Laboratory Equipment Manufacturer
www.mrclab.com

Operation Manual

Climatic Testing Chamber

The instruction manual should be read before installation

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MRC.10.22

CONTENT

1. PRODUCT OUTLINE.....1

1.1 TEST CHAMBER INTRODUCTION 1
1.2 DOOR CONTACT CONNECTOR INTRODUCTION.....6
1.3 HUMIDIFYING WATER SUPPLY INTRODUCTION 6
1.4 MAIN SPECIFICATIONS.....7

2. INSTALLATION AND COMMISSIONING 8

2.1 TRANSPORTATION AND HANDLING 8
2.2 DISASSEMBLE AND PICK & PLACE.....9
2.3 INSTALLATION 9
2.4 COMMISSIONING.....11
2.5 SHELF INSTALLATION AND SPECIMEN PICK & PLACE.....12

3. OPERATION INSTRUCTION 15

3.1 PREPARATION 15
3.2 STARTING-UP AND SHUTDOWN OPERATION.....15
3.3 CONTROL SYSTEM INTRODUCTION 16
3.4 MENU INTERFACE.....20
3.5 SETTING CENTER.....20
3.6 TREND CURVE.....27
3.7 DATA REPORT.....28
3.8 ALARM EVENT 29
3.9 SYSTEM STATUS.....30
3.10 SYSTEM MANAGEMENT.....30
3.11 USER MANAGEMENT 31
3.12 PRODUCT INFORMATION.....31
3.13 DATA MANAGEMENT.....32

4. COMMON FAULTS AND TROUBLE SHOOTING 33

5. MAINTENANCE 34

5.1 PERIODIC MAINTENANCE.....34
5.2 MAINTENANCE UNDER ABNORMAL CONDITIONS.....34

6. NOTICE.....35

STATEMENT

Users must carefully read and master the operating procedures and understand the various precautions before using this test equipment. The manufacturer assumes no responsibility for product damage and personal injury caused by failure to comply with this manual.

Due to product improvements, some of the pictures or displayed text in this manual may differ slightly from the actual product. Please refer to the actual one. If the parameters change due to product upgrade, the manufacturer will not be notified.

SUGGESTION

☞ Please keep this user manual in a random device for future reference! Relevant parameter information is also required during product maintenance and repair.

REMINDER

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- Explosive substances and flammable substances, or substances containing these ingredients, cannot be placed in the test chamber as a sample for testing!
- Do not test any specimens that may be exposed to fire, explosion, or other hazardous conditions at high or low temperatures!
- Do not put corrosive objects into the test chamber to avoid detracting from the life of the test chamber!
- It is forbidden for personnel without professional electric wages to make private changes to the power connection part of the test box to avoid the risk of electric shock!

- **Please read and understand the contents of the manual carefully before using this test chamber!**
- **Please place the instructions with the test chamber for easy access.**

1.Product Outline

1

The PCG-A series test chamber is a new type of environmental testing equipment manufactured by MRC Ltd. This series of test chambers adopts the world's leading new high-efficiency refrigeration technology, as well as stable and reliable advanced control technology, which can satisfy the majority. The user needs to provide a faster, stable and
. accurate temperature environment for your environmental testing
Before using this machine, please read the instruction manual carefully, understand the operating procedures and regulations, and clarify the safety precautions. Any improper or incorrect use may result in failure of the test and may damage the machine and test samples, endangering personal safety.

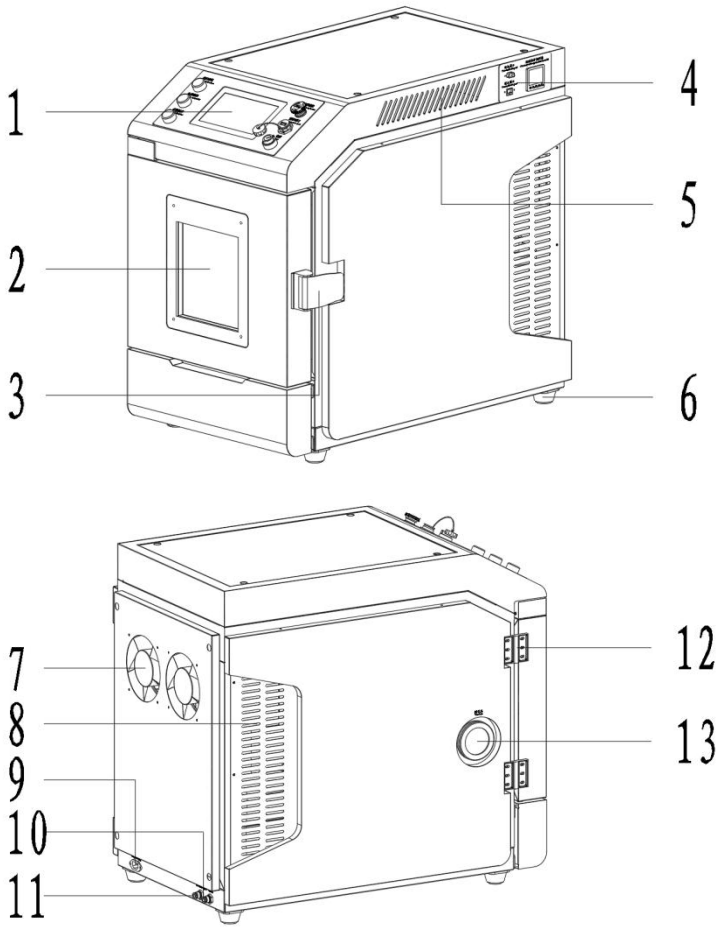
1.1 Test Chamber Introduction

The high-low temperature humidity test chamber has benchtop and floor-standing version. The appearance view of the test chamber shown in Figure 1.1 is the benchtop version. The upper part is the electric control part and operation screen of the test chamber. The refrigeration unit is placed separately behind the test chamber with the refrigeration line connected, compact and space saving.

This product adopts the internationally leading new refrigeration technology and uses compressor refrigeration operation. Compared with the traditional refrigeration technology, this product is stable, reliable, compact, low energy consumption, reduced noise, reduced requirements for the operating environment, and weakened for testing. It is suitable for military, electronic and electrical laboratories.

This product adopts advanced automatic control system. The system is self-developed, equipped with true color high-resolution touch screen, friendly interface, convenient operation and high control precision.

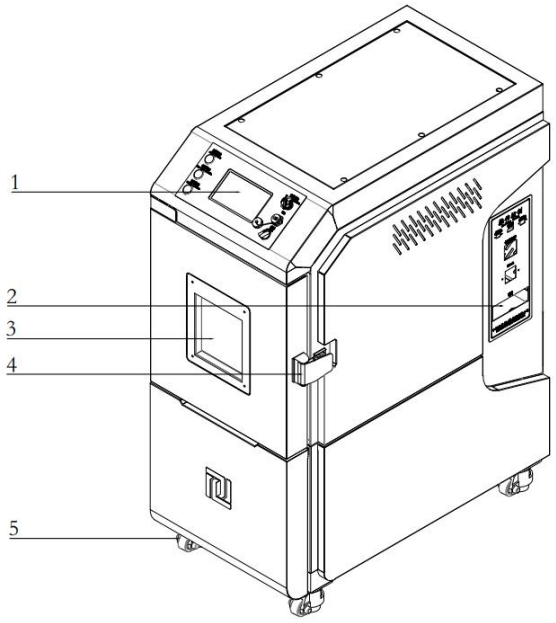
Figure1.1 Mini size 15L and 30L temperature humidity test chamber external view

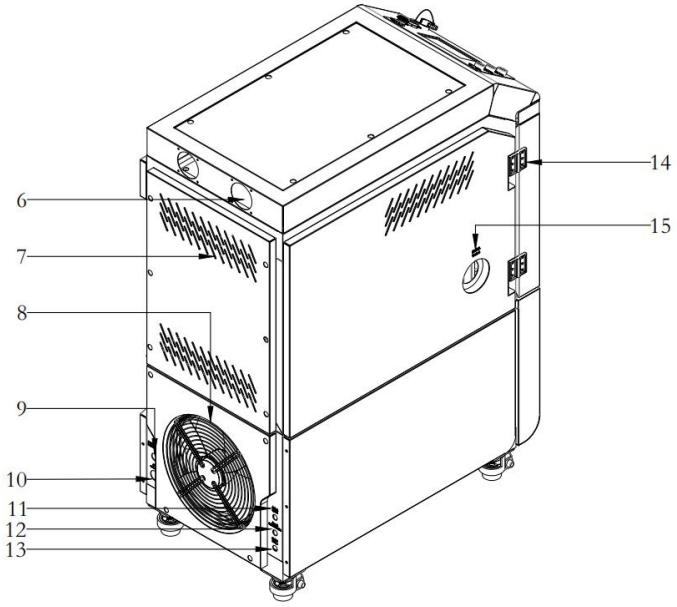


No.	Name	Function
1	Display Panel	for detail functions, see the function diagram of the display panel
2	Viewing Window	Observe the specimen in the test chamber, the upper part has the illumination lamp, the glass material is fragile, please do not collide.
3	Door Knob	After the test chamber door is closed, please push the handle in the direction of closing the door to ensure that the door lock is locked.
4	Control Panel	Part of the interaction function between the user and the test box. For detailed functions, see the function diagram of the control panel
5	Heat Emission Hole	Please keep its good ventilation and regularly clean dust, in order to maintain the best heat dissipation effect
6	Pad foot	Buffering and absorbing vibrations generated by the compressor

7	Condenser Fan	Condenser vent, pls keep its good ventilation and regularly clean dust, in order to maintain the best heat dissipation effect
8	Heat Emission Hole	Unit heat-dissipation, pls keep its good ventilation and regularly clean dust, in order to maintain the best heat dissipation effect
9	Power Line	Provision of electricity for equipment
10	Self-Priming Inlet	plugging in it with a hose, the other end is connected to clean water
11	Sewage Outlet	plugging in it with a hose, the other end is grounded and leaking.
12	Hinge	If there is a problem such as a door falling, pls contact the manufacturer in time
13	Cable Port	Cable testing inlet,pls use the built-in leather plug to prevent air leakage during the test

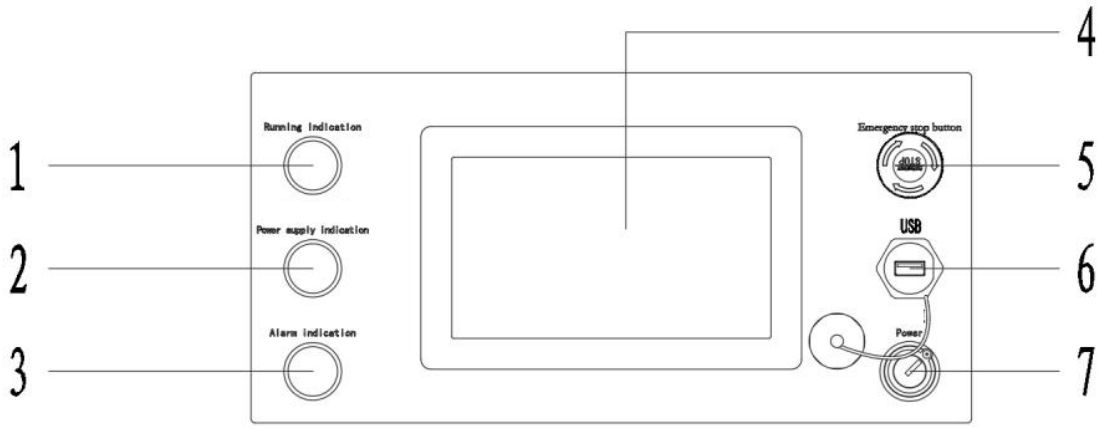
Figure 1.11 Mini size 50L temperature humidity test chamber external view



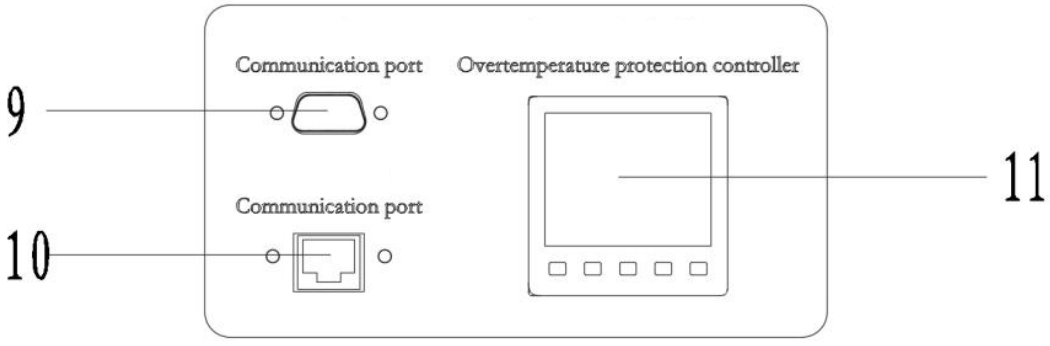


No.	Name	Function
1	Display Panel	See the function diagram of the display panel for detailed functions;
2	Control Panel	Part of the interactive functions between the user and the test chamber, see the control panel function diagram for detailed functions;
3	Viewing Window	Observe the specimen in the test chamber, there is a light on the upper part, and the glass material is fragile, please do not collide;
4	Door Lock	After the test chamber door is closed, please push the handle in the direction of closing the door gently to ensure that the door lock is locked;
5	Castor	The test chamber can be moved on a flat surface, and the bottom of the casters has a locking function,
6	Cooling Fan	For the heat dissipation of the electric control box, please ensure good ventilation and clean the dust regularly to maintain the best heat dissipation effect;
7	Heat Emission Hole	Please ensure good ventilation and clean the dust regularly to maintain the best heat dissipation effect;
8	Condenser Fan	Please ensure that the condenser exhaust vent has good ventilation and clean the dust regularly to maintain the best heat dissipation effect;
9	Option Switch	Tap water and self-priming water selection button;

10	Power Line	Connect the equipment power；
11	Tap Water	Connect with the filtered tap water hose,the water pressure should be more than 0.3MPa;
12	Self-Priming Inlet	After connecting with a hose, connect the other end with clean water;
13	Sewage Outlet	After connecting with a hose, the other end is grounded;
14	Hinge	If there is a problem such as a door falling, please contact the manufacturer in time;
15	Cable Port	Cable testing inlet,pls use the built-in leather plug to prevent air leakage during the test

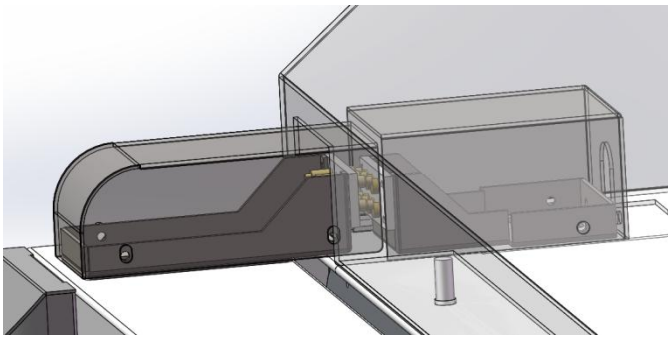


Display Panel



Control Panel

1.2 Door Contact Connector Introduction

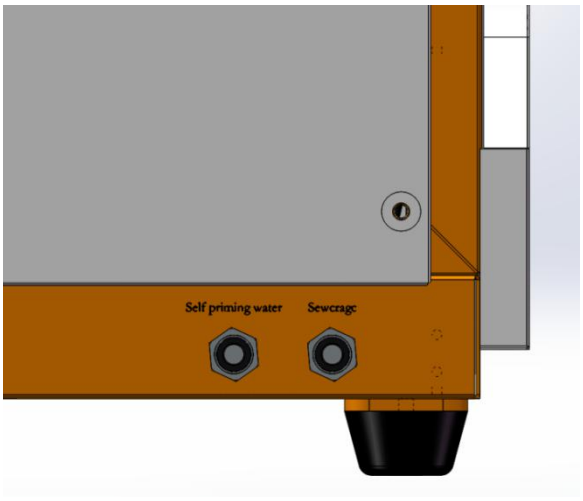


The door contact connector is a structure for supplying power to the test box door. When the door is closed, the contact is turned on, and the heating and illumination on the test box door can work normally. The door contact connector has a working voltage of 24V, which is a safe voltage and does not cause harm to people. If the politeness is dismantled, it is easy to cause the virtual contact of the contact, so that the lighting on the test box door and the heating cannot work normally.

1.3 Humidifying Water Supply (Only when with humidifying function)

Water supply conditions: using pure water, distilled water or deionized water, resistivity ≥500Ω.m.

1) Diagram of self-priming water connection:



No.	Name	Function
1	Self-priming water	Connect the hose with the filter in the accessories, one side of the hose with the filter is inserted into the bucket containing pure water, and the other side is connected to the self-priming water inlet.
2	Sewage Outlet	Connect the hose without the filter in the accessories, put one side of the hose into the empty bucket, and connect the other side to the sewage outlet.

Note: The equipment has a self-priming water pump, pls insert the hose with the filter into the bucket containing pure water. The hose will be blocked if sucking into solid objects.

1.4 Main Specifications:

2. Installation and Commissioning 2

Before using this machine for the first time, users must carefully read the contents of this chapter, familiar with the installation and commissioning of the product and precautions for use to avoid malfunctions and unnecessary user property damage. Any improper or incorrect use and operation may cause harm to the machine itself and to the safety of the user's personal property.

2.1 Transportation and Handling

This series of products is compact in structure, small in space, beautiful in appearance, low in noise, and has little impact on the surrounding environment. It can be conveniently placed in offices, laboratories and production test workshops.

Since the equipment includes a refrigeration system with high sealing requirements and a precise control system, users must strictly observe the relevant precautions when handling, installing and commissioning this product to avoid unnecessary damage to the product. When the product is delivered, the service personnel will conduct a preliminary on-site inspection of the product to determine the integrity of the product.

The main body of the product is a split structure, which can be separated and transported and handled conveniently. However, since the product is a precision and valuable equipment, the following matters should be noted when transporting:

1. Packing and transporting materials with good shock-proof performance and good safety should be used; buffer materials with good cushioning performance should be cushioned at the bottom of the equipment to avoid hard impact during transportation;

2. During the transportation process, it is strictly forbidden to stack hard block objects on the top of the product packaging box to avoid damage to the product caused by sudden impact;

3. During the loading and unloading process, careful construction should be carried out. Special loading and unloading tool carts must be used to lift the box from the bottom side. After leaving the ground, it can be loaded or unloaded or moved long distance. It is strictly

prohibited to fall and tip over;

2.2 Disassemble and Pick & Place

Before opening the package, the user should confirm that the processed product is the same model and number as the product purchased by him. If there is any difference, please contact the manufacturer immediately.

After checking the model number, open the top of the box, take out the product packing list placed at the top, confirm the relevant accessories, and check the model number again.

Open the baffle around the box and expose the test box as a whole. Remove the transparent protective film wrapped around it, take out the power cord, user manual and warranty card, etc. placed in the box and place it properly.

According to the contents of the product packing list, carefully check and fill out the product status sheet. If the part is missing or damaged, please contact the dealer immediately.

After the product is confirmed, the test box is smoothly transported to the location according to the requirements of "2.3-2.4 Installation and Commissioning".

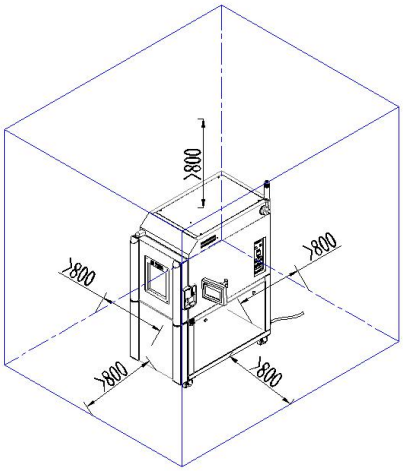
2.3 Installation

- Installation location requirements

Using Environmental conditions:

Ambient Environmental：5℃～35℃　　Relative Humidity：20%RH～80%RH

Due to the need for heat dissipation, there must be enough space between the front and back of the cabinet and the wall or the surrounding obscuration surface (more than 600mm is recommended), as shown in the following figure. When selecting the installation location, it is necessary to select a placement space of 1.5 to 2 times the total volume or more according to the product model.



ATTENTION

During the installation process, it must be ensured that the back and sides of the cabinet are more than 800mm away from the wall or other sealing surfaces! There must be no coverings. Otherwise, it may affect the heat dissipation of the chamber and detract from its performance.

➢ Installation Conditions

Keep the whole chamber in a horizontal state after pushing it to the resettlement site. Instruments such as spirit level should be used when necessary.

ATTENTION

Make sure that the chamber is level and not subject to any shaking or dumping.

A dedicated power supply that meets the requirements should be guaranteed within 3 meters of the product installation location. If you need to extend the power cord in the middle, you must have a professional electrician to carry out the construction.

The working power supply must conform to the power supply specified on the nameplate, and the power supply must be dedicated and must not share the same power supply with other equipment.

2.4 Commissioning

It must be allowed to stand for more than 30 minutes after the product is placed! To ensure the stability of the refrigerant in the refrigeration system.

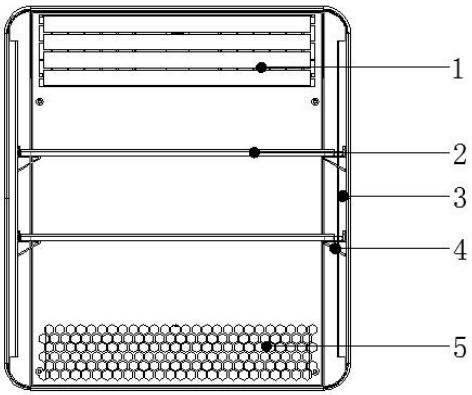
The user can power on the device for the first time after completing the above installation under the guidance of the technician. The first power-on should be carried out by professional and technical personnel. After plugging in the power, first confirm that the power supply is working properly, then turn the power key to the right, hear a “click”, the main relay is closed, the green running indicator lights up, the machine enters the self-test state, after a few seconds, before the machine The control screen on the panel lights up and gives a corresponding reminder.

The enclosure must be reliably grounded before the device is powered on!

After the product is installed, the equipment must be allowed to stand for more than 30 minutes before powering up the compressor!

2.5 Shelf Installation and Specimen Pick & Place

1. Shelf Installation



No.	Name	Function
1	Air-Outlet Louver	Adjust the direction of the wind to make the temperature and clarity inside the box even, the factory has been adjusted, cannot be adjusted.
2	Shelf	To put the specimen on and the grid shelf is also good for ventilation.
3	Shelf Column	Fixed shelf and can be adjusted up and down.
4	Shelf Hook	put the shelf on and move it up and down the shelf column.
5	Return-Air Inlet	Circulating wind return air inlet, cannot be blocked, and must kept clean.

When the test chamber is delivered to the user, depending on the model, one to three stainless steel sample shelfs (according to the test chamber volume) are provided with the chamber , so that the user can pick up and place the sample during the test. In general, test

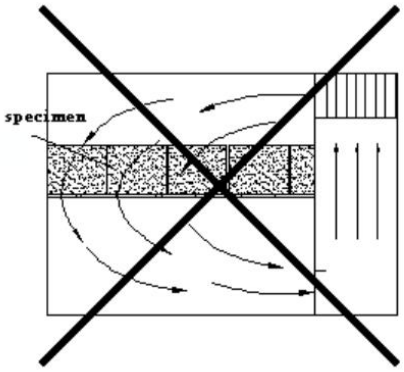
samples should be placed on a sample shelf for testing.

The specimen load of the test chamber should meet the following conditions:

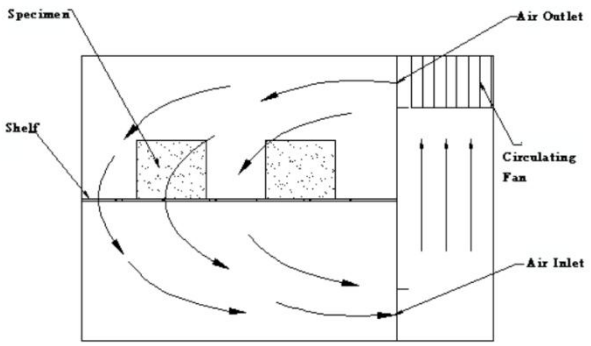
(a) The total mass of the specimen load shall not exceed 80 kg per cubic meter of working volume;

(b) The total volume of the specimen load is not more than 1/5 of the working volume;

(c) In any section perpendicular to the dominant wind direction, the sum of the specimen load areas shall not be greater than 1/3 of the cross-sectional area of the working chamber, and the flow of the airflow shall not be blocked when the specimen load is placed.



ERROR!



CORRECT!

When installing the specimen shelf, follow the steps below.

1 According to the size and quantity of the specimen, determine the placement height of the sample holder, and then put the support strip into the corresponding card slot of the fixed strip according to the height of the sample holder, and confirm it firmly by hand; please note that under normal circumstances, try to avoid the sample holder too high or too low.

2 Snap the sample holder into the support strip and push it from the outside to the bottom of the cabinet. Please note that the sample holder is facing up.

3 After the installation is completed, please confirm the horizontal position of the sample holder again and ensure that it is firm and reliable, so as to avoid falling off during the test and damage the sample and test chamber.

2. Specimen Pick & Place

During the test, the temperature of the sample may be very high or very low. The operator must strictly observe the following safety precautions when handling the sample to avoid damage to the test chamber and loss of the sample.

① Protective gloves must be worn when handling samples;

② When picking up and placing the sample, the test chamber door must be opened and closed as soon as possible to reduce the rewarming time of the test chamber;

③ When picking up and dropping the sample, the sample must be lifted off the shelf and not allowed to slide on the shelf to avoid damage to the shelf and the sample itself;

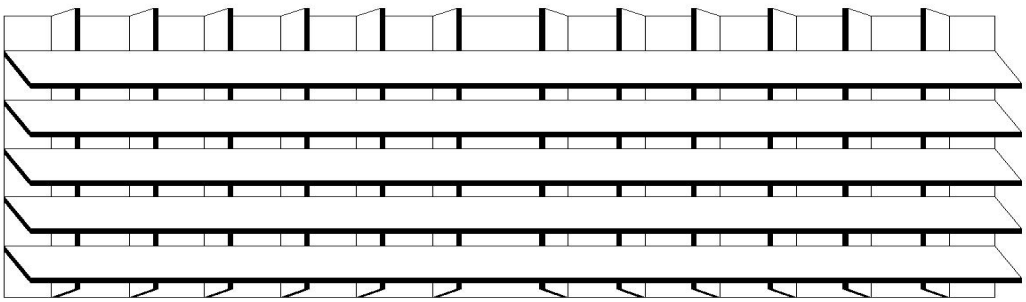
④ When the sample pick-and-place frequency is too frequent, it may cause certain damage to the test chamber, so it must be explained to the sales person to take corresponding measures.

ATTENTION!

☞ During the sample test, protective gloves must be worn for handling samples!

3. Air outlet deflector adjustment

The outlet deflector is designed to make the temperature uniformity in the inspection box. It has been adjusted at the factory, and the customer cannot adjust the outlet baffle at will, so that the temperature inside the test chamber is not uniform.



Air Outlet Deflector

3. Operation Instruction

3

This product adopts advanced touch screen and PLC control technology. Please read this chapter carefully before use. Familiar with the product's switching, setting, operation, alarm handling and other operational precautions, in order to successfully complete the test, avoid machine failure and unnecessary property loss. Any improper or incorrect use and operation may cause damage to the machine.

When an abnormal situation cannot be handled and the machine is abnormal, please turn off the power of the machine and contact the factory after-sales technician.

The following sections apply to the operating program V2.1 Build 20120501. If the operating system is upgraded, please refer to the latest corresponding version of the operating guide.

3.1 Preparation

1. Before starting the machine, carefully check whether the components are in good condition, whether the wiring is loose, whether the approved power supply is consistent with the specified power supply of the device, and ensure that the chamber is reliably grounded;

2. Check if the door handle is loose, and make sure the door is closed.

This instrument needs to be handled by a special person, please strictly follow the instructions in the instruction manual.

3.2 Starting-up and Shutdown Operation

1, Starting-up Operation

a. After ensuring that the external power supply is working properly,

turn on the device power switch.

b. After the touch screen is lit, set the desired target temperature, then click the [System Running] button on the touch screen to confirm. The system starts running after the operation.

2, Shutdown Operation

a. When the system is running, the [System Running] button will display the dynamic fill status. Touch the [System Running] button at this time to confirm that the device stops working after the operation.

b. Turn off the device power switch and disconnect external power.

[See the following details for the target value setting and the specific starting-up and shutdown operation method]

3.3 Control System Introduction

This equipment uses a stable and reliable industrial-grade programmable logic controller (PLC) and high-precision 7-inch color human-machine interface (HMI). Users can perform simple fixed-point/program operation settings through the touch screen, input/change operating parameters, and view. / Maintain system information.

After the system is powered on and initialized, the touch screen first displays the welcome interface, as shown in Figure 3.1. The product name, model number, factory number, and control system version information are displayed in the interface. This screen is displayed for 3 seconds to automatically enter the main interface of the control system.

Figure3.1 Starting-up Screen

The control system interface has a menu interface, which is the first level interface of the control system, as shown in Figure 3.2. In the menu interface, the function interface name is displayed, and the touch button can enter the corresponding interface, as shown in Figures 3.3~3.12.

On the function interface, click  can return to the menu interface.

Door opening reminder when the chamber door is open.

Door closing reminder when the chamber door is closed.

The fixed value monitoring interface mainly displays information such as actual temperature, target temperature, current running time, and timing setting time etc. This interface also includes functions such as system starting-up and shutdown operation and the lighting inside the chamber etc.

The program monitoring interface mainly displays the actual temperature, target temperature, temperature slope, running program group, setting the total number of running segments, setting the number of required cycles, the actual number of cycles, the actual number of running segments, and the remaining time of this segment. The interface also includes system starting-up and shutdown operation, chamber lighting, maintenance, skipping and other functions;

The setting interface can mainly set the target temperature, slope and fixed value running time;

The program setting interface mainly sets the parameters of the program running. The system has 10 program groups, each program group has 50 segments; the program running system has a program group connection function;

The parameter setting interface is divided into 9 separate functions:

1. Touch screen date adjustment
2. Temperature protection upper and lower limit setting
3. Timing start time setting, this function has on/off switch button
4. The operation mode is divided into fixed value operation and program operation.
5. Lighting time setting
6. Display system cumulative running time
7. System rewarming
8. Power-off holding function
9. Correction

The curve interface mainly shows the change state of the target temperature and the actual temperature;

The data report interface mainly displays the values of the target temperature and the actual temperature;

The alarm display mainly displays the alarm status and alarm name, and the alarm report mainly displays the alarm record;

The operating state mainly shows the valve body output state, the compressor running state, etc., and the temperature PID output state is also displayed on this interface;

The system management interface integrates functions such as user management, product information, data export, and expert management. Enter the corresponding interface after touch the button.

Menu

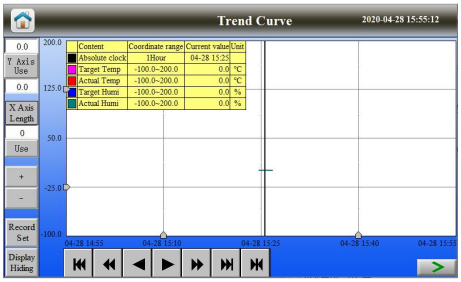
Fixed Value Run Monitor

Program Run Monitor

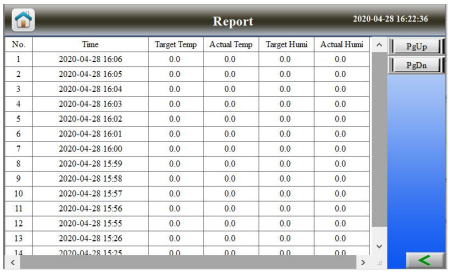
Fixed Value Setting

Program Setting

Function Setting



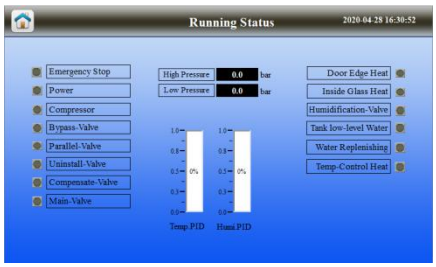
Trend Curve



Data Report

Alarm Event

Alarm Report



Running Status

System Management

When the device encounters an emergency and needs an emergency stop, you can press the emergency stop button to stop the device. At this time, the touch screen pops up a prompt interface, as shown on the right

3.4 Menu Interface

Click the main screen button at the top of each work interface  , You can enter the main work interface as shown in Figure 3.2.

Figure3.2 Menu Interface

Press the button to enter to enter the corresponding function interface.

3.5 Setting Center

Click 

button on the menu interface, then we can enter the interface shown in Figure 3.3.

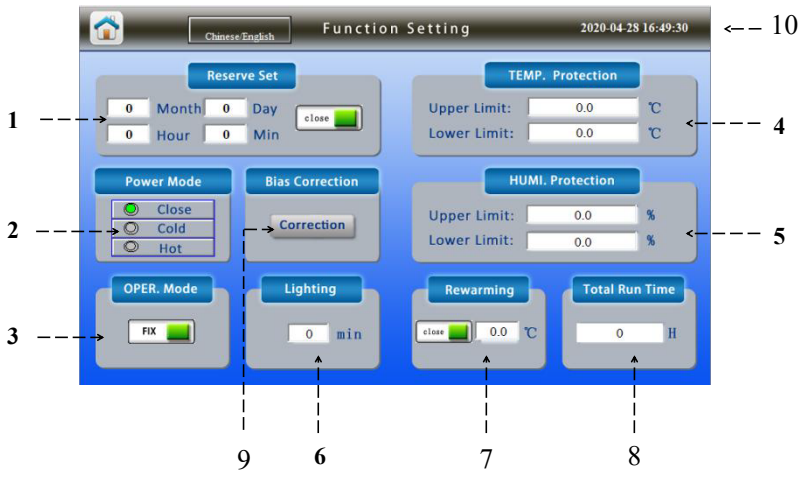


Figure3.3 Function setting interface

In the high and low temperature test, users want to strengthen the protection of temperature sensitive sample parts. The over temperature protection setting function can be used to set the maximum temperature and minimum temperature of the system. When the temperature of the system exceeds the maximum temperature or the lowest temperature, the system immediately alarms and stops; the humidity over temperature protection setting function and the temperature over temperature protection function principle the same.

This series of models provides a reserved power-on function. The user can turn on the power according to the test requirements. After setting the time, turn the switch control switch on to make it "on".

When the power-off hold button is off, the device defaults to the standby state after the system is powered off and restarted; when that button is turned on, the device automatically returns to the state before the power-off after the system is powered off and restarted.

If you want the temperature in the test chamber to be constant within a set range after the end of the experiment, you can use the rewarming function to set a constant temperature value and switch the rewarming button to the on state.

No.	Name	Paraphrase	Remark
1	Reserve Time	Start/stop timing start function	Valid when turn on
2	Power Mode	Power cut and restart mode function	Valid when turn on
3	OPER. Mode	Fixed value/program function switching	
4	Temp. Protection	Temperature upper/lower limit setting	
5	Humi. Protection	Humidity upper/lower limit setting	
6	Lighting	System lighting time	
7	Rewarming	Recover the inside temperature to the fixed value	Valid when turn on
8	Total Run Time	Display system total running time	Only displayed, cannot be changed
9	Correction	Correct the temperature and humidity deviation of the system	Click to enter the modification interface
10	Date Modify	Modify the date and time of the system	Click to enter the modification interface

- The system has two working modes: fixed value running and program running. During the use of the user, the user can flexibly choose according to the test needs, and switch instantly. However, pls notice that the switch button is invalid when the system is in running process.
- In the fixed operation mode, it can be constant at the set temperature for a long time. During operation, the user can change the target temperature at any time, and flexibly create a more accurate temperature environment for the test sample.
- In the program running mode, it can be operated according to the preset target temperature range, time, number of cycles, etc. without user intervention. In general, the program operation mode can be used when performing regular cycle tests.
- Target temperature setting in fixed value mode

On the function settings page, click the fixed button 

, the test chamber is in the

fixed value mode.

[Note: When the test chamber is turned on, the default operation mode is the fixed value mode]

In the menu page, in the fixed value mode 

, click 

for the fixed value run monitor interface, as shown in Figure 3.4.

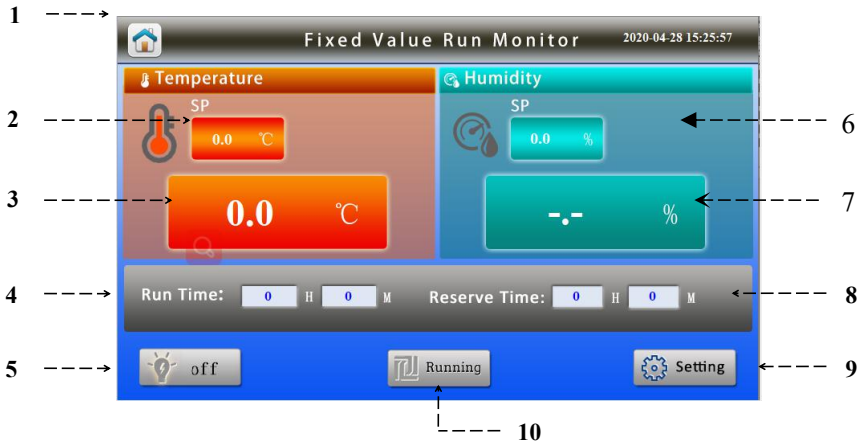


Figure 3.4 Fixed value run monitor interface

Click the main switch button 

, The confirm prompt window pops up as shown on the right. Click the confirm button to start the operation. The LOGO color on the start/stop switch is dynamically filled, indicating that the system has started running. If to stop the machine, click the switch button 

again, Confirm in the pop-up prompt window to stop.

Lightly click the fixed value number, then the numeric keypad will pop-up on the screen. Input the target temperature, and then click the confirm button, the numeric keypad will exit. The target temperature is updated to the fixed value, and the fixed-point temperature setting is finished.

Click the button 

of the fixed value running monitoring page to enter the below

No.	Name	Paraphrase	Remark
1	Menu Button	Return to menu page	
2	Target Temperature	Display the target temperature	can be set
3	Actual Temperature	Display the working area actual temperature	
4	Run Time	Display the running time from booting the equipment	Power down return to zero
5	Lighting	Display the working area lighting on/off	Manual operation
6	Target Humidity	Display the target humidity	can be set
7	Actual Humidity	Display the working area actual humidity	
8	Reserve Time	Display timing running time	
9	Fixed Value Setting	Switch to parameter setting interface	
10	Running	System switch operation button	

fixed value setting page as shown in Figure 3.5.

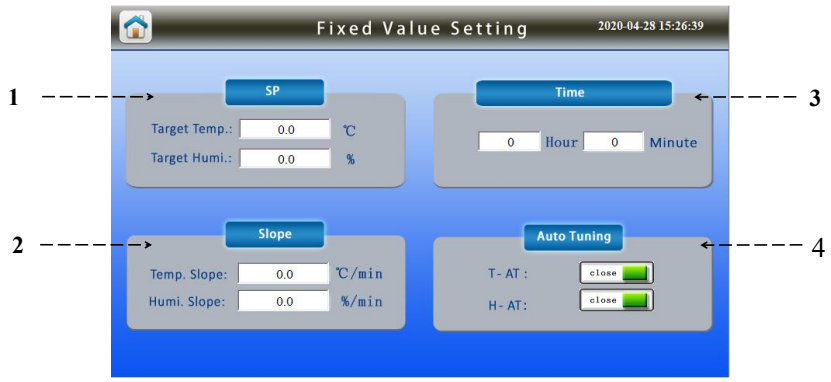


Figure3.5 Fixed Value Setting

This system provides a temperature change rate control function, and the user can set the temperature heating and cooling rate. The specific steps are as follows:

1. Input the target temperature;

2. Touch the temperature gradient input box, input the required rate value (0.5~5°C/min) in the pop-up keypad, click OK, the gradient is set well.

Note: The humidity gradient setting method is the same as the temperature.

No.	Name	Paraphrase	Remark
1	SP	Set the target temperature humidity	Based on fixed mode is valid
2	Slope	Set the temperature humidity slope	Based on Fixed model is valid but not zero
3	Time	Set a fixed value running time	Based on when the timing time is not zero
4	Auto Tuning	Operating temperature tuning and humidity tuning	Automatic reset at the end of self-tuning (this device doesn't have this function)

➢ Programming of programs in program mode

On the function settings page, click the Running Mode Selection button, the test chamber is in the program mode PROG.

In the menu page, in the program running mode PROG, click Monitor Screen for the program running monitoring interface, as shown in Figure 3.6.

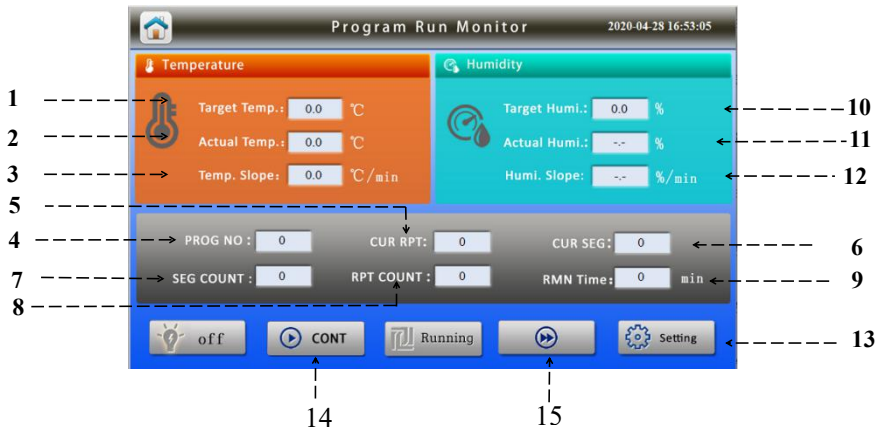


Figure 3.6 Program run monitor interface

No.	Name	Paraphrase	Remark
1	Target temp.	Display the target temperature	
2	Actual temp.	Display the working area actual temperature	
3	Tempe. Slope	Rate of temperature change	
4	PROG NO	Currently running program No.	
5	CUR RPT	The current times of running repeat	
6	CUR SEG	The current number of running segment	
7	SEG COUNT	Setting the total needed number of segments	
8	RPT COUNT	Setting the total needed times of repeat	
9	RMN Time	The remaining time of the current segment	
10	Target Humi.	Display the target humidity	
11	Actual Humi.	Display the working area actual humidity	
12	Humi. Slope	Rate of humidity change	
13	Setting	Click to enter the program setting	
14	CONT	Click for continue the current status	
15	Next	Click for the next segment	

Click the button 

of the program run monitor interface. The test chamber will be in the program setting page as shown in figure 3.7

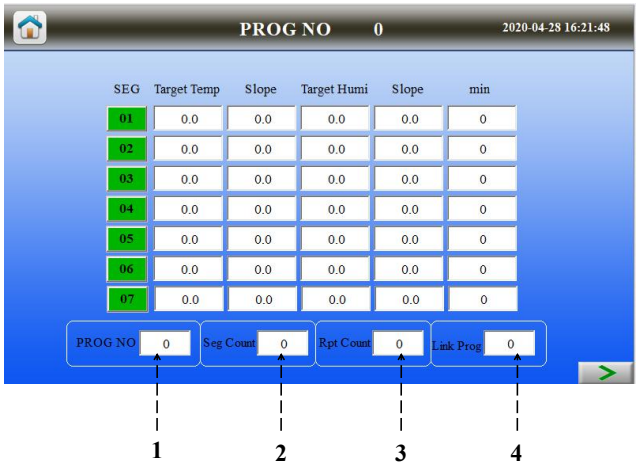


Figure 3.7 Program setting interface

No.	Name	Paraphrase	Remark
1	PROG NO	Select the running program group	
2	SEG COUNT	Setting the number of running segments	
3	RPT COUNT	Setting the repeat times	
8	Link PROG	Automatically run to the specified program connect group after the current program group is carried out.	based on the value is not zero

Users can input the **program group number (1~20),** the number of phases and the number of cycles times according to the sample test needs, and set the target temperature, temperature gradient and running time hour/minute of each phase. Click the next page button  to set the go on.

Reminder: This system has the power-off hold function. The program set by the user can save the existing settings after the power is turned off again. If still want to use the former the program, just input the corresponding program number (1~10) to enter the program.

After completing the program setting, click  to exit the program setting mode interface, return to the menu interface, and click 

to enter the program run monitor interface.

3.6 Trend Curve

Click the button 

in the menu interface to display the temperature trend curve interface, as shown in Figure 3.8. This screen displays the actual temperature (red) and target temperature (blue) trend curve. The X-axis of the trend curve is time, the interval is within 1 hour of the current time; the Y-axis is the temperature value, and the interval is -200 to

+200 °C.

This trend provides a viewing function: Touching any position of the curve in the table will pop up a data table showing the temperature value corresponding to the vertical line time. To move the curve, click the operation button at the bottom of the trend graph to move left  and right  to move the curve. To query the historical curve, click the rightmost button  below the trend curve to pop up the Set Curve Start Time window to query the historical curve within the set time range.

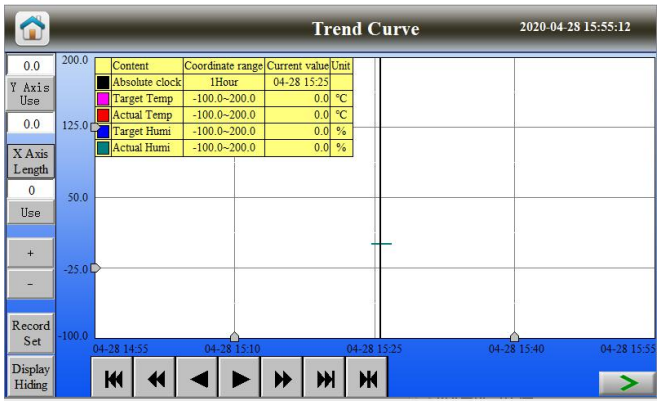


Figure 3.8 curve graph interface

3.7 Data Report

Click the next page button  in the temperature curve interface to display the data recording interface, as shown in Figure 3.9. The temperature data table includes information such as number, time, date, actual temperature, and target temperature etc. The data is recorded every minute, and the latest data is placed at the top of the table.

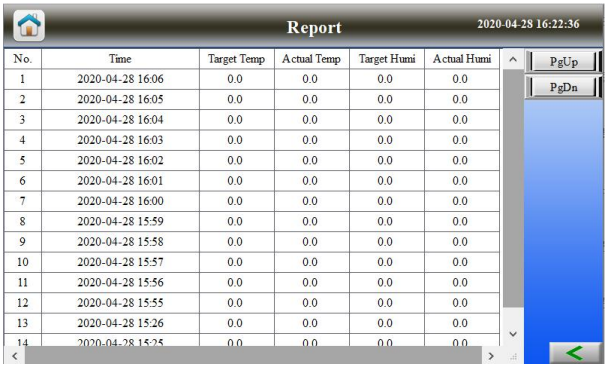
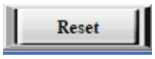


Figure 3.9 data report interface

3.8 Alarm Event

During the system standby or running, when an alarm occurs, the alarm display interface will pop up automatically. When the external alarm is lifted, click the reset button 

to lift the system alarm.

The indicator light has two states, gray and red. It displays gray  when there is no alarm and red  when it is alarmed. click the prompt text to view the alarm details, as shown on the right.

Figure 3.10 Alarm display window

In order to convenient for the user to view historical alarms, the system has developed an alarm storage function, and the generated alarms are automatically stored, and the user can query by date. (the alarm data is can be storage when power off)

Click the next-page button  to enter the alarm report interface, as shown in Figure 3.11.

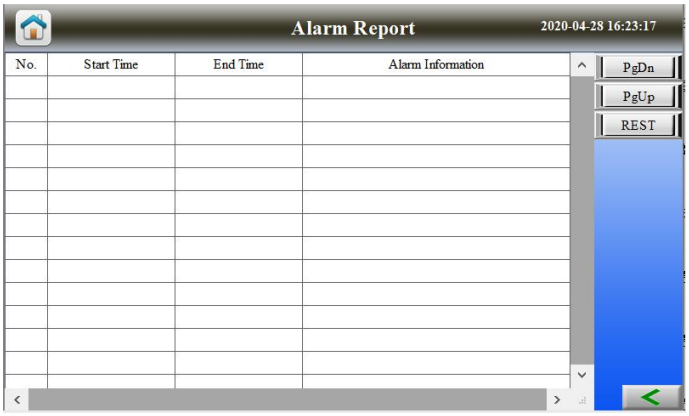


Figure 3.11 Alarm report

3.9 System Status

Click the button 

in the menu interface to display the system running status interface, as shown in Figure 3.12. It shows the working status of the main operating parts of the test chamber (compressor, circulating fan, electric heater, refrigeration system control valve) and also the chamber temperature, the chamber humidity, temperature humidity and water temperature PID output ratio.

When the indicator light of the corresponding component is green, it indicates that the component is on-state.

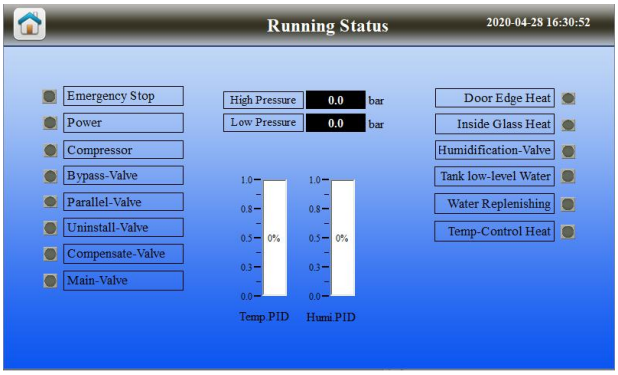


Figure 3.12 running status window

3.10 System Management

Click the button 

on the menu interface to enter the system management interface as shown in Figure 3.13.

Figure3.13 System management

3.11 User Management

Click the button 

on the menu interface to enter the auxiliary function interface as shown in Figure 3.14.

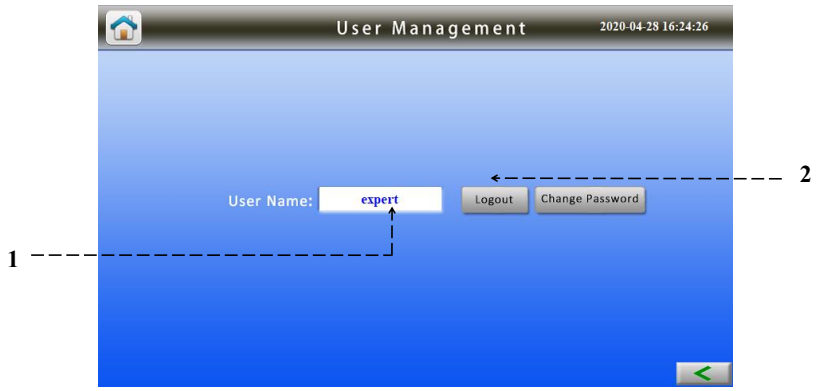


Figure 3.14 user management

When click the temperature gradient input box, the user name button 

will pop-up on the screen, select the user name and enter the password, then click the OK button to log in.

No.	Name	Paraphrase	Remark
1	User name	Enter the user name and password to log in	Operator（password is 123456） Administrator（password is the digital of Product No on the nameplate ）
2	Logout	Log out of user login	

3.12 Product Information

Click the button 

on the system management interface to enter the auxiliary function interface as shown in Figure 3.15.

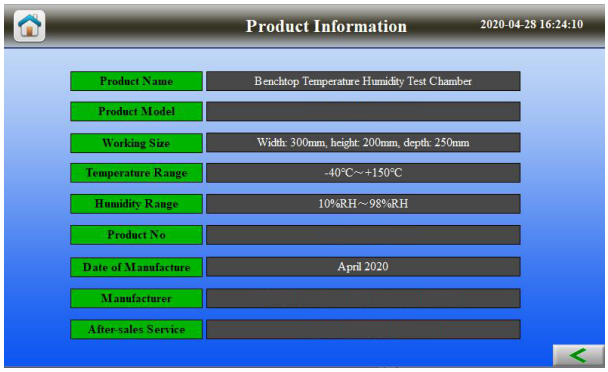


Figure 3.15 product information window

The product information interface displays product specific information including: name, model, size, temperature range, product number, date of manufacture, manufacturer, and after-sales phone.

If there is a device failure in the field, you can check the after-sales phone number of this interface to contact us.

3.13 Data Management

The system supports the data export function. The operation steps are as follows: first insert the USB flash drive into the USB interface on the chamber, then enter the data recording interface, click the system management interface and click the button 

to switch to the data export interface as shown in Figure 3.16.

Input the start time and end time of the exported data, and then click the button 

to export the status indication from 0 to 1. The exported data volume shows the number of exported data, indicating that the export is complete.

Pull out the USB flash drive and insert it into the USB port of the computer. You can see that there is an Excel sheet with the file name "Temperature Report" in the USB flash drive. When you open it, you can see the exported data record. The first column in the table is time, and the third column and the fourth column are the actual temperature and the target temperature respectively.

Figure3.16 Data management

4. Common faults and Trouble Shooting

4

During the operation of the test box, if there is an abnormal fault, the machine cannot operate normally, or when there is a buzzer alarm and a light prompt, please refer to the following fault phenomenon and troubleshooting for inspection and maintenance.

If the fault phenomenon is not listed in the following table, please contact the manufacturer's technical personnel or the relevant sales personnel. It is strictly forbidden to carry out the private modification and modification. The resulting product manufacturer is not responsible and is not covered by the warranty.

Fault	Fault Cause	Elimination Methods
Cannot turn on the equipment	1．Whether the power is connected ot not	Power on
	2．Whether the fuse is in good condition or not	Replace the fuse
	3．Switch contact and connecting parts of various parts are not reliable	Connect well
Temperature is out of control	1. Whether the solid-state relay is damaged or not	Professionals for replacement
	2．Whether the temperature sensor is faulty or not	Professionals to check or replace
	3．Whether the refrigeration system is faulty or not	Professionals to check
Automatic Shutdown	1．Whether the ambient temperature too high or not	Move to suitable environment
	2．Is there any obstacle in the air outlet of the refrigeration unit?	Remove obstacles, the outlet should be greater than 1 meter
	3．Refrigerator failure	Professionals maintenance
Slow cooling rate or no cooling	1．Ambient temperature is too high	Check if the ambient temperature exceeds 30 °C
	2．Less refrigerant or refrigerator failure	Professionals maintenance
Abnormal vibration	1. Poor ventilation	Check the air inlet and outlet
	2. Loose connection	Find loose points and reinforce

5. Maintenance

5

5.1 Periodic Maintenance

In order to extend the life of the product, users need to perform regular maintenance on the equipment. When servicing, the power must be turned off and carefully handled. After the maintenance is complete, the product should be allowed to stand for a while and then turned on.

Main maintenance content:

1. Always keep the cabinet clean and tidy. After use, clean the cabinet and outer casing. Disconnect the power plug when not in use for a long time;

2. Cleaning of the condenser filter. The filter is installed on the suction side of the condenser. Please take out the filter regularly for cleaning. Rinse with clean water or use a gas pipe to clean the surface of the filter, clean the surface debris, and then put the filter back. .

3. The touch screen is clean. Long-term use, especially in harsh environments, the touch screen is prone to stains, should be wiped clean in time. When wiping, apply a soft rag and gently wipe it with a special cleaning agent for the LCD screen.

Other maintenance is carried out according to actual needs.

5.2 Maintenance under abnormal conditions

During the operation of the test box, when an unexpected situation occurs, or a certain fault occurs continuously, it should be maintained in time.

Please follow the instructions of the technician for maintenance.

6. Notice

6

1. The power supply voltage used in this instrument must be within 380V (1±10%), and it has reliable grounding protection, no looseness or poor contact;

2. The equipment is required to be clean and tidy, and the ground is flat. Do not place in a messy, humid, flammable or explosive place;

3. Wear protective gloves when handling to avoid burns and frostbite;

4. When the test box is running at a temperature below 0 °C, please try not to open the door. If it must be opened, the number of door opening should be reduced as much as possible to prevent frost in the box.

5. When the test box is stopped at a temperature below 0 °C, please re-warm to above normal temperature before stopping.

7. If the refrigeration system finds a problem, it should be inspected and repaired by a professional refrigeration technician or notified to the factory. Other personnel are not allowed to dismantle it at will.

Forbidden to put any samples that may be exposed to fire, explosion and other dangerous conditions at high or low temperatures for testing! Forbidden to put corrosive objects into the chamber to avoid reducing the life of the equipment!

Forbidden to open the door frequently during the operation of the test.

Forbidden for personnel without professional electric wages to make private changes to the power connection part of the test chamber to avoid the risk of electric shock!

Please read and understand the contents of the manual before using this product! (Reminder: Please place the manual with the test chamber for easy reference.)

Please ensure that the equipment is grounded well before starting up!

During the sample test, protective gloves must be worn for handling samples!