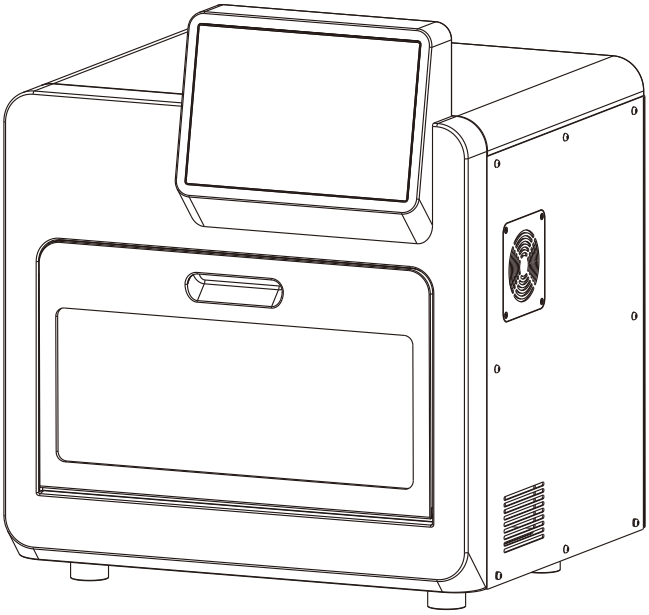
Servicebio®



User Manual

Automatic Nucleic Acid Extractor

Y-48

Please read the instructions carefully and keep them properly before using the product for future reference.

Wuhan Servicebio Technology Co.,Ltd.

CONTENTS

01 Product Overview

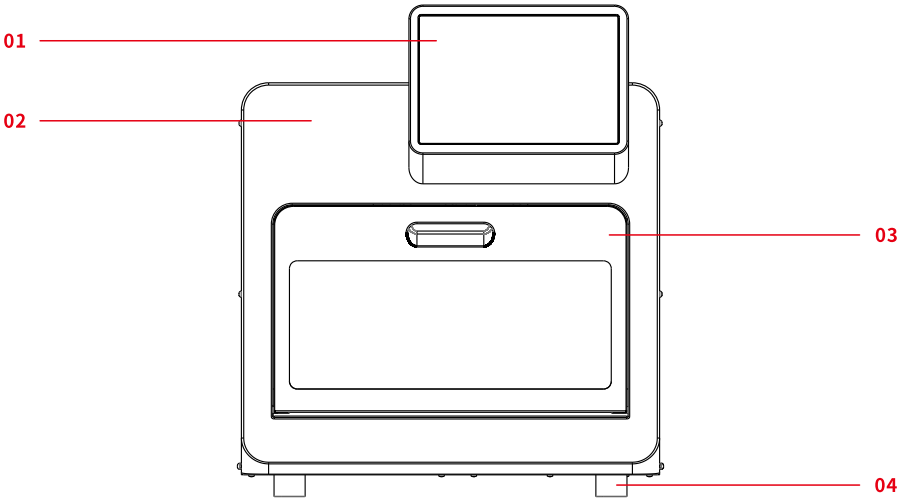
1.1 Instrument Introduction

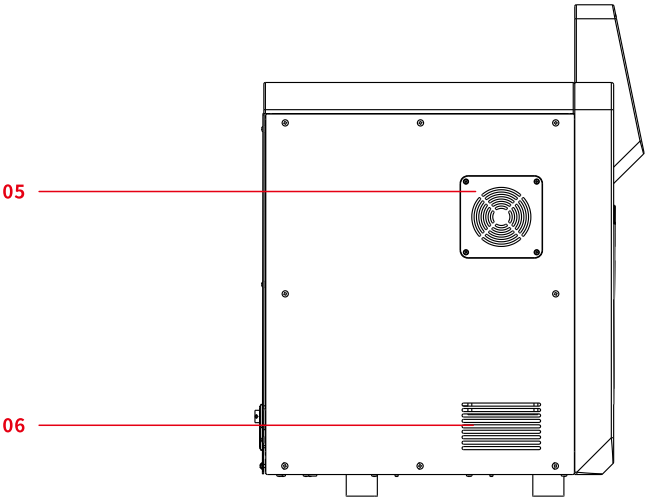
The automatic nucleic acid extractor is designed for fully automated extraction and purification of DNA/RNA, proteins, and cells. It transfers magnetic beads and samples via adsorption and release by magnetic rods and sleeves, enabling automated extraction. With 96-well deep-well plates, it can process 1~48 samples simultaneously, offering fast and user-friendly operation.

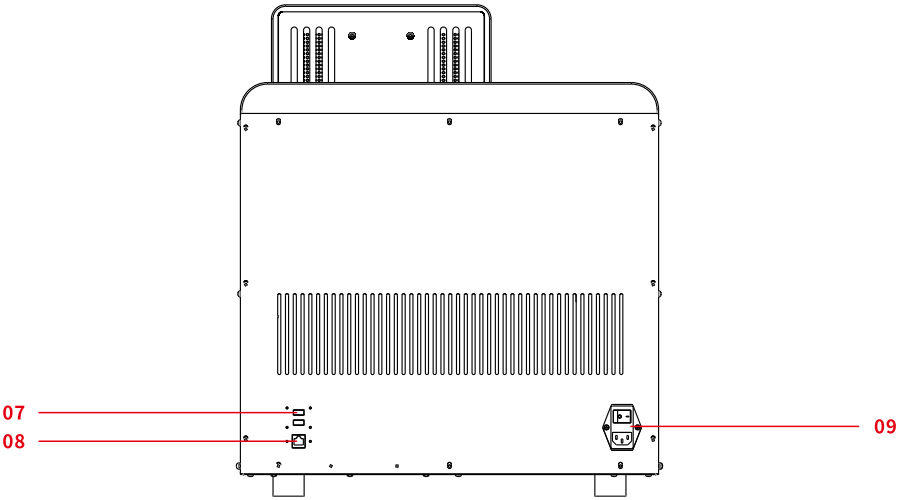
The Y-48 is an integrated automated nucleic acid preparation system capable of purifying nucleic acids from whole blood, viruses, tissues, plants, bacteria, and cultured cells. It provides efficient, automated, and high-quality solutions for downstream genetic analysis, molecular diagnostics, and clinical sample processing.

1.2 Instrument Structure

The extractor consists of mechanical and electrical components, including the housing, sample mixing mechanism, magnetic bead transfer mechanism, heating module, UV sterilization unit, color touchscreen, automated extraction software, and hardware circuit boards.







01 Screen	02 Housing	03 Rotating Door
04 Rubber Feet	05 HEPA Filter Unit	06 Heat dissipation channel
07 USB Port	08 Ethernet Port	09 Triple-in-One Power Socket

02 Working Principle

Principle: Magnetic Bead Adsorption Method：

The instrument processes up to 48 samples simultaneously. Magnetic rods transfer nucleic acid-bound magnetic beads between reagent wells. The magnetic sleeves mix liquids rapidly via vertical motion, ensuring uniform interaction. The process includes cell lysis, nucleic acid adsorption, washing, and elution, yielding high-purity nucleic acids.

03 Technical Specifications

3.1 Basic Parameters

Cat.No.	Y-48
Principle	Magnetic Bead Method
Working Volume	20μL~1mL
Sample Throughput	1~48 samples
Bead Recovery Rate	99%
Consumables	96-well Deep-well Plate
Heating Temperature	Room Temp.~120°C
Operating Ambient Temperature	10°C~40°C
Relative Humidity	10%~90%
User Interface	10.1-inch Color Touchscreen
Built-in Programs	Can store 500 programs
Program Management	Create, Edit, Modify, Delete
Network	Wireless Wi-Fi Function
Sterilization/Disinfection	UV Sterilization
Rated Power	750W
Power Supply	AC 100~240V (±10%), 50Hz/60Hz±1Hz
Dimensions	632.5×538×490mm
Weight	36.9Kg

3.2 Appearance

01.The housing is made of ABS material with a smooth white finish, free of edges, scratches, or defects;

02.Screen printing must exhibit no ghosting, ink bleeding, missing corners, misalignment, ink shortage, or positional deviation. The printed graphics/text must have strong adhesion and resist alcohol wiping without color fading;

03.Fasteners must be securely connected without loosening, and all fixed holes shall be equipped with screws;

04.The door and chassis shall fit tightly, ensuring smooth door operation without interference or jamming.

3.3 Software Application Functions

The software interface shall control the horizontal/vertical motion of the equipment' s movement modules, the temperature of the heating module, the UV sterilization device, and the LED lighting:

01.Configurable parameters include workstations, waiting time, mixing mode, mixing duration, pause settings, magnetic adsorption time, volume, temperature, and motor parameters. The system settings allow 10 adjustable mixing speeds that can be freely combined with mixing modes. Workstation settings enable fine adjustments for individual workstations. Motor parameter settings allow adjustments to the position and speed of each motor during operation, mixing, and magnetic adsorption;

02.Horizontal Motion: The robotic arm moves from Workstation 1 to Workstation 6. Position and speed parameters can be input via the color touchscreen interface. During operation, the sequence and timing of each movement must match the set parameters, ensuring smooth movement without interference, abnormal noise, or sudden jumps;

03.Vertical Motion: Sample mixing and magnetic adsorption. Position and speed parameters can be input via the touchscreen. During operation, the magnetic rod and sleeve must descend centrally into the deep-well plate, with movements matching the set parameters and free from interference or noise;

04.In the UV lamp settings interface, set the UV irradiation time and press the “Run” or “Stop” button to toggle the UV lamp on/off;

05.During operation, the LED lighting can be turned on/off at any time via virtual buttons on the screen.

3.4 Electrical Safety

Compliance is required with the following standards:GB 4793.1-2007 Safety Requirements for Electrical Equipment for Measurement, Control, and Laboratory Use – Part 1: General RequirementsGB 4793.6-2008 Safety Requirements for Electrical Equipment for Measurement, Control, and Laboratory Use – Part 6: Particular Requirements for Laboratory Equipment for Material HeatingGB 4793.9-2013 Safety Requirements for Electrical Equipment for Measurement, Control, and Laboratory Use – Part 9: Particular Requirements for Automatic and Semi-Automatic Laboratory Equipment for Analysis and Other PurposesYY 0648-2008 Safety Requirements for Electrical Equipment for Measurement, Control, and Laboratory Use – Part 2-101: Particular Requirements for In Vitro Diagnostic (IVD) Medical Equipment.

3.5 Electromagnetic Compatibility

GB/T 18268.1-2010 Electromagnetic Compatibility Requirements for Electrical Equipment for Measurement, Control, and Laboratory Use – Part 1: General RequirementsGB/T 18268.26-2010 Electromagnetic Compatibility Requirements for Electrical Equipment for Measurement, Control, and Laboratory Use – Part 26: Particular Requirements for In Vitro Diagnostic (IVD) Medical Equipment.

3.6 Environmental Testing

Compliance is required with GB/T 14710-2009 Environmental Requirements and Test Methods for Medical Electrical Equipment, including:Climatic Environment Group IMechanical Environment Group IRequirements specified in Table 1.

04 Installation Guide

4.1 Environmental Requirements

Install and operate the Y-48 in an indoor environment meeting the following conditions:

01.Ambient Temperature:10℃~40℃;

02.Relative Humidity:30%~80%;

03.Altitude: Below 2000 meters;

04.Power Supply:100~240V/3.4A, 50/60Hz;

05.Ventilation: Adequate airflow, avoid direct sunlight;

06.Installation Space: A flat, stable tabletop with dimensions no less than 1000×700×800mm and a load-bearing capacity exceeding 50kg.

4.2 Unpacking the Instrument

The Y-48 Fully Automated Nucleic Acid Extraction Instrument package includes the following items:

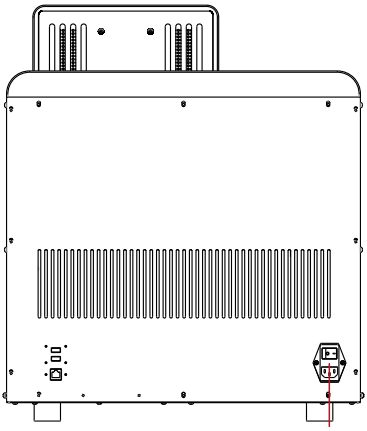
No.	Item	Quantity
1	Automated Nucleic Acid Extractor	1
2	Power Cable	1
3	User Manual	1
4	Warranty Card	1
5	Certificate of Compliance	1

Remove the instrument from the packaging box.Open the front door assembly and remove the shock-absorbing foam between the magnetic rod rack and sleeves.

Note: Handle with care during unpacking. Avoid colliding with the magnetic rods during removal, as this may damage them!

4.3 Connecting Power

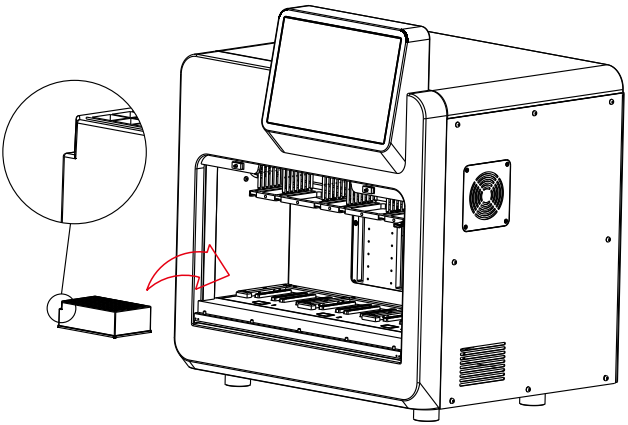
Take the power cable from the packaging box. Connect one end to the power socket on the instrument' s rear panel, and the other end to an AC 220V power outlet (compatible with 100~240V).Turn on the power switch on the instrument' s rear panel to start the device.

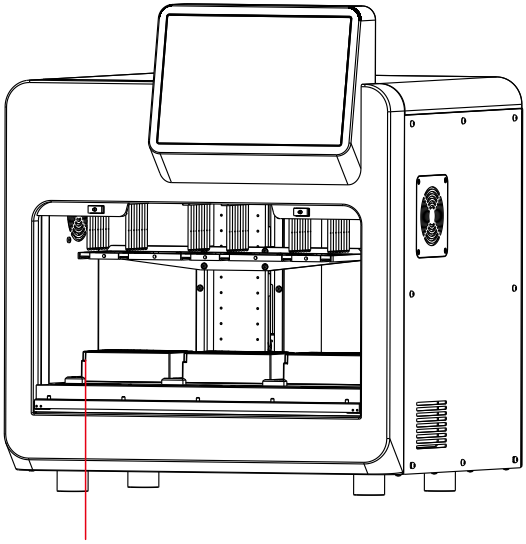


Triple-in-one Power Socket

4.4 Installing the 96-Well Deep-Well Plate

Press the 96-well deep-well plate (pre-filled with samples) into the positioning slot.Ensure the plate is oriented correctly: the chamfered edge of the reaction disk should face left.Proceed to the next step after confirming proper alignment.

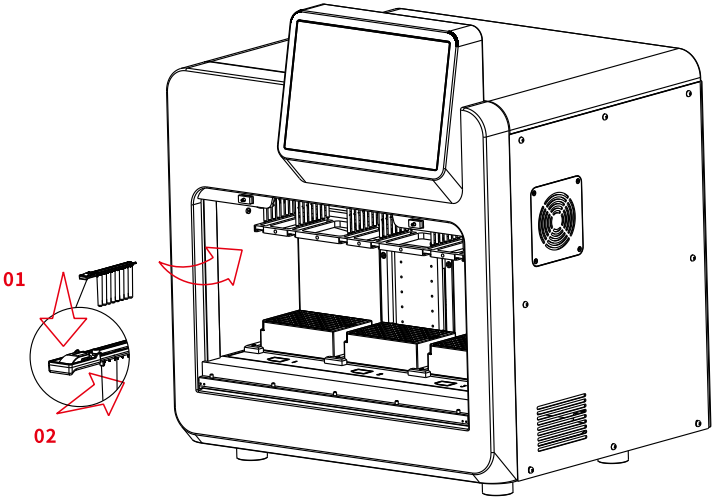


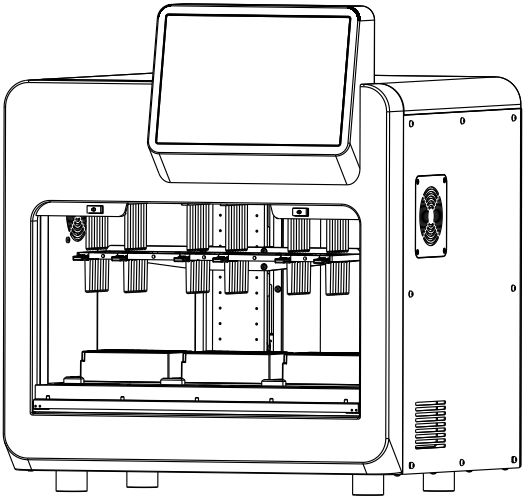


Note: Pay attention to the diagonal orientation

4.5 Installing the Magnetic Rod Sleeves

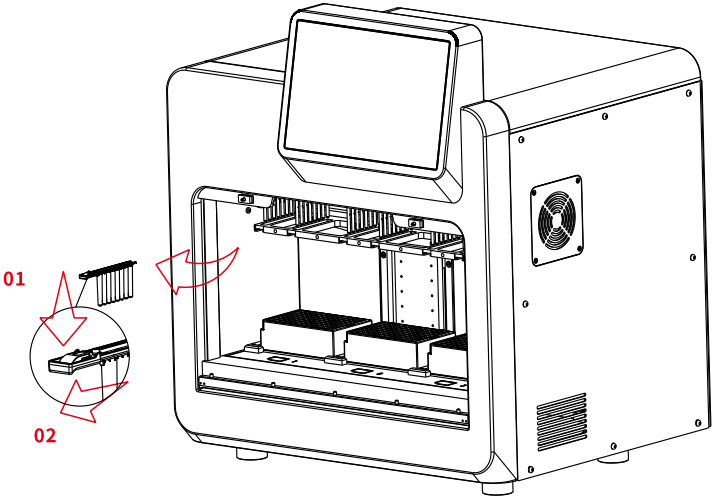
Insert the magnetic rod sleeves into the fixed slots of the magnetic rod sleeve rack in the direction indicated by the arrow. Ensure the sleeves are fully inserted.





Note: Y-48 magnetic rod sleeve can accommodate a maximum of 6 insertions.

4.6 Removing the Magnetic Rod Sleeves



Press the button on the magnetic rod sleeve in the direction of Arrow 1.Simultaneously pull the sleeve outward in the direction of Arrow 2.

05 Operation Guide

5.1 Main Interface Description

Home screen icons: Program List, UV Sterilization, System Settings (see Figure 1).

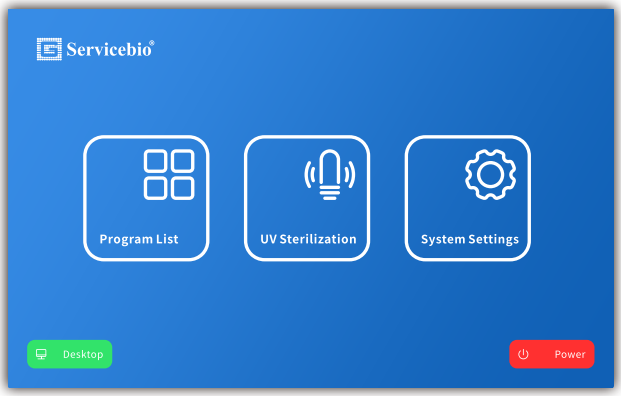


Figure 1

The bottom row of buttons includes the “Desktop” and “Power” keys. Clicking the “Desktop” button will trigger a confirmation prompt: Closes the software and returns to the operating system desktop. Exits the prompt and returns to the program main interface (Refer to Figure 2).Clicking the “Power” button will shut down the computer. After the computer powers off, turn off the main power switch to fully deactivate the device.

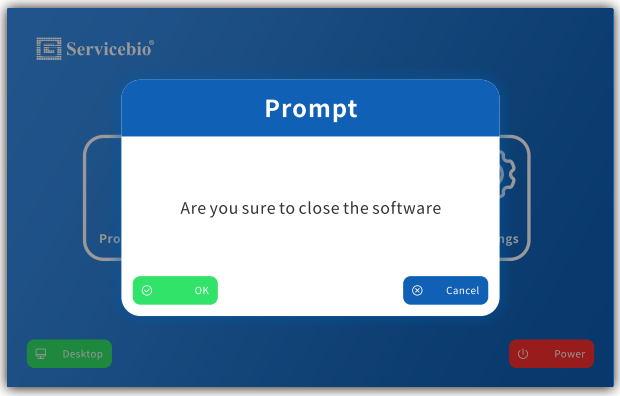


Figure 2

5.2 How to Run

01.Click the “Program List” button on the main interface to access the program list (Refer to Figure 3).

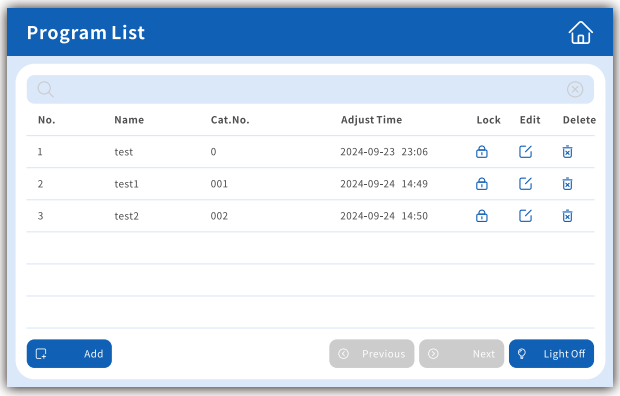


Figure 3

The bottom row of buttons, from left to right, includes: Add, Previous Page, Next Page, and Light.

For each test program, the corresponding action buttons are: Lock: Once locked, the program cannot be modified or deleted. Edit: Clicking it opens the parameter editing interface (Refer to Figure 4).Delete: Permanently removes the test program. Clicking the program name directly runs the program.

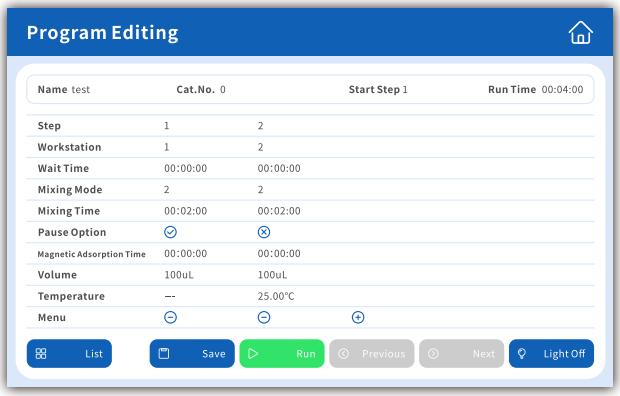


Figure 4

02.Click “Add” to enter the program editing interface (Refer to Figure 5).

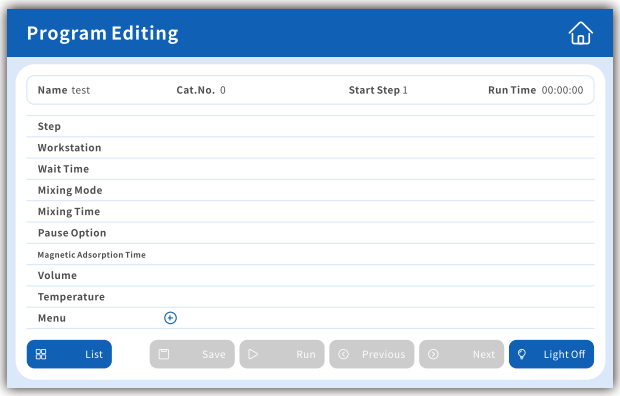


Figure 5

The bottom row of buttons, arranged from left to right, includes: Back to List, Save, Run, Previous Page, Next Page, and Light.After completing settings, click Save to save the program.Click Run to execute the program directly without saving changes.

03.Click the Run button to enter the program execution interface. The top-right corner buttons, from left to right, are: Run, Pause, and Stop (Refer to Figure 6).

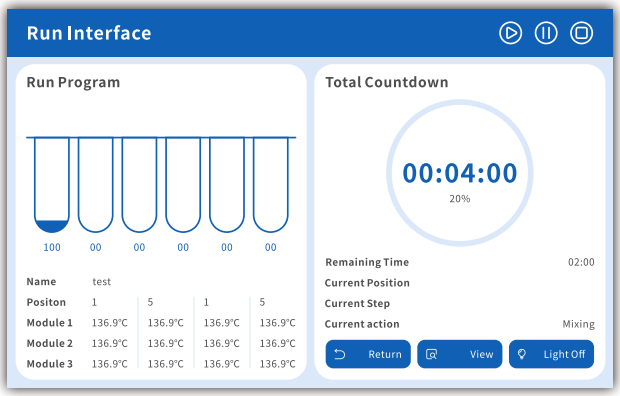


Figure 6

The buttons in the lower-right corner (from left to right) are: Return to Program List，View Program Parameters，Lighting Control.

04.When clicking the program run button, a prompt window will pop up stating “Please confirm whether the magnetic sleeve has been installed”.Be sure to check the installation status of the magnetic sleeve. If it is already installed, click the “OK” button in the lower-left corner to start the instrument. If the operation was accidental, click the “Cancel” button in the lower-right corner to exit, and rerun the program after completing the check (Refer to Figure 7 below for details).

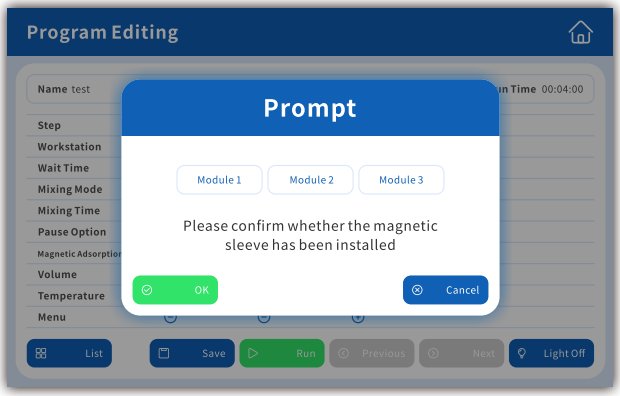


Figure 7

05.The operation interface displays: Total countdown time，Remaining time，Current action，Current position，Remaining time for current step，Real-time temperature(Refer to Figure 8).

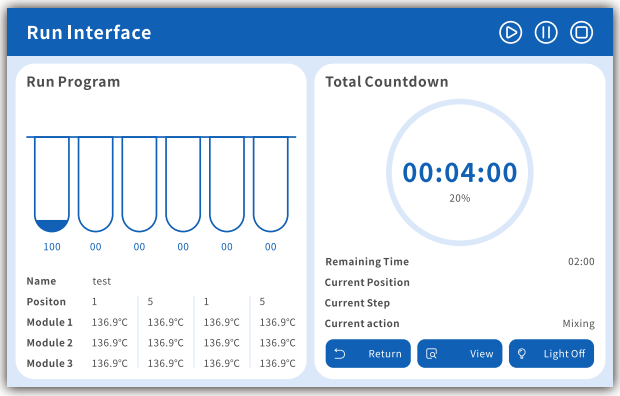


Figure 8

The buttons in the lower-right corner (from left to right) are: Return to Program List，View Program Parameters，Lighting Control. During operation: Press “Pause” to temporarily halt the program，Press “Stop” to terminate the program.

Note: The pause function maintains the current workstation position while stopping movement, allowing for program continuation. The stop function completely ends operation and resets the robotic arm.

5.3 Program Search Function

If the program list is extensive, click the “Search” field on the program list page and enter keywords to filter by name or catalog number (Refer to Figure 9).

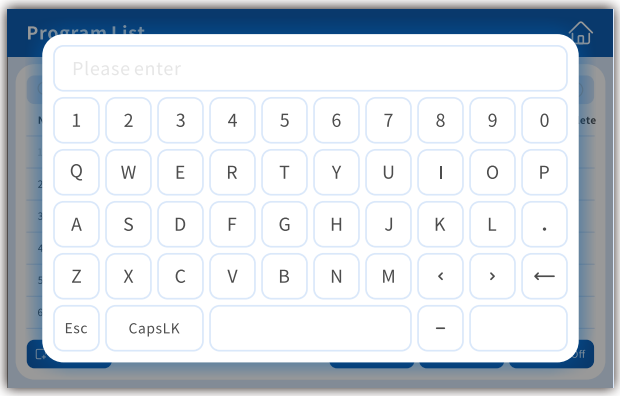


Figure 9

5.4 Program Deletion Function

If the “Lock” area of the program displays a red lock-shaped icon, it indicates that the program is locked and cannot be modified or deleted. If the “Lock” area shows a blue lock-shaped icon, the program is unlocked, allowing free modification of parameters or deletion of the program item(See Figure 10).

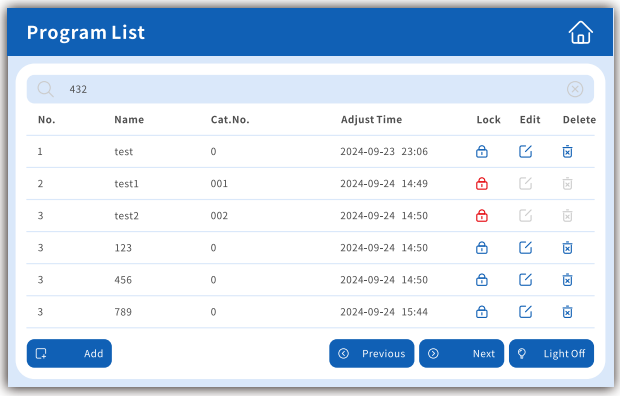


Figure 10

When clicking the delete button, an unlocked program will immediately trigger a confirmation prompt. To delete the program, click the “OK” button in the lower-left corner. To cancel the deletion, click the “Cancel” button in the lower-right corner(See Figure 11).

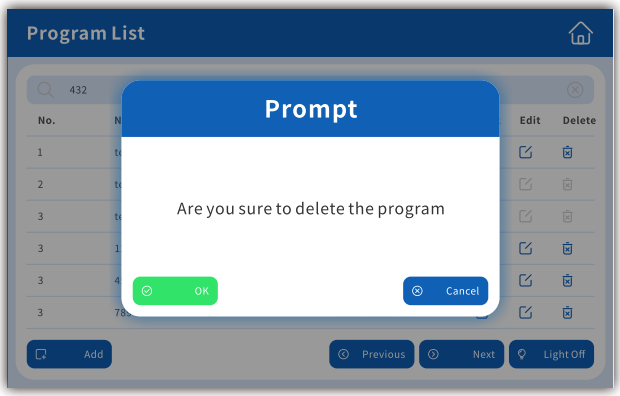


Figure 11

5.5 UV Sterilization Function

Click the “UV Sterilization” button on the main page to access the UV lamp settings interface. The system is preset with a 15-minute UV irradiation time. Click the “Run” button in the lower-left corner to activate the UV lamp and start the countdown timer. Click the “Stop” button in the lower-right corner to turn off the UV lamp at any time. To modify the irradiation time, tap on the time display to bring up the numeric keypad. Set the desired time in “HH:MM:SS” format (hours, minutes, seconds) “00:00:00” indicates zero hours, minutes and seconds(See Figure 12 for reference).

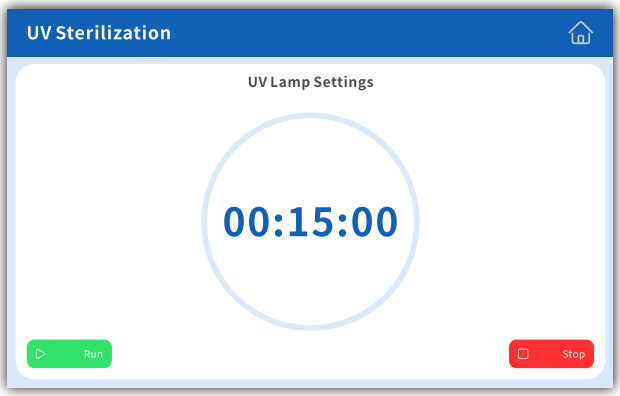


Figure 12

06 Precautions

6.1 Maintenance and Safety

01.Read the manual thoroughly and attend operator training before use;

02.Regular Maintenance: Clean the instrument weekly using 75% ethanol, Perform UV sterilization for ⩾30 minutes after cleaning. Do NOT use strong bleach solutions (⩾0.5%) or organic solvents as they may damage the housing and touchscreen. Avoid contact with highly corrosive liquids and mechanical impacts;

03.Maintain stable environmental conditions. Ensure consistent power supply voltage. Keep within specified temperature and humidity ranges. Place the instrument on a stable, level surface;

04.Always install the magnetic sleeve during operation to prevent solution contact with the magnetic rod. If contamination occurs, gently clean with 75% alcohol or distilled water using a lint-free cloth;

05.Only authorized service personnel may open the instrument or replace components. All maintenance must be performed by certified technicians approved by our company;

06.Never operate the instrument with wet hands;

07.Do NOT touch the heating block during operation to prevent burns.

6.2 Transportation and Storage Environmental Constraints

01.Ambient temperature range:-10°C~40°C;

02.Relative humidity range:10%~90%;

03.Atmospheric pressure range:70kPa~106kPa;

04.Indoor environment free of corrosive gases and with adequate ventilation.

6.3 Common Malfunctions and Troubleshooting Methods

No.	Common Malfunctions	Troubleshooting Methods
1	No Display on Screen	1.Check if the machine' s power switch is turned on 2.Verify that the power cable is securely plugged in 3.Ensure the power outlet is functioning 4.If the machine still fails to power on, contact after-sales support

No.	Common Malfunctions	Troubleshooting Methods
2	Abnormal Machine Noise	1.Check for obstructions on the rail that may prevent the robotic arm from moving 2.Inspect the magnetic rod sleeve rack for foreign objects 3.Ensure the magnetic rod sleeve is fully inserted 4.Confirm the deep-well plate is correctly positioned in the workstation 5.If normal operation cannot be restored, contact after-sales support
3	System Crash	1.Restart the instrument using the power switch on the rear panel 2.If there is no response after multiple restarts, contact after-sales support
4	UV Lamp Failure	1.Restart the instrument and check if the crash persists 2.Inspect the UV lamp tube connections for proper contact 3.Replace the UV lamp tube if necessary
5	Incomplete Magnetic Adsorption (Partial Wells)	1.Check for dirt or physical damage to the lamp 2.Test for demagnetization using a magnet and iron object
6	Heating Block Not Heating	1.Confirm the heating temperature and duration are set correctly 2.Restart the instrument to check for system crash interference 3.If unresolved, this may indicate hardware failure
7	When there is liquid inside the instrument or After the instrument was subjected to a significant mechanical impact	Cut off the power immediately and contact after-sales as soon as possible

07 After-Sales Service

We provide pre-sales consultation, installation, debugging, training, and repair services. The instrument is under a 2-year warranty.

Date of Repair	Fault and Repair Details	Date of Repair	Repair Technician

Servicebio®

Wuhan Servicebio Technology Co., Ltd.

4006-027-178

www.servicebio.com

5th Floor, 22 Building, Biopark, No. 388 Gaoxin 2nd Road, East Lake High-tech Developing Zone, Wuhan, Hubei,China