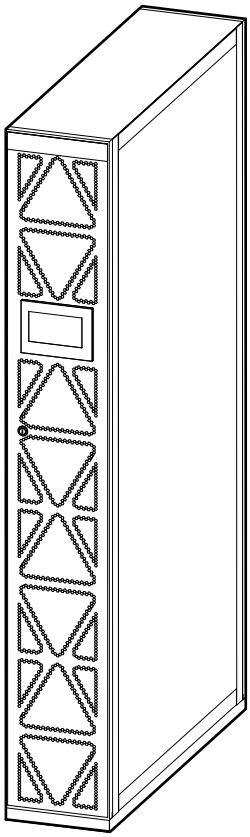
Easy Cooling Row Chilled Water

Operation and Maintenance

ERC301BS1CGS, ERC301BD1CPS, ERC301BD1HPS, ERC601DS1CGS, ERC601DD1CPS, ERC601DD1HPS

12/2019



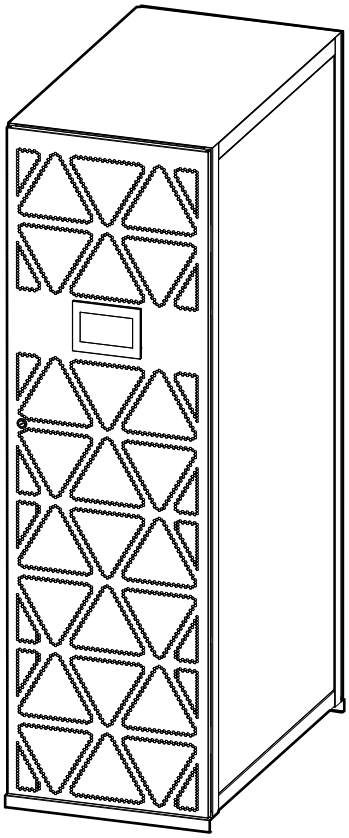


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Table of Contents

Important Safety Instructions — SAVE THESE INSTRUCTIONS

Read these instructions carefully and look at the equipment to become familiar with it before trying to install, operate, service or maintain it. The following safety messages may appear throughout this manual or on the equipment to warn of potential hazards or to call attention to information that clarifies or simplifies a procedure.

The addition of this symbol to a “Danger” or “Warning” safety message indicates that an electrical hazard exists which will result in personal injury if the instructions are not followed.

This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages with this symbol to avoid possible injury or death.

⚠DANGER

DANGER indicates a hazardous situation which, if not avoided, **will result in** death or serious injury.

Failure to follow these instructions will result in death or serious injury.

⚠WARNING

WARNING indicates a hazardous situation which, if not avoided, **could result in** death or serious injury.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

⚠CAUTION

CAUTION indicates a hazardous situation which, if not avoided, **could result in** minor or moderate injury.

Failure to follow these instructions can result in injury or equipment damage.

NOTICE

NOTICE is used to address practices not related to physical injury. The safety alert symbol shall not be used with this type of safety message.

Failure to follow these instructions can result in equipment damage.

Please Note

Electrical equipment should only be installed, operated, serviced, and maintained by qualified personnel. No responsibility is assumed by Schneider Electric for any consequences arising out of the use of this material.

A qualified person is one who has skills and knowledge related to the construction, installation, and operation of electrical equipment and has received safety training to recognize and avoid the hazards involved.

Safety Precautions

⚠⚠DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

- The cooling unit must be installed, operated, serviced, and maintained only by qualified personnel.
- Apply appropriate personal protective equipment (PPE) and follow safe electrical work practices.
- Turn off all power supplying the cooling unit before working on the cooling unit.
- All electrical work must be performed by licensed electricians.
- Follow lockout/tagout procedures.
- Remove watches, rings, and other metal object before working on the cooling unit.

Failure to follow these instructions will result in death or serious injury.

⚠WARNING

MOVING PARTS

- Keep hands and clothing away from moving parts. Check the cooling unit for foreign objects before closing the doors and starting up the cooling unit.
- Do not remove rear panels during operation.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

⚠WARNING

TIP HAZARD

- Two persons are required for any movement of the cooling unit.
- Always push, pull, or turn while facing the front and rear of this equipment.
- Slowly move this equipment across uneven surfaces or door thresholds.
- Lower the leveling feet when the equipment is at rest.
- Lower the leveling feet and attach the joining brackets to adjacent racks when the equipment is in its final position.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

Product Overview

The Easy Cooling Row Chilled Water cooling unit can provide a cooling capacity of up to 30 kW based on a half-rack platform of 300 mm, whereas a full-rack of 600 mm can provide a cooling capacity of up to 60 kW. An actuator works with the fans and a fin-tube exchanger to provide the best cooling efficiency.

This modular, row-based computer room cooling unit offers efficient, predictable, and value for money cooling. Critical environmental requirements reach far beyond the confines of the traditional data center or computer room to encompass a larger suite of applications, referred to as technology rooms.

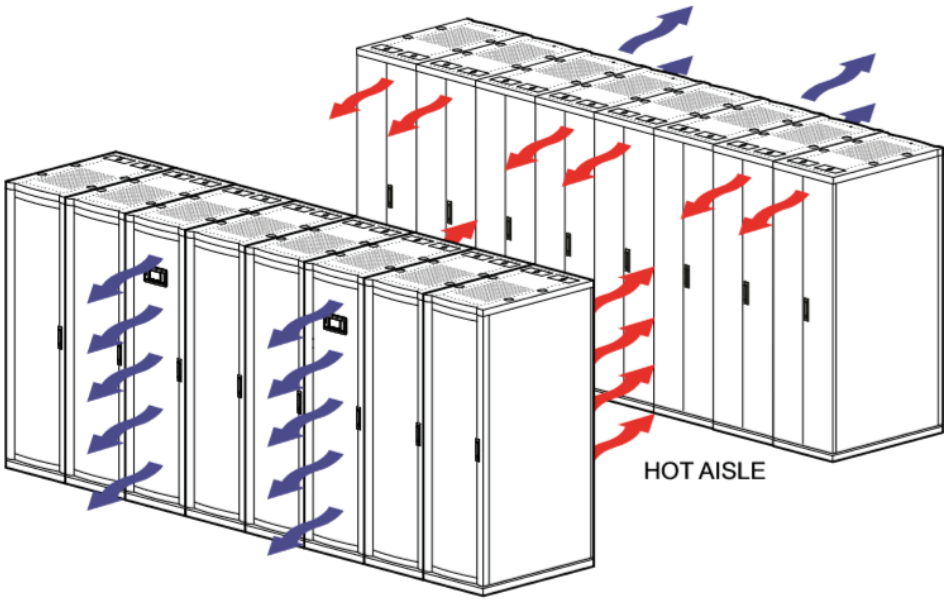
Critical environment applications include the following:

- Computer rooms
- Telecommunication facilities
- Clean rooms
- Power equipment
- Medical equipment rooms
- LAN/WAN environments

Benefits

The row-based solution improves energy efficiency and cooling ability in a number of ways.

- The cooling unit draws air directly from the hot aisle, allowing it to take advantage of higher heat transfer efficiency due to higher temperature differences.
- The cooling unit can discharge room-temperature air directly in front of the servers it is cooling.
- Placing the cooling unit in the row enables the unit to operate at higher return and supply air temperatures, yielding 100% sensible capacity. This significantly reduces the need for humidification.



Commissioning

Inspection Checklists

Initial Inspection Checklist

⚠⚠WARNING

UNEXPECTED EQUIPMENT OPERATION

Do not route service equipment in front of the fans.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

The initial inspection helps to ensure that the cooling unit has been properly installed, the location of the cooling unit has been properly prepared, and the cooling unit is free of damage.

NOTE: The vapor barrier minimizes the moisture in filtration. Without a vapor barrier, it is difficult to maintain the humidity in the room. Do not introduce unconditioned outside air into the space.

Make sure that the following checkpoints are adhered to:

- The installation procedure is completed according to the requirements of the installation manual and the local codes.
- The walls, floor, and ceiling of the room, where the cooling unit is located, are sealed with a vapor barrier.
- There is no damage to the cooling unit.
- The clearance around the cooling unit is in accordance with CE, local, and national codes as well as the installation manual.
- The cooling unit is leveled and interconnected with adjacent racks.
- The cooling unit is not installed at the open end of a row.

Electrical Inspection Checklist

⚠⚠DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

- Apply appropriate personal protective equipment (PPE) and follow safe electrical work practices.
- All electrical work must be performed by licensed electricians.
- Turn off all power supplying this cooling unit before working on the cooling unit.
- Install all devices, doors, and covers before turning on power to this cooling unit.

Failure to follow these instructions will result in death or serious injury.

⚠⚠WARNING

ELECTRICAL HAZARD

- Electrical service must conform to local and national electrical codes and regulations.
- The cooling unit must be grounded.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

The electrical inspection verifies that all electrical connections are correct and that the cooling unit is properly grounded.

Make sure that the following checkpoints are adhered to:

- Incoming voltages match the phase and voltage rating on the nameplate.
- Electrical wiring complies with local and national codes and regulations.
- The cooling unit is properly earthed.
- Front and rear doors are properly grounded.
- Internal electrical components and terminal blocks do not have any loose connections.
- Electrical connections are tight, including contactors, terminal blocks, controllers, switches, relays, auxiliary devices, and field connections.
- The input and bypass (if applicable) sources are properly connected.
- The circuit breakers are suitable and properly attached to the DIN rail.
- The rack temperature sensors are installed correctly for the cooling unit.
- The optional rope water detection device is installed correctly.
- The temperature and humidity sensors are connected correctly.

Mechanical Inspection Checklist

⚠CAUTION

PERSONAL INJURY AND EQUIPMENT DAMAGE

- The cooling unit is shipped with a nitrogen holding charge. Remove the nitrogen holding charge using the service ports located on the internal refrigerant piping.
- Improperly installed piping may result in improper operation and possible damage to the cooling unit or surrounding equipment.

Failure to follow these instructions can result in injury or equipment damage.

The mechanical inspection verifies that all mechanical components and connections are tight and ready for start-up. The inspection helps to ensure that the field piping is installed correctly.

Make sure that the following checkpoints are adhered to:

- The condensate drain line is the size of the drain connection and has proper slope away from the cooling unit.
- The mechanical connections are tight, including the refrigerant piping and the condensate drain line.
- Vertical, horizontal, and total lengths are recorded for liquid and gas lines.
- Field-installed trap sand piping are in accordance with the installation manual and follow proper piping practices.
- The number of 45- and 90-degree bends in the refrigerant piping are recorded.
- The room conditions comply with the operating guidelines. Covers and guards are in place.
- Piping is adequately supported and isolated where necessary.
- Piping in the building and on the roof is insulated adequately.
- Piping has been leak tested.

Display Interface Inspection Checklist

The display interface inspection verifies that the sensor and internal communication links are installed correctly.

Make sure that the following checkpoints are adhered to:

- The cooling unit is connected to the other cooling units in the room if cooling group controls are used.
- The input contacts and output relays are connected correctly.
- The building management system is connected correctly and a terminator is wired into the final cooling unit correctly.
- The network port is connected correctly and a communication address has been assigned to the cooling unit.

Start-Up Inspection Checklist

The start-up inspection helps to ensure that the equipment is operating correctly after the initial start-up. This inspection verifies that all modes of operation are working correctly and that the cooling unit is ready for normal operation.

While the cooling unit is operating, make sure that the following checkpoints are adhered to:

- The cooling unit is free from malfunctions, including water leaks, unusual vibrations, or other irregularities in each mode of operation.
- The cooling unit has the proper refrigerant charge for year-round operation.
- The air filters are clean and free of debris. Replace air filters if necessary.
- If applicable, air balance is done to verify that the fans are set to the desired fan speed.
- The temperature and humidity sensors are working correctly.

User Interface Checklist

User interface checks are done to verify that the cooling unit sensors and the interior communication connections are in good working condition.

Verify that:

- RS485 communication connections between all the cooling units are correct.
- The input contact and the output relay connections are correct.
- The building management system connections are correct. If **Remote communication control** function is displayed on the screen, select **MODBUS**. The baud rate is 9600.
- In group control function, the group mode of each cooling unit is set to **Group Control**, and the IP address does not conflict.

Final Inspection Checklist

The final inspection verifies that the system is clean, the installed options work correctly, and the start-up form is sent to Schneider Electric.

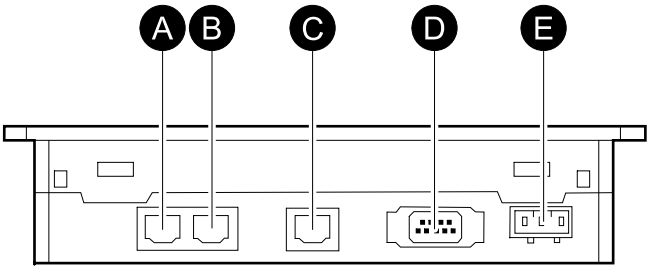
Make sure that the following checkpoints are adhered to:

- Interior and exterior of the cooling unit are clean and free from debris and loose hardware.
- Internal protective covers and hardware are installed.
- Packaging materials are disposed off correctly.
- There are no active alarms.
- The user is trained to use the user display and is able to view active alarms and status readings.
- The user is given the technical support contact number that is applicable for their region.
- The user is given the unit documentation.
- Start-up form is filled in and sent to Schneider Electric.

Display Interface

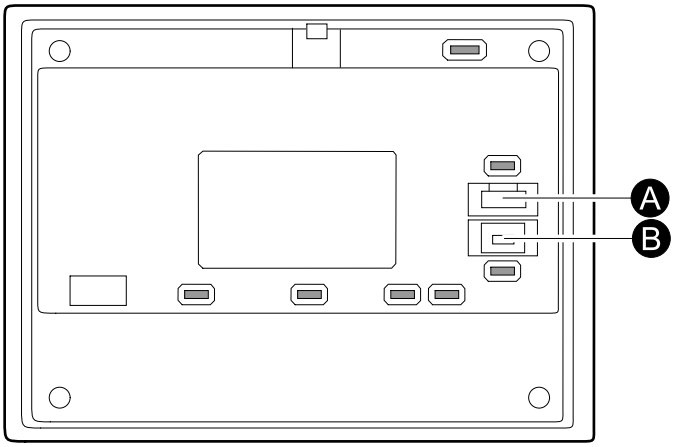
The display interface is designed for computer room application.

Bottom View of the Display



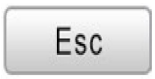
A. Ethernet interface 2
B. Ethernet interface 1
C. COM2 serial interface
D. COM1 serial interface
E. Power

Rear View of the Display



A. USB (A) port
B. USB (micro-B) port

Display Symbols	Function	Description
	Home	Tap this symbol to go to main menu or exit current page and go back to overview screen.
	Alarm indication	• The symbol is green when the cooling unit works in normal state. • The symbol is red and keeps on flashing when the alarm has been triggered.
11/21/2019 23:36	Date & time: Month/day/year, time	Tap this symbol to change the date and time. **NOTE:** A pop-up window appears on the screen.
< >	Back/Forward	Tap this symbol to go to the previous/next page.

Display Symbols	Function	Description
	First/Last	Tap this symbol to turn to the first page or last page.
	Confirmation	Tap this symbol to confirm selection or display value.
	Exit	Tap this symbol to exit without accepting the parameter changes.

Communication Ports

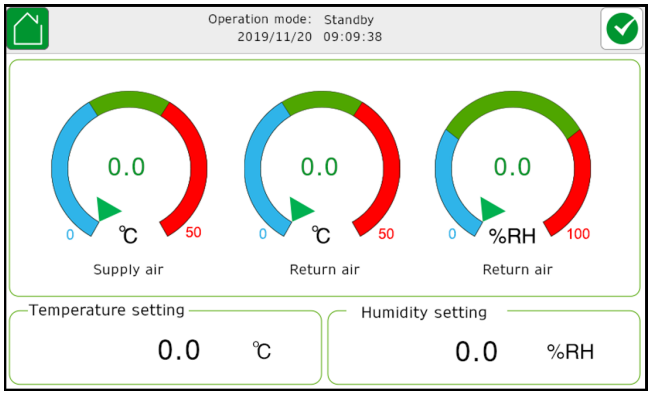
Label	Parameter	Description	Connection
COM1 , COM2	Main control board communication port	Main control board communication	RS-485 RS-232C
USB	Data interface	Software upgrade	USB

Using the Display

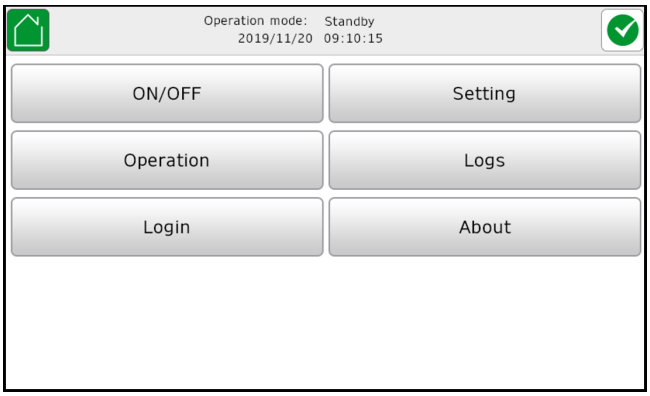
When power is applied to the cooling unit, the control system initializes and the display starts up.

Overview Screen

After start-up, the display shows an overview screen containing basic status information. Tap  to go to the main menu screen. After a period of inactivity, the display reverts to the overview screen.



Main Menu Screen



The  is displayed on all pages at the left-top corner. Tap  to go to the main menu screen. Tap  to review alarm information.

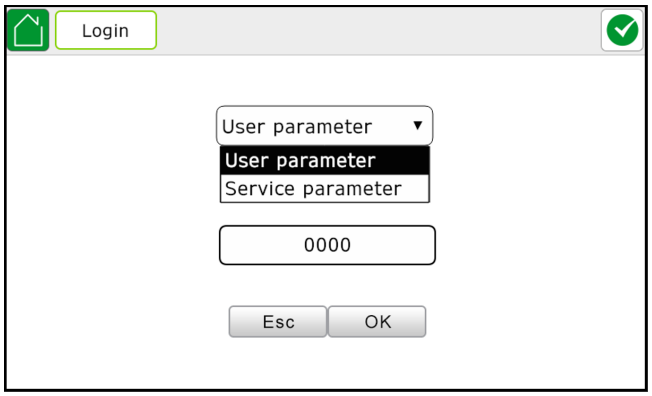
NOTE:  symbol changes based on the status of the cooling unit.

Logging In/Password Entry

The display requires PIN verification before settings can be changed. There are two PIN codes for user and service login.

Log In as a User

1. From the home screen of the display, select **Main > Login**.



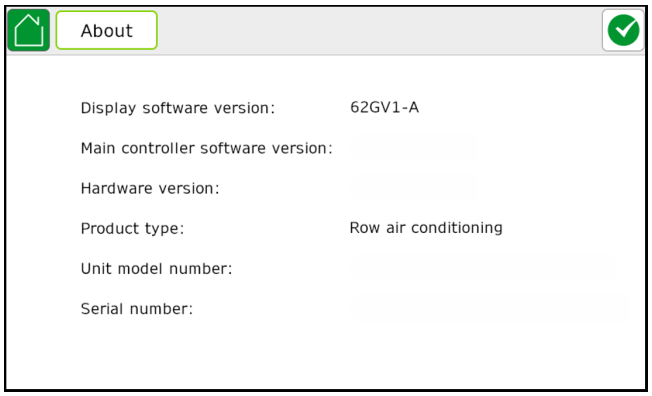
2. Select **User parameter**.
3. Tap on the PIN.
   A pop-up window appears on the screen.
4. Enter the PIN and tap **OK** to confirm.

Log In as a Field Service Representative

1. From the home screen of the display, select **Main > Login**.
2. Select **Service parameter**.
3. Tap on the PIN.
   A pop-up window appears on the screen.
4. Enter the PIN and tap **OK** to confirm.

About

From the home screen of the display, select **Main > About**.



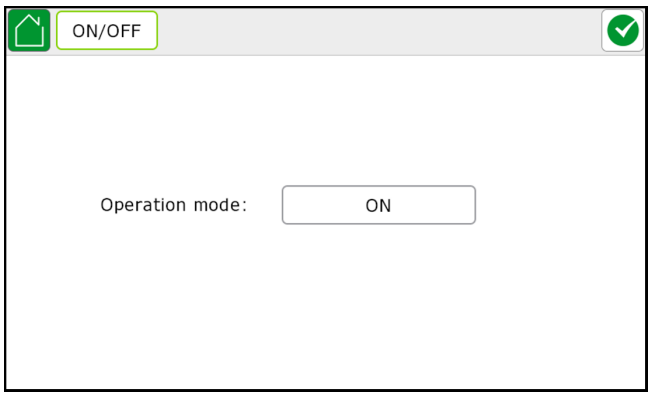
In the **About** page, information about the model and software version of the cooling unit is available.

NOTE: The above image is a typical sample. The actual cooling unit may show different information.

Operation Procedures

Start Up the Cooling Unit

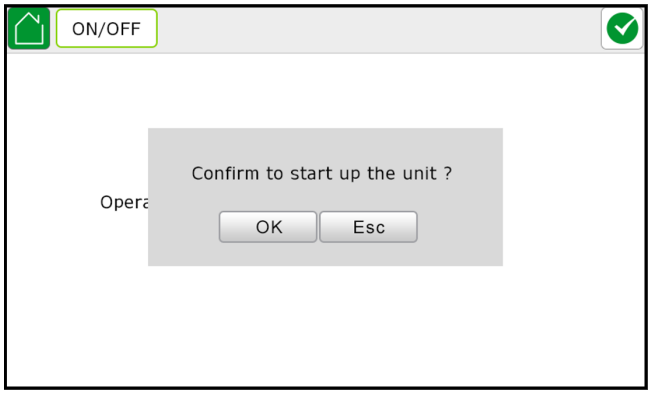
1. From the home screen of the display, select **Main > ON/OFF**.



2. Tap **ON**.

   A pop-up window appears on the screen.

3. Tap **OK** to confirm start up of the cooling unit.



Shut Down the Cooling Unit

⚠DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

The Off option does not completely remove power from the cooling unit. Disconnect the input and bypass (if available) sources to completely remove power from the cooling unit.

Failure to follow these instructions will result in death or serious injury.

1. From the home screen of the display, select **Main > ON/OFF**
2. Tap **OFF**.

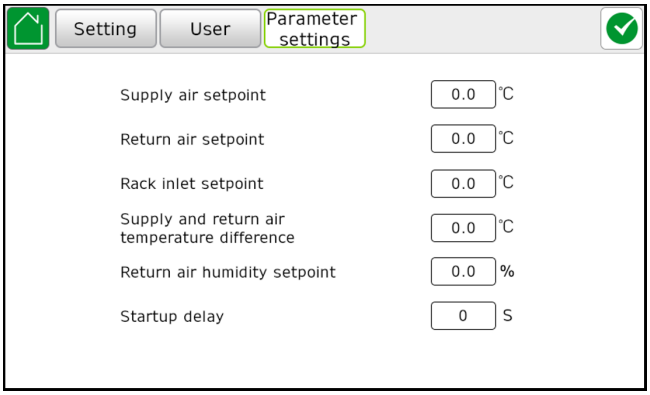
   A pop-up window appears on the screen.

3. Tap **OK** to confirm power off of the cooling unit.

Configure the Cooling Unit

Configure the Parameter Settings

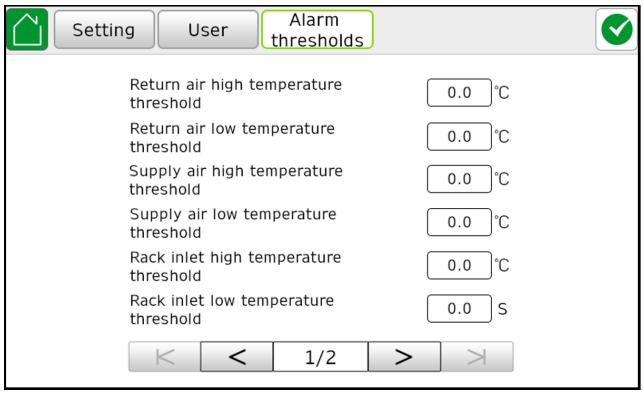
1. From the home screen of the display, select **Main > Setting > User > Parameter settings**.

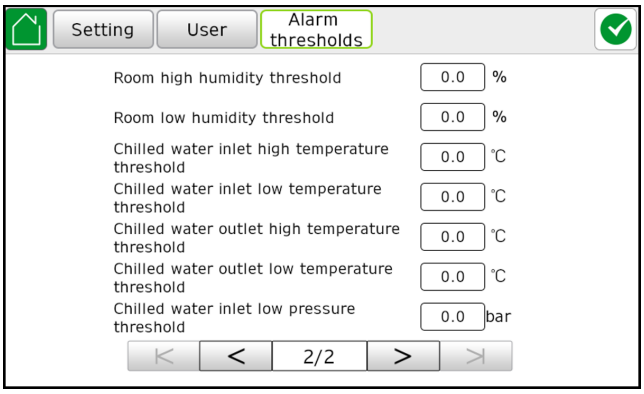


2. Set the **Supply air setpoint**. Choose a value between 5 and 50 °C and tap **OK** to save the settings. The default value is 22 °C.
3. Set the **Return air setpoint**. Choose a value between 5 and 50 °C and tap **OK** to save the settings. The default value is 35 °C.
4. Set the **Rack inlet setpoint**. Choose a value between 5 and 50 °C and tap **OK** to save the settings. The default value is 22 °C.
5. Set the **Supply and return air temperature difference**. Choose a value between 0 and 25 °C and tap **OK** to save the settings. The default value is 13 °C.
6. Set the **Return air humidity setpoint**. Choose a value between 10 and 95% and tap **OK** to save the settings. The default value is 25%.
7. Set the **Startup delay**. Choose a value between 0 and 240 seconds and tap **OK** to save the settings. The default value is 2.

Configure the Alarm Settings

1. From the home screen of the display, select **Main > Setting > User > Alarm thresholds**.



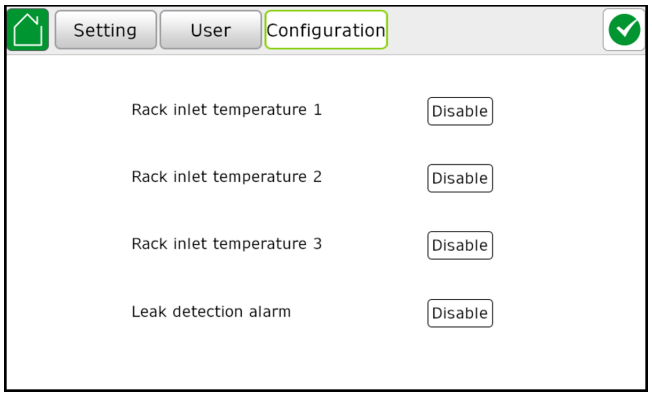


2. Set the **Return air high temperature threshold**. Choose a value between 10 and 50 °C and tap **OK** to save the settings.

3. Set the **Return air low temperature threshold**. Choose a value between 0 and 40 ℃ and tap **OK** to save the settings.
4. Set the **Supply air high temperature threshold**. Choose a value between 1 and 35 ℃ and tap **OK** to save the settings.
5. Set the **Supply air low temperature threshold**. Choose a value between 1 and 30 ℃ and tap **OK** to save the settings.
6. Set the **Rack inlet high temperature threshold**. Choose a value between 1 and 35 ℃ and tap **OK** to save the settings.
7. Set the **Rack inlet low temperature threshold**. Choose a value between 1 and 30 ℃ and tap **OK** to save the settings.
8. Set the **Room high humidity threshold**. Choose a value between 10 and 95% and tap **OK** to save the settings.
9. Set the **Room low humidity threshold**. Choose a value between 10 and 95% and tap **OK** to save the settings.
10. Set the **Chilled water inlet high temperature threshold**. Choose a value between 0 and 30 ℃ and tap **OK** to save the settings.
11. Set the **Chilled water inlet low temperature threshold**. Choose a value between 0 and 30 ℃ and tap **OK** to save the settings.
12. Set the **Chilled water outlet high temperature threshold**. Choose a value between 0 and 30 ℃ and tap **OK** to save the settings.
13. Set the **Chilled water outlet low temperature threshold**. Choose a value between 0 and 30 ℃ and tap **OK** to save the settings.
14. Set the **Chilled water inlet low pressure threshold**. Choose a value between 0 and 5 bar and tap **OK** to save the settings.

Set the Configuration Settings

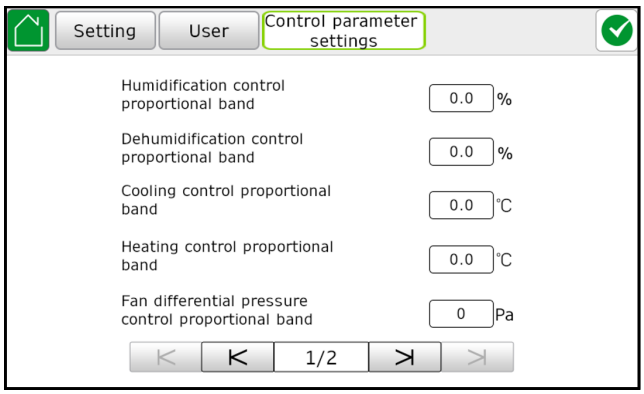
1. From the home screen of the display, select **Main > Setting > User > Configuration**.

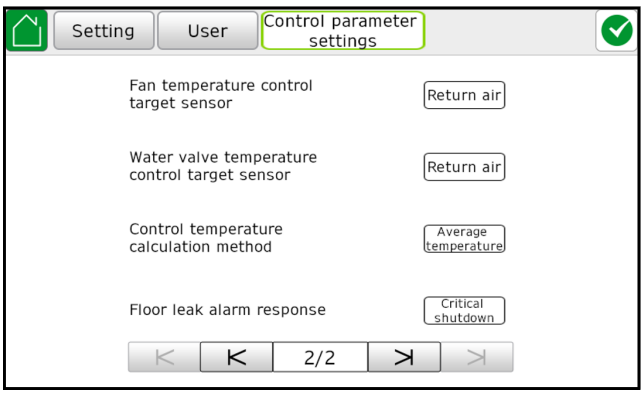


2. Set the **Rack inlet temperature 1** to **Enable** or **Disable** as per the requirement and tap **OK** to save the settings.
3. Set the **Rack inlet temperature 2** to **Enable** or **Disable** as per the requirement and tap **OK** to save the settings.
4. Set the **Rack inlet temperature 3** to **Enable** or **Disable** as per the requirement and tap **OK** to save the settings.
5. Set the **Leak detection alarm** to **Enable** or **Disable** as per the requirement and tap **OK** to save the settings.

Configure the Control Parameter Settings

1. From the home screen of the display, select **Main > Setting > User > Control parameter settings**.

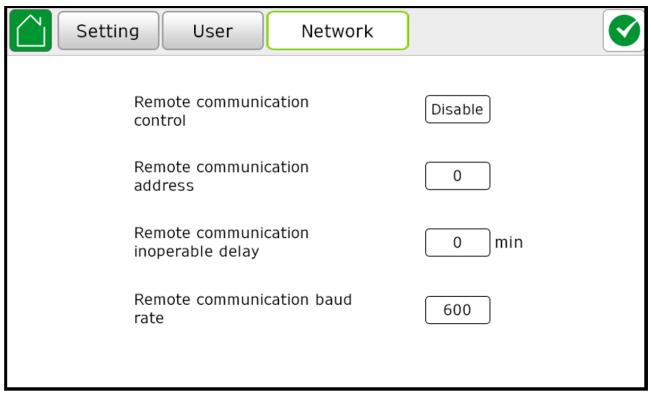




2. Set the **Humidification control proportional band**. Choose a value between 0 and 100% and tap **OK** to save the settings.
3. Set the **Dehumidification control proportional band**. Choose a value between 0 and 100% and tap **OK** to save the settings.
4. Set the **Cooling control proportional band**. Choose a value between 0.5 and 10 °C and tap **OK** to save the settings.
5. Set the **Heating control proportional band**. Choose a value between 1 and 10 °C and tap **OK** to save the settings.
6. Set the **Fan differential pressure control proportional band**. Choose a value between 1 and 30 Pa and tap **OK** to save the settings.
7. Set the **Fan temperature control target sensor**. Choose one of the following options and tap **OK** to save the settings:
   - **Return air**
   - **Rack inlet air control (Tmax)**
   - **Supply air control**
   - **Supply air and return air delta T control**
8. Set the **Water valve temperature control target sensor**. Choose one of the following options and tap **OK** to save the settings:
   - **Return air**
   - **Rack inlet air control (Tmax)**
   - **Supply air control**
   - **Supply air and return air delta T control**
9. Set the **Control temperature calculation method**. Choose **Average temperature** or **Max temp.** and tap **OK** to save the settings.
10. Set the **Floor leak alarm response**. Choose **Critical shutdown** or **Only alarm** and tap **OK** to save the settings.

Configure the Network Settings

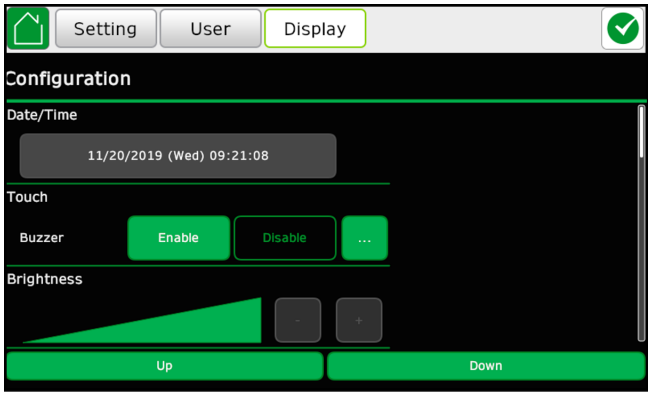
1. From the home screen of the display, select **Main > Setting > User > Network**.



2. Set the **Remote communication control** option. Choose one of the following options and tap **OK** to save the settings:
   - **Disable**
   - **Modbus**
   - **YDT**
3. Set the **Remote communication address**. Choose a value between 1 and 240 and tap **OK** to save the settings.
4. Set the **Remote communication inoperable delay**. Choose a value between 0 and 10 min and tap **OK** to save the settings.
5. Set the **Remote communication baud rate**. Choose a value between 0 and 5 and tap **OK** to save the settings.

Configure the Display Settings

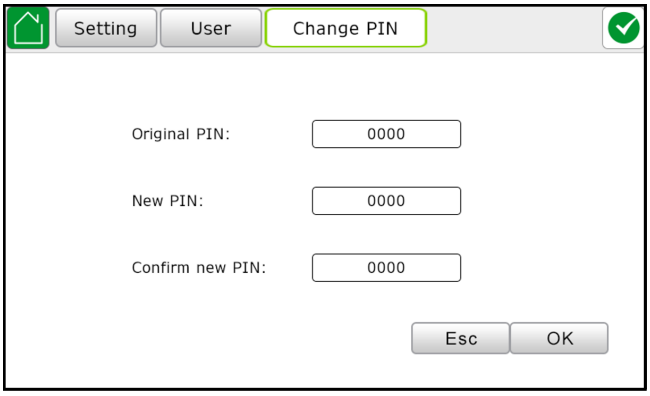
1. From the home screen of the display, select **Main > Setting > User > Display**.



2. Tap on the **Date/Time** button and set the time.
3. Set the **Buzzer** to **Enable** or **Disable** (default is **Enable**).
4. Tap the + and - buttons to set the brightness of the display.

Change the PIN

1. From the home screen of the display, select **Main > Setting > User > Change PIN**.

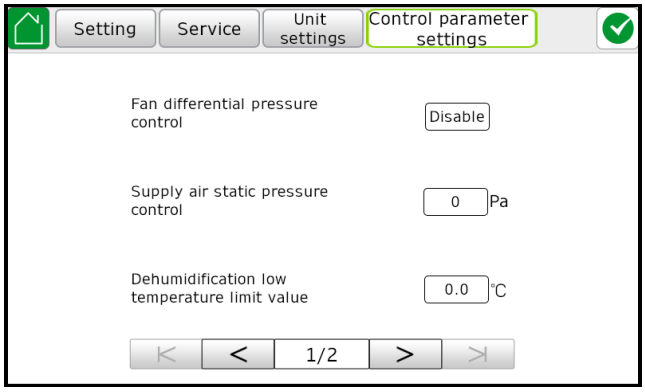


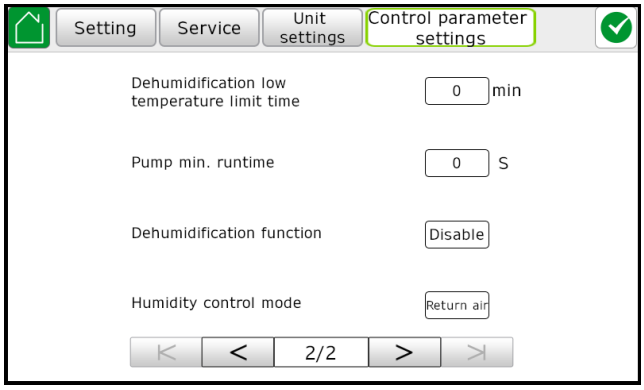
2. Type in the **Original PIN**.
3. Type in the **New PIN**.
4. Confirm the new PIN.
5. Tap **OK** to save the settings.

Configure the Service Settings

Configure the Control Parameter Settings

1. From the home screen of the display, select **Main > Configuration > Service > Unit settings > Control parameter settings**.

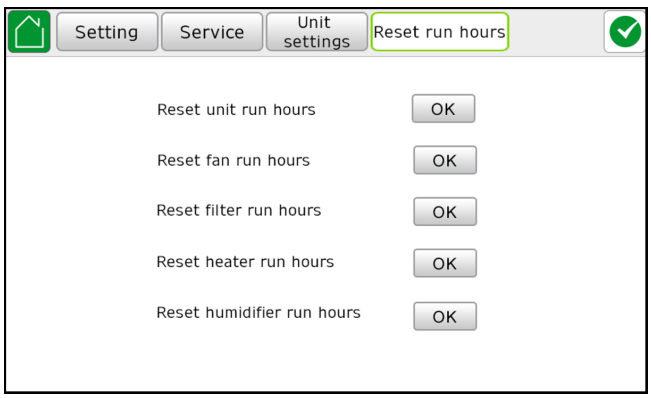




2. Set the **Fan differential pressure control** to **Enable** or **Disable** and tap **OK** to save the settings.
3. Set the **Supply air static pressure control**. Choose a value between 50 and 500 Pa and tap **OK** to save the settings.
4. Set the **Dehumidification low temperature limit value**. Choose a value between 2 and 10 °C and tap **OK** to save the settings.
5. Set the **Dehumidification low temperature limit time**. Choose a value between 0 and 60 minutes and tap **OK** to save the settings.
6. Set the **Pump min. runtime**. Choose a value between 1 and 999 minutes and tap **OK** to save the settings.
7. Set the **Dehumidification function** to **Enable** or **Disable** and tap **OK** to save the settings.
8. Set the **Humidity control mode** as **Return Air** and tap **OK** to save the settings.

Reset the Run Hours

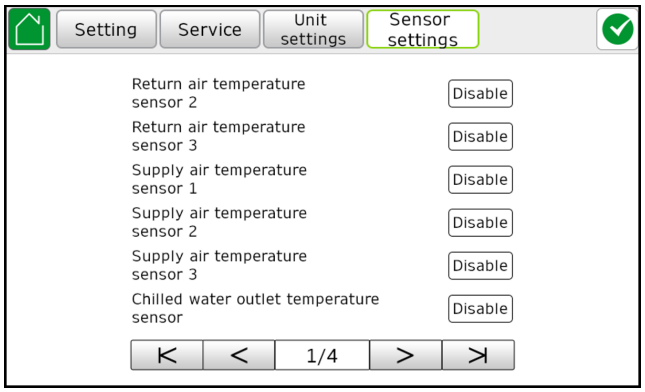
1. From the home screen of the display, select **Main > Setting > Service > Unit settings > Reset run hours**.

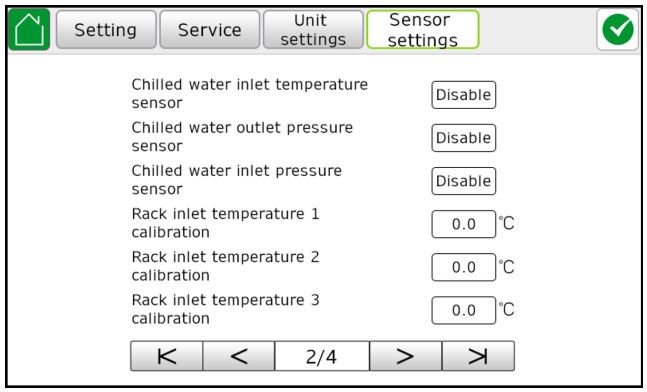


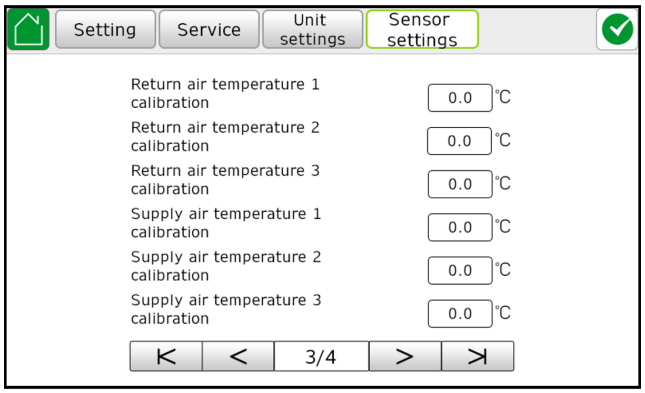
2. Tap **OK** for each part below to reset the run hours.
   a. Reset the unit run hours.
   b. Reset the fan run hours.
   c. Reset the filter run hours.
   d. Reset the heater run hours.
   e. Reset the humidifier run hours.

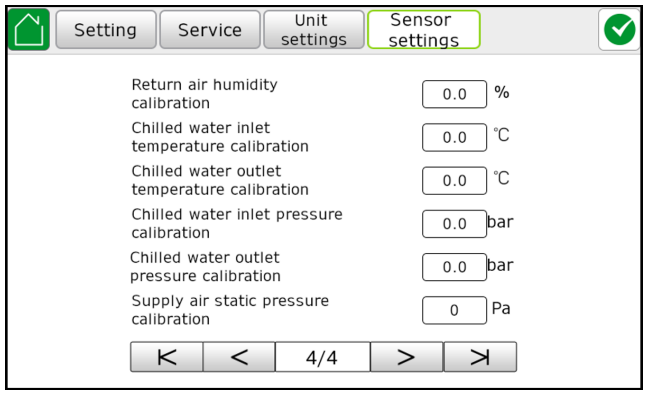
Configure the Sensors

1. From the home screen of the display, select **Main > Setting > Service > Unit settings > Sensor settings**.







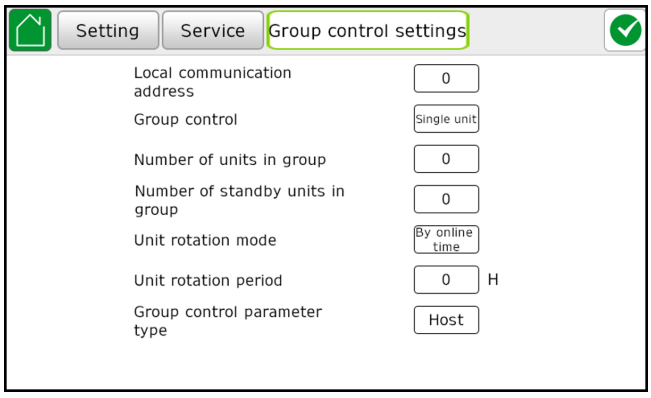


2. Set the **Return air temperature sensor 2** to **Enable** or **Disable** and tap **OK** to save the settings.
3. Set the **Return air temperature sensor 3** to **Enable** or **Disable**t and tap **OK** to save the settings.
4. Set the **Supply air temperature sensor 1** to **Enable** or **Disable** and tap **OK** to save the settings.
5. Set the **Supply air temperature sensor 2** to **Enable** or **Disable** and tap **OK** to save the settings.
6. Set the **Supply air temperature sensor 3** to **Enable** or **Disable** and tap **OK** to save the settings.
7. Set the **Chilled Water outlet temperature sensor** to **Enable** or **Disable** as per the requirement and tap **OK** to save the settings.
8. Set the **Chilled Water inlet temperature sensor** to **Enable** or **Disable** and tap **OK** to save the settings.

9. Set the **Chilled water outlet pressure sensor** to **Enable** or **Disable** and tap **OK** to save the settings.
10. Set the **Chilled water inlet pressure sensor** to **Enable** or **Disable** and tap **OK** to save the settings.
11. Set the **Rack inlet temperature 1 calibration**. Choose a value between -9.9 and 9.9 ℃ and tap **OK** to save the settings.
12. Set the **Rack inlet temperature 2 calibration**. Choose a value between -9.9 and 9.9 ℃ and tap **OK** to save the settings.
13. Set the **Rack inlet temperature 3 calibration**. Choose a value between -9.9 and 9.9 ℃ and tap **OK** to save the settings.
14. Set the **Return air temperature 1 calibration**. Choose a value between -9.9 and 9.9 ℃ and tap **OK** to save the settings.
15. Set the **Return air temperature 2 calibration**. Choose a value between -9.9 and 9.9 ℃ and tap **OK** to save the settings.
16. Set the **Supply air temperature 1 calibration**. Choose a value between -9.9 and 9.9 ℃ and tap **OK** to save the settings.
17. Set the **Supply air temperature 2 calibration**. Choose a value between -9.9 and 9.9 ℃ and tap **OK** to save the settings.
18. Set the **Supply air temperature 3 calibration**. Choose a value between -9.9 and 9.9 ℃ and tap **OK** to save the settings.
19. Set the **Supply air humidity calibration**. Choose a value between -30 and 30% and tap **OK** to save the settings.
20. Set the **Chilled water inlet temperature calibration**. Choose a value between -9.9 and 9.9 ℃ and tap **OK** to save the settings.
21. Set the **Chilled water outlet temperature calibration**. Choose a value between -9.9 and 9.9 ℃ and tap **OK** to save the settings.
22. Set the **Chilled water inlet pressure calibration**. Choose a value between -9.9 and 9.9 ℃ and tap **OK** to save the settings.
23. Set the **Chilled water outlet pressure calibration**. Choose a value between -9.9 and 9.9 ℃ and tap **OK** to save the settings.
24. Set the **Supply air static pressure calibration**. Choose a value between -30 and 30 Pa and tap **OK** to save the settings.

Configure the Group Control Settings

1. From the home screen of the display, select **Main > Setting > Service > Group control settings**.

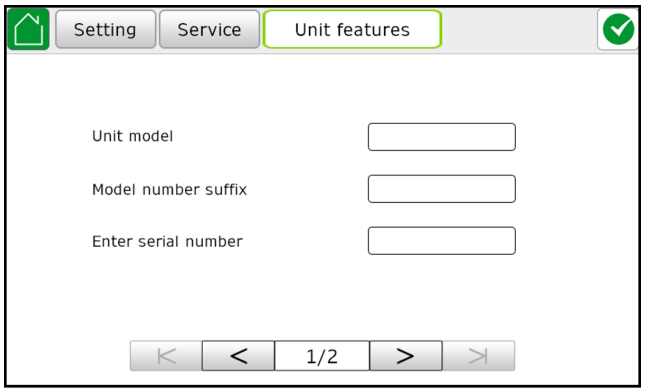


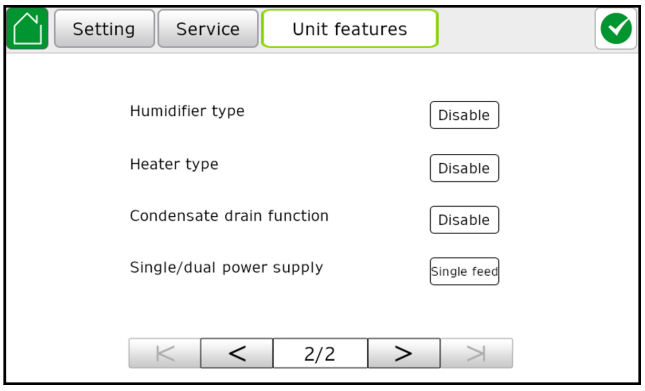
2. Set the **Local communication address**. Choose a value between 0 and 31 and tap **OK** to save the settings.

3. Set the **Group control**. Choose **Single unit** or **Group control** and tap **OK** to save the settings.
4. Set the **Number of units in group**. Choose a value between 0 and 32 and tap **OK** to save the settings.
5. Set the **Number of standby units in group**. Choose a value between 0 and 31 and tap **OK** to save the settings.
6. Set the **Unit rotation mode**. Choose **By online time** or **By address** and tap **OK** to save the settings.
7. Set the **Unit rotation period**. Choose a value between 1 and 240 hours and tap **OK** to save the settings.
8. Set the **Group control parameter type**. Choose one of the following options and tap **OK** to save the settings:
   - **Host**
   - **Slave**
   - **Slave average**

Configure the Unit Features

1. From the home screen of the display, select **Main > Setting > Service > Unit features**.





2. Set the **Unit model** and tap **OK** to save the settings.

   The model number of the cooling unit is available in the **About** page.
3. Set the **Model number suffix** and tap **OK** to save the settings.

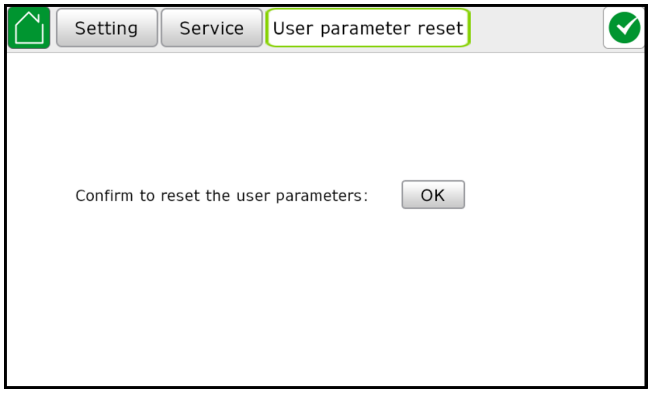
   The model suffix supplement number of the cooling unit is available in the **About** page.
4. **Enter serial number** and tap **OK** to save the settings.

   The serial number of the cooling unit is available in the **About** page.
5. Set the **Humidifier type**. Choose one of the following options and tap **OK** to save the settings:
   - **Disable**
   - **Electrode humidifier**
6. Set the **Heater type**. Choose one of the following options and tap **OK** to save the settings:
   - **Disable**
   - **1**
   - **2**

7. Set the **Condensate drain function** to **Enable** or **Disable** and tap **OK** to save the settings.
8. Set the **Single/Dual power supply**[1]. Choose between **Single feed** or **Dual feed** and tap **OK** to save the settings.

Reset User Parameters to Factory Settings

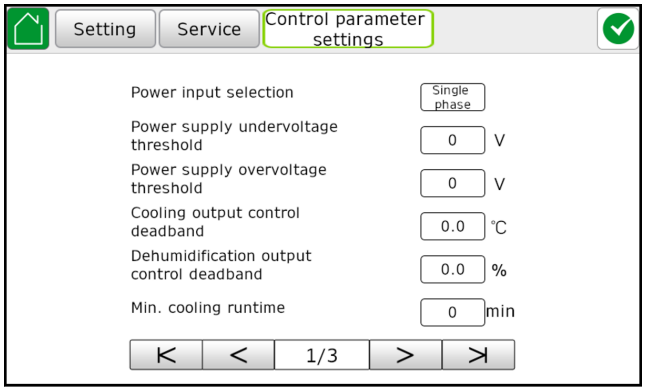
1. From the home screen of the display, select **Main > Setting > Service > User parameter reset**.

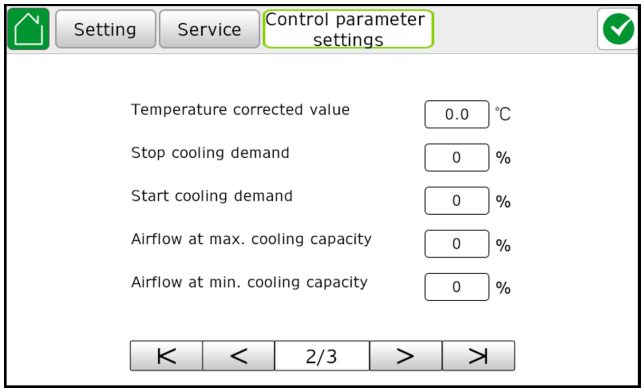


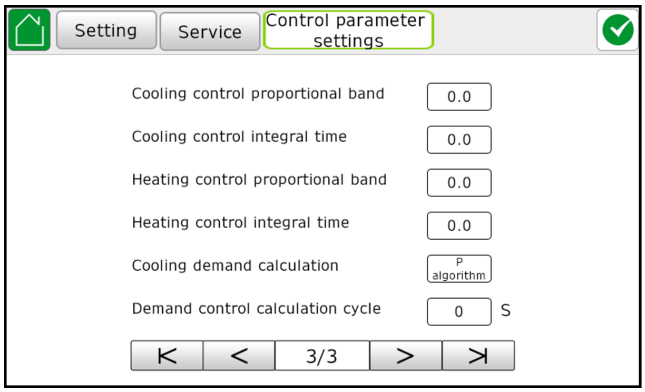
2. Tap **OK** to reset the user parameters to factory settings.

Configure the Control Parameter Settings

1. From the home screen of the display, select **Main > Setting > Service > Control parameter settings**.







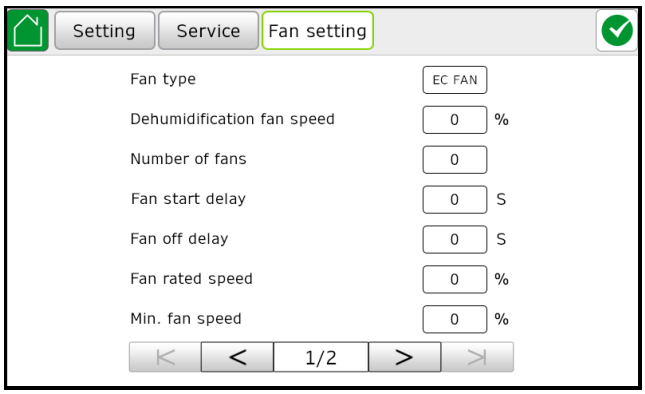
1. The value of this parameter is automatically set based on the model of the cooling unit.

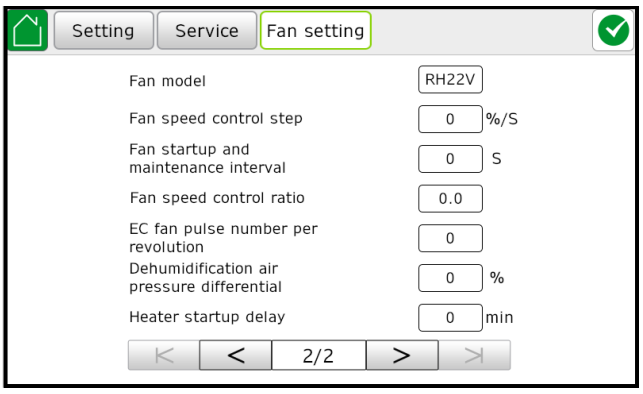
2. Set the **Power input selection**. Choose **Single phase** or **Three phase** and tap **OK** to save the settings.
3. Set the **Power supply undervoltage threshold**[2]. Choose a value between 150 and 300 V and tap **OK** to save the settings.
4. Set the **Power supply overvoltage threshold**[2]. Choose a value between 150 and 300 V and tap **OK** to save the settings.
5. Set the **Cooling output control deadband**. Choose a value between 0.5 and 5 °C and tap **OK** to save the settings.
6. Set the **Dehumidification output control deadband**. Choose a value between 0 and 10% and tap **OK** to save the settings.
7. Set the **Min. cooling runtime**. Choose a value between 1 and 30 minutes and tap **OK** to save the settings.
8. Set the **Temperature corrected value**[3]. Choose a value between 0 and 5 °C and tap **OK** to save the settings.
9. Set the **Stop cooling demand**. Choose a value between –100 and 0% and tap **OK** to save the settings.
10. Set the **Start cooling demand**. Choose a value between 0 and 100% and tap **OK** to save the settings.
11. Set the **Airflow at max. cooling capacity**. Choose a value between 1 and 100% and tap **OK** to save the settings.
12. Set the **Airflow at min. cooling capacity**. Choose a value between 0 and 100% and tap **OK** to save the settings.
13. Set the **Cooling control proportional band**. Choose a value between 1 and 100 and tap **OK** to save the settings.
14. Set the **Cooling control integral time**. Choose a value between 0 and 100 and tap **OK** to save the settings.
15. Set the **Heating control proportional band**. Choose a value between 1 and 100 and tap **OK** to save the settings.
16. Set the **Heating control integral time**. Choose a value between 0 and 100 and tap **OK** to save the settings.
17. Set the **Cooling demand calculation**. Choose **P** or **PI** and tap **OK** to save the settings.
18. Set the **Demand control calculation cycle**. Choose a value between 5 and 600 seconds and tap **OK** to save the settings.

2. Power supply undervoltage/overvoltage is for single power supply.
3. Actual temp. setting control value = Supply air temp. settings (display value) - temp. corrected value.

Configure the Fan Settings

1. From the home screen of the display, select **Main > Configuration > Service > Fan settings**.

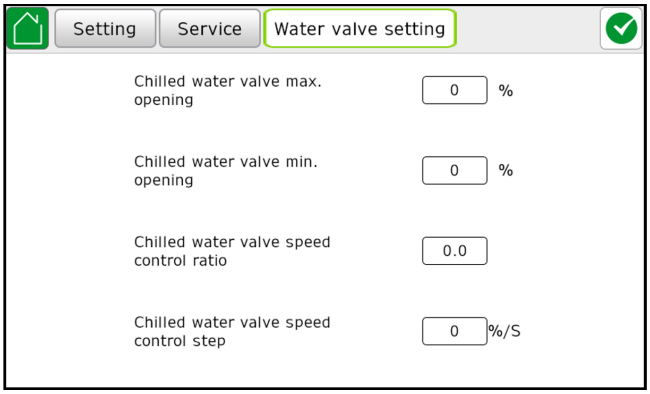




2. Set the **Fan type**. Choose **EC FAN** and tap **OK** to save the settings.
3. Set the **Dehumidification fan speed** and tap **OK** to save the settings.
4. Set the **Number of fans** and tap **OK** to save the settings.
5. Set **Fan start delay**. Choose a value between 1 and 255 seconds and tap **OK** to save the settings.
6. Set **Fan off delay**. Choose a value between 1 and 255 seconds and tap **OK** to save the settings.
7. Set the **Fan rated speed**. Choose a value between 0 and 100% and tap **OK** to save the settings.
8. Set the **Min. fan speed**. Choose a value between 0 and 100% and tap **OK** to save the settings.
9. Set the **Fan model**. Choose between **RH22V** and **RH35V** and tap **OK** to save the settings.
10. Set the **Fan speed control step**. Choose a value between 1 and 10% and tap **OK** to save the settings.
11. Set the **Fan start-up and maintenance interval**. Choose a value between 0 and 600 seconds and tap **OK** to save the settings.
12. Set the **Fan speed control ratio**. Choose a value between 1 and 10 and tap **OK** to save the settings.
13. Set the **EC fan pulse number per revolution**. Choose a value between 1 and 20 and tap **OK** to save the settings.
14. Set the **Dehumidification air pressure differential**. Choose a value between 1 and 100% and tap **OK** to save the settings.
15. Set the **Heater startup delay**. Choose a value between 1 and 10 minutes and tap **OK** to save the settings.

Configure the Water Valve Settings

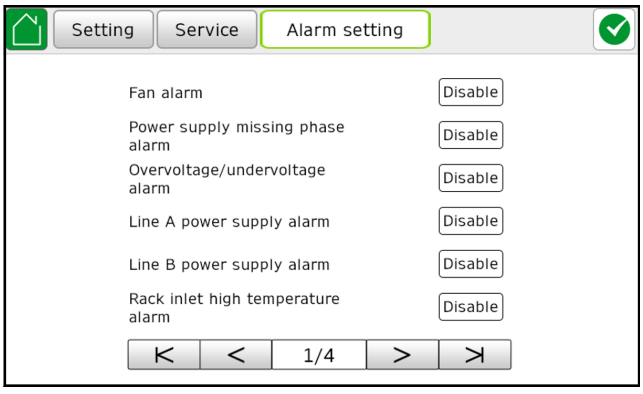
1. From the home screen of the display, select **Main > Setting > Service > Water valve settings**.

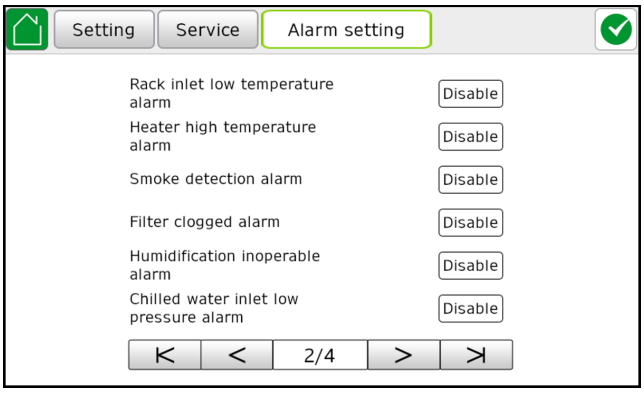


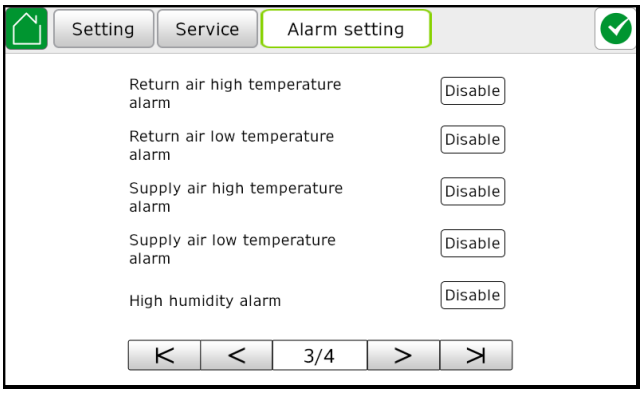
2. Set the **Chilled water valve max. opening**. Choose a value between minimum setting and 100% and tap **OK** to save the settings. Default value is 100.
3. Set the **Chilled water valve min. opening**. Choose a value between 0% and the maximum setting and tap **OK** to save the settings. Default value is 10.
4. Set the **Chilled water valve speed control ratio**. Choose a value between 0 and 10 and tap **OK** to save the settings. Default value is 10.
5. Set the **Chilled water valve speed control step**. Choose a value between 1 and 100% per second and tap **OK** to save the settings. Default value is 1.

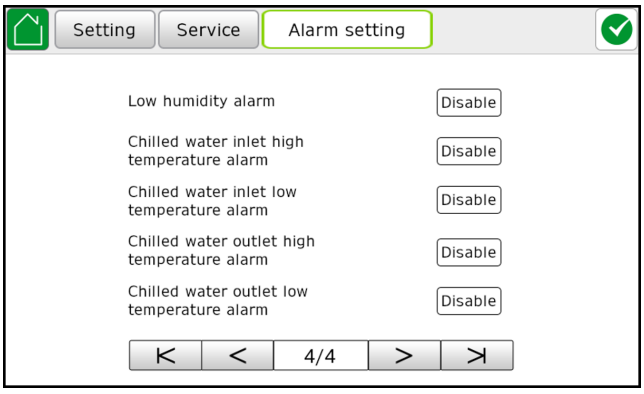
Configure the Alarm Settings

1. From the home screen of the display, select **Main > Setting > Service > Alarm setting**.









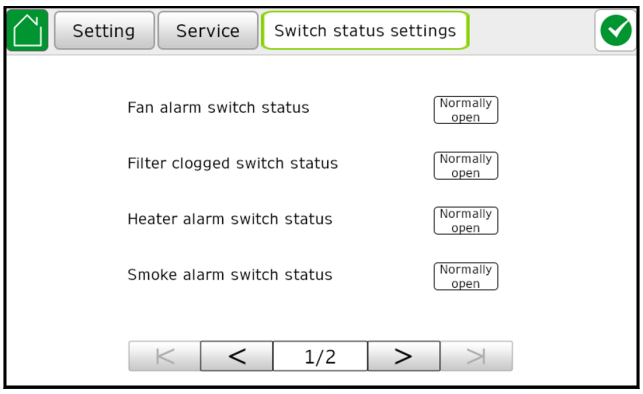
2. Set the **Fan alarm**. Choose one of the following options and tap **OK** to save the settings:
   - **Disable**. If this option is selected, the alarm will not be triggered when the fan is inoperable.
   - **Check overload/air flow**. If this option is selected, the fan overload alarm will be triggered when the fan is inoperable.
   - **Check feedback/air flow**. If this option is selected, the fan feedback alarm will be triggered when the fan is inoperable.
     - For the 300 mm wide cooling units, the default alarm setting is **Check feedback/air flow**.
     - For the 600 mm wide cooling units, the default alarm setting is **Check overload/air flow**.
3. Set the **Power supply missing phase alarm** to **Enable** or **Disable** and tap **OK** to save the settings.
4. Set the **Overvoltage/undervoltage alarm** to **Enable** or **Disable** and tap **OK** to save the settings.
5. Set the **Line A power supply alarm** to **Enable** or **Disable** and tap **OK** to save the settings.
6. Set the **Line B power supply alarm** to **Enable** or **Disable** and tap **OK** to save the settings.
7. Set the **Rack inlet high temperature alarm** to **Enable** or **Disable** and tap **OK** to save the settings.
8. Set the **Rack inlet low temperature alarm** to **Enable** or **Disable** and tap **OK** to save the settings.
9. Set the **Heater high temperature alarm** to **Enable** or **Disable** and tap **OK** to save the settings.
10. Set the **Smoke detection alarm** to **Enable** or **Disable** and tap **OK** to save the settings.
11. Set the **Filter clogged alarm** to **Enable** or **Disable** and tap **OK** to save the settings.
12. Set the **Humidification inoperable alarm** to **Enable** or **Disable** and tap **OK** to save the settings.
13. Set the **Chilled water inlet low pressure alarm** to **Enable** or **Disable** and tap **OK** to save the settings.
14. Set the **Return air high temperature alarm** to **Enable** or **Disable** and tap **OK** to save the settings.
15. Set the **Return air low temperature alarm** to **Enable** or **Disable** and tap **OK** to save the settings.
16. Set the **Supply air high temperature alarm** to **Enable** or **Disable** and tap **OK** to save the settings.
17. Set the **Supply air low temperature alarm** to **Enable** or **Disable** and tap **OK** to save the settings.
18. Set the **High humidity alarm** to **Enable** or **Disable** and tap **OK** to save the settings.
19. Set the **Low humidity alarm** to **Enable** or **Disable** and tap **OK** to save the settings.
20. Set the **Chilled water inlet high temperature alarm** to **Enable** or **Disable** and tap **OK** to save the settings.
21. Set the **Chilled water inlet low temperature alarm** to **Enable** or **Disable** and tap **OK** to save the settings.

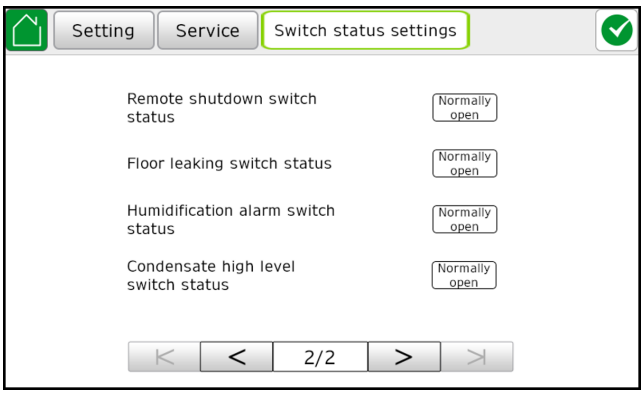
22. Set the **Chilled water outlet water high temperature alarm** to **Enable** or **Disable** and tap **OK** to save the settings.
23. Set the **Chilled water outlet water low temperature alarm** to **Enable** or **Disable** and tap **OK** to save the settings.

Configure the Switch Status Settings

1. From the home screen of the display, select **Main > Setting > Service > Switch status settings**.

NOTICE
INOPERABLE EQUIPMENT Only qualified service personnel must make changes to these settings. **Failure to follow these instructions can result in equipment damage.**

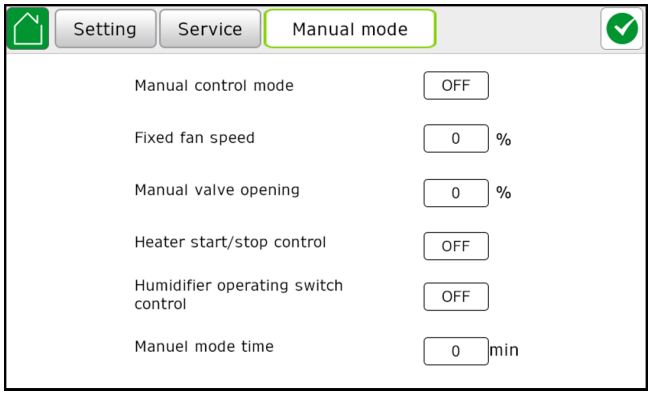




2. Set the **Fan alarm switch status**. Choose **Normally open** or **Normally closed** and tap **OK** to save the settings.
3. Set the **Filter clogged switch status**. Choose **Normally open** or **Normally closed** and tap **OK** to save the settings.
4. Set the **Heater alarm switch status**. Choose **Normally open** or **Normally closed** and tap **OK** to save the settings.
5. Set the **Smoke alarm switch status**. Choose **Normally open** or **Normally closed** and tap **OK** to save the settings.
6. Set the **Remote shutdown switch status**. Choose **Normally open** or **Normally closed** and tap **OK** to save the settings.
7. Set the **Floor leaking switch status**. Choose **Normally open** or **Normally closed** and tap **OK** to save the settings.
8. Set the **Humidification alarm switch status**. Choose **Normally open** or **Normally closed** and tap **OK** to save the settings.
9. Set the **Condensate high level switch status**. Choose **Normally open** or **Normally closed** and tap **OK** to save the settings.

Configure the Manual Mode Settings

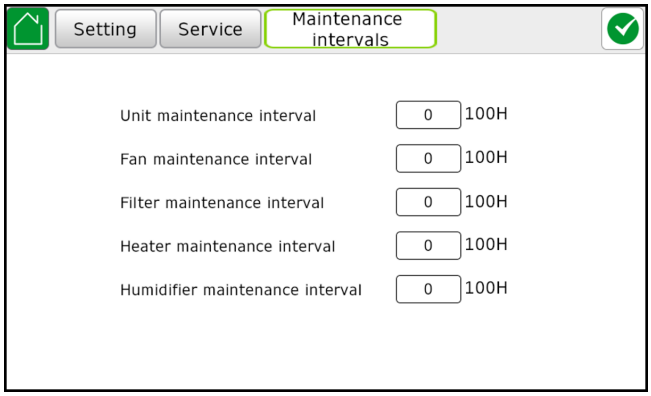
1. From the home screen of the display, select **Main > Setting > Service > Manual mode**.



2. Set the **Manual control mode**[4]. Choose **ON** or **OFF** and tap **OK** to save the settings.
3. Set the **Fixed fan speed**. Choose a value between 0 and 100% and tap **OK** to save the settings.
4. Set the **Manual valve opening**. Choose a value between 0 and 100% and tap **OK** to save the settings.
5. Set the **Heater start/stop control**. Choose **ON** or **OFF** and tap **OK** to save the settings.
6. Set the **Humidifier operating switch control**. Choose **ON** or **OFF** and tap **OK** to save the settings.
7. Set the **Manual mode time**. Choose a value between 0 and 999 minutes and tap **OK** to save the settings.

Set the Maintenance Intervals

1. From the home screen of the display, select **Main > Setting > Service > Maintenance intervals**.



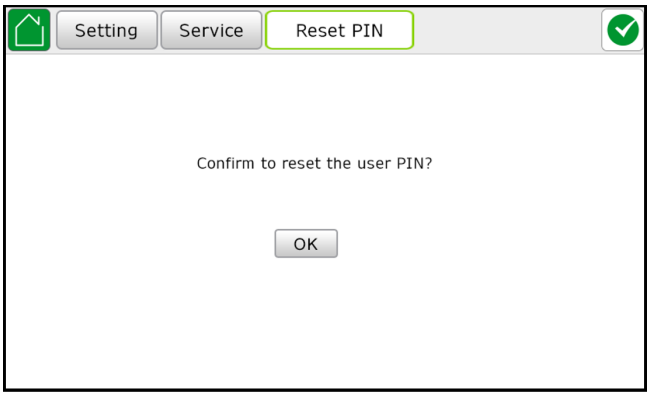
2. Set the **Unit maintenance interval**. Choose a value between 1000 and 65500 and tap **OK** to save the settings. The default value is 65500.
3. Set the **Fan maintenance interval**. Choose a value between 1000 and 65500 and tap **OK** to save the settings. The default value is 44000.
4. Set the **Filter maintenance interval**. Choose a value between 1000 and 65500 and tap **OK** to save the settings. The default value is 4300.

4. If the cooling unit is in operation, the **Manual mode** will not be available. Power off the cooling unit first, and then set the **Manual mode** to **Close**.

5. Set the **Heater maintenance interval**. Choose a value between 1000 and 65500 and tap **OK** to save the settings. The default value is 44000.
6. Set the **Humidifier maintenance interval**. Choose a value between 1000 and 65500 and tap **OK** to save the settings. The default value is 44000.

Reset the PIN

1. From the home screen of the display, select **Main > Setting > Service > Reset PIN**.



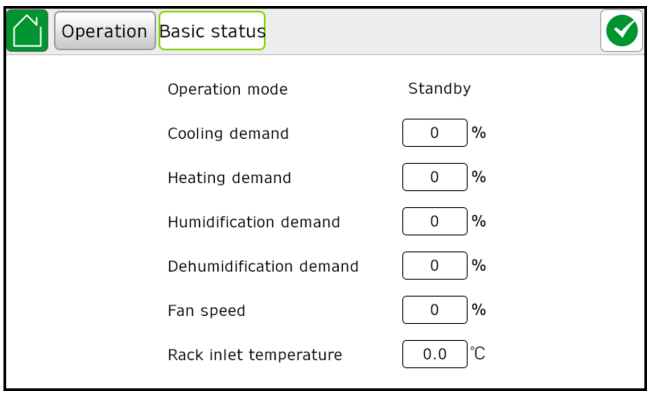
2. Tap **OK** to reset the user PIN.

   The default PIN is 0000.

View the Operation Status

View Basic Status Information

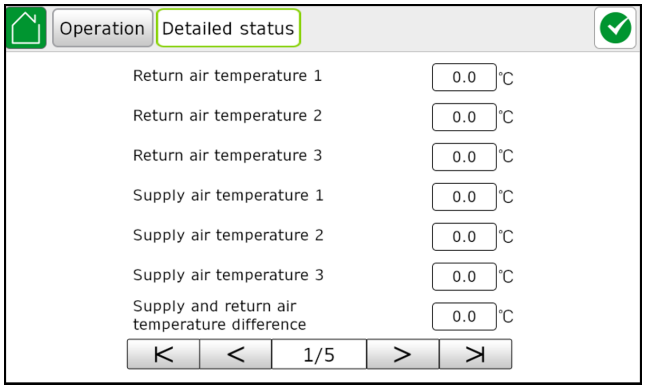
From the home screen of the display, select **Main > Operation > Basic status**.

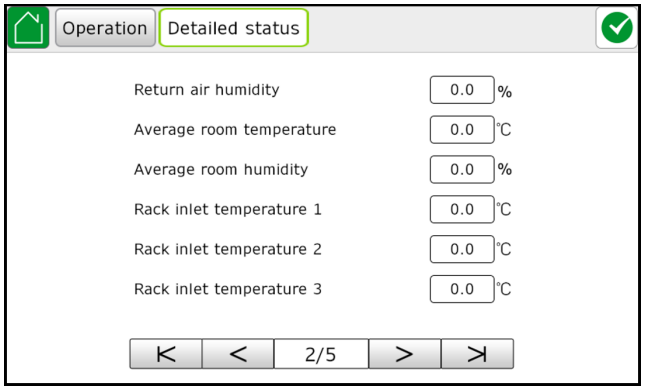


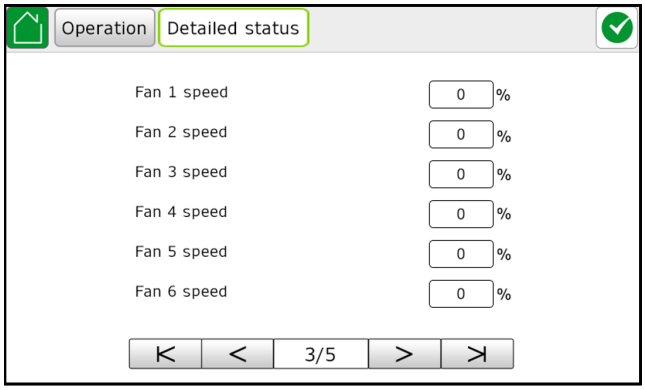
View Detailed Status Information

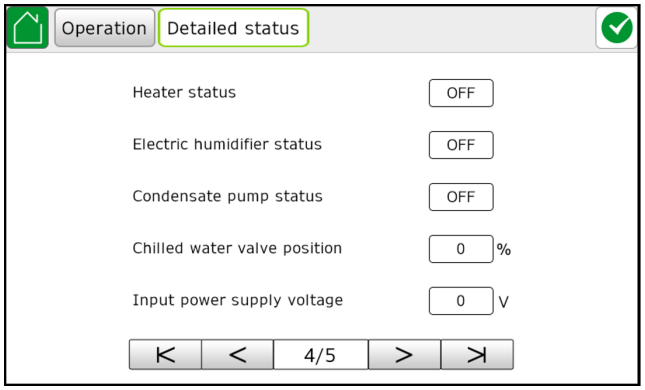
From the home screen of the display, select **Main > Operation > Detailed status**.

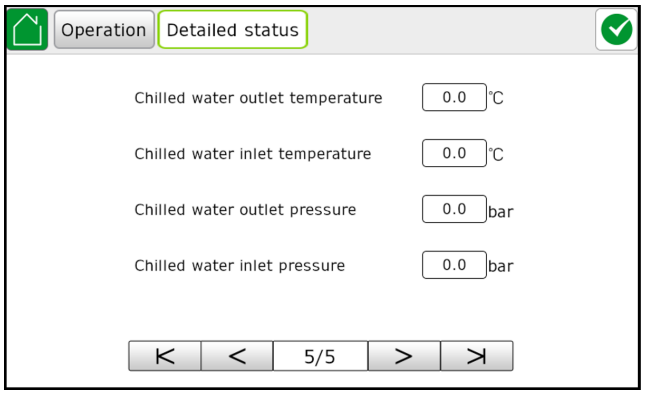
On the detailed status screens you can check temperature and humidity, water inlet/outlet temperature and pressure, actual value of supply fan speed, water valve timely opening, and other components' on/off status.







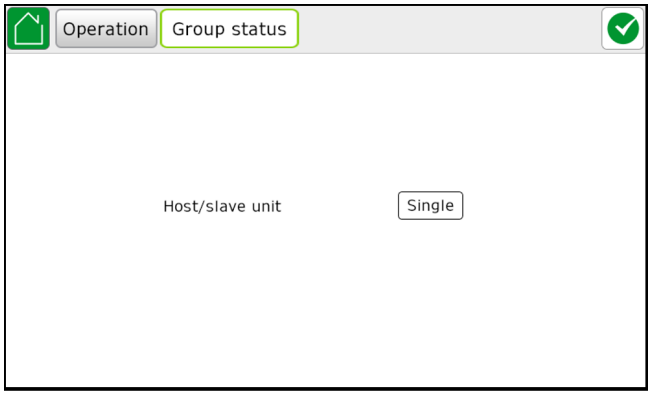




View Group Status Information

From the home screen of the display, select **Main > Operation > Group status**.

The role of the current cooling unit is shown on the screen.



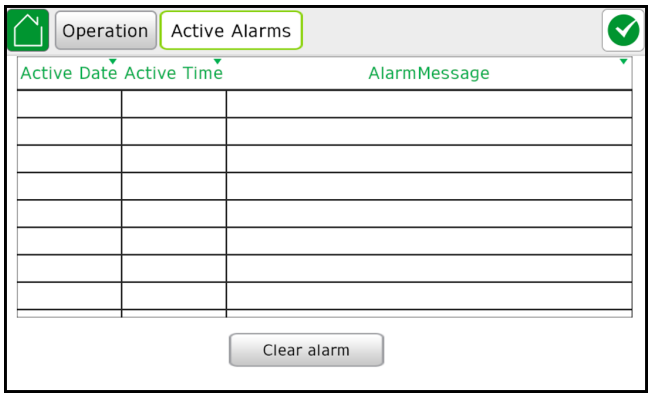
The group status of the group, that the cooling unit is included in, is displayed on the screen. There are four different group statuses: **Master**, **Online**, **Backup**, and **Single**.

NOTE: In group control mode:

- When **local communication address** is zero, the cooling unit always displays **Master**.
- When **local communication address** is not zero and the cooling unit is in operation, it displays **Online**. If the cooling unit is not in operation, it displays **Backup**.

View Active Alarms

From the home screen of the display, select **Main > Operation > Active Alarms**.



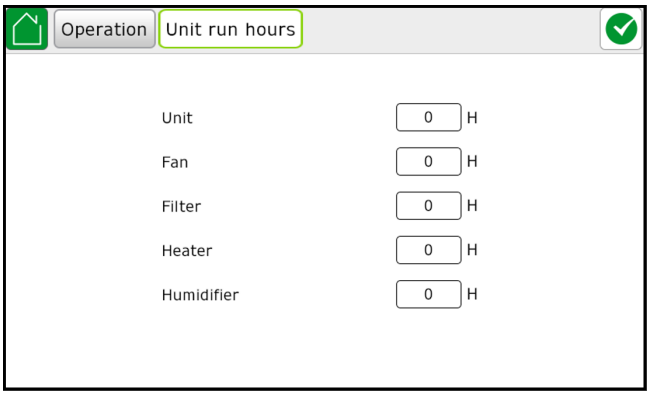
Tap **Clear alarm** button to clear all the records.

Tap  or  symbol at the top-right corner on any screen to go to the **Active Alarms** page. Most of the alarms are automatically reset once the alarm is cleared.

NOTE: Some alarms such as inoperable fan needs to be cleared manually. Tap **Clear alarm** to manually clear the alarm.

View Information on Run Hours

From the home screen of the display, select **Main > Operation > Unit run hours**.

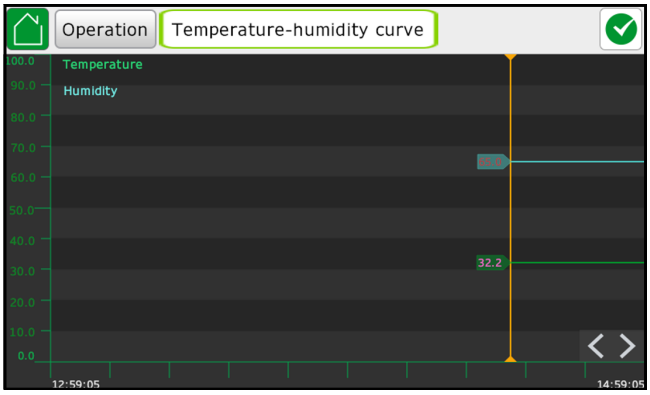


On the **Unit run hours screen** you can get see how many hours the parts in the system have been running.

For information on how to reset these parameters, see *Reset the Run Hours, page 21*.

View Temperature and Humidity Curve

From the home screen of the display, select **Main > Operation > Temperature-humidity curve**.



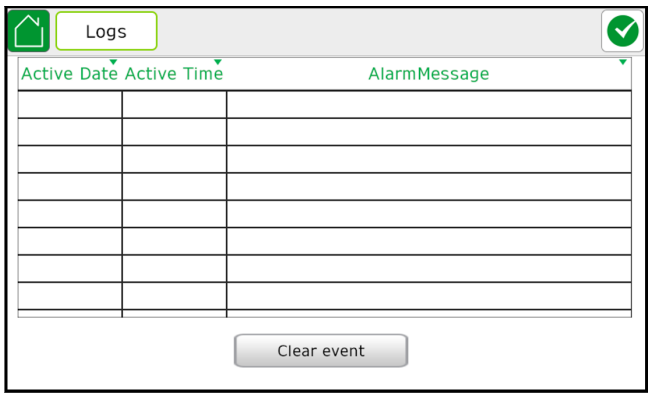
NOTE:

- The left ordinate is temperature value (℃), the right ordinate is humidity value (%), the abscissa is time (5 minutes as a grid).
- The yellow curve is temperature and the blue curve is humidity.

Troubleshooting

View the Log

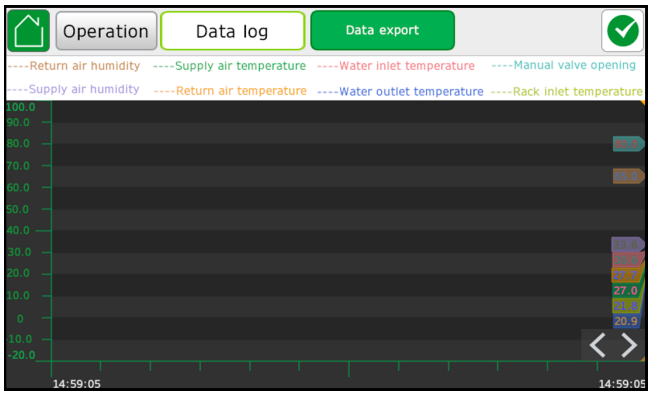
From the home screen of the display, select **Main > Logs**.



In the **Logs** page, the history of alarm information is available.

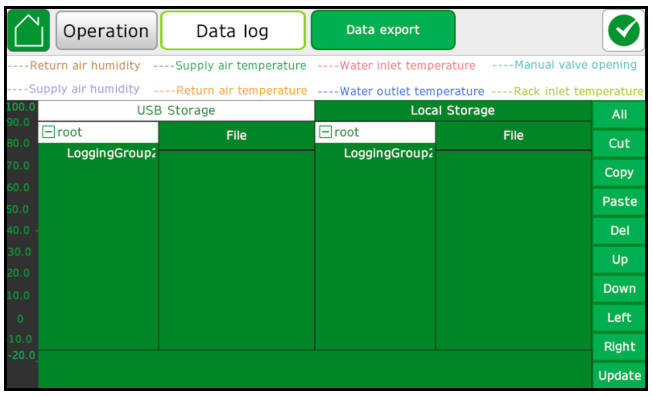
View the Data Log

From the home screen of the display, select **Main > Operation > Data log**.



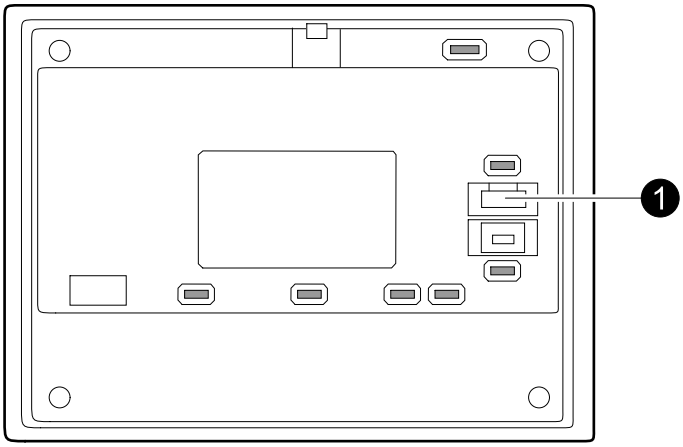
The display shows history data such as information on temperature and humidity, water inlet/outlet temperature and pressure, and valve opening.

To export the data log, insert a USB device in the bottom of the display and tap **Data export**.



Perform a Firmware Update

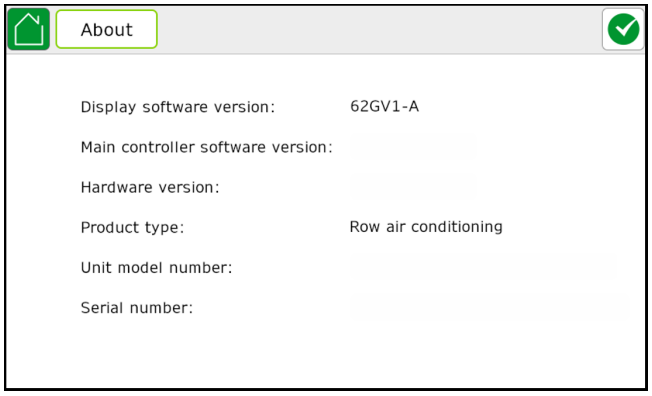
1. Insert a USB device into the USB port on the rear of the display.



2. From the display, tap **Download from USB**. If the button is not green, verify that the USB device is correctly inserted in the USB port.

3. From the home screen in the display, select **Main > About** and verify that the firmware version is correct.

   NOTE: The below screen shown is a typical sample. The actual cooling unit may show different information.



Alarm List

No	Alarm Text	Alarm Detection	Alarm Delay	Alarm Duration	Alarm Reset
1	**Power supply overvoltage/ undervoltage**	Real time	0 s	5 s	Automatic
2	**Phase missing**	Real time	0 s	2 s	Automatic
3	**Fan alarm**	Fan blower	60 s	5 s	Manual
4	**Heater protection**	Boot detection	0 s	5 s	Automatic
5	**Smoke alarm**	Real time	0 s	2 s	Automatic
6	**Leak detection alarm**	Real time	0 s	5 s	Automatic
7	**Filter clogged alarm**	Fan blow	0 s	10 s	Manual
8	**Humidifier alarm**	Humidifier start	0 s	5 s	Automatic
9	**Return air temperature sensor 1 inoperable**	Real time	0 s	5 s	Automatic
10	**Return air temperature sensor 2 inoperable**	Real time	0 s	5 s	Automatic
11	**Return air temperature sensor 3 inoperable**	Real time	0 s	5 s	Automatic
12	**Rack inlet temperature sensor 1 inoperable**	Real time	0 s	5 s	Automatic
13	**Rack inlet temperature sensor 2 inoperable**	Real time	0 s	5 s	Automatic
14	**Rack inlet temperature sensor 3 inoperable**	Real time	0 s	5 s	Automatic
15	**Return air humidity sensor inoperable**	Real time	0 s	5 s	Automatic
16	**Supply air temperature sensor 1 inoperable**	Real time	0 s	5 s	Automatic
17	**Supply air temperature sensor 2 inoperable**	Real time	0 s	5 s	Automatic
18	**Supply air temperature sensor 3 inoperable**	Real time	0 s	5 s	Automatic
19	**Chilled water inlet temperature sensor inoperable**	Real time	0 s	5 s	Automatic
20	**Chilled water outlet temperature sensor inoperable**	Real time	0 s	5 s	Automatic
21	**Fan differential pressure sensor inoperable**	Real time	0 s	5 s	Automatic
22	**Return air high temperature**	Boot detection	0 s	5 s	Automatic
23	**Return air low temperature**	Boot detection	0 s	5 s	Automatic
24	**High humidity alarm**	Boot detection	0 s	5 s	Automatic
25	**Low humidity alarm**	Boot detection	0 s	5 s	Automatic
26	**Supply air high temperature**	Water valve start	90 s	5 s	Automatic
27	**Supply air low temperature**	Heater start	90 s	5 s	Automatic
28	**Chilled water inlet max. temperature**	Water valve start	90 s	5 s	Automatic
29	**Chilled water inlet min. temperature**	Water valve start	90 s	5 s	Automatic
30	**Chilled water outlet max. temperature**	Water valve start	90 s	5 s	Automatic
31	**Chilled water outlet min. temperature**	Water valve start	90 s	5 s	Automatic
32	**Chilled water inlet min. pressure**	Water valve start	90 s	5 s	Automatic
33	**EEPROM inoperable**	Real time	0 s	0 s	Automatic
34	**Remote communication inoperable**	Real time	0 s	0 s	Automatic

No	Alarm Text	Alarm Detection	Alarm Delay	Alarm Duration	Alarm Reset
35	**Touch screen communication inoperable**	Real time	0 s	0 s	Automatic
36	**Local network communication inoperable**	Group control	0 s	0 s	Automatic
37	**Extension board communication inoperable**	Real time	0 s	3 s	Automatic
38	**Line A power supply inoperable**	Real time	0 s	0 s	Automatic
39	**Line B power supply inoperable**	Real time	0 s	0 s	Automatic
40	**Unit operating timeout**	Real time	0 s	0 s	Manual
41	**Fan operating timeout**	Real time	0 s	0 s	Manual
42	**Filter operating timeout**	Real time	0 s	0 s	Manual
43	**Heater timeout**	Real time	0 s	0 s	Manual
44	**Humidifier timeout**	Real time	0 s	0 s	Manual
45	**Rack inlet high temperature**	Water valve start	90 s	5 s	Automatic
46	**Rack inlet low temperature**	Heater start	90 s	5 s	Automatic
47	**High water level alarm**	Real time	0 s	5 s	Automatic
48	**Condensate management alarm**	Minimum runtime of condensation pump	0 s	5 s	Automatic

Troubleshooting and Recommended Actions

Description	Possible cause	Components to check	Recommended actions
Supply fan is inoperable.	No input power to the system.	Verify the power supply at the input breaker.	Turn on the breaker/power supply.
	No input power to the supply fan.	• Verify the power supply for the supply fan. • Verify the working of the supply fan.	• Correct the wiring. • Replace the fan relay or the contactor, if inoperable.
	Controller fails to signal the running condition of the supply fan.	• View the current supply fan command in the display. • Check the supply fan signal wiring. • Check the power on/off switch of the supply fan.	• Replace the inoperable components. • Correct or tighten the wiring according to the wiring diagram.
	Incorrect feedback wiring.	Verify the feedback wiring.	• Fasten the wires. • Correct the wiring.
	Inoperable fan.	Supply fan.	Replace the inoperable supply fan.
Water flow valve is inoperable.	No input power to the water valve.	Verify the power supply for the water flow valve.	Correct the wiring.
	Incorrect signal value Y set for the water flow valve.	View the current signal value in the display.	Correct to default value: Y1.
No humidification.	No water charged.	• Water supply • Solenoid valve • Water filter • Water pump	• Correct the operation of the components. • Clean the water filter. • Replace the inoperable components.
	Incorrect value set for the humidifier to turn on.	In the display, view the current settings for humidification.	Correct the humidifier settings.
No heating.	Incorrect value set for the heater to turn on.	In the display, view the current settings for the heater to turn on.	Correct the heater settings.

Description	Possible cause	Components to check	Recommended actions
	Heater circuit failure.	• Heater. • Heater contactor. • Heater protection device (fused, located inside the heater).	Replace the inoperable components. Correct or tighten the wiring according to wiring diagram.
Temperature control is not accurate.	Wrong location of remote temperature sensor.	Sensors.	Relocate the sensors in cold aisle.
Water leakage in the cooling unit.	The hose of condensation water is not connected correctly. Improper piping work.	Hose.	Tighten the hose and configure it out of the cooling unit.
	Piping system leakage.	Pipe connections.	Find the leakage and repair it.
	The cooling unit is not leveled properly.		Level the cooling unit by adjusting the leveling foot.
	The thermal insulation is broken.	Thermal insulation around pipes.	Replace the broken part or repair it.
Display does not work, but the cooling unit is in operation.	Display circuit inoperable.	Display. Connection cable.	• Tighten the wiring according to the wiring diagram • Replace the inoperable components.
Air filter clogged.	Air filter is too dirty.	Air filter.	Clean the air filter or replace it with a new one.
	Incorrect air pressure differential switch setting.	Arrow on the dial of the air pressure differential switch should be at 350.	Correct the setting to 350.
	Inoperable air pressure differential switch.	Air pressure differential switch.	If the switch is open while the filter is clean and the setting is correct, replace the switch.
Alarms do not display on the monitoring equipment.	The exterior monitoring equipment is not powered on. Incorrect communication.	The wiring is correct and have output.	• Correct the wiring. • Inform that the equipment is functioning correctly and ask them to check the monitoring equipment.

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As standards, specifications, and design change from time to time, please ask for confirmation of the information given in this publication.

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