FHB-HWS54N/SSM

The Internet of Things type constant temperature and humidity control equipment

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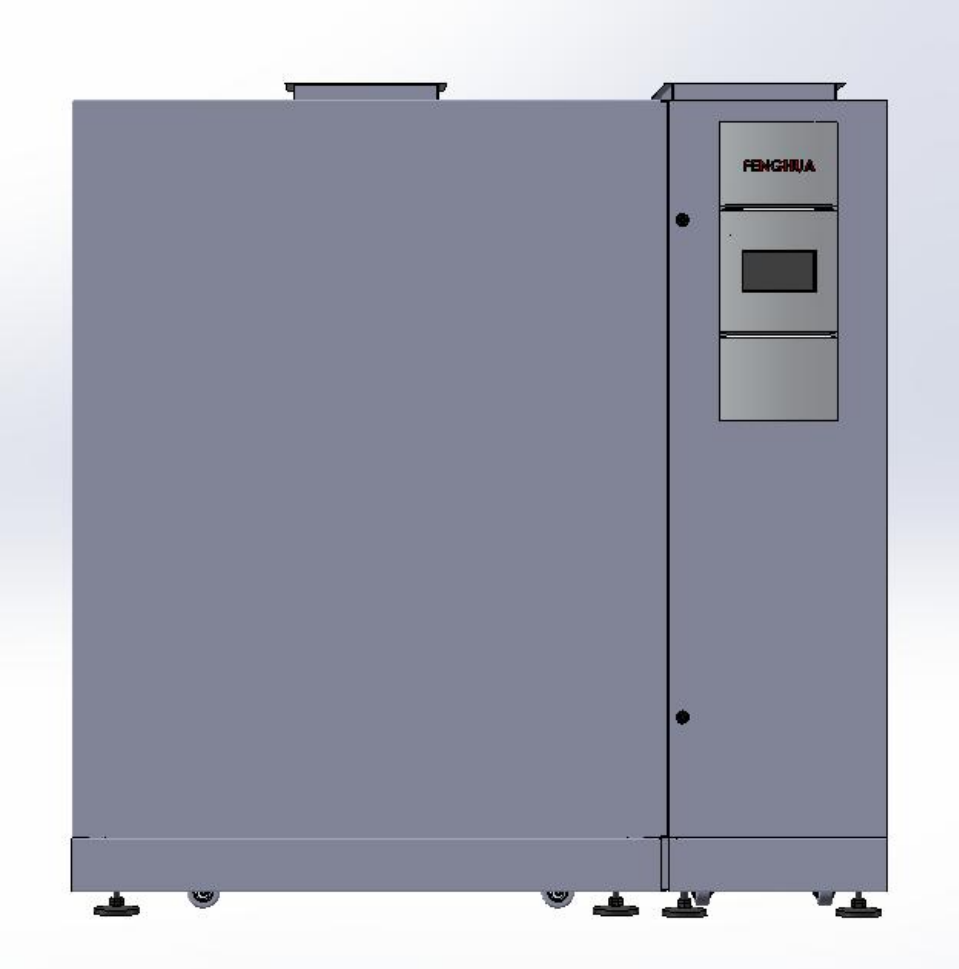
Zhengzhou Fenghua Industrial Co., Ltd

catalogue

一、 summary

The constant temperature and humidity unit of the warehouse is a split type structure unit, which is divided into main engine and outdoor unit. COPELAND digital vortex compressor, internal threaded copper pipe hydrophilic aluminum fin type efficient heat exchanger, DANFOSS, Emerson and other refrigeration accessories are selected. With superior performance, high energy efficiency, simple operation, stable control, beautiful appearance and other characteristics, widely used in cultural relics warehouse, archives, machine room, laboratory, precision machinery manufacturing and other places with strict requirements on temperature and humidity.



1 Main performance parameters: (due to product improvement, the following parameters may be changed, subject to the nameplate parameters)

Model: FHB-HWS54N / SSM Power supply: 380V 3PH 50Hz
Refrigeration capacity: 54.0kW Compressor power: 7.6KW 2
Refrigerant: R410A Temperature control range: 18-30 ± 1℃
Air volume: 10500 m3/h Wet control range: 40-70 ± 5%
Heat addition: 25kW humidification amount: 16.0kg/h
Maximum power: 40 Kw Maximum current: 69.6A
Overall dimension: 18008001800mm Weight: 550kg
Note: The unit should be run together with two special outdoor units.

2. dehumidification principle:

The return air passes through the low temperature surface of the evaporator. Because the surface temperature of the evaporator is lower than the dew point temperature of the return air, there will be condensate water precipitation, reducing the water carried in the return air, so as to achieve the purpose of dehumidification. The air supply only contacts with the surface of the clean evaporator in the evaporator, and completely separates from the refrigerant, which is more safe than the dehumidification mode of salt solution, completely avoid the pollution of the salt steam to the air supply in the dehumidification mode of salt solution, and ensure the clean and safety of the air supply. The compressor refrigeration method is used to always keep the evaporator surface in the temperature range suitable for dehumidification (about 2℃). The compressor refrigeration workflow is as follows:

Compressor air-cooled condenser reservoir throttle device evaporator air-liquid separator compressor.

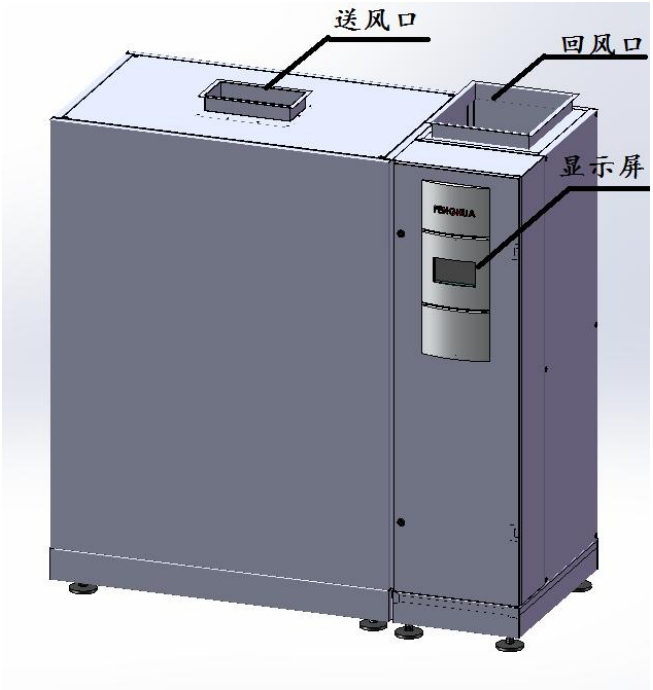
The compressor from the evaporator absorbs low temperature, low pressure refrigerant steam compression into high pressure, high temperature gas to the condenser, At this time, the refrigerant vapor warms up due to the compression, In addition is the heat added to the thermal equivalent of the motor, Transfer heat together to the cooler condenser, The refrigerant steam that loses heat is condensed into a liquid refrigerant; The throttling device supplements the condensed liquid refrigerant to the evaporator in moderation, After the liquid refrigerant is reduced by the throttling device, To the gas-liquid two-phase state at low temperature and low pressure, Phase transition due to boiling with reduced pressure, The refrigerant steam which changes to low temperature and low pressure after absorbing heat in the evaporator returns to the compressor, The whole working process is about taking the heat of the low-temperature evaporator environment, Forced to high temperature condenser ambient air, Through the combination of accurate adjustment of air volume and digital adjustment of compressor, Keep the evaporator surface always at a temperature suitable for dehumidification, So as to achieve the "surface cold dehumidification" effect.

3. Purification principle:

Using the pure physical method for filtration and purification, safe, reliable and pollution-free. After the return air is filtered by the initial effect filter and the bag filter, the bag filter is made of non-woven materials containing activated carbon, which can not only remove particulate pollutants such as PM10 and PM2.5, but also remove harmful gases such as formaldehyde, sulfur dioxide, nitrogen oxide and other gases, giving cultural relics a clean and safe space.

4. Electrical control system

It consists of Siemens PLC and LCD screen. Using large screen touch screen, easy to operate.

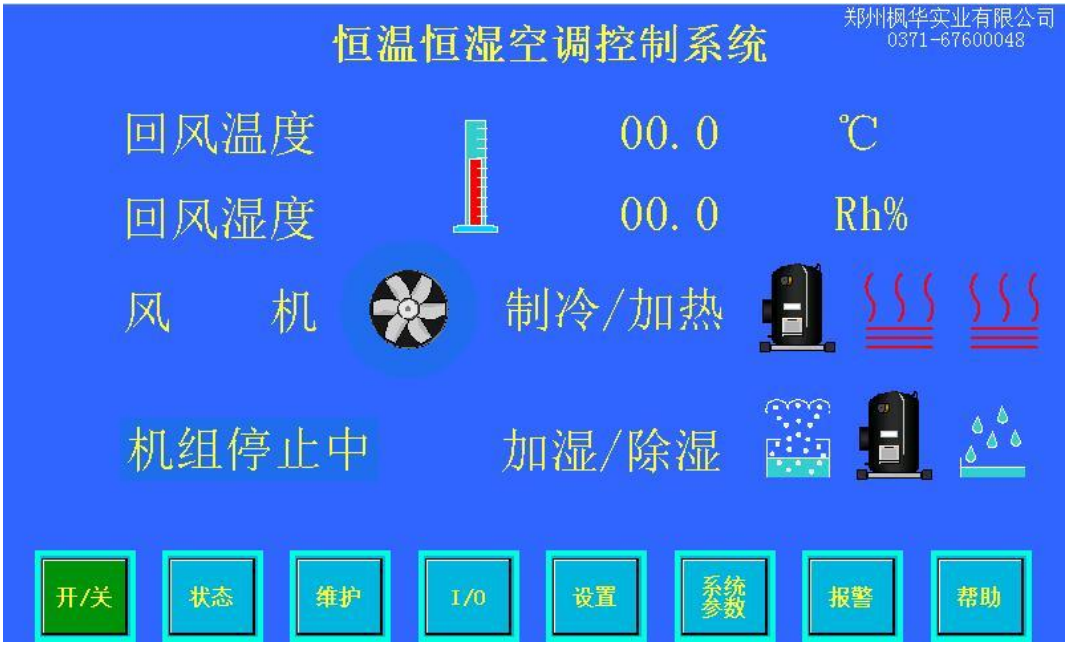


二、 Use and operation

1. Main interface of unit operation status:

The unit operation status shows on the main interface. When the unit stops, press the "On / off" button to start operation. The interface displays the temperature, humidity and other parameters and the status of the main equipment. The set temperature and humidity parameters have the memory function of power loss. If the unit is powered off, you only need to reset the power supply. Click the "Status" button on the "Status" button to return to the main interface. The "Maintenance" button can

debug and maintain the unit, and enter the need to log in. The "I / O" button displays all the inputs and outputs from the current system. The "Set" button enters the operation parameter setting interface and enters the required password."System parameter" is a parameter related to system operation, generally used by debugging personnel, entering the password. The "Alarm" page displays the fault or status warning during the unit operation. The button is yellow when the system has a fault or warning.



2. I / O Status " interface:

The page is divided into four sub-pages: digital input, digital output, analog input and analog output. This page displays the input and output parameters of the control system. The technician can judge the status of the system according on the page.

3. Maintenance interface:

Click the "Maintenance" button to enter the interface. The interface is only for professionals, and customers cannot change it at will. There are three sub-pages under the interface. The data of the "Maintenance hour meter" page is a system operation record, and the "Manual run" page can be used by system debugging personnel, or for special control requirements, and the page is invalid when the system is automatically running. The Sensor Calibration page is used to set calibration values for each sensor parameters such as temperature and humidity.

4. "Setting" interface:

Click the "Settings" button to enter this interface, the user can set the target temperature, humidity and other parameters, enter the required password, the initial password of the system password is "110".

5. The "System Parameters" interface:

This interface is used by the system debugging personnel. A password is required to enter this interface.

6. Alarm record page:

Show faults in system operation, or warnings, some faults will automatically reset and some require manually reset.

tell the world:

The temperature and humidity setting method of the warehouse constant temperature and humidity unit must be operated by more than two people. One person operates, one person records and reviews, and can not be confirmed until the equipment is fully operated in accordance with the new set value. Otherwise, the manufacturer shall not be responsible for the loss of cultural relics or materials.

三、 Maintenance and maintenance

1 The management, repair and maintenance of air conditioners, must be familiar with the air conditioner personnel to manage, or
There are air-conditioning technology and understand the electrical technology of the professionals to be responsible for the management.

2. The filter screen should be cleaned regularly, generally once every three months, rinse with clean water, and the evaporator can be cleaned for a year
Once you can.

3. The condenser should be cleaned regularly, usually once half a year. If the dirt is serious, it must use air conditioning
Clean it with a detergent.

4. High and low voltage pressure switch, air pressure switch, and overload

protection of electrical appliances have been before the factory
Adjust and limit, shall not change at will. If various protection action because of fault, must be eliminated
Can reset the boot (overload must be manually reset).

5. The humidifier is humidified by ultrasonic atomization device and pure water to avoid scaling, and the conductivity is below 80 μ S / CM.

四、 Lifting and handling requirements

If the equipment is lifted by forklift or crane, it must be lifted with transport belts or steel cables, to ensure that the upper part of the machine or packing box is not under pressure, and place the wooden strips around the machine at certain intervals to protect the machine from injury. Do not use any parts of the equipment as a fulcrum of force.

Note: The machine should not open the packing box and place it in the sun, because the refrigerant pressure inside the machine may cause the safety valve to move.

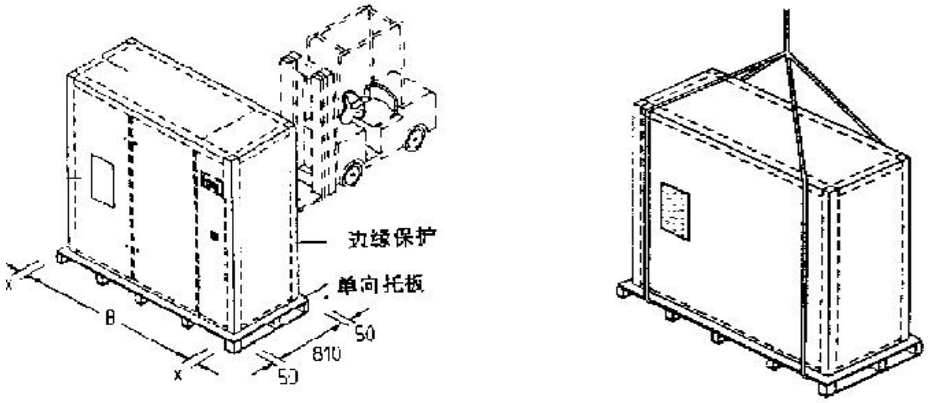


Figure 1: Outdoor transportation schematic diagram

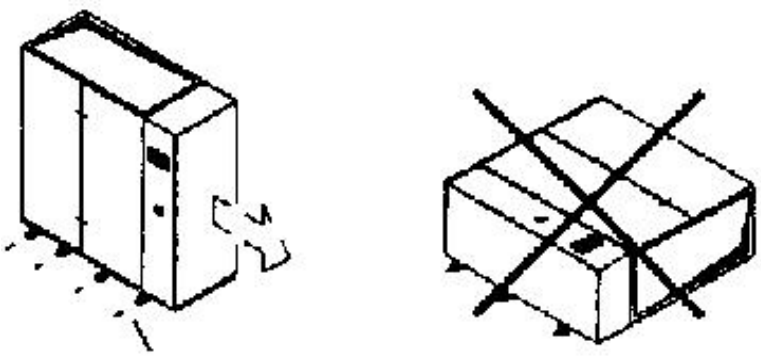


Figure 2: Indoor transport schematic diagram

Note: do not move backwards. The steel pipe can be placed on the lower part of the unit. The number and size of the lower steel pipe of the unit are determined according to the needs. If possible, the steel pipe should be placed directly under the chassis.

五、 Installation considerations:

1. In the compressor in the outdoor unit, in the process of handling and lifting, its inclination should not exceed 45 degrees, let alone be inverted.
2. The outdoor unit should be installed in a well-ventilated place around, and leave enough space for maintenance around.
3. Indoor machine installation can be directly placed on the ground and fixed with expansion wire, can also be used with groove steel or corner iron welding frame, placed on the shelf above, and then fixed with screws.
4. For the installation of indoor and outdoor machines, the height drop should not exceed 15 meters, and the length of copper pipe should not exceed 50 meters. If the height drop is large, an oil bend shall be installed every 5 meters, and the length of copper pipe shall exceed 15 meters. The diameter of the copper pipe should be increased; the refrigerant pipe of the host and outdoor condenser should be shortened as long as possible to avoid unnecessary bending.

Within the height (m. m)	Within the length (m)	Connect pipe steam pipe	Connect the tubing pipe
5	15	Normal installation Oil bend 1 (a)	Normal installation No oil storage bent in the liquid pipe,
10	15	Normal installation Oil bend 2 (s)	Normal installation There is no oil storage bend in the liquid pipe
10	30	The pipe diameter is increased to No.1 Oil bend 2 (s)	The pipe diameter is increased to No.1 There is no oil storage bend in the liquid pipe
15	50	The pipe diameter is increased to No.2 Oil bend 3 (s)	The pipe diameter is increased to No.1 There is no oil

5.

			storage bend in the liquid pipe

Power supply: indoor and outdoor units should have independent power supply, which cannot be shared with other power consuming equipment. The section of the wire should match the power of the unit.

6. The air conditioning unit and power supply should be installed with matching air switch and have a certain margin.
7. The air outlet of the indoor machine should be connected with soft canvas to reduce vibration and noise.
8. Indoor and outdoor copper pipe connection, copper pipe must be welded with nitrogen protection to avoid dirty blockage and no flat cracking.
9. The water supply pipe and drainage pipe of the indoor machine should be installed firmly and tightly, with no water leakage.
10. The power supply adopts three-phase four-wire system, and the voltage fluctuation shall not be more than 10%.

11 compressor in the outdoor unit, factory with refrigerant, the unit should open the valve, according to the <<refrigeration installation specification manual>>, query the diameter of the corresponding copper pipe, according to the length of the copper pipe to fill a certain amount of refrigerant, when the length within 10 meters, no need to add refrigerant.

六、 install:

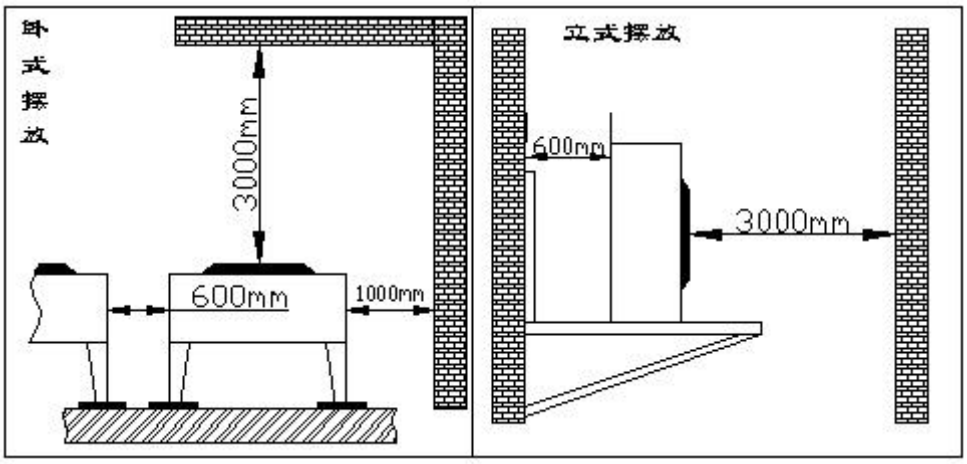
1. Installation content of the unit (in order):

（1） Main engine and outdoor unit are in place
（2） Connect the main machine and the outdoor unit refrigerant line
（3） Connect the signal line and power cable between the main engine and the outdoor unit
（4） Connect the water supply pipe of the humidification system
(6) Connect the condensate drainage pipe

2. Main engine and outdoor unit are in place:

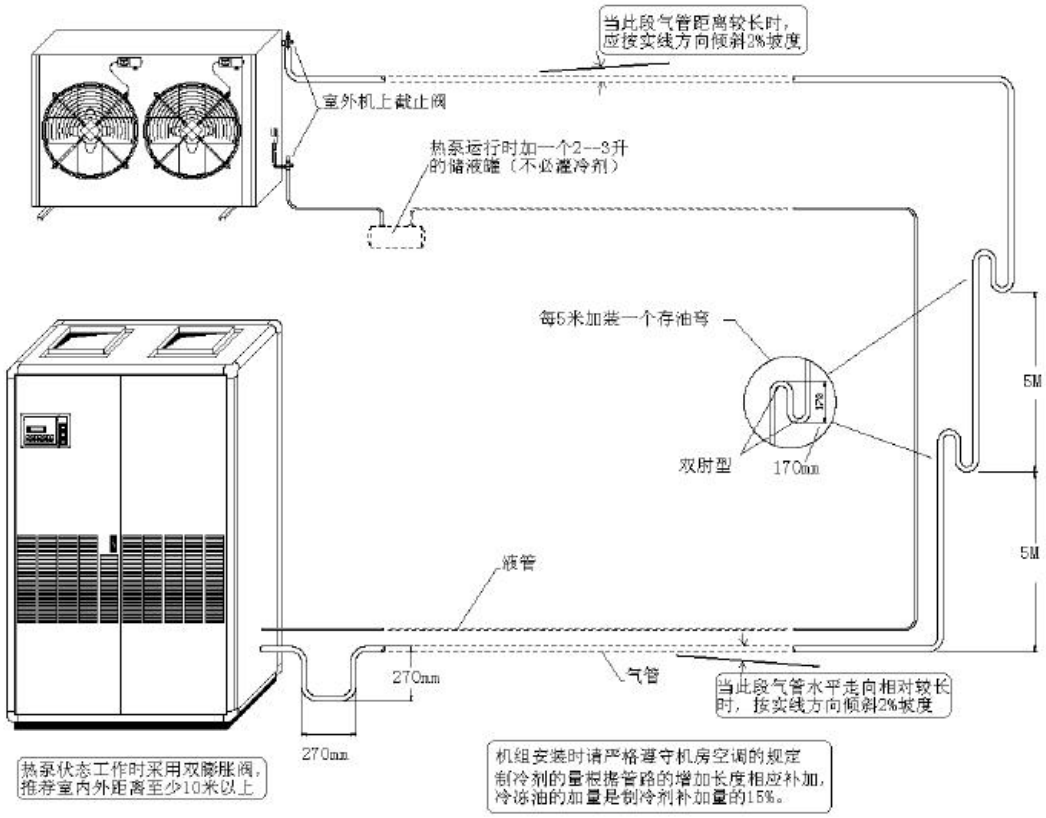
(1). There must be maintenance space around the main engine (600 and 600mm after the first 1000 side).
(2). The static floor of the blower set shall be at least 300mm high, and no debris or a large number of wires shall be allowed under the floor (there shall be no obstacles within 3000mm of the air supply outlet). In principle, the diameter of the air duct is not allowed to be smaller than the air outlet, and the wind speed in the main air duct should be controlled at 5 ~ 8 m/s.
(3). The outdoor condenser should be placed in a safe, easy to repair and smooth air flow to avoid short circuit of discharge air circulation and causing the rise of condensation temperature or high voltage switch action. The distance between the unit and the wall, obstacles or nearby units should be

greater than 600mm~1000mm. There shall be no surface obstacles within 3000mm directly opposite the condensing fan of the unit.



(4). Whether the unit uses upper air supply or side air supply, the unit must make a support.
(5). Ensure that the ground in place is flat and level. Vibration rubber should be placed between the machine and the foundation, indoor rubber must be 10mm and outdoor rubber must be 5mm.

3. Connect the main machine and the outdoor unit refrigerant pipeline



(1). The distance between the host machine and the condenser should be shortened as far as possible to avoid unnecessary bending.
(2). If the vertical distance is 5 meters, it can be installed normally;
(3). If the vertical distance is> 5 meters, especially when the connecting length is> 15 meters, the copper pipe diameter should be increased by no. 1.
(4). Add an oil storage bend at the vertical distance of 5 meters (add on the steam pipe).
(5). For every 15 meters of the total length of the connecting pipe, the copper pipe diameter is increased by no. 1, and the vertical distance is an oil storage bend for every 5 meters of increase.
(6). The elbow will cause a pressure drop and reduce the unit performance, so it should be used as little as possible.
(7). Install piping in a conference room, lounge, or office (noise problem). The pipe clamp should be installed at least every 2 meters on the road. In order to avoid vibration, the pipe clamp should be isolated. The first tube clip behind the host machine and in front of the condenser shall be mounted on the flexible bracket. The exhaust pipe has the potential to expand, so at least one meter from the elbow should be fixed by the pipe clip.
(8). The copper pipe connected between the main engine and the outdoor unit shall be insulated.
(9). Before pipe erection, check whether the interior of the pipe fittings is dry and clean, and the pipe inner wall shall be cleaned with alcohol or gasoline. After cleaning, attention should be paid to close the port of the pipe with plugs to prevent secondary entry of impurities.
(10). The cold tube can only be cut with a cutter and can be slightly curved or calibrated to correct

the inner diameter of the pipe mouth.

Do not cut the pipe with a saw, because the iron and copper chips cannot be completely removed, which will block the control components or damage the compressor.

(11). If the copper pipe needs to be expanded, a special copper pipe expander should be used, and first, the cone of the expander should be slightly lubricated with refrigeration oil to prevent the burr from being brought into the pipe.

(12). After the connection, the system shall be pressed. The pressure shall be more than 800 kpa and the pressure shall be more than 60 minutes.

4. Signal line and power cable connecting the main engine and the outdoor unit

(1). The connection between the main engine power line and the outdoor unit should be fixed with different color lines and tie belt.

(2). First connect the power cable to the main machine room, and set up the control box, and then connect the power line of the main machine to the control box.

5. Installation of water supply and drainage pipe:

(1). The water supply pipe of the humidification system should be connected to the tap water outlet by 4, and the silk buckle should be set to avoid leakage. Manual ball valve or gate valve shall be provided to facilitate maintenance.

(2). The drainage pipe of the air conditioning system shall be connected to the water outlet (floor drain or drain, etc.) with a water pipe not less than Φ 25. The direction of the drainage pipe should be inclined according to the 1% slope to the water outlet of the unit to facilitate drainage. It is strictly prohibited to lift, otherwise the condensed water may not be discharged smoothly and overflow beyond the unit.

(3). The filling and drainage pipes shall be carefully connected to ensure no leakage and fixed to the ground or wall. The drainage pipe shall be treated with thermal insulation after the installation.

6. Power supply requirements:

Host power supply voltage: 380V 3PH 50Hz
Allowable deviation of power supply voltage: 380V ± 10%
Power supply mode: 3-phase, 4-wire + protective grounding

七、 Analysis and troubleshooting of faults:

(1) No refrigeration			
Possible fault parts	failure cause	The exclusion method	
1. Power supply	Check the circuit for electricity	epistrophy	R e p a
2. Compressor does not work	High pressure protection	A, Condenser dirty blocking...wash	

		B, too much Freon... Exclude excess	i r n o r m a l b o o t
		C, high voltage switch broken...renewal	
	low voltage protection	A, Check the copper pipe... Fill in the gaps and fluoride	
		B, Low voltage switch is broken...renewal	
		C. Return gas valve is not open...renewal	
	overload protection	A, the voltage is too low or too high..., the voltage adjustment	
		B, poor compressor insulation... replacement	
		And c. short circuit to ground... replacement	
3. The external fan does not work	A. Open circuit or short circuit	... renewal	
	b. Bad capacitance	... Replace capacitance	
	c. Fan overload	... Check the cause, and reset it	
4. The water pump does not work	A. The water pump motor is open circuit or short circuit	... Replace the pump	
	b. Bad capacitance	... renewal	
	c, impeller card dead	... repair	
5. Compressor	A, The compressor is buzzing and cannot be started	... Check the power supply, phase absence or phase breaking	
	B. the compressor starts to immediately alarm	... Compressor insulation damage, motor burn out	
	C. The compressor operates normally, but has no change in high and low pressure	... Damage to the internal suction and exhaust parts	
6. Temperature sensor fault	A, Temperature value is high or low	... Damaged sensor, replaced	
	And b, No change in the displayed values	... Controller analog volume inlet or outlet bad	
7. High and low voltage controller	A. The exhaust pressure is too high	... Check the filter, the throttling system	
	B, The inspiratory pressure is	... The system is no	

action	too low	fluorine or the expansion valve is broken, replace
	c. The fan does not turn	... Check the capacitor, motor coil, and replace it
8. Insufficient cooling capacity	A. Check whether there are any leakage points	... Reinfused with Freon
	B. The compressor stops for too long time	... Reset the operation parameters
	C. The air supply volume is too small	... Check whether the filter screen is blocked and cleaned
	And d. The condenser has a poor effect	... Check the space or blockage around the condenser
9. The exhaust pressure is too high	A. Check the outdoor unit fan and motor	... No turn or reverse, tune the phase sequence
	B. The outdoor unit condenser is blocked	... wash
	C. Improper refrigerant	... Pull out and replace the corresponding type of refrigerant
	D, there is a non-condensing gas in the system	... Pull and re-vacuum
10. The exhaust pressure is too low	A, Too little refrigerant	... Check the leakage point and supplement the refrigerant
	B. The compressor valve is broken	... Replace the high and low pressure valves
	C. c. The inspiratory pressure is too low	... The ambient temperature is too low
	And d, the gas-liquid separator valve is blocked	... Water or impurities in the system
11. Excessive inspiratory pressure	A. Excessive inhalation of fresh air	... Reduce the amount of fresh air inhaled
	B. The temperature controller is faulty	... renewal
	C. Overcharged with the refrigerant	... Excluding excess freon
12. The inspiration pressure is	A. Insufficient refrigerant	... Add refrigerant
	B, the liquid supply pipeline is blocked	... Clean up debris

too low	And c, the liquid supply filter is blocked	... Replace the filter	
	D. The liquid supply and expansion valve is blocked	... Clean up debris	
	E. The air filter screen is blocked	... Wash. with clean water	
	F. The fire prevention valve in the air duct is not open	... Re-open	
13. Operation noise is high	A. The screw of the indoor blower is loose	... Reinforcement	
	b, impeller collision	... Tighten the impeller or housing	
	C. Bad bearing or lack of oil	... Replace the bearings or add the butter	
	d. The strength of the base is not enough	... Add the fixing bolts	
	E. Unreasonable installation of the air duct	... Check the air duct fixation condition	
(2) No heating			
Possible fault parts	**failure cause**	**The exclusion method**	
	A. Whether the power supply is charged	... repair	Repair normal boot
	B. The AC contactor is broken	... renewal	
	c. The thread is burned out	... Repair or replace	
	d. The coil burns badly	... Repair or replace	
	E. Electrical of circuit circuit	... Replace the corresponding sub-electric heating tube	
	F, Temperature protection is bad	... Replace the temperature protector	
	g, thermal overload	... Check the overload protector or the external circuit	
	H. Inappropriate temperature adjustment device	... Resaking to set point above room temperature	
	I. Indoor air transmission fan is not turned or protected	... Repair or replace	
(3) No humidification			
Possible fault	**failure cause**	**The exclusion method**	

parts			
	A. Check whether the power supply has an electrical input	... repair	
	B. Check whether the contactor moves	... repair	Repair normal boot
	C. Check whether the wire head is burned out	... Repair or replace	
	D. Check whether the coil is burnt out	... Repair or replace	
	E. Whether the heating pipe or oscillator in the humidified bucket is burned out	... A more heated tube or oscillator	
	F. Check whether the protection device in the humidified bucket is disconnected	... Repair or replace	
	G, Whether the overload protector is disconnected, and the external circuit has a short circuit or open circuit	... Repair or replace	
	H. Check whether the water supply valve is opened	... Repair or replace	
(4) No dehumidification			
Possible fault parts	failure cause	The exclusion method	
	A. Check the refrigeration system	... Refer to the above elimination method of no refrigeration	Repair normal boot
	B. Check the heating system	... Refer to the above method of excluding exclusion	
	C. Check the water pump or waterway system	... Refer to the above exclusion method without humidifying	
	D. Whether the humidity setting is correct	... Resew as required	

VIII. Warranty policy

This equipment from the date of selling the factory, free warranty for one year, and responsible for maintenance.

Note: This product shall only be maintained by qualified service personnel, and incorrect methods may cause serious injury accident or property loss.

★★★ *As the technology advances, the product technical parameters are subject to change without notice to* ★★★