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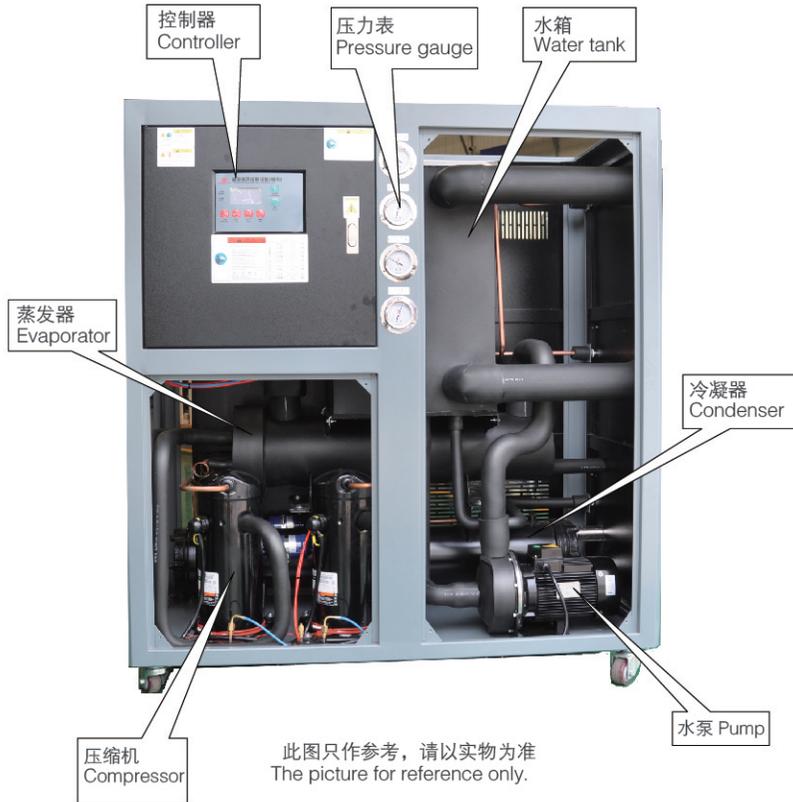
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水冷式冷水机使用手册 WATER-COOLED CHILLER MANUAL

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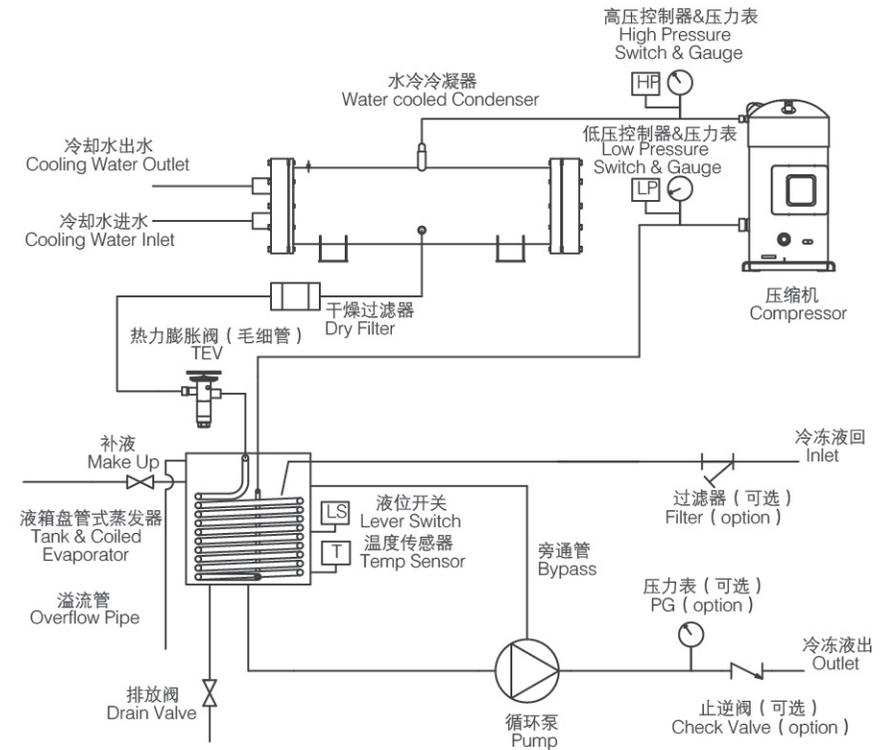
2 机器部分组件 Chapter two, Machine Parts Element



3 管路原理图 Chapter three, Pipeline Schematic Diagram

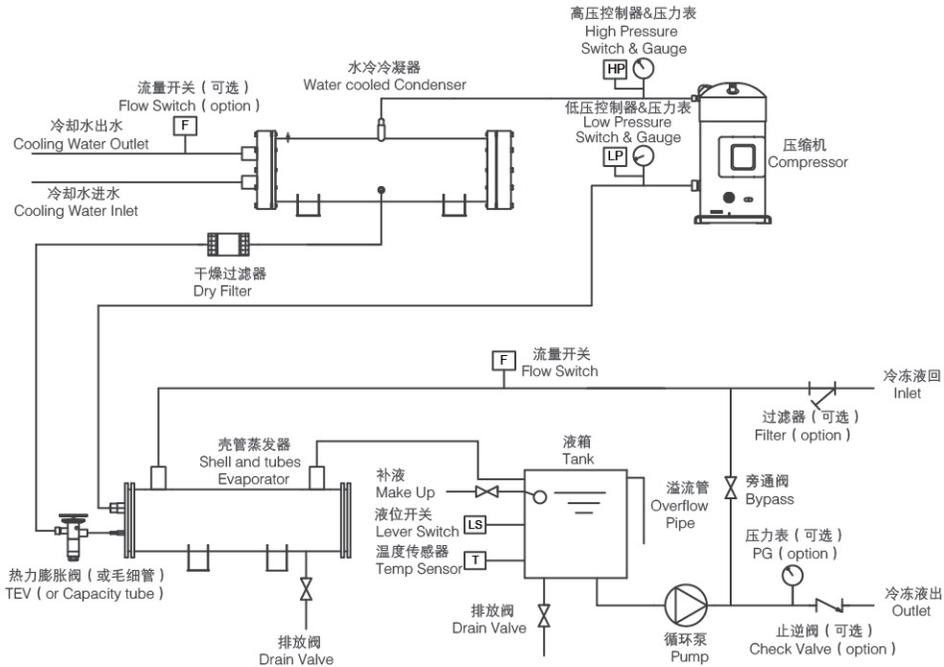
盘管蒸发器管路图(以单系统为例, 仅供参考):

Coiled Evaporator (with one freon system as an example):



壳管(板式)蒸发器管路图(以单系统为例, 仅供参考):

Shell and tubes(or Plate) Evaporator(with one freon system as an example):

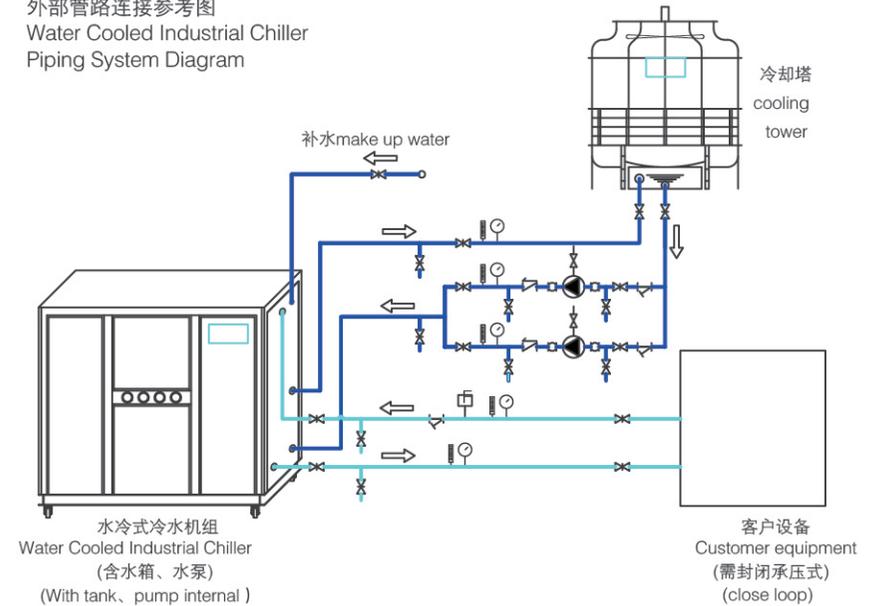


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机器安装 Chapter four, Installation Machine

4.1 安装示意图 Installation Diagram

水冷冷水机组
外部管路连接参考图
Water Cooled Industrial Chiller
Piping System Diagram



注意

- 在机组安装到位后, 才可连接电源线。
- Only after the chiller installation finished, it can be energized.
- 所有导线必须牢固连接。
- All wires must be connected securely.
- 所有导线不得与运动部件接触或产生干涉。
- All wires shall not contact or interfere with moving parts.
- 保证电源符合所用机组的要求, 按照铭牌所示。
- Make sure that the power supply is according to the nameplate.
- 电源线的地线必须与系统地线牢固连接, 确保人身安全。
- In order to make personal safety, the power ground wire must be connected to the system ground wire firmly.

4.2 安装注意事项 Installation Notes

- ◎ 水冷式冷水机安装前请选择地基平稳，四周空气畅通，无腐蚀性污染的场所，根据冷水机组制冷量选用匹配的冷却塔，冷水机管路配管，请根据机身管径尺寸进行选配安装，切勿将冷却水管管径尺寸缩小，否则会引起高压过载，影响制冷效果及增加耗电量。
- ◎ Please select a foundation smooth, airflow, non-corrosive pollution places for chiller installation. In order to achieve the best cooling effect, it is necessary to select a water tower according to the cooling capacity off chiller. Make sure that the pipeline size between the chiller and water tower is same as the inlet/outlet of condenser.
- ◎ 安装机器的环境温度最好在43℃以下，以确保机器发挥最大效能。电源、负载及接地部分请依照相关规定施工。
- ◎ In order to maximize effectiveness, it is better to Install the chiller in the location with environment temperature below 43℃. Power, load and grounding in accordance with the relevant provisions.

4.3 首次运转 First Running

- ◎ 电源电压及相数是否符合型号规格，请对照铭牌所示，注意：一般3HP及3HP以上冷水机，电源是采用三相，电压380/450V，50HZ电源，3HP以下的冷水机电源都采用单相220V，50HZ电源，具体情况请以铭牌上的为准，相位分别为R(黄)，S(绿)，T(红)，接地线为黄绿。
- ◎ Please check if the power supply is according to nameplate. Note: For the chiller with cooling capacity ≥ 3HP, the normal power supply is 3PH-380/450V-50HZ; For the chiller with cooling capacity < 3HP, the normal power supply is 1PH-220V-50HZ. For detail, please refer to nameplate, phase sequence, R(Yellow) S(Green) T(Red).
- ◎ 补给水入口是否已接通管路，各阀门要保持常开。
- ◎ Check if the water supply pipeline was connected, and the valve was open.
- ◎ 先将冷冻水箱加满水后方可启动水泵。
- ◎ Only after the chilled water tank filled with water, the pump can start running.
- ◎ 请留意水泵运转是否逆向，(参考机身上的方向)，如逆转须将电源相位线中任意两相互换。
- ◎ Please make sure the pump is not reversed (The direction refer to the motor shown). If pump reverses, please change any two power wire.



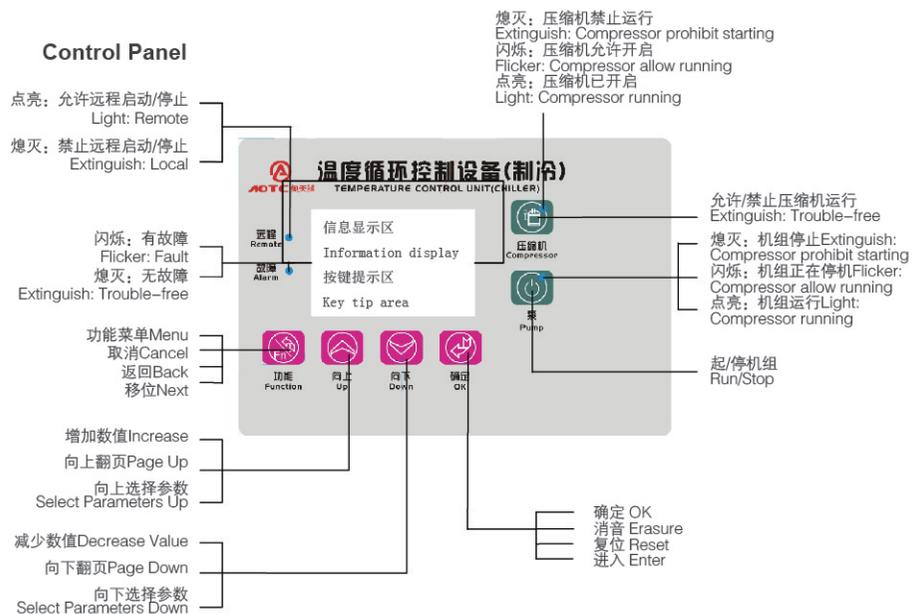
注意

1. 冷冻水泵不可在水箱内无水时运转；
The chilled water pump cannot running as water tank is empty;
2. 操作开关请尽量避免连续切换；
Please try not to switch the select switch continuously;
3. 水温达到设定温度时，压缩机会自动停止运行，此属正常现象；
The compressor will stop running as the temp. reach at the set value;
4. 温度调节开关应避免设定在5℃以下，防止蒸发器结冰。
Try not to set the temp. Below 5℃, in order to prevent evaporator freezing.

5

操作说明
Chapter five, Operating Instructions

5.1 面板示意图 Control Panel



5.2 首次上电 First Power-on

控制器首次上电需进行配置，具体操作请参考5.8.4配置向导。

The controller needs to be configured when powered on for the first time. Please refer to 5.8.4 Configuration Wizard for specific operation.

5.3 常用界面 Common Screens

常用界面包括主界面和报警界面。

Commonly used screens include the main screen and the alarm screen.

5.3.1 主界面 Main Screen

倒计时完毕后会进入主界面，主界面显示如下：

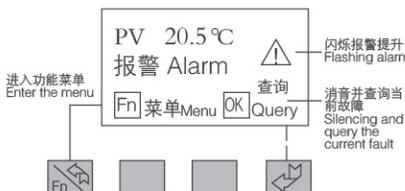
The system will enter the main screen after countdown, which displays as follows:



5.3.2 报警界面 Alarm Screen

当机组发生故障时，报警提示界面如下：

In case of unit failure, the alarm screen is as follows:



5.4 常用操作 Common Operation

5.4.1 快速修改设定温度 Quick Modification of Setting Temperature

如果用户参数【锁定温度】设置为“否”，主界面下可直接修改设定温度，操作如下：

If the user parameter [Locked T.set] is set to "No", the setting temperature can be modified directly in the main screen, with operation details as follows:



注：也可以在用户参数中修改设定温度。

Note: the setting temperature can also be modified in the user parameters.

5.4.2 查询/复位故障 Query/Reset Fault

发生故障时会自动弹出报警界面，故障查询及复位操作如下：



5.4.3 快速切换中英文显示 Cut over the Chinese-English quickly

在主界面下，同时按 + 3秒后切换显示语言。

Press at the same time + 3 seconds in the main screen cut over the Chinese-English quickly behind .

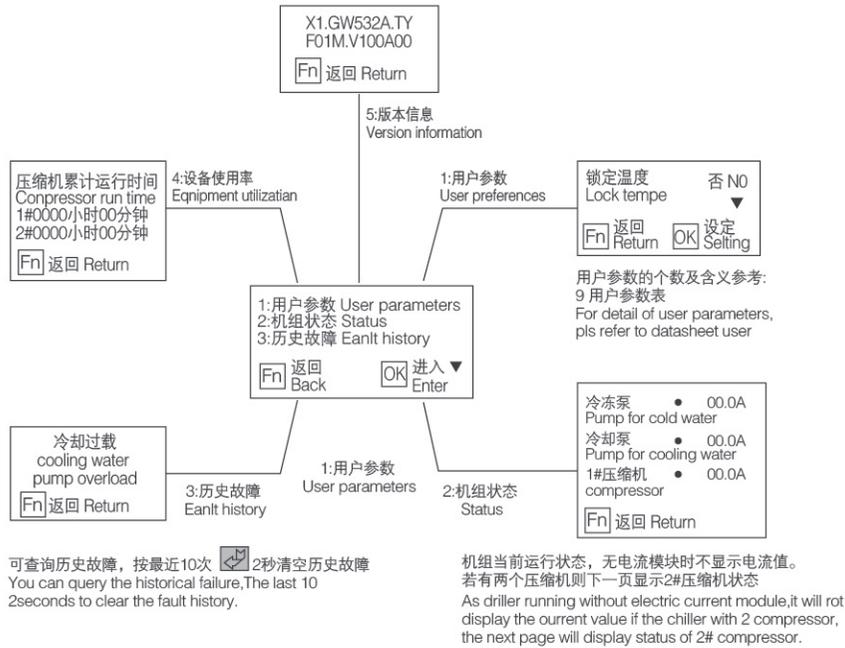
Note: The language establishes can also be modified in the user parameters.

5.5 功能菜单 Function Menu

在主界面下按 进入功能菜单，功能菜单5项内容，如下表：

Press the button on the main screen to enter the Function Menu, which includes five items as the table below:

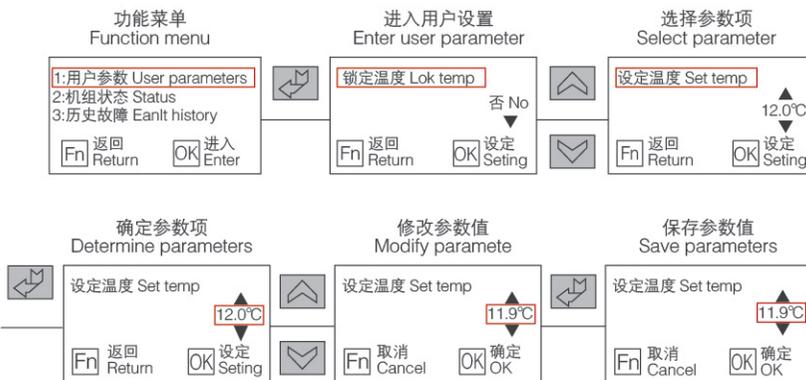
菜单项 Menu Item	功能 Function	备注 Remark
用户设置 User Settings	显示用户参数 To display user parameters	用户参数个数及含义参考:5.7用户参数表 For number of user parameters and their implications, please refer to: 5.7 User Parameters Table.
机组状态 Unit Status	显示机组当前运行状态 To display the current operating status of the unit .	不使用电流模块时不显示电流值 Current value is not displayed when current module is not used.
历史故障 History List	可查询最近10次发生过的故障 Allowing the query of the last 10 faults	按 2s清空历史故障。 Press for 2s to clear the fault history.
设备使用率 Comp Run Time	显示压缩机累计运行时间 To display the cumulative operation time of the compressor.	
版本信息 Version	查询当前使用的软件版本 To check the current software version	



5.6 参数操作 Parameter Operation

参数值的修改操作, 以用户操作修改设定温度为例进行说明。(【锁定温度】选择“否”)

For the modification operation of parameter value, the user's modification of setting temperature will be described as an example.



5.7 用户参数表 User Parameters Table

用户参数中各参数的含义如下表:

The implication of each parameter in the user parameters is listed in the following table:

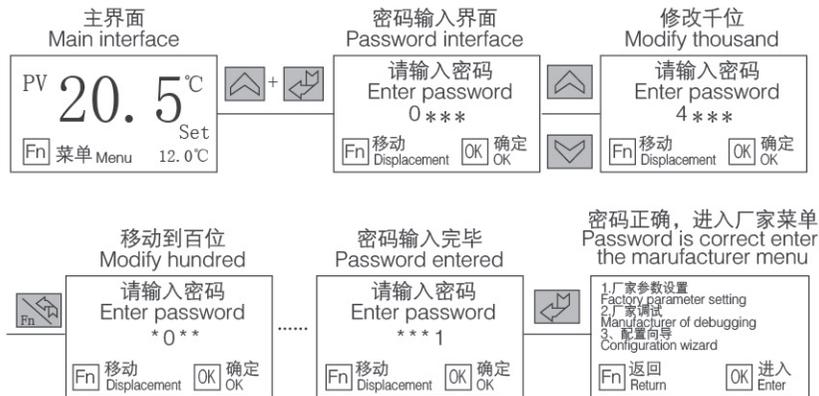
参数名称 Parameter	出厂值 Factory Default	设定范围 Setting Range	备注 Remark
锁定温度 Locked T.set	否 No	是~否 Yes ~ No	是: 锁定后不能在主界面修改设定温度。 Yes: the set temperature can not be modified on the main screen when locked. 否: 可以在主界面修改设定温度。 No: the set temperature can be modified on the main screen.
设定温度 T.setpoint	12.0°C	【设定温度下限】 [setting lower temperature limit]~【设定温度上 限】 [setting upper temperature limit]	设定范围受厂家参数【设定温度上限】、【设定温度下限】的限制。摄氏温度时显示。 Setting range is limited by the manufacturer parameters [setting upper temperature limit], [setting lower temperature limit].(When the [Temp unit] is set "Fahrenheit", the parameter is not displayed.)
设定温度 T.setpoint	53.6 °F	【设定温度下限】 [setting lower temperature limit]~【设定温度上 限】 [setting upper temperature limit]	设定范围受厂家参数【设定温度上限】、【设定温度下限】的限制。华氏温度时显示。 Setting range is limited by the manufacturer parameters [setting upper temperature limit], [setting lower temperature limit]. (When the [Temp unit] is set "Celsius", the parameter is not displayed.)
温度单位 Temp unit	摄氏温度 Celsius	摄氏温度 Celsius; 华氏温度 Fahrenheit	
调节对比度 Contrast	32	Celsius; 20~44	调节液晶对比度 Adjust the LCD contrast
启动方式 On/Off type	本地 Local	本地; 本地+远程; 远程Local; Local + Remote; Remote	本地: 仅可以本地启停机组。 Local: the unit can only start and stop locally. 本地+远程: 本地和远程都可以控制启停机组。 Local + Remote: the start and stop of the unit can be controlled both locally and remotely. 远程: 仅可以远程启停机组。 Remote: the unit can only start and stop remotely
关背光时间 Backlight On	0	0~255分钟 0~255 minute(s)	0: 不关背光; 0: backlight is not turned off.
多语言 Language	中文 Chinese	中文~English Chinese~English	选择显示语言 Select the display language.
压机使用选 Comp Select	2个压机 Two Comp	1#压机、2#压机、 2个压机 1#Comp/2#Comp /Two Comp	选择允许开启的压机。选择为其中一台压机时, 另一台压机不工作, 控制逻辑同单压机。单压机时该参数不显示。 Select the Comp to run. if select one comp the other does not work. The parameter is not listed for the single comp machine.

5.8 厂家菜单 Manufacturer Menu

在主界面下，按 + 进入输入密码界面，输入正确厂家密码(默认值4561，建议修改该值)，进入厂家功能菜单，厂家功能菜单包含5项内容。

Press + in the main screen to enter the Enter Password screen and enter the correct manufacturer password (default 4561, which is recommended to change). Then enter the Manufacturer Function Menu, which includes five items.

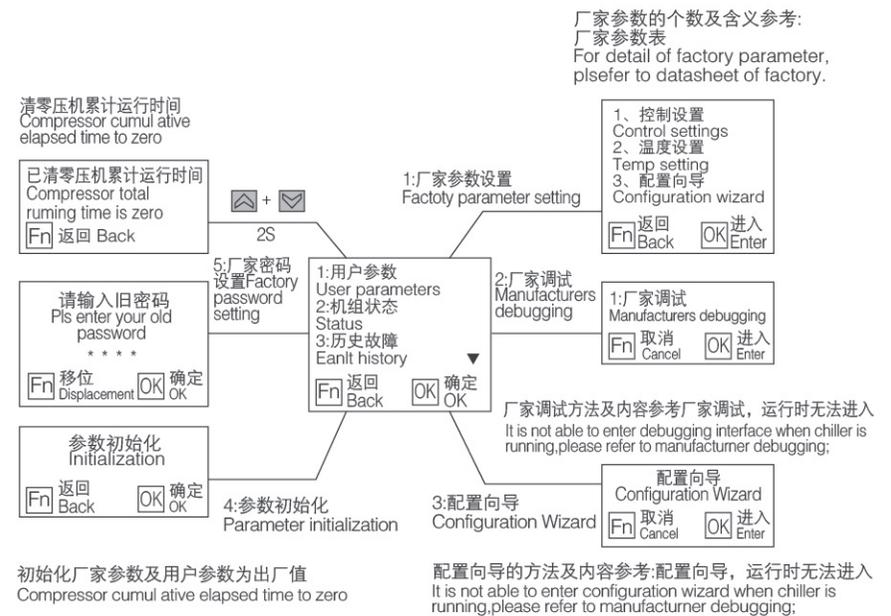
5.8.1 厂家菜单进入方法Procedures of Entering Manufacturer Menu



5.8.2 厂家菜单内容Details of Manufacturer Menu

厂家菜单的内容及功能如下表：
The details and function of manufacturer menu are shown in the following table:

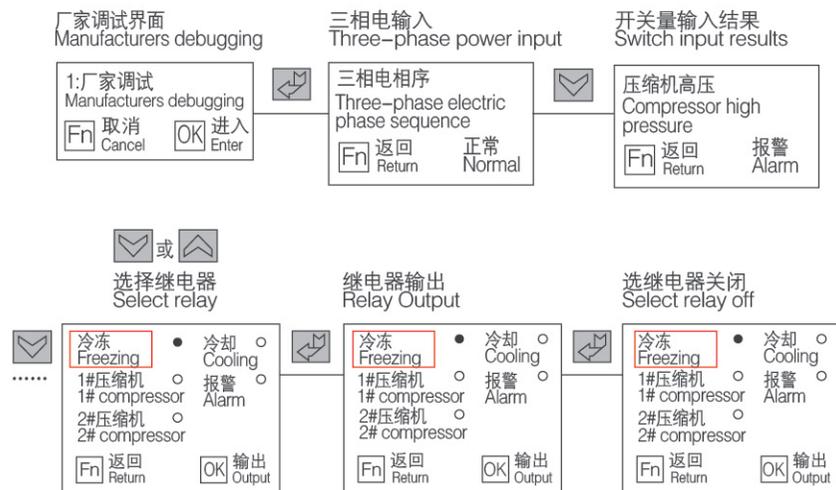
菜单项 Parameter Item	功能 Function	备注 Remarks
厂家参数设置 Manuf. setting	设置厂家参数 To set the parameters commonly used by the manufacturer	具体参数请参考5.11厂家参数表。 Refer to 5.11 Manufacturer Parameters for specific parameters.
厂家调试 Manuf. Debug	调试机组各电气部分动作是否正常 To debug the abnormal operation of each electrical part of the unit	机组运行时无法进入。 Not available during the unit operation.
配置向导 Config Wizard	配置机组常用参数。 Commonly used parameters of config the unit	机组运行时无法进入。 Not available during the unit operation. 首次上电会弹出该界面。 The screen will pop up when powered on for the first time.
参数初始化 Initialize	用户参数恢复出厂初始值 For initialize all parameters of the machine	参数初始值参考5.11厂家参数表。 Refer to 5.11 Manufacture Parameters for the initial values of the parameters.
厂家密码设置 Password Set	设置进入厂家菜单的密码 To set the password to enter manufacturer menu.	初始值4561，建议更改该值。 The default value is 4561, which is recommended to change.
清零压机累计运行时间 Reset press machine add up the total run time	按 + 2秒可清零压机累计运行时间 Press + 2 seconds can reset press machine add up the total run time.	



5.8.3 厂家调试Manufacturer Debugging

厂家调试主要用于测试机组各电气部分动作是否正常，机组运行时无法进入。方法通过测试三相电输入、7个报警输入(两个压缩机时为10个报警输入)和5个继电器输出来确定机组是否正常。对报警输入只显示检测结果，若正常，说明接线良好及参数设置正确。若报警，则闪烁显示报警字符，此时请确认外部接线是否良好及参数设置是否一致。

Manufacturer debugging is mainly used to test whether the operation of each electrical part of the unit is normal, which is not available when the unit is under operation. Method: to determine whether the unit is normal by testing three-phase power input, seven alarm inputs (10 alarm inputs for two compressors) and 5 relay outputs. For alarm input, it only displays the test result. If the result is normal the wiring is good and parameter settings are correct; if it alarms, with flashing display of alarm characters, then make sure whether the external wiring is good and the parameter settings are consistent.



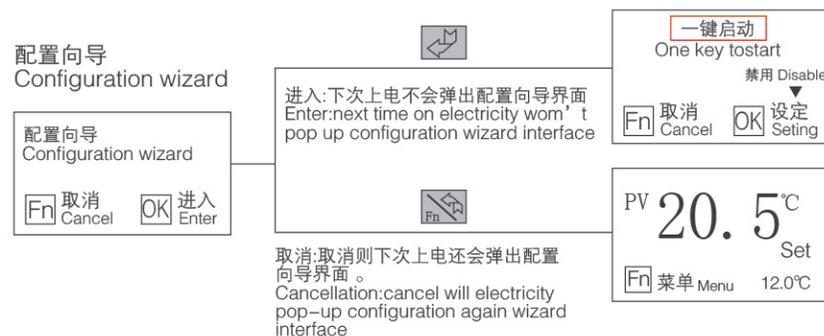
5.8.4 配置向导Configuration Wizard

对机器常用的参数进行配置。配置向导的参数个数及意义参考5.11厂家参数表。机组运行时无法进入，具体的配置方法参考参数操作。首次上电会弹出配置向导界面，此时点击“取消”，不进行配置，下次上电仍会弹出配置向导界面。一旦进入过配置向导，上电后就不会弹出配置向导界面，只能通过厂家菜单进入配置向导。

Configure the common parameters of the machine. For the number of parameters of configuration wizard and the significance, please refer to 5.11 Manufacturer Parameters Table. Access is not available during the unit operation. Refer to the Parameter Operation for specific

configuration method. The Configuration Wizard screen will pop up when powered on for the first time. And if you click “Cancel” operation without configuring at this point, the Configuration Wizard screen will still pop up when powered on next time. Once you have entered the Configuration Wizard, the Configuration Wizard screen will not pop up when powered on and you can only enter the Configuration Wizard through the Manufacturer Menu.

配置向导参数个数及意义 参考：厂家参数表
For detail, pls refer to configuration wizard



5.9 故障表 Fault List

故障名称 Fault	检测条件 Test Conditions	故障处理 Trouble shooting	解决方法 Solution
1#压缩机高压 1#Comp.P high	压机状态指示灯闪烁或点亮时检测 Test when the compressor button has pressed .	只停1#压缩机，不影响其他设备工作【备注1】 Stop compressor 1 only without affect other equipments to work. [Note1]	检查输入是否和开关量设置一致 Check if the input is consistent with the switch setting.
1#压缩机低压 1#Comp.P low	若【低压检测延时】为0，压机状态指示灯闪烁或点亮时检测； If the [LP check delay] is 0, test when the compressor button has pressed; 若【低压检测延时】不为0，1#压缩机运行检测 If the [LP check delay] is not 0, then compressor1 runs the test.		
1#压缩机过载 1#Comp overload	1#压缩机运行检测 Compressor1 runs the test.		检查输入是否和开关量设置一致 Check if the input is consistent with the switch setting.
1#压缩机电流过高 1#Comp.l high			检查压缩机额定电流设置是否合理 Check if the rated current of compressor1 is input is reasonable.

故障名称 Fault	检测条件 Test Conditions	故障处理 Trouble shooting	解决方法 Solution
1#压缩机电流过低 1#Comp.I low			检查压缩机电流接线是否正确，接口是否牢固 Check the compressor current wiring whether is correct, interface whether is strong .
1#排气温度过高 1#T.Vent high			检查输入是否和开关量设置一致 Check if the input is consistent with the switch setting.
2#压缩机高压 2#Comp.P high	压机状态指示灯闪烁或点亮时检测 Test when the compressor button has pressed .	只停2#压缩机，不影响其他设备工作【备注2】 Stop compressor2 only without affect other equipments to work. [Note2]	检查输入是否和开关量设置一致 Check if the input is consistent with the switch setting.
2#压缩机低压 2#Comp.P low	若【低压检测延时】为0，压机状态指示灯闪烁或点亮时检测；If the [LP check delay] is 0, test when the compressor button has pressed; 若【低压检测延时】不为0，2#压缩机运行检测 If the [LP check delay] is not 0, then compressor2 runs the test.		
2#压缩机过载 2#Comp overload	2#压缩机运行检测 Compressor2 runs the test.		检查输入是否和开关量设置一致 Check if the input is consistent with the switch setting.
2#压缩机电流过高 2#Comp.I high			检查压缩机额定电流设置是否合理 Check if the rated current of compressor1 is input is reasonable.
2#压缩机电流过低 2#Comp.I low			检查压缩机电流接线是否正确，接口是否牢固 Check the compressor current wiring whether is correct, interface whether is strong .
2#排气温度过高 2#T.Vent high			检查输入是否和开关量设置一致 Check if the input is consistent with the switch setting.
温度过低 Temp.low AL	运行检测 Operation detection	停压机、延时停冷却泵、冷冻泵不停 Stop the compressor and delay to stop the cool pump, and do not stop the cold pump.	出水温度低于设定的低温保护温度 Check if the Liquid temperature is lower than the set temperature of Liquid protection.
超温预警 T.high warn		只报警，不影响工作中的设备 Alarm only without affect other equipments to work.	出水温度高于设定的超温保护温度 Check if the Liquid temperature is higher than the set temperature of Liquid protection.

故障名称 Fault	检测条件 Test Conditions	故障处理 Trouble shooting	解决方法 Solution
超温停机 Temp.high AL		若【超温报警处理】设为“不停冷冻泵”停压机、延时停冷却泵、冷冻泵不停；If the [Temp. high AL] is set “Pump keep”，Stop the compressor and delay to stop the cool pump, and do not stop the cold pump;若【超温报警处理】设为“停冷冻泵”，停机组。If the [Temp. high AL] is set “Pump stop”，Stop the unit in case of fault.	出水温度高于超温预警温度 Check if the Liquid temperature is higher than the set temperature of Liquid warn.
防冻故障 Anti-freeze.AL	上电检测 Power on to test	停压机、延时停冷却泵、冷冻泵不停。Stop all the compressor and cool pump, and do not stop the cold pump.	检查防冻输入是否和开关量设置一致 Check if the antifreeze input is consistent with the switch setting.
温度探头断路 Probe break			检查温度探头是否接触良好 Check if the temperature probe is in proper contact.
温度探头短路 Probe short			
冷却过载【备注3】 Cool fan overload [Note3]	冷却泵启动后检测 Test after Cool pump starts	停压机和冷却泵、冷冻泵不停 Stop compressor1 and cool pump or fan only	检查冷却过载输入是否和开关量设置一致 Check if the fan1 overload input is consistent with the switch setting.
冷却电路过高 Cool.I high			检查冷却泵额定电流设置是否合理 Check if the rated current of cool is input is reasonable.
冷却电流过低 Cool.I low			检查冷却泵电流接线是否正确，接口是否牢固 Check the cool pump current wiring whether is correct, interface whether is strong .
冷却水流故障 Cool W.flow AL	冷却泵启动【冷却启动延时】时间后检测 Test after the cool pump starts for [Cool on delay] time		检查冷却水流输入是否和开关量设置一致 Check if the cool water flow input is consistent with the switch setting.
冷冻水流故障 Cold W.flow AL	冷冻泵启动【冷冻启动延时】时间后检测 Test after the cold pump starts for [Pump on delay] time.	若【水流不足处理】设为“停水泵”，发生故障时停机组；If the [Lack of liquid] is set “Pump keep”，Stop compressor and cool pump in case of fault. 若【水流不足处理】设为“不停水泵”，发生故障时停压机和冷却泵，冷冻泵不停。If the [Lack of liquid] is set “Pump stop”，Stop the unit in case of fault.	检查水流输入是否和开关量设置一致 Check if the cold water flow input is consistent with the switch setting.

故障名称 Fault	检测条件 Test Conditions	故障处理 Trouble shooting	解决方法 Solution
冷冻过载【备注3】 Cold pump overload [Note3]	冷冻泵启动后检测 Test after cold pump starts	停机组 Stop the machine unit	检查冷冻过载输入是否和开关量设置一致 Check if the cold pump overload input is consistent with the switch setting.
冷冻电流过高 Pump.I high	检查冷冻泵额定电流设置是否合理 Check if the rated current of cold is input is reasonable.		
冷冻电流过低 Pump.I low	检查冷冻泵电流接线是否正确，接口是否牢固。 Check the cold pump current wiring whether is correct, interface whether is strong.		
三相电源故障 Phase AL	上电检测 Power on to test	停机组 Stop the machine unit	检查三相电输入是否缺相或逆相；开关量是否正确 Check if there is default phase or anti-phase in the three-phase power input and if the switch is correct.
水位故障 Water level AL	上电检测 Power on to test	若【水位低处理】设为“停水泵”，发生故障时停机组； If the [Low liquid lv] is set "Pump keep", Stop compressor and cool pump in case of fault. 若【水位低处理】设为“不停水泵”，发生故障时停压机和冷却泵，冷冻泵不停。 If the [Low liquid lv] is set "Pump stop", Stop the unit in case of fault.	检查水位输入是否和开关量设置一致 Check if the water level input is consistent with the switch setting.
机组需维护 Need Maintain	运行检测 Test after cold pump starts	机组一旦停机则不能开启（压机累计运行时间超过设定值） The unit cannot start once stops (the accumulative operation time of compressor exceeds the set value).	

【备注1】：若【低压停泵延时】不为0，出现“1#压缩机低压”故障，则故障处理方案为：立即停所有压缩机和冷却泵，延时【低压停泵延时】时间停冷冻泵。若【低压停泵延时】为0，则故障处理方案为：只停1#压缩机，不影响其他设备工作。

[Note 1]: In case of "1#Comp.P low" fault, if [LP stop pump] is not zero, the troubleshooting program is: to immediately stop all compressors and cool pump, delay the [LP stop pump] and stop the cold pump. If [LP stop pump] is zero, then the troubleshooting program is: to only stop compressor1 without affect other equipments to work.

【备注2】：出现“2#压缩机低压”故障，故障处理类似“1#压缩机低压”故障处理，即与【低压停泵延时】参数有关。

[Note 2]: In case of "2#Comp.P low" fault, if [LP stop pump] is not zero, the troubleshooting program is: to immediately stop all compressors and cool pump, delay the [LP stop pump] and stop the cold pump. If [LP stop pump] is zero, then the troubleshooting program is: to only stop compressor2 without affect other equipments to work.

【备注3】：冷却过载故障信息显示如下表：

机型	冷冻过载显示信息	冷却过载显示信息
风冷冷水	冷冻泵过载	冷却风机过载
水冷冷水	冷冻泵过载	冷却泵过载
风冷风	冷冻风机过载	冷却风机过载
水冷风	冷冻风机过载	冷却泵过载

[Note 3]:

Machine type	Cold Overld Information	Cooling Overld Information
air-cooled water chiller	Cold Pump Overld	Cooling Fan Overld
water-cooled waterchiller	Cold Pump Overld	Cooling Pump Overld
air-cooled aircooler	Cold Fan Overld	Cooling Fan Overld
water-cooled air cooler	Cold Fan Overld	Cooling Pump Overld

5.10 控制逻辑 Control Logic

双压机但只选择一台压机/单压机：升温过程，当 $PV \geq SV + ADD$ 时启动压缩机。

降温过程，当 $PV < SV - SUB$ 时停止压缩机。

Double compressor but select only one / Single compressor:

The heating process, the compressor ON when $PV \geq SV + ADD$.

The cooling process, the compressor OFF when $PV < SV - SUB$.

双压机：Double compressors:

若【卸载偏差】不为0

升温过程，当 $PV > SV$ 启动一台压机， $PV \geq SV + ADD$ 时启动两台压缩机。

降温过程，若当前开启的压机为两台，当 $PV < SV$ 停止一台压机， $PV < SV - SUB$ 时停止两台压缩机。

若当前开启的压机为一台， $PV < SV - SUB$ 时停压缩机。

If [Unload offset] is not 0

The heating process, one compressor ON when $PV > SV$ and two compressors ON when $PV \geq SV + ADD$.

The cooling process, if two compressors ON currently, one compressor OFF when $PV < SV$ and two compressors OFF when $PV < SV - SUB$. If compressor ON currently, the compressor OFF when $PV < SV - SUB$.

若【卸载偏差】为0

升温过程， $PV \geq SV + ADD$ 时启动一台压缩机，一个【能量调节周期】时间后，若仍满足 $PV \geq SV + ADD$

时启动两台压机。

降温过程， $PV < SV$ 停压缩机。

If [Unload offset] is 0

The heating process, one compressor ON when $PV \geq SV + ADD$; after the time of [Capacity ctrl], if $PV \geq SV + ADD$ remains, two compressors ON.

The cooling process, the compressor OFF when $PV < SV$.

说明 PV: 出水温度 SV: 设定温度 ADD: 加载温差 SUB: 卸载温差

Note: PV: The liquid temperature SV: set temperature

ADD: load temperature difference SUB: unload temperature difference

5.11 厂家参数表 Manufacturer Parameters Table

厂家设置的参数及参数含义如下表: (带“*”项为配置向导参数标志)

Parameters set by the manufacturer and parameter meanings are listed as follows: (“*” is for parameters of the configuration wizard)

控制设置 Control Setting

参数名称 Name of Parameter	出厂值 Factory Default	设定范围 Setting Range	备注 Remark
*一键启动 *One-Key start	禁用 Forbid	禁用~使用 Forbid ~ Use	禁用: 按压缩机按键后压缩机才允许启动使用; Forbid: the compressor is allowed to ON only when press the compressor button; 使用: 按泵按键后压缩机自动允许运行 Used: the compressor allows ON when press the pump button.
来电自启动 Auto start up	禁用 Forbid	禁用~使用 Forbid ~ Use	使用: 上电自动启动机组; 禁用: 上电不自启动机组 Use: the unit starts automatically when powered on; Forbid: the unit doesn't start automatically when powered on; 用户参数【启动方式】设为“远程”时, 来电自启动无效。 When the user parameter [On/Off type] is set to be "Remote", the electrical autostart is invalid.
报警输出方式 Alarm output	消音保持输出 Keep when mute	消音保持输出~ 消音停止 Mute~ Stop when mute	消音保持输出: 一旦有故障就按“报警输出类型”参数动作; 当消音: press the "alarm output" parameter to take action once a fault occurs; 消音停止输出: 消音后接无故障时“报警输出类型”参数动作 Keep Stop when mute: press the "alarm output" parameter to take action in case of no fault after silencing.
报警输出类型 Alarm type	常开 N.O	常闭~常开 N.O~N.C	常开: 故障时继电器闭合; 常闭: 故障时继电器断开 N.O: the alarm relay is ON in case of faults; N.C: the alarm relay is OFF in case of faults.
DI5输入选择 DI5 fuction	水位检测 Water switch	水位检测; 1# 排气温度 Water switch; Vent1 temp	水位检测: DI5输入用于水位检测 1#排气温度; DI5输入用于 1#排气温度检测 Water switch: DI5 input for water level detection Vent1 temp: DI5 input for Vent1 temperature detection
DI9输入选择 DI9 fuction	相序检测 Phase switch	相序检测; 2# 排气温度; 冷 却水流检测 Phase switch ; Vent2 temp; Cool W.flow	相序检测: DI9输入用于相序检测 2#排气温度; DI9输入用于 2#排气温度检测 冷却水流检测: DI9输入用于冷却水流检测 Phase switch : DI9 input for phase sequence detection Vent2 temp: DI9 input for Vent2 temperature detection Cool W.flow: DI9 input for cool water flow detection

参数名称 Name of Parameter	出厂值 Factory Default	设定范围 Setting Range	备注 Remark
*水位低处理 *Low water lv.	停水泵 Pump stop	停水泵~ 不停水泵 Pump stop ~ Pump keep	停水泵: 发生水位低故障时停冷冻水泵; Pump stop: stop the cold pump in case of low water level fault; 不停水泵: 发生水位低故障时不停冷冻水泵 Pump keep: do not stop the cold pump in case of low water level fault.
水流不足处理 Lack of water	停水泵 Pump stop	停水泵~ 不停水泵 Pump stop ~ Pump keep	停水泵: 发生流量不足故障时停冷冻水泵; Pump stop: stop the cold pump in case of cold water flow fault; 不停水泵: 发生流量不足故障时不停冷冻水泵 Pump keep: do not stop the cold pump in case of cold water flow fault.
电流检测 Current detect	使用 Use	禁用~使用 Forbid ~ Use	使用: 有电流检测模块; 禁用: 没有电流检测模块 Use: there is a current detection module; Forbid: no current detection module
1#压机额定电压 1#Comp.l rating	0.3A	0~35.0A	0A: 不检测该电流故障。【电流检测】设为禁用时, 不显示该参数 注: 若压机或泵工作时电流 < 1.0A, 建议绕线 2~3 圈使用互感器, 以绕线后额定电流参数值应设为实际值的 n 倍, 详见附录。 0A: do not detect the current fault. When [Current detect] is set "Forbid", those parameter is not displayed. (if the rating current of Comp or Pump is lower 1A, when using please winding two or three laps on the sensor)
2#压机额定电流 *2#Comp.l rating	0.3A	0~35.0A	
冷冻额定电流 *Pump. l rating	0.3A	0~35.0A	
冷却额定电流 *Cool. l rating	0.3A	0~35.0A	
*三相电检测 *Phase monitor	板载 On_board	板载~禁用~ 开关量输入 On_board; Forbid; IO_input	板载: 使用控制器自带三相电保护; 开关量输入: 使用外部三相电保护。(【DI9输入选择】设为“相序检测”时, 才能使用外部三相电保护) 禁用: 不使用三相电检测功能。 Onboard: use the controller's own three-phase power protection; Switch input: use an external three-phase power protection. (The external three-phase power protection can only be used when [DI9 fuction] is set "Phase switch"). Forbid: do not use three-phase power detection function.
防冻/冷却过载 DI1 input opt	冷却过载 Cool overload	冷却过载~防冻 Cool overload; Anti-freezing	开关量 DI1 输入功能选择 Selection of switch DI1 input function
*压缩机个数 *Comp number	2	1~2	压缩机个数选择 Selection of the number of compressor
*机型选择 *Machine type	风冷冷水 AIR-WATER	共4种机型 A total of four types	4种机型: 风冷冷水、水冷冷水、风冷冷风、水冷冷风 Four models: fan-cooled water chiller, water-cooled water chiller, fan-cooled fan cooler and water-cooled fan cooler
*用户切换语言 *Lang switch	使用 Use	禁用~使用 Forbid ~ Use	使用: 用户菜单有【多语言】参数, 允许用户切换中英文显示。 Use: Allows users to switch between English and Chinese. 禁用: 用户菜单无【多语言】参数, 用户不能切换中英文显示。 Forbid: Forbid users to switch between English and Chinese.
超温报警处理 Temp.high AL	不停冷冻泵 Pump keep	停冷冻泵~不 停冷冻泵 Pump stop ~ Pump keep	停冷冻泵: 发生超温停机故障时停冷冻水泵; Pump stop: stop the cold pump in case of Temp. high fault; 不停冷冻泵: 发生超温停机故障时不停冷冻水泵 Pump keep: do not stop the cold pump in case of Temp. high fault.

温度设置 Temperature Settings

参数名称 Name of Parameter	出厂值 Factory Default	设定范围 Setting Range	备注 Remark
加载偏差 Load offset	1.0°C	0~10.0°C	开压机温度偏差 Temperature deviation of load the compressor
加载偏差 Load offset	1.8°F	0~18.0°F	华氏温度°F Fahrenheit °F
卸载偏差 Unload offset	1.0°C	0~10.0°C	关压机温度偏差 华氏温度°F Temperature deviation of unload the compressor
卸载偏差 Unload offset	1.8°F	0~18.0°F	Fahrenheit °F
设定温度上限 T.setpoint max	30.0°C	-38.0~99.9°C	用户设定温度的范围限制 To limit the temperature of user set.
设定温度上限 T.setpoint max	86.0°F	-36.4~211.8°F	华氏温度°F Fahrenheit °F
设定温度下限 T.setpoint min	5.0°C	-38.0~99.9°C	用户设定温度的范围限制 To limit the temperature of user set.
设定温度下限 T.setpoint min	41.0°F	-36.4~211.8°F	华氏温度°F Fahrenheit °F
温度补偿 T.bias	0.0°C	-9.9~9.9°C	对出水温度进行补偿 Compensation for the liquid temperature
温度补偿 T.bias	0.0°F	-17.8~17.8	华氏温度°F Fahrenheit °F
低温保护 T.low protect	4.0°C	-40.0~99.9°C	出水温度小于该设定值则报温度过低故障 Fault of "Temp.low AL" warning is reported when the liquid temperature is lower than the set value.
低温保护 T.low protect	39.2°F	-40.0~211.8°F	华氏温度°F Fahrenheit °F
超温预警 T.high warn	50.0°C	0~99.9°C	出水温度高于该设定值则报超温预警故障，不停机，可自动复位Fault of "Temp.high warn" warning is reported when the liquid temperature is higher than the set value.
超温预警 T.high warn	122.0°F	32.0~211.8°F	华氏温度°F Fahrenheit °F
超温报警 T.high alarm	60.0°C	0~99.9°C	出水温度高于该设定值则报超温停机故障，停压机，延时停冷却泵.Fault of "Temp.high AL" warning is reported when the liquid temperature is higher than the set value. And Stop the compressor and delay to stop the cool pump.
超温报警 T.high alarm	140.0°F	32.0~211.8°F	华氏温度°F Fahrenheit °F
超温回差 T.high reset	5.0°C	0~99.9°C	出水温度<【超温报警】-【超温回差】时，允许手动复位超温停机故障；If liquid temperature< [T.high alarm] - [T.high reset], manual reset of "Temp.high AL" fault is allowed;出水温度<【超温报警】-【超温回差】时，自动复位超温预警故障。If liquid temperature<[T.high warn] - [T.high rese], the "Temp.high warn" fault is automatically reset.
超温回差 T.high reset	9.0°F	0~179.8°F	华氏温度°F Fahrenheit °F

时间设置Time Settings

参数名称 Name of Parameter	出厂值 Factory Default	设定范围 Setting Range	备注 Remark
冷冻启动延时 Pump on delay	10秒 10 S	1~255秒 1~255 S	冷冻水泵启动后延时 Delay after cold pump startup
冷却启动延时 Cool on delay	10秒 10 S	1~255秒 1~255 S	冷却水泵启动后延时 Delay after cool pump startup.
能量调节周期 Capacity ctrl.	5秒 5 S	0~255秒 0~255 S	间隔【能量调节周期】时间控制一次压机的启动/停止；若为双压机控制，满足开两台压机时，先开其中一台压机，间隔【能量调节周期】时间，再开另一台。Control the compressor ON/OFF every [Capacity ctrl.] interval time;For double-compressor control, if the conditions of two compressors ON are satisfied, then one of the compressors ON and the other after the time of [Capacity ctrl.].
压缩机保护 Comp protect	60秒 60 S	0~255秒 0~255 S	压机防频繁启动延时，压机两次启动间隔时间需大于该设定值.To avoid frequent ON/OFF the compressor, the interval between the start of two compressors must be greater than the set value.
一般故障消抖 Input stable	2秒 2 S	0~255秒 0~255 S	一般故障消抖 The time General fault stable.
水流不足消抖 W.flow stab.	5秒 5 S	0~255秒 0~255 S	冷却水流故障、冷冻水流故障持续该时间才认为有效 It is considered to be valid only when the water flow alarm continue for the time.
低压检测延时 LP detect dly	60秒 60 S	0~255秒 0~255 S	压机运行该设定时间后才允许检测压机低压故障输入Compressor low-pressure fault input is allowed only when the compressor has run for the set time.
低压消抖 LP stable	5秒 5 S	0~255秒 0~255 S	低压故障消抖时间 Low-pressure fault stable time
低压停泵延时 LP stop pump	0秒 0 S	0~300秒 0~300 S	0: 该参数无作用。非0: 当出现 压缩机低压故障时，立即停压缩机和冷却泵，延时【低压停泵延时】时间停冷冻泵。0: the parameter has no effect .Non-0: in case of low pressure fault of the compressor, immediately stop all compressors and cool pump, delay the [LP stop pump] and stop the cold pump.
压缩机使用时 Comp operation	0小时 0 H	0~9999小时 0~9999 H	0: 该参数无作用 非0: 当压机累计运行时间大于该设定值机组将无法开启 0: this parameter has no effect.Non-0: the compressor cannot start when the accumulative operation time is greater than the set value.
压缩机切换时间 Comp shift	0小时 0 H	0~255小时 0~255 H	0: 该参数无作用；非0: 当一个压缩机连续运行该时间后会自动切换到另一个压缩机 0: the parameter has no effect ;Non-0: a compressor will automatically switch to another after it has run continuously for that time
1#压机启动时 1#Comp.l avoid	2秒 2 S	1~255秒 1~255 S	1#压机启动该设定时间后才允许检测1#压机电流故障(【电流检测】设为禁用时，不显示该参数) The current fault of 1#compressor can only be detected after 1# compressor has started for the set time.(When the [Current detect] is set "forbid", the parameter is not displayed.)

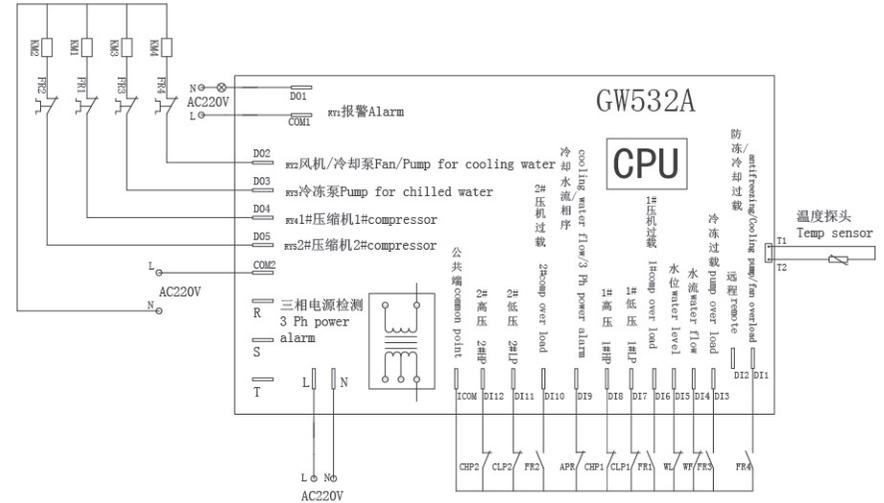
参数名称 Name of Parameter	出厂值 Factory Default	设定范围 Setting Range	备注 Remark
2#压机启动时 2#Comp.1 avoid	2秒 2 S	1~255秒 1~255 S	2#压机启动该设定时间后才允许检测2#压机电流故障(【电流检测】设为禁用时,不显示该参数) The current fault of 2#compressor can only be detected after 2# compressor has started for the set time.(When the [Current detect] is set "forbid", the parameter is not displayed.)
冷冻启动时间 Pump.1 avoid	2秒 2 S	1~255秒 1~255 S	冷冻泵启动该设定时间后才允许检测冷冻电流故障(【电流检测】设为禁用时,不显示该参数) The current fault of cold pump can only be detected after it has started for the set time.(When the [Current detect] is set "forbid", the parameter is not displayed.)
冷却启动时间 Cool.1 avoid	2秒 2 S	1~255秒 1~255 S	冷却泵启动该设定时间后才允许检测冷却电流故障(【电流检测】设为禁用时,不显示该参数) The current fault of cool pump can only be detected after it has started for the set time.(When the [Current detect] is set "forbid", the parameter is not displayed.)

开关量设置【备注1】Switch Settings [Note1]

*冷冻过载 *Freez overload	常开 N.O	常闭~常开 N.O ~ N.C	开关量输入方式选择 常开: 没有故障时开关断开; 常闭: 没有故障时开关闭合。 Selection of switch input mode N.O: switch off with no fault; N.C: the switch is closed with no fault.
*冷冻水流开关 *Cold W.flow	常闭 N.C	常闭~常开 N.O ~ N.C	
*水位开关 *W.level switch	常闭 N.C	常闭~常开 N.O ~ N.C	当【DI5输入选择】为“1#排气温度”时,该处为1#排气温度检测常开常闭设置 When [DI5 fuction] is "Vent1 temp", it is the place for N.O and N.C settings of vent1 temperature detection
*压缩机过载 *Comp overload	常开 N.O	常闭~常开 N.O ~ N.C	开关量输入方式选择 常开: 没有故障时开关断开; 常闭: 没有故障时开关闭合。 Selection of switch input mode N.O: switch off with no fault; N.C: the switch is closed with no fault.
*压缩机低压 *Low pressure	常闭 N.C	常闭~常开 N.O ~ N.C	
*压缩机高压 *High pressure	常开 N.O	常闭~常开 N.O ~ N.C	
*三相电源故障 *Phase error	常开 N.O	常闭~常开 N.O ~ N.C	当【DI9输入选择】为“冷却水流检测”时,该处为冷却水流开关常开常闭设置。当【DI9输入选择】为“2#排气温度”时,该处为2#排气温度检测常开常闭设置。 When [DI9 fuction] is "Cool W.flow", it is the place for N.O and N.C settings of cool water flow switch.When [DI9 fuction] is "Vent1 temperature", it is the place for N.O and N.C settings of vent1 temperature detection.
*冷却过载 *Cool overload	常闭 N.C	常闭~常开 N.O ~ N.C	当【冷却过载/防冻】为“防冻”时,该处为防冻开关常开常闭设置。 When [DI1 input opt] is "Anti-freezing", it is the place for N.O and N.C settings of antifreezing switch.

【备注1】: 远程开关, 当使用远程控制时, 远程开关输入闭合则启动机组、远程开关输入断开则停机组。
[Note1]: remote switch, if the remote control is used, the unit will start up when remote switch input is closed and stop when remote switch input is disconnected.

5.12 电气连接示意图 Electrical Connection Diagram



说明: 此图以双压缩机为例, 若压缩机数量不同, 图中接触器KM、热继电器FR的后缀编号会有变化, 具体以随机电路图为准。
Remarks: This figure takes 2 compressor as an example. If the number of compressors is different, the suffix numbers of the contactor KM and the thermal relay FR in the figure will change, Please refer to the random circuit diagram.

6 故障排除 Chapter six, Trouble Shooting

状态 Status	原因 Reason	故障排除 Solution
电源正常 全机不能运转 Power source is normal, but the machine can't run	①保险丝熔断; ②负荷开关坏; ③逆向继电器故障或脱落。 ①Fuse is broken; ②Load switch is damaged; ③Reverse relay does not work or comes off.	①更换备用保险丝; ②逆向继电器重新更换 ③更换新负荷开关坏 ①Replace with standby fuse ②Plug Reverse relay again firmly or replace it ③Replace with a new load switch
无熔丝开关跳脱 No fuse breaker jumps off	①电器负载线路接地或短路; ②压缩机, 水泵、马达故障接地。 1.Electrical load wire grounded or short circuit ②Compressors, pumps, motors grounded fault.	①换新处理; ②检查后, 如确定故障, 换新或修理。 ①Replace with new no fuse breaker; ②Replace with new one or repair it.
逆相 Reverse phase	①水泵及风扇逆相; ②欠相 ①Reverse phase of water pump and fan ②Lack of phase	①将电源中任意两相交换; ②测量三相电流是否正常。 ①Exchange any two phases of the power source; ②Check if 3-phase current is normal.
散热不良 Poor heat radiation, 指示灯亮 Indicator is on	①高压跳脱; ②高压开关故障。 ①Jumps off by high pressure; ②High pressure switch dose not work	①高压过载; ②换新(高压跳脱自动复位), 重新启动压缩机。①Clean condenser of fins and keep air below 104°Fand cope with it as per note; ②Replace with a new part for Automatic Resetting by High-pressure Jumping off and start compressor again.

状态 Status	原因 Reason	故障排除 Solution
冷媒不足 Short of refrigerant 指示灯亮 Indicator is on	①冷媒不足低压跳脱；②蒸发器结冰。 ①Refrigerant is insufficient and machine jumps off by low pressure; ②Evaporator is frozen.	①依附注二处理；②查看膨胀水箱是否缺水，循环水泵是否运转，待正常后，低压自动复位，重新启动压缩机；③如蒸发器结冰，请将冰水排出，再加温水，使冰熔化；④注意不可用硬物敲打冰块，如穿透铜管进水，将使压缩机损坏；⑤把温度设置提高到+5℃以上。 ①Cope with it as per Note2; ②check if expansion water tank is lack of water; if circulation water pump runs or not ,After they are normal automatic resetting by low ,pressure and start compressor again . ③if evaporator is frozen ,discharge freezing water ,and then add warm water to melt the ice.④Make sure not to strike the ice with any hard object, in case copper pipe is broken and water enters ,compressor will be damaged ⑤Adjust the temp. more than 41°F .
过载指示灯亮 Overload indicator is on	①电压异常；②马达、水泵、压缩机轴承故障，卡住；③散热不良；④过载继电器值太低；⑤线路接点不良松动。 ①Capacity is not sufficient ; ②Cold medium is not sufficient ; ③Cold medium is blocked ; ④Value for overload relay is too low ; ⑤Joint of lins is poor or loosen.	①3相电源电压降或电压不稳及欠相修理；②更换轴承或换新；③请依附注一处理；④依正常调高；⑤拧紧螺丝。 ①Repair fallen voltage for 3-phase power source, or unstable voltage or lack of phase ; ②Replace with new bearings; ③Cope with it as per Note 1; ④Adjust higher as per standard; ⑤Fasten screws.
红灯未亮，压缩机无法运转 Red light is off & compressor can't run	保护装置跳脱 Protective unit jumps off	请依附注五处理。 Cope with it as per Note 5.
冷冻水不冷或低压跳脱 Chilled water is not cold or machine jumps off by low pressure.	①容量不足够； ②冷媒不足； ③冷媒阻塞； ④阀片破裂 ⑤温度开关设定太高； ⑥温度开关故障； ⑦散热不良 ①Cooling capacity is not sufficient; ②Refrigerant is not sufficient; ③Refrigerant is blocked; ④Valve plate is broken; ⑤Temperature switch is set too high; ⑥Temperature switch does not work; ⑦Heat radiation is poor.	①加大主机制冷量；②依附注二处理；③更换阻塞部份如干燥剂或膨胀阀，抽真空后再充注冷媒；4)更换压缩机，由附注三判定；⑤往下调低；⑥换新；⑦效率低，请依附注一处理。 ①Enlarge capacity of main unit. ②Cope With it as per Note 2; ③Change blocking parts such as drying agent or refill cold medium after expansion valve is vaccunized. ④replace with a new compressor judge as per Note3; ⑤Adjust lower; ⑥Replace with new parts; ⑦Efficiency is low, cope with as per Note1

附注一 Note1

当冷凝器散热不良时，压缩机效率低，运转电流大，当高压升至24kg/cm²，压缩机受高压开关保护跳脱，压缩机停止运转，高压过载指示灯亮。此时请检视：

When the condenser cooling bad, the compressor will run at heavy current with low efficiency. When the value of high pressure gauge is higher than 24kg/cm², the high pressure switch will tripped, the compressor stop running, and the high pressure overload indicator. The operator need to check the following items;

- ◎冷却水塔循环水是否正常；
- ◎冷却水温是否过高；
- ◎冷却塔风扇及水泵是否运转；
- ◎冷却水是否太脏；
- ◎冷却水阀门是否完全打开；

以上正常后再重新开机即可正常运转

- ◎If the cooling water is able to cycling properly?
- ◎If the cooling water is over-temperature?
- ◎If the fan/pump of water tower is working normally?
- ◎If the cooling water is too dirty?
- ◎ If the valve of cooling water is open?

Only confirmed the above items ,the chiller can be restarted.

附注二 Note2

冷媒不足处理方法：

- ◎当水温在5℃以上，低压显示低于2kg/cm²时，即表示冷媒不足，必须先将漏冷媒的地方进行补漏处理，再更换干燥剂，重新抽真空处理后，再充注适量冷媒。
- ◎当您发现漏冷媒部分浸入水中，请立即停止冰水机运行，速将水箱内水排除，尽快通知公司派员维修，以免压缩机将水吸入系统造成更严重损坏。

Approaches for lack of refrigerant:

- ◎When the water temperature higher than 5℃ and the value of low pressure gauge is lower than 2kg/cm², it means lack of refrigerant. Processing methods: Find out where the refrigerant leakage, and patch it; Replace the desiccant, and vacuum processing again; Filling the refrigerant.
- ◎If the leakage of refrigerant part is immersed in the tank, please stop the chiller immediately and emptying the water tank. Do not start the chiller, until the problem is solved.

附注三 Note3

高低压是否正常

- ◎压缩机正常运行时高压表显示12-16kgf/cm²为最佳，但不得高于24kgf/cm²，当高压高于24kgf/cm²时，高压保护开关跳脱，请依附注一处理，低压表显示以3-5kgf/cm²为最佳，但不得低于2kgf/cm²，低压跳脱时请依附注二处理。(注意：若机器为特殊低温型，当冷冻水在0℃以下时，低压偏低，属于正常现象。)
- ◎当压缩机运行时高压和低压两者差压极少或相等时，即表示压缩机本身阀片或涡旋盘破损或断裂，请即停止运转并通知公司派人处理。

High pressure & Low pressure

- ◎As compressor running, the best value of high pressure gauge is 12-16kg/cm², but no higher than 24kgf/cm²; and the best value of low pressure gauge is 3-5kgf/cm², no lower than 2kgf/cm². If the value of high pressure gauge is higher than 24kgf/cm², the high pressure switch will tripped. For processing methods, please refer to note 1. If the value of

low pressure gauge is lower than 2kgf/cm², the low pressure switch will tripped. For processing methods, please refer to note 2.(Remark: For low temperature chiller, it is alright while the chilled water below 0°C.)

- ◎When the compressor running,the difference between high pressure gauge and low pressure gauge is small or equal, it means that the compressor valve plate or scroll was damaged. Please stop the chiller and call us for maintenance.

附注四 Note4

当压缩机因某种原因发生故障时,此时水泵如继续运行,可能造成水温急速升高,而当水温超过70°C时,机内水管及水泵轴封极可能被损坏造成漏水。

If the pump keep running as some problem happened to the compressor, the water temperature may rise rapidly. When the temperature is higher than 70°C, it may cause leakage as pipeline and pump seal was damaged.

附注五 Note5

当故障指示灯及保护开关全部正常,压缩机不能启动,请检查:

- ◎温度开关是否调太高或损坏;
 - ◎切换开关是否损坏;
 - ◎防冻开关是否损坏;
 - ◎低压开关跳脱或损坏;
 - ◎压缩机过载保护器损坏或跳脱;
 - ◎电磁继电器线圈损坏及过载保护器损坏;
 - ◎如机内无水箱型,请查冰水流量开关是否损坏,
- 以上控制开关或线路如有故障,压缩机即不能运转。

If the compressor can not start running while all fault indicator and protection switch is OK, please check the following items:

- ◎If the temp. Switch was set too high or damaged;
- ◎If the selection switch was damaged;
- ◎If the antifreeze switch was damaged;
- ◎If the low-pressure switch has tripped or damaged;
- ◎If the overload protector of compressor has tripped or damaged;
- ◎If the magnetic switch of compressor was damaged;
- ◎The chiller without water tank, please check if the flow switch was damaged;

Any case above occurred , the compressor will not to start.

7

维护与保养 Chapter seven ,Care and Maintenance

7.1 冷凝器 Condenser

对水冷式冷凝器的维修保养,主要在于冷却水对冷凝器冷却管道的管壁积垢的清除工作,一般进行管道疏通,常规采用化学清洗(克垢)除垢,也可用圆钢丝刷安装在软轴上旋转除垢,水垢清除程度直接影响到制冷效果,所以必须注意:定期清洗冷凝器,每半年用化学方法(克垢)清洗一次。

The main content of condenser maintenance is clean the scale on the tube wall. There are two methods: one is chemical cleaning, and the other is brush cleaning. Since scale clearing directly affect the cooling efficiency, it must pay attention to those following item: Please clean the condenser regularly, and cleaning it with chemicals once every six months

注:积垢只要是受水质的影响,尽量避免使用硬度高的水。

Remark: Scaling is mainly caused by the water with bad quality, try to avoid using the high hardness water.

7.2 压缩机 Compressor

压缩机运转累计1000小时以后,要对其检查:

- ◎润滑油是否正常
- ◎压缩机运转时电流是否正常
- ◎压缩机运转时是否有异常声音

As operating time reach 1000 hours, the operator need to check the compressor situation;

- ◎If lubricant is OK;
- ◎If the electric current is alright during compressor running;
- ◎If any big noise during compressor running;

7.3 其他 Others

机器使用一定时间后,由于各方面因素,有必要进行如下事项:

- ◎对压力开关进行性能测试,是否可高低压力报警。对电控箱,要定期把里面灰尘吹干净,同时查看螺丝是否松动,避免机器损坏,以防事故发生。
- ◎机器停用时,在冬天应把系统的水排干,以防冰结成冰把系统的管路涨破。
- ◎以上如有异常,请尽快通知公司派维修人员处理。

It is need to Check the following matters regularly:

- ◎Check if the pressure switch function is alright.
- ◎It is need to clean the dust in the electric control cabinet regularly, and check if any screws are loose.
- ◎In order to avoid pipe icing broken, it is need to empty the pipe as the chiller disabled in the winter if any problem, please contact us as soon as possible.

8

标准系列规格参数表
Chapter eight, Standard series Specification

表(一) Sheet 1

项目Item	单位/unit	AC-03WS	AC-04WS	AC-05WS	AC-06WS	AC-08WD
冷冻能力Cooling Capacity	kcal/h	8514	10922	13158	17028	21844
	kW	9.9	12.7	15.3	19.8	25.4
电源Power Supply	V	3N, 380V, 50Hz				
总输入功率Total Power Input	kW	2.7	3.2	4.0	4.6	6.0
最大电流Max Amp	A	9	12	14	16	23
制冷剂Refrigerant	型号Type	R22/R407C				
	充注量Charge(kg)	1.7	2.2	2.8	4.5	4.4
压缩机功率Compressor Power	kW	2.13 × 1	2.64 × 1	3.29 × 1	3.82 × 1	2.64 × 2
冷却水量Cooling water	m ³ /h	2.1	2.7	3.3	4.3	5.5
冷却水管径Cooling Water In/Out Pipe Size	inch	1"				1.5"
水箱容量Tank Volume	L	70	70	70	70	120
水泵功率Pump Power	kW	0.38		0.75		
冷冻水流量Chilled Water Flow	m ³ /h	1.7	2.2	2.6	3.4	4.4
冷冻水管径Chilled Water In/Out Pipe Size	inch	1"				1.5"
外型尺寸Outline Size	长L(mm)	900	900	900	900	1300
	宽W(mm)	500	500	500	500	610
	高H(mm)	1100	1100	1100	1100	1430
重量Net Weight	kg	130	140	150	200	220

备注：以上参数基于冷冻水出水温度为15°C/10°C，冷冻水进/出水温度为30°C/35°C。

Notes: The above parameters based on chilled water inlet/outlet temperature of 15°C(59°F)/10°C(50°F), cooling water inlet temperature of 30°C(86°F)/ 35°C(95°F).

表(二) Sheet 2

项目Item	单位/unit	AC-10WD	AC-12WS	AC-15WD	AC-20WD	AC-25WD
冷冻能力Cooling Capacity	kcal/h	26316	32078	41108	55900	64156
	kW	30.6	37.3	47.8	65	74.6
电源Power Supply	V	3N, 380V, 50Hz				
总输入功率Total Power Input	kW	7.7	8.5	11.3	14.9	16.6
最大电流Max Amp	A	26	26	38	46	52
制冷剂Refrigerant	型号Type	R22/R407C				
	充注量Charge(kg)	5.6	6.8	8.4	11.2	13.6

项目Item	单位/unit	3.29 × 2	7.41 × 1	3.29+6.53	6.53 × 2	7.41 × 2
压缩机功率Compressor Power	kW	3.29 × 2	7.41 × 1	3.29+6.53	6.53 × 2	7.41 × 2
冷却水量Cooling water	m ³ /h	6.6	8.0	10.3	14.0	16.0
冷却水管径Cooling Water In/Out Pipe Size	inch	1.5"	2"			2.5"
水箱容量Tank Volume	L	120	120	120	200	200
水泵功率Pump Power	kW	1.5			2.2	
冷冻水流量Chilled Water Flow	m ³ /h	5.3	6.4	8.2	11.2	12.8
冷冻水管径In/Out Pipe Size	inch	2"			2.5"	
外型尺寸Outline Size	长L(mm)	1300	1300	1680	1700	1700
	宽W(mm)	610	610	780	850	850
	高H(mm)	1430	1430	1630	1650	1650
重量Net Weight	kg	300	320	400	440	620

备注：以上参数基于冷冻水出水温度为15°C/10°C，冷冻水进/出水温度为30°C/35°C。

Notes: The above parameters based on chilled water inlet/outlet temperature of 15°C(59°F)/10°C(50°F), cooling water inlet temperature of 30°C(86°F)/ 35°C(95°F).

表(三) Sheet 3

项目Item	单位/unit	AC-30WT	AC-36WT	AC-40WF	AC-50WF	AC-60WF
冷冻能力Cooling Capacity	kcal/h	83850	96234	111800	128312	163400
	kW	97.5	111.9	130	149.2	190
电源Power Supply	V	3N, 380V, 50Hz				
总输入功率Total Power Input	kW	22.6	26.2	30.1	33.6	64.3
最大电流Max Amp	A	69	81	92	104	165
制冷剂Refrigerant	型号Type	R22/R407C				
	充注量Charge(kg)	16.8	20.4	22.4	27.2	34.0
压缩机功率Compressor Power	kW	6.53 × 3	7.41 × 3	6.53 × 4	7.41 × 4	10 × 4
冷却水量Cooling water	m ³ /h	21.0	24.1	28.0	32.1	40.9
水箱容量Tank Volume	L	200	200	400	400	400
水泵功率Pump Power	kW	2.2		4.0		
冷冻水流量Chilled Water Flow	m ³ /h	16.8	19.2	22.4	25.7	31.0
冷冻水管径In/Out Pipe Size	inch	2.5"		3"		
外型尺寸Outline Size	长L(mm)	2200	2200	2400	2600	2600
	宽W(mm)	1100	1100	1005	1300	1300
	高H(mm)	1650	1650	1800	1780	1780
重量Net Weight	kg	690	760	950	1000	1100

备注：以上参数基于冷冻水出水温度为15°C/10°C，冷冻水进/出水温度为30°C/35°C。

Notes: The above parameters based on chilled water inlet/outlet temperature of 15°C(59°F)/10°C(50°F), cooling water inlet temperature of 30°C(86°F)/ 35°C(95°F).