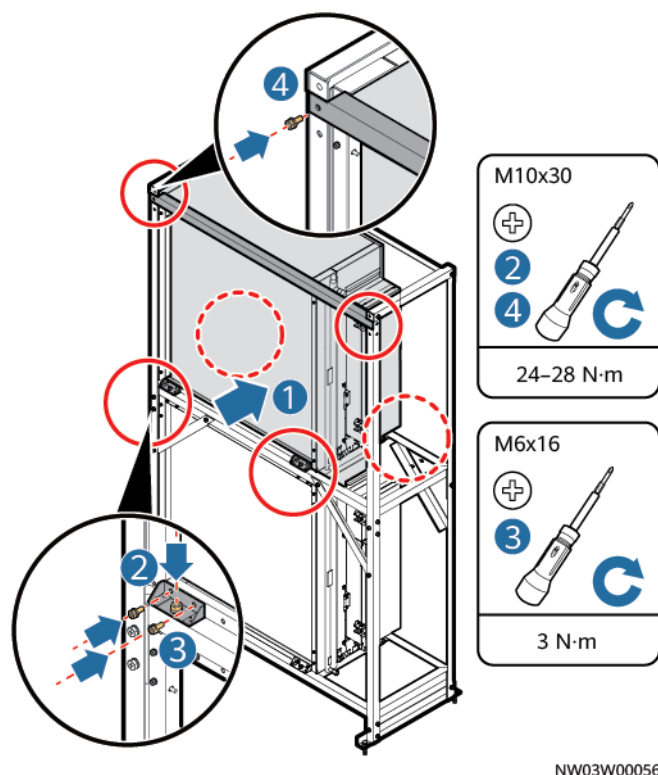
Step 5 Secure the three beams on the top of the base to the columns using six M10x30 stainless steel bolts, as shown in [Figure 4-47](#).

Figure 4-47 Installing beams



Step 6 Secure an outdoor unit to the second layer of base.

Figure 4-48 Installing an outdoor unit on the second layer



1. Lift the outdoor unit from the front onto the second layer of base, as shown by (1) in [Figure 4-48](#).
2. Secure the outdoor unit to the base using four angle brackets on the side panels. One M10x30 stainless steel bolt is used on the base side, and two M6x16 stainless steel bolts are used on the outdoor unit side, as shown in [Figure 4-48](#).
3. Secure the last beam on the top of the base to the columns using two M10x30 stainless steel bolts, as shown by (4) in [Figure 4-48](#).

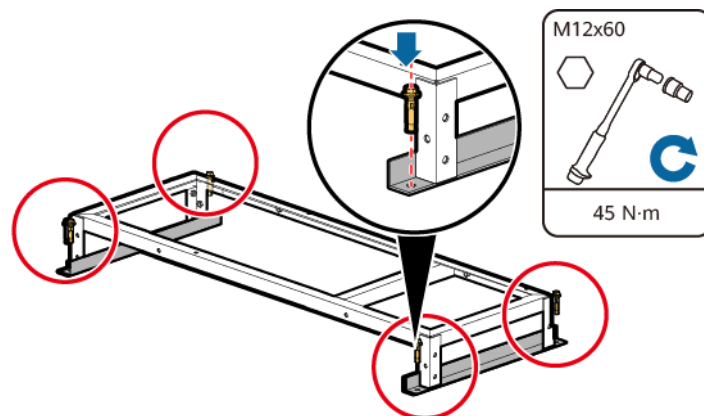
Step 7 Connect the beams to the wall through the two reserved bolt holes on the left and right sides of the top of the base using M10x30 stainless steel bolts.

----End

4.5.3.3 Vertical Installation Scenario (NetCol500-A120)

Step 1 Secure the base to the ground using four M12x60 stainless steel expansion anchor bolts, as shown in [Figure 4-49](#).

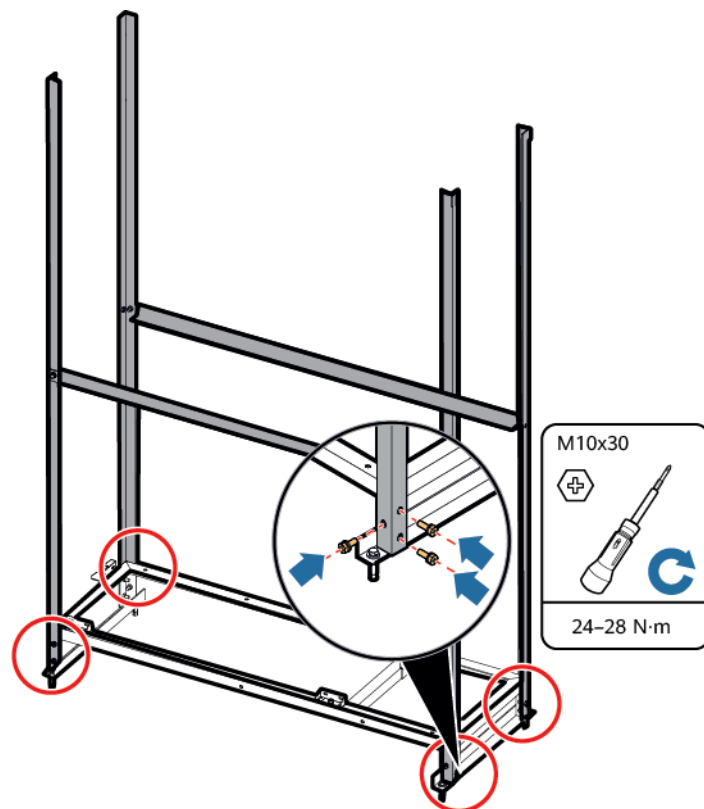
Figure 4-49 Securing a base



NW03W00031

Step 2 Secure the four columns to the base using twelve M10x30 stainless steel bolts.

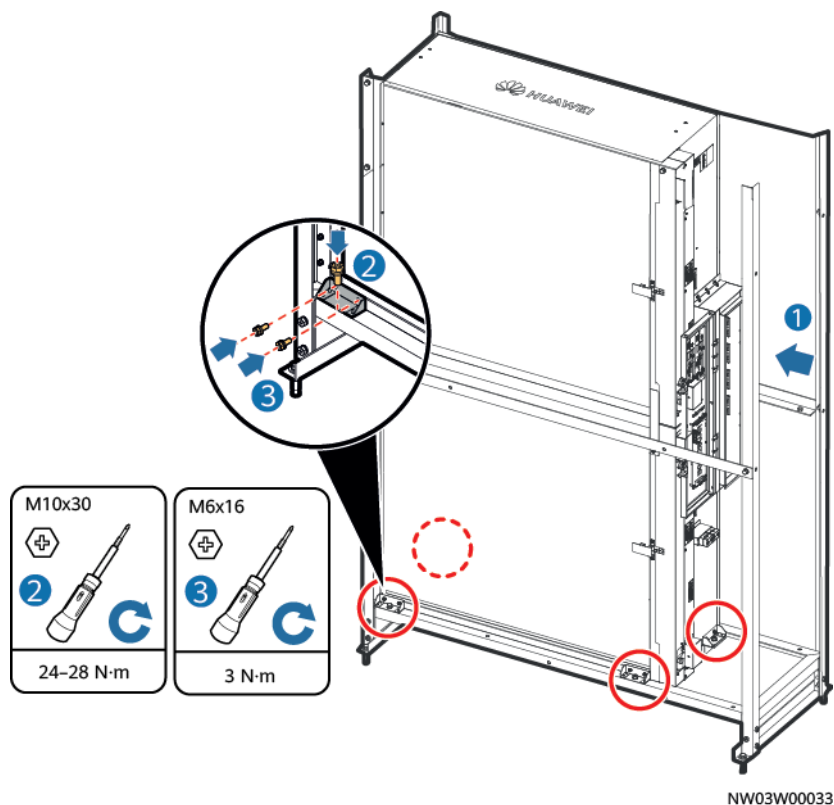
Figure 4-50 Securing columns



NW03W00032

Step 3 Secure an outdoor unit onto the base.

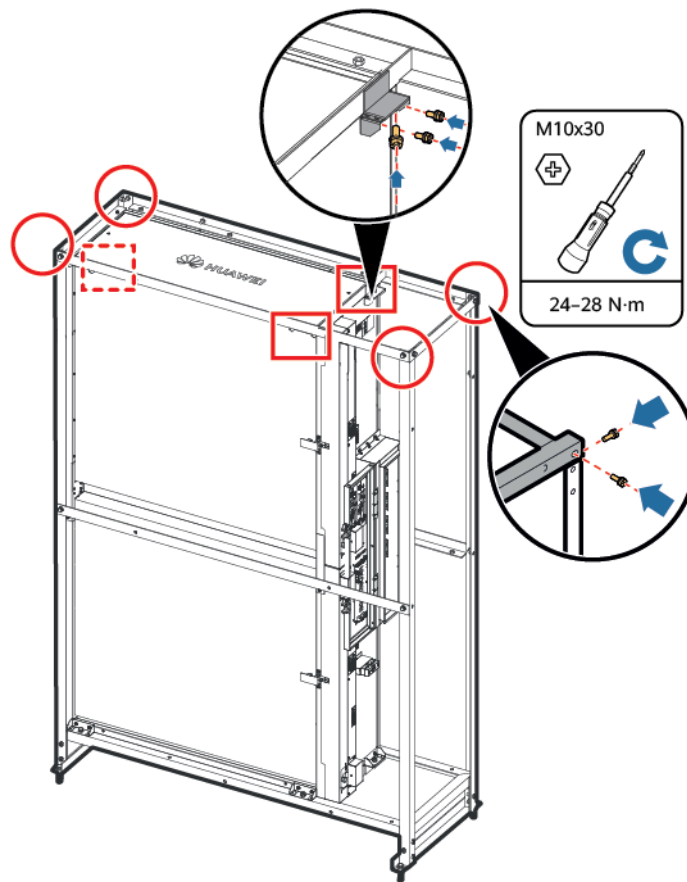
Figure 4-51 Installing an outdoor unit



1. Lift the outdoor unit from the side onto the base, as shown by (1) in [Figure 4-51](#).
2. Secure the outdoor unit to the base using four bracket angles on the side panel. One M10x30 stainless steel bolt is used on the base side, and two M6x16 stainless steel bolts are used on the outdoor unit side, as shown in [Figure 4-51](#).

Step 4 Secure the four beams on the top to the base using eight M10x30 stainless steel bolts, and secure the top of outdoor unit to the base as shown in [Figure 4-52](#).

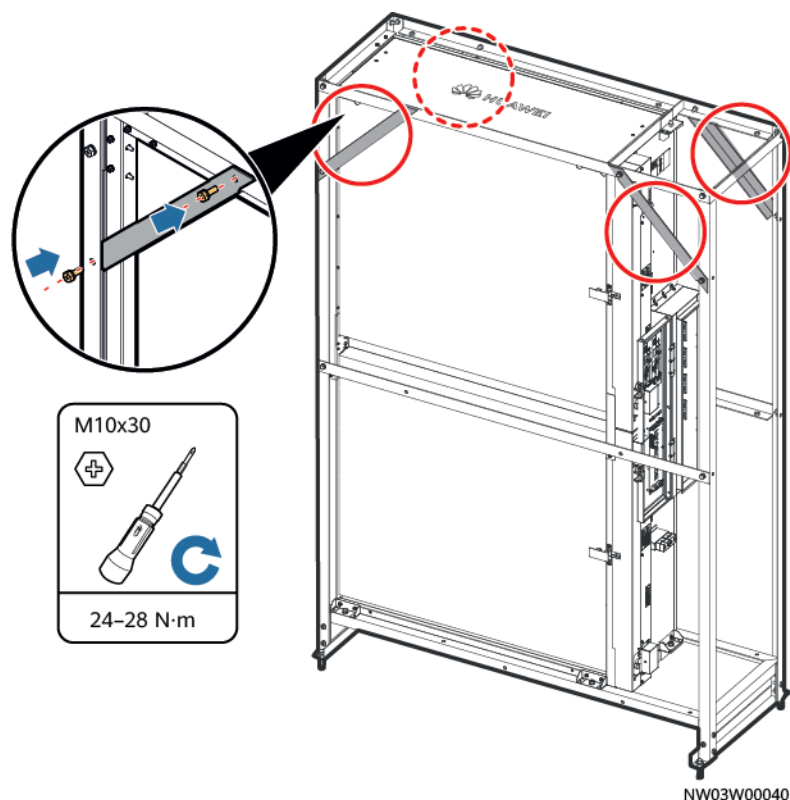
Figure 4-52 Installing beams and securing the top of the outdoor unit



NW03W00041

Step 5 Secure four slanting beams to the base using eight M10x30 stainless steel bolts, as shown in [Figure 4-53](#).

Figure 4-53 Installing slanting beams



Step 6 Connect the beam to the wall by routing M10x30 stainless steel bolts through the reserved tapped holes on the left and right sides at the top of the base.

----End

4.6 (Optional) Installing Low-temperature Component

4.6.1 Checking the Nitrogen Pressure

Context

Before delivery, low temperature components are injected with nitrogen to 0.2–0.6 MPa. Before connecting pipes, the nitrogen inside pipes must be discharged.

CAUTION

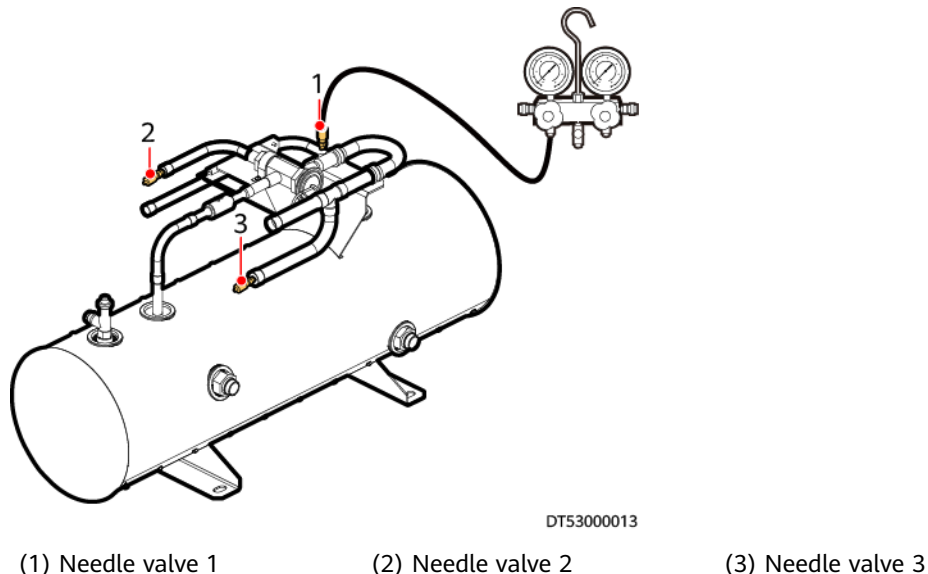
Nitrogen must be discharged; otherwise, air jets emitted during pipe welding may cause bodily injuries.

Procedure

Step 1 Connect the hose to the pressure gauge, and tighten all pressure gauge valves.

- Step 2** Remove the bonnets of the three needle valves on the low temperature component, and connect the other end of the hose to the three needle valves in turn, as shown in [Figure 4-54](#).

Figure 4-54 Checking the pressure of the low temperature component



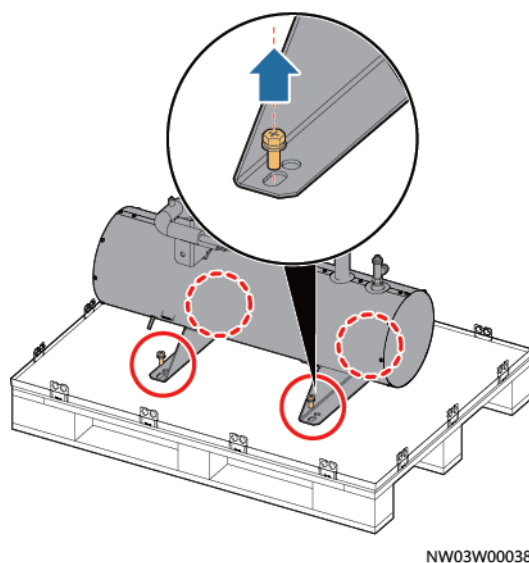
- If the pressure gauge reading is no less than 0.2 MPa, the unit is airtight. Then open the pressure gauge valve where the hose is connected to discharge nitrogen. After the discharge is complete, remove the hose and reinstall the valve bonnet.
- If the pressure gauge reading is less than 0.2 MPa, pipes have leakage points, and you need to contact Huawei technical support.

----End

4.6.2 Removing the Pallet

Remove the four screws securing the low temperature component to the pallet using an adjustable wrench, as shown in [Figure 4-55](#). Remove the pallet.

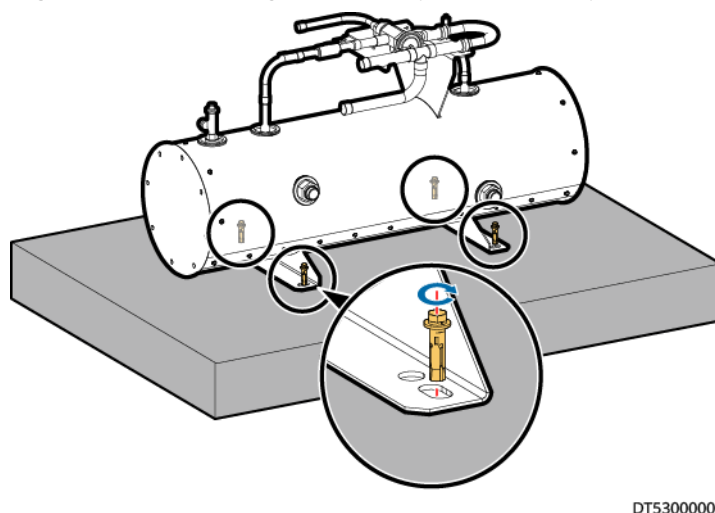
Figure 4-55 Removing a low temperature component



4.6.3 Securing a Low Temperature Component

Place the low temperature component on a concrete platform, and align the mounting holes with the holes in the concrete platform. Secure the low temperature component to the concrete platform using four M12 x 60 stainless steel expansion bolts to a torque of 45 N·m, as shown in [Figure 4-56](#).

Figure 4-56 Securing a low temperature component



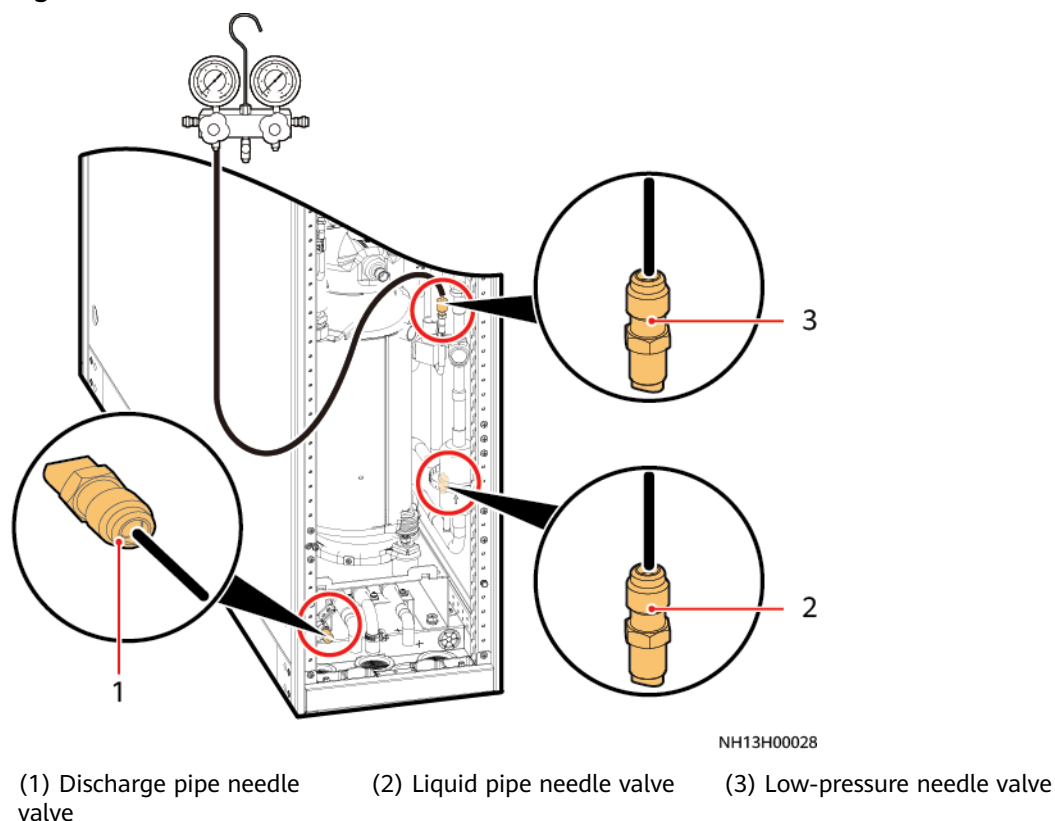
4.7 Installing Pipes

4.7.1 Exhausting Nitrogen

Context

[Figure 4-57](#) shows the positions of needle valves.

Figure 4-57 Positions of needle valves



Procedure

- Step 1** Remove the bonnets of the liquid pipe needle valve, low-pressure needle valve, and exhaust pipe needle valve in turn, as shown in [Figure 4-57](#).

NOTICE

You will hear a sound of strong air flow when air is being exhausted.

- Step 2** Connect a hose to the liquid pipe needle valve, low-pressure needle valve, and exhaust pipe needle valve in turn to slowly exhaust nitrogen.
- Step 3** Reinstall the valve bonnets until no air exhausts from the needle valves.

----End

4.7.2 Installing Refrigerant Pipes

Prerequisites

DANGER

Before welding, exhaust all nitrogen from the refrigerant pipe to avoid explosion and personal injury.

NOTICE

- When welding the pipes connecting to the indoor unit, protect the needle valve and its tag.
- Before welding, take measures to protect the needle valve (discharge pipe needle valve) within 500 mm from the welding position (by removing the valve plug or wrapping the valve with a piece of wet cloth).
- During welding, avoid burning the bottom plate, top plate, and side panels, especially the thermal insulation foam, labels, water pipes, and cables on the side panels.
- During welding, do not expose the refrigerant pipes for over 15 minutes. Otherwise, system reliability may deteriorate.
- To avoid air leaks 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.
- All refrigerant pipes should be wrapped with thermal insulation foam.
- Avoid elbows and ensure that the pipe route between the indoor and outdoor units is as short as possible.
- Use a rubber hose to connect the nitrogen cylinder which connecting the reducing valve and the end of the copper pipe, then fill nitrogen at 0.03–0.05 MPa into the copper pipe to avoid internal oxidation.

Refrigerant Pipe

Table 4-15 Pipe connection dimensions for the indoor and outdoor units

Model	Pipe Length (m)	Recommended Gas Pipe Diameter	Recommended Wall Thickness	Recommended Liquid Pipe Diameter	Recommended Wall Thickness
NetCol5000-A035 and NetCol500-A080 are used together.	0 m < L ≤ 100 m	7/8 inch	1.2 mm	5/8 inch	1.0 mm
Others	0 m < L ≤ 100 m	3/4 inch	1.0 mm	5/8 inch	1.0 mm
If the one-way pipe length is longer than 100 m, contact Huawei technical support.					

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

Table 4-16 Equivalent length of components

Pipe Outer Diameter (inch)	45-Degree Bend (m)	90-Degree Bend (m)	180-Degree Bend (m)	T-shaped 3-Way Valve (m)
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

You are advised to select the pipes based on the total length of the pipes connecting the indoor unit and the outdoor unit, because different pipe diameters influence the pressure drop and performance of the cooling system.

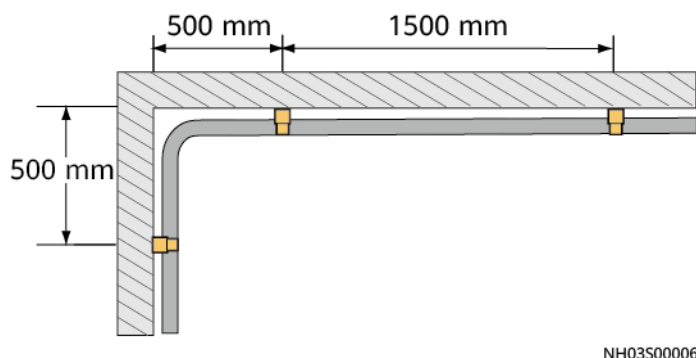
Connect the refrigerant pipes by referring to [Figure 4-58](#).

- If the direction of a refrigerant pipe changes, add a support at the position 500 mm before and after the changing point respectively.
- If a refrigerant pipe is straight, add a support every 1500 mm.

NOTE

Ask the site engineering personnel to prepare and install pipe supports. For details about the pipe support requirements, see [Figure 4-24](#).

Figure 4-58 Installing a refrigerant pipe



Procedure

- Step 1** Remove the two plugs from the two ends of the refrigerant pipe using a welding torque, as shown in [Figure 4-59](#).

NOTICE

Exercise caution during welding to avoid burning components, such as rubber rings, inside the cabinet.

During welding, fill nitrogen into the pipes to prevent oxidation, as shown in [Figure 4-60](#).

Nitrogen injection volume range: 6–12 L/min. The nitrogen injection time for the entire system is greater than 2 minutes. The nitrogen injection time after pipe welding is greater than 1 minute.

- When welding a gas pipe, gently inject nitrogen into the pipe through the discharge pipe needle valve.
- When welding a liquid pipe, gently inject nitrogen into the pipe through the liquid pipe needle valve.

Figure 4-59 Bottom pipe routing

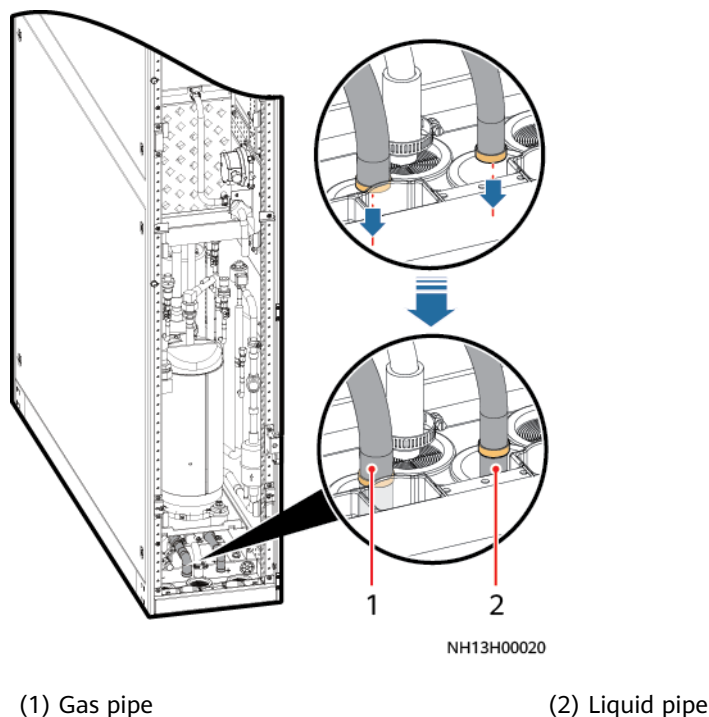
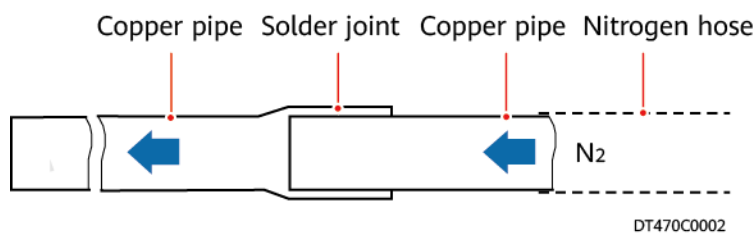


Figure 4-60 Welding



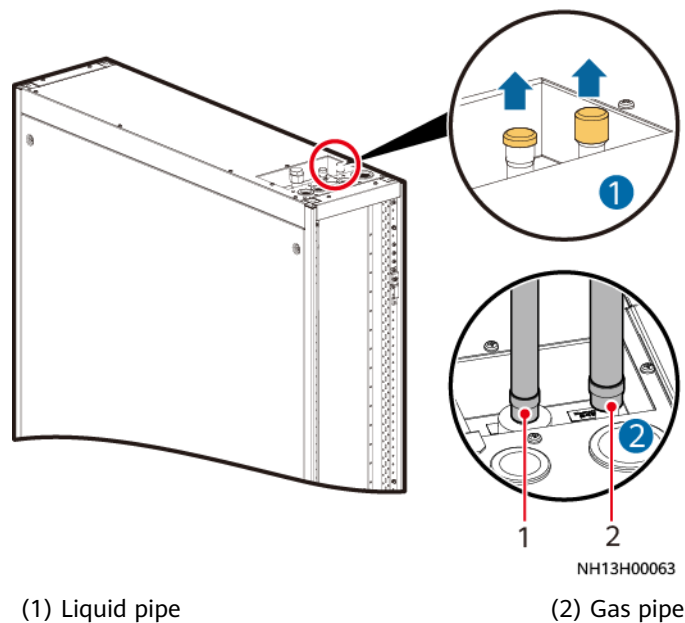
Step 2 [Figure 4-59](#) shows the position for welding straight pipes.

NOTICE

When routing pipes from the top, do not route the pipes over servers or other devices to protect the servers or other devices from being affected by pipe leaks.

- Step 3** Connect the refrigerant gas and liquid pipes for the two straight pipes respectively to the gas and liquid pipes for the outdoor unit.
- Step 4** When you route pipes from the top, use a welding torch to remove the plugs at the refrigerant pipe ends. Connect the refrigerant gas pipe and liquid pipe to the gas pipe and liquid pipe of the outdoor unit respectively using a welding torch, as shown in [Figure 4-61](#).

Figure 4-61 Top pipe routing



----End

4.7.3 Installing Drainpipes

NOTICE

- When procuring water pipes, ensure that the water pipes covered with thermal insulation foam can be routed through holes in the bottom or top plate. For the hole specifications, see [4.1.3 Preparing Knock-out Holes for the Indoor Unit](#).
- The humidifier water inlet pipe connects to running water or other water supply systems, and the drainpipe connects to the drainage system.
- It is recommended that a water leakage detection device be added to the top drainpipe or water supply pipe to prevent faults caused by a pipe burst.
- The external drainpipe must have a certain gradient (1:100), and no accumulated water is allowed.

Determine the drainpipe to be connected based on whether a water pump is configured onsite. See [Table 4-17](#).

Table 4-17 Pipe routing description

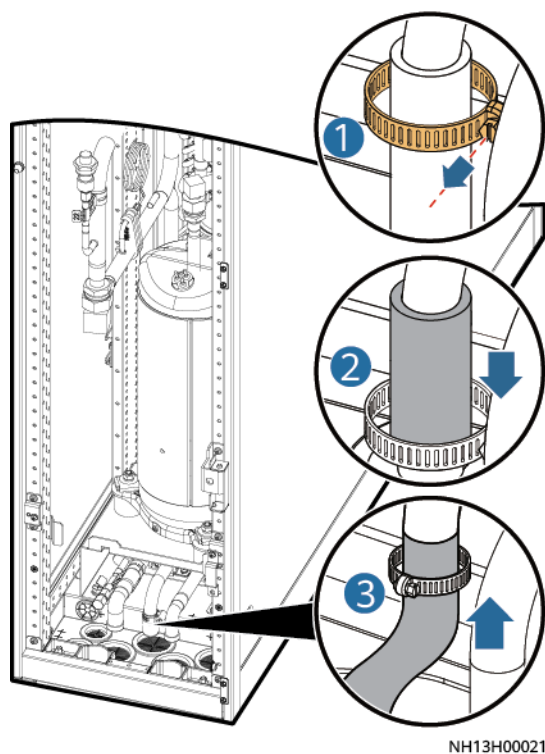
Drainage Mode	Pipe Routing Mode	Connection Method
Water pump	Top	See A in Figure 4-26 .
	Bottom	See B and C in Figure 4-26 .
Automatic drainage	Bottom	See B and C in Figure 4-26 .

A water pump drainpipe can be routed from the top or bottom. Determine the pipe routing mode based on site conditions.

Bottom Pipe Routing

Use a flat-head screwdriver to remove the hose clamp from the pipe and take out the hose delivered with the smart cooling product. Mount the hose onto the drainpipe and secure it using the hose clamp, as shown in [Figure 4-62](#). Wrap the entire pipe with thermal insulation foam.

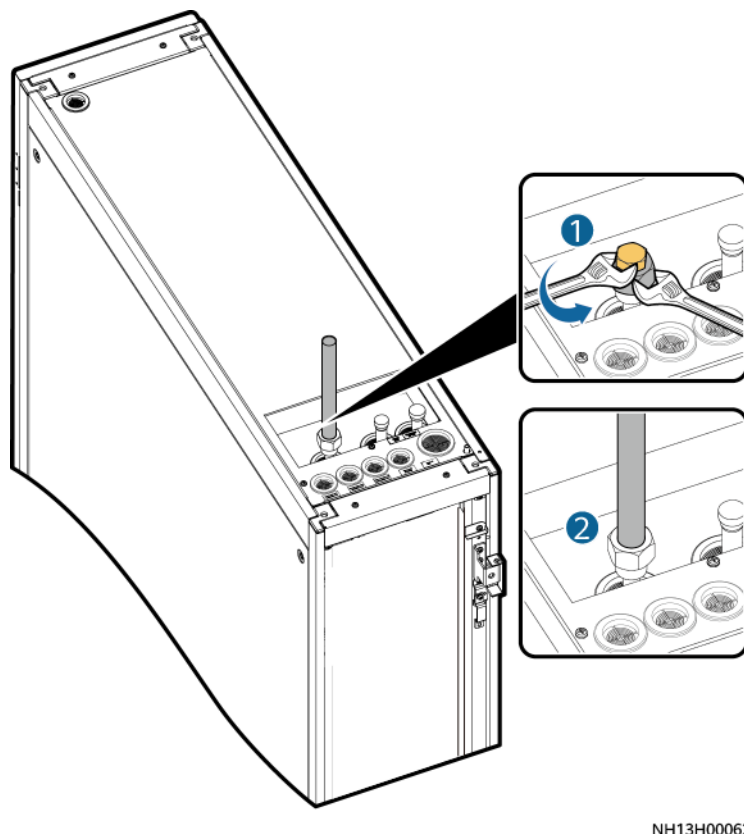
Figure 4-62 Connecting the drainpipe in the scenario of bottom pipe routing



Top Pipe Routing

Remove the water pipe plug from the top of the unit using an adjustable wrench and connect the drainpipe, as shown in [Figure 4-63](#). Wrap the entire pipe with thermal insulation foam.

Figure 4-63 Connecting the drainpipe in the scenario of top pipe routing



4.7.4 (Optional) Installing the Water Inlet Pipe to the Wet Film Humidifier

A humidifier water inlet pipe can be routed from the bottom or top. You can route the pipe based on site requirements.

NOTICE

- When routing pipes from the top, do not route the pipes over servers. If unavoidable, take measures to protect the servers from being affected by pipe leaking.
- Do not remove the humidifier water inlet pipe to prevent sealing failure between the water inlet pipe and the wet film humidifier.

The humidifier water inlet pipe is a hose installed under the humidifier. When connecting the hose, straighten the hose, as shown by [Figure 4-64](#) and [Figure 4-65](#).

NOTICE

After routing pipes, secure it with cable ties along the right side post of the cabinet.

Figure 4-64 Routing a humidifier water inlet pipe from the bottom

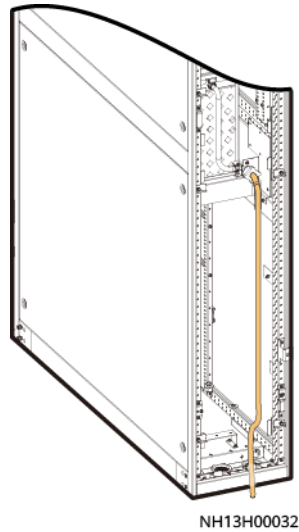
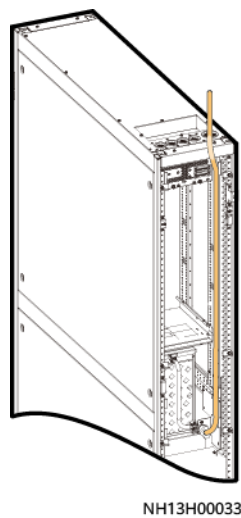


Figure 4-65 Routing a humidifier water inlet pipe from the top



4.7.5 Leakage Test with Nitrogen

Context

NOTICE

- The measuring range of the pressure gauge must be greater than or equal to 4.0 MPa, and the tolerance range of the rubber hose must be greater than or equal to 4.5 MPa.
- During pressure preservation, do not remove the rubber hoses and pressure gauges; otherwise, nitrogen may leak.

The nitrogen injection ports are located at the low-pressure needle valve and discharge pipe needle valve, as shown in [Figure 4-66](#).

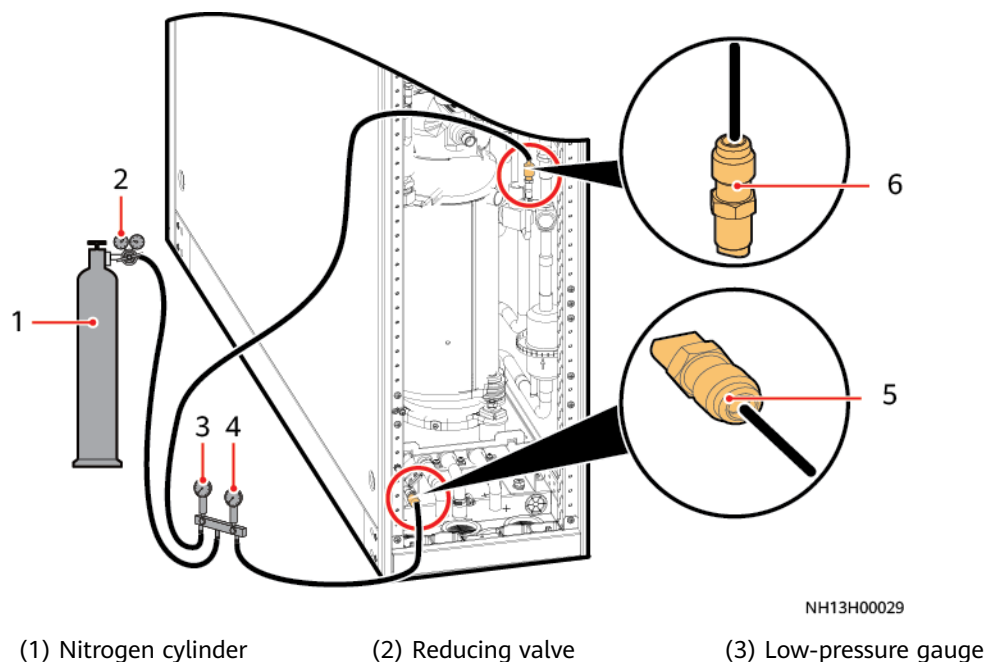
Procedure

- Step 1** Connect the pressure gauge, hose, and nitrogen cylinder. Install a reducing valve at the outlet of the nitrogen cylinder, as shown in [Figure 4-66](#). The outlet pressure of the reducing valve must not be more than 3.0 MPa.

NOTICE

If the outlet pressure of the reducing valve is greater than 3.0 MPa, some parts of the system may be damaged.

Figure 4-66 Nitrogen injection for pressure preservation (without a low temperature component)

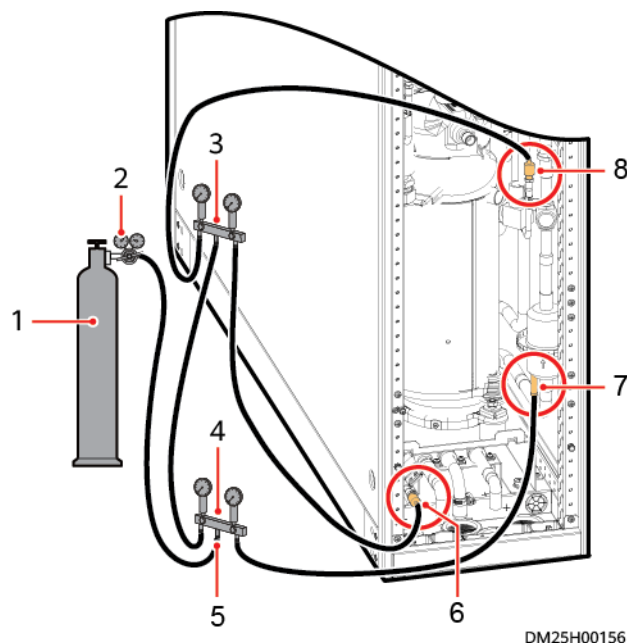


(4) High-pressure gauge

(5) Discharge pipe needle
valve

(6) Low-pressure needle valve

Figure 4-67 Nitrogen injection for pressure preservation (with a low temperature component)



(1) Nitrogen cylinder

(2) Reducing valve

(3) Pressure gauge 1

(4) Pressure gauge 2

(5) Connection nut

(6) Discharge pipe needle
valve

(7) Liquid pipe needle valve

(8) Low-pressure needle valve

Step 2 Inject 3.0 MPa nitrogen and preserve the pressure for at least 12 hours (24 hours is recommended). The system pressure should stay constant under unchanging ambient temperature conditions. If the pressure has a slight deviation due to great change in the ambient temperature, perform the test again.

Step 3 If welding defects exist, locate and repair the leaks. If the pressure does not change, exhaust nitrogen through the injection needle valves.

----End

4.8 Installing Cables

4.8.1 Cable Connection Precautions

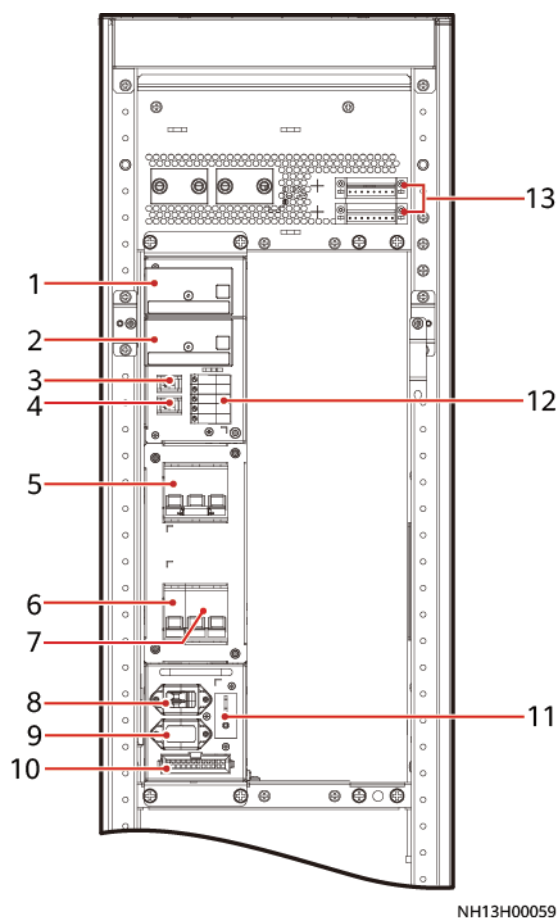
- Check that the input power cable of the indoor unit has no reverse phase sequence or open phase.
- Keep cables away from the compressor, fan, and copper pipe (if unavoidable, take protective measures), and connect cables securely.
- The device must be grounded as required by local electrical regulations.

- Before connecting cables, remove the power cable protective cover.
- Cables must be routed in through the cable clips.
- Power cables and ground cables are routed and bundled separately from other types of cables.

4.8.2 Ports for an Electrical Control Box

Figure 4-68 shows the port layout on the electrical control box.

Figure 4-68 Port layout on the electrical control box



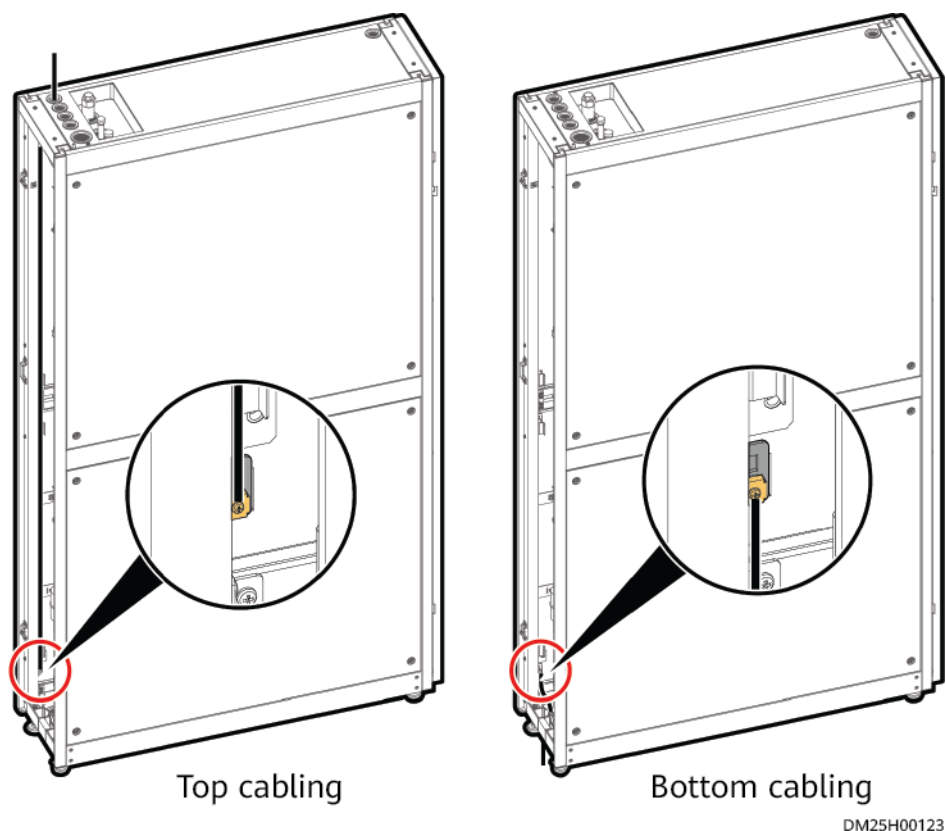
- | | |
|--|---|
| (1) Active power supply | (2) Standby power supply |
| (3) Contactor control switch (MD1) | (4) Contactor control switch (MD2) |
| (5) Drive switch (QF3) | (6) Switch (QF12) for the receiver heater (optional for the outdoor unit) |
| (7) Electric heater switch (QF4) | (8) Compressor PSU power port (X101) (connection not required onsite) |
| (9) Power supply port (X102) for the electric heater and outdoor unit fan (connection not required onsite) | (10) External signal port (X103) (connection not required onsite) |
| (11) Surge protection board grounding (connection not required onsite) | (12) Outdoor unit power 1U, 1V, 1W and Low temperature component power L, N (AC3) |

(13) External signal port (X301, X302)
(connected by yourself)

4.8.3 Installing the Equipotential Ground Cable

The following figure shows the equipotential ground position.

Figure 4-69 Equipotential ground position



4.8.4 Installing the Indoor Unit Power Cable

Prerequisites

Before connecting cables, remove the top cover from the power terminals.

Context



CAUTION

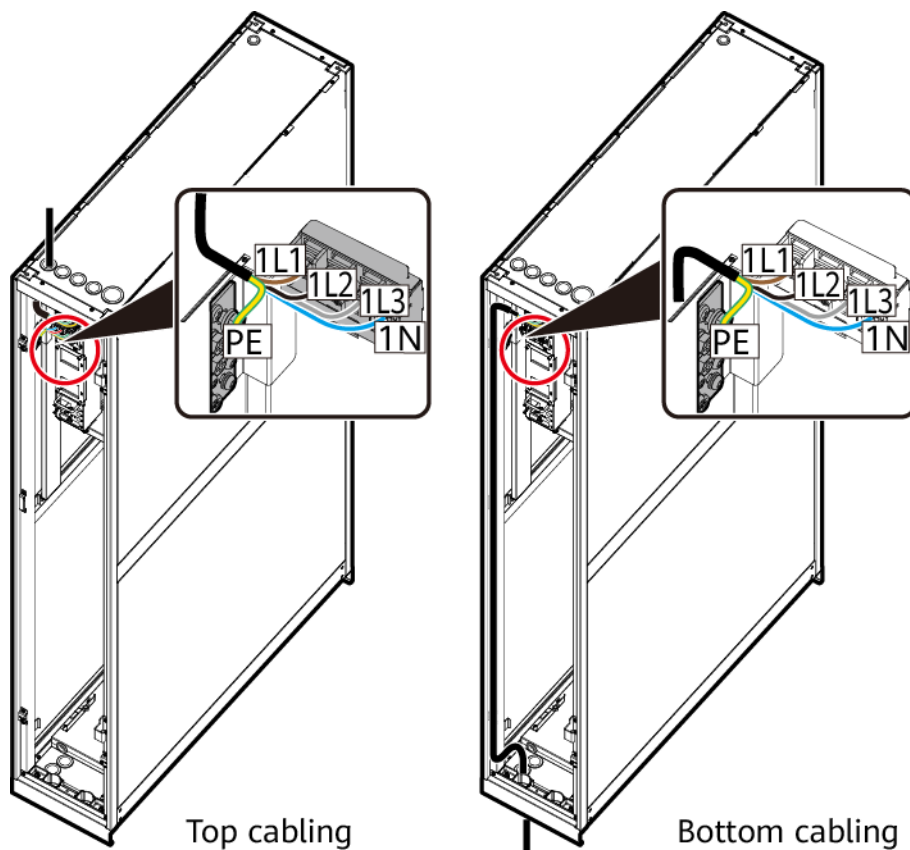
- Route power cables from the top or bottom.
- If there is only one power supply, connect the power cable to the main power route.

Procedure

Step 1 If there is only one power supply, connect the external power cable to the L1, L2, L3, and N terminals for the active input of the indoor unit. If there are two power supplies, connect the external power cables to the 1L1, 1L2, 1L3, and 1N terminals for the active input and the 2L1, 2L2, 2L3, and 2N terminals for the standby input of the indoor unit.

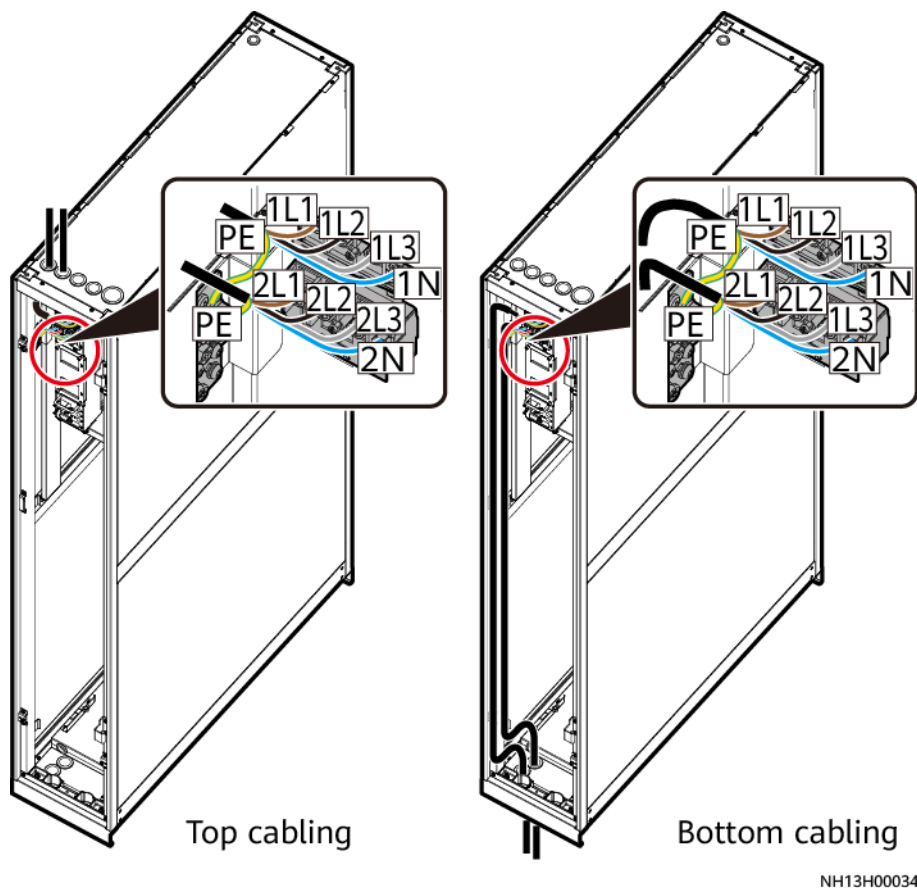
Step 2 Connect the PE cable to the cabinet ground bar.

Figure 4-70 Routing power cables in the single power supply scenario



NH13H00035

Figure 4-71 Routing power cables in the dual power supply scenario



----End

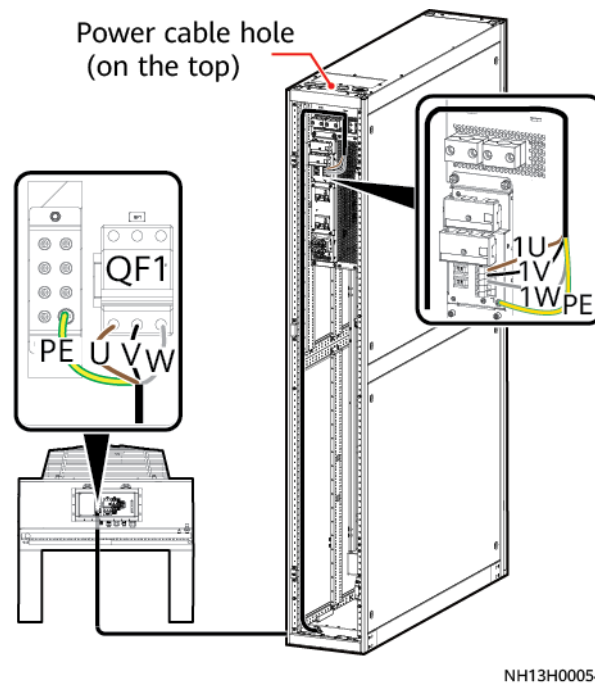
4.8.5 Installing the Outdoor Unit Power Cable

Route the outdoor unit power cable through the cabinet cable hole to the 1U, 1V, and 1W terminals on the indoor unit. Connect the PE cable to the PE terminal in the lower-right corner.

CAUTION

- Ensure that the cables are connected in the correct phase sequence.
- The outer insulation layer must be reserved when the cable is routed through the waterproof connector.

Figure 4-72 Connecting the power cable between the indoor and outdoor units



4.8.6 (Optional) Installing Power Cables for the Low Temperature Component

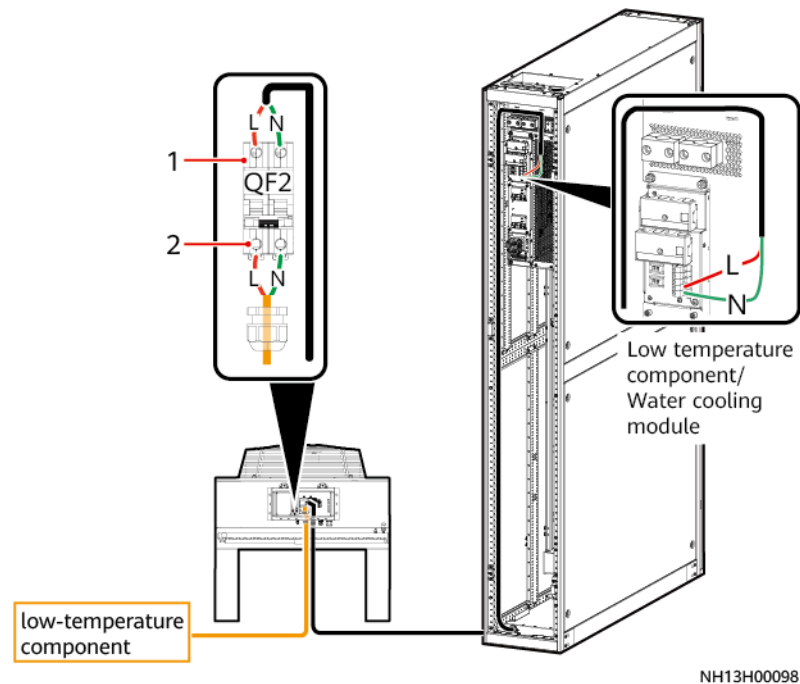
Prerequisites

Before connecting cables, remove the top cover from the power terminals.

Procedure

- Step 1** Connect the cable delivered with the low temperature component to the L/N terminal on the outdoor unit QF2.

Figure 4-73 Connecting the power cable for an outdoor unit



(1) Power cable for the low temperature component between the outdoor unit and the indoor unit

(2) Power cable between the low temperature component and the outdoor unit

NOTE

The label is "Receiver heater/Water cooling module" or "Low temperature component/Water cooling module". The actual label prevails.

Step 2 Connect one end of an additional 2 x 1.5 mm² power cable for the low temperature component to the L/N terminal on the outdoor unit QF2, and the other end to the L/N terminal on the indoor unit.

Step 3 Secure the cable on the post of the cabinet with cable ties.

----End

4.8.7 Preparations Before Signal Cable Connections

NOTICE

- Before connecting signal cables, take effective ESD measures.
- Secure signal ports to a torque of 0.5 N·m.
- Routing for the power cables and monitoring cables meets the requirements for routing electric and ELV cables and complies with the cable routing plan.

NOTE

- You can purchase signal cables from Huawei or another vendor.
- Before connecting cables, determine the cable routes based on engineering survey.

Figure 4-74 shows the zoomed-in view of the external signal ports that are used for alarm output from the main control board and access of the outdoor unit startup and shutdown, remote startup and shutdown of the indoor unit, water sensor, smoke sensor, and mains failure alarm signals.

Figure 4-74 Zoomed-in view of external signal ports

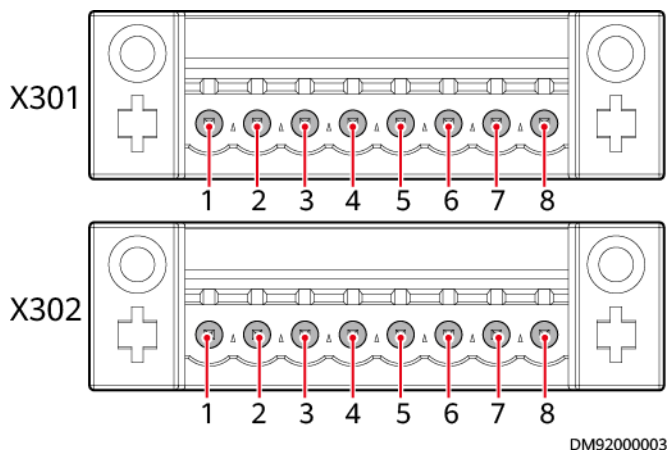


Table 4-18 describes the definitions and functions of external signal ports.

Table 4-18 External signal port description

No.	Port Silk Screen	Port Name	
X301	1	Outdoor unit ON/OFF control	Outdoor unit ON/OFF control +
	2		Outdoor unit ON/OFF control -
	3	Smoke sensor	Smoke sensor power supply (12 V DC)
	4		Smoke sensor feedback
	5	Remote startup and shutdown	Remote startup and shutdown+
	6		Remote startup and shutdown-
	7	Water sensor	Water leak detection- contact 1 (water leak in the floor)+
	8		Water leak detection- contact 1 (water leak in the floor)-
X302	1	Outdoor unit RS485 control	RS485-SW+
	2		RS485-SW-
	3		GND-ISO
	4	Common alarm 1	Common alarm 1+
	5		Common alarm 1-

No.	Port Silk Screen	Port Name	
	6	Common alarm 2	Common alarm 2+
	7		Common alarm 2-
	8	Reserved	-

NOTICE

- The female connector needs to be removed from the wiring terminal on the external signal port. After the cable is connected to the female connector, reconnect the connector to the wiring terminal.
- Avoid reverse connection for X301 and X302 terminals.

4.8.8 Installing the Outdoor Unit Signal Cable

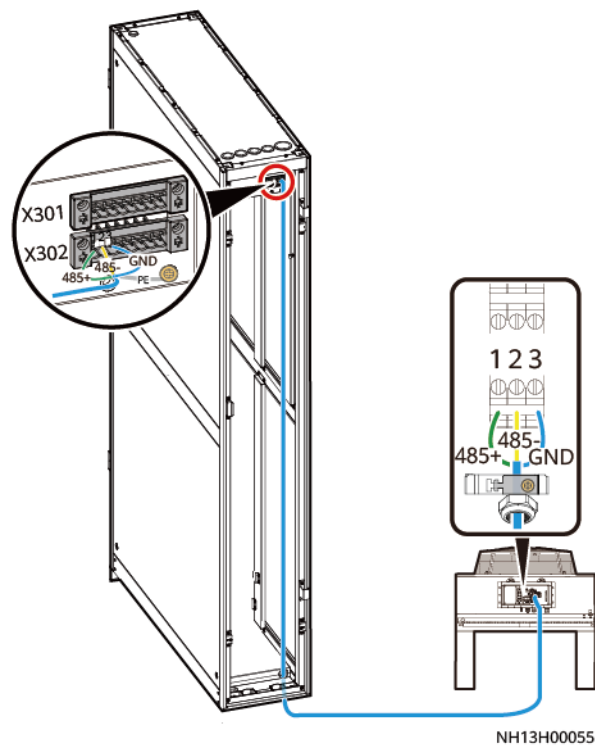
Context

This cable is required only for the outdoor unit configured with a temperature control intelligent monitoring board. The following figure shows the position of the temperature control monitoring board. This cable is not required for other outdoor units.)

Procedure

- Step 1** Route the cable through the cable protection ring on the top or bottom from the outside, then through the cable hole on the top or bottom of the electric control box along the outside of the electric control box.
- Step 2** Connect the signal cable to terminals 1, 2, and 3 on the X302 terminal block of the indoor unit and to terminals 1, 2, and 3 on the outdoor unit.

Figure 4-75 Connecting the signal cable between the indoor and outdoor units



Step 3 Secure the cable using cable ties.

NOTICE

The shield layer of signal cable must be grounded.

- Air-cooled outdoor unit: The shield layer must be routed through the buckle and crimped properly.
- Indoor unit: The shield layer must be reliably connected to the nearby PE point.

----End

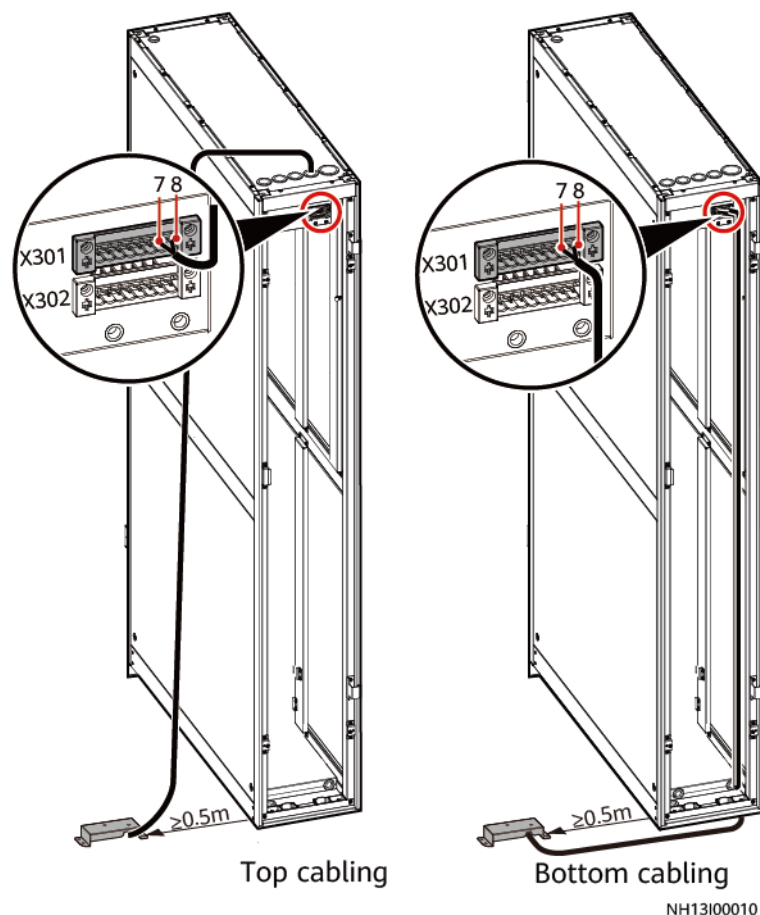
4.8.9 Installing the Water Sensor Cable

Procedure

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

Step 2 Connect the other end of the water sensor cable to points 7 and 8 on the external signal port X301.

Figure 4-76 Connecting the water sensor cable



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

----End

4.8.10 Installing Cables for T/H Sensors Outside the Cabinet

Context

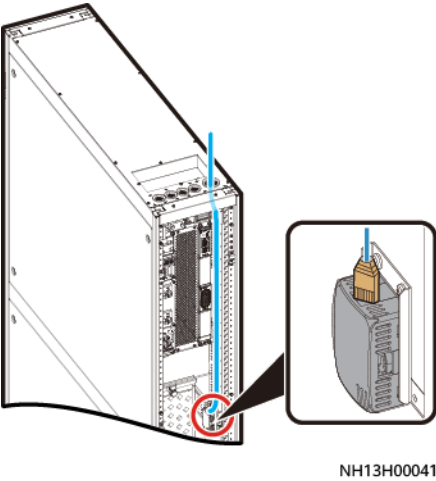
NOTICE

T/H sensors outside the cabinet are installed to detect the temperatures of cold/hot aisles. They can be flexibly installed on the server cabinet based on onsite situation. It is recommended that the T/H sensors be deployed near heat sources in the hot aisle, or near places that lack cooling capacity in the cold aisle. The T/H sensors outside the cabinet must be near the smart cooling product to sense the temperature of the outlet air, and must be away from the air exhaust vents of other smart cooling products.

Procedure

- Step 1** Connect one end of a network cable to the unwired port of the T/H sensor on the air return side, and connect the other end to the T/H sensor outside the cabinet. Connect the cables in series based on the actual positions of T/H sensors.

Figure 4-77 Cables routed T/H sensors



NOTE

- The T/H sensors should be 1.5 m above the ground (33 U).
- Each smart cooling product supports a maximum of ten T/H sensors.
- The RS485 ports at both ends of a T/H sensor (33010516) do not distinguish between the input and output, and they can be connected directly in series.

- Step 2** Set DIP switches of the T/H sensors according to [Table 4-19](#).

Figure 4-78 Position of the DIP switch on a T/H sensor

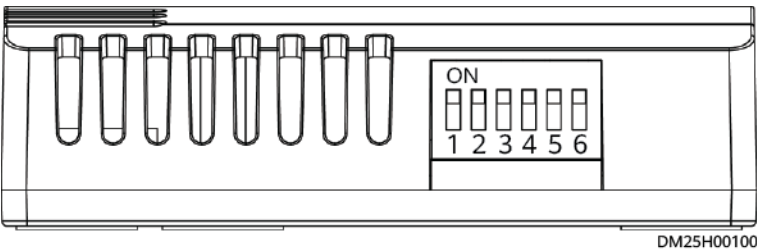


Table 4-19 DIP switch settings on T/H sensors

Location	Display Name	Address	DIP Switch Sequence No.					
			1	2	3	4	5	6
Air return side	Return air 2 temp/humid	1	ON	OFF	OFF	OFF	OFF	OFF

Location	Display Name	Address	DIP Switch Sequence No.					
			1	2	3	4	5	6
Cold aisle	Cold aisle 1 temp/humid	11	ON	ON	OFF	ON	OFF	OFF
	Cold aisle 2 temp/humid	12	OFF	OFF	ON	ON	OFF	OFF
	Cold aisle 3 temp/humid	13	ON	OFF	ON	ON	OFF	OFF
	Cold aisle 4 temp/humid	14	OFF	ON	ON	ON	OFF	OFF
	Cold aisle 5 temp/humid	15	ON	ON	ON	ON	OFF	OFF
Hot aisle	Hot aisle 1 temp/humid	21	ON	OFF	ON	OFF	ON	OFF
	Hot aisle 2 temp/humid	22	OFF	ON	ON	OFF	ON	OFF
	Hot aisle 3 temp/humid	23	ON	ON	ON	OFF	ON	OFF
	Hot aisle 4 temp/humid	24	OFF	OFF	OFF	ON	ON	OFF
	Hot aisle 5 temp/humid	25	ON	OFF	OFF	ON	ON	OFF

 NOTE

- The T/H sensors should be 1.5 m above the ground (33 U).
- Each smart cooling product supports a maximum of ten T/H sensors.

----End

4.8.11 (Optional) Installing Teamwork and Monitoring Communications Cables

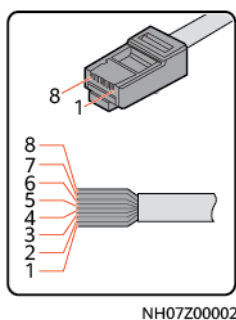
NOTICE

- Units of different models and software versions cannot be networked for teamwork.
- Connect teamwork and monitoring communications cables based on the networking scenario.
- The teamwork communications cable must be a shielded network cable of Cat 5e or higher specifications. The network cable length between adjacent units must be less than or equal to 100 m, and the maximum distance for CAN teamwork communication must be less than or equal to 310 m. Route cables in compliance with local standards. Take appropriate shielding measures, such as using a galvanized pipe or an ELV cable tray, to reduce the impact of electromagnetic interference on teamwork communication. Otherwise, teamwork networking may fail.

4.8.11.1 Preparing a Network Cable

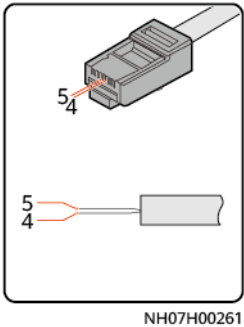
Step 1 Crimp a network cable.

Figure 4-79 Teamwork communications cable and FE monitoring communications cable



- | | | | |
|----------------------|------------|---------------------|-----------|
| (1) White-and-orange | (2) Orange | (3) White-and-green | (4) Blue |
| (5) White-and-blue | (6) Green | (7) White-and-brown | (8) Brown |

Figure 4-80 RS485 monitoring communications cable



(4) Blue (5) White-and-blue

----End

4.8.11.2 Smart Module Networking Scenario

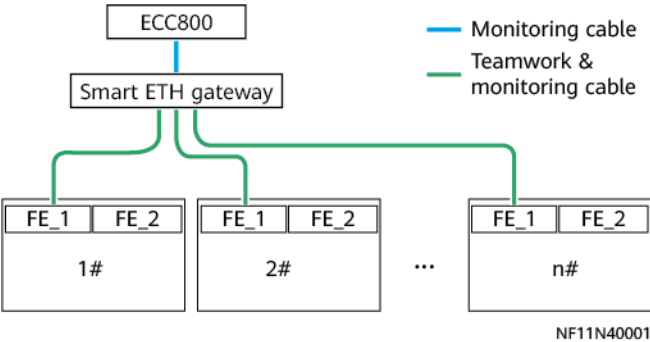
NOTE

Smart module networking is the networking of in-row smart cooling products using the ECC800 in a smart module.

Step 1 Connect teamwork and monitoring communications cables.

Networking	Teamwork	Monitoring
Protocol	MAC_CAN	Modbus-TCP

Figure 4-81 Connecting communications cables



----End

4.8.11.3 Independent Networking

NOTE

Select one of the following networking modes according to the actual situation.

4.8.11.3.1 CAN Teamwork + RS485 Monitoring

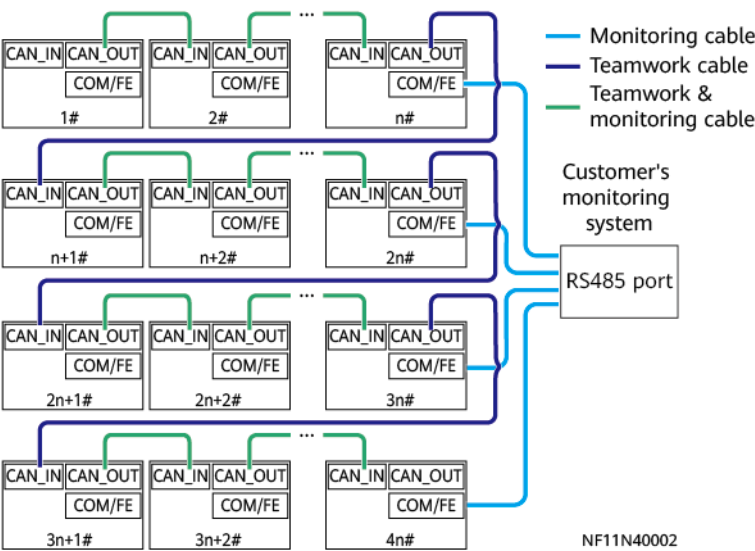
Step 1 Connect teamwork and monitoring communications cables.

Networking	CAN Teamwork	RS485 Monitoring
Protocol	CAN	Modbus-RTU
Description	One teamwork network supports a maximum of 32 units. On the Teamwork Settings screen of the display modules of the first and last units, set Enable teamwork CAN resistor to Yes .	It takes $3 \times n$ seconds to collect data from n units. If the time required for the host to collect data from all units does not meet the performance requirements, group the units. • If units are not grouped ($n = 1$), set RS485 monitoring grouping to Enable on the Modbus Settings screen for each unit. • If units are grouped ($n > 1$; recommended: $n \leq 4$), set RS485 monitoring grouping to Enable on the Modbus Settings screen for the unit with the COM/FE port connected. Retain the default setting (Disable) for other units.

NOTE

- Connect the COM/FE port on the main control module of the last unit in each group to the RS485 port on the host.
- Customers can purchase an ECC and NetEco as the monitoring system.

Figure 4-82 Connecting communications cables



----End

4.8.11.3.2 CAN Teamwork + FE Monitoring

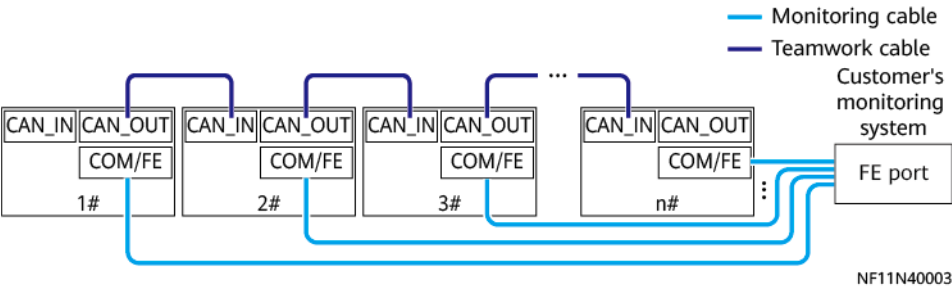
Step 1 Connect teamwork and monitoring communications cables.

Networking	CAN Teamwork	FE Monitoring
Protocol	CAN	Modbus-TCP/SNMP
Description	One teamwork network supports a maximum of 32 units. On the Teamwork Settings screen of the display modules of the first and last units, set Enable teamwork CAN resistor to Yes .	-

NOTE

Customers can purchase a switch and NetEco as the monitoring system.

Figure 4-83 Connecting communications cables



----End

4.8.11.3.3 FE Teamwork + RS485 Monitoring

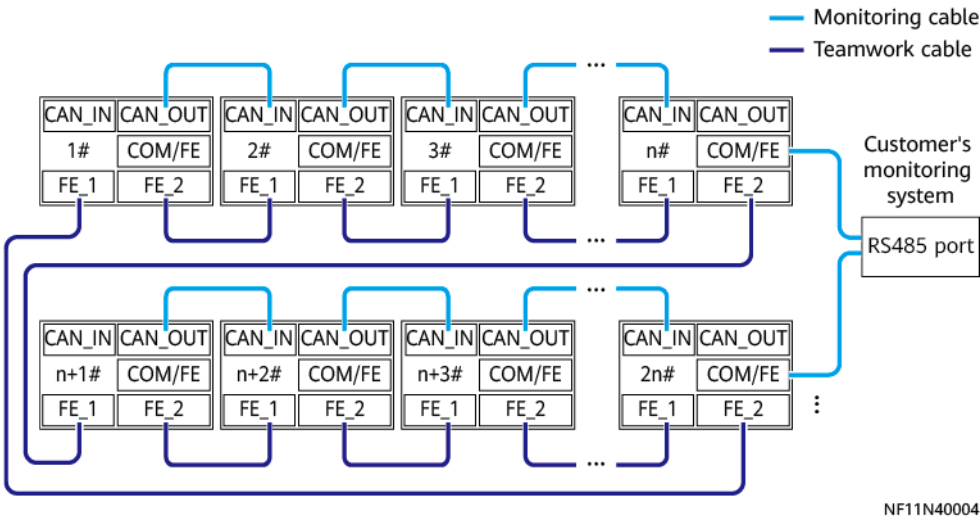
Step 1 Connect teamwork and monitoring communications cables.

Networking	FE Teamwork	RS485 Monitoring
Protocol	MAC_CAN	Modbus-RTU
Note	A teamwork network supports a maximum of 16 units.	It takes $3 \times n$ seconds to collect data from n units. If the time required for the host to collect data from all units does not meet the performance requirements, group the units. • If units are not grouped ($n = 1$), set RS485 monitoring grouping to Enable on the Modbus Settings screen for each unit. • If units are grouped ($n > 1$; recommended: $n \leq 4$), set RS485 monitoring grouping to Enable on the Modbus Settings screen for the unit with the COM/FE port connected. Retain the default setting (Disable) for other units.

NOTE

- Connect the COM/FE port on the main control module of the last unit in each group to the RS485 port on the host.
- Customers can purchase an ECC and NetEco as the monitoring system.

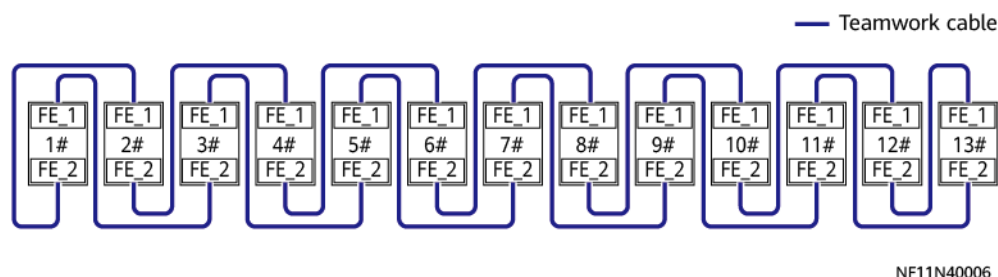
Figure 4-84 Connecting communications cables



If the length of a network cable in the FE teamwork is greater than or equal to 100 m, use the group-based ring networking mode.

1. Connecting units with odd numbers: Connect the FE_1 port of the unit with an odd number to the FE_2 port of the unit with the next odd number.
2. Connecting units with even numbers: Connect the FE_2 port of the unit with an even number to the FE_1 port of the next unit with an even number.
3. Connect FE_2 of No. 1 unit and FE_1 of No. 2 unit, and connect the remaining FE_1 and FE_2 of the last two units.

Figure 4-85 FE teamwork group-based ring networking (using 13 units as an example)



----End

4.8.11.3.4 FE Teamwork + FE Monitoring

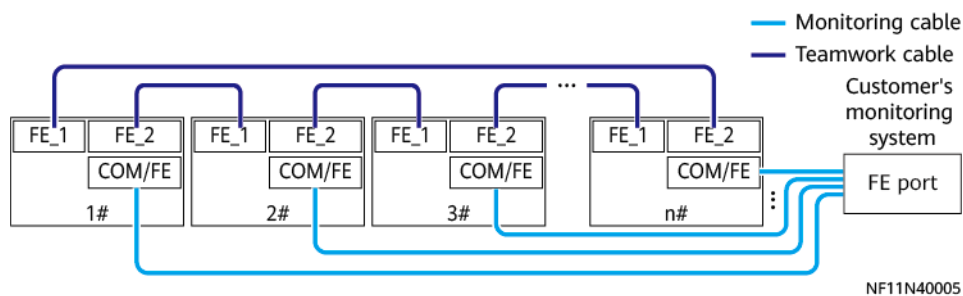
Step 1 Connect teamwork and monitoring communications cables.

Networking	FE Teamwork	FE Monitoring
Protocol	MAC_CAN	Modbus-TCP/SNMP
Description	A teamwork network supports a maximum of 16 units.	-

NOTE

Customers can purchase a switch and NetEco as the monitoring system.

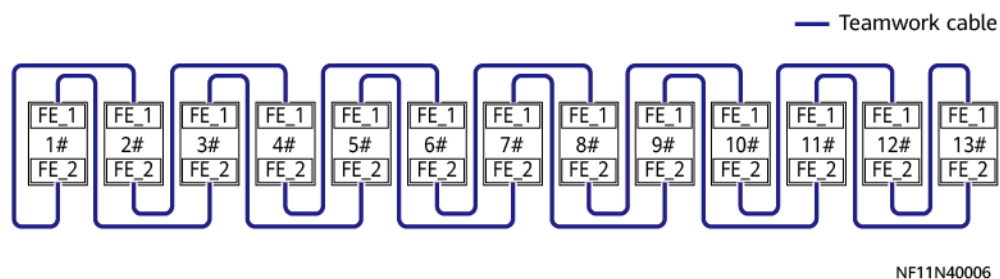
Figure 4-86 Connecting communications cables



If the length of a network cable in the FE teamwork is greater than or equal to 100 m, use the group-based ring networking mode.

1. Connecting units with odd numbers: Connect the FE_1 port of the unit with an odd number to the FE_2 port of the unit with the next odd number.
2. Connecting units with even numbers: Connect the FE_2 port of the unit with an even number to the FE_1 port of the next unit with an even number.
3. Connect FE_2 of No. 1 unit and FE_1 of No. 2 unit, and connect the remaining FE_1 and FE_2 of the last two units.

Figure 4-87 FE teamwork group-based ring networking (using 13 units as an example)



----End

5 Verifying the Installation

Table 5-1, Table 5-2 and Table 5-3 list the items for the verification after installation. Record results in the table after verification.

Table 5-1 Cabinet checklist

Check Item	Expected Result	Check Result
Cabinet	The cabinet is installed properly, without any tilt.	☐ Passed ☐ Failed
	The cabinet is secured to the base using bolts.	☐ Passed ☐ Failed
	Foreign matter inside the cabinet such as cable ties and cable cuts has been cleaned up.	☐ Passed ☐ Failed
Display module	The cables at the rear of the display module are connected.	☐ Passed ☐ Failed
Electric heater	The electric heater is secured.	☐ Passed ☐ Failed
Fan	The fan is secured.	☐ Passed ☐ Failed
	The fan has no foreign matter inside.	☐ Passed ☐ Failed
	The fan blades rotate properly.	☐ Passed ☐ Failed
Wet film humidifier	The water inlet solenoid valve is secured reliably and steadily.	☐ Passed ☐ Failed
	The wet film is secured reliably and steadily.	☐ Passed ☐ Failed
	Water inlet pipes are connected securely without leaks.	☐ Passed ☐ Failed
Compressor	The sheet metal fasteners on the compressor have been removed.	☐ Passed ☐ Failed

Check Item	Expected Result	Check Result
	The bolts on the compressor are tightened.	☐ Passed ☐ Failed
	The electronic expansion valve coils are correctly assembled and properly installed.	☐ Passed ☐ Failed
	Cables are securely connected to the EEV coils.	☐ Passed ☐ Failed
	The EEV coils do not rub against its surrounding objects.	☐ Passed ☐ Failed
Liquid level detector	The liquid level detector is securely installed.	☐ Passed ☐ Failed
	The interconnection terminal of the low liquid level detector has been connected.	☐ Passed ☐ Failed
	The low liquid level detector moves smoothly.	☐ Passed ☐ Failed
Air filter	The air filter is correctly installed according to the air flow direction on the frame.	☐ Passed ☐ Failed
Differential pressure switch	The cable ties are securely tightened around the pressure inlet tube.	☐ Passed ☐ Failed
	The pressure inlet tube is not blocked or bent.	☐ Passed ☐ Failed

Table 5-2 Pipe checklist

Expected Result	Check Result
Ports are connected properly. The pipe routes have oil traps, inverted traps, gradients (of refrigerant pipes), and supports.	☐ Passed ☐ Failed
The hose clamps and cable ties of the condensate water pipe are reliably secured.	☐ Passed ☐ Failed
All pipes are secured reliably.	☐ Passed ☐ Failed
All pipes are wrapped with thermal insulation foam, and the insulation foam is intact.	☐ Passed ☐ Failed
Water pipe joints are sealed by sealant.	☐ Passed ☐ Failed
The needle valve plug is secured and equipped with a valve bonnet.	☐ Passed ☐ Failed

Expected Result	Check Result
The needle valve plug is secured (torque of 0.45 ± 0.05 N·m), and the valve bonnet is tightened.	☐ Passed ☐ Failed
The pipes have no sharp bends.	☐ Passed ☐ Failed

Table 5-3 Cable connection checklist

Expected Result	Check Result
The cables have no sharp bends.	☐ Passed ☐ Failed
Cables are intact.	☐ Passed ☐ Failed
No open or short circuits, or incorrect connections occur in electrical loops.	☐ Passed ☐ Failed
The power cables to the indoor and outdoor units, signal cable to the outdoor unit, teamwork cable, and the T/H sensors are connected properly.	☐ Passed ☐ Failed
The rated specifications of the general switch meet the maximum current requirement.	☐ Passed ☐ Failed
All cables, connectors, and bolts are secured.	☐ Passed ☐ Failed
Devices are properly grounded.	☐ Passed ☐ Failed
Power cables and ground cables are routed and bundled separately from other types of cables.	☐ Passed ☐ Failed
Routing for the power cables and monitoring cables meets the requirements for routing electric and ELV cables and complies with the cable routing plan.	☐ Passed ☐ Failed

6 Power-On Commissioning

6.1 Vacuumizing and Precharging Refrigerant

NOTICE

During the commissioning of the smart cooling product, ensure that no comburent substance (such as air or additive) enters the smart cooling product system. Huawei is not liable for any risks and losses caused due to violation.

6.1.1 Refrigerant Charge Amount

The maximum one-way pipe length (L) is 100 m.

Table 6-1 Refrigerant charge amount (NetCol5000-A035)

Charge Amount of Refrigerant	Total Amount of Refrigerant to Be Charged	NetCol500-A060/A120	NetCol500-A060/A120 (with a low temperature component)	NetCol500-A080
$L \leq 10\text{ m}$	Charge amount (kg) = Standard charge amount	9.5	35	15
$10\text{ m} < L \leq 100\text{ m}$	Charge amount (kg) = Standard charge amount + Extra charge amount	$9.5 + (L - 10) \times 0.185$	$35 + (L - 10) \times 0.185$	$15 + (L - 10) \times 0.165$

Table 6-2 Refrigerant charge amount (NetCol5000-A025)

Charge Amount of Refrigerant	Total Amount of Refrigerant to Be Charged	NetCol500-A040	NetCol500-A040 (with a low temperature component)	NetCol500-A060/A120	NetCol500-A060/A120 (with a low temperature component)
$L \leq 10 \text{ m}$	Charge amount (kg) = Standard charge amount	8.6	32.7	9.4	34
$10 \text{ m} < L \leq 100 \text{ m}$	Charge amount (kg) = Standard charge amount + Extra charge amount	$8.6 + (L - 10) \times 0.17$	$32.7 + (L - 10) \times 0.19$	$9.4 + (L - 10) \times 0.18$	$34 + (L - 10) \times 0.18$

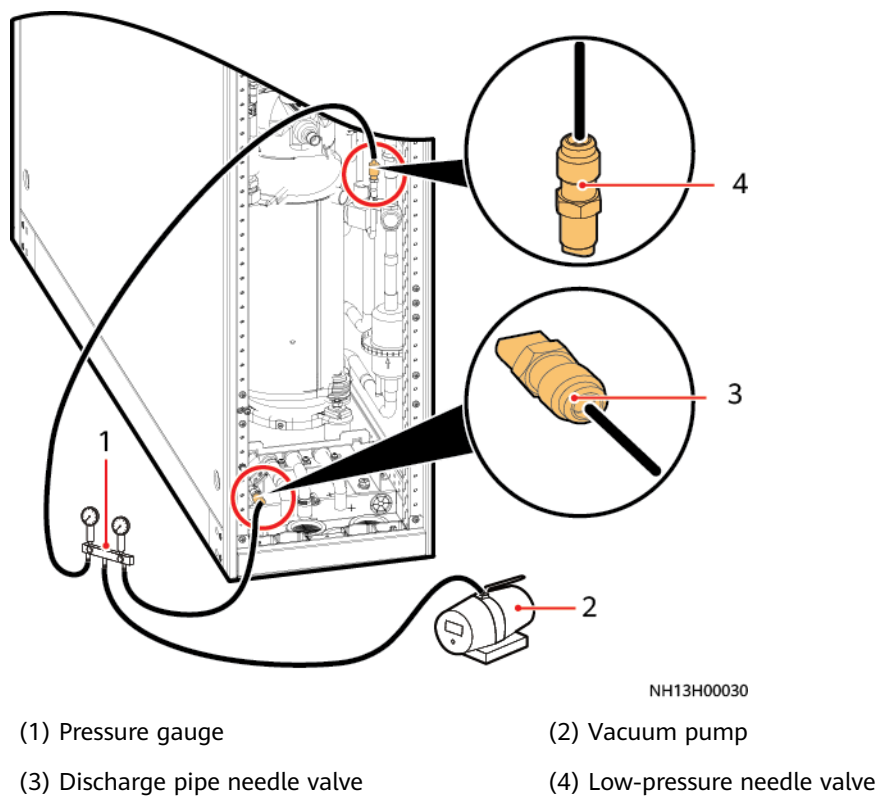
6.1.2 Vacuumizing

Procedure

Step 1 Connect a pressure gauge to the vacuum pump.

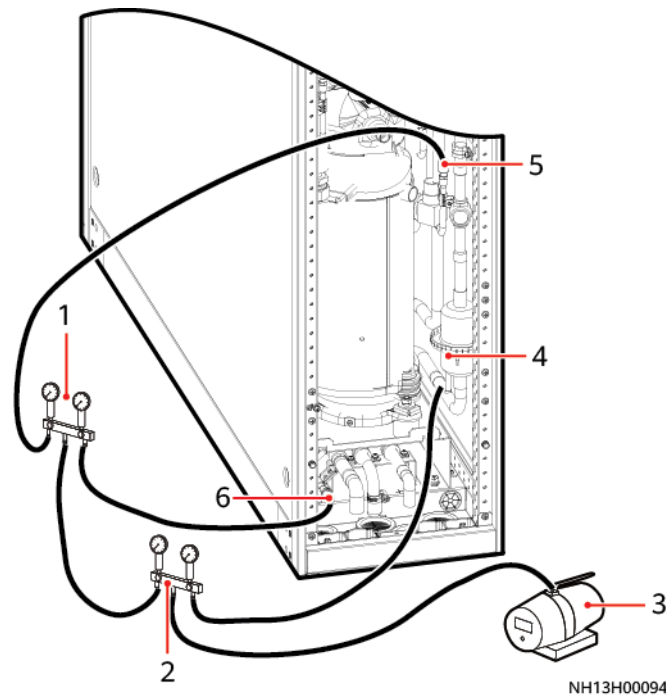
- If no low temperature component is installed on the outdoor side, connect the pressure gauge and vacuum pump at the low-pressure and discharge pipe needle valves to vacuumize the system simultaneously.

Figure 6-1 Vacuumizing the system without a low temperature component



- If a low temperature component is installed on the outdoor side, connect the pressure gauge and vacuum pump at the low-pressure, discharge pipe, and liquid pipe needle valves to vacuumize the system simultaneously.

Figure 6-2 Vacuumizing the system with a low temperature component



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

- Step 2** In the beginning, the vacuum pump makes loud noises and exhausts white gas from the exhaust vent. After 10 minutes, if it still exhausts white gas, 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 noises. Close and open the pressure gauges repeatedly for several times. The position of the pressure gauge pointers and the sound made by the vacuum pump should not change. Otherwise, the cooling system may not be sealed properly.
- Step 4** After making sure that the cooling system does not leak, vacuumize for at least 80 minutes. The final pressure of the vacuum pump (absolute pressure) should not be higher than 60 Pa and the sight glass shows that the vacuum pump is dry (green) inside.
- Step 5** After vacuumizing, close all valves of the pressure gauges and the vacuum pump (no disconnection is required), preserve the pressure for 10 minutes, and ensure that the system pressure (absolute pressure) is less than or equal to 90 Pa.

NOTE

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

----End

6.1.3 Precharging Refrigerant

Prerequisites

Before precharging refrigerant, ensure that air is exhausted from the gas pipe connecting to the refrigerant steel cylinder.

Context

CAUTION

- Wear antifreeze gloves when handling refrigerant.
 - When charging refrigerant, you are advised to use a safety valve to prevent refrigerant leakage during the removal of a rubber hose, which may cause frostbite.
-

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 [6.1.1 Refrigerant Charge Amount](#). Otherwise, the device may be damaged.
-

Procedure

- Step 1** Close the high-pressure valve and low-pressure valve of the pressure gauge.
- Step 2** Replace the vacuum pump with the steel cylinder of liquid refrigerant, as shown in [Figure 6-3](#).

Figure 6-3 Precharging refrigerant into the system without a low temperature component

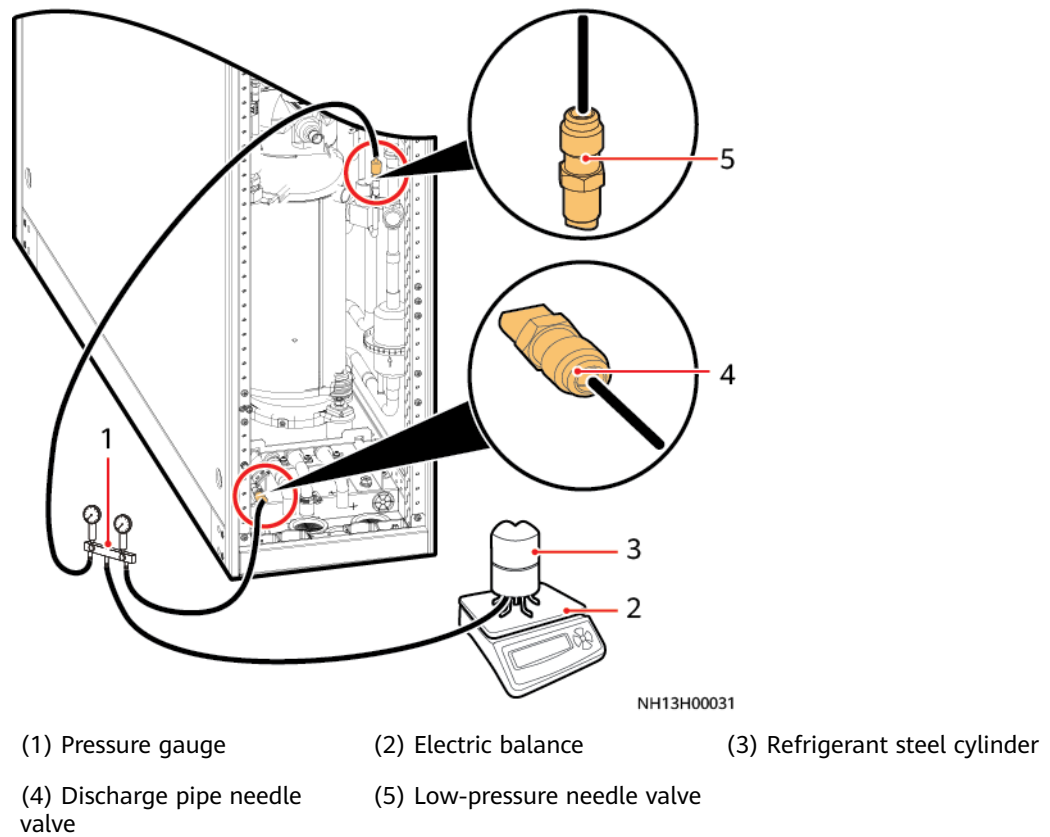
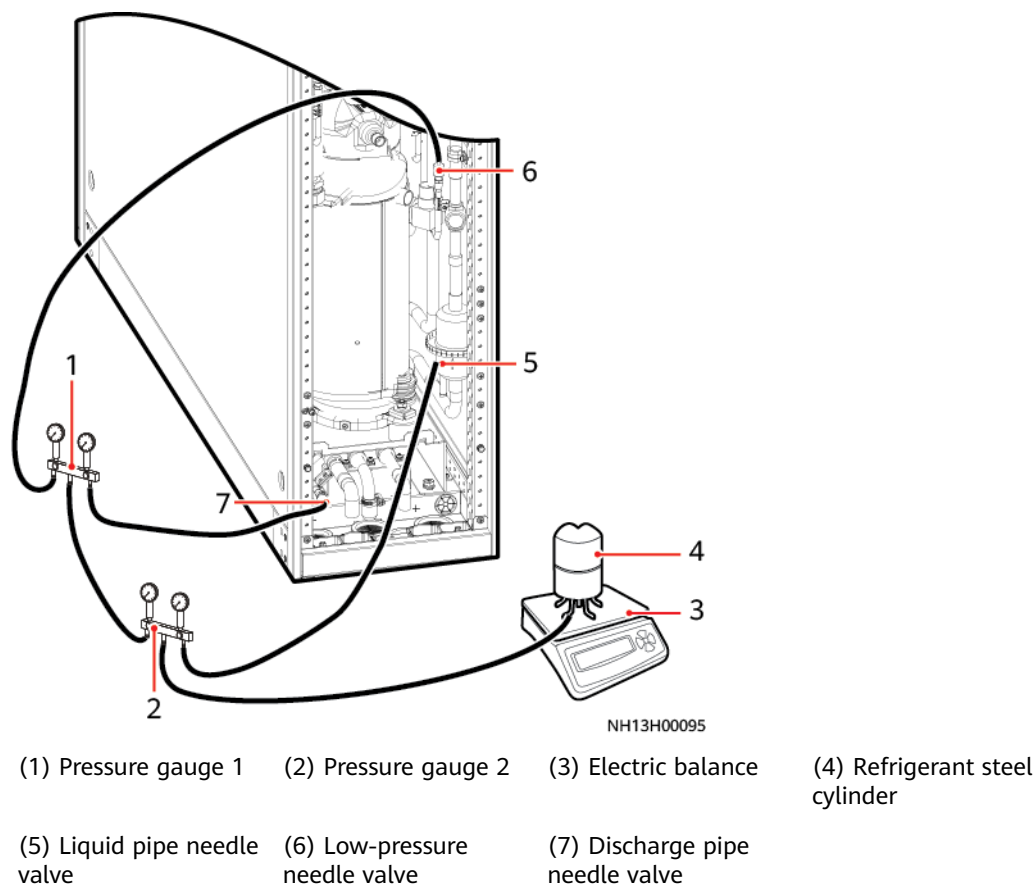


Figure 6-4 Precharging refrigerant when a low temperature component is configured



- Step 3** Slightly open the refrigerant cylinder valve and slightly loosen the connection nut of the pressure gauge and rubber hose. Tighten the nut when cold air escapes out of the nut.
- Step 4** Put the refrigerant steel cylinder upside down on an electric balance and clear the reading to zero.
- Step 5** Open all pressure gauge valves and the refrigerant cylinder valve to charge refrigerant.

NOTICE

- Never move the hose or steel cylinder during refrigerant charging. Otherwise, the value on the electric balance is influenced.
- When charging refrigerant for a cooling system without a low temperature component, open only the low-pressure gauge valve. Charge less than 1 kg of refrigerant from the low pressure side, and then close the low-pressure gauge valve. Open the high-pressure gauge valve and charge the remaining refrigerant from the discharge pipe needle valve on the high pressure side.
- When charging refrigerant for a cooling system with a low temperature component, open only the low-pressure valve of gauge 1 and gauge 2. Charge 1 kg of refrigerant from the low pressure side, and then close the low-pressure valve of gauge 1. Then, open the high-pressure valves of gauge 1 and gauge 2. Charge the remaining refrigerant from the discharge pipe needle valve and liquid pipe needle valve.

Step 6 Refrigerant to be precharged should be between half of the total calculated amount and the total calculated amount. If the total amount is not reached after refrigerant precharging, charge the remaining refrigerant when commissioning the system, as described in [6.7 Charging the Remaining Refrigerant](#).

Step 7 Close valves of the pressure gauges and refrigerant steel cylinder after charging refrigerant.

NOTE

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

----End

6.2 Power-On Preparations

Procedure

Step 1 Verify that the humidifier water inlet pipe and drainpipe are correctly connected, and that the thermal insulation foam is intact. Then connect refrigerant pipes and precharge refrigerant.

NOTICE

Ensure that there is no reverse or open phase for the input power cable of the smart cooling product. Otherwise, the smart cooling product may be damaged beyond repair.

Step 2 Verify that the 1L1, 1L2, 1L3, 1N, and PE cables are connected to the indoor and outdoor units in correct phase sequence. (If there are two power supplies, also verify the connection of the 2L1, 2L2, 2L3, 2N, and PE cables.)

Step 3 Verify that switch QF3 that controls the outdoor unit and compressor as well as switch QF4 that controls the heater is ON.

- Step 4** Verify that fan switches Fan1 to Fan7 are ON.
- Step 5** For the single power supply scenario, verify that the phase sequence is correct. For the dual power supply scenario, verify that the phase sequence is correct, and that MD1 and MD2 are ON.
- Step 6** Verify that the smart cooling product switch in the upstream power distribution frame (PDF) is OFF.
- Step 7** Verify that the input terminals of AC1 and AC2 are not short-circuited, and that the live wire is not connected to the ground.
- Step 8** Verify that the input voltage meets the requirement.
- Step 9** Verify that the indoor unit power cable is connected properly.
- Step 10** Verify that the signal cable between the indoor and outdoor units is properly connected.
- Step 11** Verify that the water sensor is properly installed.
- Step 12** If teamwork networking is required, verify that the teamwork cable is correctly connected.
- Step 13** Verify that the cable connections and DIP switch settings of the T/H sensors are correct.

----End

6.3 Power-On

Procedure

- Step 1** Turn on the indoor fan circuit breaker.
- Step 2** Turn on the smart cooling product switch in the upstream PDF. The display module of the smart cooling product automatically lights up.
- Step 3** After the initial power-on, the **Quick Settings** screen is displayed. Log in as user **admin**, as shown in [Figure 6-5](#).

Figure 6-5 Initial power-on

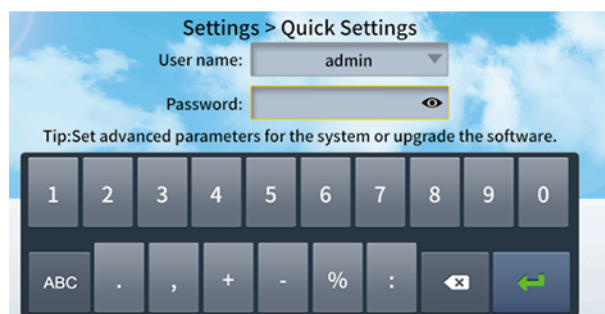


Table 6-3 Preset passwords

User	Preset Password	Permission Description
admin (administrator user)	000001	Can set all the menus.
operator (common user)	000001	Can only view parameters and set some parameters.

NOTICE

- User **operator** can access customer and delivery parameters. The parameters on the **Advanced** menu are delivery parameters. User **admin** can access customer, delivery, maintenance, and R&D parameters. The parameters on the **Advanced** menu are R&D parameters.
- To prevent the effect of misoperations on the system, log in as user **operator** before modifying parameters. Confirm with Huawei technical support before modifying parameters which cannot be modified by user **operator**. Otherwise, Huawei will not be liable for any consequences of the modification performed by the user.
- Only certified professionals are allowed to modify the advanced parameters. Unauthorized modifications may lead to device malfunction or damage.
- For system security purposes, change the preset password after first login.
- After login, your permission will become invalid automatically if no operation is performed for 3 minutes (configurable). For security purposes, tap **Logout**  at the lower-right corner of the screen to manually log out after you have completed all operations.

Step 4 Set related parameters as shown in [Figure 6-6](#) and tap **Next** until the home screen is displayed.

Figure 6-6 Quick Settings



Tab	Parameter	Description
Select Language	Language	Specifies the display language.

Tab	Parameter	Description
Date and Time Settings	Date format	Specifies the date format.
	Date settings	Specifies the date.
	Time zone	Specifies the time zone.
	Time	Specifies the time.
Teamwork Settings	Teamwork group No.	Specifies the planned teamwork group number. This parameter should be the same for all units in the same teamwork group.
	System address	Specifies the planned unit address. The addresses of units in the same teamwork group must be unique.
	Teamwork function	Specifies whether to enable the teamwork function. Set this parameter based on onsite heat load distribution. • Disable: A unit operates independently. • Enable: A unit operates in team with other units.
	Networking mode	Specifies the networking mode for teamwork control. The networking mode selected on the screen must match the actual networking mode. Otherwise, the teamwork function is unavailable.
	Number of systems in this group	Specifies the total number of units in this group. The value is an integer ranging from 1 to 32. NOTE This parameter is displayed after Teamwork function is set to Enable .
	Number of running systems in this group	Specifies the number of running units in this group. The value is an integer ranging from 1 to the value of Number of systems in this group . NOTE This parameter is displayed after Teamwork function is set to Enable .
System Optional Parts	Cold aisle sensor	Enables or disables a sensor.
	Hot aisle sensor	Enables or disables a sensor.

Tab	Parameter	Description
	Cold aisle temperature and humidity sharing	This function can be enabled only when at least one smart cooling product in the teamwork group is equipped with cold aisle T/H sensors. If this function is enabled, the master unit in the teamwork group collects the cold aisle temperature and humidity values from all units equipped with cold aisle sensors, and synchronizes the temperature and humidity control type and setpoints to all slave units.
	Hot aisle temperature and humidity sharing	This function can be enabled only when at least one smart cooling product in the group is equipped with hot aisle T/H sensors. If this function is enabled, the master unit in the teamwork group collects the hot aisle temperature and humidity values from all units equipped with hot aisle sensors, and synchronizes the temperature and humidity control type and setpoints to all slave units.
	Low temperature component	Specifies whether a low temperature component is used.
System Settings	Outdoor unit condensate mode	- Air-cooled: The outdoor unit is an air-cooled outdoor unit. - Water-cooled: The outdoor unit is a water-cooled module.
	Temp control intelligent monitoring board	A temperature control intelligent monitoring board is used to monitor the outdoor environment. Check the interior of the electric control box of the outdoor unit: - If there is an intelligent temperature control monitoring board, set this parameter to Yes. - If there is no intelligent temperature control monitoring board, set this parameter to No.

Tab	Parameter	Description
	Smart diagnosis function	• Enable: If there is an intelligent temperature control monitoring board, this function is enabled to start refrigerant status detection. • Disable: The smart diagnosis function is disabled. Conditions for starting refrigerant status detection: • No low temperature component is configured. • Altitude: ≤ 2000 m • $7.5\text{ m} \leq$ equivalent pipe length of the one-way pipe ≤ 100 m • $-8\text{ m} \leq$ vertical distance between the indoor and outdoor units $\leq +30$ m • $5^{\circ}\text{C} \leq$ outdoor ambient temperature $\leq 40.5^{\circ}\text{C}$
	Require password to start or shutdown onsite	• No: No password is required for startup or shutdown. • Yes: A password is required for startup and shutdown.
	Altitude	Set this parameter based on the actual altitude.
	Liquid pipe length	Set this parameter after Smart diagnosis function is set to Enable . Specify the length of the liquid pipe between the indoor and outdoor units of a smart cooling product.
	Height difference between indoor and outdoor units	Set this parameter after Smart diagnosis function is set to Enable . Specify the height difference between the indoor and outdoor units of a smart cooling product.

Tab	Parameter	Description
	Heating function	• Enable: The device starts humidifying when the ambient temperature is lower than the temperature setpoint by a certain range. • Enabled when active power supply is working: The device starts heating only when the active power supply is used and the ambient temperature is lower than the temperature setpoint by a certain range. (The electric heater is an auxiliary function. By default, it is enabled when the active power supply is used and is disabled when the standby power supply is used.) • Disable: The heating function is disabled.
	Heating mode	This parameter can be set to Dehumidifying heating, Low-temperature heating, or Dehumidification & Low temperature heating. • Dehumidifying heating: When the dehumidifying function is enabled, the electric heater is started to supplement the cooling capacity to achieve dehumidification at constant temperature. • Low-temperature heating: The heating function is enabled when the current temperature is lower than the temperature setpoint by a certain value. • Dehumidification & Low temperature heating: Both functions are available.

Tab	Parameter	Description
	Humidifying function	• Enable: The device starts humidifying when the ambient humidity is lower than the humidity setpoint. • Enabled when active power supply is working: The device starts humidifying only when the active power supply is used and the ambient humidity is lower than the humidity setpoint by a certain range. • Disable: The humidifying function is disabled.
	Dehumidifying function	• Enable: The device starts dehumidifying when the ambient humidity is higher than the humidity setpoint. • Disable: The dehumidifying function is disabled.
	DO_1	• If this parameter is set to Smoke & Water only, DO_1 acts according to DO_1 action when a smoke or water overflow alarm is generated. • If this parameter is set to Critical alarm, DO_1 acts according to DO_1 action when a critical alarm is generated. • If this parameter is set to Major alarm, DO_1 acts according to DO_1 action when a major alarm is generated. • If this parameter is set to Alarm, DO_1 acts according to DO_1 action when a critical alarm, major alarm, or warning is generated. • If this parameter is set to Startup status, DO_1 acts according to DO_1 action when the unit is started. • If this parameter is set to No, no alarm is generated when DO_1 is disconnected.

Tab	Parameter	Description
	DO_2	• If this parameter is set to Smoke & Water only, DO_2 acts according to DO_2 action when a smoke or water overflow alarm is generated. • If this parameter is set to Critical alarm, DO_2 acts according to DO_2 action when a critical alarm is generated. • If this parameter is set to Major alarm, DO_2 acts according to DO_2 action when a major alarm is generated. • If this parameter is set to Alarm, DO_2 acts according to DO_2 action when a critical alarm, major alarm, or warning is generated. • If this parameter is set to Startup status, DO_2 acts according to DO_2 action when the unit is started. • If this parameter is set to No, no alarm is generated when DO_2 is disconnected. • If this parameter is set to Power abnormal, DO_2 acts according to DO_2 action when a power exception alarm is generated.
	DO_1 action	This parameter can be set to On or Off , and is used together with DO_1. For details, see DO_1 description.
	DO_2 action	This parameter can be set to On or Off , and is used together with DO_2. For details, see DO_2 description.

Tab	Parameter	Description
	Floor water overflow alarm action	Set the action of the device if there is water overflow on the floor based on the actual scenario. • Shutdown: The device shuts down when a floor water overflow alarm is generated. • Inactivity: The device runs as usual when a floor water overflow alarm is generated. • Only indoor fan running: Only the indoor fan runs when a floor water overflow alarm is generated. • Humidifier stopped: Only the humidifier is stopped when a floor water overflow alarm is generated.
	In-cabinet water overflow alarm action	Set the action of the device if there is water overflow in the cabinet based on the actual scenario. • Shutdown: The device shuts down when an in-cabinet water overflow alarm is generated. • Inactivity: The device runs as usual when an in-cabinet water overflow alarm is generated. • Only indoor fan running: Only the indoor fan runs when an in-cabinet water overflow alarm is generated. • Humidifier stopped: Only the humidifier is stopped when an in-cabinet water overflow alarm is generated.
T/H Sensor	Temperature and humidity control type	When the application scenario is non-aisle containment, you are advised to choose Return air. Choose Cold aisle if cold aisle T/H sensors are installed. Hot aisle is not recommended.
	Temperature setpoint	After the temperature and humidity control type and the temperature value under this type are set, the device performs regulation based on the settings. • Return air: 26–35°C recommended • Supply air: 18–24°C recommended • Cold aisle: 18–24°C recommended • Hot aisle: 26–35°C recommended

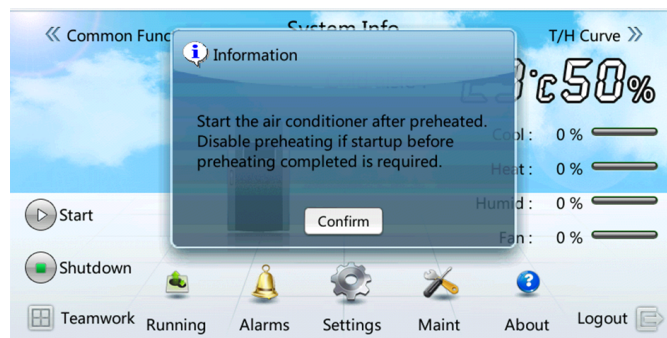
Tab	Parameter	Description
	Humidity setpoint	After the temperature and humidity control type and the humidity value under this type are set, the device performs regulation based on the settings. 40%–60% is recommended.
Comm Settings	Modbus Comm address	Enter the communication address planned for the smart cooling product. The management system communicates with the smart cooling product through this address. The communication addresses of the two smart cooling products connected to the same management system must be different.

----End

Follow-up Procedure

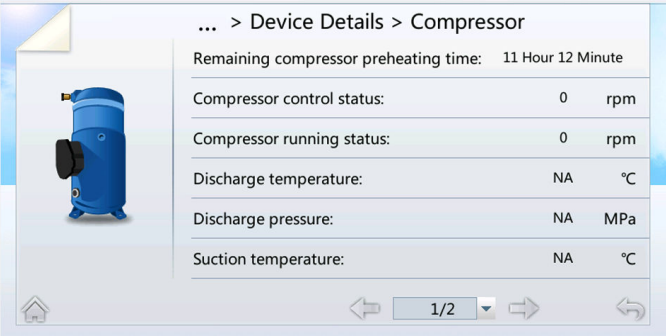
After powering on, the compressor starts preheating, and the system generates an alarm indicating that the compressor is preheating. Do not start the smart cooling product before the preheating ends. [Figure 6-7](#) is shown if you tap **Start**.

Figure 6-7 Compressor preheating warning



If you need to query the remaining preheating time, choose **Running > Device Details > Compressor** on the home screen.

Figure 6-8 Remaining compressor preheating time



6.4 Home Screen

The home screen of the display module displays the system status and allows you to access other function menus, such as **Running**, **Alarms** and **Settings**. **Figure 6-9** shows the home screen of the display module.

NOTICE

The information in the screenshots is for reference only. The actual parameters may vary.

Figure 6-9 Home screen

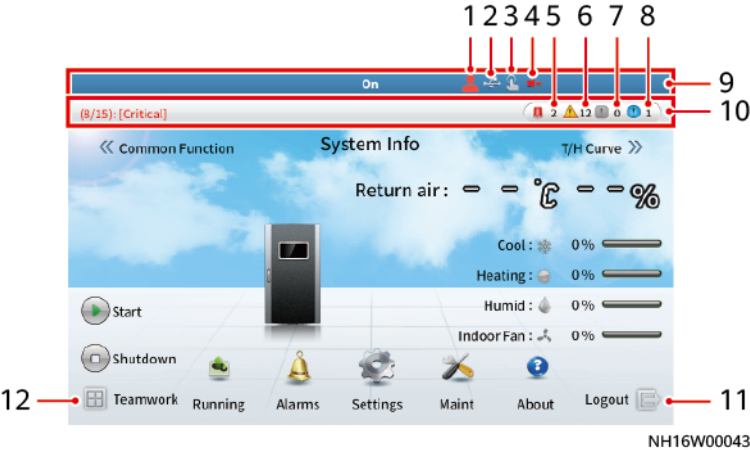


Table 6-4 Notes for the screen

No.	Item	Note
1	Permission status	 indicates that you have not logged in to the system.  indicates that you have logged in to the system as an operator user.  indicates that you have logged in to the system as an admin user.
2	USB status	 indicates that a USB flash drive is successfully connected to the display module.
3	Diagnostic mode status	 in the status bar indicates that the smart cooling product is in diagnostic mode. Tap the icon to exit from the diagnostic mode.
4	Buzzer status	The buzzer status can be set to On or Off. The  icon indicates that the buzzer is on. When the buzzer is on, it buzzes when an alarm is generated. When the buzzer is buzzing, you can tap anywhere on the screen to mute the buzzer. After the buzzer is muted, it still buzzes when a new alarm is generated. The  icon indicates that the buzzer is off (silenced). After the buzzer is silenced, it does not buzz when an alarm is generated.
5	Critical alarms	 0 indicates the number of active critical alarms.
6	Major alarms	 1 indicates the number of active major alarms.
7	Minor alarms	 0 indicates the number of active minor alarms.
8	Warnings	 1 indicates the number of active warnings.
9	Status bar	-
10	Alarm bar	You can tap  0  1  0  1 in the alarm bar to enter the active alarm screen that displays all active alarms.

No.	Item	Note
11	Login button/Logout button	Login  indicates that you have not logged in to the system, and can tap the icon to log in. Logout  indicates that you have logged in to the system as admin or operator user, and can tap the icon to log out.
12	Teamwork control button	 indicates that there is no teamwork control at present.  indicates that there is teamwork control without alarms at present.  indicates that there is teamwork control with alarms at present.

6.5 Setting Parameters

6.5.1 Setting T/H Sensor Parameters

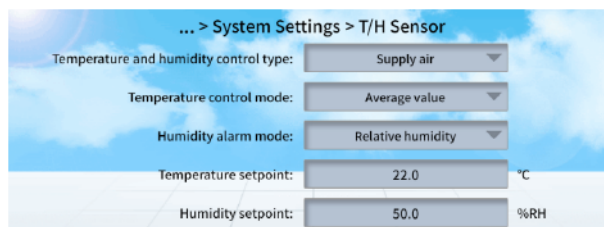
Prerequisites

- If T/H sensors outside cabinets have been deployed in the aisle, enable the sensors. Otherwise, skip [Step 2](#).
- This section describes how to enable **Cold aisle sensor 1**.

Procedure

- Step 1** On the home screen, choose **Settings > System Settings > T/H sensor**. The screen shown in [Figure 6-10](#) is displayed.

Figure 6-10 T/H Sensor



- Step 2** Set **Cold aisle sensor 1** to **Enable**.

- Step 3** Set temperature and humidity parameters.

Parameter	Description
Cold aisle sensor	Enables or disables a sensor.

Parameter	Description
Hot aisle sensor	Enables or disables a sensor.
Temperature and humidity control type	When the application scenario is non-aisle containment, you are advised to choose Return air . Choose Cold aisle if cold aisle T/H sensors are installed. Hot aisle is not recommended.
Temperature control mode	The temperature inside the equipment room or aisle is controlled based on the average value, maximum value, or minimum value collected by multiple sensors.
Humidity alarm mode	Set this parameter as required.
Temperature setpoint	After the temperature and humidity control type and the temperature value under this type are set, the device performs regulation based on the settings. - Return air: 26–35°C recommended - Supply air: 18–24°C recommended - Cold aisle: 18–24°C recommended - Hot aisle: 26–35°C recommended
Humidity setpoint	After the temperature and humidity control type and the humidity value under this type are set, the device performs regulation based on the settings. 40%–60% is recommended.

The relationship between the temperature setpoint and the humidity setpoint is as follows: Under the condition that the absolute humidity range is [0.0026, 0.0141] for the default temperature setpoint 23°C and relative humidity range [15% RH, 80% RH], ensure that the absolute humidity range is [0.0026, 0.0141] when you set the temperature setpoint and humidity setpoint.

Table 6-5 Setting example

Temperature Setpoint (°C)	Lower Limit of Humidity Setpoint (% RH)	Upper Limit of Humidity Setpoint (% RH)
15	24.7	80
16	23.1	80
17	21.7	80
18	20.4	80
19	19.2	80
20	18	80

Temperature Setpoint (°C)	Lower Limit of Humidity Setpoint (% RH)	Upper Limit of Humidity Setpoint (% RH)
21	16.9	80
22	15.9	80
23	15	80
24	15	75.3
25	15	70.9
26	15	66.9
27	15	63
28	15	59.5
29	15	56.1
30	15	53
31	15	50
32	15	47.3
33	15	44.7
34	15	42.2
35	15	40
36	15	37.8
37	15	35.8
38	15	33.9
39	15	32.1
40	15	30.5
41	15	28.9
42	15	27.4
43	15	26
44	15	24.7
45	15	23.4

----End

6.5.2 (Optional) Setting Teamwork Parameters

Prerequisites

The teamwork group number and addresses for the smart cooling products have been set as follows:

- Teamwork group No.: Group the smart cooling products in same aisle or adjacent areas as one, that is, assign one teamwork group number for them. At most four teamwork groups can be assigned (1–4).
- System address: The address (configurable range: 1–32) of each smart cooling product in the same group must be unique. The smart cooling product with the smallest unit address is the master unit, which collects, processes, and delivers group data.

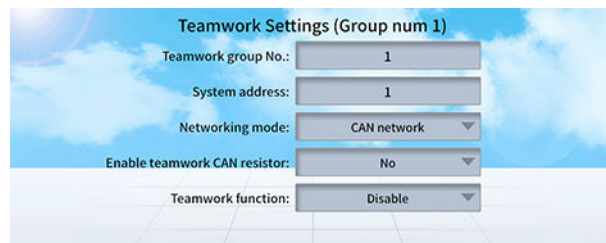
Context

The parameters in this section are for reference only. Set actually parameter values as required.

Procedure

- Step 1** On the home screen, tap  > **Teamwork Settings** to enter the **Teamwork Settings** screen, as shown in [Figure 6-11](#).

Figure 6-11 Teamwork Settings



- Step 2** Set teamwork parameters.

Parameter	Description
Teamwork group No.	Specifies the planned teamwork group number. This parameter should be the same for all units in the same teamwork group.
System address	Specifies the planned unit address. The addresses of units in the same teamwork group must be unique.

Parameter	Description
Enable teamwork CAN resistor	If CAN network is selected, set Enable teamwork CAN resistor to Yes for the first and last units. If Enable teamwork CAN resistor is set to No for the first and last units, the CAN communication quality will be affected, and even the teamwork CAN networking will fail. Yes: The teamwork control CAN resistor is enabled for the unit. No: The teamwork control CAN resistor is disabled for the unit.
Teamwork function	Specifies whether to enable the teamwork function. Set this parameter based on onsite heat load distribution. • Disable: A unit operates independently. • Enable: A unit operates in team with other units.
Networking mode	Specifies the networking mode for teamwork control. The networking mode selected on the screen must match the actual networking mode. Otherwise, the teamwork function is unavailable.
Teamwork parameter synchronization	If Teamwork function and Teamwork parameter synchronization are both set to Enable, you can select Set Local or Set Teamwork when setting parameters. NOTE • Set Local: Set parameters for the local unit. • Set Teamwork: Set parameters for all units in a teamwork group.
Number of systems in this group	Specifies the total number of units in this group. The value is an integer ranging from 1 to 32. NOTE This parameter is displayed after Teamwork function is set to Enable.
Number of running systems in this group	Specifies the number of running units in this group. The value is an integer ranging from 1 to the value of Number of systems in this group. NOTE This parameter is displayed after Teamwork function is set to Enable.

Parameter	Description
Percentage of units allowed to dehumidify in this group	Set Percentage of units allowed to dehumidify in this group based on site requirements. NOTE You are advised to retain the default value. The number of units that perform the dehumidification function is controlled to prevent all units in the group from starting dehumidification at the same time, thereby avoiding supercooling and temperature fluctuation in the equipment room. • Number of units allowed to dehumidify is the roundup value of Total number of systems in this group multiplied by Percentage of units allowed to dehumidify in this group. The units allowed to dehumidify are automatically deployed among all running units. • If the anti-competitive running mode of the teamwork group is dehumidification, the master unit sends the anti-competitive running flag whose value is dehumidification allowed to the units allowed to dehumidify.
Rotation function	Indicates whether to allow the smart cooling products to work as the standby device in turn, maximizing their service life. NOTE It is recommended that the function be enabled when the load is even.
Rotation period	Number of days for rotation (1–30).
Rotation time	Specifies the start time of rotation for the active and standby units. 24 time points in a day (0–23).
Forced rotation	Indicates whether to enable forced rotation regardless of the specified rotation time. After a forced rotation, the rotation period starts again.

Parameter	Description
Requirement control	Indicates whether to enable or disable the requirement control function on the master unit. - When Requirement control is set to Disable, the master unit does not synchronize operating data to slave units, and all the smart cooling products in the group operate based on their own requirements, not referring to the mode delivered by the master unit. - When Requirement control is set to Anti-competitive running, the master unit synchronizes operating data (the temperature and humidity control type and set points of the master unit) to the slave units, and all the smart cooling products in the group refer to the mode delivered by the master unit.
Cascade function	When requirement control is enabled, you can enable the cascade function to start standby units if running units cannot meet the cooling capacity requirement.
Cold aisle temperature and humidity sharing	This function can be enabled only when at least one smart cooling product in the teamwork group is equipped with cold aisle T/H sensors. If this function is enabled, the master unit in the teamwork group collects the cold aisle temperature and humidity values from all units equipped with cold aisle sensors, and synchronizes the temperature and humidity control type and setpoints to all slave units.
Hot aisle temperature and humidity sharing	This function can be enabled only when at least one smart cooling product in the group is equipped with hot aisle T/H sensors. If this function is enabled, the master unit in the teamwork group collects the hot aisle temperature and humidity values from all units equipped with hot aisle sensors, and synchronizes the temperature and humidity control type and setpoints to all slave units.
Outdoor unit auto-cleaning function	Outdoor unit auto-cleaning function: Disable the cooling and dehumidification functions, shut down the compressor system and fluorine pump system, and control the outdoor fans to reversely rotate for 3 minutes. - Disable: Outdoor unit auto-cleaning is not performed. - Enable: If the teamwork networking is normal, the cooling function of teamwork units is normal, and no high temperature alarm is generated, the teamwork units control the outdoor fans to rotate reversely in sequence during the period from 22:00 to 06:00 to implement auto-cleaning.

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

Step 4 On the home screen of the display module of any teamwork controlled smart cooling product, tap . If the teamwork control succeeds, the teamwork topology of the smart cooling product in the group is displayed, as shown in [Figure 6-12](#). [Table 6-6](#) describes the note for the screen.

Figure 6-12 Teamwork topology



Table 6-6 Notes for the screen

No.	Item	Note
1	On/Off	On indicates that the smart cooling product is started and Off indicates that the smart cooling product is shut down.
2	01, 02, 03	Indicates the device address. The smallest address is for the master unit and the rest are for slave units. NOTE If the master unit is offline, the online device with the smallest address is selected to be the new master.
3	Active/Standby	Active: An active unit properly responds to control requirements. Standby: A standby unit responds to control requirements only if an active unit is faulty (critical alarm, shutdown, or offline) or the active unit cannot meet cooling requirements.
4	M/S	M indicates the master unit, and S indicates a slave unit. A blue icon indicates that the unit is operating, and a gray icon indicates that the unit is idle.
5	Frame: green/non-green	A green frame indicates the unit itself,  as shown in  .
		A non-green frame indicates other units in the group,  as shown in  .

No.	Item	Note
6	Ground color: red, bright gray	Red indicates that a critical alarm is generated,  as shown in  .
		Bright gray indicates that the device is operating without any critical alarms,  as shown in  .

 NOTE

If the teamwork networking is successful, the teamwork icon is green. If the teamwork networking fails, the teamwork icon is red. If the teamwork networking is disabled, the teamwork icon is gray.

----End

Follow-up Procedure

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

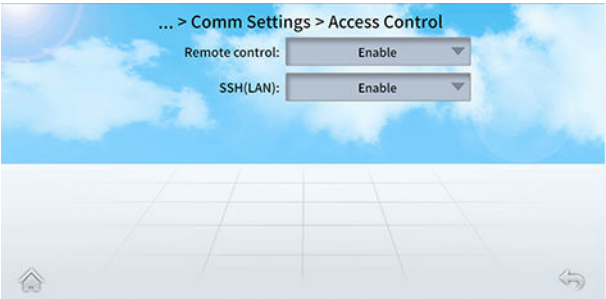
1. Check whether the number of devices in the topology is the same as the actual number of devices.
 - If yes, go to [2](#).
 - If no, check the cable connection and the teamwork settings.
2. Check whether the number of running devices in the topology is the same as the actual number of devices.
 - If yes, go to [3](#).
 - If no, check the cable connection and the teamwork settings.
3. Check whether the number of standby devices in the topology is the same as the actual number of devices.
 - If yes, go to [4](#).
 - If no, check the cable connection and the teamwork settings.
4. Check whether the number of online devices in the topology is the same as the actual number of devices.
 - If yes, the check is complete.
 - If no, check the cable connection and the teamwork settings.

6.5.3 (Optional) Setting Communications Parameters

6.5.3.1 Setting Access Control Parameters

Path: **Settings > Comm Settings > Access Control**

Figure 6-13 Access Control



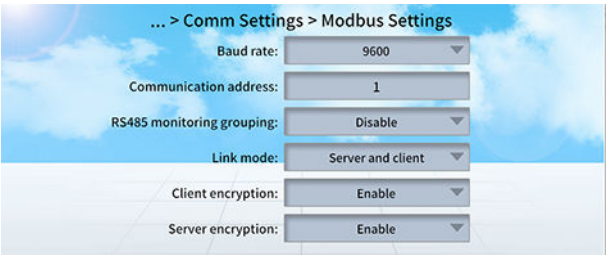
Parameter	Description
Remote control	• Enable: Users can control the unit over their monitoring system. • Disable: Users cannot control the unit over their monitoring system.
SSH (LAN)	• Enable: Access to the unit through the intranet using SSH (default port number: 22) is allowed. • Disable: Access to the unit through the intranet using SSH is not allowed. • If this parameter is set to Disable, the function will be enabled within 30 minutes after power-on by default. • If this parameter is set to Enable, the function will be automatically disabled after 24 hours of running.

6.5.3.2 Setting Communications Parameters (Modbus-RTU Protocol)

Procedure

Step 1 On the home screen, choose **Settings > Comm Settings > Modbus Settings**.

Figure 6-14 Modbus Settings



Step 2 Set the baud rate, communication address, and RS485 monitoring group.

Parameter	Description
Baud rate	Set this parameter based on the baud rate of the connected device. The baud rate must be the same as that on the NMS. The value can be 9600 or 19200 .
Communication address	Enter the communications address of the smart cooling product as planned. The NMS communicates with the smart cooling product using this address, and the communications addresses of two smart cooling products connected to the same NMS must be different.
RS485 monitoring grouping	• In non-grouping scenarios, set RS485 monitoring grouping to Enable for each unit. • In grouping scenarios, set RS485 monitoring grouping to Enable for the unit with the COM/FE port connected, and Disable for other units.

----End

6.5.3.3 Setting Communications Parameters (Modbus-TCP Protocol)

Context

This section applies to the scenario where the unit is connected to the NMS.

Procedure

Step 1 On the home screen, choose **Settings > Comm Settings > WAN IP Settings**, and set the IP address, subnet mask, and gateway based on the actual plan.

Figure 6-15 WAN IP Settings



NF06I00133

NOTE

The WAN IP address cannot be in the 192.168.245.X, 192.168.246.X, or 192.168.248.X network segment.

Step 2 On the home screen, choose **Settings > Comm Settings > Modbus Settings**.

Parameter	Description
Link mode	• Server: The smart cooling product works as the server and can connect to two clients for communication. • Client: The smart cooling product works as the client and can connect to a remote server for communication. • Server and client: The smart cooling product works as the server and can connect to two clients for communication. It also works as the client and can connect to a remote server for communication.
Client encryption	This parameter is configurable when Link mode involves Client .
Server encryption	This parameter is configurable when Link mode involves Server .
Encryption algorithm CBC	Specifies whether to use the CBC encryption algorithm. After the parameter setting is changed, the system automatically restarts. Exercise caution with the setting.
NMS IP address	Enter the actual IP address of the NMS. The IP addresses of the display board, client NMS, and server NMS must be unique. This parameter is configurable when Link mode involves Client .
NMS port number	This parameter is configurable when Link mode involves Client . • Connecting to the NetEco: Set this parameter to 32907 if Client encryption is enabled, or set it to 32906 if Client encryption is disabled. • Connecting to other NMSs: You are advised not to change the value. In special cases, set this parameter based on the site requirements.
Pre-shared password	Secondary authentication password used for Modbus-TCP connection.

----End

6.5.3.4 Setting Communications Parameters (SNMP Protocol)

Context

- To set communications parameters, log in as the **admin** user.
- This section is suitable only for SNMP. Skip this section if you use Modbus.
- Record the values entered in this section. They will be used when you connect a unit to a network management system (NMS).

- One unit supports concurrent access of up to 6 NMSs through SNMP.

Procedure

Step 1 On the home screen, choose **Settings > Comm Settings > SNMP Settings**.

Figure 6-16 Setting SNMP communications parameters

Step 2 Set **SNMP Version** based on site requirements, and then tap **Submit**.

- When **SNMP Version** is set to **ALL** or **SNMPv1&v2c**, you can set **Read Community** and **Write Community**.
- When **SNMP Version** is set to **ALL** or **SNMPv3**, you can add an SNMPv3 user.



CAUTION

SNMPv1&SNMPv2c are insecure protocols. **SNMPv3** is recommended.

Step 3 Set **Read Community** and **Write Community**.

1. Tap the text box next to **Read Community**, set the read community parameter based on the actual plan, and tap **Submit**.
2. Tap the text box next to **Write Community**, set the write community parameter based on the actual plan, and tap **Submit**.

Step 4 Add a SNMPv3 user.

1. Tap **Add** under **SNMP V3**.
2. Set **User Name**, **Auth Protocol**, and **Prop Protocol** based on the actual plan.

MD5 and DES protocols are not secure. It is recommended that you set **Auth Protocol** to **SHA2-512**, and set **Prop Protocol** to **AES-256**. The following operations use the recommended settings as an example.

Figure 6-17 Setting the protocol type

NOTICE

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

- The password must contain at least two types of characters among uppercase letters (A-Z), lowercase letters (a-z), and digits (0-9). The password must contain 8 to 15 characters and be different from the user name or its reverse.
- A password must not be a string containing duplicate sections, such as **12a12a12a**.
- Week passwords such as **Password**, **Admin_1243**, and **Changeme_123** are not allowed.

-
3. Set **SHA Password** and **Confirm Password** as planned.
 4. Set **AES Password** and **Confirm Password** as planned.

Step 5 Tap the text box next to **SNMP Port**, set **SNMP Port** based on the actual port number, and tap **Submit**.

 NOTE

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

Step 6 Tap **Next Page**.

Step 7 Set SNMP trap parameters.

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

 NOTE

Trap Port is set to null by default.

3. Select **SNMP Version**. If an SNMPv3 user is configured, it is recommended that **SNMP Version** be set to **SNMPv3**.
4. If **SNMP Version** is set to **SNMPv3**, you need to select **SNMPv3 User Name**. For other protocols, you need to set **Trap Community**.

----End

Follow-up Procedure

After a USB flash drive has been inserted into the USB port of the main control module and successfully identified, tap **Export File** under **MIB File** to export the MIB file to the USB flash drive for the customer's use in accessing a third-party NMS.

NOTICE

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

6.5.3.5 (Optional) Setting WiFi Parameters

Connect the mobile phone to the WiFi network and use the mobile phone app for power-on commissioning and software upgrade.

Prerequisites

After the WiFi module of the USB port is connected to the USB port on the main control module of the unit, **WiFi Settings** can be set.

Procedure

Step 1 On the home screen, choose **Settings > Comm Settings > WIFI Settings**.

Figure 6-18 WIFI Setting



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Step 2 Set parameters.

Parameter	Description
WiFi SSID	Set WiFi SSID based on the actual configuration; WiFi SSID is the name used for the WiFi hotspot over which a mobile phone can connect to the smart cooling product.
WiFi password	Enter the WiFi password when you use a mobile phone to connect to the WiFi. The WiFi has no preset password. When you enable the WiFi function for the first time, you need to set a password.
Enable WiFi	Enables the WiFi function of the smart cooling product. The default status is Disable .
WiFi group sharing enable	When a mobile phone is connected to the WiFi of the smart cooling product, it can access the units in the same FE cascading network.

Step 3 Tap **Submit**.

----End

6.6 Startup

Initial Startup

NOTICE

- Before startup, ensure that you have downloaded the **Service Expert** app from the app store and applied for the permission to use the app. Currently, the Android operating system is supported.
- After factory settings are restored, startup verification is required.

Step 1 Tap **Start** on the home screen to enter the initial startup screen. Tap **OK** to enter the startup authorization screen.

Figure 6-19 Initial startup

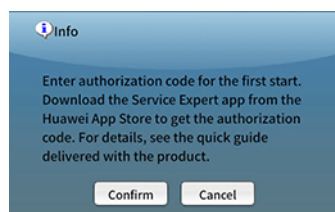
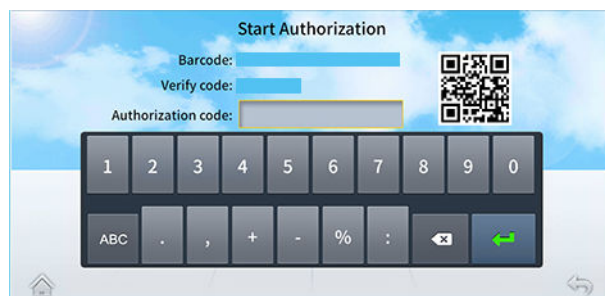


Figure 6-20 Startup authorization



Step 2 Open the **Service Expert** app, tap **Startup Commissioning** > **Offline Activation** on the home screen to generate a startup password.

Figure 6-21 Offline activation

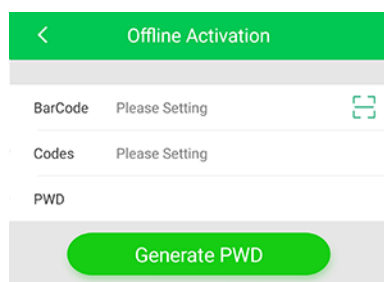


- Method 1: Tap  to scan the QR code on the startup authorization screen. The barcode and verification code are automatically entered. Tap **Generate PWD**.
- Method 2: Enter the bar code and verification code on the startup authorization screen, and tap **Generate PWD**.

 NOTE

To ensure security, the original password becomes invalid and the initial startup authentication fails if the startup verification fails.

Figure 6-22 Generating a startup password



Step 3 Enter the startup password generated by the app in **Authorization code** on the startup authorization screen to start the device. The home screen is displayed.

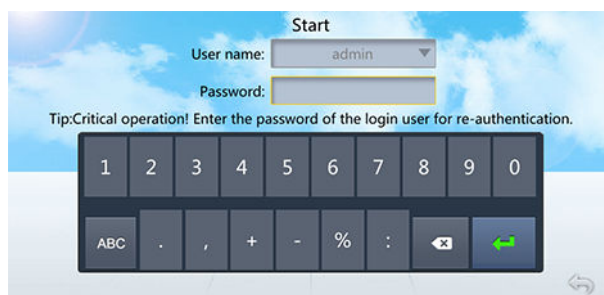
----End

Non-initial Startup

Step 1 Tap **Start** on the home screen.

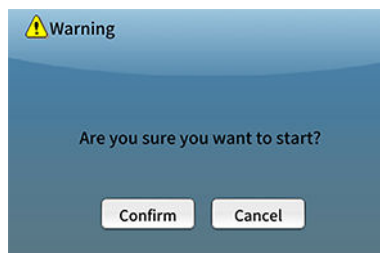
- If the **Require password to start or shut down onsite** function is enabled, enter the login password to start the device.

Figure 6-23 Requiring a startup password



- If the **Require password to start or shut down onsite** function is not enabled, tap **OK** to start the device.

Figure 6-24 Not requiring a startup password



-----End

6.7 Charging the Remaining Refrigerant

Prerequisites

- Check that the outdoor unit switch is turned on before you start the compressor.
- Remove the refrigerant steel vessel after checking that no more refrigerant is required.
- Charge refrigerant in an amount exactly as standard charge required. Otherwise, the devices may be damaged.

Procedure

Step 1 Tap **Start** on the home screen.

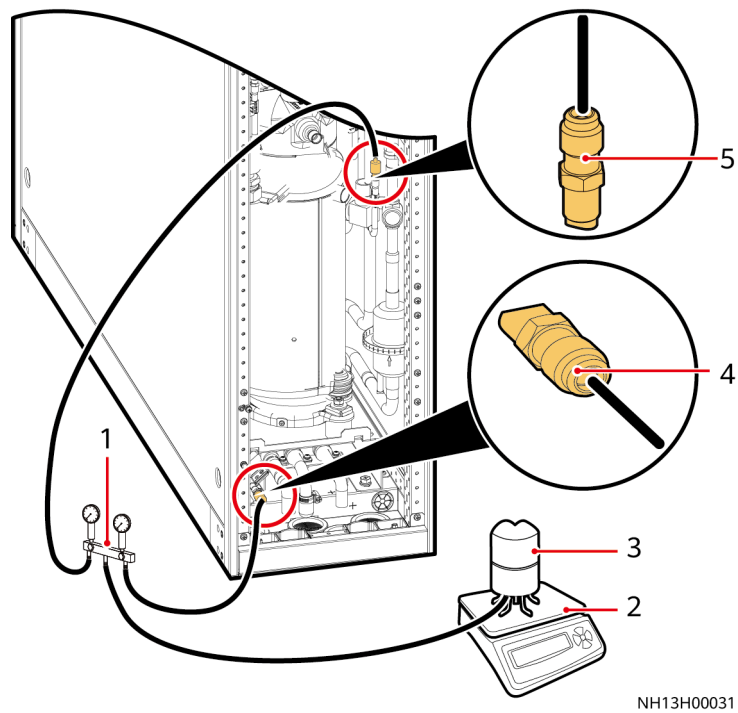
Step 2 Choose **Maint > Diagnostic Mode > Enter** to enter the diagnostic mode.

Step 3 Set the compressor to 3000 rpm.

Step 4 Charge refrigerant on the basis of the precharging.

- Open the low-pressure valve of the pressure gauge, and charge the remaining refrigerant from the low-pressure needle valve in small flow or intermittently.

Figure 6-25 Precharging refrigerant into the system without a low temperature component



(1) Pressure gauge

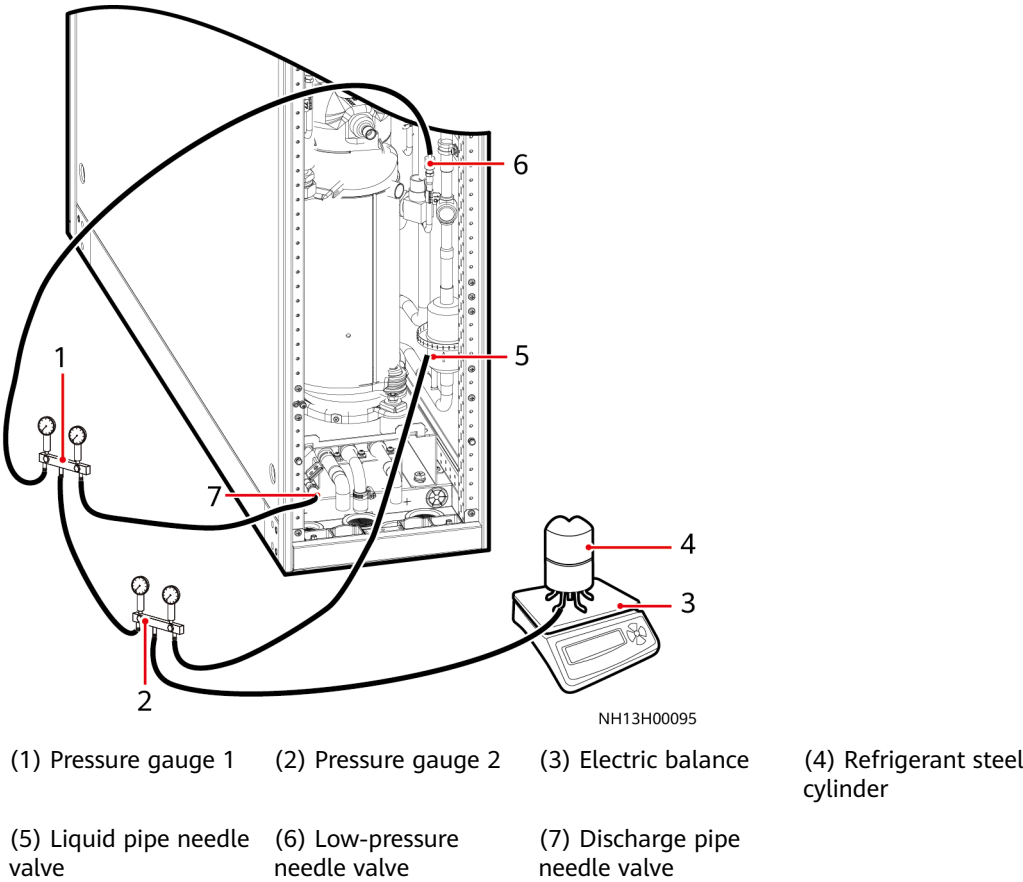
(2) Electric balance

(3) Refrigerant steel cylinder

(4) Discharge pipe needle
valve

(5) Low-pressure needle
valve

Figure 6-26 Precharging refrigerant when a low temperature component is configured



Step 5 On the home screen, choose **Running > Device Details > Compressor**, and view **Suction pressure** and **Discharge pressure** to determine whether they are within normal ranges. Choose **Running > Device Details > EEV**, and view the **EEV suction superheat degree** to determine whether it is within normal ranges.

Table 6-7 Normal discharge pressure ranges

Outdoor Ambient Temperature	Discharge Pressure Range	Suction Pressure Range	Suction Superheat Degree
< 15°C	1.5–2.5 MPa	0.7–1.2 MPa	8–15°C
15–35°C	1.5–3.1 MPa		
35–45°C	2.5–3.8 MPa		
> 45°C	3.1–4.15 MPa		

 NOTE

If the suction pressure, discharge pressure, and suction overheating degree is without normal ranges, check and make sure that:

1. Charge refrigerant in an amount exactly as standard charge required. (Refrigerant charging too much would result in high discharge pressure. Refrigerant charging too little would result in low suction pressure, low discharge pressure, and high suction overheating degree.)
2. The air inlet and outlet of outdoor unit are without block. (The air inlet and outlet blockage would result in high discharge pressure.)

Step 6 After charging refrigerant, close all valves, restore the thermal insulation foam on the needle valves.

Step 7 Tap  to exit the diagnostic mode.

Step 8 Tap **Shutdown** on the home screen and confirm it.

-----End

6.8 Wizard Startup

Context

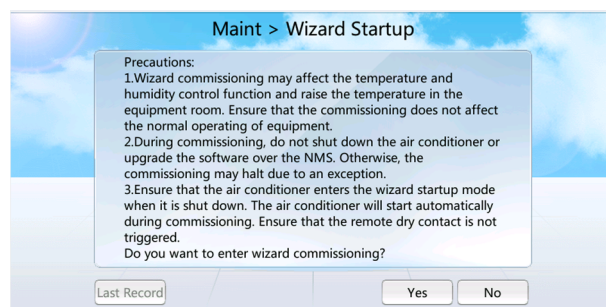
NOTICE

- Check that refrigerant is fully charged before performing the wizard startup.
- **Wizard Startup** allows you to commission the indoor and outdoor fans, electric heater, humidifier, condensate pump, and cooling system, and supports automatic running and judgment of components.
- After you power on the smart cooling product for the first time, the **Wizard Startup** screen is displayed. If the smart cooling product is not started for the first time, choose **Maint > Wizard Startup** to enter the **Wizard Startup** screen.
- Tapping **No** or **Exit**, a submission timeout, and a system exception all result in commissioning failures. Choose **Maint > Wizard Startup** to enter the **Wizard Startup** screen and start the commissioning again.

Procedure

Step 1 On the home screen, choose **Maint > Wizard Startup**, as shown in [Figure 6-27](#).

Figure 6-27 Wizard Startup



 NOTE

- For the initial wizard-based startup, **Last Record** is in gray, indicating that operation is not allowed.
- For a non-initial wizard-based startup, you can choose **Last Record** to view the last wizard startup report.

Step 2 Tap **Yes**. The checking before startup screen is displayed, as shown in [Figure 6-28](#).

NOTICE

If the remaining refrigerant is not charged, tap **No**. Complete refrigerant charging, and then perform the wizard-based commissioning.

Figure 6-28 Checking before startup



Step 3 Follow the onscreen instructions to complete the wizard startup.

NOTICE

- If the system is not configured with the electric heater and humidifier components, the electric heater and humidifier commissioning items will not appear on the screen.
- If the heating function and humidification function are disabled, you cannot select the electric heater and humidifier items.
- All the items are selected by default if you enter the screen for selecting commissioning items for the first time. You can clear commissioning items that are not required.
- After the fan commissioning, the electric heater commissioning screen is displayed. 30s after the electric heater is enabled, use a clamp meter to measure the currents of X102.1, X102.2, and X102.3 (two cables) terminals. Enter the measured values on the screen, and tap **Submit** within the time limit displayed on the screen. The display module automatically determines whether the current of the smart cooling product is within the normal range.

-----End

6.9 (Optional) Power-Off

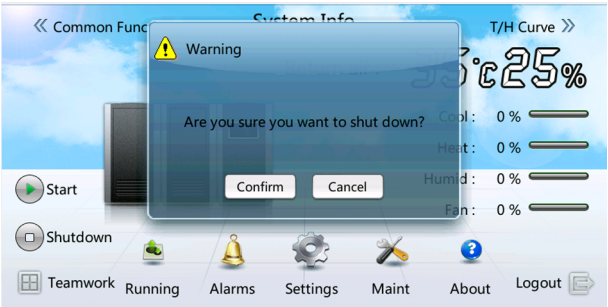
Context

In shutdown mode, the **Shutdown** button is green (unavailable) and the **Start** button is gray (available).

Procedure

- Step 1** Tap **Shutdown** on the home screen of the display module. A dialog box is displayed, indicating whether to shut down the smart cooling product, as shown in [Figure 6-29](#).

Figure 6-29 Shutdown



- Step 2** Tap **Confirm**. If the device is successfully shut, the system displays a message, indicating that the command is successfully triggered.
- Step 3** Turn off the smart cooling product switch in the upstream PDF.
- End

6.10 Checking After Commissioning

[Table 6-8](#) lists the commissioning checklist.

Table 6-8 Commissioning checklist

Check Item	Actual Result
No oil stain exists on the copper pipe thermal insulation foam or bottom plate, or it has been cleaned.	☐ Passed ☐ Failed
The needle valve plug is secured (torque of 0.45±0.05 N·m), and valve bonnet is tightened.	☐ Passed ☐ Failed
The foreign matter inside the water pan and bottom plate is cleaned up.	☐ Passed ☐ Failed
The air filter is correctly installed according to the air flow direction on the frame.	☐ Passed ☐ Failed

7 WebUI

7.1 Preparations and WebUI Login

Prerequisites

- Operating system: Windows 7 or later
- Browser: Chrome, Firefox, Internet Explorer 9 or later. The following uses Internet Explorer as an example.

Procedure

Step 1 Log in to the WebUI from a WAN or LAN.

- Log in from a LAN.
 - a. Connect a network cable between the network port on the PC and the FE_1 or FE_2 port on the unit.
 - b. On the main screen of the unit, choose **Settings > Comm Settings > LAN IP Settings**. Set **LAN IP address assignment mode** to **Manual**, and set the LAN IP address, LAN subnet mask, and LAN gateway for the unit.
 - c. Configure the PC IP address and the IP address of the unit in the same network segment.

For example, if the IP address of the unit is 192.168.248.10, the subnet mask is 255.255.255.000, and the default gateway is 192.168.248.1, set the IP address of the PC to 192.168.248.12, the subnet mask to 255.255.255.000, and the default gateway to 192.168.248.1.

NOTE

The unit IP address must be different from the PC IP address.

- Log in from a WAN.
 - a. Connect a network cable between the network port on the PC and the COM/FE port on the unit.
 - b. On the main screen of the unit, choose **Settings > Comm Settings > WAN IP Settings**, and set the IP address, subnet mask, and gateway for the unit.

- c. Configure the PC IP address and the IP address of the unit in the same network segment.

For example, if the WAN IP address of the unit is 172.017.248.10, the subnet mask is 255.255.255.000, and the default gateway is 172.017.248.1, set the IP address of the PC to 172.017.248.12, the subnet mask to 255.255.255.000, and the default gateway to 172.017.248.1.

 NOTE

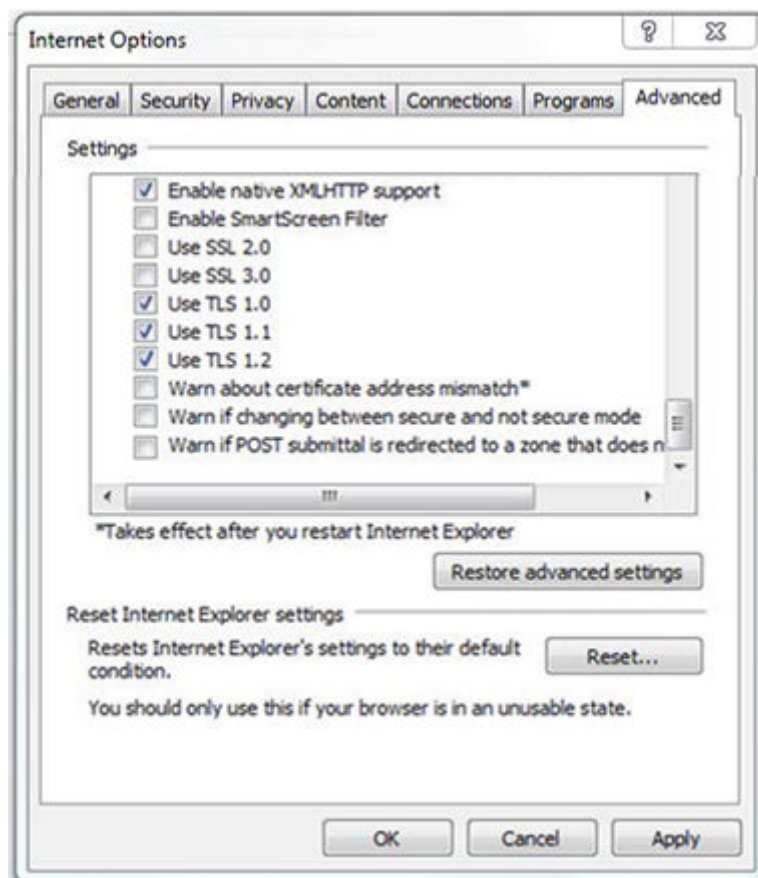
The WAN IP address cannot be in the 192.168.245.X, 192.168.246.X, or 192.168.248.X network segment.

Step 2 Set LAN parameters.

 NOTE

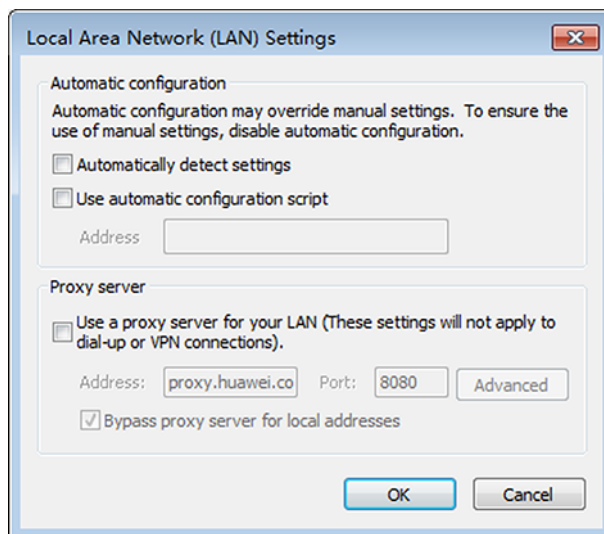
- If the unit connects to a LAN and a proxy server has been selected, perform [Step 2.3](#) and [Step 2.4](#).
 - If the unit connects to the Internet, and the PC in a LAN accesses the Internet over a proxy server, do not perform [Step 2.3](#) or [Step 2.4](#). Otherwise, you will fail to access the WebUI.
1. Open the Internet Explorer and choose **Tools > Internet Options**.
 2. Click the **Advanced** tab and select **Use TLS1.1** and **Use TLS1.2**.

Figure 7-1 Setting Internet options



3. (Optional) Click the **Connections** tab and select **LAN settings**.
4. (Optional) Under **Proxy server**, deselect **Use a proxy server for your LAN**.

Figure 7-2 Setting the proxy server



5. Click **OK**.

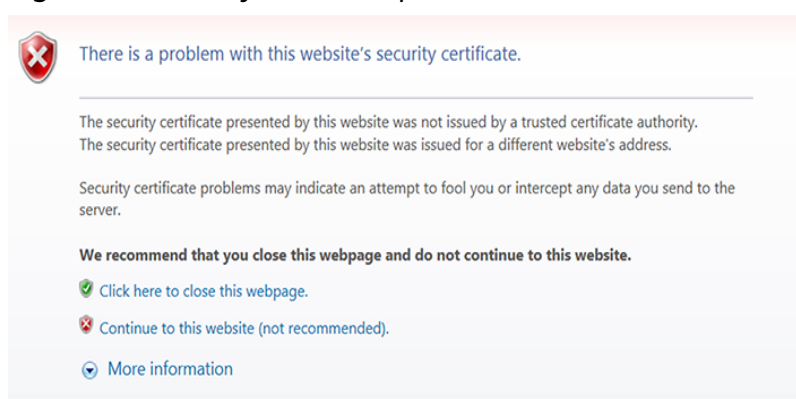
Step 3 Log in to the WebUI of the unit.

1. Enter **https://IP address** (such as **https://192.168.0.10**) in the address box of the browser, and then press **Enter** to enter the WebUI login page.

NOTE

- If no certificate is installed, a warning is displayed. Click **Continue to this website (not recommended)**.
- The unit has a built-in security certificate before delivery, which is used for SSL encrypted connection between the WebUI and a browser. To improve system security, you are advised to use your own security certificate and periodically update it. The imported security certificate needs to be bound to the IP address of the unit. Otherwise, the security risk warning will still be displayed during login.

Figure 7-3 Security certificate problem



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

 NOTE

- Change the preset password after your first login.
- If a password with low complexity is set, the system will display a message indicating that the password complexity is low and asking you to set a new one. Examples of low complexity passwords: H#uawei123, Password and openasadminAdmin23@#
- An account is logged out due to timeout if no operation is performed within 20 minutes after system login.

----End

7.2 Introduction to the WebUI

For data transmission security, the unit supports WebUI access through SSL.

WebUI common functions

Table 7-1 WebUI common functions

Menu	Function
Monitoring	Monitor the running information of the unit in real time, set running parameters, and control the running. For example, set the temperature and humidity of the unit, enable the T/H sensor, and set the fan control type.
Query	Query historical alarms.
System Settings	• Upload a network security certificate. • Set the time zone, time, and date. • Set the IP address. • Set Modbus communications parameters. • Set the SNMP network parameters. • Configure the outbox. • Configure the IP address whitelist.
Maintenance	• The system and components of the unit can be upgraded online. • Query the version and e-labels. • Query and export fault information. • Manage users, such as adding, modifying, deleting, locking, and unlocking user accounts. • Import and export configuration files to configure the unit quickly.

8 Maintenance

8.1 Indoor Unit Routine Maintenance

Definition

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

Precautions

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

- Exercise caution when performing professional maintenance tasks. For details, consult Huawei technical support.
- During component replacement, do not lean any material against the cabinet.

8.1.1 Data Record

Before performing monthly maintenance, record data in [Table 8-1](#).

Table 8-1 Recording table

Menu Item	Parameter	Record
Choose Settings > System Settings > T/H Sensor .	Temperature and humidity control type	
	Temperature setpoint	
	Humidity setpoint	
Choose Common Functions > Operating Info , or tap Running > Operating Info .	Current temperature	
	Current humidity	
	Measured power voltage	
Choose Running > Device Details > Compressor .	Discharge temperature	
	Discharge pressure	
	Suction pressure	
Tap Teamwork .	Teamwork function	
Choose Teamwork > Teamwork Settings .	Number of systems in this group	
	Number of running systems in this group	

8.1.2 Monthly Maintenance

Table 8-2 Monthly maintenance

Item	Method	Troubleshooting
Air filter	Check that the filter is not blocked.	Clean the air filter (water cleaning is recommended).
	Check that the filter is not damaged or distorted.	Replace the air filter.

Item	Method	Troubleshooting
Fan	Check that the indoor fan guard is not distorted.	Maintain or replace the fan guard.
	Check that the indoor fan blades are intact.	Replace the fan.
	Check that the indoor fan does not generate abnormal noise during operation.	Replace the fan.
	Check that the screws on the indoor fan are not loose or distorted.	Tighten the screws.
Water pan filter	Check that the condensate pan and liquid level detector have no dirt or scale.	Clean dirt or scale from the condensate pan and liquid level detector.
	Check that the water pan filter is clean and not blocked.	Clean the water pan filter.
Compressor	Check that the compressor is secured properly.	Tighten the compressor screws.
	Check that there is no oil stain on the compressor service valve.	Clean the refrigerant oil on the valve.
	Check that the sound of the compressor is properly.	Replace the compressor.
Wet film humidifier	The wet film and humidifier water pan are clean and have no scale.	Replace the wet film humidifier.
	No operating overtime alarm is generated on the wet film humidifier.	Replace the wet film humidifier.

8.1.3 Semi-Annual Maintenance

NOTICE

Remove the fan before maintaining the electric heater.

Table 8-3 Semiannual maintenance checklist

Item	Method	(On the Basis of Monthly Maintenance) Troubleshooting
Monitoring	Export smart cooling product logs, alarms, temperature data, humidity data, as well as the operating status and runtime of the compressor, fan, electric heater, electrode humidifier, and water pump from the monitoring system. View the historical alarms generated select the most common five ones. (If no monitoring system is available, skip this item.)	Rectify the fault or contact Huawei technical support.
Electric heater	Check that the electric heater is secured reliably.	Tighten the electric heater and its switch.
	Check that the electric heater surface does not erode.	Replace the electric heater.
Cable	Check that no cable deteriorates.	Replace deteriorating cables.
Water detector	Check that the water detector cable is securely connected.	–

8.1.4 Yearly Maintenance

Table 8-4 Yearly maintenance

Item	Method	Troubleshooting
T/H sensor	Check that the temperature and humidity readings are correct as measured.	If the temperature deviation is greater than 1°C or humidity deviation is greater than 5%, calibrate or replace the T/H sensor.
Evaporator	Check that no foreign matter exists on the evaporator surface.	Clear the foreign matter.

8.2 Outdoor Unit Routine Maintenance

CAUTION

- Perform the troubleshooting with the power off: If an exception is identified and needs to be handled, you must power off the outdoor unit first.
- Check and perform the troubleshooting with the power off: Before checking and exception handling, you must power off the outdoor unit first.
- In heavy snow situations, clean up snow from the fan, pipes, electric control box, and low-temperature component of the outdoor unit in time.

8.2.1 Monthly Maintenance

Table 8-5 Monthly maintenance items

Item	Expected Result	Troubleshooting	Remarks
Refrigerant pipe	The refrigerant pipes are secured.	Secure the pipe support.	Perform the troubleshooting with the power off.
	All refrigerant pipes are clean without leaking and eroding.	Drain the refrigerant, and repair the leakage on the pipe.	Perform the troubleshooting with the power off.
	The thermal insulator on the refrigerant pipe is not damaged.	Rewrap the thermal insulator.	Perform the troubleshooting with the power off.
Condenser	The fins are not pushed down.	Restore the fins by using a wire brush.	Perform the troubleshooting with the power off.
	The air intake section of the condenser and the air exhaust section of the fan are unblocked.	Clean up obstacles on the inlet and outlet.	Perform the troubleshooting with the power off.
	The fins are not blocked.	Clean the fins.	Perform the troubleshooting with the power off.

8.2.2 Semi-Annual Maintenance

Table 8-6 Semi-annual maintenance items

Item	Expected Result	Troubleshooting	Remarks
Rack	The rack is secured to the ground.	Tighten the screws that secure the rack to the floor.	Perform the troubleshooting with the power off.
Fans	The fan connection box is intact and secured.	Secure the fan connection box.	Check and perform the troubleshooting with the power off.
	The net cover and flow deflecting ring are independent of each other and not deformed or damaged.	Maintain or replace the net cover.	Perform the troubleshooting with the power off.
	The fan runs smoothly without abnormal voice or vibration, and the blades rotate in the direction as the symbols show.	Replace the fan.	Perform the troubleshooting with the power off.
Electric control system	Cables are connected properly.	Secure the terminals.	Check and perform the troubleshooting with the power off.
	The cable holes of the electrical control box are properly sealed.	Check whether the waterproof connector is aging, if yes, replace a new one.	Check and perform the troubleshooting with the power off.
	Cables are not damaged or aged.	Replace the cables.	Check and perform the troubleshooting with the power off.
	The electrical control box is free from water.	Clean up the water stains in the electric control box and locate the cause of water leakage.	Check and perform the troubleshooting with the power off.
Low temperature component (optional)	Bolts are properly tightened.	Tighten bolts.	Check and perform the troubleshooting with the power off.

Item	Expected Result	Troubleshooting	Remarks
	Cables are securely connected.	Check the cable connection. If the cable is loose, secure it.	Check and perform the troubleshooting with the power off.

9 Alarm Reference

For details, see the *FusionCol & NetCol Smart Cooling Product Alarm Reference*.

10 Troubleshooting

 CAUTION

Certain circuits in the smart cooling product have lethal voltages. Only professional technicians are allowed to perform maintenance.

NOTICE

- Exercise caution during live-line troubleshooting.
- If jumpers are used for troubleshooting, remove them after troubleshooting. Connected jumpers may affect control functions and damage equipment.

Table 10-1 describes how to troubleshoot the NetCol5000-A.

Table 10-1 Troubleshooting

Symptom	Possible Cause	Solution
The unit generates abnormal voice.	Compressor, fans, or pipes are loose.	Check and secure loose parts.
A compressor does not work.	The high-pressure switch reacts.	Check the high-pressure switch status.
	Circuit breakers, fuses, or cables are disconnected.	Check the main circuit breaker, compressor circuit breakers, fuses, and cables.
	A compressor motor is damaged.	Replace the motor.
	A compressor does not need to be started.	Check the requirement status on the display module.

Symptom	Possible Cause	Solution
	The compressor does not work.	Check whether the drive is faulty. Replace it if it is faulty.
The compressor discharge temperature is too high.	The refrigerant loop or a component is blocked.	Clean the blockage in the refrigerant loop.
	The outdoor unit is installed in an inappropriate position. (The outdoor unit should not be exposed to direct sunlight and must be installed at a specified spacing according to the installation guide.)	Install the outdoor unit in a correct position, without exposure to direct sunlight and with an appropriate spacing.
	Air exists in the cooling system.	Exhaust air, and examine and repair the pipeline.
	Heat dissipation is poor because of blockages in the condenser.	Clean the condenser fins.
	An outdoor fan fails.	Check whether the outdoor fan works.
	Refrigerant is insufficient.	Increase the amount of refrigerant filled.
The compressor discharge pressure is too low.	The outdoor fan speed controller fails.	Replace the speed controller.
	Refrigerant is insufficient.	Increase the amount of refrigerant filled.
	Refrigerant leaks.	Check the pipeline for any leakage.
The compressor discharge pressure is too high.	The refrigerant is overfilled.	Fill refrigerant according to the refrigerant filling requirements.
	The outdoor fan is faulty.	Check that the outdoor fan is running properly.
The compressor suction pressure is too low or liquid returns.	The refrigerant filled is insufficient.	Add the refrigerant.
	The indoor temperature is too low.	Change the temperature setting.
	Filters are clogged with dirt.	Replace the filters.
	The external excess pressure is too high, and air decreases.	Check whether the air duct is blocked.
	The condensing pressure is too low.	Check the condenser.

Symptom	Possible Cause	Solution
The compressor generates excessive noises.	Liquid is returning to the compressor.	Check whether the oil temperature and discharge temperature are within the normal range.
	Refrigerant oil is insufficient.	Add refrigerant oil.
	The transport sheet metal is not removed from a compressor.	Remove the sheet metal.
An indoor fan fails to start.	The switch of the indoor fan is not turned on.	Check the switch of the indoor fan.
	An indoor fan is damaged.	Replace the indoor fan.
	The interconnection terminals for the indoor fan are not securely connected.	Secure the interconnection terminals again.
The heating function is unavailable.	The electric heater temperature switch is being protected.	Check the temperature switch and replace it if it is faulty.
	The electric heater is not switched on.	Check the electric heater switch.
	The electric heater burns out.	Disconnect the power supply and check whether the electric heater is damaged by checking the electric heater resistance properties with an ohmmeter.
No water is supplied to the water inlet solenoid valve of the humidifier.	The upstream water supply is faulty or the water pressure is below the lower threshold.	Restore the water supply.
	The water inlet solenoid valve is blocked or faulty.	Replace the water inlet solenoid valve.
	The cable to the water inlet solenoid valve is incorrectly connected.	Reconnect the cable.
Water in the smart cooling product overflows.	The drainpipe does not connect to the pump, or the lift between the drainpipe and the water chiller is set to an appropriate value.	Ensure that the drainpipe is properly connected to the pump and that the lift of the drainpipe is lower than 4 meters.
	The condensate pump is faulty.	Replace the condensate pump.

Symptom	Possible Cause	Solution
	The liquid level detector is faulty.	Check the alarm. Check cable connections for high and low liquid level detectors. Check whether the liquid level detectors are damaged. If necessary, replace the liquid level detectors.
	The inlet pipe and drainpipe leak.	Check the inlet pipe and drainpipe and the connectors. Rectify any leakage and fasten the connectors.
	The automatic drainage pipe is blocked.	Check whether the automatic drainage port is blocked and whether the automatic drainage pipe contains foreign matter or is frozen.
The humidity of the computer room is high, or condensate water generates.	The server heat load for each smart cooling product is lower than 5 kW.	• Check that the doors, windows, floors, and ceilings of the equipment room are properly sealed. • If the outdoor humidity is too high, shut down the fresh air system. • Open the aisle doors or control skylights of the smart module, or open the filler panels of some server cabinets.
Power failures occur on the active and standby routes.	1. The input power has an open phase. 2. The contactor fuse in the active route is damaged. 3. The interlock contactor and middle contactor are damaged.	1. Rectify the power supply fault. 2. Replace the fuse. 3. Replace the interlock contactor and middle contactor.
The electric heater switch trips abnormally.	The switch is faulty.	Replace the electric heater switch.
The electric heater fails.	The electric heater contactor is not closed.	Replace the electric heater contactor.

Symptom	Possible Cause	Solution
The compressor switch trips abnormally.	The switch is faulty.	Replace the compressor switch.
The electric heating belt of the crankcase does not heat.	1. The electric heating belt of the crankcase is disconnected abnormally. 2. The fuse has blown. 3. The electric heating belt of the crankcase is short-circuited abnormally, and the fuse has blown.	1. Replace the electric heating belt of the crankcase. 2. Replace the fuse. 3. Replace the electric heating belt of the crankcase and the fuse.
The electric heating belt of the crankcase does not stop heating.	The relay contacts of the electric heating belt of the crankcase are short-circuited.	Replace the electric heating belt of the crankcase relay.

 NOTE

If the fault persists, contact Huawei technical support.

11 Parts Replacement

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

11.1 Replacing an Air Filter

Prerequisites

- An air filter needs to be replaced.
- A spare air filter of the same model is available and functional.

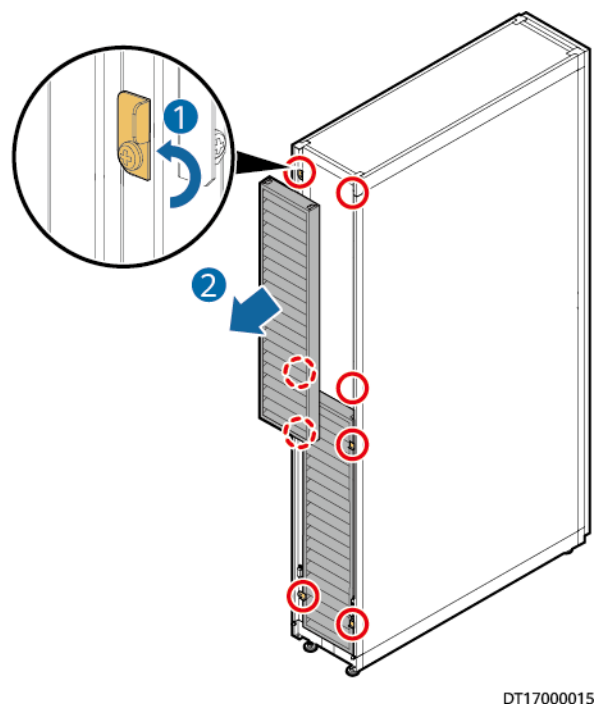
Context

Each smart cooling product has two air filters, located in the upper and lower parts. The air filters need to be maintained from the rear door.

Procedure

- Step 1** Open the rear door, rotate the clips on both sides of the upper air filter, and draw out the air filter, as shown in [Figure 11-1](#).

Figure 11-1 Removing an air filter



Step 2 Install a new air filter in accordance with the arrow direction shown on the air filter frame (the arrow points to the smart cooling product interior). Then close the rear door.

----End

Follow-up Procedure

Power on the device, choose **Maint > Performance Maint** on the home screen of the display module, and clear the air filter runtime.

11.2 Replacing an Indoor Fan

Prerequisites

- An indoor fan needs to be replaced.
- A spare indoor fan of the same model is available and functional.
- Tools: protective gloves, Phillips screwdriver, diagonal pliers, cable tie

Context

The indoor fan needs to be maintained from the front door.

Procedure

Step 1 Tap **Shutdown** on the home screen of the display module.

NOTE

The indoor fan can also be maintained after the device is started.

Step 2 Open the front door and turn off the switch for the faulty fan.

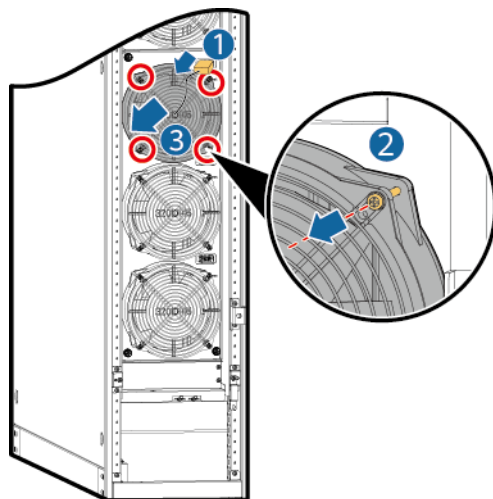
Step 3 Cut off the cable tie that secures the cable to the faulty fan, and remove the fan terminal, as shown by (1) in [Figure 11-2](#).

NOTICE

When removing a fan, remove the screws before loosening the captive screws. When installing a fan, tighten the captive screws clockwise, and then install the screws.

Step 4 Use a Phillips screwdriver to remove the four screws that secure the fan, and remove the faulty fan and fan guard.

Figure 11-2 Removing a fan



NH13H00038

Step 5 Install a new fan and fan guard, connect the connectors, and use a cable tie to secure the cable.

Step 6 Turn on the switch for the fan and close the front door.

Step 7 Choose **Maint > Performance Maint** on the home screen of the display module and clear the runtime of the indoor fan.

Step 8 Tap **Start** on the home screen. Ensure that the smart cooling product is running normally without any alarms.

NOTE

If the indoor fan is maintained when the device has been started, manually clear the corresponding alarm.

----End

11.3 Replacing an Outdoor Fan

Prerequisites

- Recommended tools and materials: hex key, Phillips screwdriver, socket wrench, small flat-head screwdriver (2 mm), diagonal pliers, cable ties, new fan
- Preparations: Shut down the system and cut off external power supplies.

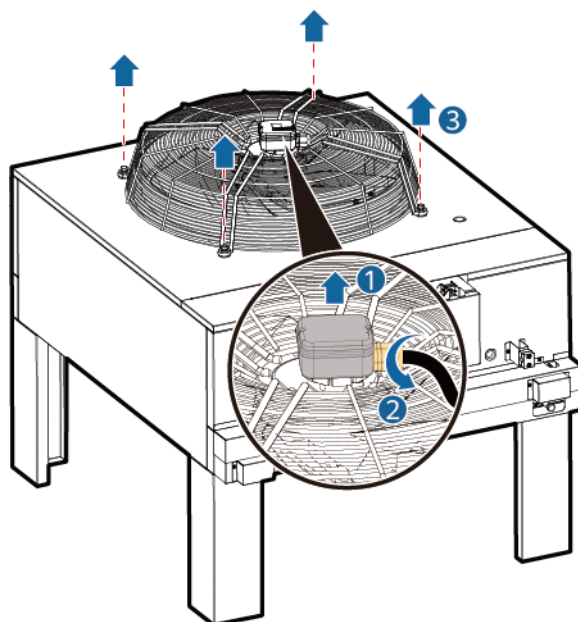
Procedure

Step 1 Tap **Shutdown** on the home screen of the display module and turn off the outdoor unit fan switch.

Step 2 Remove the faulty fan.

1. Cut off the cable ties that secure the fan cables, remove the cover of the fan connection box using a Phillips screwdriver to a torque of less than 2 N·m, and remove the four cable terminals using a small flat-head screwdriver.
2. Loosen the waterproof terminal on the cable and pull out the cable from the connection box.
3. Remove the four screws that secure the fan assembly, and remove the faulty fan assembly.

Figure 11-3 Removing the faulty fan



NH16H00080

Step 3 Remove the waterproof connector from the new fan and replace it with the waterproof connector delivered with the spare fan. The required torque is 3.75 N·m.

Step 4 Install the new fan assembly, connect and secure cables, and install the connection box cover.

- Step 5** After re-power on, on the home screen of the indoor unit, choose **Maint > Diagnostic Mode > Enter**, and set the outdoor unit speed to 100%. After the outdoor unit has run for 5 minutes, check that the outdoor fan is running properly and no alarm is raised.
- Step 6** After confirmation, set the outdoor unit speed to 0% and exit from the diagnostic mode.
- End

11.4 Replacing a Differential Pressure Switch

Prerequisites

- A differential pressure switch needs to be replaced.
- A spare differential pressure switch of the same model is available and functional.
- Tool: Phillips screwdriver

Context

The differential pressure switch needs to be maintained from the rear door.

Procedure

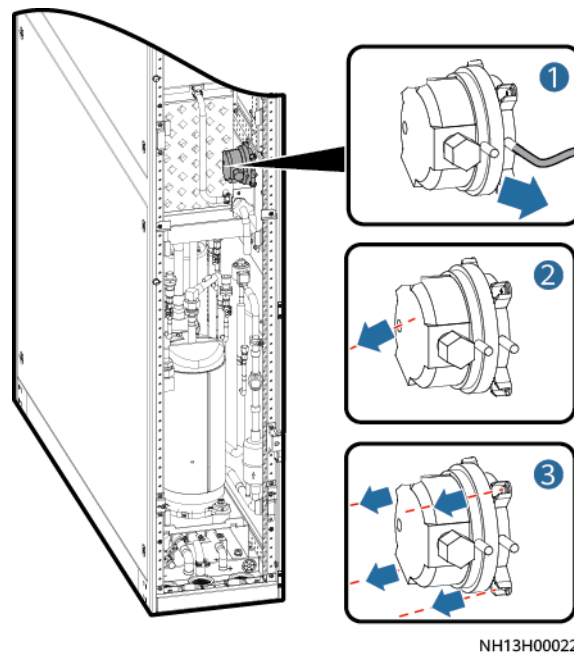
- Step 1** Tap **Shutdown** on the home screen of the display module and turn off the smart cooling product switch in the upstream PDF.

NOTICE

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

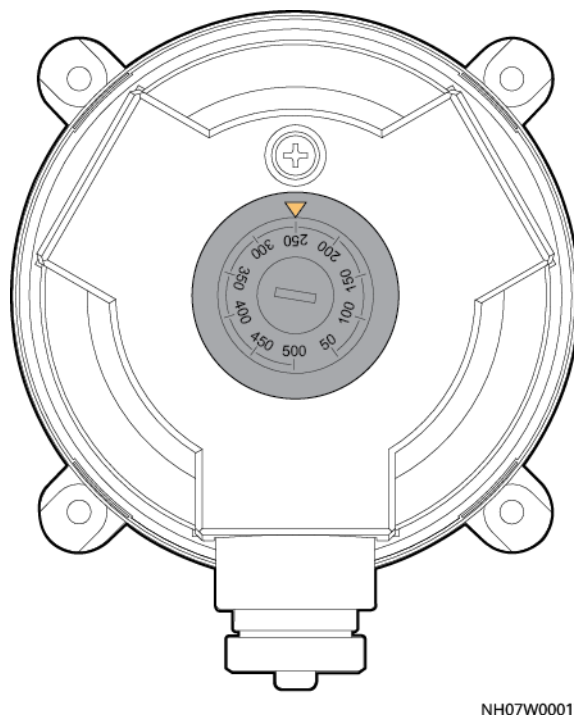
- Step 2** Open the rear door and remove the air filter.
- Step 3** Remove the pressure inlet tube, as shown by (1) in [Figure 11-4](#).

Figure 11-4 Removing a differential pressure switch



- Step 4** Use a Phillips screwdriver to remove the screws on the top cover of the differential pressure switch and cable screws, as shown by (2) in [Figure 11-4](#), and remove the cables.
- Step 5** Use a Phillips screwdriver to remove the four screws, and remove the differential pressure switch, as shown by (3) in [Figure 11-4](#).
- Step 6** Set the new differential pressure switch to 250 Pa.

Figure 11-5 Setting the differential pressure switch



Step 7 Install the new differential pressure switch, install the pressure inlet tube, and connect cables.

Step 8 Install the air filter and close the rear door.

Step 9 Power on the device and tap **Start** on the home screen. Ensure that the smart cooling product is running normally without any alarms.

----End

11.5 Replacing a Pressure Switch or Pressure Sensor

The procedure for replacing a high pressure sensor or low pressure sensor is similar to that of replacing a high pressure switch. The following describes how to replace a high pressure switch.

Prerequisites

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

Context

The high pressure switch needs to be maintained from the rear door.

Procedure

Step 1 Tap **Shutdown** on the home screen of the display module and turn off the smart cooling product switch in the upstream PDF.

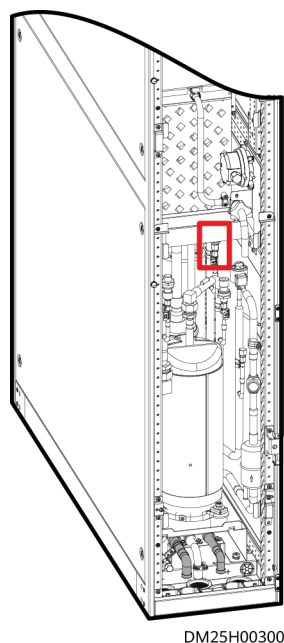
NOTICE

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

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

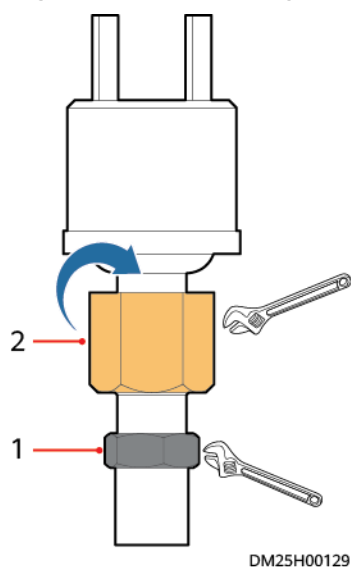
Step 3 Remove the cables from the high pressure switch.

Figure 11-6 Position of the high pressure switch



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

Figure 11-7 Removing a high pressure switch



(1) Pipe nut

(2) Adjustable nut

WARNING

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

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

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

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

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

----End

11.6 Replacing a Compressor

Prerequisites

- A compressor needs to be replaced.
- A spare compressor of the same model is available and functional.
- Tools: protective gloves, flat-head screwdriver, Phillips screwdriver, heat gun, refrigerant retrieval device (configured based on local conditions), sealant for refrigerant pipes, angle valve sealing ring, three 30# and one 36# adjustable wrenches, 13# ratchet wrench (or 13# solid wrench), nitrogen cylinder, rubber hose, filter dryer, and torque wrench

Context

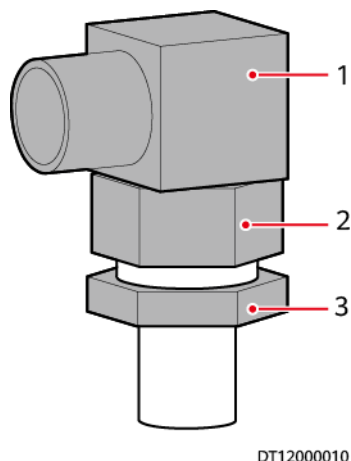
The compressor needs to be maintained from the rear door.

CAUTION

- Reclaim or dispose of the refrigerant in accordance with local laws and regulations. Do not discharge the refrigerant to the atmosphere. During the reclaim process, the R410A refrigerant composition may change. Therefore, you are not advised to refill the reclaimed R410A refrigerant to the cooling system.
 - When replacing a compressor, avoid skin contact with the refrigerant or refrigerant oil to prevent frostbite or burns.
 - Do not tilt the compressor during replacement to prevent lubricant leaks.
 - Install a new compressor immediately after you remove the rubber plugs of suction and discharge vents to prevent the moisture intake.
-

Figure 11-8 shows an angle valve.

Figure 11-8 Angle valve



(1) Angle valve nut

(2) Adjustable nut

(3) Pipe nut

Procedure

Step 1 Tap **Shutdown** on the home screen of the display module and turn off the smart cooling product switch in the upstream PDF.

NOTICE

- Exercise caution because the device is still energized after it is shut down on the home screen of the display module.
- When replacing the compressor, tighten the suction angle valve to a torque of 150 N·m and the discharge angle valve to a torque of 120 N·m.

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

Step 3 Switch off QF3.

Step 4 Reclaim the refrigerant and ensure that the system has no pressure.

1. Connect the refrigerant reclaiming pump to the outdoor unit needle valve and (if a low temperature component is deployed) the needle valve at the outdoor unit liquid pipe port of the low temperature component. When the pressure decreases to the atmospheric pressure and becomes stable, shut down the refrigerant reclaiming pump.
2. Connect the refrigerant reclaiming pump to the low-pressure needle valve of the indoor unit. When the pressure decreases to the atmospheric pressure and becomes stable, shut down the refrigerant reclaiming pump. Ensure that there is no pressure in the system and the refrigerant is completely reclaimed.

Step 5 Remove the electric heating belt.

Step 6 Remove the compressor.

1. Use a flat-head screwdriver to clamp the buckle of the compressor connection box, remove the cover of the connection box, and disconnect cables from the compressor.

2. Heat the suction angle valve thread connection position for 10 minutes using a heat gun. Use two 30# adjustable wrenches to secure the angle valve nut and pipe nut on the suction side, and use a 36# adjustable wrench to loosen the adjustable nut until the pipe is separated from the angle valve.

NOTICE

After removal, seal the suction vent immediately to keep the system clean and prevent moisture from entering the system.

3. Heat the discharge angle valve for 10 minutes using a heat gun. Use two 30# adjustable wrenches to secure the angle valve nut and pipe nut on the discharge side, and use a 30# adjustable wrench to loosen the adjustable nut until the pipe is separated from the angle valve. Seal the discharge vent immediately after the removal.
4. Use a 13# ratchet wrench (or solid wrench) to remove the two M8 screws below the compressor support.
5. Pull out the compressor and support.

Step 7 Use a 13# ratchet wrench (or solid wrench) to remove the three M8 bolts that secure the compressor and support, and remove the compressor.

NOTICE

- Seal the screw thread joints in the pipe using sealant.
- After the installation, check that the input power cables of the compressor are in the same phase sequence as the wiring terminals.

Step 8 Secure the new compressor to the support using a solid wrench, secure the compressor support to the cabinet interior using a 13# socket wrench, and install an electric heating belt in the cabinet.

Step 9 Apply red glue from the second to fourth circles of the internal screw threads of the discharge angle valve. Use two 30# adjustable wrenches to secure the angle valve nut and pipe nut on the discharge side, and use a torque wrench to tighten the adjustable nut.

NOTICE

Installation of the suction angle valve is the same as that of the discharge angle valve.

Step 10 Vacuumize the system and precharge refrigerant.

Step 11 Connect the compressor cables, check that the phase sequence is correct, and power on. Choose **Maint > Performance Maint** to access the performance maintenance screen, and clear the compressor running time.

Step 12 Choose **Maint > Diagnostic > Enter** to check the system pressure and temperature and ensure the refrigerant is charged with an optimal status. Ensure

that the system is running normally without alarms. After the remaining refrigerant is added, exit the diagnostic mode.

Step 13 Install the air filter and close the rear door.

-----End

11.7 Replacing a Filter Dryer (Welding)

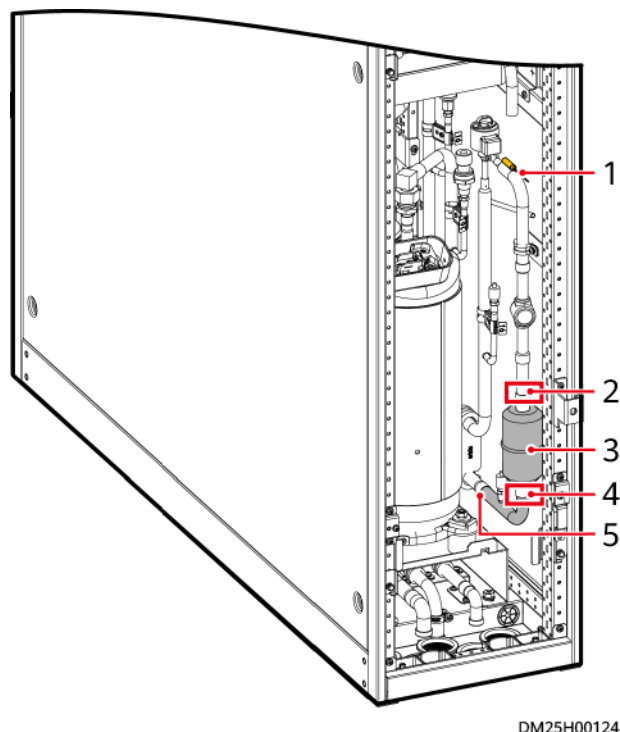
Prerequisites

- A filter dryer needs to be replaced.
- A spare filter dryer of the same model is available and functional.
- Tools: welding equipment, refrigerant retrieval device (configured based on local conditions), Phillips screwdriver, nitrogen cylinder, refrigerant tank, vacuum pump, pressure gauge, rubber hose, protective gloves
- Preparation: Power off the indoor unit and reclaim all refrigerant from the system.

Context

Figure 11-9 shows the position of the filter dryer.

Figure 11-9 Position of the filter dryer



(1) Liquid pipe NTC
temperature sensor

(2) Welding point A

(3) Filter dryer

(4) Welding point B

(5) Welding point C

Procedure

- Step 1** Tap **Shutdown** on the home screen of the display module and turn off the smart cooling product switch in the PDF and the compressor switch QF3.

NOTICE

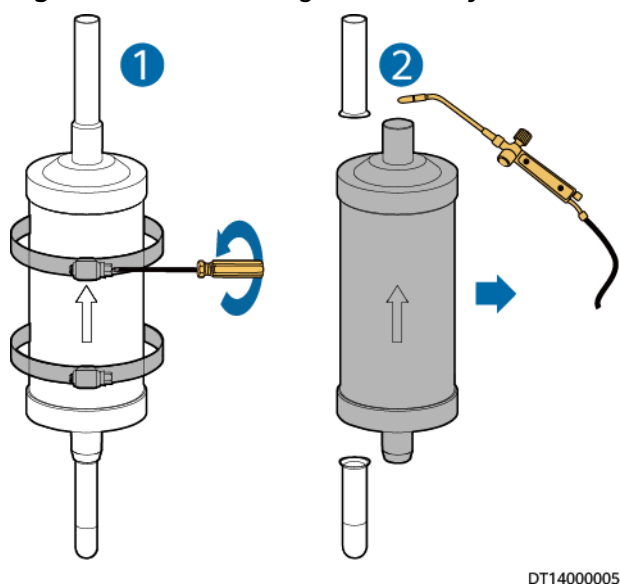
Exercise caution because the device is still energized after it is shut down on the home screen of the display module.

- Step 2** Reclaim the refrigerant and ensure that the system has no pressure.
1. Connect the refrigerant reclaiming pump to the outdoor unit needle valve and (if a low temperature component is deployed) the needle valve at the outdoor unit liquid pipe port of the low temperature component. When the pressure decreases to the atmospheric pressure and becomes stable, shut down the refrigerant reclaiming pump.
 2. Connect the refrigerant reclaiming pump to the low-pressure needle valve of the indoor unit. When the pressure decreases to the atmospheric pressure and becomes stable, shut down the refrigerant reclaiming pump. Ensure that there is no pressure in the system and the refrigerant is completely reclaimed.
- Step 3** Remove the liquid pipe NTC temperature sensor shown by (1) in [Figure 11-9](#).
- Step 4** Remove the filter dryer, as shown in [Figure 11-10](#).

NOTICE

- Use copper welding rods to weld the connection ports and check that the welding joints are in good condition, without poor soldering.
 - To avoid burning the internal components, other pipes, thermal insulation foam, power cables, and labels, take protective measures, such as spreading wet cloth, around the welding position.
 - Do not use face-down bonding.
-

Figure 11-10 Removing the filter dryer



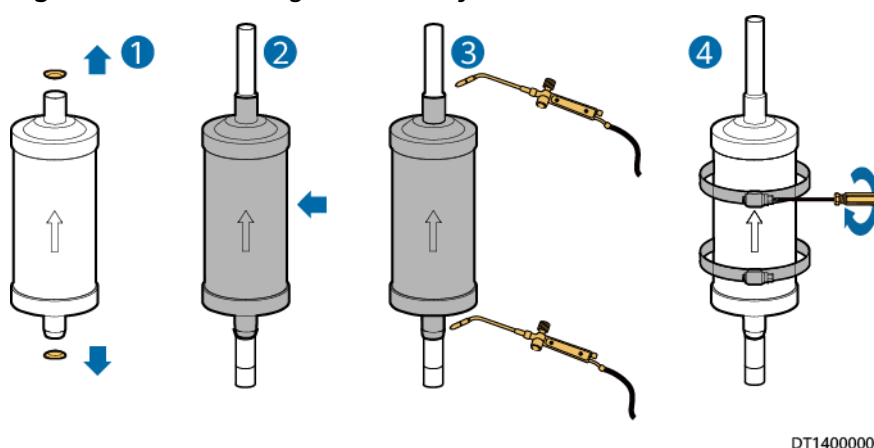
1. Remove the hold hoop from the filter dryer using a Phillips screwdriver.
2. Weld off the entrance elbow below the filter dryer.
3. Weld off the filter dryer assembly (including the filter dryer and entrance elbow) from the top of the filter dryer.
4. Weld off the entrance elbow from the filter dryer assembly and take out the filter dryer.

Step 5 Install the new filter dryer, as shown in [Figure 11-11](#).

NOTICE

- Weld the entrance elbow and the new filter dryer to form an assembly, and then weld the assembly to the original position. Note that the arrow direction on the filter dryer identifies the flow direction of the refrigerant.
- Do not use face-down bonding.

Figure 11-11 Installing the filter dryer



1. Remove the rubber plug sealing the port of the new filter dryer.
2. Weld the removed entrance elbow and the new filter dryer to form a new assembly (including the filter dryer and entrance elbow).
3. Weld the assembly to the original position.
4. Reinstall the hold hoop.

Step 6 Reinstall the liquid pipe NTC temperature sensor.

Step 7 Perform a leakage test with nitrogen again.

Step 8 After checking that there is no leakage, vacuumize the system and charge refrigerant.

-----End

11.8 (Optional) Replacing a Liquid Level Detector

Prerequisites

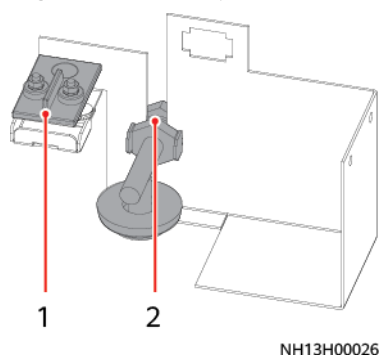
- A liquid level detector needs to be replaced.
- A spare liquid level detector of the same model is available and functional.
- Tool: Phillips screwdriver

Context

Components and working principle: A liquid level detector is composed of the conductor outer jacket, liquid level detector, switch, and card pole. A liquid level detector rises or drops as the liquid level changes due to the magnetism of the liquid level switch, causing the reed switch chip in the specified position inside the sensor detection pipe to move and send the contact on/off conversion signal to control the liquid level detector.

The liquid level detector can be maintained only from the front.

Figure 11-12 Liquid level detector



(1) High liquid level detector

(2) Low liquid level detector

Procedure

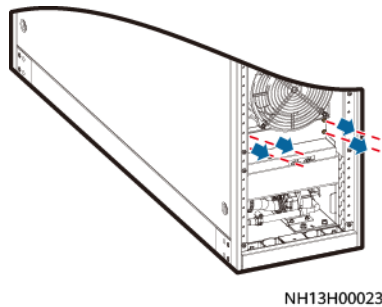
Step 1 Tap **Shutdown** on the home screen of the display module.

NOTICE

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

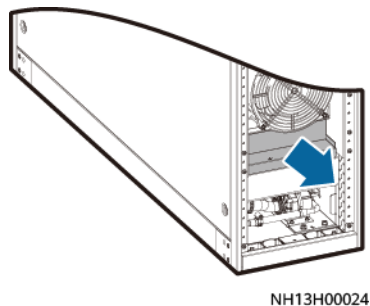
Step 2 Open the front door and remove the four screws that secure the water pan cover.

Figure 11-13 Removing a water pan cover



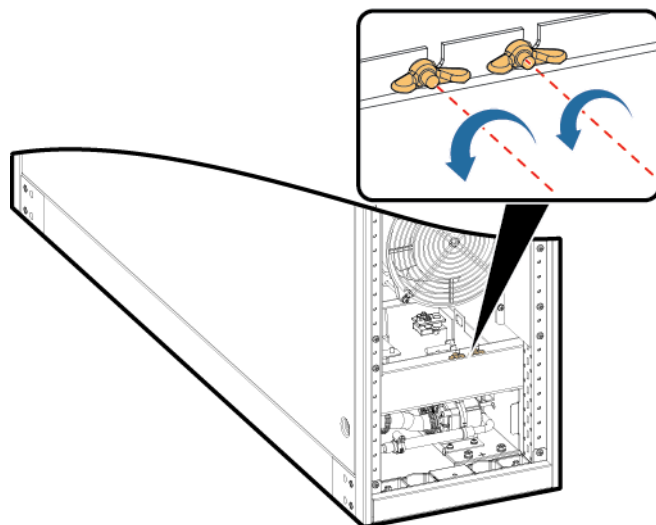
Step 3 Pull the water pan cover outward.

Figure 11-14 Pulling the water pan cover outward



Step 4 Remove the two screws that secure the sheet metal fastener of the liquid level detector, disconnect the interconnection terminal of the liquid level detector, and then remove the sheet metal fastener of the liquid level detector.

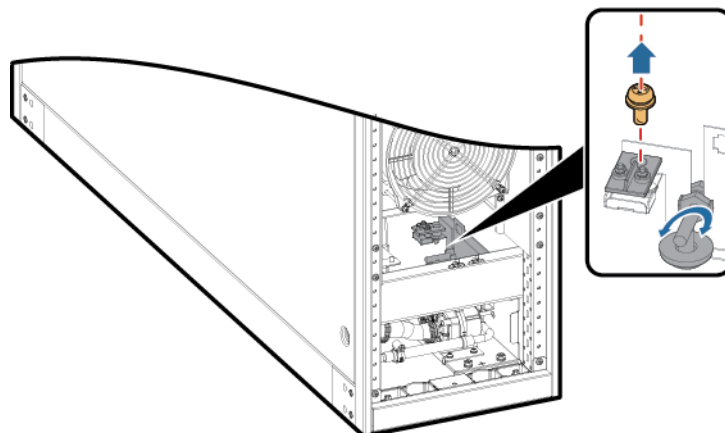
Figure 11-15 Removing screws from the sheet metal fastener of a liquid level detector



NH13H00025

- Step 5** Use a Phillips screwdriver to remove the screws that secure the high liquid level detector, and remove the high liquid level detector (the low liquid level detector can be taken out by rotating it).

Figure 11-16 Removing the liquid level detector



NH13H00027

- Step 6** Install the new liquid level detector and connect the interconnection terminal of the liquid level detector.
- Step 7** Tighten screws, connect cables, install the water pan cover, and close the front door.

----End

11.9 (Optional) Replacing a Condensate Pump

Prerequisites

- A water pump needs to be replaced.

- A spare water pump of the same model is available and functional.
- Tools: flat-head screwdriver, socket wrench
- Before removing the water pump, drain water from the water pan completely.

Context

The water pump can be maintained only from the front.

Procedure

- Step 1** Tap **Shutdown** on the home screen of the display module and turn off the smart cooling product switch in the PDF.

NOTICE

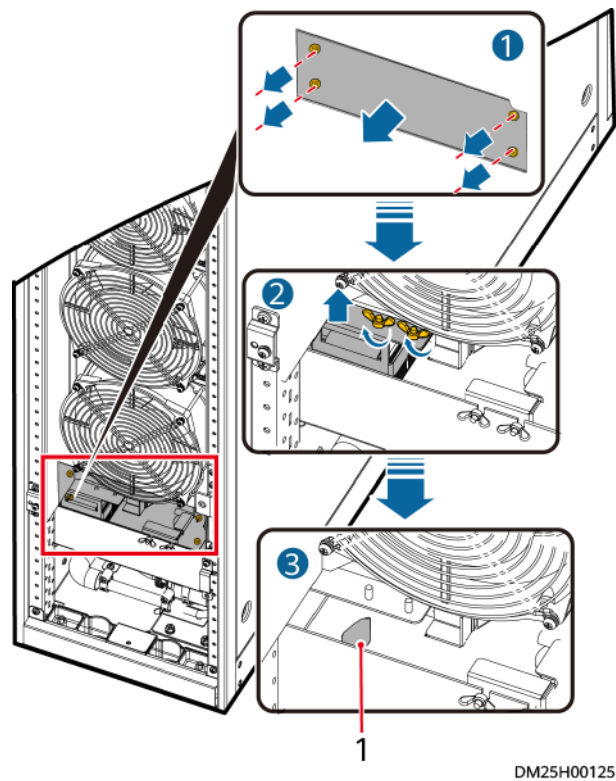
Exercise caution because the device is still energized after it is shut down on the home screen of the display module.

- Step 2** Open the front door and disconnect the water pump power cable terminal.
- Step 3** Remove the four screws from the cover, remove the cover.
- Step 4** Remove the disc nut from the filter, remove the filter.
- Step 5** Block the inlet and outlet of the water pump.

NOTICE

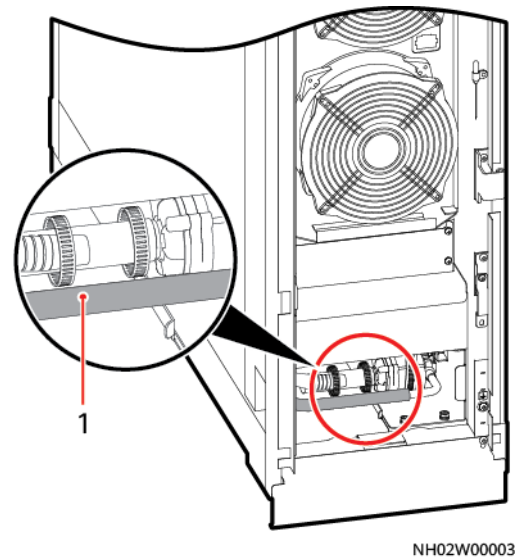
- Before removing the water pump, block the water inlet pipe and drainpipe of the water pump to prevent water overflowing out of the water pan and water pipe.
 - At the front end of the water pump, block the drain outlet of the water pan, as shown in [Figure 11-17](#). Use a suitable object such as a cloth to block the outlet, based on the actual condition.
 - At the rear end of the water pump, bend the white drainpipe (shown in [Figure 11-18](#)) and tie it securely. You can use a proper object, such as a cable tie or rope, to bind the cable according to the actual situation.
-

Figure 11-17 Water pan hole



(1) Water pan hole

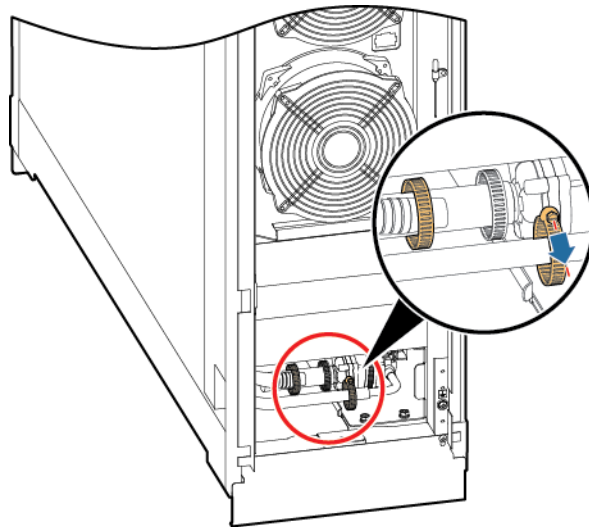
Figure 11-18 Water pump drainpipe



(1) Water pump drainpipe

Step 6 Use a flat-head screwdriver to remove the two hose clamps from the pipe, and remove the hoses at the water inlet and outlet of the condensate pump, as shown in [Figure 11-19](#).

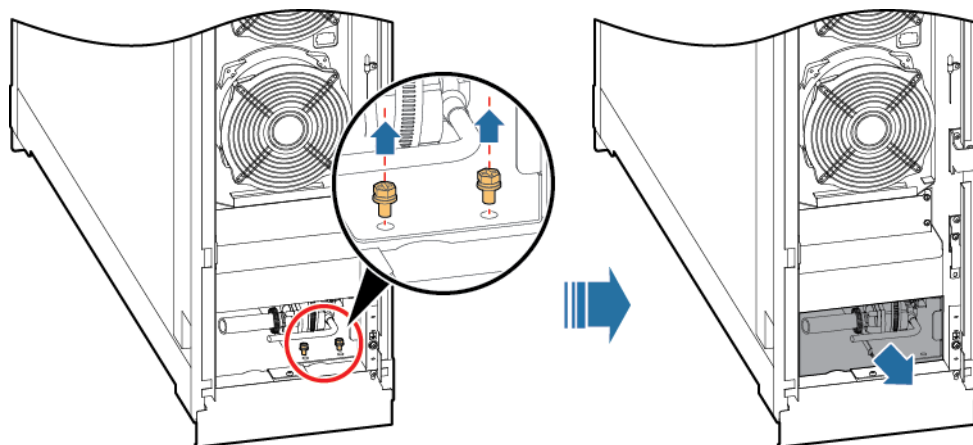
Figure 11-19 Removing hose clamps from a pipe



DT29000007

Step 7 Remove the two M6 screws from the pump fastener using a socket wrench, and pull out the pump assembly. See [Figure 11-20](#).

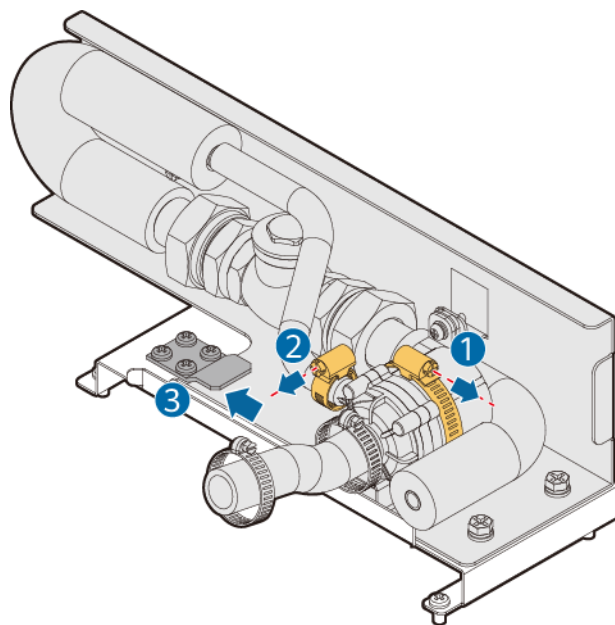
Figure 11-20 Removing a water pump assembly



DT29000010

Step 8 Use a flat-head screwdriver to remove the hose clamp from the water pump, and then remove the pump, as shown in by (1) and (2) in [Figure 11-21](#).

Figure 11-21 Removing a water pump



DT29000011

- Step 9** Install a new water pump and reinstall the water pump assembly in the cabinet, as shown in by (3) in [Figure 11-21](#). Connect the water pipe and secure it using a hose clamp. Connect the water pump power cable.
- Step 10** Remove the blockage from the water pan, reinstall the water pan cover, and then close the front door.

----End

11.10 (Optional) Replacing a Wet Film Humidifier

Prerequisites

- A humidifier needs to be replaced.
- A spare humidifier of the same model is available and functional.
- Tools: flat-head screwdriver and water bucket

Context

The humidifier needs to be maintained from the rear door.

Procedure

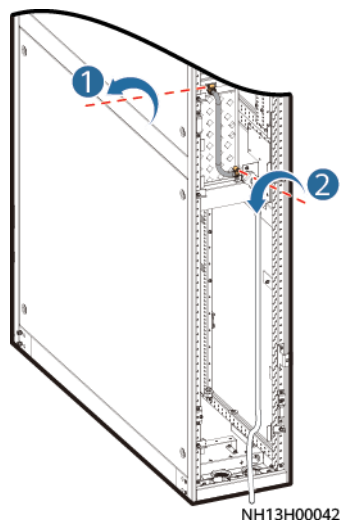
- Step 1** Tap **Shutdown** on the home screen of the display module and turn off the smart cooling product switch in the upstream PDF.

NOTICE

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

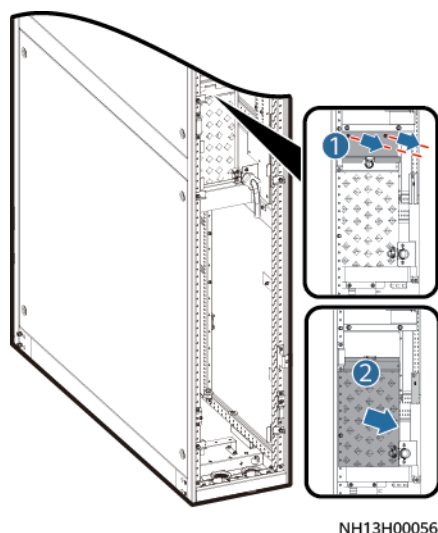
- Step 2** Open the rear door and remove the air filter.
- Step 3** Switch off QF4.
- Step 4** Remove the hose clamp from the water inlet pipe of the wet film humidifier, and remove the water inlet pipe.

Figure 11-22 Removing the water inlet pipe



- Step 5** Remove the screws connecting the humidifier sheet metal and the drive, remove the humidifier sheet metal, move the wet film leftwards, and pull out the humidifier.

Figure 11-23 Removing the humidifier



- Step 6** Install the new humidifier and fasteners, install the liquid level detector, connect the water inlet pipe, and start the humidifier.
- Step 7** Install the air filter and close the rear door.

- Step 8** Power on the device again, choose **Maint > Performance Maint** on the home screen of the display module to access the performance maintenance screen, and clear the humidifier runtime.

----End

11.11 Replacing a Display Module

Prerequisites

- A display module needs to be replaced.
- A spare display module of the same model (or BOM number) as the faulty display module is available.

Context

Recommended tools: Phillips screwdriver (M4), ESD gloves

Preparation: Maintain from the front door.

Procedure

- Step 1** (Optional) Back up data. If the WebUI or ECC is not configured, skip this step.
1. Insert the USB flash drive into the main control board (or main control module). Choose **Maint > USB Operations > Export** as an admin user to back up data to the USB flash drive.
 2. Log in to the WebUI of the smart cooling product as an admin user. Choose **Maintenance > Configuration**. (Optional) After tapping **Configuration File Encryption Password**, tap **Back Up Current Settings** to back up data to the computer.
 3. Log in to the WebUI of the ECC as an admin user. Choose **Query > Export Data** and set **Data Type** to the smart cooling product. Tap **Export Local Data of Southbound Devices** to back up data to the computer.
- Step 2** Replace the display module.

CAUTION

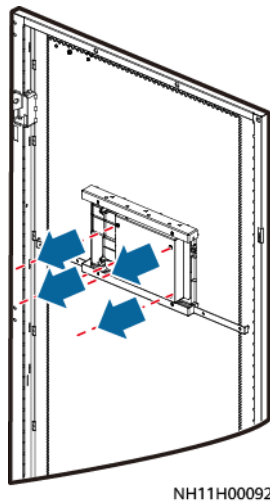
- Do not frequently or quickly disconnect or connect the DP cable of the display module. Do not forcibly pull the DP cable.
- You are advised to power off the main control board (or main control module) before replacing the display module.
- If the main control board is not powered off, you are advised to back up the configuration file of the product by referring to [a](#) or [b](#).

-
1. Open the front door and do not damage the cables connected to the display module.
 2. Remove the cables from the display module.
 3. Use a Phillips screwdriver to remove the four screws and gaskets that secure the display module, and pull out the display module.

NOTICE

- When pushing the display module leftwards or rightwards, pay attention to the buckles to prevent damage to the display module.
- The gasket is used to adjust the distance between the display module and the door panel.
- The gasket dimensions are 25 mm (L) x 12 mm (W) x 2 mm (H) and the center aperture is 6 mm.

Figure 11-24 Replacing a display module



4. Install the new display module in the original position on the front door by performing the preceding steps in reverse order.
5. Connect the control signal cables to the display module. Close and lock the front door.

CAUTION

- If the main control board is not powered off, the main control board detects and initializes the display module after the DP cable is connected to the display module. This process takes 10s to 30s. Wait for 5s to 10s. The indicator on the panel turns on, but the screen does not turn on. Wait for another 5s to 20s until the screen is restored to the state before the replacement.
- If the main control board is powered off, power on the main control board after the DP cable is connected to the display module. After the main control board is powered on, the startup logo and self-check progress bar are displayed on the display module. The main screen is displayed. The whole restoration takes about 60s to 90s.

Step 3 (Optional) Import the configuration. If the WebUI or ECC is not configured, skip this step.

1. Insert the USB flash drive into the main control board (or main control module). Choose **Maint > USB Operations > Import Config** as an admin user to import the backup data in the USB flash drive.

2. Log in to the WebUI of the smart cooling product as an admin user. Choose **Maintenance > Configuration**, and choose the backup data. (Optional) After entering **Configuration File Encryption Password**, tap **Upload** to import the backup data from the computer.

----End

11.12 Replacing a Module

Prerequisites

- A module needs to be replaced.
- A spare module of the same model is available and functional.

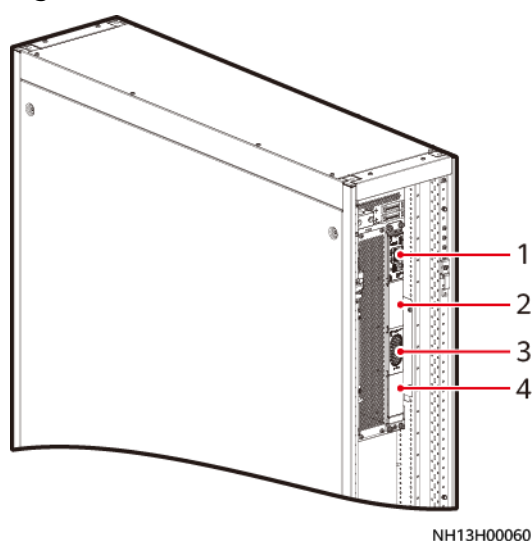
Context

NOTICE

- The new module must be installed in the same slot as the faulty module. Otherwise, the smart cooling product may fail to work properly.
- Before replacing a main control module, disconnect the network cable from the module.
- To replace the main control module, download the software and software upgrade guide from the Huawei website, and upgrade the software on the display module.

The module needs to be maintained from the rear door.

Figure 11-25 Module



(1) Main control module

(2) Reserved

(3) PSU

(4) Reserved

Procedure

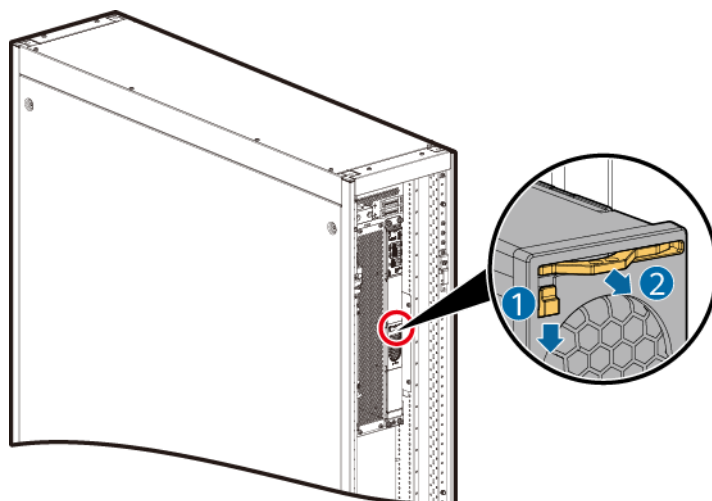
- Step 1** Tap **Shutdown** on the home screen of the display module and turn off the smart cooling product switch in the upstream PDF.

NOTICE

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

- Step 2** Open the rear door and remove the air filter.
- Step 3** Flip the clip on the module downwards, as shown by (1) in [Figure 11-26](#).

Figure 11-26 Removing a module



NH13H00061

- Step 4** Take out the handle and pull out the module from the subrack, as shown by (2) in [Figure 11-26](#).

NOTICE

When installing a new module, ensure that the handle is in the upper part of the module, and the HUAWEI logo is in the lower left of the module.

- Step 5** Insert the spare module into the corresponding slot, and flip the clip upwards to lock the module.
- Step 6** Install the air filter and close the rear door.

-----End

11.13 Replacing an Electric Control Box

Prerequisites

- The component needs to be replaced.
- A spare component of the same model is available and functional.
- Tool: Phillips screwdriver

Procedure

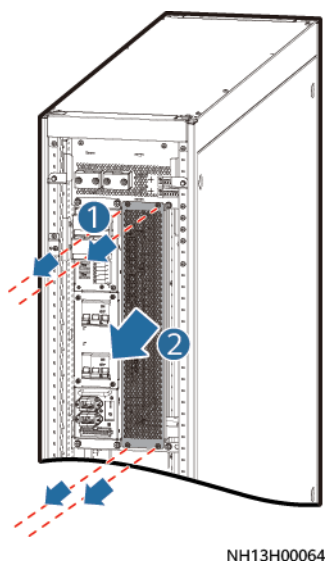
- Step 1** Tap **Shutdown** on the home screen of the display module. Turn off the smart cooling product switch in the PDF, and check whether the port is electrified. (Use a multimeter to check that the AC voltage of the port is 0 V.)

NOTICE

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

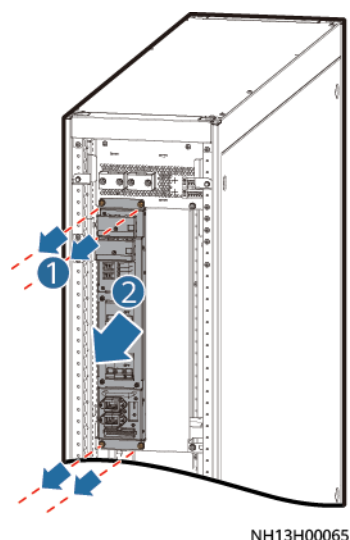
- Step 2** Open the rear door and remove the air filter.
- Step 3** Remove all cables and terminals connected to the electric control box.
- Step 4** Use a Phillips screwdriver to remove the four screws that secure the protective cover, and remove the protective cover.

Figure 11-27 Removing the protective cover



- Step 5** Use a Phillips screwdriver to remove the four screws from the front of the electric control box, pull the electric control box out along the guide rails by the handle, and remove the electric control box.

Figure 11-28 Removing the electric control box



Step 6 Replace the electric control box.

NOTICE

Ensure that the four screws are tightened when installing the electric control box.

Step 7 Place a new electric control box and the protective cover in the installation position and tighten them.

Step 8 Reconnect cables and terminals.

Step 9 Power on the device and check that it runs properly.

Step 10 Install the air filter and close the rear door.

----End

11.14 Replacing a Transformer

Prerequisites

- A transformer needs to be replaced.
- A spare transformer of the same model is available and functional.
- Tools: protective gloves, Phillips screwdriver, cable label

Context

The transformer needs to be maintained from the rear door.

Procedure

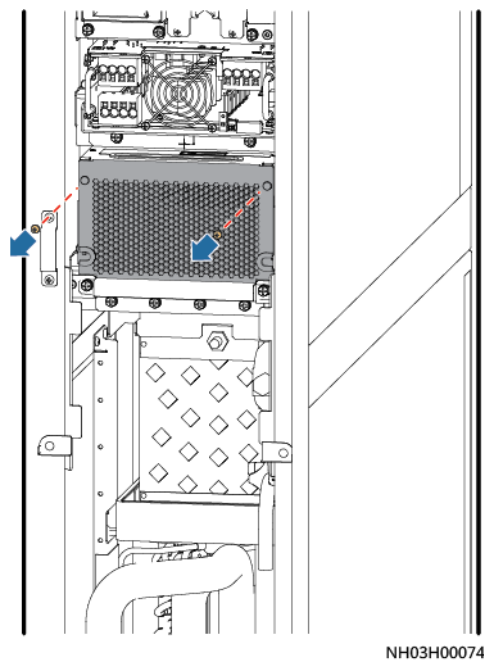
Step 1 Tap **Shutdown** on the home screen of the display module and turn off the smart cooling product switch in the upstream PDF.

NOTICE

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

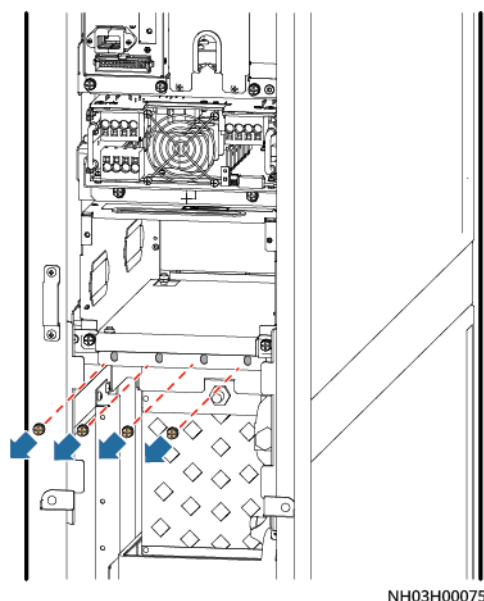
- Step 2** Open the rear door and remove the air filter.
- Step 3** Remove the two M4 screws from the front panel of the transformer and remove the front panel.

Figure 11-29 Removing the two M4 screws



- Step 4** Remove the cables connected to the transformer and attach the corresponding port labels.
- Step 5** Remove the four M6 screws that secure the transformer and pull out the faulty transformer module horizontally.

Figure 11-30 Removing the four M6 screws



- Step 6** Push the new transformer module into the cabinet along the rails and tighten the four M6 screws for the transformer.
- Step 7** Connect the transformer cables according to the names on the labels, reinstall the front panel, and tighten the two M4 screws on the front panel.
- Step 8** Reinstall the air filter and close the rear door.
- Step 9** Power on the device and tap **Start** on the home screen. Ensure that the smart cooling product is running normally without any alarms.
- End

11.15 Replacing a T/H Sensor

Prerequisites

- A T/H sensor needs to be replaced.
- A spare T/H sensor of the same model is available and functional.

Context

The T/H sensor needs to be maintained from the rear door.

Procedure

- Step 1** Tap **Shutdown** on the home screen of the display module.

NOTICE

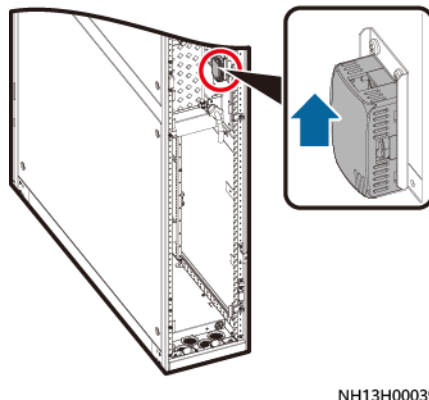
Exercise caution because the device is still energized after it is shut down on the home screen of the display module.

- Step 2** Open the rear door and remove the air filter.
- Step 3** Disconnect cables from the ports on the T/H sensor.
- Step 4** Pull out the T/H sensor in the direction shown in [Figure 11-31](#).

NOTICE

Before installing a new T/H sensor, check that the DIP switch setting is consistent with that for the original T/H sensor.

Figure 11-31 Replacing a T/H sensor



- Step 5** Install a new T/H sensor in the original position, and connect cables to the ports.
- Step 6** Install the air filter and close the rear door.

-----End

12 FAQ

12.1 How Do I Issue a Start/Shutdown Command?

You can use the start/shutdown signal over the smart cooling product LCD, ECC WebUI, or NetEco WebUI, or hardware port to start or shut down the smart cooling product.

Scenario	Operation	Start/Shutdown Signal Status - LCD/ECC/NetEco WebUI	Start/Shutdown Signal Status - Hardware Port
If the equipment is started, issue a shutdown command to shut down the equipment.	Method 1: Set the start/shutdown signal to shutdown on the smart cooling product LCD, ECC WebUI, or NetEco WebUI.	Shutdown	Start
	Method 2: Connect the remote start/shutdown dry contacts of the hardware port.	Start	Shutdown
If the equipment is shut down, issue a start command to start the equipment.	1. Check that the remote start/shutdown signal status of the hardware port is start. 2. Set the start/shutdown control signal to start on the smart cooling product LCD, ECC WebUI, or NetEco WebUI.	Start	Start

Scenario	Operation	Start/Shutdown Signal Status - LCD/ECC/NetEco WebUI	Start/Shutdown Signal Status - Hardware Port
NOTE - For shutdown commands, the remote start/shutdown signal of the hardware port has the highest priority, and that of the smart cooling product LCD, ECC WebUI, and NetEco WebUI has the same priority. - If ON/OFF via NMS is disabled on the smart cooling product LCD, the device cannot be started or shut down over the ECC or NetEco.			

Figure 12-1 Start/Shutdown over the LCD

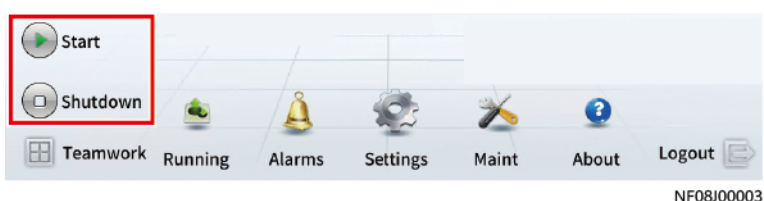


Figure 12-2 Start/Shutdown over the ECC WebUI

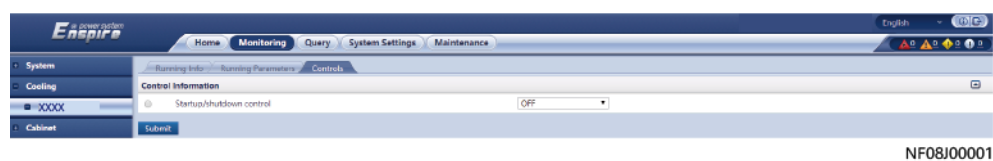


Figure 12-3 Start/Shutdown over the NetEco WebUI

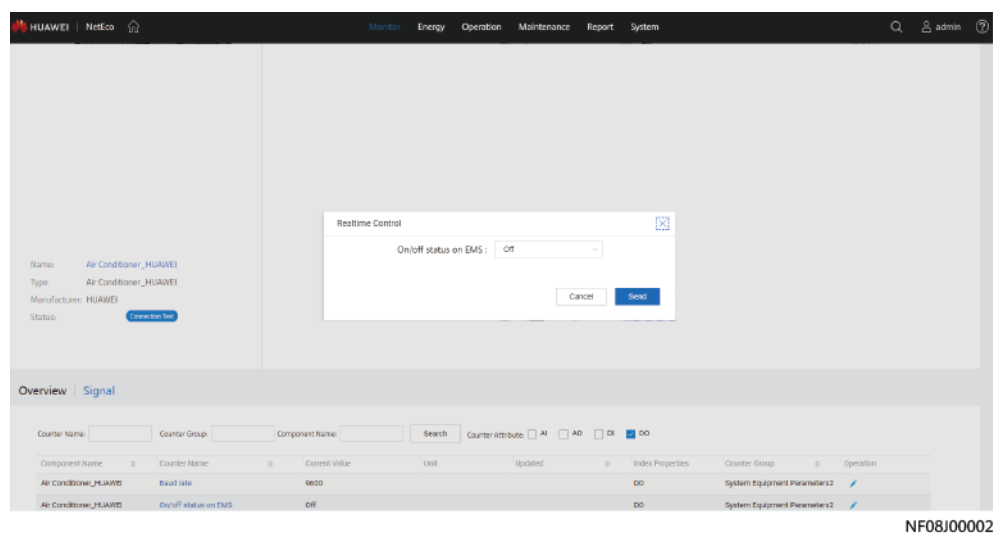
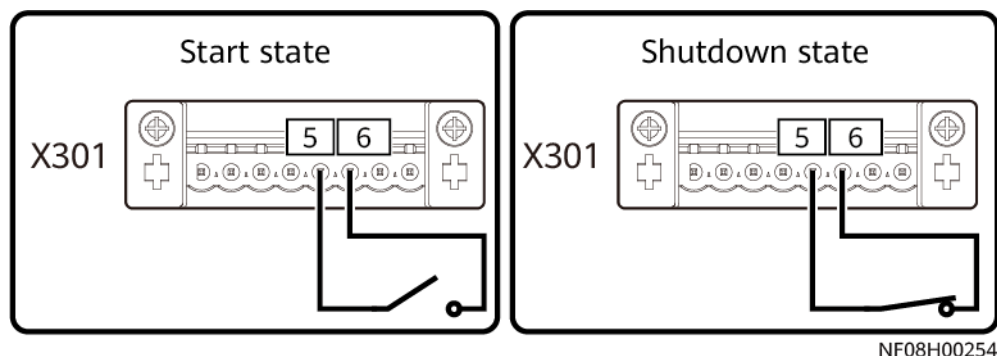


Figure 12-4 Start/Shutdown over the hardware port



12.2 Operations with a USB Flash Drive

Context

After connecting a USB flash drive to the USB port on the main control module, you can export data, import and export configuration files, and import certificates and keys.

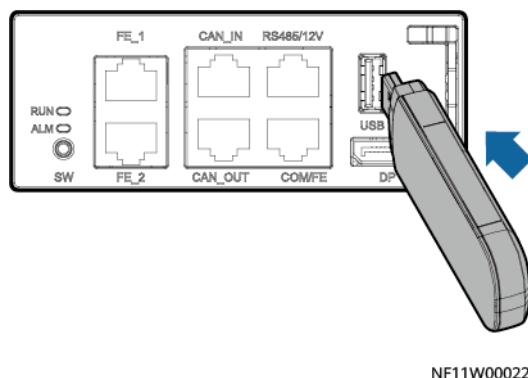
NOTICE

- You are advised to use the FAT32 USB flash drive with a capacity less than or equal to 64 GB. For a non-FAT32 USB flash drive, format it to the FAT32 format using a computer.
- Before using a USB flash drive, ensure that its data has been scanned by antivirus software and is secure.

Procedure

Step 1 Connect a USB flash drive.

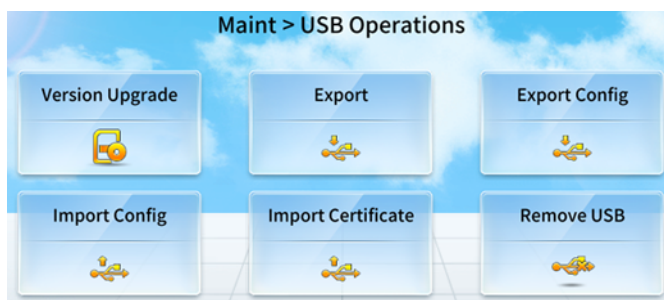
Figure 12-5 Connecting to a USB flash drive



Step 2 Check that  is displayed in the status bar of the home screen, indicating that the USB flash drive is successfully identified.

Step 3 Select an operation in **USB Operations** and perform the operation as prompted.

Figure 12-6 USB Operations



Step 4 Tap **Remove USB** to remove the USB flash drive in safe mode.

Step 5 Remove the USB flash drive and set it aside.

-----End

12.2.1 How Do I Export Data?

Context

With the one-click mode, you can export active alarms, historical alarms, run logs, and so on.

Procedure

Step 1 Choose **Maint > USB Operations > Export** to enter the **Select Path** screen.

Figure 12-7 Select Path



Step 2 On the **Select Path** screen, specify the save path and tap **Next**. In the displayed dialog box, tap **Yes**.

Step 3 After the data is successfully exported, tap **Finish**.

Step 4 On the home screen, choose **Maint > USB Operations > Remove USB** to remove the USB flash drive in safe mode.

-----End

12.2.2 How Do I Import and Export a Configuration File?

Context

You can export the configuration file containing the parameter settings of unit 1 to a USB flash drive. When you need to set the same parameters for smart cooling product 2, import the configuration file to unit 2.

Procedure

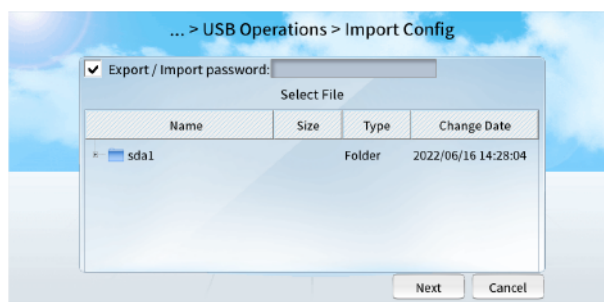
- Step 1** On the home screen of unit 1, choose **Maint > USB Operations > Export Config**. The **Select Path** screen is displayed.

Figure 12-8 Select Path screen



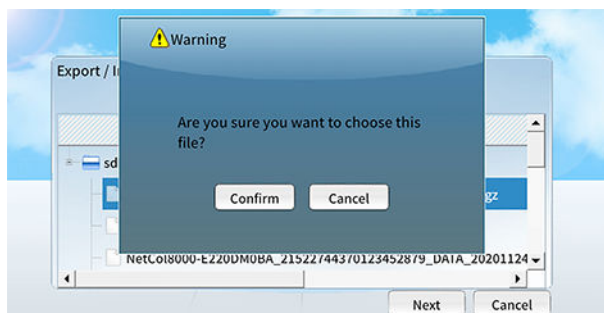
- Step 2** On the **Select Path** screen, specify the save path and tap **Next**. In the displayed dialog box, tap **Yes**.
- Step 3** After the data is successfully exported, tap **Finish**.
- Step 4** On the home screen, choose **Maint > USB Operations > Remove USB** to remove the USB flash drive in safe mode.
- Step 5** On the home screen of unit 2, choose **Maint > USB Operations > Import Config**.

Figure 12-9 Selecting a file



- Step 6** Select the file package to be imported and tap **Next**.

Figure 12-10 Confirming the file



Step 7 Choose **Confirm** and tap **Next**.

Step 8 After the import is complete, tap **Finish**.

NOTE

If the file fails to be imported, a failure message will be displayed.

Step 9 On the home screen, choose **Maint > USB Operations > Remove USB** to remove the USB flash drive in safe mode.

----End

12.2.3 How Do I Import a Certificate and Key?

Prerequisites

The **CA certificate file**, **local certificate file**, and **key file** have been saved in a USB flash drive.

NOTICE

Ensure that the key file has been encrypted using AES128.

Procedure

Step 1 On the home screen, choose **Maint > USB Operations > Import Certificate**.

Figure 12-11 Importing a security certificate



- Step 2** Select **Client certificate** or **Server certificate** based on the type of the certificate in use.
- Step 3** Tap **Browse** next to **Upload CA certificate file**.
- Step 4** Select the CA certificate file to be uploaded.
- Step 5** Upload the local certificate file and key file in turn in the same way.
- Step 6** Enter **Key password** and **Confirm key password**.
- Step 7** Tap **Submit**.
- If files are imported successfully, a success message will be displayed.
 - If files fail to be imported, a message indicating the cause for failure will be displayed. Rectify the fault according to the message and import files again.
- Step 8** On the home screen, choose **Maint > USB Operations > Remove USB** to remove the USB flash drive in safe mode.

----End

12.3 Display Module Screen Operations

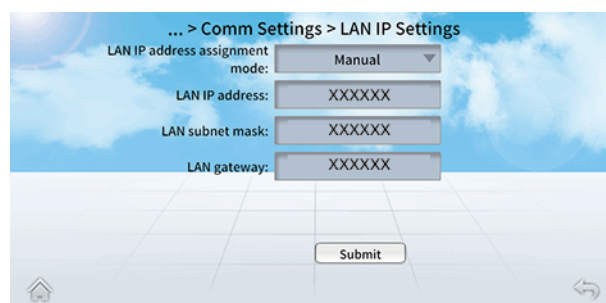
12.3.1 How Do I Set LAN Parameters?

If the teamwork networking mode is FE networking, set the LAN parameters based on the actual situation.

Procedure

- Step 1** On the home screen, choose **Settings > Comm Settings > LAN IP Settings**, and set **LAN IP assigning mode** to **Manual**. Set **LAN IP address**, **LAN subnet mask**, and **LAN gateway** based on the actual plan.

Figure 12-12 LAN IP Settings



NF06I00126

 NOTE

- If the **LAN IP address** of the unit has not been changed, the **LAN IP address** of each unit in the group is reallocated when the **Teamwork function** is enabled.
- If the **LAN IP address** of the unit has been changed, the **LAN IP address** of the unit remains unchanged when the **Teamwork function** is enabled.
- The LAN IP address must be in the 192.168.248.X network segment.

----End

12.3.2 How Do I Query Temperature and Humidity Curves?

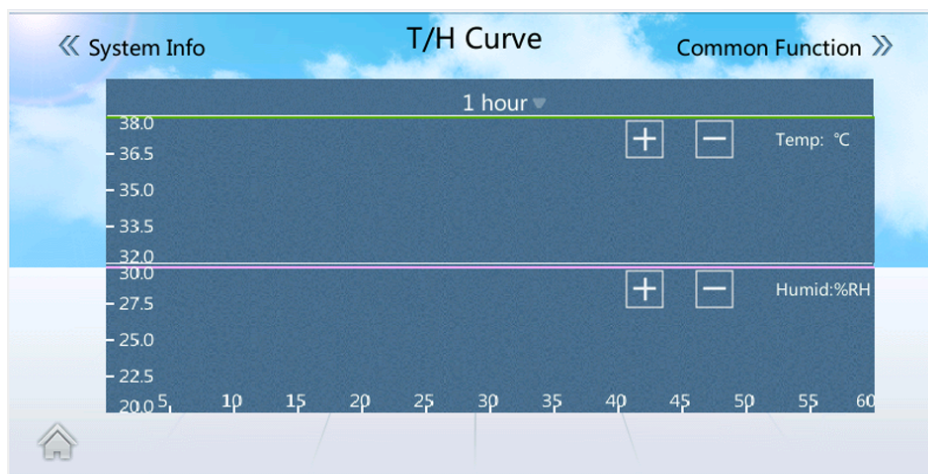
Context

On the **T/H Curve** screen, the temperature and humidity curves show the recent temperature and humidity changes. You can choose to display the curves in recent one hour, one day, seven days, or 30 days.

Procedure

- Step 1** Tap **T/H Curve** on the home screen. The screen shown in [Figure 12-13](#) is displayed.

Figure 12-13 T/H Curve screen



NOTE

- The temperature curve (upper) and the humidity curve (lower) are displayed on the same screen. The abscissa shows time. The temperature setpoint is the midpoint temperature on the upper ordinate while the humidity setpoint is the midpoint humidity on the lower ordinate.
- The temperature and humidity curves show the current average temperature and humidity of the control point.
- You can tap  and  to zoom in or out the range of the temperature and humidity ordinate. The midpoint temperature and humidity are the temperature and humidity setpoints after the ordinate range is zoomed in or out.
- The temperature display range is from $\pm 3^{\circ}\text{C}$ to $\pm 30^{\circ}\text{C}$ of the temperature setpoint.
- The humidity display range is from $\pm 5\%$ to $\pm 50\%$ of the humidity setpoint. The displayed value varies according to smart cooling products. The actual displayed value may vary.

----End

12.3.3 Querying Logs

Context

The **Query Logs** screen displays the operations performed by the user.

Procedure

Step 1 On the home screen, choose **Maint > Query Logs**. **Figure 12-14** is displayed.

Figure 12-14 Query logs screen

Maint > Query Logs				
No.	User Name	Time	Source	Parameter
1	admin	09/23/2017 12:07:04	LCD	A/C System-Teamwork function: Enable->Disable
2	admin	09/23/2017 11:58:00	LCD	A/C System-Requirement control: Disable->Anti-competitive running
3	admin	09/23/2017 11:57:48	LCD	A/C System-Rotation function: Disable->Enable
4	admin	09/23/2017 11:57:03	LCD	A/C System-Teamwork function: Disable->Enable
5	admin	09/23/2017 11:12:28	LCD	Indoor fan-Indoor fan control type: R/S air temp diff rate ctrl->Pressure diff ctrl
6	admin	09/23/2017 11:12:21	LCD	Indoor fan-Air-side difference pressure sensor type: No->0~50Pa
		Total: 24	 1/4  	

----End

12.3.4 How Do I View Component Status?

Context

You can view the component status on the display module in the following two ways:

- Enter the **Status Summary** screen to view the control or running status of major components such as the compressor, EEV, and indoor fan.

- Enter the **Device Details** screen and select a component to view the status of the component.

Procedure

- View on **Status Summary**: On the home screen, choose **Common Function** > **Status Summary** or choose **Running** > **Status Summary**. The **Status Summary** screen is displayed. **Running** > **Status Summary** is used as an example.
- View on **Device Details**: The following describes how to view the status of a T/H sensor. On the home screen, choose **Running** > **Device Details** > **T/H Sensor**.

----End

12.3.5 Querying System Parameters

Procedure

- Choose **Common Function** > **Operating Info** on the home screen, the related screen is displayed.
- Choose **Running** > **System Overview** on the home screen, the related screen is displayed.

----End

12.3.6 Querying Version Details

Procedure

Step 1 On the home screen, select **About**.

Step 2 On the **About** screen, tap **Version Info** or **E-label**.

NOTE

- The **Version Info** screen displays version details of the control board, compressor, SPD and volt detect board, and outdoor fan. The **E-label** screen displays electronic labels of the entire system, control board, compressor, SPD and volt detect board, and outdoor fan.
- When some T/H boards of the cold or hot aisles are enabled, **T/H Board** on the **About** > **Version Info** screen, or **T/H Board** on the **About** > **E-label** screen shows the information of these T/H boards.
- When some T/H boards of the cold or hot aisles are disabled, **T/H Board** on the **About** > **Version Info** screen, or **T/H Board** on the **About** > **E-label** screen does not show the information of these T/H boards.

----End

12.3.7 How Do I Check Teamwork Control Information?

Procedure

Step 1 On the home screen, choose  >  to display the teamwork information of the current group.

 NOTE

Master/Slave indicates the information of the current unit. Other information is about the teamwork information of the group.

----End

12.3.8 How Do I Mute or Silence a Buzzer?

Context

After a buzzer is muted, it does not buzz when a new alarm is generated.

Procedure

Step 1 Tap the  icon in the status bar, tap **Off**. The icon changes to .

----End

12.3.9 How Can I Handle Active Alarms?

Procedure

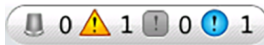
Step 1 Tap  (or choose **Alarms** > **Query Act Alarms**) on the home screen to enter the active alarms screen.

Figure 12-15 Act Alarms

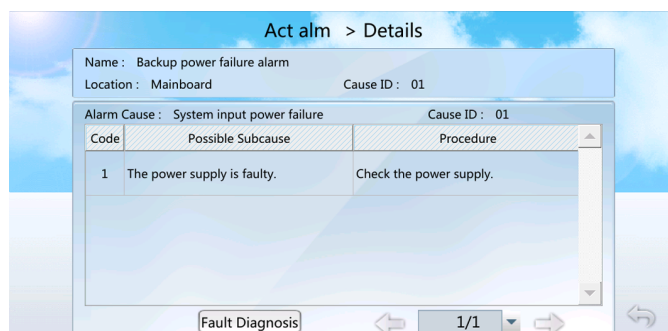
Act alm					
No.	Severity	Name	ID	Location	Generated On
1	 Major	Backup power failure alarm	A118-01	Mainboard	12/07/2019 21:06:41

 NOTE

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

Step 2 Click each alarm to open the **Details** page, which contains **Name**, **Generated**, **Severity**, **Location**, **Cause ID**, **Code**, **Possible Causes** and **Procedure** for the alarm.

Figure 12-16 Details

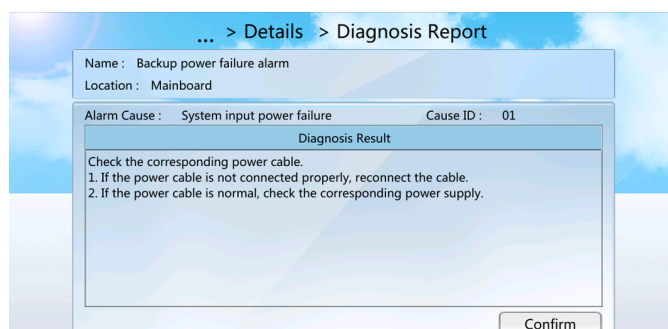


NOTE

- If the **Manually Clear** icon is not displayed on the **Details** screen, the alarm can be automatically cleared after the fault is rectified.
- If the **Manually Clear** icon is displayed on the **Details** screen, it indicates that the alarm can be cleared manually. You need to tap **Clear** to clear the alarm after the fault is rectified. The alarm clearance type (automatic or manual) varies with smart cooling products. Some of the alarms can either be cleared automatically or manually. Perform operations as required.

Step 3 Tap **Diagnostic Mode** to view the diagnosis report. Rectify the faults following instructions in the diagnosis report.

Figure 12-17 Diagnosis report



-----End

Follow-up Procedure

To query historical alarms, choose **Common Function > Query Hist Alarms** or **Alarms > Query Hist Alarms** on the home screen.

NOTE

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

12.3.10 How Do I Delete Historical Alarms?

Context

To delete historical alarms, log in as user **admin**.

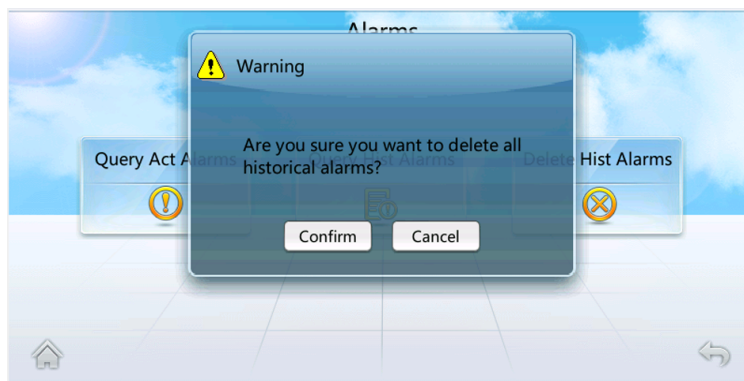
NOTICE

Exercise caution when deleting all historical alarms. Because this operation will clear all historical alarms and affect device maintenance.

Procedure

- Step 1** On the home screen, choose **Alarms > Delete Historical Alarms**. The screen shown in **Figure 12-18** is displayed.

Figure 12-18 Deleting historical alarms



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

NOTE

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

----End

12.3.11 How Do I Clear Component Runtime?

Context

NOTICE

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

Procedure

- Step 1** On the home screen, choose **Maint > Performance Maint**.
- Step 2** Tap **Clear** of a specific performance parameter to clear its runtime.

----End

12.3.12 How to Calibrate a Sensor

Context

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

Procedure

Step 1 On the home screen, choose **Maint > Sensor Calibration**.

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

----End

12.3.13 How Do I Change the Password?

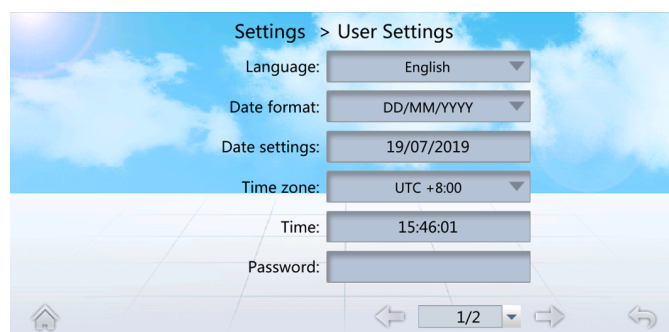
Prerequisites

- To modify a password, log in as the **admin** user or **operator** user.
- You can only change the password of the current user.

Procedure

Step 1 On the home screen, choose **Settings > User Settings** to enter the **User Settings** screen, as shown in [Figure 12-19](#).

Figure 12-19 User Settings



Step 2 Tap **Password** to enter the password changing screen, as shown in [Figure 12-20](#).

NOTE

It is recommended that the password should contain at least two types of characters.

Figure 12-20 Changing a password



DM25H00111

----End

12.3.14 How to Set Alarm Parameters

Prerequisites

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

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

- Power underfrequency alarm threshold < Power overfrequency alarm threshold
- Backup power underfrequency alarm threshold < Backup power overfrequency alarm threshold
- Supply air high temperature alarm threshold + 5°C ≤ Return air high temperature alarm threshold
- Supply air high temperature alarm threshold + 5°C ≤ Hot aisle high temperature alarm threshold
- Cold aisle high temperature alarm threshold + 5°C ≤ Hot aisle high temperature alarm threshold
- Cold aisle high temperature alarm threshold + 5°C ≤ Return air high temperature alarm threshold
- Supply air low temperature alarm threshold + 5°C ≤ Return air low temperature alarm threshold

Context

- To set an alarm threshold, follow the instructions in this section.
- The method for setting each alarm is the same. This section describes how to set **Threshold of Supply air high temperature alarm to 45**.
- If you need to change alarm settings, log in as the Admin user.

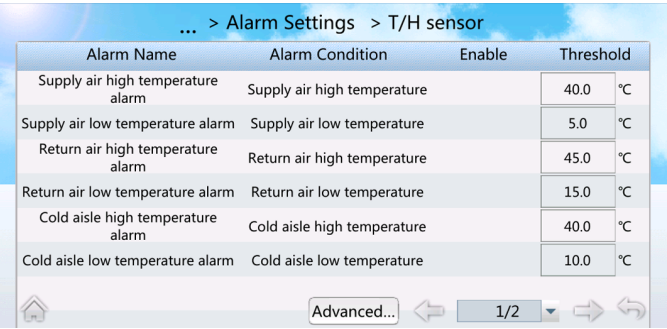
NOTICE

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

Procedure

Step 1 Choose **Settings > Alarm Settings > T/H Sensor** on the home screen. **Figure 12-21** is displayed.

Figure 12-21 Setting alarm parameter 1

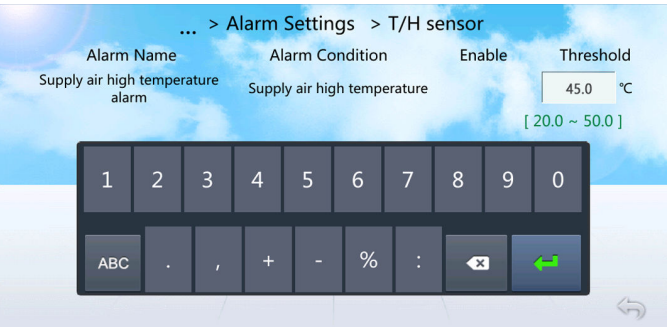


Alarm Name	Alarm Condition	Enable	Threshold
Supply air high temperature alarm	Supply air high temperature		40.0 °C
Supply air low temperature alarm	Supply air low temperature		5.0 °C
Return air high temperature alarm	Return air high temperature		45.0 °C
Return air low temperature alarm	Return air low temperature		15.0 °C
Cold aisle high temperature alarm	Cold aisle high temperature		40.0 °C
Cold aisle low temperature alarm	Cold aisle low temperature		10.0 °C

Step 2 Tap **Threshold** following **Supply air high temperature alarm**.

Step 3 Set the value to **45** and tap , as shown in **Figure 12-22**.

Figure 12-22 Setting alarm parameter 2



----End

12.3.15 How to Commission Single Component

Context

- On the diagnostic mode screen, you can turn on or off components, and control their output ratio.
- If you need to manually turn on or off system components in diagnostic mode, ensure that the smart cooling product is started before operation.
- Take commissioning the indoor fan as an example.

Procedure

Step 1 Choose **Maint > Diagnostic Mode > Enter**.

NOTE

The screen for entering the diagnostic mode:

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

Step 2 Set **Indoor fan** to 50%.

NOTICE

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

- When the electric heater is turned on, the indoor fans will turn on automatically.
- When the electrode humidifier is turned on, the indoor fans and inlet water solenoid valve will start automatically.
- When the input value of the indoor fan is less than the minimum speed, the indoor fan will run at the minimum speed.

Step 3 Check that the indoor fans run properly, and no alarm generates.

Step 4 Choose **Maint > Diagnostic Mode > Exit** or tap  to exit the diagnostic mode.

----End

12.3.16 How Do I Query the Setting of a Parameter Before Change?

On the home screen, choose **Maint > Query Logs** to query the setting of a parameter before change. The value before -> is the setting before change, and the value after -> is the setting after change.

NOTE

The log query screen displays logs of LCD user operations, including user login and setting change records.

Figure 12-23 Query Logs

Maint > Query Logs				
No.	User Name	Time	Source	Parameter
1	admin	10/10/2020 18:06:19	LCD	User login
2	admin	10/10/2020 18:04:52	LCD	User logout
3	admin	10/10/2020 18:00:21	LCD	A/C System-Date format: DD/MM/YYYY->DD/MM/YYYY

12.4 WebUI Operations

12.4.1 How Do I Manage WebUI Users?

Context

WebUI users are classified into **administrator**, **engineer**, and **operator**. They have different operation rights.

- **Administrator**: This role has all rights, including the rights for user management, browsing and modifying parameters, software upgrade, and data import and export. The user name is **admin** and the preset password is **Changeme** by default.
- **Engineer**: Compared with the administrator, only the user management function is unavailable to this role. There is no default user name. If necessary, add an engineer account.
- **Operator**: Compared with the administrator, this role has no rights for network security certificates, Modbus, SNMP, software upgrade, and fault information. There is no default user name. If necessary, add an operator account.

Procedure

Step 1 Change the login password.

1. Log in to the WebUI as an administrator.
2. Choose **Maintenance > User Management**. The user management page is displayed.
3. Choose the **admin** user and click **Modify**. Reset the login password on the displayed page and click **Confirm**.

Figure 12-24 Changing the login password

The screenshot shows the 'User Management' window with the following fields and options:

- Old Password**: Text input field.
- ☐ **Change Password**: Checkbox.
- New Password**: Text input field with a hint: 'a~z','A~Z','0~9','_' (8~20 characters of at least two types. Different from the user name or its reverse).
- Confirm Password**: Text input field.
- Authority**: Dropdown menu set to 'Administrator'.
- Password Validity Period**: Text input field set to '11000' with a range of '1-11000(Day)' and a note '[Remain validity period:10999Day]'.
- Advance Warning**: Text input field set to '1' with a range of '1-90(Day)'.
- Confirm**: Button at the bottom.

4. Enter **Login user password** and click **Submit**.

Figure 12-25 Recertification

The screenshot shows the 'Recertification' window with the following fields and options:

- Login user password**: Text input field.
- Submit**: Button at the bottom.

Step 2 Add a WebUI user.

1. Choose **Maintenance > User Management**. The user management page is displayed.
2. Click **Add**.
3. Enter information about the new user and click **Confirm**.

Figure 12-26 User Management

The screenshot shows the 'User Management' window with the following fields and options:

- User Name**: Text input field with a hint: 'a~z','A~Z','0~9','_' (1~20Characters).
- Password**: Text input field with a hint: 'a~z','A~Z','0~9','_' (8~20 characters of at least two types. Different from the user name or its reverse).
- Confirm Password**: Text input field.
- Authority**: Dropdown menu set to 'Operator'.
- Login Source**: Dropdown menu set to 'WEB'.
- Password Validity Period**: Text input field set to '90' with a range of '1-11000(Day)'.
- Account Validity Period**: Text input field set to '90' with a range of '1-11000(Day)'.
- Advance Warning Before Expires (days)**: Text input field set to '7' with a range of '1-90(Day)'.
- Confirm**: Button at the bottom.

 NOTE

After **Multi-factor Authentication** is enabled and the notification mode is configured, the following functions can be implemented:

- Retrieve the password if you forgot it. On the login page, click **Forgot password**, enter related information to obtain a verification code, and reset the login password.
- A verification code is used for login.

4. Enter **Login user password** and click **Submit**.

 NOTE

- On the user management page, you can modify, delete, lock, and unlock a user.
- If the password is not complex enough, the system displays the message **The password does not meet complexity requirements. Please enter a password again**.
- If the password is found to be weak, the system displays the message **Weak password. Enter another password**. Examples of weak passwords are **Password**, **Admin_1243**, and **Changeme_123**.
- **Advance Warning Before Expires** cannot exceed **Password Validity Period**. **Password Validity Period** cannot exceed **Account Password Period**.
- The WebUI supports a maximum of 20 users and a maximum of 3 concurrent online users.

----End

12.4.2 How Do I Install a Network Security Certificate?

Context

- You have copied a network security certificate and its key you obtained to the PC.
- Install a network security certificate if a security certificate problem message is displayed when you attempt to log in to the WebUI.
- You need to apply to an organization authorized by the customer for a network security certificate and its key with the IP address or domain name. This section describes how to import the certificate and key.

Procedure

Step 1 Log in to the WebUI as an administrator.

Step 2 Upload a network security certificate.

1. Choose **System Settings > Network Security Cert**.
2. Select a certificate format from the drop-down list box.
3. Select the network security certificate to be uploaded and upload it.
4. Select the network security certificate key to be uploaded and upload it.
5. If the network security certificate is encrypted, select **If an encrypted private key is imported, enter the password for decryption**, and specify **Key Password** and **Confirm Key Password**.
6. Click **Submit** in the **Network Security Certificate** area.

----End

12.4.3 How Do I View Active Alarms and Historical Alarms?

Procedure

- Step 1** Log in to the WebUI of the unit as an administrator.
- Step 2** Choose **Home > Active Alarm** to view the active alarms of the unit. Click **Details** in the **Alarm Description** area to view alarm details of devices.
- Step 3** To view historical alarms, choose **Query > Historical Alarm** and query historical alarms based on the site requirements.

----End

12.4.4 How Do I Export or Import a Configuration File?

Context

You can export the configuration file containing the parameter settings of unit 1 to a PC. When you need to set the same parameters for unit 2, import the configuration file to unit 2.

Procedure

- Step 1** Log in to the WebUI of unit 1 as an administrator.
 - Step 2** Choose **Maintenance > Configuration File**.
 - Step 3** Export a configuration file.
 - 1. Specify **Configuration File Encryption Password**.
-  **NOTE**
- Record the password for importing a configuration file.
- 2. Click **Back Up Current Settings**.
 - Step 4** Import a configuration file.
 - 1. Log in to the WebUI of unit 2 as an administrator.
 - 2. Choose **Maintenance > Configuration File**.
 - 3. Specify **Configuration File Decryption Password**.
 - 4. Click **Select a file** next to **Import A New Configuration File**.
 - 5. Select the configuration file to be imported, and click **Upload**.

----End

12.4.5 How Do I Export Fault Information?

Procedure

- Step 1** Log in to the WebUI of the unit as an administrator.
- Step 2** Choose **Maintenance > Fault Information**.

- Step 3** (Optional) Select **Encryption Password for Export** and enter an encryption password.

NOTICE

If **Encryption Password for Export** is selected, the exported data package will be encrypted, and you need to enter the encryption password to decompress the data package. To ensure data security, you are advised to select **Encryption Password for Export**.

NOTE

Record the password for decompressing the data package.

- Step 4** Click **Export Fault Information**.
- Step 5** Save the exported data to the PC.

----End

12.4.6 How Do I Change an IP Address?

Context

You have obtained the IP address, subnet mask, and default gateway information planned for the unit.

Procedure

- Step 1** Log in to the WebUI of the unit as an administrator.
- Step 2** Choose **System Settings > IP Address** and change the IP address, subnet mask, and default gateway information for the unit as planned.
- Step 3** Click **Submit**.
- End

12.4.7 How Do I View Version Information?

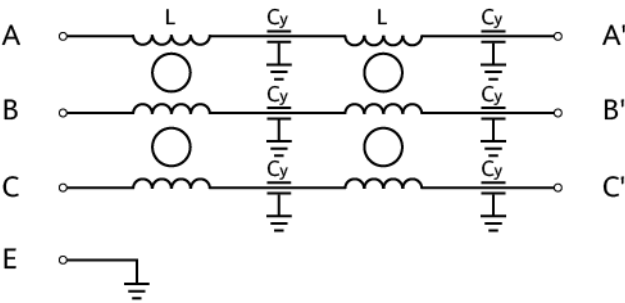
Procedure

- Step 1** Log in to the WebUI as an administrator.
- Step 2** Click  in the upper right corner of the home page and view the version information.
- Step 3** Choose **Maintenance > Version Information** and view the version information, software version, and BSP version.
- End

A Power Cable Filter for an Outdoor Unit

In a shielded equipment room, outdoor unit power cables must be used together with a filter that has the following topology and component parameters.

Figure A-1 Filter topology



NH11H00231

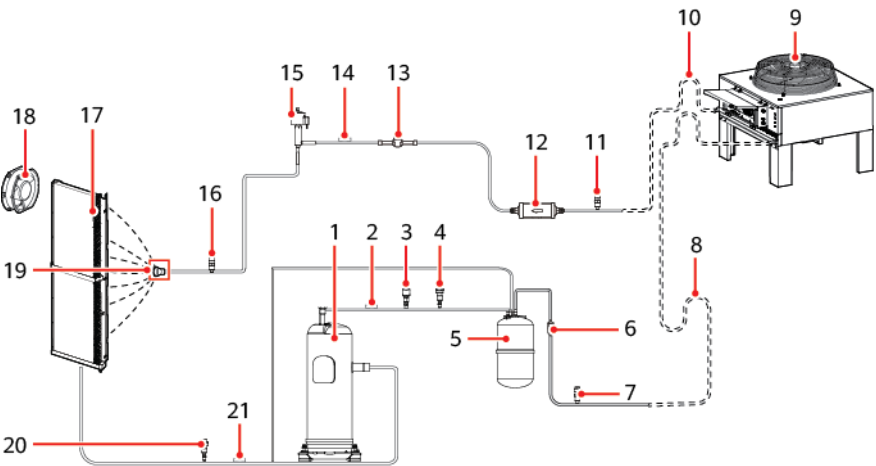
A, B, and C are connected to the indoor unit. A', B', and C' are connected to the outdoor unit. E is the PE point for the filter, which is grounded nearby.

Table A-1 Filter component specifications

Position No.	Name	Specifications	Deviation	Remarks
L	Common-mode inductor	22.5–45 mH @ 10 kHz	-	Ultra-microcrystal inductor, which can withstand 16 kHz switching frequency and does not generate heat due to saturation
C _y	Y capacitor	2.7 nF @ 10 kHz	±10%	Thin film feedthrough capacitor

B Cooling Device Layout Diagram

Figure B-1 Cooling component layout



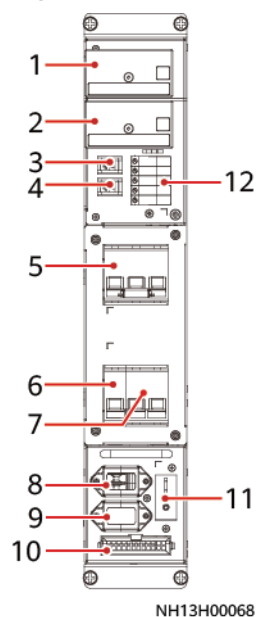
NH13H00097

- | | | |
|---------------------------------|-------------------------------------|---------------------------------|
| (1) Compressor | (2) Discharge temperature sensor | (3) High pressure switch |
| (4) High pressure sensor | (5) Oil separator | (6) Check valve |
| (7) Discharge pipe needle valve | (8) Oil trap | (9) Outdoor unit |
| (10) Inverted U-shaped trap | (11) Liquid pipe needle valve | (12) Filter dryer |
| (13) Sight glass | (14) Liquid pipe temperature sensor | (15) Electronic expansion valve |
| (16) Low-pressure needle valve | (17) Evaporator | (18) Indoor fan |
| (19) Distributor | (20) Low pressure sensor | (21) Suction temperature sensor |

C Electric Control Box

C.1 Electric Control Box Layout for the Indoor Unit

Figure C-1 Electric box layout



- | | |
|--|---|
| (1) Active power supply | (2) Standby power supply |
| (3) Contactor control switch (MD1) | (4) Contactor control switch (MD2) |
| (5) Drive switch (QF3) | (6) Switch (QF12) for the receiver heater (optional for the outdoor unit) |
| (7) Electric heater switch (QF4) | (8) Compressor, PSU power port (X101) (connection not required onsite) |
| (9) Power supply port (X102) for the electric heater and outdoor unit fan (connection not required onsite) | (10) External signal port (X103) (connection not required onsite) |

(11) Surge protection board grounding
(connection not required onsite)

(12) Outdoor unit power 1U, 1V, 1W and low
temperature component power L, N (AC3)

Figure C-2 ELV box layout

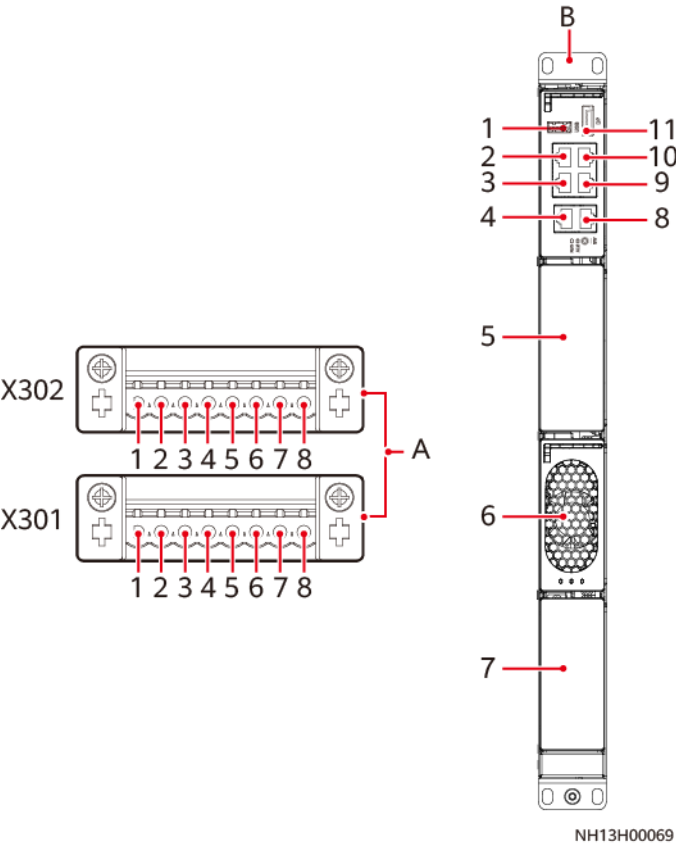


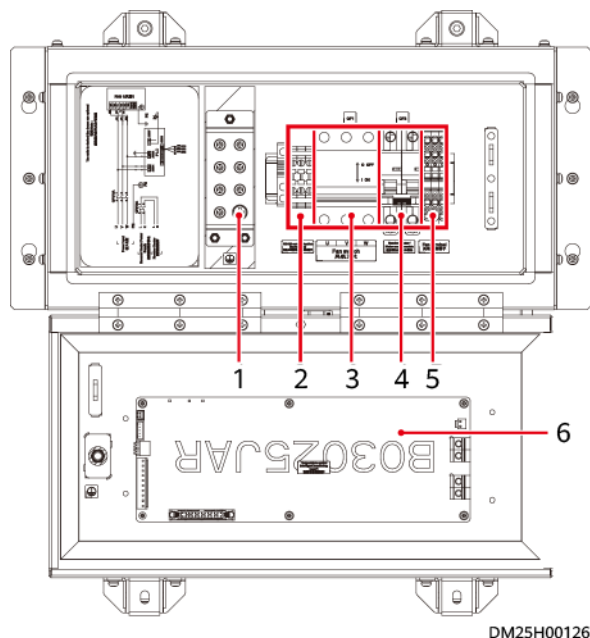
Table C-1 Ports of the ELV box

No. Name and Function					
A	Signal cable terminal block	X301	(1)	Outdoor unit ON/OFF control	Outdoor unit ON/OFF control +
			(2)		Outdoor unit ON/OFF control -
			(3)	Smoke sensor	Smoke sensor power supply (12 V DC)
			(4)		Smoke sensor feedback
			(5)	Remote startup and shutdown	Remote startup and shutdown+
			(6)		Remote startup and shutdown-

No.	Name and Function				
			(7)	Water sensor	Water leak detection-contact 1 (water leak in the floor)+
			(8)		Water leak detection-contact 1 (water leak in the floor)-
		X302	(1)	Outdoor unit RS485 control	RS485-SW+
			(2)		RS485-SW-
			(3)		GND-ISO
			(4)	Common alarm 1	Common alarm 1+
			(5)		Common alarm 1-
			(6)	Common alarm 2	Common alarm 2+
			(7)		Common alarm 2-
			(8)	Reserved	-
B	ELV box	(1) USB (USB port)	(2) RS485/12 V (T/H module port)	(3) CAN_IN (input port of the teamwork CAN/northbound RS485 port)	(4) FE_1 (FE ring network input and output terminal)
		(5) Filler panel	(6) PSU	(7) Filler panel	(8) FE_2 (FE ring network input and output terminal)
		(9) CAN_OUT (output port of the teamwork CAN/northbound RS485 port)	(10) COM (northbound RS485 port)	(11) DP (connecting to the display module)	-

C.2 NetCol500-A040 Electric Control Box Layout

Figure C-3 NetCol500-A040 electric control box



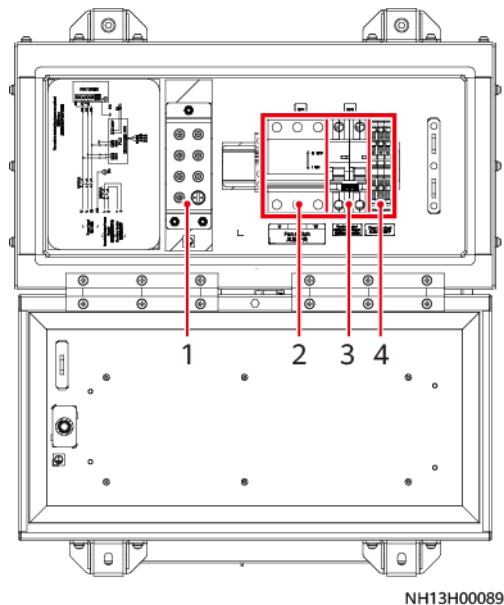
- | | | |
|---|--|--|
| (1) PE bar | (2) RS485 communications terminals (RS485+, RS485-, and GND) | (3) Fan switch (QF1) |
| (4) Receiver heater/Water-cooled module (QF2) | (5) Fan wiring terminals | (6) Temperature control intelligent monitoring board |

NOTE

The temperature control intelligent monitoring board (optional) is located on the inner cover of the electronic control box.

C.3 NetCol500-A060 Electric Control Box Layout

Figure C-4 NetCol500-A060 electric control box (without temperature control intelligent monitoring board)



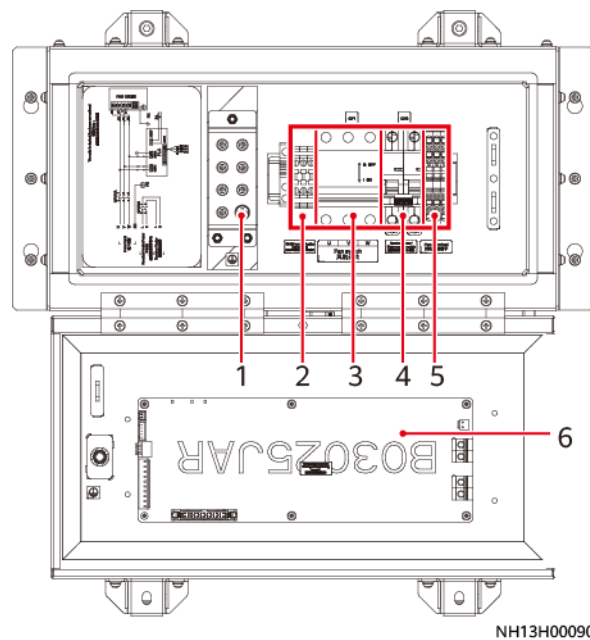
(1) PE bar

(2) Fan switch (QF1)

(3) Receiver heater/Water cooling module
(QF2)

(4) Fan terminal

Figure C-5 NetCol500-A060 electric control box (with temperature control intelligent monitoring board)



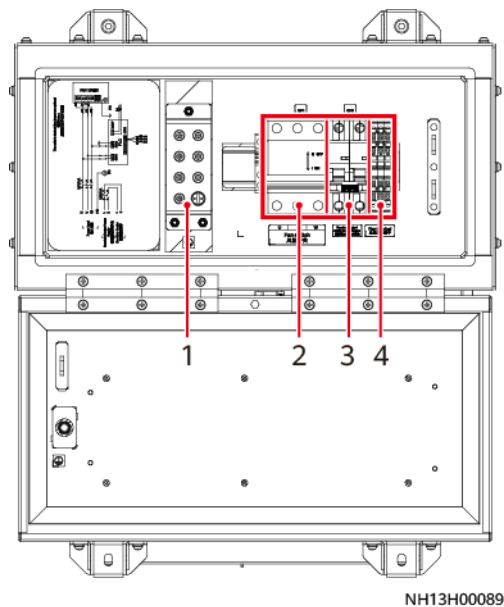
- | | | |
|--|---|--|
| (1) PE bar | (2) RS485 communication line terminal (RS485+, RS485-, GND) | (3) Fan switch (QF1) |
| (4) Receiver heater/Water cooling module (QF2) | (5) Fan terminal | (6) Temperature control intelligent monitoring board |

NOTE

The temperature control intelligent monitoring board is located on the inner cover of the electronic control box.

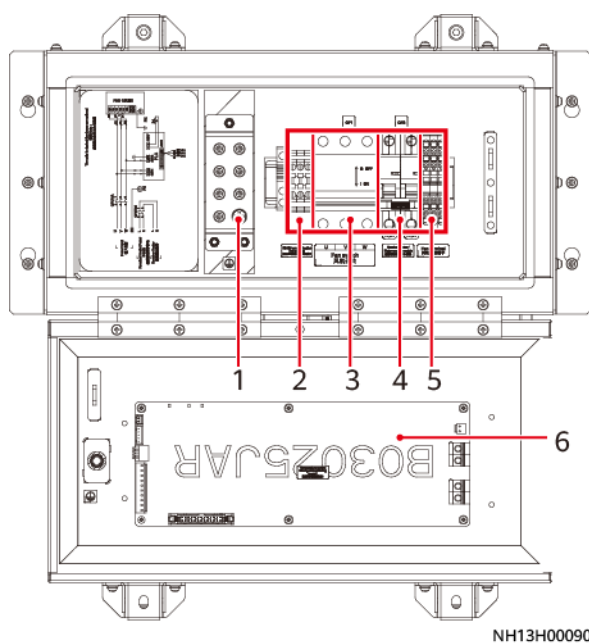
C.4 NetCol500-A080 Electric Control Box Layout

Figure C-6 NetCol500-A080 electric control box (without temperature control intelligent monitoring board)



- | | |
|--|----------------------|
| (1) PE bar | (2) Fan switch (QF1) |
| (3) Receiver heater/Water cooling module (QF2) | (4) Fan terminal |

Figure C-7 NetCol500-A080 electric control box (with temperature control intelligent monitoring board)



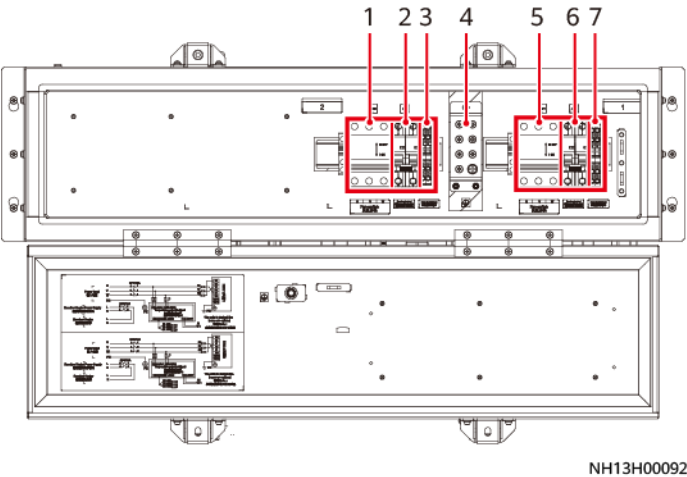
- | | | |
|--|---|--|
| (1) PE bar | (2) RS485 communication line terminal (RS485+, RS485-, GND) | (3) Fan switch (QF1) |
| (4) Receiver heater/Water cooling module (QF2) | (5) Fan terminal | (6) Temperature control intelligent monitoring board |

NOTE

The temperature control intelligent monitoring board is located on the inner cover of the electronic control box.

C.5 NetCol500-A120 Electric Control Box Layout

Figure C-8 NetCol500-A120 electric control box (without temperature control intelligent monitoring board)

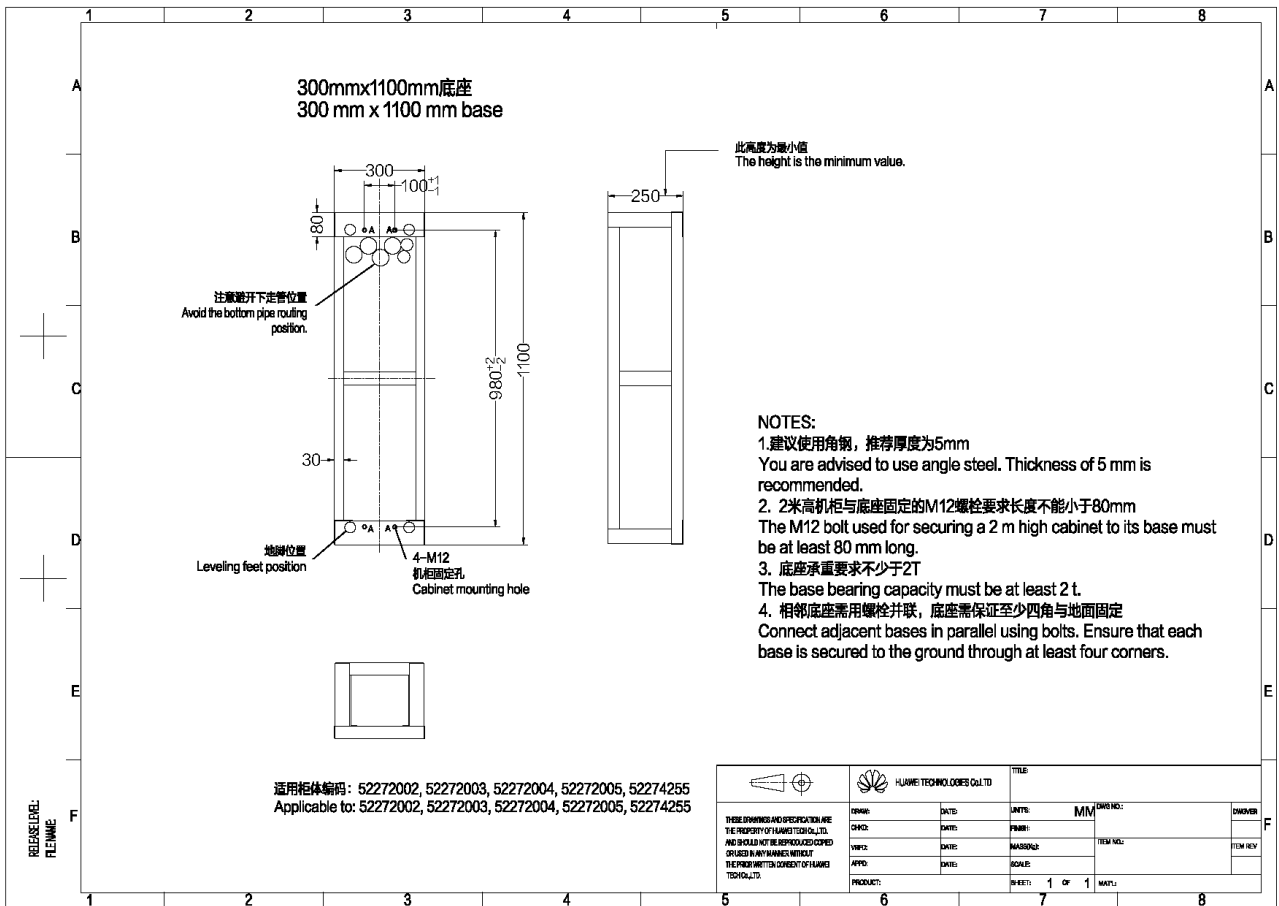


- | | |
|----------------------|--|
| (1) Fan switch (QF3) | (2) Receiver heater/Water cooling module (QF4) |
| (3) Fan terminal 2 | (4) PE bar |
| (5) Fan switch (QF1) | (6) Receiver heater/Water cooling module (QF2) |
| (7) Fan terminal 1 | |

D Base Drawing

D.1 Indoor Unit Base Drawings

Figure D-1 Base dimensions of NetCol5000-A025 (unit: mm)



俯视图 Top view

300
100^{L1}
80
1080^{L2}
1200
30

注意避开下走管位置
Avoid the bottom pipe routing position.

地脚位置
Leveling feet position

4-M12
机柜固定孔
Cabinet mounting hole

侧视图 Side view

250

此高度为最小值
The height is the minimum value.

正视图 Front view

通用柜体编码: 52274254
Applicable to: 52274254

NOTES:

- 建议使用角钢，推荐厚度为5mm
You are advised to use angle steel. Thickness of 5 mm is recommended.
- 2米高机柜与底座固定的M12螺栓要求长度不能小于80mm
The M12 bolt used for securing a 2 m high cabinet to its base must be at least 80 mm long.
- 底座承重要求不少于2T
The base bearing capacity must be at least 2 t.
- 相邻底座需用螺栓并联，底座需保证至少四角与地面固定
Connect adjacent bases in parallel using bolts. Ensure that each base is secured to the ground through at least four corners.

 NOTE

- You are advised to use angle steel or channel steel. Thickness of 3 mm to 5 mm is recommended.
- Control welding errors during the manufacturing process. If welding errors are large, the base will be unusable after welding.
- The M12 bolt used for securing the cabinet to its base must be at least 80 mm long.
- The base bearing capacity must be at least 2 t.
- Connect adjacent bases in parallel using bolts. Ensure that each base is secured to the ground through at least four corners.

D.2 Outdoor Unit Base Drawings

 NOTE

- It is recommended that the base be made of cost-effective angle steel of 45 mm x 45 mm x 4 mm.
- It is recommended that the base be higher than 100 mm.
- The base is a welded structure. Ensure that the installation surface is polished and the base is rust-proof.

When preparing the base, pay attention to the following points:

1. Angle, square, or channel steel with a width of 45–60 mm and a thickness of 4–5 mm is recommended.
 - a. If the angle steel width is less than or equal to 60 mm, there is no need to consider measures for avoiding blockage.
 - b. If the angle steel width is greater than 60 mm, the base interferes with the hole for routing cables. In this case, cut holes on the angle steel to avoid blockage.
2. Install shock pads between the base and the unit. The shock pads should be made of EPDM rubber and 5 mm thick.
3. Control welding errors during the manufacturing process. If welding errors are large, the base will be unusable after welding.
4. The base height can be adjusted based on site requirements.

D.2.1 NetCol500-A040

Horizontal Installation

Figure D-3 Concrete base for the NetCol500-A040

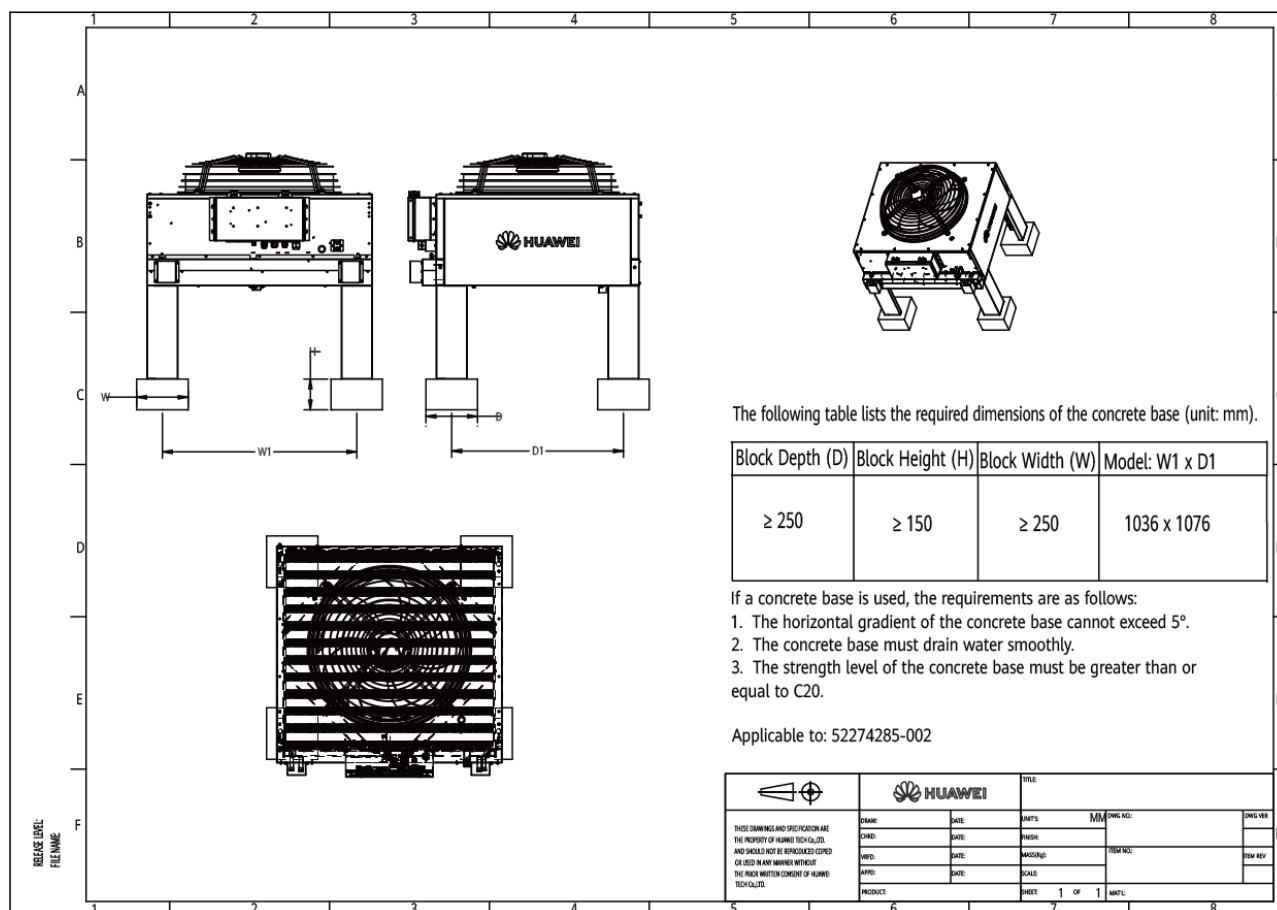
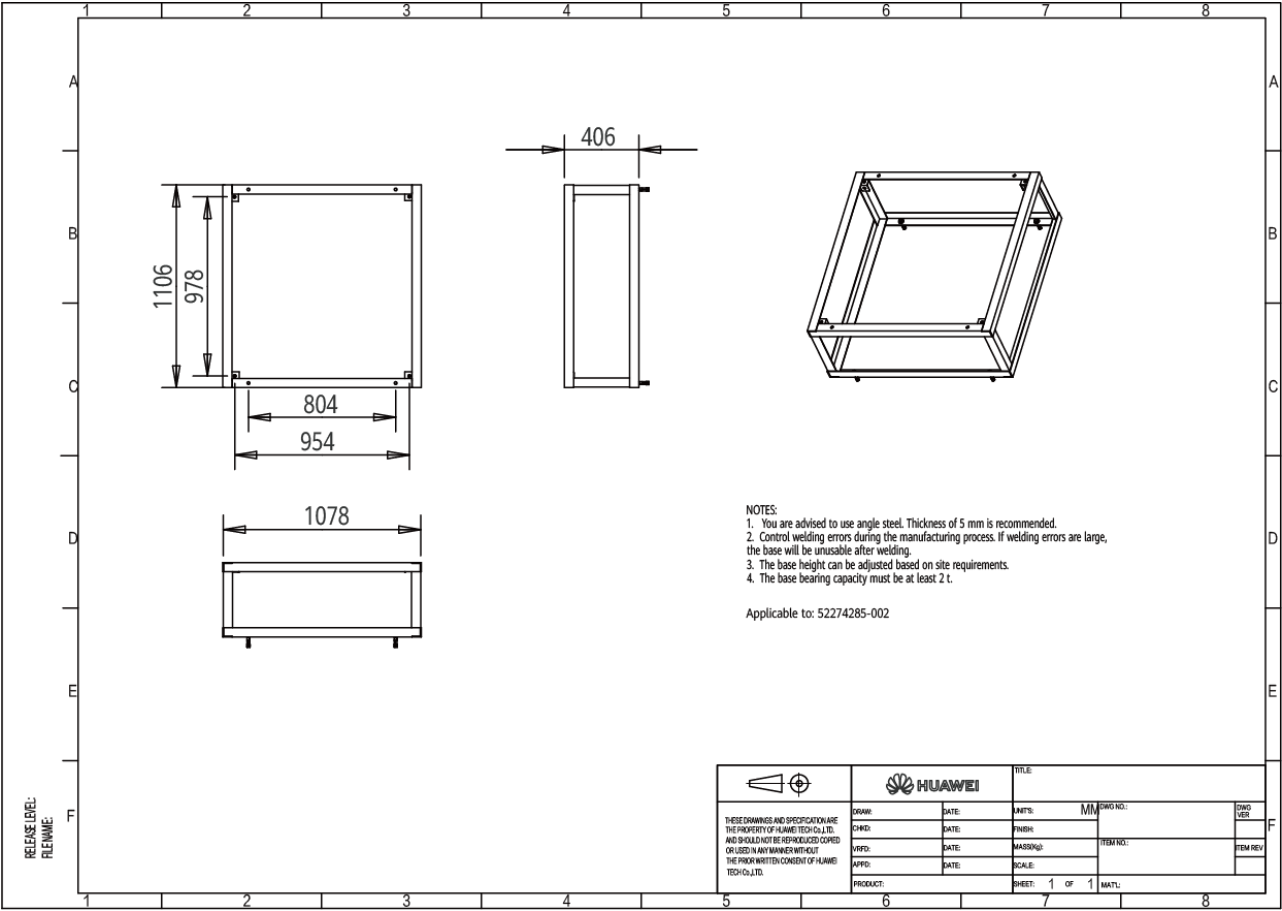
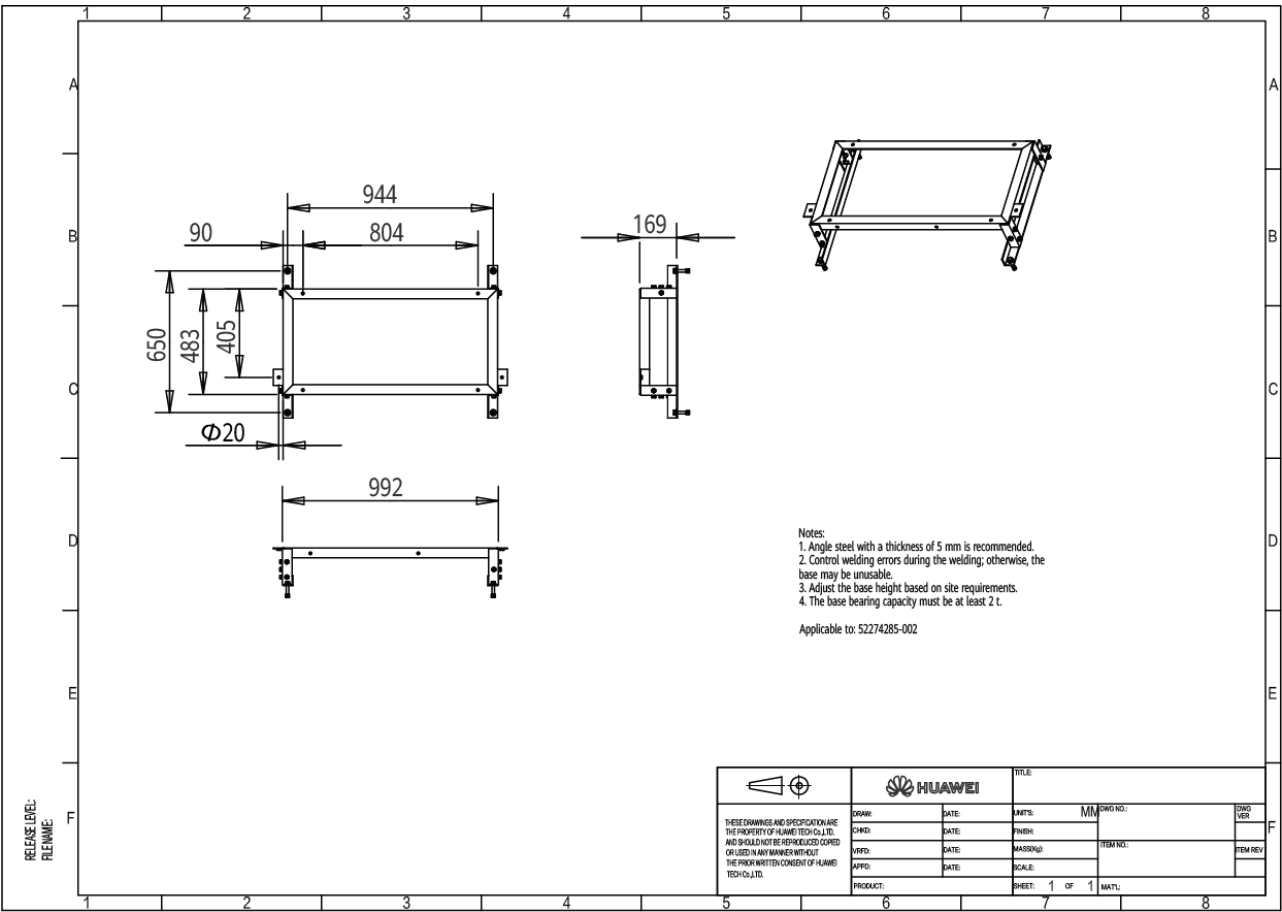


Figure D-4 Support base for the NetCol500-A040



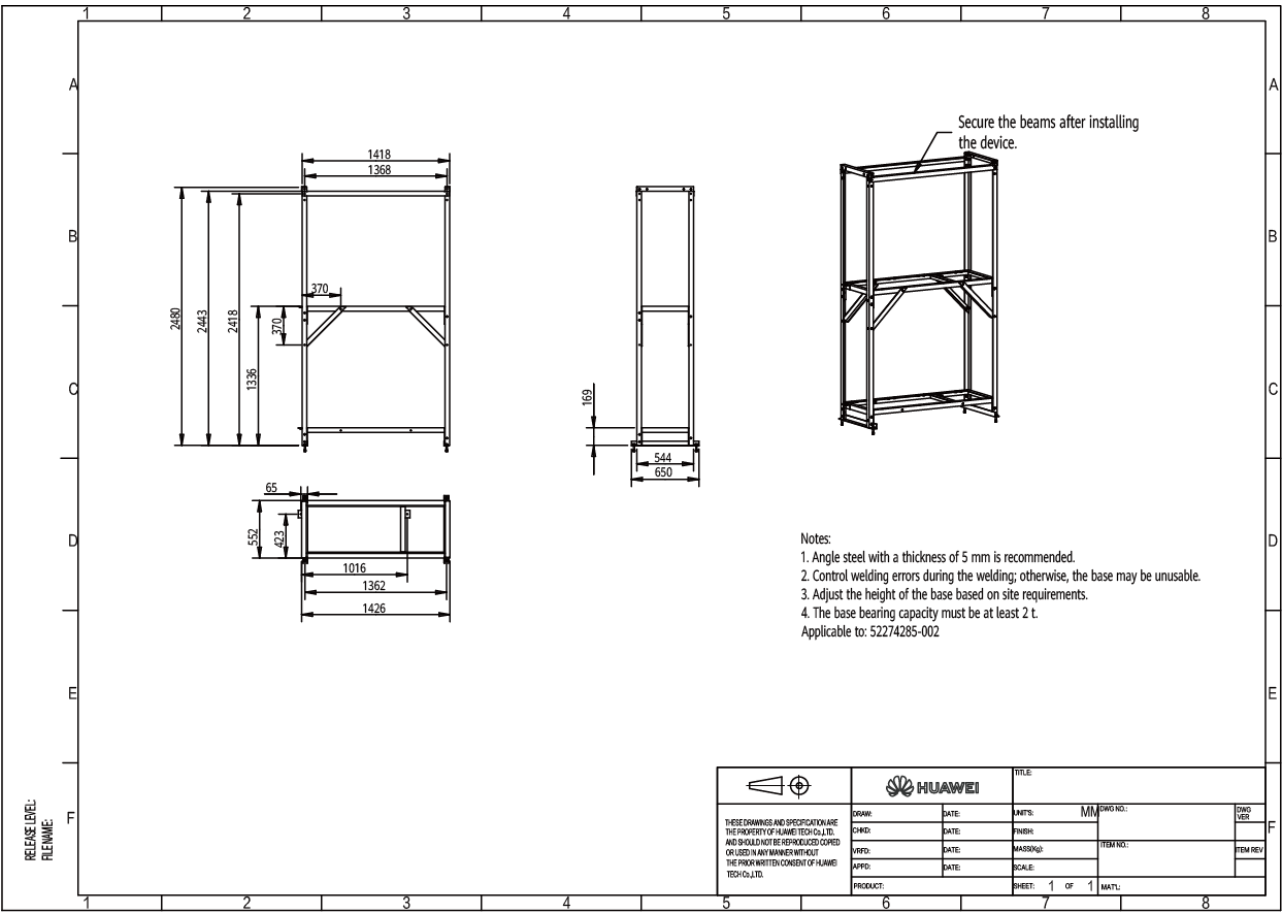
Vertical Single-Layer Installation

Figure D-5 Single-layer support base for vertical installation of the NetCol500-A040



Vertical Double-Layer Installation

Figure D-6 Double-layer support base for vertical installation of the NetCol500-A040



NOTES:

- You are advised to use angle steel. Thickness of 5 mm is recommended.
- Control welding errors during the manufacturing process. If welding errors are large, the base will be unusable after welding.
- The base height can be adjusted based on site requirements.
- The base bearing capacity must be at least 2 t.

Two horizontal bases need to be placed side by side during installation of S2273755/52273755-002. Remove the screws on the interconnecting side and use them for installing the bases together.

		TITLE:	
DRAWN:	DATE:	UNIT:	MM
CHECKED:	DATE:	DESIGNED:	
INVESTIGATED:	DATE:	MANUFACTURED:	ITEM NO.:
APPROVED:	DATE:	SCALE:	
PRODUCT:		SHEET:	1 OF 1 MATL.

Vertical Single-Layer Installation

Figure D-9 Concrete base for the NetCol500-A060

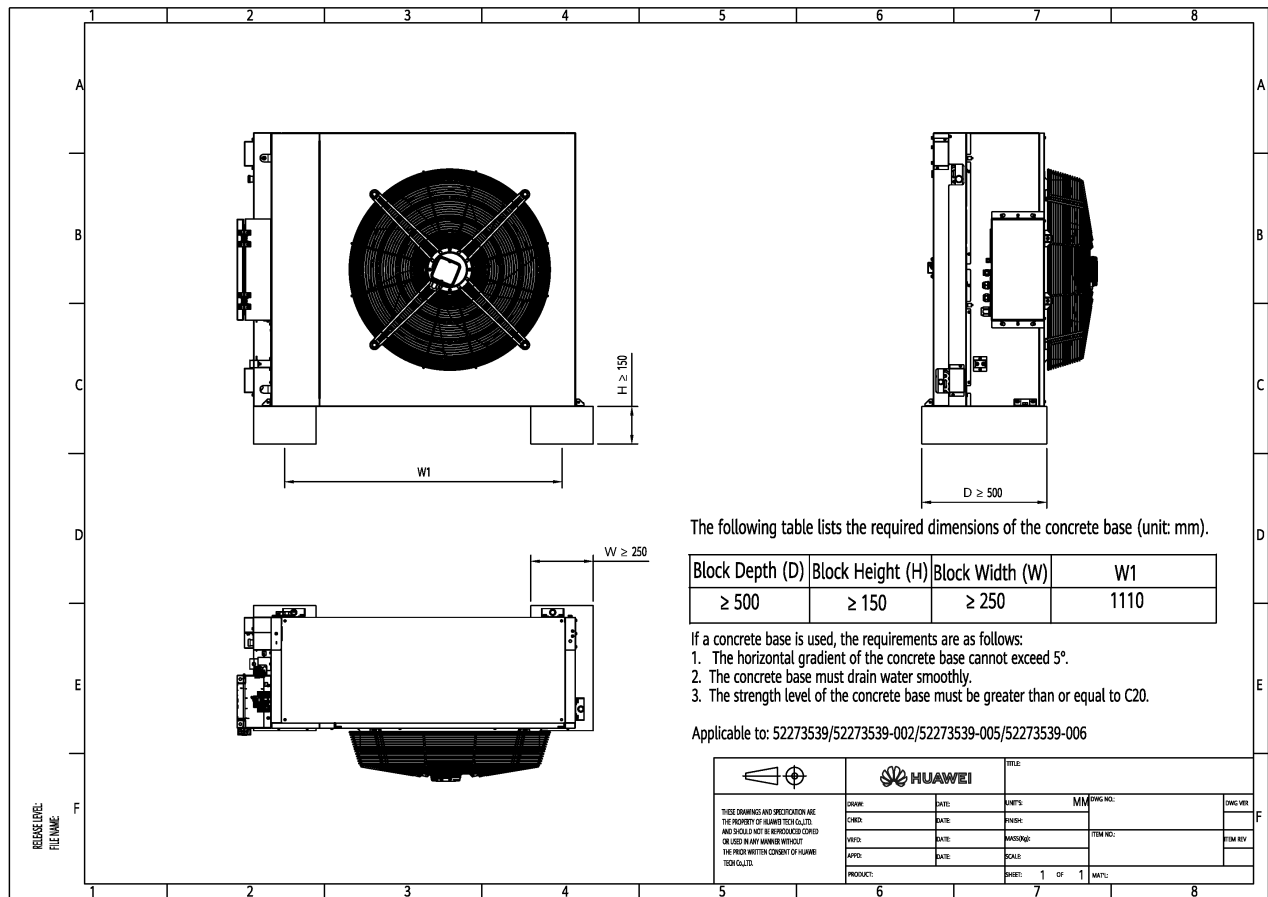
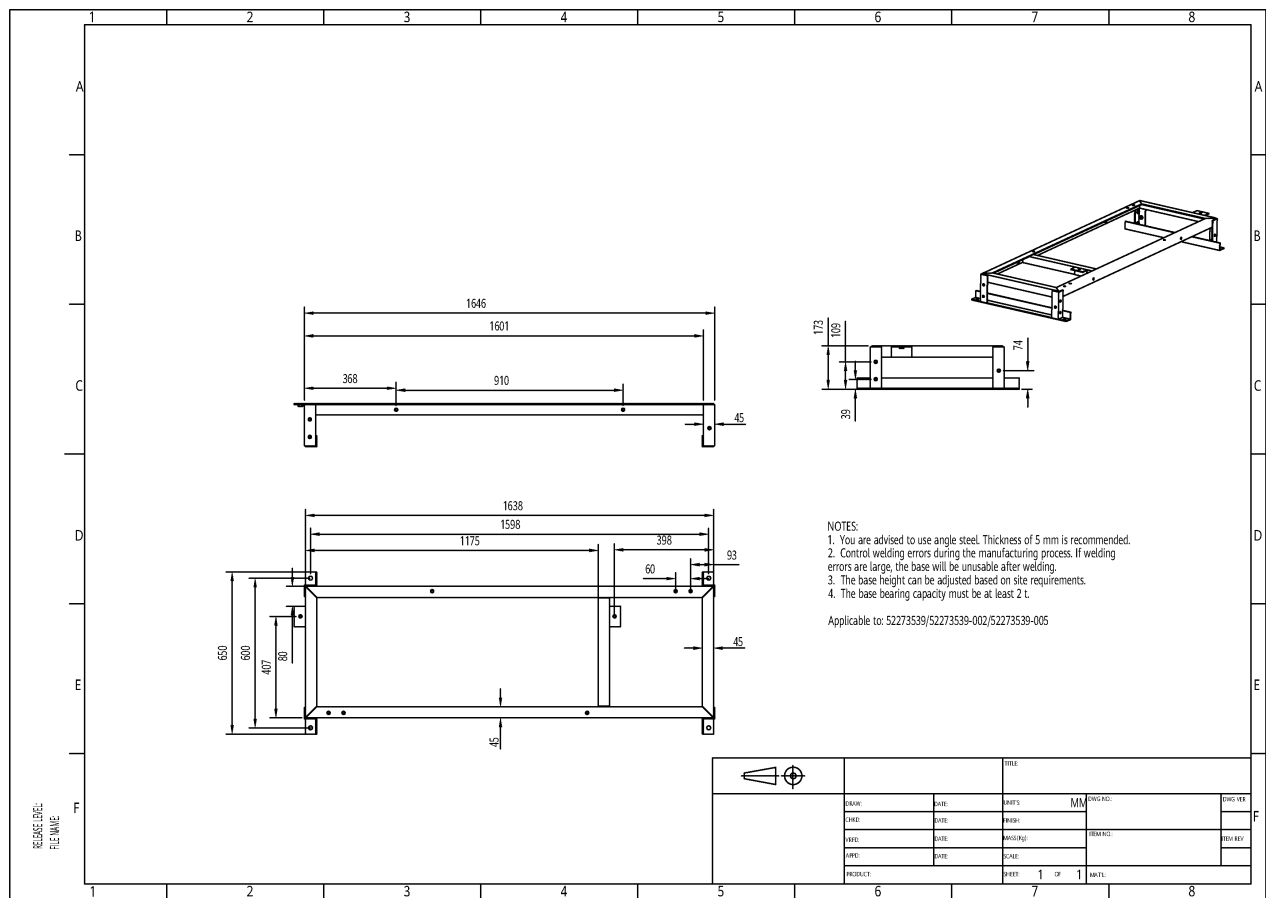


Figure D-10 Single-layer support base for vertical installation of the NetCol500-A060MC1D0



Technical drawing of a base plate for a 5G antenna. The drawing includes a top view, a side view, and a perspective view. The top view shows a rectangular plate with dimensions 1638mm by 1260mm. The side view shows a height of 173.000mm and a width of 604mm. The perspective view shows the plate with a 45-degree angle. The drawing is labeled with dimensions and a title block.

Dimensions:

- Top View: 1638mm (width), 1260mm (depth), 1175mm (inner width), 508mm (inner depth), 153mm (flange width), 60mm (flange depth), 45mm (corner radius).
- Side View: 173.000mm (height), 604mm (width).
- Perspective View: 45mm (corner radius).

Notes:

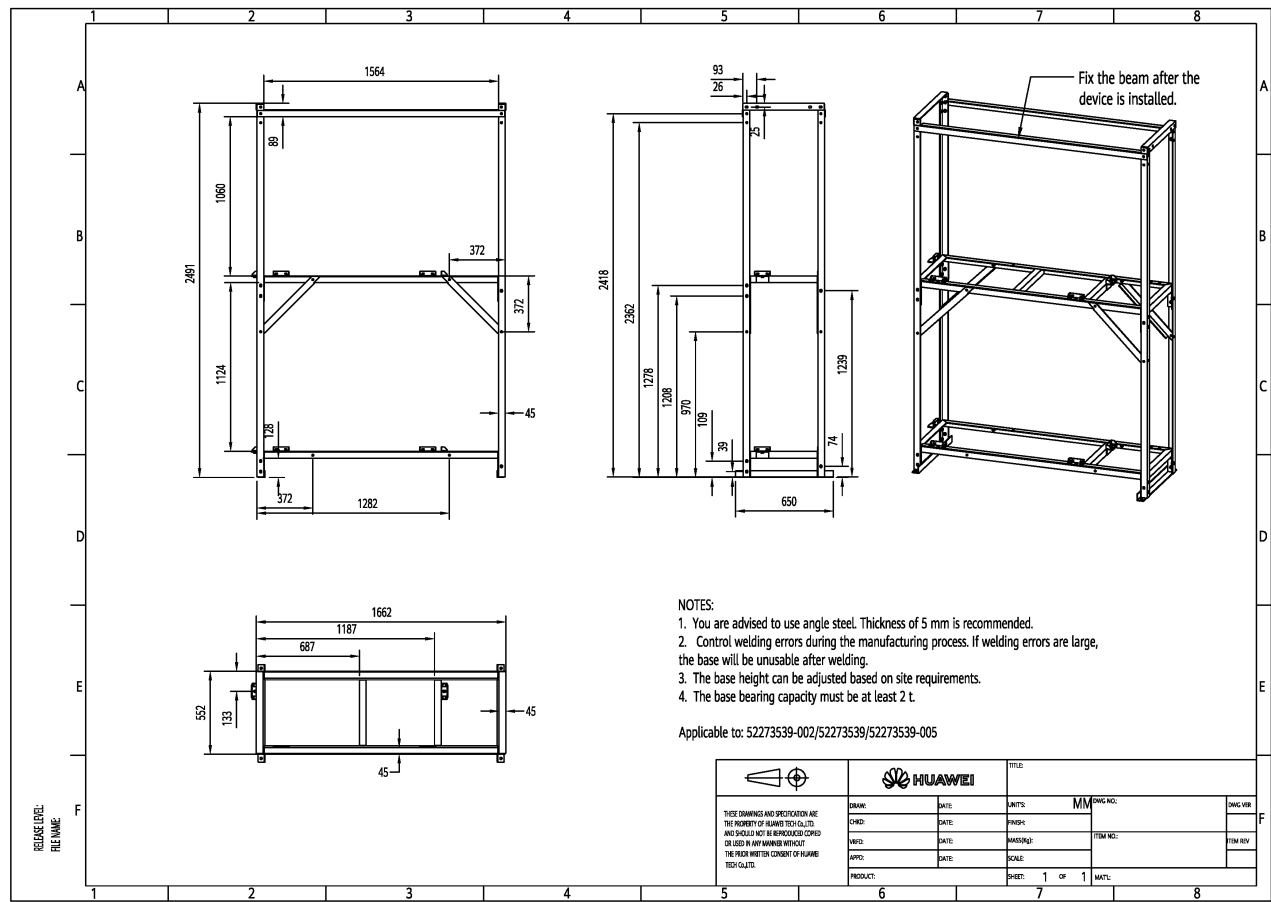
- You are advised to use angle steel. Thickness of 5 mm is recommended.
- Control welding errors during the manufacturing process. If welding errors are large, the base will be unusable after welding.
- The base height can be adjusted based on site requirements.
- The base bearing capacity must be at least 2 t.

Applicable to: 52273539-006

		TITLE:	
DRAWN:	DATE:	UNITS:	MM
CHECKED:	DATE:	DRAWN:	ITEM NO:
WFO:	DATE:	WFO:	ITEM REV:
APPD:	DATE:	SCALE:	SHEET: 1 OF 1
PRODUCT:		MATL:	

Vertical Double-Layer Installation

Figure D-12 Double-layer support base for vertical installation of the NetCol500-A060MC1D0



Technical drawing of a 2x2 antenna array structure. The drawing includes a front view, a side view, and a perspective view.

Front View Dimensions:

- Total Width: 1662 mm
- Total Height: 2480 mm
- Internal Vertical Spacing: 1124 mm
- Internal Horizontal Spacing: 1105 mm
- Beam Thickness: 45 mm
- Base Height: 124 mm
- Base Width: 133 mm
- Base Depth: 109 mm

Side View Dimensions:

- Total Depth: 604 mm
- Total Height: 2422 mm
- Internal Vertical Spacing: 1278 mm
- Internal Horizontal Spacing: 1208 mm
- Beam Thickness: 45 mm
- Base Height: 970 mm

Notes:

- You are advised to use angle steel. Thickness of 5 mm is recommended.
- Control welding errors during the manufacturing process. If welding errors are large, the base will be unusable after welding.
- The base height can be adjusted based on site requirements.
- The base bearing capacity must be at least 2 t.

Applicable to: 52273539-006

HUAWEI		TITLE:	
DRAWN:	DATE:	UNITS:	MM
CHD:	DATE:	PROJ:	
WFO:	DATE:	INSTR:	
APP:	DATE:	SCALE:	
PRODUCT:		SHEET:	1 OF 1

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Horizontal Installation

Figure D-14 Concrete base for the NetCol500-A080

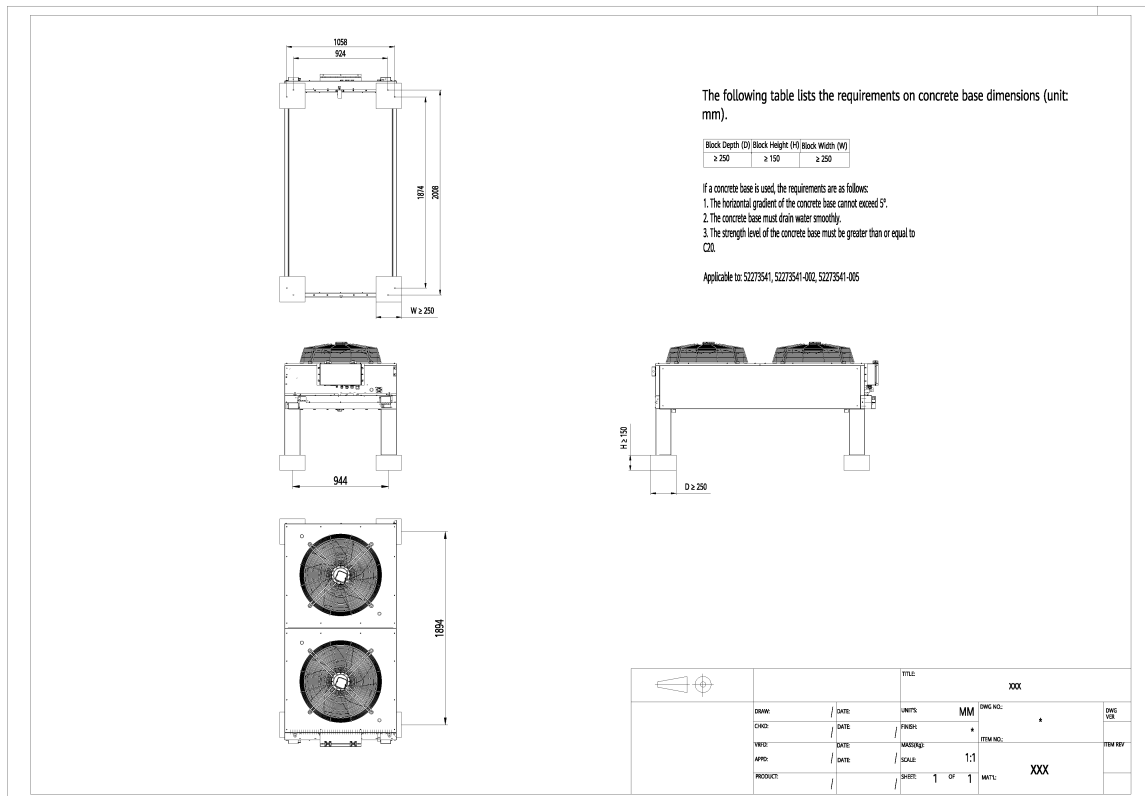
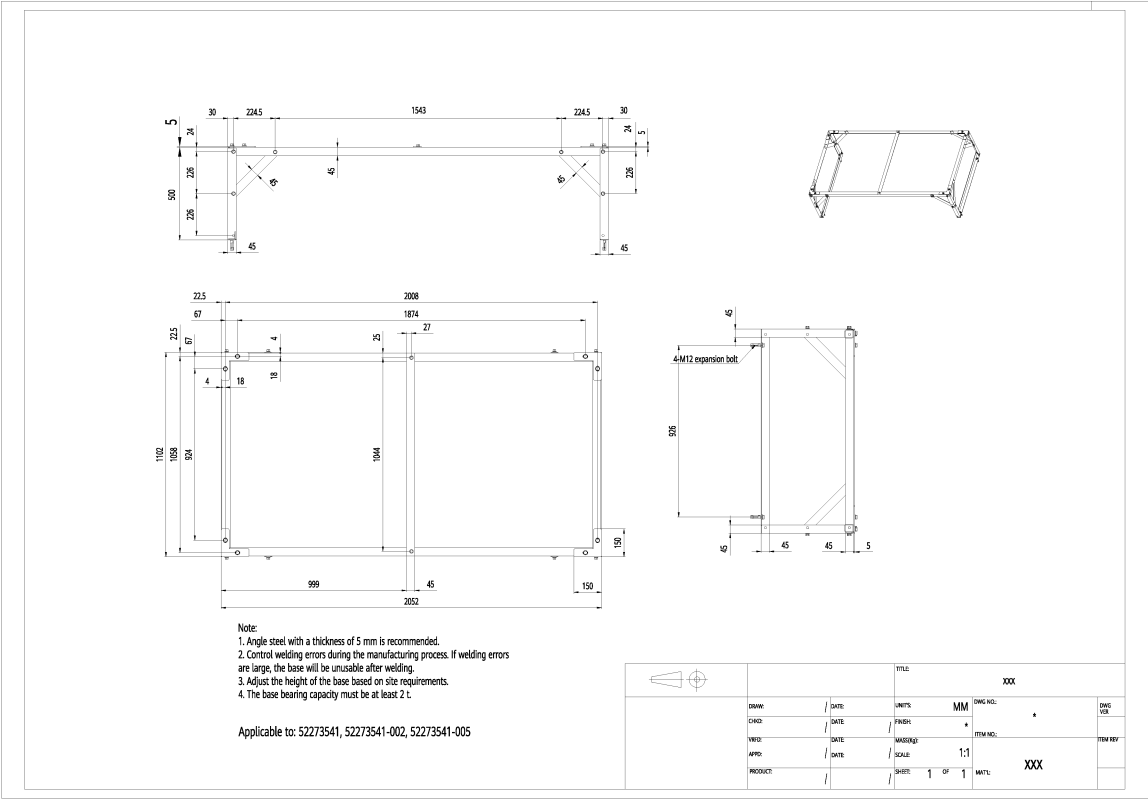


Figure D-15 Support base for the NetCol500-A080



Vertical Single-Layer Installation

Figure D-16 Concrete base for vertical installation of the NetCol500-A080

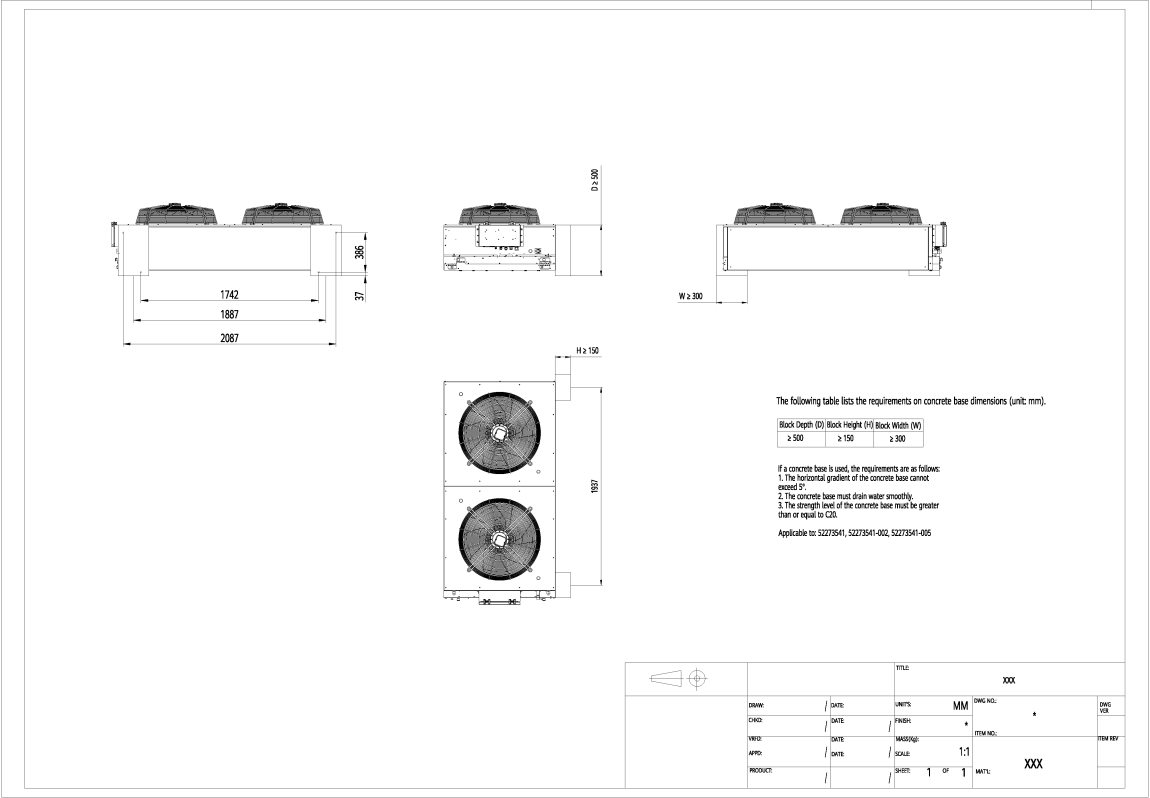


Figure D-17 Single-layer support base for vertical installation of the NetCol500-A080

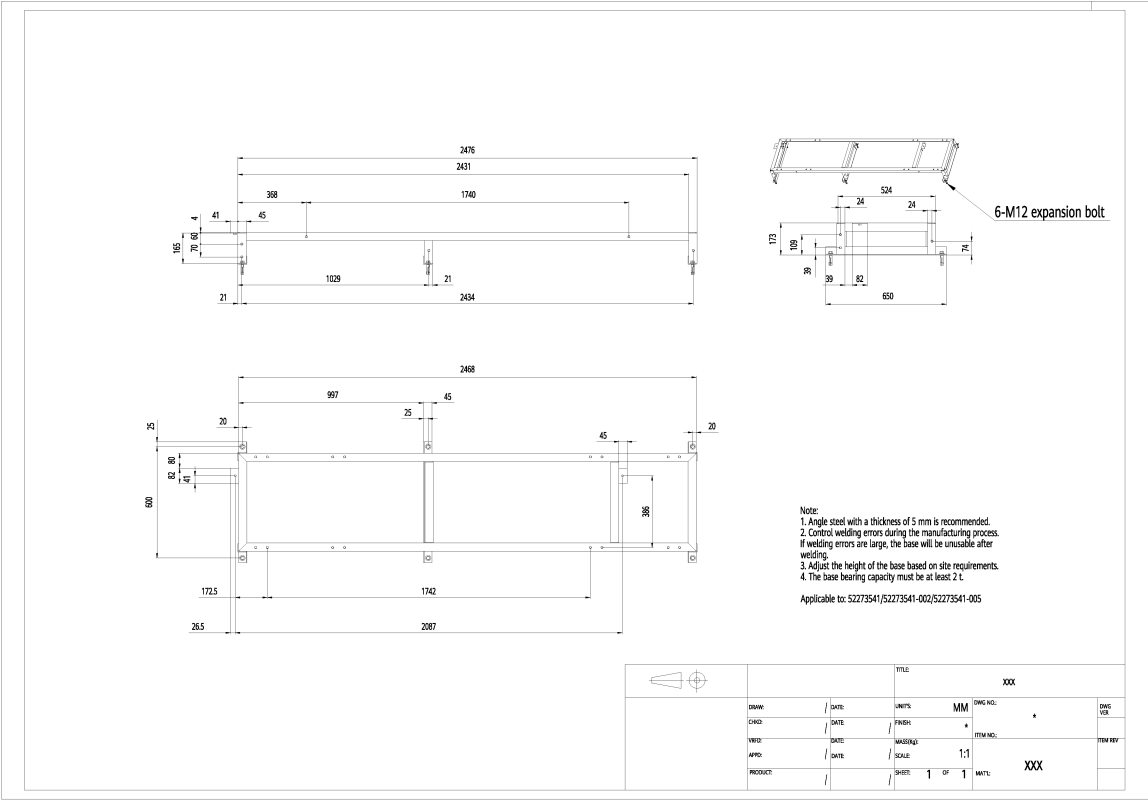


Figure D-18 Double-layer support base for vertical installation of the NetCol500-A080



NOTES:

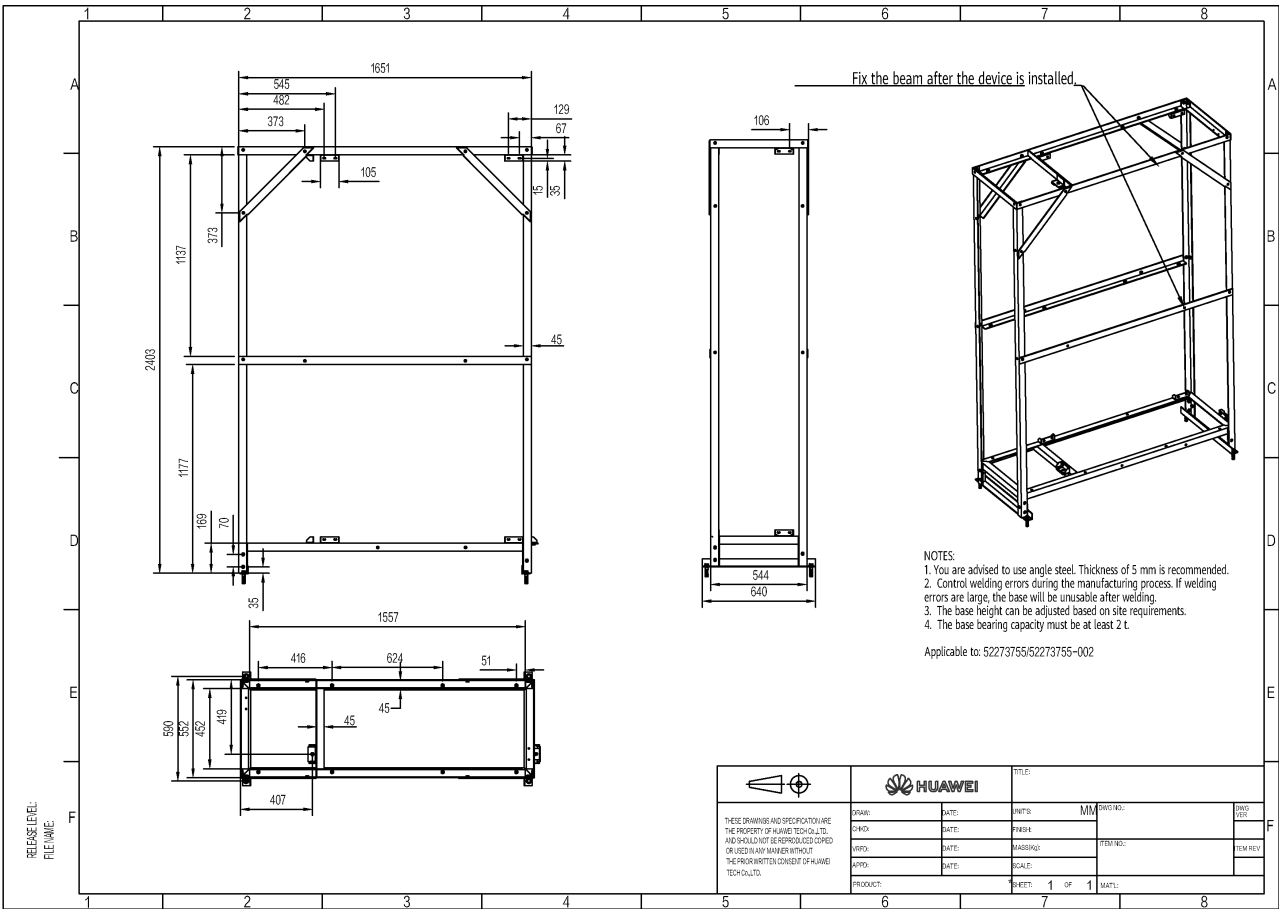
- You are advised to use angle steel. Thickness of 5 mm is recommended.
- Control welding errors during the manufacturing process. If welding errors are large, the base will be unusable after welding.
- The base height can be adjusted based on site requirements.
- The base bearing capacity must be at least 2 t.

Two horizontal bases need to be placed side by side during installation of S2273755/S2273755-002. Remove the screws on the interconnecting side and use them for installing the bases together.

		TITLE:	
DRAWN:	DATE:	UNITS: MM	DWG. NO.:
CHECKED:	DATE:	DESIGNED:	
INSPD:	DATE:	MANUFACTURED:	ITEM NO.:
APPROVED:	DATE:	SCALE:	
PRODUCT:		SHEET: 1 OF 1	MATL:

Vertical Single-Layer Installation of Outdoor Units

Figure D-21 Single-layer support base for vertical installation of the NetCol500-A120



E Electric Conceptual Diagram

E.1 Indoor Unit Electrical Diagrams

Figure E-1 NetCol5000-A035H4WE0/NetCol5000-A035H40E0

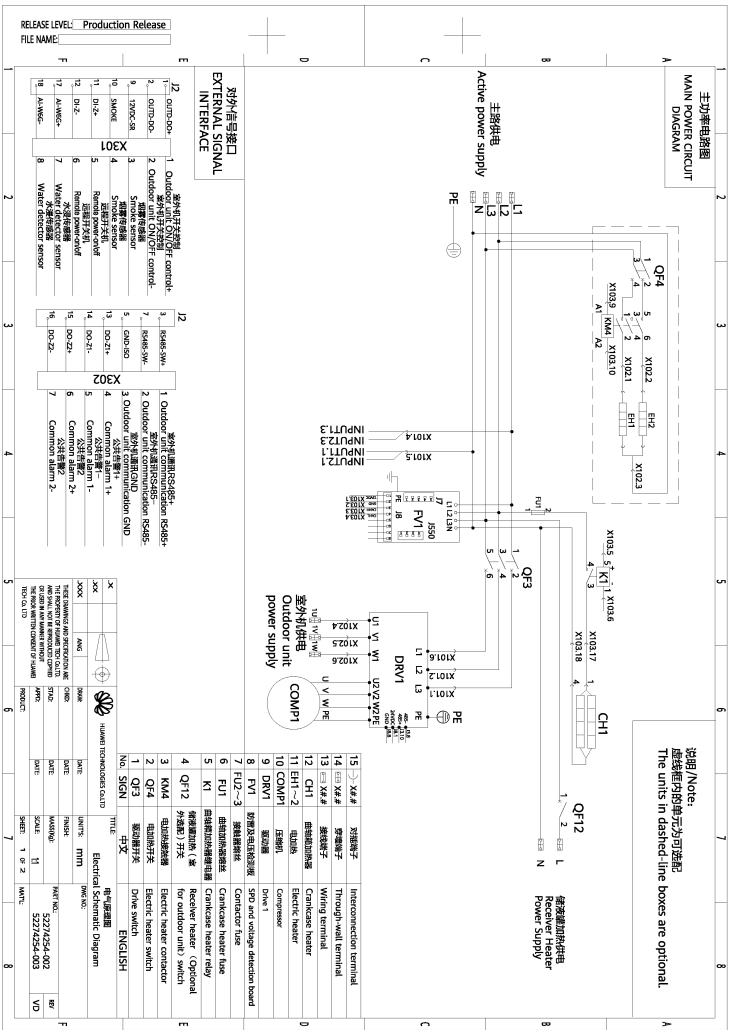


Figure E-2 NetCol5000-A035H4WE0/NetCol5000-A035H40E0

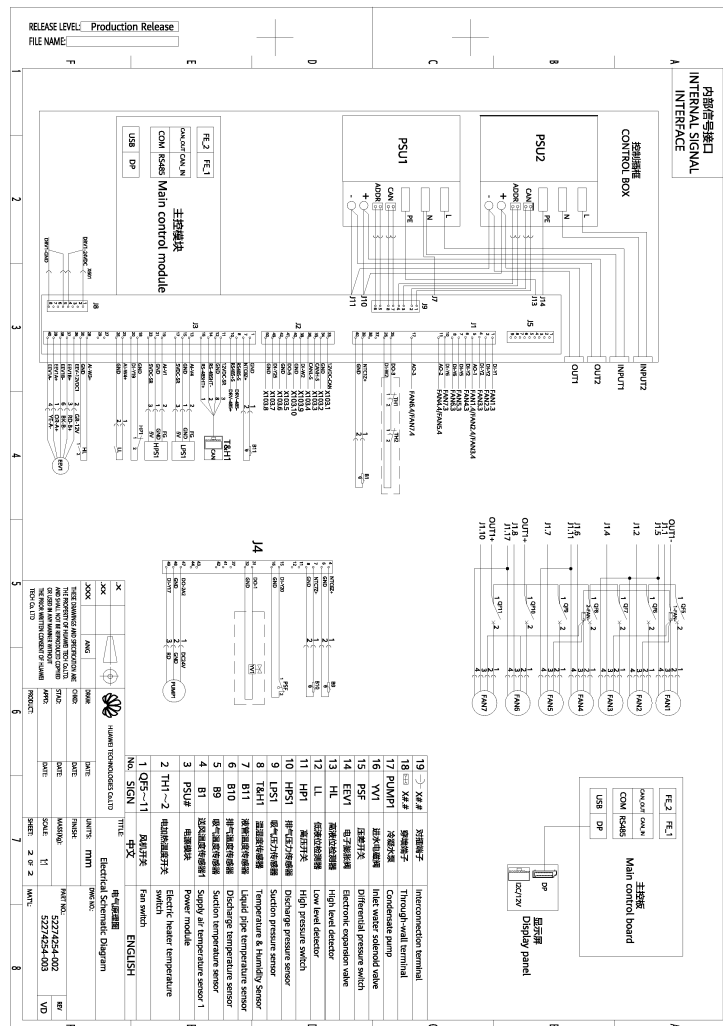


Figure E-3 NetCol5000-A035H4WE2/NetCol5000-A035H40E2/NetCol5000-A025H4WE2

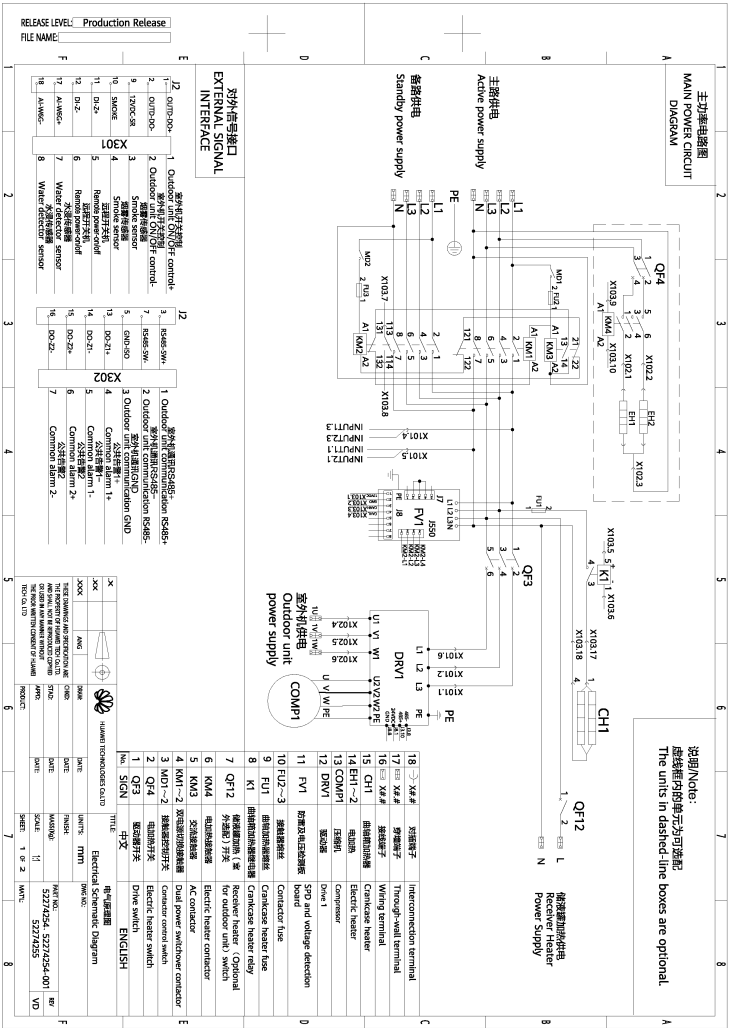


Figure E-4 NetCol5000-A035H4WE2/NetCol5000-A035H40E2/NetCol5000-A025H4WE2

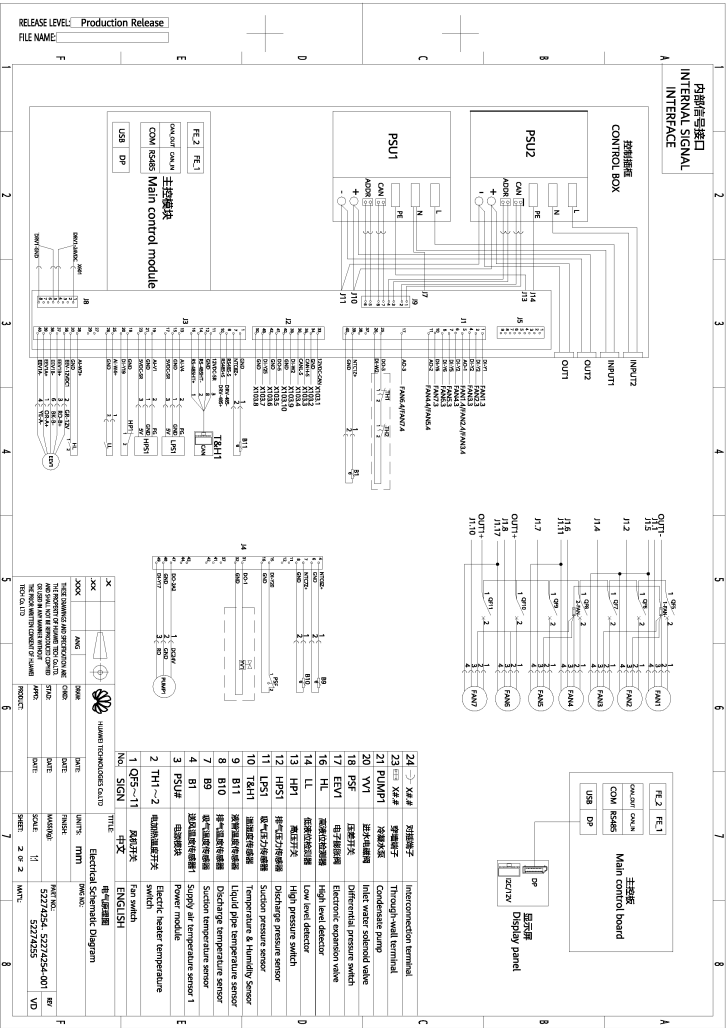


Figure E-5 NetCol5000-A025HNWE2

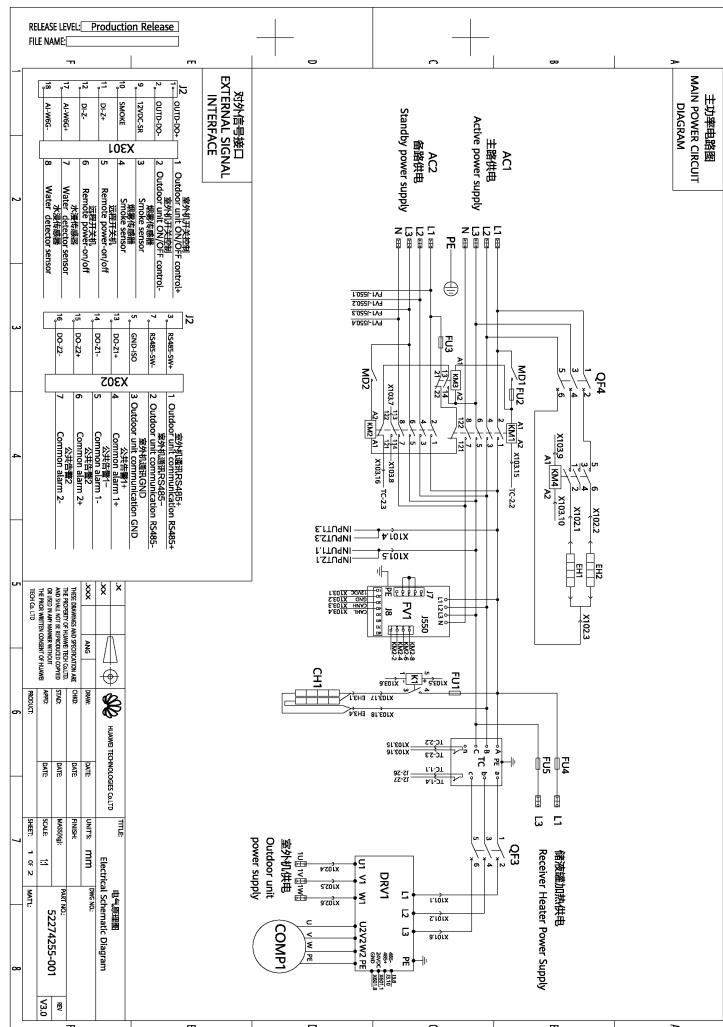
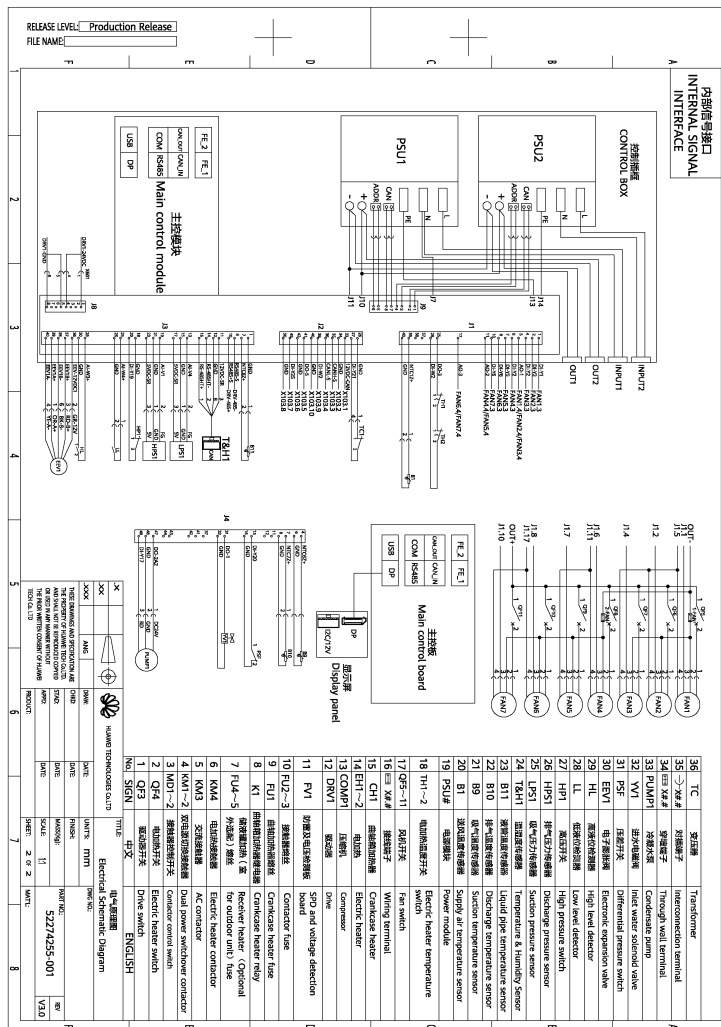
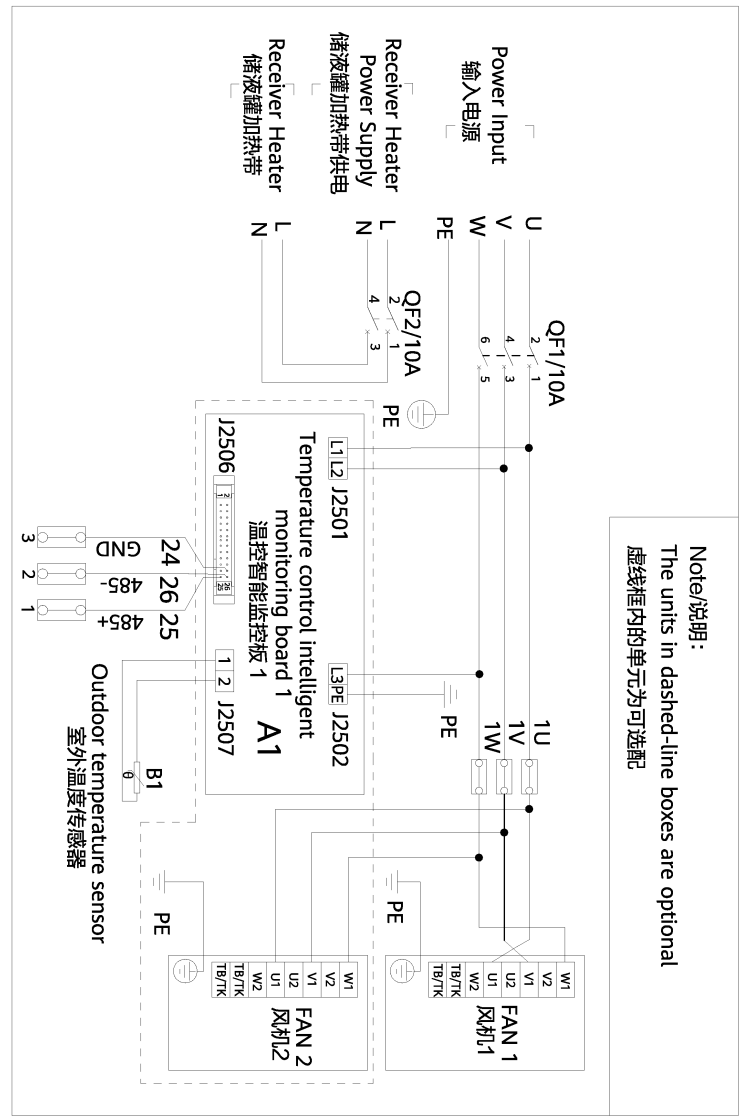


Figure E-6 NetCol5000-A025HNWE2



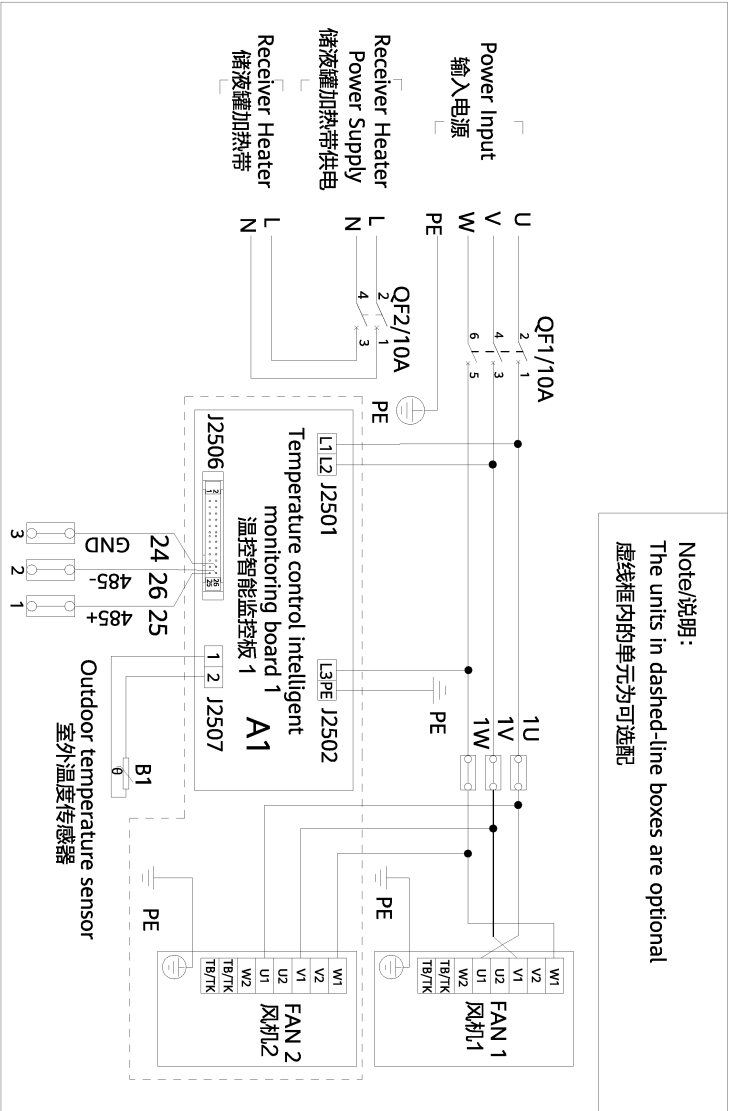
E.2 NetCol500-A040 Electric Conceptual Diagram

Figure E-7 NetCol500-A040 electrical conceptual diagram



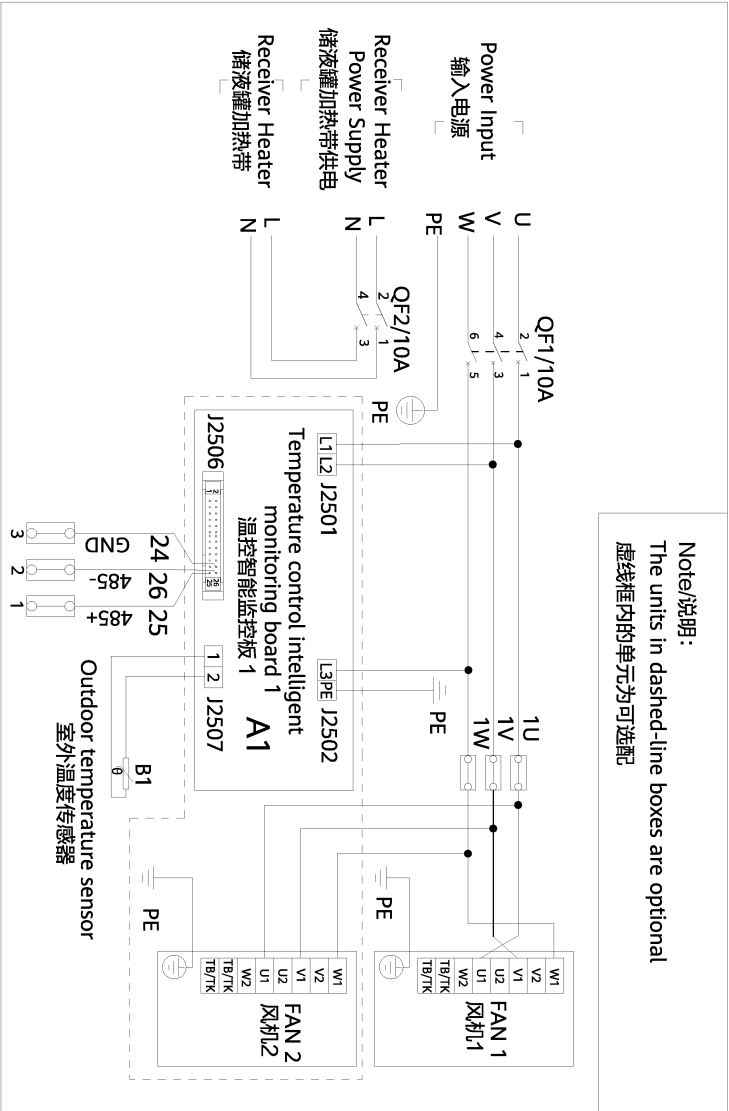
E.3 NetCol500-A060 Electric Conceptual Diagram

Figure E-8 NetCol500-A060 electrical conceptual diagram



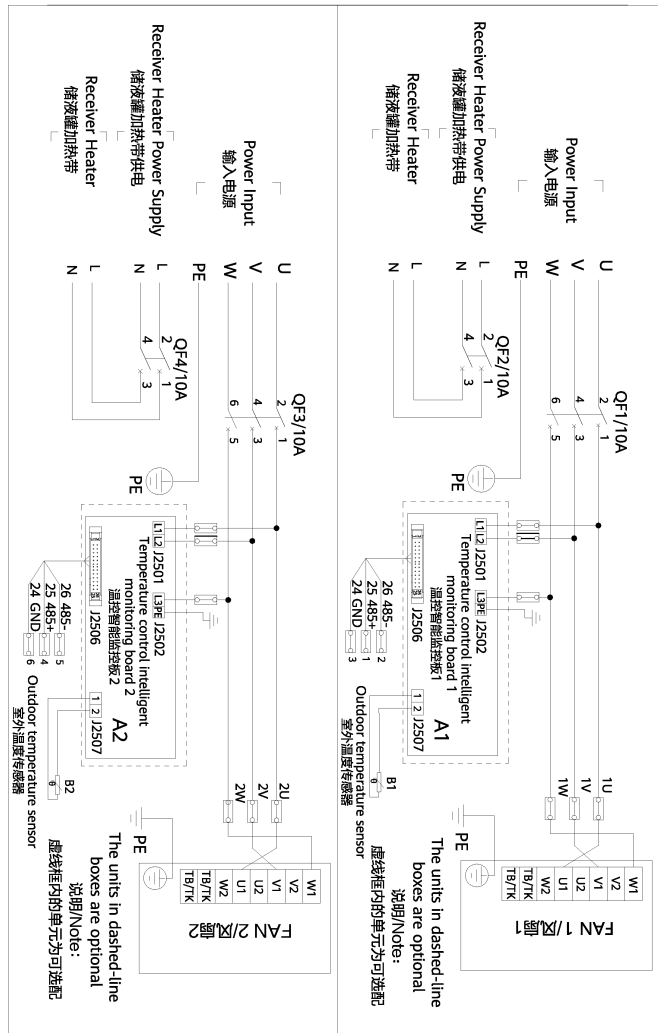
E.4 NetCol500-A080 Electrical Conceptual Diagram

Figure E-9 NetCol500-A080 electrical conceptual diagram



E.5 NetCol500-A120 Electrical Diagram

Figure E-10 NetCol500-A120 electrical diagram



F Acronyms and Abbreviations

A

AC alternating current

C

CFD computational fluid
dynamics

CAN controller area network

D

DC direct current

E

EC electronic commutation

F

FE fast Ethernet

I

IP Internet Protocol

L

LCD liquid crystal display

N

NTC negative temperature
coefficient

P

PC personal computer

PTC positive temperature
coefficient

R

RCCB residual current circuit
breaker

U

USB Universal Serial Bus