Order: 010-59822688
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TIANGEN BIOTECH (BEIJING) CO., LTD

Version No: OS241210

TGuide S96 Automated Nucleic Acid Extractor

Cat. No.	Product name
YOSE-S96-01	TGuide S96 Automated Nucleic Acid Extractor (96-DW)
YOSE-S96-02	TGuide S96 Automated Nucleic Acid Extractor (96-MW)
YOSE-S96-03	TGuide S96 Automated Nucleic Acid Extractor (24-DW)

Important Notes

The following basic safety measures must be strictly observed during the operation, maintenance and repair of this instrument. If users 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, it will also destroy the safety standards of design and manufacture and the expected application range of the instrument. Our company will not assume any responsibility for all consequences caused by users not complying with the following requirements.

A Warning signs

Notes: The items contain particularly important information. Please read it carefully. If users do not pay attention to the prompts, it may cause damage or malfunction to the instrument.

Warning: The warning messages require users to be especially careful about a certain operation step or method. If users do not follow the requirements correctly, it may lead to serious personal injury.

Prompt: The prompt message requires users to proceed to the next step after confirming this step, otherwise the instrument will have unpredictable errors, resulting in damage or malfunction.

Prohibition: The experimenter is reminded not to follow this operation, otherwise it may cause damage or malfunction to the instrument.

Biochemical hazards: This sign reminds users to pay attention to the protection of biohazards and dangerous chemical substances.

Prevention of scald: This sign reminds users to pay attention to being scalded by the temperature control module of the experiment chamber.

Mechanical injury: This sign reminds users to pay attention to the potential personal injury caused by mechanical collision or rotation.

B Precautions

1) Instrument grounding

In order 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. It is a safety device.

2) Power supply

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

3) Power cord

The instrument should use the supplied power cord. If the power cord is damaged, it must be replaced instead of being repaired. It shall be replaced with a power cord of the same type and specification. Do not put anything on the power cord when the instrument is in use. Do not place the power cord where people move around. Hold the plug when plugging or unplugging the power cord and make sure that the plug is fully inserted into the socket when inserting the plug. Do not pull the power cord forcibly when unplugging the plug.

4) Placement of the instrument

The instrument shall be placed in a place with low humidity and less dust and far away from water sources (such as close to pools, water pipes, etc.), and the room shall be well ventilated and free from corrosive gas or strong magnetic field interference. Do not place the instrument in a damp or dusty place.

The openings on this instrument are designed for ventilation and heat dissipation. In order to avoid overheating, these holes for ventilation and heat dissipation must not be blocked or covered. When the instrument is running, the holes for ventilation and heat dissipation in front and back of the instrument and the nearest object shall not be less than 25cm. In addition, do not use the instrument on a soft surface, otherwise it will affect the ventilation and heat dissipation at the bottom of the instrument.

If the temperature is too high, it will affect the test performance of the instrument or cause malfunction. Do not use the instrument in direct sunlight, and keep away from heaters, stoves and other heat sources. When the instrument is not used for a long time, unplug the power plug and cover the instrument with a soft cloth or plastic bag to prevent dust from entering.

5) Under the following circumstances, immediately unplug the instrument from the power socket, and contact the supplier or ask qualified maintenance personnel to handle it:

※ The instrument gets wet due to rain or water;

※ It occurs unusual sound or smell when the instrument is working;

※ The instrument is fallen down or the shell is damaged;

※ The function of the instrument has changed obviously.

6) Do not disassemble the instrument without authorization

Operators are not allowed to open the instrument, replace components or perform in-machine debugging without the authorization of the manufacturer. If users need to open the instrument, it must be completed by professional maintenance personnel with the consent of the manufacturer, otherwise the manufacturer will not provide warranty.

7) Unpacking acceptance

After the instrument is unpacked, the items in the packing box shall be accepted according to the packing list. In case of damaged or missing items, please contact the supplier. After passing the acceptance, please fill in the relevant contents on the installation information feedback form and give it back to our company for documentation and warranty. After unpacking the instrument, please properly save the packaging materials for later use. Our company will not assume any responsibility for the damage of the instrument due to improper packaging on the way to the maintenance department.

Contents

I. Overview

1. Schematic diagram of instrument structure

1.1 Front

Figure 1. Instrument front

1.2 Touch operation panel

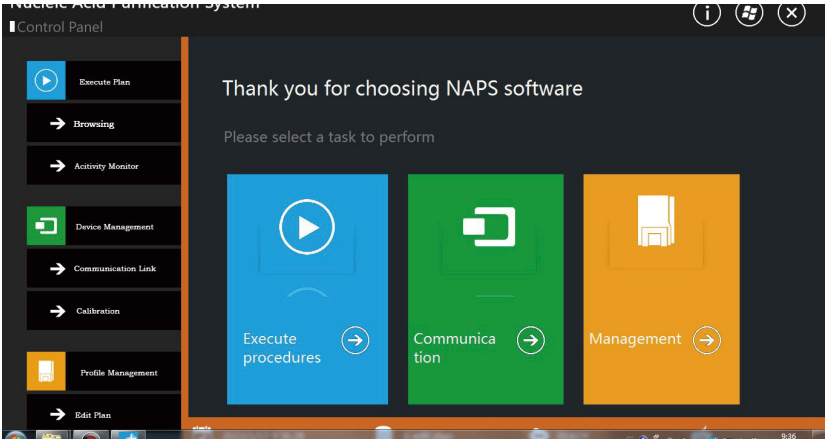

Figure 2. Touch operation panel

1.3 Switch

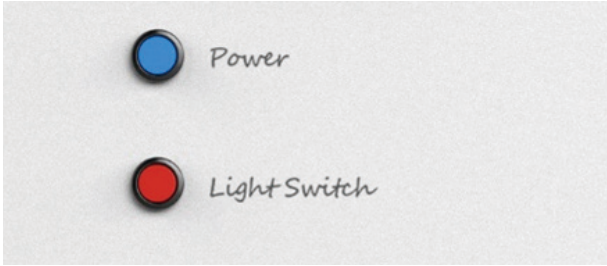

Figure 3. Instrument power switch

The power-on operation procedure of the instrument is as follows: press "Power" of the instrument. When the power button is lit, wait for the screen to light up and complete the initialization.

The power-off operation procedure of the instrument is as follows: click the Windows at the top right of the touch screen, return to the home page of the computer, click the power option menu, click the Light Switch in the menu, and the screen will be off. After the screen is off, press "Power", and the power off of the instrument power will be completed.

1.4 Experimental chamber

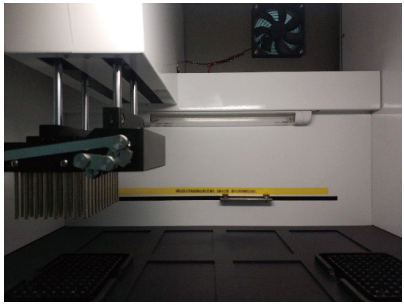

Figure 4. Instrument experimental cabin

2. Instrument features

- **Intuitive and friendly human-machine interaction interface:** Easy-to-use 10.1-inch color touch screen with Windows system;
- **Stable and reliable:** Four-dimensional integrated motion mode for smooth and precise operation;
- **Pollution control:** Strict control of inter-well contamination and batch-to-batch contamination through precision motion control, anti-liquid drip tray, disposable consumables and UV disinfection self-cleaning to eliminate cross-contamination;
- **Safe and reliable:** Automatic locking of the door to ensure operational safety, closed experimental chamber, disposable consumables, minimizing the contact between the operator and the reagents; Intelligent operation to avoid harmful substances on the human body.

II. Performance standards

1. Operating environment requirements

* Ambient temperature: 10℃-30℃;
* Relative humidity: ≤80%;
* Atmospheric pressure range: 86.0-106.0KPa;
* Power supply: AC 220±22V, 50±1Hz;
* Fuse protector: ϕ5×20, 10A, AC 250V;
* Keep away from heat source and strong magnetic field and maintain reliable grounding.

2. Various technical characteristics

Model	YOSE-S96-01	YOSE-S96-02	YOSE-S96-03
Processing volume	30~1000 μl	30~1000 μl	50~5000 μl
Sample throughput	96	96	24
Plate type	96-deep well plate	96-micro well plate	24-deep well plate
Magnetic rod	96	96	24
Temperature control	Heating plate position : ambient~80℃		
Interface mode	USB		
Operation interface	10.1-inch full-color LCD touch screen;		

3. Dimension and weight

Dimensions: 805 × 640 × 725 mm
Weight: 140 kg

III. Application scope

1. Principle

The instrument adopts magnetic separation technology, using the magnetic rod and the tip comb to move the magnetic beads with adsorbed nucleic acid into different reagent plates, and then using the tip comb to repeatedly and rapidly stir the liquid to fully mix the reaction liquid system. After sample lysis, nucleic acid adsorption, wash and elution, the separated and purified nucleic acid will be obtained.

The nucleic acid extraction and purification process consists of the following main steps:

Lysis: Add the sample to the lysis buffer and mix thoroughly to disrupt the external structure of the sample by lysis, so as to allow full release of the nucleic acid;

Adsorption: Add magnetic beads to the sample lysis buffer and mix thoroughly, so that the nucleic acids will be adsorbed to the specific encapsulated material on the surface of the beads;

Washing: The magnetic beads with bound nucleic acids are collected and transferred to wash buffer and washed repeatedly to remove impurities;

Elution: The magnetic beads are transferred to the elution buffer solution and mixed thoroughly, and together with the appropriate elution temperature, the nucleic acids are dissociated from the surface of the beads and solubilized into the elution buffer solution.

2. Scope of application

This instrument with TIANGEN different kinds of magnetic beads nucleic acid reagents can quickly complete DNA and RNA extraction of 1-96 samples, covering blood, saliva, tissue, cells, swabs, soil, feces and other sample types. It is widely used in conventional scientific research, genomics, inspection and quarantine, molecular diagnosis, forensics and other fields. This instrument can also be configured with 24-throughput module, which has good adaptability to large volume samples, and with TIANGEN integrated reagents, it can operate 1-24 samples at the same time. The maximum sample volume processed by the instrument is 5ml. It is especially suitable for the extraction of free nucleic acids in serum and plasma with high extraction rate and good purity, which can be used in tumor test, NIPT and other fields.

IV. Operating instructions of nucleic acid extractor

1. Main interface

After the instrument is powered on and completes the necessary self-test, it enters the main interface for user operation. As shown in Figure 5. The instrument operation interface is mainly composed of the following parts.

(1) Function menu on the left, see ① in Figure 5.

(2) Status bar at the bottom, see ②③④ in Figure 5. The status bar displays the current date and time of the system (②), the number of existing execution plans in the system (③), and the start button of the touch suspended keyboard (④).

(3) Central operator interface area, see ⑤ in Figure 5. The content in this area changes as the user selects different menu items and is the main human-machine interaction area of the instrument.

(4) Title bar at the top, see ⑥⑦⑧ in Figure 5. ⑥ is used to pop up the "About Dialog" displaying software version information, ⑦ is used to minimize the main interface window, and ⑧ is used to close the main interface window.

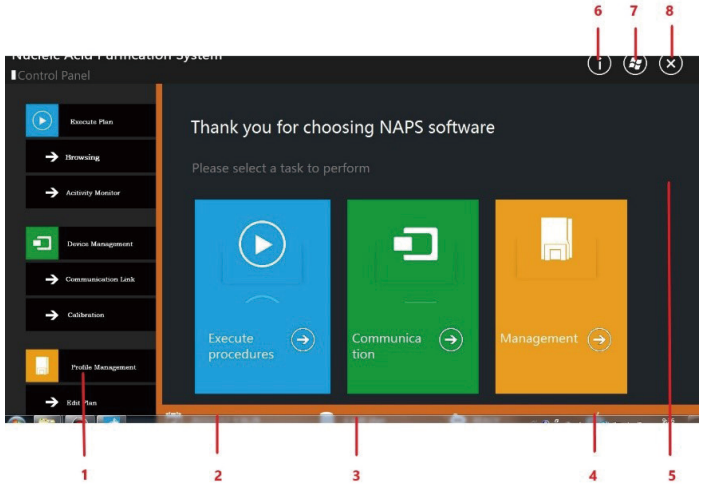

Figure 5. Main Interface of User Operation

2. Main functions of the main interface

The main interface of the instrument consists of 3 main functions, as shown below:

- **Viewing and operation monitoring of execution plan:** it mainly previews the stored execution plans in the system, and the monitoring of the execution status of the plans.
- **Instrument connection and commissioning:** it mainly detects the connectivity of the main module units of the instrument, indicates the current temperature of the temperature control unit, tests each moving part of the instrument, calibrates the position of the moving parts, and detects the function the UV disinfection light.
- **File management:** it mainly manages the stored execution plans in the system. Users can create, edit, modify, copy and delete execution plans through the main interface.

3. Running of the execution plan

3.1 Viewing of the execution plan

After clicking the "Browse and View" menu in the left function menu area of the main interface, the central operation interface area of the main interface presents the user with browsing and screening page of the execution plan, as shown in Figure 6.

① in Figure 6 shows the "Browse View" menu. Clicking the menu, the central operation interface area will pop up, see ④ in Figure 6. As illustrated in ② in Figure 6, each colored box represents a stored execution plan in the system, which indicates the name of the execution plan and descriptive information. There are four box colors, namely green, blue, red and purple, which represent different sample types targeted by the execution plan respectively. The corresponding relationship between the background colors of different execution plan boxes and sample types is shown in Table 1:

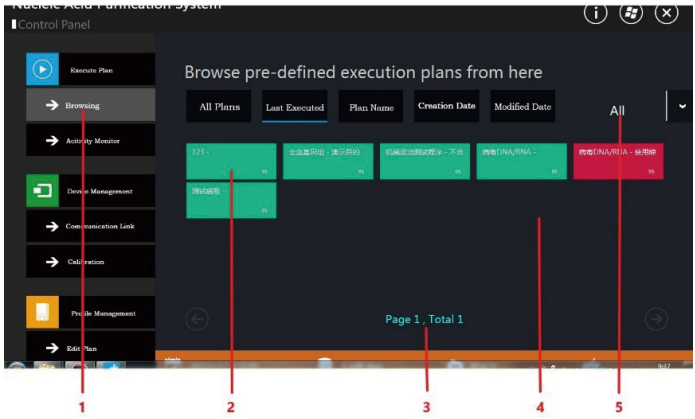

Figure 6. User Interface for Browsing Execution Plan

Table 1. Comparison Table between the Background Color of the Execution Plan Box and the Sample Type

Comparison Table between the Background Color of the Execution Plan Box and the Sample Type	
Background color of execution plan box	**Corresponding sample type**
Green	Universal execution plan for multiple sample types
Blue	The sample type is "whole blood"
Red	The sample type is "virus"
Purple	Other sample types except "whole blood" and "virus"

③ in Figure 6 represents the paging column. When numerous execution plans are stored in the system, the execution plans will be displayed in pages, with a maximum of 20 execution plans displayed on each page. Users can click the arrow "← →" in the paging column to browse by page.

⑤ in Figure 6 represents the sorting and screening column, which enables user to sort and screen the execution plans in the system and facilitate users to find specific execution plans. For example, the "Recent Execution" shown in ⑤ in Figure 6 indicates that user sorts the execution plans according to the recent operation.

Click any stored execution plan box in the central operation interface ④ to enter the detailed interface of the execution plan, as shown in Figure 7. ① in Figure 7 represents the content classification label of the execution plan. The information stored in an execution plan is divided into four categories, which are basic information, experimental cabin information, consumables information and experimental program. Click on each label, and the system will present corresponding information to users in ② in Figure 7. For example, Figure 7 displays the basic information of the execution plan, including name, description information, plan creator, creation, modification and recent running time of the plan, etc.

After confirming the required execution plan by browsing the detailed information, the user can click "Run" in ③ in Figure 7. If the user wants to continue browsing other execution plans, click the back button in ④ in Figure 7 to return to the sorting and filtering interface of execution plans.

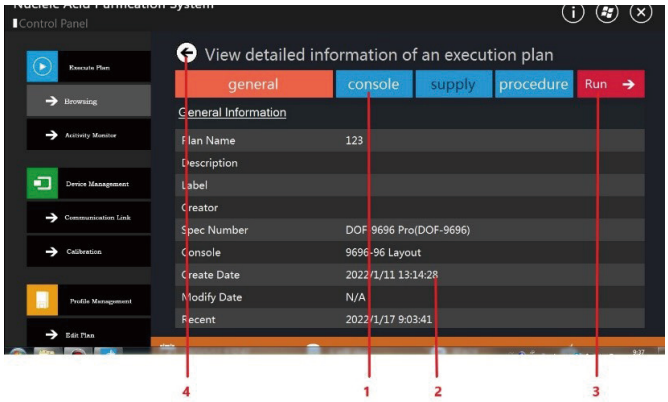

Figure 7. User Interface of Basic Information of Execution Plan

As shown in Figure 8, when the user clicks the experimental cabin label in the content classification label of the execution plan, the system will display the layout of the experiment cabin required for the execution plan. ① in Figure 8 represents the layout of the instrument experimental cabin required for the execution plan. ② in Figure 8 is the plate position setting of the experimental cabin, and each plate position can be placed with a deep well plate. For example, the work table shown in Figure 8 adopts the layout of two rows and four columns with a total of eight plate positions, which are represented by different colors. The red one indicates that the plate position can be temperature controlled, the light yellow plate position shows that no temperature control is provided, while the light blue plate position refers to the currently selected plate position by the user. As the user clicks to select a plate position, the line corresponding to the plate position in the list shown in ③ in Figure 8 will also be highlighted to indicate the work to be conducted at this plate position required by the user in execution plan.

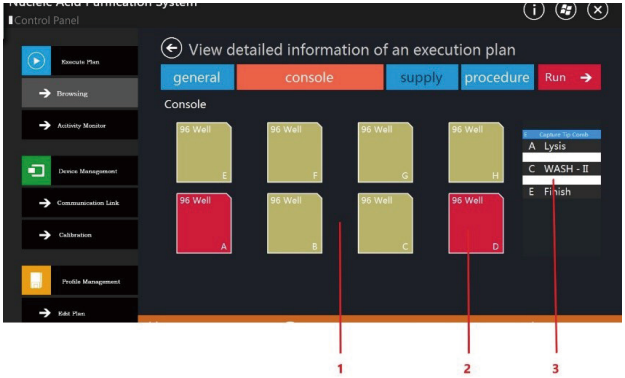

Figure 8. User Interface of Execution Plan Work Table Layout Information

As shown in Figure 9, the system will present the detailed experiment procedure of the plan on the condition that the user clicks the experiment program label in the content classification label of the execution plan. ① in Figure 9 indicates each execution phase of the execution plan, which is displayed in the form of a vertical list according to the order of execution. Each row in the list represents an execution stage. When the user clicks, the system shows the execution actions and its parameters in this stage. ② in Figure 9 represents the execution actions involved in the stage of grasping the tip comb, and ③ in Figure 9 represents the action parameters involved in the execution of the manipulator actions in the stage of grasping the tip comb.

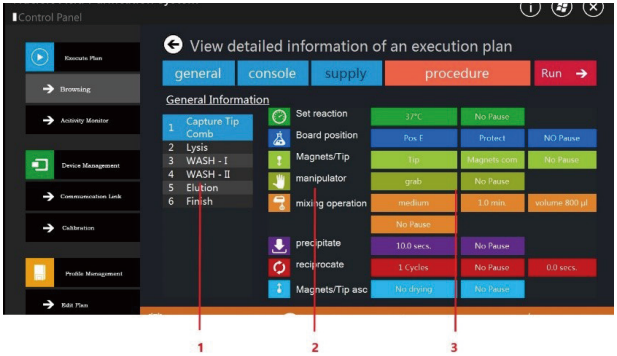

Figure 9. User Interface of Execution Plan Experiment Process Information

3.2 Running monitoring of the execution plan

As shown in Figure 10, after confirming the required execution plan by browsing the detailed information, the user can click the "Run" button, and the important operation area of the main interface will switch to the operation monitoring interface of the execution plan.

- ① in Figure 10 represents the name of the execution plan selected by the user to be run.
- ② in Figure 10 represents each execution phase of the execution plan, which is arranged from top to bottom on the basis of the order of execution.
- ③ in Figure 10 represents the working plate position of each execution phase.
- The area shown in ④ in Figure 10 displays the current running status and the results of each execution phase after planning to run. When an execution phase is finished, the system will display a small green icon in this area to indicate its success. When an error occurs in the operation of an execution stage, the system will display a small red icon and error information, and suspend the execution of the action sequence. The user can terminate the execution of the plan with errors. The icon of the execution status is shown in Table 2 below.
- ⑤ in Figure 10 represents the operation control button for executing the plan. There are three buttons from left to right, namely "Start Operation", "Pause Operation" and "Stop Operation". Start Operation starts or resumes the operation of the execution plan, Pause Operation indicates the instrument to temporarily stop the operation of the plan, and Stop Operation will terminate the execution of the plan. Before the user terminates the planned operation, the system will pop up a prompt dialog box to remind the user to confirm the termination operation. During the planned operation, the instrument will check the status of the safety door of the instrument at any time. If the safety door is accidentally opened, the instrument will suspend the planned operation. After the user closes the safety door correctly, click the Start Operation again to resume the planned operation.
- ⑥ in Figure 10 is the execution progress bar, which prompts the user with the completion progress of the current execution plan in the form of percentage.
- ⑦ in Figure 10 represents the UV disinfection control button. After clicking the button, the system pops up the UV disinfection control dialog box, which can be used by users to realize regular UV irradiation disinfection of the work table area before and after the experiment. When the execution plan is proceeded, the system prohibits users from UV disinfection. When UV disinfection is carried out, if the safety door is accidentally opened, UV disinfection is suspended to protect operators from radiation.
- ⑧ in Figure 10 represents the temperature indicator, which is used to display the current temperature value of the temperature control panel on the instrument console. Since TGuide S96 Nucleic Acid Extractor has two temperature control panels, the latter two temperature indicators are not used, and they always display 0□.
- ⑨ in Figure 10 represents the liquid anti-drip tray retreat button, which is used to control the tray to move to the corresponding plate position and avoid blocking the position when placing consumables.

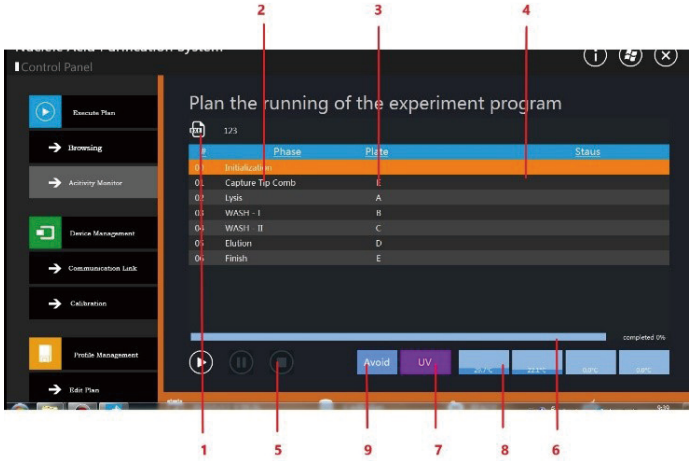

Figure 10. User Interface for Operation Monitoring of Execution Plan

Table 2. List of Icon Meaning for Operation Monitoring of Execution Plan

Icon Meaning for Operation Monitoring of Execution Plan	
Icon	**Meaning**
	An execution phase is completed without errors.
	An error occurred at runtime of an execution phase, and the associated error message is displayed.
	The instrument is performing the initialization action before the experiment begins.
	The instrument is executing the temperature control action and displaying the set target temperature value of the temperature control.
	The instrument is executing the movement of the board position and displaying the letter representation of the target board position.
	The instrument is executing the magnetic rod or tip comb descent and displaying information about the descent.
	The instrument is executing vibration mixing action and displaying the time progress information of vibration mixing.
	The instrument is executing the sedimentation action and displaying the time progress information of sedimentation.
	The instrument is executing magnetic reciprocation action and displaying relevant information of magnetic attraction sedimentation.
	The instrument is executing the magnetic rod or tip comb ascent and displaying information about the ascent.
	The instrument is executing the action of grabbing or releasing the tip comb and displaying relevant information.

4. Archive management

Archive management includes the management of execution plans.

> The software features in this section can only be used by users of NAPS Administrators or NAPS Researchers.

4.1 Management of execution plans

After clicking the "Edit Plan" menu item in the left function menu area of the main interface, the central operation interface area of the main interface presents the user with file management interface of the execution plan, as shown in Figure 11.

- ① in Figure 11 represents a list box of execution plans, and each row in the list box represents an execution plan stored in the system.
- ② in Figure 11 represents the sorting and screening setting area of the execution plan, and the user can sort and screen the execution plan displayed in the execution plan list box.
- ③ in Figure 11 represents an ascending or descending selection button for execution plan sorting.
- ④ in Figure 11 represents the command button of "Create". The editing page of creating execution plan will be presented after clicking the command button.
- ⑤ in Figure 11 represents the command button of "Modify". The editing page of modifying execution plan will be presented after clicking the command button.
- ⑥ in Figure 11 represents the command button shown of "Copy". Clicking the command button will automatically create a new execution plan and clone the contents of the currently selected execution plan in the execution plan list box.
- ⑦ in Figure 11 represents the command button "Delete". Clicking this command button will delete the currently selected execution plan in the execution plan list box. Before the deletion operation is executed, the system will pop up a deletion confirmation dialog box, and the selected execution plan will be deleted only after the user confirms the deletion.

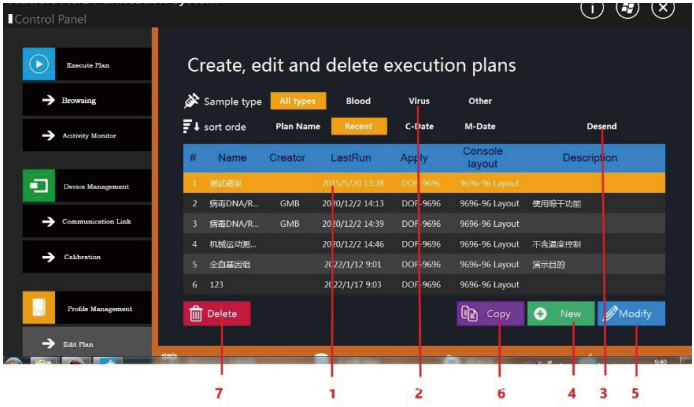

Figure 11. User Interface for Archive Management of Execution Plan

4.1.1 Create a new execution plan

Clicking the "Create" command button in archive management interface of execution plan, the central operation interface area of the main interface will present the execution plan editing interface for the user, as shown in Figure 12.

- ① in Figure 12 represents the button to abandon editing and return to the archive management interface of the execution plan. Clicking this button, the newly created execution plan will be canceled.
- ② in Figure 12 represents the content label bar of the execution plan. An execution plan consists of two aspects: basic information and experimental programs.
- ③ in Figure 12 represents the "Save" button of execution plan. After clicking this button, any modifications made by the user to the execution plan will be saved by the system.

4.1.2 Edit the execution plan

Select and click the execution plan to be edited in the list box of the execution plan, and click the "Edit" command button in the archive management interface of the execution plan. The central operation interface area of the main interface presents the execution plan editing interface for the user, which is exactly the same as the interface style and usage mode of creating a new execution plan. As shown in Figure 12.

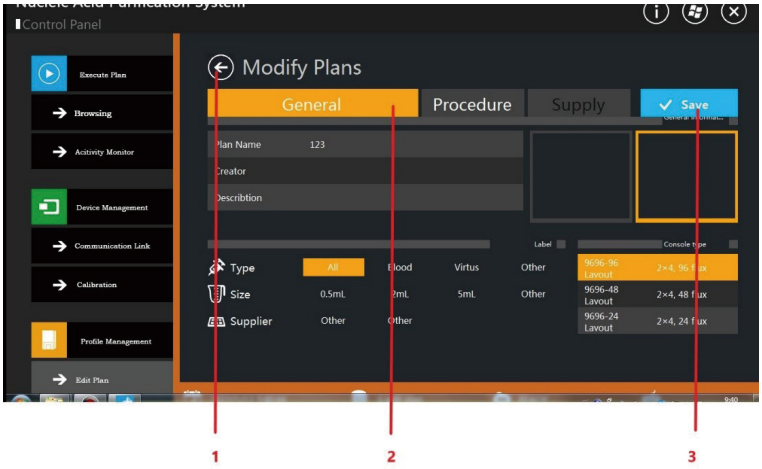

Figure 12. User Interface for Execution Plan Editing

4.1.3 Setting of basic information of execution plan

Click the "Basic Information" label in the execution plan editing interface to display the basic information of the execution plan, as shown in Figure 13. The basic information of the execution plan includes text information, instrument category information, laboratory cabin layout information and label information.

- ① in Figure 13 represents the text information of the basic information of the execution plan. The text information includes "Plan Name", "Creator" and "Description Information". In the text information, the plan name is mandatory, and the rest of the text information is optional.
- ② in Figure 13 represents the label information of the execution plan, which is optional. If users do not set the label information, the execution plan will not be affected.
- ③ in Figure 13 represents the instrument category of the execution plan, which can be set by default without modification.

In order to realize touch-based text input, before inputting text information, the user can click the suspended keyboard button in the status bar of the main interface.

When setting the instrument category shown in ③ in Figure 13, the experimental process information saved before the execution plan will be cleared. Therefore, before changing these two information, the system will pop up a confirmation dialog box for the user to confirm. As a result, when editing an execution plan, set these two types of information first, and consider carefully before making changes.

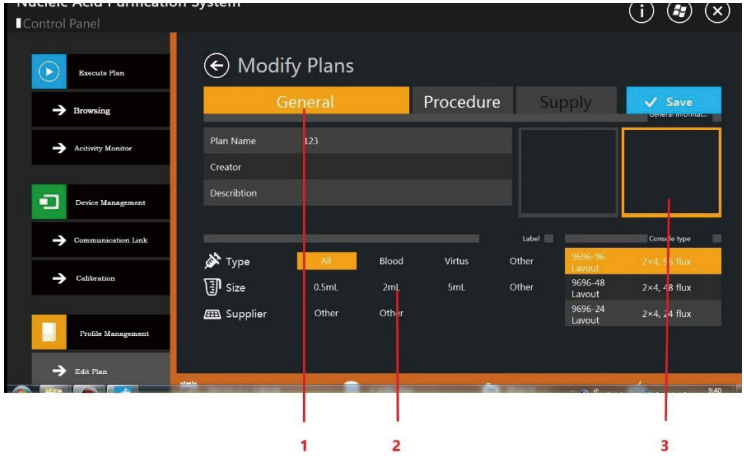

Figure 13. User Interface of Editing Basic Information of Execution Plan

4.1.4 Setting of the experimental process of execution plan

Click the "Experimental Program" label in the execution plan editing interface. The system will present the experimental process editor of the execution plan, as shown in Figure 14. The experimental process editor of the execution plan consists three areas: the execution phase editing area, the main action selection area (Actions) and the action parameter setting area, as shown in ①, ② and ③ in Figure 14. The main functions of these three areas are shown in the Table 3 below:

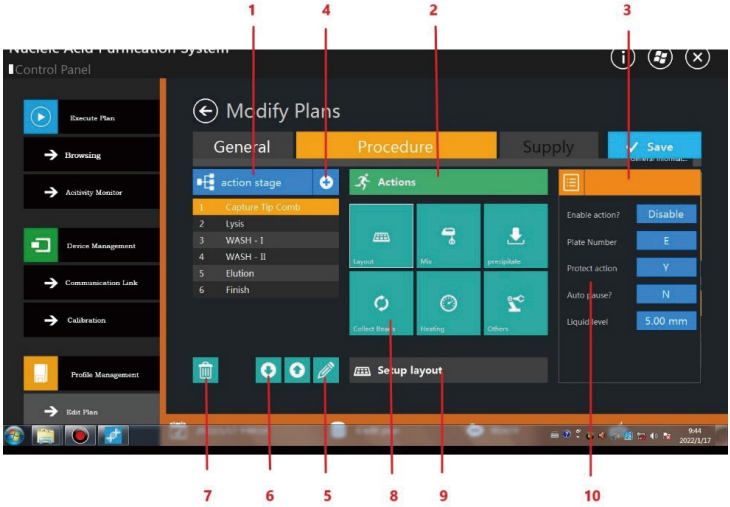

Figure 14. User Interface of Execution Plan Experiment Process Editor

Table 3. Division Definition Table of Experimental Process Editor

Editor partition and its usage of experimental flow			
Editor partition	**Main functions of partition**	**Interface elements in region**	**Function of the operating elements**
Action stage	The experimental process of an execution plan consists several execution phase, and the main function of this partition is to provide users with editing functions (addition, deletion and modification) in the execution phase. The execution phase partition consists a vertical list of execution phases and several action buttons.	As shown in ④ in the figure	When adding a new execution phase, there are 9 kinds of execution phases supported by the system, which are: ● Capture Tip comb; ● Lysis; ● Collect Beads; ● Bind; ● WASH-I; ● WASH-II; ● WASH-III; ● Elution; ● Finish.

		 As shown in ⑤ in the figure	Modify the currently selected phase.
		 As shown in ⑥ in the figure	Move the currently selected phase up or down.
		 As shown in ⑦ in the figure	Delete the currently selected phases from the experimental procedure.
 Actions	An execution phase contains many main actions, and the main function of this division is to offer users a method to define the main actions in the phase. Different actions can be contained in each execution phase. Actions needed can be flexibly disposed in accordance with users' needs.	 As shown in ⑧ in the figure	Plate movement is always valid in any user-defined execution phase.
		 As shown in ⑧ in the figure	Vibration blending action defines the vibration blending operation of the instrument to the sample. The user can set whether to enable this action in an execution phase as required. ●Green indicates that the action is enabled. ●Gray indicates that the action is not enabled.
		 As shown in ⑧ in the figure	Precipitation action defines the sample sedimentation operation of the instrument. ●Green indicates that the action is enabled. ●Gray indicates that the action is not enabled.
		 As shown in ⑧ in the figure	Magnetic reciprocation action defines the magnetic absorption of the instrument to the sample. ●Green indicates that the action is enabled. ●Gray indicates that the action is not enabled.
		 As shown in ⑧ in the figure	Temperature control action defines the temperature control instruction of the temperature control board on the instrument. ●Green indicates that the action is enabled. ●Gray indicates that the action is not enabled.
		 As shown in ⑧ in the figure	Miscellaneous, this action is always valid in any user-defined execution phase.
		As shown in ⑨ in the figure	The main action selected by the user is displayed, and the parameter of the selected action will be displayed in the action parameter editing area for editing and setting.
 Parameter	The characters of action are determined by a set of specific action parameters, which can be set by the user through the parameter buttons in the parameter setting area.	The setting is shown in blue buttons in ⑩ in the figure.	Users can revise the parameters by clicking on the specific action parameter button.

The routine use of the experimental process editor is in the following:

1) Firstly, each execution phase of experiment procedure of execution plan is defined by   in the execution phase editing area.

2) Select a specific phase in the phase editing area.

3) In the main action selection area, select the main action in the phase, click the corresponding action button  according to the needs of the execution phase. If a certain action needs to be included in the selected execution phase, click the action button, and click the blue "Enable Action" button in the action parameter setting area to enable this action.

4) Main action parameters of each enabled action are set in the action parameter setting area.

5) Steps 2) to 4) shall be repeated until the action setting of each execution phase is completed.

4.1.5 Setting of the action parameters of the plate

There are 5 action parameters of plate, as shown in Table 4.

Table 4. Plate Action Parameter Table

Setting of the Action Parameters of the Plate	
Action parameters	**Parameter meaning**
Enable action?	Whether this action is enabled, or the action of plate is always enabled and the user doesn't need to set.
Plate number	The plate moves to the target position. ●The position coordinates have 8 plate positions, ranges from {A, B, C, D, E, F, G, H}.
Protect action	Guard board protection. Whether the guard board device of the instrument provides protection against dripping when the guard board is moving. ●No: The guard board does not provide protection against dripping ●Yes: The guard board provides protection against dripping
Auto pause?	Automatic pause. Whether the execution of the action sequence is automatically paused after the action is executed. ●No: Un-pause ●Yes: Automatic pause
Liquid level	Raising heights during magnetic attraction. The value range is 0 to 50mm.

4.1.6 Setting of the action parameters of vibration mixing

There are 6 vibration blending action parameters, as shown in Table 5.

Table 5. Mix Action Parameter Table

Setting of the Action Parameters of Vibration Mixing	
Action parameters	**Parameter meaning**
Enable action?	Whether to enable the action. Click the parameter button to enable the action, and the action button will display "Enable". Click the parameter button again to disable the action, and the action button will display.
Volume	Liquid volume at plate position, with μ as the unit
Mix speed	Velocity/frequency of vibration mixing. There are 10 adjustable speed levels that indicate the frequency of mixing and the speed of vibration, as follows: 1) extreme slow: the slowest speed 2) very slow: extremely slow speed 3) slow: low speed 4) medium slow: slow-medium speed 5) medium: medium speed 6) medium fast: medium-fast speed 7) fast: quick 8) very fast: extremely fast 9) ultra fast: superfast 10) extreme fast: the fastest speed
Mix time	The time of mixing is ranging from 0.2min to 60min.
Auto pause?	Automatic pause. Whether the execution of the action sequence is automatically paused after the action is executed. ● No: Un-pause ● Yes: Automatic pause
Advanced mode	Advanced mode setting. Whether to enable this mode. Click the parameter button to enable the advanced mode settings. Under this mode, the blending can be set in three phases. If the setting parameters are not saved in each phase, the mode won't be started.

4.1.7 Setting of the action parameters of sedimentation

There are 6 action parameters of precipitation, as shown in Table 6.

Table 6. Precipitation Action Parameter Table

Setting of the Action of Precipitation of Sedimentation	
Action parameters	**Parameter meaning**
Enable action?	Whether to enable the action. Click the parameter button to enable the action, and the action button will display "Enabled". Click the parameter button again to disable the action, and the action button will display "Disable".
Settling time	Indicate the time of precipitation, ranging from 0 to 3,600 sec.
Post mix times	Indicate the mixing times before precipitation, ranging from 0 to 9,999 times.
Amplitude	Indicate the mixing amplitude before precipitation, ranging from 0-30mm.
Post mix speed	Indicate the mixing frequency and vibration speed before precipitation, ranging from 0 to 200
Auto pause?	Automatic pause. Whether the execution of the action sequence is automatically paused after the action is executed. ●No: Un-pause ●Yes: Automatic pause

4.1.8 Setting of the action parameters of magnetic bead collection

There are 5 magnetic bead collection action parameters, as shown in Table 7.

Table 7. Action Parameter Table of collect beads

Action parameter setting of collect beads	
Action parameters	**Parameter meaning**
Enable action?	Whether to enable the action. Click the parameter button to enable the action, and the action button will display "Enabled". Click the parameter button again to disable the action, and the action button will display "Disable".
Repeat times	Indicate the number of magnetic reciprocations. The value ranges from 0 to 5 times.
Auto pause?	Automatic pause. Whether the execution of the action sequence is automatically paused after the action is executed. ●No: Un-pause ●Yes: Automatic pause
Duration	Indicate the time interval between each magnetic reciprocation, ranging from 0 to 60 sec.
Run speed	Indicate the running speed of the magnetic rod when collecting the magnetic beads, ranging from 0.1 to 10.

4.1.9 Setting of the action parameters of temperature control

TGuide S96 automated nucleic acid extractor have 4 temperature control action parameters, as shown in Table 8.

Table 8. Action Parameter Table of Temperature Control

Setting of the Action Parameters of Sedimentation	
Action parameters	**Parameter meaning**
Enable action?	Whether to enable the action. Click the parameter button to enable the action, and the action button will display "Enabled". Click the parameter button again to disable the action, and the action button will display "Disable".
Temperature	The specific temperature value ranges from 4°C to 80°C.
Control #01?	Indicate whether to turn on the temperature controller 01 and set its temperature control target as a parameter. Temperature value defined by Temperature. The temperature controller 01 is located at plate A of nucleic acid extractor. ●No: Disable ●Yes: Enable
Control #02?	Indicate whether to turn on the temperature controller 02 and set its temperature control target as a parameter Temperature value defined by Temperature. The temperature controller 02 is located at plate D of nucleic acid extractor. ●No: Disable ●Yes: Enable

	It is not suggested to turn on two temperature controllers at the same time due to the characteristics of the instrument. The experimental process of nucleic acid extraction and purification doesn't need two temperature controllers at the same time.

4.1.10 Setting of the miscellaneous action parameters

4 miscellaneous action parameters are included, as shown in Table 9 below.

Table 9. Miscellaneous Action Parameter Table

Action parameter setting of magnetic reciprocation	
Action parameters	**Parameter meaning**
Only drop Tip	Indicate the instrument to lower the magnetic sleeve mechanism only or lower the magnetic needle/magnetic sleeve mechanism at the same time. ●Yes: Only lower the magnetic sleeve mechanism to the specified height ●No: Lower the magnetic needle/magnetic sleeve mechanism to the specified height at the same time.
Magnet lifting	Indicate whether the instrument performs separation operation after the magnetic needle and magnetic sleeve are lowered. ●No: No separation. The magnetic sleeve is set in the magnetic sleeve pipe. ●Yes: The magnetic needle is lowered and separated from the magnetic sleeve pipe.
Dry Time	Indicate the magnetic needle and magnetic rod sleeve of the instrument to pause the time, ranging from 0 to 600 sec.
Grab action?	Indicate whether the instrument grabs or releases the tip comb at the current plate position. ●N/A: No action ●Grab: Grab the tip comb ●Release: Release the tip comb

5. Instrument connection and commissioning

The connection and commissioning of the instrument include the connectivity test of the main modules of the instrument, the effectiveness test of the main moving parts of the instrument, the current temperature indication of the temperature control unit, the position calibration of the moving parts, and the function detection of UV disinfection light.

Warning: The contents covered in this chapter and the corresponding software functions involve the detection and commissioning of the instrument. During the commissioning, the operator shall not place any part of his/her body inside the instrument test cabin to avoid accidental injury.

Warning: When testing the function of the UV lamp, the operator must ensure that the safety door of the instrument is properly closed and keep a safe distance to avoid radiation.

Notes: When using the functions involved in this chapter, the operator shall operate in strict accordance with the steps specified in the operation manual, and pay special attention to the operation manual, software interface and the alarming/warning information noted/marked/pasted on the instrument, so as to avoid irreparable damage to the instrument due to improper operation.

5.1 Instrument connection test

In the function menu area on the left of the main interface, click the "Communication Link" menu item, and the central operation interface area of the main interface presents the instrument connection test interface to the user, as shown in Figure 15. The instrument connection test interface provides operators with connectivity tests of three module units: instrument motion control module, temperature control module and BLDC module. In addition, the equipment connection test interface also provides operators with functional tests of UV disinfection light, aerosol removal fan, manipulator and safety door status. As for whether each control module is working normally and whether the connection is successful, the corresponding area will provide the basis for judgment for the operator in the form of graphics and text information. For the specific meaning of the connection graphics, please refer to Table 10.

① in Figure 15 is the command button of "Module Scanning and Detection". When the operator finds that there is a problem with module connection, click the command button and the instrument will re-perform module scanning and re-test the connectivity of each module.

If the user fails to connect to the module repeatedly during use, please turn off the power of the instrument and wait for a while.

Restart the instrument. If the problem persists, please temporarily stop using the instrument and contact the product after-sales and maintenance personnel.

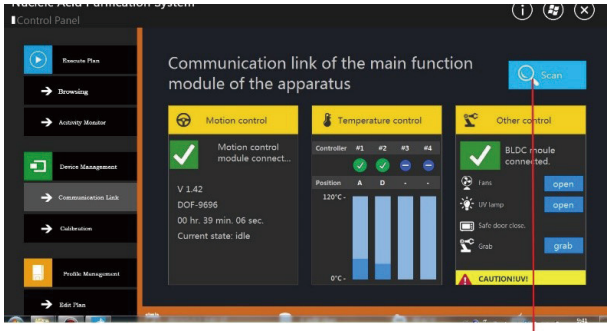

Figure 15. User Interface of Instrument Connection Test

Table 10. Module Connection Illustration

Module Connection Illustration	
Module connection test diagram	**Meaning of the illustration**
	The module is being tested, please wait...
	The motion control module/BLDC module is successfully connected.
	The motion control module/BLDC module is failing to be connected.
	The temperature control module is successfully connected.
	The temperature control module is failing to be connected.
	The temperature control module is not applicable to the current instrument. TGuide S96 automated nucleic acid extractor is only equipped with two temperature control parts, so #03 and #04 will show inapplicable icons after scanning, which is normal and not the instrument malfunction.

5.2 Functional test of moving parts of the instrument

The instrument connection test interface provides operators with functional test of the status of UV disinfection light, aerosol removal fan, manipulator and safety door. The meaning of the operable interface elements in the functional testing area and the specific test methods are shown in Table 11.

Warning: When testing the function of the UV lamp, the operator must ensure that the safety door of the instrument is properly closed and keep a safe distance to avoid radiation.

Warning: When the operator is testing the function of the manipulator, the operator shall not place any part of the body inside the test chamber of the instrument, and shall not touch the manipulator of the instrument with his/her hands to avoid mechanical pinching.

Table 11: Moving Parts of Functional Testing Item Description

Functional Test of Moving Parts of the Instrument	
Functional test item	**Test purpose and test method**
 Aerosol removal fan	Test the applicability of the aerosol removal fan set. Test method: When the user clicks the blue button on this function item, the aerosol removal fan is on, the button text changes to "Off"; The user clicks the blue button again, and the aerosol removal fan is off, and the button text changes to "On".
 UV disinfection light	Test the applicability of the UV disinfection light. Test method: First, the user properly closes the safety door of the instrument. When the user clicks the blue button on this function item, the UV disinfection light is on, the button text changes to "Off"; The user clicks the blue button again, and the UV disinfection light is off, and the button text changes to "On".
 The safety door has been closed.	Indicate the current status of the safety door of the instrument in the form of a text prompt message. Test method: When the user opens the safety door, the text information verifying this function item changes to: "The safety door has been opened." When the user closes the safety door, the text information verifying this function item changes to: "The safety door has been closed."
 Manipulator	Test the applicability of the manipulator of the instrument. Test method: When the user clicks the blue button on this function item, the manipulator shrinks to execute the grasping action, and the button text changes to "Grasp". The user clicks the blue button again, the manipulator opens and performs a release action, and the button text changes to "Release".

5.3 Position calibration of moving parts of the instrument

> Warning: The contents covered in this chapter and the corresponding software functions involve the detection and commissioning of the instrument. During the commissioning, the operator shall not place any part of his/her body inside the instrument test cabin to avoid accidental injury.

> The software features in this section can only be used by users of NAPS Administrators or NAPS Researchers.

After clicking the "Calibration Test" menu item in the left function menu area of the main interface, the central operation interface area of the main interface presents the user with the running part position calibration interface, as shown in Figure 16.

- ① in Figure 16 represents the "Replace Magnetic Rod" command button, through which users can install/replace magnetic rod attachments of different specifications for the instrument.
- ② in Figure 16 represents the command button of "Safely Releasing the Tip Comb". The function of this command button is to control the manipulator to safely release the tip comb to the plate position specified by the user, so as to reduce the risk of pollution caused by the user taking the tip comb directly by hand.
- ③ in Figure 16 represents the interactive area of "Plate Layout", where the system displays the plate position layout of the work table of the experimental cabin in a visual way, and each plate position can interact with the user by clicking. The plate layout will be displayed only after the initialization of the instrument motion mechanism.
- ④ in Figure 16 represents the vibration and mixing test area, through which users can test the influence of different amplitudes and vibration frequencies on samples.
- ⑤ in Figure 16 represents the position calibration control area. The 9 calibration control buttons in this area are used in conjunction with the plate layout interaction area shown in ③ to facilitate the user to realize the position positioning and calibration of moving parts at each plate position of the work table. Table 12 shows the functions of the 9 calibration control buttons.

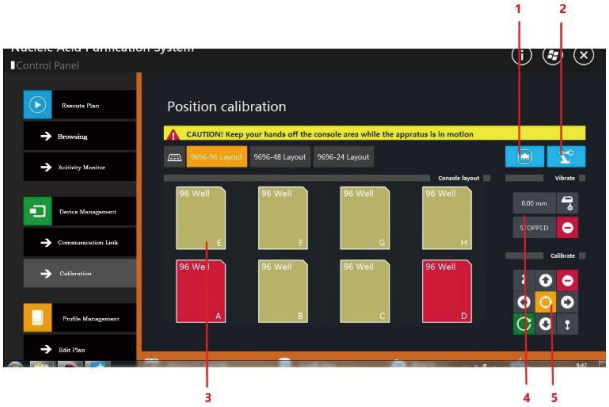

Figure 16: Calibration of Moving Parts/User Interface Commissioning

Table 12: Functional Description of Position Calibration Buttons

Functional Description of Position Calibration Control Buttons	
Control button	**Function**
	Initialization of the motion mechanism of the instrument
	Clearing of the position error calibration value of the current plate position, and setting the position error of the current plate position as (0,0).
	Based on the setting value of the center position of the current plate position, move a tiny distance of 0.1mm to the left or right, and set the tiny distance as the position error calibration of the current plate position. The maximum cumulative movement scope of the tiny movement is ±5.0mm, and the system would save automatically according to the user's operation.
	Based on the setting value of the center position of the current plate position, move a tiny distance of 0.1mm to the front or back, and set the tiny distance as the position error calibration of the current plate position. The maximum cumulative movement scope of the tiny movement is ±5.0mm, and the system would save automatically according to the user's operation.
	Lift the tip comb movement mechanism to the upper limit of the tip comb movement mechanism. There are two lifting points: rising from the lower limit position of the tip comb to the suspending position on the upper surface of the microwell plate; rising from the upper surface of the upper surface of the microwell plate to the upper limit position of the tip comb movement.
	Lower the tip comb movement mechanism to the lower limit of the tip comb movement mechanism. There are two lowering points: lowering from the upper limit position of the tip comb movement to the suspending position on the upper surface of the microwell plate; lowering from the upper surface of the upper surface of the microwell plate to the lower limit position of the tip comb movement.
	Cease the movement of the mechanism. When the user would like to cease the movement of the instrument mechanism anytime, click the control button.

5.4 Routine operation procedure of position calibration

Warning: The contents covered in this chapter and the corresponding software functions involve the detection and commissioning of the instrument. During the commissioning, the operator shall not place any part of his/her body inside the instrument test cabin to avoid accidental injury.

1) After clicking the "Calibration and Commissioning" menu item in the function menu area on the left side of the main interface, the central operation interface area of the main interface would present the position calibration interface of the running parts for the user.

2) Click the mechanism initialization button ( ) of instrument movement in the calibration control button, and wait for the completion of the initialization.

3) After completing the initialization, the position calibration interface presents the layout interaction area of the work table for the user, as shown in the figure below. In the layout interaction area of the work table, the red plate represents the temperature control plate, the light yellow plate represents the non-temperature control plate, and the light blue plate represents the plate selected by the user. Click the plate position that is to be calibrated.

4) Wait for the mechanism to move above the calibration plate position selected by the user.

5) The user clicks the lowering button ( ) in the calibration control button, so that the tip comb mechanism descends to the suspending height of the upper surface of the microwell plate.

6) The user observes the position difference between the tip comb and the plate through visual measurement, and clicks the left, right, front and back micro-step adjustment buttons ( ) in the calibration control button according to the visual measurement result, so that the tip comb can be located in the center of the plate as much as possible. If the user is dissatisfied with the results of fine tuning, please click the deleting button ( ) in the calibration control button to eliminate the previous calibration value and recalibrate.

7) When the user judges that the position calibration has met the positioning accuracy through visual observation, click another plate position to be calibrated and repeat steps 4) to 6) until the calibration of all plate positions is completed.

Plate position calibration is a relatively complicated procedure. After calibrating every plate position, it is needless to recalibrate for some time. When operating the routine execution plan, the instrument will automatically move the plate position of the movement mechanism according to the plate position calibration instruction set by the user.

5.5 Operation procedure of replacing magnetic needle

1) After clicking the "Calibration and Commissioning" menu item in the function menu area on the left side of the main interface, the central operation interface area of the main interface would present the position calibration interface of the running parts for the user.

2) Click the mechanism initialization button ( ) of instrument movement in the calibration control button, and wait for the completion of the initialization.

3) After finishing the initialization, the position calibration interface would present the layout interaction area of the work table for the user. Click the board position to be replaced with the magnetic needle in the layout interactive area of the work table.

4) Wait for the mechanism to move above the plate position selected by the user.

5) The user clicks on the "Replace Magnetic Needle" command button ( ) on the position calibration interface. At this moment, the instrument will lower the magnetic needle/tip comb mechanism to the lower limit position in the current plate position.

6) When the mechanism stops, the icon of the command button of "Replace Magnetic Needle" changes to " ".

7) At this moment, the user can disassemble or assemble the magnetic needle attachment.

8) After finishing the magnetic needle replacement, the user clicks on the "Replace Magnetic Needle" command button ( ) again, and the instrument rises the magnetic needle and tip comb mechanism to the upper limit position again. The "Replace Magnetic Needle" command button is reset to " ", and the magnetic needle replacement is finished.

Warning: When the operator replaces the magnetic needle, please make sure that no one clicks any operation elements on the main interface to avoid mechanical collision injury caused by mis-operation.

5.6 Operation procedure of releasing magnetic rod sleeve safely

1) After clicking the "Calibration and Commissioning" menu item in the function menu area on the left side of the main interface, the central operation interface area of the main interface would present the position calibration interface of the running parts for the user.
2) Click the mechanism initialization button () of instrument movement in the calibration control button, and wait for the completion of the initialization.
3) After finishing the initialization, the position calibration interface would present the layout interaction area of the work table for the user. Click the board position to safely release the tip comb in the layout interactive area of the work table.
4) Wait for the mechanism to move above the plate position selected by the user.
5) The user clicks the "Safely Release of Tip Comb" command button () which is on the position calibration interface. At this moment, in the current plate position, the instrument would lower the tip comb mechanism to the lower limit position, and orders the manipulator of the instrument to open and release the tip comb.
6) The user clicks the rise button () in the calibration control button, which can have the tip comb mechanism rise to the upper limit position.
7) The user wearing the safety gloves opens the safety door and then takes away the released tip comb.

Warning: Before the release of the tip comb, the operator shall not put any part of the body inside the experimental cabin, or touch the manipulator of the instrument with hand to prevent mechanical pinch injury.

5.7 Operation procedure of vibration and mixing test

Warning: The contents covered in this chapter and the corresponding software functions involve the detection and commissioning of the instrument. During the commissioning, the operator shall not place any part of his/her body inside the instrument test cabin to avoid accidental injury.

1) After clicking the "Calibration and Commissioning" menu item in the function menu area on the left side of the main interface, the central operation interface area of the main interface would present the position calibration interface of the running parts for the user.
2) Click the mechanism initialization button () of instrument movement in the calibration control button, and wait for the completion of the initialization.
3) After finishing the initialization, the position calibration interface would present the layout interaction area of the work table for the user. Click the board position to carry out the vibration and mixing test in the layout interactive area of the work table.
4) Click the vibration amplitude setting button in the vibration and mixing test area to set the amplitude of vibration.
5) Click the vibration frequency setting button in the vibration and mixing test area to set the vibration frequency.
6) Click the starting button () in the vibration and mixing test area, and the instrument would lower the magnetic sleeve mechanism to the lower limit position of the current selected plate position, and it starts vibrating in accordance with the amplitude and frequency set by the user.
7) In the process of vibration, the user can adjust and alter the amplitude and frequency setting values through the vibration amplitude and vibration frequency setting button.
8) If the user would like to cease the vibration test, click the stop vibration button () in the vibration and mixing test area, and the instrument will stop vibrating and lift the magnetic sleeve mechanism to suspend.

V. Experimental operation guideline

	Notes: When using the instrument for the first time, please be sure to open the door firstly, and check the mode type of magnetic needle and corresponding heating bottom block to make sure that it is required by the experiment, and then electrify it for the test.
	Notes: During the experiment, there will be a small amount of aerosol volatilization in the instrument experimental cabin. The experimental personnel and operators must take necessary protective measures. The experimental personnel shall wear work clothes, isolation clothes, rubber shoes, masks, gloves and work hats when necessary. If possible, they can wear goggles.
	Notes: Disposable consumables, reagent and sample residues, disposable protective gloves, or masks, which are used in the experiment, shall be properly treated in accordance with the operating procedures of biochemical laboratory. Laboratory waste shall be classified for post-treatment and put into non-biohazard or biohazard waste bags respectively. Qualified disposable consumables shall be conducted with bio-safety disposal after using.
	The notch of 96-deep well plate is faced inward and placed in place. The magnetic tip comb has been put into the specified position. If it is not checked, it may cause instrument abnormalities and affect the experimental results.

1) Check whether the instrument and power supply are intact, and then power on after confirming that they are intact.
2) Place samples and reagents in the corresponding plates of 96-deep well plates according to the experimental requirements.
3) Put the 96-deep well plate in the experiment chamber, with the notch of 96-deep well plate is faced inward and placed in place. Put the magnetic needle sleeve into the specified initial position and check it carefully.
4) Close the cabin door, edit the settings or directly select the program file to run, and press the start key to run.
5) During the program running, if there is no abnormality, the experimenter shall not open the cabin door.
6) After the normal operation of a program file is completed, the buzzer gives three prompt tone indicating the end of the experiment.

VI. Maintenance of the instrument

1) Please carefully check the manual before using the instrument.
2) At the end of the experiment, clean the experimental cabin with 75% ethanol and turn on the UV lamp for more than 30 minutes to disinfect.
3) Regularly clean the surface of the instrument and the test cabin, and avoid the use of strong alkali, neutral spirits and solvent solutions;
4) When using the instrument, please ensure ventilation around the instrument.
5) When the voltage is unstable, too high or too low, do not use the instrument.
6) Keep the environment in the lab dry and free from water stains.

VII. Transportation and installation

1) This product is packaged in an aluminum alloy box when shipped from the factory, accompanied by a full set of random documents, manuals, and certificates.
2) The packaged products shall be stored in a well ventilated room with a relative humidity of no more than 80% and no corrosive gas;
3) The packaged products can be transported by general transportation, but it should be protected from severe impact and vibration during transportation, and measures should be taken to prevent moisture and rain.
4) Please check the integrity of the outer package of the instrument before unpacking. If there are defects, collision or water immersion marks, please contact the transportation department or our company.
5) Open the outer package, take out the host carefully, and check the products and their accessories according to the packing list. If there is any discrepancy, please contact with our company timely.
6) If the instrument needs to be transported, please fix the magnetic rod sleeve rack and the magnetic tip comb rack at first. The instrument shall be handled by four people with the way that one corner of the instrument shall be lifted by each person. The instrument shall be handled carefully to avoid collision.

VIII. Precautions

1. Installation and use environment


Prohibition: Do not use in the presence or possible presence of flammable and explosive gas.


Warning: Do not place the instrument on the cushion to prevent the base from falling into the cushion and blocking the lower vent.


Warning: The instrument shall be placed in a place with low humidity and less dust and far away from water sources (such as close to pools, water pipes, etc.), and the room shall be well ventilated and free from corrosive gas or strong magnetic field interference. Do not use the instrument in direct sunlight, and keep away from heaters, stoves and other heat sources.

2. Power supply


Warning: Please carefully check whether the power connection is firm. Be sure to hold the plug when plugging in and out the power cord. Ensure that the plug is fully inserted into the socket when inserting the plug. Do not pull the power cord hard when pulling out the plug.


Prohibition: If there is any leakage of electricity, please cut off the power supply immediately and stop using it.


Warning: Do not touch the power plug and switch with wet hands.


Warning: Before moving the instrument, please cut off the power first, and then fix the magnetic rod sleeve rack with foam.


Warning: Please make sure that the power cord does not pass through the heater and other high-temperature objects.


Warning: When the product is not used for a long time, please unplug the plug and cover the instrument with a soft cloth or plastic bag to prevent dust from entering.

3. Keep away from live circuits

Warning: Personnel other than from the company are not allowed to open the instrument, replace components or adjust in the instrument without authorization. It must be operated by professional maintenance personnel after being approved by our company. Do not replace components when the power cord is connected.

4. Instrument operation

Warning: Do not drop or damage the instrument and please handle it carefully.

Notes: Operators of the instrument should take protective measures, wear masks and gloves, etc.

Notes: If the system does not work properly, please cut off the power supply and restart the system.

5. Attachment

Notes: The complimentary power cord is a standard product and can be replaced by the user.

6. Cleaning and maintenance

Prohibition: Do not clean when it is running. Do not clean the surface of the instrument with organic solvents, such as neutral spirits.

Prohibition: The magnetic needle should not be in contact with the reagent. It is recommended to wipe it with an alcohol cotton ball every 1-2 weeks. It will not be covered by the warranty if it is damaged because of human factors.

IX. Common malfunction and troubleshooting

1. No screen display at power on

A. Check whether the power socket is powered.

B. Check whether the power cord is firmly connected.

C. Check whether the instrument switch is turned on.

D. Check the voltage of the power socket.

2. A strange sound of the instrument

A. Check whether the bottom feet of the instrument are all in contact with the work table.

B. Check whether the magnetic needle and magnetic sleeve are installed correctly.

C. Check whether the 96-deep well plate is placed in place.

3. Abnormal magnetic rod action, not falling or rising

A. Touch the pause button to pause the program, and touch the reset button to return the magnetic needle to the initial position.

B. Check whether the magnetic needle and the magnetic sleeve bracket are jammed.

C. Without placing reagents and 96-deep well plate, execute the DEMO program and observe whether it is still abnormal.

D. If there are still abnormalities, please contact the supplier.

4. Crash or out of control

A. When the instrument crashes due to improper operation, cut off the power supply and restart the instrument.

B. If there are still abnormalities, please contact the supplier.

5. No temperature rising when the heating function is on

A. Check whether the temperature control and check whether the experimental program is set to be on.

B. Execute the DEMO program and observe whether it is still abnormal.

C. If there are still abnormalities, please contact the supplier.

6. Malfunction of UV lamp

A. Check whether the UV lamp base is in good condition.

B. Check whether the UV lamp is installed correctly.

C. Check whether the UV lamp is damaged. If damaged, replace it with a new one.

7. Dirty magnetic rod

A. Before each operation, please be sure to install a clean magnetic rod sleeve to avoid accidentally touching the residual liquid in the 96-deep well plate.

B. Wipe carefully with clean cotton cloth or absorbent cotton dipped in water.

C. Do not wipe the magnetic rod with organic solvent or neutral spirits.

D. When removing the magnetic rod for maintenance, please do not place it with a temperature exceeding 100℃, otherwise it may cause permanent damage.

8. Damage or falling off of magnetic rod

In case of the following situations, please contact the supplier.

⚠ Notes: In the following situations, cut off the power supply immediately and contact the supplier or our company for professional trained maintenance personnel to deal with it:

-Liquid is spilled into the inside of the instrument;

-The instrument is drenched or watered;

-The instrument has any abnormal noise or smell;

-The shell of the instrument is damaged due to falling;

-The function of the instrument has changed significantly.

X. After-sale services

1. Warranty content

For this instrument, within 12 months from the date of delivery, TIANGEN provides a warranty for malfunction caused by defects in materials and manufacturing. During the warranty period, Tiangen will selectively repair or replace the instruments proved to be defective.

The instrument for maintenance must be sent by the user to the maintenance department designated by Tiangen. Tiangen will charge the maintenance fee appropriately for the maintenance beyond the warranty period.

2. Warranty scope

The above warranty does not apply to damage caused by improper use and maintenance by the user, use under conditions that do not meet the requirements, or unauthorized repair or modification.