High-temperature Air source Heatpump for drying

OPERATING INSTRUCTION MANUAL

CE

MIMICO JOINT STOCK COMPANY

Before operating this product, please read the instructions carefully and save this manual for future use.

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Warm Reminder

Dear Customer,

Thank you for choosing the efficient, energy-saving High-temperature air source heat pump drying and dehumidifying init produced by our company. To provide you with energy-saving, environmentally friendly and safe drying equipment, energy saving and emission reduction is our common pursuit!

1. To the User

Please read this manual before installing and using this equipment. After reading this, please keep this manual in a safe place for future reference.

- Installation and maintenance should be undertaken by professionals who are familiar with national and local safety regulations. Failure to follow the instructions and precautions and safety regulations contained in this manual during installation, repair, and use may result in damage to the equipment or property loss and even injury to the operator. The best prevention is: **proper installation, correct operation and regular maintenance and care.**
- This manual is accurate at the time of publication, but due to continuous improvement of the product, the company reserves the right to change the technical data of the product without prior notice, and does not assume any responsibility.
- When reading this manual, if you need technical advice, please contact your local dealer or us.

2. Introduction to Technology of Air Source Heat Pump Drying and Dehumidifying Unit

The heat pump is essentially a heat lifting device. The air source heat pump dryer uses the reverse Carnot principle to extract heat from the surrounding environment and transfer it to the heated object (high temperature object). The working principle is same as chiller's, both of them work according to the reverse Carnot cycle principle, the only difference is the working temperature range. **Advantages in heat pump technology:**

2.1 Energy saving: thermal efficiency is 460%, operating cost is 1/3 of gas and oil-fired boilers, 1/4 of electric water heaters, 40% lower than solar energy

2.2 Environment friendly: no waste heat, waste water, waste gas

2.3 Safety: separation of water and electricity, no risk of leakage

3. Technical Prospects

The material drying process is a huge energy-consuming process. According to statistics, in most developed countries, the energy consumed for drying accounts for 7%-15% of the total energy consumption in the country, while the thermal efficiency is only 25%-50%. And most of the drying process, especially for heat sensitive materials (such as

food and biological materials), will have an effect on its color, nutrients, flavor and texture. The heat pump drying technology has the advantages of low energy consumption, low environmental pollution, high drying quality and wide application range. Its excellent energy saving effect has been proved by various experimental researches and practical applications at home and abroad.

4. The Working Principle of Air Source Heat Pump Drying and Dehumidifying Unit

The air source heat pump drying and dehumidifying unit mainly consists of a finned evaporator, a compressor, a fin condenser and an expansion valve, which allow the refrigerant to continuously complete the thermal cycle process, evaporation (to absorb the heat of the outdoor environment) → compression → condensation (heat release in the indoor drying chamber) → throttling → evaporation, so that the heat in the external low temperature environment is transferred to the drying chamber, the refrigerant is circulating in the system under the action of the compressor . It completes the gaseous pressure and temperature boosting process in the compressor (temperature up to 100 °C), it enters into the indoor unit to release high temperature heat and heat the air in the drying chamber, meanwhile being cooled and converted into liquid state, when it runs into the outdoor unit, the liquid state rapidly absorbs the heat and evaporates again into a gaseous state, and the evaporator temperature can be decreased to -0 ° C ~ -10 ° C, at this time the air around the evaporator will continuously transfer heat to the refrigerant.

The air source heat pump drying and dehumidifying unit works like ordinary air conditioners and heat pumps, absorbs the energy QA of the low temperature environment medium in the evaporator; it consumes a part of energy, that is, the compressor consumed electricity QB, through the working medium cycle, release the heat QC in the condenser, QC=QA+QB, so the efficiency of the high temperature heat pump dryer is (QB+QC)/QB, while the heating efficiency of other heating equipment is less than 1, so the heating efficiency of the air source dryer is much higher than the efficiency of other heating equipment. It can be seen that the air source heat pump dryer can be used as a drying device to save energy, and at the same time reduce the emission of pollutants such as CO^2 and achieve the effect of energy saving and emission reduction.

5. The Features of Air Source Heat Pump Drying and Dehumidifying Unit

5.1 Easy installation: Easy to install and dismantle, less floor space, can be installed indoor and outdoor

5.2 High efficiency and energy saving: Only need to consume a small amount of electricity, it can absorb a large amount of heat in the air, the power consumption is only 1/3-1/4 of the electric heater. Compared with the coal, oil, gas-fired dryer, it can save about 75% operating cost. 1kW.h of electricity can get 4kW heating capacity.

5.3 Environment friendly and pollution-free: Without any burning substances and emissions, it is a sustainable and environment friendly product.

5.4 Safe and reliable operation: The whole system runs without the danger of flammable, explosive, poisoning and short circuit which may exist in the traditional dryer (fuel, gas-fired or electric heater). It is an absolutely safe and reliable semi-closed drying system.

5.5 Long service life, low maintenance cost: It is developed based on the traditional air conditioning technology. Stable, reliable, long service life. Safe and reliable operation, automatic manual free operation, intelligent control.
5.6 Comfortable and convenient, high level of automation and intelligence: The use of self-controlled thermostat, 24 hours continuous drying operations.
5.7 Wide application range, not affected by climate: It can be widely used in heating and drying operations in food, chemical, pharmaceutical, paper, leather, wood, agricultural and sideline products processing industries.

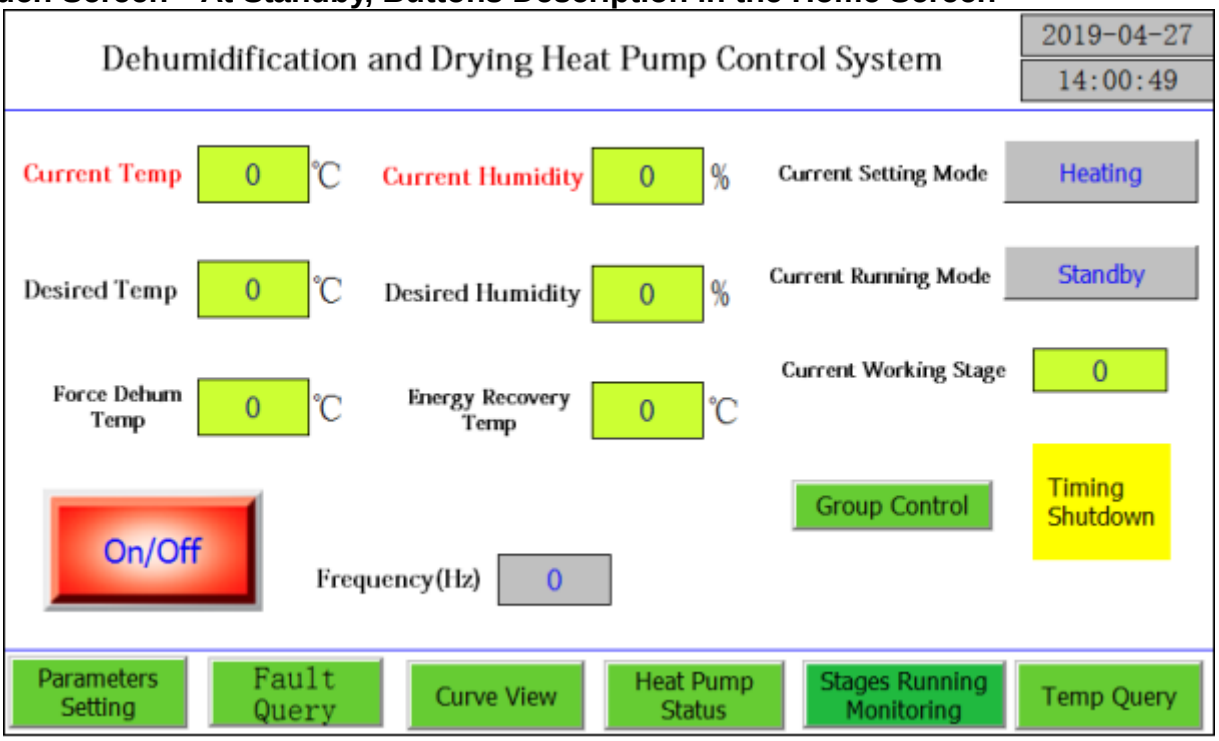
6. Application Range of Air Source Heat Pump Drying and Dehumidifying Unit

Air source heat pump drying and dehumidifying unit is suitable for the drying of bedding in hotels, seafood, vegetable dehydration, AD black white fungus, melon seeds, peanuts, fruits and vegetables, meat products, casings for sausages, tobacco, leather, mushrooms, alfalfa, dried fruits, mosquito coils, Gongxiang, cloth, clothing, grain, noodles, yuba, fertilizer, medicine, Chinese herbal medicine, paper, wood, seed, sludge, gypsum, hardware products, metallurgical products, mining by-products, chemical products, flue gas desulfurization gypsum, clay, pasture, flue-cured tobacco, pulverized coal, coal slime, lignite etc. In the aspect of industrial hot water, it can also meet the constant temperature of electroplating bath in electroplating plant, the heating and heat preservation of high temperature hot water in slaughterhouse, the supply of high temperature hot water in star hotel and the demand of high temperature hot water in industrial enterprises.

7. Operation and Application of Dehumidification and Drying Heat Pump

7.1 Operation Instruction of Air Source Heat Pump Dryer

Touch Screen At Standby, Buttons Description in the Home Screen



Description of each button operation:

Current Temp: It indicates the air inlet temperature of the dehumidification unit in the drying room, that means, the temperature of the drying room. Only measured values are displayed. It's not operational.

Current Humidity: It indicates the relative humidity measured at the air inlet of the dehumidification unit in the drying room. Only measured values are displayed. It's not operational.

Outlet Air Temp: It indicates the air outlet temperature of the dehumidification unit in the drying room, that means, the air outlet temperature of the machine. Only measured values are displayed. It's not operational.

Desired Temp: It shows the target temperature value setted in the current operating mode. When the return air temperature (Current Temp) rises to this value, the compressor stops working. After the temperature decreases by a few degrees (setted by the Temp Difference), the compressor starts running again. And it stops again after it reaches the setting temperature, so reciprocating. At this stage, the circulating fan operates as usual and it is not affected by this. Only measured values are displayed. It's not operational.

Desired Humidity: It shows the target humidity value setted in the current operating mode. When the drying room humidity drops to this value, the compressor stops working. After the humidity increased by a few degrees (setted by the Humidity Difference), the compressor starts running again. And it stops again after it reaches the setting humidity, so reciprocating. At this stage, the circulating fan operates as usual and is not affected by this. Only measured values are displayed. It's not operational.

Current Running Mode: It displays the running status of the current operating mode. It displays "Standby" when the compressor stops running. When the compressor is running, the running mode is displayed. For example, "Heating" means running in the heating mode, meanwhile the compressor is running. Only measured values are displayed. It's not operational.

Current Setting Mode: It displays the current selected operating mode, including Heating, Dehum, Cooling, Heating + Dehum, Cooling + Dehum etc. Mode selection can be done in parameters setting. (This heat pump dryer can only use the function of dehumidification, please select the Dehum mode to run.)

Current Working Stage: there are Master Stage (it displays as 11 at master stage) and Sub-stages (10 stages can be setted at sub-stages, the operating parameters of each stage can be setted independently). When it displays currently running at this stage, the unit runs according to the setting parameters in this current stage. When it's at master stage, it displays as 11. When it is running at sub-stages, the number of the current running stage is displayed, for example, "3" is displayed, the operation is performed according to the parameters setted in the 3rd stage.

Current Working Stage Remaining Time: It displays the minutes remaining in the current working stage. It automatically runs to the next stage after the minutes in this stage is completed.

Current Working Time: It indicates the cumulative running time from the time when the "On/Off" button is clicked to the current time. When accumulating to the setted working time,

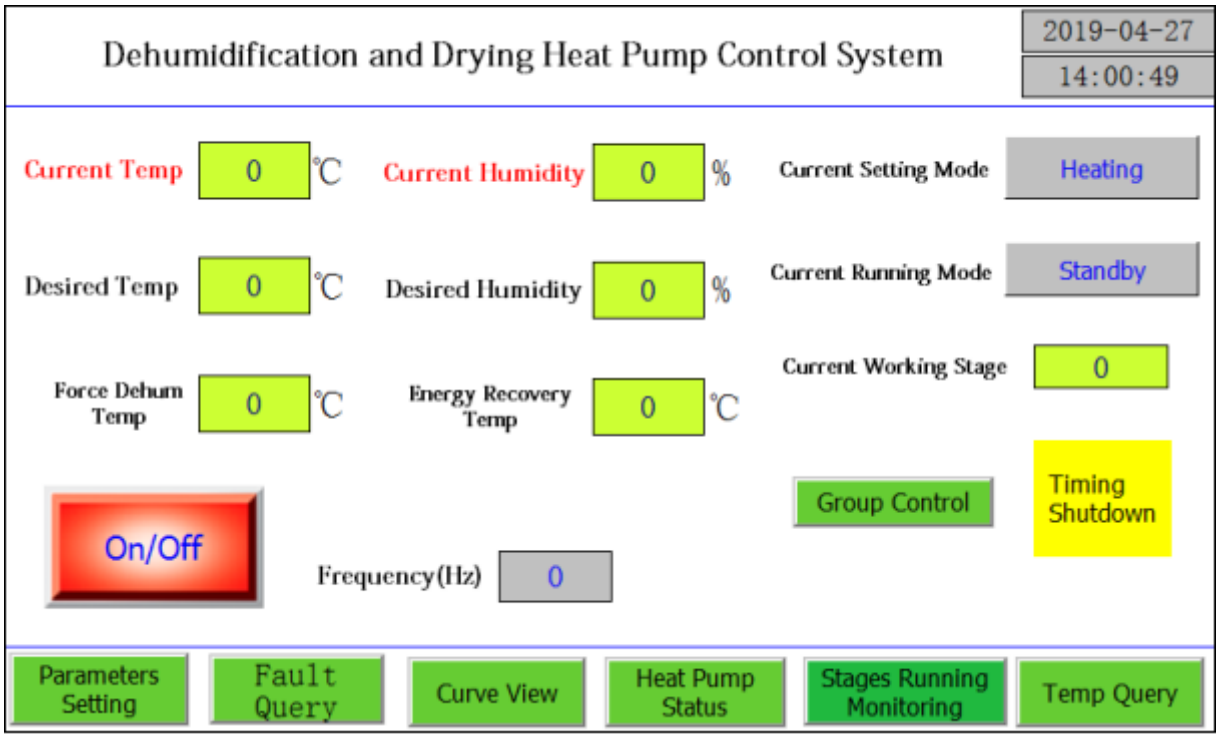
the compressor stops. After each click of the "On/Off" button, the running time is automatically cleared.

Communication Error: When the datas have bad reading between the control panel and the PC board, the red words are displayed. Power off the machine and restart, the error can be eliminated.

The above texts on the display only have display functions, and the parameters cannot be changed. For the buttons at the bottom, you can click into their corresponding pages.

Group Control: After clicking it and entering, you can switch on and off each machine. The system can control up to 8 units.

On/Off: When the red light is on, indicating that the current unit is at the off-state. After clicking it and entering, it displays the interface to confirm the execution of the power-on operation. After clicking "Confirm", the unit will enter the power-on state, and this button will display "On", and it will display light blue when starting up, see the following figure:



Time Reset: Click this button, the current working stage and the current accumulative working time will be cleared, and the running time will be calculated again from the beginning.

Online Address: Click the number's frame to set the online address to 1, which means that all the display and operation of the current display are the operating parameters of Unit 1. When the online address is set to 2, it means that all the display and operation of the current display are the operation parameters of Unit 2. As system default, the Unit 2 is setted as the main control unit. When the online address is 2, as long as the shutdown operation is performed, the operation of Units 1-8 will be automatically turned off.

Parameters Setting: Click once to enter the setting interface of the system operation parameters.
Fault Query: Click once to enter the interface of the system fault query. When there is a fault alarm, the fault content will be displayed.
Curve View: Click once to view the operation parameters curve of system temperature and humidity for the past 2 hours.
Heat Pump Status: Click once to enter the current working status of each component, whether it is running or stopped.
Temp Query: Click once to enter the system to check the temperature parameters of each part to judge the operating conditions of the unit.

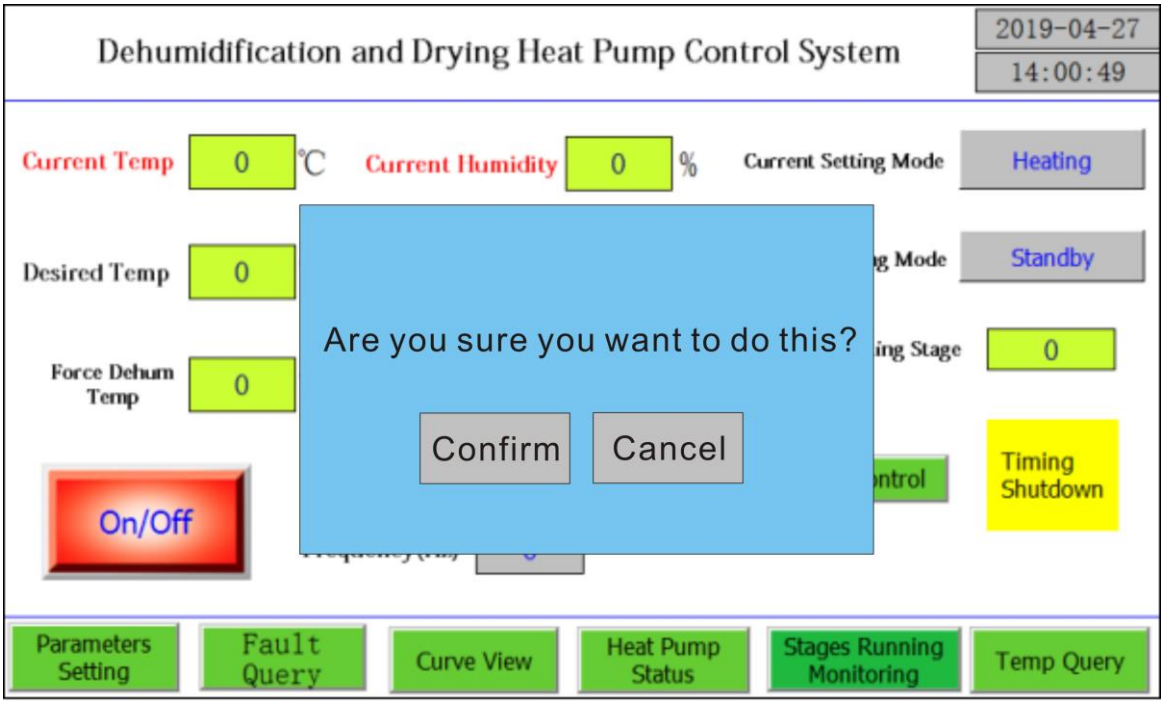
7.2 On/Off Operation:

In the state when the button is displayed as "On/Off" (red light), click the button of "On/Off", press "Confirm" to confirm the power on or off (lightly touch the button of "On/Off", press the "Confirm" button), and then turn it on. Same for power-off.

Note: Before power on/off, please adjust to each Linking Address, press "Stages Time Reset" to reset the time of each PC board, and end the accumulative time of this operation, to avoid that a shutdown occurs during the next operation due to the arrival of accumulative time because of the running time in this setting.

Several Important Setting Parameters:

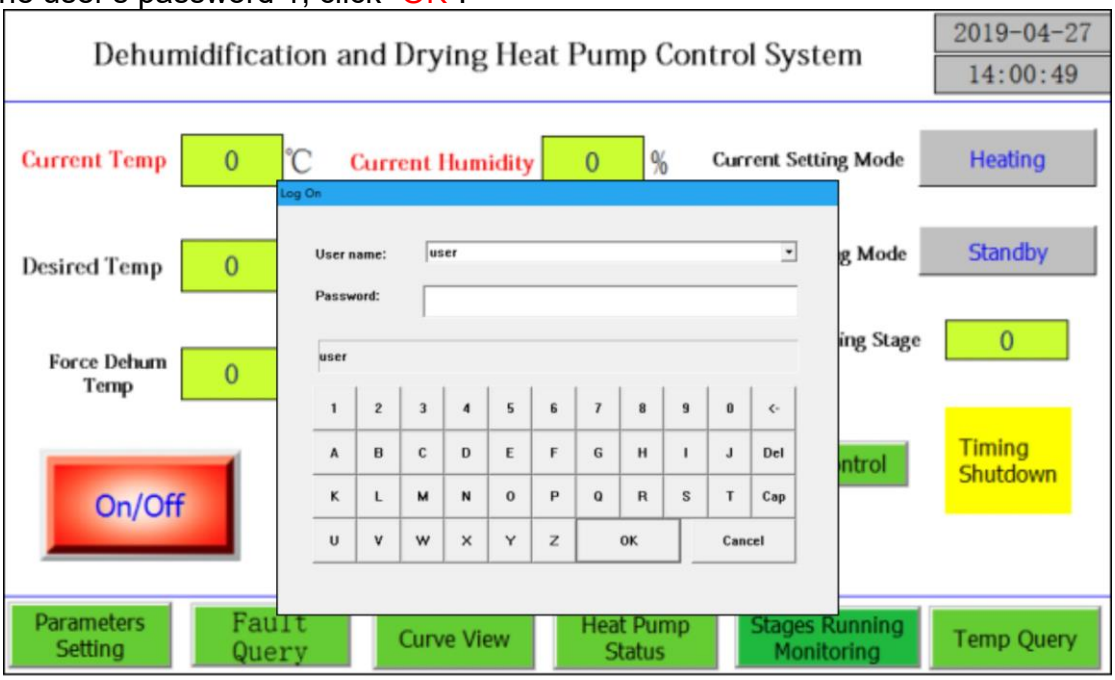
1. The operation mode should be selected correctly.
2. The desired stopping temperature (Desired Temp) is selected.
3. The desired stopping humidity (Desired Humidity) is selected.
4. Select 2-3 degrees C for the desired temp difference.
5. Select 2-3 for the desired humidity difference.
6. The heat recovery fresh air starting temperature (Heat Recovery Temp) is about 10 degrees lower than the desired temperature.
7. The forced dehumidification starting temperature (Force Dehum Temp) is 2-3 degrees C lower than the desired temperature.
8. The heat recovery fresh air temperature difference (Heat Recovery Temp Difference) and the forced dehumidification temperature difference (Force Dehum Temp Difference) are setted to 1-2 degrees C, and the system's default is 2 degrees C.
9. The start and stop temperature of the energy loading (E-heater Start Temp, E-heater Stop Temp) are selected. The start temperature is 4 degrees C lower than the desired temperature, and the stop temperature is 2 degrees C lower than the desired temperature. (See the second level dealer parameters for details)



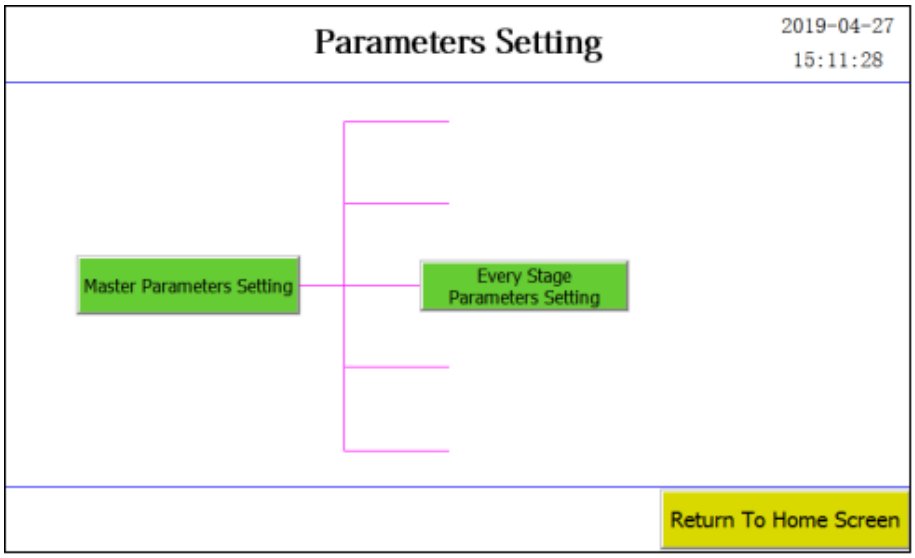
7.3 Parameters Setting

Parameters Setting: There are three levels of permission setting. The user names are "user", "Dealer" and "Vendor" respectively. The three levels of permissions need different passwords to enter the interface. The initial password of the user level is 1, returning by Return to Home Screen. The "user" level is for the user's basic operation parameters setting. The "Dealer" and "Vendor" levels are required by the technician to make changes to the internal program parameters.

Click the "Parameters Setting" button and enter the log on interface of user. For example, enter the user's password 1, click "OK".



The First Level User Parameters Setting Interface



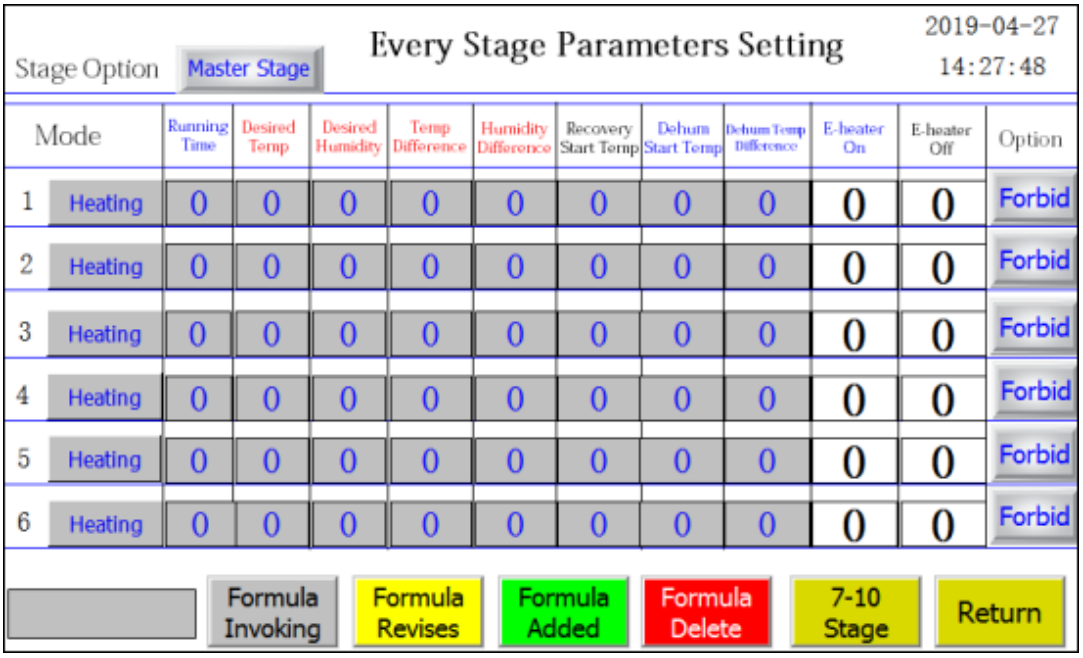
Master Parameters Setting: Click to enter the setting interface of system operating parameters and operating mode when it is at master stage.

Drying Stage Option: After clicking and entering, you can choose no stage (drying stage option button displays "Master Stage").

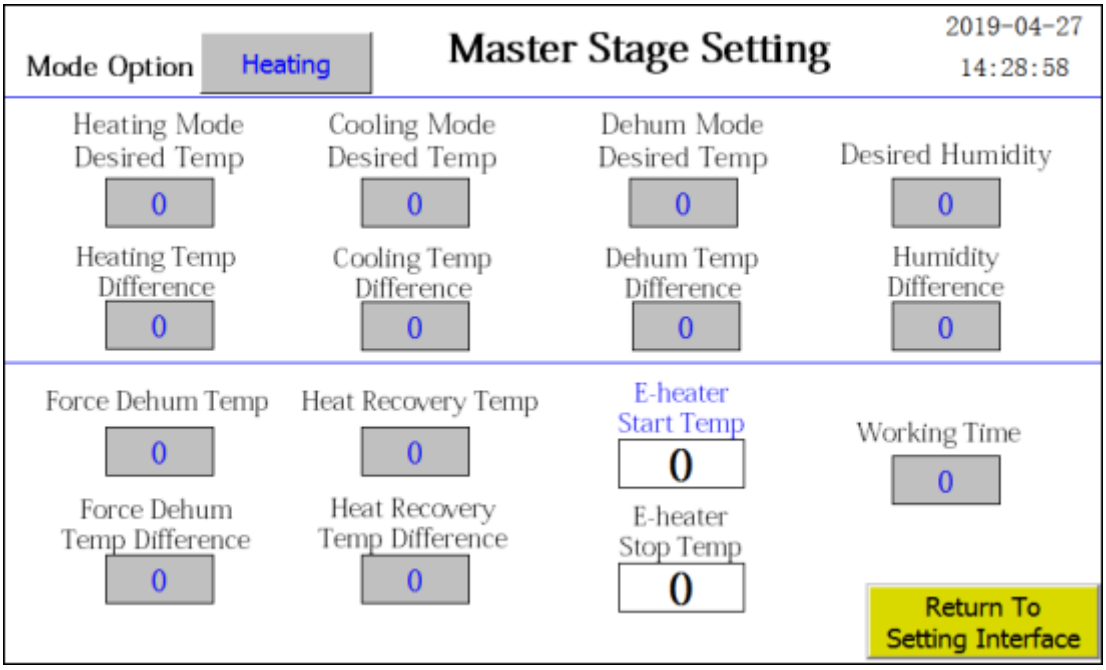
Or Sub-Stages, when you select Sub-Stages running, you can set the number of stages to run.

Every Stage Parameters Setting: It is valid only when “sub-stages” operation mode is selected, and clicks to enter the parameters setting of each stage, such as the temperature, humidity, dehumidification temperature etc. See the instructions below.

Click “Stage Option” to enter the following interface: When the Stage Option is displayed as “Master Stage”, that means, the no sub-stages operation mode is selected, and the system parameters will be run according to the “Master Parameters Setting”. Click “Return” to return to the interface of "Parameter Settings", and then enter the interface of "Master Parameters Setting".



7.3.1 Master Parameters Setting Interface (Master Stage): Description of Each Button Operation



Mode Option: Click the gray button to switch of Heating, Dehum, Cooling, Heating + Dehum, Cooling + Dehum, press one time to switch one mode. (This heat pump dryer can only use dehumidification function, please select the Dehum mode to run.)

The current settings of the home screen: The Running Mode will display the mode selected here.

Mode 1 Heating

Heating Mode Desired Temp: 0-100 degrees C can be setted, generally choose 60 degrees C, that means, in the heating mode, the system heats up to this temperature, the compressor stops working. After the temperature is lowered by N degrees C (**the setted degrees of Heating Temp Difference**), the compressor starts again, and so on.

Mode 2 Cooling

Cooling Mode Desired Temp: 0-100 degrees C can be setted, generally choose 60 degrees C, that means, in the cooling mode, the system cools down to this temperature, the compressor stops working. After the temperature rises by N degrees (**the setted degrees of Cooling Temp Difference**), the compressor starts again, and so on.

Force Dehum Temp: 0-100 degrees C can be setted, generally choose 2-5 degrees C lower than the Heating Mode Desired Temp, that means, in the heating + dehumidification mode, when the system rises to this temperature, the forced dehumidification blower starts, and the moisture and partial heat are removed from the drying room. Meanwhile the drying room temperature drops, when it drops more than 2 degrees C (the system default: 2 degrees C), the forced dehumidification will stop and the system temperature will continue to rise, so reciprocating, to achieve the purpose of system constant temperature and dehumidification.

Desired Humidity: You can set 0-100 degrees C, generally choose 05 degrees C, that means, in any mode, when he relative humidity inside the system decreases to this humidity,

the compressor stops working, after the water is evaporated, and the humidity rises by N degrees C (**the setted degrees of Humidity Difference**), the compressor restarts, and so on.

Mode 3 Dehum

Dehum Mode Desired Temp: 0-100 degrees C can be setted, generally choose 60 degrees C, that means, in the dehumidification mode, the system heats up to this temperature, the machine stops working. After the temperature is lowered by N degrees (**the setted degrees of Dehum Temp Difference**), the compressor restarts, and so on.

Mode 4 Heating + Dehum: Heating mode is priority (only for the unit with dual-mode operation), when the temperature of heating mode is reached, it automatically switches to the dehumidification mode, and finally runs continuously according to the parameters setted in the dehumidification mode.

Mode 5 Cooling + Dehum: Cooling mode is priority (only for the unit with dual-mode operation), when the temperature of the cooling mode is reached, it automatically switches to the dehumidification mode, and finally runs continuously according to the parameters setted in the dehumidification mode.

Heating Temp Difference: It's valid in heating mode, that means, the temperature difference to restart the compressor after it reaches the setting temperature and compressor stops operating. For example, heating temperature difference is setted to 3 degrees C (generally it is setted to 3-5 degrees C). When the heating mode desired temp is reached, the compressor stops. When the temperature drops by 3 degrees, the compressor starts again.

Cooling Temp Difference: It is valid in cooling mode, that means, the temperature difference to restart the compressor after it reaches the setting temperature and compressor stops running. For example, the cooling temperature difference is setted to 3 degrees C (generally it is setted to 3-5 degrees C). When the cooling mode desired temp is reached, the compressor stops. When the temperature rises by 3 degrees, the compressor starts again.

Heat Recovery Temp: 0-100 degrees C can be setted, generally choose 15-10 degrees C lower than the heating mode desired temp, that means, in heating + dehumidification mode, when the system heats up to this temperature, the heat recovery dehumification fresh air blower will start, and the moisture and vapor will be quickly removed from the drying room. Meanwhile, the heat recovery is transferred to the fresh air entering the drying room, so that the temperature of the fresh air entering the drying room can be increased, to reduce the energy consumption. And the humidity in the drying room is continuously decreased, and the air in the drying room is continuously dried. When the temperature inside the drying room is lowered 2 degrees than this temperature (the system default: 2 degrees), the fresh air compensation stops and the system temperature continues to rise, so reciprocating, to achieve the purpose of system constant temperature and dehumidification

Humidity Difference: It is valid in any mode, that means, the humidity difference to restart the compressor after it reaches the desired humidity and compressor stops operating. For example, humidity difference is setted to 3 degrees C (generally it is setted to 3-5 degrees C). When the desired humidity reaches, the compressor stops. When the humidity rises by 3 degrees, the compressor starts again.

Dehum Temp Difference: It is valid in dehumification mode, that means, the temperature difference to restart the compressor after it reaches the Dehum Mode Desired Temp and compressor stops operating. For example, Dehum Temp Difference is setted to 3 degrees C (generally it is setted to 3-5 degrees C). When the Dehum Mode Desired Temp is reached, the compressor stops running. When the temperature drops by 3 degrees, the compressor starts again.

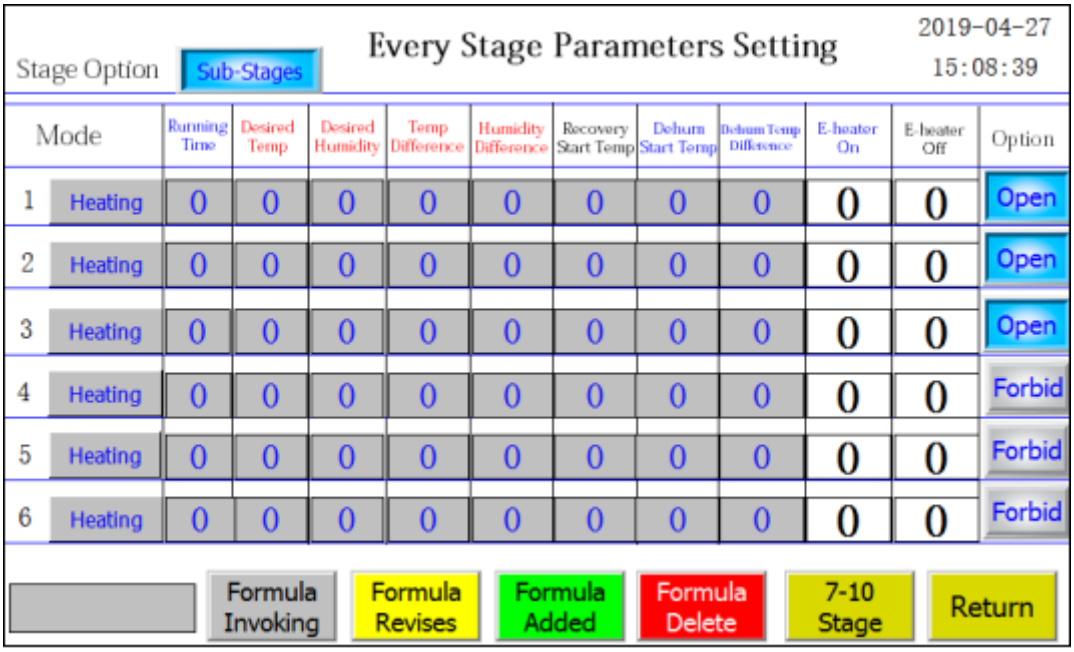
Working Time: 0-100 hours can be setted. That means, the longest cumulative time of the system during the continuous operation stage from start-up to shutdown. Generally it is setted to 100. For example, it is setted to 10, when the system runs for 10 hours cumulatively after the machine is turned on, the unit stops working, but the fan does not stop working, after the temperature rises or drops by N degrees (the setted degrees of Cooling Temp Difference), the compressor started again, so reciprocating.

Frequency Conversion Control: Set the Return Air starting temperature and the Inner Evaporator Temp, then it automatically adjusts the frequency.

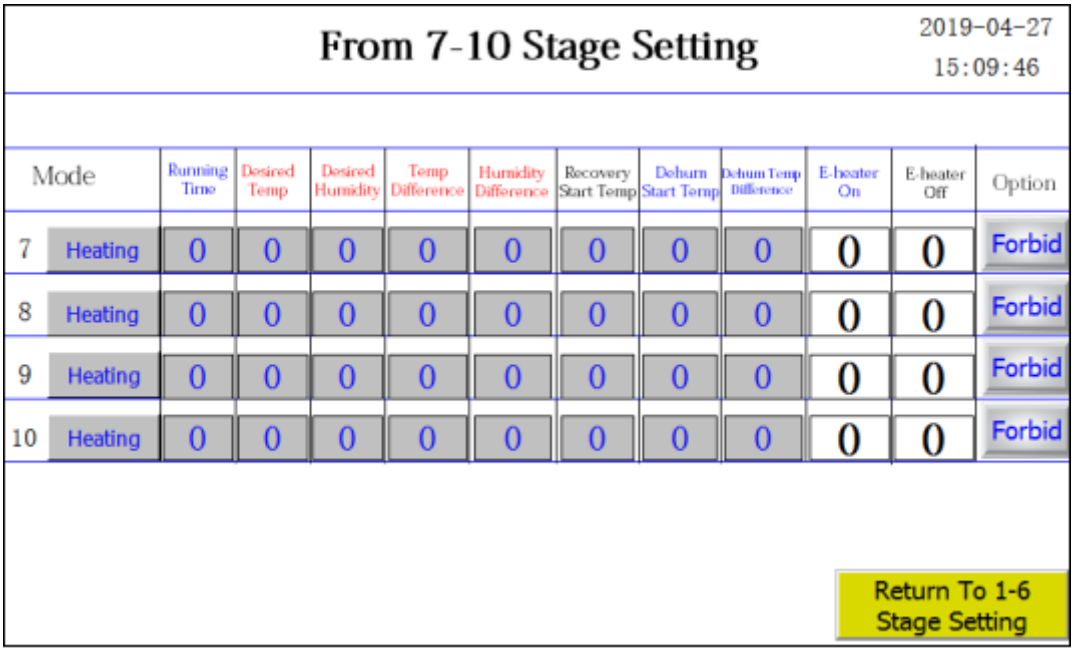
7.3.2 Sub-Stages Parameters Setting:

It can be divided into maximum 10 stages, firstly set "**Stage Option**" as "Sub-Stages"

If you want to select 3 stages to run, click “Open” to open 3 stages, as shown in the following figure.



After selecting “**Sub-Stages**”, the system will run according to the setted working time and the parameters of the corresponding stages. After the working time of the first stage is reached, it will automatically run according to the working time and parameters of the second stage. The mode of each stage can be selected. Other parameters can be setted according to requirements.



The Mode of Each Stage: Same as the master stage's parameters setting.

Running Time: 0-100 hours is optional. When the time is up, the machine runs automatically according to the operation parameters of next stage.

Desired Temp: The desired temperature corresponding to the running mode. Same as the master stage's parameters setting.

Desired Humidity: The desired humidity corresponding to the running mode. Same as the master stage's parameters setting.

Temp Difference: The temperature difference to the desired temperature corresponding to the running mode. Same as the master stage's parameters setting.

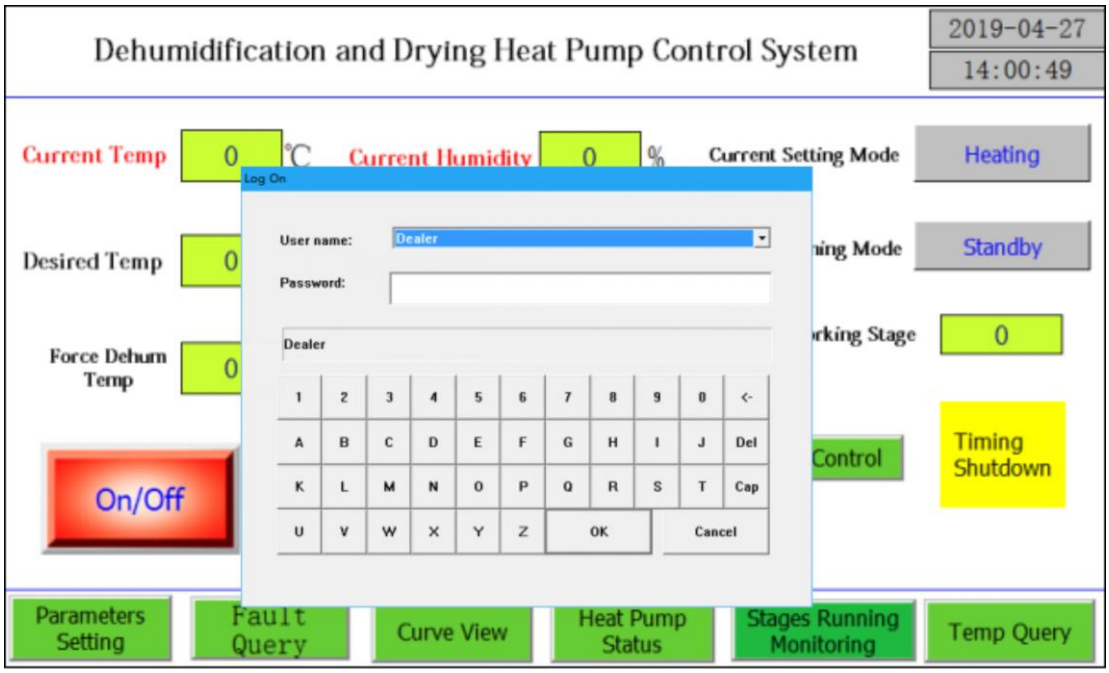
Humidity Difference: The humidity difference to the desired humidity corresponding to the running mode. Same as the master stage's parameters setting.

Recovery Start Temp: The starting temperature of the heat recovery dehumidification fresh air blower. See the master stage's parameters setting for details.

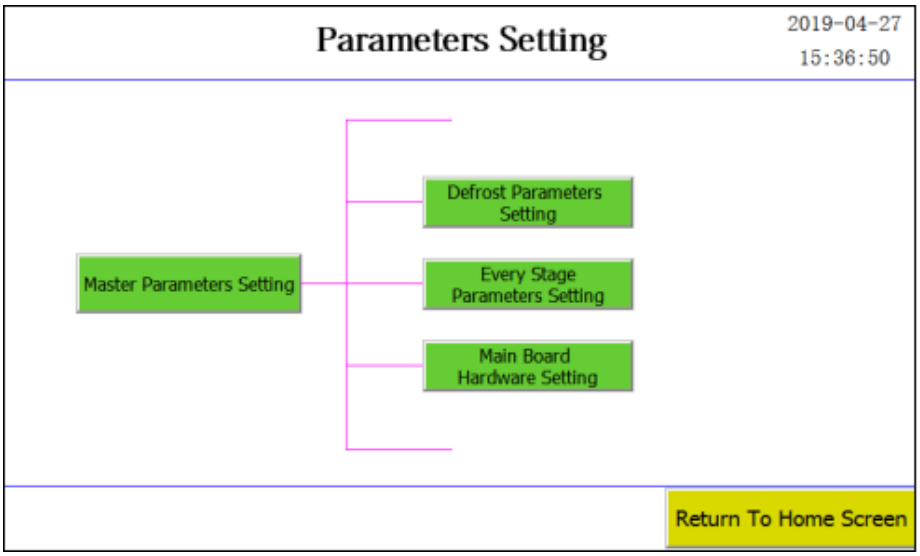
Dehum Start Temp: The starting temperature of the forced dehumidification blower. See the master stage's parameters setting for details.

(Note: For the temperature difference of fresh air temperature and dehumification, the system default: 2 degrees C.)

The Second Level Dealer Parameters Setting (Authorized Password), Return to Home Screen to Return.

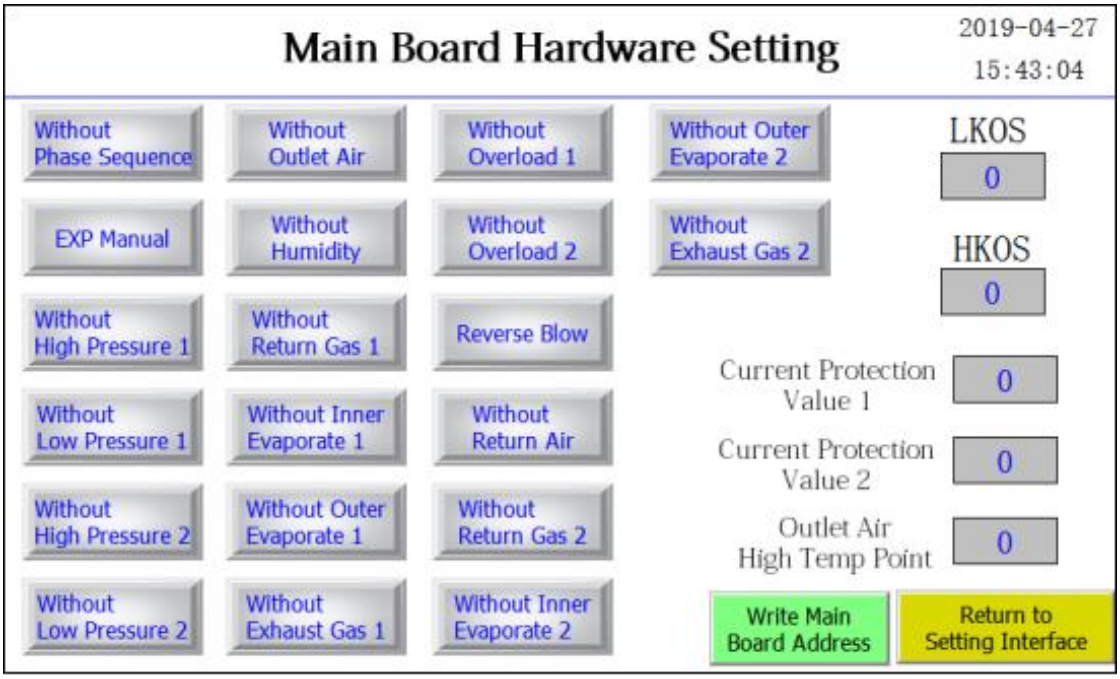


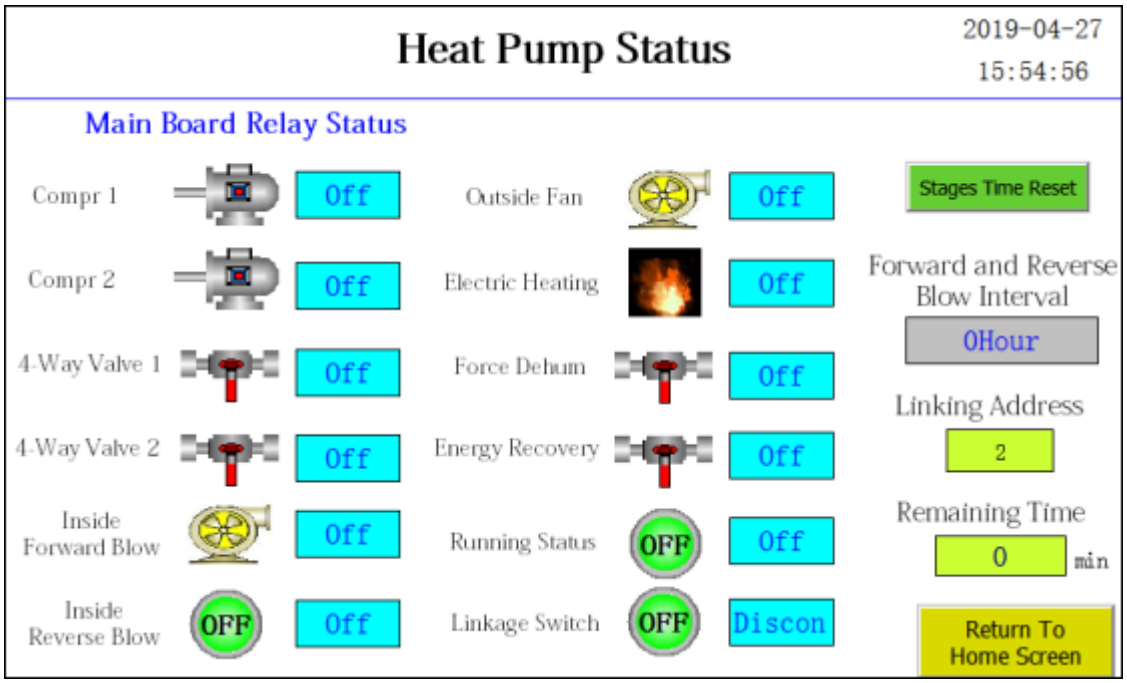
7.3.3 Dealer Parameters Setting Interface (Authorized Password: 2)



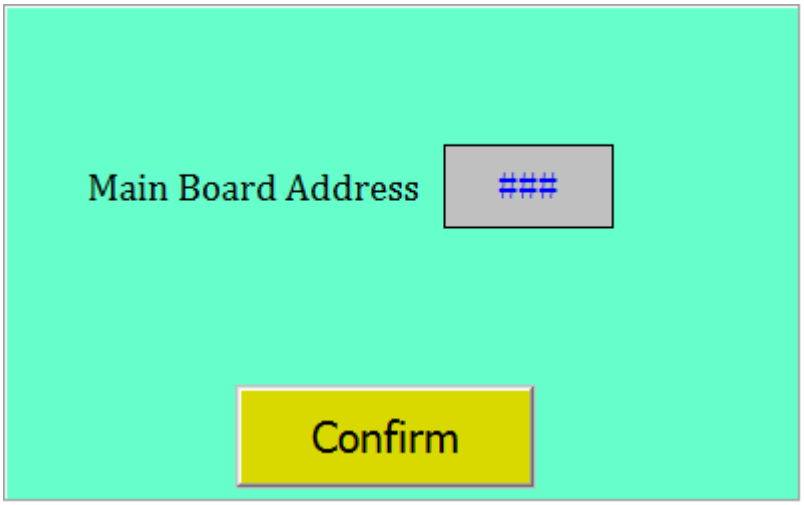
7.3.4 Compared with the first-level user parameters setting, the Main Board Hardware Setting, Defrost Parameters Setting, and energy loading parameters(E-heater) are added.

7.3.5 Main Board Hardware Setting: All alarm detection components can be setted to with-detection or without-detection. The current protection value is setted according to the machine's operating current protection requirements. **Forward and reverse blow can be selected. When the forward blow is selected, only the forward blow is performed. When the forward and reverse blow is selected, the timing forward and reverse blow is implemented according to the design states by adjusting the interval.**


Main Board Hardware Setting
2019-04-27
15:43:04
Without Phase Sequence
Without Outlet Air
Without Overload 1
Without Outer Evaporate 2
EXP Manual
Without Humidity
Without Overload 2
Without Exhaust Gas 2
Without High Pressure 1
Without Return Gas 1
Reverse Blow
Without Low Pressure 1
Without Inner Evaporate 1
Without Return Air
Without High Pressure 2
Without Outer Evaporate 1
Without Return Gas 2
Without Low Pressure 2
Without Exhaust Gas 1
Without Inner Evaporate 2
LKOS
0
HKOS
0
Current Protection Value 1
0
Current Protection Value 2
0
Outlet Air High Temp Point
0
Write Main Board Address
Return to Setting Interface


Heat Pump Status
2019-04-27
15:54:56
Main Board Relay Status
Compr 1
Off
Compr 2
Off
4-Way Valve 1
Off
4-Way Valve 2
Off
Inside Forward Blow
Off
Inside Reverse Blow
OFF
Off
Outside Fan
Off
Electric Heating
Off
Force Defum
Off
Energy Recovery
Off
Running Status
OFF
Off
Linkage Switch
OFF
Discon
Stages Time Reset
Forward and Reverse Blow Interval
0Hour
Linking Address
2
Remaining Time
0
min
Return To Home Screen

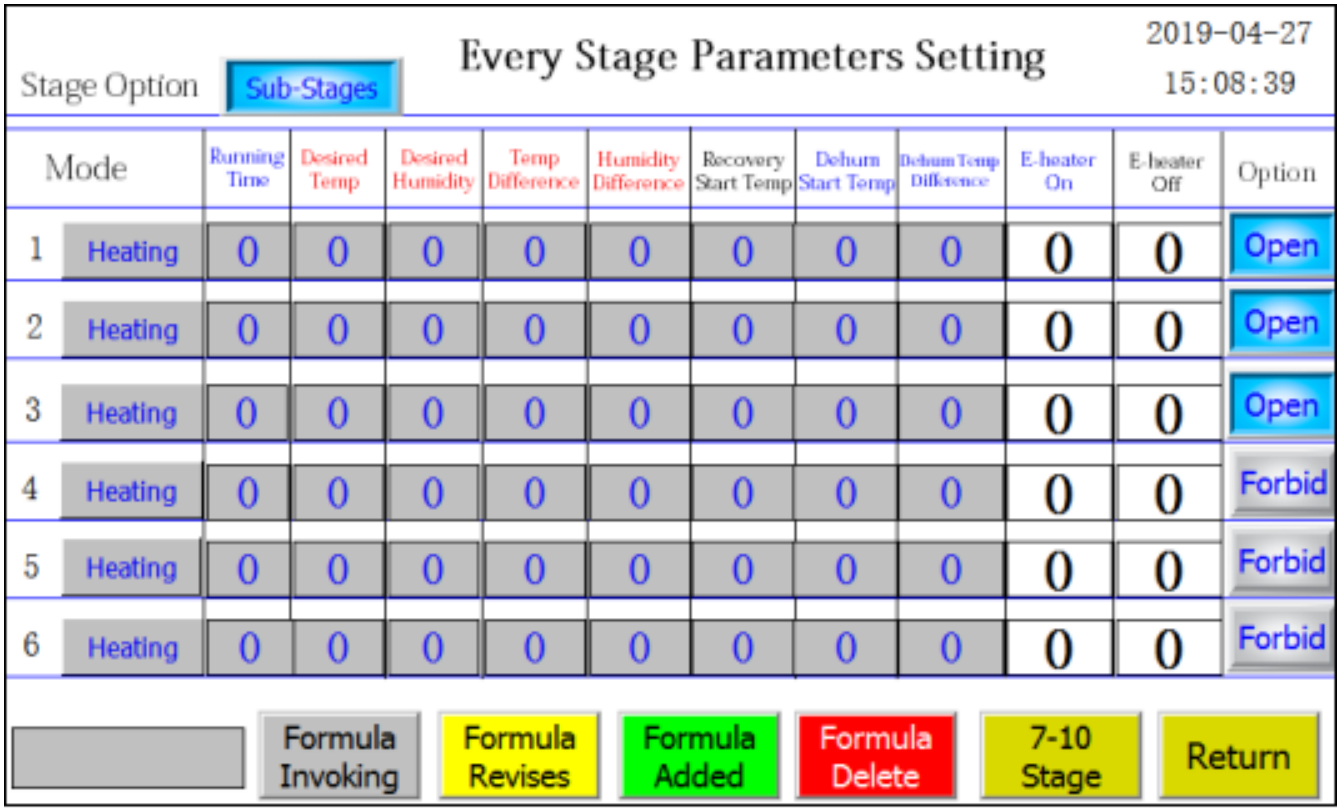
7.3.6 Write Main Board Address: When there are multiple machines running together, you need to set each unit's main board address to 1-8. When setting each board, the main board address of the unit to be written must be same as the online address in the home screen at standby. The central main module's address is 2.



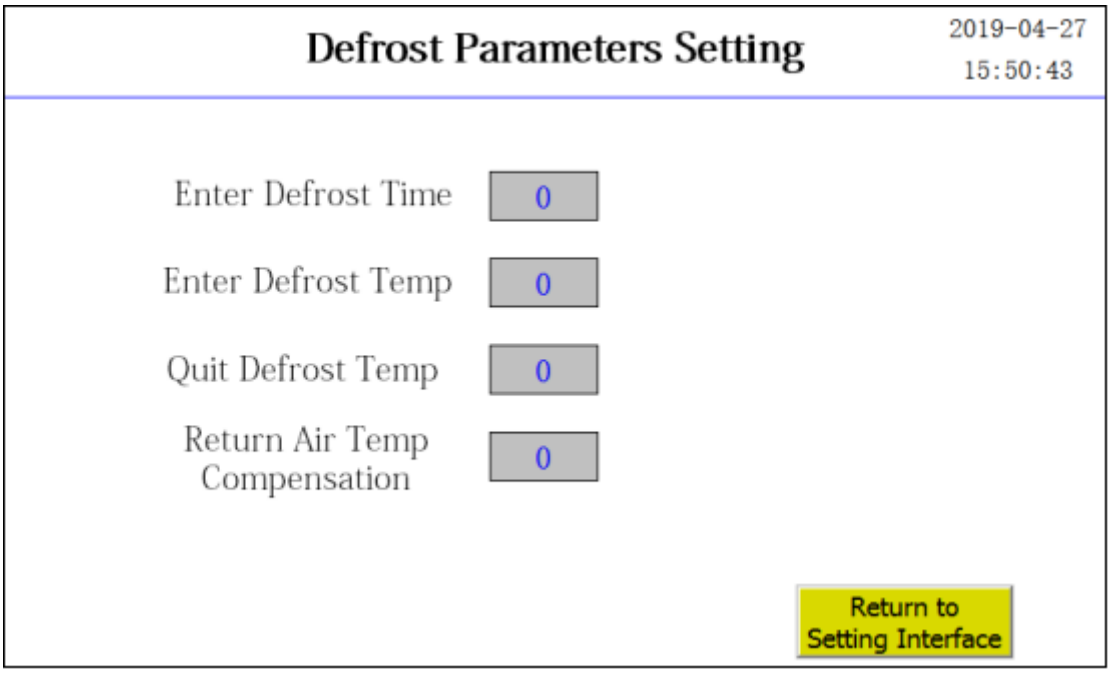
7.3.7 Each energy loading parameter (E-heater) mode can be selected, other parameters are setted according to needs.

The start-stop temperature of the **energy loading (E-heater)** running for each stage can be set to increase the speed of the temperature rise.

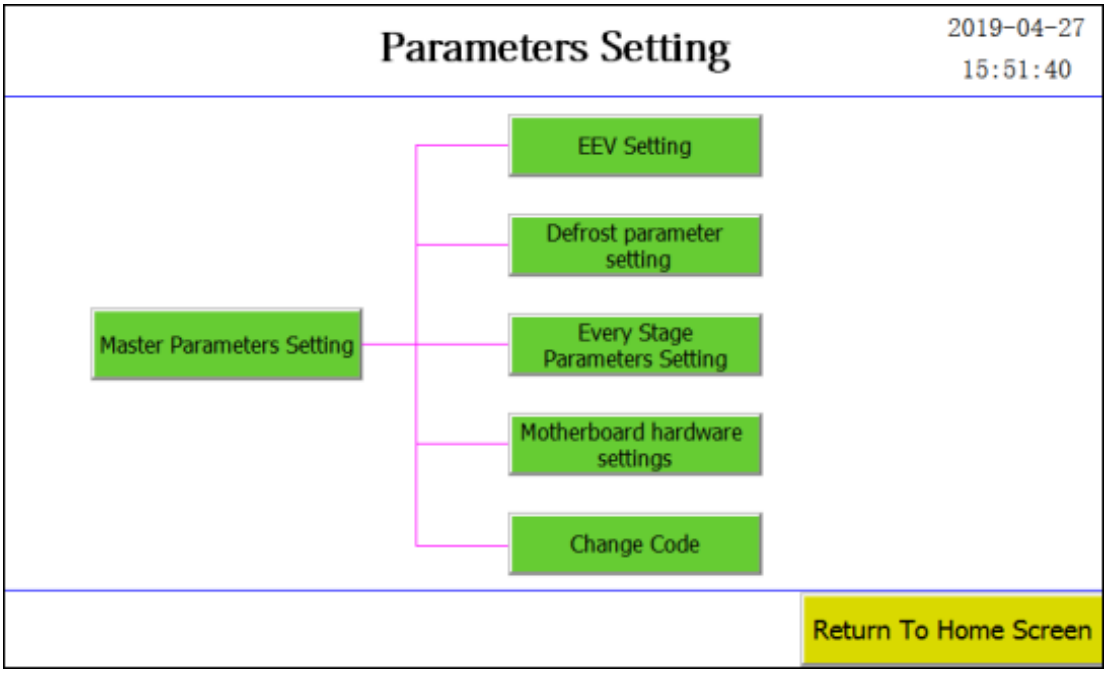
For example, the starting temperature is 50 degrees C, the stopping temperature is 55 degrees C, when the temperature in the drying room is lower than 50 degrees C, the electric heater starts, when it's higher than 55 degrees C, the electric heater stops.



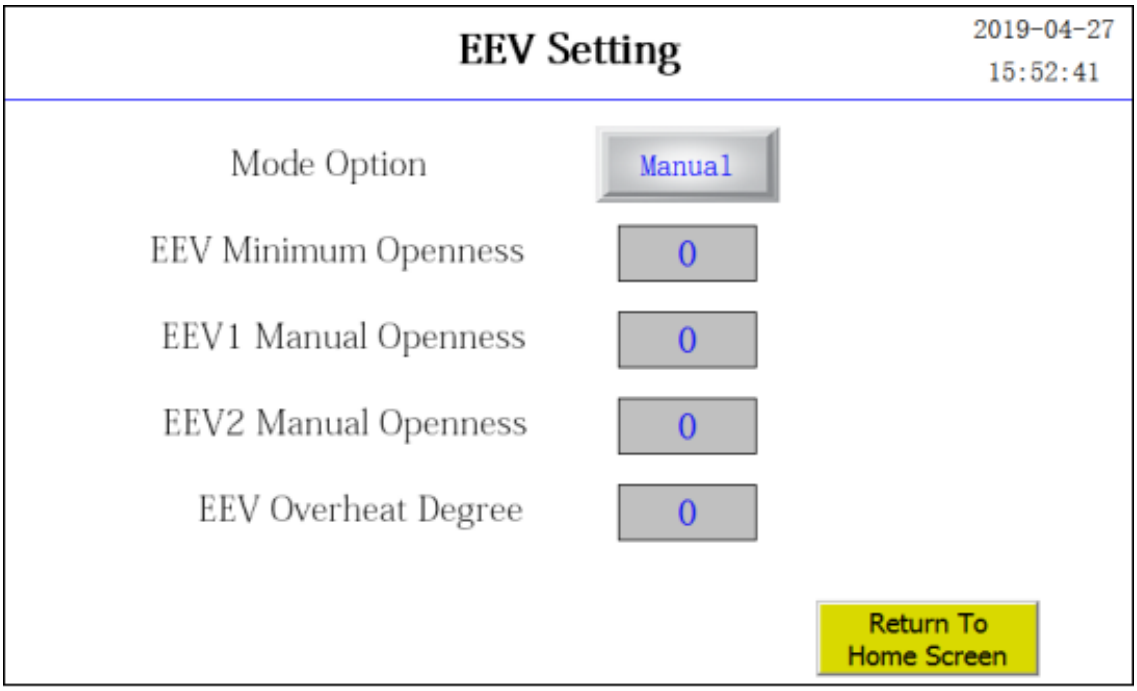
7.3.8 Defrosting Parameters Setting (the auxiliary electric switch function is useless here, it has been canceled)



The Third Level Vendor Parameters Setting Interface (authorized password) (for technical engineers to modify the program)

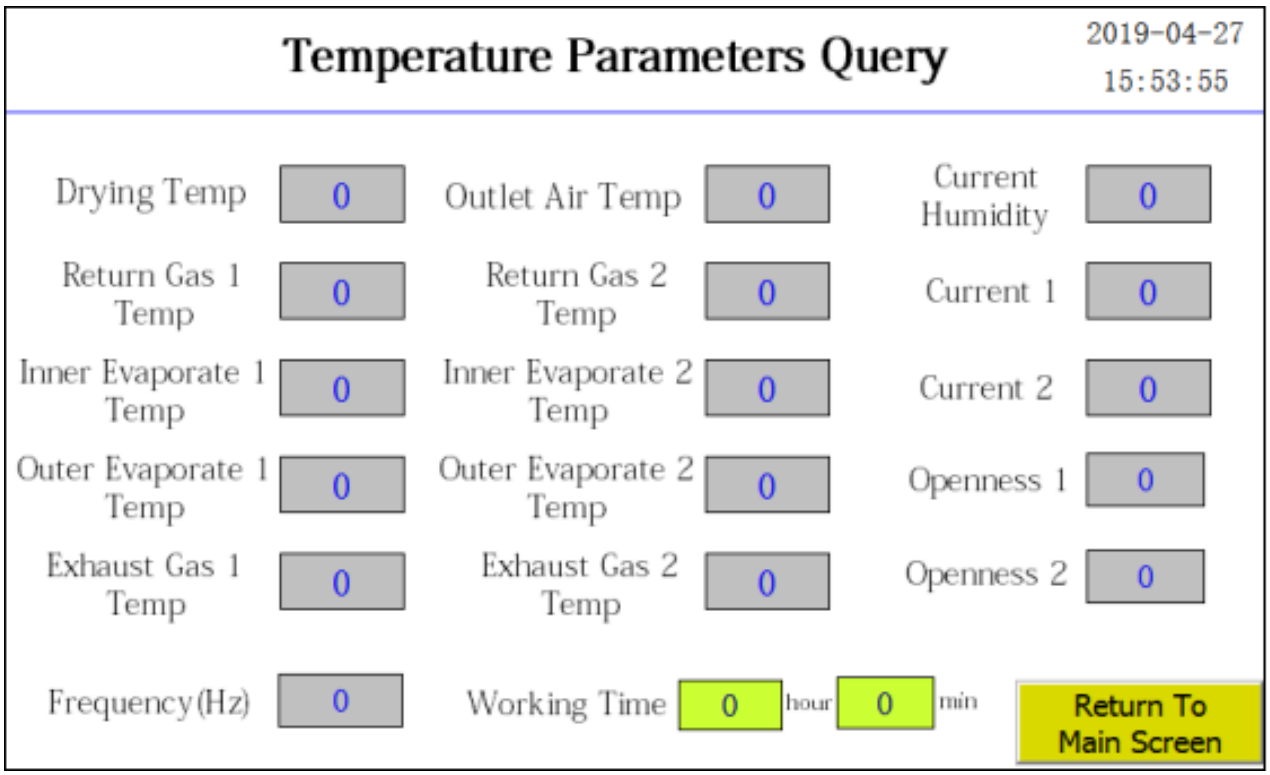


7.3.9 Adjusting the Operation Characteristics of the Electronic Expansion Valve(EEV)



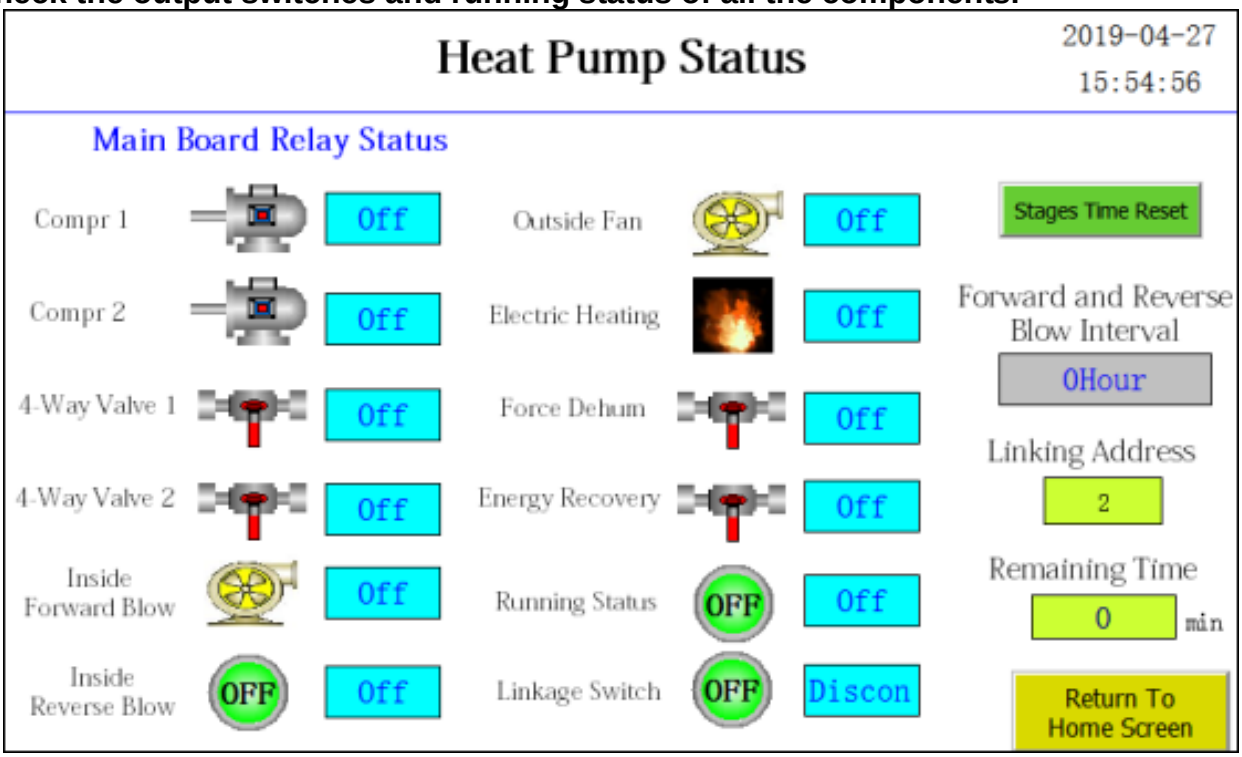
7.4 Temp Query

Check all operating datas of temperature, humidity and current, click “Return to Main Screen” to return.



7.5 Heat Pump Status

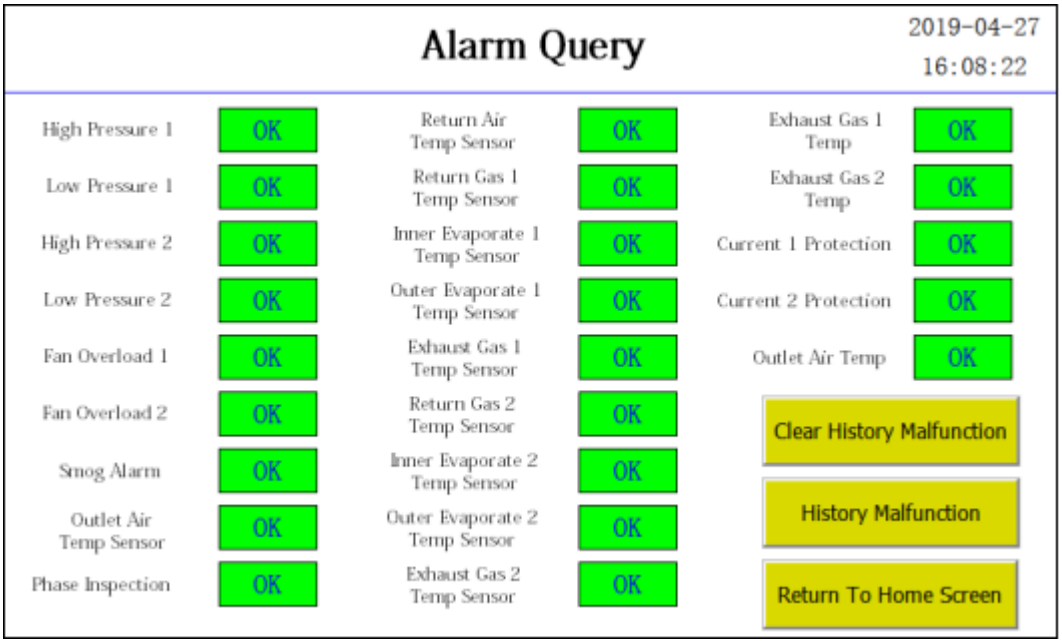
Check the output switches and running status of all the components.



4-way Valve 1 and 4-way Valve 2 are the switching of dehumidification, heating and cooling.
Outside Fan is the outdoor unit. (N/A)
Force Dehum (Valve 1) is forced dehumidification.
Energy Recovery (Valve 2) is heat recovery and fresh air compensation.
Electric Heating is the energy loading.

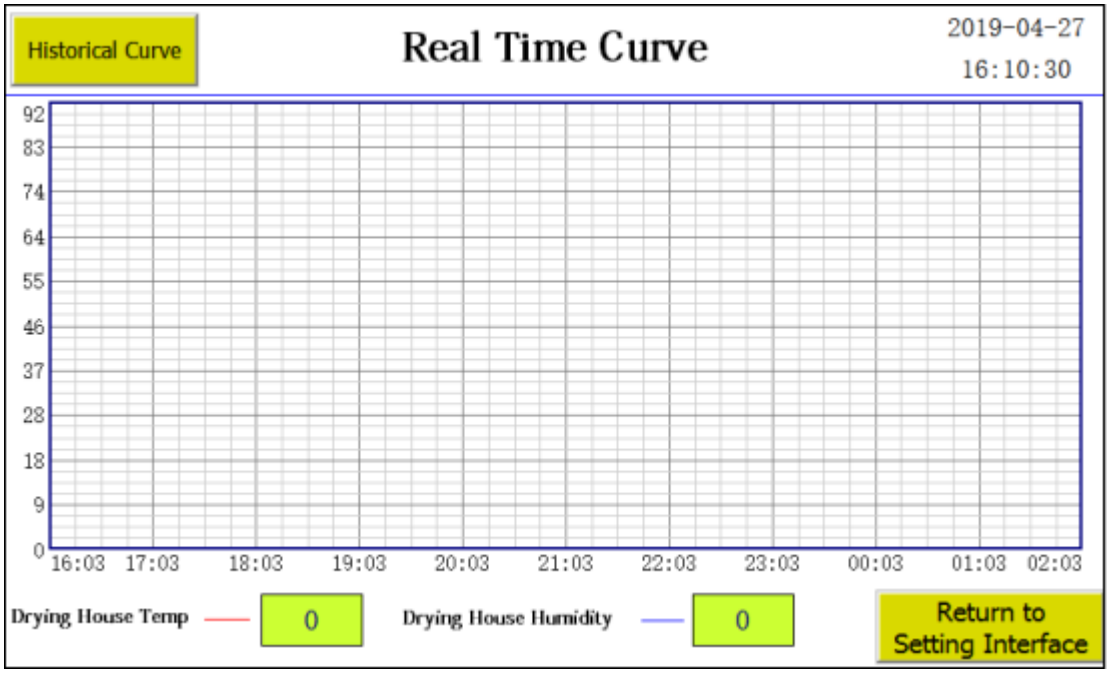
7.6 Fault Query

Intuitively query the current fault and historical fault content, “Return to Home Screen” to return



7.7 Curve View

Intuitively view the temperature and humidity curve of the drying room in the past 10 hours at different time.



7.8 Tri-color Lights Operation Indication Meaning

Red Light is on: It indicates that the unit is running with a fault alarm meanwhile stopping the system, accompanying by a beeping sound.
Yellow Light is on: It indicates that the unit is in standby state.
Green Light is on: It indicates that the unit is in normal operation.

7.9 Heat Recovery Fresh Air Unit:

With manual and automatic control, the automatic control operates according to the "**Heat Recovery Temp**" setted by the touch screen. When the drying room temperature reaches the fresh air setting temperature (Heat Recovery Temp), the fresh air heat recovery unit runs.

When the drying room temperature is 2 degrees lower than the setting temperature (the system default: 2 degrees), it stops.

7.10 Forced Dehumidification Blower:

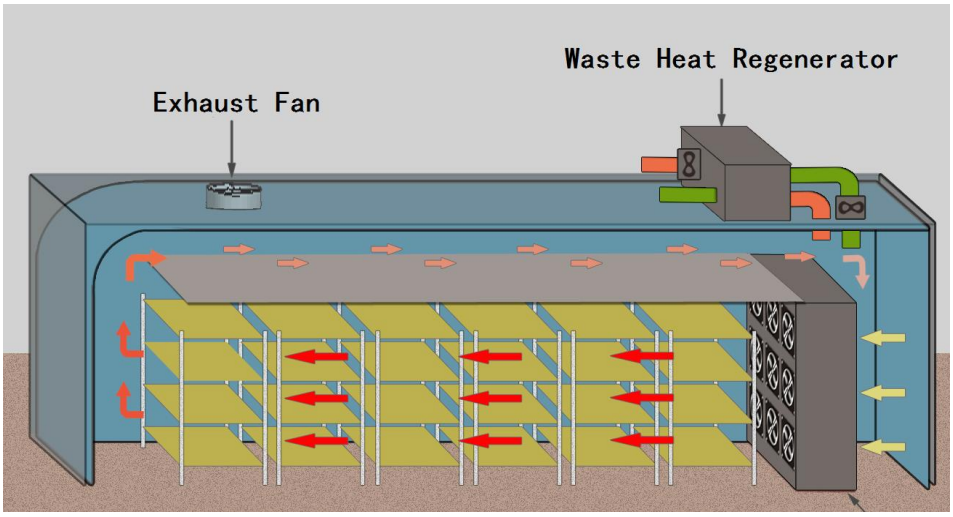
With manual and automatic control, the automatic control operates according to the "**Force Dehum Temp**" setted by the touch screen. When the drying room temperature reaches the humidification setting temperature, the forced dehumidification blower runs. When the drying room temperature is 2 degrees lower than the setting temperature (the system default: 2 degrees), it stops.

7.11 Emergency Stop Switch (Leakage Switch)

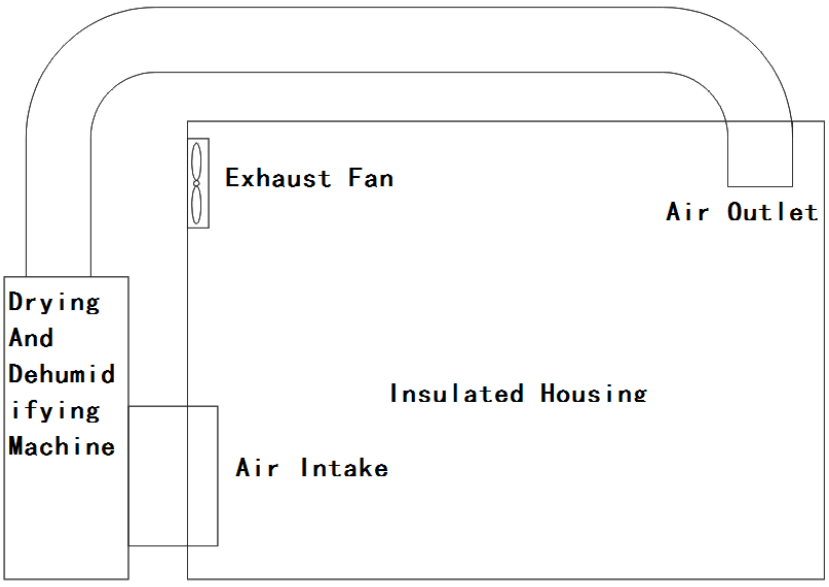
When the emergency stop switch (leakage switch) is pressed, all devices stop running.

8. Installation Diagram

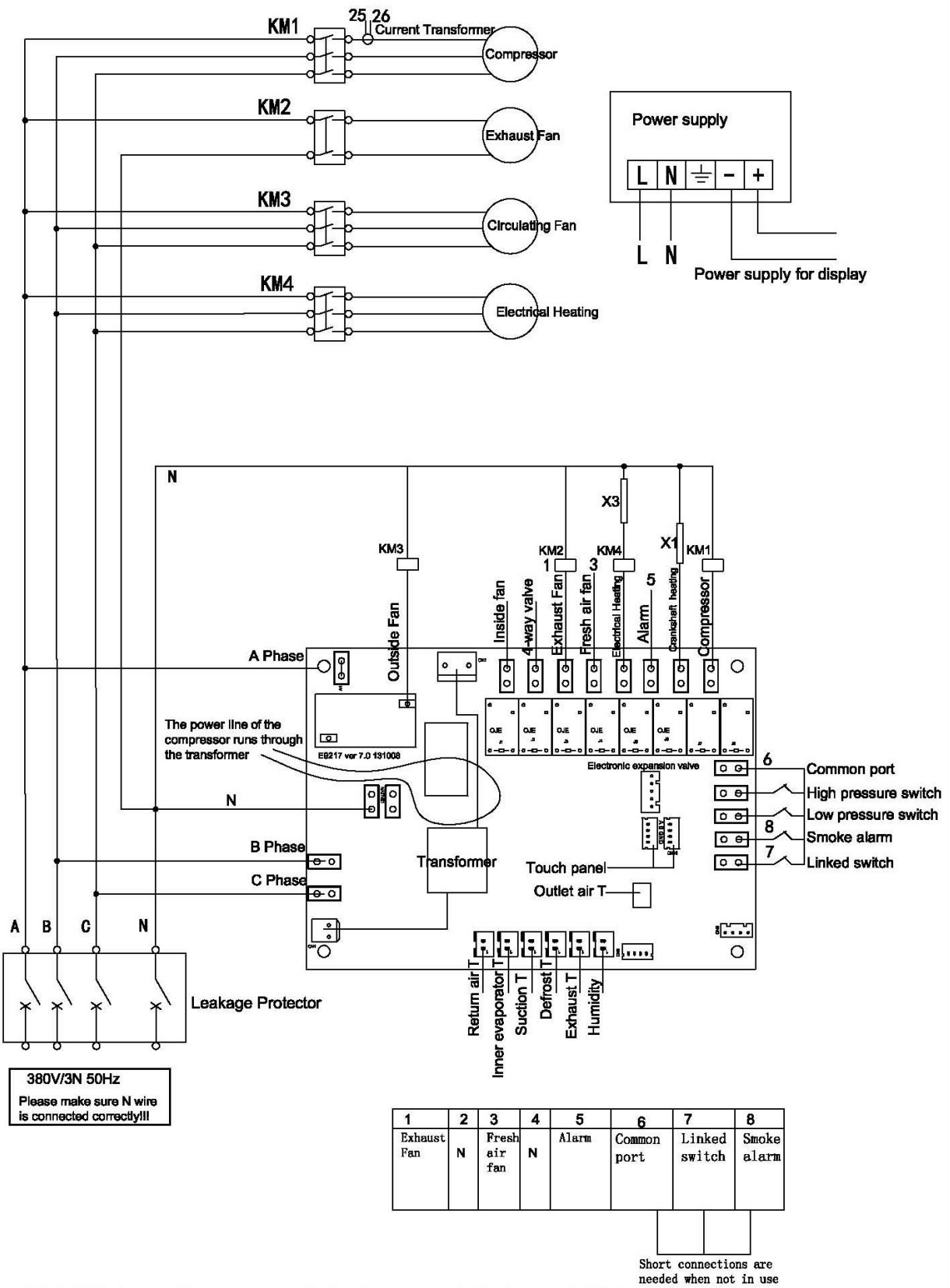
8.1 Direct Blowing Installation Diagram



8.2 Installation Diagram of the Top Discharge and Downside Air Return Unit



9. Electrical Wiring Diagram



5P Wiring diagram of drying and dehumidifying Unit

10. Unit Installation

Only professionals can install and debug this machine!

10.1 Installation Preparation

10.1.1. Acceptance

When receiving the goods, the unit should be carefully inspected to confirm whether the goods are damaged during the transportation process. And the main unit and accessories are counted according to the packing list to check whether the parts are missing. Before the unit is delivered, the outdoor unit has a sufficient amount of refrigerant. Check whether there is pressure in the machine before installation, and confirm whether it leaks during transportation.

10.1.2. Handling

When transporting, use a forklift, crane or sling to transport the unit to the designated location. Take protective measures such as shock absorption during transportation to prevent collision and damage to the external spraying of the unit, resulting in easy corrosion of the unit. The unit should be kept vertical and the unit tilt angle must not exceed 30°. It is recommended that the outdoor unit be lifted as much as possible before removing the wooden package.

10.2 Installation note

The installation position of the unit is flexible, and the installation position can be determined according to the production technique and the actual site.

The following points must be noted:

- The machine must be installed by special personnel and must comply with the corresponding regulations of the local government and relevant departments.
- Consideration should be given to leaving enough space to connect water pipes and wires while taking into account the space required for maintenance. (Cannot be smaller than the gap marked in the figure below.)
- After the unit is installed, check whether the unit is well fixed and whether the base is equipped with a shockproof rubber pad.
- The unit should be installed in an outdoor ventilated place, and should be kept at an appropriate distance from the adjacent wall, as shown in the figure, so as not to hinder the air circulation and affect the air conditioning effect, and it is also easy to maintain. The distance between the obstruction in the unit's air outlet and the unit shall not be less than 1.8 meters.

Warning

A Try to avoid the direction of the discharged air to the direction of the strong wind in the year, and the discharged air will not return.

B Avoid installation in the environment where dirt, defoliation and insects gather to prevent blockage of the heat exchanger.

C The heat exchanger should be cleaned regularly to ensure heat exchange's efficiency.

D Install awnings above the unit as much as possible to protect the unit

E The unit should be installed close to the power supply for easy wiring. The installation must be conducive to the drainage of rainwater and condensate water.

F Units should not be used in environments containing oil, salt, or corrosive gases that can corrode the unit, causing malfunctions or even shortening unit life.

G The installation position should have sufficient strength, and the shock absorber or

vibration damping pad should be used on the bottom of the unit to reduce the vibration transmission.

H The unit can be directly fixed on the base with expansion bolts. The dimensions of the unit installation positioning holes are shown in the outline drawing of the unit. The base can be prefabricated with cement and the drainage channel is reserved. Angle brackets can also be used to make brackets, using with anti-vibration rubber mats. They can be placed on the ground or roof plane. Small units can also be mounted on the wall. That means, the unit is placed on the angle brackets, and the angle brackets are fixed on the wall. After the brackets are fixed, the support capacity should be greater than 4 times of the unit weight. The surface of the base should be level.

10.3 Electrical Installation

The lines that need to be installed on the site include external power cables, controller cables, unit cables, customer-configured power cables, and control signal cables.

Once the unit is in place, the power cord, electrical controls and mounting, and connecting lines can be connected. All wires must be securely connected and must not be in contact with any moving parts. All wires must be rubber cord and must meet the requirements of this manual. The unit must have grounding measures and it is strictly forbidden to use the unit without reliable grounding. All electrical equipment and its installation must comply with national and local safety regulations.

WARNING: Wires must not be tied to unsealed copper tubing.

Note: All protection and interlocking devices must be installed and connected to the corresponding terminal block in the control box, otherwise the faults and damages caused by this are not covered by the warranty.

Note: The ground cable must be longer than the other main power cords.

11. Commissioning

After the machine is installed, firstly check if there is any problem with the installation, then check if the voltage of power supply is normal, and finally start the machine for commissioning operation. For the three-phase unit, if the unit does not respond after power-on, you should cut off the unit's power supply and do the phase sequence adjustment (swop any two of the three phases). During the operation, check the operation of the unit. For example, if the compressor has abnormal vibration or abnormal noise, whether the fan is normal, whether the fan is running in the correct direction, and whether the unit and the pipeline have abnormal noise.

Please note the following points during the operation:

A The indoor setting temperature in the controller should be at least 3 °C higher than the chamber temperature, then the compressor starts.

B Do not place the computer, TV, etc. close to the controller, otherwise the 2 devices will interfere with each other and affect the operation;

C When the unit is running, please do not completely close the doors and windows, ventilate to ensure the unit is running stably;

D The controller and the unit's electric control box should be moisture-proof. Do

not operate the unit with wet hands, do not flush the unit directly with water to prevent electric shock.

Warning

During the operation, if abnormal phenomena are found (such as burnt smell, electric control box flashes), stop immediately, turn off the power, ask the dealer for help, and check with the professional maintenance personnel. Because it will cause damage to the unit if you continue to operate in this situation.

Electric

1. The unit should be equipped with a dedicated power supply. The voltage fluctuation range of the power supply is ±10%. The automatic air switch should be used. The rated current is 1.5 times of the unit operating current. It is absolutely forbidden to use the knife switch.
2. The unit should be reliably grounded.
3. Unit switches should not be operated frequently, and it should not exceed four times per hour. The electrical control box should be protected from moisture.
4. For the three-phase unit, the phase sequence protector is installed in the unit, and it has phase sequence requirements for the external power supply. If the control board does not respond when the power is on, and the unit does not start, please turn off the main power supply and swop the phases of the external three-phase power supply, and then turn it on again. Or it may even cause an electric shock or fire accident.

12. Maintenance

- Do the following work before seasonal using the machine every year:
  - Before starting the machine, the preheating of the compressor is not less than 12 hours, so that the amount of liquid refrigerant in the compressor is reduced when the unit is started, and the oil temperature is raised to reduce the wear of the compressor.
  - When using for the first time, observe the start and operation of the unit. If any abnormal, stop the machine immediately and check it.
- Regularly clean the heat exchanger (once every three months) to ensure the operation of the unit. Cleaning must be carried out by a professional air conditioning technician.
- Check the drain pipe before the unit is running. If it is blocked, foreign substances must be removed so that the condensate water drains smoothly. When the winter arrives, check and clean the drain pipe to prevent the condensate pipe from frost crack.
- If the unit fails, please contact the dealer or agent immediately. Do not disassemble or repair the unit to cause the fault expanded.
- When the machine is deactivated for a long time, please turn off the main power supply, otherwise the unit will still consume a certain amount of electricity. At the same time, ensure that the water in the heat exchanger and pipes is drained to prevent heat exchanger and pipelines in the winter from frozen burst. But, before you turn on the power next time, please send power to the unit one day in advance to preheat the compressor.
- Maintenance must be carried out after cutting off all power to the unit to avoid danger.

13. Common Faults and Troubleshooting

No.	Problem	Cause	Corrective Action
1	The unit does not work after the power is connected.	The reverse phase protector does not work. Improper adjustment of the controller	Swop the phase sequence (applicable for 380V unit). Check the power supply Adjust the controller according to the instructions
2	Low pressure switch protection action	Insufficient refrigerant, system leakage of refrigerant Improper or malfunctioning of the pressure switch Insufficient air volume / water flow	Find out the leakage, repair the leakage, recharge refrigerant Adjust or replace the pressure switch Clean the filter
3	Exhaust pressure is too high	The condenser has dirt Excessive refrigerant charged The air volume is too small / the return air temperature is high	Clean the condenser Drain excess refrigerant Clean the filter
4	Suction pressure is too high	Too much refrigerant is charged	Drain excess refrigerant
5	Suction pressure is too low	Ambient temperature is too low Too little refrigerant charged	Supplement refrigerant
6	Excessive noise	Compressor failure Excessive refrigerant charged Fan system failure Loose screws	Replace compressor Drain excess refrigerant Repair the fan Tighten the screws

14. After Sales Service

Respected User:

Thank you for choosing the air source heat pump dryer produced by our company!

Before use, please read the instruction manual carefully, and correctly master the installation and use of this product. If you have any questions or comments, please contact the installation company or our company, we will provide you satisfactory and thoughtful service.

The air source heat pump drying and dehumidifying unit you purchased will be warranted for one year from the date of purchase. Free service during the warranty period, and the corresponding material fee will be charged appropriately after the warranty period. The unit is

provided with lifetime maintenance services.

In the event of a malfunction, please inform the company of the fault and warranty card number, and we will assign a technical engineer to maintain it.

The following conditions are not covered by the warranty:

1. Faults caused by natural disasters, for example, floods, earthquakes, typhoons, and lightning etc.
2. Faults caused by improper maintenance, for example: the fins are not cleaned, wash directly with water, the phase of power supply is missing.
3. Faults caused by out of the use range, for example, the temperature range is exceeded, the voltage of the power supply is too high or too low, and the working time is too long.
4. Faults caused by changing the circuit distribution line or the private modification to the product.
5. Faults caused by illegal installation.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