LABSTAC

OPERATION MANUAL

Automatic Nucleic Acid Extraction System

NPS13-96

Attention

When operating , maintaining, repairing and transporting this instrument, the following basic safety measures must be strictly observed . If you do not follow these measures or the warnings pointed out elsewhere in this manual, it may affect the safety protection provided by this instrument. At the same time , this will also undermine the safety standards of design and manufacturing and the expected use range of the instrument.

A. Symbol

Attention ：The prompt message requires the operator to confirm this step before proceeding to the next step.Otherwise , the instrument function will be affected .

Note: The project contains particularly important information, please read it carefully. If you do not follow the prompts , the instrument may not work properly .。

Warning: A warning message requires you to be especially careful about a certain operation step or method.If you do not follow the requirements correctly , it may make the instrument unable to work normally or cause injury to the operator .

Prohibition: The operator is forbidden to perform this operation , otherwise it will cause damage to the instrument , failure to work normally , or injury to the operator .

B. Important safety operation information

Before using the nucleic acid extraction instrument , the user must have a complete understanding of the use of the instrument . Before operating the system please read this manual carefully.
Note: If the user does not follow the instructions on the manual for all consequences caused by the operation , our company will not bear any responsibility .

Note: When using this instrument for the first time, please remove the cushion cotton according to the instructions attached to the handle of the safety door . Otherwise, our company will not take any responsibility for the damage to the instrument .

Note: After unpacking the instrument , check the contents of the packing box according to the packing list . If the item is damaged or missing, please contact our company or supplier. After passing the acceptance, please fill in the relevant content on the installation information feedback form and feed it back to our company for documentation and warranty . After unpacking the instrument , please properly save the packaging materials for future use . Our company will not bear any responsibility for the damage of the instrument due to improper packaging while being sent to the maintenance department .

Note: Under the following conditions, immediately unplug the power plug of the instrument from the power socket, and contact the supplier or ask our professional maintenance personnel to deal with it :

- The instrument has been exposed to rain or water;
- Abnormal sound or smell occurs when the instrument is working ;
- The instrument is dropped or the casing is damaged ;
- The instrument function has changed obviously .

Warning:
1. Do not open the door during operation ;
2. During operation , the surface of the heating strip may be hot , please do not touch it to avoid occurrence scald .

Warning: The operator is not allowed to open the instrument , replace the components or debug the instrument without authorization from our company. If you need to open the instrument, it must be completed by a professional with the consent of our company, otherwise it will not be guaranteed .

Warning: This instrument has voltage that is harmful to the human body . Please cut off the power of the instrument at any time before opening the case .

Prohibition:
1. It is forbidden to clean the instrument while the instrument is working ;
2. It is forbidden to use organic solvents such as concentrated alcohol to clean the surface of the instrument .

Prohibition: It is strictly forbidden to use the handle on the safety door of the experiment cabin to drag the instrument when moving the instrument

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01. Overview

1.1 Product Description

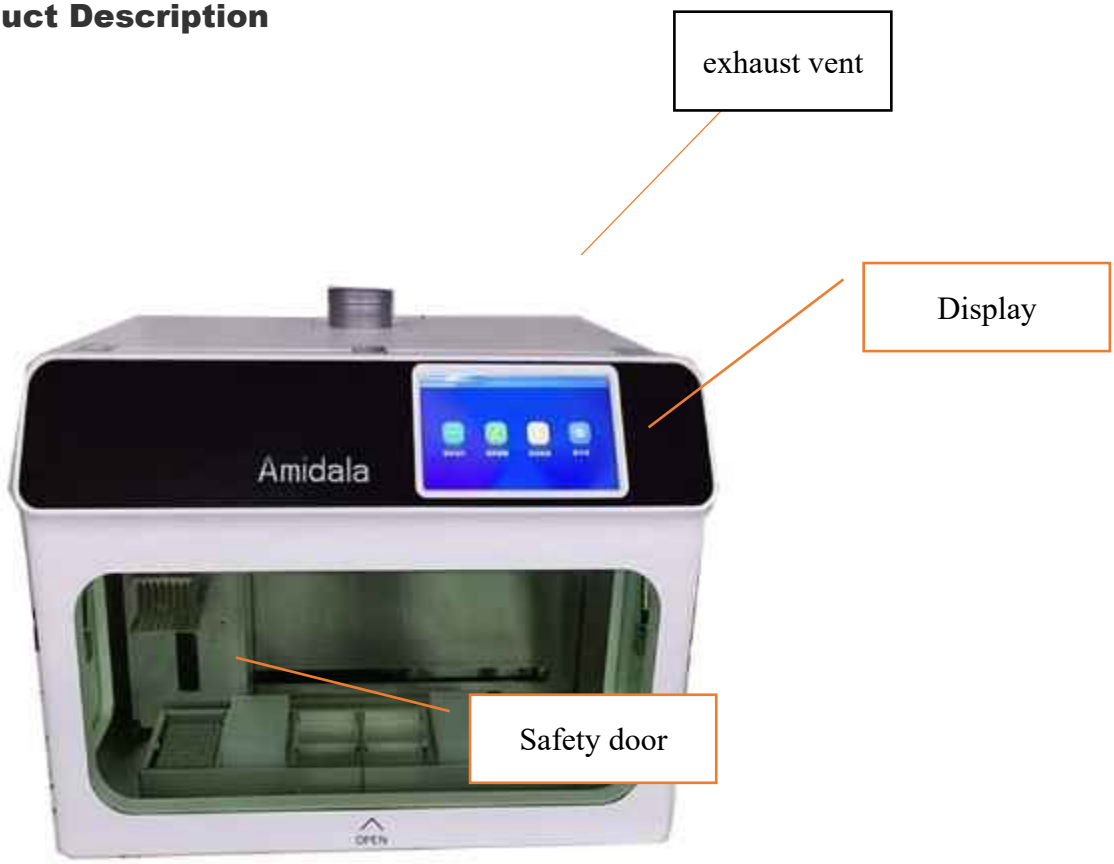

Figure 1-1 The front of the nucleic acid extractor

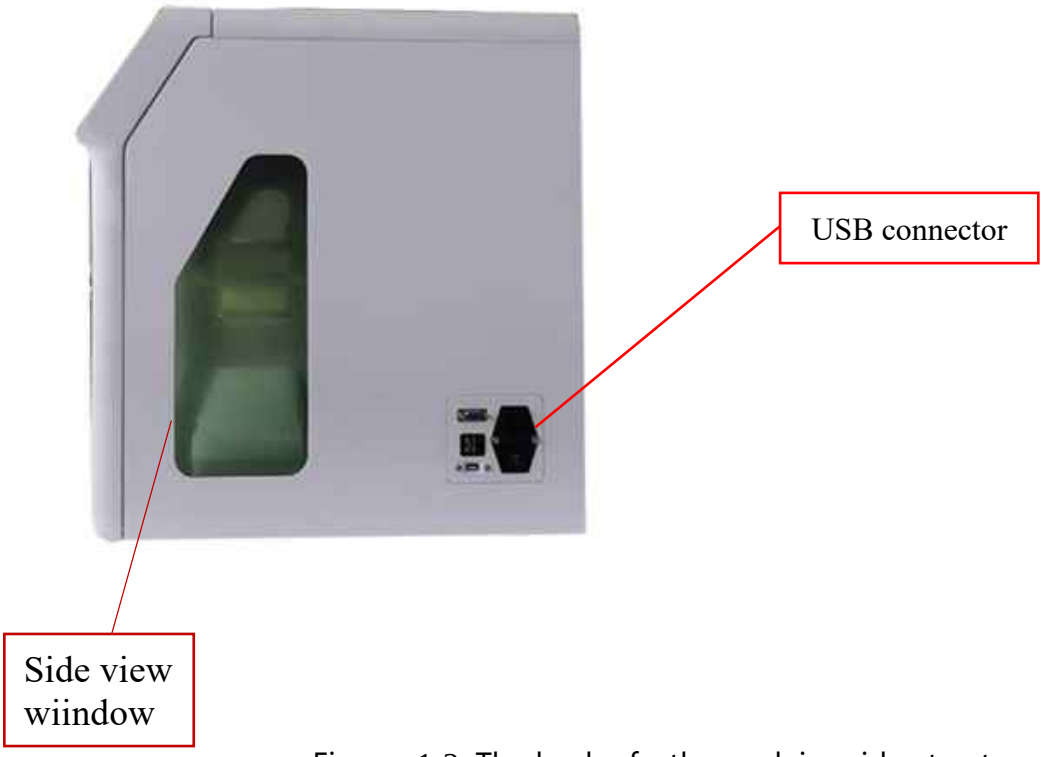

Figure 1-2 The back of the nucleic acid extractor

1.2 Experiment Cabin

Figure 1-3 Experiment Cabin

As shown in Figure 1-3, the contents of the experiment cabin are as follows :
(1) Magnetic rod holder and magnetic rod
(2) Mixing frame
(3)96 reagent deep well plate

02. Working principle

This instrument is a high-tech product that uses the universal magnetic bead method to extract nucleic acids. It has the advantages of high automation, fast extraction speed, stable results, and easy operation. Using a dedicated 96-well deep well plate, 1-96 samples can be operated simultaneously.
Use the magnetic rod on the magnetic rod holder of the experiment chamber to move the magnetic beads with nucleic acid to different reagent wells, and then use the stirring sleeve sheathed on the outer layer of the magnetic rod to stir the liquid repeatedly and quickly to make the liquid and the magnetic beads uniform After cell lysis, nucleic acid adsorption, washing and elution, high purity nucleic acid is finally obtained,as shown in Figure 2-1.

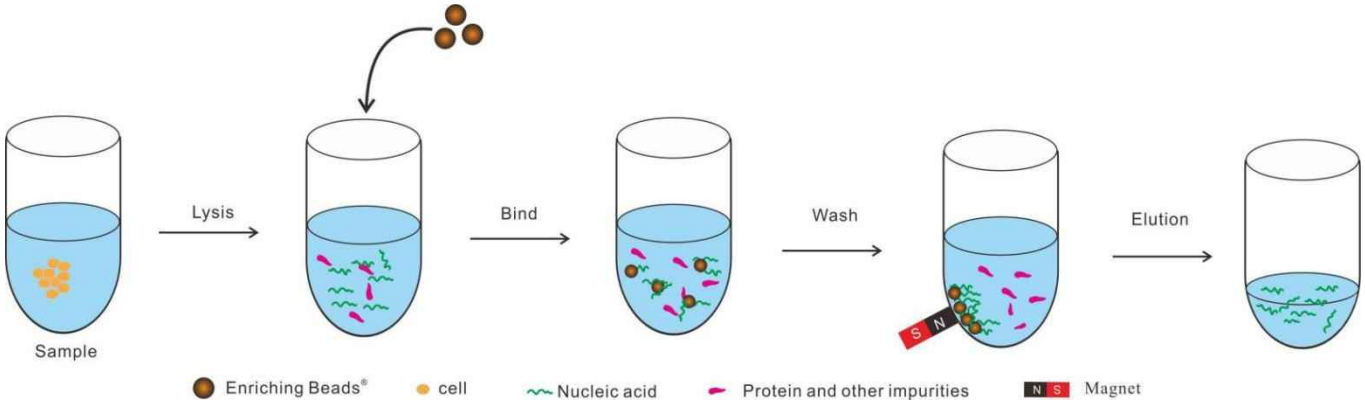

Figure 2-1 Schematic diagram of the principle of nucleic acid extraction

03. Application

It is widely used in routine scientific research, genomics, disease control system,food safety, forensic and other fields. To use this instrument, you only need to add the sample and the automatic nucleic acid extraction reagent with magnetic beads as the carrier to the 96-well deep-well plate, select or edit the appropriate program and execute it. With different types of magnetic bead nucleic acid extraction reagents , it can quickly extract DNA and RNA in samples of animal and plant tissues, blood, body fluids, and criminal materials.

04. Working environment

a) Ambient temperature: 10 ℃～30 ℃;
b) Relative humidity: ≤70%;
c) Atmospheric pressure: 86 kPa～106 kPa;
d) There is no strong vibration and corrosive gas around ;
e) Avoid direct sunlight or other heat and cold sources ;
f) Keep away from strong electromagnetic field interference ;
g) Power supply voltage: 110-220 V, 50 Hz、60Hz;

05. Technical parameter

Model	NPS13-96
Sample number	96
Magnetic rod （fixed）	1*96
Sample volume	60～1000ul
Collection efficiency of magnetic beads	>98%
Magnetic beads size	0.2～1.0um
Size （mm）	770*530*540（L*W*H）
Service life	8 years

06. Performance characteristics

1) Sample protection: The instrument has functions such as power-on self-check to minimize the possibility of sample loss during the use of the instrument ;
2) Modular design: The modular structure is adopted , and the core components are all independently designed, which has higher efficiency and lower failure rate, ensuring better stability during the operation of the instrument ;
3) Humanized interface : program visualization , precise control , simple operation , easy to use;
4) Independent programming control : According to user needs, the program can be freely edited ;
5) Open platform:suitable for a variety of nucleic acid methods based on bio-nanomagnetic beads .

07. The main structure

The nucleic acid extractor is mainly composed of heating module components , magnetic separation module components, industrial control module components, base frame module components , and housing components .

08. Installation and debugging

1) Place the instrument

This instrument is only suitable for indoor installation with good indoor ventilation, no corrosive gas , and no strong magnetic field interference . Do not place the instrument in a humid or dusty place ; do not place the instrument on a soft cushion, so as to prevent the base from sinking into the soft cushion and block the vent below; the openings on the instrument are for ventilation and heat dissipation. Leaning against walls or stacking other objects, do not block or cover these ventilation holes . When the instrument is running , the distance between the ventilation holes of the instrument and the nearest object should not be less than 25cm,so as not to affect heat dissipation; do not use the instrument in direct sunlight. Keep away from heaters , stoves and all other heat sources.

2) Ground the instrument

To avoid electric shock, the input power cord of the instrument must be grounded reliably. This instrument uses a three pin plug , which can only be used with this type of power socket. This is a safety device .

3) Power supply

a. Power requirements

Before connecting the AC power supply, make sure that the voltage of the power supply is consistent with the voltage required by the instrument (a deviation of ±10% is allowed). And make sure that the rated load of the power socket is not less than the requirement of the instrument .

b.Pay attention to the power cord

This instrument should usually use the power cord that comes with it . If the power cord is damaged, it must be replaced and not repaired. The power cord of the same type and specification must be used instead . When the instrument is in use , do not put anything on the power cord, and do not place the power cord where people move.

c. Plug and unplug the power cord

Always hold the plug when plugging or unplugging the power cord. When inserting the plug , make sure that the plug is fully inserted into the socket . Do not pull the power cord when unplugging the plug .

09. Preparation for use

After the instrument is installed, you must first remove the cushion cotton according to the prompt information of the front safety door, then turn on the power, close the front door, and then power on.

Warning: When the instrument is used for the first time, the cushion cotton must be removed.

Note: If the experiment or reagent requires high temperature, please start the program with heating (heating temperature is set to 60 ℃), preheat for 30 minutes, and then perform the experiment.

10. Operation

10.1 Boot

Turn on the nucleic acid extraction instrument switch, the instrument is starting. After the instrument enters the system it starts to initialize the equipment , reset and self - check of the motion device . This process takes about 1 to 2 minutes. The system initialization interface is as follows As shown in Figure 3-1.

Note: When the instrument is turned on for the first time, please follow the instructions attached to the handle of the safety door and remove the cushion cotton . Otherwise, the instrument will be damaged when it is powered on and the instrument will not work properly .

Figure 10-1 Instrument initialization interface

After the instrument is powered on , the equipment is initialized, the motion device is reset, and the self check is over, the system enters the main operation interface , as shown in Figure 10-2.
The main operation interface includes shortcuts for instrument functions and program files. The upper one is the system function keys , including "Program running ", "Program edit", "Setup", and "UV disinfection ".
Click the experiment name or the icon above the name to enter the running interface of the program file .

Note: When powering on , please close the front safety door so that the instrument can initialize , reset and self check normally, and enter the main operation interface.

Figure 10-2 Main operation interface

10.2 Program Edit

Click "Program Edit " in the main operation interface to enter the program editing interface directly . As shown in Figure 10-3.

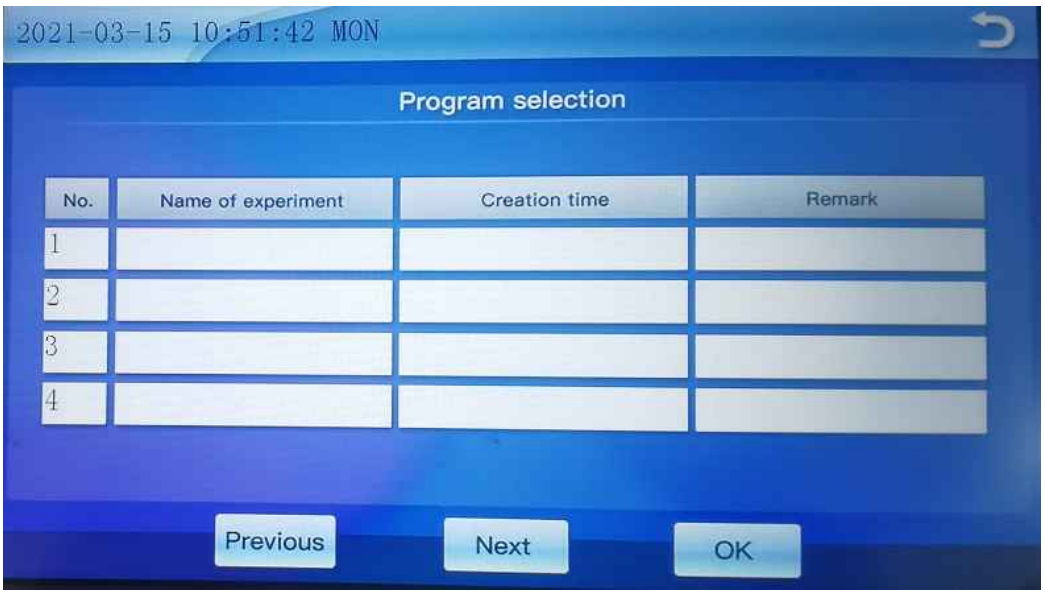

Figure 10-3 Program edit interface

10.2.1 New program

After selecting one of the rows and the color overall turns green, touch "Edit", a new program naming window will pop up as shown in Figure 10-4.

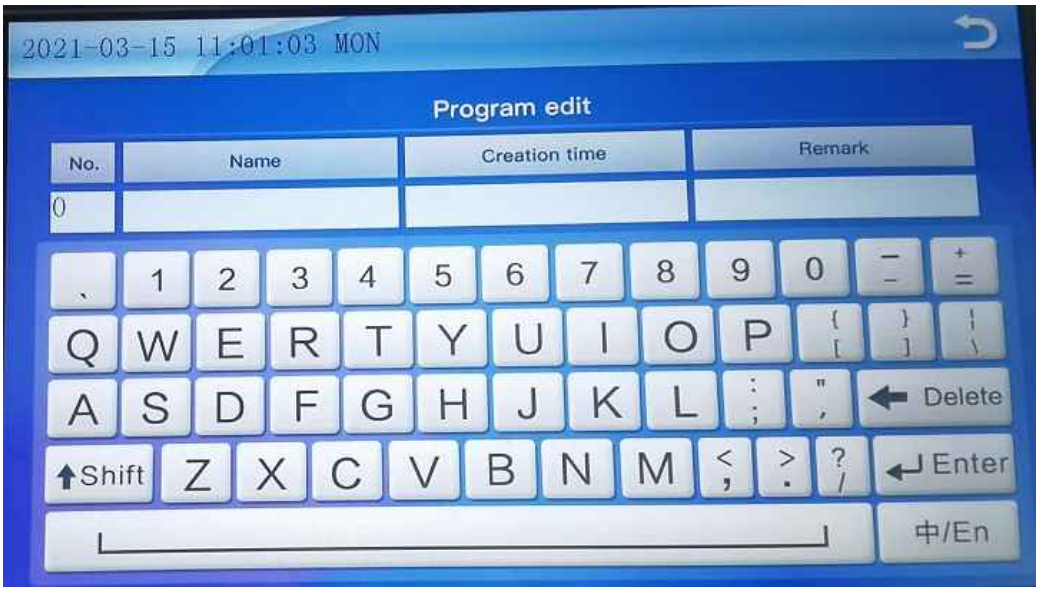

Figure 10-4 New program naming window

Touch the box below the experiment name, enter the name of the program and touch Enter to confirm.To cancel the creation , touch the Delete key to clear the information , and then touch the Enter key to return .

10.2.2 Program content editing

Select the newly created program or the program that has been edited in the previous stage, touch "Edit" in the program editing interface to enter the program editing interface, as shown in Figure 10-5.

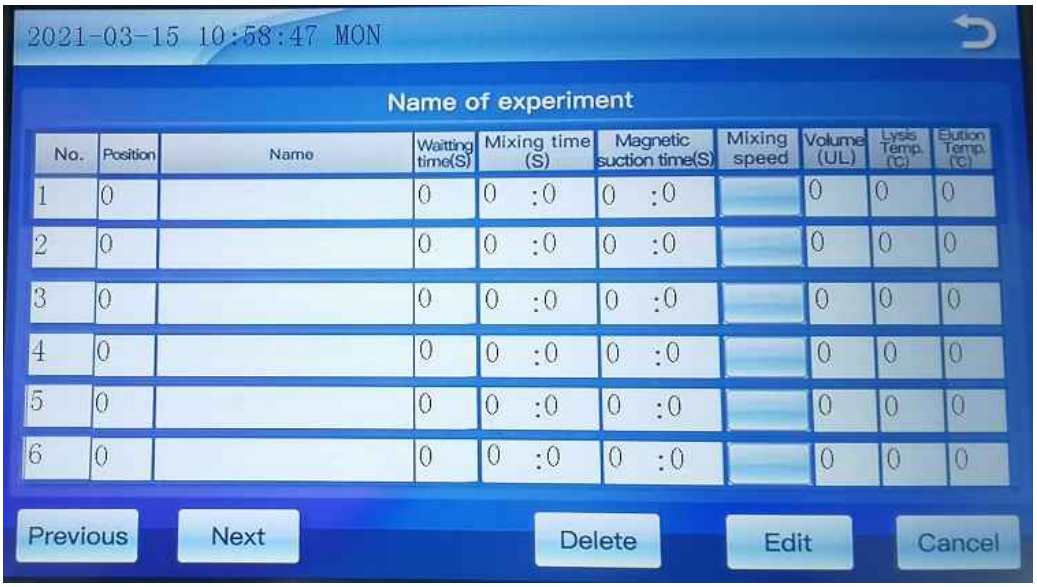

Figure 10-5 Program edit window

Program editing needs to start from the first row,select the first row,and after the color turns red as a whole , touch "Edit" to enter the single program editing interface , as shown in Figure 10-6.

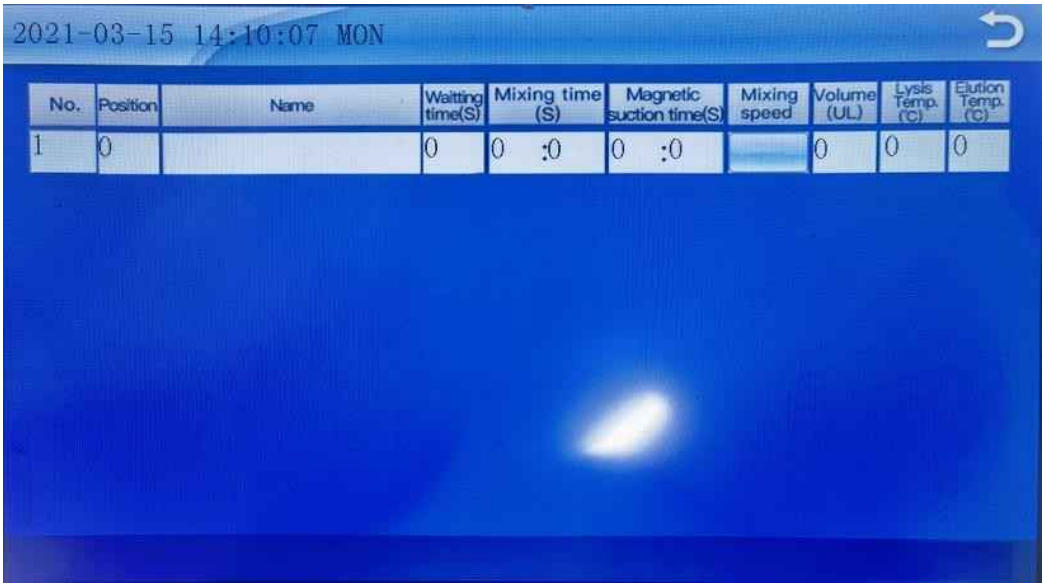

Figure 10-6 Single program edit window

Position: the hole position on the 96-well deep-well plate corresponding to this step .
Names: Lysis (lysis), Bead (magnetic bead recovery), Bind (magnetic bead preparation), Wash (washing), Elution (elution).
Waiting time : the waiting time before the magnet bar enters the liquid .
Mixing time : the mixing time of this step .
Magnetic suction time : the time for magnetic bead adsorption in this step .
Mixing speed : fast, medium and slow
Volume: The volume of solution added in the hole .
Lysis temperature : the appropriate temperature required for cracking.
Elution temperature : the appropriate temperature required for elution.

10.3 Program Running

The program running includes all the experimental program files stored in the system . The user can select the appropriate experimental program file and run it according to his own requirements for the experiment .

10.3.1 Program selection

Touch "Program Running " on the main operation interface to enter the interface for selecting a program to run , as shown in the figure 10-8.

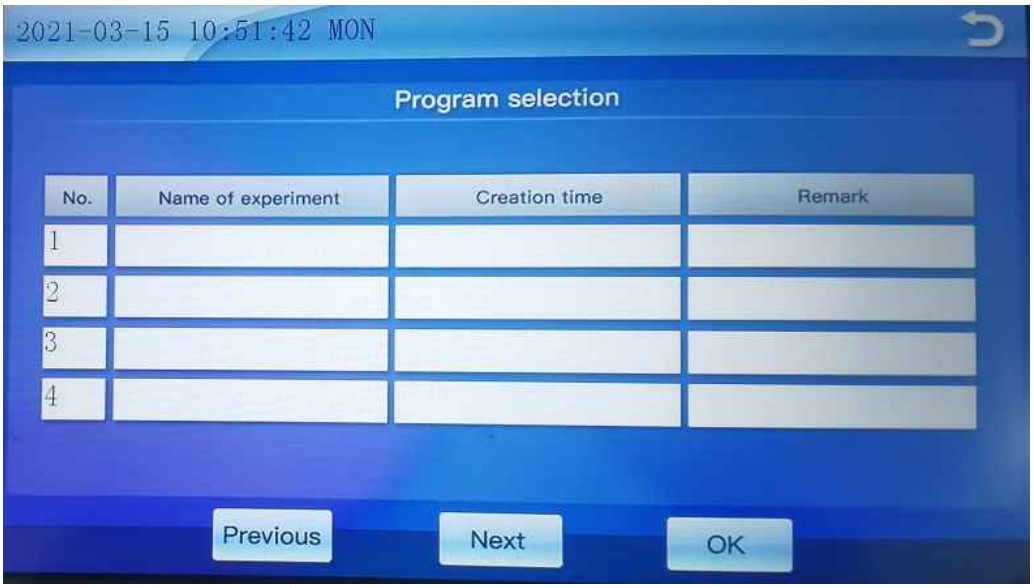

Figure 10-8 Program selection Interface

Enter the next page of the program if the last page is displayed it will not response if you touch this button .

Enter the next page of the program if the first page is displayed it will not response if you touch this button .
Return to the previous operation interface .

Enter the interface of the selected program Before touching this button , you need to select the program to run . If the program is not selected,touching this button will have no response .

10.3.2 Program running

Select the program and touch "OK" to enter the program running interface , as shown in Figure 10-9.

Figure 10-9 Program running interface

10.4 UV settings

Touch " UV disinfection " in the main operation interface , and the UV lamp running time setting will pop up as shown in Figure 10-10.

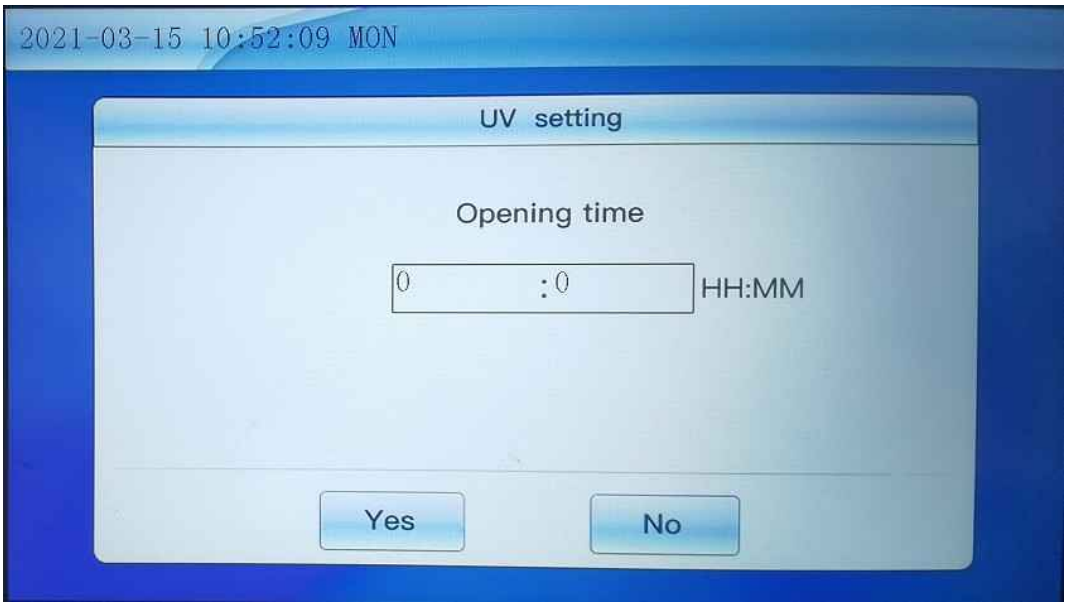

Figure 10-10 UV lamp setting interface

Set the corresponding UV lamp running time as required Click "No" on the interface of Figure 10-9 to exit this interface and the UV lamp is not turned on . Click "Yes", the UV lamp is turned on , and the UV lamp running time will pop up as shown in Figure 10-11.

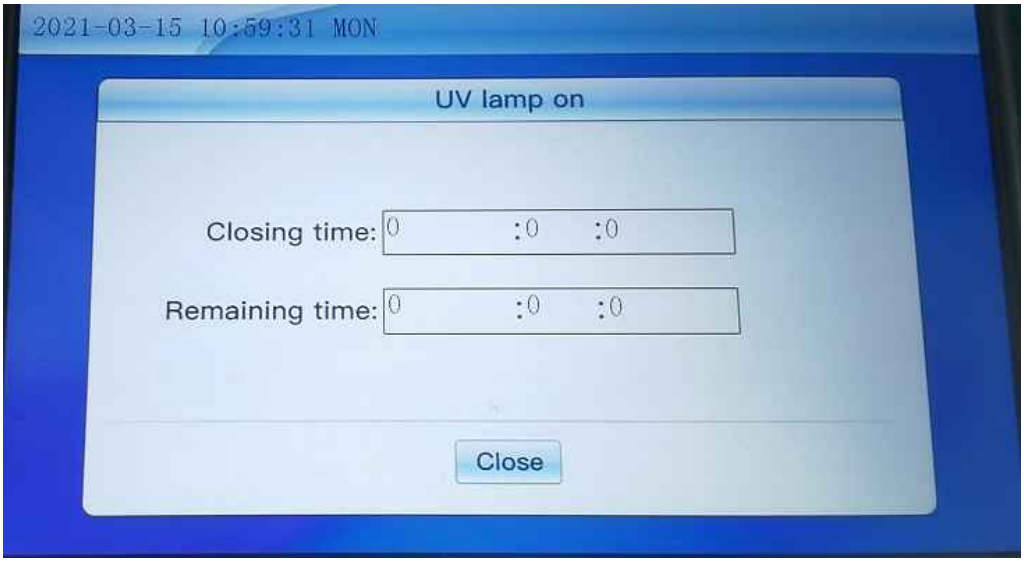

Figure 10-11 UV lamp running interface

Touch "Close" to turn off the UV lamp .

Note:

1. During the disinfection process of the UV lamp , please do not open the front safety door. If the experimenter hits the safety door at this time, the UV lamp will automatically turn off and the time will stop counting down . After closing the safety door, the UV lamp will be turned on again and the time will continue to count down until the end of the timer .
2. When the disinfection time is up the system will automatically turn off the UV lamp , or the experimenter will turn off the UV lamp according to the actual situation;
3. The plexiglass of the front safety door has the function of filtering ultraviolet light. To avoid accidents , please do not look directly at the ultraviolet light;
4. During the UV lamp disinfection process, the program cannot be run, and the program can only be run when the UV lamp is turned off .

11. Troubleshooting

No.	Question	Reason	Solution
1	The screen does not display after turning on the power	Power cable connection is not well	Reconnect the power cable
		The fuse is damage	Replace the fuse
		Whether the switch indicator light is on	Contact our company or supplier
		Others	
2	The machine makes an abnormal sound	Cushion cotton is removed	Remove the cushion cotton
		Whether the mixing sleeve is fully inserted	Reinsert the mixing sleeve
		Whether the 96-well deep well plate is placed correctly	Replace the deep-well plate
3	The temperature has not risen	Check the temperature control	Open the temperature control
		other	Contact our company or supplier
4	Uv lamp is not working	The UV lamp is not connection well	Reinstall the UV lamp
		UV lamp is damaged	Replace the UV lamp
5	Abnormal magnetic bar action	No movement	Pause the program, touch the "Reset" button to reset
		Others	Contact our company or supplier
6	Magnetic rod falls off		Contact our company or supplier
7	System freezes or loses control	Improper use or operation error	Turn off the power and restart the instrument
		Others	Contact our company or supplier

12. Maintenance

In order to enable the nucleic acid extractor to work long term safely and effectively, and to extend its trouble-free working time, the machine should be regularly maintained and inspected. If you have any questions or problems, please notify the management and the company's maintenance department immediately.

1) Please check the manual carefully before using the instrument;
2) After the experiment is over, turn off the power supply of the instrument and use 75% ethanol to clean the experiment chamber. When using it, do not pour ethanol into the experiment chamber. Please wipe with absorbent cotton. After the ethanol is dry, turn on the UV lamp Irradiate for more than 30 minutes for disinfection;
3) Clean the surface of the instrument and the experimental chamber regularly, and avoid using strong alkali, concentrated alcohol and organic solvent solutions;
4) Keep the environment in the experiment cabin relatively dry and free of water stains and other things;
5) Do not use the instrument in a dusty environment;
6) When using the instrument, please ensure ventilation around the instrument;
7) Please do not use the instrument when the voltage is unstable, too high or too low;
8) When the instrument is not in use for a long time, please unplug the plug and cover the instrument with a soft cloth or plastic bag to prevent dust from entering.
9) When the instrument is out of use, in order to ensure the stable performance of the instrument, it is recommended to start the instrument to run without sample once every 30 days.

Prohibition: It is forbidden to clean the experiment chamber or the surface of the instrument while the instrument is working.

13. Contraindications

Nucleic acid extractor currently has no known contraindications.

14. Store

The packed nucleic acid extractor should be stored at 10℃～30℃,relative humidity not exceeding 70%, no corrosive gas and well ventilated environment.
The storage period of the nucleic acid extractor should not exceed one year, and the nucleic acid extractor that exceeds one year should be checked out of the box, and the nucleic acid extractor that passes the open box inspection can enter the circulation field.

15. Packing List

NPS13-96 Packing List

Name	Amount
NPS13-96 main instrument	1
Power cable	1
NPS13-96 User manual	1
Test report	1
Certification	1
Warranty card	1
Product acceptance form and installation report	1

16. Warranty commitment

Dear customer: Any product has the possibility of failure. Please monitor the operating status of the equipment in real time during use . If there is any abnormality, please refer to the manual to deal with it . If it still cannot be solved , you should notify the company's service center in time to avoid in order to avoid your losses.

After-sales service matters

1. The whole machine is guaranteed for one year free of charge from the date of equipment sale, and technical support is provided .
2. Warranty certificate: When you need normal consultation or maintenance, please contact our company's local after-sales service center with the warranty certificate and purchase invoice and keep the warranty certificate properly .

Appendix: Experimental Process

1.The main content

The purpose of this manual is to enable users to combine the operation of the BNP 96 nucleic acid extractor with the reagents used , so as to master the operation process of this instrument as soon as possible .

2.Operation

Before performing nucleic acid extraction, please select the magnetic bead method nucleic acid extraction reagents that are compatible with the BNP96 nucleic acid extractor. The general nucleic acid extraction reagents are divided into : lysis solution, magnetic bead solution, washing solution I, washing solution II and eluent, etc. ingredient.

The role of each component :

Component	Role
Lysis solution	Lyse the sample and release the nucleic acid
Magnetic bead solution	Adsorb the nucleic acid released from the sample
Washing solution I / II	Wash away other substances other than nucleic acids such as protein
Eluent	Elution of nucleic acid adsorbed on magnetic beads

The composition and concentration of each component vary according to the classification of the sample to be extracted . Please strictly select the appropriate nucleic acid extraction reagent according to the classification of the sample .

Ⅰ. Take Labstac Nucleic acid extraction kit 4 (magnetic bead method) as an example to introduce the DNA/RNA extraction operation:

1.1. Material:
Tips and centrifuge tubes without nuclease contamination

1.2. Preparation before use :

a) Take out the pre-packaged reagent plate from the kit and invert several times to resuspend the magnetic beads evenly .
b) The pre-dispensing plate should be shaken lightly or quickly centrifuged before use to avoid reagent staining. Carefully tear off the aluminum foil sealing film to prevent liquid from spilling

1.3. Sample type :

Blood,animal tissue, environmental samples, saliva, nasal fluid,swabs , etc.

1.4. The composition of the kit (96T):

Composition	96 servings/box
Pre-packaged reagent plate	Reagent plate 1 (600μL lysate 1)
	Reagent plate 2 (800μL cleaning solution I)
	Reagent plate 3 (800μL washing solution II +10μL magnetic beads)
	Reagent plate 4 (100μL eluent)
Lysis solution 2	2×1.1mL
Magnetic rod sleeve	1

1.5. Operation Steps :

a) Add 200μL of sample to the 96-well position of reagent plate 1 (the sample should be equilibrated to room temperature and mix thoroughly), pipette and mix once, and add 20ul lysate 2 (lysate 2 should be fully mixed).

Note: Please run the program on the computer within 1h after sample addition .

b) Put the 4 reagent plates into the correct position of the machine , and insert the stirring sleeve .

c) Select the program DNA RNA and run it .

d) After the program runs , take out the stirring sleeve and discard it . Take out the reagent plate. The liquid in the reagent plate 4 is the obtained sample DNA RNA . If downstream tests cannot be performed in time , DNA samples can be stored at -20◦C, and RNA samples can be stored at -80◦C.

II. Experimental process and Attention

1. When using the instrument for the first time, be sure to open the door first, remove the cushion cotton , and then power on for the test .
2. Check whether the instrument and power supply are intact , and then turn on the power after confirming that they are intact ;
3. Place samples and reagents in the corresponding wells of the 96-well deep-well plate according to experimental requirements;
4. Put the 96-well deep-well plate into the experiment chamber, push the stirring sleeve into place , and carefully check whether it is in place . If it is not checked, it may cause instrument abnormalities and affect the experimental results;

Tip: The letters of the 96-well deep well plate are facing left .

Tip: The mixing sleeve has been pushed into place

5. Close the safety door of the experiment cabin, edit the settings or directly select the program file to be run , and press start ;
6. During the running of the program if there are no abnormalities or experimental needs, the experimenter should not open the actual

If the inspection safety door needs to be opened, please suspend the operation procedure;

7. After the normal operation of a program file is completed, the buzzer emits intermittent long beeps to indicate the end of the experiment .

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