

96 Channe Automated Nucleic Acid Extractor

Product Number: EX-9601

Shipping and Storage

Packaged nucleic acid extractors shall be stored in a well-ventilated environment at 10°C ~ 30°C with relative humidity $\leq 70\%$ and no corrosive gas.

The maximum storage period for packaged instruments is 1 year. Instruments stored for more than one year must be unpacked and inspected; only qualified instruments may re-enter circulation.

Preface

1. Read this manual in full before operating the machine for the first time.
2. This equipment shall only be operated by trained and authorized personnel.
3. Equipment maintenance and repair shall only be performed by our company or authorized distributors.
4. If operators encounter issues not covered in this manual, contact our company or authorized distributors for proper solutions.
5. The machine must be inspected and maintained at specified intervals.
6. After reading this manual, store it in an easily accessible place for quick lookup.

Important Instructions

All basic safety precautions below must be strictly followed during equipment operation, maintenance, repair and transportation. Failure to comply with these measures or warning notes elsewhere in this manual may compromise the safety protection provided by the equipment. It will also violate the safety standards designed and manufactured for the instrument and exceed its intended scope of use.

Symbol Markings

Prompt: Prompt information requires operators to confirm completion of this step before proceeding to the next step; otherwise, instrument functions may be affected.

Caution: Caution items contain critical information that must be read carefully. Failure to follow prompts may result in abnormal instrument operation.

Warning: Warning information requires extra care during specific operating steps or methods. Improper operation may cause instrument malfunction or personal injury to operators.

Prohibition: Operators are forbidden to perform this operation; otherwise, equipment damage, abnormal operation or personal injury may occur.

Critical Safety Operation Information

Users must fully understand the operation of the nucleic acid extractor before use. Read this manual completely before running the system.

Caution:

Our company shall not bear any liability for any consequences arising from failure to operate in accordance with the prompts in this manual;

Inspect all items inside the package against the packing list after unpacking the instrument. Contact our company or supplier if any items are damaged or missing. After acceptance, fill in relevant information on the installation feedback form and return it to our company for filing and warranty purposes. Keep all packaging materials properly after unpacking for future use. Our company shall not be liable for equipment damage occurring during transit to the maintenance department due to improper packaging;

Immediately unplug the power cord of the instrument and contact the supplier or professional maintenance personnel from our company for handling under the following circumstances:

1. The instrument is exposed to rain or water immersion;
2. Abnormal noises or odors are emitted during instrument operation;
3. The instrument falls or the outer casing is damaged;
4. Obvious changes occur in instrument functions.

Warning:

1. Do not open the door while the instrument is running;
2. The heating strip surface may reach high temperatures during operation. Do not touch it to avoid scalding.
3. Operators shall not open the instrument, replace components or perform internal debugging without authorization from our company. Any disassembly must be completed by professional personnel with prior approval from our company; otherwise, the warranty shall be voided.
4. This instrument contains hazardous voltage that may harm the human body. Cut off the instrument power supply before opening the outer casing at any time.

Prohibition:

1. Do not clean the instrument while it is in operation;
2. Do not use concentrated alcohol or other organic solvents to clean the instrument surface.
3. Do not drag the instrument by the handle on the safety door of the experimental chamber when moving the equipment.

Instrument Structure

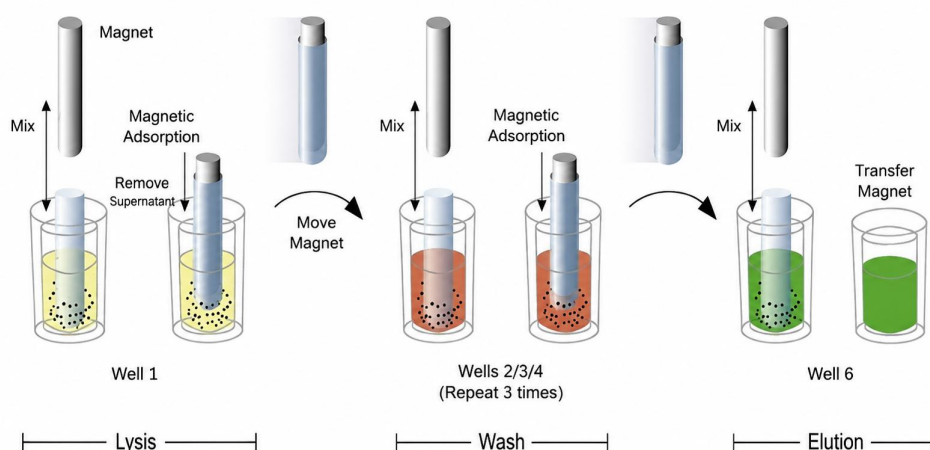
The experimental chamber contains the following components as shown in Figure:

1. Magnetic rod rack and magnetic sleeves
2. Drip-proof plate
3. Lysis position, numbered 1 from left to right
4. Magnetic bead position, numbered 2 from left to right
5. Washing position 1, numbered 3 from left to right
6. Washing position 2, numbered 4 from left to right
7. Elution position, numbered 5 from left to right

Working Principle

This instrument is a high-tech device that extracts nucleic acids using the universal magnetic bead method, featuring high automation, fast extraction speed, stable results and simple operation. It uses a dedicated 96-well deep-well plate and can process 1 to 96 samples simultaneously.

Magnetic rods mounted on the magnetic rod rack inside the experimental chamber transfer magnetic beads bound with nucleic acids into different reagent wells. The stirring sleeves covering the outer layer of magnetic rods repeatedly and rapidly agitate the liquid to achieve uniform mixing between liquid and magnetic beads. High-purity nucleic acids are finally obtained through cell lysis, nucleic acid binding, washing and elution steps, as shown in the following figure.



Application

Widely applied in general scientific research, genomics, disease control systems, food safety, forensic science and other fields. Simply load samples and magnetic bead-based fully automatic nucleic acid extraction reagents into the 96-well deep-well plate, then select or edit an appropriate program to execute. Matching different types of magnetic bead nucleic acid extraction reagents enables rapid extraction of DNA and RNA from animal and plant tissues, blood, body fluids, criminal forensic specimens and other samples.

Operating Environment

1. Ambient temperature: 10 °C ~ 30 °C
2. Relative humidity: ≤70%
3. Atmospheric pressure: 86 kPa ~ 106 kPa
4. No strong vibration or corrosive gas in the surrounding area
5. Avoid direct sunlight or other cold/heat sources
6. Keep away from strong electromagnetic field interference
7. Power supply voltage: 220 V, 50 Hz

Technical Parameters

Item	EX-9601
Maximum sample throughput	96 samples per run
Magnetic rods	96 independent magnetic rods
Sample volume range	20~1000μL
Magnetic bead recovery efficiency	>95%
Optimal magnetic bead size	0.2~1.0μm
Overall dimensions (mm)	800*500*500 (L*W*H)
Service life	5 years

Performance

1. Sample protection: Equipped with power-on self-test and power failure protection functions to minimize sample loss during operation.
2. Modular design: Adopts modular structure with self-developed core components, delivering higher efficiency, lower failure rate and stable instrument operation.
3. User-friendly interface: Visualized programs with precise control for simple, easy-to-learn operation.
4. Independent programmable control: Supports free program editing per user requirements.

5. Open platform: Compatible with multiple biological nano-magnetic bead-based nucleic acid extraction methods.

Main Structure

The nucleic acid extractor mainly consists of heating module assembly, magnetic separation module assembly, industrial control module assembly, base frame module assembly and outer casing assembly.

Installation and Commissioning

1. Instrument Placement

This instrument is only suitable for indoor installation with good ventilation, no corrosive gas and no strong magnetic field interference. Do not place the instrument in humid or dusty environments. Do not place it on soft cushions, as the base may sink and block the bottom ventilation openings. All openings on the instrument are designed for heat dissipation; do not place the rear of the instrument against walls or stack items around it. Never block or cover these ventilation holes. During operation, the distance between ventilation holes and nearby objects shall be no less than 25 cm to avoid poor heat dissipation. Avoid direct sunlight and keep away from heaters, stoves and all other heat sources.

2. Instrument Grounding

To prevent electric shock, the input power cord of the instrument must be reliably grounded. This instrument uses a three-pin plug and shall only be matched with a corresponding power socket, which serves as a safety device.

3. Power Supply Usage

- 3.1. Power supply requirements: Before connecting AC power, confirm that the power supply voltage matches the instrument's rated voltage (allowable deviation $\pm 10\%$). Ensure the rated load of the power socket meets the instrument's requirements.
- 3.2. Power cord precautions: Use the power cord supplied with the instrument as standard. If the power cord is damaged, replace it with a cord of identical type and specification; damaged cords shall not be repaired. Do not place any objects on the power cord during instrument operation, and avoid routing the cord through pedestrian walkways.
- 3.3. Plugging and unplugging the power cord: Grip the plug directly when plugging in or unplugging the power cord. Insert the plug fully into the socket; do not pull the cord hard when unplugging.

4. Pre-operation Preparation

After instrument placement, remove the cross-head fixing screws on the stirring sleeve rack following the prompts on the front safety door, connect the power supply, close the front door tightly, then power on and start the instrument.

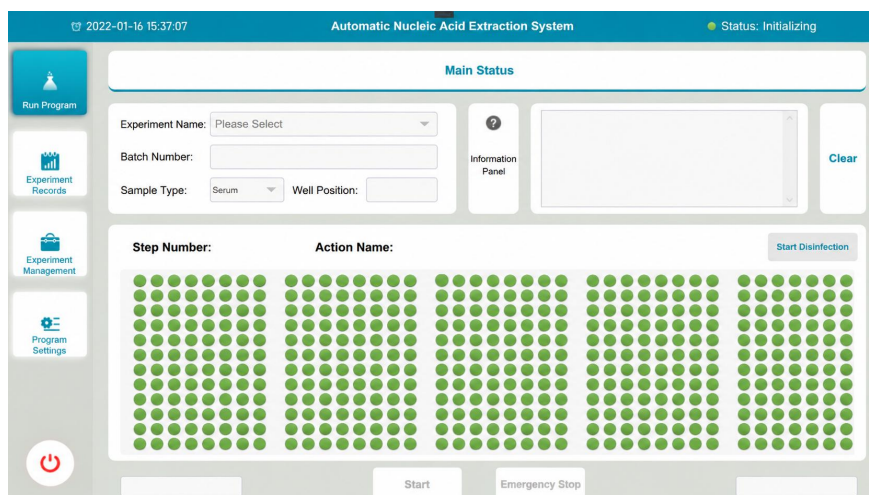
Warning: The cross-head fixing screws on the stirring sleeve rack must be removed before powering on the instrument for first use.

Note: If the experiment or reagents have strict temperature requirements, run a heating program set to 60 °C for 30 minutes of preheating before conducting experiments.

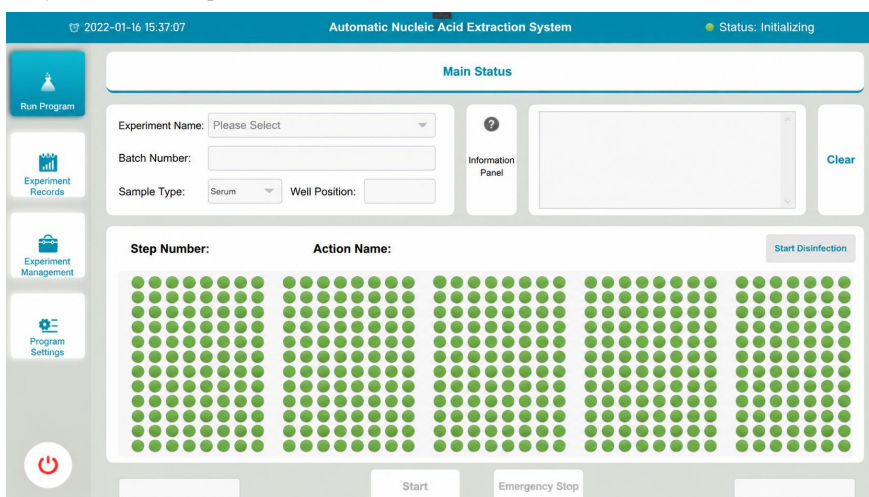
Protocol

1. Power-on Startup

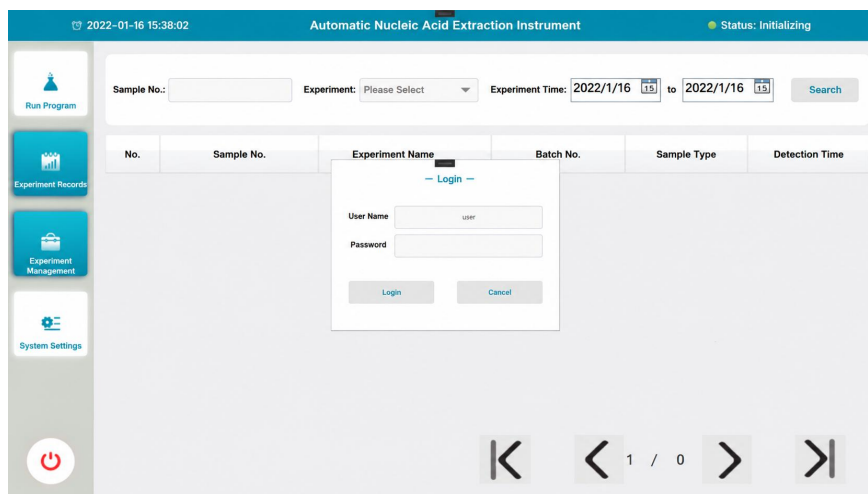
- 1.1. Turn on the power switch of the nucleic acid extractor; the buzzer emits two short beeps and the instrument initiates startup. After entering the system, the instrument performs equipment initialization, mechanical reset and self-test, which takes approximately 1 to 2 minutes. The system initialization interface is shown in Figure.



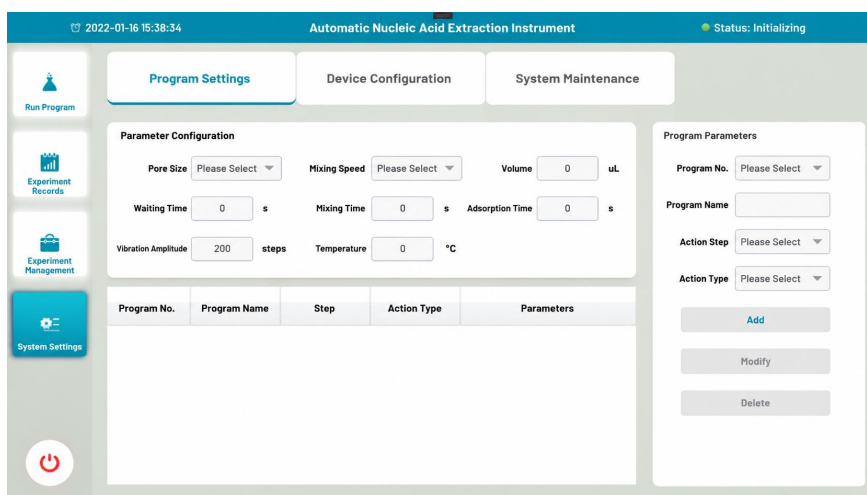
- 1.2. After power-on initialization, mechanical reset and self-test complete, the system enters the main operation interface.
- 1.3. The main operation interface contains shortcut keys for instrument functions and program files. The top row displays system function keys including "Run Program", "Edit Program", "System Settings" and "UV Lamp". Tap the experiment name or its upper icon to enter the corresponding program running interface.
- 1.4. Note: Keep the front safety door closed during power-on startup to enable normal initialization, mechanical reset and self-test for entry into the main operation interface.



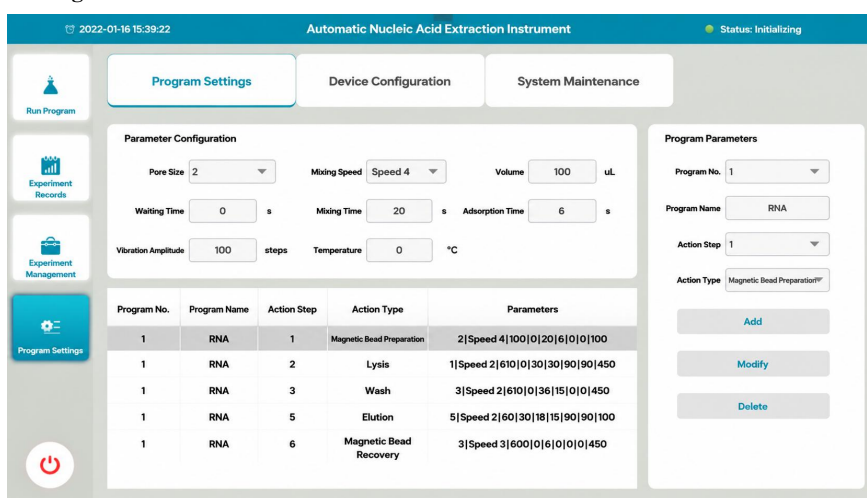
2. Program Editing



Tap "Menu" on the main operation interface to directly enter the program editing interface.



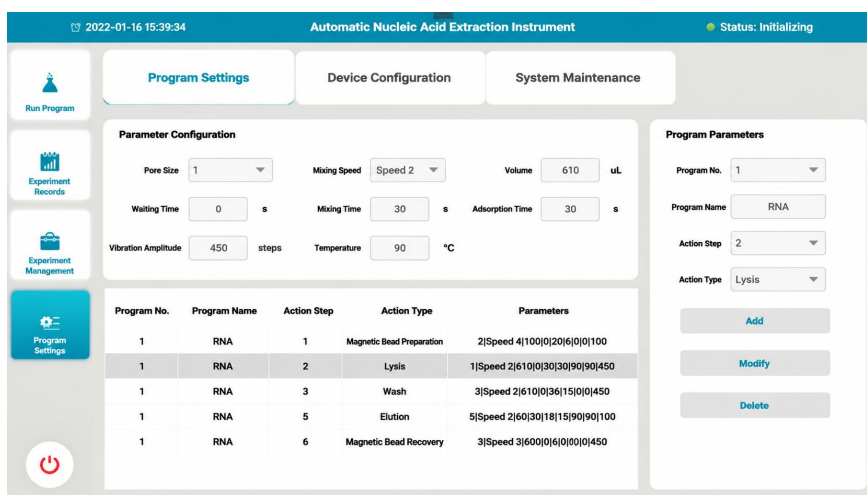
2.1. Create New Program



Enter program serial number, program name and action ID in sequence.

Available action types: Lysis, Bead (Magnetic bead recovery), Bind (Magnetic bead preparation), Wash (Washing), Elution (Elution).

After selecting the action type, enter the corresponding program editing interface as shown in Figure. Each action consists of the following adjustable parameters, which users may configure according to the kit manual.



2022-01-16 15:39:48

Automatic Nucleic Acid Extraction Instrument

Status: Initializing

Run Program

Experiment Records

Experiment Management

Program Settings

Program Settings

Device Configuration

System Maintenance

Parameter Configuration

Pore Size: 3

Mixing Speed: Speed 2

Volume: 610 uL

Waiting Time: 0 s

Mixing Time: 36 s

Adsorption Time: 15 s

Vibration Amplitude: 450 steps

Temperature: 0 °C

Program Parameters

Program No.: 1

Program Name: RNA

Action Step: 3

Action Type: Wash

Add

Modify

Delete

Program No.	Program Name	Action Step	Action Type	Parameters
1	RNA	1	Magnetic Bead Preparation	2 Speed 4 100 0 20 6 0 0 100
1	RNA	2	Lysis	1 Speed 2 610 0 30 30 90 90 450
1	RNA	3	Wash	3 Speed 2 610 0 36 15 0 0 450
1	RNA	5	Elution	5 Speed 2 60 30 18 15 90 90 100
1	RNA	6	Magnetic Bead Recovery	3 Speed 3 600 0 6 0 0 0 450

Run Program

Experiment Records

Experiment Management

Program Settings

Parameter Configuration

Pore Size: 5

Mixing Speed: Speed 2

Volume: 60 uL

Waiting Time: 30 s

Mixing Time: 18 s

Adsorption Time: 15 s

Vibration Amplitude: 100 steps

Temperature: 90 °C

Program Parameters

Program No.: 1

Program Name: RNA

Action Step: 5

Action Type: Elution

Add

Modify

Delete

Run Program

Experiment Records

Experiment Management

Program Settings

Parameter Configuration

Pore Size: 3

Mixing Speed: Speed 3

Volume: 600 uL

Waiting Time: 0 s

Mixing Time: 6 s

Adsorption Time: 0 s

Vibration Amplitude: 450 steps

Temperature: 0 °C

Program Parameters

Program No.: 1

Program Name: RNA

Action Step: 6

Action Type: Magnetic Bead Recovery**

Add

Modify

Delete

Well Position: Corresponding well position on the 96-well deep-well plate for this step.

Mixing Speed: Three options: Fast, Medium, Slow.

Volume: Volume of liquid loaded in the well.

Waiting Time: Delay time before magnetic rods enter liquid for preheating or other timing requirements.

Mixing Time: Duration of mixing in this step.

Binding Time: Magnetic bead adsorption duration for this step.

Lysis Temperature: Optimal temperature for lysis, adjustable from room temperature to 120°C.

Elution Temperature: Optimal temperature for elution, adjustable from room temperature to 120°C.

Vibration Amplitude: Reciprocating oscillation amplitude of magnetic sleeves inside wells.

3. Program Operation

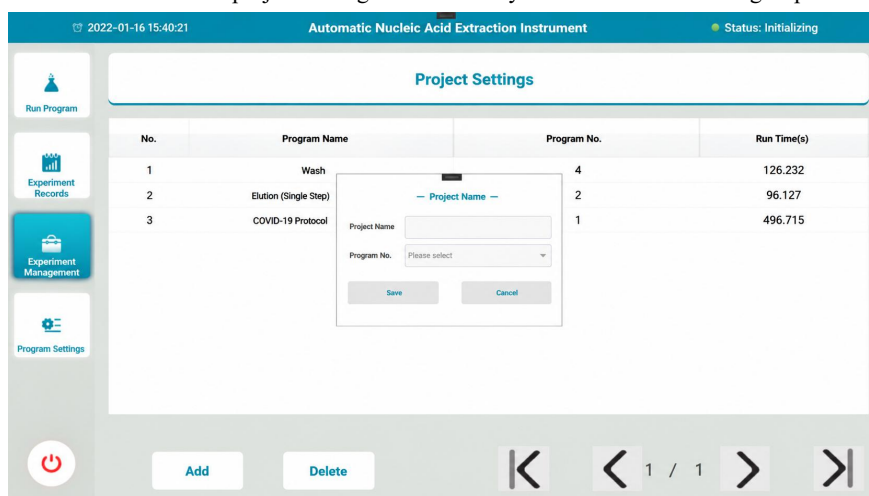
All stored experimental program files are available for program operation. Users may select and run appropriate programs

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based on experimental requirements.

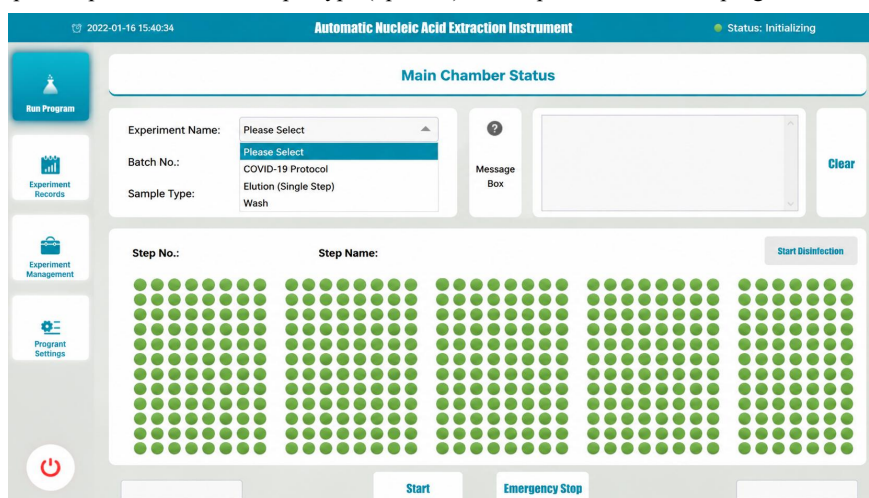
3.1. Select Program to Run

Programs must be added to the project management directory before selection. Adding steps:



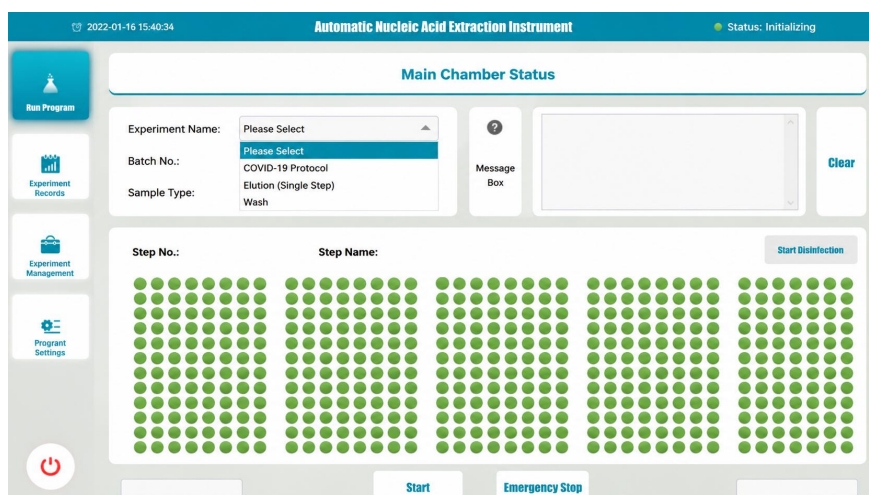
Tap Add, a pop-up dialog box appears. Enter program name and project serial number, select the edited experiment name from the step serial number drop-down menu, then tap Save.

Tap "Run Program" on the main operation interface, select the added program from the experiment name drop-down menu, input sample number and sample type (optional), then tap Start to enter the program running interface.



4. UV Lamp Switch

Tap "Start Disinfection" on the main operation interface to turn on the UV lamp; tap again to switch it off automatically.



Note:

Do not open the front safety door during UV disinfection.

The system automatically turns off the UV lamp upon completion of disinfection, or users may manually switch it off as needed.

The organic glass of the front safety door filters ultraviolet light; avoid direct eye contact with UV light to prevent injury.

During UV disinfection, other interface icons remain functional, but programs cannot be run until the UV lamp is switched off.

Fault Diagnosis and Troubleshooting

Serial No.	Fault Phenomenon	Root Cause	Solution & Handling Method
1	No screen display after power-on	1. Power cord loose 2. Fuse damaged 3. Power switch indicator off 4. Other faults	1. Reconnect power cord firmly 2. Replace fuse 3. Contact our company or supplier 4. Contact our company or supplier
2	Abnormal noise during operation	1. Fixed cross-head screws for stirring sleeves not removed 2. Stirring sleeves not fully inserted 3. 96-well deep-well plate misplaced	1. Remove fixing screws 2. Reinstall stirring sleeves fully 3. Re-position deep-well plate correctly
3	Temperature fails to rise	1. Temperature control function disabled 2. Other faults	1. Enable temperature controller 2. Contact our company or supplier
4	UV lamp fails to light up	1. Poor UV tube contact 2. UV tube damaged	1. Reinstall UV tube 2. Replace UV tube with new one
5	Abnormal magnetic rod movement (fails to rise or fall)	Mechanical reset failure	Pause the program and tap Reset button; contact our company or supplier for other failures
6	Magnetic rod falling off		Contact our company or supplier
7	System crash or out of control	1. Improper operation 2. Other faults	1. Cut off power and restart instrument 2. Contact our company or supplier

Maintenance

Regular inspection and maintenance are required to ensure long-term, safe and efficient operation of the nucleic acid extractor and extend its trouble-free service life. Contact management staff and our maintenance department immediately if any questions or faults arise.

1. Read the manual carefully before each instrument use.
2. Cut off the instrument power supply after experiments. Wipe the experimental chamber with absorbent cotton soaked in 75% ethanol; do not pour ethanol directly into the chamber. After ethanol fully evaporates, turn on the UV lamp for disinfection for at least 30 minutes.
3. Regularly clean the instrument surface and experimental chamber; avoid strong alkali, concentrated alcohol and organic solvent cleaning solutions.
4. Keep the experimental chamber dry and free of water stains.
5. Avoid using the instrument in dusty environments.
6. Ensure adequate ventilation around the instrument during operation.
7. Do not operate the instrument under unstable, excessively high or low voltage conditions.
8. Unplug the power cord if the instrument will not be used for a long time; cover the instrument with soft cloth or plastic bag to prevent dust accumulation.
9. To maintain stable performance during long-term storage, run the instrument empty once every 30 days when idle.

Prohibition: Do not clean the experimental chamber or instrument surface while the equipment is operating.

Label Descriptions

1. Corporate Logo

2. Biological Hazard Warning



3. High Temperature Caution

**Contraindications**

No known contraindications for the nucleic acid extractor.

Warranty Commitment

Dear Customer: All products may develop faults during service. Monitor equipment operation status in real time during use. If abnormalities occur, troubleshoot following this manual first; contact our service center promptly if the issue persists to avoid losses.

After-sales Service Terms:

1. The whole machine enjoys free one-year warranty starting from the date of sale (based on invoice), with full technical support provided.
2. Warranty Card: Keep the warranty card and purchase invoice properly, and present both when consulting or requesting maintenance from our local after-sales service center.