



Operation Manual

Auto Slide Stainer Patho S30

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1. PRODUCT OVERVIEW

1.1 Intended Use

Used to normal and special staining in pathology laboratory. Both normal staining and special staining, all can simultaneously or independently process and achieve qualified staining effect.

1.2 Application

Be used for staining and sealing blood, tissues and cells before sample analysis

1.3 Model and Specification

Product Name: Auto Slide Stainer

Model and Specification:

Model :	Patho S30	Product Name :	Auto Slide Stainer
Rated voltage :	AC 220V 50Hz	Rated Power:	300VA
Mode of Running:	Run Continuously	Software version :	V1.0
Degree of protection:	I	Pollution Class:	II
Size (LxWxH)	1000×620×710mm	Net Weight	120kg

1.4 Working condition and environment

1) AmbientTemperature: 5°C~35°C

2) Ambient humidity: ≤80%

3) Atmospheric pressure range: 70 kPa~106kPa

4) Voltage: AC 220V, 50Hz

★The unit machine is used free of harmful gases, chemical precipitation and other flammable, explosive and corrosive media that seriously affect the use of the machine or close to heat sources, and should be well ventilated, and the box should be kept dry

★ It cannot be used together with high-frequency surgical equipment. Near the unit to use short wave and microwave therapy equipment may cause unstable output of this device.

★ The simultaneous use with high electromagnetic compatibility requirements may cause other equipment to work abnormally.

2. CAUTIONS

>>> Before using the equipment, carefully read the instruction manual and fully master the safe and correct operation methods. If the equipment is not used according to the method specified by the manufacturer, the protection provided by the equipment may be damaged.

>>> Equipment maintenance personnel must receive professional technical training or professional technicians from the equipment manufacturer. Non professional personnel are strictly prohibited from repairing equipment, otherwise they shall bear the consequences of safety accidents. Risk of electric shock when disassembling the power adapter; If the main machine casing is disassembled, live working is prohibited.

>>> Do not disassemble the equipment or replace any parts without the permission of the company, otherwise bear all the consequences.

>>> If it is necessary to carry the equipment for a long distance, the original packaging of the equipment must be used, otherwise the consequences of equipment damage shall be borne by yourself.

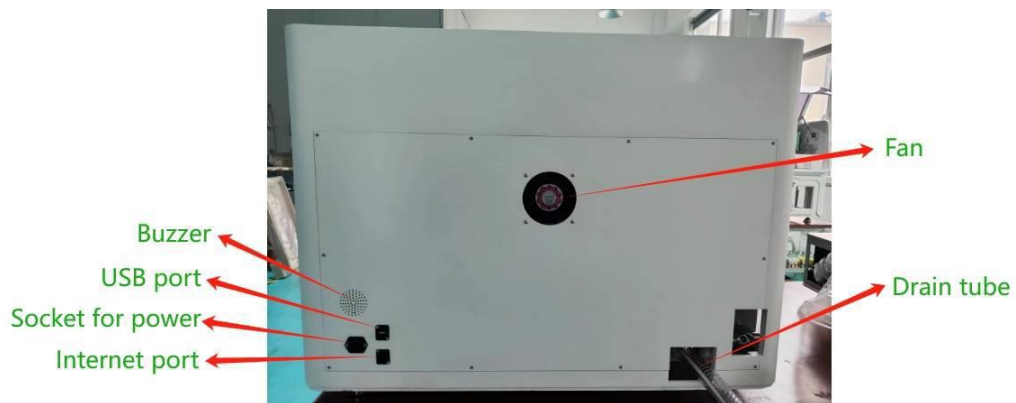
3. INSTRUMENT COMPONENTS & WORKING PRINCIPLES

3.1 Instrument Components

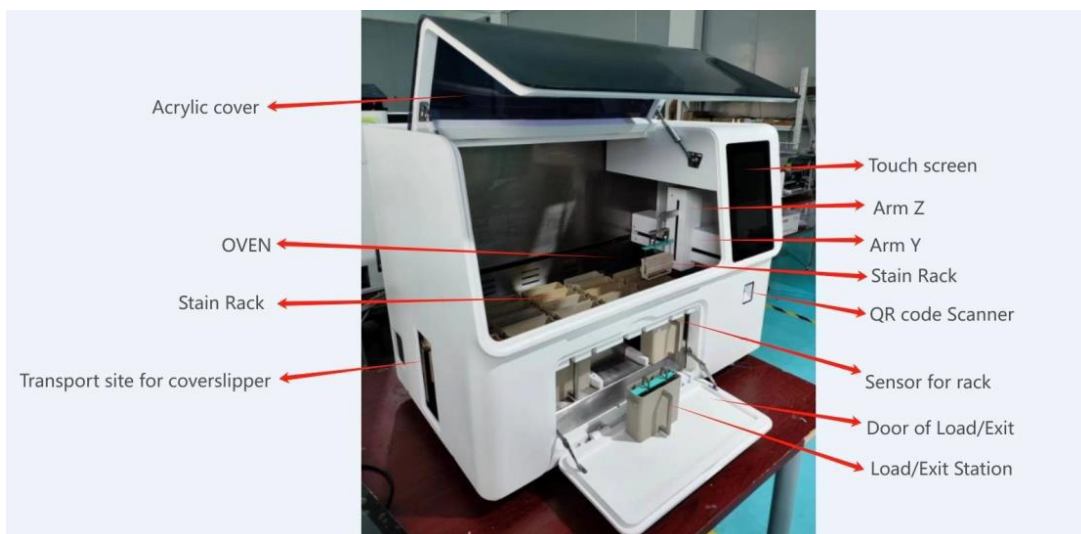
It mainly consists of robotic arm, reagent cylinder, and control software



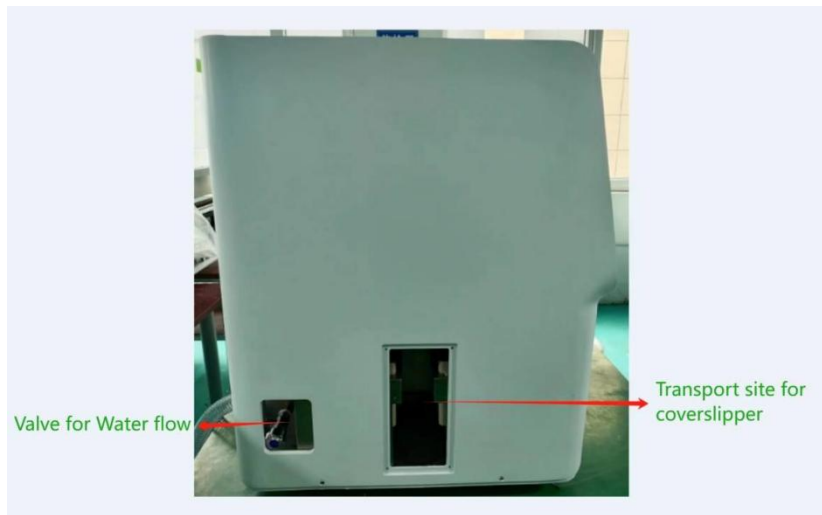
Auto Slide Stainer Model : Patho S30



Back View



Front View



Valve for Water flow

Transport site for coverslipper

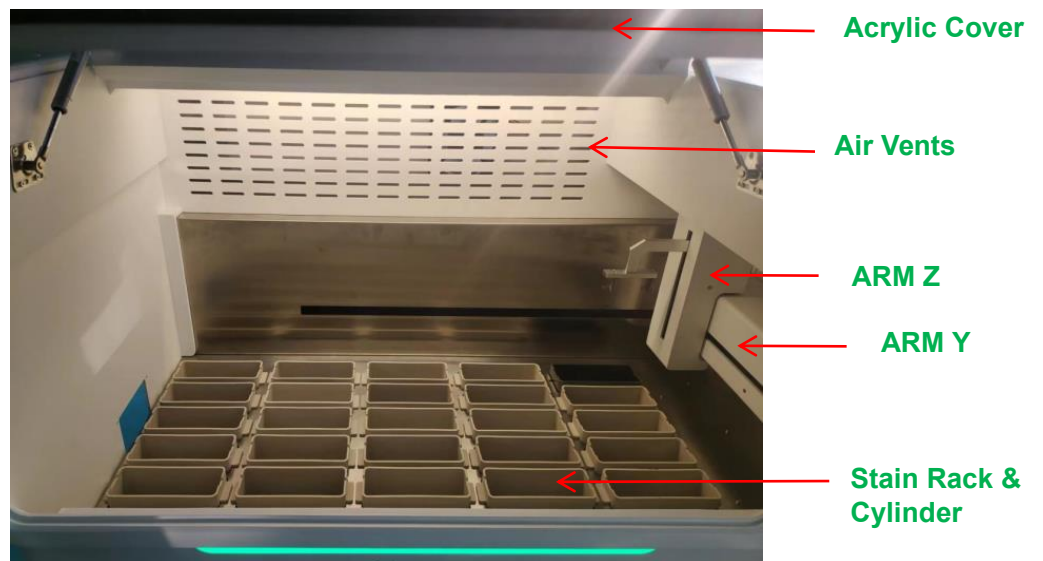
Left View



Socket for power

Door for maintenance

Right View



Acrylic Cover

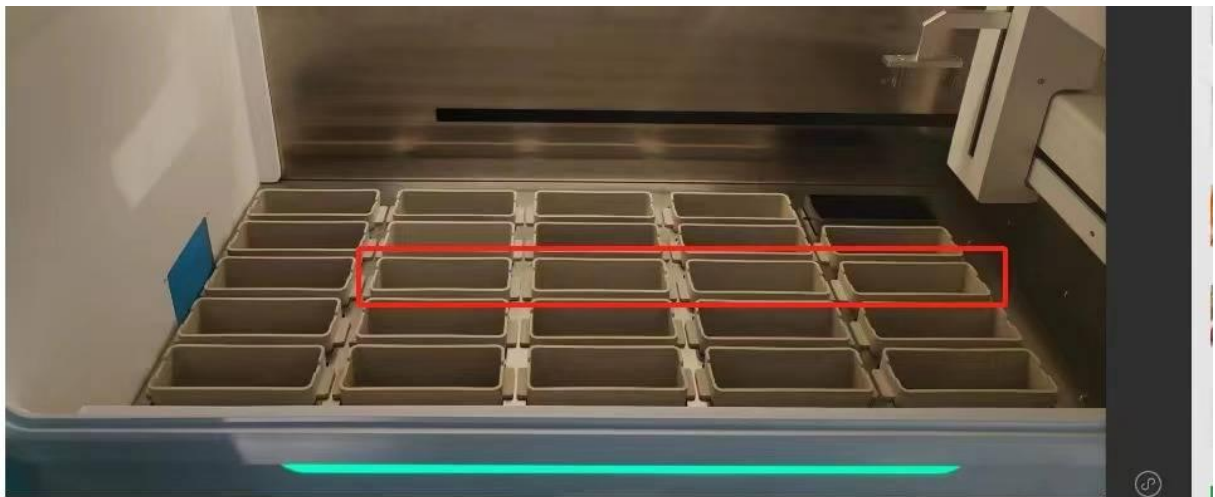
Air Vents

ARM Z

ARM Y

Stain Rack & Cylinder

Inside View



Wash Cylinder & Wash Position

3.2 Working principle

Place the specimens into the device, and the intelligent reagent distribution system of the device dispatches the XYZ three-axis robotic arm to sequentially place the specimens into the designated reagent solution as the set steps and step attributes. After all the reagents required for staining are executed, the device places the stained specimens into the exit tank. The staining process of the specimens is completed, and the device enters the waiting status.

4. TECHNICAL SPECIFICATION

4.1 Technical Data

Throughput	360 slides/hour (max)
Capacity of racks	≥ 15 pcs racks
Capacity of each rack loading	30slides / rack
Station	30 stations
Reagent	22 stations
Volume of reagent tank	480±50ml
Washing station	4 stations
Oven	1 station
Position to entry and exit	3 positions
Position to entry setting	1 or 2 positions
Position to exit setting	1 or 2 positions
Temperature of oven	Ambient to 70°C
Staining time setting	1 sec - 99 min 59 sec
Staining Program	≥ 100 Programs
Steps of each protocols	≥ 50 steps
Relative humidity	80-85%
Voltage	AC 220 V±10% 50-60 Hz
Size (LxWxH)	1000X620X710(mm)
Weight	approximately 120 kg
Power Draw	300 VA
Touch Screen.....	11.6 inches (show status, result, functional operation and interface)
Working system.....	15 racks simultaneously, loading continuously, stop function

5.ATTENTION

5.1 Warnings

- When replacing the fuse of the machine, the power plug must be unplugged first and the fuse of the same specification and model must be selected
- The machine only be used by trained professional doctors and operated in strict accordance with regulations.
- Please read this manual carefully before use. If the machine is damaged or other consequences are caused by not operating in accordance with the applicable manual, the company will not assume any responsibility.
- Good grounding of the machine is the guarantee of safe use, and it must be connected to the earth (single-phase three-level socket with good protection grounding is applicable) to avoid accidents.
- Do not open the cabinet or allow liquid to flow into the machine to avoid accidents during works
- Unplug the power cord before opening the cabinet with tools.
- In case of equipment failure during works, the power supply shall be cut off immediately.
- If the user loses this manual, please check with sales representative.
- When the sample loading, if the temperature near the tank is too high, please disconnect the power supply of the equipment in time.
- Pour the test tubes in the used kit into the designated medical garbage can.
- It cannot be used at the same time with high-frequency surgical equipment. Using this equipment close to short wave and microwave treatment equipment may cause the equipment to work abnormally.

5.2 Safety operations

- Refer 6.2 installation
- Wrong steps for safe operation may cause equipment damage or accidental electric shock

6.INSTALLATION SITE REQUIREMENTS

6.1 Installation conditions

- The unit requires a fixed platform of 1.3m long and 1m wide with good ventilation conditions
- The power supply voltage is AC220V+/-10% 50-60Hz, and the connecting part between the equipment and the network power supply must have more than twice the capacity.
- The rated current of the built-in fuse of the equipment is 4A
- Check whether all functions of the equipment are normal after power on
- Provide professional technical training for medical personnel using the instrument to avoid operational errors
- The full-automatic stain and coverslipper should be placed in a room of at least 20 m², and the electrical installation space involves the grounding system, grounding fault interruption system, etc
- The corresponding water inlet / outlet on the instrument is 1.5m farthest from the faucet and 2m farthest from the waste water pipe
- Sufficient space (about 0.9m) shall be reserved above the test bench to facilitate unimpeded opening / closing of the instrument door assembly

6.2 Instrument debugging

- Please careful read operation manual when meet to make sure safety operations.
- Confirm that the installation environment meets the requirements of electromagnetic compatibility (refer 11 for details), and the installation process is guided by our professional technicians.
- Take out the machine from the packing box, please fix its bottom . Check the attached accessories according to the items listed in the packing list and check whether they are in good condition
- Insert the power cord into the three wire single-phase standard socket, turn on the power and turn on the power switch.

- Observe and operate the function buttons on the LCD screen to check whether they work according to the specified functions
- Connect the water outlet pipe between the machine drain and the sewer pipe in the room
- Connect the water inlet pipe between the faucet and the water inlet interface of the machine
- Pour in the sealing glue and install the cover glass
- Test whether the drawer on the machine is pushed and pulled normally.
- Select the test staining programme that the machine auto test itself. The machine will run idle, and check whether the three-axis manipulator, drying tank, water tank, etc. have the expected function.
- Turn off the power and finish debugging

6.3 ESD countermeasure

- 1) Ensure environmental humidity.
- 2) It is recommended to lay anti-static floor or carpet.
- 3) It is recommended to use ion air gun, ion head, ion bar and other facilities to prevent static electricity within a certain range.
- 4) It is recommended that operators should wear anti-static hand straps on their wrists, which should have good grounding performance. This measure is the most effective.
- 5) It is recommended to avoid wearing chemical fiber clothes that are easy to be electrified

7. OPERATION

7.1 Home Page

After turning on the power of the instrument, please sign in **User : admin** and **Password : 20SP20**, the device enters the startup initialization state. The machine will self-test automatically. After successful initialization, you will enter the monitoring page.

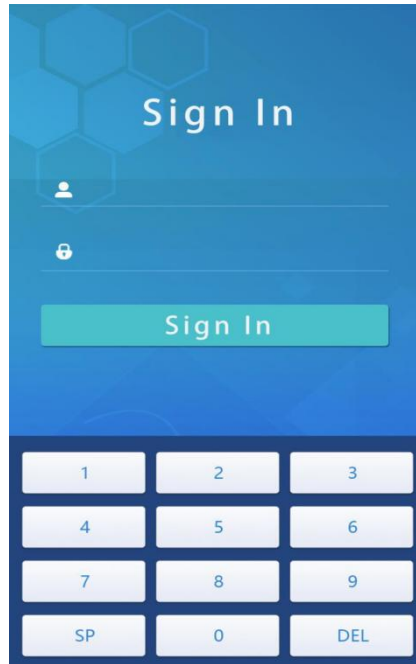


Fig 1 : User login interface

7.2 Monitoring

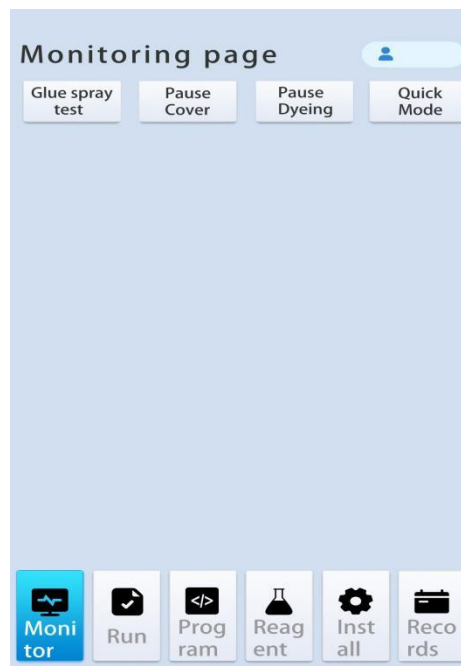


Fig 2 : Monitoring page

7.3 Introduction to monitoring interface

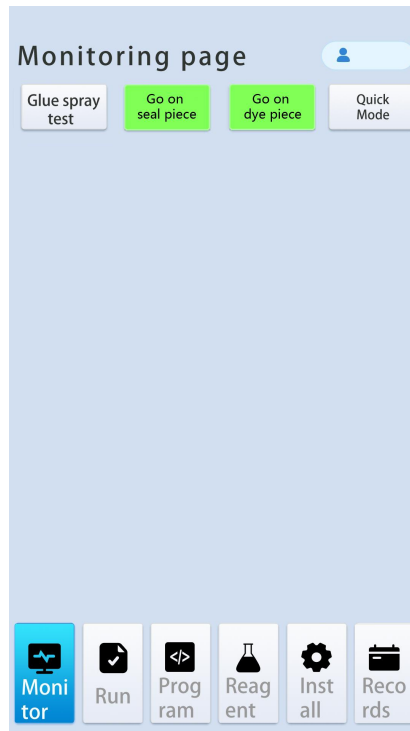


Fig 3 : Monitoring interface page

1. State Information: Click this button to display the state information interface, as shown in Figure 4, which can be viewed. Look at the temperature of the oven, the water inlet flow rate of the four water washing tanks, and the operation information of the current dyeing.

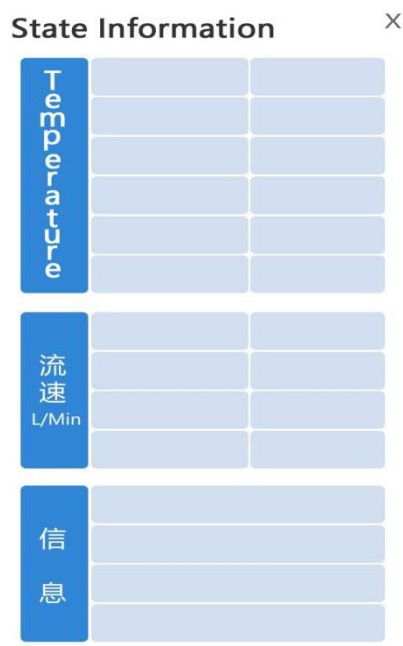


Fig 4 : State Information page

2. Pause/Start

2.1 When the equipment is running, click this button to enter the pause state, and the three-axis manipulator will stop running.

2.2 If the equipment triggers the alarm prompt, click pause after the alarm fault is removed, and click start to remove the sound and light alarm status

3. Quick Mode button -When monitoring the page, you can click the "Shortcut" button at anytime. After clicking, the system enters the shortcut interface as shown in Figure 5 In the shortcut interface, the user can configure the system as "Automatic Program Creation" and "Manual Program Selection", and take out the specimen loaded into the machine by operating the "Take Out Rack" function. The specific operation steps are as follows:

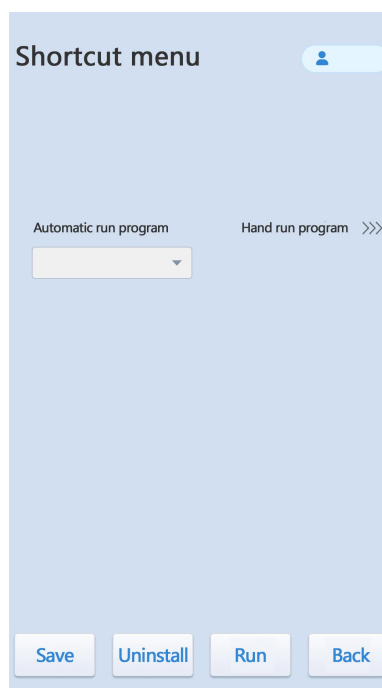


Fig 5 : Shortcut Interface

3.1 To configure the auto-create program :

Click the white selection bar below "Auto Create Program", and the dyeing program currently saved in the system will be automatically switched every time. Click repeatedly until the name of the automatic running program to be specified is displayed in the selection bar. Click the "Save" button in this interface to complete this operation.

3.2 To configure the manual selector :

3.2.1 Click the "> > >" arrow on the right side of "Manual program selection" to switch

to the specified shortcut startup program interface, as shown in Figure 6.

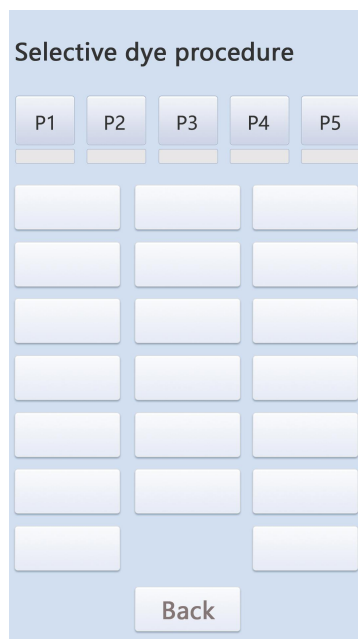


Fig 6 : Specifying the Launcher Shortcut

3.2.2 Click "P1", and the P1 button will be displayed in green. Click the shortcut startup program to be specified for P1, such as HE-2. At this time, the words "HE-2" will be displayed below P1, and so on. You can specify the shortcut startup program for P2-P5. After setting, click the "Return" button on the screen to switch to the interface as shown in Figure 4. Now you can see the program buttons of P1-P5 that have been assigned.

3.2.3 Click the "Save" button at the bottom of the screen to complete the manual selection of the program configuration

4. Reagent layout window: display the reagent information completely corresponding to the layout position of the reagent cylinder in the equipment in real time, and click the corresponding reagent cylinder position to configure the attribute of the current reagent or view the use status of the reagent. The reagent attribute configuration interface is shown in Figure 7, and the specific operation method is as follows:

Fig 7 : Reagent cylinder attribute configuration interface

4.1 Reagent cylinder attribute configuration:

4.1.1 Cylinder position serial number: fixed attribute, automatically set by the system, no need to modify

4.1.2 Reagent name: Click the blank square on the right to pop up the "List of Alternative Reagents" interface, and select the reagent in the list as required.

4.1.3 Times of use: the system automatically records the times of use of the current reagent and displays it here. If the current times of use is greater than or equal to the upper limit, the reagent cylinder position on the monitoring interface will turn yellow or red to remind the user of the reagent performance status.

4.1.4 Days of use: The system automatically records the current days of use of the reagent. If the current days of use is greater than or equal to the upper limit of days, the reagent tank position on the monitoring interface will turn yellow or red to remind the user of the performance status of the reagent.

4.1.5 Upper limit of times : click the blank box on the right to pop up the input method dialog box to set the upper limit of times that the reagent can be used. If the actual number of times that the reagent is used reaches this set value, the system will give a color alarm prompt. See 4.1.3 for details.

4.1.6 Upper limit of days: click the blank box on the right to pop up the input method dialog box to set the upper limit of available days of the reagent. If the reagent reaches

this set value, the system will give a color alarm prompt. See 4.1.4 for details.

4.1.7 Change user: display the user who changes the reagent, follow the system, and automatically fill in the display.

4.1.8 Replacement time: display the time of reagent replacement, follow the system, and automatically fill in the display

4.1.9 QC mode: there are three options: "Times of use", "Days of use" and "Close". Each time you click the white input bar, a mode will be automatically switched. Click in turn to select the QC mode to be used.

4.1.10 Reagent type : there are options such as "normal", "out of the jar", "into the jar", "heating", the "running water", the "baking jar" and the "trolley". The user can select according to the actual situation. Click the white input column once to automatically switch a mode. Click in turn to select the required quality control mode.

4.1.11 Intelligent overtime : configure the self-energy overtime function of the reagent, and the function configuration method is defined as follows:

a) Fixed additional time : when the number of times the reagent is used reaches the set value of "start time" , the time for each subsequent staining will be automatically set as the start time in the program + the set time here as the staining time, and the unit is S.

b) Split-timing : Start from the number of shelves set at "Start Time" , and take the number of shelves set at " Interval Time" as the cycle. After each cycle, the system automatically adds the time set by the program to the time set at the previous "Split-timing", and the unit is S.

c) Start time : the basis for automatically increasing the dyeing time. Input the dyeing times here, for example, input 10. When the dyeing times of the newly replaced dye solution are ≤ 10 , the dyeing time is the time specified in the dyeing program. When the dyeing times are > 10 , the dyeing time is increased from the 11th rack.

d) Interval time: It is used together with the start time. The set value here is the number of interval shelves to increase the time. For example, if the start time is 10 and the interval time is 5, it means that the dyeing time from 11 to 15 shelves is the time in the original program + the time in the "sectional overtime". If the total time is N, the dyeing time from 16 to 10 shelves is $N +$ the time in "sectional overtime" , and so on. Until the

reagent is replaced with a new one.

4.1.12 Replace and save : after replacing the reagent, be sure to click this button. At this time, the data in the column of "Times of Use" is cleared and the counting is restarted.

4.1.13 Save: if the reagent is not replaced and other parameters in the attribute interface are modified, click this button, and the previously accumulated data in the column of "Times of Use" will not be cleared.

4.1.14 Return : parameter setting completed , exit this interface

5. Function interface switching menu bar:

5.1 Monitoring interface: Click the "Monitor" button to switch to the monitoring interface. For specific operations, see 7-1.2 Introduction to Monitoring Interface.

5.2 Operation interface : Click "Operation" to switch to the operation interface. For details, see 7-1.3 Introduction to Operation Interface.

5.3 Program interface : Click "Program" button to switch to display the program interface. For specific operations, see 7-1.4 Introduction to Operation Interface.

5.4 Reagent interface : Click "Reagent" to switch to display the reagent interface. For specific operations, see 7-1.5 Introduction to Operation Interface.

5.5 Setting interface: Click "Setting" button to switch to display the setting interface. For specific operations, see 7-1.6 Introduction to Operation Interface.

5.6 History interface: click the "History" button to switch to display the history interface. For specific operations, see 7-1.7 Introduction to Operation Interface

7.4 Introduction to the operation interface

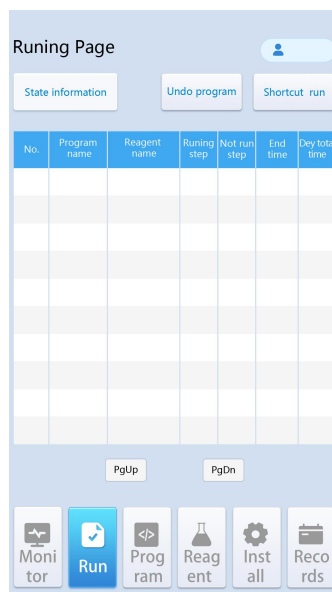


Figure 8 Operation interface

1. Status information: see Function Introduction in 7.3
2. Uncheck:
 - 2.1 First, select the running program line you want to cancel in Figure 8. At this time, the selected line will turn gray, and then click the "Cancel Selection" button. The prompt message "Confirm to cancel" will appear on the top of the device. Click the "Cancel Selection" button again. The system will prompt "Information on completion of cancellation", and the program name column will display waiting for cancellation. The machine will automatically take out the sample that has executed the cancellation function from the current reagent tank and put it into the outlet tank. At this time, the cancellation is completed.
 - 2.2 If the current program to be revoked is in non-revocable status, click the "Revoke Selection" button, and the system will prompt the message "Current Program is Irrevocable".
3. Quick run: The system provides a way to run the dyeing program quickly by manually specifying the dyeing starting point. Click the Quick Run button to enter the Quick Run interface, as shown in Figure 8. Its functions are described as follows:

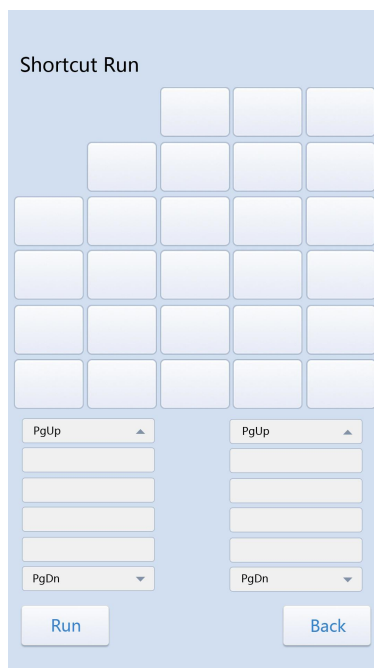


Figure 9 Quick Run

3.1 Creation of quick operation program: the first step is to select the reagent tank where the dyeing rack is currently located, as shown in the figure, it is assumed to be in the bluing solution; the second step is to select the dyeing program to be executed by itself, as shown in the figure, it is assumed to be HE-2; the third step is to choose the first reagent to be executed, as shown as absolute ethanol 1

3.2 Click the "Run" button to complete the function of running the specified staining program from the specified step

3.3 If you do not need to run the specified shortcut program in the shortcut running interface, click the "Return" button in the interface.

4. Program running list: the current list displays the information of all running dyeing programs for the operator to view and understand

5. Previous Page/Next Page: When the programs running at the same time exceed the range displayed on the current page, a second page will be automatically created to display the excessive staining information. At this time, the interface can be switched to view through Previous Page/Next Page.

7.5 Introduction to program interface

The user can edit the dyeing program on this interface and perform necessary operations on the dyeing program, such as copy, delete, paste, etc. The program interface is shown in Figure 10, and its functional operations are as follows:

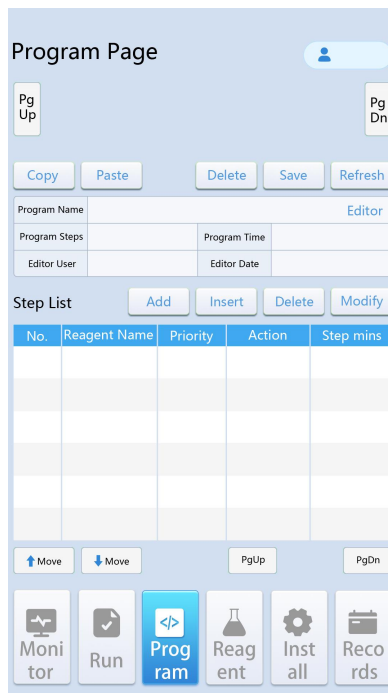


Figure 10 Program Interface page

1. Program storage space: P1-P5 displayed in this interface are the storage space for dyeing programs. Different dyeing programs can be stored in P1-P5. The previous page/next page on the left and right sides can switch back and forth between all the storage spaces to expand the program storage space.
2. Program operating instructions:
 - 2.1 Copy/Paste: Select the dyeing program to be copied, such as P1, and click the "Copy" button. Select the space where the copied dyeing program is stored, such as P2, and click the "Paste" button. That is, the whole set of program in P1 is copied to P2, and the copied program steps will be displayed in the program list.
 - 2.2 Delete: Select the dyeing program to be deleted, such as P1, and click "Delete" button to delete the program in P1 and clear the dyeing steps in the program list.
 - 2.3 Save: Save the edited dyeing program. After saving, it will be permanently saved in the specified program space.
 - 2.4 Refresh: Refresh the currently displayed list of programs
3. Dyeing step operating instructions:
 - 3.1 Add: Select the line in the program list of the step to be added, and click "Add" to pop up the step attribute configuration interface, which is used to configure the basic attributes of the dyeing step. If the dyeing step is added continuously, you can directly click the "Add" button after the first step is created to set the dyeing steps continuously,

as shown in Figure 11.

The figure displays two versions of a step attribute configuration interface. The left version is a standard form with input fields for 'Step number', 'Reagent name', and 'Step mins'. It includes radio buttons for 'Priority level' (Ordinary, Priority, Accurate) and 'Set action' (Drain fluid, Dip-dye, Jilt piece, Static). The right version, titled 'Step Information', adds a numeric keypad (0-9) and 'OK' and 'DEL' buttons for easier step number entry. Both versions feature 'Ensure' and 'Back' buttons at the bottom.

Figure 11 Step attribute configuration interface page

3.1.1 Step No.: automatically added by the system

3.1.2 Reagent name: click the text bar to call up the monitoring interface as shown in Figure 2. Click the reagent name in the interface to add the selected reagent here.

3.1.3 Priority: This is used to define the order in which the current step duration is executed in the dyeing process. Normal is the slowest, priority is the second, and precision is the highest.

3.1.4 Specified action: It is used to define the operation action of Z-axis manipulator during the dyeing process. Leaching indicates that the Z-axis rises slowly and has a good leaching effect. When the dyeing rack is transferred between reagents, the amount of liquid is the least, which can reduce the cross-contamination between reagents. Dipping indicates that the dyeing rack is lifted and lowered again after the reagents are put in. The film throwing function is to be started. Stand still function to be turned on

3.1.5 Step duration : set the reaction time of the staining rack in the reagent, in second

3.1.6 Confirm: After the program configuration is completed, click this button to save the configuration information and return to the previous interface

3.1.7 Return: abort the step information of the configuration and return to the previous interface

3.2 Insert : insert a dyeing step, click the next line at the position where the step needs to be inserted, and click the "Insert" button to call out the step attribute configuration interface as shown in Figure 11. See 3.1 for the operation steps to complete the attribute configuration of the insertion step.

3.3 Delete: Select the row of the step to be deleted, and click Delete to delete the current step

3.4 Modify: Select the step to be modified and click "Modify" to call out the step attribute configuration interface as shown in Figure 11. See 3.1 for the operation steps to complete the attribute modification of the selected step.

4. Step list : it is used to edit the area of specific dyeing steps. See 1.4-3 Operation Instructions of Dyeing Steps for specific operation modes.

5. Move Up/Move Down : move the selected dyeing step line up or down by one line. Press once to execute once

6. Previous/Next: Page through the list of steps to edit or view the staining step

7. Program name: after the dyeing step is created, click "Edit" to set a name for the current program, click the "Save" button in the program operation instruction , the program name is displayed below P1, and the program is saved successfully

8. Number of steps : total staining steps for the current program

9. Program elapsed time : total staining time for the current program.

10. Modify User : automatically filled with the currently logged in user

11. Modification time : after clicking the "Save" button of the program operation instruction, it will be automatically updated

7.6 Reagent interface introduction

In this interface, the use status of each reagent can be viewed in a centralized way. When the use times or days of all reagents are updated to zero, the interface is as shown in Figure 12.

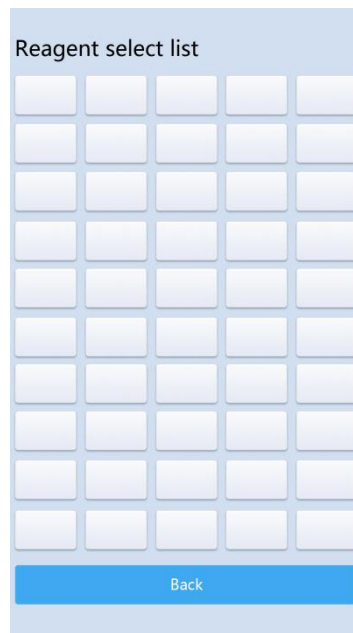


Fig. 12 Reagent Setting Interface

1. Replace all : Click this button to update the reagent times and days of use of all reagents to zero, which means that the operator replaces all reagents with new ones.
2. Save All: save the updated data to the system. After saving, the data in the "Monitoring Interface" will also be cleared
3. Reagent list : display the remaining data of each reagent according to the set QC mode of the reagent, that is, the set value minus the used value

7.7 Introduction to the setting interface

Setting interface : used to configure the system parameters of the device, as shown in Figure 13. The specific configuration method of the system parameters is as follows

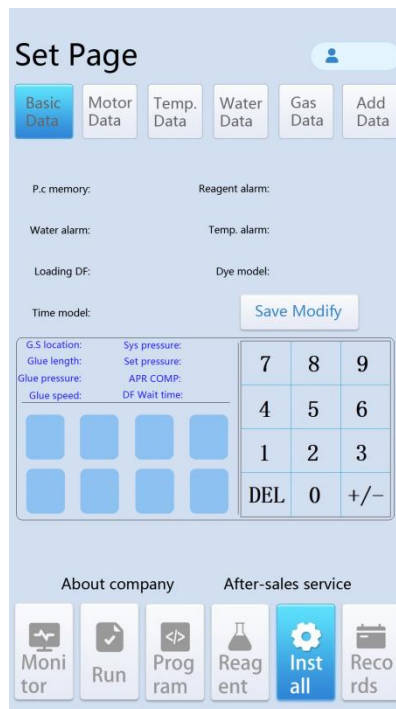


Figure 13 Setup interface page

1. Basic parameters : the settings of basic parameters are shown in Figure 13, and the specific functions are described as follows

1.1 Power-off memory : In case of unexpected power-off or man-made power-off of the equipment, the equipment will save the running state before power-off. After power-on, it can continue to execute the dyeing program automatically according to the previous breakpoint. This function can be turned on and disabled by clicking the dial switch.

1.2 Reagent alarm : turn on this function. When the number of times the reagent used is greater than or equal to the set value, the reagent in the monitoring interface will remind the operator to replace the reagent in a color manner. This function can be turned on or disabled by clicking the dial switch.

1.3 Running water alarm : turn on and disable the real-time detection function of running water. If it is turned on, the equipment will give an audible and visual alarm to prompt the operator when the water in the 4-way washing tank is abnormal. Turn on and disable this function by clicking the dial switch.

1.4 Temperature alarm : turn on and disable the real-time detection function of the oven. If it is turned on, when the temperature in the oven is lower than the set temperature during use, the equipment will give an audible and visual alarm to prompt the operator. Turn on and disable this function by clicking the dial switch.

1.5 Leaching in the cylinder: This function is used to control the Z-axis manipulator to rise slowly when taking out the dyeing rack from the cylinder, so as to reduce the amount of liquid. If there is reagent in the cylinder, it is recommended to turn on this function. Click the dial switch to turn on and disable this function.

1.6 Dyeing mode: The equipment provides two dyeing modes. The standard mode has high dyeing efficiency, but cannot fix the running water tank. The special mode has low dyeing efficiency, but can fix the dyeing tank, so that the same dyeing rack can only enter the same washing tank when running water is needed. It is recommended to use the standard dyeing mode. This function can be turned on and disabled by clicking the dial switch.

1.7 Timing compensation : This function provides two timing modes during dyeing. When it is enabled, only when the current dyeing time is 0, the dyeing rack can be taken out. When it is disabled , the whole dyeing program takes into account the running time of the manipulator. It is recommended to take the disable command and click the dial switch to enable and disable this function.

1.8 Save and modify : save the set basic parameters.

1.9 About the company : Scan the QR code to get a profile of the company

1.10 After-sales service : By scanning this QR code in the future, you can view the analysis and solutions of common faults.

2. Motor parameters: the contents set by the motor parameters are shown in Figure 14, and the specific functions are described as follows:



Figure 14 Motor parameter interface

2.1 Cylinder positioning list : this is mainly used to assist the coordinate positioning of X/Y coordinates of cylinder positions in the equipment.

2.2 X coordinate : X-axis coordinate of a reagent cylinder position, which is the coordinate when the manipulator descends. This coordinate is required to be on the right side of the dyeing rack, and it is ensured that when the dyeing rack is close to the right most side of the dyeing cylinder, the Z-axis descent will not touch the dyeing rack hook.

2.3 Y coordinate : Y-axis coordinate of a reagent cylinder position. This coordinate is required to coincide with the center line of the triangle of the dyeing rack hook when the dyeing rack is taken again.

2.4 X grabbing coordinate : on the basis of X coordinate, the coordinate position of forward movement requires that when the dyeing rack is close to the leftmost side of the dyeing cylinder, this coordinate will not touch the hook of the dyeing rack when it stops, but it is about 1mm away from the hook surface.

2.5 Cylinder position : the number here indicates the position of the cylinder position selected in the cylinder position list, and also indicates the X/Y coordinate positioning of this cylinder position.

2.6 Grab : This function can be used only after all the reagent cylinder position coordinates have been located. First, select the target cylinder position in the cylinder position list, and the corresponding number will be displayed at the cylinder position. Click "Grab", and the three -axis manipulator will run to the designated cylinder position to take out the dyeing rack.

2.7 Placement : Select the cylinder position to be placed in the cylinder position list, click the "Placement" button, and the manipulator will place the dyeing rack taken out into the target cylinder position.

2.8 Release : After executing the "Place" command, click this button to release the robot from the dyeing rack.

2.9 Reset : Click this button to return the manipulator to the origin position of the coordinate.

2.10 Motor operating system parameter list: this list is the parameter for configuring the operating speed of the three-axis manipulator, which has been adjusted and saved in the system when the equipment leaves the factory. If it needs to be adjusted, it needs to

be carried out by our engineers, so it will not be explained in detail here.

3. Temperature parameter: This interface is used to set the temperature of the oven, as shown in Figure 15. The specific operation mode is as follows

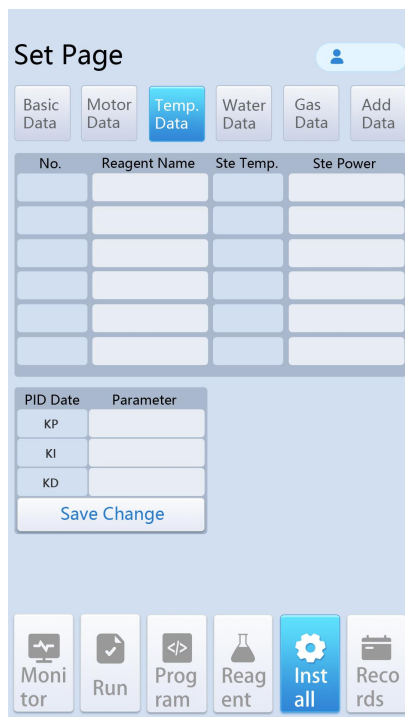


Figure 15 Temperature parameter interface

3.1 In the oven position corresponding to the motor in the "Monitoring Interface", change the reagent type to oven in the reagent cylinder attribute configuration interface in Figure 7

3.2 Click the text box under the set temperature to enter the target temperature.

3.3 Click the text box under the maximum power and input the heating power. The larger the value is, the faster the heating speed is, but the temperature step response becomes larger. On the contrary, the heating speed is slow, but the temperature step Response is smooth.

3.4 KP/KI/KD: system built-in parameters, used to control the PID parameters of the oven heating curve, used without modification.

4. Flow water parameter: This interface is used to operate the flow water tank, as shown in Figure 16. The specific operation mode is as follows

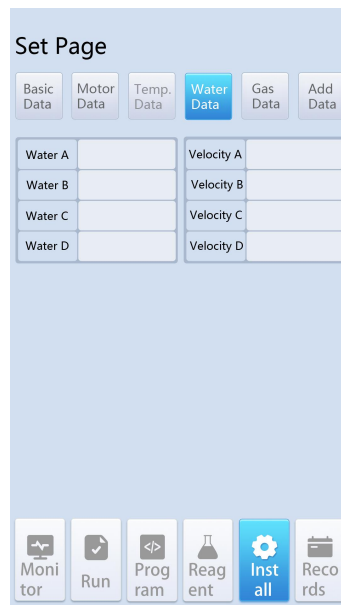


Figure 16 Pipeline operation interface

4.2 Flow rate A-B-C-D: used to display the water inlet flow rate of each water washing Tank.

4.1 Water valve A-B-C-D: It is used to control the opening and closing of the 4-way running water tank separately , and control the washing tank by toggling the dial switch.

5. Gas parameter: This interface is used to view the parameters of gas detection, with reserved functions as shown in Figure 17. The interface contents are as follows:

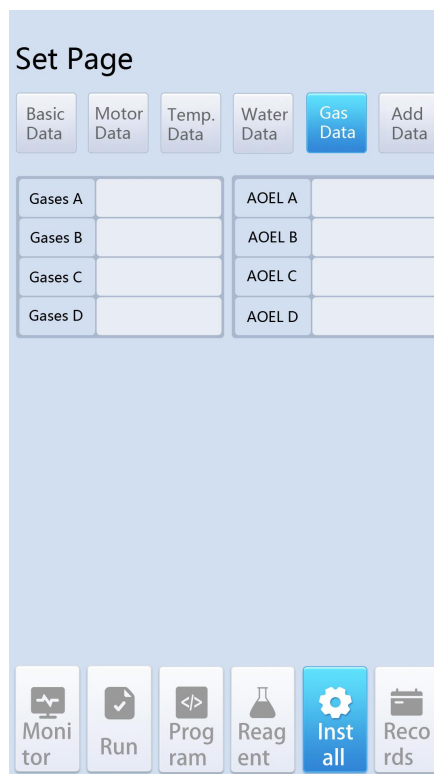


Fig. 17 Gas Parameter Interface

5.2 Gas A-B-C-D : It is used to control the opening and closing of 4-way gas detection function separately, and control the gas detection sensor by toggling the dial switch.

5.3 Flow rate A-B-C-D : used to display the water inlet flow rate of each water washing tank.

6. Additional parameters: It is used to set some additional parameters of the system, as shown in Figure 18. The specific operation mode is as follows

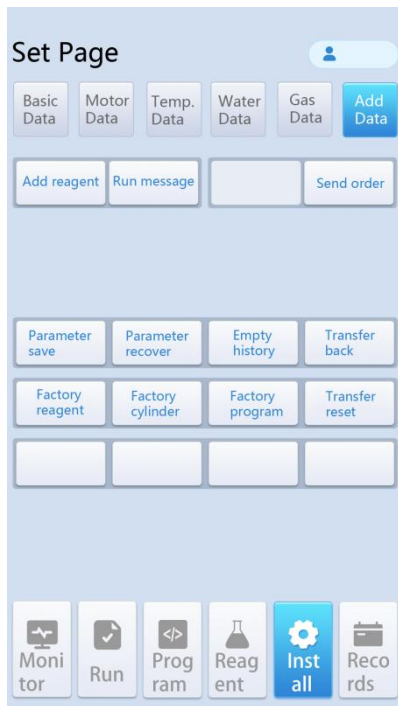


Figure 18 Additional parameter interface

6.1 Add Reagent : add the name of the reagent used in the staining process for the system. Click this button to call out the "List of Alternative Reagents" as shown in Figure 19.

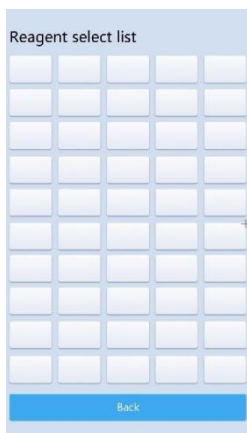


Figure 19 List of Alternative Reagents

6.1.1 In the alternative reagent list, click the reagent cylinder position to pop up the reagent name input window, and then click the OK button in the keyboard to complete the input of reagent name and return to the previous interface.

6.1.2 Return: after reagent name is added, click this button to return to the additional parameter interface.

6.2 Operation information: when the equipment fails, click this button to display the failure cause code

6.3 Send command: engineer operation button, used to debug the equipment in stand-alone mode.

6.4 Save parameters : after all the parameters of the equipment are configured, click this button to save the parameters in the equipment.

6.5 Parameter recovery: click this button to recover the device parameters stored in the device to the latest saved data

6.6 Clear History : Click this button to clear the dyeing history data

6.7 Trolley leaving : no user action required

6.8 Factory reagent : no user action required

6.9 Factory cylinder position : no operation required by the user

6.10 Factory procedure : no user action required

6.11 Trolley classified as : no operation required by the user

7.8 Introduction to the history interface

This interface is mainly used to display the history of dyeing and equipment failure, and to view the relevant history information, as shown in Figure 20. The specific display contents are as follows

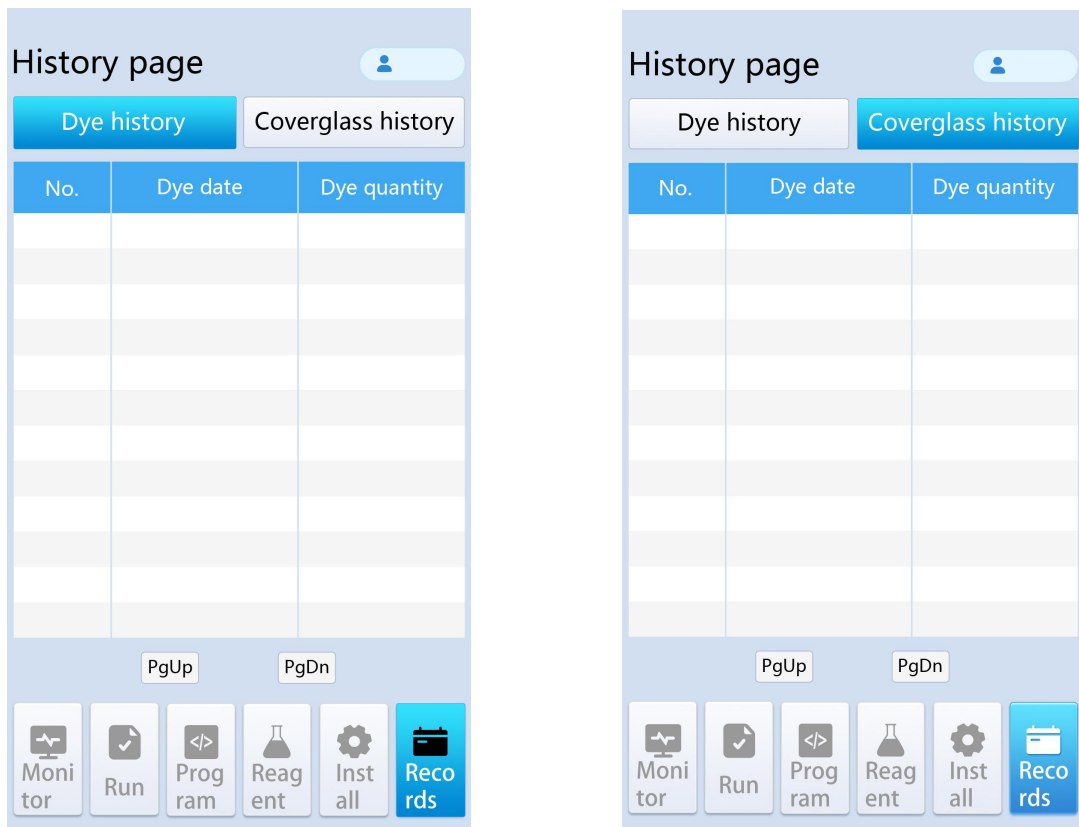


Figure 20 History interface

1. Stain History: The date of staining of the equipment and the number of stains on the day of the staining procedure are recorded for reference
2. Alarm history: It records when and what kind of alarm information appears on the equipment for reference.
3. Previous/Next: Turn the page to view the dyeing history information and the alarm history information

8.MALFUNCTION AND TROUBLE SHOOTING

8.1 The possible faults and troubleshooting methods during the use of the product are as follows:

Faults 1: The equipment doesn't star

Solution: Check whether the power cable of the unit is connected normally. If the connection cable is normal, check whether the USB cable and power switch are turned on, and check whether the power socket is powered on

8.2 Cleaning, disinfection and sterilization

The product does not need to be sterilized and disinfected. The product shell can be wiped with a cotton towel. If necessary, it can be wiped with a small amount of water dipped in a towel after power off

8.3 Environmental protection

The unit beyond its service life shall be disposed according to local laws & regulations and environmental protection requirements, and shall not be discarded at will.

8.4 Warning

>>> Before using the equipment, carefully read the instruction manual and fully master the safe and correct operation methods. If the equipment is not used according to the method specified by the manufacturer, the protection provided by the equipment may be damaged.

>>> Equipment maintenance personnel must receive professional technical training or professional technicians from the equipment manufacturer. Non professional personnel are strictly prohibited from repairing equipment, otherwise they shall bear the consequences of safety accidents. Risk of electric shock when disassembling the power adapter; If the main machine casing is disassembled, live working is prohibited.

>>> Do not disassemble the equipment or replace any parts without the permission of the company, otherwise bear all the consequences

>>> If it is necessary to carry the equipment for a long distance, the original packaging of the equipment must be used, otherwise the consequences of equipment damage shall be borne by yourself.

9.PACKING AND TRANSPORTATION

>>> The product packaging shall have sufficient strength to ensure that the product can with stand multiple loading and unloading, transportation without damage and deformation

>>> During product transportation, it is required to follow the "Up" sign, bind it securely, and prevent it from rolling in turbulence and damaging the equipment by collision

>>> The unit shall not be inverted or tilted during transportation

10. STORAGE

>>> The equipment shall be placed in a dry and ventilated room without corrosive, flammable and explosive gases.

>>> Avoid heavy pressure

>>> Equipment is easy to be damaged when the content of dust particles in the air is high

>>> Ambient temperature: - 20 °C~+55 °C, and relative humidity of air is not more than 90%.

>>> Avoid sun exposure

11. EMC

Attention

> This section is a special tip for electromagnetic compatibility. The full-automatic staining and sealing machine shall be installed and used according to the electromagnetic compatibility information in this section

> In the home environment, this equipment may cause radio interference, and protective measures shall be taken

> It is recommended to evaluate the electromagnetic environment before using the equipment

> It is prohibited to use this unit near strong radiation sources (such as unshielded RF sources), otherwise it may interfere with the normal operation of the equipment.

> The use of the full-automatic staining and sealing machine together with high-frequency or high-power equipment and portable mobile communication equipment may cause instability due to interference, such as electric drills, microwave ovens, mobile phones, etc., and may also cause other equipment sensitive to electromagnetic interference to work abnormally.

> Before operating the equipment, touch the heating pipe or uncharged metal conductor to release the excess charge carried by itself, causing electrostatic discharge damage.




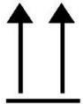




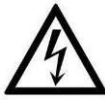
> The full-automatic staining and sealing machine may cause radio interference or disturb the operation of nearby equipment. It may be necessary to take mitigation measures, such as readjusting the direction and position of the full-automatic dyeing and sealing machine or shielding the corresponding site




> In addition to the transducers and cables sold as spare parts of internal components by the manufacturer of the full-automatic staining and sealing all-in-one machine, the use of accessories, transducers and cables other than those specified may lead to an increase in emission or a decrease in immunity of the full-automatic staining and sealing all-in-one machine

> The full-automatic staining and sealing machine shall not be close to or stacked with other equipment. If it must be stacked for use, it shall be observed and

verified that it can operate normally in its used configuration.

12. LABELLING

1		Protective grounding
2		Caution, Danger
3		Indicates a medical device that needs to be protected from moisture
4		Indicates correct upright position of the transport package
5		Don't roll
6		Indicates a medical device that can be broken or damaged if not handled carefully
7		AC
8		DC
9		The surface or area of the instrument that will be energized during operation is marked with this symbol, so direct contact should be avoided.

10	 IVD	Only for in vitro diagnosis
11		Biological hazard
12	 SN	Serial Number

13. Attached LIST

14. Warranty and SERVICE

14.1 Maintenance

The company guarantees that the delivered contract products adopt the overall quality control procedures based on our internal test standards, and that the products are in good condition and meet all the technical specifications and / or specified guarantee characteristics. The warranty scope is based on the contents of the agreement, and the free warranty period is one year from the date of sale (if man-made damage is not included in the warranty scope)

14.2 Technical service information

If you need customer technical services or replacement parts, please contact us and provide the following information: Name, model and number of the instrument; Instrument location and contact person; Delivery date of instrument

14.3 Service

If you need customer technical services or replacement parts, please contact us and provide the following information: Name, model and number of the instrument
Instrument location and contact person; Delivery date of instrument

14.4 Upgrade

Maintaining the latest product environment helps maximize product functions and advantages.