Next Generation Critical Cooling
for Room and Row

**Liebert PEX**

*Efficiency And Reliability For High Availability Cooling*

# Chilled Water Models
# User Manual

EMERSON
Network Power

# Liebert.PEX Chilled Water Series Air Conditioner

# User Manual

**Version** V1.1
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**Emerson Network Power provides customers with technical support. Users may contact the nearest Emerson local sales office or service center.**



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## ATTENTION - AUSTRALIA & NEW ZEALAND CUSTOMERS

**Please note that the following features apply to PEX units marketed and sold into Australia and New Zealand. These features differ to the content in this user manual and should be considered when specifying, installing, commissioning or maintaining the equipment. Contact your local Emerson sales office for further information or clarification.**

*** 2 way chilled water motorised valves**
*** EC fan option uses 3.1kW motor for all models**

# Contents

# Chapter 1 Overview

**The Liebert.PEX chilled water air conditioner (chilled water AC for short) is a medium-large sized precision environment control system configured with electrical heater and humidifier, suitable for the environment control of the equipment room or computer room. It uses the chilled water supplied by the cooling water units. It aims to provide a sound operation environment for precision equipment, such as sensitive equipment, industry processing equipment, communication equipment and computers.**

**This chapter introduces the model description, main components and environmental requirements of chilled water AC.**

## 1.1 Model Description

**The model description of the chilled water AC is shown in Figure 1-1.**

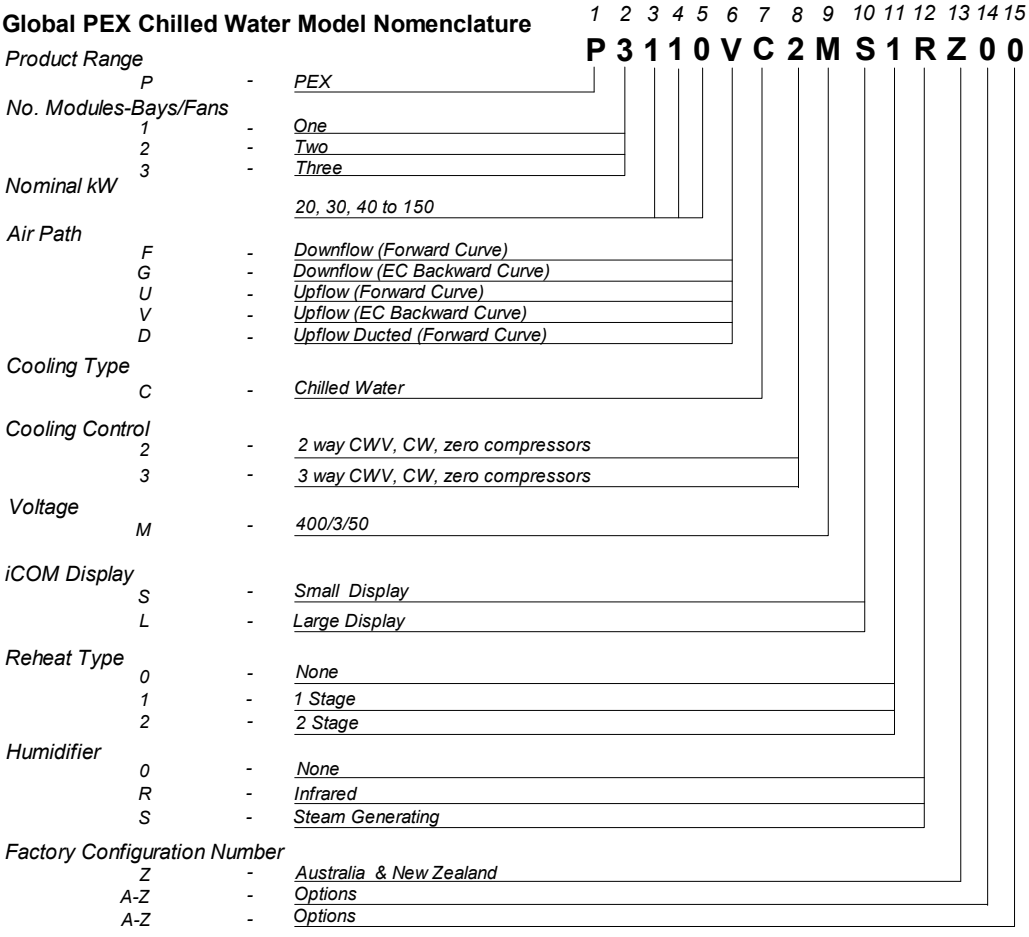



***Figure 1-1 Model description***

## 1.2 Main Components

**The chilled water AC unit includes heat exchanger, infrared humidifier, fan, electrical heater, water flow control valve and micro-processing controller.**

**Heat exchanger**

**Use finned-tube heat exchanger with high heat emission efficiency. The model-specific distributions can ensure the even distribution of chilled water in each loop and greatly improve the efficiency of the heat exchanger, as well as minimize the water resistance of heat exchanging coil.**

**Infrared humidifier**

**Configure with infrared humidifier which is easy for teardown, cleaning and maintenance. It is adjustable to a wide range of water qualities, with fast startup and high humidifying efficiency.**

**Fan**

**Use forward centrifugal fan with high efficiency and reliability, large airflow and long blowing distance. With the belt transmission mechanism, it is easy for maintenance. The user can also select electronically commutated (EC for short) fan with backward blades. EC fan is energy-saving and space-saving with high efficiency and low noise. It is also subject to stepless speed regulation. For the structure of EC fan downflow unit, the solution of air supply by putting fan unit under floor is considered, which can significantly improve the efficiency of air supply.**

**Electrical heater**

**Use screw finned U type stainless steel electrical heating tube, with fast heating speed and evenly distributed heat volume.**

**Water flow control valve**

**The water flow control valve can adjust the chilled water flow quantity according to the cooling requirement. It is connected to the system pipes with live joints, easy for field installation and maintenance, thus reducing the project installation cost.**

**Micro-processing controller**

**The micro-processing controller of the chilled water AC uses an LCD screen with blue backlight and 128 × 64 dots. The user interface operation is simple. The multi-level password protection can effectively prevent illegal operation. It also features power failure auto-restoration and high / low voltage protection function. The operation time of components is available through the menus. The expert-level fault diagnosis system can display the current fault information automatically, facilitating the maintenance. It can store up to 400 records of historical events. The panel of micro-processing controller is shown in Figure 1-2.**


***Figure 1-2 Micro-processing controller panel***

# 1.3 Remote Monitoring Software

**The chilled water AC can communicate with the host computer through a configured communication port to receive the control of the host software.**

# 1.4 Environmental Requirements

## 1.4.1 Operation Environment

**See Table 1-1 for details.**

***Table 1-1 Operation environment requirement***

| Item | Requirement |
|---|---|
| Operation range | Indoor temperature: 4°C ~ 40°C<br>Chilled water supply temperature: 5°C ~ 13°C |
| Altitude | < 1000m. Above that, derating is required |
| Operation voltage range | 400V (-10% ~ +10%), three-phase AC, 50Hz |

### 1.4.2 Storage Environment

**See Table 1-2 for details.**

*Table 1-2 Storage environment requirement*

| Item | Requirement |
|---|---|
| Storage environment | Indoor, clean, no dust |
| Ambient humidity | 5%RH ~ 85%RH (non-condensing) |
| Ambient temperature | -20°C ~ +54°C |
| Storage time | Total transportation and storage time should not exceed 6 months. Otherwise, the performance needs to be re-evaluated |

# Chapter 2 Mechanical Installation

**This chapter introduces the mechanical installation of the chilled water AC, including the transportation and movement, unpacking, inspection, installation notes and installation procedures.**

## 2.1 Installation Preparation

### 2.1.1 Transportation And Movement

**Railroad transportation and shipping are the recommended means of transportation. If truck transportation is unavoidable, choose roads that are less bumpy in order to protect the equipment.**

**The chilled water AC is heavy (see Table 2-1 for the weight parameters). It is recommended to use a mechanical handbarrow such as an electric forklift when unpacking and moving the equipment to the place closest to the installation site. Insert the tines of the forklift below the pallet, as shown in Figure 2-1. Align the tines with the center of gravity to prevent the unit from falling over.**


*Figure 2-1 Fork direction*

**Keep the obliquity within 75° ~ 105° during the movement, as shown in Figure 2-2. Extreme incline is not allowed.**

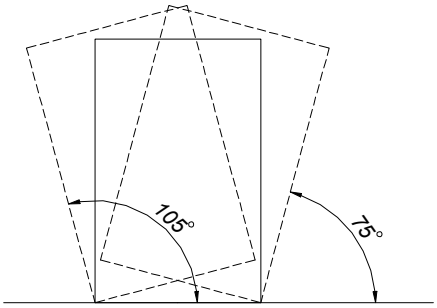



*Figure 2-2 Moving obliquity*

### 2.1.2 Unpacking

**Move the equipment to the place closest to the final installation site and then unpack it.**

**Follow the procedures below to unpack the unit:**

**1. Removing the side boards and top cover**

**The chilled water AC uses international packaging. You can use a hammer or straight screwdriver to straighten the hook, as shown in Figure 2-3.**

*Figure 2-3 Straightening the hook*

**At first, straighten all the hooks that fix side board I, and remove side board I. Then straighten all the hooks that fix side board II, and remove side board II. At last remove top cover III, as shown in Figure 2-4.**

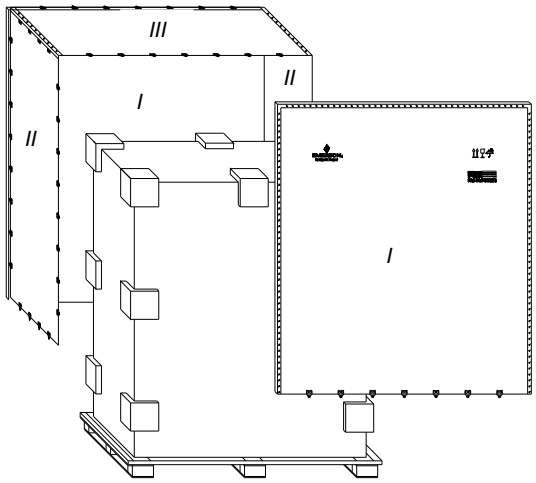



*Figure 2-4 Removing side boards and top cover*

**2. Removing the pallet**

**The chilled water AC is fixed onto the pallet with M10 × 70 screws, as shown in Figure 2-5. You can use an M10 open-end spanner, a ratchet spanner or a sleeve to remove the fixing screws.**

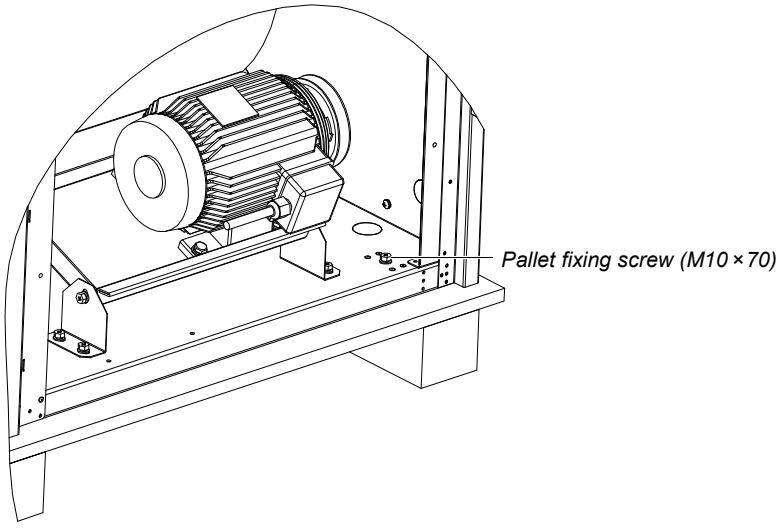



*Figure 2-5 Fixing screw position of pallet*

### 2.1.3 Inspection

**After receiving the product, you should check it against the packing list. If any parts are found missing, distorted or damaged, please report to the carrier immediately. If any covert defects are found, please report to the carrier and the local office of Emerson Network Power Co., Ltd.**

### 2.1.4 Installation Notes

**To realize the designed performance and maximum product life, correct installation is vital. This section should be used in conjunction with local industry standards for mechanical and electrical installations. Note the following items:**

**1. The chilled water AC is designed for integrated floor installation. It should be installed on the floor of the equipment room or computer room.**

**2. Before the installation, make sure that the installation environment meets the requirements (see *1.4 Environmental Requirements*) and the building should be transformed to accommodate the construction work of piping, wiring and ventilation ducts.**

**3. Follow the design drawings strictly when installing the equipment, and reserve the space for maintenance. The engineering dimensions drawings provided by the manufacturer can serve as a reference.**

## 2.2 System Installation Arrangement

### 2.2.1 General Arrangement

**The general arrangement of the chilled water AC is shown in Figure 2-6.**

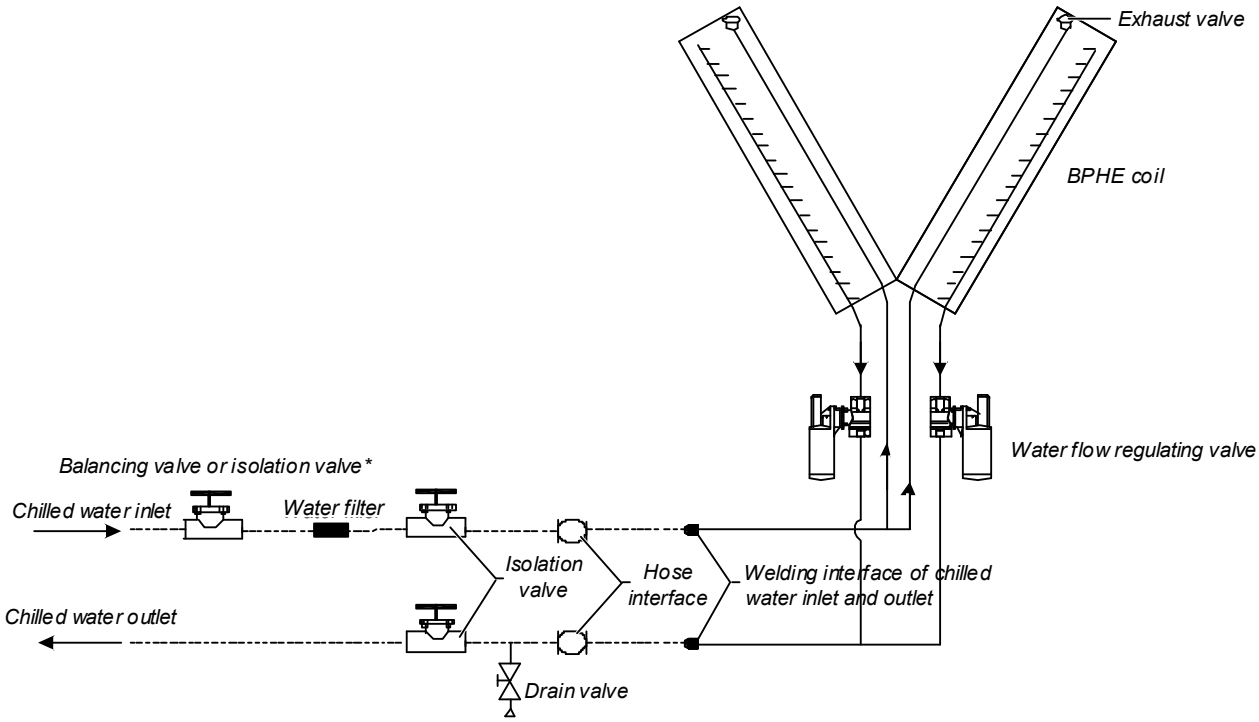



***Figure 2-6 General arrangement diagram***

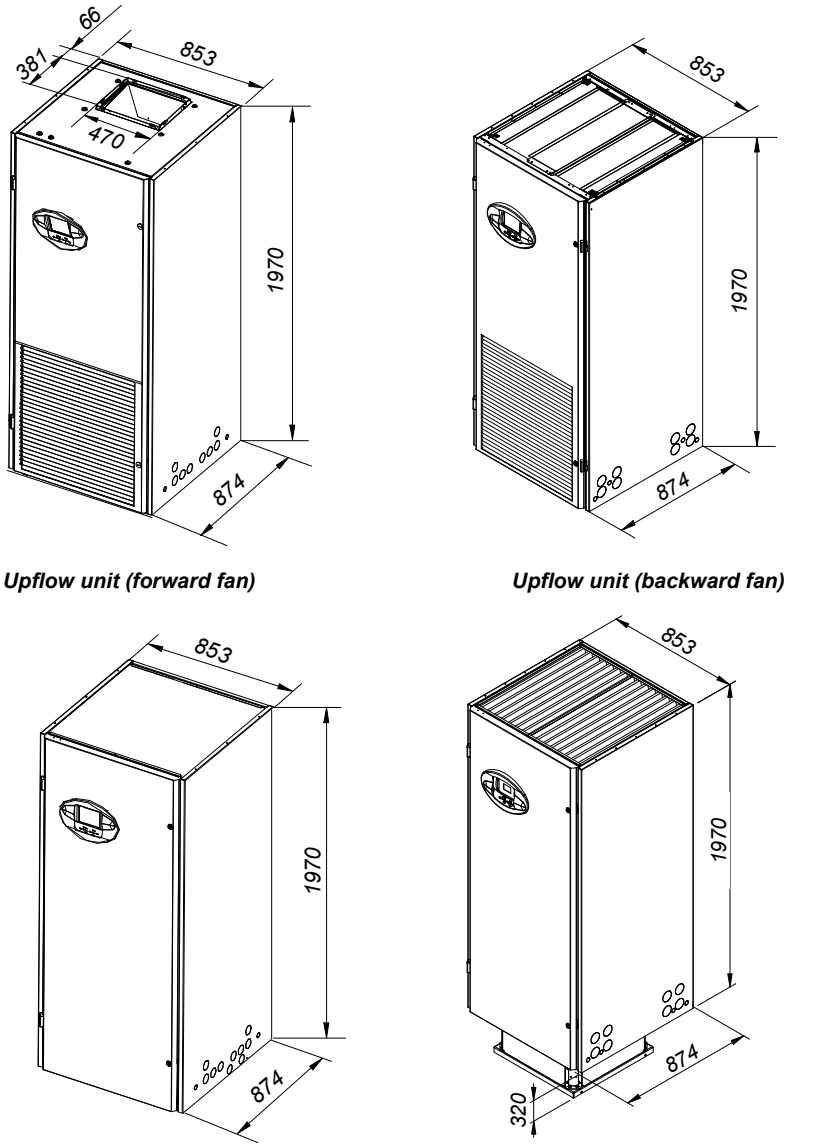
**Note**

1. ———— : Factory piping.
2. — — — — — — : Field piping (by technicians).
3. *: Components are not supplied by Emerson but are recommended for proper circuit operation and maintenance.
4. After the project installation, exhaust the AC unit before filling water to ensure the efficiency of the heat exchanger.
5. In winter, the AC unit in northern area does not operate for a long term; you must empty the water in AC unit to protect the heat exchanger from frost cracking.

## 2.2.2 Mechanical Parameters

**Dimensions**

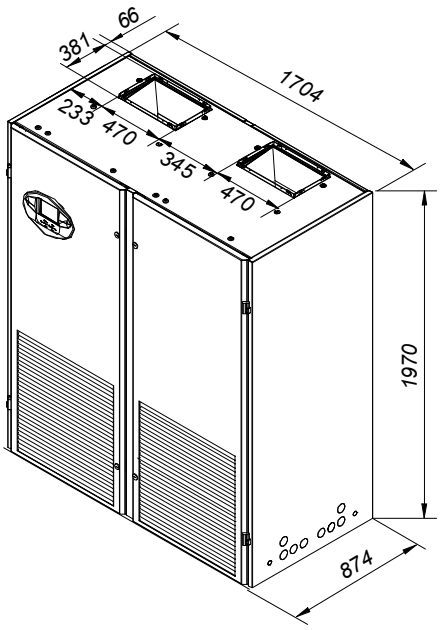
**The dimensions of the chilled water AC are shown in Figure 2-7, Figure 2-8, Figure 2-9 and Table 2-1.**



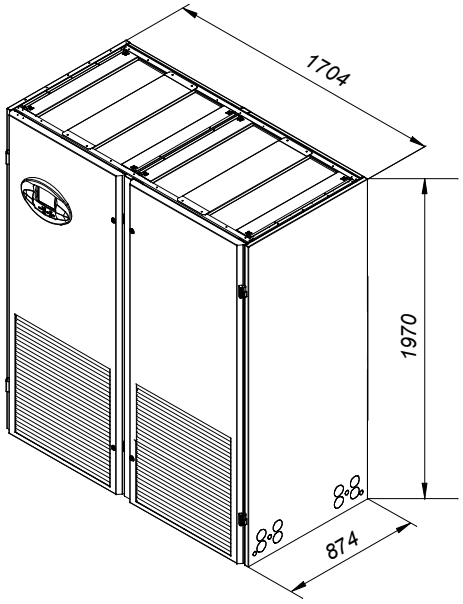

*Upflow unit (forward fan)* *Upflow unit (backward fan)*

*Downflow unit (forward fan)* *Downflow unit (backward fan)*

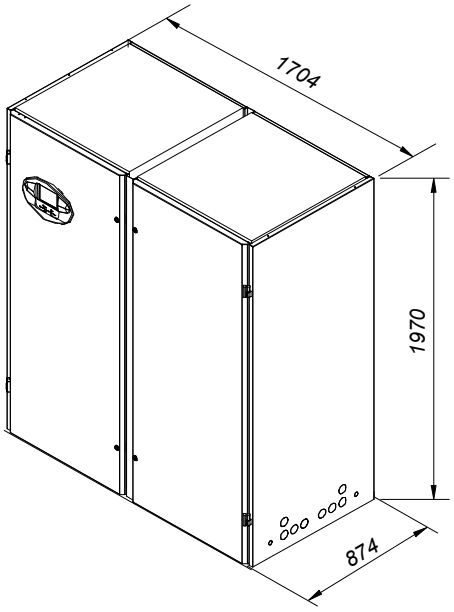
*Figure 2-7 One-bay series (unit: mm)*



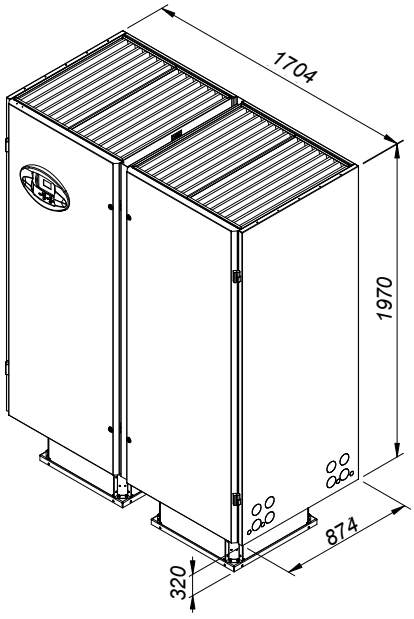

*Upflow unit (forward fan)*




*Upflow unit (backward fan)*

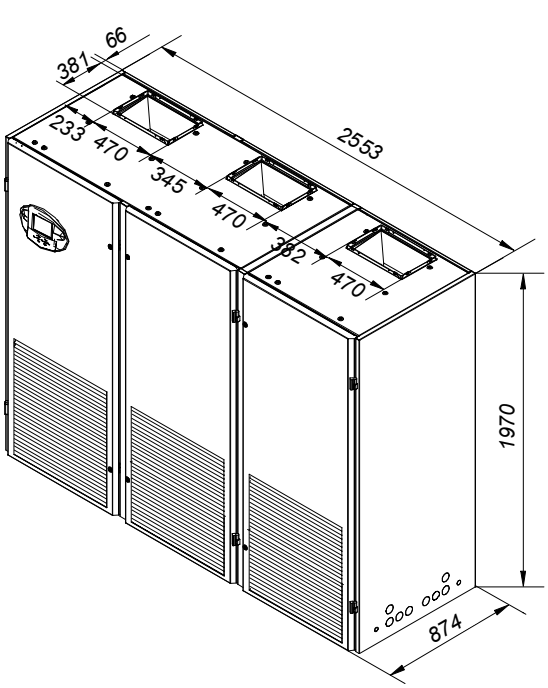



*Downflow unit (forward fan)*

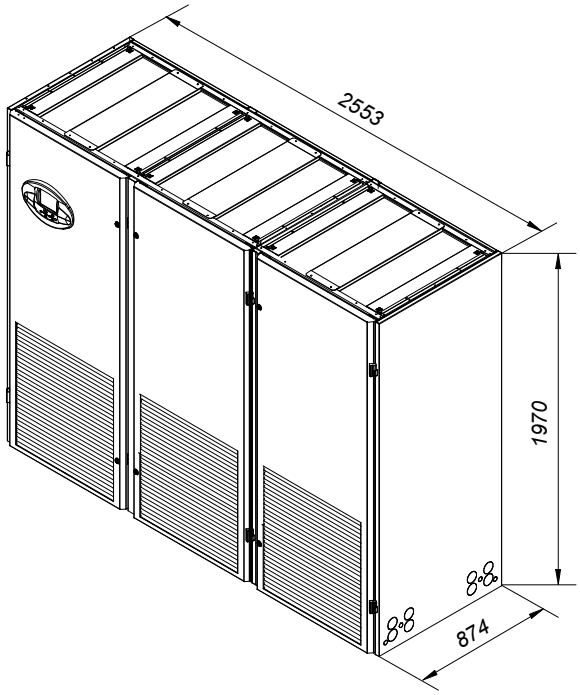



*Downflow unit (backward fan)*

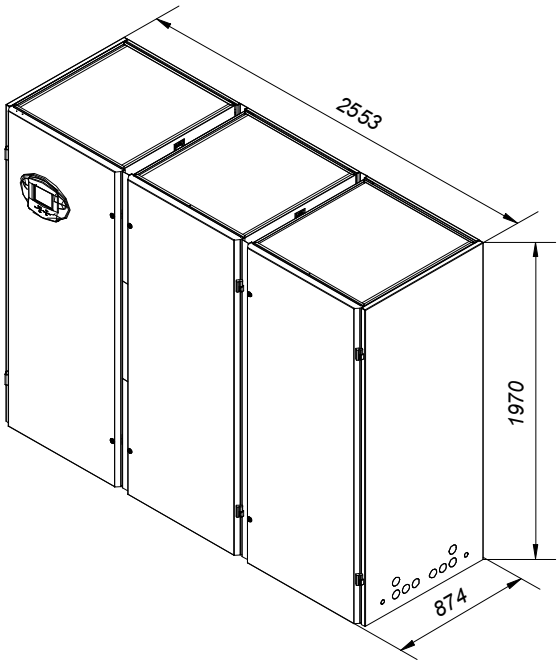
***Figure 2-8 Two-bay series (unit: mm)***



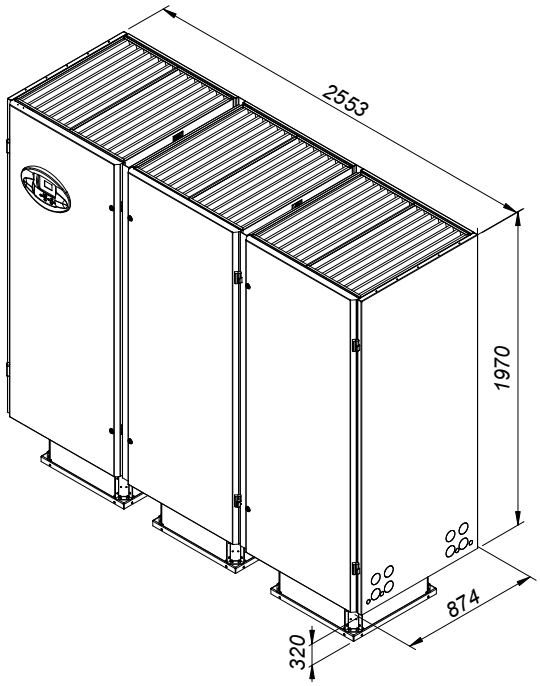

*Upflow unit (forward fan)*




*Upflow unit (backward fan)*




*Downflow unit (forward fan)*




*Downflow unit (backward fan)*

*Figure 2-9 Three-bay series (unit: mm)*

*Table 2-1 Dimension*

| Model | Dimensions (W × D × H) (mm) | Net weight (kg) |
|---|---|---|
| P1020 | 853 × 874 × 1970 | ≤ 315 |
| P1030 | 853 × 874 × 1970 | ≤ 315 |
| P1040 | 853 × 874 × 1970 | ≤ 338 |
| P1050 | 853 × 874 × 1970 | ≤ 343 |
| P2050 | 1704 × 874 × 1970 | ≤ 476 |
| P2070 | 1704 × 874 × 1970 | ≤ 476 |
| P2090 | 1704 × 874 × 1970 | ≤ 505 |
| P2100 | 1704 × 874 × 1970 | ≤ 530 |
| P3110 | 2553 × 874 × 1970 | ≤ 656 |

| Model | Dimensions (W × D × H) (mm) | Net weight (kg) |
|---|---|---|
| P3140 | 2553 × 874 × 1970 | ≤ 706 |
| P3150 | 2553 × 874 × 1970 | ≤ 715 |

**Plenum dimensions**

**You can select the air supply plenum with grids for the upflow system. The appearance of the plenum is shown in Figure 2-10, Figure 2-11 and Figure 2-12. The detailed dimensions are listed in Table 2-2.**

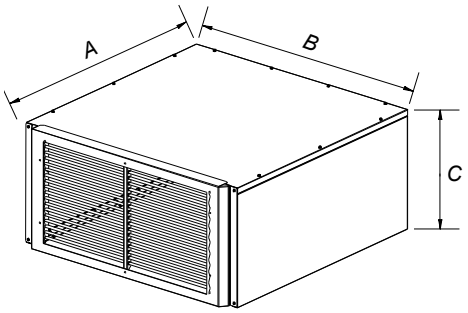



*Figure 2-10 One-bay plenum*

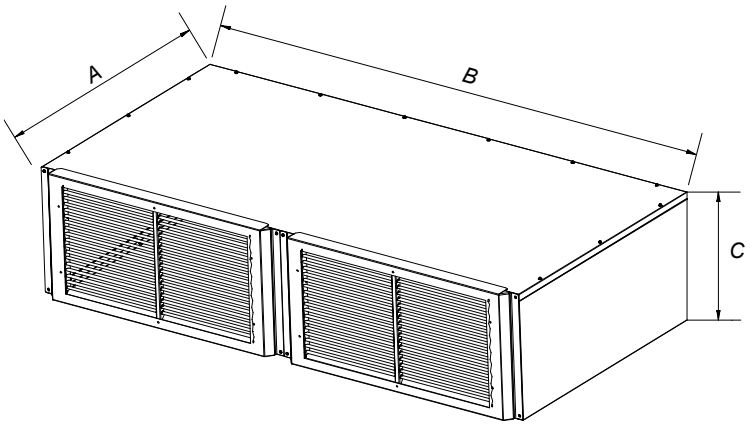



*Figure 2-11 Two-bay plenum*

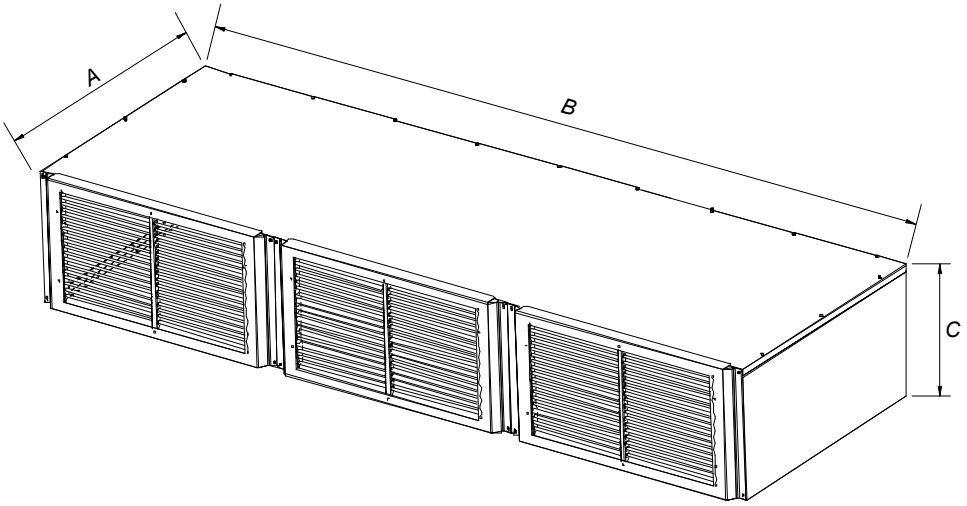



*Figure 2-12 Three-bay plenum*

*Table 2-2 Dimensions of plenum (unit: mm)*

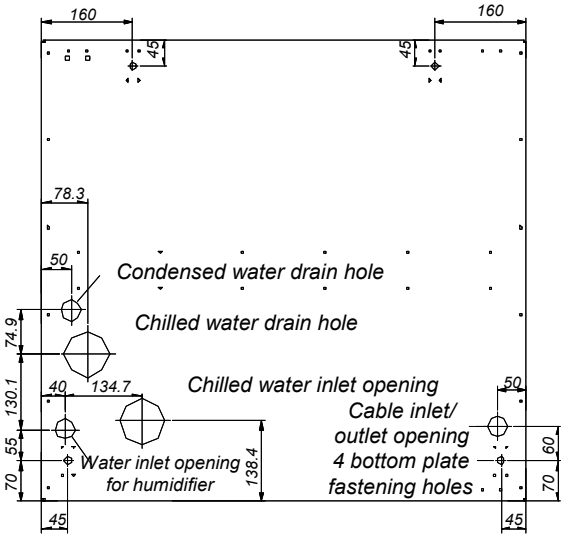
| Type | A | B | C |
|---|---|---|---|
| One-bay | 867 | 853 | 400 (600, optional) |
| Two-bay | 867 | 1704 | 400 (600, optional) |
| Three-bay | 867 | 2553 | 400 (600, optional) |

**Note**

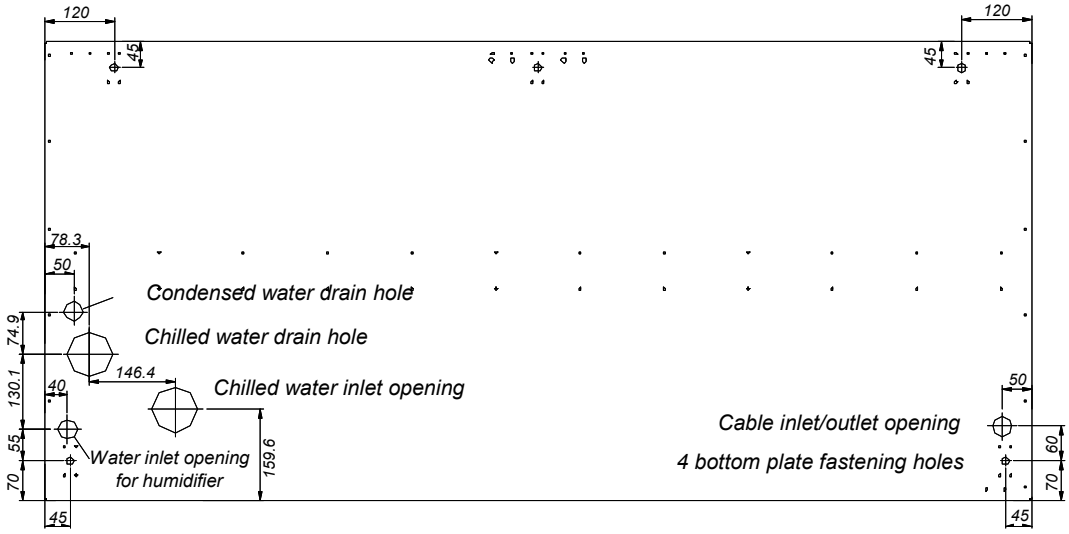
If the height of the plenum selected for air conditioner unit exceeds 600mm, consult the factory for non-standard production.

**Base cut-out location dimensions**

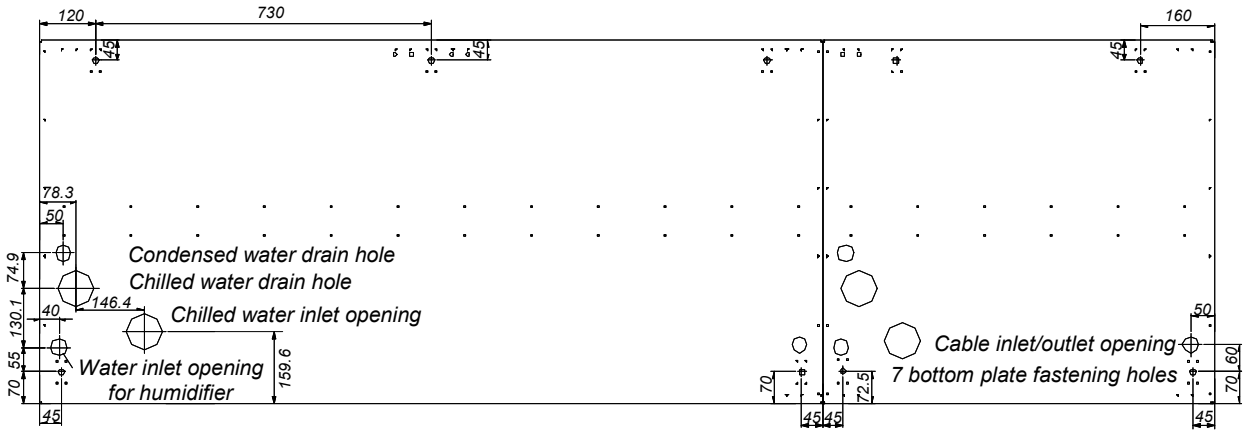
**The base cut-out position dimensions of the chilled water AC are shown in Figure 2-13, Figure 2-14 and Figure 2-15.**




***One-bay series***

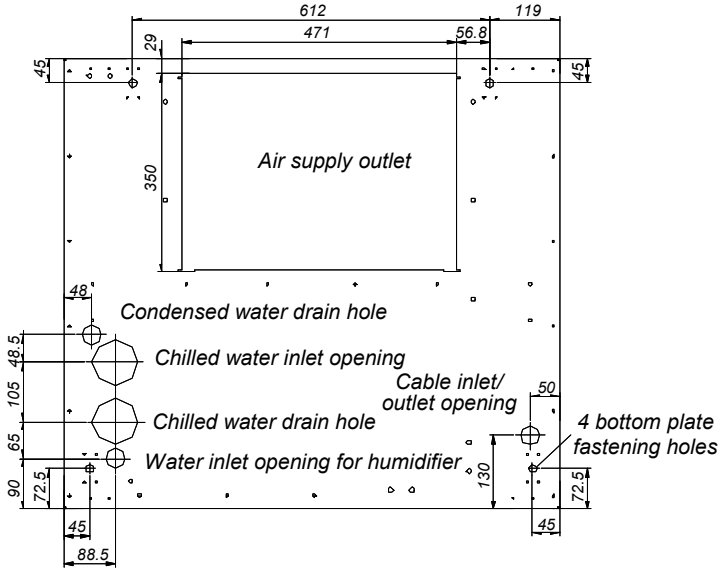



***Two-bay series***

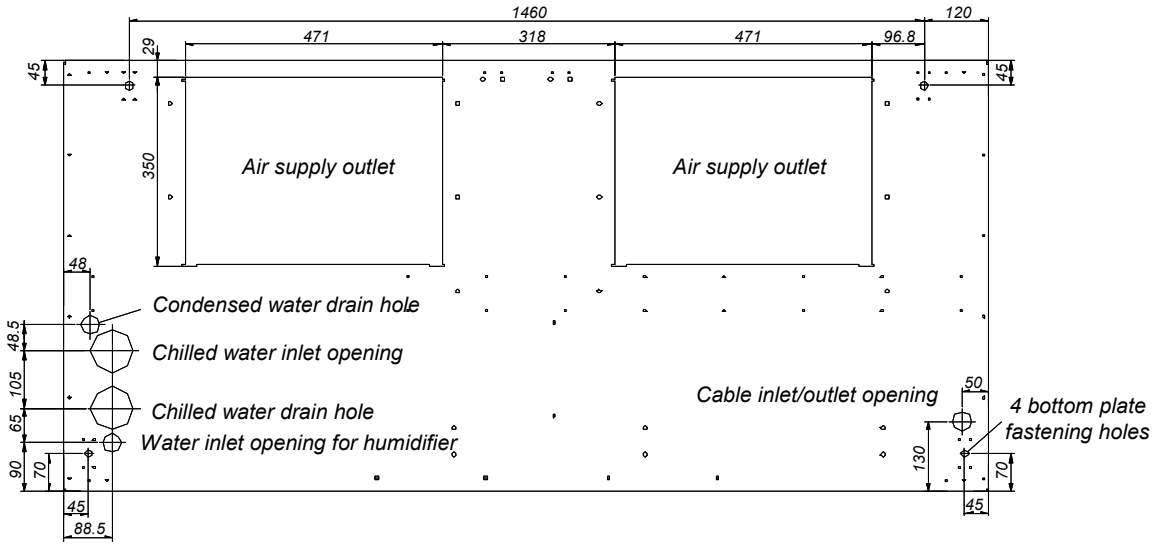



***Three-bay series***

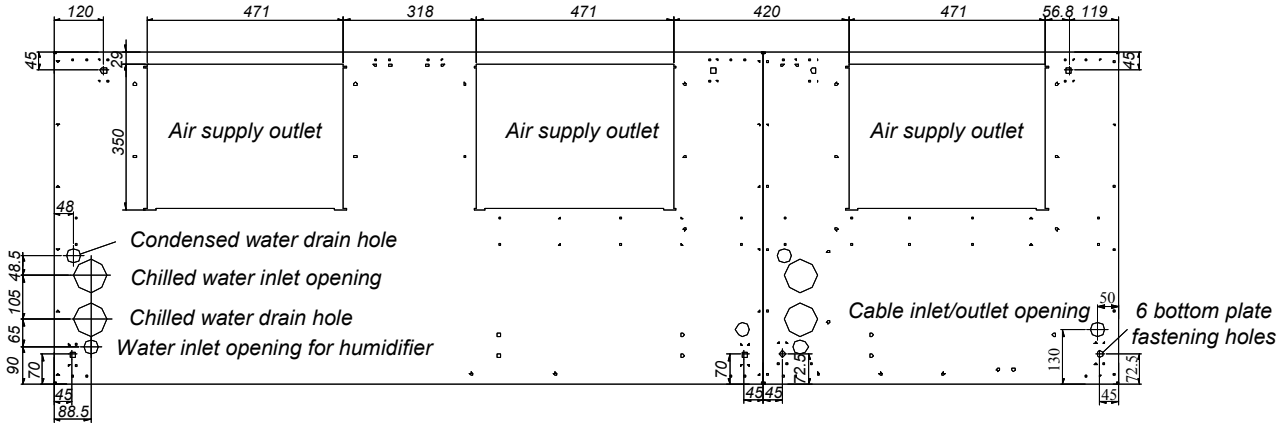
*Figure 2-13 Base cut-out locations of the upflow series (unit: mm)*




***One-bay series***

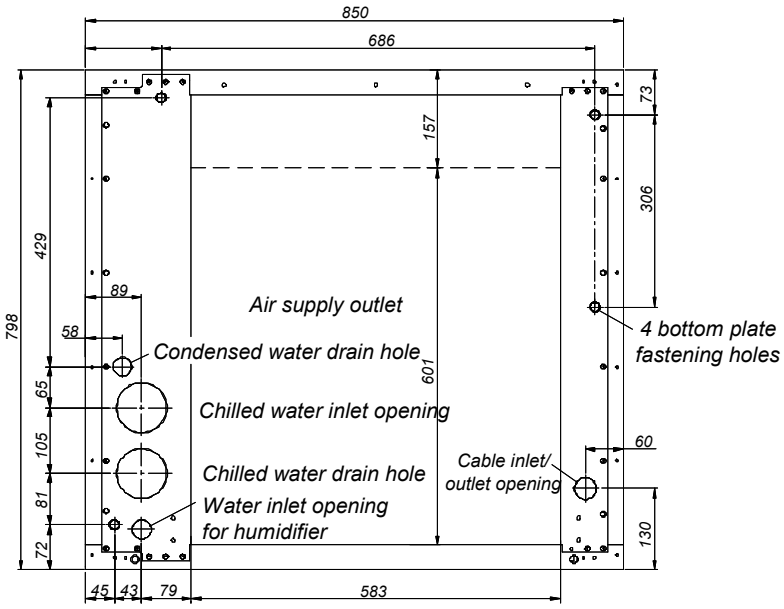



***Two-bay series***

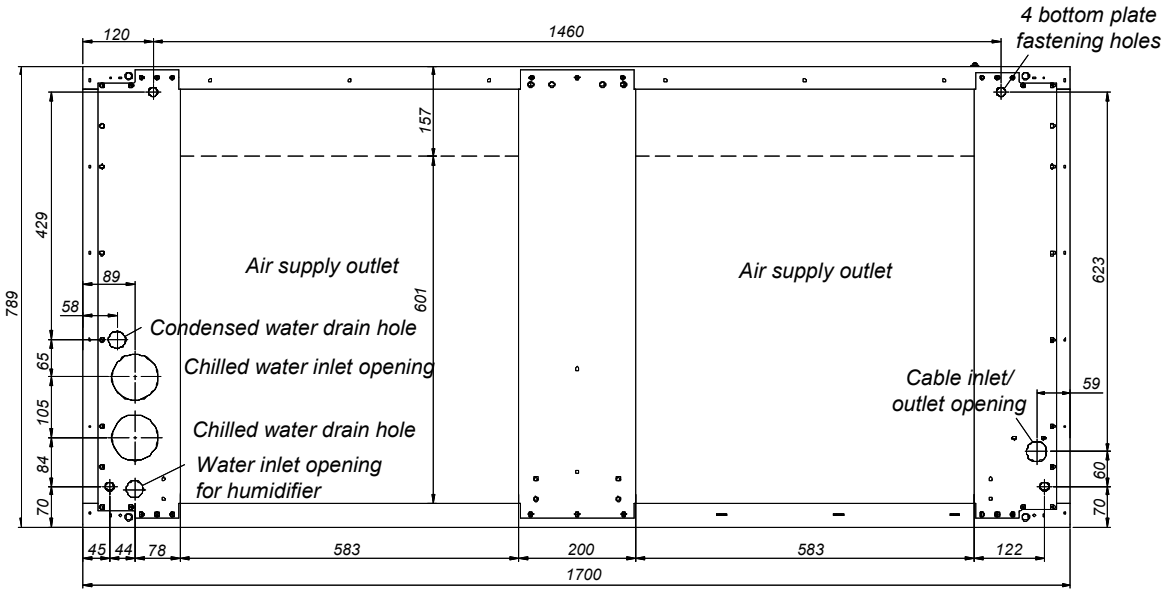



***Three-bay series***

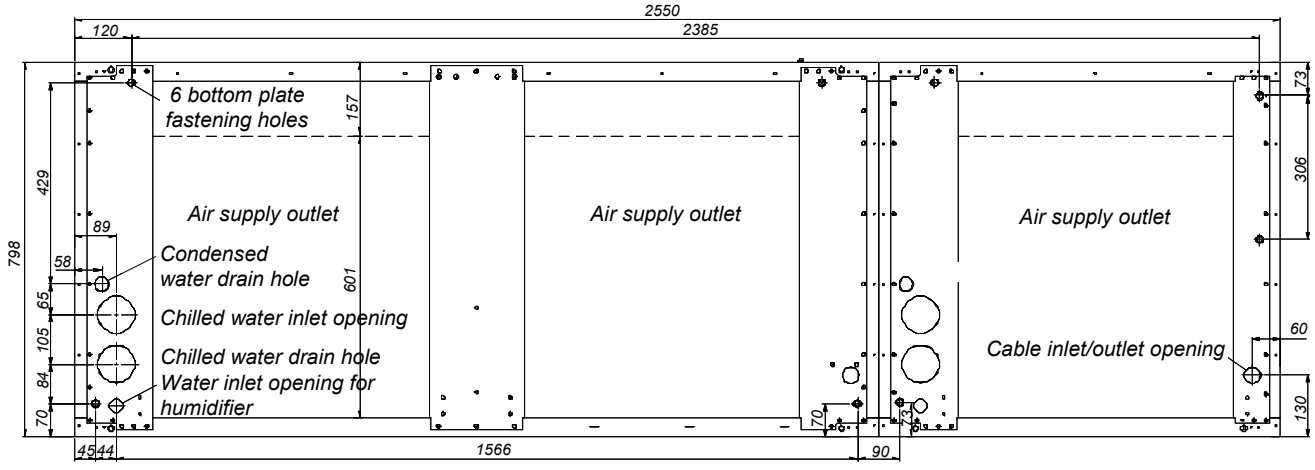
*Figure 2-14 Base cut-out locations of the forward fan downflow series (unit: mm)*




***One-bay series***




***Two-bay series***

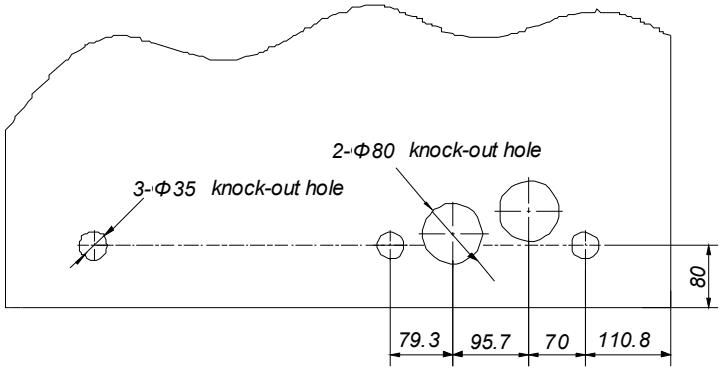



***Three-bay series***

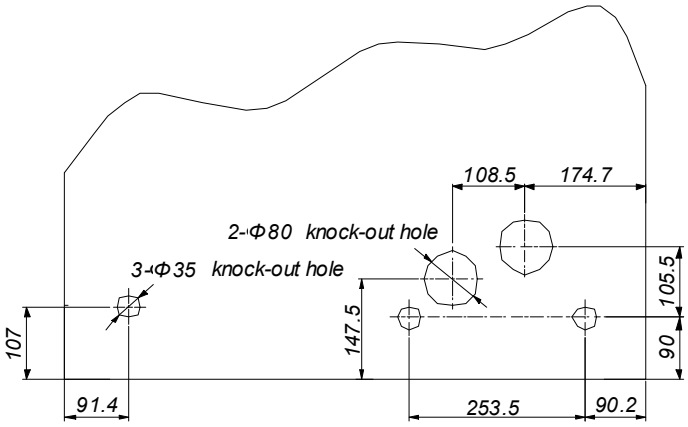
***Figure 2-15 Base cut-out locations of the backward fan downflow series (unit: mm)***

**Side panel cut-out locations**

**If piping and wiring from the base are difficult, connection from side panel can be selected. The locations and dimensions of knock-out holes are shown in Figure 2-16. You can select the in and out holes according to the factual needs, but must confirm that any two cables of pipe, power cable and signal cable cannot use the same hole.**




***Upflow series***




***Downflow series***

***Figure 2-16 Knock-out holes of side panel (unit: mm)***

# 2.3 Installing Chilled Water AC Unit

## 2.3.1 Installation Requirement

**Equipment room requirement**

**The requirements of equipment room are as follows:**

**1. Damp proof and heat preservation must be done to make sure that the system can operate normally.**

**2. The equipment room should have good heat insulation and sealed damp proof layer. The damp proof layer of the ceiling and walls must use polyethylene film, and the coating of the concrete wall and the floor must be damp proof.**

**3. Prevent the outdoor air from entering the equipment room, because the outdoor air that enters the equipment room may increase the load of heating, cooling, humidifying and dehumidification of the system. It is recommended that the inhalation of outdoor air be kept below 5% of the total indoor airflow.**

**4. All the doors and windows should be closed and the seams should be as narrow as possible.**

**Installation space requirement**

> 🕮 **Note**
>
> The chilled water AC will generate condensed water, and water leakage may damage the precision equipment nearby. So do not install the system in the vicinity of any precision equipment, and the installation site must provide drain pipes.

**1. To ensure normal operation, the installation space for the indoor unit shall be capacious enough.**

**2. Too small space for the indoor unit will baffle the airflow, shorten the cooling cycle; the air supply and air exhaust may mix, and the decibel may rise.**

**3. Do not place the indoor unit in a concave or at the end of a strip area.**

**4. Do not huddle multiple indoor units, lest there should be mixed airflow, unbalanced load and competitive operation.**

**5. For the convenience of daily maintenance, do not install other equipment (such as smoke detector) above the cabinet.**

**6. Backward fan downflow unit: because the fan needs to sink during the operation, so the floor must be higher than 400mm.**

**Figure 2-17 shows the installation place of the indoor unit.**

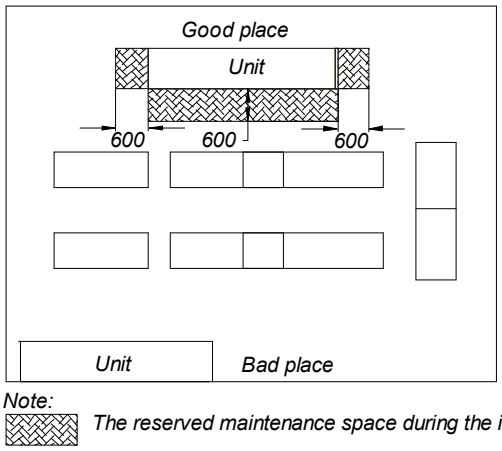



***Figure 2-17 Installation place of indoor unit (unit: mm)***

**Maintenance space requirement**

**Leave more than 600mm of maintenance space in the front and on both sides of the chilled water AC unit, as shown in Figure 2-17.**

## 2.3.2 Installation Procedures

**The installation procedures of indoor unit are as follows:**

**1. Make the mounting base according to the dimensions in Figure 2-18, Figure 2-19 and Figure 2-20 and the requirements in Table 2-3. You can make it yourself or contact Emerson Network Power Co., Ltd. for non-standard production.**

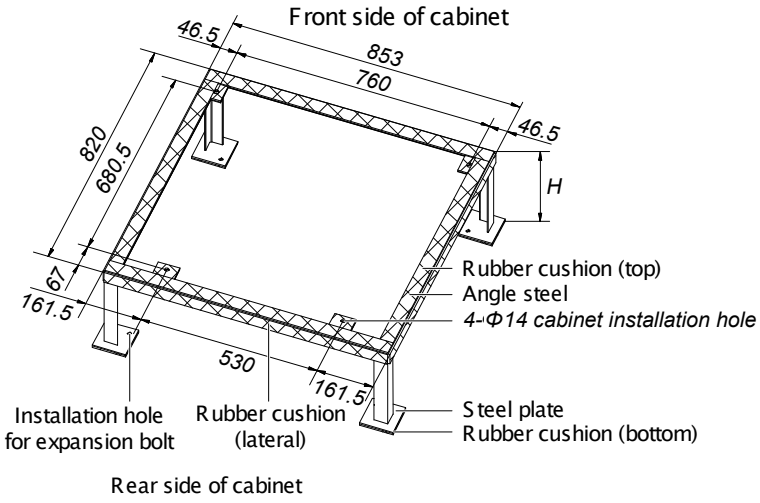



***Figure 2-18 Mounting base of one-bay series (unit: mm)***

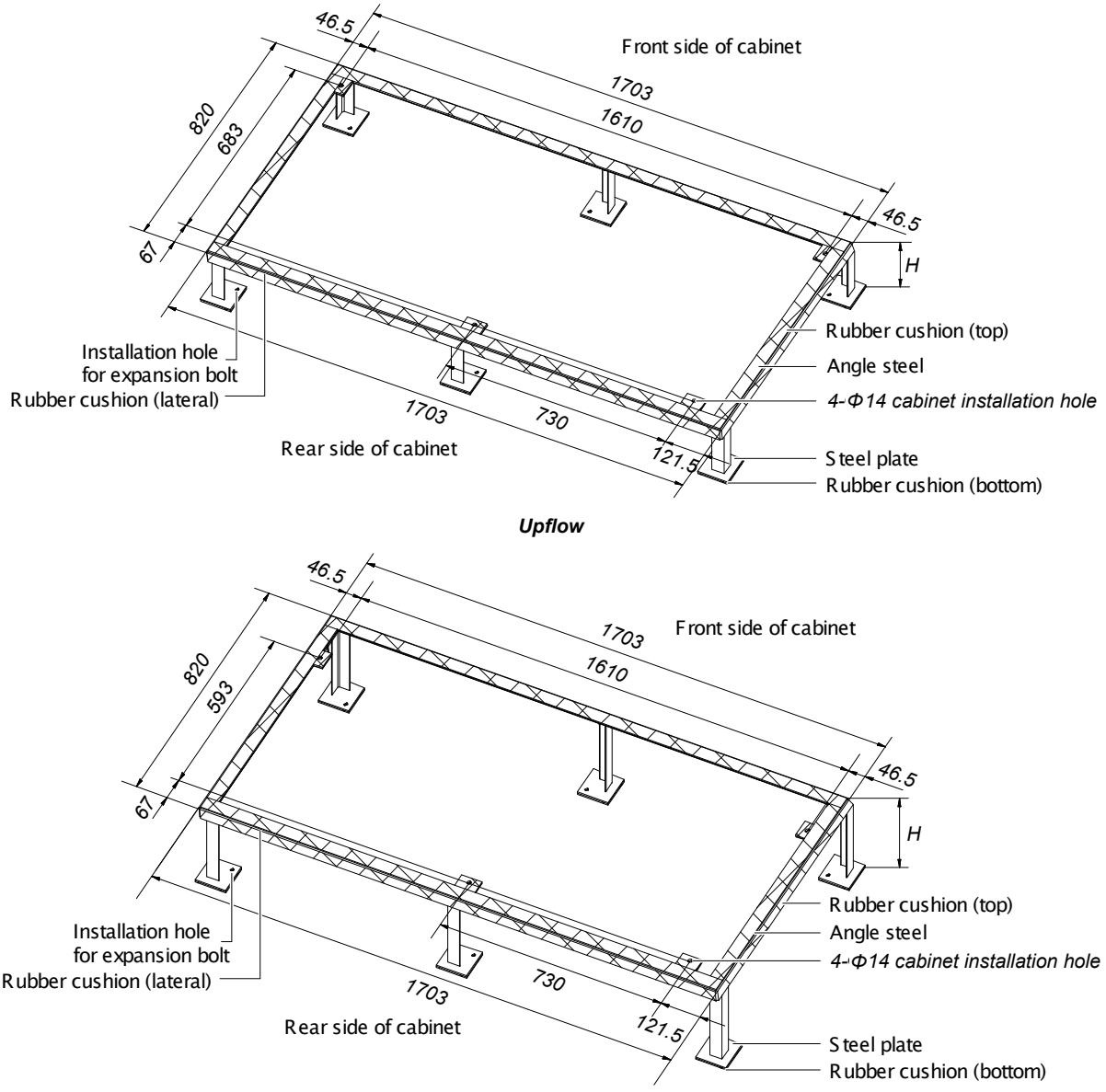



***Figure 2-19 Mounting base of two-bay series (unit: mm)***

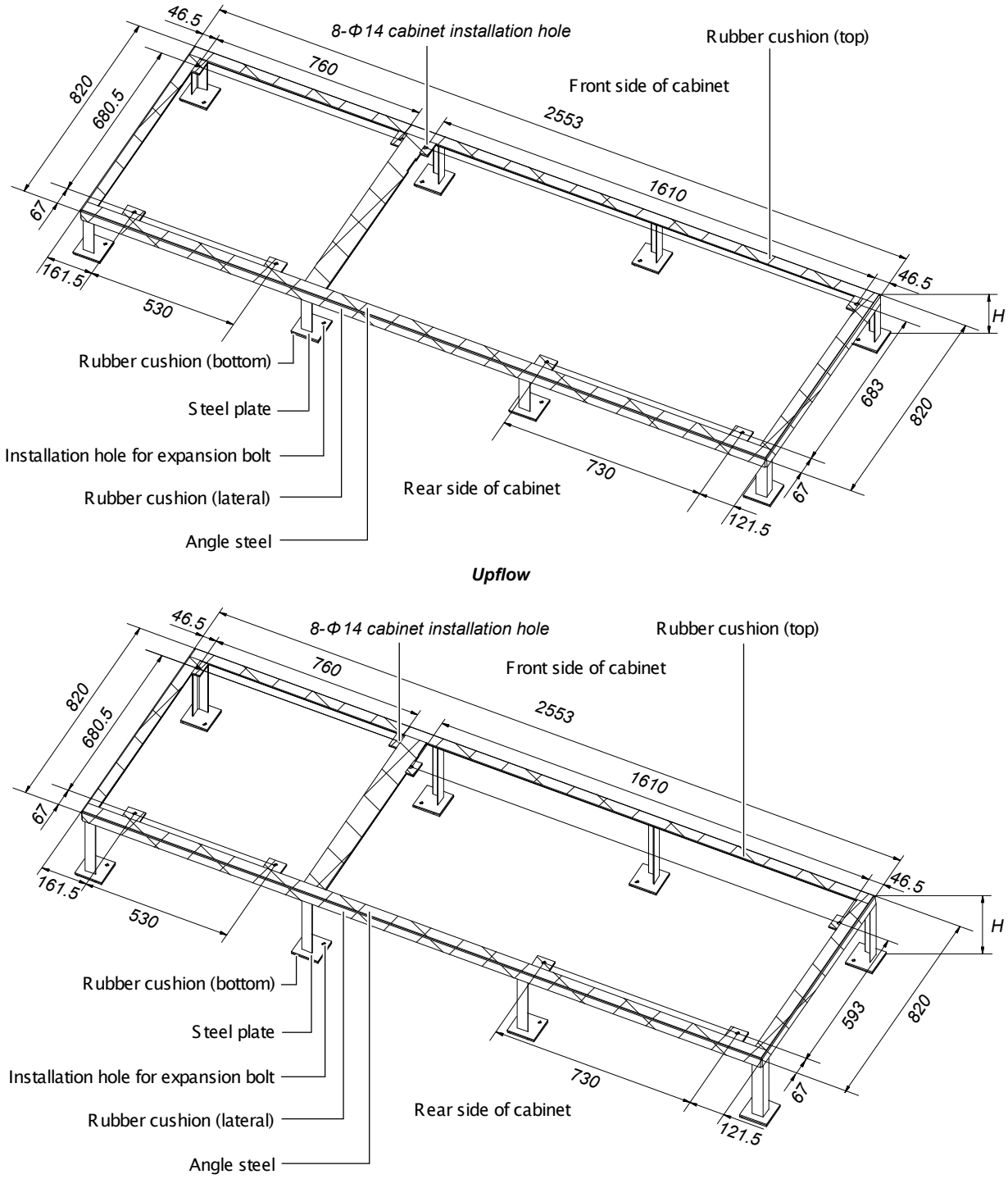



***Figure 2-20 Mounting base of three-bay series (unit: mm)***

*Table 2-3 Specifications of indoor unit mounting base*

| Item | | Specification | Remark |
|---|---|---|---|
| Steel plate | | 100mm × 100mm × (5 ~ 6.5)mm | - |
| Angle steel | | 40mm × 40mm × 3mm | - |
| Rubber cushion | Top | Thickness: 3mm ~ 5mm | - |
| | Lateral | Thickness: 2mm ~ 3mm | - |
| | Bottom | Thickness: 10mm ~ 12mm | - |
| Installation hole for expansion bolt | | - | Install the bolts according to your requirements |
| H | One-bay | H = 200mm (upflow unit)<br>H = 300mm (forward fan downflow unit, according to the floor height)<br>H ≥ 400mm (backward fan downflow unit) | 1. The forward downflow unit needs guide plate.<br>2. Size H here is for reference only, and it shall be determined according to the actual needs. Backward fan downflow unit: because the fan needs to sink during the operation, size H must be larger than 400mm |
| | Two-bay | | |
| | Three-bay | | |
| Note:<br>The external side boards of the unit cannot bear weight. Take this into consideration while selecting angle steels and fixing holes | | | |

**2. Lay a layer of rubber cushion on the top, lateral of mounting base and on the bottom of the steel plate respectively. See Figure 2-18, Figure 2-19 and Figure 2-20 for their positions and see Table 2-3 for the thickness.**

**3. Determine the installation position. Fix the mounting base onto the mounting base according to the site conditions and your requirement.**

**4. Fix the AC unit onto the mounting base with nuts, spring washers, flat washers and bolts.**

**5. Backward fan downflow unit: the fan must sink under floor, the detailed operation procedures are as follows:**

**a. Before placing the unit to the actual installation location, open the rear board and remove the backward fan fixing board, then install the rear board, see Figure 2-21;**

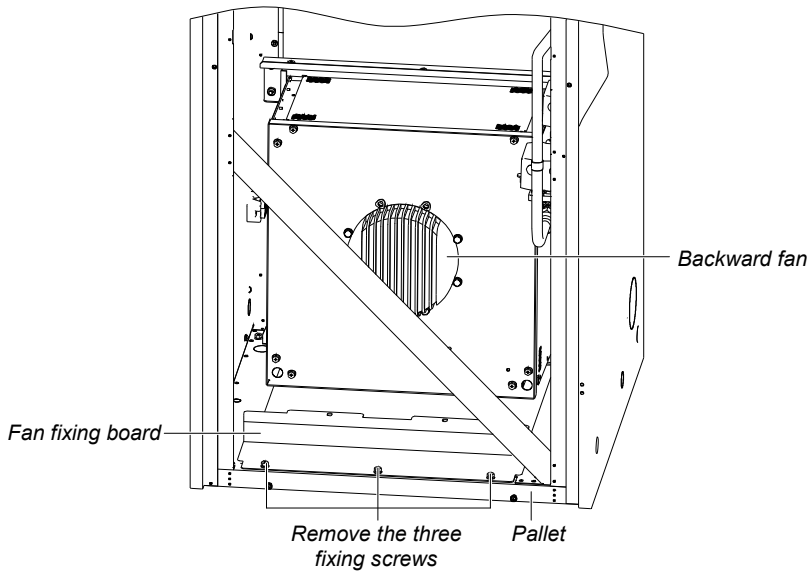



*Figure 2-21 Removing backward fan fixing board*

**b. Place the unit to the actual installation location, and remove backward fan transportation fixing board and pallet, see Figure 2-22;**

- **Remove the humidifier water tray drain pipe;**
- **Remove the transportation fixing board (7 fixing screws);**
- **Remove the pallet (2 fixing screws);**

**Note**

When removing the pallet, you must grasp the handle and support the fan so as to prevent the fan from falling.

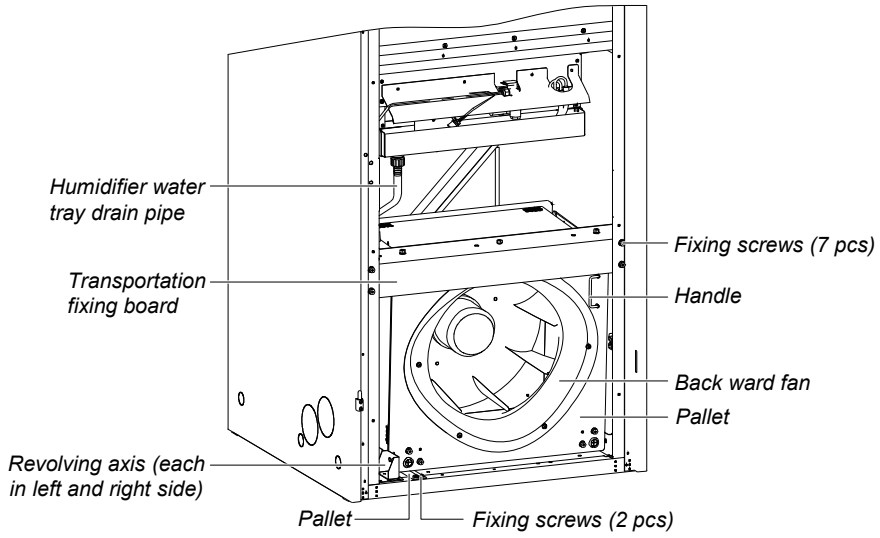



***Figure 2-22 Removing backward fan transportation fixing board and pallet***

**c. Grasp the handle, make a slow 90° rotation CCW of backward fan, so the fan would sink under pallet, see Figure 2-23;**

**d. Install the fan fixing board, and tighten the 5 fixing screws, see Figure 2-23.**

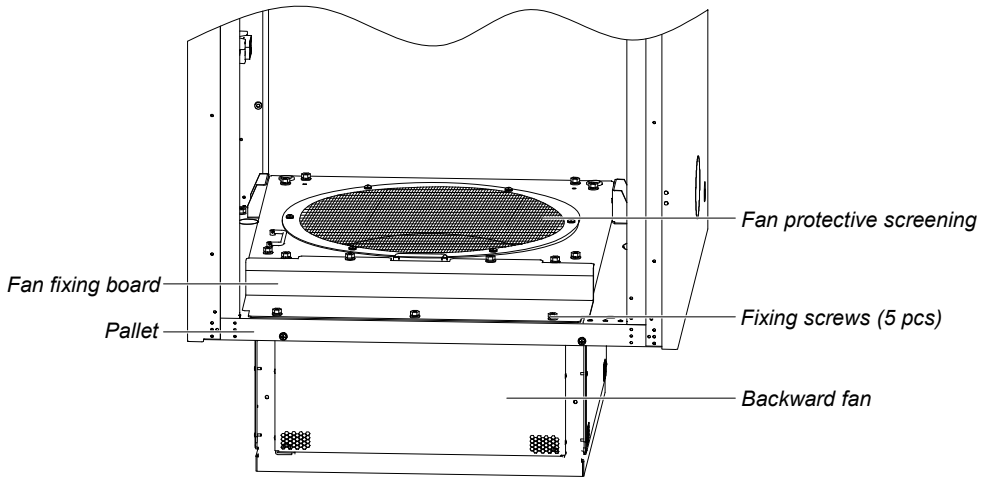



***Figure 2-23 Fan sinking under floor***

## 2.4 Piping

**The pipes to connect include:**

**1. Water drain-pipe of the unit.**

**2. Water inlet pipe of infrared humidifier.**

**3. Chilled water inlet and outlet pipes.**

**Connecting the water drain-pipe of the unit**

**The condensing water of infrared humidifier and evaporator is converged by the cross connector and drains through the drain pipe, as shown in Figure 2-24. The outer diameter (OD) of the pipe is 25mm. If the drain pipe is used by three or more units, the minimal OD of the pipe should be 40mm.**

**Note**

1. A Φ25 hose clamp is delivered as an accessory to connect the drain pipe.
2. Because the humidifier contains boiling water, the plastic pipe must be rated higher than 194°F.
3. When connecting the drain pipe, make sure that the U bend is installed vertically and the ‘U’ shape is not distorted, so as to ensure that the cooling water can be drained immediately and effectively.

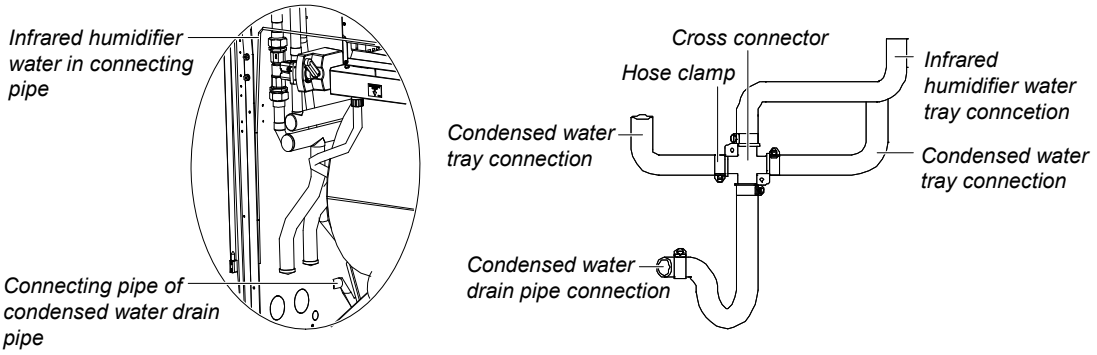



*Figure 2-24 Connection of water in and out pipes*

**Connecting water inlet pipe of infrared humidifier**

**Connect water pipes for the infrared humidifier. To facilitate maintenance, a strainer / non-return isolation valve is fitted to the supply water pipe. The infrared humidifier reserves a copper pipe (OD: 6.35mm) as shown in Figure 2-25. 1/4" copper screw nut is put at the end of the copper pipe. Please connect it with the 1/4" × 1/2" converted copper thread in the attached bag. Connect it with pipes according to the site condition. Make sure the connection is well sealed to prevent leakage. The pipe pressure is 100kPa ~ 700kPa.**

**Where the main pressure may rise above 700kPa, a pressure reducer should be fitted. Where the pressure falls below 100kPa, a water tank and pump system should be used.**

🕮 **Note**

Main water supply connections must be made in accordance with local laws and regulations.

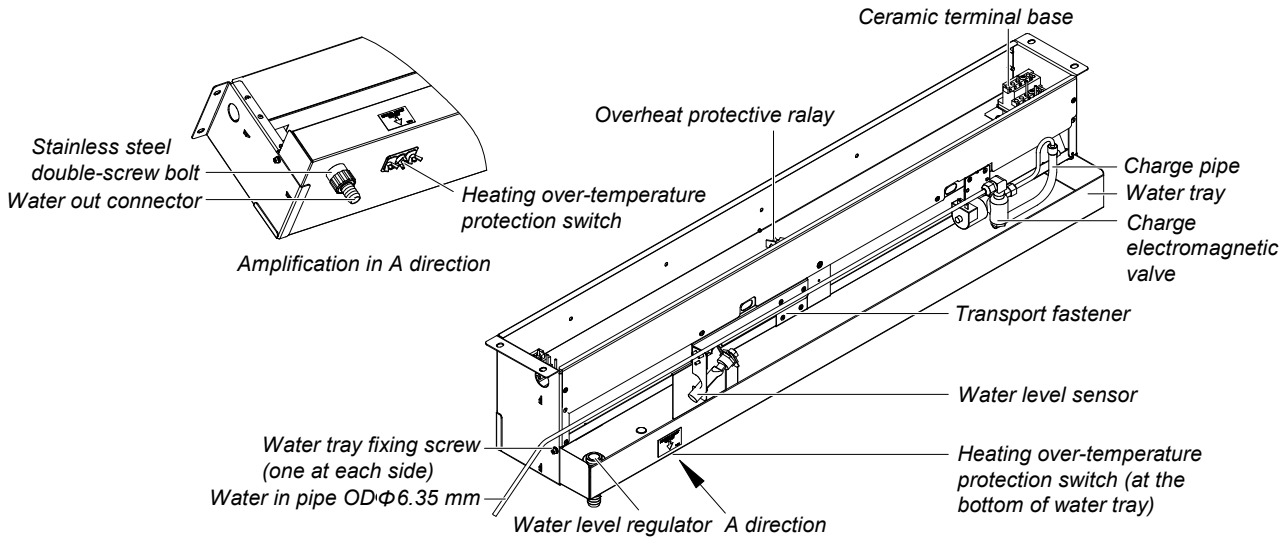



*Figure 2-25 Infrared humidifier*

**Connecting chilled water inlet and outlet pipes**

**The chilled water inlet and outlet pipes are connected with the chilled water unit by welding, as shown in Figure 2-26. Inlet and outlet pipes should be welded according to the labels on the unit. Please do not reverse the connection. Chilled water inlet and outlet pipes can be connected through the bottom plate or the side plate. For the pipe entrance, please refer to Figure 2-13, Figure 2-14 and Figure 2-15. The chilled water inlet and outlet pipes should have soft connector at the unit connections. The chilled water inlet pipes should be equipped with the water filter with over 60 meshes to facilitate the clearance of impurities in the pipes. The chilled water inlet and outlet pipes need to be equipped with several isolation valves, which can cut off water sources during maintenance. One of the isolation valves can be a balancing valve. Chilled water system with a balancing valve would be more efficient and more accurate in controlling water distribution. For detailed distribution, please refer to Figure 2-6.**

**Water pressure should be able to overcome the water pressure drop caused by all the components of water system. Considering the possibility that water pressure drop would increase due to incrustation and impurities resulted from long-time running of the system. Therefore, when choosing the head components**

**(e.g. pump), we should consider making 20% ~ 25% redundancy. The weight of the water pipes connected with the unit should not be assumed by the unit. The chilled water inlet and outlet pipes must be kept warm. Table 2-4 shows the connecting dimensions of chilled water in and out pipes of various units.**

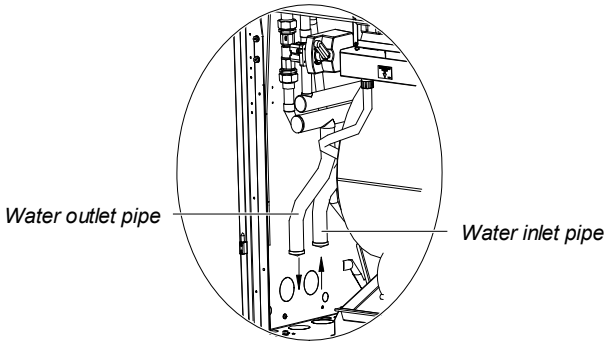



***Figure 2-26 Welding figure of chilled water in and out pipes***

***Table 2-4 OD of chilled water in and out pipes***

| Model | OD of chilled water in and out pipes (mm) | | Model | OD of chilled water in and out pipes (mm) |
|---|---|---|---|---|
| P1020 | 32 | | P2090 | 42 |
| P1030 | 32 | | P2100 | 42 |
| P1040 | 32 | | P3110 | 54 |
| P1050 | 32 | | P3140 | 54 |
| P2050 | 42 | | P3150 | 54 |
| P2070 | 42 | | | |

## 2.5 Removing Transport Fastener And Vibration Absorber

**In order to protect partial components from being damaged and distorted due to bumping, impact and resonation, fasteners and vibration absorbers are mounted at certain locations before delivery. Remove the fasteners and vibration absorbers before installation and commissioning.**

**Removing transport binding belt of front door**

**To protect the front door from moving during transport, tighten the gemel of the front door with binding string. Before putting the unit into operation, you should cut the binding string. Each front door needs two binding strings. See Figure 2-27 for their position.**

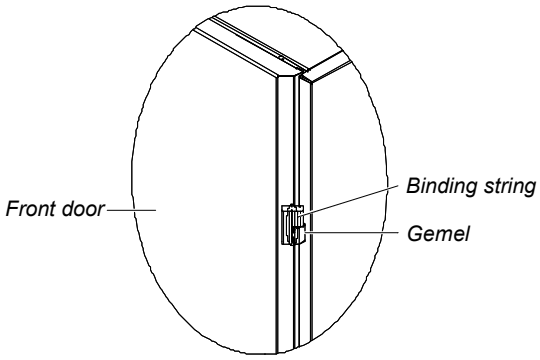



***Figure 2-27 Binding string of front door***

**Removing transport fastener of fan components**

**1. Upflow unit**

**To minimize the fan operation noise and prolong the belt life, the motor base of the fan is designed with a semi-free self-tension structure. During transportation, to protect the semi-free structure from failing or collapsing due to resonation, the upflow unit is especially fastened with sheet metal connector (left and right symmetrical, one at each side), as shown in Figure 2-28.**

**You should cut the binding string on the belt and remove the sheet metal connectors on both sides of the motor before the power-on operation. Removing the sheet metal connectors requires the collaboration of two persons, with one holding the motor and the other removing the sheet metal connector.**

**Note**

After opening the front door of unit, you will see a warning label concerning the removal of the sheet metal connector on the sealing panel of the fan. Do remove the sheet metal connector by following the preceding instructions.

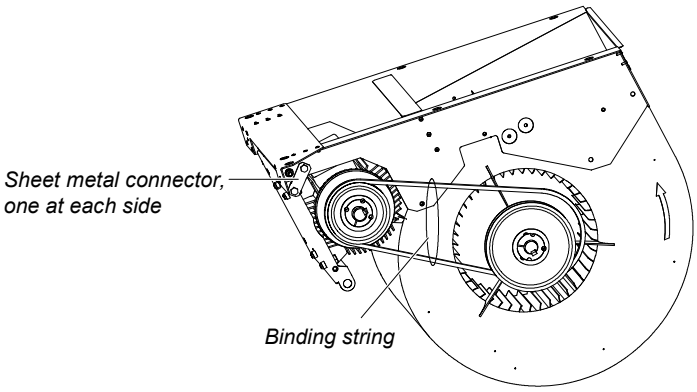



***Figure 2-28 Transportation fan unit binding screw and string***

**2. Downflow unit**

**During transportation, to protect the semi-free structure from falling or collapsing due to resonation, the motor mounting plate is fixed on the bottom plate with connector by bolts, as shown in Figure 2-29. You must remove the two connectors before the power-on operation.**

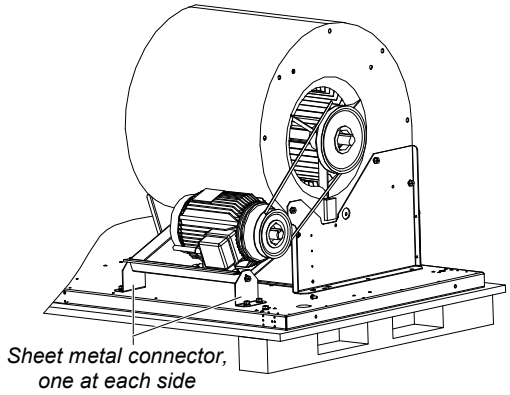



***Figure 2-29 Transportation fan unit binding screw***

**Note**

In any case, never put hands into the triangle gap between the motor installation board and base.

**Removing the transport components of infrared humidifier**

**In order to protect the infrared humidifier lamp from being damaged during transportation, the transport protection foam should be fitted to the infrared humidifier components. Before operating the unit, check the protection foam, and connect high water-level detection switch cable. If you operate the unit without complying with this, the infrared humidifier cannot operate normally and fire may be caused.**

**Detailed operation procedures are as follows:**

**1. Cut off the binding wire, and remove the protection foam fixed under the lamp, as shown in Figure 2-30 and Figure 2-31.**


***Figure 2-30 Removing protection foam 1***

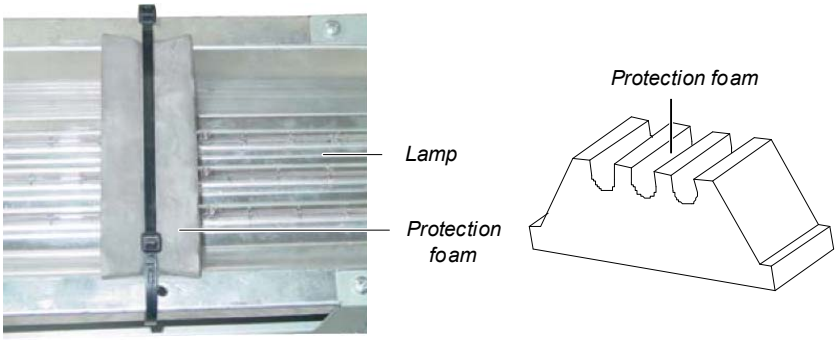



***Figure 2-31 Removing protection foam 2***

**2. Remove the four self-tapping screws in the front cover plate of the infrared humidifier connection box, and then remove the front cover plate, as shown in Figure 2-32.**

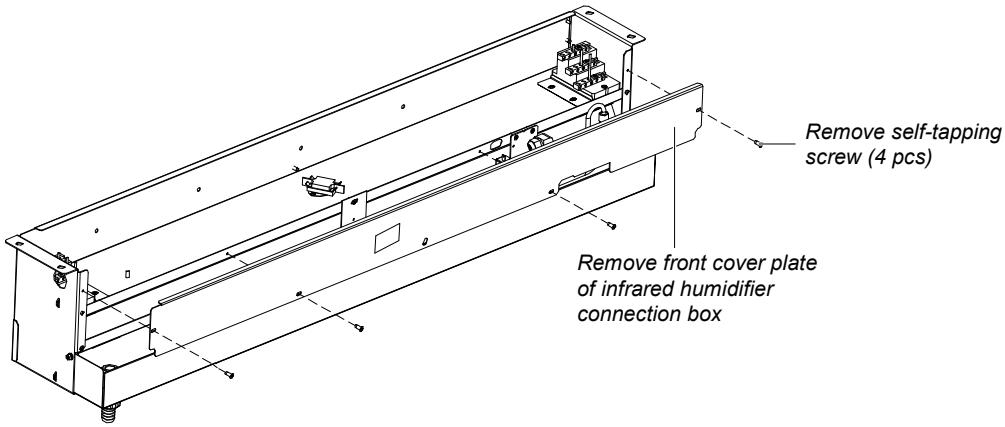



***Figure 2-32 Opening front cover plate of the connection box***

**3. Lead the detection switch cable of the high water-level through the cable access hole, as shown in Figure 2-30. Then insert the corresponding cable terminals and the HWA cable terminals in the connecting box, as shown in Figure 2-33.**

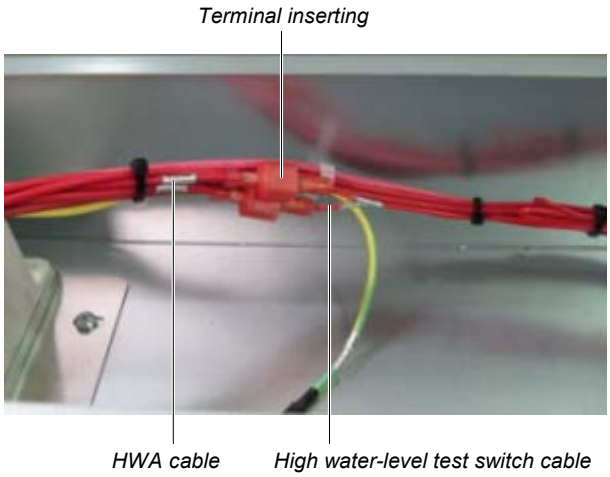



*Figure 2-33 Connecting the corresponding cable terminals of the high water-level detection switch and the HWA cable terminal*

**4. Close the front cover of the infrared humidifier's connection box, and tighten the self-tapping screw.**

**5. The infrared humidifier's high water-level detection switch floating pole and its body have been tightened with the rubber string in factory, as shown in Figure 2-34. Before operating the unit, remove the rubber string, otherwise the unit cannot detect and alarm the high water-level.**


*Figure 2-34 Floating pole of the high water-level sense switch*

**Remove the rubber string to fix the pipe**

**To avoid the sheet-metal from damaging the longer copper pipe, the damping foam is used to underlay or clamp the pipe before it leaves the factory. The foam should be removed and cleaned before commissioning.**

## 2.6 Adjusting Water Level Regulator

**The water level regulator of the infrared humidifier is screwed down completely. Before commissioning, unscrew the water level regulator till its head is 45mm above the water tray bottom, as shown in Figure 2-35.**

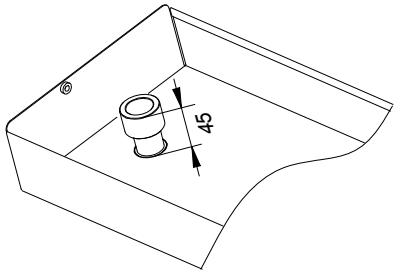



*Figure 2-35 Adjusting distance from the water tray*

## 2.7 Installation Inspection

**After the mechanical installation is completed, you should check that:**

**1. A certain space is left around the unit for maintenance. For details, see *Maintenance space requirement* in *2.3.1 Installation Requirement*;**

**2. The equipment is installed vertically and the installation fasteners have been fixed;**

**3. The pipes connecting the indoor unit and outdoor unit have been connected;**

**4. The condensate pump (if needed) has been installed;**

**5. The drain pipe has been connected;**

**6. The water supply pipe for infrared humidifier has been connected;**

**7. All pipe joints have been fixed;**

**8. The transport fasteners have been removed;**

**9. The water level regulator of the infrared humidifier has been unscrewed to the required height;**

**10. The debris (such as transportation materials, structure materials and tools) inside or around the equipment has been cleaned.**

**After confirming the preceding points, you can then start the electrical installation.**

# Chapter 3 Electric Installation

**This chapter introduces the electric installation of the chilled water AC, including the work introduction, installation notes, wiring of the unit and installation inspection.**

## 3.1 Work Introduction And Installation Notes

**Wires to be connected on-site**

**1. Unit power cables.**

**2. Unit input and output control cables.**

**Installation notes**

**1. The connection of all power cables, control cables and ground cables must comply with local electrician regulations;**

**2. See the equipment nameplate for the full load current. The cable sizes should meet the local wiring rules;**

**3. Mains supply requirement: 380Vac, 50Hz;**

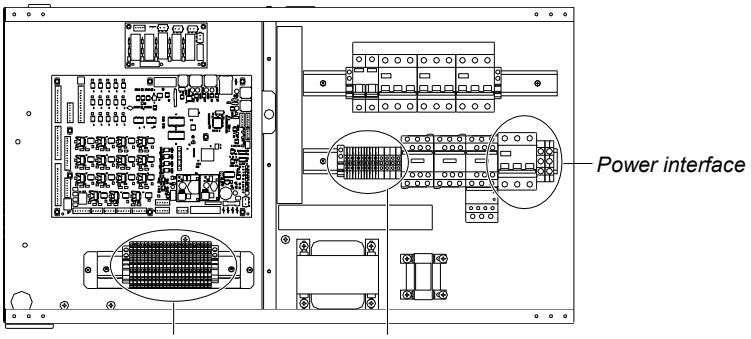
**4. The electrical installation must be completed by trained personnel;**

**5. Before the wiring, use a multimeter to measure the power supply voltage and make sure that the power supply has been switched off.**

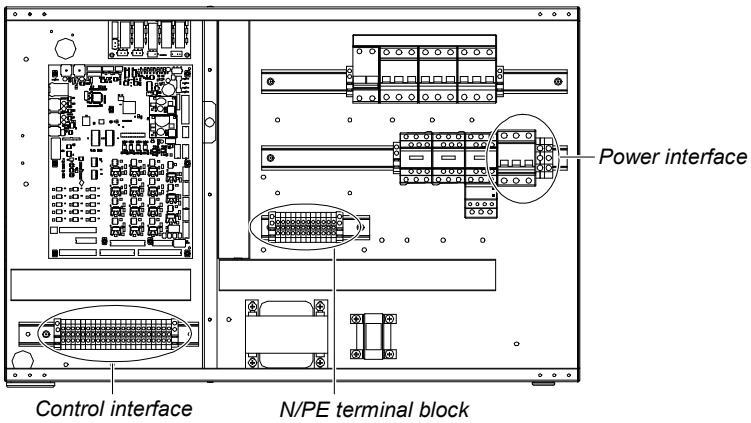
## 3.2 Wiring Of Chilled Water AC Unit

### 3.2.1 Locating Electrical Interfaces

**Opening the front door of the chilled water AC unit can reveal the interfaces of electrical control box, as shown in Figure 3-1, Figure 3-2 and Figure 3-3.**

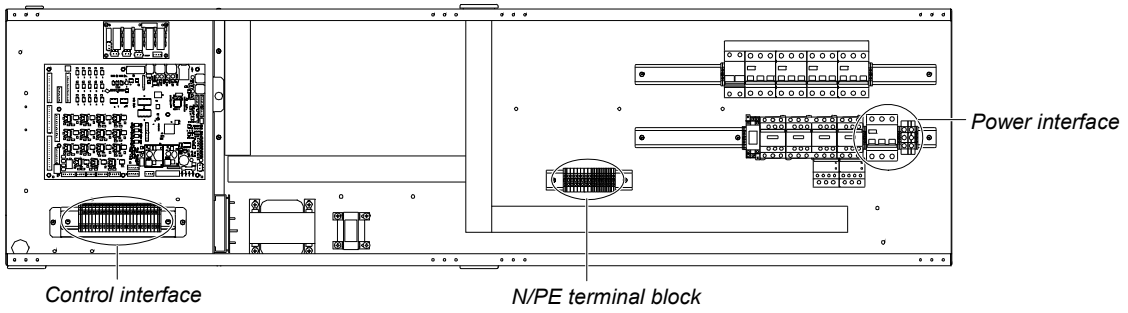



***Upflow***

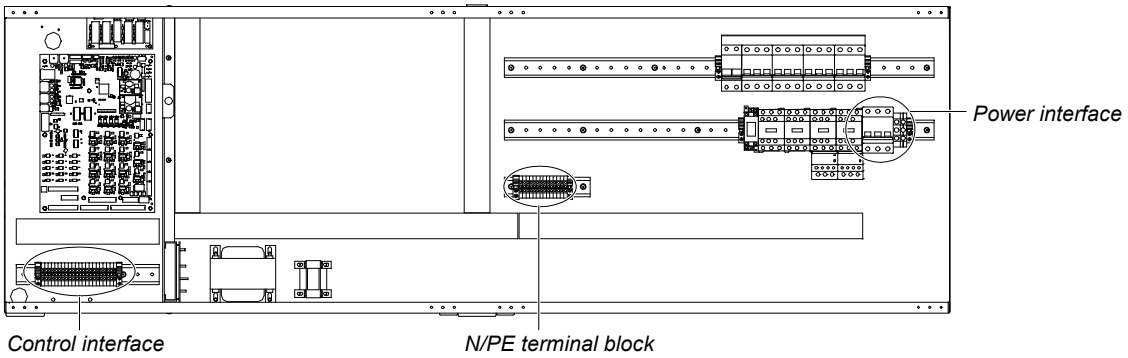



***Downflow***

*Figure 3-1 Electrical control box interfaces of one-bay series*

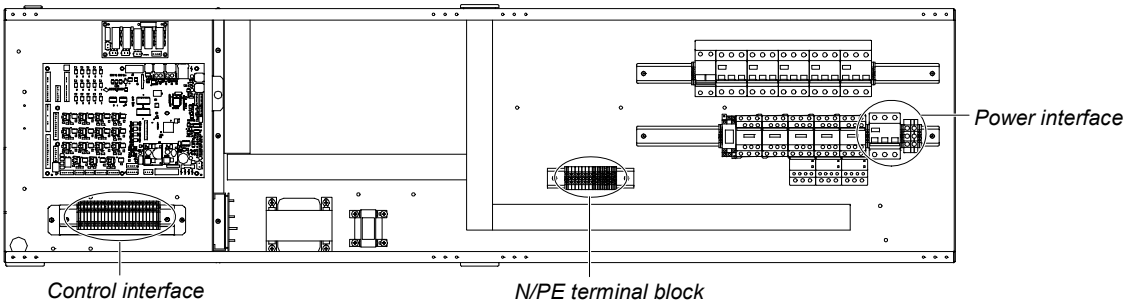



***Upflow***

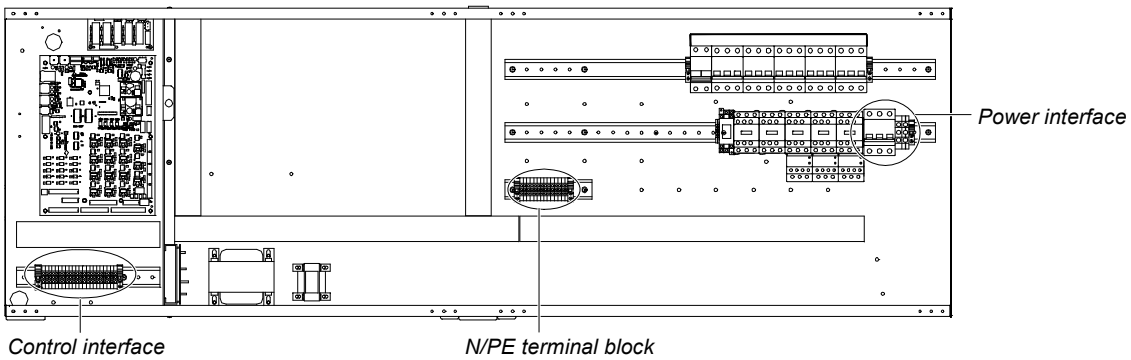



***Downflow***

*Figure 3-2 Electrical control box interfaces of two-bay series*




***Upflow***




***Downflow***

*Figure 3-3 Electrical control box interfaces of three-bay series*

### 3.2.2 Connecting Power Cable Of Chilled Water AC Unit

**The power interfaces are located as shown in Figure 3-1, Figure 3-2 and Figure 3-3 and the power interface is amplified as shown in Figure 3-4. Connect terminals L1, L2, L3, N, and PE to their counterparts of external power supply. Fix the input cables to the cable clamp located on the right inner side panel, as shown in Figure 3-5. As for the cable specification, see the unit maximum operation current in Table 3-1.**

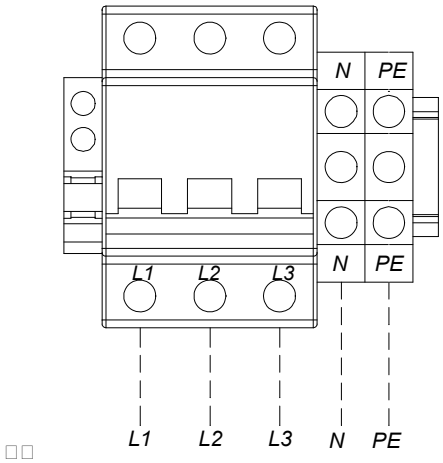



*Figure 3-4 Amplified figure of power interface*

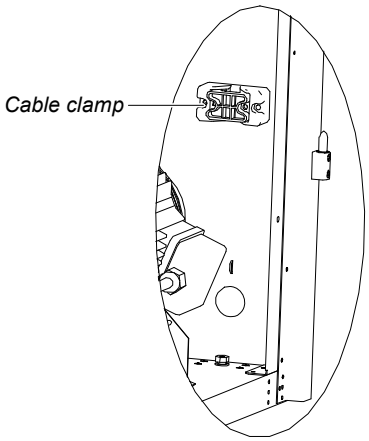



*Figure 3-5 Cable clamp*

**Note**

The cable sizes should meet the local wiring rules.

*Table 3-1 Maximum operation current of AC unit*

| Model | Maximum operation current (A) | | Model | Maximum operation current (A) |
|---|---|---|---|---|
| P1020 | 13.1 | | P2090 | 23.5 |
| P1030 | 13.1 | | P2100 | 23.5 |
| P1040 | 13.1 | | P3110 | 28.2 |
| P1050 | 13.1 | | P3140 | 28.2 |
| P2050 | 23.5 | | P3150 | 28.2 |
| P2070 | 23.5 | | | |

## 3.2.3 Connecting Control Cables

**The control interfaces are located as shown in Figure 3-1, Figure 3-2 and Figure 3-3. The control interface is amplified in Figure 3-6. The upper part of the terminal block is connected to the AC unit, while the lower part is used as user control signal interfaces.**

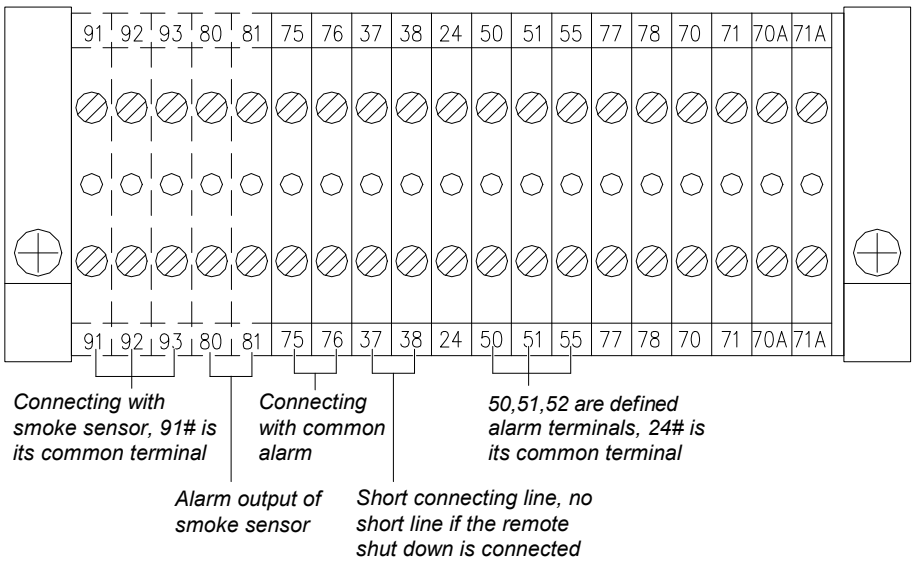



*Figure 3-6 Wiring of control interfaces*

**Note**

Before connecting the control cables, the wiring personnel must take antistatic measures.

You can connect the following monitoring and alarm devices.

Remote shutdown (RSD)

Terminals 37 and 38 can be connected to the remote shutdown switch. By default, terminals 37 and 38 are shorted. Remove the shorting wire if remote shutdown is needed. When terminals 37 and 38 are open, the system is shut down.

Smoke detect (SDC)

Terminals 91, 92 and 93 can be connected to the smoke sensor, with 91 being the common terminal, 92 being the NO contact, and 93 being the NC contact. You can select NO or NC contact according to the smoke sensor logic.

Terminals 80 and 81 are used to output external alarms for the smoke sensor.

Customized alarm terminals

Terminals 50, 51, 55 can be connected to three kinds of sensors, including fire sensor and water sensor. Terminal 24 is the common terminal. After connecting sensors to the terminals, you should set the corresponding customized alarm through the microprocessor. See *5.7.6 SET ALARMS* for details. When the contactor is open and there is no external alarm, the input state of the customized terminal is open. But when the contactor is closed and the external alarm is raised, the input state of the customized terminal will be shorted. At this time, the system will raise sirens, and the LCD of indoor unit will display the alarm information. If a PC installed with Emerson monitoring software is connected to the system, the alarm will also be displayed on the PC.

The terminals can be defined as follows:

Terminals 50 and 24: remote alarm (optional).

Terminals 51 and 24: water sensor (by default).

Terminals 55 and 24: safe switch for condensation water pump (optional).

Water-under-floor sensor (WUF)

Each unit is equipped with one WUF sensor. You should connect one end of the sensor to terminal 51, and the other end to the common terminal 24. The number of sensors in parallel connection is not limited, but there is only one water-under-floor alarm for each unit.

Condensing pump safe switch (CPSS)

When the CPSS is configured, you should connect one end of the CPSS to terminal 55, and the other end to the common terminal 24.

External common alarm terminals

Terminals 75 and 76 can be used as external common alarm terminals. They are controlled by the external alarm relay K3 on the circuit board. They output signals to external alarm devices, such as the alarm indicator. When critical alarm occurs, the contactor will close to trigger remote alarms, send signals to the building management system or dial the paging system automatically. The power supply of the external alarm system is user self-prepared.

Refer to *Appendix 2 Circuit Diagram* for the detailed definition of other terminals.

## 3.3 Installation Inspection

After the electrical installation is completed, you should check and confirm that:

1. The power resource voltage meets the rating on the nameplate.
2. The system electric loop has no open circuit or short circuit.
3. Power cables and grounding cables are connected to the circuit breakers, indoor unit and outdoor unit.
4. The ratings of the circuit breakers and fuses are correct.
5. The control cables are properly connected.
6. All the cable connections are fastened, with no loose screws.

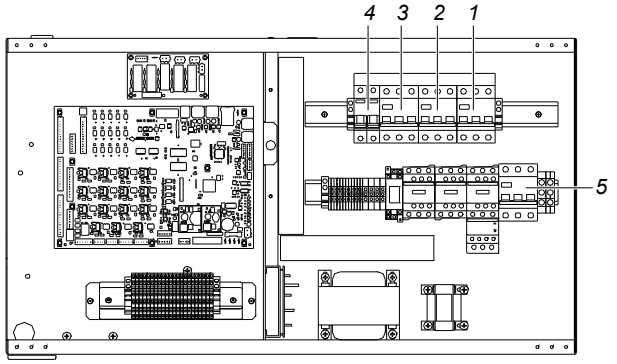
You can start commissioning after confirming the preceding points.

# Chapter 4 System Start-Up Commissioning

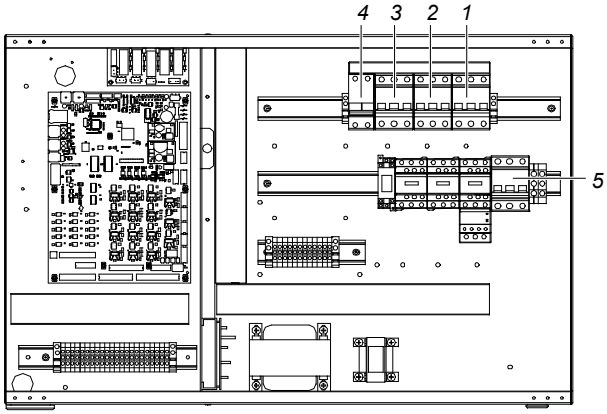
**This chapter introduces the start-up commissioning of the chilled water AC, including preparation before commissioning, commissioning procedures and inspection after commissioning.**

## 4.1 Locating MCBs

**The MCBs are located as shown in Figure 4-1, Figure 4-2 and Figure 4-3.**

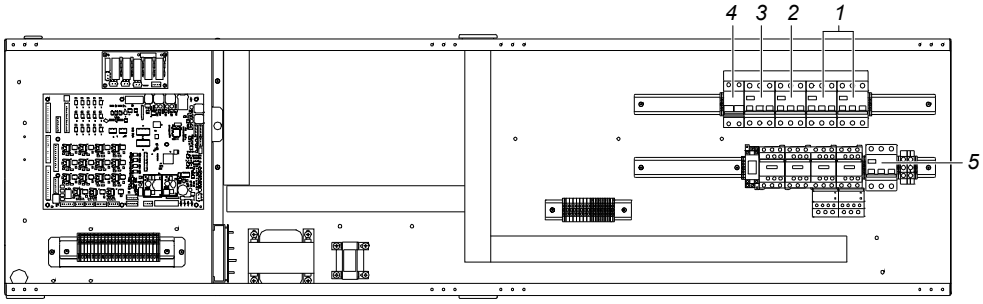



***Upflow***

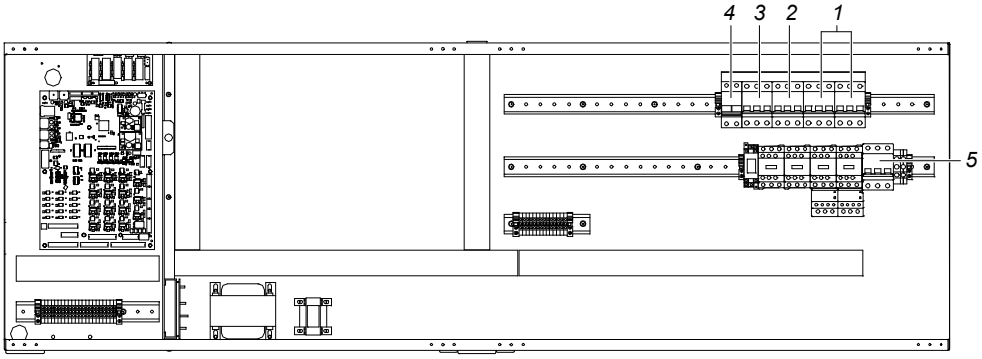



***Downflow***

***Figure 4-1 MCBs of one-bay series***

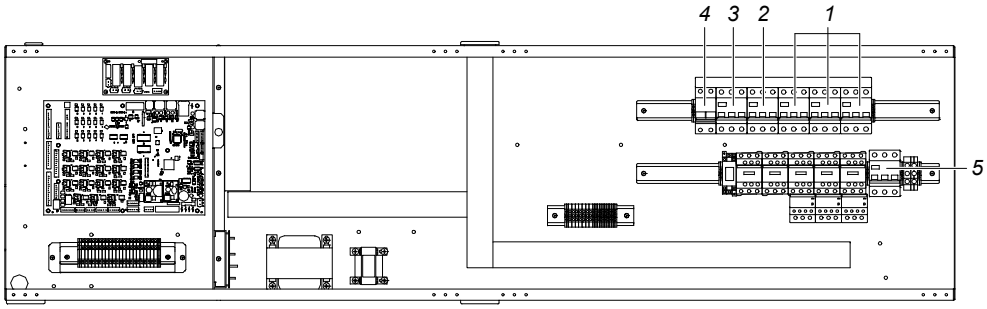



*Upflow*

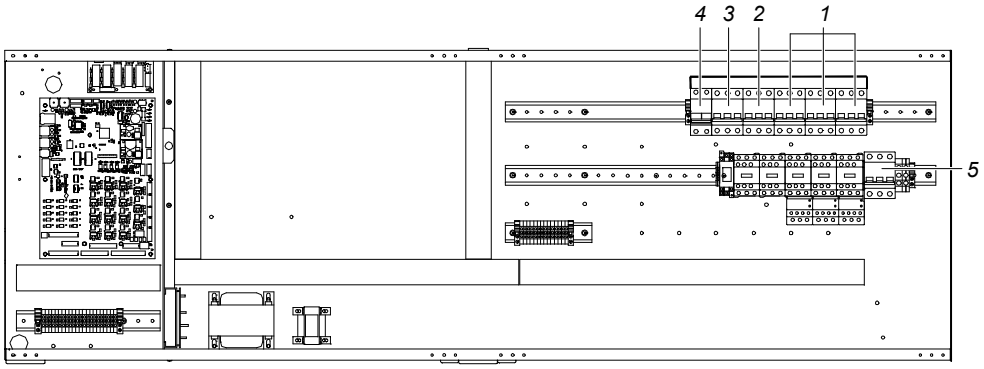



*Downflow*

*Figure 4-2 MCBs of two-bay series*




*Upflow*




*Downflow*

*Figure 4-3 MCBs of three-bay series*

*1: Fan MCB*

*2: Electrical heater MCB*

*3: Infrared humidifier MCB*

*4: Control board MCB*

*5: Main isolation switch*

# 4.2 Start-Up Commissioning

## 4.2.1 Preparation Before Commissioning

**Mechanical and system part**

**1. Check that the protection materials during transportation have been removed;**

**2. Check that the motor pulley and the fan pulley are fixed, the motor bearing and fan bearing are parallel, the belt is perpendicular to the two bearings and the tension of the belt is proper;**

**3. The pressure-leak detection of the chilled water system has been done and the chilled water system is confirmed to be qualified;**

**4. The cleaning and emptying of the chilled water system have been done (air vent valve is located in the top of the heat exchanger coil);**

**5. The chilled water system has been confirmed ready for operation;**

**6. The water supply-/drainage-pipe system of the humidification system has been reliably connected according to the material requirements and has been checked against leakage;**

**7. Make sure the equipment room temperature is above 68°F with sufficient heat load. If the heat load is insufficient, heat the equipment room with other heating devices, or by forcibly hand-running the heater of the unit or adjacent other equipment (in this case, go through the following procedures till the third step of *4.2.2 Commissioning Procedures*) to make sure the heat load is sufficient for the commissioning.**

**Electrical part**

**1. Check that the input voltage of the main power is -10% ~ +15% of the rating;**

**2. Check that all electrical or control cables are correctly connected. Fasten all the connecting terminals;**

**3. The power cables and the low voltage control cables are laid away from each other;**

**4. Check the phase sequence. The phase sequences of all three-phase devices have been adjusted consistent before delivery. During commissioning, you only need to ensure the phase sequence of a random three-phase device is correct. In step two of *4.2.2 Commissioning Procedures*, you can use a straight screwdriver to click on the fan contactor within the electric control box to judge the phase sequence by observing the wind direction. If the phase sequence is wrong, exchange any two phases of the L line of the power supply.**

## 4.2.2 Commissioning Procedures

**1. Turn off the MCBs of various parts. Turn on the main MCB and control MCB and check the control voltage.**

**2. Switch on the fan MCB and click on the contactor of the indoor fan with a screwdriver to confirm the rotation direction of the fan. Start the equipment and measure all the phase currents of the fan.**

**3. Switch on the electrical heater MCB and change the temperature setting to start the electric reheat, or start the heater manually. Measure all the phase currents of electrical heater.**

**To trigger the electrical heater, you should:**

**Change the temperature setting (see *5.7 SERVICE MENUS*) to 9°F higher than the indoor temperature. The system should then trigger the call for heating and the electric reheat starts to work. Then set the temperature setting to 9°F lower than the indoor temperature. If the electrical heater stops working, it means the heating function is normal. Keeping the temperature setting can make no heating requirement. Continue the following commissioning steps.**

**4. Switch on the humidification MCB and change the humidity setting to start the humidifier, or start the humidifier manually. Measure all the phase currents of the humidifier. Manually charge water into the cooling system to check that the charge-/drainage-pipes do not leak and the drainage pipes are clear.**

**To trigger the humidifier, you should:**

**Adjust the humidity setting (see *5.7 SERVICE MENUS*) to 10% higher than the indoor relative humidity. The control system should then trigger the call for humidification, and the humidifier starts to work. If the humidifier stops working when the humidity setting is lower than the indoor relative humidity, it means the humidifying function is normal.**

**Note**

After commissioning, restore the humidity setting to the default or the original setting.

**5. Change the temperature setting and start the refrigeration, or start the refrigeration manually. Record the water flow quantity of the system and water resistance.**

**To start the refrigeration (open the water flow control valve), you should:**

**Change the temperature setting (see *5.7 SERVICE MENUS*) to 9°F lower than the indoor temperature. The control system should then trigger the call for refrigeration, and the water flow control valve switches on. After at least three minutes of refrigeration, change the temperature setting to 9°F higher than the indoor temperature. If the water flow control valve is closed, it means the refrigeration function is normal.**

**6. Change the humidity setting and the unit will enter a dehumidifying status. Record the water flow quantity of the system and water resistance.**

**To trigger dehumidification, you should:**

**Change the humidify setting (see *5.7 SERVICE MENUS*) to 10% lower than the indoor relative humidity. The control system should then trigger the call for dehumidification, the water flow control valve switches on. Note that during the commissioning process, if the indoor temperature is 5.4°F higher than the temperature setting, the system may enter the forced refrigeration mode, and the dehumidification demand will not be responded. After commissioning, restore the humidity setting to the default or the original setting.**

### 4.2.3 Inspection After Commissioning

**1. Check that all output functions are automatic;**

**2. Check that the temperature & humidity settings and control precisions are set reasonably;**

**3. Make sure all the other functions are set reasonably.**

# Chapter 5 iCOM Controller

**The iCOM controller adopts menu operation. It can monitor, display and operate the precision cooling air conditioner and control the environment within a set range. This chapter expounds the LCD, button and indicator panel, structure chart of control menu, startup interface, main interface, USER MENUS, SERVICE MENUS, ADVANCED MENUS and EVENT NAME AND DIFINITION of the iCOM controller.**

## 5.1 LCD

**An LCD is located on the front panel of the Liebert.PEX2 series air conditioner. The LCD can display the current state of the equipment room, such as temperature and humidity, and so on. You can also read and modify the equipment configuration through the LCD.**

**The LCD uses blue backlight. If no button is pressed within a certain period of time (settable; default: 5min), the backlight will be off, until the next time any button is pressed.**

## 5.2 Button And Indicator Panel

**Nine buttons and two indicators are located on the button and indicator panel, including:**

- **Indicators: alarm indicator and operation indicator.**
- **Buttons: ON/OFF button, enter button, ESC button, up button, down button, left button, right button, alarm silence button and help button.**

**The button and indicator panel is shown in Figure 5-1.**

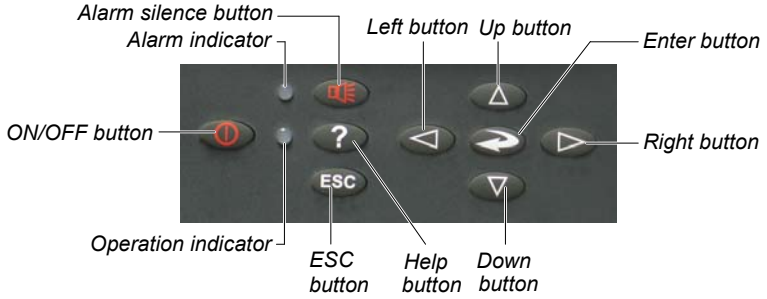



***Figure 5-1 Button and indicator panel***

**The indicators are described in Table 5-1.**

***Table 5-1 Indicator description***

| Indicator | Description |
|---|---|
| Alarm indicator | The alarm indicator turns on in red upon alarms. It is off after the alarm is cleared |
| Operation indicator | The operation indicator is on in green when the unit is operating. When the unit is shut down, it will be on in yellow |

**The functions of the buttons are described in Table 5-2.**

*Table 5-2 Function description of buttons*

| Button | Function description |
|---|---|
| ON/OFF button | 1. Switch on/off the system.<br>Press the ON/OFF button to shut down an operating system, or to start an idle system.<br>2. Test the display state of the backlight of the LCD and the operation indicator.<br>After powering-on, when the system is in the standby state (defined as test state in this manual), pressing the ON/OFF button will switch between the operation indicator (green then) and the LCD backlight. This function is used to test whether the LCD backlight and the operation indicator are normal |
| Enter button | 1. Enter the selected menu, or save the setting after parameters are changed. When you are entering a menu or changing a parameter, the menu and the parameter will be high lighted.<br>2. Test the display of characters.<br>When the system is in the test state, pressing the enter button will display the ASCII code. This function is used to test whether the characters are displayed normally on the LCD |
| ESC button | 1. Quit the current menu.<br>2. Abolish the current change of parameter.<br>3. Test the LCD high light.<br>Pressing the ESC button to switch the LCD between light and high light when the system is in the test state. This function can test whether the LCD high light is normal |
| Up button | 1. Increase the value of the displayed parameter during parameter setting.<br>2. Scroll a row or a screen up in the query state.<br>3. Test the buzzer.<br>Pressing the up button when the system is in the test state will increase the buzzing frequency (initial value: 0%). Meanwhile the buzzer will sound at the set frequency. This function is used to test whether the buzzer is normal |
| Down button | 1. Decrease the value of the displayed parameter during parameter setting.<br>2. Scroll a row or a screen down in the query state.<br>3. Test the buzzer.<br>If the buzzer frequency is not 0%, pressing the down button when the system is in the test state will decrease the buzzing frequency. Meanwhile the buzzer will sound at the set frequency. This function is used to test whether the buzzer is normal |
| Left button | 1. Select the left bit during the parameter setting operation.<br>2. Test the LCD contrast.<br>Pressing the left button when the system is in the test state will decrease the LCD contrast (by default: 100%). This function is used to test whether the LCD contrast is normal |
| Right button | 1. Select the right bit during the parameter setting operation.<br>2. Test the LCD contrast.<br>If the LCD contrast is not 100%, pressing the right button when the system is in the test state will increase the LCD contrast. This function is used to test whether the LCD contrast is normal |
| Alarm silence button | 1. The system will issue an alarm sound upon alarms. If you press the alarm silence button, the alarm sound will be eliminated.<br>2. Clear the current alarm after the alarm sound is silenced.<br>3. Test the alarm indicator, and rest the LCD contrast and buzzer frequency.<br>Pressing the alarm silence button when the system is in the test state will switch the alarm indicator between on and off. It can test whether the alarm indicator is normal. Meanwhile, reset the LCD contrast to 100% and buzzer frequency to 0% |
| Help button | 1. Display the online help.<br>2. Test the yellow display of the LCD operation indicator.<br>When the system is in the test state, pressing the help button will switch on and off the LCD operation indicator. This function is used to test whether the yellow display of the LCD operation indicator is normal |

**Note**

1. After the system is powered on, the system will assume the operation state before power-off. For example, if the system is in the work state when it is powered off, it will enter the work state automatically after power-on. You do not need to start it manually.

2. When the system is in the test state, the setpoints will not be written into the iCOM controller.

## 5.3 Structure Chart Of Control Menu

Please refer to *Error! Reference source not found.Error! Reference source not found.*.

## 5.4 Startup Interface

After the system is powered on, it is in the waiting state. The LCD will display the interface shown in Figure 5-2.

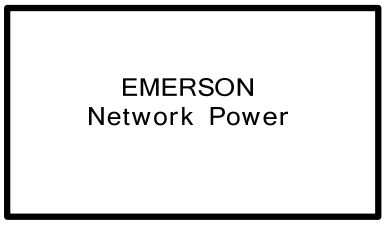



*Figure 5-2 Startup interface*

## 5.5 Main Interface

After power-on, the LCD will enter the main interface after 20s. The main interface provides the general information of the relative equipment status, including current temperature and humidity, temperature and humidity setpoints, equipment output status (fan, compressor, cooling, heating, dehumidifying, humidifying), alarm and maintenance status.

The main interface has two display modes: graphical and simple. The difference between the two display modes is that the graphic interface (see Figure 5-3) displays the percentage output chart of the function components while the simple interface (see Figure 5-4) displays the icons of current operation mode only. The switching of two modes can be realized by operating the menu. For details, refer to *5.6.7 DISPLAY SETUP*. The upper left corner of the main interface displays the current unit number; the upper right corner displays the current system status. If there is no button operation for 255s on other menu display screen, the LCD screen will return to the main interface.

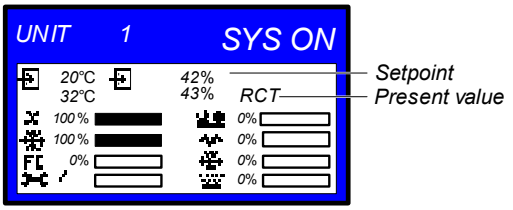



*Figure 5-3 Graphical mode of main interface*

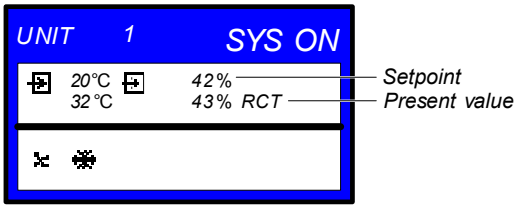



*Figure 5-4 Simple mode of main interface*

The icons of the graphical mode and the simple mode on the main interface are defined in Table 5-3.

*Table 5-3 Definition of icons*

| Icon | Definition | | Icon | Definition |
|---|---|---|---|---|
| | Fan running | | FC | Free cooling |
| | Cooling | | | Maintenance |
| | Hot water heating | | | Dehumidifying |
| | Electric heating | | | Humidifying |

# 5.6 USER MENUS

Press the enter or down button on the main interface to enter the USER MENUS, as shown in Figure 5-5. The USER MENUS are displayed in six pages, each displaying one or two submenus. Press the enter button to highlight the submenu, the up or down button to browse the submenus, and the enter button to enter the selected one.

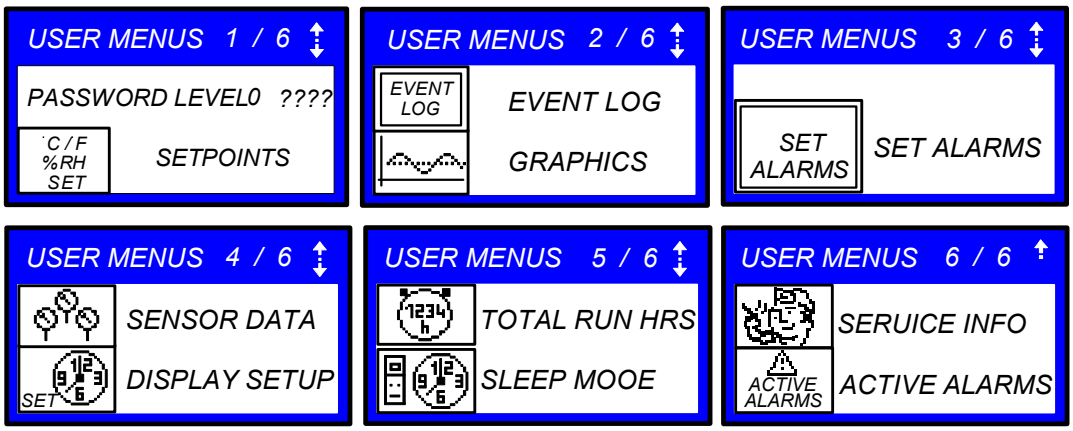



*Figure 5-5 USER MENUS*

## 5.6.1 PASSWORD

The password is necessary for some setpoints. After inputting the password (user password: 149), use the up button and down button to browse all the options, and then press the enter button to enter the selected one.

## 5.6.2 SETPOINTS

The setpoints will not be lost when the power fails. You can enter to browse and set the parameters in the SETPOINTS submenu through the USER MENUS. The left row displays the parameter codes; the middle row, the parameter name; the right row, the setpoints, as shown in Table 5-4.

*Table 5-4 Descriptions of SETPOINTS parameters*

| Parameters | | Default | Setting range | Description |
|---|---|---|---|---|
| U102 | TEMP SET | 23°C | 5°C ~ 40°C | Temperature setpoint |
| U103 | HUM SET | 50% | 1% ~ 80% | Humidity setpoint |
| U104 | HUM CTRL | Rel | Pred (predictive), Comp (compensable), Rel (relative) | Humidity control type |
| U105 | SUP SENS | No | No, Lim, Ctrl, Cool | Supply air type |
| U106 | SUP TEMP | 15°C | 5°C ~ 25°C | Air temperature limit setpoint |
| U107 | BACK TSP | 15°C | 5°C ~ 40°C | Backup temperature setpoints |

If you want to modify the preceding setpoints, you should input the password before entering the SETPOINTS menu. Then press the enter button to highlight it and use the up and down button to scroll the options. Press the enter button to select one parameter, use the up or down button to set the value, and press the enter button to save the change.

## 5.6.3 EVENT LOG

You can enter the EVENT LOG menu without a password, as shown in Figure 5-6.

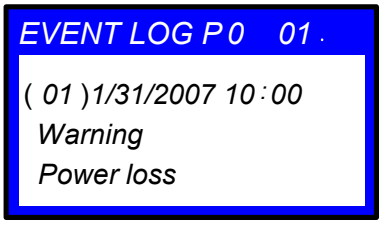



*Figure 5-6 EVENT LOG menu*

The EVENT LOG menu saves the last 400 system records. The event types include message, warning and alarm.

- When the event type is message, the LCD will display the event name only.
- When the event type is warning, the LCD will display the event name and the alarm indicator will turn on in red.
- When the event type is alarm, the LCD will display the event name, the alarm indicator will turn on in red, and an audible alarm will be raised.

### 5.6.4 GRAPHICS

The GRAPHICS menu provides two kinds of graphs: RETURN TEMP and RETURN HUMIDITY. These graphs reflect the temperature and humidity changes over a period of time in the past.

In the graphs, the current temperature or humidity is the origin, the time is the horizontal axis, and the temperature or humidity is the vertical axis, as shown in Figure 5-7.

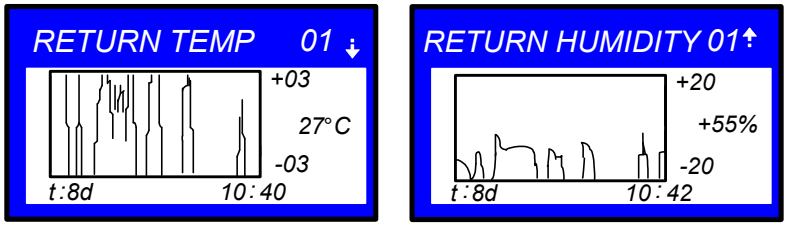



*Figure 5-7 The graph of return temperature and return humidity*

As the horizontal axis, the time range can be set into eight kinds. Each pixel indicates different time in different time ranges. See Table 5-5 for the detailed time range.

*Table 5-5 Time range*

| Time range | Time indicated by each pixel | | Time range | Time indicated by each pixel |
|---|---|---|---|---|
| 8min | 6s | | 2d | 36min |
| 32min | 24s | | 4d | 72min |
| 1hr | 45s | | 8d | 144min |
| 12hr | 9min | | 16d | 288min |
| 24hr | 18min | | | |

The scaling of the vertical axis can also be set. For the RETURN TEMP, the scaling range is ±3 ~ ±20; for the RETURN HUMIDITY, the scaling range is ±10 ~ ±30. The bigger the scaling range is, the bigger the value each pixel indicates will be, and the more centered the curves will be.

You can set the parameters without inputting the password. Press the enter button to highlight the parameters, use the up or down button to select one parameter. Then press the enter button again to enter the parameter, and use the up or down button to set the value. Press the enter button to save the change at last.

### 5.6.5 SET ALARMS

The SET ALARMS menu is used to set the upper and lower limits of temperature and humidity alarms. The settings will not be lost when the power fails. You can select the 'SET ALARMS' submenu to browse and set the parameters through the USER MENUS. The parameters are described in Table 5-6.

**Note**

It is recommended not to change the system defaults. If you consider it necessary to change the defaults, consult professionals first and set the alarm settings under the guidance of them.

*Table 5-6 Descriptions of SET ALARMS parameters*

| Parameters | | Default | Setting range | Description |
|---|---|---|---|---|
| U202 | RTN SNSR | Yes | Yes, No | Return air alarm enable |
| U203 | HI TEMP | 27°C | 1°C ~ 99°C | High return air temperature alarm setpoint |
| U204 | LO TEMP | 18°C | 1°C ~ 99°C | Low return air temperature alarm setpoint |
| U205 | HI HUM | 60% | 1% ~ 99% | High return air humidity alarm setpoint |
| U206 | LOW HUM | 40% | 1% ~ 99% | Low return air humidity alarm setpoint |
| U207 | SENSOR A | No | Yes, No | Sensor A alarm enable |
| U208 | HI TEMPA | 50°C | 1°C ~ 99°C | High temperature alarm setpoint of sensor A |
| U209 | LO TEMPA | 25°C | 1°C ~ 99°C | Low temperature alarm setpoint of sensor A |
| U210 | HI HUM A | 70% | 1% ~ 99% | High humidity alarm setpoint of sensor A |
| U211 | LO HUM A | 30% | 1% ~ 99% | Low humidity alarm setpoint of sensor A |
| U213 | SUP SNSR | No | Yes, No | Supply air alarm enable |
| U214 | HI SUP T | 24°C | 1°C ~ 99°C | High supply air temperature alarm setting value |
| U215 | LO SUP T | 10°C | 1°C ~ 99°C | Low supply air temperature alarm setting value |

**To browse through the menu, press the enter button to highlight the option, and use the up or down button to scroll.**

**Password is required for changing the setpoints. Then, enter the SET ALARMS menu, press the enter button to highlight the option, use the up or down button to browse the submenu. Press the enter button to enter the selected parameter. Use the up or down button to change the setpoints, and press the enter button to save the change, or press the ESC button to quit the change.**

### 5.6.6 SENSOR DATA

**You can monitor the data acquired by the sensors through the SENSOR DATA menu. The values are read only, no setting or change is allowed. The parameters are described in Table 5-7.**

*Table 5-7 Descriptions of SENSOR DATA parameters*

| Parameters | | Unit | Description | | Parameters | | Unit | Description |
|---|---|---|---|---|---|---|---|---|
| U301 | TEMP A | °C | Temperature of sensor A | | U313 | Hi Temp | °C | Daily high temperature |
| U302 | HUM A | % | Relative humidity of sensor A | | U314 | Lo Te H | h | Daily low temperature (hour) |
| U303 | TEMP B | °C | Temperature of sensor B | | U314 | Lo Te M | m | Daily low temperature (minute) |
| U304 | HUM B | % | Relative humidity of sensor B | | U314 | Lo Te S | s | Daily low temperature (second) |
| U305 | TEMP C | °C | Temperature of sensor C | | U314 | Lo Temp | °C | Daily low temperature |
| U306 | HUM C | % | Relative humidity of sensor C | | U315 | Hi Hu H | h | Daily high humidity (hour) |
| U307 | FC TEMP | °C | Free cooling temperature | | U315 | Hi Hu M | m | Daily high humidity (minute) |
| U308 | AMB TEMP | °C | Outdoor temperature | | U315 | Hi Hu S | s | Daily high humidity (second) |
| U309 | FC STATE | - | Free cooling status | | U315 | Hi Humi | % | Daily high humidity |
| U310 | DS1 TEMP | °C | Temperature of digital scroll 1 | | U316 | Lo Hu H | h | Daily low humidity (hour) |
| U311 | DS2 TEMP | °C | Temperature of digital scroll 2 | | U316 | Lo Hu M | m | Daily low humidity (minute) |
| U313 | Hi Te H | hr | Daily high temperature (hour) | | U316 | Lo Hu S | s | Daily low humidity (second) |
| U313 | Hi Te M | m | Daily high temperature (minute) | | U316 | Lo Humi | % | Daily low humidity |
| U313 | Hi Te S | s | Daily high temperature (second) | | | | | |

### 5.6.7 DISPLAY SETUP

**The DISPLAY SETUP menu is used to set the LCD display attributes. Password is not required for changing the setpoints. The parameters are described in Table 5-8.**

*Table 5-8 Descriptions of DISPLAY SETUP parameters*

| Parameters | | Default | Setting range | Description |
|---|---|---|---|---|
| U401 | LANGUAG | EN | RUS, CZE, CHI, ESP, FRE, ITA, DEU, EN, POR | Language options |
| U402 | YEAR | 2005 | - | Current year |
| U402 | MONTH | 04 | 01 ~ 12 | Current month |
| U402 | DAY | 19 | 01 ~ 31 | Current day |
| U403 | HOUR | 19h | - | Current hour |
| U403 | MINUTE | 8min | - | Current minute |
| U403 | SECOND | 17s | - | Current second |
| U404 | TEMP F/C | °C | °F, °C | Temperature indication |
| U405 | CONTRAST | 50% | 0% ~ 100% | Display contract |
| U406 | BUZ FREQ | 50% | 0% ~ 100% | Buzzer frequency. 0% means buzzer silenced |
| U406 | BUZ TEST | Off | On, Off | Buzzer frequency test switch. It determines whether or not there will be sound accompanying the adjustment of BUZ FREQ through the setting |
| U407 | BACKLITE | 5min | 5min, 10min, 30min, 1hr, 12hr | Backlight time, or the backlight time when there is no button operation |
| U408 | SCREEN | Graph | Graph, Simple, SimCo, GraCo | Main interface display mode |
| U409 | SHOWS | A + S | SET, ACT, A + S | Main interface display mode of setpoints and actual values.<br>Range:<br>SET: only setpoints of the temperature and humidity are displayed.<br>ACT: only actual temperature and humidity are displayed.<br>A + S: both setpoints and actual values of the temperature and humidity are displayed |
| U410 | DISPLAY | Norm | Norm (normal), Inv | Display color |
| U411 | DATE | m/d/y | m/d/y, d.m.y, y-m-d | Date display format |

## 5.6.8 TOTAL RUN HRS

**The TOTAL RUN HRS menu records the total run time (unit: hr) of the system components. You can also set the run time limits of the system components through this menu. If the actual component run time exceeds the set limit, alarms will be raised.**

**This menu requires password. You can reset the total run time to zero in order to restart timing.**

**Note**

Resetting the timers is not needed unless the components are replaced.

**The parameters on this menu are described in Table 5-9. Each component has a LIMIT option to set the run time limit of the corresponding component.**

*Table 5-9 Descriptions of TOTAL RUN HRS parameters*

| Parameters | | Default | Related component | | Parameters | | Default | Related component |
|---|---|---|---|---|---|---|---|---|
| U502 | MOTOR(S) | 1000hr | Fan motor | | U507 | EL HEAT1 | 34hr | Electric heater 1 |
| U502 | LIMIT | 32000hr | | | U507 | LIMIT | 32000hr | |
| U503 | COMP1 | 500hr | Compressor 1 | | U508 | EL HEAT2 | 45hr | Electric heater 2 |
| U503 | LIMIT | 32000hr | | | U508 | LIMIT | 32000hr | |
| U504 | COMP2 | 500hr | Compressor 2 | | U509 | EL HEAT3 | 0hr | Electric heater 3 |
| U504 | LIMIT | 32000hr | | | U509 | LIMIT | 32000hr | |
| U505 | CW/FC | 1000hr | Chilled water/free cooling | | U510 | HUM | 7hr | Humidifier |
| U505 | LIMIT | 32000hr | | | U510 | LIMIT | 32000hr | |
| U506 | HG/HW | 23hr | Hot gas/hot water | | U511 | DEHUM | 1hr | Dehumidification |
| U506 | LIMIT | 32000hr | | | U511 | LIMIT | 32000hr | |

### 5.6.9 SLEEP MODE

**In the sleep mode, the air conditioner unit can realize auto-on/off. Through the SLEEP MODE menu, you can set two time zones of the sleep mode, and select the sleep timing mode. The parameters on this menu are described in Table 5-10.**

*Table 5-10 Descriptions of SLEEP MODE parameters*

| Parameters | | Default | Setting range | Description |
|---|---|---|---|---|
| U602 | MON | No | Yes, No | Sleep mode day, including Monday ~ Sunday. Set the value of any day to 'Yes', and the system will enter sleep mode on that day every week. This parameter works together with the following hour and minute settings to designate an exact time |
| U602 | TUE | No | | |
| U602 | WED | No | | |
| U602 | THU | No | | |
| U602 | FRI | No | | |
| U602 | SAT | No | | |
| U602 | SUN | No | | |
| U605 | START 1 | 0hr | - | Sleep mode start time 1. The first parameter is used to set the hour of time, and the second one is used to set the minute of time |
| U605 | START 1 | 0m | | |
| U605 | STOP 1 | 0hr | | Sleep mode end time 1. The first parameter is used to set the hour of time, and the second one is used to set the minute of time |
| U605 | STOP 1 | 0m | | |
| U607 | START 2 | 0hr | | Sleep mode start time 2. The first parameter is used to set the hour of time, and the second one is used to set the minute of time |
| U607 | START 2 | 0m | | |
| U607 | STOP 2 | 0hr | | Sleep mode end time 2. The first parameter is used to set the hour of time, and the second one is used to set the minute of time |
| U607 | STOP 2 | 0m | | |
| U609 | TIME MOD | Auto | Auto, Yes, No | Timing mode setting. Range:<br>Auto: during the system sleep time, if high/low temperature occurs, the system will resume operation and mask the alarm for 15min. The system will re-enter the sleep mode after the alarm is cleared<br>Yes: start sleep mode<br>No: no sleep mode |
| U610 | TIME TYP | S.OFF | S.OFF, DEADB | Timing mode selection |
| U611 | DEADBAND | K | 2K ~ 15K | Used to set the deadband temperature setting range |

### 5.6.10 SERVICE INFO

**The SERVICE INFO menu provides the contact information of customer service personnel. The information is read only.**

### 5.6.11 ACTIVE ALARMS

**The ACTIVE ALARMS menu displays the active alarms of the system. No password is required to query this menu.**

## 5.7 SERVICE MENUS

**Press the right button at the first page of the USER MENUS, and you can enter the SERVICE MENUS, as shown in Figure 5-8.**

**The SERVICE MENUS are displayed in five pages. Each page displays one or two submenus. Press the enter button to highlight the submenus, and use the up or down button to scroll up or down. Press the enter button to enter the selected submenu.**

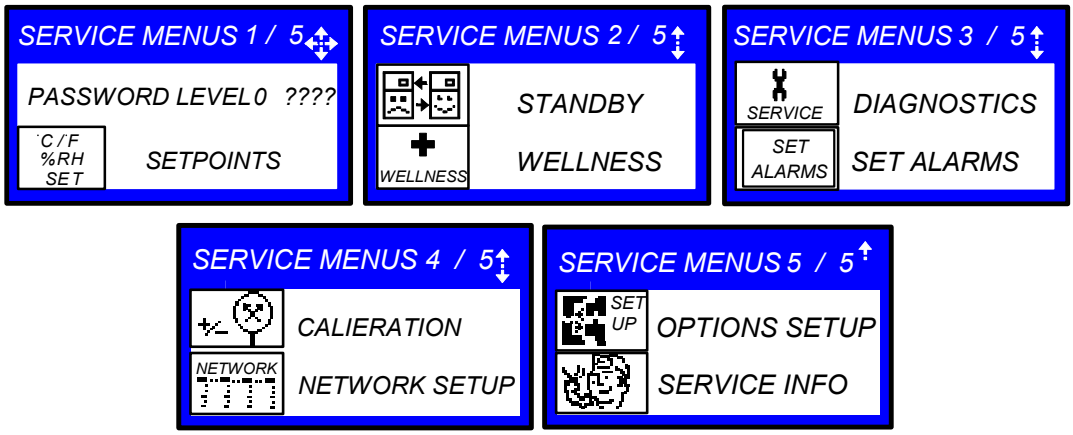



*Figure 5-8 SERVICE MENUS*

### 5.7.1 PASSWORD LEVEL

**It is operated by Emerson service personnel.**

### 5.7.2 SETPOINTS

**Different from the SETPOINTS in the USER MENUS, the SETPOINTS in SERVICE MENUS has many more parameters. See Table 5-11 for the parameter descriptions.**

*Table 5-11 Descriptions of SETPOINTS parameters*

| Parameters | | Default | Setting range | Description |
|---|---|---|---|---|
| S102 | TEMP SET | 25°C | 5°C ~ 40°C | Temperature setpoint |
| S103 | CTRL TYPE | PI | Prop, PI, Intel, No | Control type selection |
| S104 | TEMP PB | 7K | 2.2K ~ 30K | Temperature proportional band setpoint, or the P in PID control |
| S105 | TEMP INT | min | - | Temperature integration time setpoint, or the I in PID control |
| S107 | AUTOSET | Yes | Yes, No | Autoset enable |
| S108 | TEMP DB | 0K | 0K~20K | Temperature deadband setting range |
| S109 | 2ND SETP | 23°C | 5°C ~ 40°C | - |
| S110 | BACK TSP | 23°C | 5°C ~ 40°C | Backup temperature setpoint |
| S111 | HEAT DB | 0K | 0K~20K | Heaters deadband setting range |
| S113 | HUM SET | 50% | 1% ~ 80% | Humidity setpoint |
| S114 | HUM CTRL | Pred | Comp, Rel, Pred | Humidity control type |
| S115 | HUM PB | 10% | 1% ~ 20% | Humidity proportional band |
| S116 | HUM INT | 5min | - | Humidity integration time |
| S117 | HUM DB | 0% | 1% ~ 50% | Humidity deadband setting range |
| S118 | LO LIM 1 | k | - | Dehum/Heat low limit 1 |
| S119 | LO LIM 2 | -1.7K | -5.5K ~ -1.1K | Dehum/Heat low limit 2 |
| S124 | SUP SENS | No | No, Lim, Ctrl, Cool | Supply air type |
| S125 | SUP TEMP | 5°C | 5°C ~ 27°C | Air supply limit temperature setpoint |
| S126 | SUP TYPE | PI | Prop, PI, PID, Intel | Supply control type |
| S127 | SUP PB | 12K | 2K ~ 30K | Supply proportional band |
| S128 | SUINT | 0min | 0 ~ 15min | Supply integration |
| S130 | SUP DB | - | 0K~20K | Supply deadband |
| S131 | VPULS | 5% | 0 ~ 10% | Valve Pulse |
| S132 | CF0 | - | 0.01 ~ 100% | Cooling filter at 0% |
| S132 | CF100 | - | 0.01 ~ 100% | Cooling filter at 100% |
| S133 | RET CO | 0K | 0 ~ 10K | Return Compensation |
| S135 | AMB TYPE | No | CONT, EFC, VAL, No | DT between Room/Outdoor Type |
| S136 | AMB DT | 5°C | 0°C ~ 20°C | DT between Room Air/Outdoor |
| S137 | FC TYPE | No | No, CONT, VAL | DT between Room/FC Type |
| S138 | FC DT | 4.5°C | 0°C ~ 20°C | DT between Room Air/FC Fluid |
| S139 | MIN CW | No | Yes, No | Minimum CW temperature protection selection |
| S140 | MIN CW | 7°C | 0°C ~ 20°C | Minimum CW temperature value |

| Parameters | | Default | Setting range | Description |
|---|---|---|---|---|
| S141 | LOCK FC | 0°C | 0°C ~ 9°C | Lockout FC at FC Fluid below |
| S142 | TRANS CH | 2% | 0.1 ~ 100% | Transition Change |
| S146 | FANSPEED | Auto | Auto, Man, ECO, SUP, DELT | VSD Fanspeed |
| S147 | VSD SET | 100% | 0 ~ 100% | Standard speed of the unit |
| S148 | VSD MIN | 60% | 0 ~ 100% | Minimum speed of the unit |
| S149 | VSD DEH | 60% | 0 ~ 100% | Speed used during dehum |
| S150 | VSD NOP | 100% | 0 ~ 100% | Speed used when CI is active |
| S151 | FF0% | 0.2% | 0 ~ 100% | Fanspeed Change (at 0%) |
| S151 | FF100% | 1% | 0 ~ 100% | Fanspeed Change (at 100%) |
| S152 | FRD | 0s | 0 ~ 300s | Fanspeed Reposition Delay |
| S153 | HAD | - | - | - |
| S154 | HAP | 6°C | 2°C ~ 30°C | Fanspeed P-Band |
| S155 | HAI | 5min | 0 ~ 15min | Fanspeed Integration |
| S157 | SCR TYPE | - | - | - |
| S158 | CO1 ON | - | - | - |
| S159 | CO1 OFF | - | - | - |
| S160 | CO1 TD | - | - | - |
| S161 | CO2 ON | - | - | - |
| S162 | CO2 OFF | - | - | - |
| S163 | CO2 TD | - | - | - |
| S164 | CYCLET | - | - | - |
| S165 | SCR FACT | - | - | - |
| S166 | ACT SCR | - | - | - |

### 5.7.3 STANDBY

The parameters of the STANDBY menu are described in Table 5-12.

*Table 5-12 Descriptions of STANDBY parameters*

| Parameters | | Default | Setting range | Description |
|---|---|---|---|---|
| S502 | #STANDBY | 1 | 0 ~ 32 | Number of standby units |
| S503 | ROTATION | Daily | No, Daily, MON ~ SUN, M - MON ~ M - SUN | Rotation frequency setting of the running and standby units. Range:<br>Daily: rotate once a day.<br>MON ~ SUN: rotate once a week. The rotation occurs on Monday ~ Sunday of the week. For example, MON means rotation occurs on Monday of every week.<br>M - MON ~ M - SUN: rotate once a month. The rotation occurs on Monday ~ Sunday of the first week of the month. For example, M - MON means rotation occurs on Monday of the first week of every month |
| S504 | ROT HOUR | hr | - | Used to set the hour of the detailed time while rotation |
| S505 | ROT MIN | min | - | Used to set the minute of the detailed time while rotation |
| S506 | ROT BY | 1 | 1 ~ 8 | The unit number for a rotation |
| S507 | DO ROT | No | Yes, No | Perform one rotation |
| S508 | CASCADE | No | CO/HE, Cool, Yes, No | Cascade function selection. ‘Yes’ corresponds to temperature and humidity control and ‘no’ corresponds to closing the cascade |
| S509 | STBY HT | No | Yes, No | Whether to start all standby units upon high temperature alarm |

### 5.7.4 WELLNESS

The iCOM controller calculates the bonus and penalty over the equipment maintenance based on the parameters in the WELLNESS menu and the equipment operation historical data, so as to find out the next system maintenance time.

Informing the maintenance personnel of the maintenance time makes the air conditioner run in the optimal mode, which reduces the chances of faults and raises the system reliability.

**The WELLNESS menu includes nine groups of parameters, including WELLNESS BASICs, and WELLNESS MOTOR, WELLNESS COMPs, WELLNESS HEATs and WELLNESS HUM. See Table 5-13 ~ Table 5-21 for detailed parameter descriptions.**

**WELLNESS BASIC1**

*Table 5-13 Descriptions of WELLNESS BASIC1 parameters*

| Parameters | | Default | Setting range | Description |
|---|---|---|---|---|
| S002 | FREQ/YR | 1pY | 0pY ~ 12pY | Maintenance frequency every year |
| S003 | BONUS | MM | 0MM ~ 12MM | Bonus setting |
| S004 | PENALTY | MM | 0MM ~ 12MM | Penalty setting |
| S005 | LAST PM | YY | - | Last maintenance. Year (YY), month (MM) and day (DD). This parameter is read only |
| S005 | LAST PM | MM | | |
| S005 | LAST PM | DD | | |

**WELLNESS BASIC2**

*Table 5-14 Descriptions of WELLNESS BASIC2 parameters*

| Parameters | | Default | Setting range | Description |
|---|---|---|---|---|
| S006 | NAME | - | - | Service personnel setting |
| S007 | CONFIRM | No | Yes, No | Maintenance confirmation selection |
| S008 | NEXT PM | - | - | Calculated next maintenance. This parameter is read only |

**WELLNESS MOTOR**

*Table 5-15 Descriptions of WELLNESS MOTOR parameters*

| Parameters | | Default | Description |
|---|---|---|---|
| S013 | STARTS | - | Number of fan starts since the last maintenance |
| S014 | RUN HRS | hr | Fan run hours since the last maintenance |
| S015 | AVG RUN | min | Average fan run time calculated through number of fan starts and run hours |
| S016 | BEST | 1 | Starts per day best |
| S017 | WORST | 24 | Starts per day worst |
| S018 | ALARMS | 0 | Number of alarms since the last maintenance |
| S019 | BONUS | 0MM | Bonus amount. Actual bonus calculated through the number of starts and average run time. This value determines the time for the next maintenance |

**WELLNESS COMP1**

*Table 5-16 Descriptions of WELLNESS COMP1 parameters*

| Parameters | | Default | Description |
|---|---|---|---|
| S024 | STARTS | - | Number of compressor 1 starts since the last maintenance |
| S025 | RUN HRS | hr | Compressor 1 run hours since the last maintenance |
| S026 | AVG RUN | min | Average compressor 1 run time calculated through the number of starts and run hours |
| S027 | BEST | 12 | Starts per day best |
| S028 | WORST | 240 | Starts per day worst |
| S029 | HP AL | 0 | Number of high pressure alarms occurred to compressor 1 since the last maintenance |
| S030 | LP AL | 0 | Number of low pressure alarms occurred to compressor 1 since the last maintenance |
| S031 | OL AL | 0 | Number of overload alarms occurred to compressor 1 since the last maintenance |
| S032 | DS HT AL | 0 | Number of digital scroll high temperature alarms occurred to compressor 1 since the last maintenance |
| S033 | BONUS | 0MM | Bonus amount. Actual bonus calculated through the number of starts and average run time. This value determines the time for the next maintenance |

**WELLNESS COMP2**

*Table 5-17 Descriptions of WELLNESS COMP2 parameters*

| Parameters | | Default | Description |
|---|---|---|---|
| S035 | STARTS | - | Number of compressor 2 starts since the last maintenance |
| S036 | RUN HRS | hr | Compressor 2 run hours since the last maintenance |

| Parameters | | Default | Description |
|---|---|---|---|
| S037 | AVG RUN | min | Average compressor 2 run time calculated through the number of starts and run hours |
| S038 | BEST | 12 | Starts per day best |
| S039 | WORST | 240 | Starts per day worst |
| S040 | HP AL | 0 | Number of high pressure alarms occurred to compressor 2 since the last maintenance |
| S041 | LP AL | 0 | Number of low pressure alarms occurred to compressor 2 since the last maintenance |
| S042 | OL AL | 0 | Number of overload alarms occurred to compressor 2 since the last maintenance |
| S043 | DS HT AL | 0 | Number of digital scroll high temperature alarms occurred to compressor 2 since the last maintenance |
| S044 | BONUS | 0MM | Bonus amount. Actual bonus calculated through the number of starts and average run time. This value determines the time for the next maintenance |

### WELLNESS HEAT1

*Table 5-18 Descriptions of WELLNESS HEAT1 parameters*

| Parameters | | Default | Description |
|---|---|---|---|
| S046 | STARTS | - | Number of electric heater 1 starts since the last maintenance |
| S047 | RUN HRS | hr | Electric heater 1 run hours since the last maintenance |
| S048 | AVG RUN | min | Average electric heater 1 run time calculated through the number of starts and run hours |
| S049 | BEST | 24 | Starts per day best |
| S050 | WORST | 240 | Starts per day worst |
| S051 | ALARMS | 0 | Number of high pressure alarms since the last maintenance |
| S052 | BONUS | 0MM | Bonus amount. Actual bonus calculated through the number of starts and average run time. This value determines the time for the next maintenance |

### WELLNESS HEAT2

*Table 5-19 Descriptions of WELLNESS HEAT2 parameters*

| Parameters | | Default | Description |
|---|---|---|---|
| S057 | STARTS | - | Number of electric heater 2 starts since the last maintenance |
| S058 | RUN HRS | hr | Electric heater 2 run hours since the last maintenance |
| S059 | AVG RUN | min | Average electric heater 2 run time calculated through the number of starts and run hours |
| S060 | BEST | 24 | Starts per day best |
| S061 | WORST | 240 | Starts per day worst |
| S062 | ALARMS | 0 | Number of high pressure alarms since the last maintenance |
| S063 | BONUS | 0MM | Bonus amount. Actual bonus calculated through the number of starts and average run time. This value determines the time for the next maintenance |

### WELLNESS HEAT3

*Table 5-20 Descriptions of WELLNESS HEAT3 parameters*

| Parameters | | Default | Description |
|---|---|---|---|
| S068 | STARTS | - | Number of electric heater 3 starts since the last maintenance |
| S069 | RUN HRS | hr | Electric heater 3 run hours since the last maintenance |
| S070 | AVG RUN | min | Average electric heater 3 run time calculated through the number of starts and run hours |
| S071 | BEST | 24 | Starts per day best |
| S072 | WORST | 240 | Starts per day worst |
| S073 | ALARMS | 0 | Number of high pressure alarms since the last maintenance |
| S074 | BONUS | 0MM | Bonus amount. Actual bonus calculated through the number of starts and average run time. This value determines the time for the next maintenance |

### WELLNESS HUM

*Table 5-21 Descriptions of WELLNESS HUM parameters*

| Parameters | | Default | Description |
|---|---|---|---|
| S079 | STARTS | - | Number of humidifier starts since the last maintenance |
| S080 | RUN HRS | hr | Humidifier run hours since the last maintenance |

| Parameters | | Default | Description |
|---|---|---|---|
| S081 | AVG RUN | min | Average humidifier run time calculated through the number of starts and run hours |
| S082 | BEST | 24 | Starts per day best |
| S083 | WORST | 240 | Starts per day worst |
| S084 | ALARMS | 0 | Number of high pressure alarms since the last maintenance |
| S085 | BONUS | 0MM | Bonus amount. Actual bonus calculated through the number of starts and average run time. This value determines the time for the next maintenance |

### 5.7.5 DIAGNOSTICS

**The DIAGNOSTICS menu is classified into two groups. After entering the menu, pressing the up button and down button can switch between two groups and pressing the enter button can enter the parameters of the corresponding group. The parameters of group 1 are settable and used to help the maintenance personnel start and cut off devices by hand in site, so as to realize the diagnosis for devices. The parameters of group 2 are read only and reflect the fault condition of the devices. See Table 5-22 for detailed descriptions.**

*Table 5-22 Descriptions of DIAGNOSTICS parameters*

| Parameters | | | Default | Setting range | Description |
|---|---|---|---|---|---|
| Group 1 | S302 | HP1 CODE | 0 | - | HP 1 alarm counting. The counter can be reset to 0 through the parameter |
| | S303 | HP2 CODE | 0 | - | HP 2 alarm counting. The counter can be reset to 0 through the parameter |
| | S304 | HT1 CNT | 0 | - | HT 1 alarm counting. The counter can be reset to 0 through the parameter |
| | S305 | HT2 CNT | 0 | - | HT 2 alarm counting. The counter can be reset to 0 through the parameter |
| | S306 | LP1 CODE | 0 | - | LP 1 alarm counting. The counter can be reset to 0 through the parameter |
| | S307 | LP2 CODE | 0 | - | LP 2 alarm counting. The counter can be reset to 0 through the parameter |
| | S308 | LP1 ACT | br | - | Actual LP 1 |
| | S309 | LP2 ACT | br | - | Actual LP 2 |
| | S310 | LP1 ACT | br | - | Actual LP 1 |
| | S311 | LP2 ACT | br | - | Actual LP 2 |
| | S313 | MANUAL | No | Yes, No | Selecting ‘Yes’ can turn on or off the components; selecting ‘No’ can prohibit manual setting |
| | S314 | MOTOR(S) | On | On, Off | Diagnosis switch of fan motor. The settings ‘On’ and ‘Off’ are used to manually start and shut down the fan respectively |
| | S315 | COMP1 | Off | On, Off | Diagnosis switch of compressor 1. The ‘On’ setting of this parameter can start compressor 1 only when the fan has been started |
| | S315 | C1 MODE | Run | Run, Evac, Charg | Compressor 1 operation mode selection |
| | S316 | C1 CAP | Off | On, Off | Refrigeration capacity output of digital scroll compressor 1 |
| | S317 | C1 CYCLE | 0% | - | - |
| | S318 | LLSV 1 | Off | On, Off | Diagnostic of liquid line solenoid valve of compressor 1 |
| | S319 | COMP2 | Off | On, Off | Diagnostic swtich of compressor 2. Note that the On setting of this parameter can start compressor 2 only when the fan has been started |
| | S319 | C2 MODE | Run | Run, Evac, Charg | Compressor 2 operation mode selection |
| | S320 | C2 CAP | Off | - | Refrigeration capacity output of digital scroll compressor 2 |
| | S321 | C2 CYCLE | 0% | - | - |
| | S322 | LLSV2 | Off | On, Off | Diagnosis switch of liquid line solenoid valve of compressor 2 |
| | S324 | EL HEAT1 | Off | On, Off. | Diagnosis switch of electric heater 1. The ‘On’ setting of this parameter can start electric heater 1 only when the |

| Parameters | | | Default | Setting range | Description |
|---|---|---|---|---|---|
| | | | | | air loss is normal |
| | S325 | EL HEAT2 | Off | On, Off. | Diagnosis switch of electric heater 2. The 'On' setting of this parameter can start electric heater 2 only when the air loss is normal |
| | S326 | EL HEAT3 | Off | On, Off. | Diagnosis switch of electric heater 3. The 'On' setting of this parameter can start electric heater 3 only when the air loss is normal |
| | S327 | SCR HEAT | - | 0 ~ 100 % | SCR Heat |
| | S328 | DEHUMI | Off | On, Off | Diagnostic switch of Dehumidification solenoid valve |
| | S329 | HUM FILL | Off | On, Off | Diagnosis switch of solenoid valve of water supply to the humidifier |
| | S330 | HUM | Off | On, Off | Diagnosis switch of humidifier. The 'On' setting of this parameter can start the humidifier only when the air loss is normal |
| Group 1 | S331 | H DRAIN | - | On, Off | Humidfier drain |
| | S332 | HUM.C. | 0.00A | - | Electric current of humidifier |
| | S335 | ALM REL | Off | On, Off | Diagnostic switch of alarm relay. |
| | S336 | K11 REL | - | On, Off | Diagnostic switch of free cooling relay. |
| | S337 | 3P1 OPEN | Off | On, Off | Diagnostic switch of 3-phase electric regulator. |
| | S337 | 3P2 OPEN | Off | On, Off | |
| | S338 | 3P1 CLOSE | Off | On, Off | |
| | S338 | 3P2 CLOSE | Off | On, Off | |
| | S339 | BV CTRL | - | Man, Auto | Ball valve control type |
| | S340 | MBV1 POS | - | 0 ~ 100% | MBV1 position, MBV2 position |
| | S340 | MBV2 POS | - | 0 ~ 100% | |
| | S341 | ANALOG1 | 0% | 0 ~ 100% | Diagnostic output of analog variable 1 ~ 4. They can be set to be percentage of desired output |
| | S342 | ANALOG2 | 0% | 0 ~ 100% | |
| | S343 | ANALOG3 | 0% | 0 ~ 100% | |
| | S344 | ANALOG4 | 0% | 0 ~ 100% | |
| Group 2 | S345 | RSD | On | On, Off | Remote shut down. Range: On, Off |
| | S346 | AIR LOSS | OK | OK, ACT | Air loss alarm. OK means the system is normal. ACT means the air loss is active, and abnormity occurred |
| | S347 | MOTOR OL | ACT | OK, ACT | Fan motor overload alarm. OK means the fan is normal. ACT means the fan is overloaded, and abnormality occurred |
| | S348 | FILTER | OK | OK, ACT | Filter clogging situation. OK means normal; ACT means the filter is clogged |
| | S349 | CUSTOM1 | OK | OK, ACT | States of customized alarms 1 ~ 4. 'OK 'means normality; 'ACT' means that the alarm is active and that abnormality occurs |
| | S350 | CUSTOM2 | OK | OK, ACT | |
| | S351 | CUSTOM3 | Ok | OK, ACT | |
| | S352 | CUSTOM4 | OK | OK, ACT | |
| | S353 | HEAT SAF | OK | OK, ACT | Status heaters safety |
| | S354 | FLOW AT | % | - | - |
| | S355 | FLOW ACT | % | - | - |
| | S356 | HP1 | OK | OK, ACT | State of high pressure switch 1. OK means normal. ACT means abnormal |
| | S357 | LP1 | OK | OK, ACT | State of low pressure switch 1. OK means normal. ACT means abnormal |
| | S358 | C1 OL | OK | OK, ACT | Overload state of compressor 1. OK means normal. ACT means abnormal |
| | S359 | HP2 | OK | OK, ACT | State of high pressure switch 2. OK means normal. ACT means abnormal |
| | S360 | LP2 | OK | OK, ACT | State of low pressure switch 2. OK means normal. ACT means abnormal |
| | S361 | C2 OL | OK | OK, ACT | Overload state of compressor 2. OK means normal. ACT means abnormal |
| | S367 | HUM PROB | OK | OK, ACT | Humidifer fault state. OK means normal. ACT means abnormal |
| | S368 | DT1 | - | OK, ACT | Status DT1 (Outdoor/Glycol) |
| | S369 | DT2 | - | OK, ACT | Status DT2 (Glycol/Room) |

| Parameters | | | Default | Setting range | Description |
|---|---|---|---|---|---|
| | S370 | DT3 | On | On, Off | Status DT3 (Room/Setpoint) |
| | S371 | MIN CW | - | OK, ACT | Status Min CW |
| | S372 | LWD Val | - | - | - |
| | S374 | LSI | - | - | - |
| | S375 | COND 2 | - | - | - |
| | S376 | COND 1 | - | - | - |
| | S379 | V_CTRL | Time | Time, Feedb | Valve Control |
| | S380 | V_CAL | No | Yes. No | Start Valve Calibration |
| | S381 | CAL_STAT | Idle | - | - |
| | S382 | CLSD 1 | - | - | - |
| | S383 | OPEN 1 | - | - | - |
| | S384 | V1FDB | - | - | - |
| | S385 | CLSD 2 | - | - | - |
| | S386 | OPEN 2 | - | - | - |
| | S387 | V2FDB | - | - | - |

### 5.7.6 SET ALARMS

**The SET ALARMS menu is displayed in nine pages. The first page provides the settings of alarm upper/lower limits and customized alarms. The other eight pages provide the settings of alarm delay.**

**Alarm upper/lower limits setting**

**The alarm upper/lower limits in the SERVICE MENUS are set the same as those in the USER MENUS. For details, see Table 5-6.**

**Customized alarms setting**

**See Table 5-23 for the descriptions of customized alarms setting.**

*Table 5-23 Descriptions of customized alarms setting*

| Parameters | | Default | | Parameters | | Default |
|---|---|---|---|---|---|---|
| S202 | RTN SNSR | Yes | | S215 | LO SUP | 10°C |
| S203 | HI TEMP | °C | | S224 | CUST IN1 | WATER |
| S204 | LO TEMP | °C | | S225 | C1 ACT | CLOSE |
| S205 | HI HUM | 60% | | S226 | CUST IN2 | WATER |
| S206 | LOW HUM | 40% | | S227 | C2 ACT | CLOSE |
| S207 | SENSOR A | No | | S228 | CUST IN3 | WATER |
| S208 | HI TEMP A | °C | | S229 | C3 ACT | CLOSE |
| S209 | LO TEMP A | °C | | S230 | CUST IN4 | HEAT A |
| S210 | HI HUM A | % | | S231 | C4 ACT | OPEN |
| S211 | LO HUM A | % | | S232 | WA AC AL | No |
| S213 | SUP SNSR | No | | S233 | WAT OFF | No |
| S214 | HI SUP T | 24°C | | | | |

**CUST IN1, CUST IN2, CUST IN3 and CUST IN4 can be set to 21 types of input. See Table 5-24 for details.**

*Table 5-24 Descriptions of types*

| Types | Description | | Types | Description | | Types | Description |
|---|---|---|---|---|---|---|---|
| SMOKE | Smoke alarm | | RH+HU | Rht + Hum lockout | | RJTVS | HTRJ TVSS |
| WATER | Water leakage alarm | | COMP | Compressor lockout | | Fire | Fire Alarm |
| C PMP | Cooling pump alarm | | Call | Call for service | | 2.Set | 2nd Setpoint |
| FLOW | Insufficient water alarm | | Temp | High temperature alarm | | NoP | No Power |
| G PMP | Standby pump alarm | | Air | Air loss alarm | | LSI | LSI |
| STBY | Standby unit alarm | | FC L. | FC lockout | | Cnd 1 | Condensor 1 Fail |
| C-In1 | Customized alarm 1 | | HeatA | Heater alarm | | Cnd 2 | Condensor 2 Fail |
| C-In2 | Customized alarm 2 | | FLOSD | Flow AL SD | | ScRed | D-Scroll Red |
| C-In3 | Customized alarm 3 | | FLOLC | Flow AL LC | | Swap V | Swap Valve |
| C-In4 | Customized alarm 4 | | ComPD | Comp Lock PD | | ECFan | EC Fan Fail |
| RHT | Reheater lockout | | En FC | Enable FC, | | | |
| HUM | Humidifier lockout | | RJVFD | HTRJ VFD | | | |

**C1 ACT, C2 ACT, C3 ACT and C4 ACT correspond to the customer alarms. 'OPEN' means normally open, 'CLOSE' means normally closed.**

**Alarm delays setting**

**The alarm delays are the time after faults occur and before the alarms are triggered. See Figure 5-9 for the menu format.**

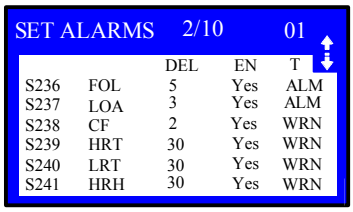



*Figure 5-9 Alarm delay*

**The alarm name, delay time, delay enabling and alarm type are displayed from left to right in the list.**

**The alarm delay can be set to 0 ~ 9999. Unit: second.**

**The delay enabling determines whether the alarm will be displayed and the alarm menu is entered, Options include 'Yes' and 'No'.**

**The alarm type can be set to 'ALM' (alarm), 'WRN' (warning) and 'MSG' (message). They determine the alarm degree of the corresponding event.**

**The alarm names are listed in Table 5-25.**

*Table 5-25 Alarm name description*

| SN | Alarm/event name | Description | | SN | Alarm/event name | Description |
|---|---|---|---|---|---|---|
| S236 | FOL | Fan overload | | S266 | LOF | Loss of flow |
| S237 | LOA | Loss of airflow | | S267 | SGP | Standby glycol pump on |
| S238 | CF | Filter clogged | | S268 | STB | Standby unit on |
| S239 | HRT | High room temp. | | S269 | HUP | Humidifier problem |
| S240 | LRT | Low room temp. | | S270 | NOC | No connection w/Unit1 |
| S241 | HRH | High room hum. | | S271 | - | No connection w/UnitX |
| S242 | LRH | Low room hum. | | S272 | LOP | LOSS OF POWER |
| S243 | HTA | High temperature of sensor A | | S275 | CI1 | Customized input 1 |
| S244 | LTA | Low temperature of sensor A | | S276 | CI2 | Customized input 2 |
| S245 | HHA | High humidity of sensor A | | S277 | CI3 | Customized input 3 |
| S246 | LHA | Low humidity of sensor A | | S278 | CI4 | Customized input 4 |
| S249 | OL1 | Compressor 1 overload | | S279 | CS | Call for service |
| S250 | OL2 | Compressor 2 overload | | S280 | HTD | High temperature |
| S251 | HP1 | Compressor 1 high pressure | | S281 | LB1 | Loss of air blower 2 |
| S252 | HP2 | Compressor 2 high pressure | | S282 | RL | Reheat lockout |
| S253 | LP1 | Compressor 1 low pressure | | S283 | HL | Humidifier lockout |
| S254 | LP2 | Compressor 2 low pressure | | S284 | FCL | FC lockout |
| S255 | PD1 | Compressor 1 pumpdown fails | | S285 | CL | Compressor(s) lockout |
| S256 | PD2 | Compressor 2 pumpdown fails | | S288 | SC1 | Short cycle 1 |
| S257 | HT1 | Digital scroll 1 high temperature | | S289 | SC2 | Short cycle 2 |
| S258 | HT2 | Digital scroll 2 high temperature | | S290 | NOP | NO power |
| S259 | EHO | EL HEAT HIGH TEMP | | S291 | CN1 | Condensor 1 Fail |
| S262 | WHE | Working hours exceeded | | S292 | CN2 | Condensor 2 Fail |
| S263 | SMO | Smoke detected | | S293 | EFF | EC Fan fail |
| S264 | WUF | Water under floor | | S294 | HST | High supply air temperature |
| S265 | CPH | Conderser pump high water | | S295 | LST | Low supply air temperature |

### 5.7.7 CALIBRATION

**The CALIBRATION menu can calibrate sensors by setting offsets. The parameters are listed in Table 5-26. The parameters are in pairs: the former is the calibrated value and the latter is the calculated value, or the sum of the measured value and the calibrated value. This value is engaged in the calculation of control need.**

*Table 5-26 Descriptions of CALIBRATION parameters*

| Parameters | | Default | Description |
|---|---|---|---|
| S602 | RTN TEMP | K | Calibrated return air temperature. It can be set as a positive or negative value. Use the up and down buttons to change the setting value, 0.1K at each step |
| S603 | CAL TEMP | 25°C | Sum of the calibrated value and measured return air temperature. This value is compared with the setting value as the system actual temperature and is engaged in the calculation |
| S604 | RTN HUM | +0.0% | Calibrated return air humidity. It can be set as a positive or negative value. Use the up and down buttons to change the setting value, 1% at each step |
| S605 | CAL HUM | 44.0% | Sum of the calibrated value and measured return air humidity. This value is compared with the setting value as the system actual humidity and is engaged in the calculation |
| S606 | DS1 NTC | +0.0K | Calibrated digital scroll 1NTC. It can be set as a positive or negative or positive value. Use the up and down buttons to change the setting value, 0.1K at each step |
| S607 | CAL DS1 | 29°C | Sum of the calibrated value and return air humidity measured by digital scroll 1NTC sensor. This value is engaged in the calculation |
| S608 | DS2 NTC | +0.0K | Calibrated digital scroll 2NTC. It can be set as a positive or negative value. Use the up and down buttons to change the setting value, 0.1K at each step |
| S609 | CAL DS2 | 25°C | Sum of the calibrated value and return air humidity measured by digital scroll 2NTC sensor. This value is engaged in the calculation |
| S610 | OUT SNS | °C | Outdoor Sensor |
| S611 | CAL OUT | +0.0K | Calibrated Outdoor Sensor |
| S613 | TEMP A | +0.0K | Calibrated value of temperature sensor A |
| S614 | CAL A | °C | Calculated value corresponding to temperature sensor A |
| S615 | HUM A | +0.0% | Calibrated value of humidity sensor A |
| S616 | CAL A | 44.0% | Calculated value corresponding to humidity sensor A |
| S617 | TEMP B | TH | Calibrated value of temperature sensor B |
| S618 | TYPE B | +0.0K | Type of temperature sensor B |
| S619 | CAL B | °C | Calculated value corresponding to temperature sensor B |
| S620 | HUM B | +0.0% | Calibrated value of humidity sensor B |
| S621 | CAL B | 44.0% | Calculated value corresponding to humidity sensor B |
| S622 | TYPE C | TH | Type of temperature sensor C |
| S624 | FC SNSR | - | Free cooling temperature sensor. PTC or NTC sensor can be configured according to the actual configuration |
| S625 | FC SNSR | +0°C | Calibrated value of free cooling temperature sensor |
| S626 | CAL FC | °C | Calculated value of free cooling temperature sensor |
| S627 | SUP SNSR | NTC | Air supply temperature sensor. PTC or NTC sensor can be configured |
| S628 | SUP TEMP | +0.0K | Calibrated value of air supply temperature sensor |
| S629 | CAL SUP | °C | Calculated value of air supply temperature sensor |
| S630 | TEMP C | +0.0K | Calibrated value of temperature sensor C |
| S631 | CAL C | °C | Calculated value of temperature sensor C |
| S632 | HUM C | +0.0% | Calibrated value of humidity sensor C |
| S633 | CAL C | % | Calculated value of humidity sensor C |

### 5.7.8 NETWORK SETUP

**The NETWORK SETUP menu is used to set the parameters when the system is in a network subject to the monitoring of a host. See Table 5-27 for parameter descriptions.**

*Table 5-27 Descriptions of NETWORK SETUP parameters*

| Parameters | | Default | Setting range | Description |
|---|---|---|---|---|
| S802 | #UNITS | 1 | 1 ~ 32 | Range: 1 ~ 32 |
| S803 | TEAMWORK | No | No, 1, 2 | Range: No, 1, 2 |

| Parameters | | Default | Setting range | Description |
|---|---|---|---|---|
| S824 | MON ADD | 3 | 1 ~ 99 | Monitoring address No. of the unit |
| S825 | MON T.O. | No | No, 1, 2 | Monitoring Timeout |
| S825 | MON H.S. | 3 | 1 ~ 99 | Monitoring Handshake |
| S831 | CS CTRL | No | Save, Load, No | Save the parameter set through MON ADD to the iCOM controller. 'No' means not saved |
| S831 | CS STAT | Change | Change, Valid | Indication of the saving state of the parameter set through MON ADD. 'Change' means that the parameter is changed but not saved. 'Valid' means that the setting is valid and saved |
| S832 | NW CTRL | No | Save, Load, No | Save the parameter set through U2U GRP to the iCOM controller. 'No' means not saved |
| S832 | NW STAT | Valid | Change, Valid | Indication of the saving state of the parameter set through U2U GRP. 'Change' means that the parameter is changed but not saved. 'Valid' means that the setting is valid and saved |
| S835 | MON PROT | Vlcty | Vlcty, HN, IGM, No | Host monitoring protocol setting. Range: Vlcty (Velocity uses intelligent card), HN (Hironet), IGM (ECA2), No |
| S836 | IP #1 | 192 | - | Set IP address |
| S836 | IP #2 | 168 | | |
| S836 | IP #3 | 254 | | |
| S836 | IP #4 | 1 | | |
| S837 | NM #1 | 255 | - | Set subnet mask |
| S837 | NM #2 | 255 | | |
| S837 | NM #3 | 255 | | |
| S837 | NM #4 | 0 | | |
| S838 | GW #1 | 0 | - | Set gateway address |
| S838 | GW #2 | 0 | | |
| S838 | GW #3 | 0 | | |
| S838 | GW #4 | 0 | | |
| S840 | U2U PROT | GBP | - | - |
| S841 | U2U ADD | 3 | - | Group address No. of this unit |
| S842 | U2U GRP | 1 | - | - |
| S843 | BL CTRL | No | S + R, No | Boot program variant load. Saving the change of S835 ~ S841 needs the S + R command of this parameter. The system will reset after the saving, and configure according to the new parameters |
| S843 | BL STAT | Change | Change, Valid | Indication of whether or not the parameters set through S835 ~ S841 are saved. 'Change' means that the parameter is changed but not saved. 'Valid' means that the setting is valid and saved |
| S844 | SR CTRL | No | C + R, No | Static RAM data reset control. If the change of S835 ~ S841 are not saved, using the C + R command in this parameter can restore S835 ~ S841 to their original settings, and the system will reset afterwards |
| S844 | SR STAT | Valid | - | STD |
| SW# | | - | - | Version No. of the control software |
| MAC | | 00:00:68:19:31:70 | 00:00:68:19:31:70 | MAC address of the network card of the iCOM controller |
| NAME | | UNIT | UNIT | Name of the unit. By default: UNIT. You can change the name as you need |

## 5.7.9 OPTIONS SETUP

The OPTIONS SETUP menu is used to set the parameters according to the equipment-specific demands. See Table 5-28 for detailed descriptions.

*Table 5-28 Descriptions of OPTIONS SETUP parameters*

| Parameters | | Default | Setting range | Description |
|---|---|---|---|---|
| S402 | COMP SEQ | Auto | Auto, 1 (compressor 1 being the | Compressor sequence. Range: Auto, 1 (compressor 1 being the primary one), 2 (compressor 2 being the primary one) |

| Parameters | | Default | Setting range | Description |
|---|---|---|---|---|
| | | | primary one), 2 (compressor 2 being the primary one) | |
| S403 | LP DELAY | 1min | - | Low pressure alarm delay |
| S405 | EL HEAT | 1 | 0 ~ 3 | Electric heating stages |
| S406 | EL HEAT C | - | - | - |
| S407 | HW HEAT | No | Yes, No | Hot water heating enabled |
| S408 | ALL HEAT | 3 | 0 ~ 3 | heating stages. |
| S409 | LWDconn | No | Yes, No | LWD connected. Range: Yes (water low sensor connected), No (water low sensor not connected) |
| S409 | V_CTRL | Time | Time, Feedback | - |
| S410 | 3P RUN | 165s | - | 3P actuator runtime |
| S411 | 3P DIR | DIR | DIR, REV | 3P actuator direction |
| S413 | HUM ENAB | Yes | Yes, No | Humidification enabled |
| S414 | IR FLUSH | 150% | - | Infrared flush rate |
| S415 | HUMSTEAM | % | - | - |
| S416 | HUM CONT | On, Off | On, Off, Prop | Humidifier control mode |
| S417 | HUM.TIME | s | - | Humidifier bottle flush time |
| S418 | HUM.MAN | Yes | Yes, No | Humidifier bottle manual flush enabled |
| S419 | DEHUM EN | Yes | Yes, No | Dehumidification enabled. |
| S420 | REST EN | Yes | Yes, No | Auto restart enabled |
| S421 | RESTART | s | - | Unit auto restart time |
| S422 | ONOFF EN | Yes | Yes, No | On-off key enabled. If “no” is selected, the ON/OFF key cannot be used to perform on/off operation on the machine. |
| S424 | CW FLUSH | 0hr | - | Cooling water auto flush time, unit: hr (hour) |
| S425 | FC FLUSH | 0hr | - | Free cooling auto flush time, unit: hr (hour) |
| S426 | HT FLUSH | 0hr | - | Hot water auto flush time, unit: hr (hour) |
| S427 | BALL OFF | +0.0br | - | - |
| S428 | HEAT AS | - | - | - |
| S429 | CW_CTRL | - | - | - |
| S430 | MAIN V | - | - | - |
| S431 | VALV ROT | - | - | - |
| S432 | VALV TIM | - | - | - |
| S433 | DEHUM OP | - | - | - |

### 5.7.10 SERVICE INFO

The SERVICE INFO menu provides the contact information of maintenance personnel. The maintenance personnel can input and save their contact information through this submenu.

## 5.8 ADVANCED MENUS

The ADVANCED MENUS include PASSWORD LEVEL, FACTORY SETUP and PASSWORDS, as shown in Figure 5-10.

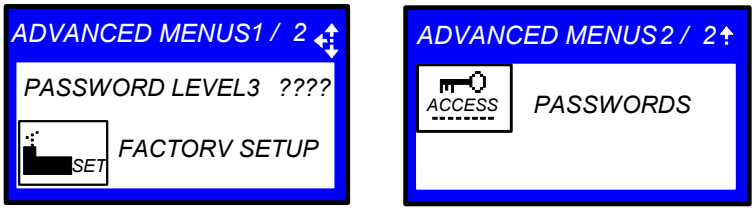



*Figure 5-10 ADVANCED MENUS*

### 5.8.1 PASSWORD LEVEL

It is operated by Emerson service personnel.

### 5.8.2 FACTORY SETUP

**The FACTORY SETUP menu is displayed in nine pages. The parameters are described in Table 5-29 ~ Table 5-38.**

**Unit code related settings**

*Table 5-29 Descriptions of unit code related settings*

| Parameters (1/9) | | Default | Setting range | Description |
|---|---|---|---|---|
| A003 | UC 01 | 0 | - | Unit code setting. The code has 18 bits. Each bit can be set as 0 ~ 20 |
| … | … | … | | |
| A003 | UC 06 | 0 | | |
| A005 | UC 07 | 0 | | |
| … | … | … | | |
| A005 | UC 12 | 0 | | |
| A007 | UC 13 | 0 | | |
| … | … | … | | |
| A007 | UC 18 | 0 | | |
| A008 | UC CTRL | No | Save, Load, Compare, No | Options include:<br>Save: after UC01 ~ UC18 are changed, the changed can be saved through the save command.<br>Load: load parameters to the unit code directly.<br>Compare: compare the present parameters and the parameters to be loaded.<br>No: All changes are cancelled. Keep the old parameters |
| A009 | UC STAT | OK | Not available, Invalid, OK, Changed, Updating | Unit code status. Range:<br>Not available: parameters set through UC01 ~ UC18 are unavailable.<br>Invalid: parameters set through UC01 ~ UC18 are invalid.<br>OK: parameters set through UC01 ~ UC18 are effective.<br>Changed: parameters UC01 ~ UC18 are changed, but not saved.<br>Updating: parameters are updating |
| A010 | EL CTRL | Load | - | External data can be loaded through the load command |
| A011 | EL STAT | OK | Not available, Invalid, OK, Changed, Updating | Exception list status. Range:<br>Not available: parameters set through UC01 ~ UC18 are unavailable.<br>Invalid: parameters set through UC01 ~ UC18 are invalid.<br>OK: parameters set through UC01 ~ UC18 are effective.<br>Changed: parameters UC01 ~ UC18 are changed, but not saved.<br>Updating: parameters are updating |

**System related settings**

*Table 5-30 Descriptions of system related settings*

| Parameters (2/9) | | Default | Setting range | Description |
|---|---|---|---|---|
| A102 | REFRIG | R22 | R407C, R22, R410A | Refrigerant type selection |
| A103 | MOTOR OL | SHUTD | SHUTD, DISAB | Main fan overload. The action to take after the fan overload. Range: SHUTD (fan shuts down), DISAB (shut down humidifier, dehumidifier and heater, only keep the cooling unit running) |
| A104 | AIR LOSS | SHUTD | SHUTD, DISAB | The action to take after the loss of airflow. Range: SHUTD (fan shuts down), DISAB (shut down humidifier, dehumidifier and heater, only keep the cooling unit running) |
| A105 | # COMP | 0 | 0 ~ 2 | Number of compressors |
| A106 | COMP DLY | s | - | Compressor delay time |
| A107 | COMP ON | min | 0 ~ 5min | Compressor minimum on time |
| A108 | COMP OFF | 3min | 0 ~ 5min | Compressor minimum off time |
| A109 | PUMPDOWN | Yes | Yes, No | Pump down enable |

| | | | | |
|---|---|---|---|---|
| A110 | CAP TYPE | No | 4step, HGBP, DS, DS + TH, No | Capacity control type. 4step: four steps. HGBP: hot gas bypass. DS: digital scroll. DS + TH: digital scroll and temperature switch. No: with no need for capacity control type |
| A111 | FLOCT | 0s | 0 ~ 180s | Shutdown time of airflow loss |

### Other settings

*Table 5-31 Descriptions of other settings*

| Parameters (3/9) | | Default | Setting range | Description |
|---|---|---|---|---|
| A113 | DS CYCLE | s | - | Digital scroll cycle |
| A114 | DS HT | °C | - | Digital scroll high temperature |
| A115 | DS SWB | °C | - | Digital scroll switchback |
| A116 | LP TYPE | Analog | Analog, Digital | Low pressure device type |
| A117 | LP PH1 | ps | - | Low pressure threshold phase 1 |
| A118 | LP PH2 | ps | - | Low pressure threshold phase 2 |
| A119 | LC PRE | 0.0s | - | Liquid control pre-time |
| A120 | LC POST | 0.0s | - | Liquid control post-time |
| A121 | CHARGE P | br | - | Loss of Charge Protection |

### LP sensor related settings

*Table 5-32 Descriptions of LP sensor related settings*

| Parameters (4/9) | | Default | Setting range | Description |
|---|---|---|---|---|
| A124 | LP1 LOW | 10% | 0 ~ 100% | LP1 sensor lower threshold (percentage) |
| A124 | LP1 LOW | 0bbr | 10 ~ 50br | LP1 sensor lower threshold |
| A125 | LP1 HIGH | 90% | 0 ~ 100% | HP1 sensor lower threshold (percentage) |
| A125 | LP1 HIGH | 10.3br | 10 ~ 50br | HP1 sensor lower threshold |
| A126 | LP1 ACT | - | - | Actual LP1 signal. Read only |
| A127 | LP2 LOW | 10% | 0 ~ 100% | LP2 sensor lower threshold (percentage) |
| A127 | LP2 LOW | 0br | 10 ~ 50br | LP2 sensor lower threshold |
| A128 | LP2 HIGH | 90% | 0 ~ 100% | HP2 sensor lower threshold (percentage) |
| A128 | LP2 HIGH | 10.3br | 10 ~ 50br | HP2 sensor lower threshold |
| A129 | LP2 ACT | - | - | Actual LP2 signal. Read only |
| A130 | PD CUT | br | - | Pumpdown cutout |
| A131 | PD RECYC | br | - | Pumpdown recycle |
| A132 | HEAT REJ | W/G | FSC, L-T, W/G | Heat rejection control. Range: FSC: fan speed control; L-T: Lee-Temp; W/G: water/glycol cooling |

### Free-cooling, HG and HW related settings

*Table 5-33 Descriptions of free-cooling, HG and HW related settings*

| Parameters (5/9) | | Default | Setting range | Description |
|---|---|---|---|---|
| A135 | K11 ACT | DEH | WNG、DEH、NOP、FC | - |
| A136 | C/W F DUR | 3min | 1min ~ 3min | Cooling water flush duration |
| A137 | COOL TYP | SINGL | Singl, FC, DC | Three cooling type |
| A138 | STOP FC+ | °C | - | Stop FC at setpoint + or value |
| A139 | FC F DUR | 0min | 1min ~ 3min | Freecooling flush duration |
| A140 | FC F K11 | Yes | Yes, No | Freecooling flush starts R5 |
| A141 | COMP + FC | No | Yes, No | Compressor plus FC simultaneously |
| A142 | HW F DUR | 3min | 0 ~ 3min | Hot water flush duration |
| A143 | HG HEAT | No | Comp.1, Comp.2, No | Hot gas heating enabled |
| A144 | HEAT OP | STAGE | Stage, Delay, No | Electric heater operation mode |

### Humidification and dehumidification related settings

*Table 5-34 Descriptions of humidification and dehumidification related settings*

| Factory 6/9 | | Default | Setting range | Description |
|---|---|---|---|---|
| A146 | HUM TYPE | IFS | External, IFS, IFL, PEX6, PEX9, PEX12, 21LLA, 53LLC, 53HLB, 93LLE, 93HLD, d3H, HT2, HT5, HT9, SGH, No | Humidifier model |
| A147 | HUM VOLT | V | - | - |
| A148 | HUM LAST | 15hr | - | Detect whether the last operation time exceeds this cycle setting during the startup of the humidifier. Unit: hr |
| A149 | PREFILL | 30s or 57s | - | Prefill time. Unit: second |
| A150 | FILL | 57s | - | Fill time. Unit: second |
| A151 | HUM ON | 584s | - | Humidifier on time. Unit: second |
| A152 | DEH COMP | 1 | 1, 2, both | Dehumidification with compressor. When 1 or 2 is selected, compressor 1 or 2 is used for dehumidification. When Both is selected, the two compressors are both used for dehumidification |

### Analog output related settings

*Table 5-35 Descriptions of analog output related settings*

| Factory 7/9 | | Default | Setting range | Description |
|---|---|---|---|---|
| A157 | ANOUT1LO | 0% | 0 ~ 100% | - |
| A157 | ANOUT1HI | 100% | 0 ~ 100% | |
| A158 | ANOUT2LO | 0% | 0 ~ 100% | |
| A158 | ANOUT2HI | 100% | 0 ~ 100% | |
| A159 | ANOUT3LO | 0% | 0 ~ 100% | |
| A159 | ANOUT3HI | 100% | 0 ~ 100% | |
| A160 | ANOUT4LO | 0% | 0 ~ 100% | |
| A160 | ANOUT4HI | 100% | 0 ~ 100% | |
| A161 | FS HE/HU | 100% | 0 ~ 100% | |
| A163 | ANOUT1 | No | - | Analog output selection. See Table 5-36 |
| A164 | ANOUT2 | No | - | |
| A165 | ANOUT3 | No | - | |
| A166 | ANOUT4 | No | - | |

*Table 5-36 Descriptions of analog output options*

| Options | Description | | Options | Description |
|---|---|---|---|---|
| CW010 | CW/FC 0 ~ 10V | | ALBD2 | AlarmBoard 2 |
| HW | Hot water | | ALBD3 | AlarmBoard 3 |
| HW175 | Hot water 1.75 | | IVAR | I-Variex 1 |
| VSD | Variable fan speed drive | | HUM% | HT HUM |
| COOL | Cooling | | SUP | Supply Temperature |
| CV175 | CW/FC 1.75 | | RET | Return Temperature |
| COOL1 | Cooling 1 | | HUMI | Humidifier |
| COOL2 | Cooling 2 | | SUPSA | Supersaver |
| HEAT | Heater | | INVCO | Inverted Cool |
| No | No use | | HEAT3 | Heating 33% |
| MBV1 | Motorized ball vavle1 | | CW210 | CW/FC 2V ~ 10V |
| MBV2 | Motorized ball vavle 2 | | C2010 | CW2 0 ~ 10V |
| SCR | Silicon controlled rectifier | | C2175 | CW2 1.75 |
| CONF | Configurable | | C2210 | CW2 2 ~ 10V |
| ALBD1 | AlarmBoard 1 | | | |

### Analog action related settings

*Table 5-37 Descriptions of analog action related settings*

| Parameters (8/9) | | Default | Setting range | Description |
|---|---|---|---|---|
| A168 | AO1 STA | 0% | 0% ~ 100% | Analog output 1 start percentage |
| A168 | AO1 STA | 0V | 0V ~ 10V | Analog output 1 start voltage |
| A169 | AO1 END | 100% | 0% ~ 100% | Analog output 1 end percentage |
| A169 | AO1 END | 10V | 0V ~ 10V | Analog output 1 end voltage |
| A170 | AO2 STA | 0% | 0% ~ 100% | Analog output 2 start percentage |
| A170 | AO2 STA | 0V | 0V ~ 10V | Analog output 2 start voltage |
| A171 | AO2 END | 100% | 0% ~ 100% | Analog output 2 end percentage |
| A171 | AO2 END | 10V | 0V ~ 10V | Analog output 2 end voltage |
| A172 | AO3 STA | 0% | 0% ~ 100% | Analog output 3 start percentage |
| A172 | AO3 STA | 0V | 0V ~ 10V | Analog output 3 start voltage |
| A173 | AO3 END | 100% | 0% ~ 100% | Analog output 3 end percentage |
| A173 | AO3 END | 10V | 0V ~ 10V | Analog output 3 end voltage |
| A174 | AO4 STA | 0% | 0% ~ 100% | Analog output 4 start percentage |
| A174 | AO4 STA | 0V | 0V ~ 10V | Analog output 4 start voltage |
| A175 | AO4 END | 100% | 0% ~ 100% | Analog output 4 end percentage |
| A175 | AO4 END | 10V | 0V ~ 10V | Analog output 4 end voltage |

**LL related settings**

*Table 5-38 Descriptions of LL related settings*

| Parameters (9/9) | | Default | Setting range | Description |
|---|---|---|---|---|
| A179 | LL1 LOW | % | 0 ~ 100% | HPT1 low limit percentage setting |
| A179 | LL1 LOW | br | 10.0 ~ 50.0br | HPT1 low limit setpoint |
| A180 | LL1 HIGH | % | 0 ~ 100% | HPT1 high limit percentage setting |
| A180 | LL1 HIGH | br | 10.0 ~ 50.0br | HPT1 high limit setpoint |
| A181 | LL1 ACT | % | - | HPT1 actual percentage, read only |
| A182 | LL1 ACT | br | - | HPT1 actual value, read only |
| A183 | LL2 LOW | % | 0 ~ 100% | HPT2 low limit percentage setting |
| A183 | LL2 LOW | br | 10.0 ~ 50.0br | HPT2 low limit setpoint |
| A184 | LL2 HIGH | % | 0 ~ 100% | HPT2 high limit percentage setting |
| A184 | LL2 HIGH | br | 10.0 ~ 50.0br | HPT2 high limit setpoint |
| A185 | LL2 ACT | % | - | HPT2 actual percentage, read only |
| A186 | LL2 ACT | br | - | HPT2 actual value, read only |

## 5.9 MBV Settings

**Through the ADVANCED MENUS screen (see Figure 5-11), you can view the current status of the cooled valve. MBV menu is displayed in six pages, and the description of the menus is listed in Table 5-39.**

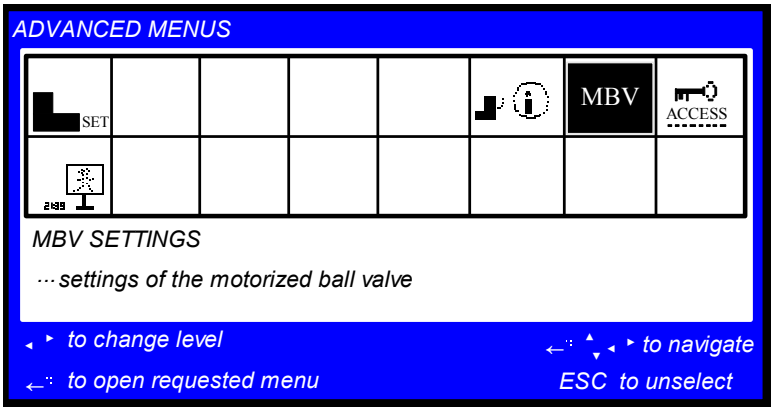



*Figure 5-11 ADVANCED MENUS screen*

*Table 5-39 MBV settings*

| Parameters | | Default | Range | Description |
|---|---|---|---|---|
| A403 | UNIT HI PRESS | - | - | Unit high pressure |
| A404 | MBV OP PRESS | - | - | MBV control available pressure |
| A405 | MBV POSITION | - | - | MBV position |
| A406 | ACTIVE OFFSET | - | - | Active offset |
| A408 | MBV PHASE | - | - | - |
| A409 | COMPR LP PHASE | - | - | - |
| A410 | MBV PRESS READ | - | - | - |
| A411 | MBV POSITION SET | - | - | - |
| A414 | START OFFSET | - | - | - |
| A415 | MAX OFFSET STEP | - | - | - |
| A416 | SERVICE OFFSET | - | - | - |
| A417 | START DELAY | - | - | - |
| A418 | STOP DELAY | - | - | - |
| A419 | 4ST OPEN PRESET | - | - | - |
| A420 | 4ST CLOSE PRESET | - | - | - |
| A424 | MBV REINT | - | - | - |
| A425 | READ INTERVAL | - | - | - |
| A426 | DIG SCROLL FILTER | - | - | - |
| A427 | 4ST-30SEC LOADING | - | - | - |
| A428 | PUMPDOWN PRESS | - | - | - |

| Parameters | | Default | Range | Description |
|---|---|---|---|---|
| A431 | REPOSITION COUNTER | - | - | MBV reposition counter |
| A432 | REPOSITION COUNTER RESET | - | - | Reposition counter reset |
| A436 | U4 | - | - | U4 proportional band |
| A437 | U3A | - | - | U3A proportional band |
| A438 | U2A | - | - | U2A proportional band |
| A439 | U1 | - | - | U1 proportional band |
| A440 | L1 | - | - | L1 proportional band |
| A441 | L2A | - | - | L2A proportional band |
| A442 | L3 | - | - | L3 default proportional band |
| A443 | ACTIVE OFFSET | - | - | ACTIVE OFFSET |
| A444 | 4ST PHASHE | - | - | 4ST PHASHE |
| A447 | MAX | - | - | Max proportional band |
| A448 | U4 | - | - | U4 default proportional band |
| A449 | U3A | - | - | U3A default proportional band |
| A450 | U3B | - | - | U3B default proportional band |
| A451 | U2A | - | - | U2A default proportional band |
| A452 | U2B | - | - | U2B default proportional band |
| A453 | U1 | - | - | U1 default proportional band |
| A458 | L1 | - | - | L1 default proportional band |
| A459 | L2A | - | - | L2A default proportional band |
| A460 | L2B | - | - | L2B default proportional band |
| A461 | L3 | - | - | L3 default proportional band |
| A462 | MIN | - | - | Min proportional band |

## 5.10 EVENT NAME AND DEFINITION

**See Table 5-40 for event name and definition.**

*Table 5-40 List of event name and definition*

| Event | Definition |
|---|---|
| General Alarm | General Alarm |
| COMP 1 HIGH PRESSURE | Compressor 1 high pressure |
| COMP 1 LOW PRESSURE | Compressor 1 low pressure |
| HIGH CW TEMP | Chilled water high temperature |
| LOSS OF CW FLOW | Loss of chilled water |
| EL HEAT HIGH TEMP | Electric heater high temperature |
| MAIN FAN OVERLOAD | Main fan overload |
| LOSS OF AIRFLOW | Loss of air flow |
| CLOGGED FILTERS | Clogged filters |
| CUSTOMER INPUT n (n = 1 ~ 4) | Customer input n (n = 1 ~ 4) |
| FC LOCKOUT | Free cooling lockout |
| LP Transducer 1 Fail | Low pressure transducer 1 fails |
| CALL SERVICE | Call for service |
| HIGH TEMPERATURE | High temperature alarm |
| LOSS OF AIR BLOWER 1 | Loss of air blower 1 |
| HIGH ROOM TEMP | High room temperature |
| LOW ROOM TEMP | Low room temperature |
| HIGH ROOM HUM | High room humidity |
| LOW ROOM HUM | Low room humidity |
| HIGH TEMP SENSOR A | High temperature of sensor A |
| LOW TEMP SENSOR A | Low temperature of sensor A |
| HIGH HUM SENSOR A | High humidity of sensor A |
| LOW HUM SENSOR A | Low humidity of sensor A |
| UNIT HRS EXCEEDED | Unit has exceeded operating time |
| COMP 1 HRS EXCEEDED | Compressor 1 has exceeded operating time limit |
| HUM HRS EXCEEDED | Humidifier has exceeded operating time limit |
| SUPPLY SENSOR FAILURE | Supply sensor failure |

| Event | Definition |
|---|---|
| DSCROLL 2 SENSOR FAIL | Digital scroll 2 sensor fails |
| ROOM SENSOR FAILURE | Room sensor failure |
| SENSOR A FAILURE | Sensor A failure |
| LP Transducer 2 Fail | Low pressure transducer 2 fails |
| NETWORK FAILURE | Network failure |
| Low Start Pressure 1 | Alarm of low start pressure 1 |
| UNIT ON | Unit on |
| UNIT OFF | Unit off |
| SLEEP MODE | Sleep mode |
| STANDBY MODE | Standby mode |
| POWER ON | Power on |
| POWER OFF | Power off |
| Unit n disconnected (n = 1 ~ 32) | Unit n disconnected (n = 1 ~ 32) |
| COMP 2 HIGH PRESSURE | Compressor 2 high pressure |
| COMP 2 LOW PRESSURE | Compressor 2 low pressure |
| COMP 2 HRS EXCEEDED | Compressor 2 has exceeded operating time limit |
| DSCROLL 1 SENSOR FAIL | digital scroll 1 sensor fails |
| FREECOOL TEMP SENSOR | Free cooling source sensor failure |
| Low Start Pressure 2 | Alarm of low Start Pressure 2 |
| ON-OFF KEY DISABLED | ON-OFFkey disabled |
| LWD SENSOR FAIL | Low water level sensor fails |
| WATER LEAKAGE | Water leakage alarm |
| Dummy 67 | Dummy alarm 067 |
| RAM / Battery Failure | RAM/battery failure |
| Low Memory 1 | Low memory 1 |
| NO CONNECTION w/Unit1 | No connection with unit 1 |
| COMP 1 OVERLOAD | Compressor 1 overload |
| COMP 2 OVERLOAD | Compressor 2 overload |
| WRONG DAMPER POSITION | Wrong damper position |
| Dummy 074 | Dummy alarm 074 |
| HP 1 SENSOR FAIL | High pressuresensor 1 fails |
| HP 2 SENSOR FAIL | High pressure sensor 2 fails |
| COMP POWER REDUCTION ACTIVE | Compressor power reduction active |
| NO POWER | No power |
| UNIT DISABLED | Humidification/heating disabled due to unit failure |
| UNIT SHUT DOWN | Unit shutdown due to failure |
| Low Coil Pressure 1 | Low coil pressure 1 |
| Low Coil Pressure 2 | Low coil pressure 2 |
| Low OP Pressure 1 | Low op pressure 1 |
| Low OP Pressure 2 | Low op pressure 2 |
| UNIT SYNCHRONISATION | Unit recovers online |
| HUMIDIFIER PROBLEM | Humidifier failure |
| REMOTE SHUTDOWN | Remote shutdown |
| DEHUM HRS EXCEEDED | Dehumidifier has exceeded operating time limit |
| FC HRS EXCEEDED | Free cooling source has exceeded operating time limit |
| C1 FREEZE PROTECTION | Compressor 1 freeze protection |
| COMP 1 PUMPDOWN FAIL | Compressor 1 pumpdown fails |
| MEMORY 1 FAIL | Memory 1 fail |
| MEMORY 2 FAIL | Memory 2 fail |
| HCB not connected | Humidifier contorl board not connected |
| BMS Disconnected | Battery management system disconnected |
| COMP 2 PUMPDOWN FAIL | Compressor 2 pumpdown fails |
| DIG SCROLL1 HIGH TEMP | Digital scroll 1 high temperature |
| DIG SCROLL2 HIGH TEMP | Digital scroll 2 high temperature |
| Dummy 099 | Dummy alarm 099 |
| RESERVED 100 | Reserved 100 |
| RESERVED 101 | Reserved 101 |
| RESERVED 102 | Reserved 102 |

| Event | Definition |
|---|---|
| Dummy 103 | Dummy alarm 103 |
| SMOKE DETECTED | Smoke detected |
| WATER UNDER FLOOR | Water leakage under floor |
| COND PUMP-HIGH WATER | Condensing pump high water level |
| LOSS OF FLOW | Loss of water flow |
| STBY GLYCOL PUMP ON | Standby glycol pump on |
| STANDBY UNIT ON | Standby unit on |
| HW/HG HRS EXCEEDED | Hot water/hot gas has exceeded operating time limit |
| EL HEAT1 HRS EXCEEDED | Electric heater 1 has exceeded operating time limit |
| EL HEAT2 HRS EXCEEDED | Electric heater 2 has exceeded operating time limit |
| EL HEAT3 HRS EXCEEDED | Electric heater 3 has exceeded operating time limit |
| UNIT CODE MISSING | Unit code missing |
| UNIT CODE n MISMATCH (n = 01 ~ 18) | Unit code n mismatch (n = 01 ~ 18) |
| FRONT DOOR OPEN | Front door not closed |
| REAR DOOR POEN | Rear door not closed |
| LOSS COMPRESSOR POWER | Loss of compressor power |
| CABINET SENSOR FAIL | Cabinet sensor fail |
| CABINET H-SENSOR FAIL | Cabinet H-sensor fail |
| EMERGENCY DAMPER FAIL | Emergency damper fails |
| HIGH CABINET TEMP | High cabinet temperature |
| LOW CABINET TEMP | Low cabinet temperature |
| HIGH EXT DEWPOINT | High external dewpoint |
| LOSS OF POWER | Loss of power |
| REHEAT LOCKOUT | Reheater lockout |
| HEAT REJ VFD | HEAT REJ VFD |
| HUMIDIFIER LOCKOUT | Humidifier lockout |
| HEAT REJ TVSS | HEAT REJ TVSS |
| COMPRESSOR (S) LOCKOUT | Compressor lockout |
| AMBIENT SENSOR FAIL | Ambient sensor fail |
| HUMIDIFIER LOW AMPS | Humidifier low current |
| COMP 1 SHORT CYCLE | Compressor 1 short cycle |
| COMP 2 SHORT CYCLE | Compressor 2 short cycle |
| HUMIDIFIER HIGH AMPS | Humidifier high current |
| HUMIDIFIER LOW WATER | Humidifier low water level |
| SYSTEM OFF REQUESTED | System off requested |
| SYSTEM OFF CONFIRMED | System off confirmed |
| C2 FREEZE PROTECTION | Compressor 2 freeze protection |
| FIRE ALARM | Fire alarm |
| HEATERS OVERHEATED | Heaters overreheated |
| CONDENSER 1 FAILURE | Condenser 1 failure |
| CONDENSER 2 FAILURE | Condenser 2 failure |
| HUM CYLINDER WORN | Humidifier cylinder worn |
| FC STOPPED FOR 1 HOUR | Free cooling stopped for 1 hour |
| MAINTENANCE DONE | Maintenance done |
| MAINTENANCE NEEDED | Maintenance needed |
| REDUCED ECO AIRFLOW | Reduced eco airflow |
| LOSS OF FLOW PUMP 1 | Loss of flow pump 1 |
| LOSS OF FLOW PUMP 2 | Loss of flow pump 2 |
| COMP 3 HIGH PRESSURE | Compressor 3 high pressure |
| COMP 4 HIGH PRESSURE | Compressor 4 high pressure |
| CONDENSATION DETECTED | Condensation detected |
| COMP 1 LOW PRESSURE | Compressor 1 low pressure |
| HIGH REF TEMPERATURE | High refrigerant temperature |
| LOW REF TEMPERATURE | Low refrigerant temperature |
| REFRIGERANT SENSOR FAIL | Refrigerant sensor fail |
| HIGH TEMP SENSOR B | High temperature sensor B |
| LOW TEMP SENSOR B | Low temperature sensor B |
| COMP 2 LOW PRESSURE | Compressor 2 low pressure |

| Event | Definition |
|---|---|
| SENSOR B FAILURE | Sensor B failure |
| COMP 3 SHORT CYCLE | Compressor 3 short cycle |
| COMP 4 SHORT CYCLE | Compressor 4 short cycle |
| HIGH DEWPOINT | High dewpoint |
| PUMP SHORT CYCLE | Pump short cycle |
| Top Fan Failure | Top fan failure |
| CONTROL VALVE FAILURE | Control valve failure |
| PUMP 1 HRS EXCEEDED | Pump 1 has exceeded operating time limit |
| PUMP 2 HRS EXCEEDED | Pump 2 has exceeded operating time limit |
| COMP 3 HRS EXCEEDED | Compressor 3 has exceeded operating time limit |
| COMP 4 HRS EXCEEDED | Compressor 4 has exceeded operating time limit |
| TANDEM 1 PUMPDOWN FAIL | Tandem 1 pumpdown fail |
| TANDEM 2 PUMPDOWN FAIL | Tandem 2 pumpdown fail |
| TANDEM 1 LOW PRESSURE | Tandem 1 low pressure |
| TANDEM 2 LOW PRESSURE | Tandem 2 low pressure |
| HIGH FLUID TEMPERATURE | High fluid temperature |
| LOW FLUID TEMPERATURE | Low fluid temperature |
| FLUID SENSOR FAILURE | Fluid sensor failure |
| FAN FAILURE | Fan failure |
| FEEDBACK SIGNAL 1 FAILURE | Feedback signal 1 failure |
| SUPPLY CW SENSOR FAILURE | Supply chilled water sensor failure |
| RETURN CW SENSOR FAILURE | Return chilled water sensor failure |
| SUPPLY REF SENSOR FAILURE | Supply refrigerant sensor failure |
| RETURN REF SENSOR FAILURE | Return refrigerant sensor failure |
| VALVE HRS EXCEEDED | Valve has exceeded operating time limit |
| COMP 1A HIGH PRESSURE | Compressor 1A high pressure |
| COMP 1B HIGH PRESSURE | Compressor 1B high pressure |
| COMP 2A HIGH PRESSURE | Compressor 2A high pressure |
| COMP 2B HIGH PRESSURE | Compressor 2B high pressure |
| COMP 1A HRS EXCEEDED | Compressor 1A has exceeded operating time limit |
| COMP 1B HRS EXCEEDED | Compressor 1B has exceeded operating time limit |
| COMP 2A HRS EXCEEDED | Compressor 2A has exceeded operating time limit |
| COMP 2B HRS EXCEEDED | Compressor 2B has exceeded operating time limit |
| COMP 1A SHORT CYCLE | Compressor 1A short cycle |
| COMP 1B SHORT CYCLE | Compressor 1B short cycle |
| COMP 2A SHORT CYCLE | Compressor 2A short cycle |
| COMP 2B SHORT CYCLE | Compressor 2B short cycle |
| HIGH SUPPLY TEMPERATURE | High supply temperature |
| LOW SUPPLY TEMPERATURE | Low supply temperature |
| HIGH RETURN HUMIDITY | High return humidity |
| LOW RETURN HUMIDITY | Low return humidity |
| NOISE RED MODE STARTED | Noise reduced mode started |
| NOISE RED MODE STOPPED | Noise reduced mode stopped |
| RACK SENSOR 1~10 FAILURE | Rack sensor 1 ~ 10 failure |
| HIGH RETURN TEMPERATURE | High return temperature |
| ROOM HUMIDITY PROBLEM | Room humidity problem |
| iCOM-DO #0 ~ #2 DISCONNECTED | iCOM-do #0 ~ #2 disconnected |
| FEEDBACK SIGNAL 2 FAILURE | Feedback signal 2 failure |
| BOTTOM FAN FAILURE | Bottom fan failure |
| EC FAN FAULT | EC fan fault |

# Chapter 6 Application Of INTELLISLOT

**This chapter introduces the application of the host communication component INTELLISLOT, including the introduction, installation and commissioning of the host communication card.**

## 6.1 Introduction Of Host Communication Card

**The chilled water series air conditioner supports two communication cards below:**

**1. TCP/IP communication card**

**The TCP/IP communication card is shown in Figure 6-1. This card can provide network port, MIB library and browse the data through IE.**

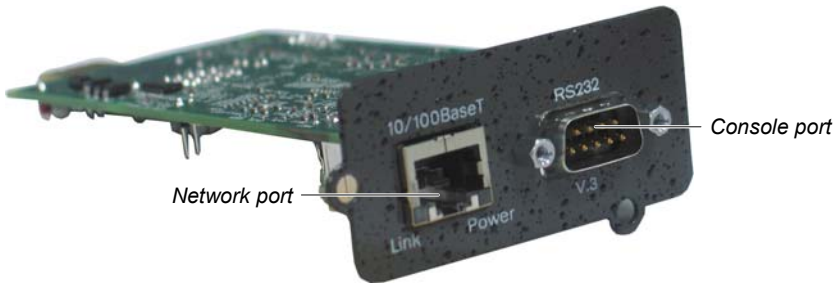



***Figure 6-1 TCP/IP communication card***

**2. 485 communication card**

**The 485 communication card is shown in Figure 6-2. This card can provide the Modbus protocol of the RS485 port to the host.**

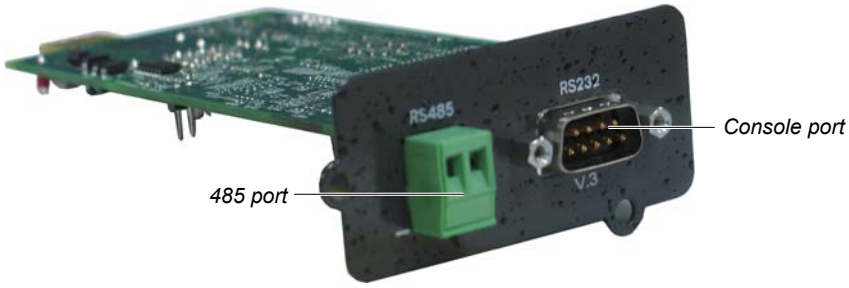



***Figure 6-2 485 communication card***

## 6.2 Installing Host Communication Card

**Installing communication card**

**The chilled water series air conditioner units have been equipped with installation boxes 1 and 2. If you want to install the host communication configuration, insert the communication card into the installation box 1 and tighten the bolts as shown in Figure 6-3.**

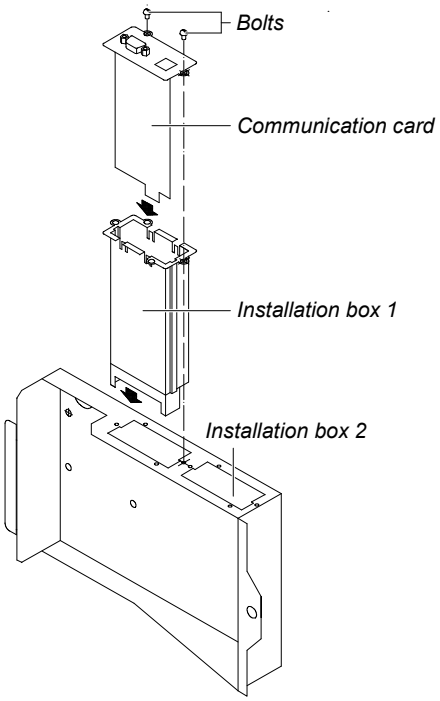



***Figure 6-3 Installing communication card***

**Connection**

**The electrical schematic figure of the host communication configuration is shown in Figure 6-4. P61, P65 and P67 cables have been connected in factory. So you should only connect the communication card to the monitoring center.**

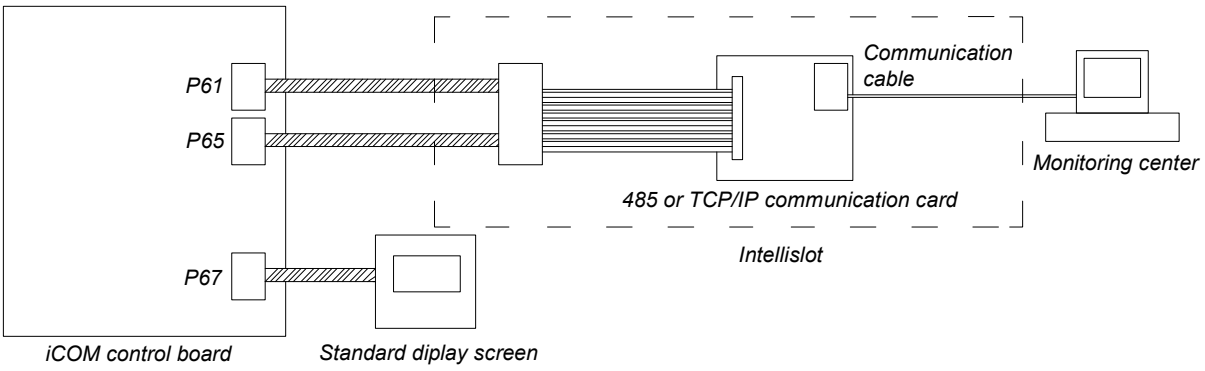



***Figure 6-4 Electrical schematic figure of host communication configuration***

## 6.3 Commissioning Host Communication Component

**After the communication cable is connected, you can start to set the HyperTerminal and communication card parameters.**

🕮 **Note**

Before commissioning, you must access the 'SERVICE Menus' of the iCOM control board to set **S824 MON ADD** as '3', **S835 MON PORT** as 'Vlcty(Velocity)' and **S843 BL CTRL** as 'S+R' in the "Network Setup".

### 6.3.1 Setting HyperTerminal

**The 485 communication card and TCP/IP communication card must be set for communicating with the host monitoring system. Use the communication cable provided together with the communication card to connect the RS232 port of the computer and the console port of the communication card and then set the parameters using the HyperTerminal of Windows. The detailed setting procedures are as follows:**

**1. Click Start-> Programs -> Accessories -> Communications -> HyperTerminal, the HyperTerminal interface will pop up, as shown in Figure 6-5. Type the name 'tt' in the Name field, and then click the OK button.**

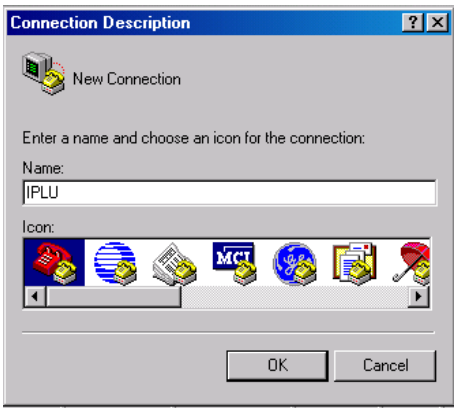



*Figure 6-5 Typing the name*

**2. In the Connect To dialog box, choose the serial port being used (such as 'COM1'), and click the OK button, as shown in Figure 6-6.**


*Figure 6-6 Choosing serial port*

**3. Set the communication parameters shown in Figure 6-7 and click the OK button.**

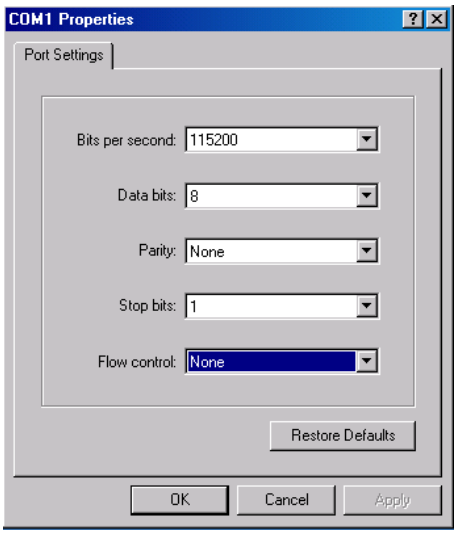



*Figure 6-7 Setting port property*

### 6.3.2 Setting 485 Communication Card

**Set the parameters of the 485 communication card according to the following procedures:**

**1. After setting the HyperTerminal, click the OK button, the following interface will appear.**

```
Emerson Network Power OpenComms 485
Discovering Device...

Main Menu
----------
1: 485 Network Settings
2: Factory Settings
3: Firmware Updates
4: Device Connection State

q: Quit and abort changes
x: Exit and save


Please select a key ?>
```

**2. Type '1' and the interface shown in the following figure will appear.**

```
Emerson Network Power OpenComms 485
Discovering Device...

485 Network Settings Menu
--------------------------
1: Enabled Application    Modbus Server
2: Control                enabled
3: Server ID              1
4: Communications Rate    9600


<ESC>: Cancel menu level

Please select a key ?> _
```

**3. Type '1' and the interface shown in the following figure will appear.**

```
 Valid Selections:
 -----------------
 1.  Modbus Server
 2.  IGMNet Server

Select Auxiliary Com Port Application: ( <Esc> - Cancel) ?>
```

**4. Type '1' and select Modbus protocol, the interface shown in the following figure will appear.**

```
Emerson Network Power OpenComms 485
Discovering Device...

485 Network Settings Menu
--------------------------
1: Enabled Application    Modbus Server
2: Control                enabled
3: Server ID              2
4: Communications Rate    9600


<ESC>: Cancel menu level

Please select a key ?> 3
```

**5. Type '3' and select the ID used to communicate between the communication card and the host, the interface shown in the following figure will appear.**

```
Enter the server ID (1 - 255) ?>
```

**6. Type the server ID under the command prompt, the interface shown in the following figure will appear.**

```
Emerson Network Power OpenComms 485
ICOM Environmental Control

485 Network Settings Menu
-------------------------
1: Enabled Application    Modbus Server
2: Control                enabled
3: Server ID              2
4: Communications Rate    9600


<ESC>: Cancel menu level

Please select a key ?> 4
```

**7. Type '4' and the interface shown in the following figure will appear.**

```
 Valid Selections:
 -----------------
 1.  9600
 2.  19200
 3.  38400
Select BaudRate: ( <Esc> - Cancel) ?>
```

**8. Type '1', '2' or '3' to select the baud rate, and the interface shown in the following figure will appear.**

```
Emerson Network Power OpenComms 485
ICOM Environmental Control

Main Menu
----------
1: 485 Network Settings
2: Factory Settings
3: Firmware Updates
4: Device Connection State

q: Quit and abort changes
x: Exit and save


Please select a key ?>
```

**9. Press the Esc button to exit and return the main interface. If you type 'x', the setting can be saved. After saving, the 485 communication card will be restarted.**

**10. On the main interface, type '4', and you can check whether the communication status between the communication card and the chilled water series air conditioner is normal, as shown in the following figure.**

```
================================================================================
                          Device Connection State
================================================================================
Stage                              Status          Details
================================================================================
00:01:04 (SysUpTime)
Discovering Communication Protocol Complete        VELOCITY
Discovering Device                 Complete        ICOM Environmental Control
Reading Device Information         Complete        100 %
Launching Services                 Complete        100 %
Running Application                00:00:57 (SysUpTime)
Connection Count                   1
```

### 6.3.3 Setting TCP/IP Communication Card

**Set the parameters of the TCP/IP communication card according to the following procedures:**

**1. After the HyperTerminal is set, you can click the OK button, the interface shown in the following figure will appear.**

```
Emerson Network Power OpenComms WEB
Discovering Device...

Main Menu
----------
1: System Information
2: IP Network Settings
3: Factory Settings
4: Firmware Updates
5: Device Connection State

q: Quit and abort changes
x: Exit and save


Please select a key ?>
```

**2. Type '2' and the interface a shown in the following figure will appear.**

```
Emerson Network Power OpenComms WEB
ICOM Environmental Control

IP Network Settings Menu
-------------------------
1: Boot/IP Settings
2: SNMP Communications
3: Web Server
4: Telnet Server
5: Change Username/Password

<ESC>: Cancel menu level

Please select a key ?> _
```

**3. Type '1' and the interface shown in the following figure will appear.**

**Normally, the Boot mode should be set to Static. If the user network can distribute the address automatically, select DHCP, and the IP address, netmask and gateway do not need to be set. Type '3', '4' and '5' and then type the corresponding IP address, netmask and gateway respectively. These three parameters should be given by the user.**

```
Emerson Network Power OpenComms WEB
ICOM Environmental Control

Boot/IP Settings Menu
----------------------
1: Speed/Duplex       Auto
2: Boot mode          Static
3: IP Address         142.100.8.35
4: Netmask            255.255.254.0
5: Default Gateway    142.100.8.1


<ESC>: Cancel menu level

Please select a key ?>
```

**4. Press Esc button to exit and return to the main interface, as shown in the following figure. If you type 'x', the setting can be saved. After saving, the TCP/IP communication card will be restarted.**

```
Emerson Network Power OpenComms WEB
Discovering Device...

Main Menu
----------
1: System Information
2: IP Network Settings
3: Factory Settings
4: Firmware Updates
5: Device Connection State

q: Quit and abort changes
x: Exit and save


Please select a key ?>
```

**5. On the main interface, type '5', and then you can check whether the communication status between the communication card and the chilled water series air conditioner is normal, as shown in the following figure.**

```
================================================================================
                          Device Connection State
================================================================================
Stage                              Status          Details
================================================================================
00:11:14 (SysUpTime)
Discovering Communication Protocol Complete        VELOCITY
Discovering Device                 Complete        ICOM Environmental Control
Reading Device Information         Complete        100 %
Launching Services                 Complete        100 %
Running Application                00:01:09 (SysUpTime)
Connection Count                   1
```

## 6.3.4 Setting SNMP Parameters Of TCP/IP Communication Card

**After the HyperTerminal of the TCP/IP communication card is set, you can set the parameters for this communication card. See the following for details:**

**1. Type the IP address of the TCP/IP communication card in the address bar of IE browser. If the interface shown in Figure 6-8 appears, it indicates that the communication between the communication card and the iCOM controller is abnormal. If the State is Completing or In Process, it indicates that the communication card is communicating with the iCOM controller.**

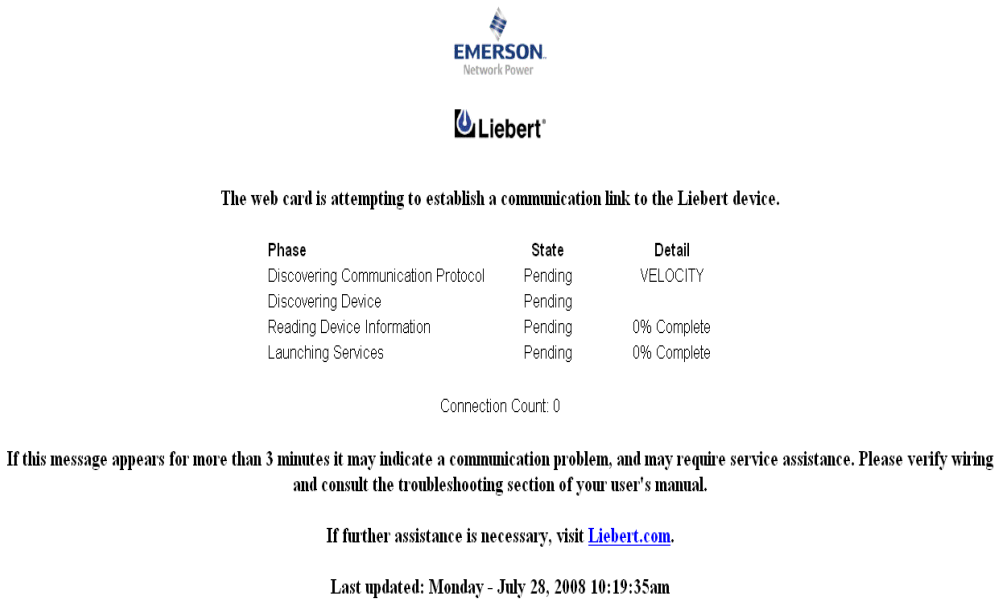



***Figure 6-8 Initial interface (1)***

**After normal communication, the interface shown in Figure 6-9 will appear.**

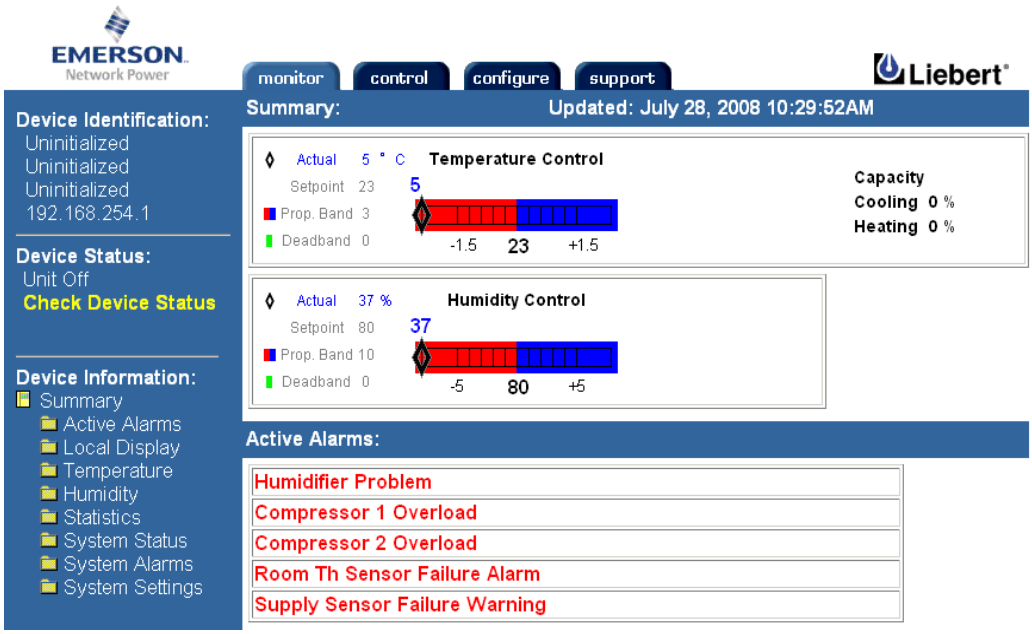



*Figure 6-9 Initial interface (2)*

**2. Click the configure tab to enter the configuration interface, as shown in Figure 6-10.**

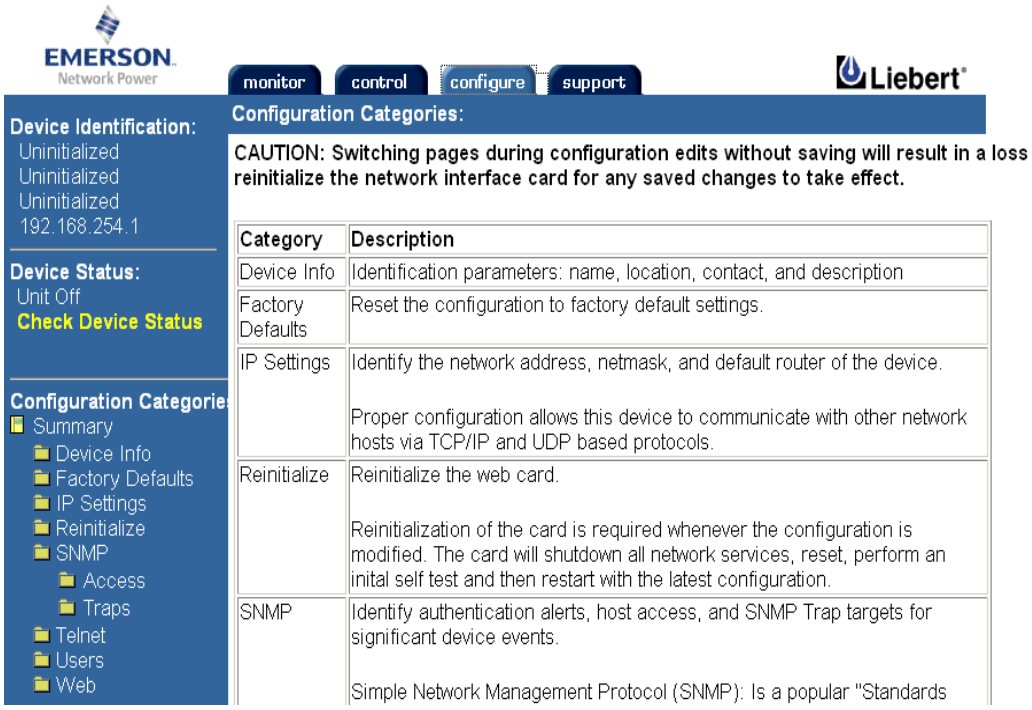



*Figure 6-10 Configuration interface*

**3. Click the Access on SNMP at the left hand of the interface, as shown in Figure 6-11. Type user name 'Liebert' and password 'Liebert' and click the OK button to enter the setting interface of configure. Note that the user name and password are case-sensitive.**

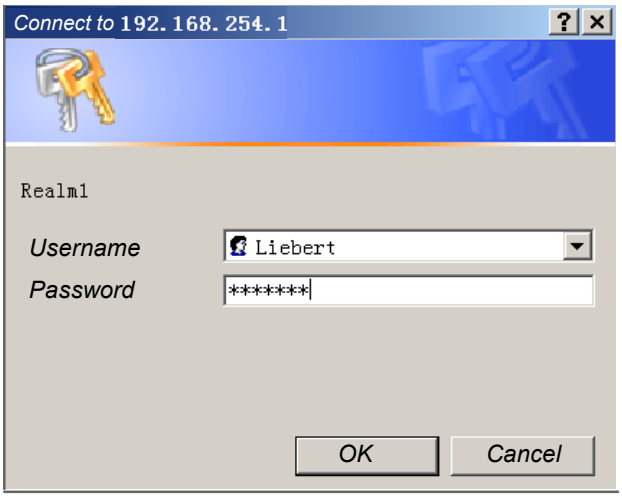



*Figure 6-11 Typing user name and password*

**4. Configure the Network Management System (NMS) of the host monitoring center in Figure 6-12. Click the Edit button and type the IP address of the NMS in IP Address. Select the 'read' or 'write' in Access, type 'Public' in Community and then click the Save button.**

**Note**

1. Before setting the NMS, the **Edit** button is displayed in the interface. After editing the configuration, the **Edit** button will become the **Save** button.
2. After the NMS is configured, you must click the **Save** button to save the setting.

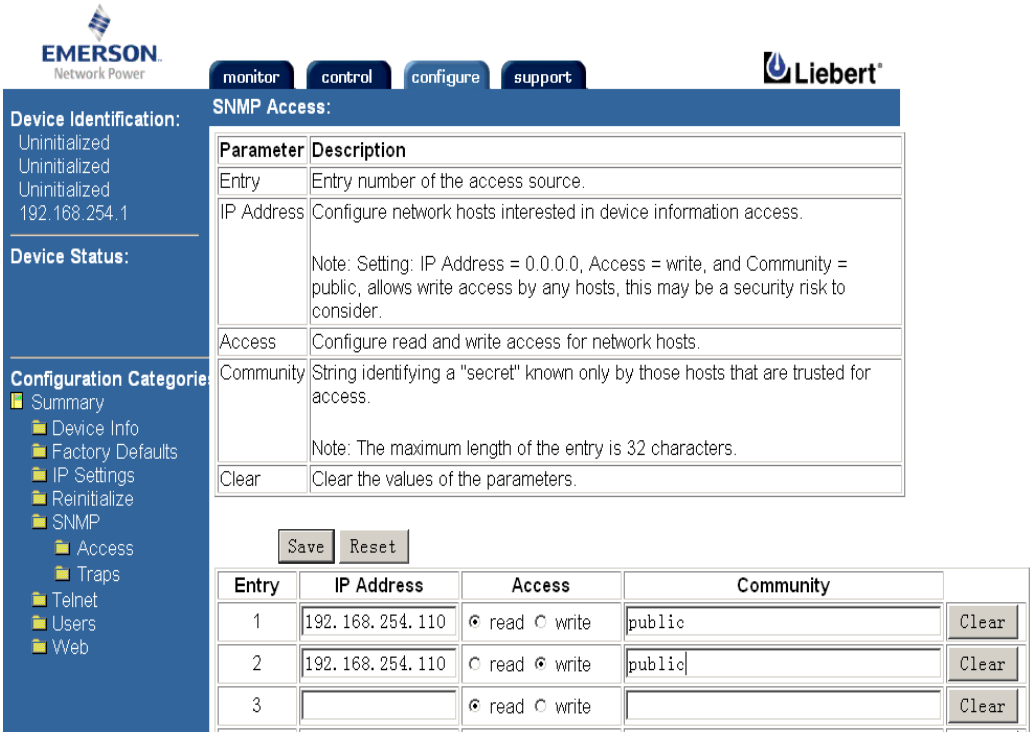



*Figure 6-12 NMS configuration interface of SNMP host monitoring center (1)*

**5. Unfold the SNMP at the left hand of the interface as shown in figure 6-13 and click Traps to set IP Address, Port and Community of the NMS for receiving Traps. After modifying, you must click Save to save the setting.**

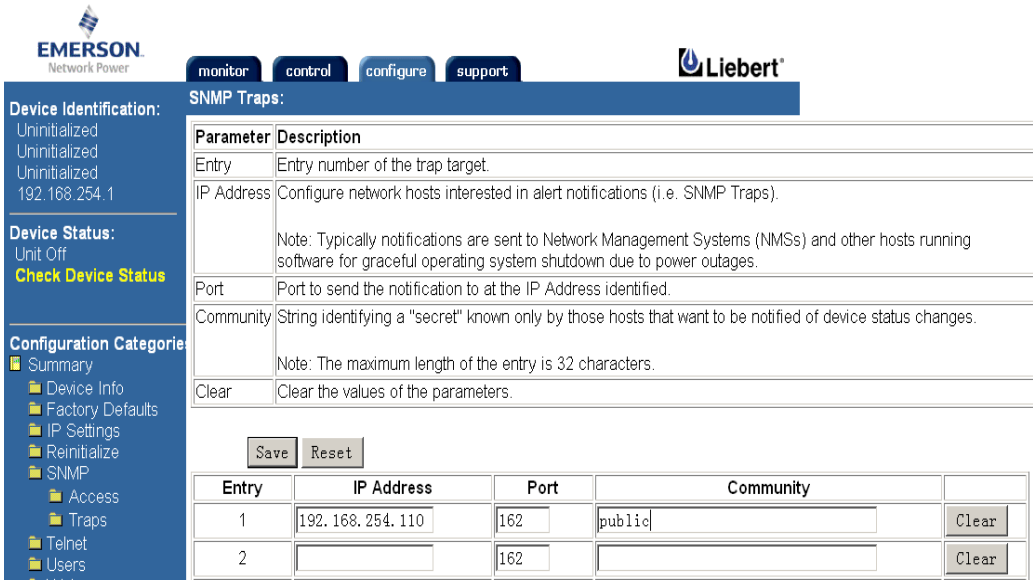



*Figure 6-13 NMS configuration interface of SNMP host monitoring center (2)*

## 6.4 Host Communication Networking Diagram

**The networking figure of the TCP/IP communication card (SNMP protocol) is shown in Figure 6-14. The air conditioner number is not limited.**

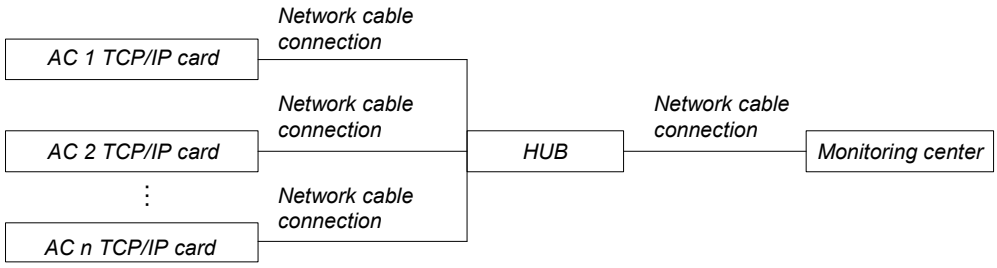



*Figure 6-14 Networking figure of TCP/IP communication card*

**Note**

The single unit does not need HUB.

**The networking figure of the 485 communication card (Modbus protocol) is shown in Figure 6-15. Up to 32 air conditioner units can be connected.**

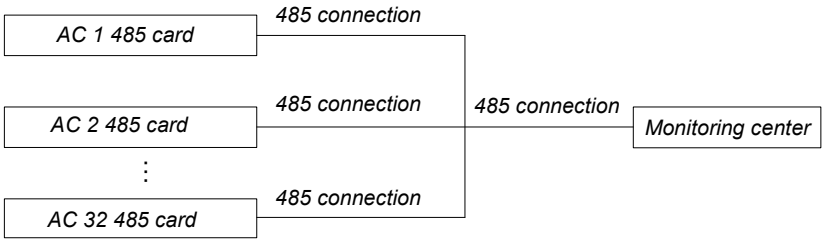



*Figure 6-15 Networking figure of 485 communication card*

# Chapter 7 System Operation And Maintenance

## 7.1 System Diagnosis Test

### 7.1.1 Self-diagnosis Function

**As limited by the environmental conditions, certain components may remain idle for a long time, and there is no telling of whether they are faulty. However, upon urgent needs, such components may fail to meet the demand. Therefore it is necessary to check the system components regularly. The controller provides the function that enables you to turn on/off the components on site manually so as to check their functionality. For the operation instruction, see *5.7.5 DIAGNOSTICS*.**

**Note**

1. During the operation of the chilled water series cooling system, lethal voltage may be present in the internal parts. It is a must to obey all the notes and warnings marked on the equipment or contained in this manual, otherwise injury or fatality may occur.
2. Only qualified maintenance and repairing personnel can operate and process the system.

### 7.1.2 Electric Control Part

**Electric maintenance**

**Carry out visual inspection and handling over the electrical connection by referring to the following items.**

**1. Overall electrical insulation test: find out the unqualified contacts and handle them. Note to disconnect the fuses or MCBs of the control part during the test lest the high voltage should damage the control components.**

**2. Carry out detection over the contactors before the power-on, make sure the contactors can act freely without obstruction.**

**3. Clean the electric and control components of dust with brush or dry compressed air.**

**4. Check the closing of contactors for arcs or signs of burning. Replace the contactor if necessary.**

**5. Fasten all the electric connection terminals.**

**6. Check that the sockets and plugs are in good condition. Replace those loosened ones.**

**Control maintenance**

**Carry out visual inspection, simple function test and handling over the control parts by referring to the following items.**

**1. Visually inspect the power transformers and isolation transformers and test the output voltage.**

**2. Check that there are no signs of aging on the control interface board, display control board, sensor board and fuse board.**

**3. Clean the electric control components and control board of dust and dirt with brush and electronic dust removing agent.**

**4. Check and fasten the I/O ports at the control interface board, including the connection between display control board and control interface board, as well as between the temperature/humidity sensor board and the interface board.**

**5. Check the connection between the user wiring terminals (37, 38) and the control interface board.**

**6. Check the output connection between the control interface board and the contactors, and the input connection between the control interface board and various components, including fan overload protector, heating over-temperature protection switch, humidifier dry-burn protection switch, humidifier top protection switch，filter clogging switch, fan air-flow safety switch and water flow control valve .**

**7. Replace the electric components that are detected faulty, such as faulty control fuses (or MCBs) and control boards.**

**8. Use temperature/humidity measuring meter with high precision to proof-read and calibrate the temperature/humidity sensor readings. Note to set the humidity control mode to relative humidity control during the process of calibration.**

**9. Check the following external sensors.**

**1) Smoke detector (optional)**

**The power supply of the smoke detector is located at the bottom (or top) of the upflow (or downflow) unit. It incessantly samples the air, analyzes the samples and makes judgment. It requires no calibration.**

**2) Water leak detector**

**The water leak detector has a dry contactor. The contactor will close when the detector probes detect water or other conductive liquid.**

**The detector should be placed away from any water pool or drainage trench on the floor, 2m ~ 2.5m away from the machine. Do not place it directly under the machine. The recommended location for the water leak detector is shown in Figure 7-1.**

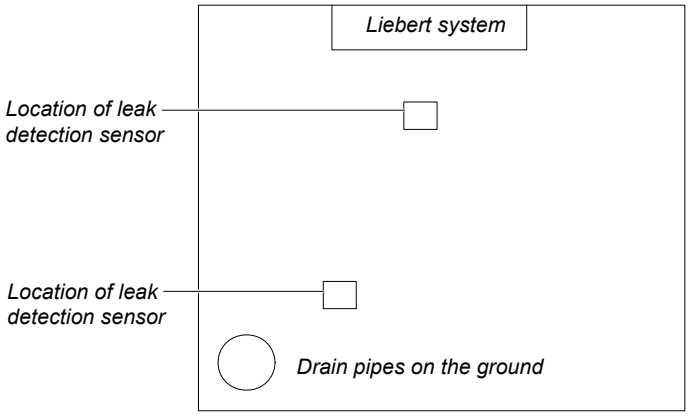



***Figure 7-1 Recommended location for the water leak detector***

**Note**

1. Before connecting any mechanical parts or cables, make sure the power supply of the control unit has been disconnected.
2. Do not use the water leak detector adjacent to flammable liquid or use it to detect flammable liquid.

**10. Adjust the setting points. Check the auto-flush control logic of water pan of the infrared humidifier and the action of the functional parts according to control logic.**

**11. Simulate the fault scenario to check the work state of protection devices including high/low voltage alarm, high/low temperature alarm, high/low water level alarm and over-temperature protection device.**

## 7.2 Filter

**To ensure efficient operation, the dust filter must be checked once a month, and be replaced as required. The filter clogging switch and pressure difference switch are located as shown in Figure 7-2.**

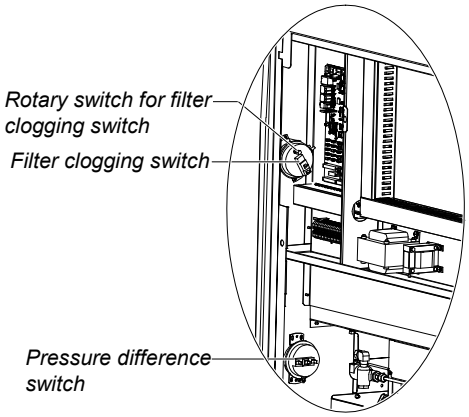



***Figure 7-2 Filter clogging switch and pressure difference switch***

**Turn off the power before replacing the filter. You need to adjust the setting point of the filter clogging switch if the new filter is of a different model. The filter clogging switch is located in the electric control box. It samples the air pressures before and behind the filter through a black hose, and decides the output after comparing the two values.**

**To adjust the setting point of the filter clogging switch, you should:**

**1. After replacing the filter, restore and seal all the panels, so that the alarm point can be found precisely.**

**2. Keep the fan running, and rotate the rotary switch of the filter clogging switch counter clockwise until the filter alarm is triggered.**

**3. Rotate the rotary switch clockwise for 2.5 rounds, or rotate it to the point where the filter should be replaced.**

🕮 **Note**

1. Set the setting point properly. Otherwise, the filter alarm may be triggered too frequently; or, in the opposite case, the dust accumulation on the filter could not trigger the alarm, endangering the system operation due to deteriorated ventilation.
2. If you are unsure about the setting point, consult with Emerson before using a filter of a different model to replace the old one.

## 7.3 Fan Kit

**For forward fan: The fan components that require regular checking include belt, motor bracket, fan bearing and blades.**

**The fan and the installation board use integrated design. The belt tension is regulated automatically under the force of gravity, so as to reduce the fan vibration and protect the belt. If you need more details, please contact the manufacturer.**

### 7.3.1 Fan Bearing And Blades

**Check the fan regularly to make sure the bearing is firmly fixed. Rotate the blades and make sure that they do not scratch the wall of the air duct. Because the bearing is permanently sealed and self-lubricated, check for signs of wearing when adjusting the belt. Roll the belt and observe the motion of the fan bearing. If any abnormal displacement is observed, replace the bearing.**

### 7.3.2 Belt

**Measure the belt tension with a tension meter. You can also press down the belt at the middle point between the two pulleys. The displacement should be 0.5” ~ 1”.**

**If the belt is found worn out or distorted, replace it with a new belt. The new belt should be of the same model as the old one.**

### 7.3.3 Motor

**To replace the failed motor, you should be very careful, especially with the upflow unit. Use a dedicated fixture to hold the motor before removing the fixing bolts at the bottom of the motor.**

**For backward EC fan：Regular check items of the fan include motor working status, fan blade status, fan assembly fixation, and the clearance between the fan and the inlet ring.**

**Specially note that the fan components and the inlet ring are fixed firmly. Rotate the blades to make sure that they do not scratch the adjacent metal plate. You should also dispose any abnormal airflow obstruction factors in time, for protecting the refrigeration system and other system components from airflow reduction.**

## 7.4 Infrared Humidifier

**During the normal operation of the humidifier, sediment will accumulate on the water pan. To ensure efficient operation of the humidifier, you need to clean the sediment regularly. However, the cleansing cycle varies because the water is different in different regions. It is recommended to check, and cleanse (when necessary) the water pan, once a month.**

**Remove the water level regulator to drain the water pan. Disconnect the drainage pipe, remove the dry-burning protection switch of the water pan, remove the fixing screws at the two ends of the pan, and pull out the water pan. Cleanse the water pan with water and hard brush, and restore the water pan by reversing the preceding procedures.**

**Note**

Before removing the water pan, make sure that the power has been cut off, and the water in the water pan is not too hot.

**The autoflush function of the humidifier can prolong the cleansing cycle. However, timed check and maintenance are indispensable.**

**Replacing the lamps of the humidifier**

**The lamp of the infrared humidifier is shown in Figure 7-3. Follow the procedures below to replace it.**

**1. Cut off the main isolation switch power.**

**2. Unplug all the control lines of the humidifier and cut off the cable ties that bind the humidifier power cables. The plugs are located to the left of the humidifier and are accessible directly.**

**3. After draining the water in the water pan, remove the drainage pipe, remove the fixing screws on both sides of the humidifier (two for each side), and then pull out the humidifier.**

**4. Open the cover plate (for single-door system, this cover plate has been opened in step two) to reveal the ceramic socket. Use the multimeter to locate the burned lamp.**

**5. Remove the humidifier water pan.**

**6. Remove the brackets in the middle that support the lamps.**

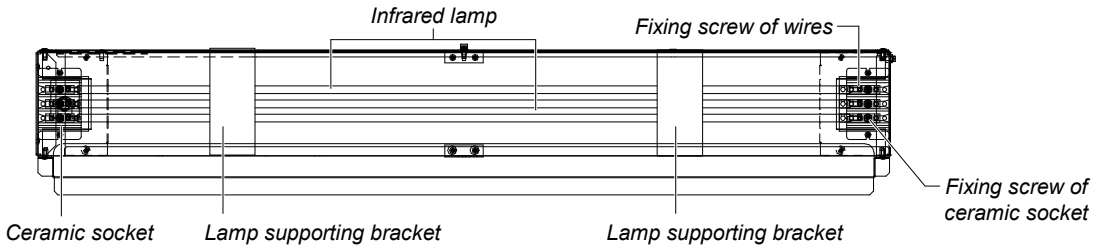



***Figure 7-3 Lamps of infrared humidifier***

**7. Remove the screws that fix the cables of the lamp to be replaced from the ceramic sockets (note to hold the lamp with hand).**

**8. Pull down the lamp.**

**9. Install a new lamp.**

**Note**

Do not touch the quartz lamp with bare hands! Greasy sediment and finger prints can seriously shorten the life span of quartz lamps. Therefore, wear clean cotton gloves during the operation.

**10. Restore the humidifier by reversing steps 3 ~ 8.**

**Autoflush system of the infrared humidifier**

**Note**

To ensure the normal operation of the autoflush system, the humidifier demands a water source with minimum water flow of 1 gpm (0.063 l/s) and minimum pressure of 20 psig (138kPa).

**Operation of the autoflush**

**The autoflush control program is an integral part of the infrared humidifier system. The program automatically controls a water makeup valve to maintain the proper water level in the humidifier pan during operation. When a call for humidification exists, the program will firstly check how long the infrared humidifier has been off.**

**1. If the off time is equal to or greater than the programmed value (factory default is 15hr), it is assumed that the pan is dry and a program called pre-fill is initiated to add water to the pan. The pre-fill time is different depending on the pan size. The factory default for a large pan is 60s and for a small pan is 30s. During the**

**pre-fill operation the infrared lamps are inactive, and the humidification is suppressed. In this way, small quantity of water will be added to the water pan to prevent the damage of the water pan by dry burning.**

**2. If the off time is less than the default value of the program, the pre-fill program is bypassed and the infrared lamps and water valve are activated at the same time to fill the pan to the proper water level and initiate humidification. Small water pan will be filled for 4min, while large water pan will be filled for 7min, and then the water makeup valve is closed.**

**During normal infrared humidification operation the water makeup valve is periodically closed (no pan fill) and opened (pan fill) based on a timing sequence to allow for the evaporation of water from the pan. Water filling will be triggered for every 8min of humidification (for small water pan) or every 10min of humidification (for large water pan) to make up the consumed water and flush the minerals floating on the water of the water pan. The water filling quantity may be set by the customer according to the local water quality.**

**You can modify the percentage from 110% to a maximum of 500% in 1% increments.**

**The autoflush system will periodically flush the water pan to prevent the accumulation of sediments because of erosion effect. Because of the difference of water supply in different regions, the water flowing past the system shall be set with program to match the local needs. The selectable water quantity is 110% to 500% of the water flow rate. The autoflush system will operate automatically after water quantity is selected, and no further adjustment is needed. See Figure 7-4 for humidification control logic.**

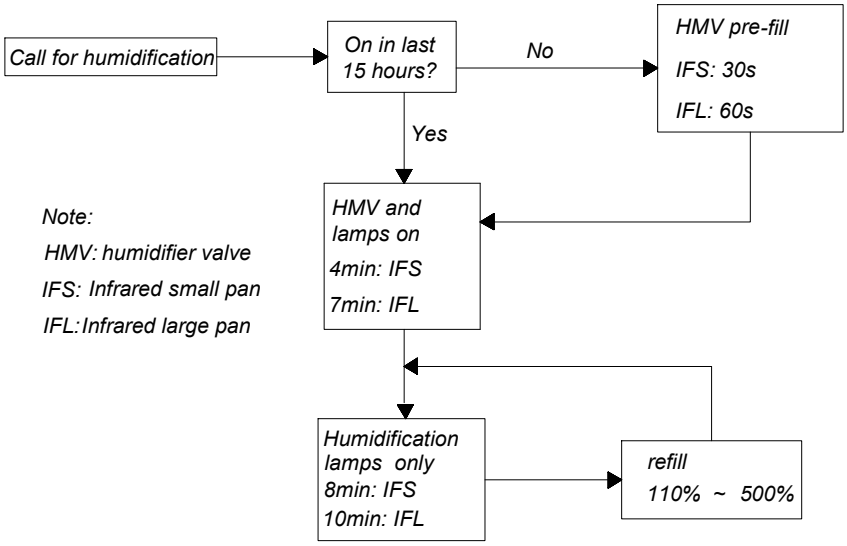
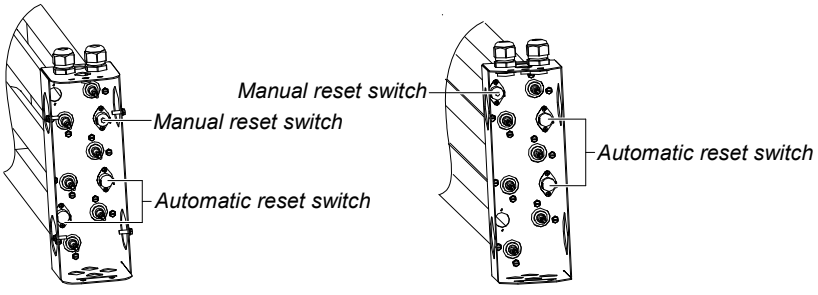



***Figure 7-4 Humidification control logic***

## 7.5 Electrical Heater

**Check the rust on the electrical heater. If necessary, clean the rust with wire brush, or replace the heater.**

**The electrical heater is classified into upflow electrical heater and downflow electrical heater, as shown in Figure 7-5. Three temperature switches are in series connected within the internal control circuit of the electrical heater, including two auto-reset switches and one manual reset switch. When the electrical heater does not respond to the heating demand, check if the manual reset switch has been disconnected.**




***Upflow electrical heater*** ***Downflow electrical heater***

***Figure 7-5 Upflow and downflow electrical heater***

## 7.6 Water Flow Control Valve

**The water flow control valve adjusts the valve position by collecting the refrigeration requirement signal, so as to control the water flow through the heat exchanger coil. The heavier the load is, the more water flow is allowed to flow through the heat exchanger coil. The water flow control valve is composed of a regulator body, connector（Small actuator without connectors, such as Figure 7-6 left; large actuator is equipped with connectors, such as Figure 7-6 right and actuator.**

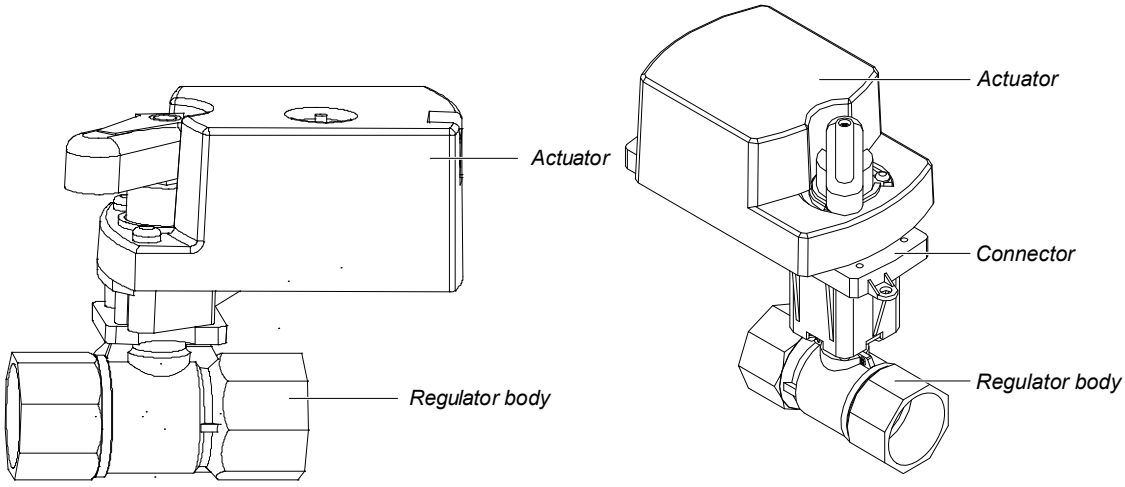



***Figure 7-6 Water flow control valve***

**Adjusting method**

**The water flow control valve automatically adjusts the valve position according to the refrigeration requirement, so as to make sure the temperature and humidity of the AC room are within the control range.**

**When the refrigeration requirement is big, the valve would open wider and the water flow would increase.**

**When the refrigeration requirement is small, the valve would open narrower and the water flow would decrease.**

**Test function**

**When there is refrigeration and dehumidification requirement, the valve would open and have water flow.**
**When there is no refrigeration or dehumidification requirement, the valve would close and have no water flow.**

# Chapter 8 Failure Diagnosis And Troubleshooting

**This chapter introduces the failure diagnosis and troubleshooting and can be used together with the alarm section.**

**Warning**

Some circuits have fatal high voltage, only professional technicians are allowed to maintain and operate the unit. You must be particularly careful in troubleshooting with power on.

**Note**

If jumpers are used for troubleshooting, remember to remove the jumper after maintenance. Otherwise, the equipment may be damaged.

**For failure diagnosis and troubleshooting of each component, please refer to Table 8-1 to Table 8-4.**

*Table 8-1 Fan Troubleshooting*

| Symptom | Potential causes | Items to be examined or handled |
|---|---|---|
| Fan cannot be started | No main power supply | Examine the rated voltage of L1, L2 and L3 |
| | Circuit breaker disconnection or fuse burnout | Examine the fuse and circuit breaker of main fan |
| | Overload, circuit breaker disconnection | Manual reset. Examine the average current |
| | Contactor not pulling on | Examine whether there is 24V AC voltage between P36-3 and E1. If there is, but the contactor cannot pull on, then the contactor has failures. Please replace the contactor |
| | Control panel failure | Examine whether there is 24V AC voltage between P36-3 and E1. If there is not, then the control panel has failures. Please check whether the green LED beside silicon control Q5 on the control panel is on or not |
| | Control panel failure (For backward EC fan) | Examine whether there is ≤ 10V DC voltage between P53-2 and P53-3. If there is not, then the control panel has failures |
| | Fuse panel failure | Examine whether there is 24V AC voltage between P36-3 and E1. If there is not, and the green LED beside Q5 is not on, please check further whether LED DS4 beside F4 on the fuse panel is on, or take down F4 to test whether it is burnt out |
| | Fan not functioning | Replace the fan |

*Table 8-2 Refrigeration and dehumidification system troubleshooting*

| Symptom | Potential causes | Items to be examined or handled |
|---|---|---|
| No refrigeration or dehumidification | Control panel failure | Examine whether there is 24V AC voltage between P51-1 and E1, P52-1 and E1. If there is not, then the control panel has failures |
| | Fuse panel failure | Examine whether there is 24V AC voltage between P51-1 and E1, P52-1 and E1. If there is not, please check further whether LEDs DS3 and DS4 beside F4 on the fuse panel are on, or take down F3, F4 to test whether they are burnt out |
| | Failure to turn on the water valve | Examine whether there is 10V DC voltage between water valve VDC/mA and E5 terminal. If there is, then the water valve has failures. Please replace the water valve |

*Table 8-3 Infrared humidifier troubleshooting*

| Symptom | Potential causes | Items to be examined or handled |
|---|---|---|
| No humidification | No water injection for the water tray | Examine the water source |
| | | Check whether watering electromagnetic valve works |
| | | Examine the state of high-water level switch/overflow valve |
| | | Check whether the water-in pipe is blocked |
| | No humidification requirement | Examine the controller state |
| | Humidification contactor cannot pull on. | Examine the circuit voltage of the contactor and fuse or the circuit breaker |
| | | Examine the open humidifier safety equipment: the water tray overtemperature protection switch, the lamp overtemperature protection switch. Connect P35-6 and P35-5 terminals with jumper. If the contactor closes, please replace the serial safety equipment and then remove the jumper |
| | Lamp of the humidifier is burnt out. | Replace the lamp |

*Table 8-4 Heating system troubleshooting*

| Symptom | Potential causes | Items to be examined or handled |
|---|---|---|
| Heating system does not operate, and the contactor does not pull on. | No heating requirement | Examine the controller state |
| | Heating system safety equipment disconnection | For secondary electric heating, inspection of P34-6 and P34-7 terminals should be made. If heating system begins to operate, it means that the safety equipment is disconnected. Then you should remove the jumper and replace the safety equipment |
| Contactor pull-on, no heating effect. | Heater burnout | Cut off the power, and detect the resistance characteristics of the heater with ohmmeter |

**Attached table 1: Table of maintenance inspection items (monthly)**

**Date:** **Prepared by:**

**Equipment model:** **Serial No.:**

**Filter**

**___ 1. Check whether the filter is damaged or blocked.**

**___ 2. Check the filter block switch.**

**___ 3. Clean the filter.**

**Fan**

**___ 1. Whether there is deformation on the fan blades.**

**___ 2. Whether there is bearing wear (For forward fan).**

**___ 3. Belt tightness and its state (For forward fan).**

**4. Whether fan and inlet ring are fixed firmly （For backward EC fan）**

**___ 5. Whether blades scratch the adjacent metal plate (For backward EC fan)**

**Water flow regulating valve**

**___ 1. Check water flow.**

**___ 2. Check water resistance.**

**Heating system**

**___ 1. Examine the operation of re-heating system components.**

**___ 2. Check the component corrosion status.**

**Infrared humidifier**

**___ 1. Check whether there is block on water tray drain.**

**___ 2. Examine the quartz lamp of the humidifier.**

**___ 3. Examine water tray mineral deposits.**

**Signature_____**

**Note: Please copy this table as an archive record.**

**Attached table 2: Table of equipment maintenance inspection items (semi-annual)**

**Date** **Prepared by:**

**Equipment model:** **Serial No.:**

**Filter**

**___ 1. Check whether the filter is damaged or blocked.**

**___ 2. Check the filter block switch.**

**___ 3. Clean the filter.**

**Fan**

**___ 1. Whether there is deformation on the fan blades.**

**___ 2. Whether there is bearing wear (For forward fan).**

**___ 3. Belt tightness and its state (For forward fan).**

**___ 4. Check and fasten the circuit connector (For forward fan).**

**5. Whether fan and inlet ring are fixed firmly (For backward EC fan).**

**___ 6. Whether blades scratch the adjacent metal plate (For backward EC fan)**

**Chilled water coil**

**___ 1. Clean water pipe system.**

**___ 2. Check whether there is leakage in water system.**

**Heating system**

**___ 1. Examine the operation of re-heating system components.**

**___ 2. Check the component corrosion status.**

**___ 3. Check and fasten the circuit connector.**

**Infrared humidifier**

**___ 1. Check whether there is block on water tray drain**

**___ 2. Examine the quartz lamp of the humidifier.**

**___ 3. Examine water tray mineral deposits.**

**___ 4. Check and fasten the circuit connector.**

**Electric control**

**___ 1. Examine the fuse and circuit breaker.**

**___ 2. Check and fasten the circuit connector.**

**___ 3. Check the control procedure.**

**___ 4. Check whether the contactor can pull on or not.**

**Signature**_____

**Note: Please copy this table as an archive record**

# Appendix 1 The Structure Chart Of Electric Control Box

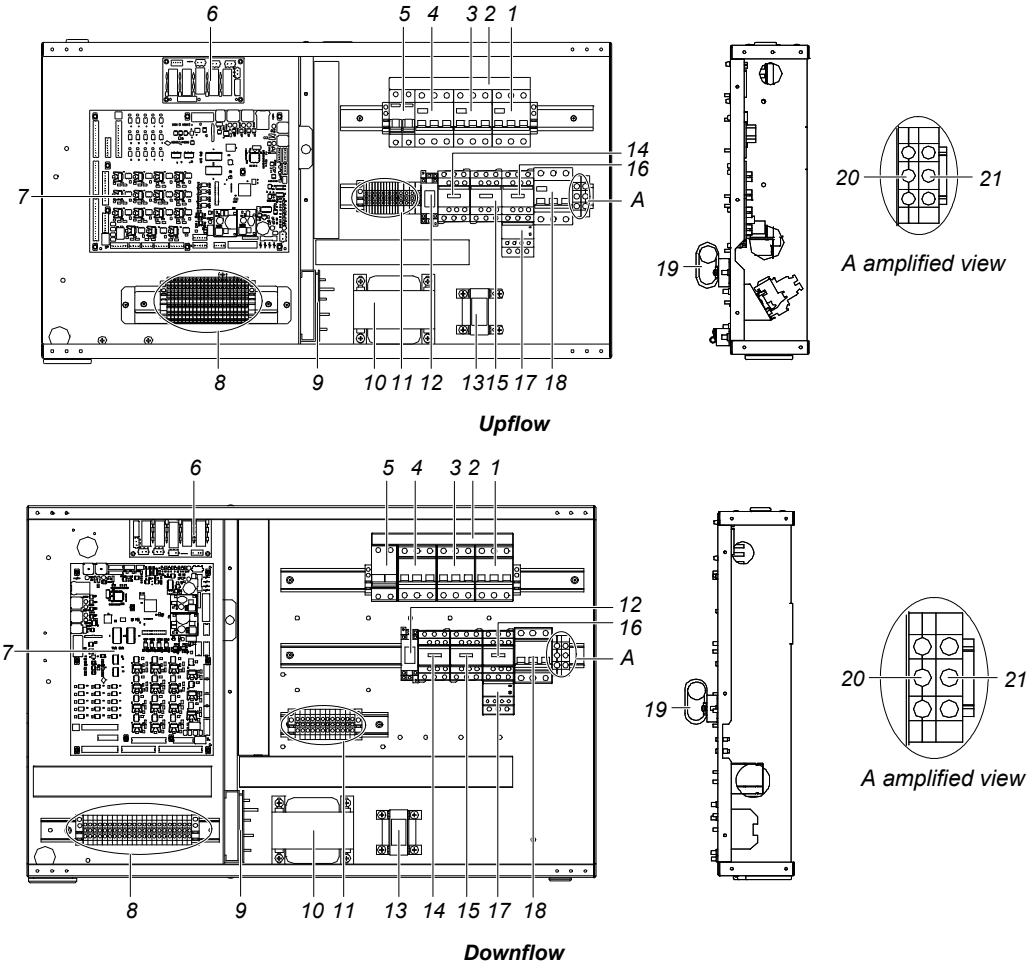
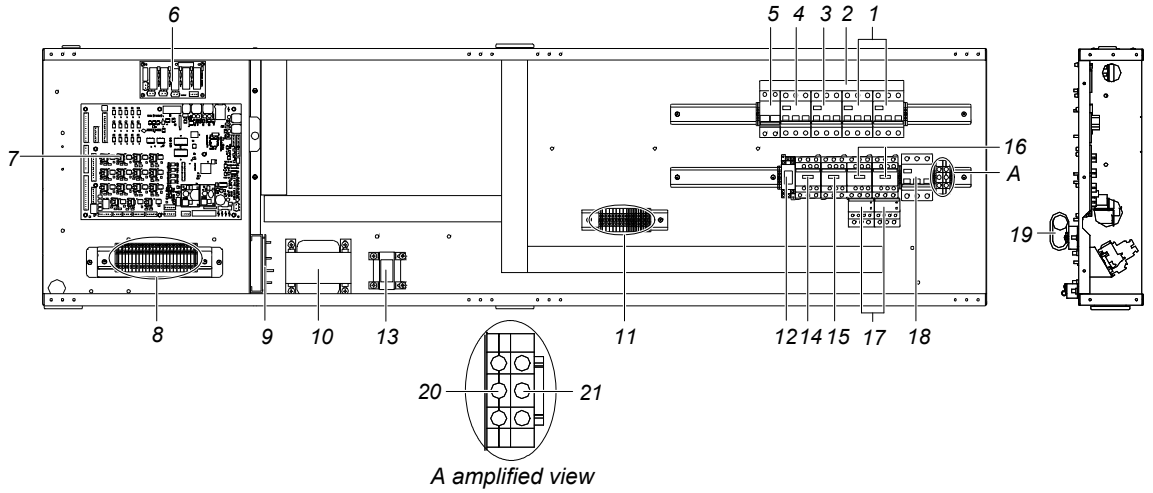
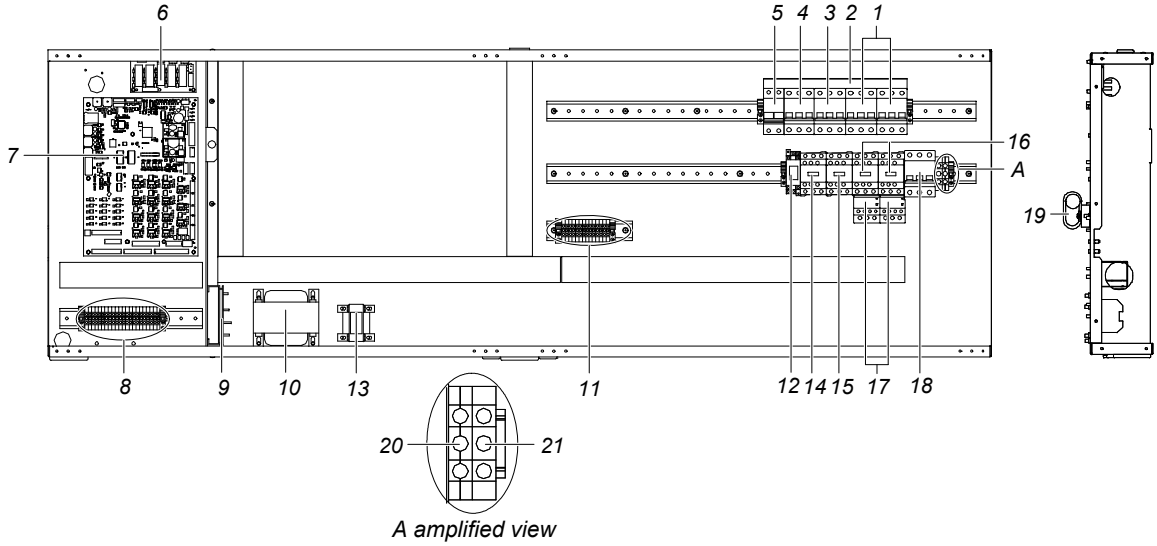



*Figure 1 Internal structure of one-bay series electrical control box*

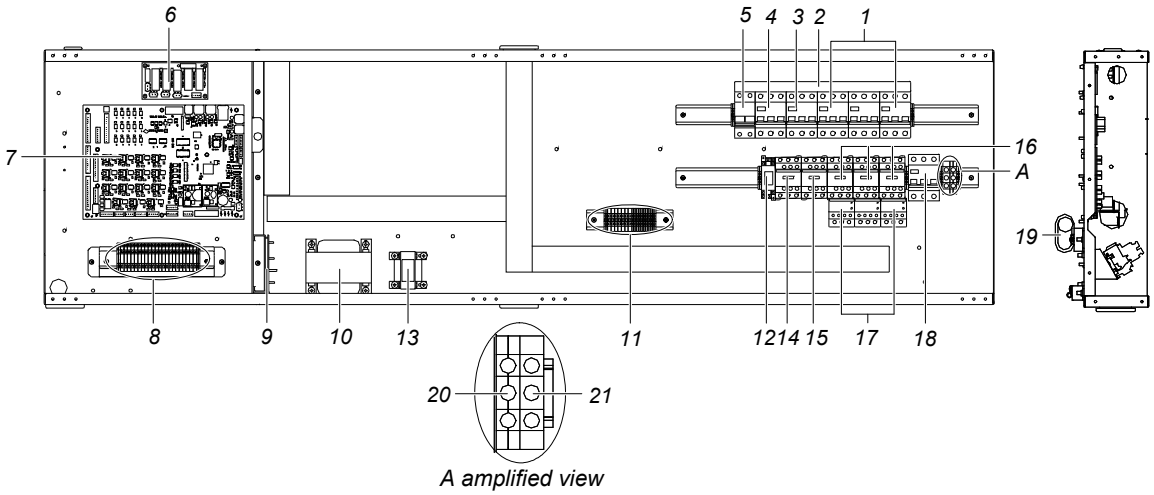



***Upflow***

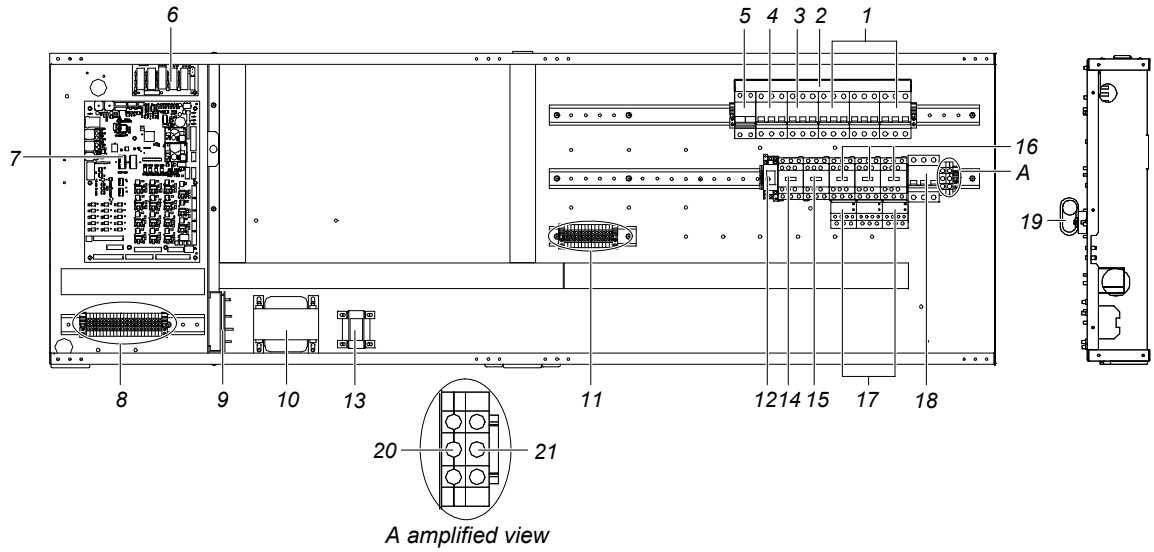



***Downflow***

***Figure 2 Internal structure of two-bay series electrical control box***




***Upflow***




***Downflow***

***Figure 3 Internal structure of three-bay series electrical control box***

| | | | |
|---|---|---|---|
| ***1——Fan MCB*** | ***6——Fuse board*** | ***11——N/PE terminal*** | ***16——Fan contactor*** |
| ***2——Bus*** | ***7——Control board*** | ***12——Backup reheat relay*** | ***17——Fan overcurrent protector*** |
| ***3——Electrical heater MCB*** | ***8——Control terminal*** | ***13——Isolation transformer*** | ***18——Main isolation switch*** |
| ***4——Infrared humidifier MCB*** | ***9——Ground current detector*** | ***14——Humidification contactor*** | ***19——Temperature/humidity sensor board*** |
| ***5——Control board MCB*** | ***10——Power transformer*** | ***15——Electrical heating contactor*** | ***20——Main N terminal*** |
| | | | ***21——Main grounding terminal*** |

# Appendix 2 Circuit Diagram

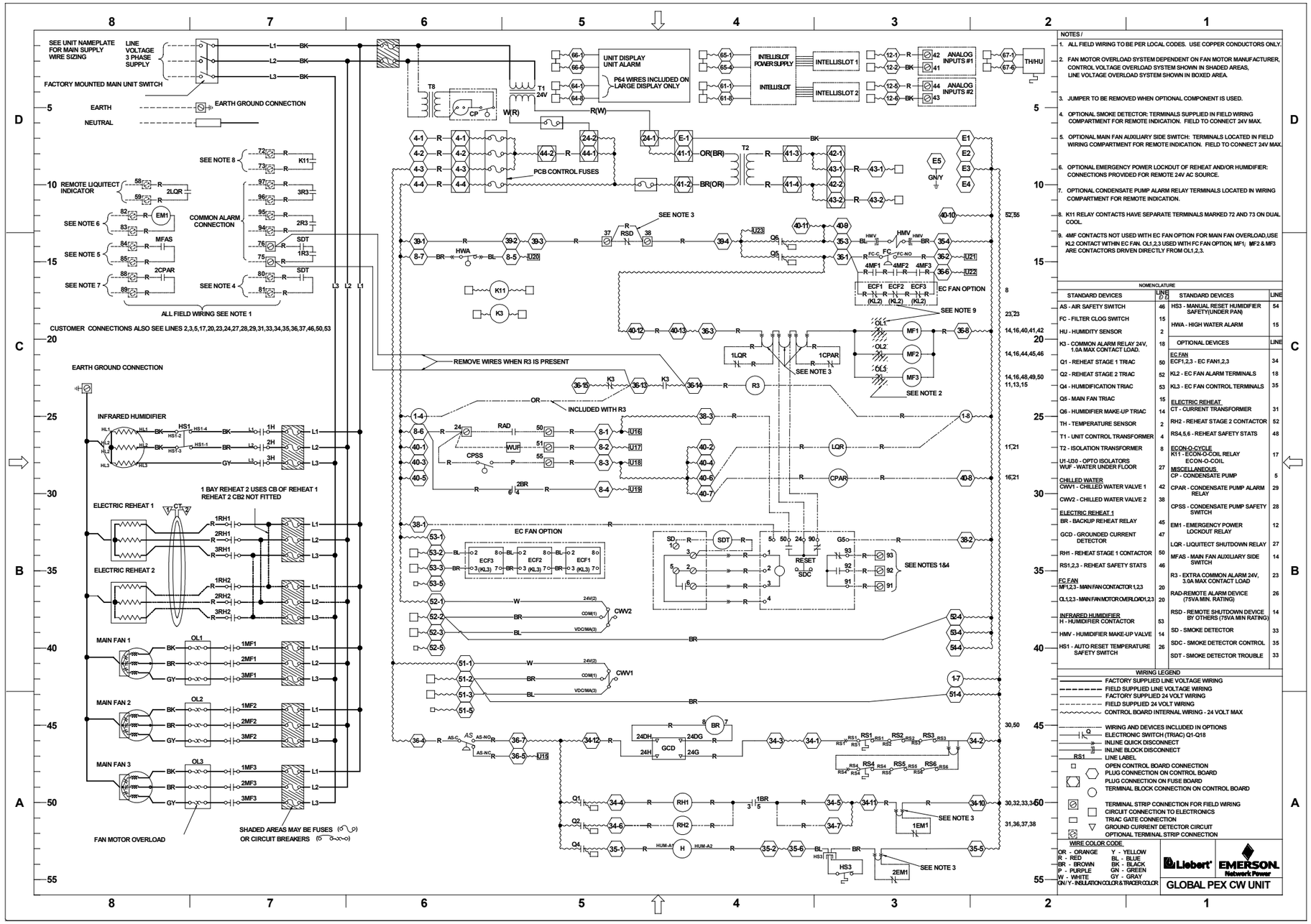



*Figure 4 Circuit diagram*

# Appendix 3 The Structure Chart Of Micro-processing Controller Menu

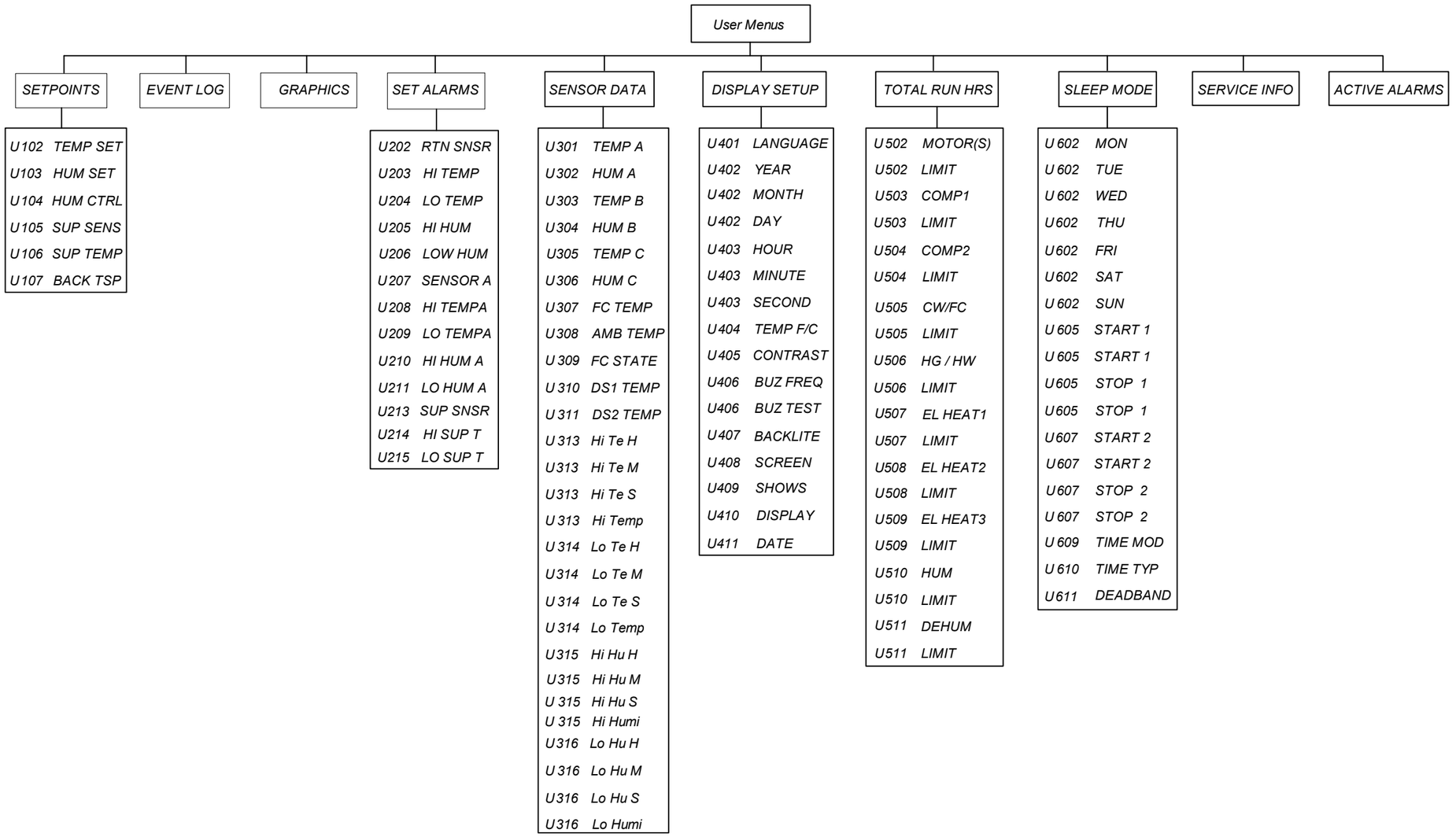



***Figure 5 Structure diagram of user menu***

- SERVICE MENUS
  - SETPOINTS
    - S102 TEMP SET
    - S103 CTRL TYP
    - S104 TEMP PB
    - S105 TEMP INT
    - S107 AUTOSET
    - S108 TEMP DB
    - S109 2ND SETP
    - S110 BACK TSP
    - S113 HUM SET
    - S114 HUM CTRL
    - S115 HUM PB
    - S116 HUM INT
    - S117 HUM DB
    - S118 LO LIM 1
    - S119 LO LIM 2
    - S124 SUP SENS
    - S125 SUP TEMP
    - S126 SUP TYPE
    - S127 SUP PB
    - S128 SUINT
    - S130 SUP DB
    - S131 VPULS
    - S132 CF0
    - S132 CF100
    - S133 RET CO
    - S135 AMB TYPE
    - S136 AMB DT
    - S137 FC TYPE
    - S138 FC DT
    - S139 MIN CW
    - S140 MIN CW
    - S141 LOCK FC
    - S142 TRANS CH
    - S146 FANSPEED
    - S147 VSD SET
    - S148 VSD MIN
    - S149 VSD DEH
    - S150 VSD NOP
    - S151 FF0%
    - S151 FF100%
    - S152 FRD
    - S153 HAD
    - S154 HAP
    - S155 HAI
    - S157 SCR TYPE
    - S158 CO1 ON
    - S159 CO1 OFF
    - S160 CO1 TD
    - S161 CO2 ON
    - S162 CO2 OFF
    - S163 CO2 TD
    - S164 CYCLET
    - S165 SCRFACT
    - S166 ACT SCR
  - STANDBY SETTINGS
    - S502 #STANDBY
    - S503 ROTATION
    - S504 ROT HOUR
    - S505 ROT MIN
    - S506 ROT BY
    - S507 DO ROT
    - S508 CASCADE
    - S509 STBY HT
  - WELLNESS BASIC
    - S002 FREQ/YR
    - S003 BONUS
    - S004 PENALTY
    - S005 LAST PM
    - S005 LAST PM
    - S005 LAST PM
    - S006 NAME
    - S007 CONFIRM
    - S008 NEXT PM
    - S013 STARTS
    - S014 RUN HRS
    - S015 AVG RUN
    - S016 BEST
    - S017 WORST
    - S018 ALARMS
    - S019 BONUS
    - S024 STARTS
    - S025 RUN HRS
    - S026 AVG RUN
    - S027 BEST
    - S028 WORST
    - S029 HP AL
    - S030 LP AL
    - S031 OL AL
    - S032 DS HT AL
    - S033 BONUS
    - S035 STARTS
    - S036 RUN HRS
    - S037 AVG RUN
    - S038 BEST
    - S039 WORST
    - S040 HP AL
    - S041 LP AL
    - S042 OL AL
    - S043 DS HT AL
    - S044 BONUS
    - S046 STARTS
    - S047 RUN HRS
    - S048 AVG RUN
    - S049 BEST
    - S050 WORST
    - S051 ALARMS
    - S052 BONUS
    - S057 STARTS
    - S058 RUN HRS
    - S059 AVG RUN
    - S060 BEST
    - S061 WORST
    - S062 ALARMS
    - S063 BONUS
    - S068 STARTS
    - S069 RUN HRS
    - S070 AVG RUN
    - S071 BEST
    - S072 WORST
    - S073 ALARMS
    - S074 BONUS
    - S079 STARTS
    - S080 RUN HRS
    - S081 AVG RUN
    - S082 BEST
    - S083 WORST
    - S084 ALARMS
    - S085 BONUS
  - DIAGNOSTICS
    - S302 HP1 CODE
    - S303 HP2 CODE
    - S304 HT1 CNT
    - S305 HT2 CNT
    - S306 LP1 CODE
    - S307 LP2 CODE
    - S308 LP1 ACT
    - S309 LP2 ACT
    - S310 HP1 ACT
    - S311 HP2 ACT
    - S313 MANUAL
    - S314 MOTOR(S)
    - S315 COMP1
    - S315 C1 MODE
    - S316 C1 CAP
    - S317 C1 CYCLE
    - S318 LLSV 1
    - S319 C2 MODE
    - S320 C2 CAP
    - S321 C2 CYCLE
    - S322 LLSV 2
    - S324 EL HEAT1
    - S325 EL HEAT2
    - S326 EL HEAT3
    - S327 SCR HEAT
    - S328 DEHUM
    - S329 HUM FILL
    - S330 HUM
    - S331 H DRAIN
    - S332 HUM.C.
    - S335 ALM REL
    - S336 K11 REL
    - S337 3P1 OPEN
    - S337 3P2 OPEN
    - S338 3P1 CLOSE
    - S338 3P2 CLOSE
    - S339 BV CTRL
    - S340 MBV1 POS
    - S340 MBV2 POS
    - S341 ANALOG1
    - S342 ANALOG2
    - S343 ANALOG3
    - S344 ANALOG4
    - S345 RSD
    - S346 AIR LOSS
    - S347 MOTOR OL
    - S348 FILTER
    - S349 CUSTOM 1
    - S350 CUSTOM 2
    - S351 CUSTOM 3
    - S352 CUSTOM 4
    - S353 HEAT SAF
    - S354 FLOW AT
    - S355 FLOW ACT
    - S356 HP1
    - S357 LP1
    - S358 C1 OL
    - S359 HP2
    - S360 LP2
    - S361 C2 OL
    - S367 HUM PROB
    - S368 DT1
    - S369 DT2
    - S370 DT3
    - S371 MIN CW
    - S372 LWD VAL
    - S374 LSI
    - S375 COND 2
    - S376 COND 1
    - S379 V_CTRL
    - S380 V_CAL
    - S381 CAL_STAT
    - S382 CLSD 1
    - S383 OPEN 1
    - S384 V1 FDB
    - S385 CLSD 2
    - S386 OPEN 2
    - S387 V2 FDB
  - SET ALARMS
    - S202 RTN SNSR
    - S203 HI TEMP
    - S204 LO TEMP
    - S205 HI HUM
    - S206 LOW HUM
    - S207 SENSOR A
    - S208 HI TEMPA
    - S209 LO TEMPA
    - S210 HI HUM A
    - S211 LO HUM A
    - S213 SUP SNSR
    - S214 HI SUP T
    - S215 LO SUP T
    - S224 CUST IN1
    - S225 C1 ACT
    - S226 CUST IN2
    - S227 C2 ACT
    - S228 CUST IN3
    - S229 C3 ACT
    - S230 CUST IN4
    - S231 C4 ACT
    - S232 WA AC AL
    - S233 WAT OFF
  - CALIBRATION
    - S602 RTN TEMP
    - S603 CAL TEMP
    - S604 RTN HUM
    - S605 CAL HUM
    - S606 DS1 NTC
    - S607 CAL DS1
    - S608 DS2 NTC
    - S609 CAL DS2
    - S610 OUT SNS
    - S611 CAL OUT
    - S613 TEMP A
    - S614 CAL A
    - S615 HUM A
    - S616 CAL A
    - S617 TYPE B
    - S618 TEMP B
    - S619 CAL B
    - S620 HUM B
    - S621 CAL B
    - S622 TYPE C
    - S624 FC SNSR
    - S625 FC SNSR
    - S626 CAL FC
    - S627 SUP SNSR
    - S628 SUP TEMP
    - S629 CAL SUP
    - S630 TEMP C
    - S631 CAL C
    - S632 HUM C
    - S633 CAL C
  - NETWORK SETUP
    - S802 # UNITS
    - S803 TEAMWORK
    - S824 MON ADD
    - S825 MON T.O.
    - S825 MON H.S.
    - S831 CS CTRL
    - S831 CS STAT
    - S832 NW CTRL
    - S832 NW STAT
    - S835 MON PROT
    - S836 IP #1
    - S836 IP #2
    - S836 IP #3
    - S836 IP #4
    - S837 NM #1
    - S837 NM #2
    - S837 NM #3
    - S837 NM #4
    - S838 GW #1
    - S838 GW #2
    - S838 GW #3
    - S838 GW #4
    - S840 U2U PROT
    - S841 U2U ADD
    - S842 U2U GRP
    - S843 BL CTRL
    - S843 BL STAT
    - S844 SR CTRL
    - S844 SR STAT
    - SW#
    - MAC
    - NAME
  - OPTIONS SETUP
    - S402 COMP SEQ
    - S403 LP DELAY
    - S405 EL HEAT
    - S406 EL HEA C
    - S407 HW HEAT
    - S408 ALL HEAT
    - S409 LWDconn
    - S409 V_CTRL
    - S410 3P RUN
    - S411 3P DIR
    - S413 HUM ENAB
    - S414 IR FLUSH
    - S415 HUMSTEAM
    - S416 HUMCONT
    - S417 HUM.TIME
    - S418 HUM.MAN
    - S419 DEHUM EN
    - S420 REST EN
    - S421 RESTART
    - S422 ONOFF EN
    - S424 CW FLUSH
    - S425 FC FLUSH
    - S426 HW FLUSH
    - S427 BALL OFF
    - S428 HEAT AS
    - S429 CW CTRL
    - S430 MAIN V
    - S431 VALV ROT
    - S432 VALV TIM
    - S433 DEHUM OP
  - SERVICE INFO

***Figure 6 Structure diagram of maintenance menu***

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