

**Product installation, use and maintenance  
instructions**

Air cooling box type water chiller unit

**(3<sup>rd</sup> edition)**

# CATALOG

一、Transportation .....	2
二、Installation.....	2
三、Power connection .....	4
四、Operation and debugging .....	4
五、Operation flow.....	6
六、Common faults .....	15

## 一、 Transportation

1、 Our company unit was packing by wooden box when delivery, suggested that the condition is allowed to use the hoisting method, when using ground transportation, you can use forklift, if the unit was hoisted after removed the package, please must pay attention to contact in the box side plate by slings, avoiding large pressure by the box, and if necessary, using brace rod to support, then hoist.

2、 If the unit have rolling wheels, it can be moved in the plain ground, when moving, should keep the balance of unit.

3、 No matter which transportation methods, must be moved carefully, do not swing over, collide, avoiding damage of equipment, and staff danger, etc.

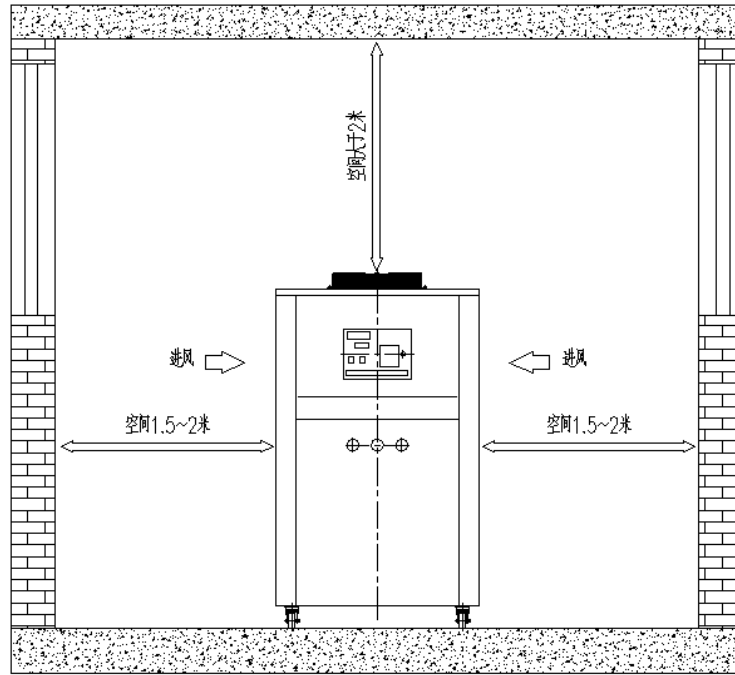
★After remove the package, do not use forklift to move it.

## 二、 Installation

### 1、 Installation location selection

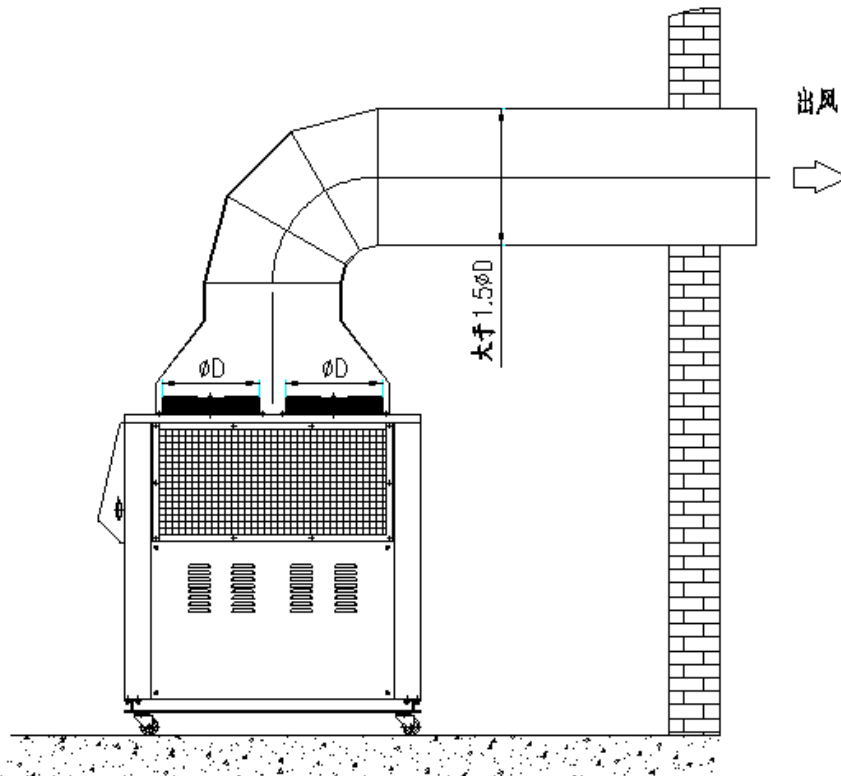
Box type water chiller unit should be fixed inside the rain proof shed or indoors with good ventilation condition. The space for the direction of the exhaust air must not be less than 2.0m, making the hot air discharged by the cooling fans when working distributed to outside, space of air inlet for condenser beside the unit should be 1.5~2 meter, ensuring the unit in normal working environment. The unit should be placed on a solid concrete foundation at the level not less than 20cm, add damping device for all above unit, tighten with anchor bolts. There must be some space for operation, check and maintenance surround the unit.

The environment temperature for box type water chiller unit should be  $-10^{\circ}\text{C} \sim 43^{\circ}\text{C}$ , relative humidity is not more than 80%.



## 2、Air duct

Regarding poor ventilation conditions room, it should be with air guide duct, lead the hot air to outdoors, the following figure is only for reference:



### 3、 Pipelines installation

The unit has passed the strict test before delivery, users only need to fit it to the location, finishing the refrigeration water circulation pipeline system and the power supply,so it can work.

★ The refrigeration water side system is installed with water flow switch, avoiding the unit accident caused by the refrigeration water side evaporator.

## 三、 Power connection

1、 The unit is equipped with temperature controller and low voltage electrical control box, the client just need connect it to the main power supply.

2、 If client want to add other controller(such as air switches), please follow the local relevant electrical regulations and standards, and equip with other control electrical equipment, ensuring the safety and stable operation.

3、 It is recommended that when selecting the wire diameter, please design it according to 1.25 to 1.3 times of the maximum continuous operating current of the unit and other auxiliary equipment(such as water pump) .

### 4、 Requirement for unit power distribution

Supply voltage: allowed inside  $\pm 5\%$ 。 Power frequency: allowed inside  $\pm 2\%$ 。 When the voltage fluctuation exceeds the specified range, must not open the unit, or deemed as improper operation, whose resulting damage is not in the scope of our company's maintenance.

5、 the controller of water flow switches, water pump motors,etc should be connecting with the unit, ensuring the unit and other auxiliary equipment can be in right position.

## 四、 Operation and debugging

### 1、 preparation before start.

A、 check if there is strange around the unit.

B、 check if the power supply connection of unit is good(whether the phase voltage is meet the unit voltage requirement).)

C、 check if chilled water valve is open, freezing water pump is in trouble after pressure test, contamination drain, air exhausting, test.

D、 check if the chiller tank is full of water, the water inlet is fitted, overflow interface is fitted to sewer.

## 2、 Operation of the water chiller system

A、 Frozen water should be with water quality treatment, as high alkalinity will aggravated corrode the copper pipes, reduce the life of heat exchanger, and make the water PH between 7.0 and 8.5.

B、 After finishing the installation of the unit and other auxiliary equipment, it should be taken of waterline cleaning, sewage discharge, pressure test and checking leak,air exhausting, frozen water system working, etc, when everything is okay, you can do adjustment, test and commissioning .

C、 After starting, observe the indexes of low and high pressure meters, to judge whether the unit is running normally, generally, when air cooling chiller is in normal running,high pressure is 14~22kg/cm<sup>2</sup>, low pressure is 2~6kg/cm<sup>2</sup>

a、 Set value of the unit every protection devices are set up well when in the factory, users please do not change it arbitrarily.

b、 When the unit is off because of malfunction alert, firstly press the stop button(the alarm light will go out), then check the cause of the fault, and do not start before failure recovery.

c、 Unless an emergency, shall not cut off the main power source to close the unit. If the unit stops to use in a long time in winter, please close the unit, then close the main power, and also discharge all the water in the system.

d、 please keep the room in clean and good ventilation, clean the condenser dirt in certain time, ensuring the unit in normal and stable operation.

## 3、 Unit maintenance

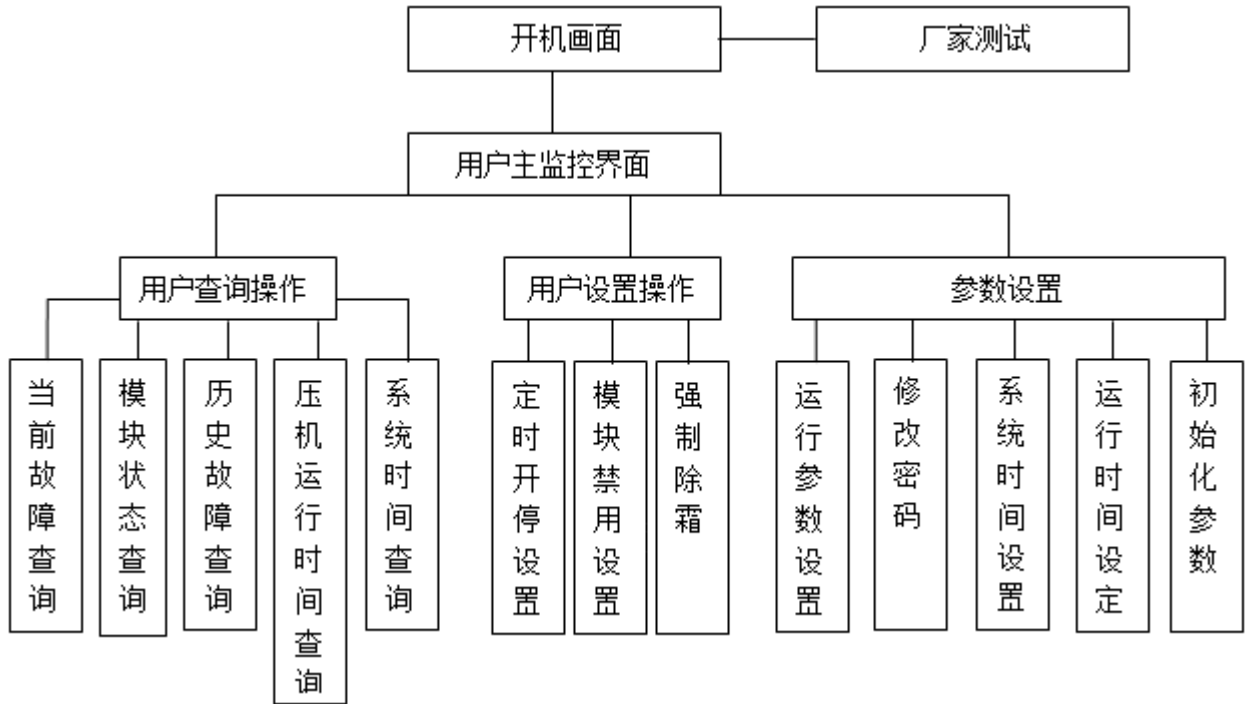
A、 Regarding the air cooling chiller unit, please keep cooling coil (condenser) surface clean, ensure surrounding air circulating, regularly clean the fouling on the coil, in order to keep good effect of heat transfer.

B、 After the unit using a time, the high and low pressure switches trip alarm or cooling capacity reduce, please arrange staff to clean the condenser.

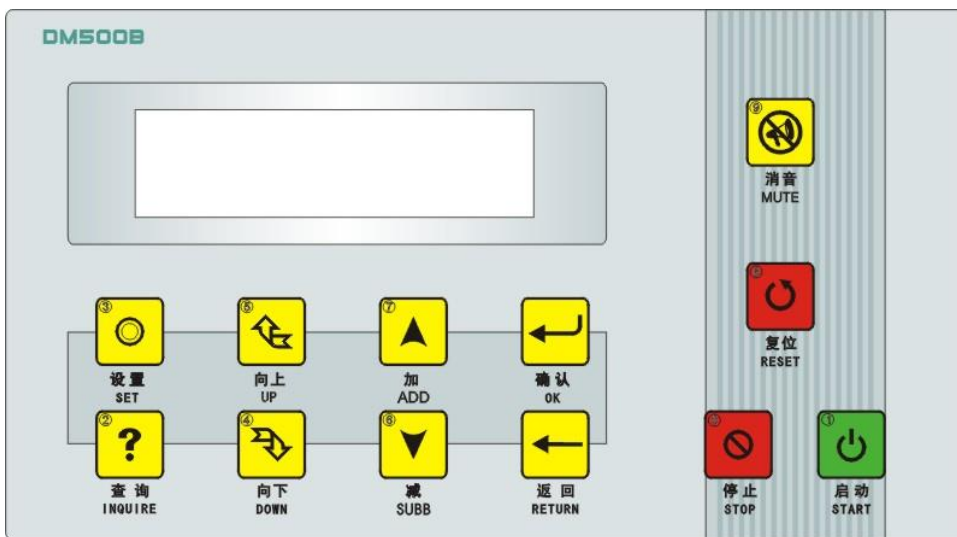
C、 If the unit stop using for some time, because of water pollution and sediment deposition, the water pump leaves maybe are solidified by waste, restart, please must loose the pump rotor, avoiding leaves not turn, and blow the fuse.

## 五、Operation flow

### 1、Controller operation framework



### 1.1 DM500B appearance diagram



### 1.2 Module board settings

(1) Model and module board: select to use different quantity of module boards according to setting modules.

The address is No. 1 board, is main communication board of all module boards.

(2) Address wire jumper: this controller can be used with 8 module boards, different module boards

use different address.

Before using, please check if wire jumper already connected according to following instruction.

(3) Main power

When giving power to module boards, please firstly confirm the power supply terminal and the service group corresponding to the electrical connection diagram.

LY509 connect to two groups of 9.8v power.

(4) Communication baud rate setting: Communication baud rate is 4800bps, JMP7and JMP8have wire jumpers。

2. Interface and operation instructions

Term formulated:

#a board: No. a board。

#a board press b: No. a board press No. b press.

#a press b: No. a board press No. b press.

2.1、User operation

(1)Boot display



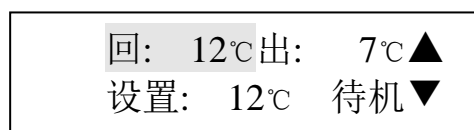
The first page shows:welcoming information, the lower right corner shows countdown.

The first line of second page shows model and mode, the left of second line shows program version number, right shows countdown.

If now press “start” and “confirm” at same time, then enter test program interface, type in password to “start”、“setting”、“↓”、“↑”、“search”、“stop” (press in orders) enter the test program interface.

(2)User main interface display

After countdown completed, enter user main interface,shows as follows:



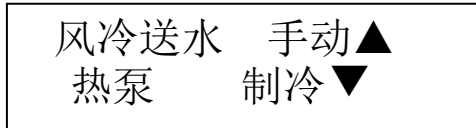
The main contents are as follows: : ▲is up to page, ▼is down to page。



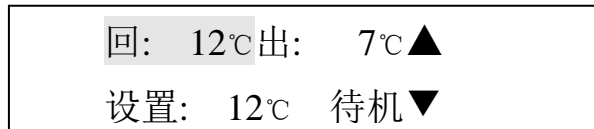
i)show welcome information or manufacturer information.



ii)Display models (air chilling cooling water etc)、mode (cold、heat pump、)、working mode (Refrigeration, heating,antifreeze,etc.) and start ways (manual、timing).



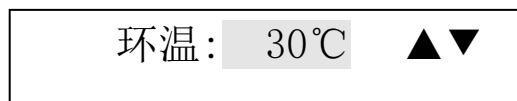
iii)main interface display: main temperature (output water temperature、return water temperature)、temperature setting and running state (Operation, delay, standby, and frost). Anti white shows the control temperature for energy adjustment like attached picture, return temperature as control temperature).



“return” means return water (air) temperature, “output” means output water (air) temperature.

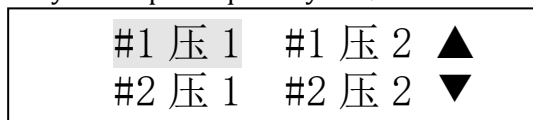
Each temperature can be measured and displayed in a range of: -20~120°C。Probe failure displays “。。。°C”。

iv)display environment temperature: Display system ambient temperature。Press return button back to main interface. Display interface will update time by time according to ambient temperature change.



v)shows all the compressors working status, display content pages will vary according to the number of different compressors,, anti white shows someone compressor, means this compressor is working.

When setting is No. 2 board, every board press quantity is 2, which shows as following:

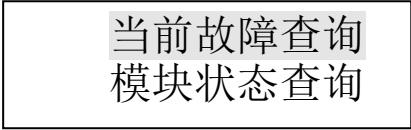


The screen display one of the pages,can via<←>and<→>buttons to query other content

iii)is the main display interface, when showing other pages contents,press<back>button can return to the main display interface.

(3)User query operation

press<query>button shows as following:



This system is designed for these user query contents as follows:

Current fault query

Module status query

Historical fault inquiry

Run time query

System time query

via<⬅>and<➡> buttons to select , press <okay>button enter each operating interface, now press<return> button exist user query interface back to main interface.

i)Current fault query

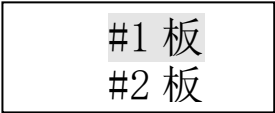
In query interface, via <⬅>and<➡> page up or down to select “current fault query” , press<okay>button to enter current fault query interf



The first line shows prompt information, the second line shows the contents of the fault, each time only shoes one fault. Now press<back> button to upper level interface(user query main interface).

ii)Module status query

In user query main interface, via<⬅>and <➡> button, select “Module status query” , press <okay>enter module status query, which shows as follows: (modules boards quantity showed is depending on the “machine parameter 1setting” setting of “Running parameter settings” in the parameter setting .



via<⬅>and<➡>select different board, press<okay> to query different status.

Select the first board

a: if this board is forbidden .



press <back> to return.

b: if this board is communication fault.

#1 板通讯故障

press <back> to return.

c: if this board is with no communication fault and not forbidden.

出 1 20°C 出 2 20°C  
翅 1 20°C 翅 2 20°C ▼

The displayed contents will be different according to different setting.

press <back> to return, via <C> and <D> to view the status of four way valve, electric heating and fan, like attached:

风机 1 风机 2 ▲  
四通阀 1 四通阀 2 ▼

If this equipment is running, then it is anti white display.

iii) Historical fault inquiry

In user query main interface, via <C> and <D> button, select “Historical fault inquiry” press <okay> enter historical fault inquiry interface:

This system can save max recent last 10 historical faults. Recent fault is in front. Now press <reset> for 3 seconds, clear the historical faults.

1: 水泵过载  
2: 水量不足

iv) Run time query

In user query main interface, via <C> and <D> button, select “Run time query”, press <okay> enter run time query interface:

#1 压 1: 0 时 0 分  
#2 压 2: 0 时 0 分

According to compressor quantity shows matched compressors' cumulative running time.

v) System time query

In user query main interface, via <C> and <D> button, select “System time query” press <okay> enter

System time query interface, which shows as following:

2016 年 03 月 05 日  
13 时 24 分 58 秒

Now the time showing is actual time, system setting start and stop time is depending on this.

press <back> to return.

(4)user setting

In user query main interface, press <setting> enter user setting interface, which shows as following:

设置回温: 12℃  
设置模式: 制冷

Total items below in setting interface:

Set back temperature: 12 °C ( when controlling object is output

temperature shows “setting output temperature: ” )





Setting mode: refrigeration

manual/timing: manual

Timing start and stop setting

Module disable settings

Forced removing cream when setting refrigeration, without this list

Each time only shows two of these items, via<  > and<  >query other contents. via<  >and<  >directly select any of the first four, then via<+>、<->correct the content, modify immediate entry into force. This modification retains memory after power down. If no action in this interface for 30 seconds, it will automatic go back to main interface. After modification,press <back>return main interface

i)timing start and stop setting

In user query main interface, press <setting> enter timing start and stop setting interface, press <okay>enter timing start and stop setting interface,which shows as following:

定时开 00 时 00 分  
定时关 01 时 01 分

When system time is same as timing start time, then perform timing start, When system time is same as

timing stop time, then perform timing stop. If want timing start and stop, must make “manual/timing” item be timing.

Via <C> and <D> to switch modifying item, then via<+>、<->modify the specific values. This modification retains memory after power down. After modification,press <back>return up level menu.

ii)module Forbidden setting

In user query main interface, via<C>and <D> button, select “module forbidden setting” press <okay>enter module forbidden setting interface, which shows as following:

定时开 00 时 00 分  
定时关 01 时 01 分

模块 1: 使用  
模块 2: 使用

Displayed content is determine according to“running parameter setting”->“machine parameter setting” total modules。When someone module is “stop” , Energy regulation does not work on the board, The corresponding fault is not detected, and without alarm.

Via <C>and<D>witch modifying item, then via<+>、<->modify it.。 This modification retains memory after power down. After modification,press <back>return up level menu.

**Note: module 1 property can not be changed,Always is use state**

iii)Forced removing cream

When the users choose heating, the Forced removing cream will come in the menu.

In user setting main interface, , via<C>and<D> select “ module Forbidden setting ” ,then press<okay>enter module Forbidden setting interface, showing as follows:

#1 压 1 强制除霜  
#2 压 1 强制除霜

Choose the compressor need remove cream, press okay, if this compressor is running, and displays as follows: (if select compressor #1press1) , dm500A will remove matched cream according to actual situation.

#1 压 1 除霜已接受  
按返回键返回

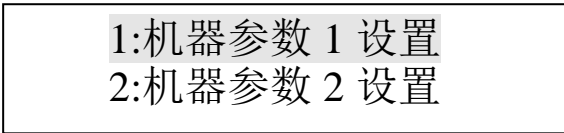
press <back> to return.

If the chosen compressor is not working, then it will keep the original status.

(5)parameter setting

i)running parameter setting

In parameter setting menu, via<⏪>and<⏩> select “running parameter setting” , press<okay> enter, showing as follows:



Parameter setting includes 10 majors, each major have many items, the content framework please see in particular 《each model parameter setting》 .

Machine parameter 1 setting (manufacturer password enter, can set with all the settings,maintenance person password enter,only can modify the “controlling object” and “Remote switch” items.)

Machine parameter 2 setting

Time 1 parameter setting

Time 2 parameter setting

Temperature 1 parameter setting

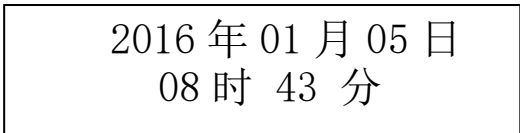
Temperature 2 parameter setting

Temperature 3 parameter setting

Switch setting

ii)system time setting

In parameter setting interface, via<⏪>and<⏩>select “system time setting” ,press<okay>enter system time setting interface, which shows as follows:



Now via<⏪>and<⏩> switch modified contents, after selecting modified content, via<+>、<-> modify the details time. When finished, press<back>return up level menu, at the meantime, system will automatic save the parameter.

iii)running time setting

via<⏪>and<⏩>select “running time setting” , press okay enter running time setting. Which shows as

follows:

1>催款功能: 取消  
2>催款时间设置

via<⏪>and<⏩> select the first item, directly via<+>、<-> modify it. If shows “cancel” means no use the reminder function,if shows “use” means use it.

via<⏪>and<⏩>select “2>reminder time setting” , press okay enter following interface, which shows as follows:

2099 年 01 月 01 日  
01 时 01 分

via<⏪> and<⏩> switch modified content, via<+>、<->modify the detailed values。 When system actual time is more than reminder time, also “reminder function” is “use” , then it shows as follows:

使用期限已到请  
与生产厂家联系

Now press <⏪> and <+> together, it will enter parameter setting interface. Operation is same as before.

iv)initialization parameter

via<⏪>and<⏩>select “initialization parameter” ,press<okay>to begin parameter initialization work. Manufacturer can initialize all the parameter by this function, including user setting, running parameter setting,,press cumulative running time, etc, excepting system time.

正在初始化.....  
5.初始化参数

After initialization completed, it shows:

初始化 SEEP 成功  
写入时钟成功

## 六、Common faults

### 1、Table of common fault analysis

faults	cause	methods
The unit can not start, or when start, stop immediately	Power off or low voltage Temperature controller is not set up properly, making contact often open No reset after overload protection	eliminate circuit faults, connecting power according to requirement Re adjust temperature controller setting Press reset button
When operation, High pressure is too high	Condenser tube fouling, heating transfer effect is poor. Too much refrigerant Expansion valve is opened too small	Clean condenser Discharge some refrigerant Properly adjust the open of expansion valve
When operation, low pressure is too low	Lack of refrigerant Filter clogging Expansion valve is opened too small	Leak detection, add refrigerant or adjust expansion valve Clean or replace the filter Properly adjust the open of
The return pipe and the compression shell are frosting	Expansion valve is opened too big Too much refrigerant Thermal load is too small	adjust expansion valve Discharge some refrigerant Increase thermal load
Freezing pump do not discharge water	Water pump reverse Impeller blockage	Correct pump motor turn Clean impeller



Water pump water flow is not enough	Impeller or water line blockage Impeller damage	Clean impeller or water pipeline Change impeller
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2、Unit controller fault code table

Fault code	Fault name	instruction
1	Fault phase protection	Please check three phase electrical input
2	1# compressor low or high pressure fault	Stop 1# compressor
3	1# compressor low or high pressure fault	
4	1# compressor overload	
5	2# compressor high pressure fault	Stop 2# compressor
6	2# compressor low pressure fault	
7	2# compressor overload	
8	Freezing water pressure too low	Freezing water pump water flow is not enough (stop the unit)
9	Freezing water pump overload	Freezing water pump overload too much (stop the unit)
10	Freezing water pressure too low/fan too hot	Freezing water pump water flow is not enough (stop all the compressor and cooling pump, not stop freezing pump)
11	Cooling fan overload	Cooling fan overload too much (stop all the

Box type water chiller system installation, use and maintenance instructions

		compressor and cooling pump, not stop freezing pump)
12	Output water temperature is too low	Protect the unit, when one or more of these faults happen, stop all the compressor and cooling pump, not stop freezing pump.
13	Output water probe open circuit	
14	Output water probe short circuit	
15	Anti freezing fault	