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# Automatic Nucleic Acid Workstation

PANA 9600S



# USER MANUAL

Xi'an Tianlong Science and Technology Co., Ltd.

# **Automatic Nucleic Acid Workstation**

## **User Manual**

**Created by Xi'an Tianlong Science and Technology Co., Ltd.**

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## Trademark Registration Statement:



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## Intended Use Statement:

The intended use of PANA 9600S Automatic Nucleic Acid Workstation (hereinafter referred to as **PANA Workstation**) is to complete the automatic extraction and purification of nucleic acid in various samples and set up the PCR reagent system for the detection of the nucleic acids extracted.

## Special Statement:

Before installing and using the PANA Workstation for the first time, please carefully read the instructions in this manual, fully consider the possible range of misoperation or non-recommended function, and pay special attention to the possible consequences.

## Contraindications:












PANA Workstation is an IVD instrument without contraindications.

## User Requirements:




PANA Workstation must be operated by laboratory professionals who have been trained in laboratory technology and have studied this user manual.

## Symbols and Markings

### A. Labels on Transport Package

Label	Description
	<b>Fragile:</b> The items inside are fragile, please handle with care.
	<b>This Side Up:</b> Indicates the upward side of the transport package.
	<b>Keep Dry:</b> Keep the transport package away from rain or any liquid.
	<b>IVD Instrument:</b> The product belongs to in vitro diagnostic equipment.
	<b>Temperature Limit:</b> Indicates the temperature limits for the storage and transportation of package.
	<b>Humidity Limit:</b> Indicates the humidity limits for the storage and transportation of package.
	<b>Atmospheric Pressure Limit:</b> Indicates the atmospheric pressure limits for the storage and transportation of package.
	<b>No Stack Up:</b> It is prohibited to stack up the instrument package for storage and transportation.
	<b>Recycle:</b> Indicates the packaging materials are recyclable.
	<b>CE Mark:</b> Indicates the instrument is in conformity with In Vitro Diagnostic Medical Devices Regulation (RU)2017/746.
	<b>Made In China:</b> Indicates that the instrument originated in China.

### B. Labels on PANA Workstation

Label	Description
	<b>Biohazard:</b> Indicates that a certain area of the PANA Workstation can be easily contaminated with biological reagents or samples. Reminding user to timely disinfect this area, keep necessary precautions during operation and take corresponding protective measures at the same time.
	<b>Warning ultraviolet light:</b> Indicates high-energy ultraviolet lamp of the PANA Workstation, which can cause serious temporary eye and skin irritation, warning user never expose unprotected eyes or skin to the UV light.
	<b>Warning hands pinching:</b> Indicates that a certain part of the PANA Workstation may produce extrusion, such as automatic door. Reminding user to proceed with

appropriate caution.



**Warning danger:** Indicates that a certain part of the PANA Workstation may cause personal injury.



**Warning laser:** Indicates that a certain part of the PANA Workstation may produce laser, reminding user do not look directly.



**Warning overhead obstacle:** Indicates overhead obstacle of the PANA Workstation, reminding user be careful.



**High Temp.:** Indicates that a certain area of the PANA Workstation may produce high temperature. Reminding user to pay attention and be careful for burns.



**CE Mark:** Indicates the instrument is in conformity with In Vitro Diagnostic Medical Devices Regulation (RU)2017/746.



**IVD Equipment:** The PANA Workstation belongs to In Vitro Diagnostic equipment.



**European Community Representative:** Indicates the authorized representative of this instrument in European.



**Serial Number:** Indicates the serial number of this instrument.



**Manufacturer:** Indicates the manufacture of this instrument.



**Caution:** Indicates the “caution” of this instrument.



**Manufacture Date:** Indicates the manufacture date of this instrument.



**Consult Instructions for Use:** Indicates the consult instructions for the use of this instrument.






**Separate Collection for this Equipment:** indicates that when the end-user wishes to discard this electrical and electronic equipment, it should not be discarded as unsorted waste but must be sent to separate collection facilities for recovery and recycling.



**Made In China:** Indicates that the instrument originated in China.

## C. Symbols Used in This Manual

Symbol	Description
	<b>Caution:</b> Reminding user pay attention to a certain operation. Operating the PANA Workstation in any manner unspecified in this manual may results in instrument damage or abnormal function.
	<b>Reminding:</b> Providing important information regarding the operation and successful application of PANA Workstation, including the information explained in further detail elsewhere in this manual.
	<b>Prohibit:</b> Prohibiting users from a certain dangerous operation. Otherwise it may results in instrument damage or abnormal function, even constitutes a personal injury hazard.


## D. Conventions Used in This Manual


Convention	Meaning
<b>Ordered list</b>	Procedure steps must be performed follow the list order.
<b>Click A</b>	Click <b>A</b> on the touch screen.
<b><i>italic + Bold</i></b>	Indicates the instructions/options of the PANA system software.
<b>&lt; italic + Bold &gt;</b>	Indicates the keys/icons of the PANA system software.
<b>[ ]</b>	Indicates the keys on computer keyboard.
<b><i>italic + Blue</i></b>	Indicates the reference chapter.

## Safety and Precautions

The operation, maintenance and repair of PANA Workstation shall strictly follow the safety specifications listed in this section and through this manual. The design of PANA Workstation has fully considered its biological contamination protection, electrical safety protection and mechanical motion protection. Non-observance of the instructions or performing any operations not stated herein may affect the safety protection provided, and may also destroy the safety standards of design and manufacture as well as the expected application scope of the PANA Workstation.

*XATL Co., Ltd. will not be responsible for any possible consequence caused by either not read or violate the instructions mentioned herein.*


 **Caution:** Please carefully read this manual before operating the PANA Workstation. Incorrect understanding or operations may result in instrument damage or inefficiency usage, laboratory damage, even personal injury.

 **Reminding:** Please pay attention to the descriptions with 'Caution', 'Reminding', 'Prohibit' symbols, and the safety labels on the instrument and transport package.


### I. General Safety and Precautions for Instrument


 **Caution:** No person except the **XATL Co., Ltd.** professional engineers are allowed to disassemble, install or transport the instrument, replace the components or debug the instrument without the authorization of our company. If needed, please contact our company for professional guidance or professional operation.

 **Caution:** Please avoid colliding or damaging the instrument and store it carefully.




 **Caution:** In case of the following situations, immediately cut off the power supply and contact the dealer or ask the Company's professional engineer to take handling measures:

- The instrument suffers from rain or water immersion;
- There is an abnormal sound or odor when the instrument is working;
- The instrument is collided or the shell is damaged;
- There are obvious functional changes of the PANA Workstation.






 **Prohibit:** Never handling or move the PANA Workstation while it is running.

 **Caution:** For protection against overheating hazards, the openings on the instrument are designed for ventilation. Please do not block these openings nor cover the instrument with dust cover and other materials while it is running.

















-  **Caution:** Please do not open the experiment compartment door or nucleic acid extraction compartment door at will. Otherwise, the biosafety, electromagnetic radiation and other protective measures set for the instrument may be destroyed, and the operation of the instrument may be stopped abnormally.
-  **Caution:** Do not forcibly place the consumable (sample tube, tip, deep well plate, rod cover, reagent bottle, PCR tube/8-strip PCR tube/PCR Plate, etc.) that do not match this instrument into the experimental operation platform.
-  **Caution:** PANA Workstation installation and transportation should be performed by professional engineer or under professional guidelines.

## II. Personal Safety and Precautions







-  **Caution:** PANA Workstation is a large laboratory equipment, please adopt appropriate tool and method.
-  **Caution:** PANA Workstation is a large laboratory equipment, at least 6 people are required to complete the lifting or moving of the instrument. Move or lift the instrument in an improper way may result in bodily injury, pain, or instrument damage.
-  **Prohibit:** Never touch the plug, the power cord or the power switch with wet hands.
-  **Prohibit:** PANA Workstation contains permanent strong magnetic field. Anyone who wears cardiac pacemaker or metal prosthetic device is prohibited to operate the instrument. The permanent magnet field may affect the functions of the cardiac pacemaker and metal prosthetic device, even result in damages.
-  **High Temp.:** Do not touch the heating bars with hands or any part of the body during the experiment or immediately after the experiment, they may generate enough heat to cause serious burns.

## III. Electrical Safety and Precautions






-  **Prohibit:** The voltage of PANA Workstation can cause harms to human body, please cut off the power supply before opening the instrument shell, and it is prohibited to replace any part of the instrument while it is electrified.
-  **Caution:** The power grid environment of PANA Workstation must have ground wire.
-  **Caution:** PANA Workstation should be properly grounded, any damage of the internal or external grounding path may cause dangerous.

-  **Caution:** In case of electric leakage, immediately unplug the PANA Workstation and stop using.
-  **Caution:** The power cord provided is a standard three-pin plug, please plug it into an appropriate three-wire grounded receptacle for operation safety.
-  **Reminding:** Under normal circumstances, please use the instrument attached power cord. If the original power cord is destroyed, please substitute it with an equal one.
-  **Caution:** Please check whether the power connection is secure carefully. Be sure to hold the plug when plugging and unplugging the power cable. Do not forcibly pull the power cable.
-  **Reminding:** Please hold the power plug when you plug the power cord and make sure the power plug is perfectly inserted into the socket, do not pull the power cord to pull out the plug.
-  **Caution:** Please keep the power cord away from heater or other high temperature objects, do not put anything on the power cord.
-  **Caution:** Please keep the power cord in an easily accessible place and keep it away from places where people move around.
-  **Caution:** The fuse tube type of the PANA Workstation is F10AH250V, located in the fuse tube box near the power outlet at the rear of the instrument. Use improper fuse tube may lead to circuit system damage.
-  **Caution:** Please check the fuse regularly and if any damage is found, please replace it with the correct type of fuse specified in this manual.
-  **Caution:** Before replacing the fuse tube, please cut off the instrument power supply, unplug the power plug and use a screwdriver to pry open the fuse box. Then substitute the old fuse tube with an equal one.
-  **Prohibit:** Do not disassemble the instrument shell, move the instrument or replace the components while the power cable is connected.

#### IV. Environmental Safety and Precautions

-  **Caution:** PANA Workstation is for indoor use only, the room should be well ventilated and without corrosive gas.
-  **Caution:** PANA Workstation should be stands on a steady firm floor in a 4 points supporting state, the average load-bearing capacity of the floor shall be no less than 0.5 T/m<sup>2</sup>.
-  **Prohibit:** Never run the PANA Workstation in places that have or may have flammable and explosive gas.
-  **Prohibit:** Spraying liquid on electrical parts may cause a short circuit and result in fire, do not use sprays in vicinity of the PANA Workstation.
-  **Reminding:** The working environment temperature of PANA Workstation should be between 15°C-35°C, and the relative humidity should be between 35%-70%.
-  **Reminding:** The working environment of the PANA Workstation should be under normal atmosphere (86.0kPa-106.0 kPa, altitude: ≤2000m).


#### V. Biological Safety and Precautions


-  **Biohazard:** The sample objects of the PANA Workstation are nucleic acids, please consider all samples are with potential biohazard, and please take applicable safety protection measures and wear appropriate protective goggles, clothing and gloves while processing the samples.
-  **Biohazard:** In case of any liquid overflows during the operation, please immediately disinfect the contaminated area with appropriate detergent to avoid the spreading of contaminant, prevent the laboratory or instrument from biohazards.
-  **Biohazard:** Please comply with the local or national applicable regulations to complete the disposal of waste and contaminated materials.
-  **Biohazard:** User should consider the abandoned PANA Workstation as biological contaminated material and comply with the local or national applicable regulations to complete the instrument disposal. Before disposal or recycle the instrument, please completely clean and disinfect the instrument.
-  **Biohazard:** User should only use reagents and consumables that are within their expiration date.


## VI. Electromagnetic Compatibility (EMC) Standard


The electromagnetic compatibility of the PANA Workstation is classified into Class A and Group I. It shall be installed and used in accordance with the electromagnetic compatibility information in this section.


- 1) The PANA Workstation meets the emission and disturbance immunity requirements stipulated in IEC 61326-1 and IEC 61326-2-6.
- 2) The PANA Workstation is designed and tested according to class A instruments in CISPR 11. In the normal working environment, the instrument may cause radio interference and require to take protective measures.
- 3) Portable and mobile RF communication devices may affect the use of the PANA Workstation. While the PANA Workstation is running, it is recommended to keep the instrument away from portable and mobile RF communication devices or turn off these devices.
- 4) The power cord and network cable provided attached with the PANA Workstation should be used. The length of power cord and network cable is as follows:
  - The power cord shall not exceed 1.5m;
  - The network cable shall not exceed 3.0m;
- 5) It is recommended to evaluate the electromagnetic environment before using the PANA Workstation.


 **Caution:** Under normal circumstances, please use the PANA Workstation attached accessories and power cord. If the original power cord is destroyed, please substitute it with an equal one. Use any accessories or power cables outside the specified range may result in the increase in instrument emissions or the reduction of immunity.

 **Prohibit:** Never run the PANA Workstation next to a strong radiation source (such as a non-shielded RF source), otherwise, it may interfere with the normal operation of the instrument.

 **Caution:** PANA Workstation should not be operated close to or stacked with other devices.

 **Caution:** Manufacturer should be responsible for providing electromagnetic compatibility information to user.

 **Caution:** User should be responsible for ensuring that the instrument is in an electromagnetic compatibility environment so that it can work normally.

 **Reminding:** Under the interference of strong electrostatic discharge or electrical fast transient, the touch screen of the PANA Workstation may appear fine lines. But this will not affect the basic electrical safety and will not cause the basic instrument performance attenuation.

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User Manual Modification Points between Versions				
SN	Modification Point	Current Version	Page	Date
1	Manual Version; Modification Time	V2.5	II	22.11.2023
2	Delete Carton package related information		2;11	
3	Add “Made in China” description		4	
4	Sample Setting		38	
5	Figure 5-10 and 5-11 and related descriptions		44;45	
6	Accident report reminding		61	
7	Delete “Faultlog”		61	
8	Contact information		62	
<p><b>Note:</b> This modification points are only for client reference. If you need modification details, please contact <b>XATL Co., Ltd</b> after-sale service referring to “<b>G. Contact Information</b>”.</p>				



# 1. Overview

## 1.1 Intended Application Fields

The intended use of PANA Workstation is to complete the automatic extraction and purification of nucleic acid in various samples and set up the PCR reagent system for the detection of the nucleic acids extracted. It is an automatic in vitro diagnostic instrument that can provide systematic solution for nucleic acid detection.

The PANA Workstation can precisely control the robot arm movement and drive the high-precision air displacement pipettor (ADP), provide accurate and reliable liquid transfer and sample adding operation. It greatly reduces the professional technology and time required for manual operation. The biological hazard of sample and reagent to the operator was reduced, and the automatic, safe and high-throughput PCR reagent system was set up for the the detection of the nucleic acids extracted. It can be used in clinical laboratory, CDC and medical institutions at all levels.

## 1.2 Product Parameters Introduction

### 1.2.1 General Parameters of Instrument

► **Instrument Specification:**

Dimension: 1370mm(L) × 810mm (W) × 890mm (H);

Weight: 220kg (instrument), 55kg (optional PANA Workstation Bracket);

► **Wooden Package Specification:**

Dimension: 1510mm(L) × 950mm (W) × 1080mm (H);

Weight: 320kg;

► **Flight Case Package Specification:**

Dimension: 1510mm(L) × 940mm (W) × 1280mm (H);

Weight: 400kg;

► **Power Specification:**

Voltage: 100-240VAC;

Frequency: 50/60Hz;

Rated power: 1000VA;

Overvoltage category: II;

► **Communication Specification:**



Ethernet connection; HL7 protocol connection to Lis system;



USB 2.0 interface;

- ❗ **Reminding:** The USB interface of PANA Workstation is only used to connect USB disk, mouse, keyboard and bar code scanner.
  - ❌ **Prohibit:** The USB interface of PANA Workstation can not be used for charging.
  - ❗ **Reminding:** The device connected the PANA Workstation via USB interface needs to pass safety certification to ensure that the PANA Workstation will not be damaged.
  - ❌ **Prohibit:** Do not connect any device via USB interface while the PANA Workstation is running.
  - ❗ **Reminding:** The rated output voltage of the USB interface is  $5V \pm 5\%$ ;
  - ❗ **Reminding:** The rated output current of the USB interface is 500mA.
  - ❗ **Reminding:** Please format the USB disk as FAT32 format before connect it to the PANA Workstation.
  - ❗ **Reminding:** Please make sure that there is at least 1GB space left in the USB disk before connect it to the PANA Workstation.
- ▶ **Application Environment:**
    - Temperature: 15°C -35°C;
    - Relative humidity: 35%-70%, non-condensing;
    - Atmospheric pressure: 56kPa-106kPa;
    - Altitude: below 4000m;
  - ▶ **Storage and Transportation Environment:**
    - Temperature: -40°C-55°C, within transport package;
    - Relative humidity: 35-93% RH;
    - Atmospheric pressure: 26.4kPa-106.0kPa;
  - ▶ **Running Noise:** While running, the maximum noise does not exceed 70 decibel.
  - ▶ **Pollution Degree:** 2
  - ▶ **Degree of Protection:** IPX0

## 1.2.2 Firmware Parameters of Instrument

▶ **Thermal System:**

PANA Workstation possesses 24 sets of built-in heating bars, in order to provide heating temperature in the lysis and elution steps during the process of nucleic acid extraction.

▶ **Magnetic Rod Specification:**

PANA Workstation possesses 6 sets of built-in magnetic rod racks, each set contains 16 magnetic rods arranged in 2 rows.

▶ **Pipettor Specification:**

PANA Workstation is equipped with 4 air displacement pipettors that can transfer liquid separately with the volume range of 5 $\mu$ L-1000 $\mu$ L.

▶ **Master Computer and Touch Screen:**

PANA Workstation possesses a built-in master computer with Windows 7 operating system, and it is equipped with a 12.1-inch touch screen.



**Caution:** It is not recommended to install other software on the master control computer of the PANA Workstation. Otherwise, there may be potential risks of software module conflict, and may also influences the results reliability.

## 1.2.3 Performance Parameters of Instrument

▶ **Sample Type:**

Plasma, serum, whole blood, swab preservation solution, etc.

▶ **PCR Reagent System Setup Capability:**

PANA Workstation is capable of setting up 4 different PCR reaction systems simultaneously, totally 192 tests.

▶ **Sample Flux:** 1-96 fluxes.

▶ **Turn Around Time:**

The turn around time of PANA Workstation depends on reagent. The whole running progress including sample adding, nucleic acid extraction and PCR reaction system setup of 96 samples (including standard products and quality control products) can be completed within 60-80 minutes.

▶ **Liquid Transfer Range:** 5 $\mu$ L-1000 $\mu$ L.

▶ **Liquid Transfer Accuracy:**

Above 50 $\mu$ L:  $\leq$  1.2%

15 $\mu$ L -50 $\mu$ L:  $\leq$  1.5%

Below 15 $\mu$ L:  $\leq$  2.0%

▶ **Liquid Transfer Repeatability:**

Above 50 $\mu$ L: CV  $\leq$  1.0%

15 $\mu$ L -50 $\mu$ L: CV  $\leq$  1.5%

Below 15 $\mu$ L: CV  $\leq$  3.0%

- ▶ **Temperature Accuracy:**  $\pm 1.2^{\circ}\text{C}$
- ▶ **Temperature Uniformity:**  $\pm 2.0^{\circ}\text{C}$
- ▶ **Temperature Range:**  $35^{\circ}\text{C}-120^{\circ}\text{C}$
- ▶ **Linear Correlation:**

The detection linear correlation coefficient of nucleic acid extracted  $r \geq 0.999$ .

## 1.3 Product Characteristics Introduction

### 1.3.1 Characteristics of Instrument

- ▶ **Reagent Refrigeration:**

The reagent cabin of PANA Workstation adopts light protection design and is capable of auto-cooling at startup to refrigerate the reagent ( $4^{\circ}\text{C}-15^{\circ}\text{C}$ ).

- ▶ **Information Management:**

- **Sample information scan:** the PANA Workstation can automatically scan individual sample barcode one by one while user loading the sample holder;
- **Reagent information identification:** the PANA Workstation can identify the codes of nucleic acid extraction reagent and PCR reagent;
- **Information transmission function:** the PANA Workstation can transmit the sample and PCR reagent to the matched PCR equipment (manufactured by **XATL Co., Ltd.**), which can automatically call the corresponding PCR experiment program and upload the experiment information to Lis system.

- ▶ **Automatic Loading of Rod Cover:**

After the extraction movable loading platform enter into the extraction cabin, the PANA Workstation can automatically grab the rod cover.

- ▶ **Precise Liquid Absorption:**

By combining the intelligent technologies of capacitive sensing liquid level detection and airtight micro-pump pressure sensing, etc. The PANA Workstation can determine the optimal liquid pipetting position and the accuracy and repeatability of liquid pipetting can be controlled within 3%, so as to guarantee the success of experiment.

- ▶ **Visual Detection:**

The PANA Workstation is equipped with a high-definition camera, which can move and automatically photograph the consumable status. The system software of PANA

Workstation can real-time analyzed the status of different consumables, reminding user if the consumables type, quantity or position are incorrect before the experiment.

### 1.3.2 Characteristics of Software System

▶ **Software Interface:**

Wizard interface, intuitive sample layout and experiment setting, easy to operate.

▶ **Nucleic Acid Extraction Program:**

- The nucleic acid extraction program can be established and saved.
- Multiple nucleic acid extraction programs can be edited according to the reagent requirements.
- Rotary mixing speed can be edited from 100rpm to 3000 rpm;
- Mixing, waiting, magnetizing and other steps can be set;
- The step time can be edited from 1s to 3600s.

▶ **Software Language:**

The default software languages of PANA Workstation are Chinese and English.

### 1.3.3 Characteristics of Experiment Consumables

▶ **General Consumables:**

- **Sample Tube:** standard blood collection tube; cryopreservation tube; 1.5mL & 2mL centrifuge tube and sample cup, etc.
- **PCR Tube:** 0.1mL & 0.2mL 8-strip PCR tube or PCR plate.
- **Reserve Tube:** 0.6mL & 1.5mL centrifuge tube.

▶ **Special Consumables:**

- **Pipetting Tip:** 2 types of pipetting tip (5 $\mu$ L-50 $\mu$ L; 50 $\mu$ L-1000 $\mu$ L).
- **Nucleic Acid Extraction Consumables:** 96- deep well plate (Preencapsulated nucleic acid extraction reagent) and rod cover.
- **PCR Consumable:** PCR setup premix bottle.



**Reminding:** The special consumables provided by XATL can not be substituted with other ones, otherwise, the instrument parameters may fail due to the consumable differences, that may lead to experiment fail.

## 2. Unpacking and Installation

There are two packaging methods: wood case packaging and aviation case packaging to meet transport distances and requirements.

### 2.1 Wooden Case Unpacking

The wooden case is made up of bottom support plate, roof plate and side plate, as shown in figure 2-1. Tightly and evenly wrapped with PE stretch film, The PANA Workstation is fixed inside the wooden case to prevent the collisions and shocks during transport.

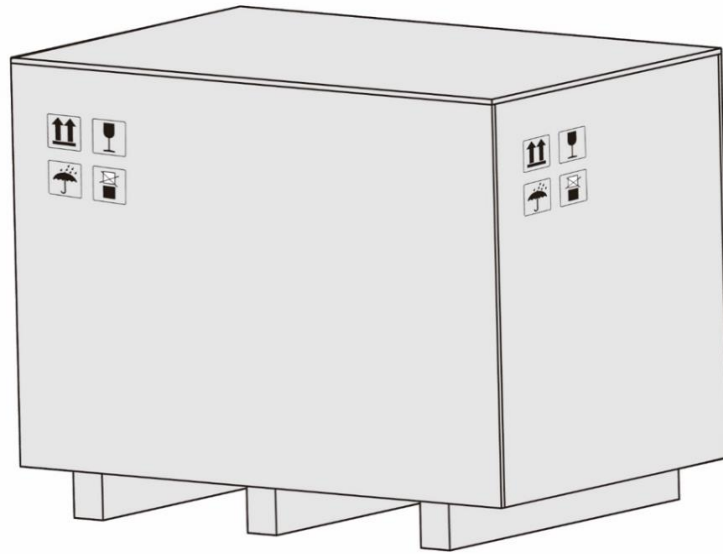


Figure 2-1. Wooden Case Package

#### 2.1.1 Unpacking Steps

The unpacking of wooden case mainly includes 4 steps, as shown in figure 2-2. The specific operation method is as follow.

**1<sup>st</sup> Step:** Please first remove the roof plate of the wooden case, as shown in figure 2-2a.

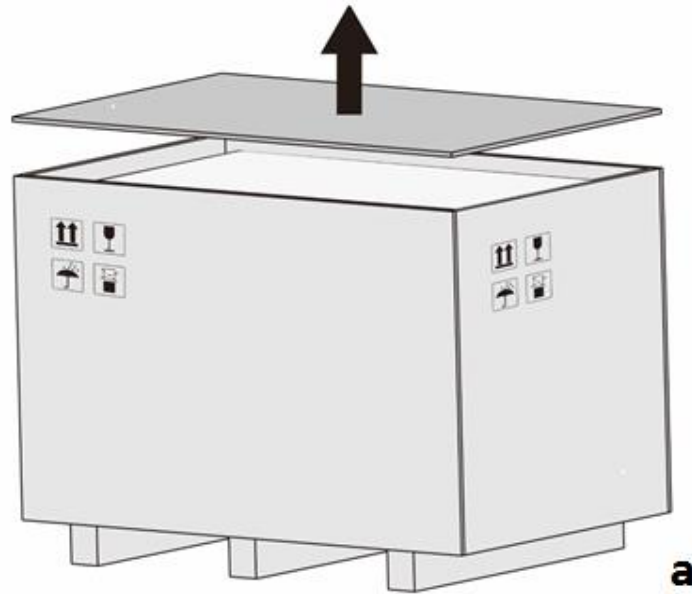


Figure 2-2a. Wooden Case Unpacking Step 1

**2<sup>nd</sup> Step:** Then disassemble the four side plates, as shown in figure 2-2b.

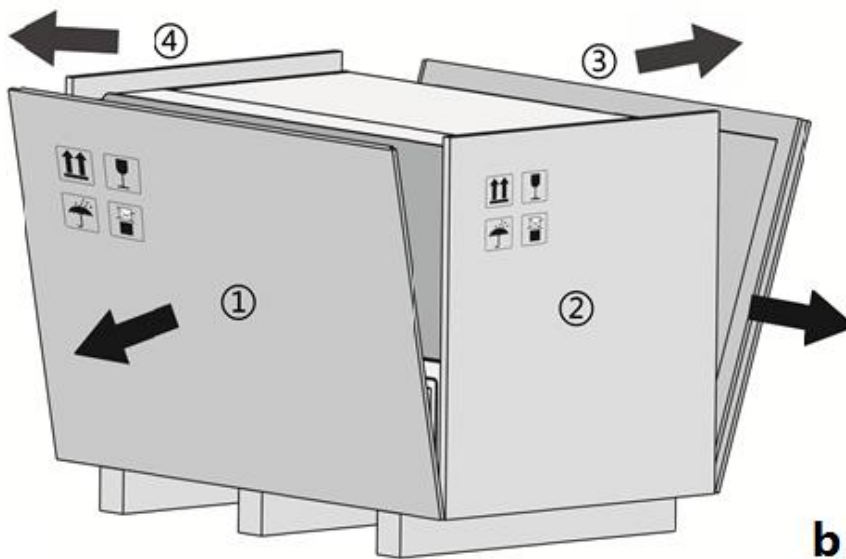


Figure 2-2b. Wooden Case Unpacking Step 2

**3<sup>rd</sup> Step:** PANA Workstation stands on the bottom support plate of the wooden case in a 4-point load-bearing state, as shown in figure 2-2c.

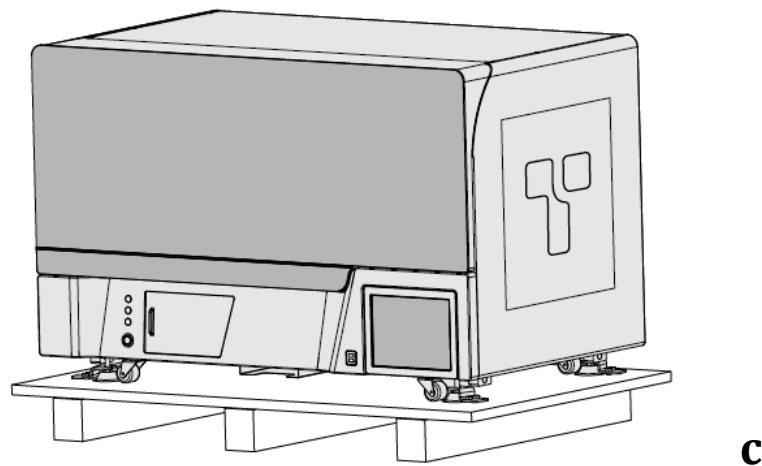


Figure 2-2c. Wooden Case Unpacking Step 3

**4<sup>th</sup> Step:** Each supporting foot is provided with a fixator, which is fixed on the support plate by two screws as shown in figure 2-2d. Please disassemble the screws on each fixator and remove the fixator, then rotate up each supporting foot to make the instrument supported by four transport wheels.

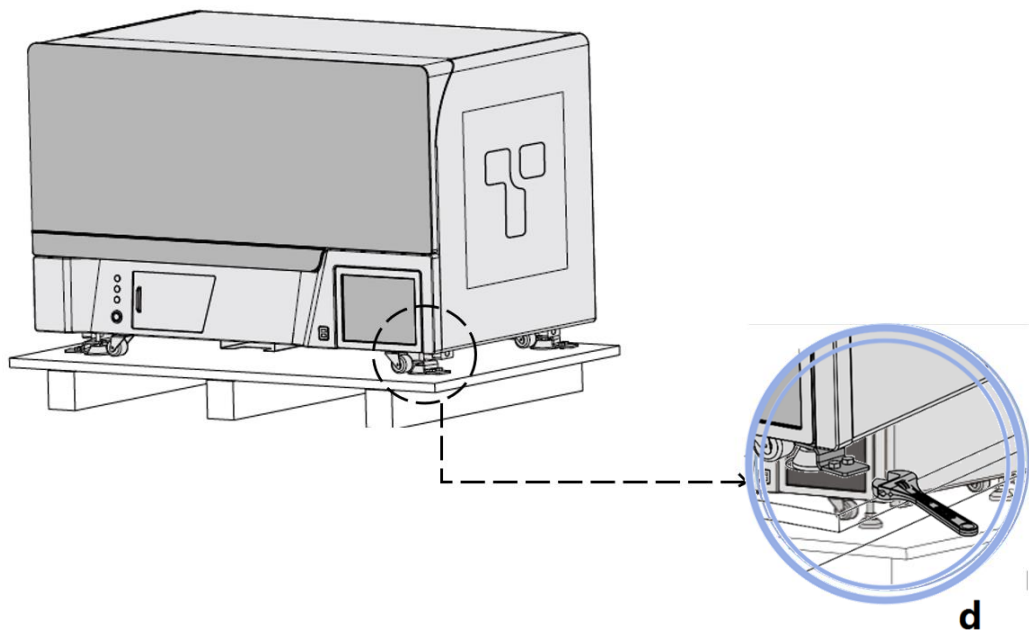


Figure 2-2d. Wooden Case Unpacking Step 4



**5<sup>th</sup> Step:** Install four transport handles in four installation slots beside the four supporting feet, as shown in figure 2-2e. multiple people hold the transport handles and stabilize the PANA Workstation to lift the instrument out of the wooden case and transport it to the predetermined place. The instrument can be pushed by the transport wheels when passing the smooth ground or slope.

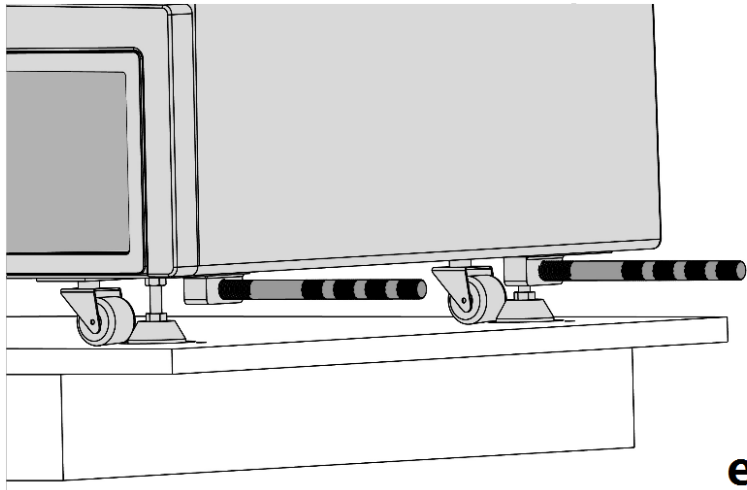


Figure 2-2e. Wooden Case Unpacking Step 5

**6<sup>th</sup> Step:** Place PANA Workstation on a steady bench, rotate down the supporting feet and let them re-landed. Adjust the height of each supporting foot and ensure the PANA Workstation to stand steadily, as shown in figure 2-2f.

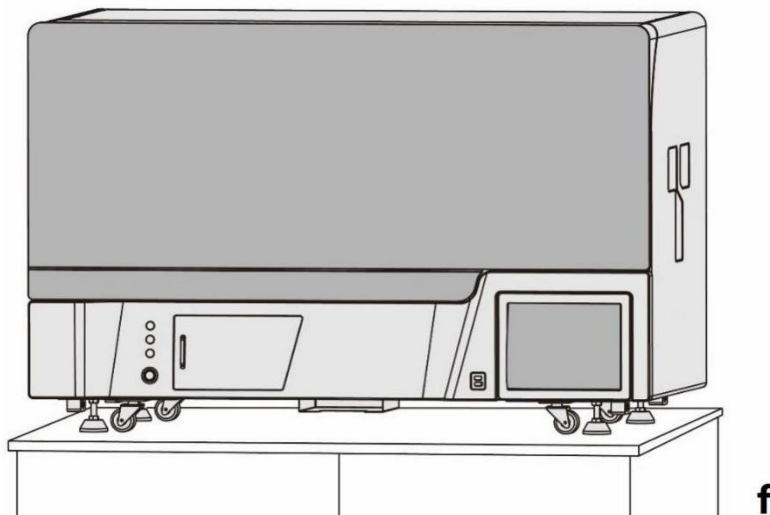


Figure 2-2f. Wooden Case Unpacking Step 6

## 2.2 Aviation Case Unpacking

The aviation case is made up of top cap, side plate and bottom support plate; the three parts are connected by two circles of buckles, as shown in figure 2-3. Tightly and evenly wrapped with PE stretch film, the PANA Workstation is fixed inside the aviation case to prevent the collisions and shocks during transport.

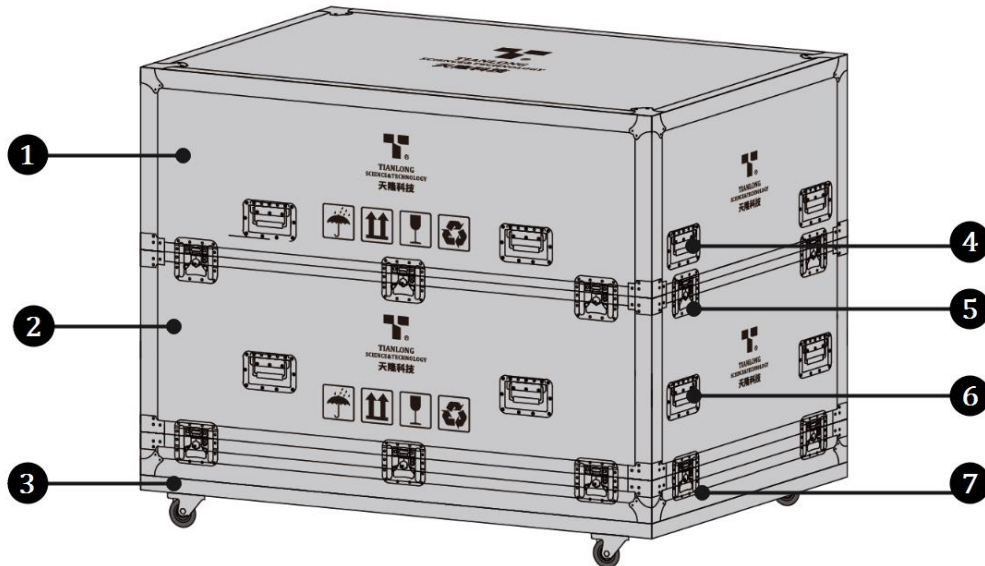


Figure 2-3. Aviation Case Package

1. Top Cap

2. Side Plate

3. Bottom Support Plate

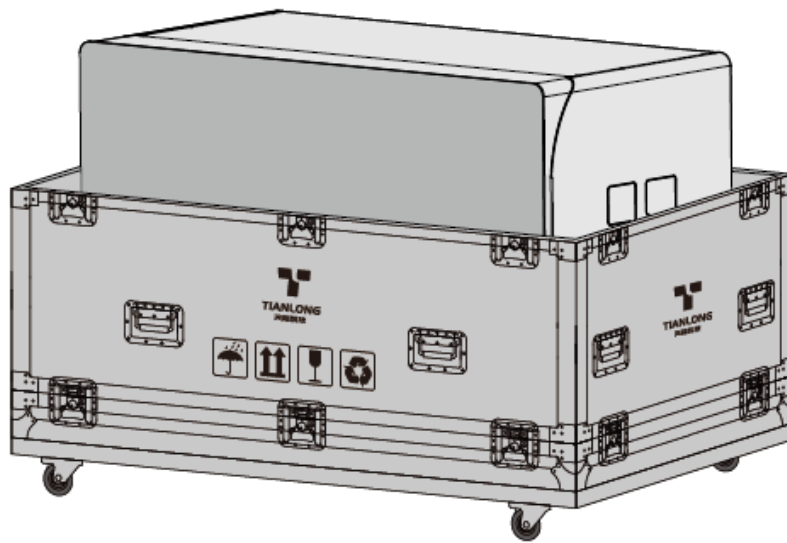
4&6. Handles

5&7. Buckles

### 2.3.1 Unpacking Steps

The unpacking of aviation case mainly includes 5 steps, as shown in figure 2-4. The specific operation method is as follow.

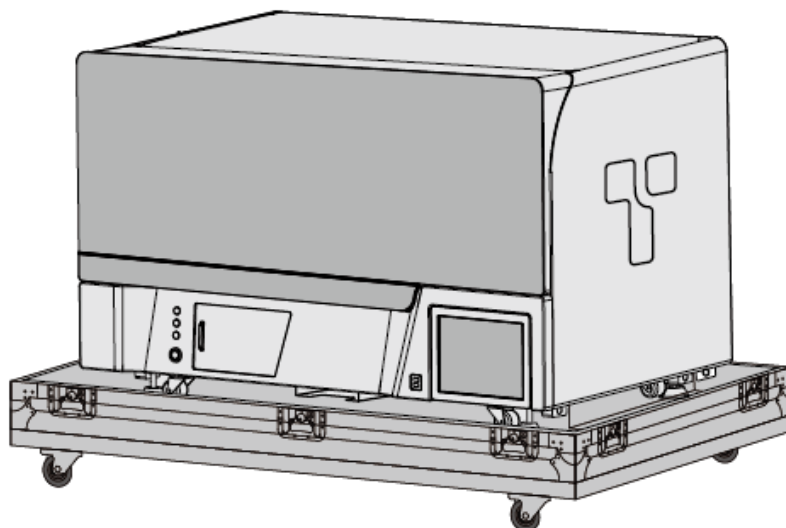
**1<sup>st</sup> Step:** Please release buckles connecting top cap with side plate. Then remove top cap by lifting handles on it, as shown in figure 2-4a.



**a**

Figure 2-4a. Aviation Case Unpacking Step 1

**2<sup>nd</sup> Step:** Please release buckles connecting side plate with bottom support plate. Then remove side plate by lifting handles on it, as shown in figure 2-4b.



**b**

Figure 2-4b. Aviation Case Unpacking Step 2

**3<sup>rd</sup> Step:** Install four transport handles in four installation slots beside the four supporting feet, as shown in figure 2-4c. Multiple people hold the transport handles and stabilize the PANA Workstation to lift the instrument out of the aviation case and transport it

to the predetermined place. The instrument can be pushed by the transport wheels when passing the smooth ground or slope during the transportation process.

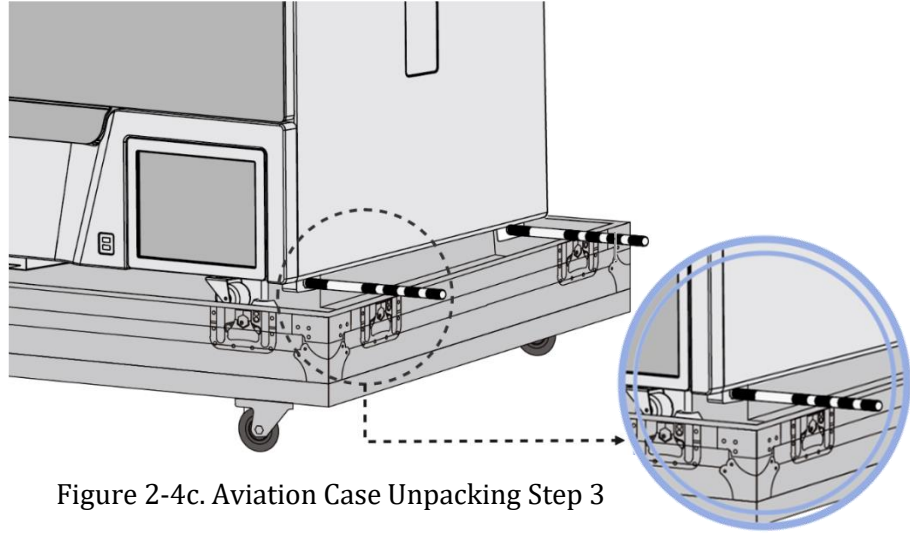


Figure 2-4c. Aviation Case Unpacking Step 3

**c**

**4<sup>th</sup> Step:** Place the PANA Workstation on a steady bench, rotate down the supporting feet and let them re-landed. Adjust the height of each supporting foot and ensure the PANA Workstation to stand steadily, as shown in figure 2-4d.

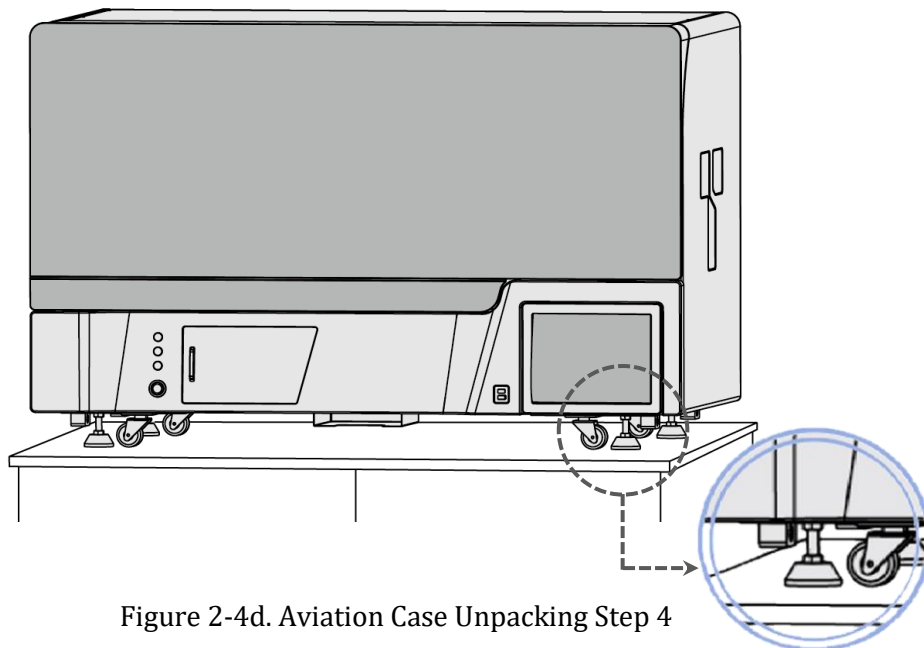






Figure 2-4d. Aviation Case Unpacking Step 4

**d**

- ❗ **Reminding:** In order to prevent the formation of condensation water, please do not open the package until it reaches the room temperature.
- ❗ **Reminding:** Please check the package integrity before open it. In case there is any damage, collision or water mark, please contact the transport department or our company.

-  **Reminding:** Please check the instrument and accessories according to the packing list and ensure that all components are present and intact, report any missing items to **XATL Co., Ltd.**
-  **Reminding:** Please fill in the relevant content on installation information feedback table after acceptance, and send it back to our company for document and warranty.
-  **Caution:** Under normal circumstances, the PANA Workstation should be unpacked and installed by our company's professional engineer.
-  **Caution:** Please reserve the original packing materials for future use. The transport package of PANA Workstation is designed to reduce the instrument damage and ensure its transportation safety. Adopt other packaging materials will break the warranty, and **XATL Co., Ltd.** will not be responsible for damages as consequences of improper packaging that incurred during the transportation. Please also keep instrument related documents provided by our company for future use too.


## 2.4 Working Environmental Requirements


### 2.4.1 Space Requirements


- 1) The PANA Workstation should be placed in the room with low humidity (between 35% RH-70%RH) and appropriate temperature (between 15°C-35°C). The room should be well ventilated and without corrosive gas.
- 2) Please keep the PANA Workstation away from heat sources (directly sunshine, heater, stoves) and water sources (such as water pool, water tube etc.).
- 3) The working environment of PANA Workstation should be without electromagnetic interference, vibration and high frequency wave electrical equipment.
- 4) The PANA Workstation should be stands on a steady firm working bench in a 4 points supporting state, the average load-bearing capacity of the working bench shall be no less than 0.5T/m<sup>2</sup>.
- 5) Please leave sufficient space around the instrument (at least leave 30cm at left and right sides, at least 15cm at backside, at least 100cm in front of the instrument)
- 6) For protection against overheating hazards, the openings on the PANA Workstation are designed for ventilation. Please do not block or cover these ventilation openings while it is running.
- 7) Do not place the PANA Workstation close to the wall or pile up other goods at the rear of the instrument, this may affect heat dissipation.


## 2.4.2 Power Requirements


- 1) The power grid environment of PANA Workstation should possess ground wire and the instrument should be properly grounded.
- 2) The power specifications of PANA Workstation are listed in [“1.2 Product Parameters Introduction - 1.2.1 General Parameters of Instrument”](#), use improper power may damage the circuit system and cause fire, it is recommended to use UPS power supply.


 **Reminding:** Before connecting the AC power supply, please ensure the consistent of the PANA Workstation required voltage and the power supply voltage (allowable deviation  $\pm 10\%$ ). And make sure that the rated load of receptacle is no less than the requirement of the instrument.


 **Reminding:** If the power supply system of the PANA Workstation working environment is unstable, please do not connect other electrical equipment at the same power circuit, and it is required to equip with over 1000VA AC regulated power supply.


 **Prohibit:** Spraying liquid on electrical parts may cause a short circuit and result in fire, do not use sprays in vicinity of the instrument.

 **Caution:** Please keep the power cord away from heater or other high temperature objects, do not put anything on the power cord.

 **Caution:** Please keep the power cord in an easily accessible place and keep it away from places where people move around.

 **Reminding:** Under normal circumstances, please use the instrument attached power cord.

 **Reminding:** Please check the power cord periodically, substitute with an equal one in case it is found to be damaged.

 **Caution:** PANA Workstation is heavy for one person. In order to avoid instrument damage, it is suggested to carefully carry the instrument with multiple people with safe guard.

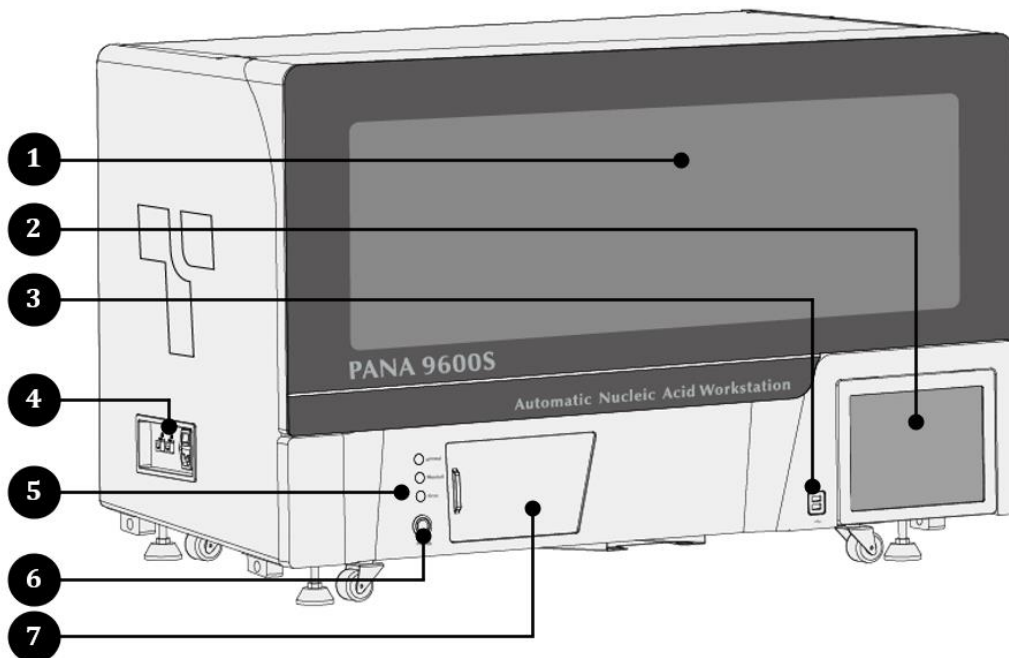
## 2.5 Remove Transport Lock

After unpacking, please do not directly power on the PANA Workstation, it is fixed by transport lock during transportation. Please remove the transport lock in accordance with the instructions as below before running the PANA Workstation.

- ⚠ Caution:** Under normal circumstances, the transport lock of PANA Workstation should be unpacked or installed by our company's professional engineer.
- ⚠ Caution:** Please do not remove any screws or other parts, unless it is specifically mentioned in this manual. This kind of behavior violates the warranty and may cause the instrument out of alignment.
- ⚠ Caution:** PANA Workstation should be installed by our company's professional engineer or under their guidance.
- ⚠ Caution:** It is necessary to fix the transport lock again to avoid instrument damage in case the PANA Workstation needs to be transported again.

## 3. Product Composition and Structure

### 3.1 Instrument Structure



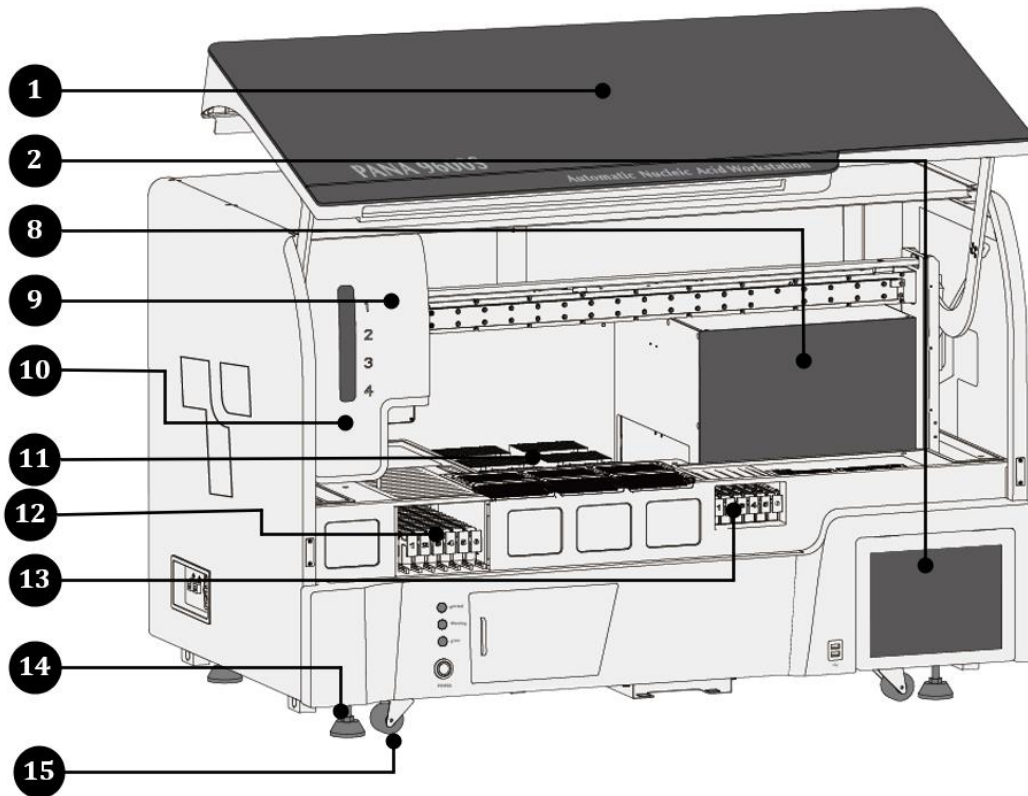


Figure 3-1. Instrument Structure of PANA Workstation

**1. Experiment Cabin Door:**

The experiment cabin door keeps experiment cabin as independent area from outside, and user can turn up and opened the experiment cabin door for experiment operation.

**2. Touch Screen:**

The touch screen is the man-machine interaction interface that used for PANA system software.

**3. USB Interface:**

The USB interface of PANA Workstation is only used to connect USB disk, mouse, keyboard and bar code scanner.



**Prohibit:** The USB interface of PANA Workstation can not be used for charging.



**Reminding:** Please format the USB disk before connect it to the PANA Workstation.

**4. Power & Network Interface:**

The power and network interface includes power socket, fuse tube, power switch, network port, as shown in figure 3-2.

**5. Indicator Lamps:**



The indicator lamps indicate the current status of PANA Workstation through different color lights.

- **Green Light On:** indicates the standby state of PANA Workstation;
- **Green Light Flicker:** indicates the running state of PANA Workstation;
- **Yellow Light Flicker:** indicates there is a prompt;
- **Blue Light Flicker:** indicates there is an error.

### 6. Instrument Switch:

The instrument switch is a quick power switch on the instrument panel.

### 7. Door of Waste Cabin:

User can slide the door of waste cabin to open it, take out the waste bin and replace the waste collection bag within.

### 8. Extraction Cabin:

The extraction cabin provides an independent area for nucleic acid extraction. The extraction cabin is equipped with the following status indicator lamps:



**Heating:** Indicates the current running step is heating step;



**Stirring:** Indicates the current running step is the stirring step;



**Magnetic:** Indicates the current running step is the magnetic absorption step;



**Wait:** Indicates the current running step is the waiting step;

### 9. Auto Pipetting Module:

The auto pipetting module contains 4 independent air displacement pipettors (ADP), it is capable of moving along the X and Y directions to realize the liquid transfer, sample and reagent adding.

### 10. Pipettor Indicator:

The pipettor indicator ① ② ③ ④ indicate the status of the four pipettors accordingly.

### 11. Operation Platform:

The details of operation platform are as shown in figure 3-3.

### 12. Sample Cabin:

- The sample cabin can load 6 sample holders;
- The sample holder can load 16 sample tubes.

### 13. Reagent and Premix Area:

This area is composed of reagent and premix area, as shown in figure 3-3 and 4-6.

- The reagent area can load 5 reagent holders each of which could hold 1-6 reagent bottle(s);



**Reminding:** Please insert the reagent bottle vertically to the reagent holder. 1# reagent

holder can load the reagent groups for extraction, such as Protein K, etc.; 2#-5# can load 4 groups of PCR reagent respectively.

- The premix area can load 1 premix holder where can hold 1-6 premix bottle(s).
- **Reminding:** Please insert the premix bottle vertically to the premix holder for mix reagent groups.

**14. Supporting Foot:** PANA Workstation stands on four supporting feet.

**15. Transport Wheel:** PANA Workstation can be moved transport via four transport wheels.

## 3.2 Power and Network Interface

The power and network interface of PANA Workstation is as shown in figure 3-2, which is located on the side wall of the PANA Workstation.

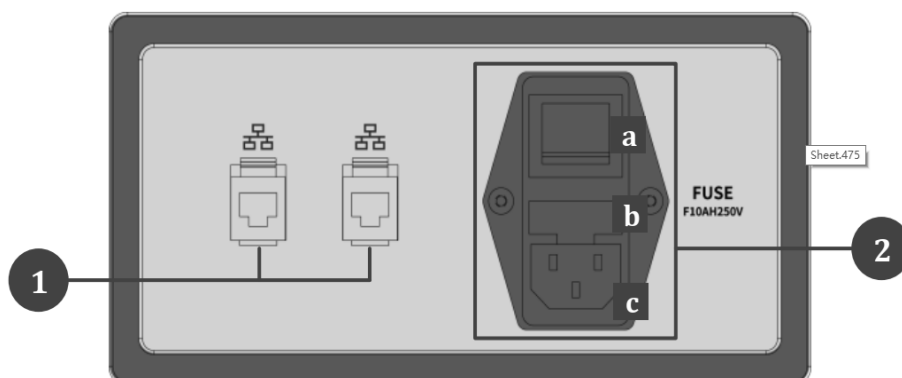



Figure 3-2. Power and Network Interface of PANA Workstation

**1. Network Interface:**

The network interface provides two Ethernet ports .

**2. Power Interface:**

The power interface includes power switch, fuse tube holder and power socket.

### 3.3 Operation Platform

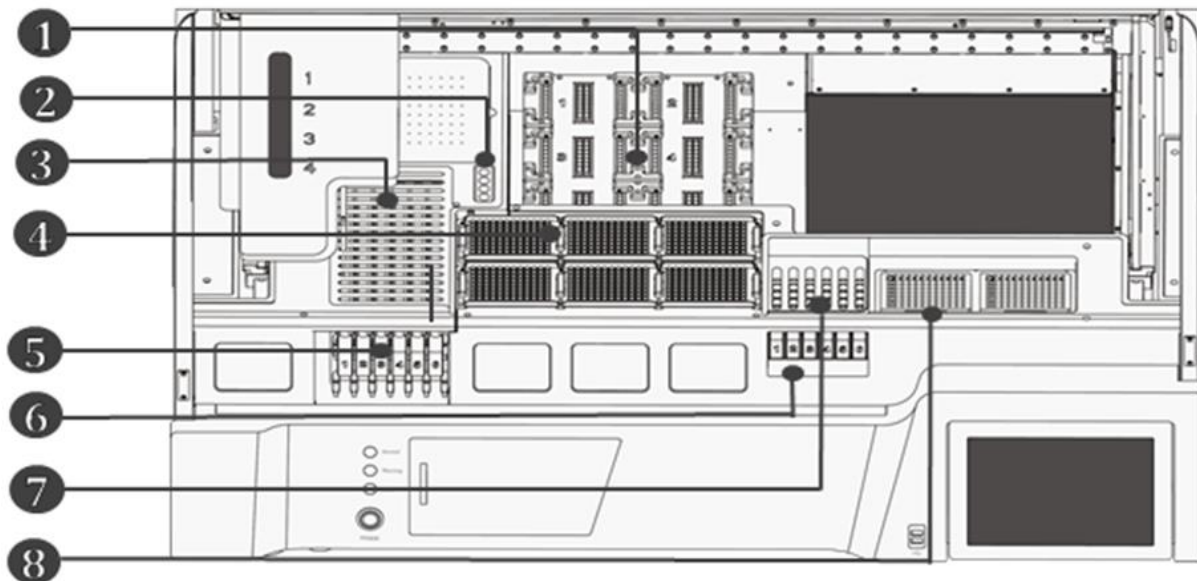


Figure 3-3. Operation Platform in the Experiment Cabin of PANA Workstation

#### 1. Movable Extraction Loading Platform:

The moveable extraction loading platform can accommodate six deep well plates, it will automatically enter the extraction cabin to perform the nucleic acid extraction process, and when this process is complete, the extraction moveable loading platform will automatically move out for other operation.

#### 2. Waste Port:

During the experiment, the used tips will be unloaded from the pipettor and throw into the waste bin through 4 waste ports.

#### 3. Sample Area Grating:

The sample area is the area for sample processing. During the experiment, the tip of pipettor will pipetting the liquid sample from the sample tube through the sample cabin grating, which can reduce dust and aerosol pollution.

#### 4. Tip Area:

The tip area can load 6 tip holders (1000 $\mu$ L tip holder $\times$ 3; 50 $\mu$ L tip holder $\times$ 3), the different color of tip holder represents the different tip specification.

- 1000 $\mu$ L tips are loaded in the yellow tip holder;
- 50 $\mu$ L tips are loaded in the green tip holder;

## 5. Sample Cabin:

The sample cabin can load 6 sample holders, one sample holder can load 16 sample tubes.

- Sample cabin entrance: user can load the sample holder through this entrance.
- Sample holder indicator: indicates the loading state of each sample holder, green light indicates the sample holder is well loaded, yellow light indicates the sample holder is unloaded or not well loaded.


## 6. Reagent Holder and Premix Holder:


- Reagent cabin entrance: User can load the reagent holder and premix holder from this entrance.
- Holder indicator: indicates the loading state of each reagent holder and premix holder, green light indicates the reagent holder is well loaded, yellow light indicates the reagent holder is unloaded. The user shall check whether the reagent holder and premix holder is well loaded.


## 7. Reagent and Premix Area:

During the experiment, the auto pipetting module will pipet the reagent from reagent area to premix area for premixing before PCR-Setup.

- Reagent area: This area can load 5 reagent holders, each of which is able to hold 1-6 reagent bottle(s);
- Premix area: This area can load 1 premix holder where is able to hold 1-6 premix bottle(s).

 **Reminding:** There is gratings over reagent and premix area so as to effectively prevent from the dust, spatters and aerosol pollution.

 **Reminding:** There equips barcode scanner in the left of reagent and premix area so as to scan the reagent barcode.

 **Reminding:** This area is functioned with refrigeration in the range of 4-15°C, which is able to effectively ensure the reagent performance.

## 8. PCR Setup Area:

The PCR-setup area is equipped with two portable PCR consumable holders, which can accommodate two 96 PCR plate and/or twenty-four 8 strip PCR tubes. The PCR consumable holder can be fixed through magnetic absorption.

## 4. The Preparation before Experiment

### 4.1 Startup the PANA Workstation

**1<sup>st</sup> Step:** Please turn on the power switch on the side wall of the PANA Workstation.

**2<sup>nd</sup> Step:** Then turn on the instrument switch on the instrument panel.

**⚠ Caution:** Before power on the PANA Workstation, please ensure the transport lock of the PANA Workstation has removed. And the power supply is properly connected.

**⚠ Caution:** Please first turn on the power switch, and then after 10 seconds, turn on the instrument switch, otherwise may result in communication failure. If this occurs, please restart the instrument for recovery.

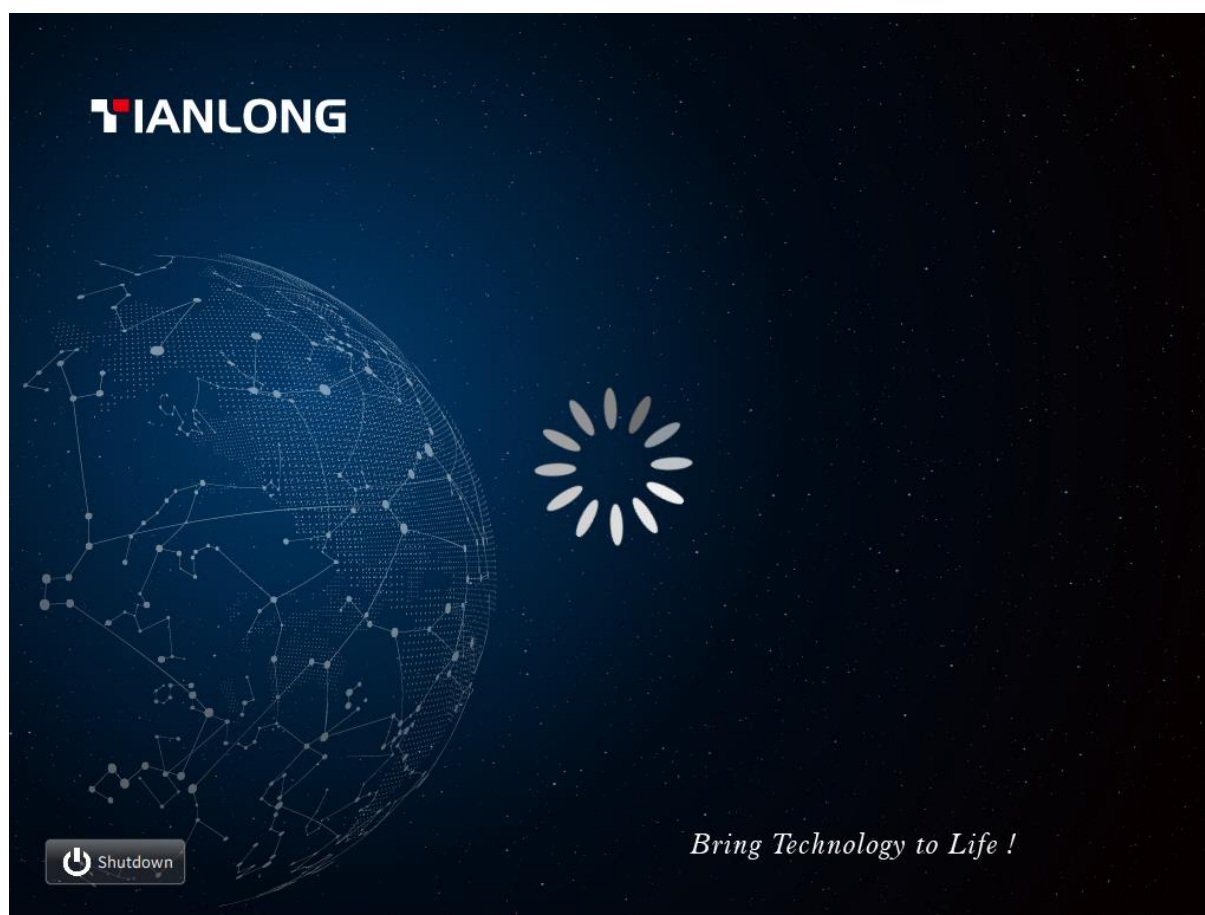


Figure 4-1. PANA System Software - Startup and Self-inspection Interface

## 4.2 System Login and Self Inspection



**1<sup>st</sup> Step:** After startup the PANA Workstation, the touch screen of the master computer will display the startup and self-inspection interface, as shown in figure 4-1.

**⚠ Caution:** If the PANA Workstation fails to pass the self-inspection, please restart the instrument, in case the PANA Workstation still fails to pass the self-inspection, please contact the distributor or **XATL Co., Ltd.**, do not slap or shake the instrument.

**2<sup>nd</sup> Step:** After the system self inspection, the startup the PANA Workstation, the touch screen of the master computer will display the Login interface, as shown in figure 4-2.



Figure 4-2. PANA System Software - Login Interface

User can select a user account after the  icon, enter the login password after the  icon and click < **Login** > to login the system software as the current account.

**⚠ Reminding:** Our professional engineer will use the **Admin** account to login the PANA system software for the first time and add new user account after login.

**⚠ Reminding:** User can change the password after login, please remember the password, otherwise you will not be able to login the system software without the permission of

the **Admin** account.

**3<sup>rd</sup> Step:** After login the PANA system software, the touch screen of the master computer will display the main interface, as shown in figure 4-3.

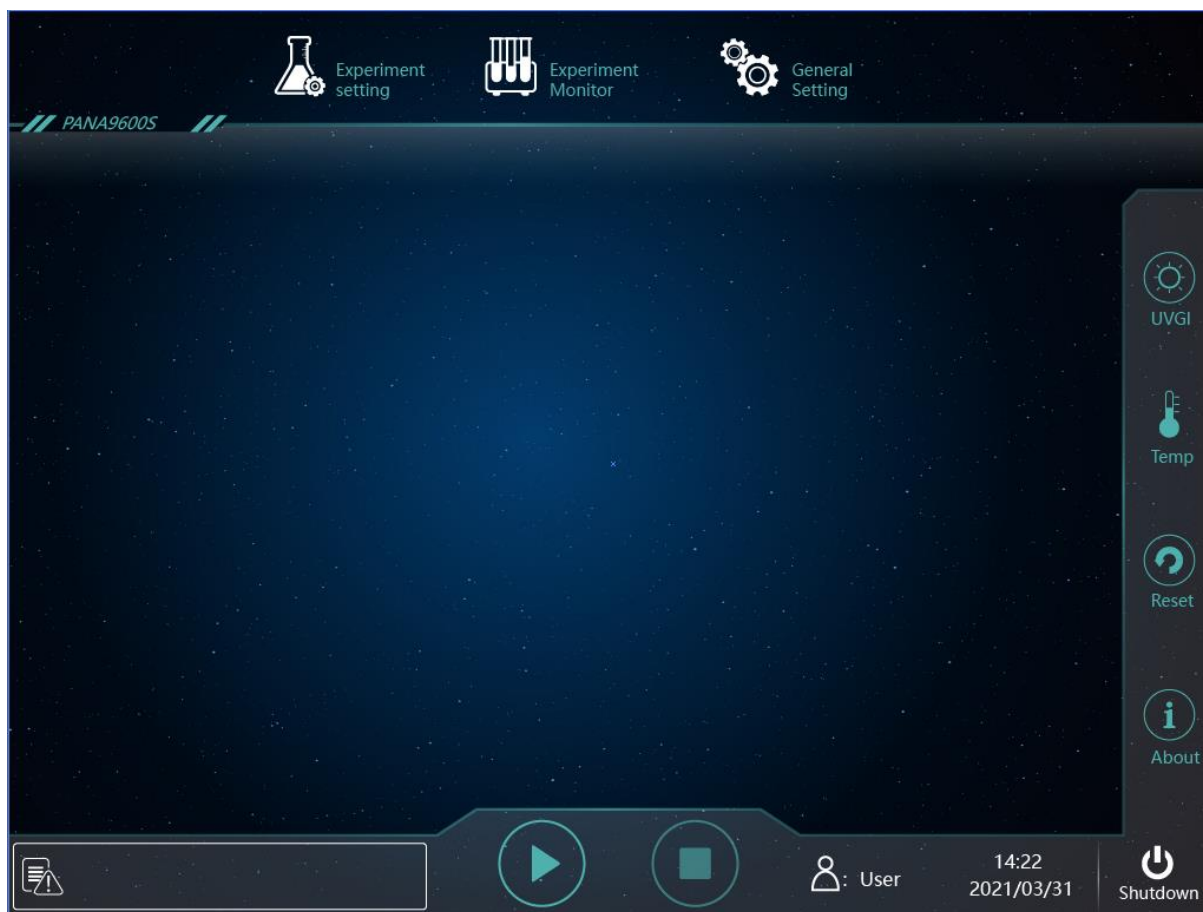


Figure 4-3. PANA System Software - Main Interface

## 4.3 Material and Sample Loading

After login the PANA system software, please first choose the experiment item and perform the sample setting, then the PANA system software will automatically indicate the consumable and reagent requirement information, and reveal their corresponding loading positions. Before startup the experiment, please prepare and load the consumable and reagent according to the software prompt.



### 4.3.1 Load Tip Holder

Please hold the two sides of the tip holder to place it into the tip holder frame. First aim the positioning gap of the tip holder to the positioning column on the tip holder frame, and insert this edge of the tip holder under the positioning strip, as shown in figure 4-4. Then press the other edge downward to insert it into the positioning strip.

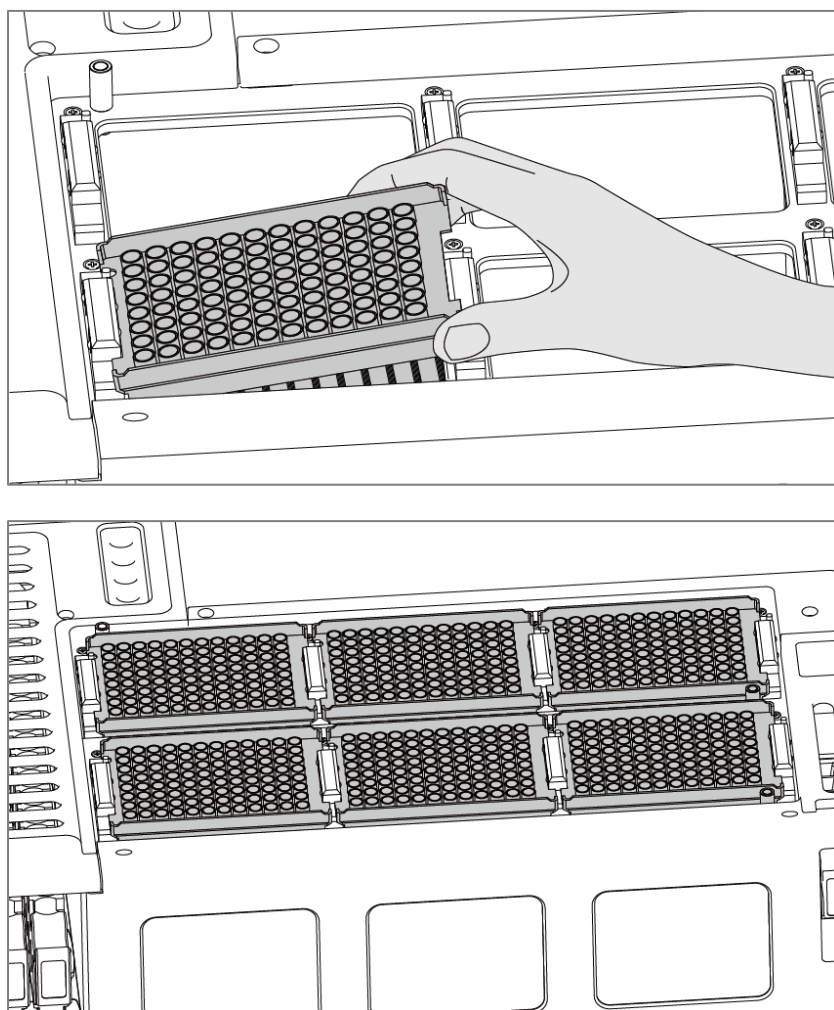


Figure 4-4. Load Tip Holder

- ❗ **Reminding:** The different color of tip holders representing different tip specifications, the color of tip holder positioning column corresponds to the color of the tip holders.
  - Yellow positioning column corresponds to yellow tip holder, which load 1000 $\mu$ L tips;
  - Green positioning column corresponds to green tip holder, which load 50 $\mu$ L tips.
- ❗ **Reminding:** The tip quantity needs to meet the experimental requirements; PANA system will automatically prompt in case the quantity of loaded tips is insufficient.



### 4.3.2 Load PCR Consumables

The PANA Workstation is equipped with two portable PCR consumable holders to load 96 PCR plate and/or 8 strip PCR tube. The PCR consumable holder can be fixed through magnetic absorption. Before the experiment, please load the PCR consumable without cap into the PCR consumable holder, as shown in figure 4-5.

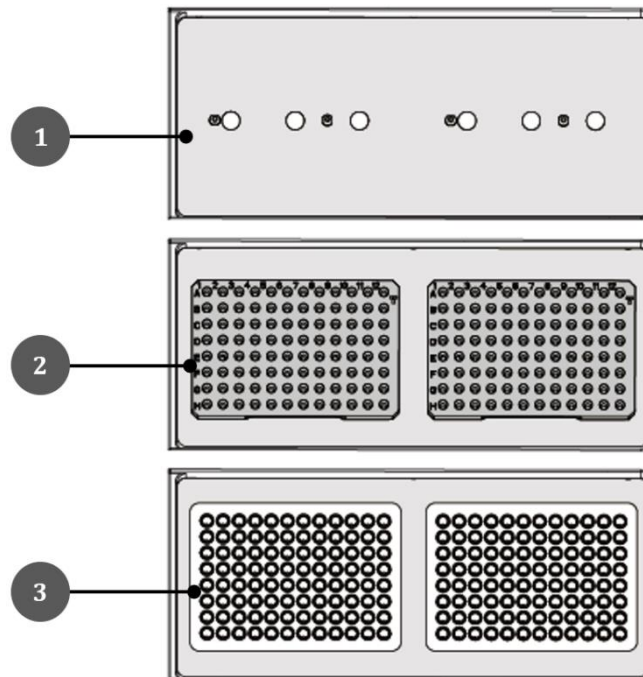


Figure 4-5. Load PCR Tube

1. Empty PCR-Setup Area      2. Portable PCR Consumable Holder      3. 96 PCR Plate

- ❗ **Reminding:** User shall select the PCR reaction consumables to be loaded according to the requirements of subsequent experiment.
- ❗ **Reminding:** Please load the 8 strip PCR tube vertically from left to right.
- ❗ **Reminding:** Please ensure the firm contact between the PCR tube and the wall of PCR tube holder well.
- ❗ **Reminding:** The PCR tube quantity needs to meet the experimental requirements, the PANA system will automatically prompt in case the quantity of PCR tubes is insufficient.
- ⚠ **Caution:** Before startup the experiment, please remember to open the PCR tube cap, otherwise may result in experiment failure and instrument damage.

### 4.3.3 Load Reagent and Premix Consumables

PANA Workstation's reagent and premix area is composed of reagent area and premix area, as shown in figure 4-6. This area is functioned with barcode scan and refrigeration in the range of 4-15°C. The user could insert the reagent bottle and premix bottle in to reagent and premix holder, and then push the reagent and premix holder in to reagent and premix area.

- a. Reagent area: This area can load 5 reagent holders, each of which is able to hold 1-6 reagent bottle(s). 1# reagent holder is for loading the reagent groups for extraction, such as Protein K, etc while 2#-5# reagent holders are for loading PCR reagent and are able to hold 4 groups of PCR reagent.
- b. Premix Area: This area can load 1 premix holder where is able to hold 1-6 premix bottle(s).

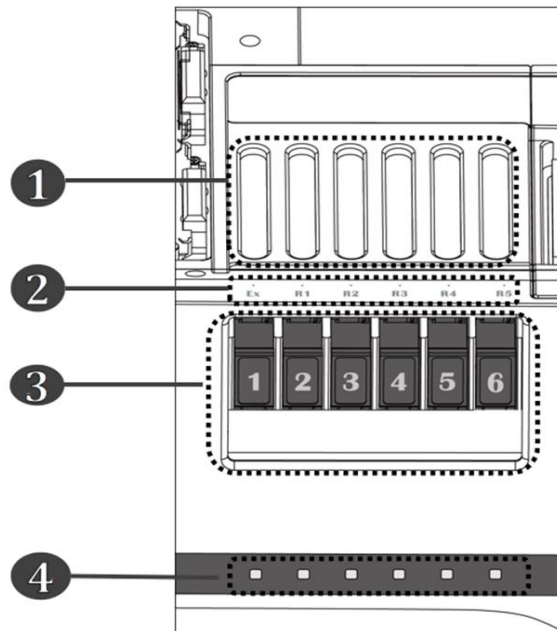


Figure 4-6. Load Reagent Holder and Premix Bottle

1. Reagent Area Grating
3. Holder Loading Area

2. Holder Position Tab
4. Holder Status Indicator

- ⚠ **Caution:** Please first insert the reagent/premix bottle into the bottom of reagent/premix holder and decap the reagent/premix bottle, or it may result in experiment failure and even damage auto pipetting module.
- ⚠ **Caution:** After successfully loads reagent/premix holder, the indicate light will turn green. If it doesn't turn green, please check whether the reagent/premix holder is loaded properly. The user can push in and pull out the reagent/premix holder for several times till the holder reaches to the end of reagent/premix area and the light turns green. If the light is not green, it may fail to premix and load reagent and even damage instrument.
- ⚠ **Caution:** Please unfreeze the reagent component before load it into the reagent cabin. Otherwise, the pipetting accuracy will be affected and may result in instrument damage.

### 4.3.4 Load Deep Well Plate and Rod Cover

Please load the deep well plate which contain the nucleic acid extraction reagent on the extraction moveable loading platform, and according to the experiment requirements, insert the rod covers into the corresponding wells of each deep well plate, as shown in figure 4-7.

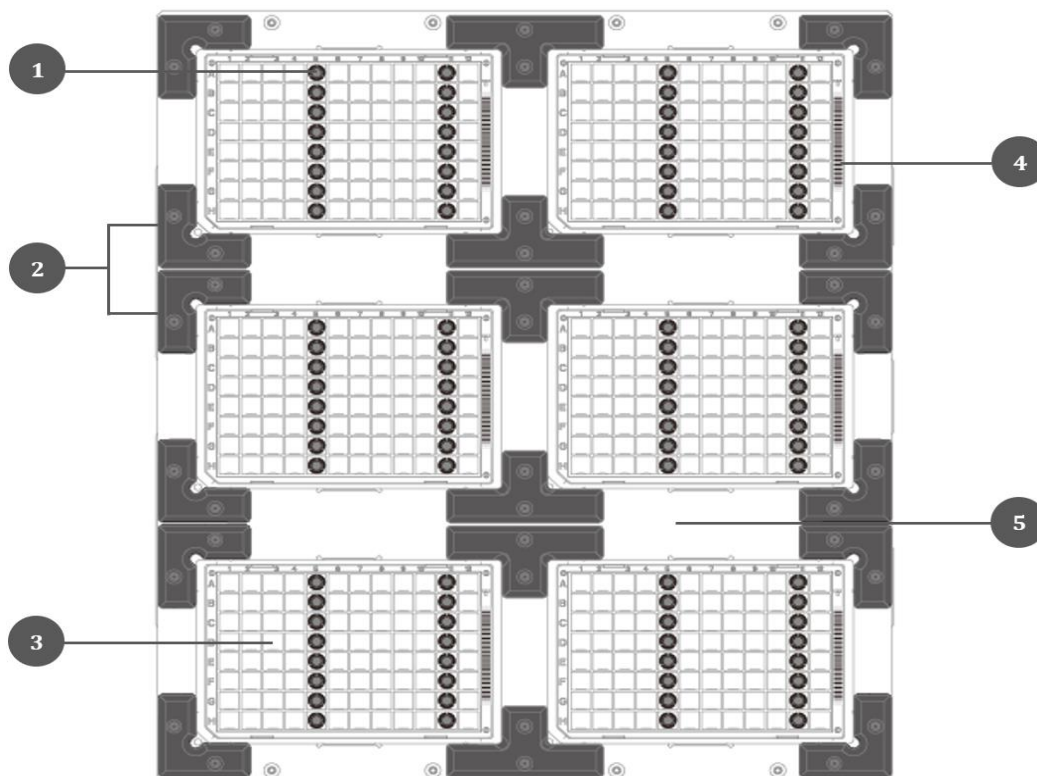


Figure 4-7. Load Deep Well Plate and Rod Cover

- |                     |                              |                    |
|---------------------|------------------------------|--------------------|
| 1. Rod Cover        | 2. Positioning Corner        | 3. Deep Well Plate |
| 4. Reagent Bar Code | 5. Moveable Loading Platform |                    |

- ⚠ Reminding:** Before load the deep well plate, please first remove its outer packing, and shake the deep well plate in order to thoroughly mix the prepackaged reagents and magnetic beads within. Then, gently swing the deep well plate (or centrifuge it), so that the prepackaged reagents are concentrated at the bottom of each well. Finally, please open the sealing aluminum film of the deep well plate.
- ⚠ Reminding:** Before load the deep well plate, please carefully checked the type of nucleic acid extraction reagent, and ensure the bar code on the deep well plate is complete and clear, so that the information of the extraction reagent can be accurately read by the instrument.
- ⚠ Reminding:** When load the deep well plate, please hold two sides of the deep well plate, aim its broken corner to the lower left positioning corner, and then press the deep well plate downward to stuck it among the four positioning corners.
- ⚠ Caution:** Before startup the experiment, please make sure that the right number of rod covers have been loaded into the correct positions of the deep well plate according to the software prompt, otherwise may result in experiment failure and the magnetic rod will be directly immersed into the liquid reagent, result in the magnetic rod damage.

### 4.3.5 Load Sample Tube and Sample Holder

Please insert the sample tube into the sample holder according to the sample setting in the PANA system software, as shown in figure 4-8.

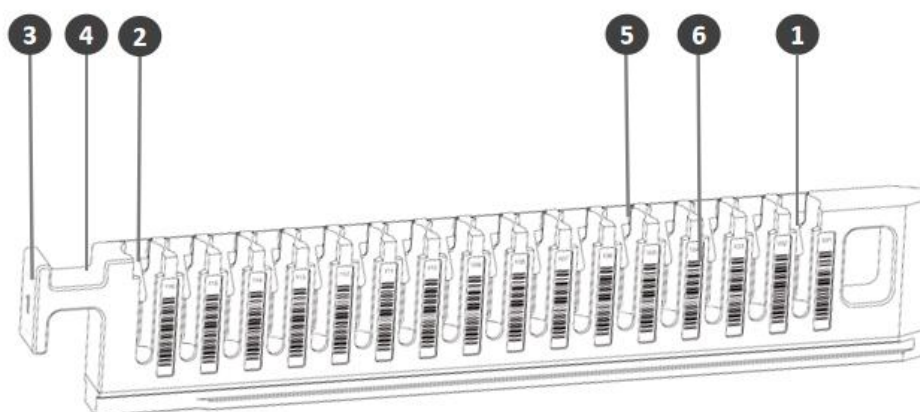











Figure 4-8. Sample Holder

- |   |                                 |
|---|---------------------------------|
| 1. Sample Tube Position No.1            | 2. Sample Tube Position No.16   |
| 3. Sample Holder QR Code                | 4. Sample Holder Handle         |
| 5. Sample Tube Bar Code Scanning Window | 6. Sample Tube Position Barcode |

-  **Reminding:** Before startup the experiment, please first record the sample information according to the requirements of laboratory operation and mark the special sample states such as hyperlipidemia, hyperbilirubinemia, hemolysis and so on, so as to carry on the data query and the final test data analysis.
-  **Reminding:** Before loading the sample, please complete the sample centrifugation and other pre-processing operations according to the experimental requirements, and add or divide the prepared samples into sample tubes.
-  **Caution:** User should complete the sample adding or dividing in the biosafety cabinet.
-  **Caution:** The air displacement pipettor (ADP) of the auto pipetting module can automatically detect the liquid level. Therefore, the sample volume in the sample tube should meet the minimum liquid level detection requirement (the sample volume in the blood collection tube should be greater than 100 $\mu$ L and the sample volume in the centrifuge tube should be greater than 50 $\mu$ L), otherwise may result in sample adding failure.
-  **Caution:** In order to ensure the stability and accuracy of sample adding, the sample volume in the sample tube should exceed the theoretical volume required by the experiment. (the sample volume in the blood collection tube should be at least 100 $\mu$ L more than the theoretical volume, and the sample volume in the centrifuge tube should be at least 50 $\mu$ L more than the theoretical volume).
-  **Caution:** Please insert the sample tube into the bottom of the sample holder and align the sample tube bar code with the sample tube bar code scanning window, otherwise the PANA Workstation will not be able to read and input the sample information.
-  **Caution:** Before startup the experiment, please take the sample tube caps and number the the sample tube caps accordingly, save properly. In case the centrifuge tubes are used, please open the sample tube cap and ensure that the caps do not block the other sample tubes, otherwise may result in experiment failure and instrument damage.

After insert the sample tubes into the sample holder, please hold the sample holder, and slowly push the sample holder along the track from the sample cabin entrance, as shown in figure 4-9.

-  **Reminding:** When loading the sample holder, please slowly push the sample holder to the end of the track. After this, the indicator light of the track will turn green.
-  **Reminding:** PANA Workstation is equipped with a code scanner. In the progress of sample holder loading, the code scanner will automatically scan the sample tube bar code and the sample tube position bar code, and input the relevant sample information into the PANA system software.

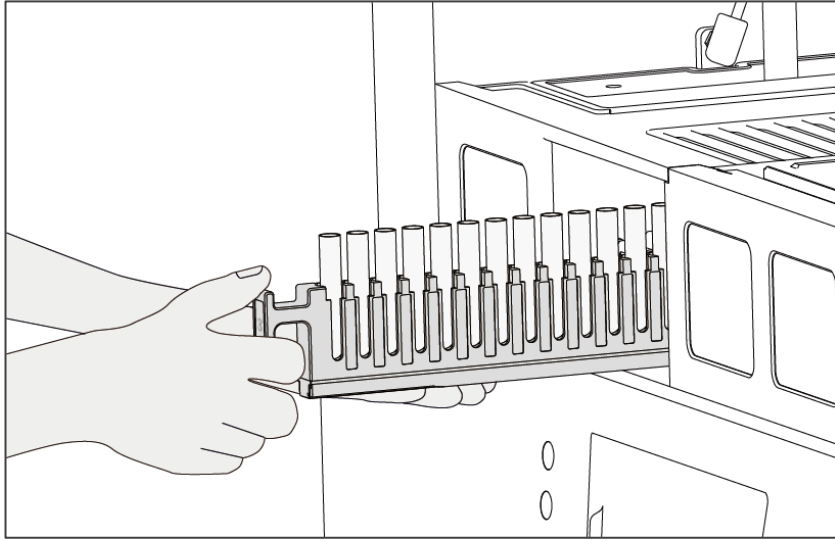


Figure 4-9. Load Sample Holder

## 5. PANA System Software Operation

This section introduces the basic functions of the PANA system software. User only need to choose the experiment item and complete the sample setting. The PANA Workstation will automatically perform the whole experiment flow, which includes automatic sample addition, nucleic acid extraction and PCR reaction system.

### 5.1 Main Interface




The PANA system software will automatically enter the main interface after login, as shown in figure 5-1.



Figure 5-1. PANA System Software - Main Interface

The main interface of PANA system software interface is consisted of following 4 parts:

### 1) Menu Bar





The menu bar of is consisted of <  **Experiment Setting** >, <  **Experiment Monitor** > and <  **General Setting** > three tabs, which are used to call the corresponding system software interface.

### 2) Main Display Area

User can click any tab in the menu bar, and the system software will display the concrete content of the selected tab in the main display area of corresponding interface.






### 3) Toolbar

The function tab bar of the system software consists of following four keys:

- ▶ <  **UVGI** >: User can click this key to perform the PANA Workstation UV light disinfection.
- ▶ <  **Temp.** >: User can click this key to view the temperature status of the reagent cabin and the extraction heating bars.
- ▶ <  **Reset** >: User can click this key to reset all components of the PANA Workstation.
- ▶ <  **About** >: User can click this key to view the current system version information of the PANA Workstation.

### 4) Information and Shortcut Bar

The information and shortcut bar display the current system status of the PANA Workstation, including prompt information, login user account and system time; At the same time, this bar also includes three shortcut operation keys.

- ▶  **Prompt Info.**: The white icon represents the normal system status. However, this icon will turn yellow or red when a certain system error occurs, and the corresponding prompt information will be shown.
- ▶  **User Account**: Displays the currently logged-in user account of PANA system.
- ▶ **System Time**: Displays the system time of the current PANA system.
- ▶ <  **Start** >: User can click this key to start running the current experiment.
- ▶ <  **Stop** >: User can click this key to stop the currently running experiment.
- ▶ <  **Shutdown** >: User can click this key to shutdown the PANA system.



## 5.2 Experiment Setting







User can click the <  **Experiment Setting** > tab in the menu bar of PANA system software, the system software will automatically enter the experiment setting interface, as shown in figure 5-2. The experiment setting interface consists of following three columns:  **Experiment Item**,  **Sample Setting** and  **Reagent/Consumable**.



Figure 5-2. PANA System Software - Experiment Setting Interface

### 5.2.1 Experiment Item

User can click the  **Item Bar** in the  **Experiment Item** column on the experiment setting interface, choose the corresponding experiment item in the drop-down menu. User can also click < **Details** >, the PANA system software will pop up the experiment item window, as shown in figure 5-3.

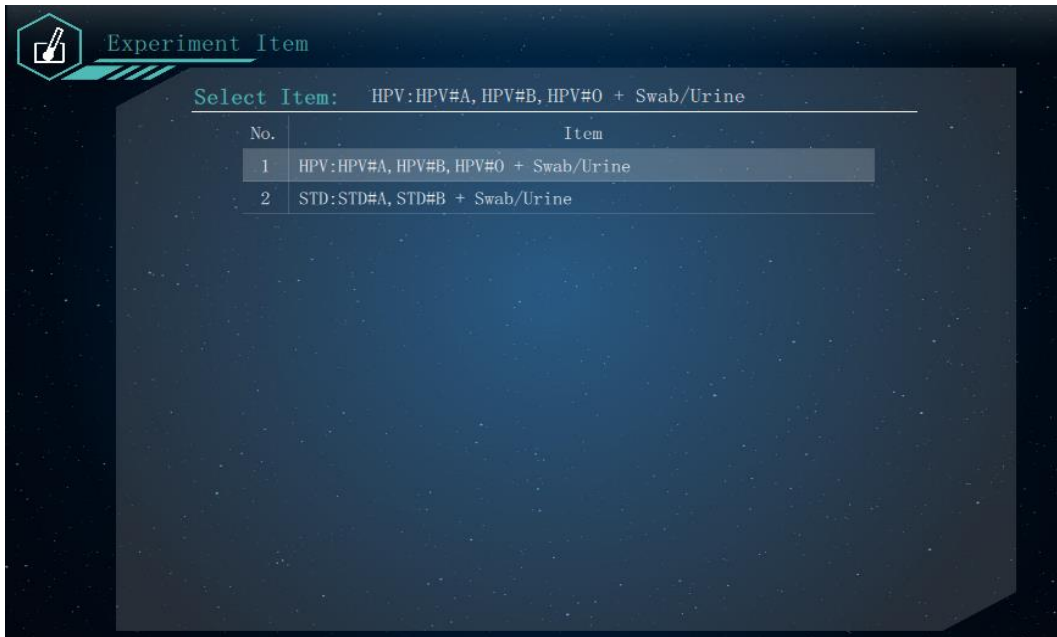


Figure 5-3. Experiment Setting Interface - Experiment Item Window

## 5.2.2 Sample Setting

User can click the **Sample Qty. : 0 + 0** in the **Sample Setting** column on the experiment setting interface, set the sample quantity in the drop-down menu, as shown in figure 5-4.

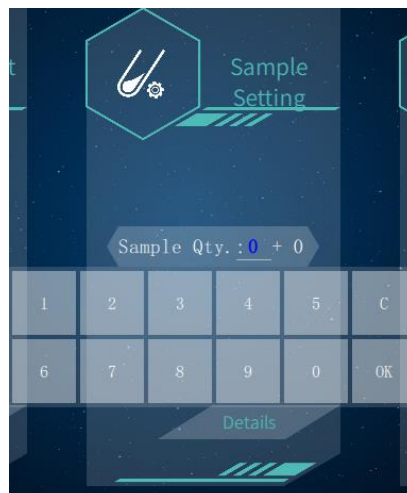


Figure 5-4. Experiment Setting Interface – Sample Quantity Setting

- ❗ **Reminding:** User can set the quantity of sample + the quantity of quality control and standard product in the drop-down menu.
- ❗ **Reminding:** The quality control and standard products should be placed behind the

sample during the sample loading.

User can also click < **Details** >, the software will pop up the sample setting window, as shown in figure 5-4.



Figure 5-4. Experiment setting interface - Sample Setting Window

The sample setting window consists of **Sample No.**, **Sample Type**, **Test Item**, **Std/Control** four sub-tabs and sample area. The sample area is divided into six columns, 16 samples per column. It corresponds to the six sample holders in the sample cabin. User can select one or more sample(s) and perform the sample setting in the left sub-tabs for the selected sample(s).

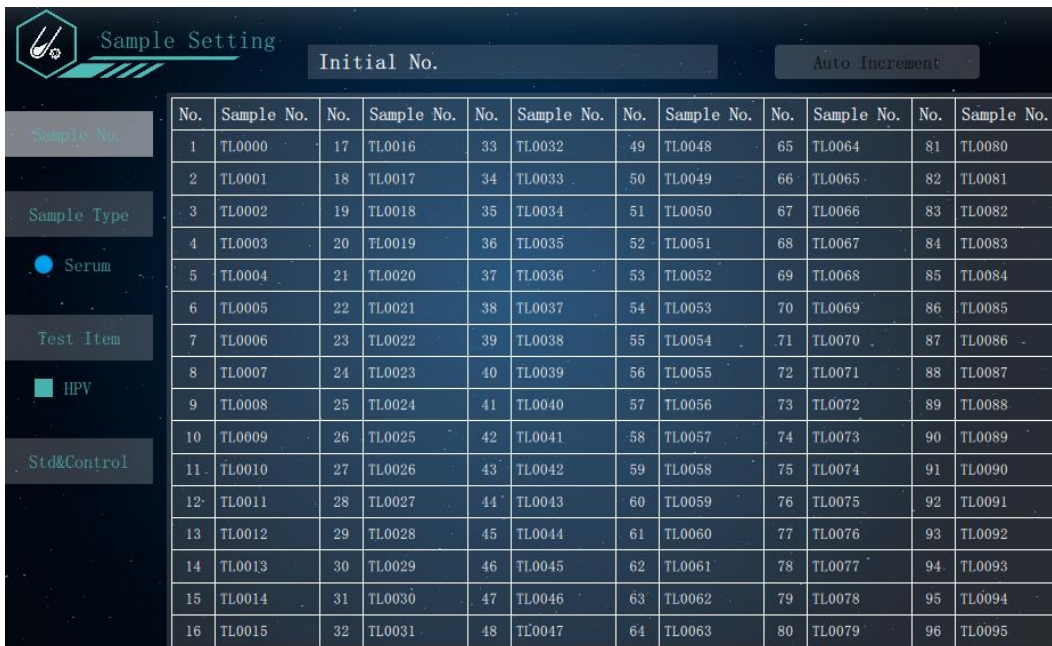
**!** **Reminding:**

- The serial number of the samples on the 1<sup>st</sup> sample holder is from 01 to 16;
- The serial number of the samples on the 2<sup>nd</sup> sample holder is from 17 to 32;
- The serial number of the samples on the 3<sup>rd</sup> sample holder is from 33 to 48;
- The serial number of the samples on the 4<sup>th</sup> sample holder is from 49 to 64;
- The serial number of the samples on the 5<sup>th</sup> sample holder is from 65 to 80;
- The serial number of the samples on the 6<sup>th</sup> sample holder is from 81 to 96.

- ▶ **Sample No.:** User can click the **Sample No.** sub-tab to set the sample number, as shown in figure 5-5. User can select one or more sample(s) and number them in the **Sample No.** column.

- !** **Reminding:** User can also select more than one sample, enter the initial sample number in the **Initial No.** input box, and click **Auto Increment**, the system software will

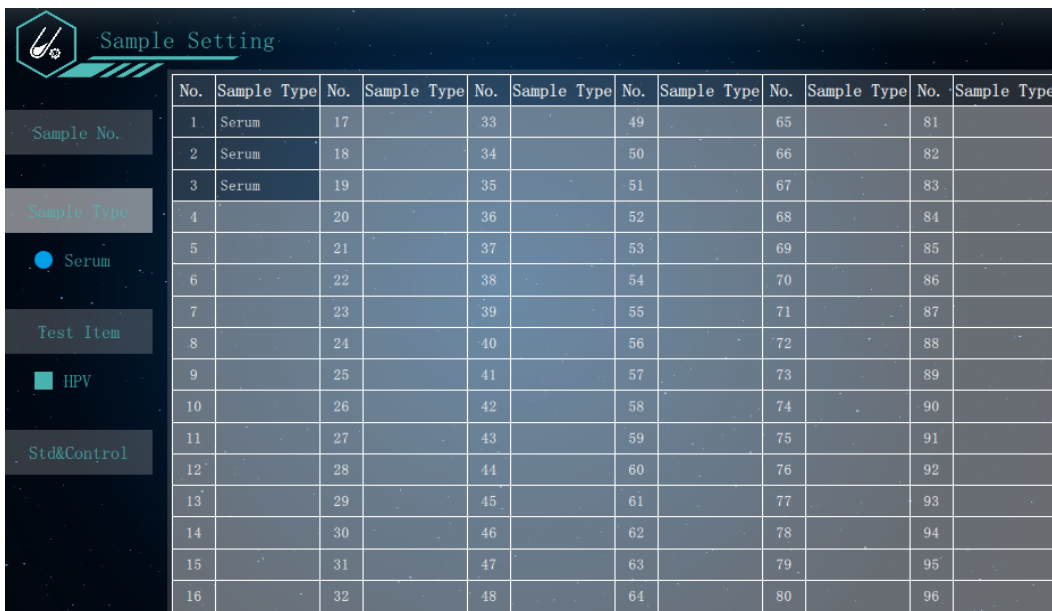
automatically number the selected samples according to their serial number.



No.	Sample No.	No.	Sample No.	No.	Sample No.	No.	Sample No.	No.	Sample No.	No.	Sample No.
1	TL0000	17	TL0016	33	TL0032	49	TL0048	65	TL0064	81	TL0080
2	TL0001	18	TL0017	34	TL0033	50	TL0049	66	TL0065	82	TL0081
3	TL0002	19	TL0018	35	TL0034	51	TL0050	67	TL0066	83	TL0082
4	TL0003	20	TL0019	36	TL0035	52	TL0051	68	TL0067	84	TL0083
5	TL0004	21	TL0020	37	TL0036	53	TL0052	69	TL0068	85	TL0084
6	TL0005	22	TL0021	38	TL0037	54	TL0053	70	TL0069	86	TL0085
7	TL0006	23	TL0022	39	TL0038	55	TL0054	71	TL0070	87	TL0086
8	TL0007	24	TL0023	40	TL0039	56	TL0055	72	TL0071	88	TL0087
9	TL0008	25	TL0024	41	TL0040	57	TL0056	73	TL0072	89	TL0088
10	TL0009	26	TL0025	42	TL0041	58	TL0057	74	TL0073	90	TL0089
11	TL0010	27	TL0026	43	TL0042	59	TL0058	75	TL0074	91	TL0090
12	TL0011	28	TL0027	44	TL0043	60	TL0059	76	TL0075	92	TL0091
13	TL0012	29	TL0028	45	TL0044	61	TL0060	77	TL0076	93	TL0092
14	TL0013	30	TL0029	46	TL0045	62	TL0061	78	TL0077	94	TL0093
15	TL0014	31	TL0030	47	TL0046	63	TL0062	79	TL0078	95	TL0094
16	TL0015	32	TL0031	48	TL0047	64	TL0063	80	TL0079	96	TL0095

Figure 5-5. Sample Setting Window- Sample Number Setting

- **Sample Type:** User can click the **Sample Type** subtab to set the sample type, as shown in figure 5-6. User can select one or more sample(s) and choose the corresponding sample type for the selected sample(s).



No.	Sample Type	No.	Sample Type	No.	Sample Type	No.	Sample Type	No.	Sample Type	No.	Sample Type
1	Serum	17		33		49		65		81	
2	Serum	18		34		50		66		82	
3	Serum	19		35		51		67		83	
4		20		36		52		68		84	
5		21		37		53		69		85	
6		22		38		54		70		86	
7		23		39		55		71		87	
8		24		40		56		72		88	
9		25		41		57		73		89	
10		26		42		58		74		90	
11		27		43		59		75		91	
12		28		44		60		76		92	
13		29		45		61		77		93	
14		30		46		62		78		94	
15		31		47		63		79		95	
16		32		48		64		80		96	

Figure 5-6. Sample Setting Window- Sample Type Setting

- ▶ **Test Item:** If there are multiple test items of the current experiment item. user can click the **Test Item** subtab to set the test item, as shown in figure 5-7. User can select one or more samples and choose the corresponding test item(s) for the selected sample(s).

No.	Test Item	No.	Test Item	No.	Test Item	No.	Test Item	No.	Test Item	No.	Test Item
1	HPV	17		33		49		65		81	
2	HPV	18		34		50		66		82	
3	HPV	19		35		51		67		83	
4		20		36		52		68		84	
5		21		37		53		69		85	
6		22		38		54		70		86	
7		23		39		55		71		87	
8		24		40		56		72		88	
9		25		41		57		73		89	
10		26		42		58		74		90	
11		27		43		59		75		91	
12		28		44		60		76		92	
13		29		45		61		77		93	
14		30		46		62		78		94	
15		31		47		63		79		95	
16		32		48		64		80		96	

Figure 5-7. Sample Setting Window- Test Item Setting

- ▶ **Std/Control:** If there are multiple standard samples and multiple types of QC samples of the current experiment item. user can click the **Std/Control** subtab to set the choose the standard sample(s) and QC sample(s), as shown in figure 5-8.

Figure 5-8. Sample Setting Window- Std and Control Setting



### 5.2.3 Reagent/Consumable

The system software of PANA Workstation can automatically analyze the requirement information of reagent and consumable according to the input of **Experiment Item** and **Sample Setting**. User can click < **Details** > in the **Reagent/Consumable** column on the experiment setting interface and query this requirement information in the pop-up reagent/consumable window.

The reagent/consumable window consists of **Reagent Prepare** and **Consumable Prepare** two subtabs. The reagent/consumable window displays the **Reagent Prepare** subtab by default, as shown in figure 5-9. User can prepare the corresponding reagent holder, reagent bottle, premix bottle and reagent components in the reagent cabin of the PANA Workstation according to the information supplied by the **Reagent Prepare** subtab.

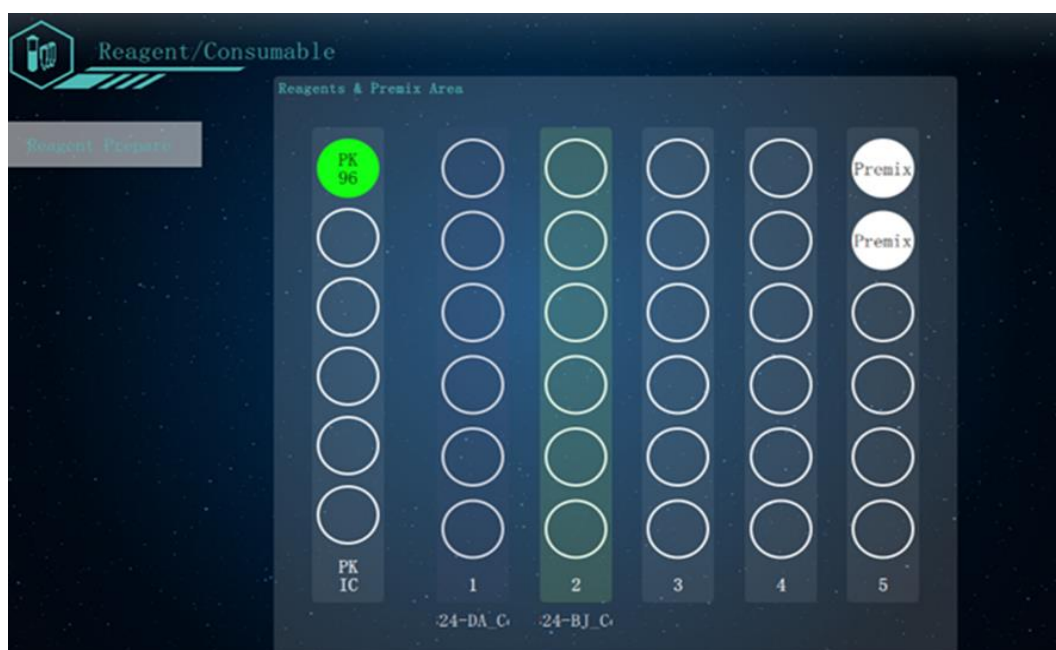







Figure 5-9. Reagent/consumable Window - Reagent Prepare Subtab

- Reminding:** After start up the experiment, the PANA Workstation will scan the code of the extraction and PCR reagents. If the result shows that the reagent information does not match the input of **Experiment Item**, the system software will automatically remind user to check the extraction reagent and PCR reagent.
- Reminding:** PANA Workstation will scan the reagent holders, reagent bottles, premix bottles in the reagent cabin. If the result shows these consumable quantity and position do not match the input of **Experiment Item** and **Sample Setting**, the system software will automatically remind user to check the consumable quantity and position.

- ❗ **Reminding:** PANA system possess the barcode scanning function. The positions of R1-R4 reagent holder in the reagent cabin and reagent bottles in all reagent holders can be placed at will. The instrument can automatically identify reagent components accordingly.
- ❗ **Reminding:** If the user has turn off the barcode scanning function, please place the reagent rack and reagent bottle in the corresponding position, as shown in figure 4-6.

## 5.3 Startup the Experiment

After complete the experiment setting, user can click the shortcut operation key on the system software interface to start running the experiment. In addition, user can also pause or stop the currently running experiment during the experiment progress.

- ▶ <  **Start** >: User can click this key to start running the current experiment.
- ▶ <  **Pause** >: The <  **Start** > key will switch to <  **Pause** > key after start up the experiment, user can click this key to pause the currently running experiment.
- ▶ <  **Stop** >: User can click this key to stop the currently running experiment.

## 5.4 Experiment Monitor

After start up the experiment, the PANA system software will automatically enter the experiment monitor interface, as shown in figure 5-10.

The experiment monitor interface consists of two parts: experiment cabin monitor area and experiment program monitor area. User can real time monitor the experiment program and all the operation in the experiment cabin of the PANA Workstation.

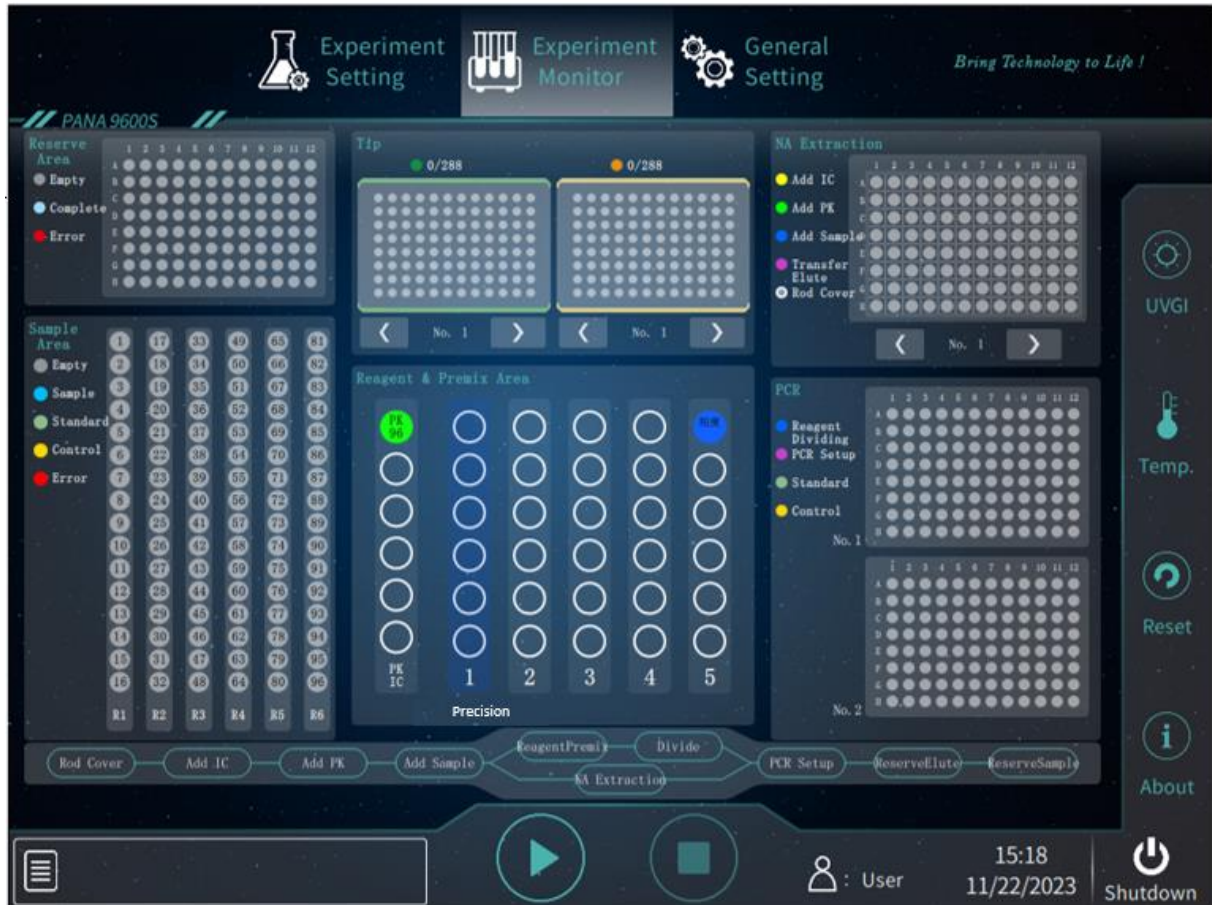


Figure 5-10. PANA System Software - Experiment Monitor Interface

### 5.4.1 Experiment Cabin Monitor Area





The experiment cabin monitor area corresponds to the arrangement of experiment cabin of PANA Workstation, as shown in figure 5-11. After start up the experiment, user can monitor all the operations occur in the experiment cabin in real time.





Figure 5-11. Experiment Monitor Interface - Experiment Cabin Monitor Area

While running, user can real-time monitor all the operations occur in the experiment cabin.

- ❗ **Reminding:** There are different colored labels in the *Reserve Area*, *Sample Area*, *Tip Area*, *NA Extraction Area*, *Reagent & Premix Area* and *PCR Area* of the experiment cabin monitor area, that represent different sample and consumable state respectively.
- ▶ **Reserve Area:** Display the real time position and status of sample or nucleic acid extracted reservation during the experiment process.
- ▶ **Sample Area:** Display the real time position and status of sample adding during the experiment process.
- ▶ **Tip Area:** Display the real time quantity of tip and their position during the experiment process.
- ❗ **Reminding:** User can click  or  to check different tip holders and the different color of tip holders represent different tip specifications.
  - Yellow tip holder load 1000 $\mu$ L tips;
  - Green tip holder c load 50 $\mu$ L tips.
- ▶ **NA Extraction Area:** Display the real time position and status of nucleic acid extraction during the experiment process.
- ❗ **Reminding:** User can click  or  to check different deep well plates.
- ▶ **Reagent & Premix Area:** Display the real time position and status of reagent adding and pre-mixing during the experiment process.

- ▶ **PCR Area:** Display the real time position and status of PCR reagent system setting up during the experiment process.

## 5.4.2 Experiment Program Monitor Area

After start up the experiment, the experiment program monitor area will be activated, as shown in figure 5-12. And highlight the currently running experiment step(s).

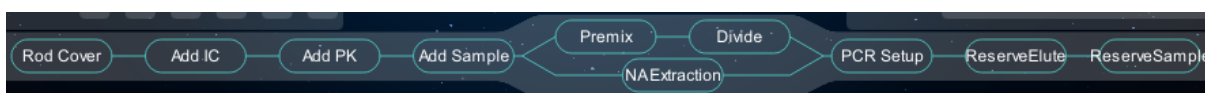



Figure 5-12. Experiment Monitor Interface - Experiment Program Monitor Area

## 5.5 General Setting

User can click <  **General Setting** > tab in the menu bar to enter the general setting interface. The general setting interface consists of **Maintenance** and **Setting** two subtabs.

### 5.5.1 Maintenance Subtab

The general setting interface displays the **Maintenance** subtab by default, as shown in figure 5-13. The **Maintenance** subtab consists of 5 function keys.

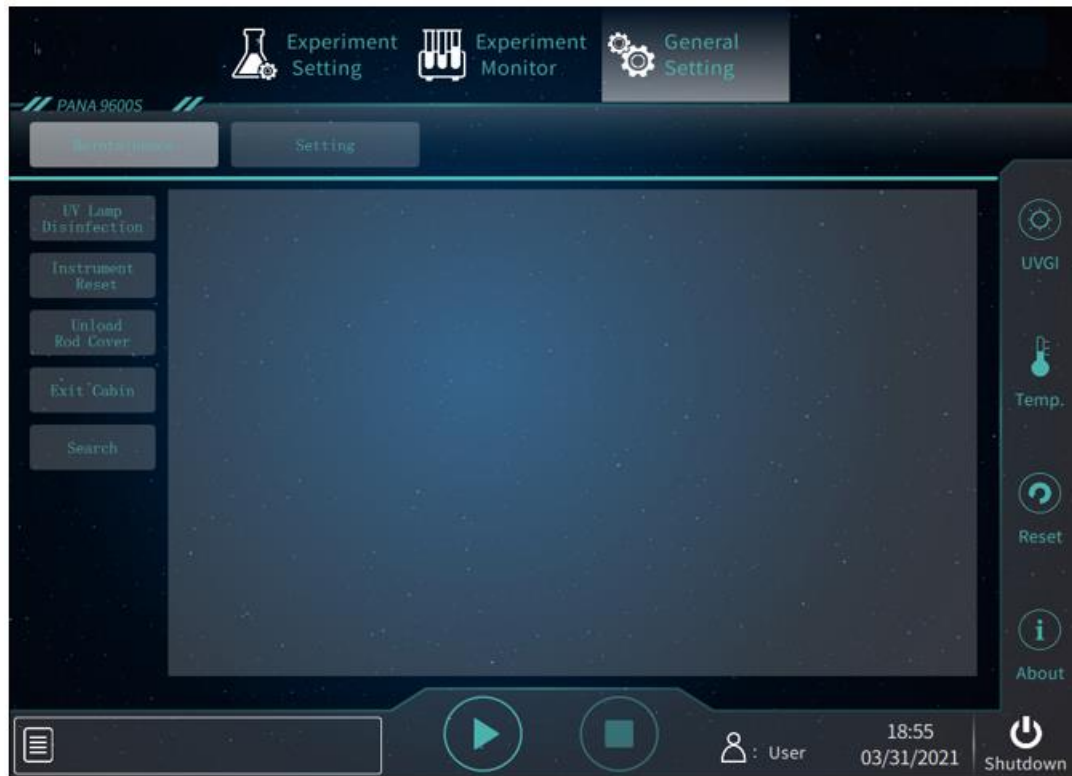


Figure 5-13. PANA System Software - General Setting Interface - Maintenance Subtab

1. < **UV Lamp Disinfection** >: User click this function key, the PANA system software will automatically pop up the UV lamp disinfection window, and user can click **Start** and **Stop** to start or end the UV lamp disinfection process, as shown in figure 5-13a.

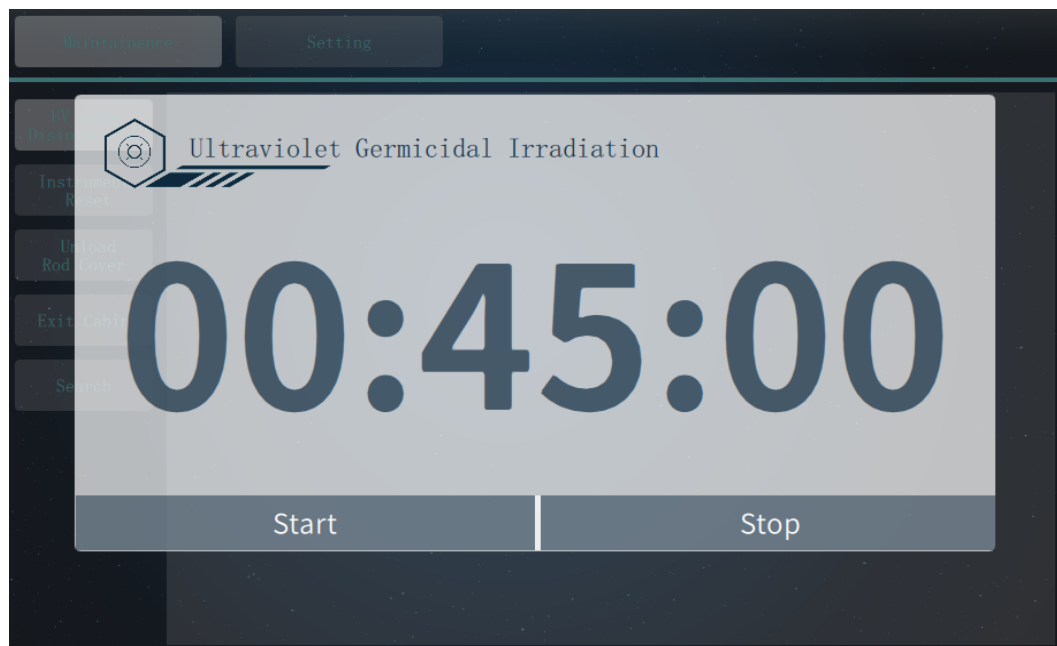


Figure 5-13a. Maintenance Subtab - UV Lamp Disinfection

2. < **Instrument Reset** >: If the experiment program was paused or stopped, user can click this function key to reset all components of the PANA Workstation.
3. < **Unload Rod Cover** >: If the experiment program was paused or stopped, user can click this function key to unload the rod covers.
4. < **Exit Cabin** >: If the experiment program was paused or stopped, user can click this function key to exit the extraction loading movable platform out of the extraction cabin.
5. < **Search** >: User can click this function key to query the recent experiment records, as shown in figure 5-13b.

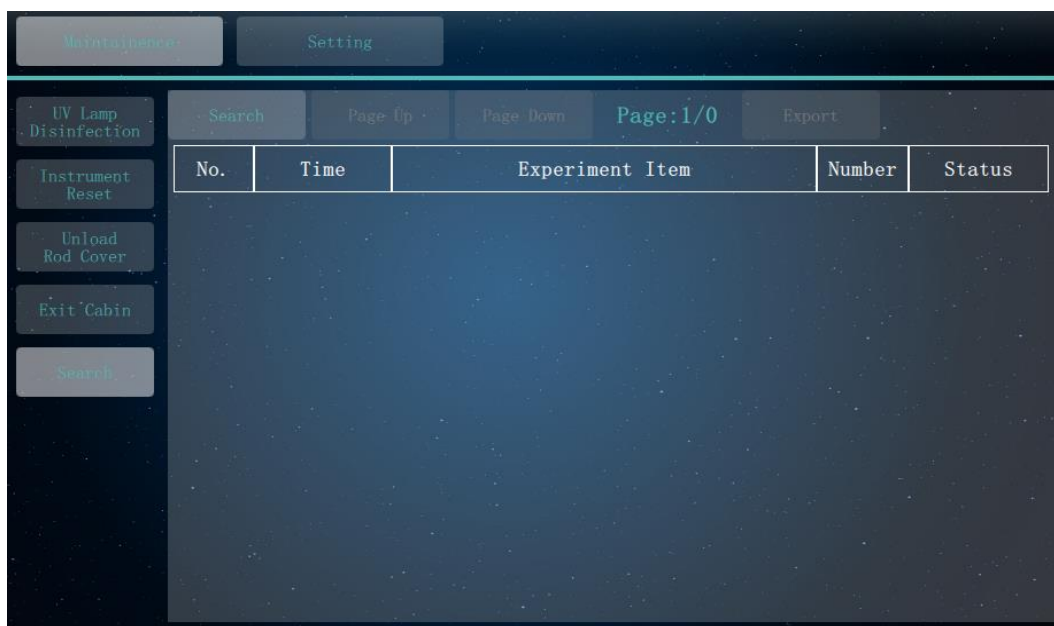


Figure 5-13b. Maintenance Subtab - Search

## 5.5.2 Setting Subtab

User can click the **Setting** subtab, and the general setting interface will be shown as figure 5-15. The **Setting** subtab consists of three function keys.

1. < **Program Setting** >: User can click this function key to set the experiment program setups. User can check the corresponding check box to select the setup(s) included in the experiment program, as shown in figure 5-14a.

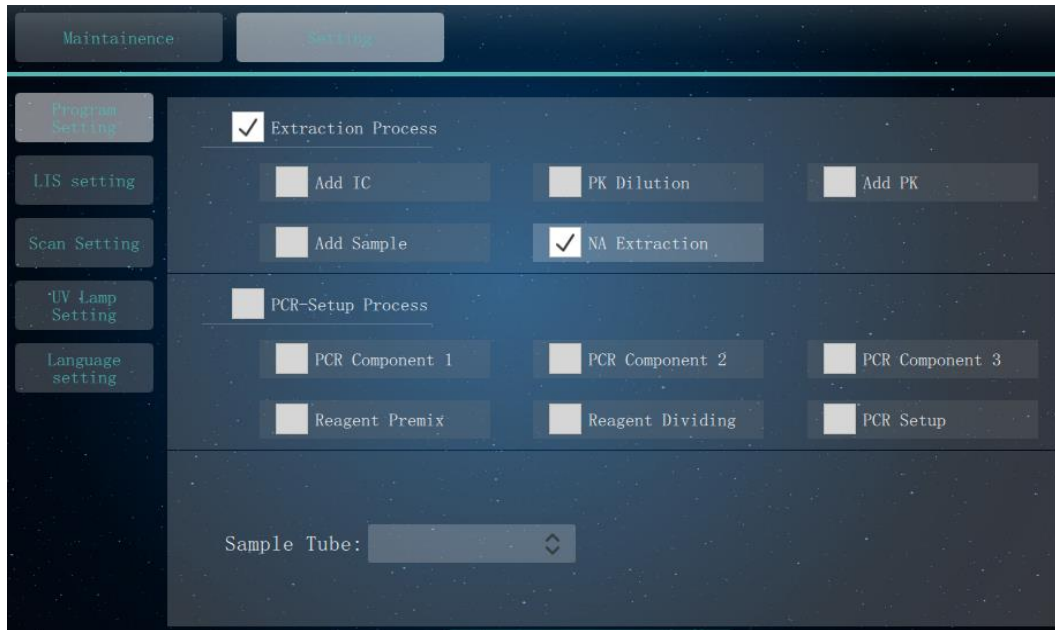


Figure 5-14a. Setting Subtab – Program Setting

2. < **LIS Setting** >: User can click this function key for LIS communication settings, as shown in figure 5-14b.



Figure 5-14b. Setting Subtab – Communication Setting

3. < **Barcode Setting** >: User can click this function key for barcode settings, as shown in figure 5-14c. User can check the check box of **Sample scan** or **Reagent scan** to open corresponding barcode scanning function.

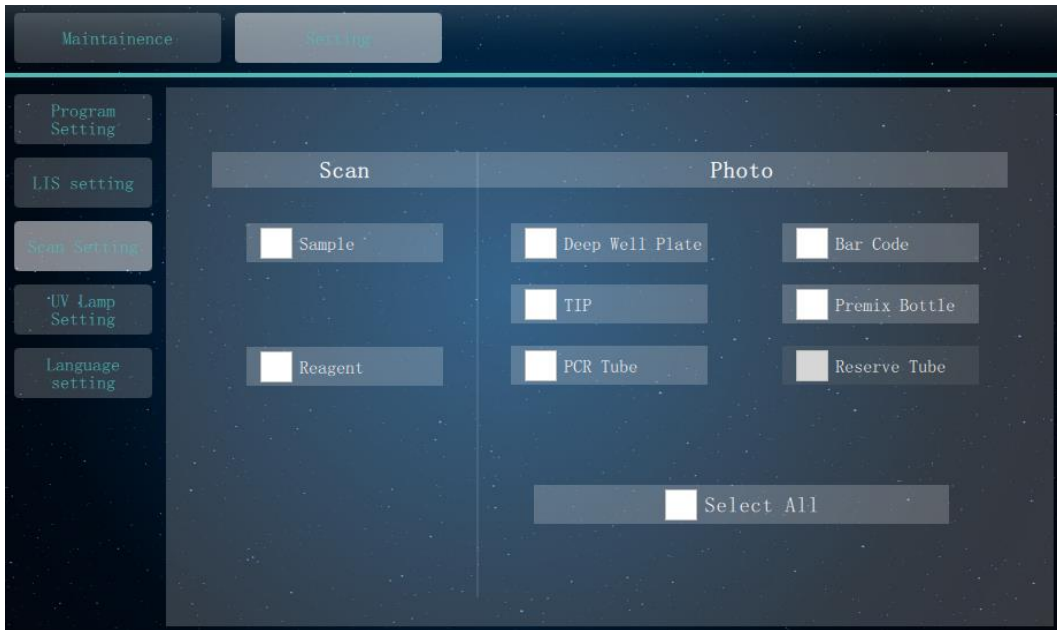


Figure 5-14c. Setting Subtab – Scan Setting

- ▶ **< UV Lamp Setting >**: User can click this function key to set the UV lamp disinfection time, as shown in figure 5-14d. User can enter the UV lamp disinfection time and click **< Confirm >** to confirm the setting.

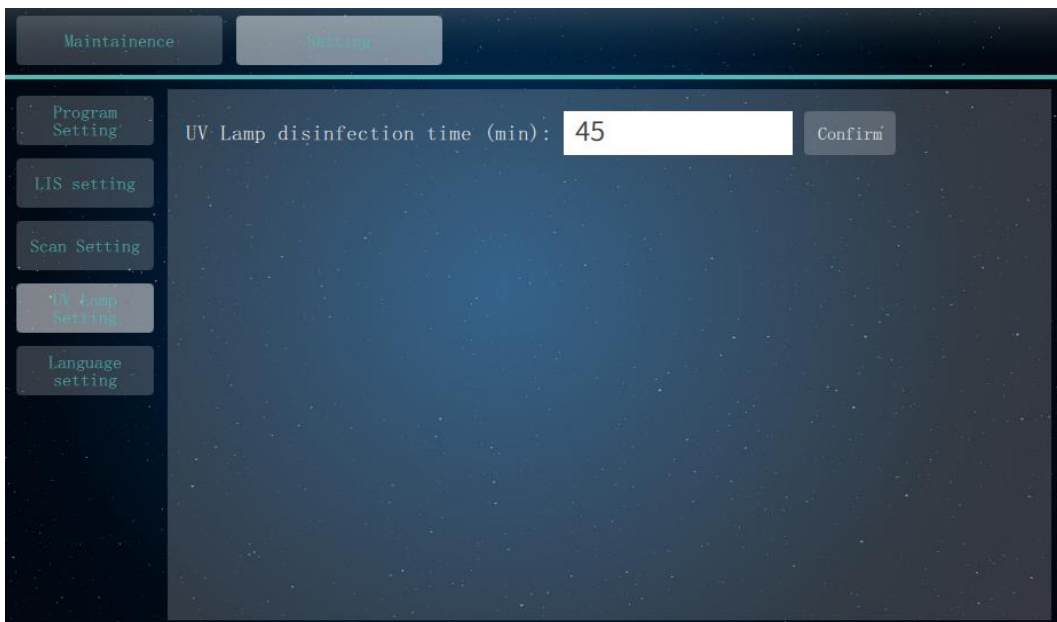


Figure 5-14d. Setting Subtab – UV Lamp Setting

- ▶ **< Language Setting >**: User can click on this function key to set the system language, as shown in figure 5-14e. PANA system software provides two system languages by default:



Chinese and English, user can click on this function key and check the corresponding check box to set the system language.

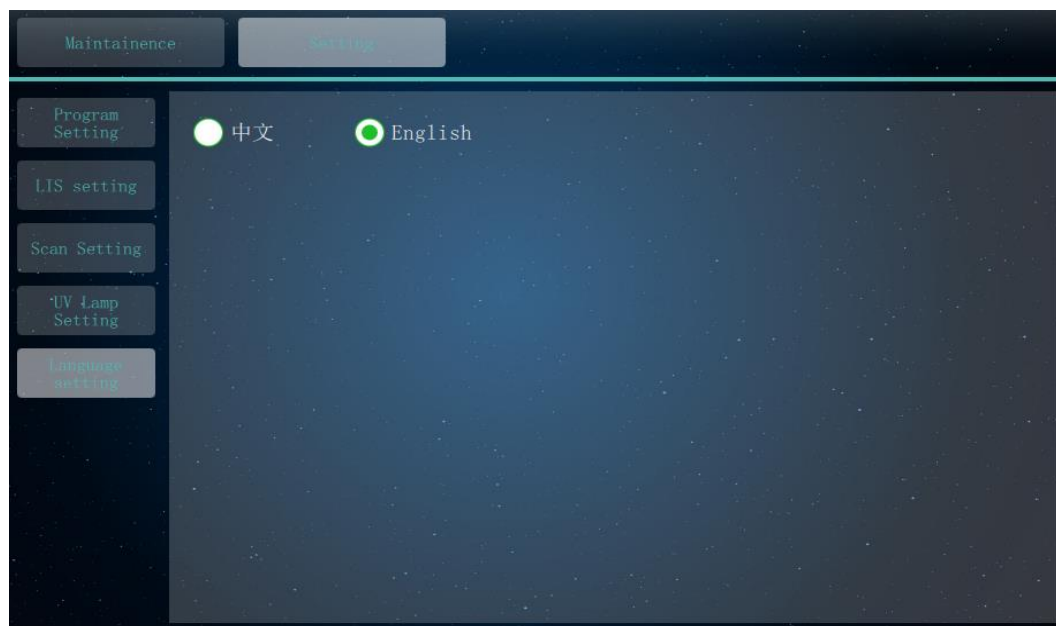








Figure 5-14e. Setting Subtab – Language Setting

## 6. Instrument Cleaning and Maintenance

Under proper use condition, the PANA Workstation requires little maintenance. However, the PANA Workstation should be cleaned and maintained on a regular schedule for long time and constant use. This section includes the information on cleaning and maintenance of the PANA Workstation.

### 6.1 Instrument Cleaning Operation Instructions

The PANA Workstation should be cleaned on a regular schedule (every other month), please carefully read the following instructions before cleaning the instrument.


-  **Prohibit:** Never clean the instrument when it is electrified.
-  **Prohibit:** Never pour water or other solutions in into the sample cabin, extraction cabin block, reagent cabin or any interior parts with in the experiment cabin. Fluids can cause electrical shock when the instrument is electrified.
-  **Caution:** Ethanol is a flammable and volatile liquid, it's exposure may irritate eyes, skin and respiratory tract, and may lead to central nervous system hypofunction and liver damage. Please wear appropriate protective goggles, clothing and gloves, when using ethanol to clean.
-  **High-Temp:** The heating bars on the extraction movable loading platform may produce high temperature during running, do not clean these heating bars until they reach the room temperature.
-  **Biohazard:** Please regard all samples as potential biohazard materials, universal safety precautions should be taken when handling or processing samples. Samples pills should be immediately disinfected with an appropriate disinfectant solution to avoid equipment contamination or user's personnel injury.
-  **Biohazard:** Do not treat or operate any potential biohazard samples without taking any safety precautions.




### 6.1.1 Clean Instrument Shell

**1<sup>st</sup> step:** Switch off the instrument and unplug the power cord;

**2<sup>nd</sup> step:** Clean the instrument shell with a piece of damp, soft cloth, and if needed, please rinse the cloth with mild commercial detergent for cleaning.

 **Prohibit:** Do not spray the detergent directly on the instrument, as malfunctions of the electronics or may occur.


 **Caution:** Please do not use organic or strong detergent to clean the instrument shell, which may ruin the surface coating.


### 6.1.2 Clean Touch Screen

**1<sup>st</sup> step:** Switch off the instrument and unplug the power cord;

**2<sup>nd</sup> step:** Gently wipe the touch screen with a piece of dry, soft cloth to remove dust, oil or fingerprints;

**3<sup>rd</sup> step:** If the touch screen is still not clean, use a piece of damp, soft cloth that moistened with low concentration isopropanol or ethanol to clean the touch screen in a gentle motion.

 **Prohibit:** Do not spray the detergent directly on the touch screen, as malfunctions of the electronics or may occur.

 **Caution:** Do not use abrasive detergent or rough material, as they may scratch the touch screen.

### 6.1.3 Clean Experiment Cabin

**1<sup>st</sup> step:** Open the experiment cabin, turn off the instrument and unplug the power cord.


**2<sup>nd</sup> step:** Take out all the samples, reagents, deep well plates, consumables and clean up the waste bin. please comply with the local or national applicable regulations to complete the disposal of waste and contaminated materials.


**3<sup>rd</sup> step:** Take out all the sample holders, reagent holders, PCR consumable holders, reserve consumable holders, drop capture and waste bin, keep the instrument on standby.

**4<sup>th</sup> step:** Spray medical alcohol or 75% alcohol on clean soft cloth or absorbent paper, wipe the inner surface of the instrument, sample area, tip area, reagent area, PCR-setup area, movable extraction loading platform and waste cabin.

**5<sup>th</sup> step:** Clean the sample holder, reagent holder, PCR consumable holder, reserve consumable holder, drop capture and waste bin with medical alcohol or 75% alcohol. Place new waste collection bag in the waste bin.

**6<sup>th</sup> step:** Place all the sample holders, reagent holders, PCR consumable holders, reserve consumable holders, drop capture and waste bin back to the instrument. Power on the PANA Workstation and conduct the UV disinfection. User can then perform the experiment or power off the instrument after the UV disinfection process.

 **Caution:** Do not clean the magnetic bar with metal instruments to protect the magnetic bar from damage.

 **Prohibit:** The instrument contains permanent strong magnetic field. Persons with pacemakers and metal prostheses are not allowed to clean or maintain the instrument. Strong magnetic field will affect the function of pacemakers or metal prostheses, and even cause damage.


### 6.1.4 Strengthen Cleaning

The sample objects of the PANA Workstation are nucleic acids, please consider all samples, reagents consumables are with potential biohazard, and please take applicable safety protection measures and wear appropriate protective goggles, clothing and gloves while processing these biohazard materials. In case of any biohazard liquid overflows during the operation, please immediately disinfect the contaminated area with appropriate detergent to avoid the spreading of contaminant, prevent the laboratory or instrument from biohazards, specific steps are as follows:

**1<sup>st</sup> step:** Open the experiment cabin, turn off the instrument and unplug the power cord.

**2<sup>nd</sup> step:** Clean the biohazard materials or stains from contaminated parts with wet blotting paper. If the stain is still stubborn, please use neutral detergent to clean again.

**3<sup>rd</sup> step:** Clean the contaminated parts thoroughly with water absorbent paper. In order to ensure the cleaning effect, please timely replace the absorbent paper, repeat this cleansing procedures 3 times. If the contaminated parts can be take out, flush these parts directly with running water.

 **Reminding:** Please clean the experiment cabin again as described in chapter 6.1.3 after the strengthen cleaning.

## 6.2 Instrument Maintenance Operation Instructions

### 6.2.1 Maintain Sufficient Air Flow


The placing area of PANA Workstation should be checked regularly, as it requires sufficient air flow to precisely reach the correct target temperature. Please ensure that the air flow is unrestricted and other items around the instrument do not interfering with the air flow.

### 6.2.2 Maintain Stable Power Supply

The PANA Workstation requires stable power supply for proper functioning, therefore its power supply should be checked regularly to ensure the consistent of instrument required voltage and the power supply voltage (allowable deviation  $\pm 10\%$ ). And make sure that the rated load of receptacle is no less than the requirement of instrument.


### 6.2.3 Maintain Instrument Cleanliness

- ▶ Please keep the instrument free of dust and liquid residue. Although the instrument is of good quality, immediately wipe off any salt, acid or alkali solution or organic solvent on the instrument to protect it from damage.
- ▶ Please keep the experiment cabin free of dust and liquid residue and clean it regularly.

 **Caution:** Although the instrument has passed the safety certification and test, when the experiment cabin is cleaned, it is strictly forbidden for the cleaning personnel to clean the instrument while it is running or in standby state, so as to avoid damaging the instrument or injuring the cleaning personnel.

### 6.2.4 Clean Waste Bin

The PANA Workstation will automatically unload the waste generated during the experiment program and throw them into the waste bin. It is requested to clean up the waste bin after the experiment.

 **Caution:** Before startup the experiment, user should confirm that waste bin has loaded with waste collection bag.

**⚠ Caution:** After the experiment, please comply with all applicable local or national regulations, dispose the biological pollutants in the waste bin within the waste cabin of the PANA Workstation, and replace the waste collection bag in the waste bin.

**⚠ Biohazard:** The sample objects of the PANA Workstation are nucleic acids, please consider all samples are with potential biohazard, and please take applicable safety protection measures and wear appropriate protective goggles, clothing and gloves while processing the samples.

### 6.2.5 Replace Fuse Tube

The fuse tube (type F10AH250V) of PANA Workstation is located in the fuse tube holder within the power interface. Before replacing the fuse tube, please switch off the instrument and unplug the power plug, use a screwdriver to pry open the fuse tube box. Then substitute the old fuse tube with an equal one, as shown in figure 6-1.

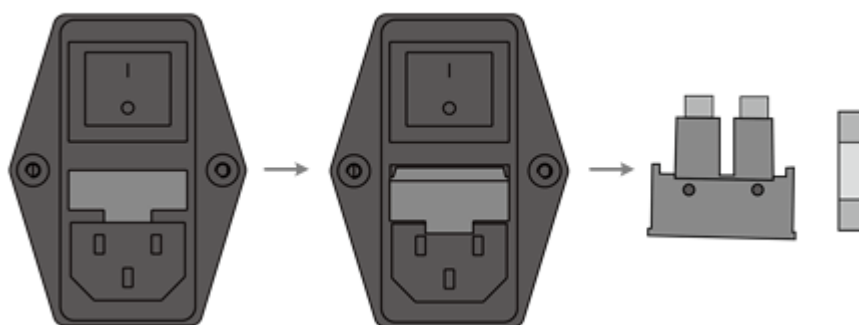


Figure 6-1. Replace the Fuse Tube

**⚠ Reminding:** Please check the fuse tube in case there is no display on the touch screen after starting up the PANA Workstation.

**⚠ Caution:** Improper fuse tube may lead to circuit system damage, even fire.

### 6.2.6 Replace UV Lamp

Ultraviolet lamps are installed in the experiment cabin, extraction cabin and waste cabin of the PANA Workstation. The system software will prompt the user in case the UV lamp has exceeded the rated service time. User can contact our company engineer to replace.

## 6.2.7 Replace Anti-pollution Filter

The PANA Workstation is equipped with anti-pollution filter in the extraction bin. The system software will prompt the user in case the anti-pollution filter has exceeded the rated service time. User can contact the company engineer to replace.

## 6.2.8 Other Maintenance and Calibration

- ▶ When the instrument is not used for a long time, please unplug the power plug and prevent dust from entering the instrument.
  - ▶ In order to ensure the performance stability of the PANA Workstation, user shall conduct a measurement calibration for the extraction temperature control module and the liquid transfer module once a year.
  - ▶ The PANA Workstation is equipped with over-temperature protection function. User should test the over-temperature protection function every year. The specific test method is: please set the heating temperature to 135°C and start run the instrument, and the heating will stop automatically. Otherwise, it is deemed that the over-temperature switch is abnormal and needs to be repaired.
- ⚠ Reminding:** The over-temperature protection function test requires the advanced system software function, which should be operated by technical service personnel from our company or authorized agents.

### ▶ Instrument Cleaning List

Cleaning Point		Period				Method
Item	Operation	Round	Day	Week	Month	
Material recycle	Recycle the remaining PCR reagents and PK		✓		✓	Recycle the remaining PCR reagents and PK as required, please pay attention to protect the bar code
	Recycle the remaining tips		✓		✓	Recycle the remaining tips in clean tip box.
	Recycle the remaining samples	✓			✓	Recycle the remaining samples, please pay attention to avoid cross contamination.
Waste dispose	Deep well plate and rod cover	✓			✓	Regard the used deep well plate and rod cover as biohazard materials, dispose them comply with applicable regulations.

	Premix bottle	✓			✓	Regard the used premix bottle as biohazard material, dispose them comply with applicable regulations.
	Waste Bin (Including the waste collected within the waste collection bag)	✓			✓	Regard the waste as biohazard materials, dispose them comply with applicable regulations.
Instrument disinfection and cleaning	Extraction Cabin		✓		✓	Spray 75% alcohol from extraction cabin door and airing to dry.
	Waste Port		✓			Spray 75% alcohol from the top and airing to dry.
	Waste Cabin		✓		✓	Wipe the surface with a soft cloth or absorbent paper covered with 75% alcohol.
	Sample Cabin	✓			✓	
	Reagent Cabin		✓		✓	
	Horizontal motor module	✓			✓	
	Reserve area	✓			✓	
	PCR setup area	✓			✓	
	Tip area		✓		✓	
	Experiment cabin	✓			✓	
	Inner side wall of the experiment cabin		✓		✓	
	Inner side of the experiment cabin backboard			✓	✓	
	Inner side of the experiment cabin roof				✓	
	Inner and outer surface of the experiment cabin door		✓		✓	
Outside surface of the instrument			✓	✓		
Accessories disinfection and cleaning	Sample holder	✓			✓	Spray 75% alcohol on accessories and place them on clean workbench and airing to dry.
	Reagent holder		✓		✓	
	PCR consumable holder	✓			✓	

	Reserve consumable holder	✓			✓	
	Waste bin	✓			✓	
UV disinfection	UV disinfection 30min	✓				Load the reagent and sample holders, PCR consumable and reserve consumable holders, the remaining tips in the experiment cabin, then perform UV disinfection.
	UV disinfection 60min				✓	
Touch screen cleaning	Touch Screen		✓			Gently wipe the screen with a piece of dry, soft cloth, or use low concentration of ethanol or isopropanol if necessary.

**⚠ Reminding:**


1. The daily cleaning operation provided in the ***Instrument Cleaning List*** is provided on the base of routine 2 rounds of experiments per day. If the number of experiments exceeds 3 rounds per day, users should strengthen the cleaning operation as appropriate.
2. After the daily operation, it is recommended to take out the reagent holder and place it outside for ventilation and drying to ensure the condensation water is dried.
3. The instrument should be cleaned thoroughly once a month. If the instrument is not used for a long time, it is recommended to turn on the instrument, place consumables and select the test procedure for dry running every 30 days in order to ensure stable performance of the instrument.
4. If any biohazard materials fall on the instrument during the experiment, special cleaning treatment should be performed.

## 6.3 Transport and Return for Maintenance

### 6.3.1 Instrument Disinfection





In case the PANA Workstation will be moved to another lab or needed to return to the after-sale service department for maintenance, please first disinfection the instrument and fill in the disinfection certificate. The disinfection process of PANA Workstation is listed as follows:

- ▶ Please wear protective clothing and medical disposable gloves;
- ▶ Open the experiment cabin and get all consumables out;
- ▶ Switch off the instrument and unplug the power cord;

- ▶ Prepare the detergent (lab routine disinfectant), wet the cotton cloth and degreased cotton swabs with the prepared detergent;
  - ▶ Wipe the interior of the experiment cabin with wet cotton cloth or absorbent cotton;
  - ▶ After wiping with disinfectant and drying the disinfectant inside the experiment cabin, clean the inside of the experiment cabin with 75% ethanol again, and clean the surface of the instrument with conventional cleanser;
  - ▶ After the ethanol in the experiment cabin and the cleanser on the surface of the instrument are dried, disinfect the instrument with UV for 2 hours as suggested;
  - ▶ Fill in the disinfection attachment or disinfection certificate.
-  **Caution:** Instrument disinfection must be carried out by trained professionals. Please wear protective clothing and disposable medical gloves during disinfection. The whole disinfection process shall be carried out in a well-ventilated environment.

### 6.3.2 Product Packaging and Return for Maintenance Installation

When the PANA Workstation is required to be transported again, please pack and transport the instrument in strict accordance with the requirements for instrument transportation in order to avoid or reduce instrument damage in the process of transportation.

-  **Reminding:** Please contact our engineer to install the transportation lock and product packing.
-  **Caution:** Before returning the PANA Workstation to the after-sales service department, please confirm that the instrument has been strictly disinfected.
-  **Caution:** The original transport package of PANA Workstation is designed to reduce the instrument damage and ensure its transportation safety. Adopt other packaging materials will broken the warranty, and **XATL Co., Ltd.** will not be responsible for damages as consequences of improper packaging that incurred during the transportation back to maintenance department.
-  **Reminding:** The transportation of PANA Workstation can adopt general transport (with awnings).



## 6.4 Troubleshooting

In general, corrective instructions will be display along with the error messages by the PANA system software. And under normal circumstances the software running errors can be solved by restarting the instrument.

This section describes the main possible errors of the PANA Workstation together with possible causes and corrective instructions.

No.	Phenomenon	Cause	Action
1	After turning on the power supply, there is no display on the touch screen.	Whether power cord is inserted	Reinsert the power cord
		Whether fuse tube is intact	Replace the fuse tube
		whether power socket is normal	Change a power supply
2	Error message or reset failure at startup	A module of the instrument failed to start	Restart the instrument
		Abnormal instrument condition	Consult maintenance engineer
3	Abnormal stop while instrument running	Improper operation	Power off and restart the instrument
		Abnormal instrument condition	Power off the instrument and consult maintenance engineer
4	Failure of consumable scanning results in abnormal experiment	Scan setting error	Check the scan settings, select the correct scan options and restart the experiment
		Experiment cabin door is not well closed, affect the scan light	Properly close the experiment cabin door and restart the experiment
		Consumable loading error	Check the consumables and restart the experiment
5	Nucleic acid extraction process abnormal	Extraction setting error or the heating function is not enabled	Consult maintenance engineer
		Abnormal instrument condition	Consult maintenance engineer
6	Abnormal movement of pipetting module	Improper operation	Power off the instrument, check the consumables and restart the experiment
		Abnormal instrument condition	Power off the instrument and consult maintenance engineer
7	Subsequent PCR experiment invalid	Experiment setting or sample setting errors	Check the experiment setting and the sample setting, restart the experiment
		Reagent expiration, failure or quality control failure	Replace with new reagents and restart the experiment
		Incorrect sample or reagent loading	Check and correct the loading situation of reagent and sample, restart the experiment

- ⚠ **Reminding:** Under normal situation, the running error phenomenon will be corrected following the corrective action. If not, please connect our company.
- ⚠ **Reminding:** The fuse tube of PANA Workstation is a F10AH250V fuse tube and it is installed between the power socket and the switch at the backside of the instrument. User could change the fuse tube following the steps below:
- a. Turn off the instrument, and unplug its power cord.
  - b. Open the fuse tube socket and take out the fuse tube.
  - c. Check the integrity of the fuse tube and change the fuse tube if it is broken.
  - d. Insert the fuse tube socket and plug the power cord.
- ⚠ **Reminding:** For a patient/user/third party in the European Union and in countries with similar regulatory regime (Regulation 2017/746/EU on IVD Medical Devices); if, during the use of this device or as a result of its use, a serious incident has occurred, please report it to the manufacturer and/or its authorized representative and to your national regulatory authority.

## 6.5 Data Maintenance

### 6.5.1 Log

- **Runlog** records the user operations and the running logs of the PANA Workstation, which is saved as log file to the directory C:\ Tianlong\ PANA 9600S\ runlog.

### 6.5.2 Data Backup

Connect a USB drive via USB interface to the PANA Workstation, and search the **Runlog** saving path provided in chapter 6.5.1, then backup the corresponding log files and save them to the USB drive.

### 6.5.3 Data Recovery

Connect a USB drive via USB interface to the PANA Workstation, query the corresponding log files in the USB drive and transmit the corresponding log files to the **Runlog** saving path provided in chapter 6.5.1 to realize the data recovery.

## 7. Contact Information



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# Annex I. Quick Guide of Experiment Operation

## A. Experiment Preparation



### 1. Reagent Preparation

- ▶ Please remove the PCR reagent from the refrigerator, thaw and balance to room temperature.
- ▶ Please add the diluent to dissolve the protease K powder according to the product specifications. In case the dissolved protease k solution is used, please remove the protease K solution from the refrigerator, thaw and balance to room temperature.




### 2. Instrument Preparation

- ▶ Please power on the PANA Workstation.
- ▶ Please login the PANA system software.
- ▶ Please input the experiment information in the  **Experiment Item** column and  **Sample Setting** column on the experiment setting interface of the PANA system software.




### 3. Sample Preparation

- ▶ Please prepare the sample according to the input of  **Experiment Item** and  **Sample Setting**.
- ▶ Please first record the sample information according to the requirements of laboratory operation and mark the special sample state such as hyperlipidemia, hyperbilirubinemia, hemolysis and so on.
- ▶ Please complete the sample centrifugation and other pre-processing operations according to the experimental requirements, and add or divide the prepared samples into sample tubes in the biosafety cabinet.
- ▶ Please insert the sample tubes into the sample holder and slowly push the sample holder along the track into the sample cabin.

#### 4. Consumable Preparation

- ▶ The system software of PANA Workstation can automatically analyze the requirement information of reagent and consumable according to the input of  **Experiment Item** and  **Sample Setting**. User can click < **Details** > in the  **Reagent/Consumable** column on the experiment setting interface to view these requirement information.
- ▶ User can prepare the corresponding reagent and consumables and load them in the right position according to the requirement information of reagent and consumable.

### B. Experiment Running

User can click <  **Start** > on the system software to start running the experiment. User can also click <  **Pause** > or <  **Stop** > to pause or stop the currently running experiment in case any exception occurs during the experiment process.

### C. Experiment Complete

#### 1. Product Transfer


- ▶ After the experiment, please add cover the PCR consumables and transfer the PCR reaction system established by the PANA Workstation to the PCR equipment for follow-up experiment.
- ▶ After the experiment, please cover the sample reserve tubes and transfer the reserved sample or nucleic acid extracted from the PANA Workstation to the -20°C refrigerator.

#### 2. Reagent and Sample Recovery

- ▶ After the experiment, please cover the reagent bottles and recover the remaining reagents (including protease K) from the reagent cabin of the PANA Workstation, and store them in -20°C refrigerator together with the code and the reagent holder.
- ▶ After the experiment, please take out the sample holders, cover the sample tubes, and store the sample in the refrigerator.

#### 3. Instrument cleaning and maintenance

- ▶ After the experiment, please regard the used consumables such as deep well plates, rod covers, premix bottles as biological contaminants and comply with all applicable local or national regulations for processing.

- ▶ After the experiment, please comply with all applicable local or national regulations, dispose the biological pollutants in the waste bin within the waste cabin of the PANA Workstation, and replace the waste bag in the waste bin.
  - ▶ After the experiment, please enter the general setting interface of PANA system software, click < **Maintenance** > subtab and then click < **UV Lamp Setting** > function key, and click < **Start** > to start the UV disinfection process.
  - ▶ After the UV disinfection process, please turn off the PANA Workstation and unplug the power cord.
-  **Reminding:** Never open the experiment cabin door during the UV disinfection process.

## Annex II. Supplied Accessories List

### A. Accessories List

No.	Accessories	Qty.	Replace Period	Replace Method	Specification & Model	Remark
1	Power cord	1	/	/	3×0.75mm <sup>2</sup> , 1.5m	EU
					3×18AWG, 1.5m	USA, Canada
					3×0.75mm <sup>2</sup> , 1.5m	Korea
					3×0.75mm <sup>2</sup> , 1.5m	China
2	Network cable	1	/	/	Shielded cable, 3m	Universal
3	Sample holder	6	/	/	4270102600	Special
4	Reagent holder	5	/	/	4270102700	Special
5	PCR consumable holder	2	/	/	4270102800	Special
6	Reserve consumable holder	1	/	/	4270102800	Special, choose one
					4270102900	
7	Condensate water storage box	1	/	/	2404005700	Special
8	Condensate water storage cotton	1	/	/	2601002900	Special
9	Waste bin	1	/	/	2404005600	Special
10	Anti-pollution filter	1	1000 Hrs	Replaced by technical engineer	2404007300	Special
11	UV lamp	2	1000 Hrs	Replaced by technical engineer	ZW10D15W-Z212	Special
12	UV lamp	2	1000 Hrs	Replaced by technical engineer	ZW3Z17W-Z52	Special
13	Fuse tube	1	After fuse tube broken	Refer to user manual chapter 6.2.5	F10AH250V	Special
14	User manual	1	/	/	Attached document	
15	Certification	1	/	/	Attached document	
16	Packing list	1	/	/	Attached document	
17	Warranty card	1	/	/	Attached document	

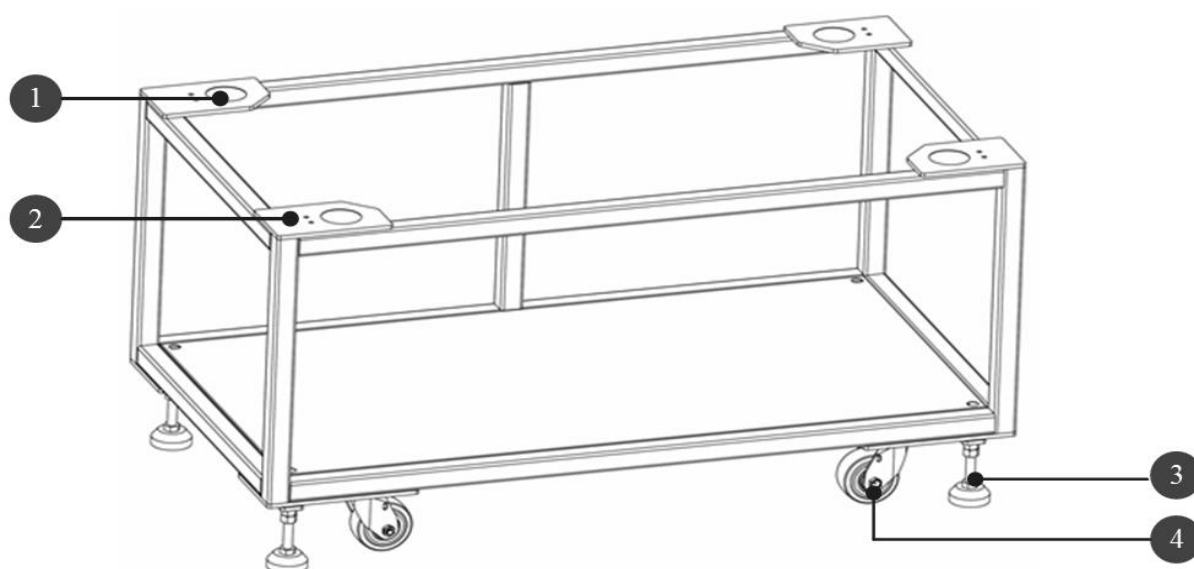
18	Installation confirmation list	1	/	/	Attached document	For user to confirm the installation conditions
19	Information feedback form	1	/	/	Attached document	After installation, the engineer will sign the feedback form and bring it back on file
20	Document bag	1	/	/	A4 document bag	Carry the attached documents
21	PANA Workstation bracket	1	/	/	42701010008	Optional

**⚠ Reminding:** PANA Workstation bracket can be used to support, fix or transport the PANA Workstation, user can purchase the bracket according to their needs.

## B. Installation Guide of PANA Workstation Bracket

### 1. The parameter of PANA Workstation Bracket

- Bracket Size: 1360 mm × 733 mm × 710mm,
- Bracket Weight: 55kg
- Bracket Appearance and structure: as shown in annex figure 1.

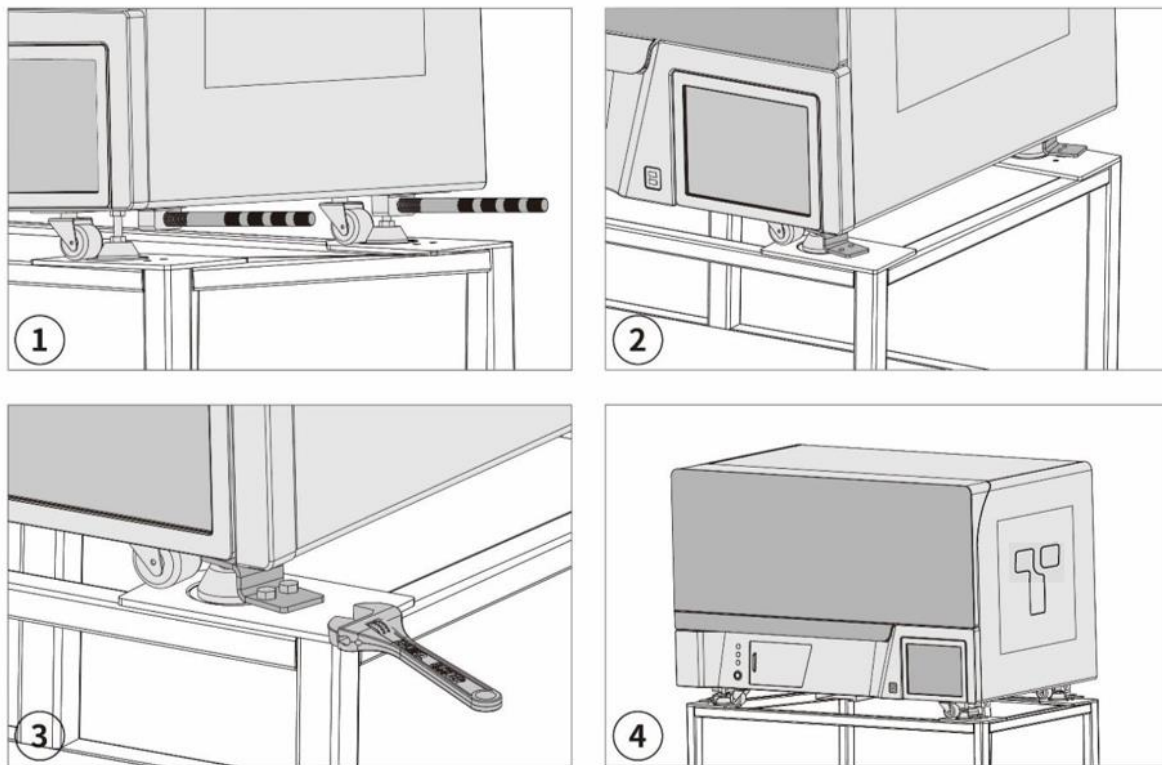


Annex figure 1. PANA Workstation Bracket

1. Positioning Circular Groove    2. Corresponding Screw Holes of Fixator  
 3. Bracket Transport Wheel    4. Bracket Supporting Foot



## 2. Installation Method of PANA Workstation Bracket



Annex figure 2. Installation Method of PANA Workstation Bracket

- 1<sup>st</sup> Step:** Before install the PANA Workstation bracket, please check carefully to make sure the bracket is supported by four supporting feet and stands on horizontal ground stably.
- 2<sup>nd</sup> Step:** Install a transport handle in the installation slot beside each supporting foot, as shown in annex figure 2-1. Holding the transport handle and stabilizing the instrument, multiple people cooperate to lift the PANA Workstation out of the wooden case and place it on the bracket. Let the four supporting feet located in the four positioning circular grooves, as shown in annex figure 2-2. Then remove the transport handles.
- 3<sup>rd</sup> Step:** Place a fixator on each supporting foot, let the gap of fixator located above the supporting foot, and face the two screw holes of each fixator corresponds to the corresponding screw holes at each corner of the bracket. Use 8 screws (M8 \* 20) to fix four fixators, as shown in annex figure 2-3.
- 4<sup>th</sup> Step:** Rotate up the four supporting feet, let the bracket supported by four transport wheels and push the bracket to the proper position. Then rotate down the supporting feet and let them re-landed, adjust the height of each supporting foot and ensure the PANA Workstation bracket stands steadily, as shown in annex figure 2-4.



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