



AIR COOLING CABINET UNIT

User Manual

EURASIAN(GUANGDONG)FREEZINGEQUIPMENTCO.,LTD

Before the initial installation and commissioning of the air cooler, the operating and construction personnel shall be fully familiar with the unit operating instructions and other necessary work data, and carefully read the contents of this manual. Understand the corresponding installation, commissioning, maintenance precautions and relevant requirements, ensure the installation specification, and make the unit operate in the best state.

Note: before the unit is operated, it must be confirmed that the air duct has been installed on the system, otherwise the unit will be damaged due to lack of protection.

一、 Product Introduction

The air-cooled cabinet unit is a heat exchanger manufactured by imported high-efficiency heat exchange copper tubes, computer machine tools and fully automatic welding technology, equipped with various imported spare parts and electronic control components. Assembled. The unit has high refrigeration efficiency, compact structure, beautiful appearance, small size, light weight, easy installation, use and maintenance. It is widely used in precision machinery production, electronics, chemical industry, pharmaceutical factory, medical and health, biological water manufacturing, food processing and various Air-conditioning system with strict requirements for temperature in laboratories and the like.

1. Chiller rating plate—Generally located on the left of the chiller control box.

2. Principle description:

(1) The unit automatically adjusts the cooling capacity according to the room return air temperature setting

(2) When the indoor return air temperature is less than the set value—return difference, the refrigeration system automatically stops the compressor; when the indoor temperature reaches the set value, then gradually reduce the cooling capacity

3. The refrigeration system has a fault signal, and the input light is on, indicating that the refrigeration part of the unit has a fault. It must be shut down to eliminate the fault before it can continue to operate.

- Equipment description:

1、The machine has two major applications: Refrigeration, heating, ventilation. The unit uses power supply 380V/3HP/60HZ

4. System Components

(1) Compressor

The scroll compressor is used, and the lubricating oil adopts a differential pressure oil supply system, and no lubricating oil pump is needed. To ensure correct rotation, reverse phase protection is provided.

(2) Condenser

Finned condenser is the most widely used heat exchange equipment in gas and liquid heat exchangers. It can enhance heat transfer by adding fins to the common base tube.

(3) Heat Expansion Valve

The chiller adopts imported external-balance heat expansion valve, ensuring the reliability and accuracy of the refrigeration system.

(4) System Parts

The main parts including solenoid valve, heat relay and contactor all are imported, ensuring the accuracy and reliability of the refrigeration system.

二、 Handling and installation

1.1 Machine assembly and disassembly

(1) Whether the unit is packaged or transported in sections depends on the size and type of the unit.

(2) Depending on the size and weight of the unit, suitable transportation or handling tools should be selected.

Forklifts, flatbed trucks or platform trucks can be used, as shown in Figure 1-1.

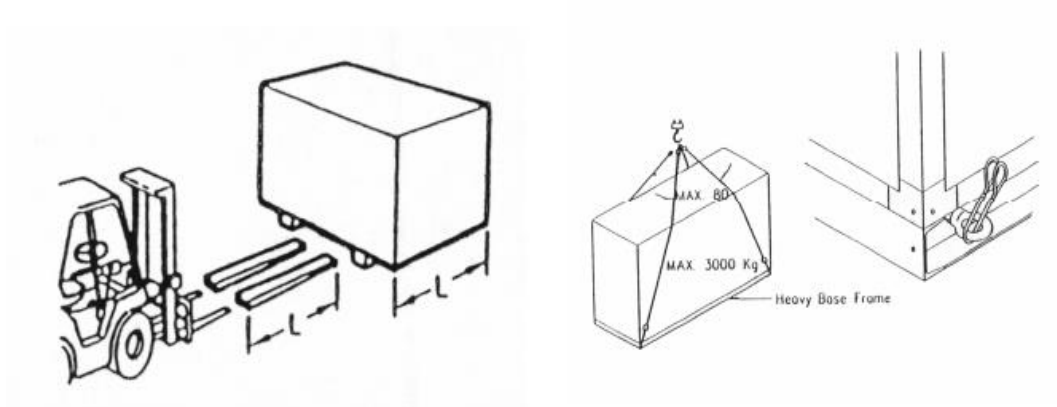


图 1-1

(3) Pay attention to the following points during loading, unloading and transportation:

- ① During the loading and unloading, the piping or manifold of the unit cannot be used as the supporting point of the crane.
- ② Before installing or taking over, please do not remove the protective layer at the coil takeover.
- ③ Before the final positioning or assembly of the unit, please keep the liner and protective layer of the unit.

三、 Preparation before installation

2. 1Preparation before Installation

1. The chiller shall have a special machine room and proper measures shall be taken to exhaust the heat produced by the chiller out of the machine room and make sure the ventilation capacity can maintain the room temperature no more than 40℃.
2. The chiller shall be installed on a rigid base or concrete foundation without distortion and such foundation shall be even on surface and able to stand the working weight of the chiller.
3. Make sure drain facilities with sufficient drainage capacity such as drainage ditch, etc. are available around the foundation of the chiller so that the water in the refrigeration system can be drained during seasonable halt or maintenance.
4. The machine room shall have sufficient room so as to facilitate the installation, maintenance and care of the chiller; in addition, no pipeline and conduits shall be laid above any compressor.
5. It is advised that, during water pipe installation, certain spacing for the installation of the vibration isolation rubber adapter is reserved between the water pipe and the chiller adapter so that proper construction and adjustment space is available when the chiller arrives at the site.
6. In order to ensure the normal work of electrical components, do not install the chiller in the place with dust, dirt, corrosive smog and much moisture. Any such misconduct must be corrected.
7. Materials and tools to be prepared: soft joint, shockproof soft cushion, lifting equipment, lifting beam, lifting chain, skid pad, roller and crowbar

Note: We will be exempted of the warranty for any revision or modification to the chiller during installation without our written consent.
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2. 2Placement and Positioning

2.2.1 After the chiller is placed into its proper position, remove the sliding skid, check its level with an air-bubble level and fix the footing of the chiller onto the foundation with foundation bolts. It is advised to place 15~20mm thick anti-shake soft cushion between the footing of the chiller and the foundation.

2.2.2 Generally, the chiller is installed in basement or on ground floor or special machine room. If it must be installed on very high floor, firstly, check if the structure of such floor can bear the working weight of the chiller; reinforce the floor where necessary. Moreover, check if such floor is level. It is advised to distribute spring shock absorbers according to the working weight

of the chiller.

四. Unit installation

1. The unit should be installed on a solid, firm and smooth surface concrete

foundation or metal steel frame. The strength of the installation platform

must be sufficient to bear the weight of the unit. If the strength is insufficient, it is easy to produce vibration and noise.

2. The surface of the concrete foundation table is generally horizontally decorated with stucco and needs to be waterproofed. The foundation table. Drainage trenches should be provided around the slope, the slope of the drainage trench should be greater than 0.5%, and the slope should be towards

the drain.

3. In order to enable the equipment to run quietly and avoid affecting the

floor below the location of the unit due to the transmission of vibration and noise, the base of the unit should be isolated from the foundation with

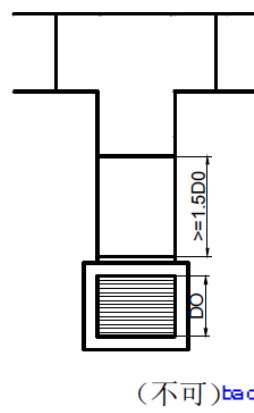
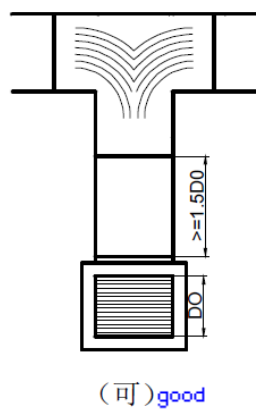
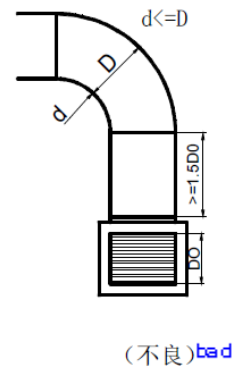
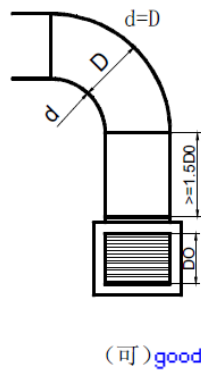
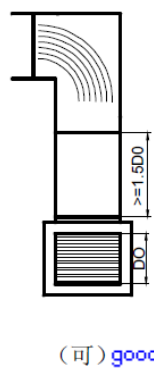
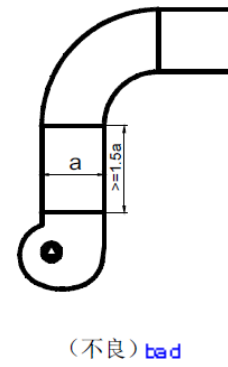
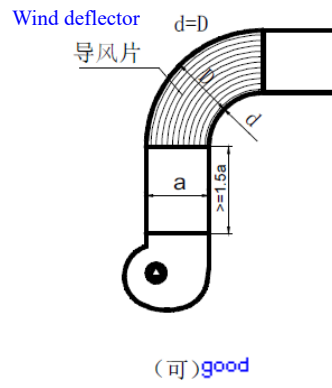
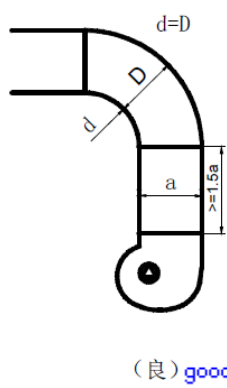
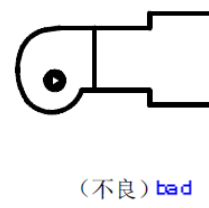
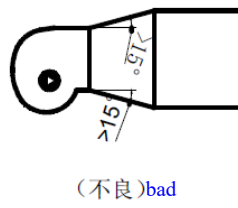
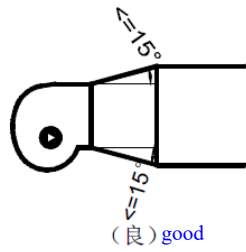
shock absorbers, and the unit should be kept at a level during installation.

Add shock-proof base.

四、 Duct connection

1. Shockproof: In order to avoid the vibration from the body to the wind pipe, add a canvas joint at the outlet of the body

2. Takeover reference:



3. Air volume: In order to reach the air volume control, the return air should be

installed with a damper to adjust the air volume. If the air volume is too large or too small, the balance of the system will be out of control, and if the air volume is too large, the motor will be overloaded or burned.

4. After installing the air duct, pressurize the leak test in accordance with the regulations, and apply heat insulation after passing the verification.

六、 On site refrigerant charging

1. When it is necessary to charge cold media to the chiller for purpose of installation or maintenance, operate as follows:

2. Use a vacuum pump to make the vacuum of the chiller below -1bar (read the chiller's pressure gauge). If the reading on the pressure gauge keeps unchanged after 12h, it will indicate the vacuum is checked OK.

3. After the vacuum is qualified, inject the specified amount of refrigerant through the copper needle bud filling hole.

七、 Electrical connection

For site wiring, in order to avoid corrosion and overheat at the connection point of terminals, make sure all power supply wires are of copper. Separate the control cable from the power cable and add certain protective circuit so as to prevent the power cable from interfering with the control cable, and make sure the housing of the chiller is reliably grounded. In addition, for site wiring, in order to avoid control error, do not let the low-voltage control circuit (24V) and the lead wires above 24V through the same wire conduit.

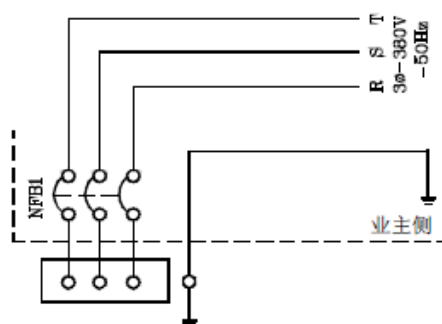
Caution: For site wiring, in order to avoid casualties, be sure to cut off the power supply before the complete connection of lines and the chiller.

1. Power supply section

1. The power supply voltage must be stable when the unit is running. Taking into account all voltage drop factors, the unit's operating voltage must be kept within $\pm 10\%$ of the rated value. Excessive or low voltage will have an adverse effect on the unit.
2. The voltage difference between the phases does not exceed the rated value $\pm 2\%$, and the difference between the highest and lowest phase current is less than 3% of the rated

value, so as not to cause the compressor to overheat.

3. The power supply frequency should be kept within $\pm 2\%$ of the rated value.
4. The minimum starting voltage of the unit shall be kept above 85% of the rated value.
5. If the power cord is too long, the compressor will not start. The length of the compressor must be less than 2% of the rated value during operation. If the length cannot be shortened, the power cord must be thickened.
6. The wiring between the power supply and the unit must be constructed in strict accordance with the standards of electrician regulations, and the insulation is good. After the unit is connected, the insulation between the terminal of the electrical accessories and the body should be measured with a 500V high resistance meter, and its insulation resistance is at least $3M\Omega$ or more.
7. In order to reduce the damage to electrical equipment such as transformers and wiring in the event of a short-circuit accident on the line and to facilitate independent control of the start and stop of the compressor, each group of power supply inlets of the unit must be equipped with a fuse-free air switch of appropriate capacity (NFB), its power wiring is shown in the following figure:



Wiring diagram of air-cooled cabinet unit

8. In order to protect personal safety, in case the body leaks to avoid the risk of electric shock, the unit casing should have Good and reliable grounding protection device to prevent electric shock accidents, it is necessary to strictly follow the requirements of electrician regulations work.
9. The operating current, input power and other parameters in the unit

performance specification table refer to the test values under standard conditions. In actual operation, there will be large differences with the

actual load of the air conditioning system and the temperature of the external air environment. If the outside air temperature is high and the air conditioning load is too large, the unit's operating current and input

power will increase. Therefore, the power supply, transformer, non-fuse switch, and wiring capacity should be selected under the possible harsh working conditions. It is recommended to select according to the capacity of 1.5 times or more of the unit's calibration value.

2.1Control

The core component of the central air conditioning control device of the air-cooled cabinet machine adopts an intelligent microcomputer touch screen control system, and the operation interface adopts English dialogue mode, which is easy to operate. The entire control device has a high level of automation and reliability.

1. The control mechanism inside the electrical control cabinet is provided with relay, power connection fault indicator, connecting terminal block and programmable controller. A different type of control cabinet for the chiller may be provided depending on the different compressor and different customer requirements.
2. The front of the electrical control cabinet is provided with operation screen and chiller stop switch.
3. The electric wiring must comply with the applicable national technical specifications; the control circuit of the chiller shall be 220V. For the wiring of the control circuit, see the wiring diagram attached to the chiller.
4. If the chiller consists of the main unit and sub-unit, the communication cable between them shall be shielded and protected with sleeve and shall be separated from the power cable.
5. All the control output cables to be wired on the site shall be AC250V-1mm² (24V).
6. Attention: It is necessary to carefully read the electrical wiring schematic and strictly follow the wiring terminal diagram for wiring.

2.2 Control Accessory Interlock Device

1. When the unit leaves the factory, the wiring between the control cabinet and the main motor, between the control cabinet and the electrical actuator, between the control cabinet and the pressure and temperature sensor elements has been connected.

八、 Chiller Running

Preparations for common tools:

1. **Common tools for refrigeration**
2. **(DVM) Digital voltmeter/ohmmeter(DVM)**
3. **Tong-type ammeter**
4. **Absolute manometer or wet bulb vacuum indicator**
5. **500V insulation tester (megameter)**

8.1 Inspection items before chiller running

8.1.1 Inspection on the power supply and electrical control instrument system

- 1) Before startup for the first time, check whether the distribution capacity is consistent with the power of the chiller and whether the cable diameter can withstand the maximum operating current for the principal machine.
- 2) Check whether the electrical system is consistent with this chiller. Electrical system for this chiller: Three-phase five-wire system (Three phase wires, one neutral wire, and one ground wire, $380V \pm 10\%$).
- 3) Check whether the power supply line of the compressor is properly tightened. If loose, retighten it. The screws may be loose due to factors such as long-distance transport and lifting of the principal machine. **Otherwise, it may cause damage to the electrical elements in the control cabinet of the principal machine (e.g. the air switch and the AC contactor) and the compressor.**
- 4) Carefully check all electrical lines with a multimeter. Check whether the wiring is correctly installed. Measure with a megohm range to ensure that there is no evidence of short circuit of

the housing. Check whether the ground wire is correctly installed. The insulation resistance to earth shall be greater than 2M ohms. Check whether the power cord meets the capacity requirements.

- 5) Check whether a circuit breaker is installed on the power cord of the chiller supplied.
- 6) Before energization, fully check that all wirings of the main circuit in the control cabinet and external wirings of the control circuit according to the wiring diagram are correct. Check whether the terminal bolts are tightened and show no evidence of loosening. Check whether electrical control instruments and electrical appliances are correctly installed and complete and valid. Check whether the interior and exterior of the electrical control cabinet, especially the connection ports, are clean and show no evidence of debris.

8.1.2 Inspection on the compressor and refrigerant piping system

- 1) Check whether the oil level in the compressor is normal. Normal oil level in the compressor is generally located in the middle position of the sight glass.
- 2) Check whether the solenoid valve coil for capacity adjustment is locked and whether the capillary for capacity adjustment is broken.
- 3) All refrigerant valves in the refrigerating system (angle valve at the outlet of the compressor and air suction and discharge shutoff valves of the compressor) are in on state to ensure that the refrigerant system is unimpeded.
- 4) Check whether the compressor lubricating oil is preheated for more than 8 hours. Before test run, energize and heat the machine oil heater for at least 8 hours to prevent refrigerant oil from blistering during startup. If the ambient temperature is low, the oil heating time is relatively long. During low-temperature startup, phenomena such as difficult startup and bad compressor loading and unloading may occur due to large lubricating oil viscosity. Running generally requires a minimum lubricating oil temperature of more than 23°C.
- 5) Check whether the compressor wiring is correct. Shut down the compressor immediately after startup to observe transient change in system pressure. Ensure that the discharge pressure rises and the return air pressure declines. Otherwise, the compressor performs reverse rotation and the order of connection of the compressor must be readjusted.
- 6) Perform test operation with the main circuit disconnected and check whether the operation sequence is normal. The normal starting sequence is: turn on the power, and three minutes after pressing the unit start button, the AC contactor will pull in and the unit will start.

8.1.5 Check whether the air conditioning terminal equipment operates normally and confirm that all air valves have been opened.

The end equipment shall be turned on normally. There shall be no abnormal noise. The air supply range and the air speed shall meet the design requirements.

Protective devices: Various protective devices are provided for this series of water chillers.

High and low pressure relay: It can switch on or off the compressor power supply according to the pressure in the refrigerating system. The pressure values at which the pressure switch acts have been adjusted in the factory and shall not be changed by the user.

For example, the value of R410A refrigerant pressure switch action is:

The high pressure switch-off pressure value is 41.5kg/cm^2 .

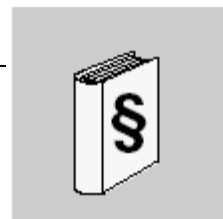
The low pressure switch-off pressure value is 0.5kg/cm^2 .

Low temperature protection cut-off: To prevent the evaporator coil from freezing, the compressor's power supply is automatically cut off when the outlet temperature is below 0°C , and the light is turned on to alarm; when the outlet temperature is higher than 5°C , the low temperature protection cut-off is automatically turned on. The device has been adjusted before leaving the factory, and the user cannot easily change it.

3. Chiller running

Safety Information

Important Information



Attention: Read carefully the instructions against the device to be familiar with the device before installation, operation and maintenance. The following special information will appear in this manual and device to give a warning for any potential risk.



When this sign appears together with Danger or Warning, it means that there is an electrical danger that may cause personal injury provided that operations are not performed according to the

instructions.



This is a safety warning sign that warns the user of potential personal injury. Please follow all safety information after this sign to avoid injury or death.

 DANGER
DANGER means that a danger is about to occur. If this case is not avoided, it will cause death, serious injury or equipment damage.

 AVERTISSEMENT
WARNING means that there is a potential danger is about to occur. If this case is not avoided, it may cause death, serious injury or equipment damage.

 ATTENTION
CAUTION means that there is a potential danger is about to occur. If this case is not avoided, it may cause injury or equipment damage.

Attention Only qualified users can use this device. The Eurasian Company disclaims any liability due to violation of this manual.

Do not worry after pressing the “Start” button because it will take a given period of time for the chiller to be started up.

After the “Stop” button is pressed, all chillers are stopped in a set stop sequence instead of immediately to avoid any impact on the power grid. Before the startup of the chillers is finished, the “Stop” button is invalid. If emergency stop is needed, press the “Emergency stop” button.



The password for entering the user parameters is ----. Do not modify any parameters that are set by the manufacturer in the factory. If any modification is needed, contact the manufacturer.



When chiller emergency stop is needed in case of emergency, toggle the key switch of the chiller to disconnect its control power supply. Attention: Perform this operation only in case of an emergency. Frequent emergency stop may cause damage to the compressor.

When the unit experiences phenomena such as "overload of the air supply fan" during operation, after the fault problem is resolved, the "start" button needs to be clicked again for the unit to start running again ‘

For other fault problems, re-clicking the “Start” button is not needed after troubleshooting is finished. According to the temperature, the chiller will judge whether to restart.

Introduction to Operation

Key: HM505A There are 8 keys:

- ON、OFF key: ON、OFF (Fault reset) operation;
- Enter、Back: Enter query、Menu confirmation、Menu return, etc;
- Up、Down: Page up and page down、witch parameter items;
- Add、Sub key: Switching module、Modify parameter values。

Interface: The text screen mainly includes startup interface, main interface, query interface, user setting and manufacturer setting interface. See the following sections for details. The positive and negative triangle in the upper right corner indicates that this page is not fully displayed. You can continue to turn up or down.



HM505A

1. Power on interface



2. main interface



It is divided into left and right display areas:

1) The left area displays temperature, return temperature, set temperature and operation mode. The displayed in reverse indicates the current control temperature (selected by the parameter [control object]).

2) The right area displays the auxiliary status, from top to bottom:

- Timing: displayed when using timing;
- Operation status: standby, start, run, delay, serious (unable to start in case of serious fault);
- Defrosting and antifreezing status;
- 3Fault status: flashes when there is a fault, and white when there is no fault.

When turning down the page, the ambient temperature, hot water temperature and WiFi connection status are displayed.



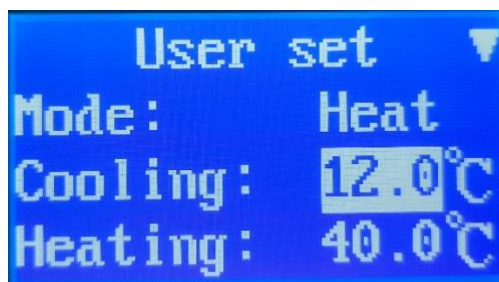
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Display the model, version number, etc. when turning up the page.

3. User setting interface

Press "add" in the main interface to enter user settings, as shown in the figure below.

4. General settings



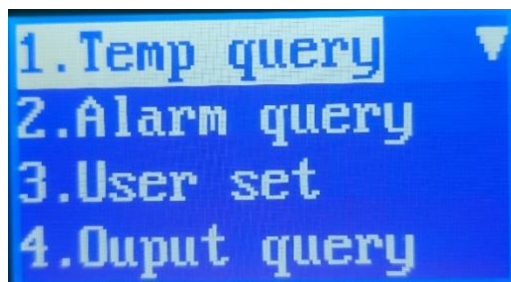
Press the up and down keys to select different parameter items;

Press the plus and minus keys to modify the selected parameter value (anti white parameter)。

Only by pressing the up, down or return key can the setting parameters take effect. If the power is cut

off directly without pressing these three keys, the parameter modification is invalid。

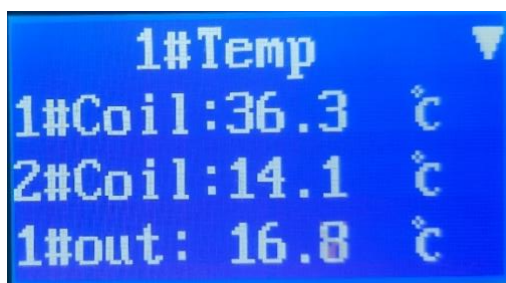
5. Query interface



Press the up and down keys to select different items;

Press the OK key to enter the selected entry.

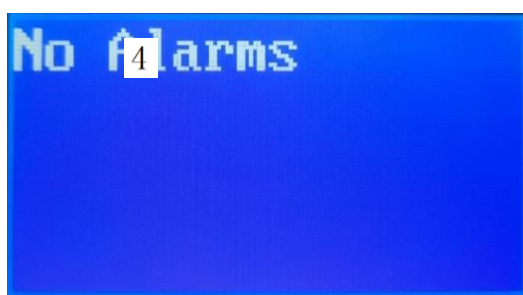
6. Query temperature



Press the up and down keys to turn the page and display the analog quantity, expansion valve status, etc;

Press the plus and minus keys to switch the module。

7. Current fault query



For current fault query, press the up and down keys to turn pages to display module faults, and up to 4 pages (16 faults) can be displayed。

Press the shutdown or confirm key to reset the fault。

"1#1# press overload": the first "1#" represents the 1# module, and the second "1#" represents the 1# press of this module.

When there is no fault, "current no fault" is displayed.

8. Output query



Press the plus and minus keys to switch the module。

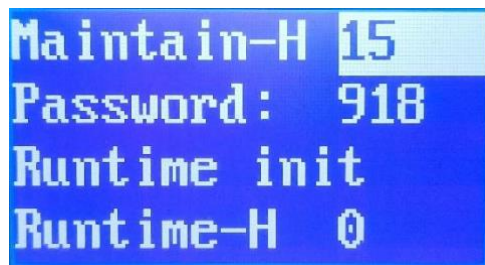
9. Input query



Press the up and down keys to turn the page and display the input status;

Press the plus and minus keys to switch the module。

10. Press the back key to exit. System maintenance settings



Set the number of hours the machine is allowed to run.

Set the cancellation password, please keep it properly. The actual password is 5 digits. If it is set to 919, please enter 00919 when entering the password in the future

The machine running time is cleared.

Query the current running time of the machine.

Press the up and down keys to select different parameter items;

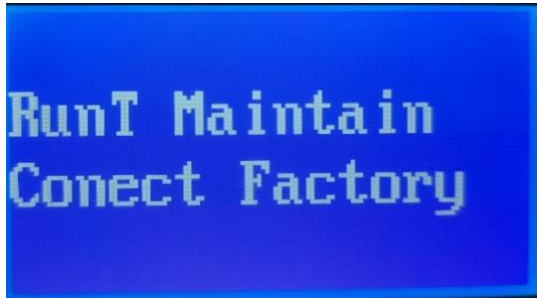
Press the left and right keys to modify the selected parameter value (anti white parameter).

The last item can only be viewed and cannot be set.

The maintenance time setting is in hours.

If the dimension does not use the system maintenance function, set the first line "maintenance time - hour" to 0 (the default is 0, which means it is not used).

When the system operation time $\geq$ maintenance time, forcibly shut down the machine, and a reminder box will pop up on the main interface:



In this interface, press the query key to enter "maintenance password" to cancel.

Or press the left and right buttons at the same time to enter the manufacturer's settings.

The on / off key is invalid.

Note: after the system is maintained and used, the manufacturer's password must be modified and kept properly.

Control logic

1、 Control logic

1、 Chiller startup process

1、 After setting the required temperature, click the "" button on the text screen, and the main unit's supply fan will start first. Then, check the water temperature. If the water temperature meets the starting conditions, the equipment will start the corresponding condensing fan according to the requirements of the selected working condition. Otherwise, the condensing fan will not start, and the compressor will not start until the return temperature reaches the starting temperature, and the equipment will start.

2、 Chiller stop process

When it is necessary to stop the equipment, the unit will stop immediately after clicking the "" button on the text screen.

2、 Energy adjustment

The energy adjustment of this control system uses fuzzy control. The temperature control zones are divided into a loading zone, a retention zone, an unloading zone and an emergency stop zone. A temperature difference is used to judge which zone the temperature is located in. Loading or unloading depends on the zone in which the temperature is located.

For example

Control temperature 12℃

Loading temperature difference setting 1℃
 Unloading temperature difference setting 1℃

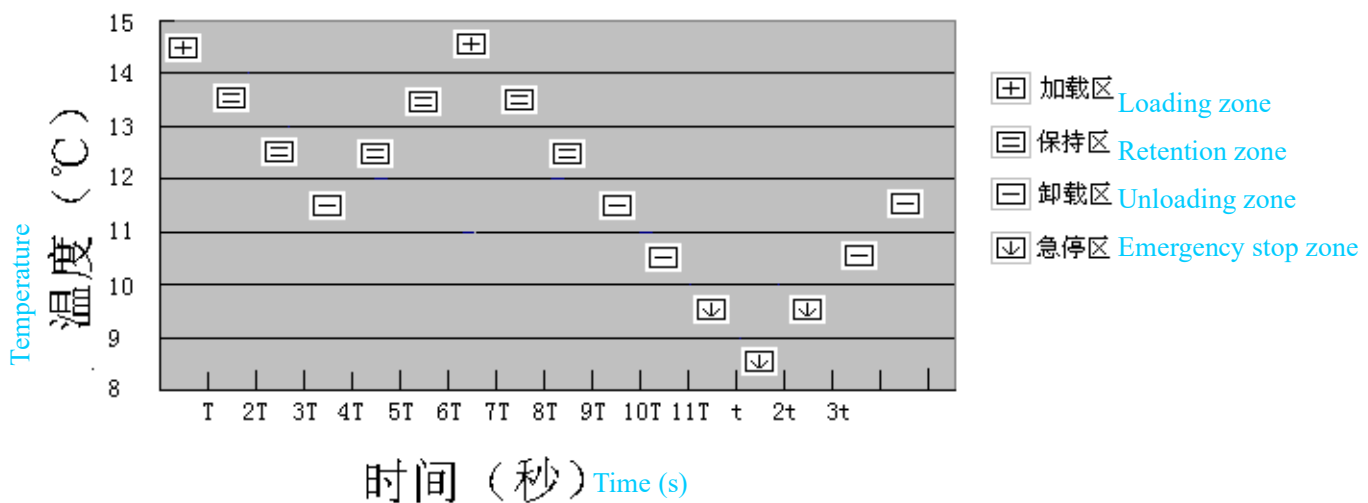
(1) Specific control logic is as follows:

T is a temperature control period; t is an emergency stop control period.

T	Measured temperature $\geq 13^{\circ}\text{C}$	(Loading zone)	Load one refrigerating capacity unit
2 T	$12^{\circ}\text{C} \leq \text{Measured temperature} \leq 13^{\circ}\text{C}$	(Retention zone)	Remain unchanged
3 T	$12^{\circ}\text{C} \leq \text{Measured temperature} \leq 13^{\circ}\text{C}$	(Retention zone)	Remain unchanged
4 T	$11^{\circ}\text{C} \leq \text{Measured temperature} \leq 12^{\circ}\text{C}$	(Unloading zone)	Unload one refrigerating capacity unit
5 T	$12^{\circ}\text{C} \leq \text{Measured temperature} \leq 13^{\circ}\text{C}$	(Retention zone)	Remain unchanged
6 T	$12^{\circ}\text{C} \leq \text{Measured temperature} \leq 13^{\circ}\text{C}$	(Retention zone)	Remain unchanged
7 T	Measured temperature $> 13^{\circ}\text{C}$	(Loading zone)	Load one refrigerating capacity unit
8 T	$12^{\circ}\text{C} \leq \text{Measured temperature} \leq 13^{\circ}\text{C}$	(Retention zone)	Remain unchanged
9 T	$12^{\circ}\text{C} \leq \text{Measured temperature} \leq 13^{\circ}\text{C}$	(Retention zone)	Remain unchanged
10T	$11^{\circ}\text{C} \leq \text{Measured temperature} \leq 12^{\circ}\text{C}$	(Unloading zone)	Unload one refrigerating capacity unit
11T	$11^{\circ}\text{C} \leq \text{Measured temperature} \leq 12^{\circ}\text{C}$	(Unloading zone)	Unload one refrigerating capacity unit
11T+t	Measured temperature $\leq 11^{\circ}\text{C}$	(Emergency stop zone)	Unload one compressor
11T+2t	Measured temperature $\leq 11^{\circ}\text{C}$	(Emergency stop zone)	Unload one compressor
11T+3t	Measured temperature $\leq 11^{\circ}\text{C}$	(Emergency stop zone)	Unload one compressor
11T+3t+T	$11^{\circ}\text{C} \leq \text{Measured temperature} \leq 12^{\circ}\text{C}$	(Unloading zone)	Unload one refrigerating capacity unit
11T+3t+2T	$11^{\circ}\text{C} \leq \text{Measured temperature} \leq 12^{\circ}\text{C}$	(Unloading zone)	Unload one refrigerating capacity unit
11T+3t+3T	$12^{\circ}\text{C} \leq \text{Measured temperature} \leq 13^{\circ}\text{C}$	(Retention zone)	Remain unchanged

(2) The control curve diagram is as follows:

温度控制逻辑表 Temperature control logic table



6、Communication function

The device provides standard modbus RTUT communication function, if you need to use this function, please contact the manufacturer

九、Machine Maintenance and Troubleshooting

9. 1Overview

This chapter introduces the preventive maintenance and fault repair of the unit. Proper maintenance and timely repair are beneficial for ensuring that the air-cooled cabinet machine is always in the best condition, maintaining the highest efficiency, and extending the life of the unit.

Maintenance refers to preventive maintenance on the chiller. Repair refers to a repair made on any fault chiller. The customer is responsible for working out a maintenance procedure according to the requirements of this chapter and this manual and assigning a qualified equipment management engineer and a special chiller operator to perform routine and periodic maintenance on the chiller. Any chiller repair job shall be done by a qualified repair organization. After the chiller warranty period expires, the customer can conclude a chiller maintenance agreement with a local customer service department of this company to ensure timely and effective repair and long-term reliable operation of the chiller.

Caution: Chiller repair caused by incorrect maintenance during the chiller warranty period will lead to the user's extra expenditure.

The most basic job for chiller maintenance is to really record chiller operating parameters and complete the chiller operating parameter table at an appropriate time interval (e.g. one hour) every day. The customer can prepare an operating parameter table in an appropriate format by referring to the Operating Parameter Record for Water Chiller. A true and complete operating parameter record helps analyze potential development trend for chiller running and promptly detect and predict potential problems to nip in the bud.

For example, by analyzing and comparing one month's operation records, it may be found that the high pressure of the unit is relatively high, and the condenser fins are constantly clogging, requiring cleaning treatment of the fins.

Attention: It is very useful to keep a parameter record of normal operation during chiller commissioning. This record can be used as a reference for comparison with a subsequent operating record to find the trend of a problem.

9. 2Maintenance

9. 2. 1Routine maintenance

- ♥ Execute the startup and stop sequence according to the specified procedure.
- ♥ Record chiller operating parameters at a given time interval.
- ♥ Check the evaporator and condenser pressure of the unit through the pressure gauge on the control cabinet, and check the difference between the evaporation temperature and the inlet and outlet air temperature, and the outer panel temperature according to the pressure temperature comparison table. Note their trends. The evaporation pressure reading shall generally be within the range of 700~1300kpa, and the condensation pressure shall generally be within the range of 2000~3500kpa. The temperature difference shall generally be within the range of 1~3 °C.

Note: the condensation pressure and evaporation pressure will change with the change of the outer disk temperature and the inlet and outlet air temperature.

- ♥ Check the refrigerant filtration and drying equipment. If frost is found at the outlet of the filtration dryer, it indicates blockage. This phenomenon is usually accompanied by low evaporation pressure and an increase in the difference between evaporation temperature and inner disc temperature. Attention should be paid to timely replacement of the refrigerant filter dryer filter element.
- ♥ Check the oil level in the oil tank. Normal oil level in the compressor is generally located in the middle position of the sight glass. If a large oil level drop is detected, refrigerant oil shall be added without delay.
- ♥ Attach importance to any stop fault and analyze causes. Before notifying the customer service department of this company for treatment, making an analysis according to the fault help in this manual may help solve a problem.

9. 2. 2Periodic maintenance

Caution: To prevent personal injury and death due to contact with any moving parts or live parts, disconnect the main power supply and attach a visible sign of no switching on in the position of the switch before maintenance inspection!

Periodic maintenance includes weekly, monthly, quarterly, semiannual and annual maintenance. The

customer shall make and execute a scientific periodic maintenance plan by referring to the following contents. This plays a very important role in preventing the occurrence of any problem.

A. Weekly maintenance

- ♥ Check and analyze an operating parameter record.

B. Monthly maintenance

- ♥ Check and analyze an operating parameter record.
- ♥ Check whether the fastening bolts for power connection are loose.
- ♥ Check whether moving parts make a noise and normally operate.
- ♥ Check whether high and low pressure values of the refrigerating system are normal.
- ♥ Check whether the motor running current and chiller insulation resistance are normal.
- ♥ Check whether the drying and filtering device and the sigh glass are normal. If frosting occurs at the outlet of the filtering device, it indicates that the filtering device is dirty and blocked and the filter screen must be cleaned. If the sigh glass has a humidity indication (The color becomes red), the filter element must be replaced.
- ♥ Check whether compressor lubricating oil are normal. Do not replace and add refrigerant oil without permission if the oil level is too low. Contact the after-sales service department of this company immediately.

C. Caution: Confirm the refrigerant oil specification when adding or replacing lubricating oil. Replacing the existing lubricating oil with other unconfirmed types of refrigerant oil may lead to damage to the chiller!

- ♥ Clean the piping filter of the evaporator and condenser water system.
- ♥ During chiller operation at full load, check the temperature drop generated by refrigerant passing through the refrigerant filtering and drying device.

D. Semiannual maintenance

- ♥ Check and analyze an operating parameter record.
- ♥ Perform a physical and chemical analysis of refrigerant oil to judge the water content and acidity of refrigerant in the chiller.
- ♥ Check the fastening of all potentially loose electrical connectors in the control cabinet, startup cabinet and motor.

E. Annual maintenance

- ♥ Check and analyze an operating parameter record.
- ♥ Check the oil level. Perform a physical and chemical analysis of refrigerant oil. If oil is found

to have been emulsified, replace it with refrigerant oil of the same designation.

- ♥ If necessary, replace the refrigerant oil filter. This inspection shall be performed by maintainers.
Take apart the connecting pipe at the outlet of the safety valve at least once a year. Carefully check the valve body to observe whether there is any evidence of corrosion, rusting, scaling and leakage in it. If any corrosion or leakage is detected, replace the safety valve. This inspection shall be performed by maintainers.
- ♥ Test the insulation resistance between the windings of the compressor motor and the winding insulation resistance to earth. This inspection shall be performed by maintainers.

F. Triennial maintenance

- ♥ Above-mentioned contents of annual maintenance inspection.
- ♥ Contact a qualified maintenance organization (e.g. a local customer service department of this company) to perform full inspection on the chiller. Especially, check the compressor vibration to ensure that components in the compressor are in good condition. Perform airtight inspection on the chiller to check whether the heat exchange copper piping shows the evidence of leakage. If necessary, perform nondestructive examination on main welds of the pressure vessels (longitudinal and circumferential welds of the evaporator and condenser barrels) to ensure safe use. Check electrical operations and safety control to ensure that electrical components are in good condition.

Caution: It may be necessary to shorten this triennial maintenance inspection according to the application of the chiller, especially the application that may cause serious or generate safety problems due to chiller shutdown, e.g. the field of air conditioning for process flow.

9. 3Troubleshooting

Symptom	Symptom	Solution
1. High pressure alarm	Insufficient air volume of condensing fan	Check if the filter screen of the condenser is blocked and if the fan is running normally
2. Low pressure alarm	Insufficient evaporator liquid supply	Increase liquid supply (Contact the manufacturer)
	Insufficient air supply volume	Check if the air supply fan is operating properly, etc

	Insufficient refrigerant	Check the chiller for leakage, detect and eliminate any fault
	Too much oil in the system	Discharge an appropriate amount of refrigerant oil (Contact the manufacturer)
3. The chiller cannot be started up	Power failure	The chiller has no supply voltage or the fuse for the main circuit blows out
	Abnormal supply voltage	Check whether the three-phase supply conforms to the standard for this chiller
	Incorrect chiller settings	Check setting values and operating modes
4. Too high exhaust gas temperature	Too small opening of the expansion valve	Increase the opening of the expansion valve
	Too little refrigerant in the system	Add more refrigerant
	Insufficient liquid supply	Check whether the filter is normal and whether the solenoid valve is opened.
5. Too low exhaust gas temperature	Too dirty condenser (Too much fouling)	Clean the condenser
	Too large opening of the expansion valve	Appropriately decrease the opening of the expansion valve
	Too much refrigerant in the system leads to poor evaporation	Discharge an appropriate amount of refrigerant
	Poor evaporation	Check if the air volume of the supply fan is too low and if the air duct is too long, resulting in low air volume
6. Low temperature alarm	Blocked air supply filter screen	Check the temperature difference between the inlet and outlet of the air supply (standard is 10-15 degrees) to determine whether the air volume is normal and whether the air supply fan is operating properly
7. Compressor overcurrent alarm	Too dirty condenser (Too much fouling)	Clean the condenser
	Check whether the supply voltage is consistent with the requirements for the water chiller	Increase the power cord diameter and reduce the voltage drop
	Check whether the compressor itself fails	Repair the windings and clean the lubricating system to reduce friction energy loss (Contact the manufacturer)
8. Compressor oil level alarm		
	Chiller leakage	Identify a leakage point, perform treatment and replenish refrigerant oil (Contact the manufacturer)
	Too much liquid supply	Adjust chiller liquid supply to ensure the degree of suction gas superheat and unimpeded oil return

9. The compressor shows the evidence of frosting. Low operating pressure results in an alarm	Poor evaporation	Expansion valve blockage
	Supply fan system malfunction	Unreasonable installation of air ducts, system blockage, air ducts too long, etc

Screen Faults and Troubleshooting:

Faults	Resolutions	RMKS
1. No display	1) Check if the AC9.8V power supply from the transformer is normal.	
	2) Check plugs and connectors are firm.	
	3) Check if the connection is correct.	
	4) Check if burning odor or trace occurs.	
	5) Check if any water comes into the screen.	
	6) Check if the connection is loose.	
2. A few presses of the text screen button to respond	1) Check if your force and location of tapping are proper.	
	2) Enter the menu to calibrate the touch screen.	
3. Dark screen	1) Check if the AC9.8V power supply from the transformer is normal.	
	2) Enter the menu to adjust contrast.	
4. Halt without fault	1) Check if the voltage is within a reasonable fluctuation scope.	
	2) Check if keys are damaged or distorted.	
5. The compressor cannot load or unload	1) Check if the chiller pauses when the set temperature is reached.	
	2) Check if water outlet or water return control points are adopted.	
	3) Check if the compressor protection time delay is reached.	
	4) Check if the temperature sensor has no fault and the temperature value is displayed normally.	
6. Communication fault	1) Check if the power supply for the touch screen and the back board is normal and the power indicator is on.	
	2) Check if the back board address wire jumper is correct.	
	3) Check if the touch screen parameters are set correct.	
	4) Check if the communication cable is intact.	

	5) Check if the back board power supply fuse is burnt out.	
7. Many faults are reported but the screen can run after reset.	1) Check if the communication has good contact.	
	2) Check if the connection is normal.	
	3) Check if the communication cable is separated from the strong power.	
	4) Try to keep the communication cable far away from the strong power cable.	
	5) Use only the shielded communication cable.	
	6) The output power supply adopts filter, contactor coil and voltage dependent resistor.	
8. Input fault alarm	1) Check if the switch state of the chiller is consistent with the computer setup.	
	2) Check if the corresponding indicator light of the input point is on.	
	3) Reset fault.	
9. No output	1) Check if the chiller is activated.	
	2) Check if the screen has output.	
	3) Check if the output relay is connected (with multimeter)	
	4) Check if the back board fuse is burnt out.	
	5) Check the voltage of the output public end.	
10. Text flat screen	1) Check if damage occurs.	
	2) Power it on again.	
	3) Initialize parameters.	

+ . Product Instructions

1. Turn on the power before use to check whether the fan rotates normally, and carefully check whether the rotation direction of the fan impeller is correct. If the direction is opposite, the power supply should be stopped and the phase sequence should be aligned before the power supply is officially connected. The motor of the unit should be connected to the 380V/3PH/50Hz power supply of the starter and the overload protection and phase loss protection device, and the unit should be connected to the ground wire.

2 、 The unit must have reliable grounding measures, the machine base should be stable, and it will not affect the tightness of each connecting section.

3、 If the residual pressure of the unit required by the order is large, and the negative pressure in the unit is also large, the condensate drain pipe of the surface cooling section and the

humidification section drain pipe outlet should be provided with a water seal elbow and a certain slope, and the water seal height needs Greater than 150mm.

4、 The unit shall not start running without connecting the air pipe or the full open air valve, so as to avoid too much air volume and the fan motor will burn out due to overload operation. The unit must close all maintenance doors before operation

5、 On/off sequence:

a. The crew is in standby mode.

b. Open the air return valve (or brand new air valve) and the air outlet valve with an opening of 1/3. If the organic group has return air and new air valves, close the new air valve first, and then adjust the opening of the new air valve according to the use requirements after the standby group is stable, and control the proportion of new and return air volume.

c. Turn on the fan. After the fan is running, adjust the opening of the air return valve (or a new air valve) to make the air volume of the unit reach the required air volume. Then lock the air valve adjustment handle to make the air volume constant.

d. The compressor works only a few minutes after the fan is turned on; when shut down, the unit can be completely shut down in a few minutes.

e. The unit returns to standby.

十一. Product maintenance

1、 The unit should have designated personnel responsible for management and operation, formulate strict post responsibility system and operating procedures, and strengthen regular maintenance, maintenance and inspection.

2、 Regularly check the wiring of electrical equipment and devices, and no leakage shall occur.

3、 Regularly check the lubrication of the running parts of the fan, motor and air valve. The bearing should be injected with a proper amount of grease every quarter to ensure the flexibility of transmission and rotation.

4、 Regularly check whether the connecting sections of the unit are leaking, whether the sealing strips and sealants are aging or damaged, and whether the soft connectors of the fan are damaged, etc. If they are aging or damaged, they should be replaced in time.

5、 The motor and fan bearings must be cleaned every year and replaced if necessary.

Annex 1: Safe current carrying capacity for plastic insulated wire (in ampere)

Section (mm ²)	Open Wire Device		Steel Pipe Wiring						Plastic Pipe Wiring						Sheathed Wire				Flexible Wire	
			Two Pieces		Three Pieces		Four Pieces		Two Pieces		Three Pieces		Four Pieces		Two-core		Three and Four-core			
	Copp er	Alum inum	Copp er	Alum inum	Copp er	Alum inum	Copp er	Alum inum	Copp er	Alum inum	Copp er	Alum inum	Copp er	Alum inum	Co pp er	Alu min um	Cop per	Alumi num	Single Core	Twin- core
0.5															7				8	7
0.75																			13	10.5
0.8															11		9		14	11
1.0	17		12		11		10		10		10		9		13		9.6		17	13
1.5	21	16	17	13	15	11	14	10	14	11	13	10	11	9	17	13	10	8	21	17
2.0															19		13		25	18
2.5	28	22	23	17	21	16	19	13	21	16	18	14	17	12	23	17	17	14	29	21
4	37	28	30	23	27	21	24	19	27	21	24	19	22	17	30	23	23	19		
6	48	37	41	30	36	28	32	24	36	27	31	23	28	22	37	29	28	22		
10	65	51	56	42	49	38	43	33	49	36	42	33	38	29	57	44	45	35		
16	91	69	71	55	64	49	56	43	62	48	56	42	49	38						
25	120	91	93	70	82	61	74	57	82	63	74	56	65	50						
35	147	113	115	87	100	78	91	70	104	78	91	69	81	61						
50	187	143	143	108	127	96	113	87	130	99	114	88	102	78						
70	230	178	177	135	159	124	143	110	160	126	145	113	128	100						
95	282	216	216	165	195	148	173	132	199	151	178	137	160	121						
120	324	246	250	190	224	168	198	148	233	173	207	155	185	138						
150	371	281	285	216	259	194	229	173	263	198	237	179	216	160						
185	423	328	328	296	294	220	259	198	307	229	268	203	242	183						
240																				

300																				
40																				
500																				