
Clean air-cooled direct expansion dual heat source air conditioner user's Guide

**Please be sure to read this manual carefully before installing, using and repairing the unit. The
manufacturer's scope of responsibility will be
This does not include damage to the unit caused by improper operation by the user beyond the provisions
of this manual.**

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1. Overview

The "Noxin" brand multifunctional series modular air conditioning units absorb advanced air conditioning technologies at home and abroad. The FLHS series air conditioning units can achieve multiple functional requirements such as air purification, constant temperature, constant humidity, and noise reduction. They are mostly used in shopping malls, hotels, gymnasiums, workshops, laboratories, hospitals and other occasions. They can realize automatic control of various air working parameters such as temperature, humidity, pressure, etc. They can meet the requirements of different levels of comfort air conditioning and various needs of industrial process air conditioning. This user manual is only applicable to the use and maintenance of the main unit of the air conditioner. For other matching equipment, a separate user manual is attached. For example, the air conditioning automatic control system developed by our factory.

Since the functions and configurations of each combined air conditioner unit are different, this manual is aimed at general and common combined air conditioners with various functions, and explains the requirements and precautions for the installation, use and maintenance of the combined air conditioner unit. Users should refer to this manual according to the specific functional requirements of the combined air conditioner unit they use, and correctly install, use and maintain the air conditioning equipment to ensure the normal operation of the equipment and achieve the best use effect of the unit.

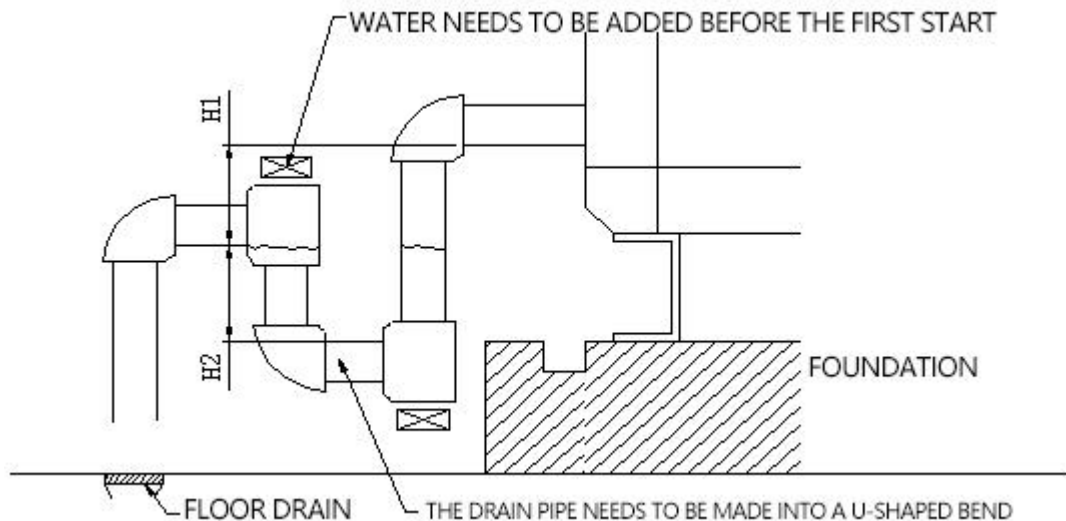
The relevant contents of this manual are for the normal operation, maintenance and repair of air-cooled constant temperature and humidity clean air-conditioning

units.

Relevant management/maintenance/operation personnel must read the relevant contents of this manual in detail in order to use the equipment correctly.

2. Unit Installation

- 1、Sufficient space is left around the unit, especially on the inspection door and the side facing the external water pipe, for maintenance equipment to enter and exit.
- 2、The unit should be placed on a flat base (cement or welded channel steel).
- 3、There should be a floor drain in the machine room to facilitate the discharge of condensate or sewage when cleaning the unit.



Schematic diagram of condensate drain pipe (Figure 3)

In the figure, when the machine is under negative pressure, $H1 \text{ (mm)} = p$

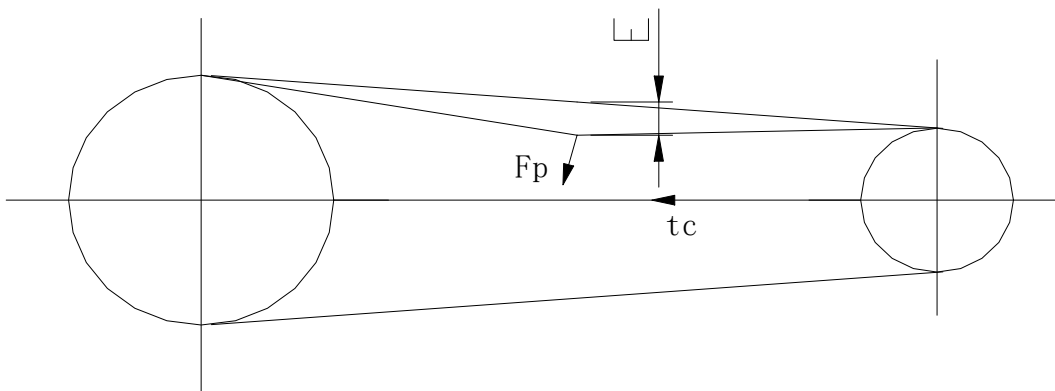
$$H2 \text{ (mm)} = p \cdot 0.75$$

When the internal pressure is positive, $H1 \text{ (mm)} = 35\text{mm}$

$$H2 \text{ (mm)} = p + 50 \text{ mm}$$

(p is the total static pressure of the unit)

- 4、Adjustment of the pulley:

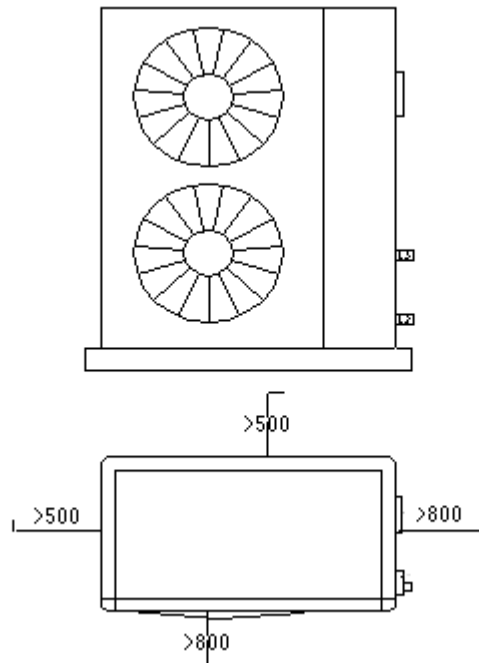


When the force F_p is 125N and the moving distance of the belt is $E=25\text{mm}$, it is appropriate. At this time, the tension t_c on the motor is the minimum tension. When the belt is loose, it can be adjusted appropriately, but the force t_c cannot be too large, otherwise it will affect the life of the bearing.

5、 The shock absorber must be tightened when the machine is being moved, and the equipment should be lowered slowly so that each shock absorber is evenly stressed at the same time to avoid damage to the shock absorber. Do not use welding to connect the equipment to the shock absorber.

6、 Installation of the unit

(A) Outdoor unit installation:



As shown in the picture above: the distance from obstacles on all four sides must not be less than the above nominal values!

The air side heat exchanger of the outdoor unit of the central air conditioning unit always exchanges heat with the ambient atmosphere. When cooling, the condenser must dissipate heat to the atmosphere. Since higher condensing temperature or lower evaporation temperature will reduce the operating efficiency and reliability of the unit, in order to give full play to the efficiency of the unit , the selection of its installation location must follow the following principles:

01) In order to prevent the exhaust gas from the air-side heat exchanger from short-circuiting, the exhaust gas of the unit should not flow back when the unit is installed, and sufficient maintenance space should be left around the machine.

02) Make sure there are no obstacles outside the air inlet or outlet of the unit. If there are any, remove the obstacles blocking the air inlet or outlet.

03) The installation site must be well ventilated and have smooth exhaust so that the unit can inhale and exhaust sufficient air, and ensure that the exhaust and operating noise of the unit does not affect the neighbors.

04) The installation place should be large enough to bear the weight of the unit and be able to isolate noise and vibration.

05) Avoid direct sunlight. If necessary, it is best to install a sunshade.

06) The installation position must ensure that the air outlet will not face strong winds, and the unit's condensation exhaust must be unobstructed.

07) The installation location must be able to drain rainwater and water generated by defrosting, and must not be affected by garbage and oil mist.

08) When installing the connecting pipe between the main unit and the outdoor unit, an insulation layer should be added to prevent condensation during summer use; the threaded connection should be sealed with a bell-shaped mouth to prevent refrigerant leakage from causing a deterioration in the refrigeration effect; after installation and connection, a soapy water leak test should be used to check for micro-leakage; $\Phi 1/2$ " is the liquid supply pipe, and $\Phi 3/4$ " is the return air pipe. When connecting the two pipes, pay attention to connecting them separately to avoid incorrect connections that cause a deterioration in the refrigeration effect.

09) The rated voltage of the power supply is (380 V, 50HZ). The power supply wiring must comply with the relevant provisions of the national electrical standards, and the installation site must be convenient for wiring and line layout.

7、Debugging of air conditioning units

- 01、 When charging the refrigerant in the air conditioning system, be sure to add it evenly, otherwise it will cause damage to the unit;
- 02) Make sure there is no air inside to avoid excessive high voltage, excessive current, and excessive temperature, which may cause poor cooling effect.
- 03) Inspection before operation
 - Check whether the indoor unit's connection wires are connected correctly and whether the fan's wind direction is correct;
 - Check whether each valve and pipeline system is open;
 - Finally, confirm that the wiring of the electrical control box, various pipeline connections, and air duct connections are all correct!

3. Operation of the unit

Before starting the air conditioner, all preparations should be made, the power supply should be complete, all debris in the air duct should be cleared, and the sealing of each pipe should be checked.

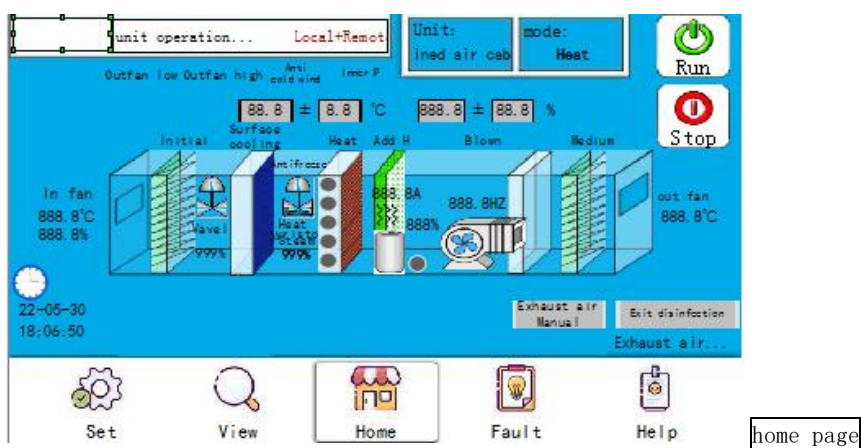
1. Before starting the supply and return fans, all wall panels and measuring holes should be closed and sealed. The condensing fan wires should be connected before starting. After starting, the high-pressure working pressure of the compressor should be within the range of (13-23kg/cm²); the low-pressure working pressure should be within the range of (3-6kg/cm²). When the air conditioner is tested without connecting all the air ducts, 3/4 of the air outlet should be blocked. To prevent the motor from burning out. After the fan reaches the rated speed, the bearing temperature should not be too high. After the new installation is completed, the monitoring operation time should be no less than 2 hours, and the trial operation time for the repair installation should be no less than half an hour. If no abnormal phenomenon occurs, it can be officially used. The power selected by the fan refers to the power consumption plus mechanical loss and the appropriate safety factor under specific working conditions. The current should be strictly controlled during operation. It must not exceed the rated value of the motor, otherwise it will burn out the motor.

- 2、 During the test run, close the air valve 3/4, start the unit and then slowly open the air valve.
- 3、 If the current is found to be too large during operation and does not meet the use requirements, or if less flow is needed in a short period of time, the valve can be used to adjust it to meet the use requirements.
- 4、 When the unit is in test operation, it is best to start it for 5 seconds and then shut it down to check if there is any abnormality in the unit. If any abnormality is found during the start-up or shutdown of the fan or during operation, it should be checked immediately.
- 5、 For minor faults found during the inspection, the cause should be promptly identified and eliminated; if a major fault is found, the vehicle should be stopped immediately for maintenance.
- 6、 If the belt is found to be stretched and slipping, it should be adjusted in time. If the coil is running chilled water, an exhaust valve is installed on the top to facilitate the exhaust of the gas in the coil during the commissioning of the unit.
- 7、 The unit starts, and the temperature and humidity parameters are set. Power on: You can enter
 1. Boot page



After the controller is powered on, the power-on interface is displayed first, as shown in the figure above, which mainly displays the manufacturer's logo. After a 30-second countdown, it enters the main page (you can choose whether to display the manufacturer's information on the manufacturer parameter setting page); {During the countdown, you can also directly click anywhere on the screen to enter the main page}

2. home page



3. User parameter settings



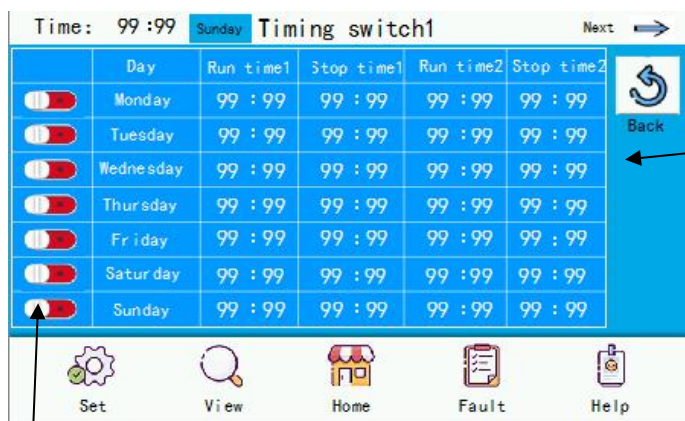
Press the parameter setting key and enter the correct password {default 2222} to enter the user parameter setting page:

3.1 User parameters

parameter name	default value	scope	illustrate
1. Set the temperature	20.0°C	Variable (controlled by upper and lower limits of return air temperature)	Setting temperature control targets
2. Temperature accuracy	02.0°C	0.5~04.0°C	Set temperature control accuracy
3. Temperature compensation	00.0°C	-10.0~10.0°C	Used to correct temperature measurements
4. Set humidity	50.0%	Variable (controlled by upper and lower limits of return air humidity)	Setting humidity control targets
5. Humidity accuracy	05.0%	02.0~10.0%	Setting humidity control accuracy
6. Humidity compensation	00.0%	-20.0~20.0%	Used to correct humidity measurements
7. Whether to use remote switch	no	No~Yes	Set whether to use the remote switch, <i>[Stop status is valid]</i>
8. Control Mode	Air supply	Air supply~cooling~heating~constant temperature and humidity	Set the temperature and humidity control mode, <i>[Stop state effective]</i> Air supply mode: only turn on the air supply fan without energy

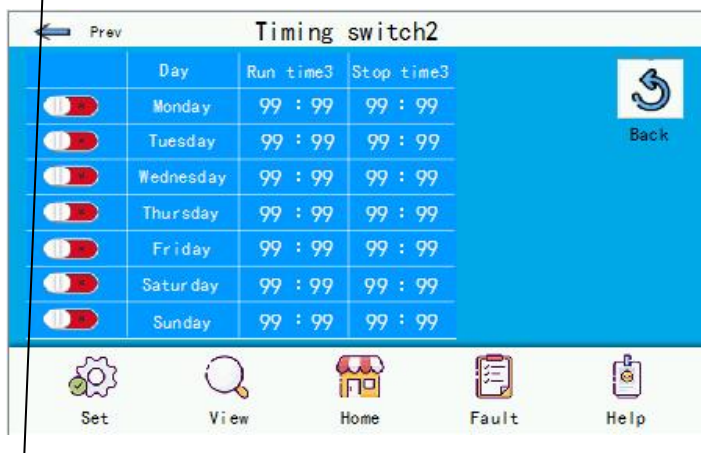
			regulation; Refrigeration: Refrigeration and humidification only Heating: Heating and humidification only Constant temperature mode: constant temperature and humidity control;
9. Minimum temperature of front stage refrigeration	5.0℃	5.0~30.0℃	It only works when using the front stage cooling function
10. Reset difference of the minimum temperature of the front stage refrigeration	1.0℃	1.0~10.0℃	
11. Minimum operating frequency of fan	35 HZ	30~50HZ	Use frequency converter
12. Wind speed /wind pressure	Wind speed 9.0m/s Wind pressure 90pa	0~2 00 .0m/s 0~2 000 .0m/s	
13. Power-on self-recovery	Disable	Disable ~Enable	When the unit suddenly loses power, power it back on to restore the state before the power failure.
15. Minimum temperature for hot water antifreeze	5.0℃	0.0~10.0℃	Use hot water only
16. Hot water exits antifreeze temperature	16.0℃	0.0~25.0℃	
17. Disinfection time	15min	0~300min	Set disinfection time
18. Disinfection mode	Manual	Manual~Timing	Select the disinfection mode
19. Scheduled Date	Monday to Friday		Timing cycle
20. Scheduled time	18:00		Timing
21. Delayed startup after exhaust	0	0~180min	if greater than 0, the machine will automatically start after disinfection.
22. Disinfection operation frequency	35	30~50HZ	Disinfection is a fixed frequency inverter
23. Ventilation time	30min	0~300min	Set the exhaust time

3.2 Timing power on/off



When the automatic power on and off starts, the boot time is the same as the current time, and the boot is automatically turned on; When the shutdown time is the same as the current time, it will automatically shut down; It is possible to

Timer switch page 1



Timer power on/off page 2

Click to control whether the week automatically switches on and off, left off and right on

4、 Working Logic

5、 After setting the temperature and humidity, press the power button to turn on the controller, and the controller will work according to the following process:

4.1 Boot process

Start the blower start signal - wait for the blower start delay - start temperature and humidity adjustment

4.2 Shutdown process

Turn off humidification - wait for 5 seconds - turn off electric heating 1 and compressor 1 - wait for 5 seconds - turn off electric heating 2 and compressor 2 - wait for 5 seconds - turn off electric heating 3 and compressor 3 - wait for 5 seconds - turn off electric heating 4 and compressor 4 - wait for 10 seconds - turn off cooling water pump or condensing fan - wait for 5 seconds - turn off fan

5. Failure

Blower overload fault: Power-on detection; if the fault lasts for 2 seconds, turn off the blower, compressor, water pump, electric heater and humidifier.

Wind pressure failure: After the blower is started, the test will be carried out after a delay of 45 seconds; if the failure lasts for 2 seconds, the blower, compressor, water pump, electric heater and humidifier will be turned off.

Compressor high-voltage fault: Power-on detection; if the fault lasts for 2 seconds, shut down the corresponding compressor.

Compressor low pressure fault: After the compressor is started, the compressor low pressure protection time is delayed; if the fault lasts for 2 seconds, the corresponding compressor will be shut down.

Compressor overload fault: Power-on detection; if the fault lasts for 2 seconds, shut down the corresponding compressor.

Internal coil temperature probe failure: When the probe is not connected, an alarm will sound and the corresponding compressor will be turned off.

Internal/external phase sequence protection fault: power-on detection; if the fault lasts for 2 seconds, turn off the blower, compressor, electric heater and humidifier.

External interlocking fault: Power-on detection; if the fault lasts for 2 seconds, turn off the blower, compressor, electric heater and humidifier.

Water flow switch: After the water pump is started, the detection is delayed for 45 seconds; if the fault lasts for 2 seconds, the water pump and compressor are turned off.

Water pump overload: Power-on detection; if the fault lasts for 2 seconds, turn off the water pump and compressor.

Condensing fan overheating: Power-on detection; if the fault lasts for 2 seconds, turn off the compressor and condensing fan.

Cooling tower fan overheating: Power-on detection; if the fault lasts for 2 seconds, turn off the compressor and cooling tower fan.

Electric heating overload fault: Power-on detection; if the fault lasts for 2 seconds, turn off the electric heating

Filter blockage fault: Power-on detection; if the fault lasts for 2 seconds, an alarm will be issued

Temperature probe failure: When the detected temperature is less than the minimum range value +1 or greater than the maximum range value -1 and lasts for 3.5 seconds, the temperature probe is considered to be faulty; the fault is automatically reset;

Humidity probe failure: When the detected humidity is less than the minimum range value +1 or greater than the maximum range value -1 and lasts for 3.5 seconds, the humidity probe is considered to be faulty; the fault is automatically reset;

Electric heating probe failure: When the probe is not connected, an alarm will sound and all electric heating will be turned off.

Electric heating temperature is too high: when the electric heating temperature is higher than the set electric heating over-temperature, it is considered a fault and the electric heating is turned off; when the electric heating temperature is lower than the set electric heating reset temperature, the fault is eliminated;

Hot water probe failure: When the probe is not connected, an alarm will sound and the hot water valve will be closed.

Hot water temperature is too high: When the hot water temperature is higher than the set electric heating over-temperature, it is considered a fault and the hot water valve is closed; when the hot water temperature is lower than the set hot water reset temperature, the fault is eliminated;

Wind speed is too low: When using wind speed frequency conversion, the wind speed is measured. If it is lower than the set fault wind speed, it is considered a fault and the blower, compressor, water pump, electric heater and humidifier are turned off;

Humidification current is too high fault: When using integrated humidification, if the humidification current is 1.5 times higher than the set current, it is considered a fault and the humidification is turned off.

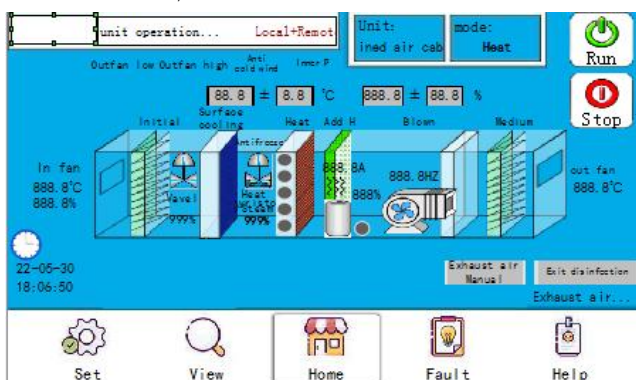
Humidification current too low fault: When using integrated humidification, if the water inlet valve is opened and the water inlet delay timeout, the humidification current is lower than 1/4 of the set current, which is considered a fault and the humidification is turned off.

Insufficient humidification current : When using integrated humidification, if the water inlet valve is opened and the humidification barrel life is extended, the humidification current does not reach the set current, which is considered a fault and the humidification is turned off.

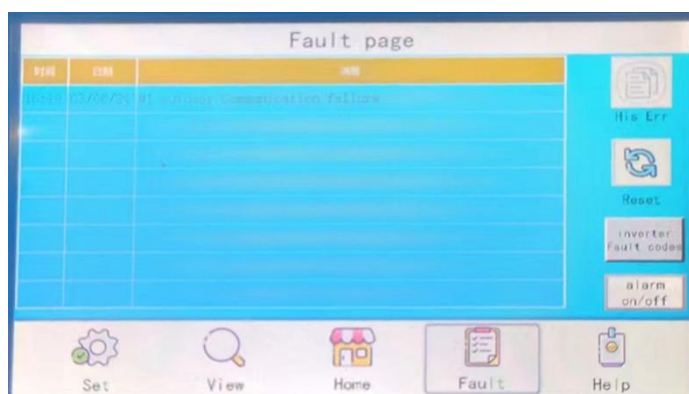
Cooling water probe failure: When the probe is not connected, an alarm will be triggered to shut down the water pump, water tower, and compressor.

Cooling water outlet temperature is too high: When the cooling water outlet temperature is too high, an alarm will be triggered to shut down the water pump, water tower, and compressor.

The unit needs maintenance 1, the unit needs maintenance 2, the unit needs maintenance 3: When the usage time is greater than the set usage time, it is considered a fault and the password must be manually entered to clear the fault;



If the unit has no fault, it will display “No Fault”. If the unit has a fault, it will display “Fault” and flash. Press the fault page to enter:



When the external I/O signal is reset, press the reset button to clear the fault;

When the number of faults exceeds 5, press the Previous or Next button to view them;

Press the View Historical Faults button to view historical fault records;

Warning: When the sterilization function uses ozone sterilization, please carefully set the start and end time of the timed sterilization when using the timed sterilization function, otherwise it may cause personnel poisoning!

The unit parameters are set at the factory or during commissioning,

and generally do not require user settings! ! !

The unit is equipped with a variety of automatic protection devices.

The set values of each protection have been set before leaving the factory.

Users should not change them at will.

Unintentional changes to the settings may cause the unit to malfunction.

4. Use and maintenance of relevant functional sections of the unit

1. Primary filtration:

The most basic filtration of air can also protect the surface cooler, humidifier, and medium-efficiency filter from being contaminated by dust and affecting the effect. The coarse-effect filter should be checked and cleaned regularly during use to prevent the coarse-effect filter from being too dusty, affecting the air flow rate and increasing the air flow resistance.

Cleaning method:

1. For primary filters made of non-woven fabrics, use compressed air to blow them in the opposite direction to remove dust before cleaning. Then soak and decontaminate them with warm water and detergent (degreasing agent), and then soak them with clean water. After drying, they can be reused. Do not use too hot water to clean them, and avoid using high-pressure water to flush or rub them, so as not to damage the fiber structure of the non-woven fabric and affect the filter effect. After three cleanings, the non-woven fabric filter should be replaced and should not be used again.

This unit uses an imported external balanced expansion valve, which has been adjusted at the factory or set to the best state during commissioning! Non-professionals are not allowed to adjust it at will to avoid malfunctions!!!

2. Evaporator :

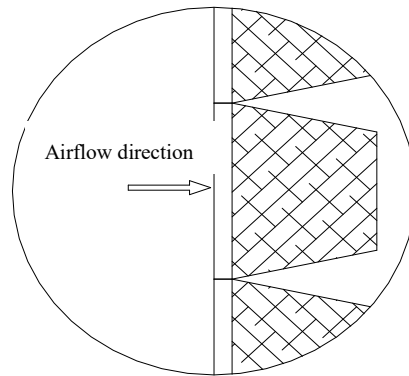
The following precautions should be taken when using the evaporator: After a certain period of use, the surface of the evaporator will be stained with a lot of oil and dust, which will affect the heat exchange effect of the evaporator. Therefore, the evaporator should also be cleaned regularly with special cleaning solutions, but alkaline or acidic detergents should not be used to avoid damaging the aluminum fins. The cleaning effect is also better when using hot water and detergent. After cleaning, be sure to rinse with clean water to avoid corrosion caused by detergent or solution remaining on the fins. Also, try to rinse the detergent and solution remaining in the basin.

3. Medium efficiency filtration:

Medium efficiency filtration (F6 grade) (is an air filter of a higher level than coarse efficiency filtration, generally made of non-woven fabric or glass fiber bag filter or box filter. The filter has one-time and multiple-time use. Multiple-time use can be reused. The following matters should be noted during installation:

- 1、 Airtightness: Since the medium-efficiency filter has a higher filtration efficiency, the installation has higher requirements for airtightness to avoid air leakage and affect the air filtration effect.
- 2、 Directionality: For bag and box filters, filter installation is directional.

The standard installation is as follows:



Like the coarse-effect filter, the medium-effect filter should be inspected and cleaned regularly. When cleaning, pay attention to the following points:

- 1、 First, blow the filter in the opposite direction with dry and clean compressed air to remove some of the floating
The dust on the device is blown out from the air inlet.
- 2、 Soak the filter in warm water and detergent to remove the oil from the filter surface.
- 3、 Do not rub the filter bag cloth hard or soak the filter in high-temperature water. Do not use high-pressure water to wash, so as not to damage the fiber structure of the bag cloth.
- 4、 After soaking, rinse repeatedly with clean water, dry it in the air or in the sun before reuse.
- 5、 Generally, the medium efficiency filter should be replaced after cleaning two to three times.

4. Heater:

The heaters include steam heaters, hot water heaters, and electric heaters (except heat pump heaters). Except for electric heating, the structures of steam heaters and hot water heaters are similar to those of cold water surface coolers, and the installation and maintenance matters are basically the same.

This set of equipment uses electric heating and is designed and installed in one group. When using electric heating, the following matters should be noted:

- 1、 Do not allow metal objects to approach or touch the electric heating wires and heating tubes to avoid short circuits or leakage.
- 2、 There should be no flammable materials near or on the surface of the electric heater to avoid ignition of the material .
- 3、 There should be no possibility that water could come into contact with the electric heater.
- 4、 The control circuit of electric heating is generally equipped with overheating (60° C) and underpressure protection (dry burning caused by no wind) protection systems, which cannot be changed at will.

After using for a period of time, a certain amount of dust will accumulate on the surface of the electric heater, which should be cleaned in time. When cleaning, do not use water, but blow it clean with dry compressed air.

5. Electrode humidification:

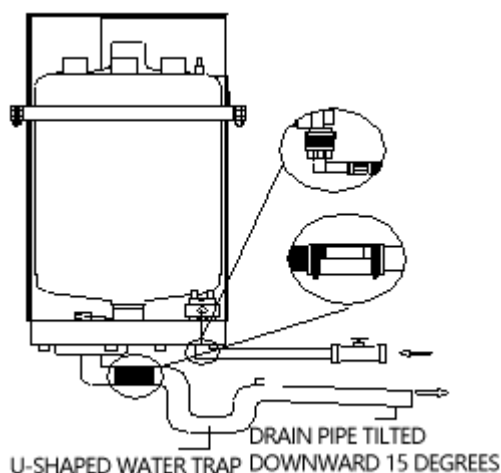
1. Working process:

- 1) . When the water inlet solenoid valve is opened, water flows into the water supply pipe through the water supply valve and enters the water storage tank of the water supply box. When the tank is full, it overflows into the water supply pipe and flows into the humidification barrel through the drain valve.
- 2) When the electrodes come into contact with water, a circuit is formed and heating begins until it boils and produces steam. (When the water level reaches a certain height, the control system will close the water inlet solenoid valve and stop the water inlet. As the steam is generated, the water level will drop. When it drops to a certain height, the control system will open the water inlet solenoid valve again and let the water in again.)
- 3) . Steam is sprayed out through the delivery pipe to the distributor and humidification begins

2. Product installation

2.1 Waterway installation

The installation of the humidifier water circuit requires the connection of the water supply and drainage pipes.



- 1.A water switch is installed on the water supply line.
- 2.A filter is installed on the water supply line
- 3.The drain pipe can withstand high temperatures of 100C
- 4.The slope of the drain pipe is greater than 10°
- 5.The drain pipe should be located lower than the humidifier drain outlet
- 6.The first section of the drain pipe uses an insulating rubber tube > 50mm
- 7.A water storage bend is installed on the drain pipe

※Important warning: Flush the water inlet pipe for about 10 minutes before installation to prevent impurities from clogging the water inlet solenoid valve or generating foam during humidification.

2.1.1 Water supply

For easy installation, the user should lead the water source to within 1.5m of the humidifier before installation. Our company provides a 4'/6' water inlet hose. When installing the water pipe, the 6' connector is connected to the humidifier water inlet solenoid valve, and the other end is a 4' connector, which is connected to the water source (if there is a filter, the 4' connector is connected to the filter, and the filter is connected to the water source).

Important Warning:

The water inlet pressure must be between 0.1–0.5mPa. If the water pressure is too high, a pressure reducing valve must be used to adjust it to between 0.1–0.5mPa. The water inlet temperature must be less than 50° C. At the same time, sewage and water containing sediment must not be injected into the humidifier.

Make sure the humidifier water inlet pipe connection is well sealed.

The switch or filter that disconnects the water line should be installed in a place where it can effectively filter out any solid impurities (such as the connection between the humidifier water inlet connection pipe and the water source).

2.1.2 Drainage

The material of the drain pipe can withstand temperatures above 100 ° C .

Important warning : The drainage pipe must be unobstructed, a water storage bend should be installed in the drainage pipe of the humidifier, and the position of the drainage pipe should be about 30cm lower than the humidifier drain outlet.

In order to prevent ground leakage, the first section of the drainage pipe must be insulated with an insulating rubber tube ($\geq 50\text{mm}$).

3. Equipment operation

Important warnings

- Before starting the equipment, check that the humidifier is in good condition, there is no water leakage, and the electrical components are kept dry.

- If the device or components are damaged or partly wet, do not connect the device to the power supply.

- Flush the water inlet pipe for about 10 minutes before installation to prevent impurities from clogging the water inlet solenoid valve or generating foam during humidification.

Before starting the humidifier, perform the following checks:

- Whether the electrical circuits, water connections and steam distribution system are installed in full compliance with this operating manual.

- The water supply switch of the equipment is in the open state.

- The steam delivery pipe is installed correctly.

4. Maintenance of humidification barrel

4.1 Humidifier cylinder maintenance

The life of the humidifier cylinder depends on various factors (including carbonates in the water, corrosion of the electrodes, correct use of the humidifier, steam output, output water quality and careful regular maintenance). Due to aging of the plastic and wear of the electrodes, even removable humidifier cylinders have a limited working life, so we recommend replacing the evaporator cylinder after 5 years or 10,000 working hours.

Important Warning:

The electrical components in the humidifier equipment are high-voltage components, and the humidification barrel is a high-temperature component. Maintenance and repair operations require professional personnel to perform. Before performing any operation on the humidification barrel, make sure that the power supply of the equipment is disconnected and carefully read the operating instructions and precautions described in this manual. Use the manual drainage button on the control panel to drain the water in the humidification barrel before removing the humidification barrel from the humidifier.

4.2 Regular inspection

- **After one hour of operation**

Check for leaks on both non-detachable and detachable humidification cylinders.

● **Two weeks of operation or no more than 300 working hours**

For non-detachable and detachable humidification barrels, check whether there is water leakage and whether the humidification barrel is operating normally; when the machine is working, check whether there is deformation and sparks between the electrodes.

● **Three months of operation or no more than 1,000 working hours**

For non-detachable and detachable humidification cylinders, check for leaks (if so, replace the evaporation cylinder); for detachable humidification cylinders, check if there are obvious blackened areas on the cylinder wall (if so, check the condition of the electrodes; if necessary, replace the evaporation cylinder together with the O-ring and gasket).

● **One year of operation or no more than 2,500 working hours**

Replace the non-detachable humidifier cylinder; for detachable humidifier cylinders, check whether there is an obvious blackened area on the inner wall of the cylinder (if there is, check the condition of the electrodes; if necessary, replace the humidifier cylinder together with the O-ring and gasket)

● **After 5 years of operation or no more than 10,000 working hours**

Both non-detachable and detachable humidification barrels need to be replaced.

Due to long-term use, a layer of solid matter will adhere to the inner wall of the humidification barrel. The presence of these solid matter will soften or even melt the plastic barrel wall. To prevent this from happening, please carefully check the degree of blackening of the inner wall of the humidification barrel and the amount of solid accumulation. It is recommended to clean the detachable humidification barrel and electrodes every three months. Use clean water with a certain pressure to flow out the scale and impurity sediment on the electrode, and clean the electrode mechanically and using chemical cleaning agents. When installing the electrode, assemble it in reverse order, and check whether the sealing gasket is intact.

When the electrode is corroded and its volume is less than 1/2 of its original volume, or the electrode is full of scale with a thickness of more than 10mm, it is recommended to replace the electrode.

Warning : When dealing with a water leak, use insulating tools before touching the humidifier barrel to avoid electric shock.

In case of seasonal shutdown or continuous shutdown for more than 48 hours, the residual water in the humidification cylinder should be completely drained and the humidification cylinder should be inspected and cleaned.

5. Maintenance of water circuit components

Important warnings

- 1、 Do not use detergents or organic solvents when cleaning plastic components.
- 2、 Use 20% acetic acid solution to remove scale, then rinse with clean water.
- 3、 With steam humidifiers, only the humidification cylinder needs to be replaced regularly.
- 4、 When there is too much scale remaining in the humidifier barrel, it will prevent the effective passage of current. At this time, the humidifier barrel needs to be cleaned, maintained or replaced.
- 5、 The operation of replacing the humidification cylinder is determined by the water quality. The higher the salt content or the more impurities in the water, the more frequently the humidification cylinder should be replaced.

After replacing the humidifier cylinder, check whether the inlet and outlet pipes are

correctly connected and whether the corresponding sealing gaskets are used. Then restart the unit and perform 2-4 water inlet / outlet operations to check for water leaks.

Attachment: Control panel manual and troubleshooting

10. Common faults and solutions of OEM humidifiers

Serial number	Working conditions	Cause Analysis	solution
1	The humidifier does not work and no steam is produced	No power supply	1. Check the humidifier power supply system 2. Make sure the wiring is correct
		No water source	1. Check whether the water valve is open and the pressure is between 0.1-0.5Mpa
		Control panel not working	1、Is the wiring correct? 2、Whether the control signal meets the requirements and is connected correctly
		Chain not closed	1. Check whether the interlocking control is connected correctly and closed.
		Low water conductivity	➤ Is tap water used? ➤ If it is distilled water or purified water, you need to change the water source
2	The humidifier does not take in water	Check the reasons for sequence number "1"	
		Fuse burnt out	Check whether the fuse on the control panel is intact.
		Water inlet solenoid valve is blocked	Cleaning water inlet solenoid valve
		Water inlet solenoid valve burnt out	Replace the water inlet solenoid valve
		Too much scale in the humidifier barrel hinders water inflow	Cleaning the humidifier barrel
3	Humidification nozzle spray water	Steam pipe is too long	If the steam pipeline is longer than 1.5 meters, insulation should be done outside the delivery pipe to prevent condensation.
		V-shaped bend in the steam delivery pipe	The steam delivery pipe should be smooth
		Steam distributor is not installed correctly	Without a 15° tilt, condensed water cannot flow back
		Condensate pipe blocked	Unclogging the condensate pipe
		Too many impurities in the water source cause excessive foam in the humidification barrel, which sprays out from the nozzle	Change water source or install filter

6. Fan section:

The fan section is the main power system of the air conditioner. For example, the fan, motor, transmission system, and vibration reduction system should be used and maintained with the following precautions:

- 1、The transmission belt will be stretched after a period of use, affecting the transmission

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- effect. It should be properly tightened by moving the motor backward to tighten the belt. However, the belt should not be too tight, so as not to increase the motor load and reduce the belt life. The appropriate belt tightness is that after the belt is made, the belt will be pressed down to a certain bending size by hand with appropriate force. (25mm to 30mm), the longer the total length of the belt, the larger the size that can be pressed down, and the belt will return to straightness after letting go. At the same time, keep the axis of the transmission belt perpendicular to the axis of the motor and fan.
- 2、Some types of fans have bearings that can be greased. Such fans should be lubricated regularly. When lubricating, pay attention to the transmission belt and the pulley should not be contaminated with oil to avoid slipping of the belt.
 - 3、The motor surface should not be covered with too much dust and oil to affect the heat dissipation of the motor. It should also not be contaminated with water to avoid leakage of the motor.
 - 4、After a long period of use, the transmission belt will be obviously worn and stretched, and can no longer be used. At this time, it should be replaced with the original belt type and length. When replacing, adjust the belt tension again.
 - 5、Be careful not to have any foreign matter in the fan. When the fan runs at high speed, it may cause damage to the fan and cause danger.

**The electrical controller of the unit should be installed, managed
and used by professionals!!!**

7. Others:

1. When the fan stops or (recently) there is a power outage, the indoor and outdoor units should be stopped immediately.
2. Nothing should be placed on the condensing fan. Be careful not to reverse it when wiring. Both fans must be started at the same time when the machine is turned on, and the compressor is started in stages.
3. Check the safety of lighting equipment and electrical equipment regularly to prevent leakage. Motors and air conditioners should be well grounded.
4. All parts that require lubrication should be filled with lubricating oil once a month.
5. The sealing strip of the wall panel should be replaced when it ages due to long-term use.
6. When inspecting the outdoor unit or compressor unit, be careful not to bend or break the pipes in the system, especially the copper pipes, as this may cause unpredictable consequences.
7. If there is any abnormality in the electric control system or electric control box during operation or startup, turn off the main switch immediately and ask a professional to repair it.
8. There must be enough space for ventilation on one side of the two condensing coils of the outdoor unit, otherwise the condensation effect will be extremely poor, resulting in a reduction in the cooling capacity of the evaporating coil.
9. The drainage pipe of the outdoor unit must be kept unobstructed. If the wiring and routing of the compressor need to be modified, professionals must be asked to do it.

, you should pay attention to safety and correct operation to avoid accidents!!!

5. Causes and countermeasures of failure

Fault	reason	Countermeasures
Bearing temperature is too high	<ol style="list-style-type: none"> 1. Insufficient lubrication, poor quality grease, deterioration, and impurities such as dust, sand, and dirt. 2. The shaft core and bearing are installed crookedly and not concentrically. 3. The belt tension is too high. 4. Bearing wear. 	<ol style="list-style-type: none"> 1. Replace or add lubricating oil. 2. Adjust the concentricity between the bearing and the shaft core. 3. Adjust the motor to make the belt tight. 4. Replace the bearings.
There is a sliding sound when the unit starts	<ol style="list-style-type: none"> 1. The belt is loose. 2. Starting speed is too fast. 3. The fastening screws of the motor or windmill are loose. 	<ol style="list-style-type: none"> 3. Adjust the belt. 4. Use Y- Δ starting or variable frequency starting. 5. Tighten the screws.
The motor makes a running sound but the fan does not run	<ol style="list-style-type: none"> (1)The unit is missing a phase. (2)The fan is blocked by foreign matter. 	<ol style="list-style-type: none"> (1) Check the power circuit and install phase loss protection. (2) Remove foreign matter.
The unit has condensation	<ol style="list-style-type: none"> 1. The sealing strip of the unit panel is leaking air. 2. The dust screen is clogged, causing the air volume to be too small and the temperature to be too low. 3. Coil blockage causes the wind speed passing through the coil to be too high, resulting in water splashing or the air supply temperature being too low. 4. Check whether the supply or return air valves are open, and whether any valves with automatic control devices fail. 5. Water accumulates in the water pan and the condensate pipe is clogged. 6. The connecting air duct is too long, the pressure loss is greater than the residual pressure of the unit, the air supply volume is excessive, and the minimum temperature is too low. 	<ol style="list-style-type: none"> 01. Re-apply the sealing strip. 02. Clean the dust screen. 03. Clean the coil. 04. Open the supply and return air valves and check the valve automatic control devices. 05. Changing the valve of the automatic control device 06. Change the motor pulley or minimize the pipe loss.
Cooling capacity	<ul style="list-style-type: none"> ➤ The temperature sensor has failed. ➤ The electric two-way valve or 	<ol style="list-style-type: none"> 6. Replace the temperature sensor. 7. Re-adjust the electric two-way

deteriorates	three-way valve fails. ➤ Coil scaling. ➤ The fresh air valve is adjusted too large. ➤ The dust screen is clogged.	valve or three-way valve. 8、Clean the coil. 9、Re-adjust the fresh air valve. 10、Clean the dust screen.
The compressor stops for no reason	1. High voltage protection action 2. Low voltage protection action (3) Control circuit failure (4) Compressor overheat protection action (5) PLC control program manual modification	1.2. Find out the reasons for the high and low voltage protection and eliminate them (3) Check and repair control circuit components (4) Find out if the current is too high, stop the compressor for 20 minutes and then restart it! (5) Have professionals readjust the PLC program

6. Unit maintenance

1. Electrical

1. This unit should be equipped with a dedicated power supply with a power supply voltage fluctuation range of $\pm 10\%$. An automatic air switch should be used with a rated current of 1.5 times the operating current of the unit . It is absolutely forbidden to use a knife switch.
2. The unit should be reliably grounded.
3. Do not operate the main engine switch frequently, no more than four times per hour. The electric control box should be protected from moisture.
4. For three-phase power supply units, the unit is equipped with a phase sequence protector and has phase sequence requirements for the external power supply. If the control panel does not respond when power is supplied and the unit does not start, please turn off the main power supply, adjust the phase of the external three-phase power supply, and then restart the unit.

2. Unit Maintenance

1. Before using the machine at the end of each season, the following work should be done:

Before starting up, the compressor should be preheated for at least 12 hours to reduce the amount of liquid R22 in the compressor when the unit is started, increase the oil temperature, and reduce compressor wear.

When using for the first time, the startup and operation of the unit should be observed. If any abnormality is found, the unit should be stopped and checked immediately.

2. Clean the outdoor unit heat exchanger (once every three months) and the indoor unit return air filter (once every month) regularly to ensure the operation effect of the air conditioner. Cleaning must be performed by professional air conditioning technicians.
3. When the air conditioner fails, please contact the dealer or agent immediately. Do not disassemble and repair the product by yourself to avoid further damage.

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4. When the machine is not used for a long time, please turn off the main power supply, otherwise the machine will still consume electricity. However, please supply power to the machine one day in advance when you start it next time so that the compressor can be preheated.
 5. Clean the air filter regularly and replace it when necessary
 6. Maintenance and servicing must be carried out after cutting off all power supplies to the unit to avoid danger.

7. After-sales service and warranty

◆After-sales service

- ※ Service and repair should be performed by dealers; improper service or repair may cause water leakage, electric shock and fire or other hazards.
- ※ If the product must be moved or reinstalled, please ask the dealer to do it; improper installation may cause water leakage, electric shock, fire or other hazards.

◆Warranty

- ※ After the dealer has filled in the necessary items, he will give you the warranty card for safekeeping. Please check the contents of the warranty card and keep it properly.
- ※ The whole machine is provided with a warranty period of twelve months from the date of delivery.
- ※ During the warranty period, any failure caused by the quality of the air conditioner will be repaired and replaced free of charge.
- ※ Provide lifelong after-sales service. For maintenance services beyond the warranty period, a certain cost will be charged as appropriate.
- ※ When requesting repair, please provide the following information:
 - Air conditioner model, factory serial number and installation date;
 - A detailed description of the fault;
 - Your name, full address and contact telephone number.
- ※ During the warranty period, the following situations will be repaired for a fee:
 - A. Failures and damages caused by incorrect installation and use by the user, as well as improper repair or modification by the user;
 - B. Damage caused by fire, earthquake, flood, lightning, poison gas, drugs, and other natural disasters, public hazards or abnormal voltage.