UV Aging Test Chamber

INSTRUCTION MANUAL

SAFETY INSTRUCTIONS

Due to the potential hazards associated with any electrical instrument it is important that the user is familiar with the instructions covering the capabilities, and the operation of the instrument. The user should ensure that all reasonable safety precautions are followed and if any doubt should seek professional advice before proceeding.

The instrument is designed for use by suitably trained, competent personnel in a controlled working environment and is intended for use as a UV Accelerated Weathering Tester only.

TESTEX cannot be held responsible for any unauthorised modifications to this unit.

WARNING

This unit contains hazardous live voltages. Under no circumstance should the user try to prevent or restrict the movement of parts or gain access to the internal circuitry, either personally or with the aid of foreign bodies.

All ventilation slots must be kept clear.

PROVISION FOR LIFTING AND CARRYING

When unpacking or moving this unit extreme care is required, owing to its physical construction and weight.

It is recommended that accepted lifting and carrying procedures are employed and that personnel wear the appropriate protective equipment e.g. safety shoes.

If the unit is to be move an appreciable distance/height it is recommended that it is moved via a suitable vehicle e.g. a fork lift truck.

OPERATING ENVIRONMENT

This unit is intended to be used in a residential, commercial and light industrial environment as laid down in BS EN 50081-1 and BS EN 50082-1.

The following list gives examples of locations in which the instrument might be located; workshops, laboratories and service centres. Locations which are considered to be commercial or light industrial.

CLIMATIC ENVIRONMENT

The unit is intended to operate within the following conditions

i)	Temp	25+/-5 deg Celsius
ii)	Humidity	30-65% RH
iii)	Altitude	<2000m above sea level.

And it is intended to be stored in a temp range of –25 - +25 deg Celsius.

ELECTRICAL INFORMATION

This unit complies with BS EN 61010-1 safety Requirements for Electrical Equipment for Measurement, Control and Laboratory Use.

INSTALLATION CATEGORY AND POLLUTION DEGREE

Installation category III

Pollution Degree 2

ELECTRICAL / AIR SUPPLY

Voltage: ☐110V; ☐ 127V; ☐220V; ☐ 230V; ☐240V; ☐ 380V; ☐ 415V;☐____V
Frequency: ☐50Hz; ☐60Hz
Phase sequence: ☐1 Phase; ☐ 3 Phase;
Air pressure : ☐0.4-0.6Mpa

WARNING LABELS

Number	Symbole	Publication	Description
1		IEC 417, No. 5031	Direct current
2		IEC 417, No. 5032	Alternating current
3		IEC 417, No. 5033	Both direct and alternating current
4		IEC 617-2, No. 02–02–06	Three–phase alternating current
5		IEC 417, No. 5017	Earth (ground) TERMINAL
6		IEC 417, No. 5019	PROTECTIVE CONDUCTOR TERMINAL
7		IEC 417, No. 5020	Frame or chassis TERMINAL
8		IEC 417, No. 5021	Equipotentiality
9		IEC 417, No. 5007	On (Supply)
10		IEC 417, No. 5008	Off (Supply)
11		IEC 417, No. 5172	Equipment protected throughout by DOUBLE INSULATION or REINFORCED INSULATION (equivalent to Class II of IEC 536 –see annex H)
12 (see note)	 Background colour – yellow; symbol and outline – black	ISO 3864, No. B.3.6	Caution, risk of electric shock
13	Symbol under consideration		Easily–touched higher temperature parts
14 (see note)	 Background colour – yellow; symbol and outline – black	ISO 3864, No. B.3.1	Caution (refer to accompanying documents)

Section 1 Safety instructions

1. Precautions

(A) Operation manual is available for the end users anytime and anywhere.

(B) Please read the operation manual carefully before use.

(C) All the instrument functions are described here, and anything other than the operation manual is not guaranteed.

(D) No edition, copy or use in part or all of this manual is allowed.

(E) A change in the manual content is permitted without prior notice or advance notice.

(F) Please contact the purchasing office or our company if there are any mistakes.

2. Precautions for product safety and modifications (changes)

2.1 Read the safety precautions (instructions) in this manual carefully in case of any damage to the system maintenance or the instrument.

2.2 We company shall not be liable for any damage caused by failure to use, place, or comply with the contents of this manual.

2.3 Additional protective devices or safety circuits should be installed outside the production in case of any damage to the system maintenance or the instrument. It is strictly forbidden to alter (change) or add to the internal structure.

2.4 Do not disassemble, repair or refurbish without permission, otherwise it may lead to electric shock, fire or malfunction.

2.5 Please contact our sales department if the parts or consumables need to be replaced.

2.6 Keep the instrument from water in case of malfunction.

2.7 Avoid crash as it may cause damage or malfunction.

3. Liability Waiver

3.1 We company only guarantee or assume responsibility for those specified in the quality assurance conditions.

3.2 We company shall not be liable for all direct or indirect damages (including those to Users or third parties when using the instrument) as a result of any defects or unpredictable

Section 2 Introduction

1. Application

This instrument has adopted the fluorescent UV lamp method, applicable to the exposure of light sources in various material test chambers, and is designed for the change of materials placed outdoors and formulation improvement of new materials as well as durability test.

2. Test Samples and Performance Evaluation

2.1 Appearance evaluation：

The instrument, employing a fluorescent UV lamp ideal for the UV segment of the sunlight spectrum, is able to simulate discoloration, decrease in brightness and intensity of samples, supported by temperature control and humidity supply devices. With the real simulation of the environment conditions of like cracking, flaking, chalking, oxidation and other damages to the sun (UV section) high temperature, high humidity, condensation, dark cycle, it is widely used to evaluate the weather resistance of materials by weakening the light or moisture resistance under the synergistic effect between UV light and moisture, or even make them fail.

The instrument has the characteristics of the best sunlight UV simulation, low cost of use and maintenance, easy operation, and its process controller automatically runs the test cycle, with high degree of automation, good stability of lighting, high reproducibility of test results.

2.2 Evaluation of mechanical and other properties:

For general rubber materials, there are tensile strength, elongation, hardness measurement, plastic measurement of impact strength, elongation at break, tensile strength, bending strength. If necessary, other performance tests can be specified.

2.3 Meet but not limited to the following criteria：

ASTM D4329、ASTM G154、ISO 4892-1、ISO 4892-3

Section 3 Structure and Technical Performance

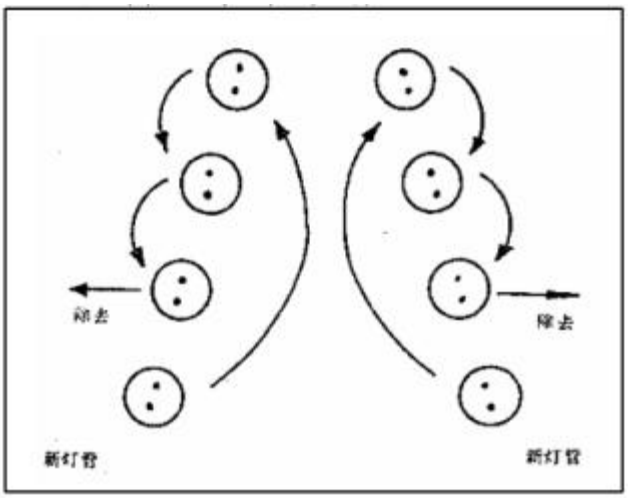
3.1 Instrument description

3.2 UV fluorescent lamp

A total of 8 UVA-340 fluorescent UV lamps, 40W each, are used, suitable for performance comparison of various polymers and stabilizers, and they are also perfect for correlation studies, since UVA-340 can accelerate tests and provide fast evaluation results, essential for QC and R&D applications and tests on strong and durable materials, accelerating tests and providing fast evaluation results.

A. Installation: Fragile UV lamps should be packaged separately at the factory, and be installed with special care. Before installation, please power off the instrument. Lift the test bin cover and both sides of the replacement port, insert the UV fluorescent lamp right into the seal, then push the lamp to insert the lamp right into the seal on the other side. In the end, adjust the sealing caps on both ends of the lamp before install the power supply connector. Keep the lamp clean in case of any effect on its irradiance; otherwise, wipe it with alcohol. Store the backup lamps in a ventilated, dry and non-corrosive environment.

B. Radiation preservation. A long-used fluorescent UV lamp will gradually decline in its output light. Consequently, the desired radiation effect fails to be achieved. Please replace the eight lamps as shown in the figure to ensure good performance when the light energy radiation is too low (UV lamp ignites amounting to 400 ~ 450h).



3. Temperature control system

(1) PLC and text display communication control, convenient and easy for operation.

(2) A/D control module for PID temperature and humidity regulation, accurate in temperature (humidity) control. Multi-point fault and information display facilitate troubleshoot check.

4. Humidification system

The humidification system consisting of water tank, humidifying system, enables the sample's exposed surface to be dewy and wet in accordance with humidity condensation mechanism, to simulate the perfect testing environmental conditions of rain, high humidity, condensation and with the sun (UV) dark synergy.

5. Carrying device

The device carrying the samples is on the UV lamp uniform radiation surface, made of 304 stainless steels, whose load capacity is less than or equal to 20kg

6. Protection System

The instrument is protected from water shortage, anti-dry burning, over-temperature,

short circuit, overload。 All these protection systems are located in the electric control panel and cabinet respectively, and automatically cut off the power supply of the instrument in the alarm state, and then an acoustic prompt is issued in case of any damage to the instrument and users.

7. Technical parameters

7.1 External dimensions： W*H*D(1300*1470*550)

7.2 Temperature range：RT+10℃～70℃

7.3 Temperature uniformity：±3℃ Temperature fluctuation：±1℃

7.4 Humidity range：≥75%RH

7.5 Center distance inside the lamp： 65～75mm

7.6 Distance between the test article and the center of the lamp：55 mm

7.7 Wave length：UV-A 340（315～400nm)

7.8 Irradiation intensity：0.55~1.0W/C ㎡ (adjustable)

7.9 Light, condensation, spraying cycle (adjustable)\ Blackboard temperature：50℃±3℃

7.10 ◎Inner material: SUS304 stainless steel plate

◎Shell material: SUS304 stainless steel plate

7.11 Lamp: UVA-340 UV lamp, a row of 4, 40W / only (8 pcs)

7.12 Water source and consumption: clean or distilled water 8 L/ day (Self-provided)

7.13 Control system: touch screen and PLC controller

8. Usage environment

- Temperature：20～35℃
- Humidity：50-70 %RH
- Atmosphere：86～106Kpa
- No strong vibration in the surroundings；
- No direct sunlight or other heat source radiation；
- No strong airflow. No airflow blown directly to the box when the surrounding air needs to be forced to flow
- No strong EMF influence；
- No high concentration of dust and corrosive substances.

- In addition to horizontal placement, reserve 300mm space between the instrument and the wall or object for operation and maintenance, ventilation

Section 4 Attention

4.1 Safety precautions！

1. Human eyes and skin often Exposure to ultraviolet light, eyes and skin will be burnt, and *high*-concentration ozone generated when the UV lamp is lit will cause headache, chest tightness and other discomfort. in order to prevent the above phenomena, the site should be kept ventilated and protective equipment should be worn.

2. To ensure the safety of the equipment, please install the external protection mechanism and supply power according to the product nameplate to ensure the instrument safe.

3. Flammable, explosive, toxic, strong corrosive substances is strictly prohibited for the test.

4. Non-specialists are not allowed to disassemble and repair.

5. The instrument should be reliably grounded. Please replace the parts with the same type and specification if there are any malfunction.

6. Never open the test bin door during the test.

7. Read the manual in detail before operation.

4.2 Precautions for use！

1. It is normal that the water shortage protection doesn't work due to the lack of water in the tank as the instrument starts working the first time. Please fill up the tap water.

2. Do not open the door when the instrument is performing PID calculations in case of any calculation errors. (The calculation has been done before leaving the factory)

3. Be careful about the water level of the water storage tank. Add water in time in case of the test interruption.

4. Do not modify the parameters of the regulator, etc. except for those allowed to be changed in the manual.

Section 5 Operation and Setting

5.1 Fix (FIX) test

5.1.1. System main screen introduction

Start-up screen [1-1]

Fig. [1-1] Main screen

Five functions are supported：

1. Fix test. In this mode, the set values of temperature and humidity can be reached according to a certain time or ratio. Click “FIX TEST” to enter the screen as shown in Figure. [1-2]

2. Program Test. This mode allows self-editing programs adjusting the temperature and humidity. Click “PROG TEST” to enter the screen as shown in Figure [2-1].

3. Function setting. This function allows operation-related settings. Click “FUNC.SET” to enter the screen as shown in Figure [4-1].

4. Failure record. This function allows the DI fault record viewing. Click “DI HIS” to enter the screen as shown in Figure [6-1].

5. Reserve. This function allows fixed-value tasks or programmed tasks at regular intervals. Click “Reserve” enter the screen as shown in Figure [7-1].

5.1.2 Main screen of fix test

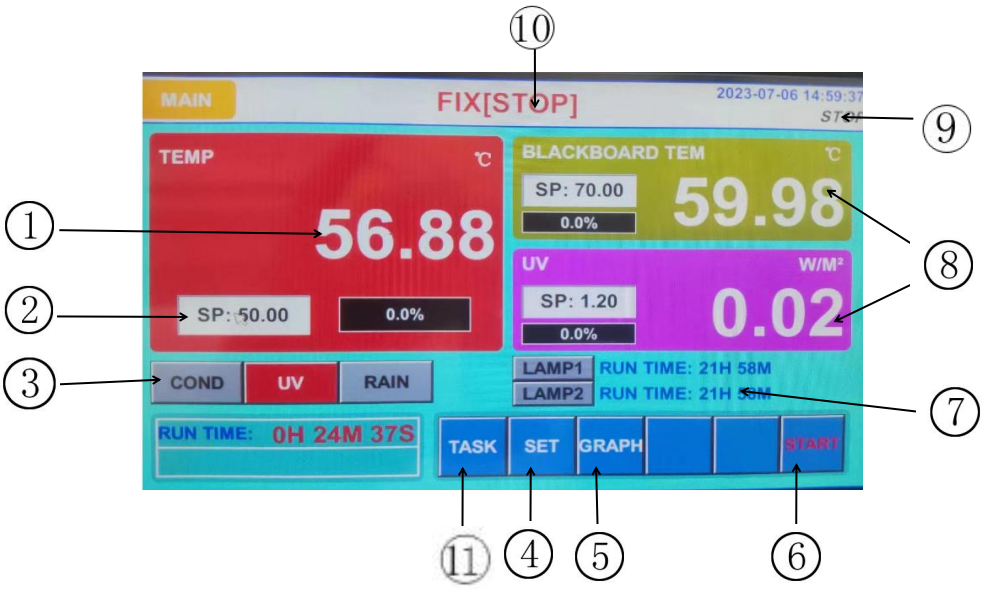


Fig. [1-2] Main screen

① Current condensing temperature.
② Current condensing temperature setting value: settable value range (-200.00-400.00)
③ Click to select the start-up mode.
④ Setting: click the setting button. Please refer to Figure [1-3] for specific settings
⑤ Switch to the curve display screen。
⑥ Run button. Please refer to Figure [1-4] for details.
⑦ Cumulative time of the front and rear lights.
⑧ Current irradiation intensity and blackboard temperature.
⑨ The current status.
⑩ The current position.
⑪ Task: enter the task setting. Please refer to Figure [1-5] for specific settings

5.1.3 Fix setting screen

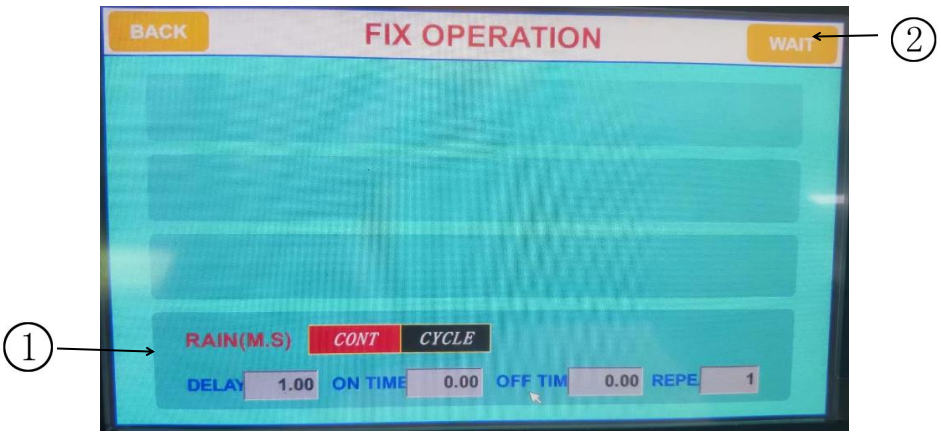


Fig. [1-3] Fix setting

① Select whether the shower mode is continuous or periodic.
② Enter the standby setting screen. Refer to Fig. [1-4] for specific settings.

5.1.4 Standby setting

Fig. [1-4] Standby setting

① Standby setting switch.
② Set condensing temperature area. (Settable range 0.00-600.00)
③ Set the standby time.

5.1.5 Fix test running screen

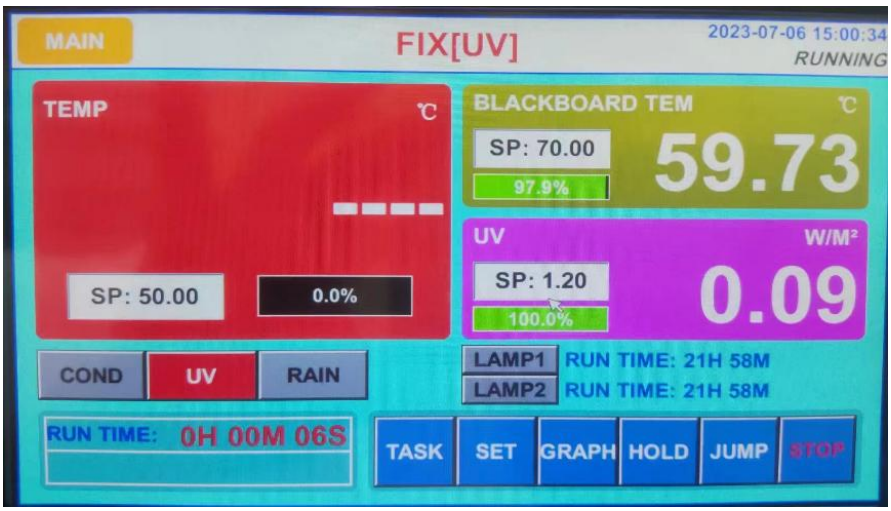


Fig. [1-5] Fix test running screen

Running operation：

1. Set the time and period as shown in Fig. [1-3].
2. Click “Running” in Fig. [1-3].

☞ After running, the screen information has been updated. In the upper right corner is the test running, and in the lower left running time and remaining time.

☞ Click “Stop” in the lower right corner to terminate the operation.

5.1.6 Task setting screen

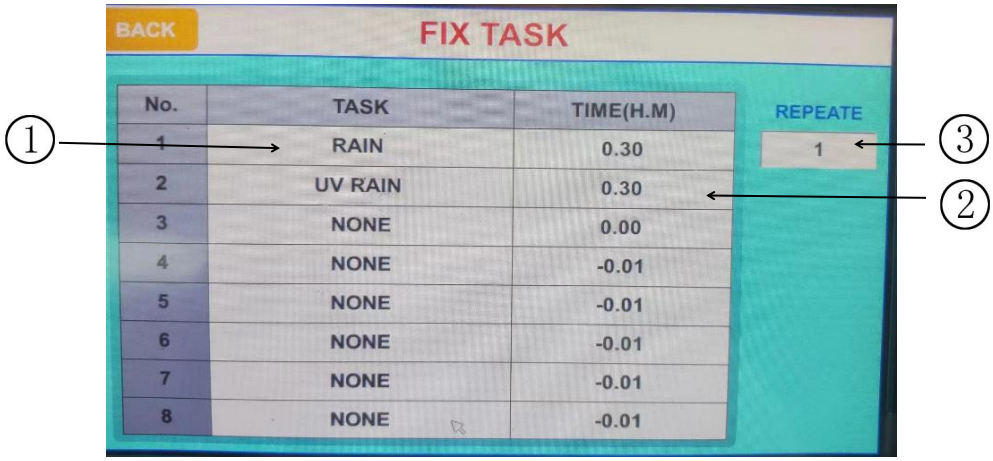


Fig. [1-5] Task setting screen

① Executing task. (Click to set different tasks)
② Task time.
③ Repeat times.

5.2 Program test

5.2.1 Main screen

Click “PROG” to enter the screen.

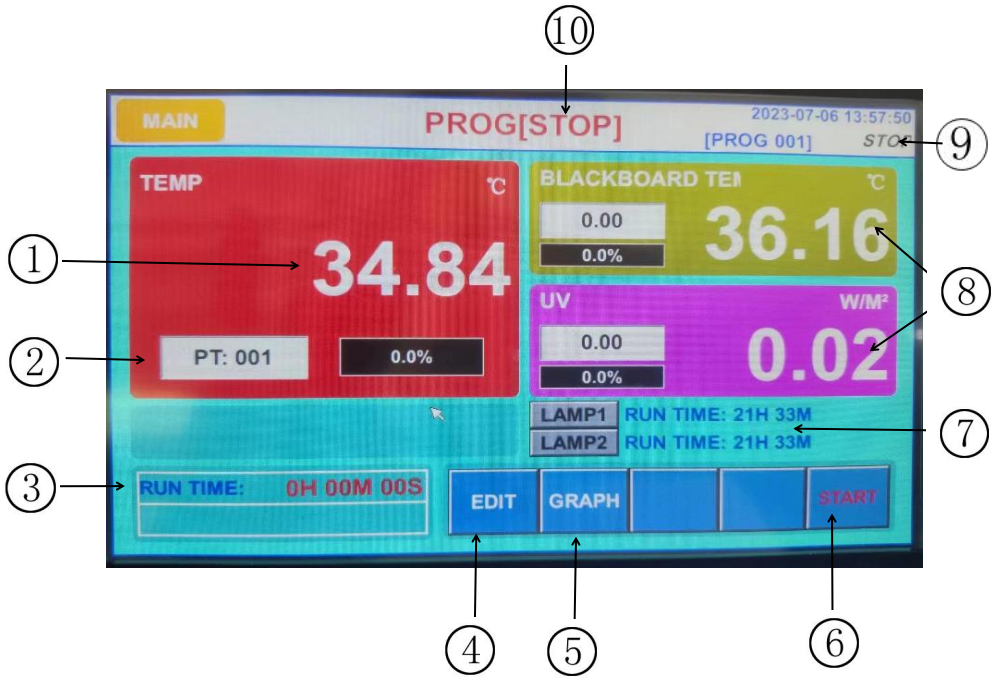


Fig. [1-2] Main creen

① Current condensing temperature.
② Current program number.
② Running time.
③ Edition: click it to edit the program. Please refer to Figure [2-2] for the specific settings.

④ Switches to the curve display screen.
⑤ Running. Refer to Fig. [1-4] for details
⑥ Accumulated time of the front and rear lights.
⑦ Current irradiation intensity and blackboard temperature.
⑧ Current status.
⑨ Current position.

5.2.2 Program edition screen

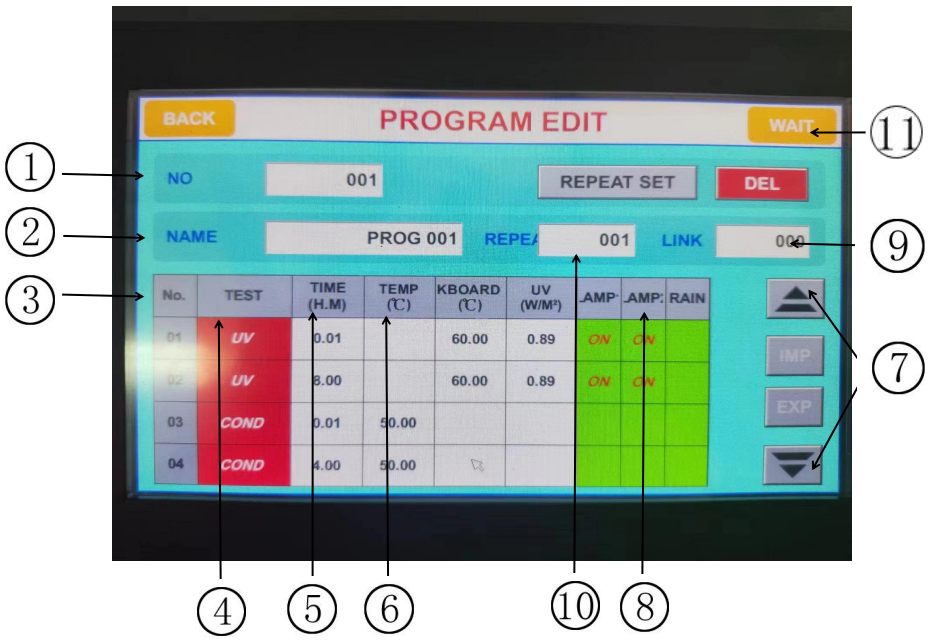


Fig. [2-2] Program edition

① Program number.
② Program name.
③ Program segment No.
④ Test mode.
⑤ Time signal
⑥ Three modes setting.
⑦ Page up and down
⑧ Click to select whether to turn on the front and rear lights.
⑨ Program connection. (Desirable range 0-120)
⑩ Set the number of cycles.
⑪ Enter the standby setting. Refer to Fig. [1-4] for specific settings

5.2.3 Program running screen

Running steps：
1. Edit a program as shown in Figure [2-2].
2. Select the program number as shown in the Figure [2-1].
3. Click “Running” button.

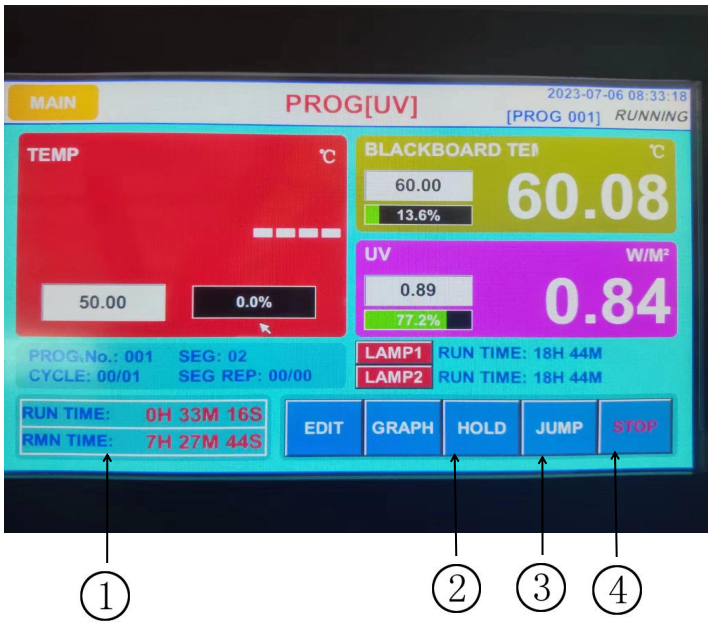


Fig. [2-3] Program test

① Remaining run time
② When the program is running, click “Hold” to keep the temperature, and click it again to cancel.
③ When the program is running, click “Jump” to skip this segment and go directly to the next run.
④ Click “Stop” to stop the present run.

5.3 Graph display

5.3.1 Real-time screen

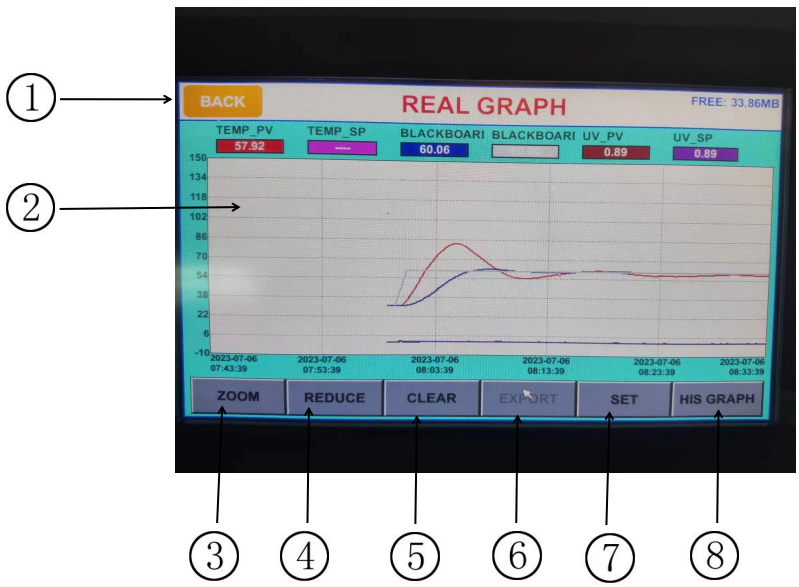


Fig. [3-1] Real graph

① Current and set values of condensation temperature and blackboard temperature,

irradiation intensity in six different color curves. (Click the corresponding boxes to present and hide the settings)

② Graph range.
③ Zoom-in.
④ Zoom out.
⑤ Clear.
⑥ Export the current graph screen. (Please connect the U disk before operation)
⑦ Graph display setting. Please refer to Figure [3-2] for specific settings.
⑧ Enter the history file screen.

5.3.2 Graph set

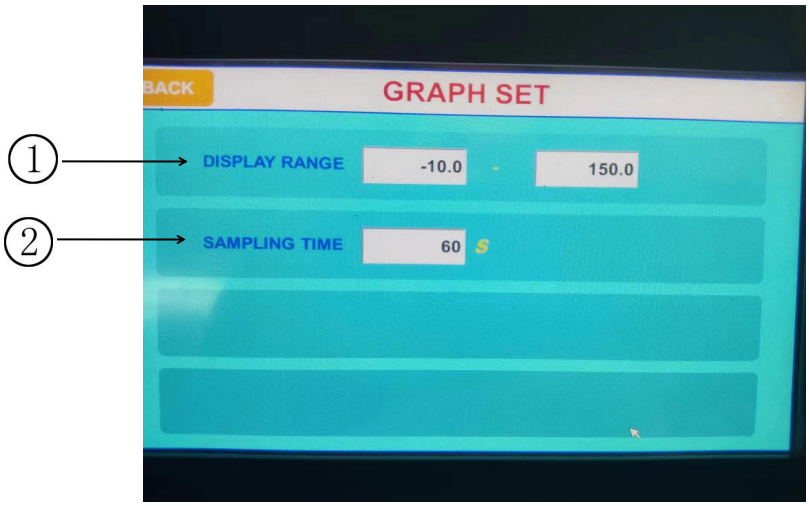


Fig. [3-2] Graph set

① Set the display range. (Available range is -100-400)
② Set the time of the sampling cycle.

5.4 Function set

5.4.1 First screen

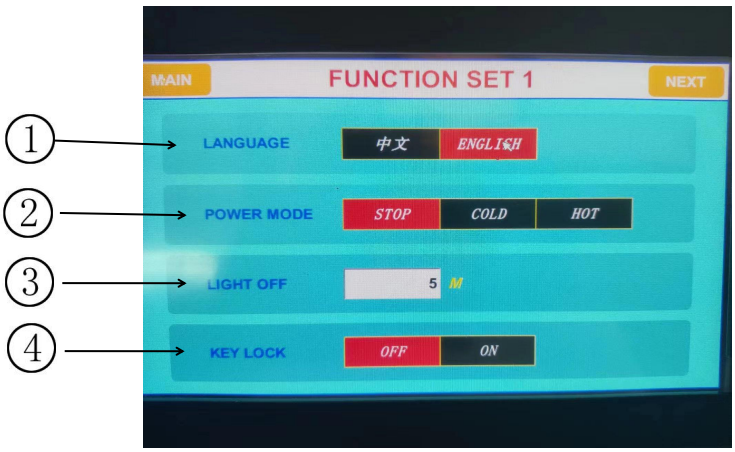


Fig. [4-1] Function set（1）

1. Select language.

2. Set the power-up operation after power off.
☞ Stop: resume operation before power failure.
☞ Cold start: after power failure, the instrument restarts
☞ Hot start: restore the state before power failure.
3.Backlight time set. 0 means the light is always on.
4.When the lock works, all parameter settings are unavailable.

5.4.2 Second screen

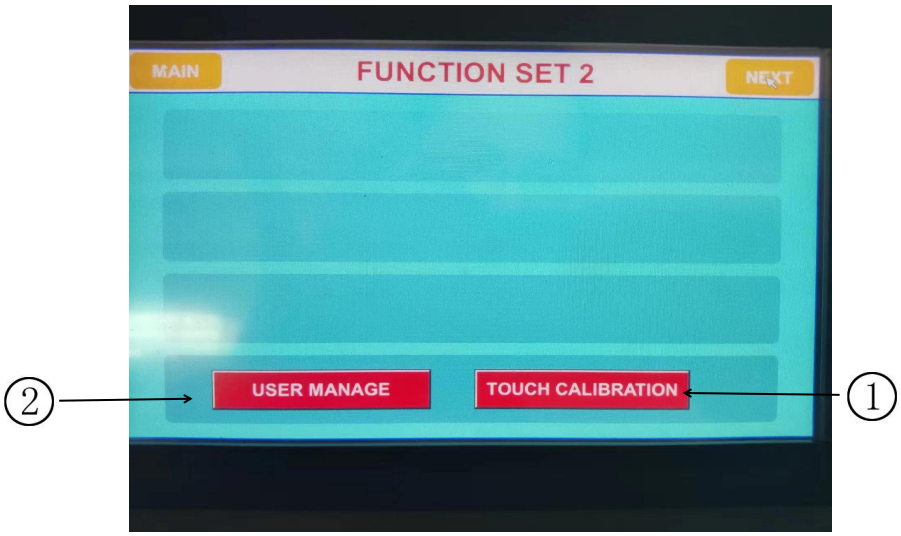


Fig. [4-2] Function set（2）

1. User management: click to set up information (refer to Figure [4-3]).
2. Touch screen calibration.

5.4.3 Third screen

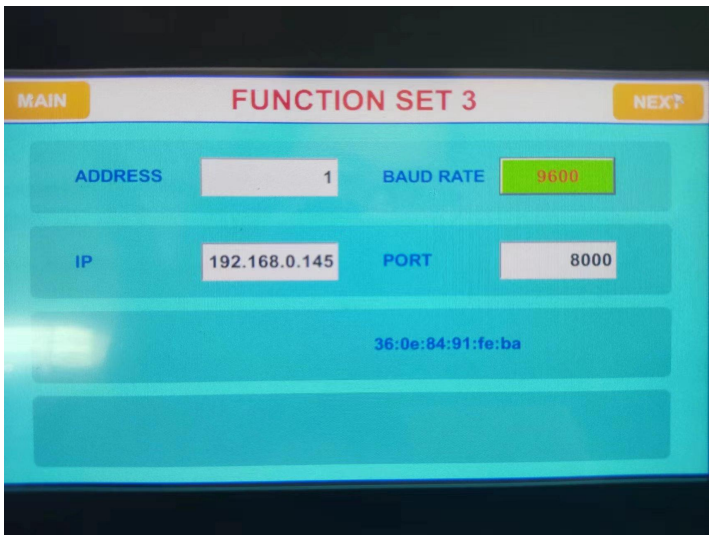


Fig. [4-3] Function set（3）

5.5 History Data

5.5.1 History graph data

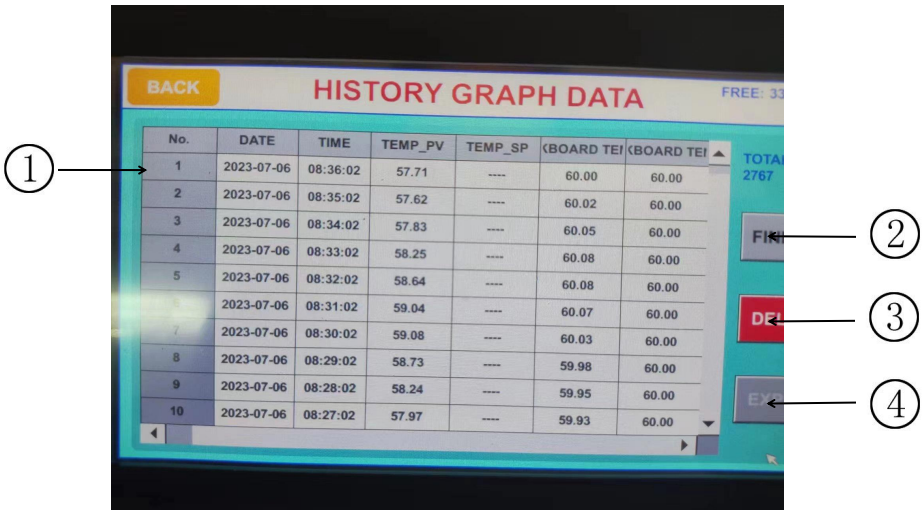


Fig. [5-1] Main screen

1. Display area.
2. Click it to go through the history data of segment number.
3. Choose whether to delete the data or not.
4. Choose to export the data with a USB flash drive.

5.5.2 History graph

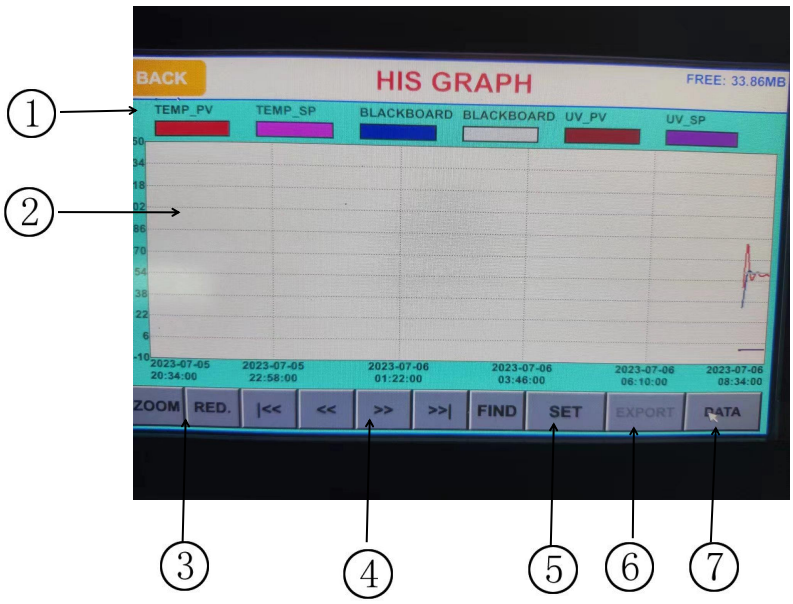


Fig. [5-2] History graph

1. Current value and the set value of the temperature in six different color curves. (Click the corresponding boxes to show and hide the settings)
2. Graph range.
3. Zoom in and out.
4. Left/right movement.
5. Display set. Please refer to Figure [3-2] for details.
6. Export the current graph screen. (Please connect U disk before operation).

7. View the history data.

5.6 Alarm history

5.6.1 Click on the alarm history to view the DI history.

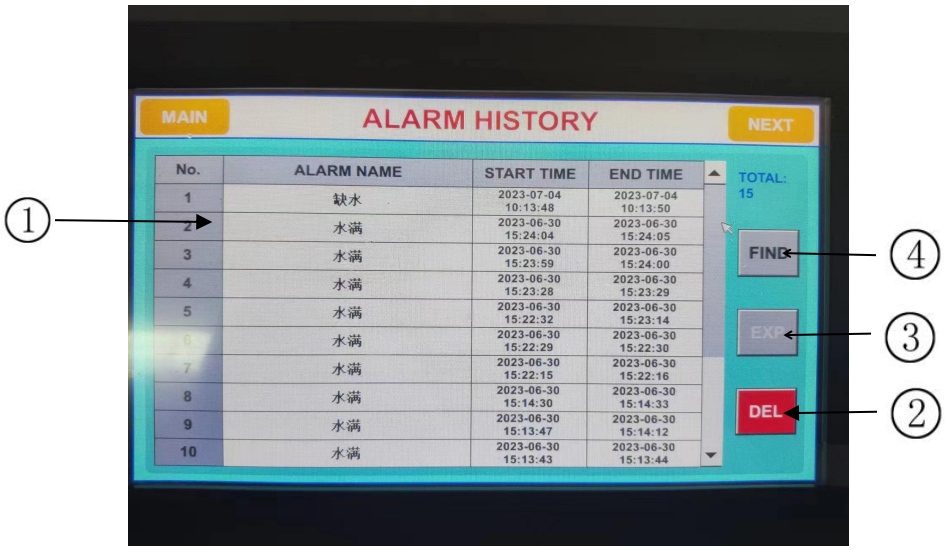


Fig. [6-1] DI history

1. Fault name.
2. Delete single or all history records.
3. Export single or all history records.
4. Click to view records of a certain time period. Refer to Figure [6-2] for details.

Fig. [6-2] Alarm history

5.7 Reserve

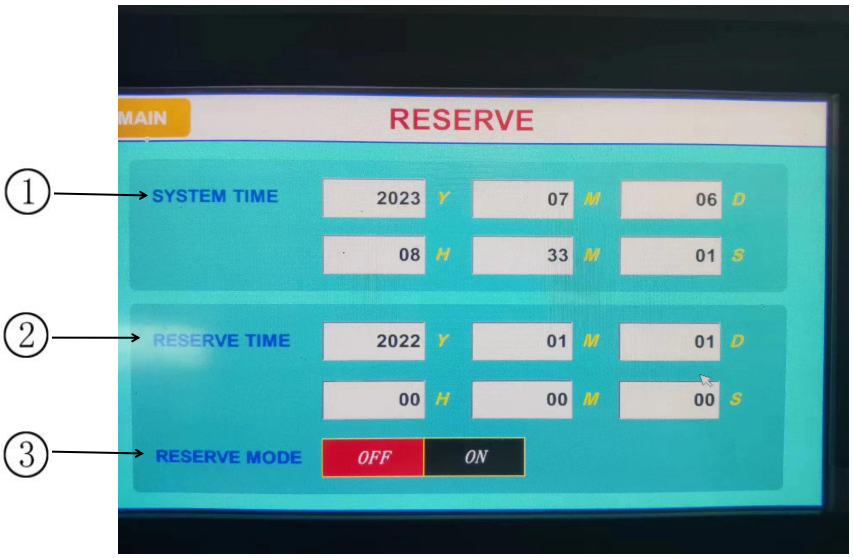


Fig. [7-1] Reserve

1. Set the system time.
2. Set the time to be reserved.
3. Set whether to use the reserve function.

☞ After the reserve set, there will be a corresponding time display in the program test as shown below in the red selected part.

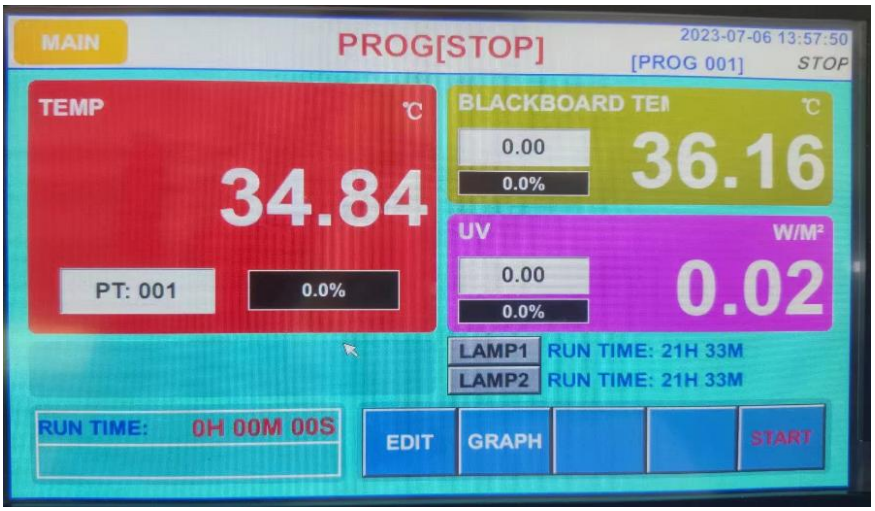


Fig. [7-2] Reserve program test

5.8 Communication failure

- The prompt "————" appears when the connection to the control board is abnormal.

Fig. [8-1] Communication failure screen

※ Causes：

① Poor communication of lines

② Poor connection status of communication line

Section 6 Machine Use

1、Manually add water

As show above picture, Open the tank and then add water, pay attention to the water level beside the tank scale, add to 80% water is ok.

2、Automatic water

NOTE：

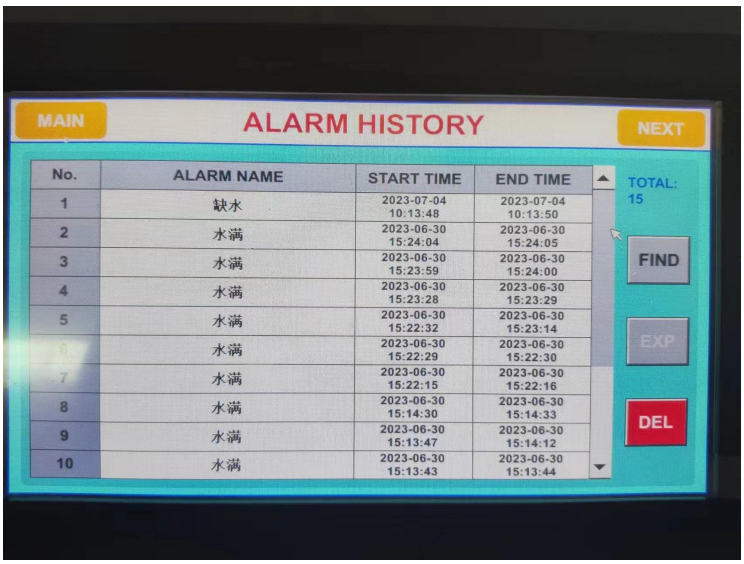
1、The water used in the machine must be pure or distilled water.

2、When manually adding water, we must pay attention to the change of the water level gauge, no less than 80%, otherwise the machine will always alarm, no more than 90%, otherwise the water will overflow, when not using the machine must put the water clean.

3、When water is added automatically, when the water level reaches 80%, the automatic valve of the machine will be closed and the machine will have an audio prompt.

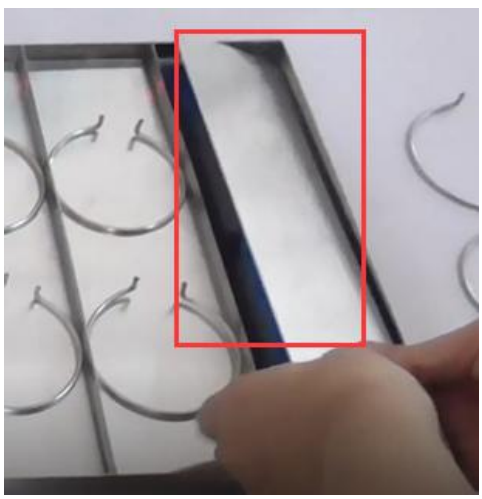
4、In and out of the water is the best position with the drain pipe, do not let the water flow everywhere.

5、If the water is insufficient, the machine will alarm when starting up, as shown in the figure below:

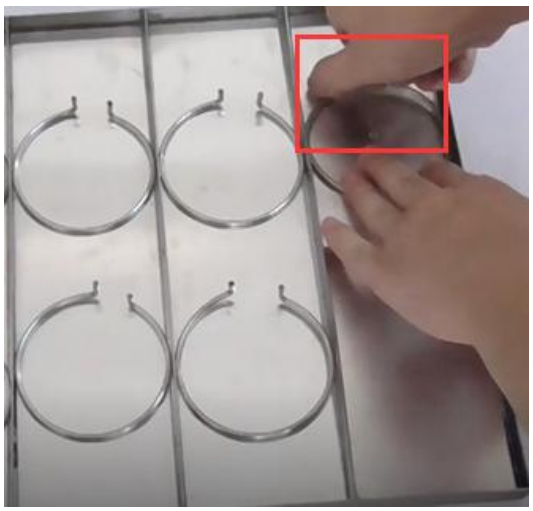


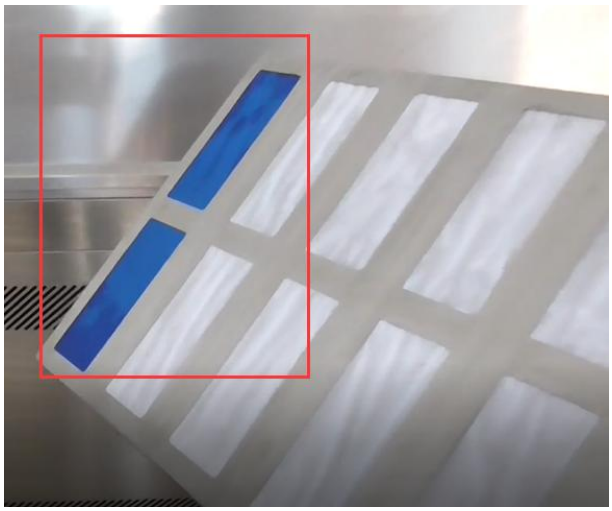
3、Install the sample

3.1 Take out sample holder



3.2 Install sample





The sample after testing

Samples can be installed before and after the machine