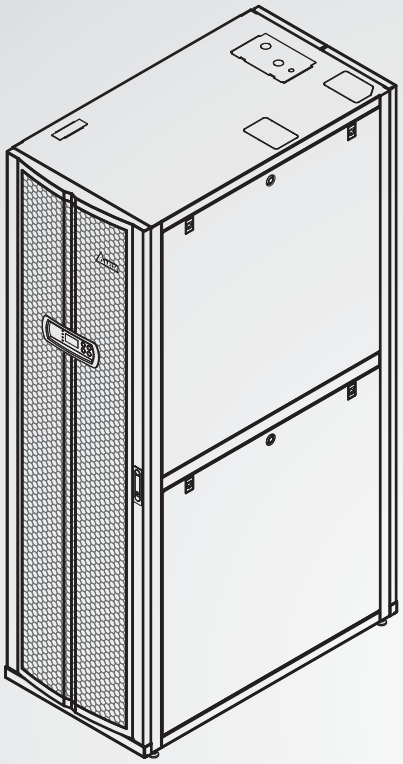

The power behind competitiveness

Delta InfraSuite Precision Cooling

RowCool
Air-Cooled Type (HCH6C60)

User Manual

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Smarter. Greener. Together.

Save This Manual

This manual contains important instructions and warnings that you should follow during the installation, operation, storage and maintenance of this product. Failure to heed these instructions and warnings will void the warranty.

Table of Contents

Chapter 1 : Safe Operation Instructions

1.1 Safety Precautions

- Before carrying out any installation, operation or maintenance, please read all chapters in this manual carefully. To avoid personal injury and equipment damage, please be sure to follow the instructions in the user manual and marks on the cabinet to operate.
- For the purpose of safety, it requires at least two persons to work together to move this equipment.
- Special attention shall be paid to the high center of gravity when moving or dismantling this equipment. Be sure to lift the equipment up from its bottom to avoid tipping when using transport equipment to move it.
- Keep limbs, hair, clothing or jewellery away from the moving parts to avoid being caught up in the equipment.
- This appliance is not intended for use by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the appliance by a person responsible for their safety.
- Children should be supervised to ensure that they do not play with the appliance.

1.2 Installation Precautions

- The equipment can only be connected to a single power source. Prior to connection, be sure that the input power supply is disconnected, and use a multimeter to check if necessary.
- It is suggested that the installation area should not have flammable objects and the equipment should be installed on a stable floor.
- This equipment is for indoor use only. The indoor installation environment must be protected from interference of ambient temperature or humidity, refer to the applicable national or local laws and regulations for specific isolation measures.
- The appliance shall be installed in accordance with national wiring regulations. Meanwhile, the grounding wires of the unit must be effectively connected with the grounding system.
- The appliance is fitted with means for disconnection from the supply mains having a contact separation in all poles that provide full disconnection under overvoltage category III conditions, and these means must be incorporated in the fixed wiring in accordance with the wiring rules.

- If the supply cord is damaged, it must be replaced by the manufacturer, its service agent or similarly qualified persons in order to avoid hazards.

1.3 Usage Warnings

- The high voltage and high-pressure refrigerant inside the equipment can cause death! Due to potential hazard of internal components, only qualified maintenance personnel can operate this equipment. Improper operation may cause severe injury or equipment damage. Please be sure to observe all precautions and warnings specified in the user manual.
- Make sure no foreign matter is left inside the cabinet before replacing the side plates, front door or rear door.

Chapter 2 : Introduction

2.1 Product Introduction

The Delta Infrasuite RowCool Precision Cooling Unit (Air-Cooled Type) based on a side-by-side cabinet design operates near a heat load to produce predictable cooling effects with high efficiency. Thanks to its scalable and mobile modular design, it is easy to reconfigure or add equipment to meet the ever-increasing cooling demands as your data center expands.

The air is sucked into the cabinet through the rear, and then the conditioned air is released through the front of the cabinet.

It is provided with an user-friendly interface to facilitate operation and management, a built-in central processing unit for active control of air conditioning efficiency, and an alarm system to warn against abnormal conditions so as to guarantee proper running of the system.

2.2 Functions & Features

- **Intelligent temperature & humidity control**

  The built-in central processing unit accurately measures and manages the system temperature and humidity.

- **User-friendly control interface**

  It offers a clear picture of the system state to facilitate setting and monitoring.

- **DC inverter-controlled compressor**

  Efficient DC inverter-controlled compressor.

  The compressor can operate within a range of 20~100% according to the fluctuation of the heat load to keep the temperature constant and save energy.

- **MERV.8 air filters**

  The MERV.8 air filters effectively filter out dust in the data center, increasing the operating life of the servers and the cooling units.

- **Indoor EC fans**

  The efficient indoor EC fans enable variable air volume control according to the heat load changes to reduce unnecessary energy consumption.

- **Outdoor EC fans**

  The outdoor EC fans with high efficiency and low noise enable speed control according to the climate to reduce unnecessary energy consumption and improve stability.

- **Flexible piping**

  For the HCH6C60 series, different models are available with upper or lower piping design, flexibly matching with the pipeline layout of the data center.

- **Alarm system**

  When any abnormal state is detected, it will send an alarm to the user via a buzzer or an external dry-contact device.

- **Heat load remote temperature sensors**

  The remote temperature sensors enable accurate control of the heat load temperature.

- **Leakage detection**

  An optional water leakage detection cable, whose length is up to 50 m, is available to give a prompt alarm in case of leakage to guarantee the equipment safety.

- **Output & input dry contacts**

  An output dry contact and an input dry contact are provided for application of fire, smoke and system alarms.

- **Insulating side plates**

  Isolate the equipment from interference of ambient temperature.

- **Lockable front & rear doors and side plates**

  Prevent the equipment from unauthorized operation and setting.

- **Casters**

  Convenient to move or reposition.

- **Pressure switch**

  When over-high or over-low pressure of the refrigerant system is detected via the pressure switch, the compressor will be automatically stopped to prevent the system from continued running and resulting danger or damage.

- **Refrigerant pressure transducer**

  With the help of the pressure transducer, it's able to forecast the system state at an early stage to avoid abnormal conditions.

2.3 Packing List

- **Indoor Unit**

No.	Item	Qty
❶	Delta InfraSuite RowCool Precision Cooling Unit	1
❷	User manual	1
❸	Key (shared by front & rear doors and side plates)	2
❹	Cable tie	3
❺	2-pin terminal	1
❻	3-pin terminal	2
❼	Cable joint	3
❽	Cover of communication cable tray	1
❾	Power supply cover	1
❿	Stainless steel hose clamp*	2

*Optional

- **Outdoor unit**

No.	Item	Qty
❶	Cable joint	2
❷	Screw & nut (for mounting the foot stand)	4

2.4 Optional Accessories

To order any optional accessories below, please contact our service representative.

- **Cleanable filter**

  Optional cleanable filter with a MERV rating of 1.

- **SNMP card**

  Delta SNMP card offers optimal compatibility.

- **Connecting pipe for modle with upper piping design**

  For the modle with upper piping design, this optional refrigerant connecting pipe is available to enable flexible refrigerant pipeline.

- **Humidifier assembly**

  The optional electrode humidifier enables humidity control of the data center and supports either top or bottom water inlet.

- **Reheater assembly**

  The optional electrical tubular reheaters can realize better dehumidifying effects of the data center.

- **Remote temp/ RH sensor**

  Enables the user to monitor the air temperature and humidity of important position.

- **Drain pump**

  The drain pump installed at the cabinet bottom can automatically drain off condensate water.

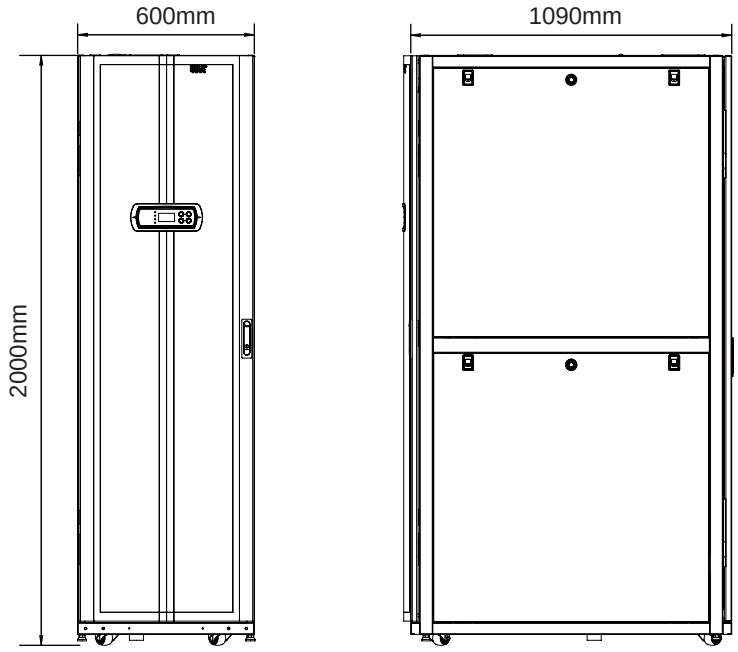
- **Low-pressure transducer**

  Enables the user to easily monitor evaporating pressure and quickly obtain information on system health.

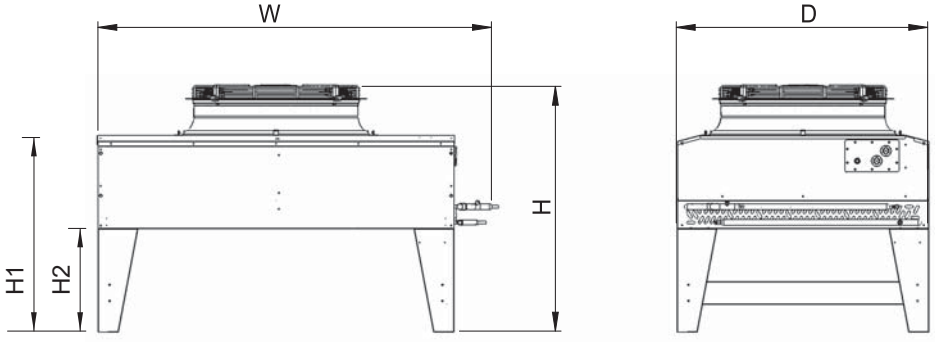
- **Liquid pipe thermometer**

  Enables the user to easily monitor liquid pipe temperature and quickly obtain information on system health.

2.5 Appearance



(Figure 2-1: Appearance & Dimensions of Indoor Unit)



(Figure 2-2: Appearance & Dimensions of Outdoor Unit)

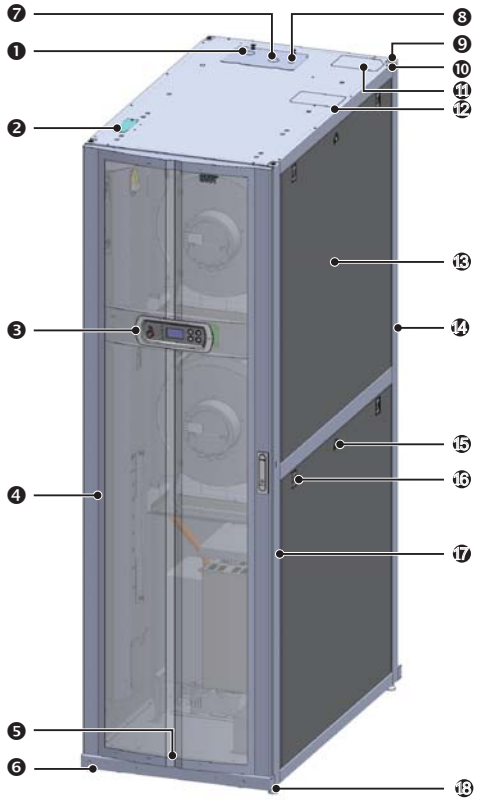
Specifications / Model	H (mm)	H1 (mm)	H2 (mm)	D (mm)	W (mm)	Fan Qty
HCC6C50-13S	1090	855	450	1100	1525	1
HCC6C50-15S	1090	855	450	1100	1725	1
HCC6C70-17D	1090	855	450	1100	1885	2

NOTE:

Please refer to ***Delta Precision Cooling Outdoor Condenser Selection Guideline*** for condenser selection.

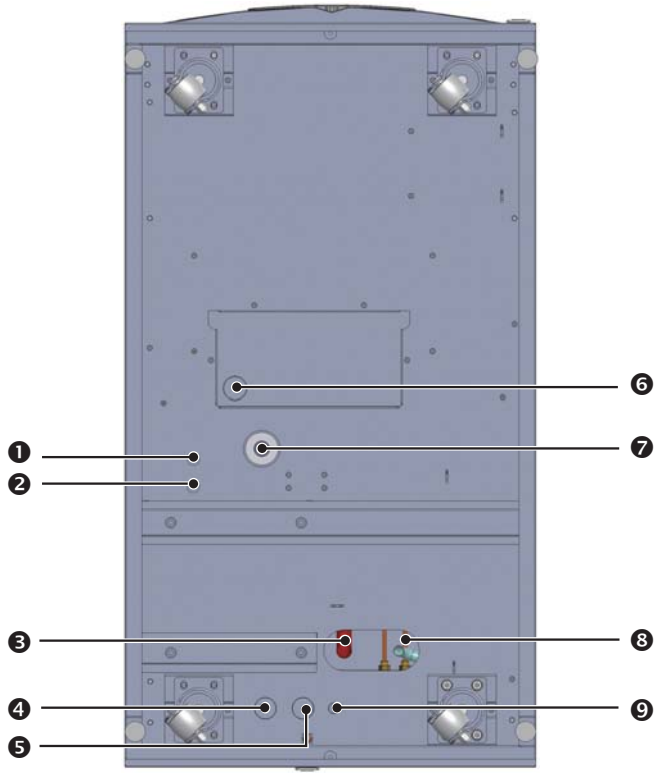
2.6 Components Identification

- **Exterior of indoor unit**



(Figure 2-3: Schematic Diagram of External Components)

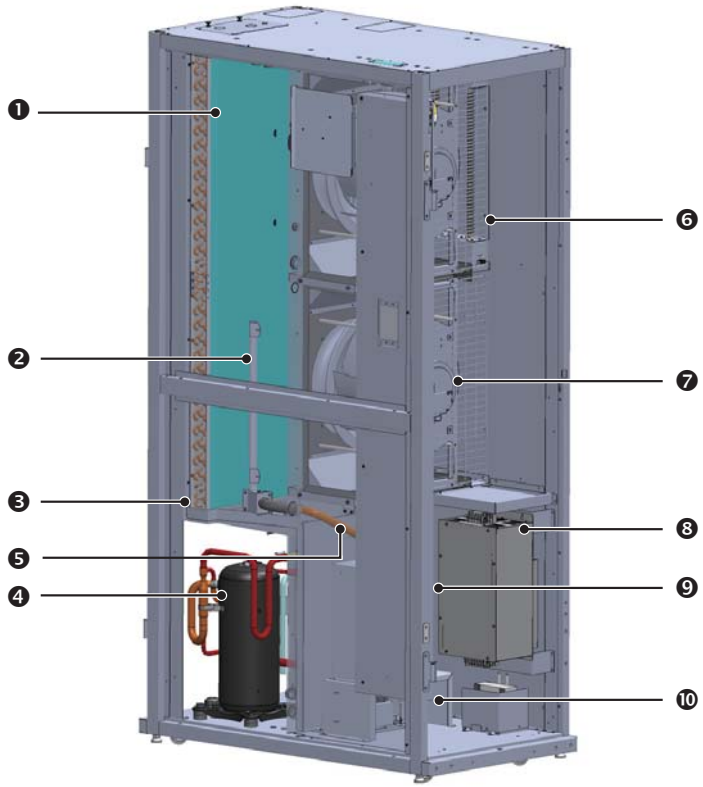
No.	Description	No.	Description
❶	Power input hole	❿	Upper drainage hole
❷	Communication cable tray	⓫	Upper refrigerant inlet
❸	Control panel	⓬	Upper refrigerant outlet
❹	Front door	⓭	Removable insulating side plate
❺	Gradienter	⓮	Removable rear door
❻	Caster	⓯	Lock of side plate
❼	Power output hole of outdoor unit	⓰	Clip of side plate
❽	Signal outlet hole of outdoor unit	⓱	Lock of front door
❾	Upper water inlet for humidifier	⓲	Leveler



(Figure 2-4: Bottom View of Indoor Unit - Schematic Diagram of Main Components)

No.	Description	No.	Description
❶	Lower water inlet for humidifier	❻	Lower gravity drainage hole for humidifier
❷	Lower forced drainage hole	❼	Lower gravity drainage hole
❸	Lower refrigerant outlet	❽	Lower refrigerant inlet
❹	Lower power input hole	❾	Lower signal output hole of outdoor unit
❺	Lower power output hole of outdoor unit		

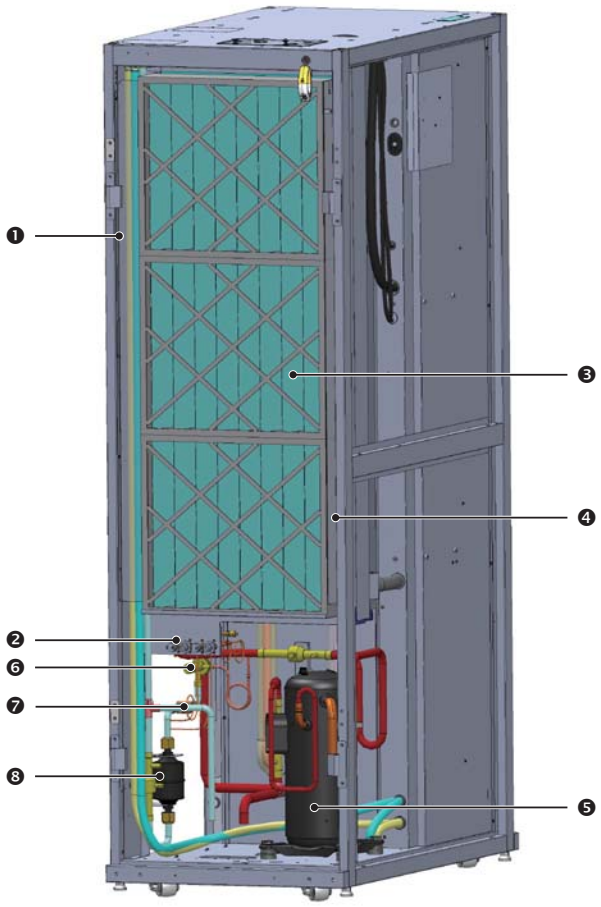
- **Interior of indoor unit**



(Figure 2-5: Internal Main Components of Indoor Unit)

No.	Description	No.	Description
❶	Evaporator	❻	Reheaters*
❷	Vapour diffusion tube*	❼	Fans
❸	Condensed water pan	❽	Frequency converter
❹	Compressor	❾	Humidifier*
❺	Vapour connecting pipe*	❿	Drain pump*

*Optional

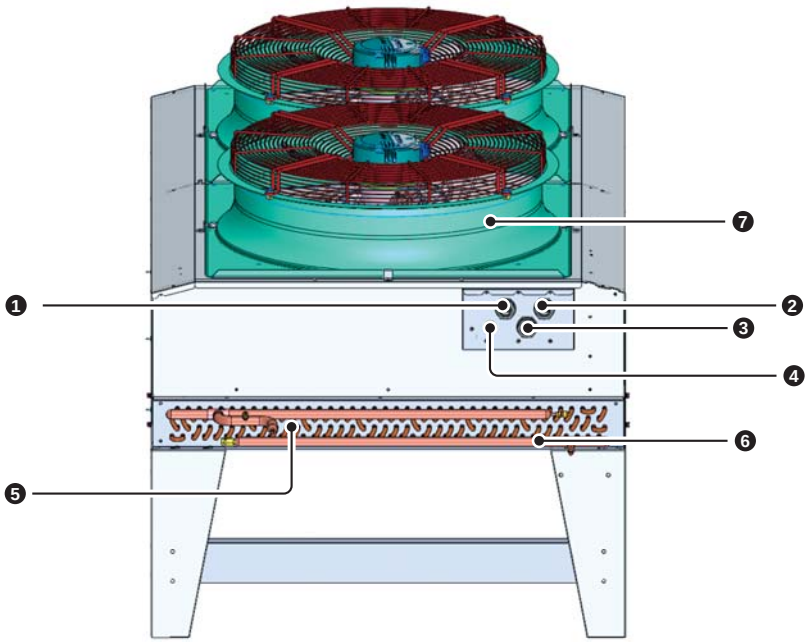


(Figure 2-6: Internal Main Components of Indoor Unit)

No.	Description	No.	Description
❶	Upper pipe trough*	❺	Compressor
❷	Pressure switch & sensor	❻	Expansion valve
❸	Filters	❼	Sight glass
❹	Cable tray	❽	Dry filter

*Optional

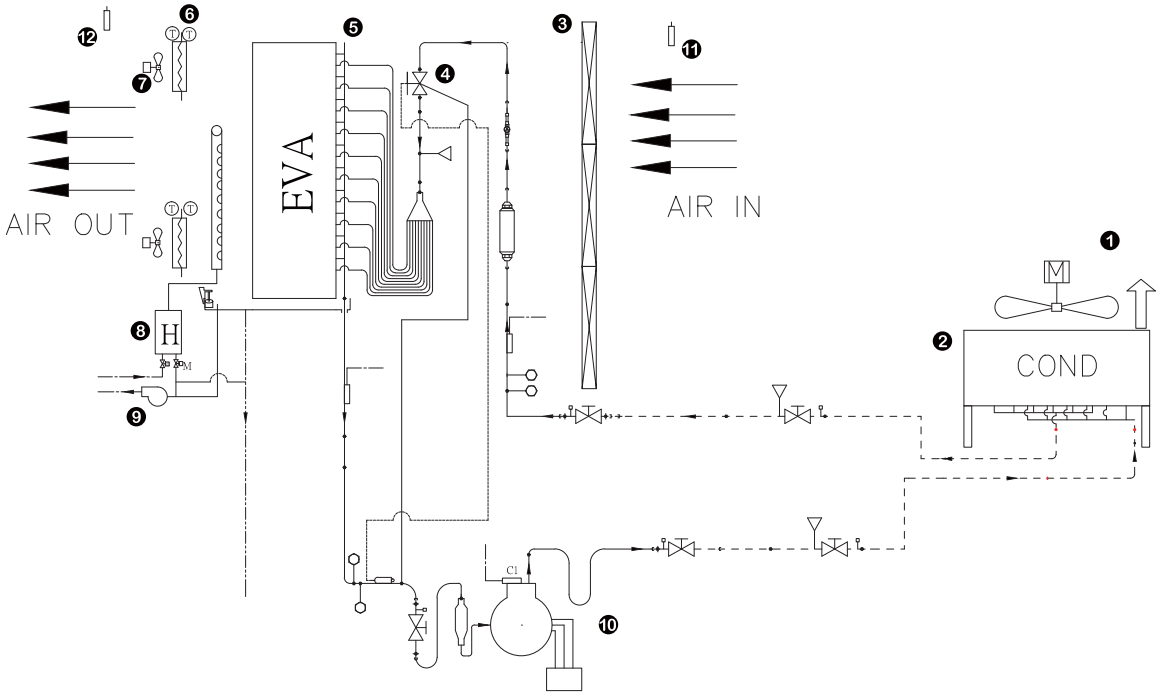
- **Outdoor unit**



(Figure 2-7: Schematic Diagram of Main Components of Outdoor Unit)

No.	Description	No.	Description
❶	Fan 2 power supply / signal ports	❺	Refrigerant gas pipe
❷	Fan 1 power supply / signal ports	❻	Refrigerant liquid pipe
❸	Power input hole	❼	Outdoor fans
❹	Signal line hole		

2.7 System Diagram



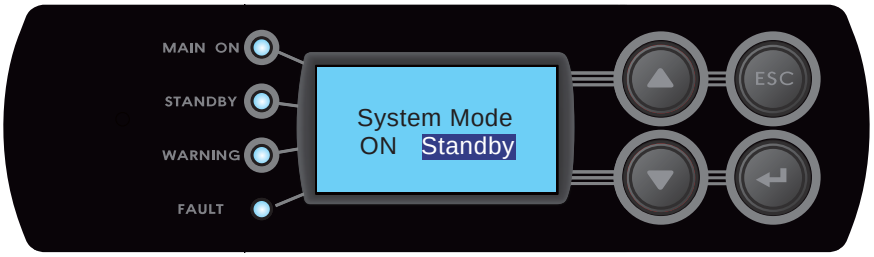
(The pipeline to be installed on site is indicated by dotted lines)

(Figure 2-8: Piping Diagram)

No.	Description	No.	Description
❶	Outdoor fans	❼	Indoor fans
❷	Condenser	❽	Humidifier*
❸	Filters	❾	Drain pump*
❹	Expansion valve	❿	Compressor
❺	Evaporator	⓫	Return air Temp/ RH sensor
❻	Reheaters*	⓬	Supply air Temp/ RH sensor

*Optional

2.8 Control Panel



Item	Function
MAIN ON LED	When it turns green, it indicates power-on.
STANDBY LED	When it turns yellow, it indicates the equipment is in Standby mode. When it flashes, it indicates the equipment is in Force mode.
WARNING LED	When it turns yellow, it indicates an alarm message.
FAULT LED	When it turns red, it indicates a fault message.
▲▼	To page up, page down, move the highlight or select code.
ESC	To return to the previous page or stop the current operation.
↵	To enter the selected option or confirm the setting.

Chapter 3 : Installation

WARNING:

1. The following installation procedures shall be carried out by professional service personnel. To avoid equipment damage and personal injury, do not carry out any installation, piping or handling work without authorization.
2. The high voltage and high-pressure refrigerant inside the equipment can cause death! Due to potential hazard of internal components, only qualified maintenance personnel can carry out connection and piping.

3.1 Installation Site

For the best performance, the following requirements must be met when planning the installation site for the cooling unit.

Environment requirements: the equipment shall be installed in a place convenient for equipment movement with sufficient floor weight loading. Sufficient clearance shall be maintained for maintenance, piping and wiring. The indoor environment must be isolated from interference of ambient temperature and humidity. Appropriate measures shall be taken to minimize entry of ambient moisture in accordance with relevant local or national regulations so as to avoid the increase of the heat load and operating cost due to temperature difference.

Moisture and heat source: appropriate waterproof and heat insulation measures shall be taken in the data center to minimize the influence of the heat load and moisture of external environment. Please note that the standard model can not humidify or dehumidify. If the humidity of installation environment exceeds the operating range (refer to ***4.3 Operating Temperature and Humidity***), it may lead to too much condensate water in the coiled pipe.

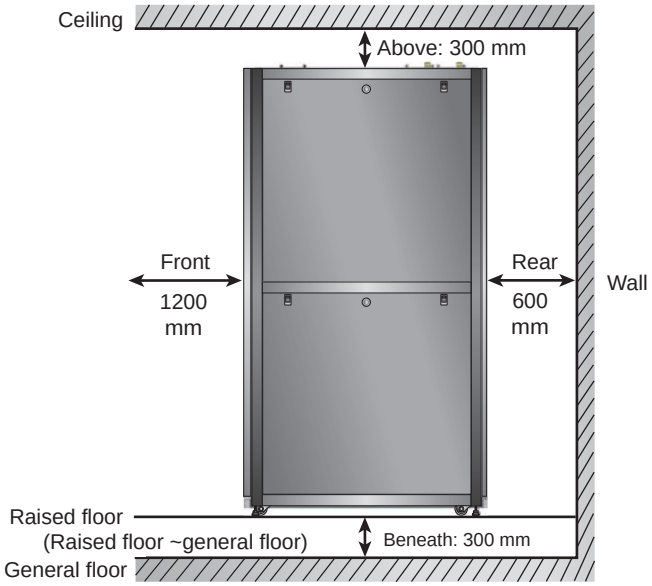
Noise influence: the cooling unit can make a lot of noise during high-load operation; thus, avoid installing it near offices.

Input power supply: before connecting the power supply to the cooling unit, check if the power supply conforms to its ratings and the distribution equipment is capable of supplying the required load. Please check the ratings of various equipment and proper earthing. Never connect more than one cooling unit to the same branch circuit or power distribution equipment.

3.1.1 Clearance

Please reserve enough clearance around the equipment for convenient maintenance, operation and good ventilation.

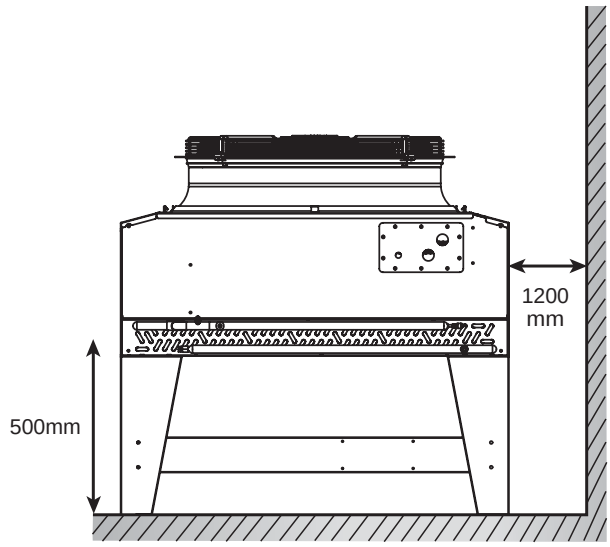
- **Indoor Unit**



(Figure 3-1: Clearance for Indoor Unit)

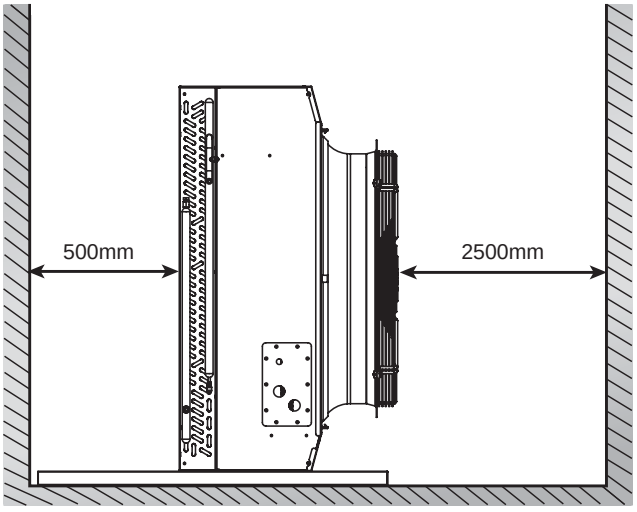
Recommended clearance: 1200 mm in front of the cabinet, 600 mm at the rear of the cabinet, and at least 300 mm above the cabinet to facilitate wiring and piping. For the model with lower piping design, the height of raised floor shall not be less than 300mm. For the model with upper piping design, it can be placed on the general floor.

- **Outdoor unit**



(Figure 3-2: Clearance for Outdoor Unit - Horizontal Type)

Clearance of 1200 mm is recommended for each of four sides and clearance of minimum 500 mm is recommended beneath the outdoor unit. Allow clearance above the fan.

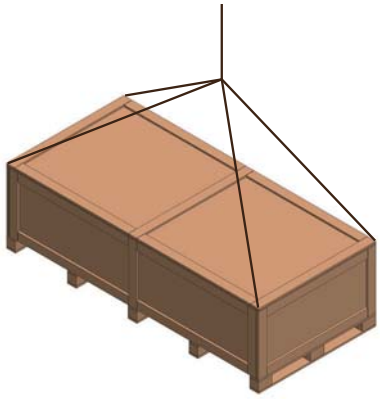


(Figure 3-3: Clearance for Outdoor Unit - Vertical Type)

Clearance of 500 mm is recommended for each of four sides and clearance of minimum 500 mm is recommended for the air inlet. Allow minimum 2500 mm of clearance at the air outlet. In case of parallel operation of two outdoor units, 1000 mm clearance must be maintained between them to facilitate installation and maintenance.

3.1.2 Handling

(Figure 3-4: Handling with a Forklift)



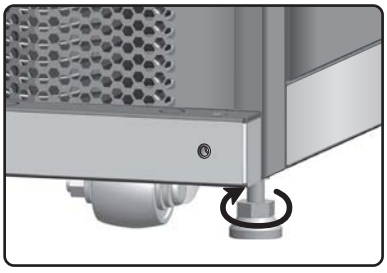
(Figure 3-5: Handling with a Hoist System)

Prior to moving the equipment to the installation site, please follow the following precautions for handling route planning:

1. Make sure the passage, floor, elevator or slope on the handling route are strong enough to support the equipment and the transport equipment. Clear the route to avoid collision.
2. The gradient of any slope on the handling route shall be no more than 15 degrees to avoid tipping.
3. The casters on the cabinet base are used for short distance moving only. In case of long distance moving, please use appropriate transport equipment (e.g., ***Figure 3-4 Handling with a Forklift*** or ***Figure 3-5 Handling with a Hoist System***) to avoid damaging the casters.
4. The casters are suitable for moving on a flat surface only. Avoid heavily falling down or moving the equipment on a rugged surface; otherwise, it may lead to damage of the casters, or even tipping of the cabinet.
5. When moving the equipment, special attention shall be paid to the high center of gravity and at least two persons are required to work together for the purpose of safety.

- **Levelers**

  When the equipment is moved to the designated place, rotate the four levelers next to the casters clockwise with a wrench to make them lower down and stably rest on the ground, and protect the equipment from slipping or tipping.



(Figure 3-6: Rotate Each Leveler Clockwise)

WARNING: The levelers are used for leveling the cabinet only. Do not use them to compensate any height difference of ground to avoid tipping.

3.1.3 Positioning

When the equipment is moved to the designated place and placed side by side with adjacent cabinets, position the cabinet properly to make sure it is stable. The following two methods are available for different installation environment:

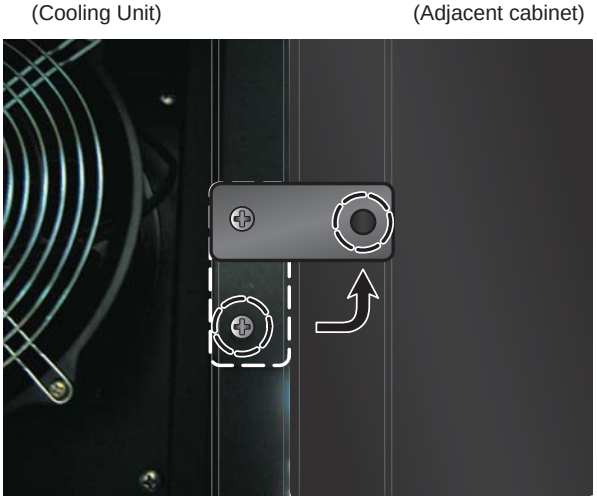
- **Fasteners for cabinet**

  If the adjacent cabinets are Delta devices (MSR1110 and MSR2110), they can be connected by fasteners. Each cooling unit is supplied with four fasteners (two in the front and two at the rear). To use the fasteners for connection, first, remove the front and rear doors temporarily. Please follow the steps below:

  1. Use the supplied key to unlock the front door if it is locked.
  2. Remove the control panel's flat cable and the unit's earth wire, lift up the front door and take it off.
  3. Use the key to unlock the rear door, remove the earth wire, lift up the rear door and take it off. Remove both leaves of the rear door as required.

  WARNING: After the front and rear doors are removed, please keep them in a safe place temporarily to avoid collision which may result in equipment damage or personal injury.

  4. Loosen the lower screw of the fastener with a screwdriver and then fasten the fastener onto the adjacent cabinet with the screw.
  5. Fasten all fasteners (8 pcs) onto the adjacent cabinet one by one.
  6. Now, put the front and rear doors back.

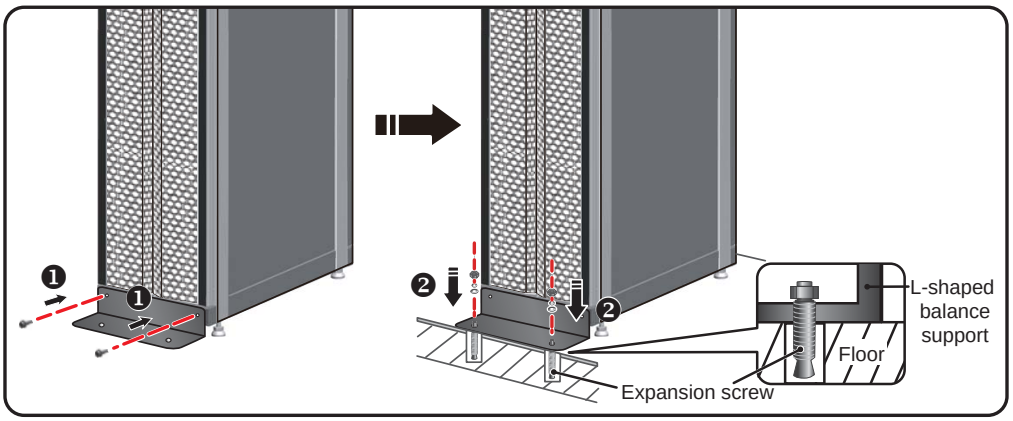


(Figure 3-7: Adjacent Cabinet Connection)

- **L-shaped balance support**

  The L-shaped balance support is originally used to fix the cooling unit onto the pallet during transportation, which after positioning, can be used to fix it on the ground to avoid tipping the unit.

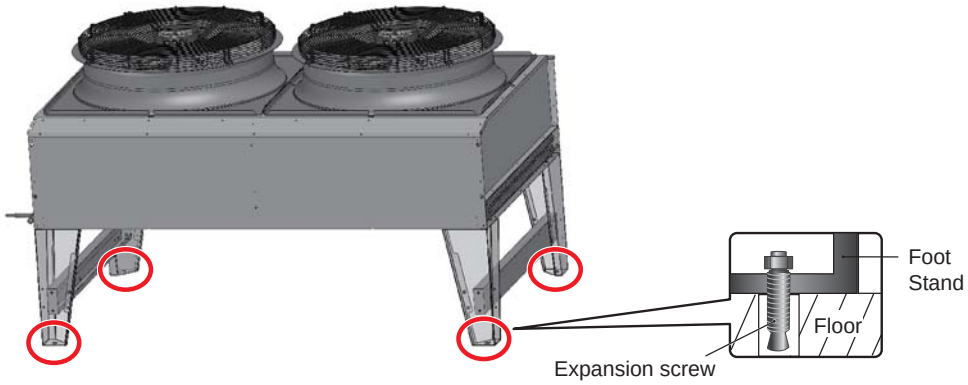
  1. Fasten the L-shaped balance support onto the front bottom of the cabinet with two M6 screws ❶ (with the protruding end facing forward). See ***Figure 3-8***.
  2. Fasten the protruding end onto the ground with two expansion screws ❷.



(Figure 3-8: L-shaped Balance Support Installation)

- **Foot stands of outdoor unit**

  The foot stands of outdoor unit are originally used to fix the outdoor unit on the pallet during transportation, which after positioning, can be used to fix them onto the floor with expansion screws.



(Figure 3-9: Outdoor Unit's Foot Stand Installation)

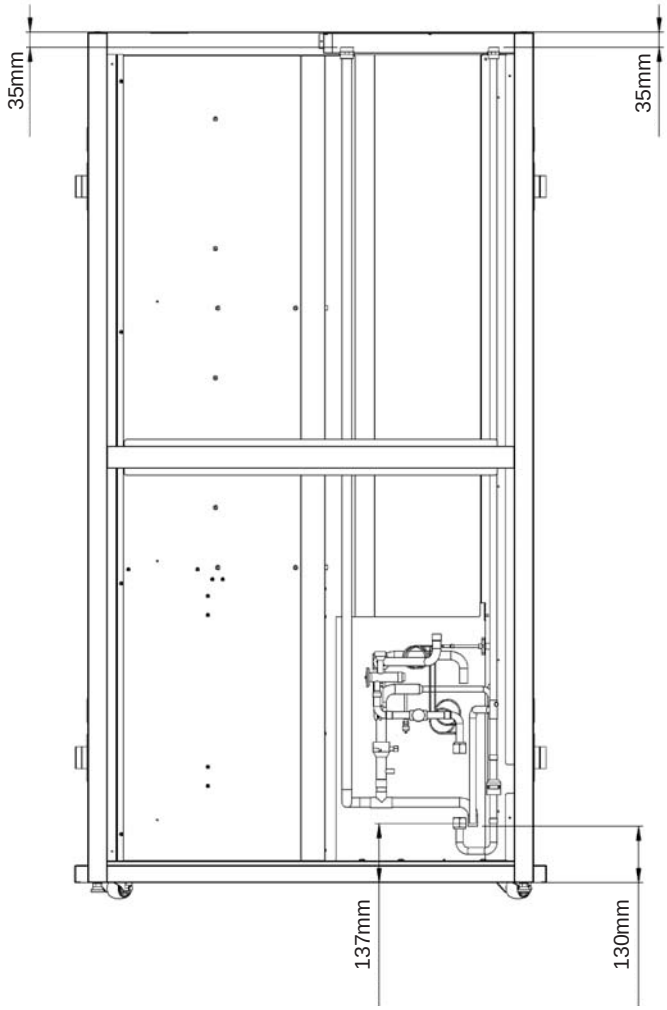
3.2 Pipe Installation

This is an air-cooled type cooling unit, whose indoor and outdoor units require copper pipe connections. A humidifier water supply pipe is required for humidity control model. A drainage pipe is also necessary for the cooling and humidification processes.

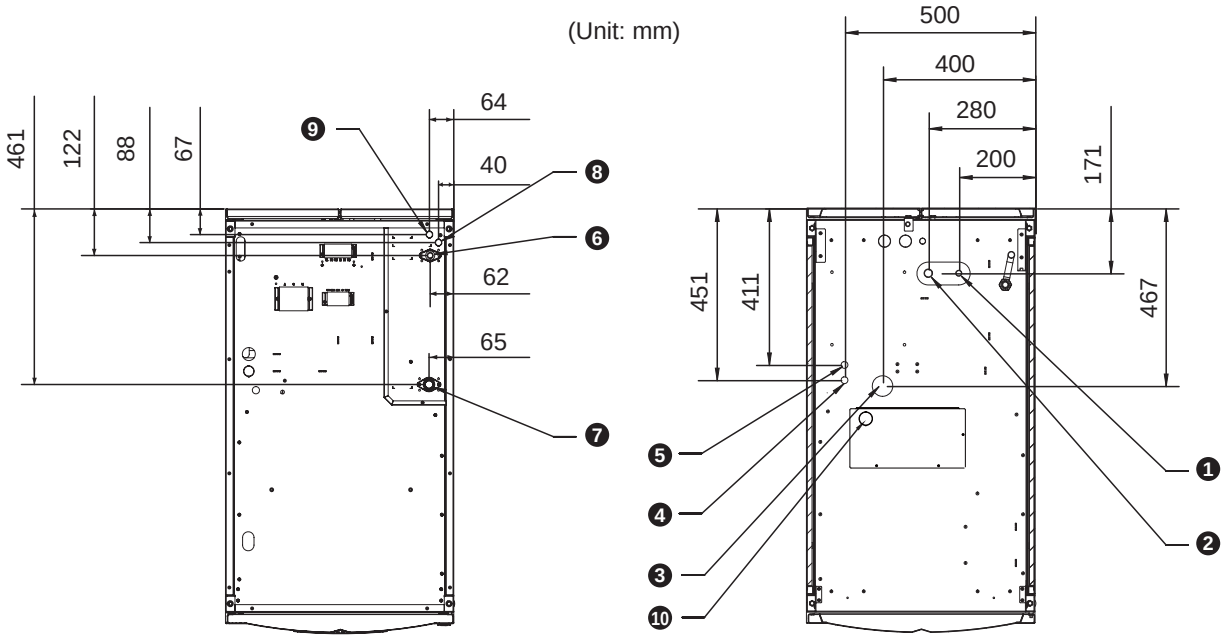
3.2.1 Hole Drilling Diameter & Name and Relevant Dimensions

Please drill holes for pipes on the raised floor or ceiling according to the following figures and piping layout (upper or lower piping).

The pipes should be covered with insulating coating to reduce impact of external objects or careless touching of the heat pipes which might cause scald. A margin about 13mm must be kept for each hole diameter.



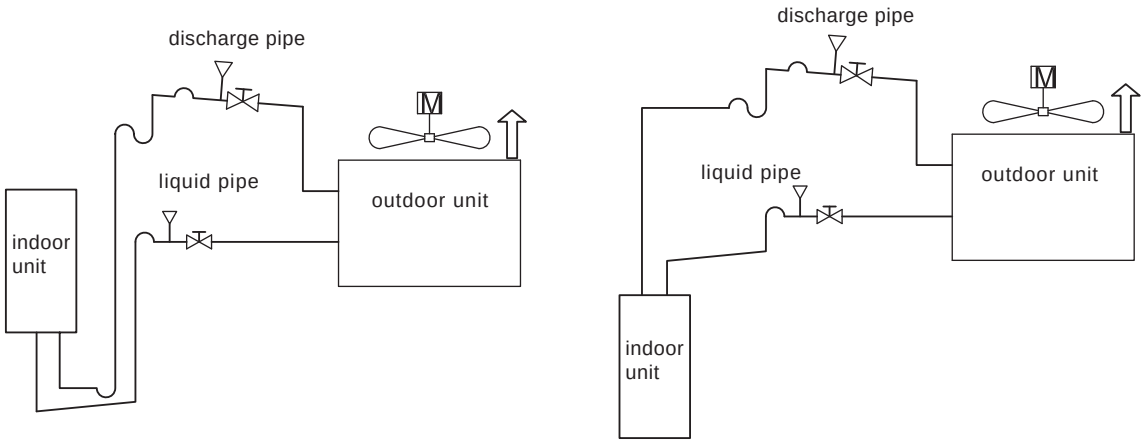
(Figure 3-11: Location & Dimension Drawing of Upper & Lower Piping)



(Figure 3-12: Location & Dimension Drawing of Upper & Lower Piping)

No.	Description	No.	Description
❶	Lower liquid pipe	❻	Upper liquid pipe
❷	Lower gas pipe	❼	Upper gas pipe
❸	Gravity drainage pipe	❽	Upper inlet pipe of humidifier
❹	Lower inlet pipe of humidifier	❾	Upper forced drainage pipe
❺	Lower forced drainage pipe	❿	Lower drainage pipe of humidifier

3.2.2 External Pipeline



(Figure 3-13: Recommended External Pipeline)

Refer to the diagram above when installing the external pipes. Add a ball valve and a service valve (optional or may be purchased and installed separately) to where the gas pipe and liquid pipe connect to the outdoor unit for vacuum pumping, refrigerant fill-in, and maintenance. Use oxygen-free high temperature welding to connect the gas pipe and liquid pipe to the indoor and outdoor units and complete the welding within 15 minutes. The outdoor unit pipes should not be located lower than the indoor unit pipes. These pipes may not exceed 60 m in length, extend vertically upward beyond 25 m, or extend downward beyond 5 m. Install an oil trap at every 5 m interval and use a double-layer pipe. For horizontal refrigerant flow, pipes should slope at 4 mm per meter.

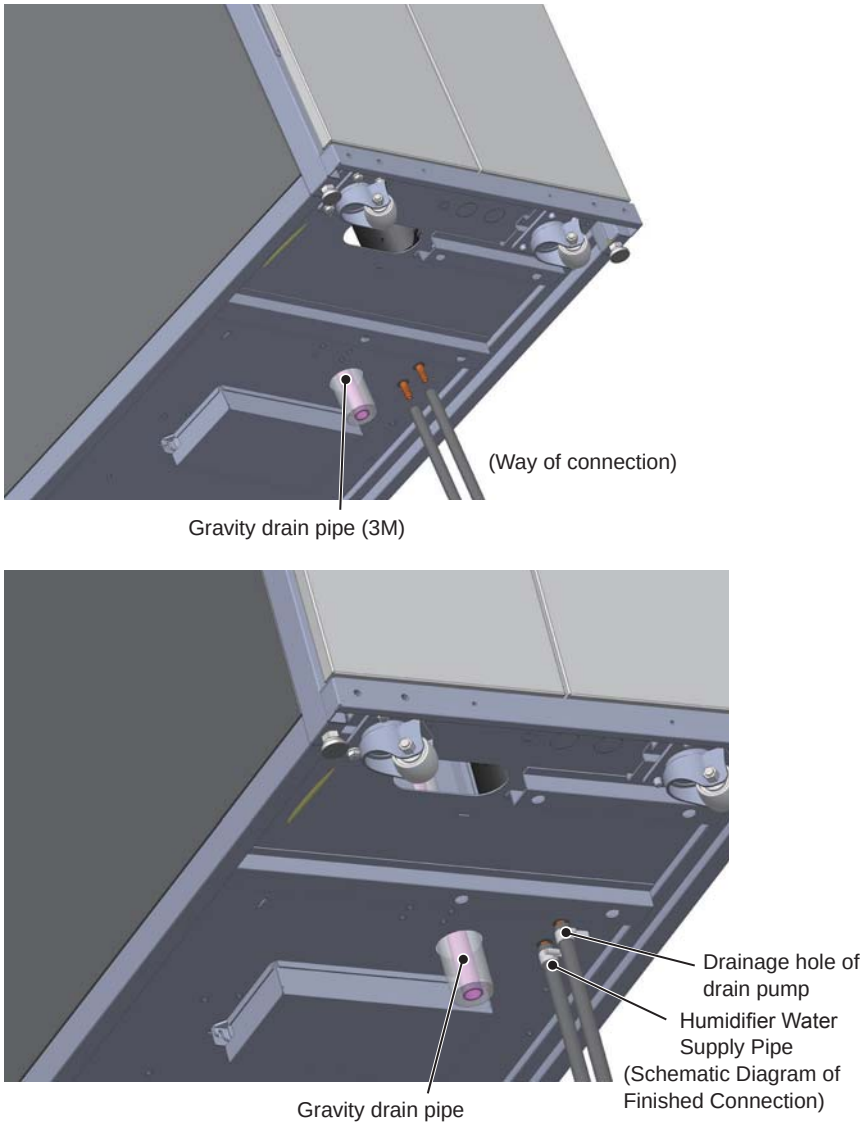
NOTE:
It is also applied to the upper piping, of which the layout of pipes, valves and filters shall be the same as that of lower piping.

3.2.3 Gravity Drain Pipe (for Lower Drainage Only)

Before delivery, one end of the gravity drain pipe has been connected to the lower part of the cabinet with a reserved length of 3m. Thus, the other end shall be run through the reserved hole at the bottom to drain off condensate water. The drainage of condensate water is realized by the height difference between the two ends of the drain pipe. Please note that the slope between the two ends of the drain pipe must be larger than 5 degrees.

3.2.4 Humidifier Water Supply Pipe & Drain Pump (Optional)

The equipment, with upper or lower piping design, can be supplied with an optional drain pump and an optional humidifier. Use appropriate connectors to connect the drain pipe and the drainage system. The vertical lift of the drainage system shall be no more than 4 m. The water supply pressure of the humidifier shall be 1~3.5 kg.



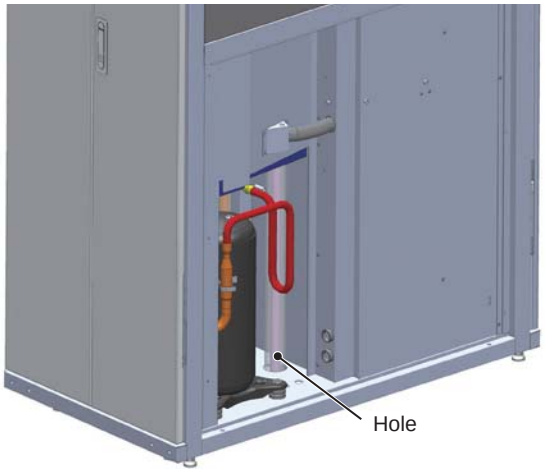
(Figure 3-14: Drain Pump & Humidifier Water Supply Pipe)

Figure 3-14 shows the connection of the drain pump and the connection of the humiditer water supply pipe, which is also applied to the upper piping. Please carry out the pipe connection in this way.

3.2.5 Water Leakage Detection Cable

This cooling unit can be supplied with an optional water leakage detection cable, which will trigger the alarm when touching water or liquid to warn the user that appropriate measures shall be taken. The user has to manually route the cable to the expected position for leakage detection, for example, low-lying places. For the cabinet with lower piping design, it's recommended to route the cable near the pipeline beneath the raised floor.

Run one end of the leakage cable through the gravity drainage hole beneath the cabinet and route the cable along the above-mentioned positions.



(Figure 4-5: Installation of Water Leakage Detection Cable)

3.3 Power Supply Connection

3.3.1 Power Supply

WARNING:

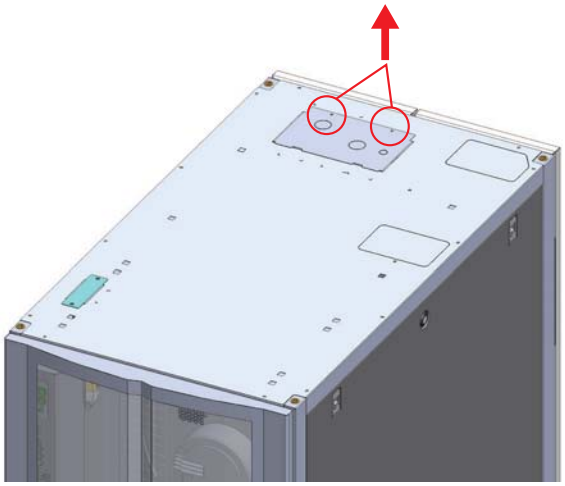
1. The input power supply must conform to the ratings indicated on the equipment nameplate.
2. Follow the recommended tightening torque (12.2Kgf-cm) when tightening the screws on the power terminal block.
3. If no wire runs through the communication cable tray on the top of cabinet, install the cover of the communication cable tray supplied in the accessory package to avoid dust accumulation.
4. When installing the input power supply, connect the earth wire first and check its connection.
5. Choose the appropriate wire size in accordance with the local/ national electric power system and relevant local regulations.

Wire size: 10AWG above for cooling-only type and 8AWG above for humidity-control type.

- **Indoor Unit**

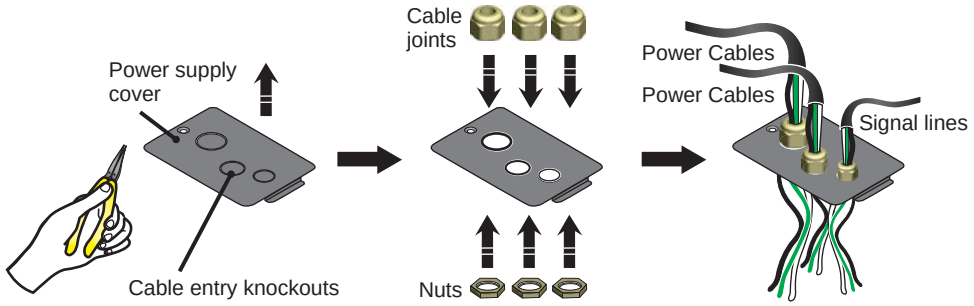
Power input from top

1 At the rear top of the indoor unit, loosen the screws with a screwdriver and remove the power supply cover.



(Figure 3-15: Remove the Power Supply Cover)

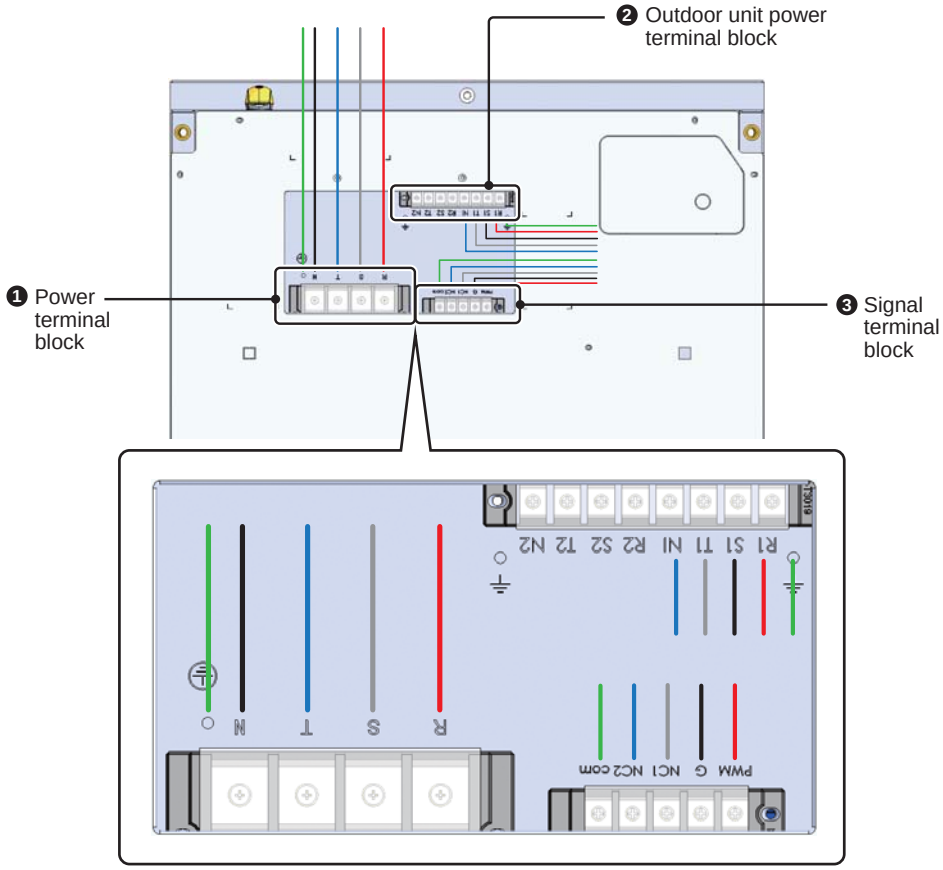
2 Remove the cable entry knockouts on the power supply cover with long nose pliers. Take out the cable joints from the accessory package, remove the nuts and screw the cable joints onto the power supply cover, and then run the power cables through the joints.



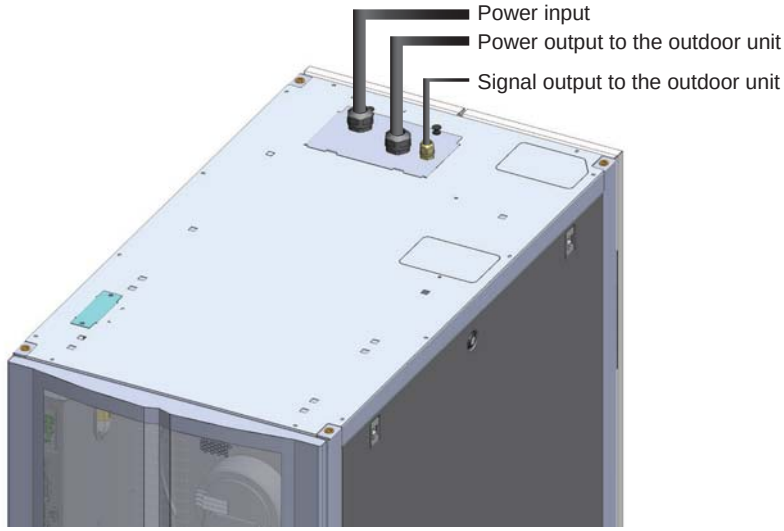
(Figure 3-16: Insert the Power Cables & Signal Lines)

3 If the outdoor unit is a three-phase power system, use a screwdriver to loosen the ❶ power terminal block, ❷ outdoor unit power terminal block and ❸ signal terminal block's screws, and install the power input cables (R, S, T, N, G), the outdoor unit's power cables (R1, S1, T1, G) and signal lines (PWM, G, NC1, NC2, COM) into those three terminal blocks according to their printing labels, and fix all cables/ lines tightly.

If the outdoor unit is a single-phase power system, cables/ lines connection remains the same. In addition, (1) three cables (R1, N1 and G) need to be connected to the outdoor unit power terminal block, and (2) the signal terminal block's NC1 & COM and NC2 & COM should be shorted if there is no feedback signal from the outdoor unit.



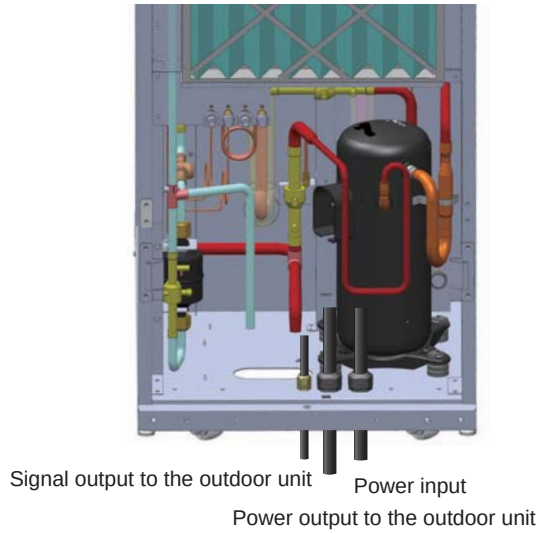
(Figure 3-17: Install the Power Cables & Signal Lines)



(Figure 3-18: Reinstall and Tighten the Power Supply Cover)

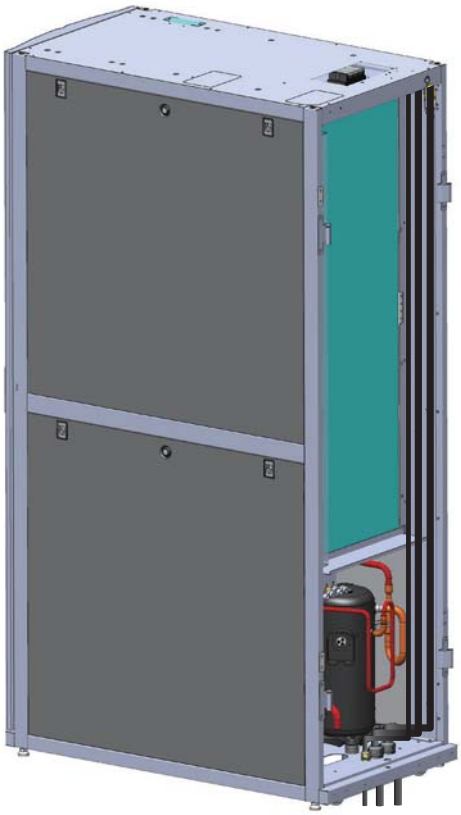
Power input from bottom

1 Remove the cable entry knockouts on the power supply cover with long nose pliers. Take out the cable joints from the accessory package, remove the nuts and screw the cable joints onto the power supply cover, and then run the power cables through the joints.



(Figure 3-19: Insert the Power Cables & Signal Lines)

2 Loosen the screws on the cable tray with a screwdriver, and fasten the cables in the cable tray with cable ties, and open the power supply cover.



(Figure 3-20: Fix the Power Cables & Signal Lines)

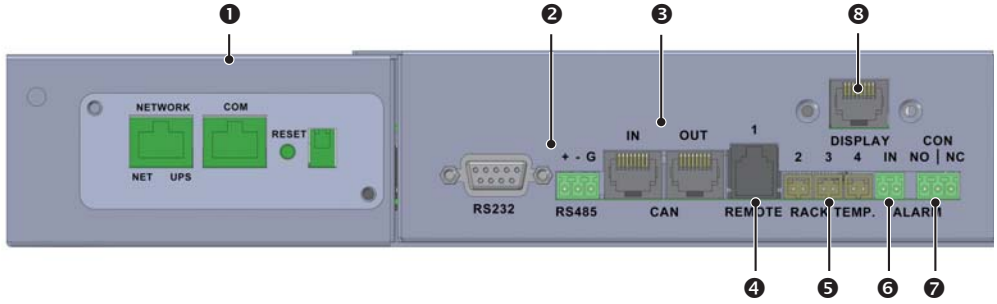
3 Connect the cables according to 3 mentioned in the ***Power input from top***, and then tighten the cable joints.

- **Outdoor unit wiring**

  Please refer to the wiring diagram attached on the outdoor unit for power line connection.

3.3.2 Control Box

- **Front**

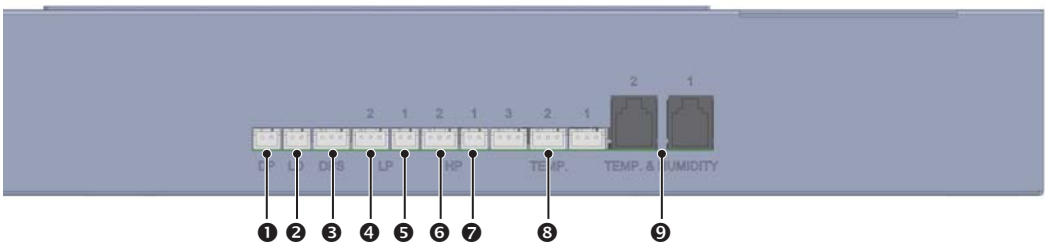


(Figure 3-21: Front of the Control Box)

No.	Item	Function
❶	SNMP slot	The equipment is compatible with the Delta SNMP card (to be ordered separately). After establishing a connection with the workstation, it can be monitored and managed based on SNMP protocol. To install the SNMP card, remove the dust cover, use a RJ45 wire to connect the workstation and SNMP card. Please refer to the user manual of the SNMP card for information about operation and setting. **NOTE:** The Delta SNMP card provides the best performance and compatibility. Please contact your distributor or customer service representative.
❷	RS232/ RS485 port	Via the RS232 or RS485 port, the equipment can be connected to the workstation or power distribution unit based on Modbus protocol to enable remote operation.
❸	CAN-Link IN/ CAN-Link OUT port	Reserved for connecting multiple cooling units based on one IN (Input) one OUT (Output) design.
❹	Port for remote temp/ RH sensor	Used for connecting the remote temp/ RH sensor (optional) to accurately detect the temperature and humidity on the heat load, which shall be installed by qualified service personnel.
❺	Ports for remote temperature sensors	Used for connecting up to three remote temperature sensors (optional), which should be connected and set to the proper positions by qualified service personnel to accurately detect the temperature on the heat load. **NOTE:** Never change the positions of the remote temperature sensors without authorization.

No.	Item	Function
❻	Input dry contact	Normally open (NO). Can be connected to a fire alarm or smoke detector. The dry contact device will be triggered by a certain event and become short-circuited. The system will record it in the event log, sound the buzzer and light the FAULT indicator.
❼	Output dry contact	Can be connected to a dry-contact output device, which will be triggered when a certain event occurs. Port 1-2 (NO): normally open; when connecting a dry-contact device to this port, the device will be triggered (to close the circuit) when an alarm event occurs. Please refer to ***5.4.1 Local Setting*** for the settable trigger conditions. Port 2-3 (NC): normally closed; when connecting a dry-contact device to this port, the device will be triggered (to open the circuit) when an alarm event occurs. Please refer to ***5.4.1 Local Setting*** for the settable trigger conditions.
❽	Display interface	Used for connecting the display interface in front of the cabinet for information output.

- **Rear**



(Figure 3-22: Rear of the Control Box)

No.	Description	No.	Description
❶	Port for water level sensor	❻	Port for high pressure sensor of refrigerant
❷	Port for leakage detection	❼	Port for high pressure switch of refrigerant
❸	Port for air pressure difference sensor of filters	❽	Ports 1, 2 & 3 for temperature sensors
❹	Port for low pressure sensor of refrigerant	❾	Ports 1 & 2 for temp/ RH sensors
❺	Port for low pressure switch of refrigerant		

3.4 System Processing

Please refer to the installation manual for information on system processing. This user manual only provides general description information.

3.4.1 Pressure Leak Test

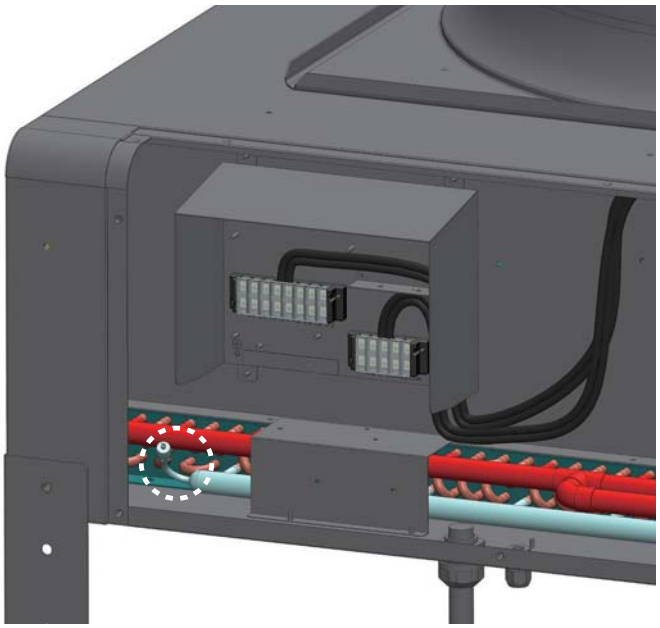
Open cut-off valves of indoor and outdoor units' liquid and gas pipes. Fill in 30 kgf/cm^2-g nitrogen. Wait for 24 hours and ensure that the gauge pressure is lower than 30 kgf/cm^2-g and there is no leak in the system.

3.4.2 Vacuum Pumping

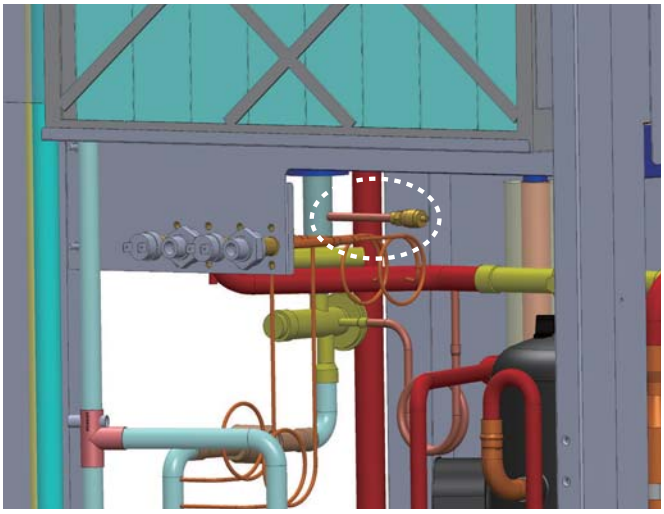
Vacuum pump the system to at least 1.5 torr. Vacuum pumping action can be stopped only after the pressure does not climb back to 2 torr or higher after 4 hrs.

3.4.3 Charging Refrigerant

As R410A is a mixed refrigerant, please use liquid refrigerant when charging refrigerant. First, fill a portion of the refrigerant into the system through the outdoor unit's refrigerant serivce valve, and then set the unit's supply air temperature to 17-24°C and let it run automatically. Fill refrigerant into the system through the indoor unit's refrigerant serivce valve until the system status is normal, as shown in ***Figure 3-23*** and ***Figure 3-24***.



(Figure 3-23: Outdoor Unit Refrigerant Service Valve)



(Figure 3-24: Indoor Unit Refrigerant Service Valve)

3.4.4 Charging Refrigeration Oil

When pipe length increases, the level of the refrigeration oil inside the compressor will drop. To avoid poor lubrication caused by low oil level, it is necessary to add refrigeration oil into the system. Refer to the installation manual for more information of the requirements for refrigeration oil in different pipe length.

Chapter 4 : Initial Start

4.1 Pre Start-up Inspection

WARNING:

1. The installation procedures described in this chapter shall be carried out by qualified service personnel only.
2. The high voltage and high-pressure refrigerant inside the equipment can cause death! Be sure the input power supply is disconnected before carrying out the following operation.
3. Never start up the equipment before completing ***4.1 Pre Start-up Inspection*** correctly; otherwise, it may lead to severe personal injury or equipment damage!

Please complete the following inspection before initial start-up.

Checklist

General items

- ☐ No damage on the equipment.
- ☐ The equipment is properly fixed and close to adjacent equipment.
- ☐ The installation work is carried out according to the instructions in ***Chapter 3: Installation***.
- ☐ The internal and external piping of the cabinet is connected properly. No damage or leakage is found on each pipe's insulating coating.
- ☐ Both front and rear doors are put in place. The flat cables of the control panel are connected.

Environment

- ☐ The indoor environment is an enclosed space isolated from interference of ambient temperature and humidity.
- ☐ The clearance around the cabinet meets the specified requirements (refer to ***3.1.1 Clearance***).

Electrical input

- ☐ The input power supply conforms to the ratings indicated on the nameplate.
- ☐ The equipment is earthed properly.

☐ All electrical connections are tight and firm.

☐ The remote temp/ RH sensor is connected correctly and set to the proper position.

☐ The water leakage detection cable is routed correctly.

Mechanical connection

☐ No break or damage on the gas and liquid pipes.

☐ The drainage pipe of condensate water is connected correctly and led to the drain.

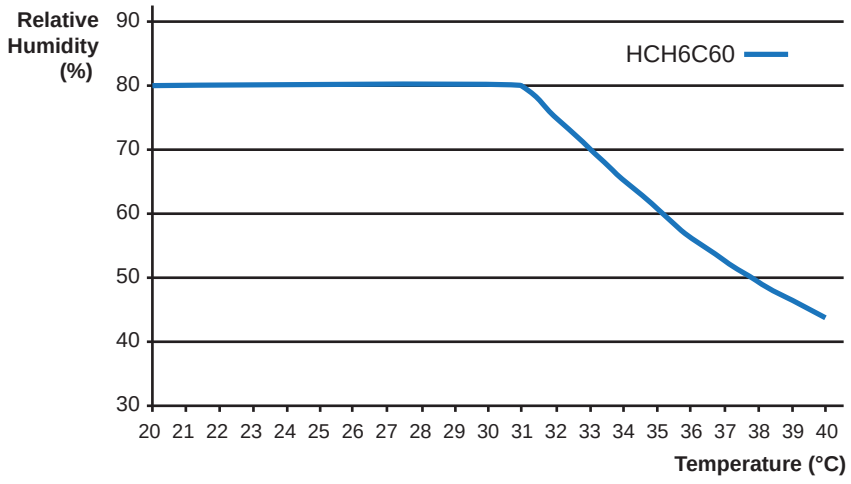
☐ No break or damage on the filling valves and ball valves.

☐ All ball valves connecting to the indoor and outdoor units are open.

4.2 Operating Temperature and Humidity

Please use an auxiliary dehumidifier or air conditioner to adjust the indoor temperature and humidity to the permissible operating range.

WARNING: In case of high indoor humidity, the condensation effects around the coil may generate too much condensate water and lead to leakage.

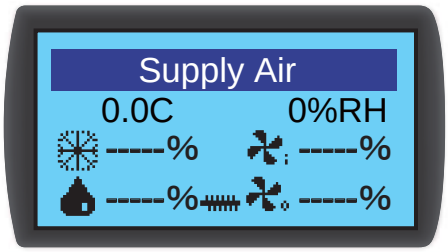


(Figure 4-2: Standard Operating Environment Conditions)

It is recommended that the supply air temperature be set at 17-28°C to avoid abnormal during operation. When restarting the compressor after a shutdown lasting more than a day, please check if the compressor's temperature has exceeded 5°C; if not, please wait for the crankcase heater to heat up the compressor to 5°C or higher before restarting the unit.

4.3 Power on

Switch on the power. The cooling unit will automatically go into standby-mode after power on and the fans will not automatically run for the sake of safety. The fans will run at the lowest speed only when the device returns to Standby mode from Manual, Auto, Force or Installation mode. Wait for about six seconds, the Delta logo appears, and then the Status page appears on the LCD.

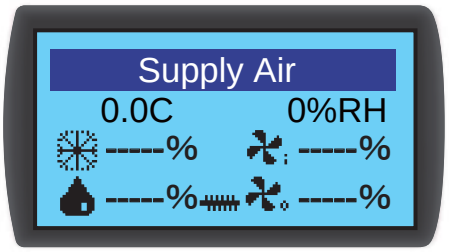


(Figure 4-1: Status Page on LCD)

For the meaning of values shown on the Status page and operation information of the control panel, please refer to ***Chapter 5 : Operation***.

Chapter 5 : Operation

5.1 Status Page & Main Menu



The LCD will be off during idling. Press ↵ to turn on the backlight and display the Status page. You are able to view the supply air state and output percentage of the compressor, humidifier, reheaters and indoor and outdoor fans.

: Compressor's refrigeration output

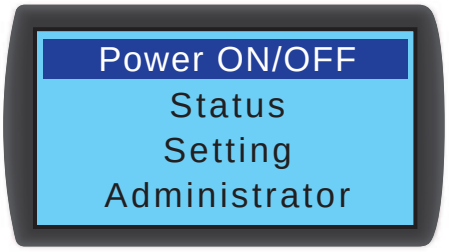
: Reheater output

: Humidifier output

: Indoor fan speed

: Outdoor fan speed

On the Status page, press ↵ to go to the Main Menu.



- **Power ON/ OFF**

  To start the cooling unit (auto-control mode) or go to Standby mode.

- **Status**

  To view the system status, readings of sensors, running time and event log.

- **Setting (User password required)**

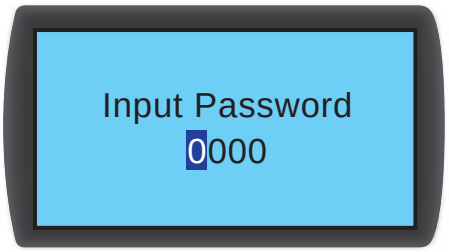
  To change set points, local setting, controller setting and alarm setting.

- **Administrator (Administrator password required)**

  To go to Manual mode or view firmware version and advanced system menu.

5.2 Account Privilege & Login

The cooling unit is provided with two account types. **Administrator** account is able to change all settings, and **User** account is able to change the System Setting only.



When you try to go to **Setting** or **Administrator** menu, the '**Input Password**' window will appear. After login, if no action is performed for long, the system will become idling and automatically log out. Enter the password once again to go to the above-mentioned menu.

When the '**Input Password**' window appears, enter the Administrator password to log in to the Administrator account, or enter the User password to log in to the User account. To enter **Power ON/ OFF** or **Status** menu, no password is required.

The default User password is 0000.

NOTE:
Do not reveal the Administrator password to unauthorized persons to prevent unauthorized change of or access to important settings. For Administrator password, please contact our service representative.

5.3 Control Panel Operation

The four buttons on the right of the control panel (see ***2.8 Control Panel***) can be used for operating and setting.

No.	Button	Description
1	ESC	To return to the previous menu or cancel the current operation.
2	↵	To enter the menu or confirm the option or value.
3	▲	To page up, move the highlight up, change the value or option.
4	▼	To page down, move the highlight down, change the value or option.

When entering any menu, if there are more than four items, press ▲▼ to page up or down, press ↵ to highlight the current selected item, and press ▲▼ to move the highlight up or down.

To enter or change a value (e.g., password or temperature setting), press ▲▼ to select a number and press ↵ to go to next field. When it reaches the last field, press ↵ to save and send, or press ESC during the process to cancel the current operation.

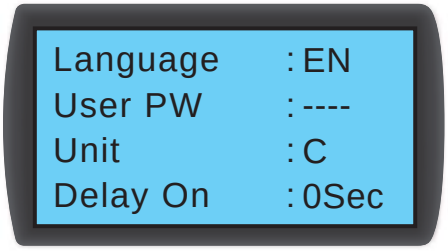
The display will automatically switch off and turn off the backlight without any operation for a long while.

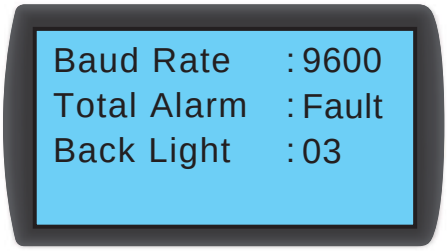
The default display language of the control interface is English. To change the display language, go to **Main Menu** → **Setting** → **Local Setting** → **Language**, and set your preferred language.

5.4 Set Up Cooling Unit

5.4.1 Local Setting

Path: Main Menu → Setting → Local Setting





- **System Time**

  To set the system time, press ▲ ▼ to select a number, press ↵ to go to next field, and finally press ↵ to confirm.

- **ID**

  The ID means the No. of the cooling unit connected in the sequence, also means the ID in the Modbus protocol (default: 1). If several cooling units are connected in series, you have to specify an unique No. for every device in the sequence.

- **Contrast**

  To adjust the screen contrast from level 0 to 5 (default: 2).

- **Buzzer**

  To set the buzzer to be ON/ OFF, which will sound when an alarm event occurs. Default: ON.

- **Language**

  To set the display language, select the language that you want and press ↵ to confirm. Default: English.

- **User PW**

  To change the current user password, enter four digits.

- **Unit**

  To set the temperature unit. Default: Celsius degree (°C).

- **Delay ON**

  To set a time delay between Auto mode activating and Auto mode actual running, after which the cooling unit will start up.

- **Baud Rate**

  To set the transmission rate for Modbus protocol, i.e., 9600, 19200, 38400 and 57600. Default: 9600.

- **Total Alarm**

  To define the specific event type that will trigger the output dry contact. Please see the detailed description below:

  Any: either alarm or fault event can trigger the output dry contact

  Severe: only fault event will trigger the output dry contact

Alarm event	
• **Clogged filters**	• **High or low air volume**
• **Anomaly in internal communication**	• **High or low remote temperature or humidity**
• **High or low of return air / supply air temperature or humidity**	• **Maintenance interval exceeded**
• **Too high or too low pressure of refrigerant**	• **Over-high level in drip tray**

Fault event	
• **Condensate water overflow**	• **Anomaly in compressor**
• **Leakage**	• **High / low pressure switch tripped**
• **Fire / smoke**	• **Anomaly in indoor fans**
• **Anomaly in supply air / return air temp/ RH sensor**	• **Anomaly in outdoor fans**
• **Anomaly in remote sensors**	• **Anomaly in reheaters**
	• **Anomaly in humidifier**

- **Back Light**

  To set the light intensity of backlight from level 0 to11. Level 0 means the backlight is off, and 11 means the backlight is always on.

5.4.2 Set Point

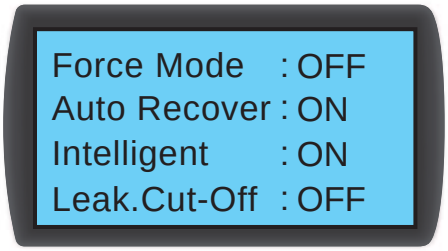
Path: Main Menu → Setting → Set Point

- **Supply Air T & Supply Air RH**

  In Auto mode, the cooling unit will automatically adjust the speed of fans and compressor according to this target supply air temperature and humidity.

5.4.3 Controller Setting

Path: Main Menu → Setting → Controller



- **Force Mode**

  When Force mode is activated, the fans will run at the highest speed and the compressor will run with full load. This mode is usually used for performance test or high heat load. If the **STANDBY** LED indicator on the control panel flashes, it indicates that the system is now in Force mode.

- **Auto Recover**

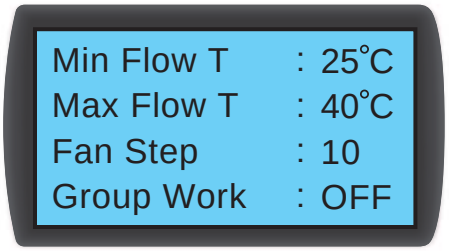
  If this function is activated and the system was in Auto mode before power outage, the equipment will go directly back to Auto mode after restart.

- **Intelligent**

  To display whether the intelligent temperature control function is activated or deactivated. This option only displays the status and can not be used to change the setting.

- **Leak. Cut-Off**

  If this function is activated, when any leakage is detected, the shutdown event will be triggered which will shut down the equipment.



- **Min Flow T**

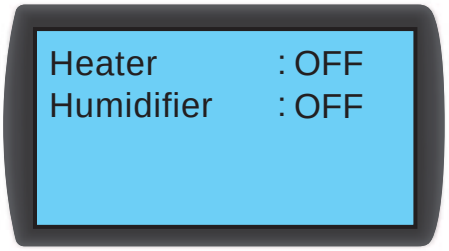
  When the temperature of return air is lower than this setting, the fans will run at the lowest speed to save energy. Default: 25°C.

- **Max Flow T**

  When the temperature of return air is higher than this setting, the fans will run at the highest speed to save energy. Default: 35°C.

- **Fan Step**

  To set the fan speed level in Auto mode from level 0 to 15. Default: 0. The cooling unit will adjust the fan speed according to the specified level.



- **Heater**

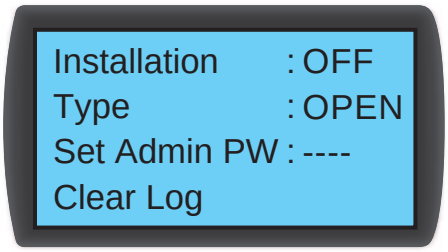
  To set the reheaters ON or OFF (for models with reheaters only).

- **Humidifier**

  To set the humidifier ON or OFF (for models with humidifier only).

5.4.4 Change System Type

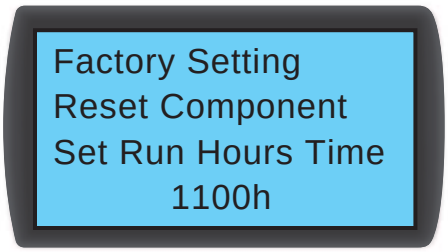
Path: Main Menu → Administrator → System → Type



Follow your data center's cold/ hot aisle configurations to set up the system Type as **OPEN** or **CLOSE**.

5.4.5 Restore Factory Setting

Path: Main Menu → Administrator → System → Factory Setting

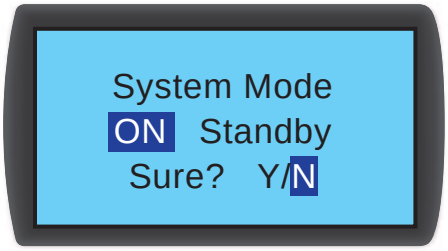


Restore all settings to factory settings, including various setting options as well as User and Administrator passwords.

WARNING: Restore Factory Settings will reset all changed settings or parameters! This cooling unit has some customized settings varying with different environment. Since arbitrary restore action may lead to errors, only qualified maintenance personnel can carry out the restore action.

5.5 Start-up

Path: Main Menu → Power ON/ OFF → ON



The cooling unit has four operation modes available.

- **Auto mode**

  Path: Main Menu → Power ON/ OFF → ON

  To enable automatic control of refrigerating capacity, select the Auto mode for the cooling unit so that the system will automatically fine tune the fan speed and compressor speed according to the set points.

  Or, on any page, press ▲▼ at the same time and hold for three seconds to quickly switch to Auto mode or Standby mode.

  NOTE: In Manual mode, when pressing ▲▼ at the same time and holding for three seconds, the system will not go to Auto mode or Standby mode.

- **Standby mode**

  Path: Main Menu → Power ON/ OFF → Standby

  In Standby mode, the fans and compressor are not started.

- **Manual mode**

  Path: Main Menu → Administrator → Manual Mode

  In Manual mode, it's able to execute test if various components function properly or have the system run according to the manual settings. In this mode, it's able to manually set up: indoor & outdoor fan speed, compressor speed, various indicators ON/ OFF, backlight ON/ OFF, buzzer ON/ OFF, alarm dry contact ON/ OFF, NC/ NO dry contact ON/ OFF, humidifying ratio, humidifier ON/ OFF, and reheater ON/ OFF.

  In Manual mode, press ESC to exit and automatically return to Standby mode.

- **Force mode**

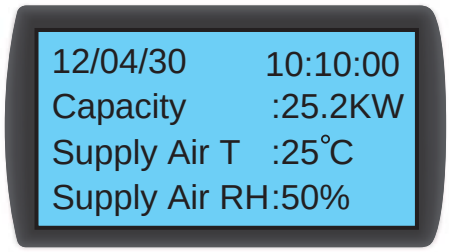
  Path: Main Menu → Setting → Controller

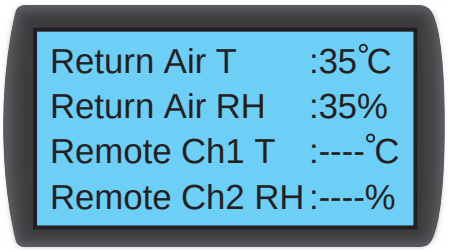
  The compressor will run with full load and the fans will run at the highest speed. This mode is usually used for equipment test or emergency cooling requirement.

5.6 Query System Status

5.6.1 Query System Status

Path: Main Menu → Status → System

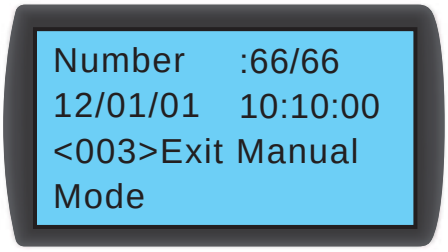




Query relevant system information, including the current compressor command, supply air temperature & humidity, return air temperature & humidity, remote 1 temperature & humidity, remote 2 temperature & humidity, remote 3 temperature, remote 4 temperature, air volume, evaporating pressure, suction pipe temperature (option), condensing pressure (option), liquid pipe temperature (option), indoor & outdoor fan command (speed setting), humidifying command, heater command, compressor top shell temperature and filter pressure.

5.6.2 Query / Clear Event Log

Path: Main Menu → Status → Event Log



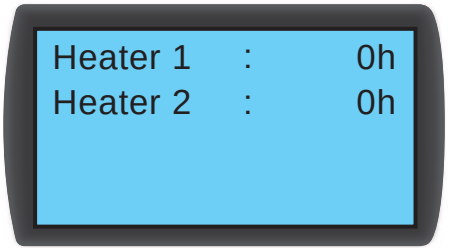
On this screen, No. means the current event / total events. A maximum of 3000 events can be recorded in the log. Press ▲▼ to switch between events, which are sorted in chronological order, that is, the No. grows with the new event. The figure in < > indicates the event code. If more than 3000 events are recorded, the oldest events will be overwritten.

The Administrator ppassword is required to delete the event log. The path is **Main Menu → Administrator → System → Clear Log**.

WARNING:
The event log is very important as reference for system running state assessment, maintenance and adjustment. Do not clear the event log without permission.

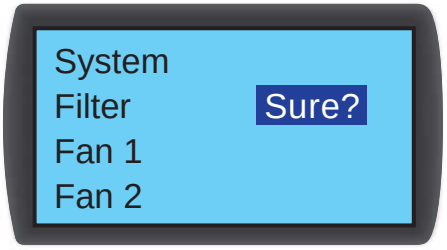
5.6.3 Query / Reset Running Time

Path: Main Menu → Status → Run Hours



Query the running time of the system and various components to help the user assess each component situation and determine the time for maintenance or replacement.

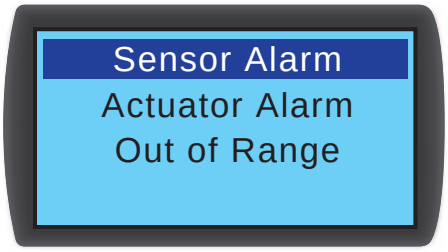
To reset the running time of each component, go to: **Main Menu → Administrator → System → Reset Component**.



After any component is replaced, please remember to reset the running time of the replaced Filter, Fan 1 ~ 2 (indoor/ outdoor), Compressor, Humidifier or Heater 1 ~ 2.

5.6.4 Alarm Setting

Path: Main Menu → Setting → Set Alarm

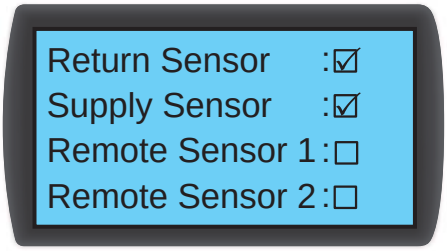


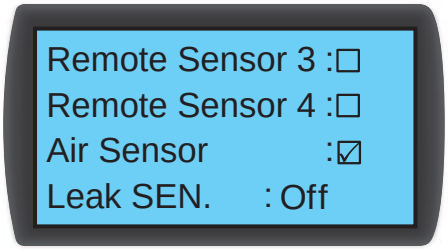
Set the '**Sensor Alarm**', '**Actuator Alarm**' and '**Out of Range**' alarm. For the item with ☐, it means this alarm is disabled. Press ↵ at this item, use ▲ ▼ to select ☑, and press ↵ to confirm to enable this alarm.

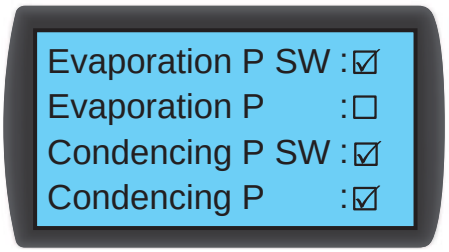
Please note, in Manual mode, if an alarm event occurs, the indicator and buzzer will not function, but the event will be recorded in the event log.

- **Sensor Alarm**

  Path: Main Menu → Setting → Set Alarm → Sensor Alarm



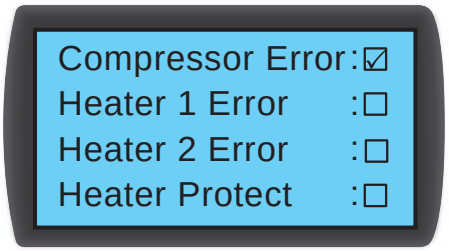


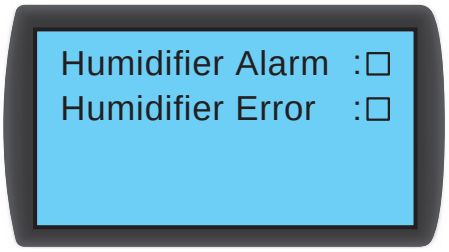


Set the alarm ON or OFF for Return Sensor, Supply Sensor, Remote Sensor 1 ~ 4, Air Sensor, Leak SEN.(leakage sensitivity), Evaporation P SW (low pressure switch), Evaporation P (evaporation pressure sensor), Condensing P SW (high pressure switch), and Condensing P (condensing pressure sensor).

- **Actuator**

  Path: Main Menu → Setting → Set Alarm → Actuator

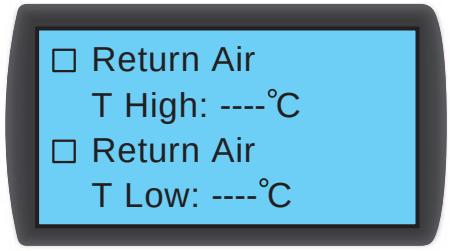


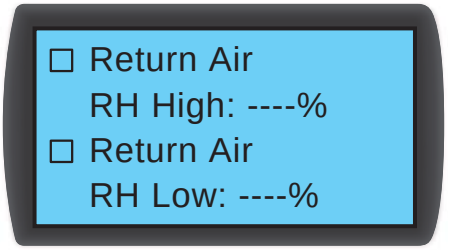


  Set the alarm ON or OFF for Indoor Fan 1, Indoor Fan 2, Outdoor Fan 1, Outdoor Fan 2, Compressor Error, Heater 1 Error, Heater 2 Error, Heater Protect, Humidifier Alarm, and Humidifier Error.

- **Out-of-Range Alarm**

  Path: Main Menu → Setting → Set Alarm → Out-of-Range

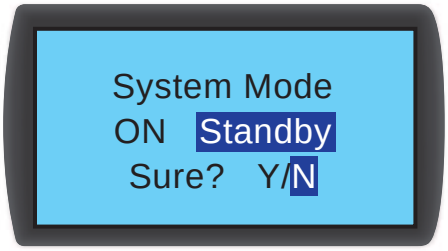




  The pictures above only display some settings. For complete settings, please refer to the information on the equipment.

5.7 Shutdown

Path: Main Menu → Power ON/ OFF → Standby



WARNING: In Standby mode, the cooling unit is still energized. Please switch off the input power supply so that the cooling unit will be completely de-energized.

To shut down the cooling unit, you have to activate Standby mode first. After 'Standby' is selected, select '**Yes**' and press ↵ to confirm. The **STANDBY** LED indicator on the control panel will be lit to indicate it is now in Standby mode; at this point, the cooling unit is still energized.

Switch off the external power supply, make sure the fans stop running and the LCD is turned off.

Chapter 6 : Maintenance & Cleaning

Check and clean the cooling unit on a periodical basis so that the equipment always operates at its best.

The internal components require periodical cleaning and check, such as fans and condensate drip tray. The device contains some replaceable components, which shall be cleaned and checked only by qualified maintenance personnel.

6.1 Firmware Update

To update the firmware, please contact our service representative.

6.2 Storage

For long time storage, it's recommended to cover the cabinet with the original packing material and store it in a place with well-controlled temperature and humidity (-15~65°C, RH 95°C) and free of corrosion, dust accumulation or contaminants. Never put the cabinet upside down or place any foreign objects inside or on the cabinet.

6.3 Monthly Maintenance

Date: Model: Maintenance staff:

Ambient condition checkup	
Is the cooling unit installed?	_____
Is it free of dust or excess water?	☐ Yes / ☐ No
Is the cabinet appearance in good condition?	☐ Yes / ☐ No
Write down the supply air temperature & humidity.	_____°C _____%
Write down high/ low pressure.	_____ /_____MPa
Write down the supply air set points.	_____°C _____%
Does the cooling unit reach the set points?	☐ Yes / ☐ No
Internal inspection	
Is the condensed water pan or water pan of the drain pump free of impurities or foreign matter?	☐ Yes / ☐ No
Do the filters function well?	☐ Yes / ☐ Replacement or cleaning is reguired.
Does water flow smoothly in the drain pipe?	☐ Yes / ☐ No
Do the fans function properly, run without restriction?	☐ Yes / ☐ No
Does the compressor function properly without over-high or over-low temperature on its top shell?	☐ Yes / ☐ No
Does the humidifier function properly?	☐ Yes / ☐ No
Do the reheaters function properly?	☐ Yes / ☐ No
Does the drain pump function properly?	
ⓘ Be sure the input power supply is disconnected before carrying out the following inspection.	
Are the electrical connections secure and free of foreign matter?	☐ Yes / ☐ No
Does the input power supply conform to the ratings of the cooling unit?	☐ Yes / ☐ No
Remark: Signature: _____	

Please copy this page for maintenance and inspection records.

6.4 Quarterly Maintenance

Date: Model: Maintenance staff:

Cleaning: Clean the following components, if necessary, use an air gun.	
Filters (replace if necessary)	☐ Completed
Front & rear doors and side plates	☐ Completed / ☐ Replaced
Condensed water pan	☐ Completed
Drain pipe	☐ Completed
⚠ Be sure the input power supply is disconnected before carrying out the following inspection.	
Coil	☐ Completed
Fans	☐ Completed
Humidifier	☐ Completed / ☐ Replaced
Reheaters	☐ Completed
Outdoor unit	☐ Completed
General inspection	
Does the system function properly? No high or low pressure alarm	☐ Yes / ☐ No
Does the alarm system function properly?	☐ Yes / ☐ No
Does the system function properly in every mode?	☐ Yes / ☐ No
Remark:	

Signature: _____

Please copy this page for maintenance and inspection records.

Chapter 7 : Troubleshooting

WARNING: The following troubleshooting procedures shall be carried out by qualified maintenance personnel, because unauthorized operation may lead to major hazards or equipment damage.

Problem	Possible cause	Troubleshooting
Fans can not start	Anomaly in power supply	Check if the input voltage is within the permissible range, the circuit breaker or switch is turned **ON** and the cooling unit is correctly earthed.
	Anomaly in an individual fan	Check the connection of each fan and replace if necessary.
Cooling unit can not start	Abnormal input voltage	Check if the input voltage is within the permissible range, the circuit breaker or switch is turned **ON** and the cooling unit is correctly earthed.
	High / low pressure switch tripped	May be caused by inappropriate system response. Please contact our service representative.
	Overheated compressor	May be caused by inappropriate system response. Please contact our service representative.
Forget password	Forget the User password or the Administrator password	Please contact our service representative.
Can not reach the set points	Worn or abnormal fans	Check each fan and replace if necessary.
	Anomaly in sensor detection	Check each sensor.
	Incorrect sensor position	Check each sensor position.
	Heat load exceeds cooling capacity	Reduce the heat load or add more cooling units.
	Clogged filters	Replace or clean the filters.
	Clogged coil	Carry out the flush procedure for the coil.
	High pressure exceeds upper limit	Check if the outdoor unit works properly and if the supply air side is blocked.
	Low pressure exceeds lower limit	Repair or replace the control box.

Problem	Possible cause	Troubleshooting
Can not reach the set points	Control module error	Check the firmware version.
	Anomaly in frequency converter	Repair the connection of the frequency converter.
Poor humidity control	Anomaly in reheaters	Check if there is any anomaly in the reheaters.
	Anomaly in humidifier	Check if there is any anomaly in the humidifier and replace if necessary.
Big noise during operation	Something sticks to the fan(s).	Clean and check the fan(s).
Water spots in the cabinet	Over-high humidity	Control the indoor humidity with the external dehumidifying device, or activate Force mode to reduce the humidity inside the cabinet.
	Supply air temperature too low	Adjust the supply air temperature (optimal range: 18-27°C).
	Fan speed too low	Adjust the fan speed.
	Abnormal output of humidifier	Check the electrical connection of the humidifier.
	Anomaly in drain pump	Check if the function of the drain pump works properly.
	Anomaly in pipe connection	Check if any anomaly in the drain pipe or in the humidifier water supply pipe.
Leakage at the cabinet bottom	Condensate water overflow	Check if the water level in the condensed water pan is too high, the drain pump functions properly, and the drain pipe is connected correctly and drained properly (without bend, damage or blockage). For upper piping, the vertical lift shall not exceed 4 m.
	Leakage in piping system	Shut down the equipment and contact our service representative.
	Cabinet is not placed horizontally	Adjust the levelers to achieve the required horizontal state.
	Damaged rubber insulating coating of pipes	Find out the breakage and reinforce.
Abnormal or no display of LCD	Wrong connection	Check the control panel's wiring and restart the cooling unit if necessary.

Problem	Possible cause	Troubleshooting
Alarm conditions are met, yet buzzer does not ring	The alarm function of buzzer is not activated	Activate the alarm function of the buzzer via the control panel. **Path: Main Menu → Setting → Local Setting**.
Anomaly in signal of remote sensor	Incorrect positions of remote sensors	Check the position of each remote sensor.
Can not establish a connection via Modbus	Incorrect connection of RS232 or RS485 connector	Re-connect.

Alarm message	Possible cause	Troubleshooting
Filter Abnormal	Clogged or worn filters	Replace or clean the filters.
Drain Pan Full	Anomaly in the drain pipe or drain pump, or vertical lift is out of range.	Remove excess water, check if the drain pipe is connected correctly and drained properly (without bend, damage or blockage). If equipped with a drain pump and with upper piping design, make sure the vertical lift does not exceed 4 m.
COND P High	Inappropriate system response or abnormal ambient conditions	Check if the outdoor unit is blocked by any foreign substances. If yes, remove the foreign substances. If the problem still exists, please contact our service representative.
HP SWITCH	Inappropriate system response or abnormal outdoor ambient conditions	Check if the outdoor unit is in good condition; if yes, restart the system. If the problem still exists, please contact our service representative.
EVA P Low	Leakage of refrigerant or abnormal indoor ambient conditions	Check if the sight glass and indoor unit are in good condition; if yes, restart the system. If the problem still exists, please contact our service representative.
LP SWITCH	Leakage of refrigerant or abnormal indoor ambient conditions	Check if the sight glass is in good condition and if the return air side or supply air side of the indoor unit is blocked by any foreign substances. If yes, remove the foreign substances. If the problem still exists, please contact our service representative.

Alarm message	Possible cause	Troubleshooting
Leak Active	Leakage is detected. Remove excess water, check the water level in the condensed water pan.	Check the drainage function, and make sure the drain pipe is free of bend, damage or blockage. For upper piping, make sure the vertical lift does not exceed 4 m.
Fire Active	Fire is detected	Check the environment and eliminate abnormal conditions.
Smoke Active	Smoke is detected	Check the environment and eliminate abnormal conditions.
Comm Abnormal	Wrong connection of CAN-Link port or repeated ID No.	Check the connection of CAN-Link port, and make sure every cooling unit in the group is provided with an unique ID No.
Compressor	Anomaly in connection	Check if the input and output connections of the inverter and the compressor become loose or have other problems.
Compressor T High	Overheated compressor	Check if the overall power consumption is in the normal range and the return air temperature is not higher than 45°C, and contact our service representative.
Return/ Supply Sensor	Anomaly in or bad connection of return air / supply air sensor	Check the function and the connection of the return air/ supply air sensor.
Remote Sensor #	Anomaly in or bad connection of remote sensor #	Check the function and the connection of remote sensor #,
Fan Failed	Anomaly in or bad connection of individual fan	Check if the fan # is blocked or abmormal, and make sure the connection lines are connected correctly.
Return/ Supply T High Return/ Supply T Low Return/ Supply RH High Return / Supply RH Low	1. Abnormal ambient temperature and humidity 2. Alarm setting error 3. Anomaly in sensors 4. Overload	1. Check if the ambient temperature and humidity are within the required operating range. 2. Check if the '**Out of Range**' alarm settings are correct. 3. Check each sensor's function. 4. If the temperature remains high after eliminating all above problems, make sure the load does not exceed the refrigerating capacity of the cooling unit.

Alarm message	Possible cause	Troubleshooting
Remote T # High Remote T # Low Remote RH High Remote RH Low	1. Abnormal ambient temperature and humidity 2. Alarm setting error 3. Anomaly in remote sensor # 4. Overload	1. Check if the ambient temperature and humidity are within the required operating range. 2. Check if the '**Out of Range**' alarm settings are correct. 3. Check the function of remote sensor #. 4. If the temperature remains high after eliminating all above problems, make sure the load does not exceed the refrigerating capacity of the cooling unit.
Run Over Hours	Periodical maintenance is not carried out for the system.	To guarantee proper function of the system, please carry out the maintenance immediately.
Humidifier	1. Too high water conductivity in humidifier 2. Too low water conductivity in humidifier 3. Anomaly in inlet valve of humidifier 4. Anomaly in drainage valve of humidifier 5. Anomaly in humidifier cylinder	Check if the humidifier cylinder is in good condition.
Heater Failed	1. Wrong reheater connection 2. Reheater protector is tripped	1. Check if the reheater connection is correct. 2. Check if the fans function properly.
Leak Wire Open	Incorrect connection of water leakage detection cable.	Check if the connection of water leakage detection cable becomes loose or broken or has poor contact.

NOTE: If all possible causes are eliminated but the alarm still appears, please contact your local dealer or customer service.

Appendix 1 : Technical Specifications

• **Indoor Unit**

Model	HCH6C60 Cooling Only		HCH6C60 Humidity Control	
Type	Air-Cooled		Air-Cooled	
Max. cooling capacity	37.2 kW		37.2 kW	
Max. sensible cooling capacity	36.1 kW		36.1 kW	
Input power	3 ~ 4W, 380V±10%, 50/60 Hz		3 ~ 4W, 380V±10%, 50/60 Hz	
Max. input current	28.4A		36.6A	
Max. input power	18.7 kW		24.0 kW	
Air flow	8340 CMH		8340 CMH	
Compressor	Scroll compressor		Scroll compressor	
Refrigerant	R410A		R410A	
Filter	MERV 8		MERV 8	
Reheater	N/A		5.4 kW	
Humidifier	N/A		3 kg/h	
Communication interface	RS232 × 1, RS485 × 1, CAN IN/OUT × 1, Input dry contact × 1, Output dry contact × 1, SNMP Slot × 1			
Piping	Gas pipe Liquid pipe Drain pipe	7/8" ODF solder 5/8" ODF solder PVC 3/4" ID	Gas pipe Liquid pipe Drain pipe Humidifier supply water	7/8" ODF solder 5/8" ODF solder PVC 3/4" ID PVC 3/8" ID
Optional parts	Remote temp/ RH sensor, Remote temp sensor, SNMP card, Drain pump, Water leakage detection cable, Reheater, Humidifier, Low pressure transducer, Liquid pipe temperature sensor, Suction pipe temperature sensor			
Dimensions (W × D × H)	600 × 1090 × 2000 mm		600 × 1090 × 2000 mm	
Weight	340 kg		352 kg	

• **Outdoor Unit**

Model	HCC6C50-13S	HCC6C50-15S	HCC6C70-17D
Power	3~, 380V±10%, 50/60 Hz		
Max. input current	1.5A / each fan		
Air flow	10800 CMH	11220 CMH	18600 CMH
Operating temperature	-15 ~ 35°C	-15 ~ 40°C	-15 ~ 45°C
Dimensions (W × D × H)	1525 × 1100 × 1090 mm	1725 × 1100 × 1090 mm	1885 × 1100 × 1090 mm
Weight	102 kg	110 kg	148 kg

* Test conditions for max. cooling capacity measurement: return air dry-bulb temperature: 40.6°C, return air wet-bulb temperature: 21.6°C, and outdoor temperature: 35°C.

** The pressure of the humidifier water supply should be 0.1~0.35 MPa.

Appendix 2 : Warranty

Seller warrants this product, if used in accordance with all applicable instructions, to be free from original defects in material and workmanship within the warranty period. If the product has any failure problem within the warranty period, Seller will repair or replace the product at its sole discretion according to the failure situation.

This warranty does not apply to normal wear or to damage resulting from improper installation, operation, usage, maintenance or irresistible force (i.e. war, fire, natural disaster, etc.), and this warranty also expressly excludes all incidental and consequential damages.

Maintenance service for a fee is provided for any damage out of the warranty period. If any maintenance is required, please directly contact the supplier or Seller.

WARNING!

The individual user should take care to determine prior to use whether the environment and the load characteristic are suitable, adequate or safe for the installation and the usage of this product. The User Manual must be carefully followed. Seller makes no representation or warranty as to the suitability or fitness of this product for any specific application.

No. 501322710101
Version : V 1.1
Release Date : 2017_02_20

Smarter. Greener. Together.