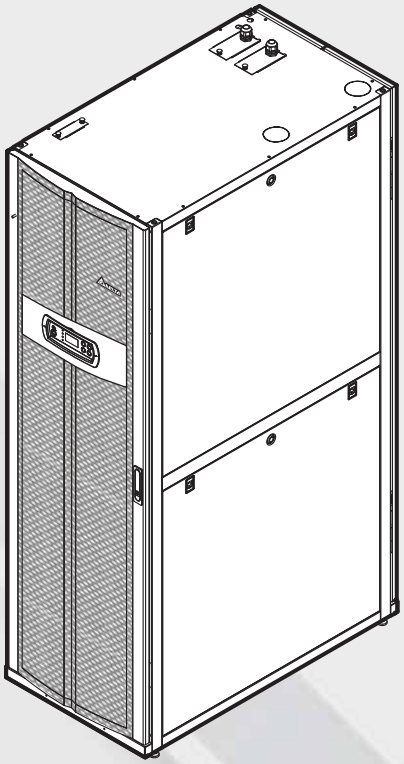


The power behind competitiveness

Delta InfraSuite Cooling

In-Row Cooling, Chilled Water

RowCool 95/120/260 kW

User Manual

www.deltaww.com

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.

Copyright © 2026 by Delta Electronics Inc. All Rights Reserved. All rights of this User Manual (“Manual”), including but not limited to the contents, information, and figures are solely owned and reserved by Delta Electronics Inc. (“Delta”). The Manual can only be applied to the operation or the use of this product. Any disposition, duplication, dissemination, reproduction, modification, translation, extraction, or usage of this Manual in whole or in part is prohibited without the prior written permission of Delta. Given that Delta will continuously improve and develop the product, changes may be made to the information in this Manual at any time without obligation to notify any person of such revision or changes. Delta will by all means update and maintain the correctness of this Manual. Delta disclaims any kinds or forms of warranty, guarantee, or undertaking, either expressly or implicitly, including but not limited to the completeness, faultlessness, accuracy, non-infringement, merchantability or fitness for a particular purpose of the Manual.

Table of Contents

SAVE THIS MANUAL ----------II

Chapter 1 : Guide for Safe Operation ----------1

1.1 Safety Instructions ---------- 1
1.2 Installation Instructions---------- 1
1.3 Instructions for Use ---------- 1

Chapter 2 : Introduction ----------2

2.1 Product Introduction ---------- 2
2.2 Functions and Features---------- 2
2.3 Packing List---------- 4
2.4 Optional Accessories ---------- 5
2.5 Appearance---------- 5
2.6 Components Identification ---------- 6
2.7 Piping System---------- 9
2.8 Control panel ----------10

Chapter 3 : Installation ---------- 11

3.1 Installation Site----------11
3.2 Clearance zone ----------12
3.3 Handling ----------12
3.4 Positioning ----------14
3.5 Open the Front Door and Remove the Side Panels----------15
3.6 Hole Drilling----------16
3.7 External Piping----------17
3.8 Power Connection----------18
3.8.1 Power ----------18
3.9 Control box----------21

Chapter 4 : Initial Startup---------- 24

4.1 Pre Start-up Inspection ----------24
4.2 Water Quality Requirements----------25
4.3 Power Supply----------26
4.4 Air Exhaust----------26
4.5 Water Leakage Detector----------27
4.6 Water Balance----------27

Chapter 5 : Operation ---------- 29

5.1 Control Panel Operation ----------29
5.2 Status Screen and Main Menu----------30
5.3 Account Authority and Login----------31
5.4 Operation mode----------31
5.5 Shutdown----------32
5.6 Setting of Cooling Unit ----------33
5.6.1 Local Setting----------33
5.6.2 Set Point----------35
5.6.3 Controller Setting----------35
5.6.4 Setting of automatic control mode ----------37
5.6.5 Alarm Setting----------37
5.6.6 Inquiry of system status ----------39
5.6.7 Inquiry/elimination of event log ----------40
5.6.8 Inquiry/reset of running hours----------40
5.6.9 Change of system type ----------41
5.6.10 Restore to Factory Setting ----------42

Chapter 6 : Maintenance and Cleaning ---------- 43

6.1 Firmware Upgrade ----------43
6.2 Storage----------43

Chapter 7 : Troubleshooting ---------- 44

Appendix 1 : Technical Specifications ---------- 51

Appendix 2 : Periodic Inspection/Maintenance List ---------- 53

Monthly maintenance----------53
Quarterly maintenance----------54

Appendix 3 : Warranty ---------- 55

Chapter 1 : Guide for Safe Operation

1.1 Safety Instructions

- Please carefully read all chapters of the Manual before any installation, operation, and maintenance. To avoid personal injury and equipment damage, please be sure to operate the product in accordance with the instructions in this Manual and the markings on the cabinet.
- When moving the equipment, the unit should only be moved by at least two people so as to guarantee safety.
- In handling or removal of the equipment, please pay attention to its height and center of gravity. When using a transportation tool for handling, it must be raised from the bottom to avoid toppling.
- The unit contains moving components. Be careful to keep it away from your arms, legs, hair, clothes or jewelry so as to avoid any danger.

1.2 Installation Instructions

- The unit can be connected with a single or dual power source. Make sure the input power is disconnected before making a connection. If necessary, use a volt-ohm-milliammeter to confirm this.
- It is suggested that the installation area should not have flammable objects and the equipment should be installed on a stable floor.
- This unit is only intended for indoor use. The indoor environment must be separated from the outside air so as to avoid temperature and humidity interference. Consult the national or local regulations for separating the installation environment.
- All specifications of diameters and lengths of electrical wires must be in compliance with local or national laws and regulations. The grounding wires of the unit must be effectively connected with the grounding system.

1.3 Instructions for Use

- The inner high voltage of the unit may be fatal! The inner components may have hidden dangers and only qualified service personnel can operate the unit. Improper operation may lead to serious injury or death or equipment damage. Be sure to follow all the instructions and warnings contained in the Manual.
- When replacing the side panels or front or back doors, make sure there is no foreign matter in the cabinet.

Chapter 2 : Introduction

2.1 Product Introduction

The Delta InfraSuite RowCool Precision Cooling Unit (Chilled Water Type) adopts a parallel cabinet design and can be set in an area adjacent to a heat load. Its high cooling efficiency can create an effect of dropping temperature. The modularized design facilitates expansion or movement and can be flexibly integrated into your data center environment. With enlargement of your data centers, increased cooling needs can be met by easy re-configuration or addition of the equipment.

When installed in a data center, the untreated air will be sucked in from the rear of the cooling unit and the air, after treatment, will be released from the front of the unit to achieve the aim of cooling.

You can manage your cooling unit via a user-friendly interface. The cooling efficiency can be actively controlled by its built-in MCU and it will remind you of any abnormality via the alarm system so as to guarantee normal operation.

2.2 Functions and Features

- **Intelligent temperature and humidity control**

  Accurate detection and management of the data center's temperature and humidity by the built-in MCU.

- **User-friendly control interface**

  Easy setting and monitoring and access to system status.

- **A-B dual power source input**

  A-B dual power source design for enhancing system reliability.

- **Automatic spring-resetting of two-way ball valve**

  In abnormal power interruption, the inner flow-rate actuator will automatically close the two-way ball valve in a short time to stop chilled water from continuously flowing into the coil and generating condensed water, which may lead to water leakage.

- **Alarm system**

  Detection of abnormality and reminding the user via a buzzer or an external dry contract device.

- **Detection of heat load temperature**

  Accurate monitor of the heat load temperature and humidity by remote sensors.

- **Leakage detection**

  Optional maximum 50m water leakage detector (4m is provided as default), which will immediately inform the user of any water leakage so as to protect the safety of the equipment.

- **Output and input dry contacts**

  Two output and two input dry contacts for fire alarm, smoke alarm, system alarm, etc.

- **Heat insulation side panels**

  Isolate the interference of outside temperature.

- **Lockable front and rear doors and side panels**

  Prevent any unauthorized operation.

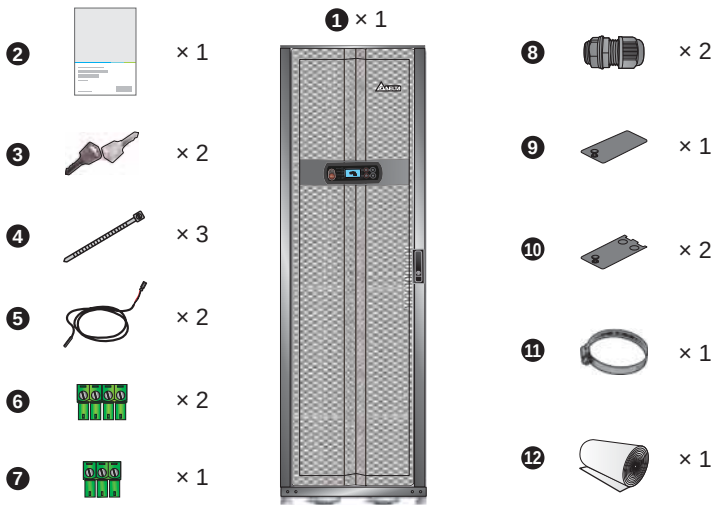
- **Casters**

  For convenient movement or relocation.

- **Compatible SNMP card (optional)**

  Monitoring management through SNMP protocol.

2.3 Packing List



No.	Description	Quantity
❶	Delta InfraSuite RowCool Precision Cooling Unit	1
❷	User manual	1
❸	Key (shared by front & rear doors and side panels)	2
❹	Cable tie	3
❺	Remote temperature sensor (4 meters)	2
❻	4-pin terminal block	2
❼	3-pin terminal block	1
❽	Cable gland	2
❾	Cover plate for communication wiring duct	1
❿	Cover plate for power supply	2
⓫	Iron hose clamp ring	1
⓬	Non-woven filter*	1

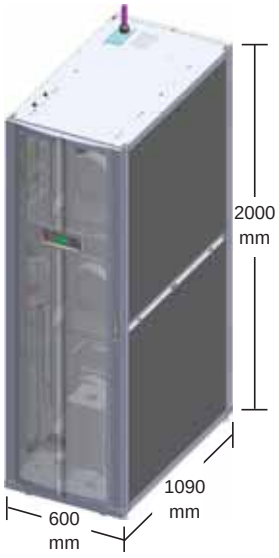
*Caution: Use only for dustproof applications at trial operation by engineering personnel. Do not continue to use in normal operation.

2.4 Optional Accessories

For purchase of the following optional accessories, please contact service personnel.

- **SNMP card:** it helps to achieve the best compatibility.
- **Remote temperature and humidity sensors:** it helps to sensor the temperature and humidity.
- **Stainless steel hose:** it reduces installation difficulty (diameter: 1 1/4”, length: 1.5M, dual-side PT tooth).

2.5 Appearance



(Figure 2-1: HCH1CD0)



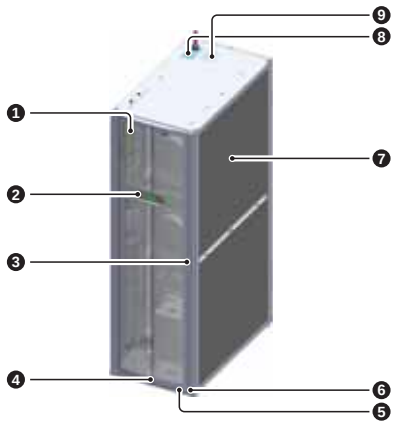
(Figure 2-2: HCH1CH0)



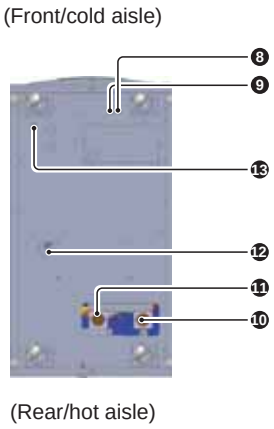
(Figure 2-3: HCH1CS0)

2.6 Components Identification

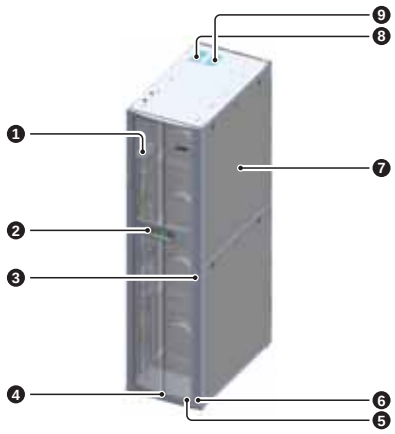
- **External**



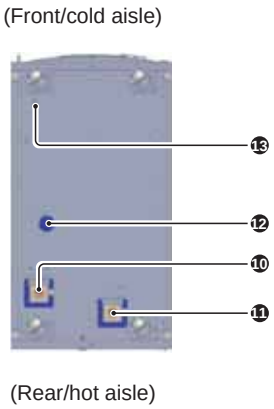
(Figure 2-4: HCH1CD0 front view)



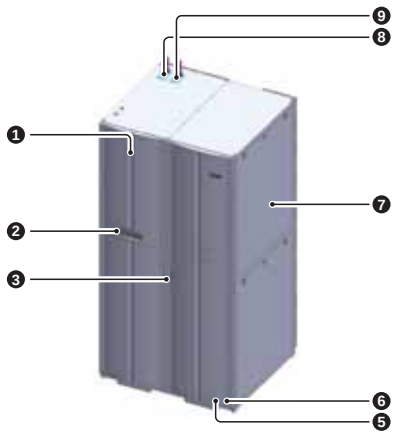
(Figure 2-5: HCH1CD0 bottom view)



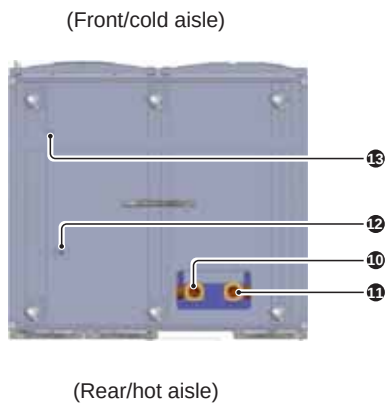
(Figure 2-6: HCH1CH0 front view)



(Figure 2-7: HCH1CH0 bottom view)



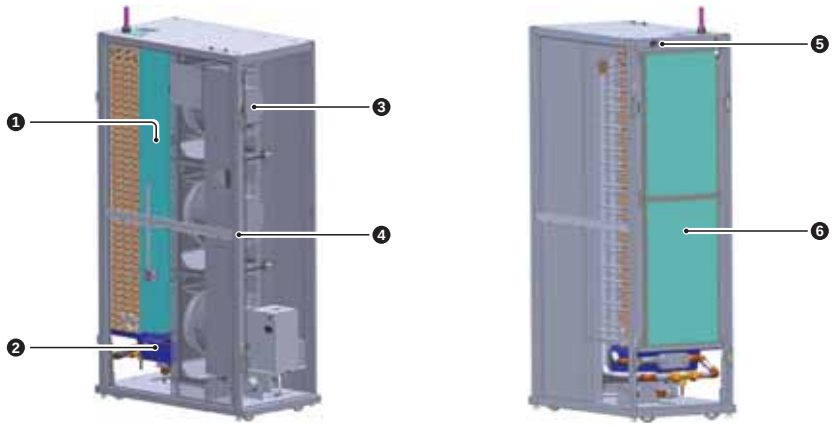
(Figure 2-8: HCH1CS0 front view)



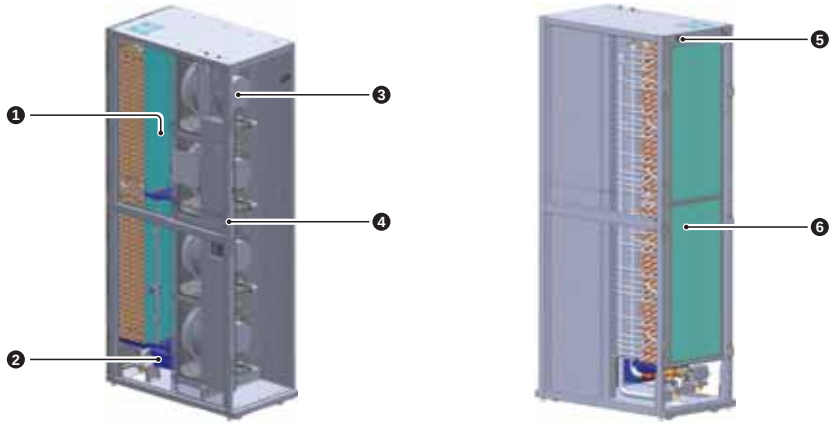
(Figure 2-9: HCH1CS0 bottom view)

No.	Description	No.	Description
❶	Front door	❽	Upper Feed A power inlet hole
❷	Control panel	❾	Upper Feed B power inlet hole
❸	Front door lock	❿	Lower outlet hole of chilled water
❹	Gradienter	⓫	Lower inlet hole of chilled water
❺	Casters	⓬	Drain hole
❻	Levelers	⓭	Leakage detector outlet
❼	Detachable heat insulation side panels		

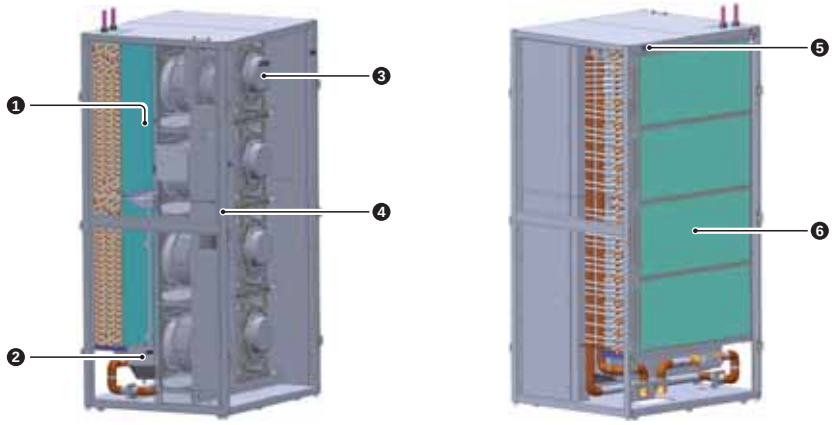
- **Internal**



(Figure 2-10: HCH1CD0 inside view)

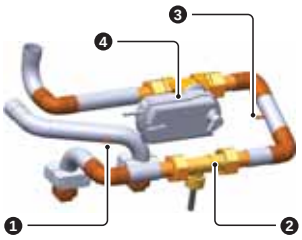


(Figure 2-11: HCH1CH0 inside view)

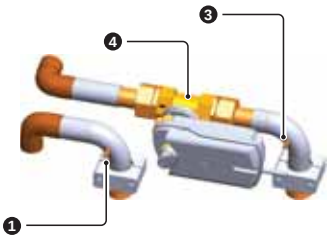


(Figure 2-12: HCH1CS0 inside view)

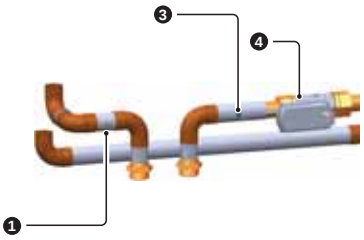
No.	Description	No.	Description
❶	Coil	❹	Electric panel
❷	Water pan	❺	Exhaust vent of return water
❸	Fans	❻	Filter



(Figure 2-13: HCH1CD0 main pipe components)



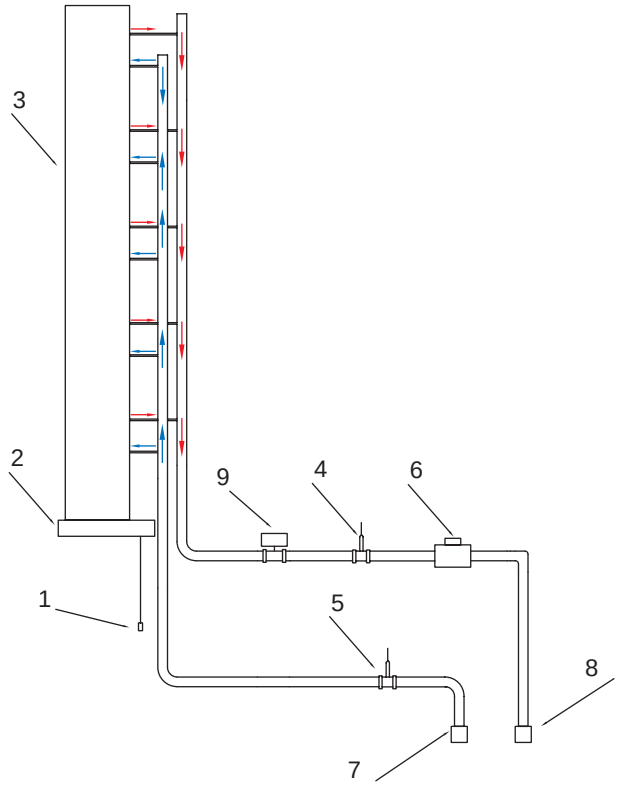
(Figure 2-14: HCH1CH0 main components)



(Figure 2-15: HCH1CS0 main components)

No.	Description	No.	Description
❶	Inlet water temperature sensor	❸	Outlet water temperature sensor
❷	Flow meter	❹	Two-way ball valve and actuator

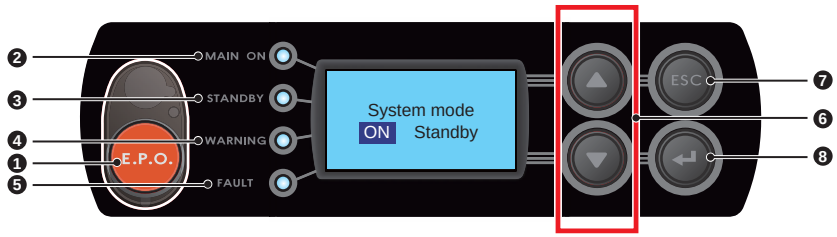
2.7 Piping System



(Figure 2-16: Pipe circuit diagram)

No.	Description	No.	Description
❶	Drain connector	❻	Flow meter
❷	Coil water pan	❼	Inlet connector of chilled water
❸	Coil	❽	Outlet connector of chilled water
❹	Outlet water temperature sensor	❾	Two-way ball valve
❺	Inlet water temperature sensor		

2.8 Control panel



(Figure 2-17: Control panel)

No.	Item	Description
❶	E.P.O.	Emergency power off button.
❷	MAIN ON	The green light indicates power-on. The flashing indicator indicates the unit is in installation mode.
❸	STANDBY	The yellow light indicates the unit runs in standby mode. The flashing indicator indicates the unit runs in force mode.
❹	WARNING	The yellow light indicates alarm information.
❺	FAULT	The red light indicates fault information.
❻	▲▼	Page Up, Page Down, move the highlighted area, or select text.
❼	ESC	Goes back to previous screen or cancels current operation.
❽	↵	Enters your selected item or confirms your selection or setting.

NOTE: The emergency power off button (E.P.O.) is OFF by default. If such a function is needed, please contact service personnel.

Chapter 3 : Installation

WARNING:

1. Only service personnel can perform the following installation procedures. No installation, piping or handling should be performed without authorization so as to avoid equipment damage and personal injury.
2. The high voltage in the equipment is potentially fatal! The inner components have potential dangers and only qualified service personnel can perform wiring.

3.1 Installation Site

When planning the installation site for the cooling unit, you must take the following into consideration so as to guarantee the best efficiency.

- **Environmental requirements**

  The installation site must allow the equipment to move in and out, the flooring must must have sufficient bearing capacity, and there is a sufficient space for maintenance, operation, and pipe layout and repair. The cooling unit can only be located indoors and the indoor environment must be isolated from the outside air to avoid temperature and humidity interference. The outside humidity entry must be minimized in accordance with the local or national regulations so as to avoid the increase of operation costs due to temperature differences increasing the heat load temperature.

- **Humidity and heat source**

  Implement water-proof and heat insulation engineering for the indoor environment so as to isolate the outside humid hot air. **NOTE:** If the humidity of the installation environment exceeds the operation scope, the condensation of the water of the coil may lead to a rise in the water level of the condensed water pan, triggering an alarm.

- **Noise impact**

  At a high load, the operation of this cooling unit may produce loud noise. Therefore, it is not suitable to install the unit close to offices.

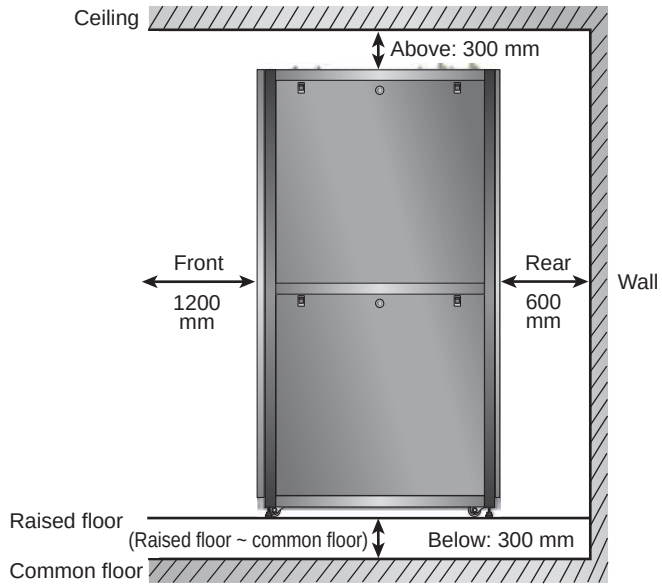
- **Input power**

  In connecting the power supply, make sure that the power conforms to the rated value and the power distribution device is sufficient to satisfy the load requirement. Inspect the rated values of each unit and make sure they have been properly grounded. Do not connect more than one cooling unit to the same branch circuit or power distribution equipment.

3.2 Clearance zone

In order to facilitate maintenance, operation, and air circulation, please reserve a net space around the equipment.

It is suggested to preserve 1200mm in the front aisle, 600mm in the rear aisle, and at least 300mm above the cabinet to facilitate wiring and piping. The height of raised floor should not be lower than 300mm.



(Figure 3-1: Space reservation)

3.3 Handling

- **Handling Instructions**

  Before moving the equipment to the installation site, plan the route according to the following instructions:

  1. Make sure the passage, floor, elevator or slope on the handling route can bear the weight of the equipment and handling device, and there is a sufficient net space to avoid collisions.
  2. In the case of a slope on the handling route, its inclination must not be greater than 15 degrees so as to avoid toppling the cabinet.

3. The bottom casters are only suitable for short distance movement. For long distance movement, use a handling device (such as ***Fig. 3-2 Forklift handling***) so as to avoid damage to the casters.



(Figure 3-2: Forklift handling)

4. The casters are only suitable for moving on flat surfaces. Avoid heavy falling of and moving of the unit on uneven ground, which may damage the casters or even result in toppling.
5. When moving the unit, pay attention to its height and center of gravity. At least two people working together should handle the unit so as to guarantee safety.

- **Levelers**

After moving the unit into place, use a wrench to rotate clockwise the four levelers beside the casters to put them down and stable on the floor. Make sure the unit cannot slide or topple.



(Figure 3-3: Levelers)

WARNING:

The levelers are only used for leveling the unit and cannot be used to compensate for the height difference of the floor so as to avoid toppling.

3.4 Positioning

After moving the unit into place and it is parallel with the adjacent cabinet, you must position it so as to ensure its stability. The following two methods can be used, depending on the installation environment:

- **Cabinet fasteners**

  If DELTA cabinet (Model number MSR1110, MSR2110) is used as the adjacent cabinet, it can be fastened by connecting fasteners. Each cooling unit is provided with four connecting fasteners (two at the front and two at the rear). You must remove the front and back doors before making the fastener connection. Refer to the following procedures:

  1. If the front door is locked, please use the attached key to open it.
  2. Remove the unit's earth wire and the control panel interface cable, raise the front door, and take it out.
  3. Use the key to unlock the rear door, remove the earth wire, raise the door, and take it out. The rear door is of the split type and, if necessary, take down both doors.

     NOTE: Put the front and rear doors that have been removed in a safe place so as to avoid any equipment damage or personal injury due to collisions.

  4. Use a screwdriver to loosen the screw below the fastener and lock it on the adjacent cabinet.
  5. Fix the front and rear (8 in all) fasteners with the adjacent cabinet.
  6. After fixing the fasteners, please re-install the front and rear doors.

(Precision Cooling Unit) (Adjacent cabinet)



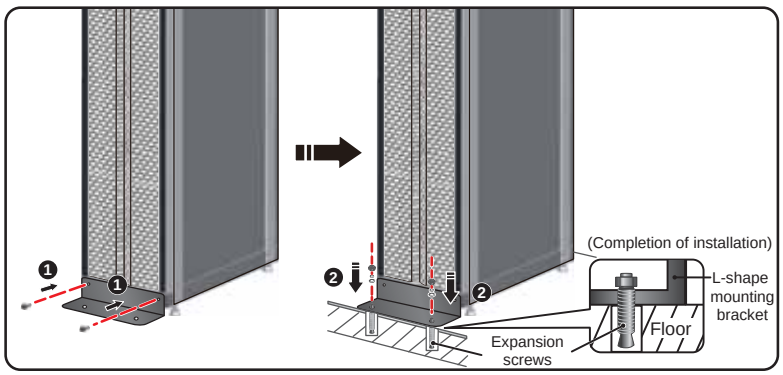
(Figure 3-4: Join the cooling unit and the adjacent cabinet together)

- **L-type balance support**

  The L-type balance support is originally used to fix the cooling unit on the pallet during transportation and can be used for ground fixing after positioning to provide extra locking force.

  1 Use two M6 screws to fix the L-type balance support below the front door (with the extruding part forward) as shown in the figure.

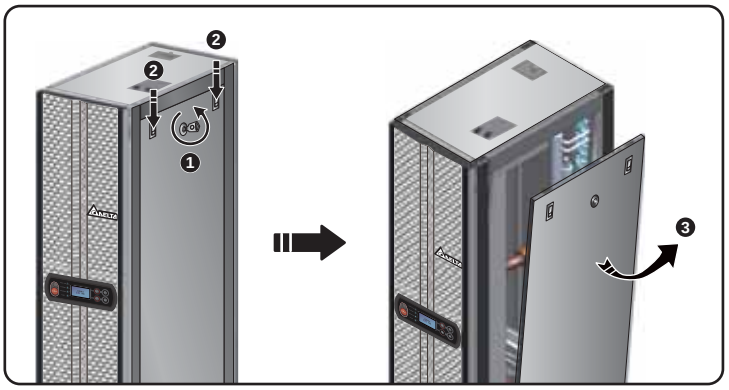
  2 Use expansion screws to fix the extruding end on the floor.



(Figure 3-5: Installation of L-type balance support)

3.5 Open the Front Door and Remove the Side Panels

To open the front door, use the attached key to unlock the front door, push the door handle's button and rotate the handle. To remove a side panel, use the same attached key to unlock the side panel, simultaneously press down the two door holders located at each side of the side panel and take the panel out.



(Figure 3-6: Removal of side panel)

To re-install the side panel, align the two lower holes and press down the two door holders at the same time to re-install the side panel.

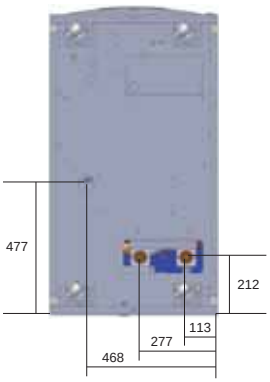
3.6 Hole Drilling

Please carry out hole drilling on the raised floor in accordance with the drawing to allow pipelines to pass through.

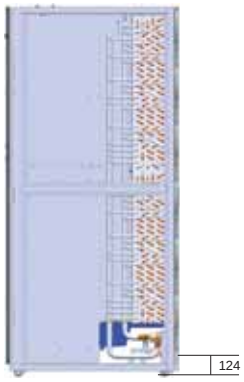
The pipeline is wrapped with an external heat insulation layer to reduce the interference of outside temperature and avoid condensed water. The hole diameter should be about 13mm.



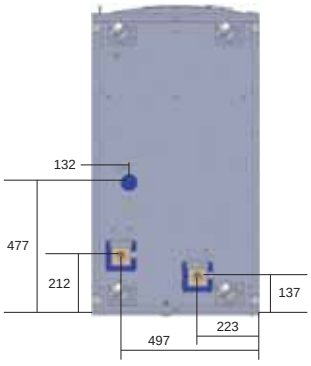
(Figure 3-7: HCH1CD0 piping positions and dimensions)



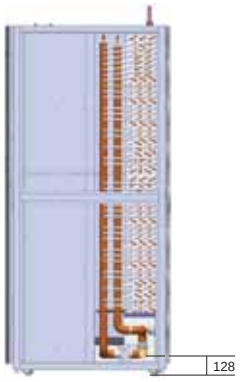
(Figure 3-8: HCH1CD0 piping diameter and positions)



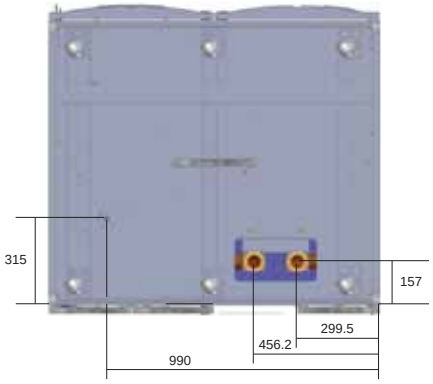
(Figure 3-9: HCH1CH0 piping positions and dimensions)



(Figure 3-10: HCH1CH0 piping diameter and positions)

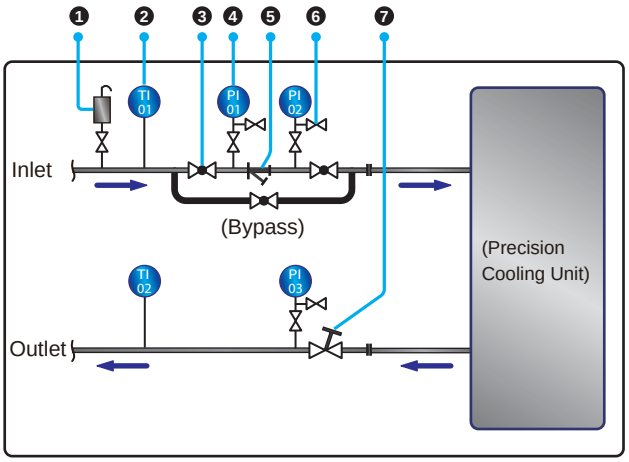


(Figure 3-11: HCH1CS0 piping positions and dimensions)



(Figure 3-12: HCH1CS0 piping diameter and positions)

3.7 External Piping



(Figure 3-13: Suggested external piping)

No.	Description	No.	Description
❶	Automatic exhaust valve	❺	Y-shape filter
❷	Thermometer	❻	Shut-off valve
❸	Ball valve	❼	Balance valve
❹	Pressure meter		

Configure an external pipeline and an automatic exhaust valve ❶ at the water inlet end as shown in the Figure for removing the air in the pipeline. Set a Y-type filter ❺ in the water inlet pipe to filter out the impurities and chemical substances in the water. Install a ball valve ❸ in front of or behind the Y-type filter to set up a branch circuit. When the filter needs cleaning or maintenance, close the ball valve to let the chilled water go to the cooling unit via the branch so as to avoid shut-off loss. Install a pressure meter ❹ ❻ in front of and after the Y-type filter and judge if there is a blockage according to the pressure difference.

Configure a multiple functional balance valve ❼ at the return water end for adjusting the return water flow rate.

- **Pipeline washing**

  To guarantee cooling efficiency, you must purify the pipeline to filter out impurities and chemical substances. For pipeline washing, use a hose to create a short circuit to make the chilled water go directly from the inlet end to the return end without passing through the cooling unit. Use a fine-meshed filter (20-mesh suggested) in the Y-type filter to filter out the fine impurities and after 12h–24h water circulation in the pipeline, change a larger-meshed filter (3-mesh suggested).

- **Pipeline installation precautions**

  1. During installation, please use tools to tighten the hexagonal nuts on the cooling unit.
  2. The tightening torque between the steel pipe and the hexagonal nuts on the cooling unit must not exceed 50 N-m.

3.8 Power Connection

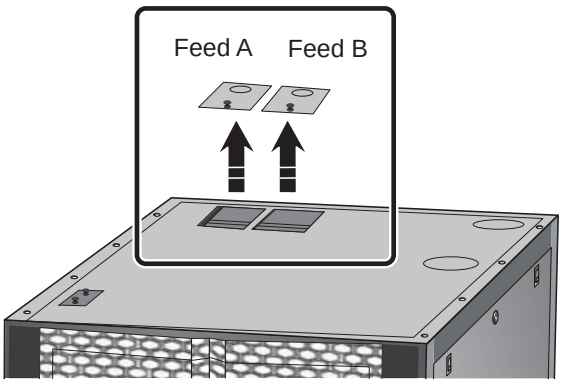
3.8.1 Power

WARNING:

1. The input power must conform to the rated value on the equipment nameplate.
2. The appliance of the power wires and backup connecting wires should conform to national or local regulations. The suggested wire specification is as follows: PVC cord with a diameter of 10AWG (4.0mm^2) and a temperature resistance of 105°C.
3. In locking the screws for wiring at the power terminal block, use the recommended installation torque (12.2Kgf-cm).
4. If there is no wire passing through the communication wire duct at the top of the cabinet, cover the duct with the cover plate provided in the accessory package so as to avoid dust accumulation.
5. Reserve inlet wire length on site wiring and make sure the G to longer than R,S,T,and N wires.

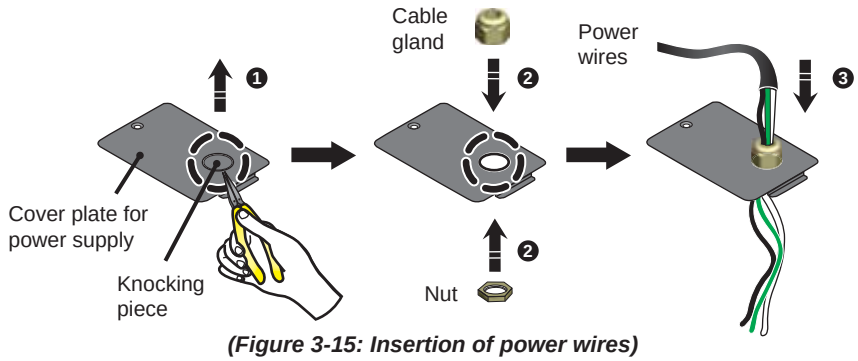
- **Upper power feed**

  1 Manually loosen and take out the power supply's cover plates at the rear of the cabinet top.



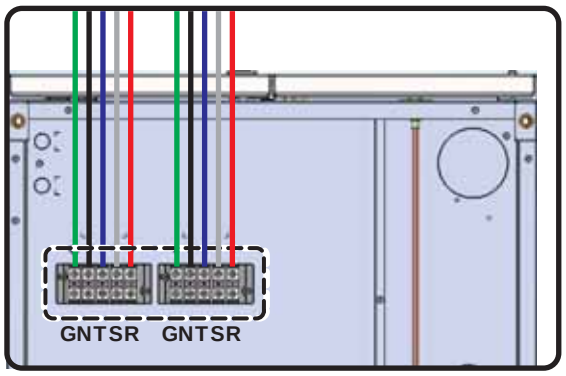
(Figure 3-14: Removal of the power supply's cover plates)

  2 Use nippers to remove each cover plate's knocking-piece, take out each cable gland from the accessory package, remove its nut, rotate and tighten the cable gland on the cover plate, and pass the power wires through it.



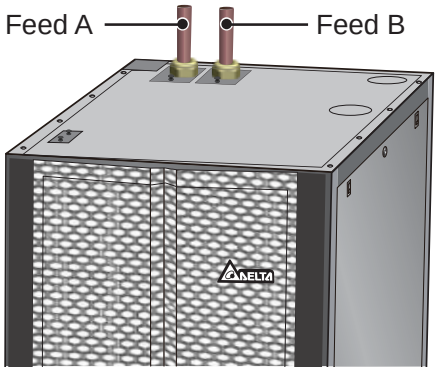
(Figure 3-15: Insertion of power wires)

3 Use a screw driver to loosen the screws of the terminal block and insert R,S,TN and G into it and lock them.



(Figure 3-16: Installation of power wires)

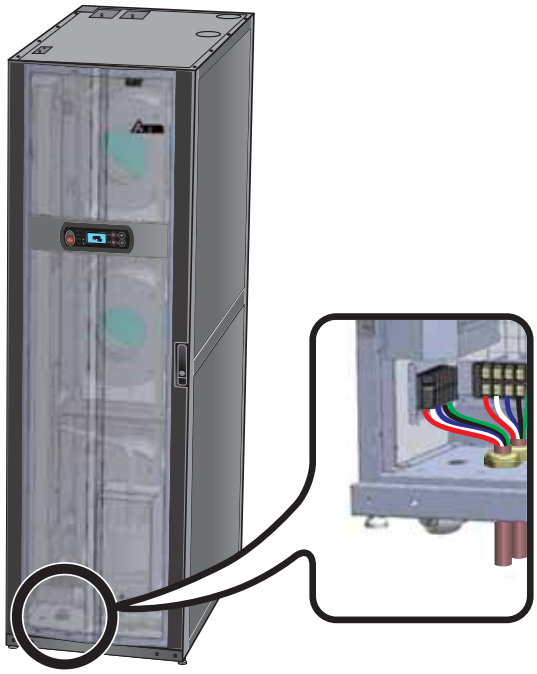
4 Re-install the power supply's cover plates and lock the cable glands tightly.



(Figure 3-17: Re-install the power supply's cover plates)

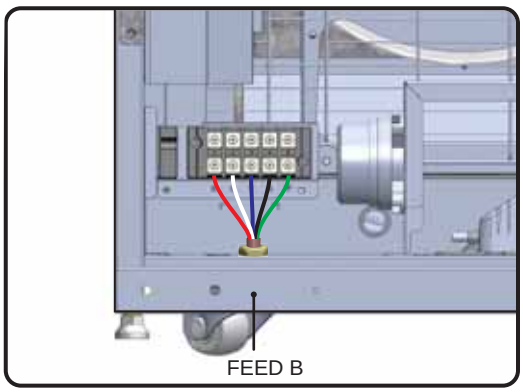
- **Lower power feed**

  1 The lower power feed is at the left lower part of the unit. Use nippers to remove the knocking-piece on each power supply's cover plate, take out each cable gland from the accessory package, remove its nut, rotate and tighten the cable gland on the cover plate, and pass the power wires through it.



(Figure 3-18: Lower power feed position)

  2 Feed A is at the left side and Feed B is at the front. Use a screwdriver to loosen the screws of the terminal block and insert R, S, T, N, and G wires into it and lock them.

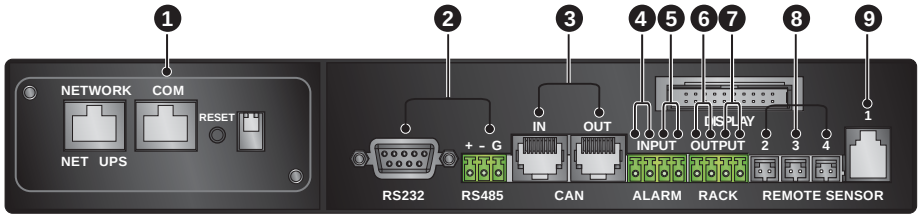


(Figure 3-19: Power input wiring position and wiring approach)

NOTE: Only the model of HCH1CD0 supports lower power input.

3.9 Control box

- **Front**



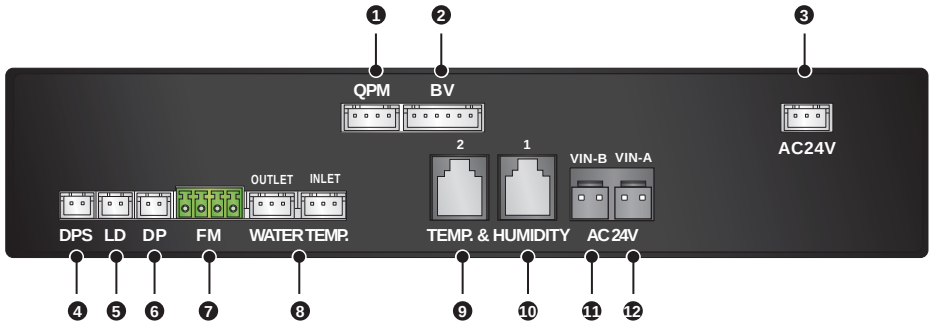
(Figure 3-20: Front of control box)

No.	Item	Description
❶	SNMP card slot	This unit is compatible with an SNMP card (optional) and can be connected with a workstation so as to monitor and manage the system based on the SNMP protocol. To install the SNMP card, first remove the dust cover from the control box, use an RJ45 cable (purchase separately) to connect the workstation and the SNMP card. For SNMP card operation and setting, refer to its user manual.
❷	RS232 RS485	The RS232 or RS485 port allows you to connect a workstation or power distribution device based on Modbus protocol for remote use.
❸	CAN-Link IN/OUT	It is reserved for series connection of several cooling units. It adopts one-Input one-Output mode.
❹ ❺	Input dry contacts	Normally open, for connecting the fire alarm or smoke detector. When an event occurs, the dry contact device is triggered to form a short circuit. The system will record it in the event log and shut down the cooling unit. Port ❹: fire alarm Port ❺: smoke detector

No.	Item	Description
❻ ❼	Output dry contacts	Connect two dry contact output devices and trigger the contacts at specific events. Port ❻ (System alarm event): Normally open. Connect the dry contact device to this port and the device will be triggered when an alarm event occurs (close the circuit). You may set the triggering conditions. Refer to ***5.7.1 Local setting***. Port ❼ (Start of cooling unit): Normally open. Automatically trigger to form a short circuit at the start of the cooling unit to remind the chiller to output chilled water and turn to the normally open status until the cooling unit is powered off.
❽	Remote temperature sensor	At most, three remote temperature sensors (two are provided) can been connected. Qualified service personnel will connect and locate them for you in installation for accurate detection of the temperature of heat loads.
❾	Remote temperature and humidity	Connects the remote temperature-humidity sensor (purchase separately) for accurate detection of the temperature and humidity of heat loads. It is suggested that qualified service personnel perform installation.
❿	Display interface	Connects the control panel locating in front of the unit for information output.

- **Rear**

  The interfaces at the rear of the control box have been connected at delivery. The connecting components are shown in the table below.



(Figure 3-21: Rear side of control box)

No.	Description	No.	Description
❶	Pressure sensor	❼	Flow meter
❷	Ball valve actuator	❽	Outlet and inlet water temperature sensor
❸	Output power (AC 24V)	❾	Temperature and humidity sensor 2
❹	Differential pressure switch sensor	❿	Temperature and humidity sensor 1
❺	Leakage detector	⓫	Input power of control box -B (AC 24V)
❻	Float switch	⓬	Input power of control box -A (AC 24V)

Chapter 4 : Initial Startup

4.1 Pre Start-up Inspection

WARNING:

1. Only qualified service personnel can carry out the installation procedures in this chapter.
2. The inner high voltage of this unit is potentially fatal! Make sure the input power has been disconnected before the following actions.
3. A startup without correctly completing ***4.1 Pre Start-up Inspection*** may lead to serious personal injury or equipment damage!

Please complete all the following inspections before implementing the initial startup procedures.

Inspection List

General items

- ☐ There is not any damage around the device.
- ☐ The unit is stably fixed and close to the adjacent cabinet.
- ☐ All the installation procedures have been performed in accordance with the instructions in ***Chapter 3: Installation***.
- ☐ The pipes in and outside the cabinet have been correctly connected and the thermal insulating layer of the pipes are free of damage and leakage.
- ☐ The front and back doors have been reinstalled and the cables of the control panel have been connected.

Environment

- ☐ The inner environment is an enclosed space and isolated from interference from outside temperature and humidity.
- ☐ The clearance zone surrounding the cabinet conforms to the regulation (please refer to ***3.2 Clearance zone***).

Electronic connection

- ☐ The rated value of the input power conforms to that marked on the nameplate.
- ☐ The equipment has been properly grounded.
- ☐ All electronic connections are tight and stable.

☐ The remote temperature (humidity) sensors have been correctly connected and located properly.

☐ The water leakage detector has been correctly laid.

Mechanical connection

☐ The pipes and valves are free of breaks or damage.

☐ The condensed water drain pipe has been correctly connected and led to the draining site.

☐ The temperature of the water supplied by the external chiller is stable (5~15°C).

4.2 Water Quality Requirements

The water quality requirements are established to minimize scale formation, corrosion and microbial growth within the system, which maintains heat transfer efficiency, ensures reliable system operation and extends equipment lifetime.

During system operation, water quality must be maintained within the specified limits listed in the table below. Regular water quality testing and evaluation should be conducted at least once every three months to ensure long-term system reliability and performance.

If test results indicate abnormal conditions or exceed the specified water quality limits, appropriate corrective actions should be taken promptly. These may include chemical water treatment, system blowdown or filtration to restore and maintain the water quality within the recommended limits.

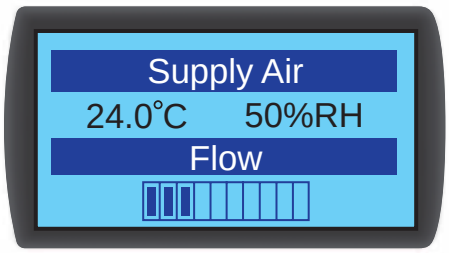
For water quality requirements, please follow the table below.

No.	Parameter	Water
1	pH	7.0 to 9.0
2	Corrosion inhibitor (s)	Required
3	Biocide	-
4	Sulfide	< 10 ppm
5	Sulfate	< 100 ppm
6	Chloride	< 50 ppm
7	Bacteria	< 1000 CFUs/ ml
8	Total hardness (ppm as $CaCO_3$)	< 200 ppm
9	Conductivity	10 ~ 2500 μS/ cm

No.	Parameter	Water
10	Total suspended solids	-
11	Residue after evaporation	< 500 ppm
12	Turbidity	< 20 NTU
13	Iron (mg/L)	≤ 1.0 ppm
14	Copper (mg/L)	≤1.0 ppm
15	Particle size	< 500 μm

4.3 Power Supply

Power on the cooling unit and it will automatically enter standby mode. For the sake of safety, the fans will not automatically rotate. After the display of the Delta trademark for three seconds, the LCD will enter the following status screen.



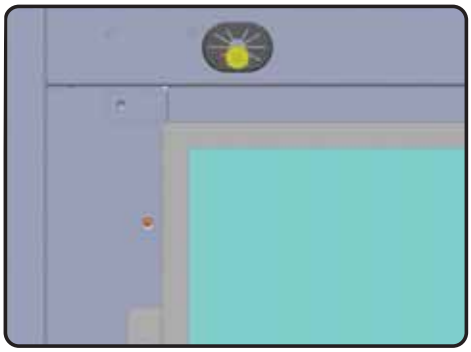
(Figure 4-1: LCD status screen)

To know each screen's meaning and how to operate the control panel, please refer to ***5.1 Control Panel Operation***.

4.4 Air Exhaust

You must carry out air exhaust procedures to get the air in the pipe naturally exhausted in accordance with the following procedures:

1. Start the system to get the chilled water to normally circulate in the chilled water pipe.
2. Twist open the cover of exhaust valve and then press the thimble to force the air out.
3. After 6~7 seconds, when the air is exhausted and water begins to be discharged from the pipe, turn off and lock the manual exhaust valve.



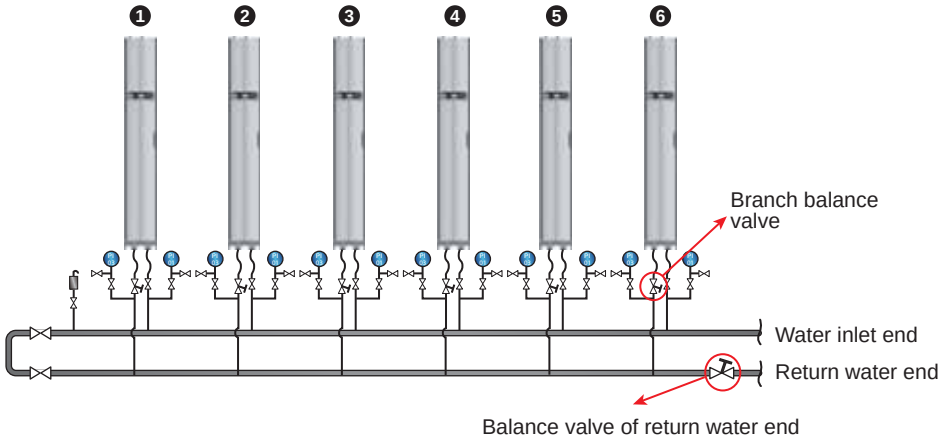
(Figure 4-2: Exhaust valve)

4.5 Water Leakage Detector

This cooling unit is provided with a water leakage detector at the cabinet bottom when delivered, which will be triggered to issue an alarm when in contact with water or liquid, reminding you to take proper measures. You must manually set the detector at the site for leakage detection, such as a low-lying place. If the lower piping is adopted, it is suggested to set it close to the pipeline below the raised floor.

Pass one end of the water leakage detector through the small hole at the lower part of the cabinet and set the detector at the above-mentioned place.

4.6 Water Balance



(Figure 4-3: Water balance)

The program adopts a compensation method and adjusts the flow rate with the first (most remote) cooling unit as a reference point. The process needs at least three people to work at the same time. It is suggested keeping communication by handheld walkie talkie. The number of the cooling units in a circuit varies and we take the six-unit configuration as an example. See the following procedures.

1. Set a balance valve at the return water end of the main pipe to adjust the total flow rate of the circuit.

2. Set all cooling units in the installation mode, and the two-way ball valves will automatically fully open (100%).

3. Fully open the balance valve of the return water end and the branch balance valves at all branches and record the flow rate of each unit.

4. Adjust the balance valve of the return water end to 110% of the rated total flow rate. If the balance valve cannot reach this value when fully opened, keep it at full opening, and adjust the flow rate of each branch proportionally.

5. Fully open the branch balance valve of Unit 1, adjust the balance valve of the return water end of the main pipe circuit to enable Unit 1 to reach its rated flow rate (±5%). Make sure once again its branch balance valve is kept fully open.

6. Adjust the branch balance valve of Unit 2 to get it to reach the rated flow rate. Another person will observe the flow rate change of Unit 1, dynamically adjust the balance valve of the return water end and make up water to enable Unit 1 to reach the rated flow rate (±5%). After adjustment, record the opening of the branch balance valve of Unit 2.

7. Adjust the branch balance valve of Unit 3 to get it to reach the rated flow rate. Another person will observe the flow rate change of Unit 1, dynamically adjust the branch balance valve of Unit 1 and complement water to enable Unit 1 to reach the rated flow rate (±5%). After adjustment, record the opening of the branch balance valve of Unit 3.

8. Repeat the procedures 6~7 to adjust Units 4~6 and record the opening of the branch balance valves.

9. When all units are adjusted, record the opening of the balance valve of the return water end and the total flow rate (rated flow rate ±10%).

10. If the circuit is unable to reach the rated value of the total flow rate after adjustment, please adjust the water flow of the chiller and water pump.

Chapter 5 : Operation

5.1 Control Panel Operation



The four buttons on the right of the control panel are used for operation and set-up:

No.	Button	Description
1	ESC	Goes back to previous menu or cancels current operation.
2	↵	Enters your selected menu or confirms your selection or setting.
3	▲	Goes back to previous screen, moves up or increases number.
4	▼	Goes to next screen, moves down or decreases number.

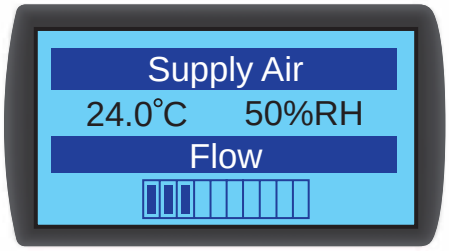
After entering a screen, if its options exceed four, you may press ▲▼ to turn the page. Press ↵, a highlighted zone appears and represents the current selected option, and press ▲▼ to move the highlighted zone.

To enter or change values (such as password or temperature), please use ▲▼. Press ↵ to skip to next field. In the last field, press ↵ to store and submit. Press **ESC** to cancel the current operation.

If it is kept in idle without operation, the display will automatically turn off and the backlight will go off.

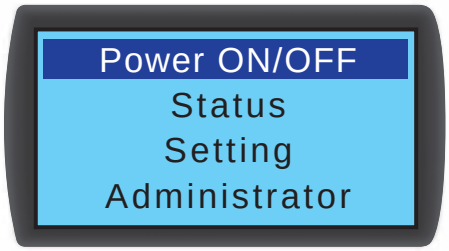
NOTE: The default language of control interface is English. The path for changing this setting is: **Main Menu→Setting→Local Setting→Language** Please set your preferred language.

5.2 Status Screen and Main Menu



The LCD display will go off when the unit is idle. Press ↵ to wake up the backlight and display the status screen. You may view the air supply status and the air flow percentage of the fans. The air flow percentage represents the fan speed and the more solid grids there are, the higher the fan speed.

Press ↵ on the status page to jump to the main menu:



- **Power ON/OFF**

  Start up the cooling unit (automatic mode) or enter the standby mode.

- **Status**

  View the system status, sensor readings, operation time and event records.

- **Setting** (user password is required)

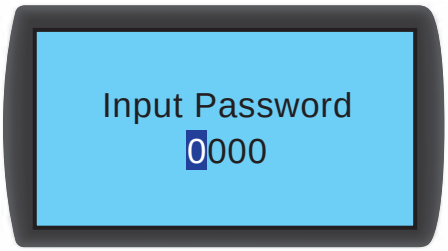
  Adjust the set point, local setting, controller setting and alarm setting.

- **Administrator** (administrator password is required)

  Enter the manual mode and view the firmware version and system setting.

5.3 Account Authority and Login

The cooling unit has two accounts. The **administrator** has the highest authority and can alter all settings while the **user** can only alter the system setting.



When you try to enter **Setting** or **Administrator** screen, a password prompt will occur. If no operation is performed for a long time after login, the login status will become invalid after the system becomes idle. If you want to re-enter the above menu, you must re-enter the password.

In the password prompt screen, entering the **admin password** means the entry of administrator and entering the **user password** represents the entry of general users. If you only enter **Power ON/OFF** or **Status** screen, no password is required.

The user's default password is **0000**.

NOTE: To avoid unauthorized change of and access to important settings, do not disclose the admin password. To get the admin password, contact service personnel.

5.4 Operation mode

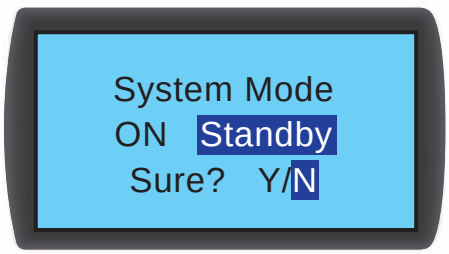
The cooling unit has five operation modes:

Operation mode	Description
Automatic mode	Path: **Main menu→Startup→Startup** To get the cooling unit to automatically control its cooling capacity, please select the automatic mode and the system will automatically micro-adjust the fan speed and the opening of the two-way ball valve in accordance with the set points. You may also simultaneously press ▲▼ for three seconds in any screen to quickly switch between the automatic mode and the standby mode. **NOTE:** In the manual mode, the simultaneous pressing of ▲▼ for 3 sec will not make the unit automatically enter the automatic mode or standby mode.

Operation mode	Description
Standby mode	Path: **Main Menu → Power ON/OFF → Standby** In standby mode, all fans are turned off, all ball valves are closed, and chilled water will flow through bypass pipe instead of coil pipe.
Manual mode	Path: **Main Menu→Administrator→Manual Mode** The manual mode is used to test if the components work normally or make the system operate in accordance with the manual setting. In this mode, you may manually set: Fan speed, ball valve opening, indicator on-off, backlight on-off, buzzer on-off, alarm dry contact on-off. In the manual mode, press **ESC** to automatically return to the standby mode.
Installation mode	Path: **Main Menu→Administrator→System→Installation** This mode is used to de-humidify and adjust the water balance. When it is started, the two-way ball valve will fully open and the fans will rotate at the minimum speed. When the system humidity falls within the operation scope, the **WARNING** indicator will flash and the buzzer will issue 0.5 sec short beeps continuously until you leave the installation mode.
Force mode	Path: **Main Menu→Setting→Controller** The two-way ball valve is fully open and the fans run at the highest speed. This mode is generally used for unit testing or emergency cooling request.

5.5 Shutdown

Path: **Main Menu → Power ON/OFF → Standby**



WARNING:

In the standby mode, the unit is still in power-on status! In the standby mode, you must disconnect the input power or two circuits of feeds (Feed A & Feed B) to get the unit to fully power-off.

To shut down the cooling unit, you must first enable the standby mode. After selecting the standby mode, select Y and press ↵ to confirm. If the **STANDBY** indicator is on, it means that it is currently in standby mode.

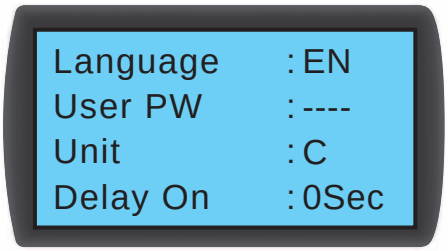
Next, disconnect the external power and make sure that the LCD display is off.

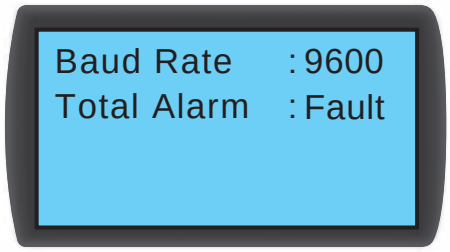
5.6 Setting of Cooling Unit

5.6.1 Local Setting

Path: **Main Menu→Setting→Local Setting**







- **System time**

  Use ▲▼ to set up the system time and press ↵ to skip to the next field and finally press ↵ to confirm.

- **ID (Number)**

  Represent the number of the cooling unit connected in series and also the ID in the Modbus protocol. The default number is **1**. If several cooling units are connected in series, you must designate each unit with a different number.

- **Contrast**

  Adjust the display screen contrast (0~5) and the default value is 2.

- **Buzzer**

  Set the buzzer on-off and issue an alarm beep to remind the user of an alarm event, if any. The default is **ON**.

- **Language**

  Set the display language. Select a language and press ↵ to confirm. The default is **English (EN)**.

- **User PW**

  To alter the current user's password, enter four digits.

- **Unit**

  Set the temperature unit and the default is **(°C)**.

- **Delay On**

  The time difference between setting the startup of automatic mode and the actual operation. The cooling unit will start up in the seconds you have designated.

- **Baud Rate**

  Please set the on-line speed based on the Modbus protocol. The options include **9600**, **19200**, **38400** and **57600**. The default value is **9600**.

- **Total Alarm**

  Decide what event can trigger the output dry contact 1. Please refer to the following descriptions:

  1. All: Any alarm and fault event can trigger it.
  2. Fault: Only fault events can trigger it.

Alarm events

1. Filters are clogged
2. Abnormal internal communication
3. High and low of air supply/return temperature and humidity
4. High and low chilled water inlet/outlet temperature
5. High and low of chilled water flow
6. High and low air volume
7. High and low of remote temperature and humidity
8. Exceeds maintenance time

Fault events

1. Emergency stop/remote emergency stop	8. Remote sensor failure
2. Overflow of condensed water	9. Abnormal chilled water inlet/outlet sensor
3. Leakage	10. Abnormal chilled water flow meter
4. Fire	11. Abnormal fan
5. Smoke	12. Abnormal three-way ball valve
6. Abnormal air supply/return temperature and humidity sensor	13. Abnormal heater
7. Abnormal input voltage/current/branch circuit	14. Abnormal humidifier

5.6.2 Set Point

Path: **Main Menu→Setting→Set Point**

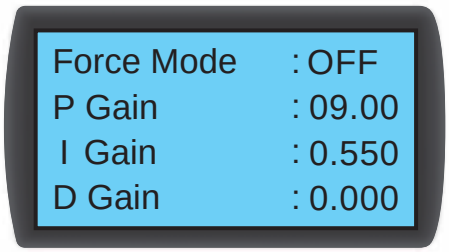


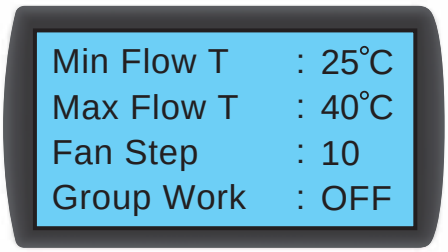
- **Supply Air T**

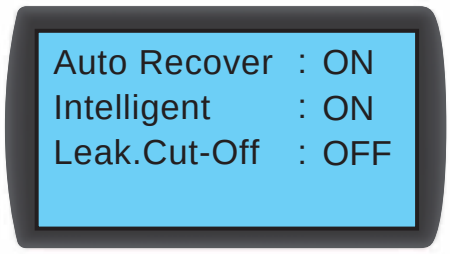
  In the automatic mode, the cooling unit will automatically adjust the fans and ball valve in accordance with this targeted supply air temperature.

5.6.3 Controller Setting

Path: **Main Menu→Setting→Controller**







- **Forced operation**

  When the force mode is enabled, the fans will run at full speed and the two-way ball valve will fully open, which is generally used for performance testing or at a high heat load. If the **STANDBY** indicator on the control panel flashes, the unit is in the force mode.

- **Min Flow T**

  When the return air temperature is lower than this value, the fans will run at the minimum speed to save energy and the default is **25°C**.

- **Max Flow T**

  When the return air temperature is higher than this value, the fans will run at the maximum speed to save energy and the default is **40°C**.

- **Fan Step**

  It is used to set the fan speed (range: 0~15) in the automatic mode. The default is **0** and the cooling unit will adjust the fan speed according to your setup.

- **Auto Recover**

  When this function is enabled and the system is in the automatic mode before power-off, at a restart, the unit will directly return to the automatic mode.

- **Intelligent**

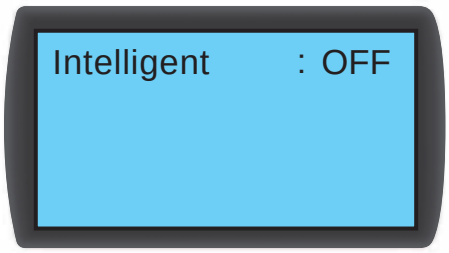
  Display if the intelligent temperature control is enabled. This option only displays the status. You cannot change the setting. For change of setting, refer to ***5.6.4 Setting of automatic control mode***.

- **Leak. Cut-Off**

  Set if the unit will stop when the water leakage detector detects any leakage so as to prevent leakage expansion.

5.6.4 Setting of automatic control mode

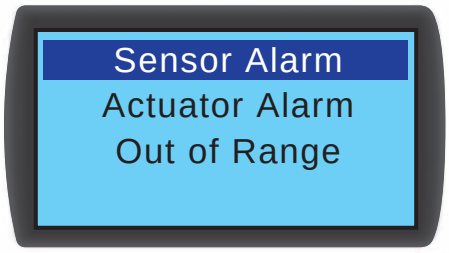
Path: **Main Menu→Administrator→System→Intelligent**



The system will automatically adjust the fans and the actuator in accordance with the set supply air temperature and humidity.

5.6.5 Alarm Setting

Path: **Main Menu→Setting→Set Alarm**

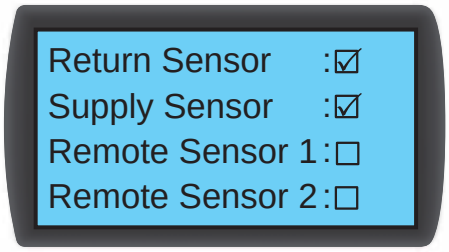


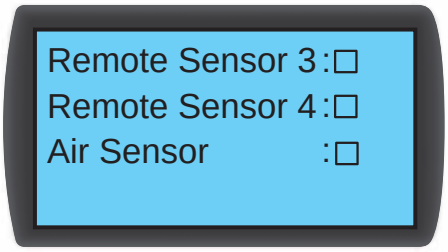
Set **Sensor Alarm**, **Actuator Alarm and Out of Range**. If an item display is □, this item is disabled. Press ↵ at this item, use ▲▼ to select ☑, press ↵ to confirm and the item is enabled.

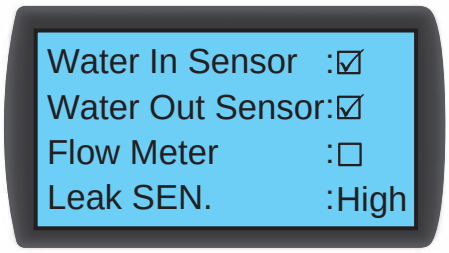
NOTE: When an alarm event occurs in the manual mode, the indicator and buzzer will not act but the event will be stored in the event log.

- **Sensor Alarm**

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



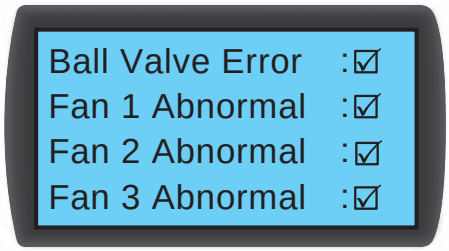


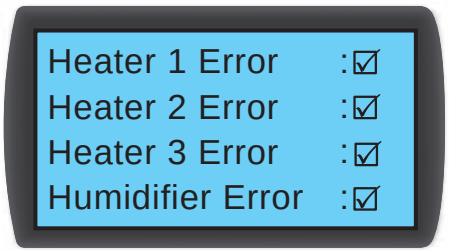


  Set the alarm on/off for **Return Sensor**, **Supply Sensor**, **Remote Sensor 1-4**, **Air Sensor**, **Water In/Out Sensor**, **Flow Meter** and **Leak SEN** (leakage detector sensitivity).

- **Sensor Alarm**

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

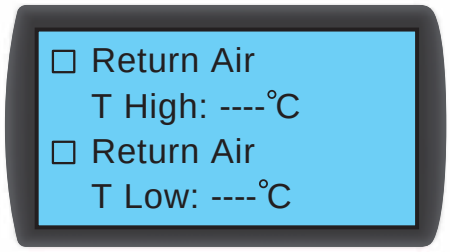


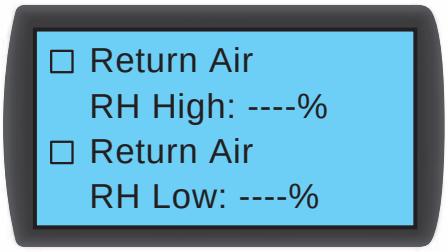


  Set the alarm on-off for **ball valve**, **fans 1-3**, **heaters 1-3** and **humidifier**.

- **Out-of-Range Alarm**

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

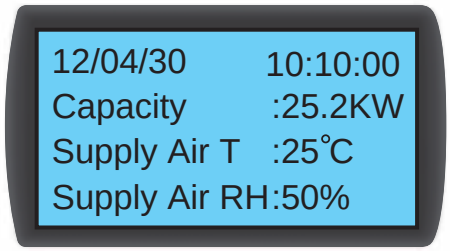


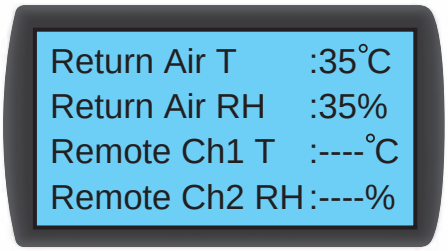


The screens above only show parts of items. For whole items, please refer to the cooling unit's actual operation.

5.6.6 Inquiry of system status

Path: **Main Menu → Status → System**



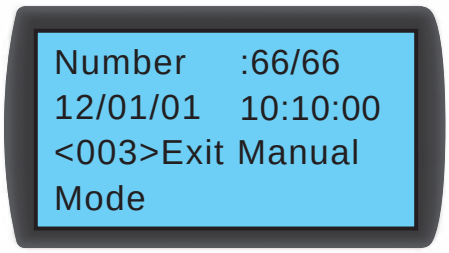




Inquire about the system related information, including **cooling capacity**, **supply air temperature and humidity**, **return air temperature and humidity**, **remote 1 temperature and humidity**, **remote 2 temperature**, **remote 3 temperature**, **air volume**, **chilled water inlet/outlet temperature**, **chilled water flow rate**, **ball valve opening**, **ball valve command** (set the ball-valve opening), **fan command** (set the fan speed), **heater command,** and **humidifier command**.

5.6.7 Inquiry/elimination of event log

Path: **Main Menu → Status → Event Log**



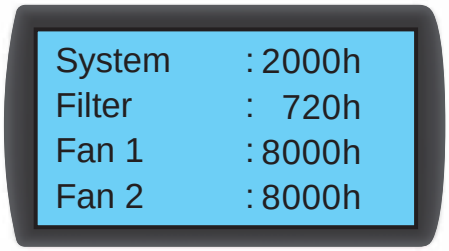
In this screen, the number of current events/total events is displayed and at most 3000 events can be recorded. Press ▲▼ to switch events. The events are numbered according to the occurrence time and the older the event, the smaller its number is. The digit in <> is the event code. If the records exceed 3000, older events will be over-written.

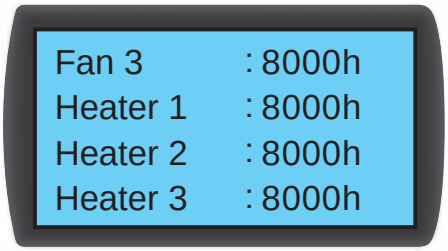
To clear any event log, the admin password is needed, and the route is **Main Menu→Administrator→System→Clear Log**.

NOTE: The event log is important information for evaluating the system status and also a reference for service personnel to perform maintenance. Therefore, do not clear the event log without authorization.

5.6.8 Inquiry/reset of running hours

Path: **Main Menu → Status → Run Hours**

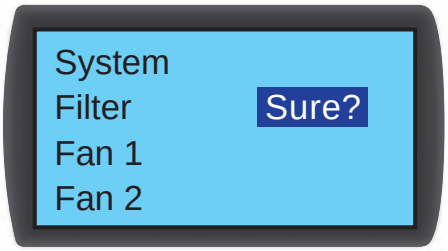






Inquire about the running hours of the system and components to assist you in evaluating the component status and judging the repair or replacement time.

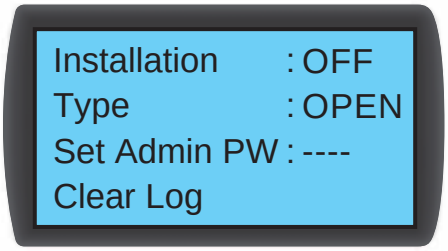
The route for re-setting each component's operation time is **Main Menu→Administrator→System→Reset Component**.



After a component is changed, reset the operation time of Filter, Fans 1-3, Heater 1-3, Humidifier or Ball Valve.

5.6.9 Change of system type

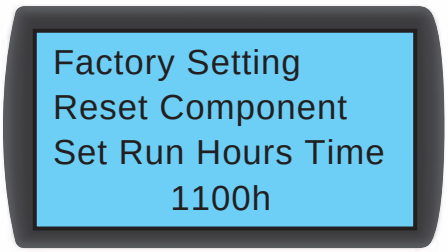
Path: **Main Menu→Administrator→System→Type**



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

5.6.10 Restore to Factory Setting

Path: **Main Menu→Administrator→System→Factory Setting**



Restore all factory defaults, including the set options and user and admin passwords.

WARNING:

The restoration of factory defaults will reset the settings or parameters that have been changed! The cooling unit has selected customized settings according to the different environments and random restoration may lead to system error. The restoration can be made only by qualified service personnel.

Chapter 6 : Maintenance and Cleaning

Periodic inspection and cleaning of the cooling unit can guarantee the equipment to operate at the best status.

The internal components such as fans and condensed water pan need periodic cleaning and inspection. This unit contains replaceable components and the cleaning and inspection of them can be done only by qualified service personnel.

6.1 Firmware Upgrade

For firmware upgrade, contact service personnel.

6.2 Storage

If you do not use this unit for long time and place it in storage, it is recommended that you wrap the unit using the original packing material and store it in a place with well controlled temperature and humidity (-15~65°C; 0~95% RH, non-condensing) and free of corrosion substance, accumulated dust and pollutants. Do not place the unit horizontally or deposit things in or on the cabinet.



NOTE: For information and method of maintenance and cleaning, contact your local dealer or customer service. Do not perform maintenance if you are not trained for it.

Chapter 7 : Troubleshooting

WARNING:

The following troubleshooting actions can only be carried out by qualified service personnel. Unauthorized action may lead to major danger or equipment damage.

System troubleshooting:

No.	Abnormal phenomenon	Possible cause	Elimination method
1	The fans cannot start.	The power supply is abnormal.	Make sure the input voltage is within the permissible range, the circuit breaker or switch is set at **ON**, and the cooling unit is correctly grounded.
		The fans are abnormal.	Make sure that each fan wiring is normal and change the abnormal fans if necessary.
2	The cooling unit cannot start.	The input voltage is abnormal.	1. Confirm that input voltage is within the tolerable range of rated value, and the breaker or switch is put in **ON** position and properly grounded. 2. If the voltage and the other things are normal, contact service personnel to see if the unit setting is wrong.
		The EPO is triggered.	The main switch or breaker's handle is at the middle position. Adjust the handle down to the **OFF** position and then lift it to the **ON** position and supply the power.
		The heater protector is triggered.	Use a multi-meter (short circuit is normal) to inspect if the over-temperature protector is triggered. If it is triggered, contact service personnel to carry out reset (the heater should be removed). After reset, confirm if the unit operates normally.
3	Forgot the password?	Forgot the user password or admin password?	Contact service personnel.

No.	Abnormal phenomenon	Possible cause	Elimination method
4	The operation noise is too high.	Foreign matter is attached to the fans or the fans' ball bearings are damaged.	Fans should be cleaned and inspected.
		The fan speed is too high.	Check if the unit runs in the force mode or if the fans are running at full speed. Adjust the set point or the fan speed accordingly.
		There is foreign matter or impurity in the pipeline.	Inspect the Y-type filter of the external piping and clean it if necessary.
5	LCD display is abnormal and does not display.	The wiring is wrong.	Inspect if the wiring of the control panel is correct or re-start the cooling unit if necessary.
6	The alarm condition is satisfied but the buzzer does not beep.	The buzzer alarm function is not enabled.	Use the control panel to enable the buzzer alarm function. Path: Main Menu→Setting→Local Setting.
7	The set point cannot be reached.	The fans are old or abnormal.	Inspect the fans and change abnormal ones if necessary.
		The sensor detection is abnormal.	Check each sensor.
		The PID parameters are wrong.	Please refer to ***4.7 Setting of PID***.
		The heat load exceeds the cooling capacity.	Reduce the heat load or increase cooling units.
		The filers are clogged.	Replace or clean the filters.
		The coil is blocked.	Carry out the coil washing procedures.
		The chilled water flow rate is insufficient or its temperature is too high.	Inspect the flow rate and temperature of the chiller (6~15 degrees are ideal).
		Error in control module	Repair or replace the control box.
		The actuator is abnormal.	Repair the actuator.
		The heaters are abnormal.	Inspect the heaters.
		The humidifier is abnormal.	Inspect if the humidifier is abnormal and replace it if necessary.

No.	Abnormal phenomenon	Possible cause	Elimination method
8	There is a water stain in the cabinet.	The humidity is too high.	Use an external de-humidifier to control the data center's humidity or enable the force mode to reduce the internal humidity of the data center.
		The inlet water temperature is too low.	Adjust the water supply temperature of the chiller (6-15 degrees are ideal).
		The fan speed is too low.	Adjust the fan speed.
		The humidifier output is abnormal.	Make sure of the electric connection of the humidifier.
		Drainage pump is abnormal	Confirm the functions of the drain pump are normal.
		The piping is abnormal.	Inspect if the chilled water pipeline and other pipelines are normal.
9	There is water leakage at the cabinet bottom.	The condensed water overflows.	Observe if the water level in the condensed water pan is too high, inspect the condensed water pump, and make sure the condensed water pipe (without bending, damage or blockage) is correctly connected and the draining is normal. If upper piping is adopted, the vertical lift shall not exceed five meters.
		The pipe system leaks.	Inspect and repair the leaking site.
		The cabinet is not on a leveled base.	Use the levelers to level the cabinet.
		The thermal insulating rubber layer of pipe is damaged.	Inspect and repair the damage site.
10	The EPO does not act.	The EPO wire goes off.	1. Inspect if the wiring is correct. 2. Contact service personnel to see if the EPO is set as Off (default: Off).
11	The signals of the remote sensors are abnormal.	The remote sensors are not correctly located.	Check the position of remote sensors.

No.	Abnormal phenomenon	Possible cause	Elimination method
12	The two-way ball valve has no response.	The actuator is not correctly connected.	Re-set the actuator.
13	It is unable to get on-line via the Modbus protocol.	The RS232 or RS485 connector is not correctly connected.	Re-connect the connector.
		The Baud rate setting is abnormal or the ID does not match.	Re-confirm the Baud rate and ID.

System alarm exclusion:

No.	Alarm Information	Possible cause	Elimination method
1	Filter clogged	The filters are clogged by foreign matter or are old.	Replace or clean the filters.
2	The condensed water overflows.	The condensed water pipe or condensed water pump is abnormal, or the piping exceeds the vertical lift	Remove the surplus water, inspect the condensed water pump and make sure the condensed water pipe (without bending, damage or blockage) is correctly connected and the draining is normal. If upper piping is adopted, make sure the vertical lift does not exceed five meters.
3	EPO Active	The EPO button on the control panel is pressed or emergency stop is triggered due to fire or smoke.	Eliminate the abnormality, reset the circuit breaker of the unit and re-start the unit to recover the normal operation.
		Emergency stop is triggered due to leakage	1. Eliminate the abnormality, make sure the water leakage detector is dry, reset the circuit breaker of the unit and re-start the unit to recover the normal operation. 2. If the water leakage detector cannot be dried in a short time, remove the detector first and reset the circuit breaker of the unit to recover the operation.

No.	Alarm Information	Possible cause	Elimination method
4	Leak Active	Leakage is detected. Remove the surplus water and inspect the water level of the condensed water pan.	Inspect if the drain function is normal and confirm that the condensed water pipe has no bending, damage or blockage. If the upper piping is adopted, please confirm that the vertical elevation is no greater than 5 meters.
5	Fire Active	Fire detection is triggered.	Inspect the environment and eliminate the abnormality.
6	Smoke Active	Smoke detection is triggered.	Inspect the environment and eliminate the abnormality.
7	Comm Abnormal	The CAN-Link port wiring is wrong or the unit ID is repeated.	Inspect the CAN-Link port wiring and confirm that the cooling units connected in series have independent and non-repeated IDs.
8	Return/Supply Sensor	The air return/supply sensor is abnormal or in bad contact.	Inspect the function of the air return/ supply sensor and confirm the wiring is stable.
9	Remote sensor # is abnormal	Remote sensor # is abnormal or in bad contact	Inspect the function of the sensor # and confirm the wiring is stable.
10	Abnormal chilled water inlet sensor	The chilled water inlet sensor is abnormal or in bad contact.	Inspect the function of the chilled water inlet sensor and confirm the wiring is stable.
11	Abnormal chilled water outlet sensor	The chilled water outlet sensor is abnormal or in bad contact.	Inspect the function of the chilled water outlet sensor and confirm the wiring is stable.
12	Flow Meter	The flow meter is abnormal or in bad contact.	Inspect the function of the flow meter and confirm the wiring is stable.
13	Fan number # failed	The # fan is abnormal or in bad contact.	Inspect if the # fan is blocked or abnormal and confirm the connection wire is correctly connected.
14	Chilled water ball valve is abnormal	The three-way ball valve is abnormal.	Inspect if the three-way ball valve is in bad contact or faulty.

No.	Alarm Information	Possible cause	Elimination method
15	Return/Supply T High	1. The environment temperature and humidity are abnormal. 2. Alarm setting is abnormal 3. Sensor is abnormal 4. The load is too large.	1. Inspect if the environment temperature and humidity are within the operation scope. 2. Inspect if the out-of-range alarm setting is correct. 3. Inspect the function of the sensor. 4. If the temperature is still too high after eliminating the above problems, please confirm the load does not exceed the cooling capacity of the cooling unit.
16	Return/Supply T Low		
17	Return/Supply RH High		
18	Return/Supply RH Low		
19	Remote # T High	1. The environment temperature and humidity are abnormal. 2. Alarm setting is abnormal 3. Remote sensor # is abnormal 4. The load is too large.	1. Inspect if the environment temperature and humidity are within the operation scope. 2. Check if the setting of out of range alarm is correct. 3. Check the function of sensor. 4. If the temperature is still too high after eliminating the above problems, please confirm the load does not exceed the cooling capacity of the cooling unit.
20	Remote # T Low		
21	Remote # RH High		
22	Remote # RH Low		
23	Water In T High	1. The temperature or flow rate of the chilled water supplied by the chiller is abnormal. 2. Alarm setting is abnormal	1. Inspect the temperature and flow rate of the chilled water. 2. Check if the setting of out of range alarm is correct.
24	Water In T Low		
25	Water Flow High		
26	Water Flow Low		
27	Run Over Hours	The periodic maintenance has not been performed.	To guarantee the normal operation of the system, carry out the maintenance immediately.

No.	Alarm Information	Possible cause	Elimination method
28	Humidifier	1. The humidifying water has a too high conductivity. 2. The humidifying water has a too low conductivity. 3. The humidifying inlet valve is abnormal. 4. The humidifying drain valve is abnormal. 5. The humidifying cylinder abnormal.	Inspect the humidifying cylinder.
29	Heater # Failed	1. The # heater connection is incorrect. 2. The re-heating protector is tripped.	1. Make sure the # heater connection is correct. 2. Make sure the fans run normally.
30	Leak Wire Open	Leakage detector wire is not properly connected	Check if the leakage detector is loosened or disconnected or in poor contact.

NOTE: If the alarm still exists after the above possible causes are eliminated, please contact your dealer or customer service.

Appendix 1 : Technical Specifications

Model	HCH1CD0	HCH1CH0	HCH1CS0
Phase/Frequency/Input Voltage	3Φ4W+G/50, 60 Hz 400V±10%	3Φ4W+G/50, 60 Hz 400V±10%	3Φ4W+G/50, 60 Hz 400V±10%
Max Power Consumption (Without/ With Heaters & Humidifier)	4.8/12.9 kW	6.8 kW	13.6 kW
Rated Cooling Capacity*	92.6 kW	120 kW	264 kW
Air Volume	8200 CFM	11900 CFM	23500 CFM
Rated Chilled Water Flow Rate	120 LPM	237 LPM	492 LPM
Pressure Drop	70 kPa	120 kPa	150 kPa
Rated Reheating Capacity	12.9 kW	–	–
Rated Humidifying Capacity (Water Conductivity Range)	3 kg/hr (75 ~1250 us/cm)	–	–
Control Accuracy	Temperature ±1°C ; Humidity ±10%		
Display	HMI： LCD 64*128 pixels with LED indicators		
Max. Return Air Temperature	40.6°C	42.7°C	
Max Inlet Water Temperature	15°C		
Water Inlet Pressure Range	1 MPa, general hard pipe		
Operating Temperature	4~ 40°C (30 ~ 85%RH, not condensed)		
Storage Temperature	-15 ~ 65°C (0 ~ 95%RH, not condensed)		
Water Inlet Pipe Diameter	1 1/ 4 inch/ PT/ Male	1 1/ 4 inch/ PF/ Male	2 inch/ PF/Male
Water Outlet Pipe Diameter	1 1/ 4 inch/ PT/ Male	1 1/ 4 inch/ PF/ Male	2 inch/ PF/Male
Drainage Pipe Diameter	3/4”inch		
Dimensions (Width x Depth x Height)	600 x 1090 x 2000mm	600 x 1090 x 2400mm	1200 x 1090 x 2400mm
Net Weight	415/ 422 kg	441 kg	838 kg

NOTE:

1. Refer to the rating label for the safety rating.
2. All specifications are subject to change without prior notice.

* Rated Cooling Capacity Determination Conditions

HCH1CD0: Return air temperature 40.6°C DB/ 21.6°C WB/temperature of inlet chilled water: 7°C/temperature of outlet chilled water: 18.6°C.

HCH1CH0: Return air temperature 42.7°C DB/ 21.6°C WB/temperature of inlet chilled water: 12°C/ temperature of outlet chilled water: 20°C.

HCH1CS0: Return air temperature 42.7°C DB/ 21.6°C WB/temperature of inlet chilled water: 12°C/ temperature of outlet chilled water: 20°C.

Appendix 2 : Periodic Inspection/Maintenance List

Monthly maintenance

Date: Model: By:

Environment inspection	
The cooling unit is installed in?	_____
Is it free of dust and surplus moisture?	☐Yes ☐No
Is the cabinet appearance perfect without damage?	☐Yes ☐No
Record the supply air temperature and humidity	_____ °C _____ %
Record the chilled water outlet temperature	_____ °C
Record the setting point of air outlet	_____ °C _____ %
Can the air conditioning device reach the setting point?	☐Yes ☐No
Internal inspection	
Is there any impurity or foreign matter in the condensed water pan or the drain pump water pan?	☐Yes ☐No
Do the filters function well?	☐Yes ☐Needs to be replaced or cleaned
Does the water in the condensed water pipe flow smoothly?	☐Yes ☐No
Do the fans act normally and rotate without interference?	☐Yes ☐No
Does the humidifier function normally?	☐Yes ☐No
Does the heater function normally?	☐Yes ☐No
Does the drainage pump function normally?	☐Yes ☐No
ⓘ **Be sure to disconnect the input power before making the following inspections.**	
Are the electronic joints stable and free of foreign matter?	☐Yes ☐No
Does the input power match the rated value of the cooling unit?	☐Yes ☐No
NOTE: Signature: _____	

Please copy this page for use during the inspection/maintenance procedures.

Quarterly maintenance

Date: Model: By:

Cleaning: Clean the following component. Air gun can be used if necessary.	
Filters (replace them if necessary)	☐Completed ☐Replaced
Front and rear doors and side panels	☐Completed
Condensed water pan	☐Completed
Condensed water pipe	☐Completed
! **Be sure to disconnect the input power before making the following inspections.**	
Coil	☐Completed
Fans	☐Completed
Humidifying cylinder	☐Completed ☐Replaced
Heaters	☐Completed
General inspections	
Is the water supplied by the chiller normal?	☐Yes ☐No
Does the alarm system operate normally?	☐Yes ☐No
Does the unit operate normally in all modes?	☐Yes ☐No

NOTE:

Signature: _____

Please copy this page for use during the inspection/maintenance procedures.

Appendix 3 : 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. 501326150101
Version : V 1.1
Release Date : 2026_11_04

Global Headquarter

Taiwan
Delta Electronics Inc.
30 Section 2, Huandong Road, Shanhua District,
Tainan City 74144, Taiwan
T +886 6 505 6565
E ups.taiwan@deltaww.com

Product Security Incident Response Team (PSIRT)
Delta Electronics, Inc.
No. 186, Ruey Kuang Road,
Neihu District Taipei City 114501, Taiwan
E Delta.PSIRT@deltaww.com



URL

Regional Office

Netherland
Delta Electronics (Netherlands) B.V.
Zandsteen 15, 2132 MZ Hoofddorp, The Netherlands
T +31 (0)20 800 3900
E info@delta-emea.com

Poland
Delta Electronics (Poland) Sp. z.o.o.
23 Poleczki St., 02-822 Warszawa, Poland
T +48 22 335 2600
E ups.poland@deltaww.com

Brazil
Delta Electronics Brasil Ltda.
Estrada Velha Rio-São Paulo, 5300 – Eugênio de Melo –
CEP 12247-001 São José dos Campos-SP-Brazil
T +55 12 39322300
E ups.brazil@deltaww.com

Peru
Delta Electronics (Peru) Inc. S.R.L.
Av. Pardo y Aliaga 699 Of. 601, San Isidro Lima, Peru.
T +51 962 834 287
E ups.peru@deltaww.com

China
Delta GreenTech (China) Co., Ltd.
238 Minxia Road, Pudong, Shanghai, 201209 P.R.C
T +86 21 5863 5678
+86 21 5863 9595
E ups.china@deltaww.com

South Korea
Delta Electronics (Korea), Inc.
1511, Byucksan Digital Valley 6-cha, Gasan-dong, Geumcheon-gu,
Seoul, Korea, 153-704
T +82-2-515-5303
E ups.south.korea@deltaww.com

Thailand
Delta Electronics (Thailand) Public Co.,Ltd.
909 Soi 9, Moo 4, E.P.Z., Bangpoo Industrial Estate,
Tambon Phraksa, Amphur Muang-samutprakarn,
Samutprakarn Province 10280, Thailand
T +662 709-2800
E ups.thailand@deltaww.com

Philippines
Eltek Power Inc./ Delta
302 Orient Square Bldg
F. Ortigas JR Road, Barangay
San Antonio, Pasig City
1605 Philippines
E ups.philippines@deltaww.com

Australia
Delta Electronics (Australia) Pty Ltd.
St Leonard's Corporate Centre
Unit 18/39 Herbert Street, St Leonards NSW 2065, Australia
T +61 2 9479 4200
E ups.australia@deltaww.com

UK
Delta Electronics (UK) Ltd.
Eltek House, Unit 1 Cleveland Road, Hemel Hempstead,
Hertfordshire, HP2 7EY, UK
T +44 1442 210805
E sales.gb@eltek.com

U.S.A
Delta Electronics (Americas) Ltd.
46101 Fremont Blvd. Fremont, CA 94538
T +1 510 668 5100
E ups.na@deltaww.com

Colombia
Delta Electronics Colombia SAS
Cra 72 # 95 – 51 Bodega 16, Parque Empresarial
Los Lagartos Bogota DC, Colombia
T +57 317 4052794
E ups.colombia@deltaww.com

India
Delta Electronics India Pvt. Ltd.
Plot No. 43, Sector-35, HSIIDC, Gurgaon-122001,
Haryana, India
T +91 124 4874 900
E ups.india@deltaww.com

Japan
Delta Electronics (Japan), Inc.
2-1-14 Shibadaimon, Minato-Ku, Tokyo, 105-0012,
Japan
T +81-3-5733-1111
E jpstps@deltaww.com

Singapore
Delta Electronics Int'l (Singapore) Pte Ltd.
17 Kallang Junction, #01-01, TRION,
Singapore 339274
T +65 6747 5155
E ups.singapore@deltaww.com

Vietnam
Delta Electronics (Vietnam) Co., Ltd.
6th floor Gems Empire Tower, No. 201 Truong Chinh street,
Phuong Liet Ward, Ha Noi City, Vietnam
T +84 974 766 198
E ups.vietnam@deltaww.com

Indonesia
Delta Electronics International (S) Pte Ltd.
Soho Capital, 30th Fl, Unit SC3009
Jl. Letjend S. Parman kav 28. Jakarta 11470 Indonesia
T + 65 9667 4687
E ups.indonesia@deltaww.com



Smarter. Greener. Together.

