

NetCo15000-C30 kW Maintenance and Troubleshooting

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Foreword

- This document describes system O&M, part replacement and handling of the NetCol5000-C30 kW air cooled in-row precision air conditioner (NetCol5000-C30 kW in short) to facilitate the use and maintenance of NetCol5000-C30 kW.



Objectives

- On completion of this course, you will be able to:
 - Know routine maintenance of NetCol5000-C30 kW air cooled in-row precision air conditioner;
 - Know troubleshooting process of NetCol5000-C30 kW air cooled in-row precision air conditioner;
 - Know part replacement process of NetCol5000-C30 kW air cooled in-row precision air conditioner.



Contents

- 1. Routine Maintenance**
2. Troubleshooting
3. Parts Replacement

Routine Maintenance (1)

- Definition

- Routine maintenance is scheduled maintenance carried out to ensure proper system operating and to therefore avoid any unscheduled breakdown and downtime. Routine maintenance helps the O&M personnel to:
 - Find and handle alarms related to equipment operating in a timely manner.
 - Discover potential risks in a timely manner, preventing faults that could possibly cause economic losses and reduce customer satisfaction.
 - Analyze the system operating trend based on collected information and take measures to improve operating efficiency.

- Precautions

- Read all the precautions and product documentation before performing routine maintenance.
- Follow local laws and safety instructions to minimize the risk of personal injury and damage to equipment. The "NOTICE", "CAUTION", "WARNING", and "DANGER" statements in this document do not represent all the safety instructions. They are only supplements to the safety instructions. Therefore, only trained and qualified personnel can install, operate, and maintain Huawei equipment, and they

Routine Maintenance (2)

- Pay attention to the safety symbols on the equipment and all safety instructions in this document. The safety precautions given in this document do not cover all safety precautions. Huawei will not be liable for any consequence caused by violation of the safety operation regulations and design, production, and usage standards.
- Most maintenance tasks should be performed only after the power supply is disconnected from the equipment. Do not connect the power supply during maintenance. If you need to perform maintenance tasks such as measuring the current, voltage, and temperature when the equipment is operating, connect the power supply only after you have finished all equipment connections. Disconnect the power supply when you finish maintenance.
- Protective measures must be taken during electrical maintenance, such as wearing insulation gloves or shoes.
- Exercise caution during professional maintenance. For details, consult Huawei technical support.

Monthly Maintenance (1)

| No. | Inspection method | Operation | Troubleshooting |
|-----|-------------------|--|---|
| 1 | Visual inspection | Check whether an air filter is blocked. | Clean (water can be used) or replace the air filter. |
| 2 | Visual inspection | Check whether an air filter is damaged or deformed. | Replace the air filter. |
| 3 | Visual inspection | Check whether the exhaust valve is leaking. | Shut down the exhaust valve. |
| 4 | Visual inspection | Check that screws fastening the condensate pump and water sensor are securely connected. | Secure the screws tightly. |
| 5 | Visual inspection | Check that the water pan filter is clean and not blocked. | Clean the water pan filter. |
| 6 | Visual inspection | The humidifier cylinder interior wall is free from layered water scale. | Replace the humidifier cylinder. Huawei recommends replacing the humidifier cylinder once every six months. |
| 7 | Visual inspection | The electric heater surface is not eroded, dirtied, or blocked. | Replace the electric heater. |
| 8 | Visual inspection | Humidity and temperature sensors in air conditioners and aisles are securely installed. | Secure the sensors again. |

Monthly Maintenance (2)

| No. | Inspection method | Operation | Troubleshooting |
|-----|----------------------|---|--|
| 9 | Operation inspection | <ul style="list-style-type: none"> • Lift the low float and tap Running > Status on the controller LCD. If the float is in the ON state, it is working properly. Five seconds later one condensate pump would start. Put down low float. • Lift the low and high float. Tap Running > Status on the controller LCD. If the floats are in the ON state, they are working properly. Five seconds later two condensate pumps would start. Put down the two floats. <p>Do not hold the two floats up so long, to avoid pumping air for a long time.</p> | <ul style="list-style-type: none"> • If the float is faulty, replace it promptly. • If the condensate pump is faulty, replace it promptly. |

Quarterly Maintenance (1)

| No. | Inspection method | Operation | Troubleshooting |
|-----|----------------------|---|--|
| 1 | Operation inspection | Start the indoor unit, choose Maint > Diagnostic Mode > Enter from the main screen, and set Humidifier to 50% . Check whether water can be injected smoothly. | <ul style="list-style-type: none"> • Check that the water inlet sluice is open. • Disconnect the humidifier water injection hose and clear the blockage in the hose. |
| 2 | Operation inspection | <p>(Following the preceding step) Set Humidifier to 0%, and press the manual water drain button on the side of the electric control box to "OFF" to check whether water drainage is normal. After the check is complete, set the manual drainage button on the side of the electric control box to "ON".</p> <p>NOTE Ensure that the manual drainage button on the side of the electric control box is set to "ON" after the check ends. Otherwise, the humidifier will not be filled with water when it is running.</p> | <p>Disconnect the drainpipe from the device, and use a rubber mallet to knock the drainpipe to remove foreign matter or impurities from the drainpipe. Then remove the water pump and clean up impurities from the water pump. If the impurities are too much to be cleared, replace the water pump.</p> <p>NOTE</p> <ul style="list-style-type: none"> • When installing a pipe, seal screw thread joints using water sealant and ensure that no water leaks. • If the fault persists after the maintenance, see Troubleshooting for further processing. |

Quarterly Maintenance (2)

| No. | Inspection method | Operation | Troubleshooting |
|-----|----------------------|---|--|
| 3 | Operation inspection | <p>Start the indoor unit, choose Maint > Diagnostic Mode > Enter from the main screen, and set electric heater to On. Check that the electric heater generates heat.</p> <p>NOTE To avoid burns, do not touch the electric heater surface with bare skin.</p> | Replace the electric heater. |
| 4 | Operation inspection | <p>Choose Maint > Diagnostic Mode > Enter and set the chilled water valve openness to 100%. Check that the chilled water valve handle automatically turns to the maximum opening.</p> | If the chilled water valve handle does not automatically turn to the maximum opening, troubleshoot by following instructions |

Semi-annual Maintenance (1)

| No. | Inspection method | Operation | Troubleshooting |
|-----|-------------------|---|--|
| 1 | Visual inspection | Check that no foreign matter exists in the fan. | Clean the foreign matters. |
| 2 | Visual inspection | Check that the blades are intact. | Maintain the blades. If the fault is not rectified, replace the fan. |
| 3 | Visual inspection | Check that no abnormal voice is generated during operation. | Clean the foreign matters, and make sure that the fan is fixed properly. |
| 4 | Visual inspection | Check that the screws are secured and not deformed. | Tighten the screws. Replace the screws if necessary. |
| 5 | Visual inspection | Check that the wiring terminals are secured. | Reconnect the cables again. |
| 6 | Visual inspection | Check and secure all cables and verify that wiring terminals are secure. For example, check that the cable connections from the electric control panel to the fan, temperature sensor, water sensor, subrack power supply, chilled water valve, and high and low float switches are secure. | If a wiring terminal is loose, secure or replace it promptly. |

Semi-annual Maintenance (2)

| No. | Inspection method | Operation | Troubleshooting |
|-----|-------------------|--|--|
| 7 | Visual inspection | Use a brush or compressed dry air to clean various electric components, control components, the main control board, and the surge protection and voltage test board. | N/A |
| 8 | Visual inspection | Check whether the display panel, humidity and temperature sensor or cables is aging on the surface. | Replace the components or cables. |
| 9 | Visual inspection | Use a high-precision humidity and temperature sensor to calibrate the humidity and temperature sensors inside and outside the cabinet. | If the temperature deviation is greater than 1°C or humidity deviation is greater than 5%, calibrate or replace the humidity and temperature sensor. |
| 10 | Visual inspection | The heat exchanger fins are not pushed down. | Use a fin brush to organize the fins that are pushed down. |



Contents

1. Routine Maintenance
- 2. Troubleshooting**
3. Parts Replacement

Troubleshooting (1)

| Symptom | Possible Causes | Troubleshooting |
|--|---|---|
| The fan does not rotate after the NetCol5000-C starts. | <ol style="list-style-type: none">1.The power supply module of the fan is faulty or abnormal (including the fuse of the power supply module is blown.)2.The fan fuse is blown.3.Cables to the fan are faulty. | <ol style="list-style-type: none">1.Ensure that the power supply module of the fan is inserted to the subrack. If the fault persists, replace the power supply module (or replace the fuse).2.Replace the fan fuse.3.Check whether the cables to the fan short-circuit or are disconnected. |
| The fan generates loud noises. | <ol style="list-style-type: none">1.The air filter is blocked.2.Dirt exists at the fan air exhaust vent.3.The fan is not securely installed.4.The fan is faulty. | <ol style="list-style-type: none">1.Clean the air filter.2.Clear the fan air exhaust vent.3.Fasten the fan screws4.Replace the fan. |

Troubleshooting (2)

| Symptom | Possible Causes | Troubleshooting |
|--|---|---|
| Drainage capacity of the NetCol5000-C decreases. | <ol style="list-style-type: none">1. The drainpipe is bent by a large angle or trap exists.2. The drainage system is faulty. (The water pump, floats, or drainpipes are faulty.) | <p>Check that self-drainpipes are not bent by a large angle and traps do not exist. Ensure that the height difference for drainage is enough. Check the pump drainage:</p> <ol style="list-style-type: none">1. Check that the floats are working properly.2. Check whether fuses on circuits C and D are blown. If yes, replace the fuses.3. Check whether the relay works properly. If not, replace the relay.4. Check whether the water pump works properly. If not, replace the water pump.5. Check that the pipes are not bent by a large angle. |

Troubleshooting (3)

| Symptom | Possible Causes | Troubleshooting |
|--|---|--|
| The NetCol5000-C leaks. | <ol style="list-style-type: none"> 1. The thermal insulation tube of the NetCol5000-C is damaged. 2. The condensate drainpipe is blocked. 3. The pipes leak. | <ol style="list-style-type: none"> 1. Check whether thermal insulation tube of the NetCol5000-C is securely installed and repair the damaged thermal insulation tube. 2. Ensure that the drainpipes are not bent by a large angle, the drainpipe connectors are securely installed, the condensate pump is not faulty, and the floats are not faulty. 3. Check the pipes and weld the pipe or fasten related bolts if the pipes leak. |
| Condensate water exists on the surfaces of the front or rear panels. | <ol style="list-style-type: none"> 1. The operating environment of the NetCol5000-C is over humidity. 2. The temperature threshold is set to a much smaller value. | <ol style="list-style-type: none"> 1. Enhance the airtightness of the equipment room. 2. Adjust the temperature and humidity thresholds. |

Troubleshooting (4)

| Symptom | Possible Causes | Troubleshooting |
|-------------------------------------|---|---|
| <p>The temperature is abnormal.</p> | <ol style="list-style-type: none"> 1. The jumper cap of the chilled water valve is not connected to the right position. 2. The valve plug of the chilled water valve is reversely installed. 3. The humidity detected by the humidity and temperature sensor is larger than the actual humidity, which results in anticond protection being triggered frequently for the NetCol5000-C. 4. The temperature and humidity thresholds are improper. 5. Alarms, such as full water, in-cabinet overflow, smoke sensor, and no refrigerant output are generated. | <ol style="list-style-type: none"> 1. Check the W1 jumper of the chilled water valve controller. Ensure that the jumper cap is on the right two pins. 2. Check that the chilled water valve plug is correctly installed. 3. Check whether the ambient temperature of the humidity and temperature sensor is too high. Ensure that the humidity and temperature sensor is located at a proper position. If the position is proper but the fault persists, replace the humidity and temperature sensor. 4. Adjust the temperature and humidity thresholds. 5. Check the alarm causes and clear the alarm manually. |

Troubleshooting (5)

| Symptom | Possible Causes | Troubleshooting |
|---|--|--|
| The humidity and temperature sensor cannot detect the humidity and temperature. | <ol style="list-style-type: none"> 1. Parameter settings on the controller are incorrect. 2. DIP switches of the humidity and temperature sensor are incorrectly set. 3. The humidity and temperature sensor is faulty. | <ol style="list-style-type: none"> 1. Check that the humidity and temperature sensor is enabled on the controller. 2. Check that DIP switches of the humidity and temperature sensor map the corresponding aisle. 3. If the fault persists after the preceding operations, replace the humidity and temperature sensor. |
| The air return temperature is high or the fan rotational speed is fast. (The temperature fluctuation exceeds $\pm 1^{\circ}\text{C}$.) | Proportional, integral and derivative (PID) control related parameters are not set properly. | <p>Decrease the Kp value by 0.01 and do not set Kp to a much smaller value.</p> <p>Ensure that temperature fluctuation is less than $\pm 1^{\circ}\text{C}$.</p> |



Contents

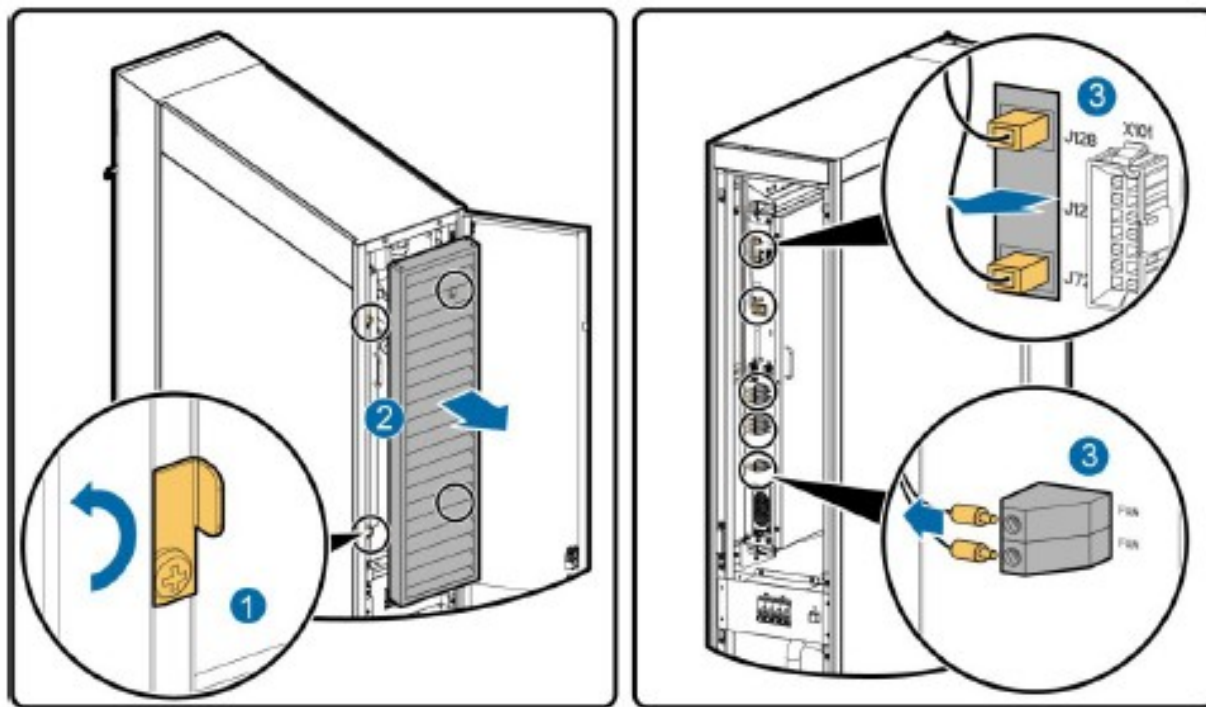
1. Routine Maintenance
2. Troubleshooting
- 3. Parts Replacement**

Replacing Components in the Electrical Control Box (1)

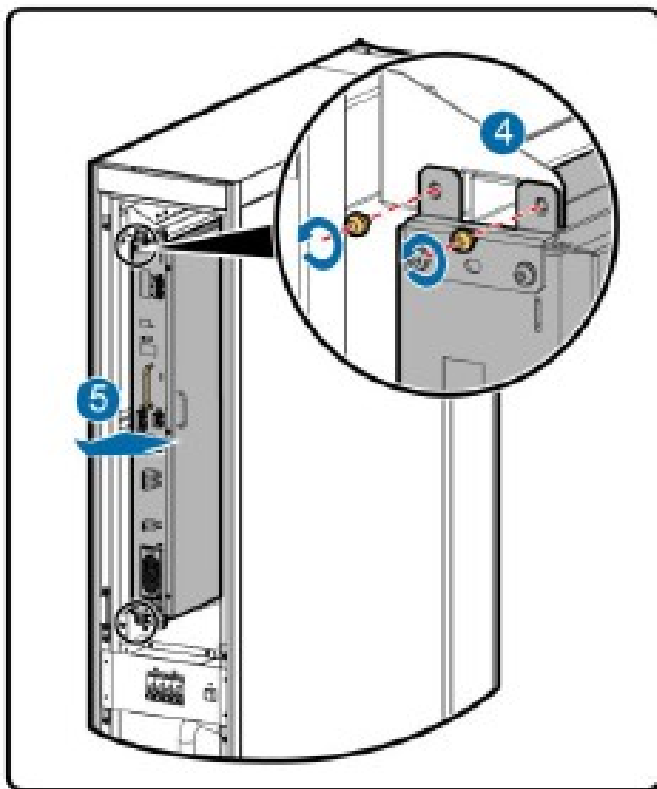
Step 1 Unlock the rear door and open the door rightwards;

Step 2 Open the air filter clip and remove the filter, as shown by (1) and (2) in Figure;

Step 3 Remove all cables from the side panel of the electric control box, as shown by



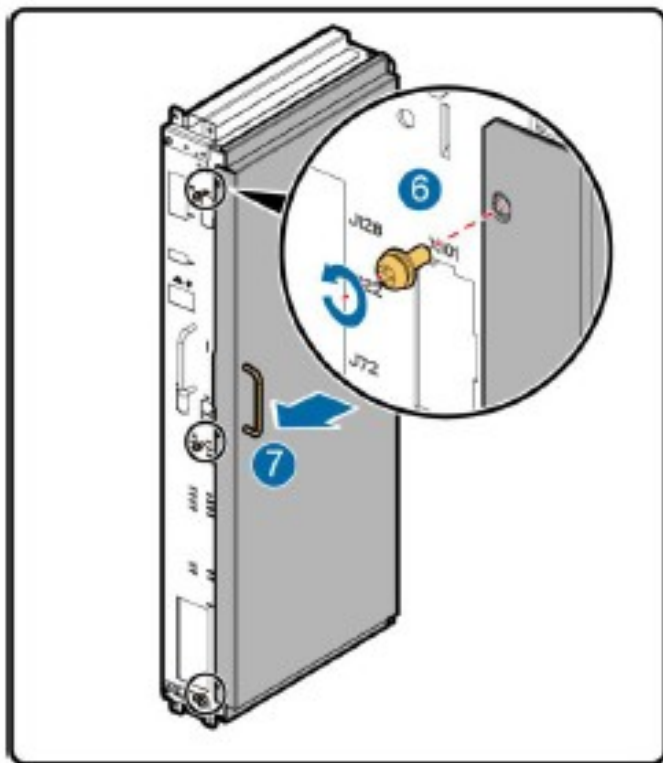
Replacing Components in the Electrical Control Box (2)



Step 4 Remove the four screws that secure the electric control box to the support, as shown by (4) in Figure;

Step 5 Pull the handle on the side panel of the electric control box to remove the box, as shown by (5) in Figure. Place it horizontal on the floor. Exercise caution because the electric control box is heavy;

Replacing Components in the Electrical Control Box (3)



Step 6 Remove the three screws from the cover of the electric control box, as shown by (6) in Figure;

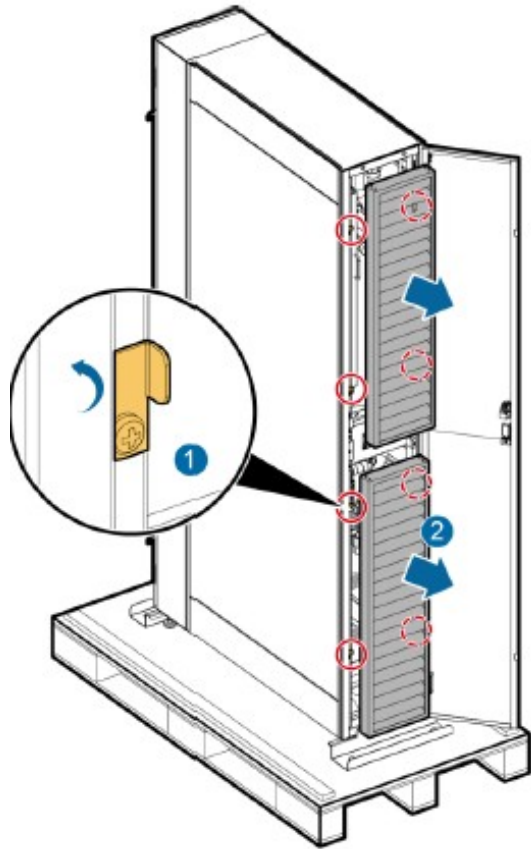
Step 7 Pull the handle on the cover to remove the cover, as shown by (7) in Figure;

Step 8 Replace the faulty component in the electric control box;

Step 9 Install the electric control box by following steps from Step 1 to Step 7 in the reverse order;

Step 10 Close and lock the rear door.

Replacing Air Filter



Step 1 Open the rear door;

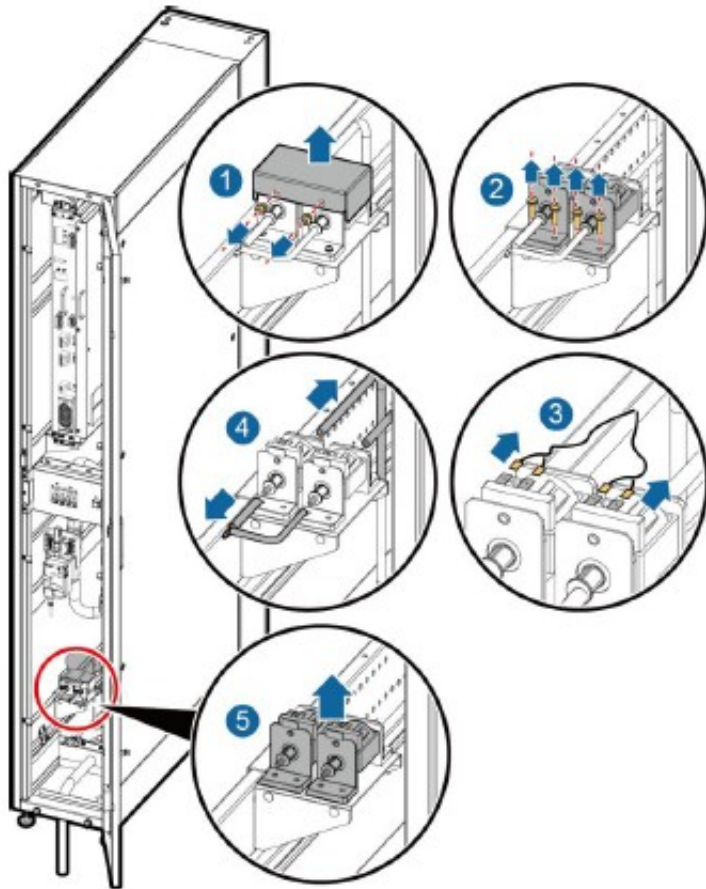
Step 2 Rotate the baffle plate and remove the air filter, as shown in Figure;

Step 3 Install the spare air filter;

Step 4 Close and lock the rear door;

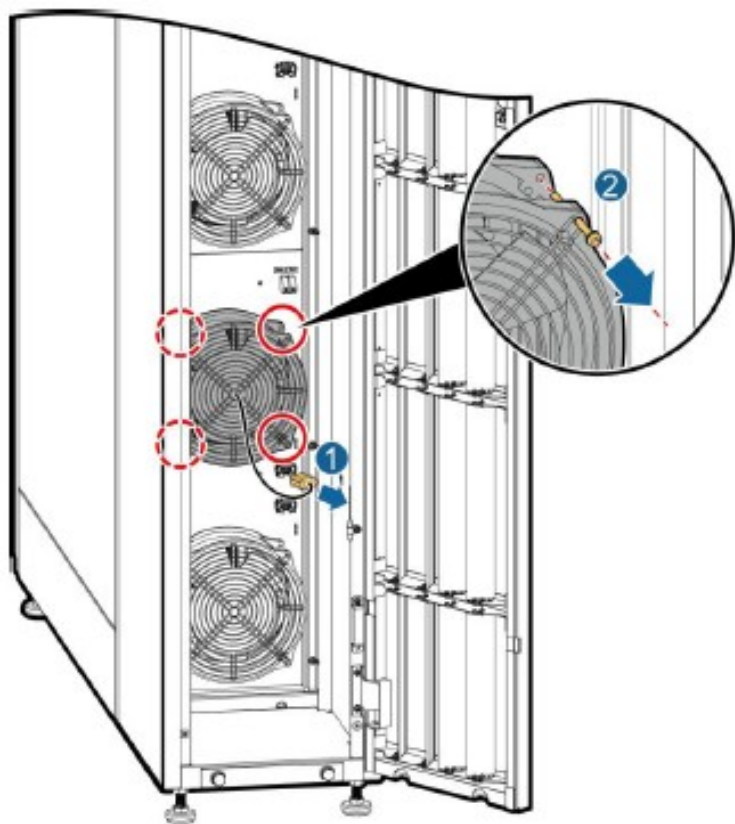
Step 5 Tap **Maint > Performance Maint** on the home screen to enter the performance maintenance screen and clear the runtime of the air filter.

(Optional) Replacing Condensate Pump



- Step 1** Turn off all AC input switches;
- Step 2** Open the rear door;
- Step 3** Remove the air filters;
- Step 4** Remove the condensate pump, as shown in Figure;
- Step 5** Install a new condensate pump and connect cables in a reverse order;
- Step 6** Install the air filters;
- Step 7** Close and lock the rear door;
- Step 8** Tap **Maint** > **Performance Maint** on the home screen and clear the condensate pump total runtime.

Replacing Fan



Step 1 Unlock the front door and open the door rightwards;

Step 2 Switch off the circuit breaker for the faulty fan;

Step 3 Remove the cables from the faulty fan, as shown by (1) in Figure;

Step 4 Remove the fan;

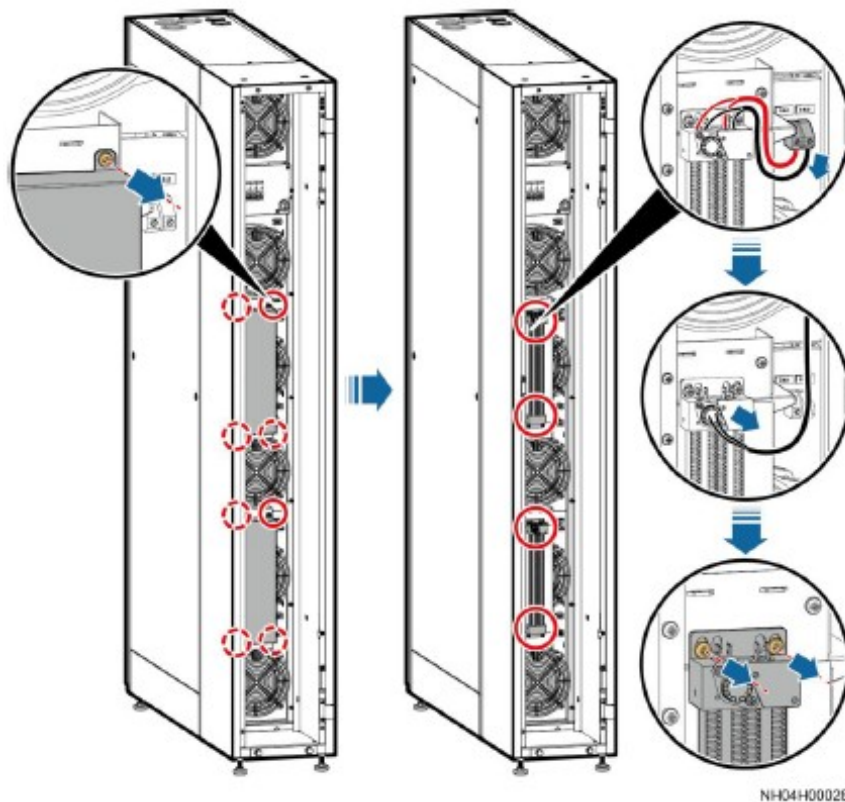
Step 5 Install a new fan in a reverse order;

Step 6 Connect the cables to the fan;

Step 7 Close and lock the front door;

Step 8 Tap **Maint** > **Performance Maint** on the home screen and clear the fan runtime.

Replacing Electric Heater



Step 1 Open the front door, remove the four M4 screws that secure the electric heater cover using a Phillips screwdriver, and remove the cover;

Step 2 Remove cables from the through-wall terminal using a flat-head screwdriver;

Step 3 Remove the two cable plugs from the sensing bulb;

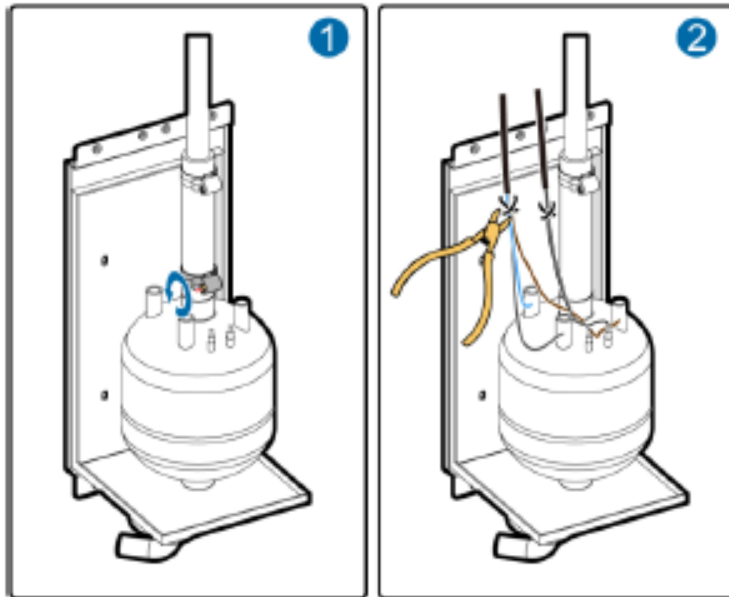
Step 4 Remove the four M4 screws on the electric heater using a Phillips screwdriver and remove the electric heater;

Step 5 Install a new electric heater by following steps from Step 1 to Step 4 in the reverse order;

Step 6 Verify that cables are correctly connected and power on the device;

Step 7 Choose **Maint > Performance Maint** on the main menu and then clear the electric heater running time.

Replacing Humidifier Cylinder (1)



Step 1 Open the rear door and remove the air filter;

Step 2 Switch the manual drain button on the side of the electric control box to the ON position to drain water in the humidifier cylinder;

Step 3 Tap **Shutdown** on the main screen and power off the device. Then switch the button back to OFF;

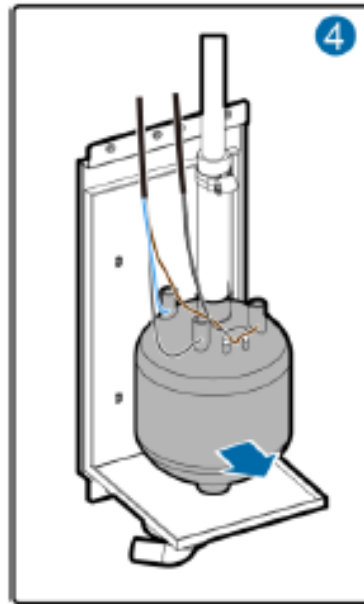
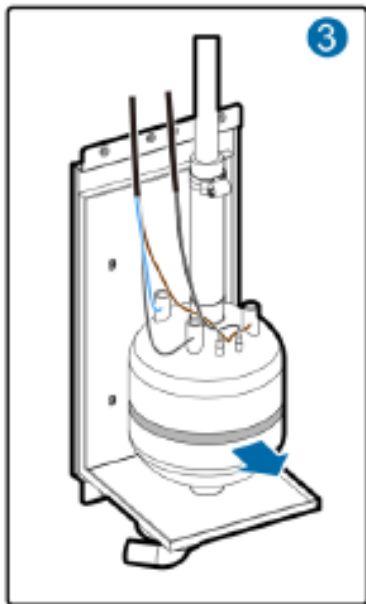
Step 4 Unfasten the screws on the evaporator hose clamp to loosen the evaporator hose, as shown by (1) in Figure;

Step 5 Cut off the cable ties, as shown by (2) in Figure;

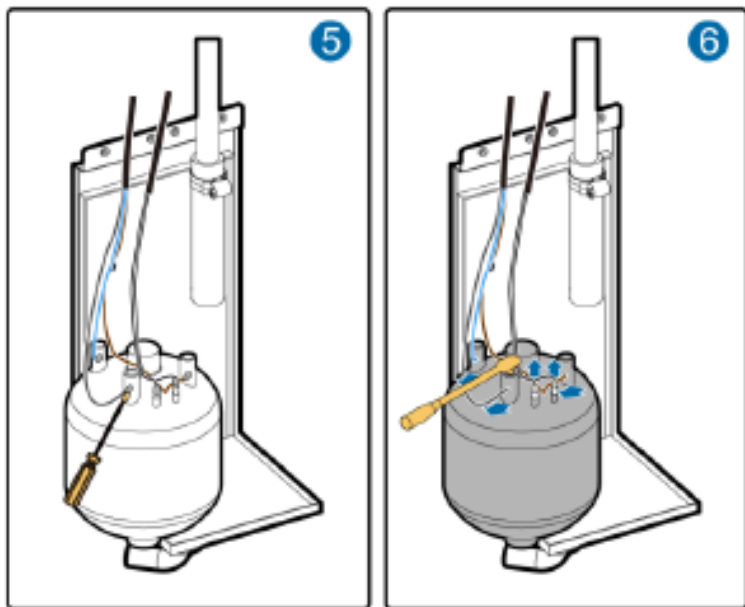
Replacing Humidifier Cylinder (2)

Step 6 Remove the belt clamp on the humidifier cylinder, as shown by (3) in Figure;

Step 7 Pull upward to remove the humidifier cylinder, as shown by (4) in Figure;



Replacing Humidifier Cylinder (3)



Step 8 Remove the scotch glue using a fat-head screwdriver, as shown by (5) in Figure;

Step 9 Remove the cable plug on the top of the humidifier cylinder using a socket wrench, as shown by (6) in Figure;

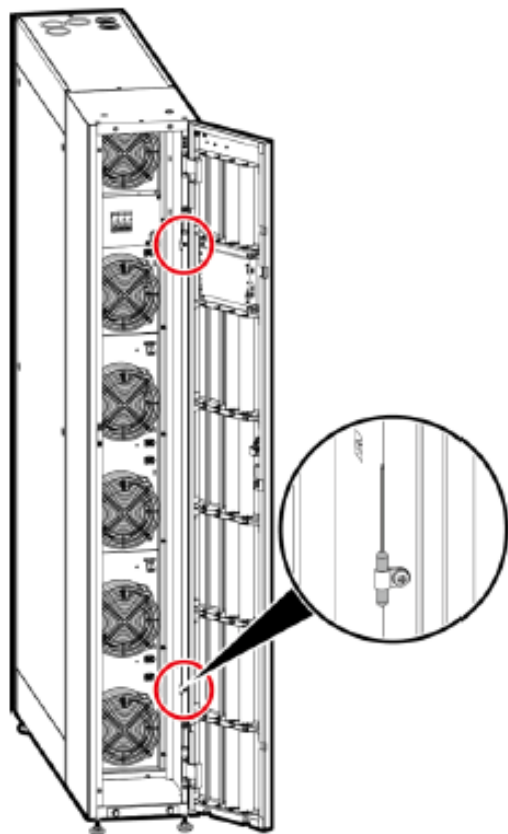
Step 10 Install a new humidifier cylinder in reverse order of Step 1 to Step 9;

Step 11 Verify that cables are correctly connected and power on the device;

Step 12 Choose **Maint** >

Performance Maint on the main menu and then clear the humidifier running time.

Replacing Air Exhaust Temperature Sensor



Step 1 Open the front door;

Step 2 Use a Phillips screwdriver to remove the R-shaped pipe clip that secures the air exhaust

temperature sensor on the front door post, as shown in Figure;

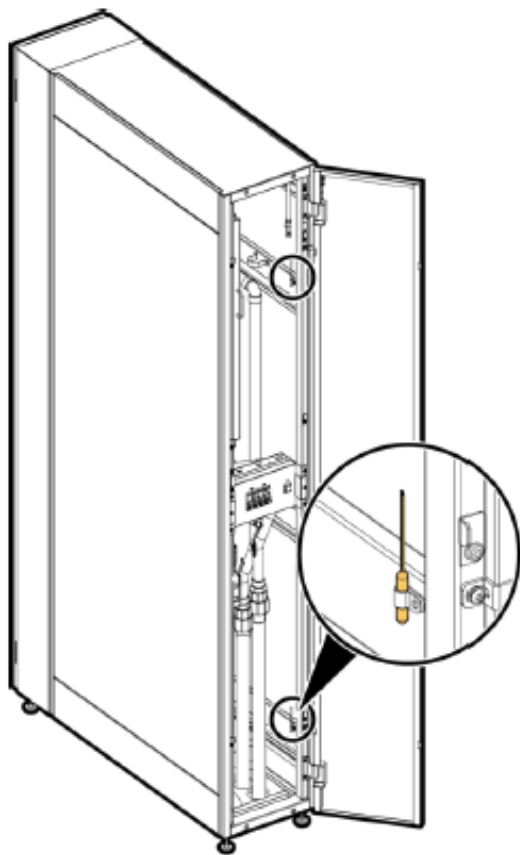
Step 3 Remove the waterproof connector from the sensor cable;

Step 4 Secure a new air exhaust temperature sensor to the original position using the R-shaped pipe clip;

Step 5 Reconnect the waterproof connector to the sensor cable;

Step 6 Close and lock the front door.

Replacing Air Intake Temperature Sensor



Step 1 Open the rear door;

Step 2 Remove the air filters;

Step 3 Use a Phillips screwdriver to remove the R-shaped pipe clip that secures the air intake

temperature sensor on the rear door post, as shown in Figure;

Step 4 Remove the waterproof connector from the sensor cable;

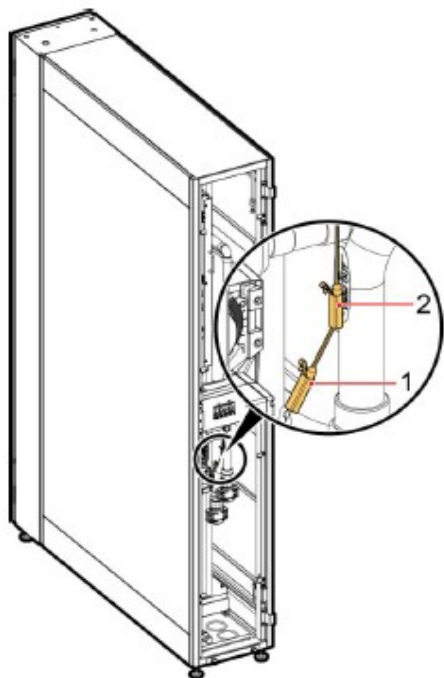
Step 5 Secure a new air intake temperature sensor to the original position using the R-shaped pipe clip;

Step 6 Reconnect the waterproof connector to the sensor cable;

Step 7 Install the air filters. For details, see 5.5 Follow-up Procedure;

Step 8 Close and lock the rear door.

Replacing Water Inlet or Outlet Temperature Sensor



(1) Water inlet temperature sensor

(2) Water outlet temperature sensor

Step 1 Open the rear door and remove the air filters;

Step 2 Cut off the cable ties and the thermal insulation form on the pipe where the temperature sensor is secured;

Step 3 Remove the water inlet or outlet temperature sensor probe. Figure shows the positions of water inlet and outlet temperature sensors;

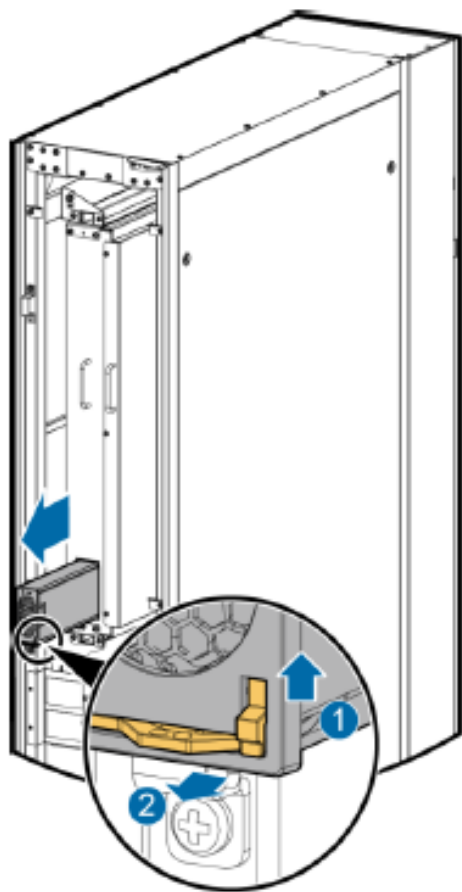
Step 4 Remove the waterproof connector from the sensor cable;

Step 5 Insert the probe of the new temperature sensor into the socket;

Step 6 Reconnect the waterproof connector to the sensor cable, bind the cable, and wrap thermal insulation foam;

Step 7 Install the air filters. Close and lock the rear door.

Replacing Rectifier



Step 1 Open the rear door;

Step 2 Remove the air filters;

Step 3 Push up the buckle button on the rack, as shown by (1) in Figure;

Step 4 Pull out the buckle, as shown by (2) in Figure, and then pull out the rectifier module from the plug-in frame;

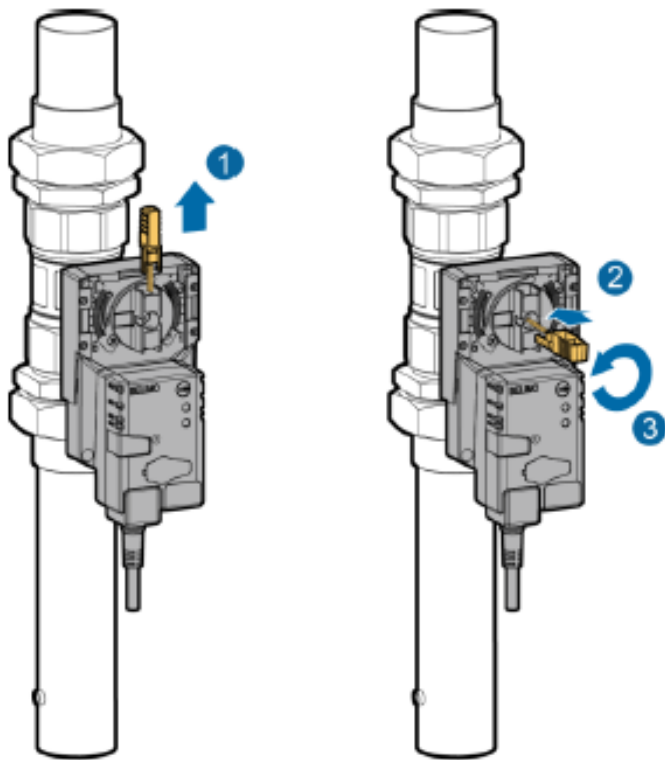
Step 5 Replace the rectifier and insert the new rectifier to the corresponding slot of the power distribution subrack;

Step 6 Push the spare rectifier module to the plug-in frame and connect the cable, and then push downward the buckle button to lock the rectifier module;

Step 7 Install the air filters and rear door;

Step 8 Power on the rectifier and check whether the rectifier works properly.

Replacing Water Valve Actuator and Chilled Water Valve (1)



Step 1 Tap **Shutdown** on the LCD home screen and switch off the active input circuit breaker, standby input circuit breaker, and the external power supply;

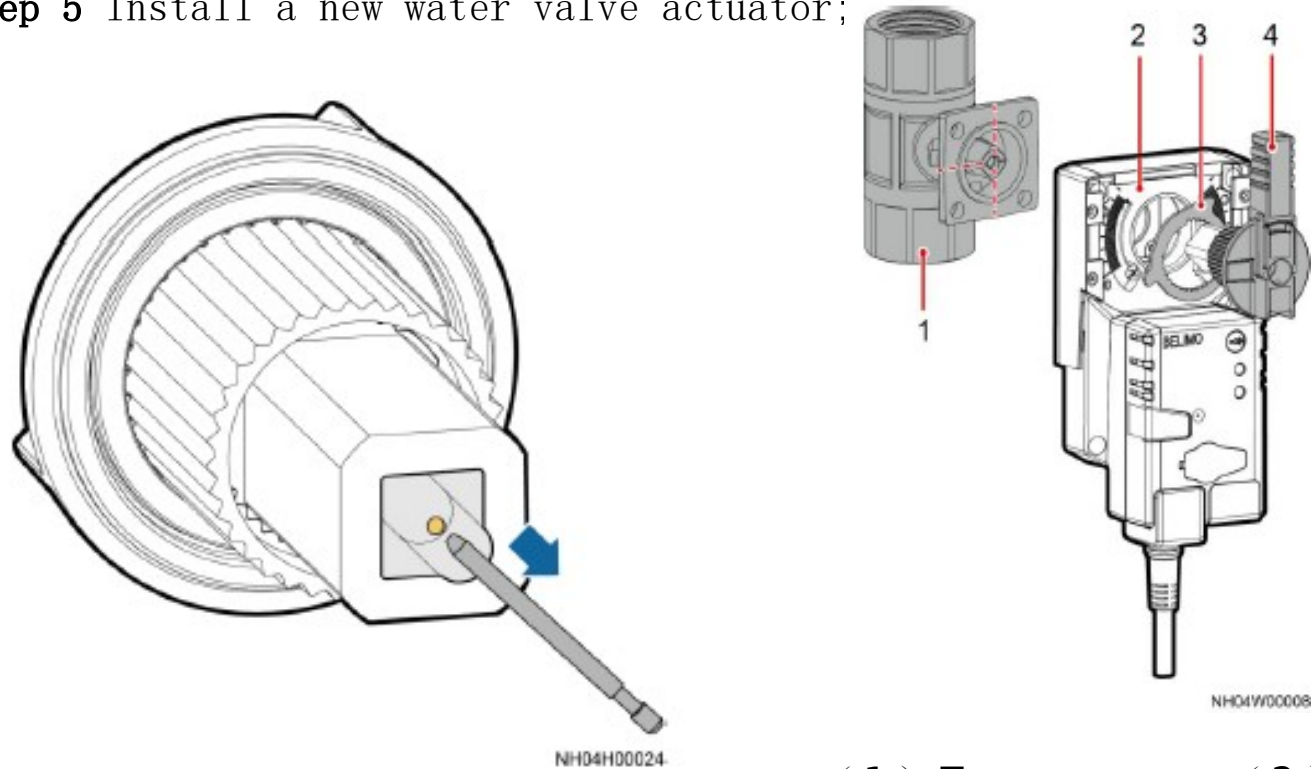
Step 2 Open the rear door and remove the air filter;

Step 3 Remove the circuit breaker cover, remove the cord end terminals 1, 2, 3, and 5 from the actuator using a small-sized flat-head screwdriver, and cut off the cable ties of the actuator to ensure that the actuator cables are separated from the unit;

Step 4 Manually set the chiller water valve opening to 100%;

Replacing Water Valve Actuator and Chilled Water Valve (2)

Step 5 Install a new water valve actuator;



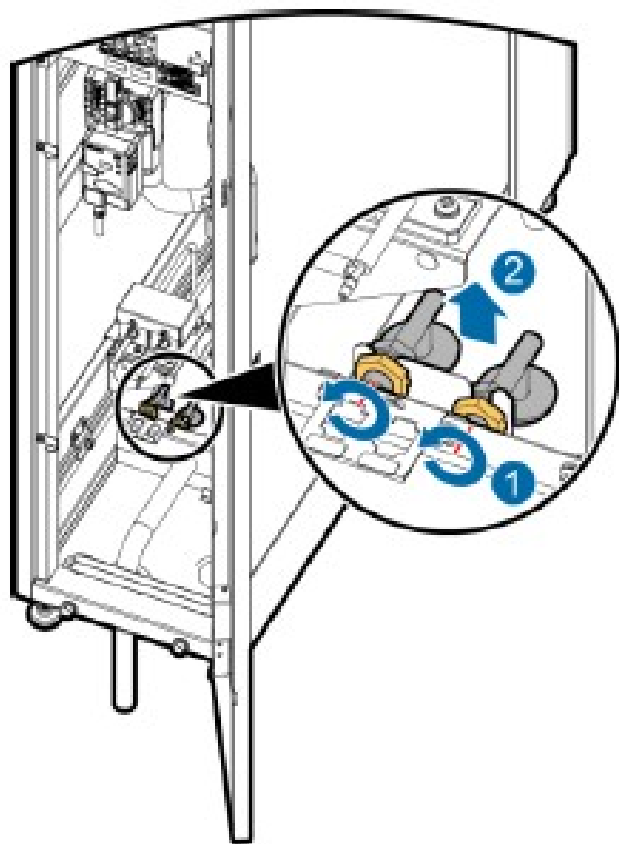
- (1) Two-way valve
- (2) Actuator valve
- (3) Connecting plate
- (4) Actuator handle

Replacing Water Valve Actuator and Chilled Water Valve (3)

Step 6 Power on the equipment. Choose **Maint > Diagnostic Mode > Enter** on the home screen to enter diagnostic mode. Adjust the opening of the chilled water valve to an appropriate value and ensure that no leakage exists. Confirm the setting and exit diagnostic mode;

Step 7 Tap **Maint > Perform Maint** on the home screen and clear the chilled water valve runtime.

Replacing Float



Step 1 Open the rear door;

Step 2 Remove the air filters;

Step 3 Remove the connectors from the float, as shown by (1) in Figure;

Step 4 Use an open-end wrench to remove the nuts fastening the float and take out the float, as shown by (2) in Figure;

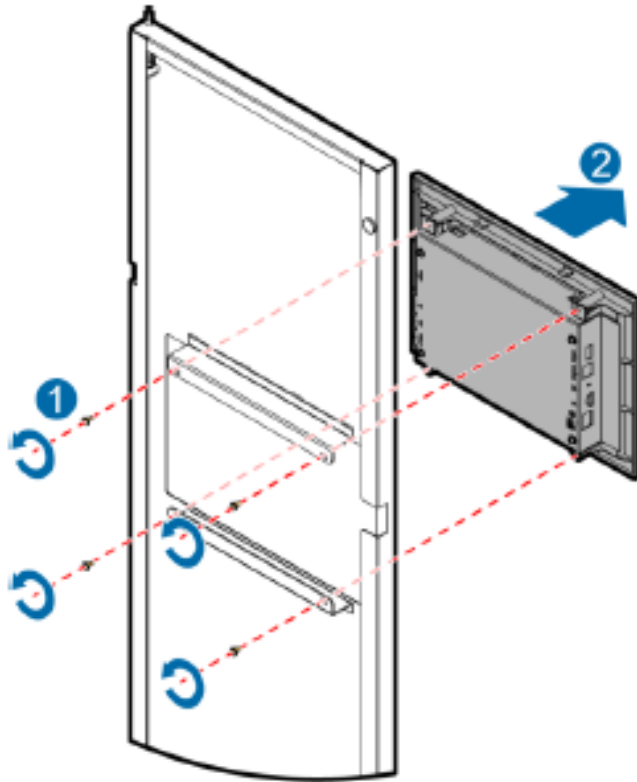
Step 5 Replace the float and install the connectors;

Step 6 Tighten the nuts using the open-end wrench and level the float;

Step 7 Install the air filters. Close and lock the rear door;

Step 8 Tap **Maint** > **Perform Maint** on the home screen and clear the float runtime.

Replacing Controller Panel



Step 1 Open the front door with caution to prevent damaging the controller cables;

Step 2 Remove cables from the controller panel;

Step 3 Remove the controller panel, as shown in Figure;

Step 4 Install the new controller panel in the original position on the front door in a reverse order;

Step 5 Connect the control signal cables to the controller panel. Close and lock the front door.

Quiz

1. When the NetCol5000-C30 kW is working properly, the drain button on the side of the electronic control box should be set in the “OFF” state?
A. T B. F



Summary

- Routine Maintenance
- Troubleshooting
- Parts Replacement



Recommendations

- Huawei E-Learning website:
 - <http://support.huawei.com/learning/en/newindex.html>
- Huawei support case library:
 - <http://support.huawei.com/enterprise/servicecenter?lang=en>

Thank You

www.huawei.com