

BasePurifier

USER MANUAL



1 DISCLAIMER AND COPYRIGHT

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We have made every effort to ensure that all the information contained in this manual is correct at the time of publishing. However, **PentaBase** reserves the right to change, modify and amendment without prior notice at any time. Updated manuals will be recognized on the version number. Please always use the version latest version valid for the consumables used.

2 USAGE PRECAUTIONS AND RESTRICTIONS

Please read the manual and follow the instructions carefully when operating the instrument. Noncompliance to the manual may result in instrument damage or failure or even harm to the operator.

The operation, maintenance, repair and transportation of the **BasePurifier** shall strictly follow the safety specifications listed in this section and through this manual.

*The design of the **BasePurifier** has been considered carefully. However, **PentaBase** will not be responsible for any consequence caused by using the instrument.*

USER REQUIREMENTS

The **BasePurifier** instrument must only be operated by laboratory professionals who have been trained in the relevant laboratory techniques and who have carefully read this manual.



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4 SAFETY SYMBOLS AND LABELS

SYMBOLS USED IN THIS MANUAL




Icon	Description
	Warning Warns the operating personnel to pay attention to a certain operation.
	Warning Indicates that the operating personnel should be careful to operate some step or method.
	Reminding Providing important information needed for successful use of the BasePurifier.
	Prohibit Prohibiting the operating personnel to perform a dangerous operation.

LABELS ON THE BASEPURIFIER

Icon	Description
	High Temperature Indicates areas with very high temperature. Do not touch these areas.
	Biohazard Indicates an area that may be contaminated by biological reagents or samples. Please disinfect these areas to avoid contamination.
	Abandoned Instrument disposal suggestion The BasePurifier is an electrical device. The disposal of an abandoned BasePurifier should not be treated as civil or domestic waste.



IMPORTANT OPERATION SAFETY INFORMATION

Icon	Meaning
	Caution Please carefully read this manual before usage. Incorrect understanding or operation may result in instrument damage, laboratory damage, operating personnel injury or inefficient usage of the instrument.
	Caution Please pay attention to the descriptions which are marked with Warning, Reminding, Prohibit , and the safety symbols and labels used in this manual or on the instrument.
	Caution <ol style="list-style-type: none">1. Before installing and using the BasePurifier, please remove and save the transport lock positioned within the BasePurifier cabin.2. Please confirm that you have removed the transport lock before powering the instrument.3. Before moving or transporting the instrument, please re-install the transport lock. <i>Failure to install transport lock when shipping the BasePurifier will remove all warranties of the instrument.</i>
	Caution <ol style="list-style-type: none">1. Please check that the quantity and quality of the items in the package is in accordance to the packing list. Report any damages or lack of items to the distributor or PentaBase.2. After acceptance, please fill in the installation feedback table with corresponding information and send it back to PentaBase for documentation and warranty.3. Please keep the packing materials for future use. <i>PentaBase will not be responsible for damages occurred as consequence of improper packaging during transportation.</i>





Caution

In case any of following conditions occur:

- Any liquid has entered the instrument
- Abnormal sound or smell appears during instrument run
- Instrument shell damage
- Obvious functional changes of the instrument

Please immediately cut off the power supply and contact the distributor or PentaBase for professional assistance.



Warning

1. Please do not open the experiment cabin door while the instrument is running.
 2. Do not directly touch the heating bars while the instrument is running, this may cause serious burns.
 3. Please do not force an unsuitable 6-strip or 96-well plate to fit into the instrument.
-



Warning

Without the authorization of PentaBase, operating personnel are not allowed to open the apparatus, replace any component or debug the instrument. Opening the apparatus must be approved by the manufacturer and be performed by professional maintenance personnel, otherwise the warranty will no longer be valid.



Warning

The voltage required by the instrument may cause harms to human body, please turn the power off before opening the instrument housing.



Warning

The instrument contains a permanent magnetic field. Anyone with a cardiac pacemaker or metal prosthetic device is prohibited to operate the instrument. The permanent magnetic field may affect or damage the functions of these devices.



Prohibit

1. Never clean the instrument while it is running.
Never clean the instrument surface with high concentration alcohol (> 75%) and other organic solvents.
 2. Never cover or move the instrument while it is running.
-



5 BRIEF INTRODUCTION

5.1 INTENDED APPLICATION FIELDS

The BasePurifier is widely used for researches in the fields of common science, genomics, CDC, food safety, forensic medicine, etc. Users could simply operate the BasePurifier by adding samples according to the sample type and specifications of the magnetic beads based nucleic acid extraction consumables into a 6-strip or 96-well plate. Through the collection of different types of nucleic acid extraction reagents, RNA/DNA can be effectively extracted from plant or animal tissues, blood or body fluids.

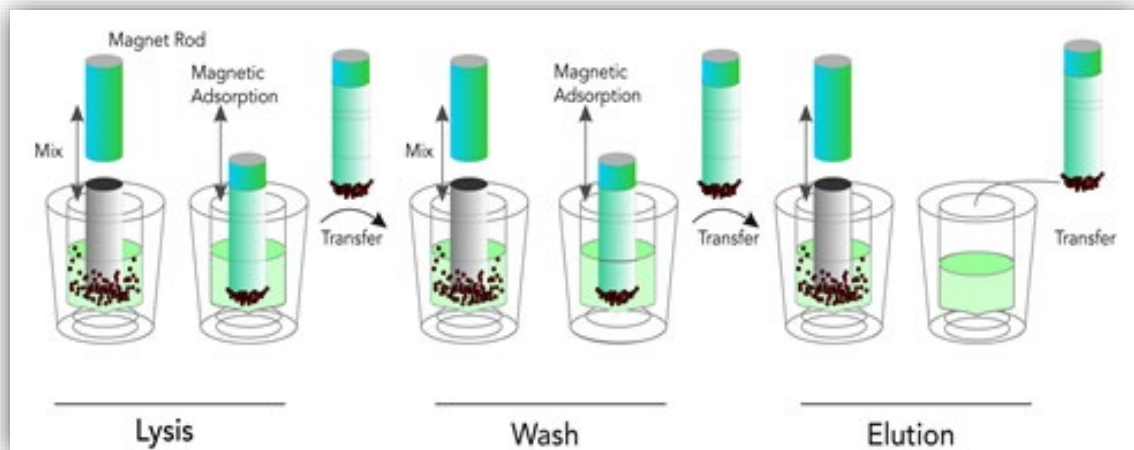


5.2 BASIC PRINCIPLES

The BasePurifier is designed as a high-tech product to extract nucleic acids by a method based on magnetic beads. The instrument is characterized by a high degree of automation, fast extraction speed, reliable results and ease of operation. By utilizing 6-strips or 96-well plates, it can simultaneously deal with 1 to 32 samples. The BasePurifier uses magnetic rods located on a frame. These rods automatically transfer the magnetic beads mixed with nucleic acids from one well to another.



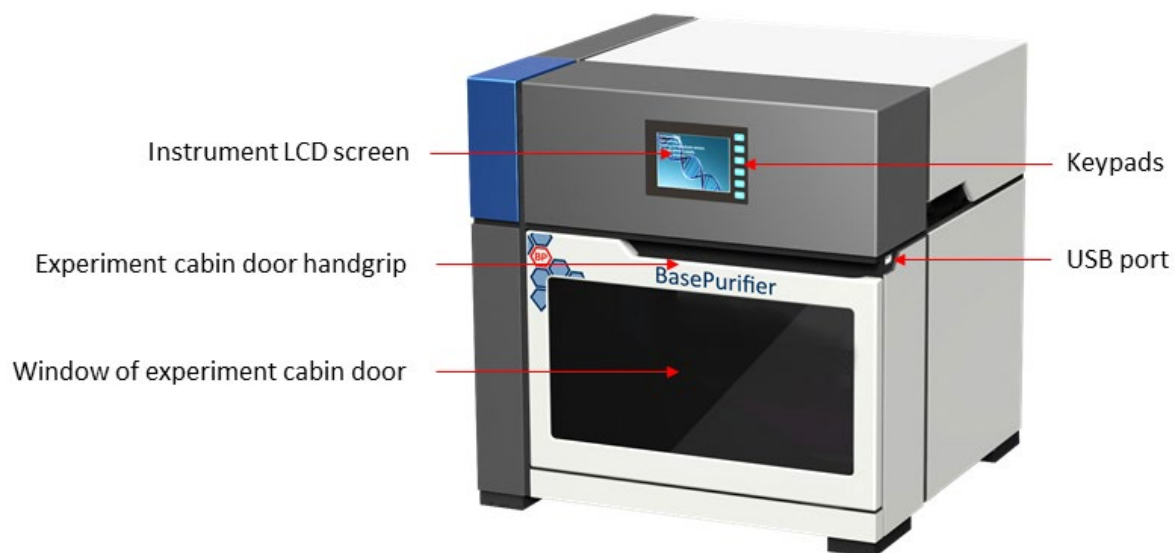
Through the movement of the magnetic rods and mixing sleeves, the instrument quickly and repeatedly mixes the reagents with the magnetic beads. Through the cell lysis, nucleic acid adsorption, washing, heating and elution processes, the instrument will complete the extraction of nucleic acids and obtain highly purified nucleic acids, as shown in the figure below:



6 FUNCTION DESCRIPTIONS

6.1 INSTRUMENT STRUCTURE DIAGRAM

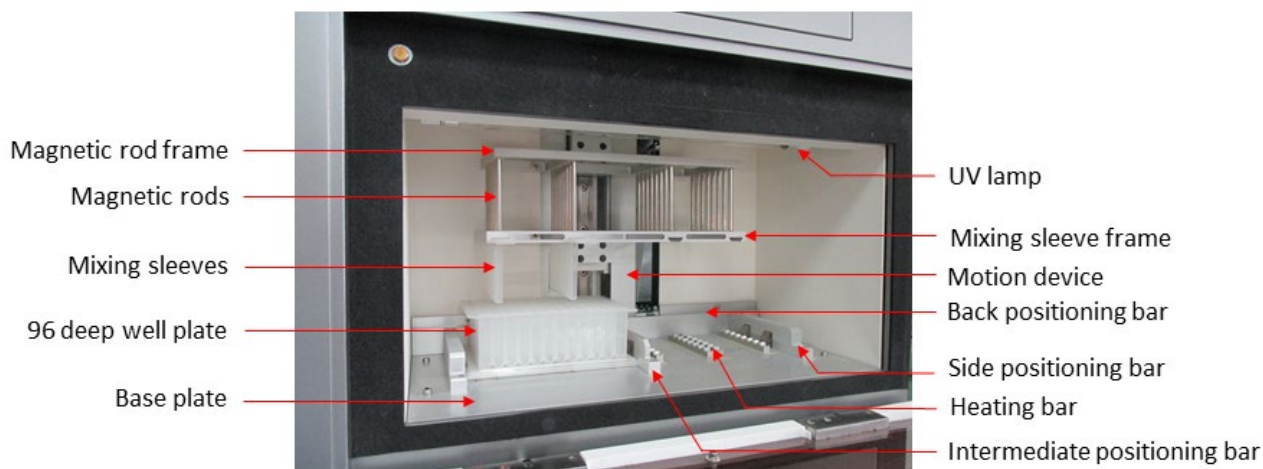
FRONT VIEW



BACK VIEW



EXPERIMENT CABIN



6.2 INSTRUMENT FEATURES

- **Touch Panel**

The instrument is equipped with a 3.5-inch LCD screen. It is capable of independently operating and monitoring the real-time running status. The instrument can also be connected to a 7-inch screen Android OS based tablet (not included in standard package), capable of remote controlling the instrument via Wi-Fi.

- **Precision Control**

A built-in engineering computer allows the system to operate independently without a tablet or a PC. It provides a highly stable automatic control system and is saving space and energy at the same time.

- **User-defined Temperature Control**

Using a tablet, the user can easily define the temperature for lysis and elution.

- **User-defined Programming**

Using a tablet allow for powerful programming functions for more flexible and efficient program edition, capable of meeting all different reagent requirements.



- **Rapid Extraction**

The instrument has a short operation time and requires only 30 to 60 minutes (depending on reagents) for a single operation.

- **High throughput**

The instrument can extract up to 32 samples simultaneously.

- **High Extraction Efficiency**

The extraction protocol can be optimized according to the reagents for a more precise incubation time. The high purity extracted DNA or RNA can be directly used for PCR or RT-PCR respectively.

- **Stability and Reliability**

The automatic operation system minimizes deviations and errors that could be caused by manual operation, ensuring stability and reliability of experimental results.

- **Self-cleaning**

With a built-in UV-lamp disinfect function, regularly disinfection can be performed.

- **Contamination Control**

By means of precision motion control, self-cleaning and using disposable material, the inter-well and inter-batch contamination are strictly controlled to prevent cross-contamination.

- **Safety Reliability**

An automatic lock program ensures operation safety. The closed experiment cabin and the utilization of disposable experimental materials minimize the contact between the operating personnel and the reagents.

- **Reagent**

Open reagent instrument. Empty 6-strips and 96-well plates can be purchased for optimizing own procedures or using own consumables for the instrument.



6.3 TECHNICAL PARAMETERS

GENERAL PARAMETERS

1. Instrument specifications

Size: 440mm (L) × 435mm (W) × 445mm (H)

Weight: 31.5kg

2. Package specifications

Size: 668mm (L) × 583mm (W) × 582mm (H)

Weight: 39.5kg

3. Operating environment

The instrument is intended for indoor use only. Environment temperature should be between 10°C and 40 °C. In case of strict temperatures of a certain experiment, the environment temperature should be between 20°C and 30 °C. The relative humidity should be between 10% and 80%. The atmospheric pressure of the operating environment should be between 85.0 kPa and 106.0 kPa. The elevation should be less than 2000 meters.

4. Transport condition

The instrument should have mounted the transport lock and be packed in the transport package. The environment temperature should be between -30 °C and 60 °C.

5. Storage condition

The instrument should be stored in the transport package. The environment temperature should be between -20 °C and 50 °C.

6. Power supply

Power voltage: AC 100V ~ 240V.

Power supply frequency: 50/60 ±1 Hz.

Rated power: 600W.

7. Running Noise

While the instrument is running, the maximum sound level does not exceed 65 decibels.



PERFORMANCE PARAMETERS

1. Processing Volume

30µl to 1000µl (up to 32 throughputs using two 96-well plates).

2. Capacity

1 to 32 samples (32 magnetic rods, 6-strips or 96-well plates and standard extraction reagent).

3. Collection Efficiency of Magnetic Beads

The reagents have been optimized to recover >95%, when using optimal samples and the consumables provided by PentaBase.

4. Inter-well Purification Accuracy

For identical samples that are extracted by an identical process: CV < 3%.

5. Magnetic Rods

The magnetic rod frame holds 32 magnetic rods.

6. Heating Temperature

Optional heating mode: Lysis heating and Elution heating (from room temperature to 120 °C).

7. Program Storage

The instrument firmware system can store up to 15 experimental programs. More than 500 experiments can be stored in the BasePurifier app system (on a 7-inch screen Android OS based tablet).

8. Upload/Download Programs

Experimental programs can be shared between the instrument firmware system and the BasePurifier app system via Wi-Fi.

9. Mixing Mode

Optional multi-modes and multi-gears for mixing.

10. Power Failure Protection

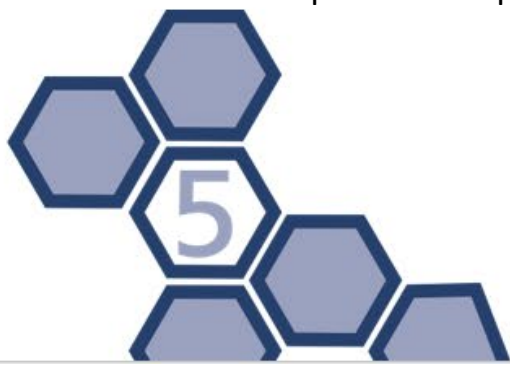
In case of power failure, the unfinished experiment will continue when the instrument is restarted.

11. Disinfection

The instrument is equipped with an UV-lamp within the experiment cabin. The disinfection time can be manually or automatically controlled.

12. Consumables

Instrument specific 6-strips and 96-well plates are available.



7 INSTALLATION AND TRANSPORTATION

7.1 RECEIVING INSTRUCTIONS

The instrument and its accessories are well packed in a box. Before opening the box, please move it to a suitable workplace. In order to prevent the instrument from condensate water, please do not open the box until it reaches room temperature. Place the instrument and its equipment on a horizontal platform. Check that the quantity and quality of the items in the package is in accordance with the packing list. Report any damages or lack of items to the distributor or the manufacturer. The BasePurifier comes with the following documents:

1. Certification
2. Packing list
3. BasePurifier User Manual

After unpacking the instrument, please keep the original box and packing material for future transportation as these are designed to decrease the possibility of instrument damage and ensure the instrument safety during transportation. Use of other packaging or packing materials violates the warranty.

PentaBase will not be responsible for damages occurred as consequences of improper packaging during transportation.





Caution: Please do not remove any screws or other parts, unless it is specifically mentioned in this manual. This violates the warranty and may affect the performance of the instrument.



Warning: The net weight of a BasePurifier is about 31.5 kg, which may be too heavy for one person to handle. In order to avoid instrument damage, it is suggested to carefully carry the instrument by two people.

7.2 ENVIRONMENTAL REQUIREMENTS

The installation and use of the BasePurifier should be performed indoor. The instrument should be placed on a laboratory table in a well-ventilated room. Dust, vibration, strong magnetic field, direct sunlight, UV radiation, air flow, high humidity and significant temperature changes should be avoided.

The specific environmental requirements are as follow:

1. The working area should be flat, dry, clean, avoid shaking and have enough room for equipment, such as cables, reagent bottles, etc.
2. Leave enough space on each side of the instrument (25cm at least).
3. The environment should be clean and without corrosive gas, smog and dust.
4. Never run the instrument in an environment with potentially dangerous liquids or gasses.
5. Ensure that the environment temperature is between 10 °C and 40 °C. If the temperature requirement of an experiment is strict, the environment temperature range must be between 20 °C and 30 °C.
6. Ensure that the relative humidity of the environment is between 10% and 80%.
7. Voltage requirement: AC 100V~240V, 50Hz / 60Hz \pm 1Hz. Input power: 600W. An UPS power supply is suggested.



7.3 INSTRUMENT INSTALLATION

The BasePurifier is laboratory equipment and its installation should follow the instructions below:

1. Confirm the location first and then place the instrument on the laboratory table.
2. Open the experiment cabin door after placing the instrument. Remove and keep the transport lock according to the labelled warning instruction. (In order to protect the instrument from damages, please fix the transport lock before moving or transporting the instrument. Please confirm that the transport lock could be removed before using the instrument).



3. Close the experiment cabin door.
4. Plug the instrument power cord, but do not power the instrument.




Caution: Under normal circumstances, please use the instrument attached power cord. If the original power cord is broken, please replace it with a similar. Please do not place anything on the power cord and do not pull the plug by the cord.





7.4 SELF-TEST

The instrument has a self-testing function which can be used to ensure that the instrument operates correctly. The self-test can be performed as described below:

1. Connect the power cord and switch on the power switch at the back side of the instrument.
2. The instrument will start the self-test and the self-test result will provide information about the instrument version, the power supply state, electric system state and the motor positions which will be displayed on the screen.
3. The instrument will go to standby mode after the self-test.
4. In order to observe that the instrument functions normally, it is suggested to run the “Demo” program before running your experimental program.

 **Caution:** For first time utilization, please ensure that the transport lock is removed before connecting the power supply.

 **Caution:** Please close the experiment cabin door while the instrument is self-testing. Do not frequently open and close the experiment cabin door.

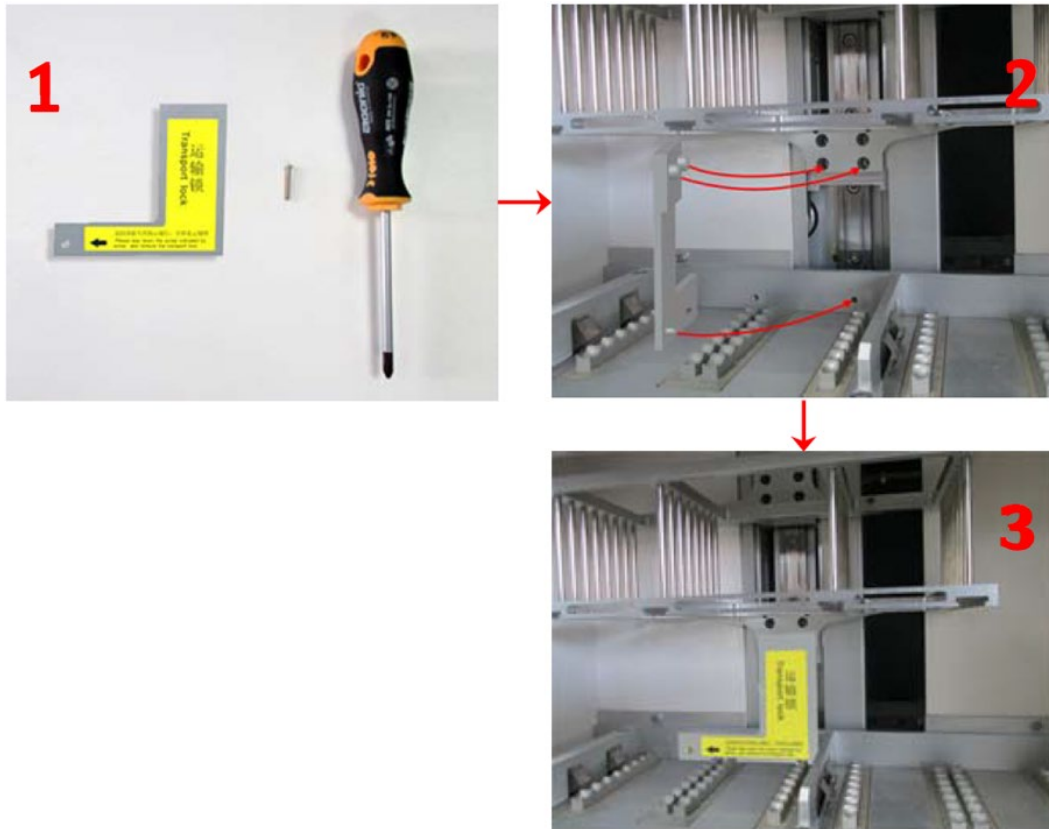
 **Warning:** Restart the instrument in case the self-test fails, or the LCD screen doesn't work properly. Please contact the distributor or the manufacturer if the self-test fails again. Please do not slap or shake the instrument.

7.5 INSTRUMENT TRANSPORTATION

In order to protect the instrument from damage, please fix the transport lock before moving or transporting the instrument. Please strictly follow the transporting instructions as below:

1. Unplug the power supply and open the experiment cabin door.
2. Fix the transport lock. Hold the mixing sleeve frame or magnetic rod frame and move the frame to the far-left end where the locking position is.
3. Fix the transport lock. The specific operation is shown below.





4. Close the experiment cabin door.
5. Steadily place the instrument into the package, then close and seal the package.

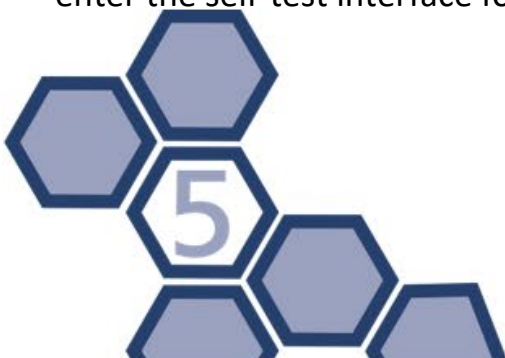
8 OPERATION INSTRUCTIONS

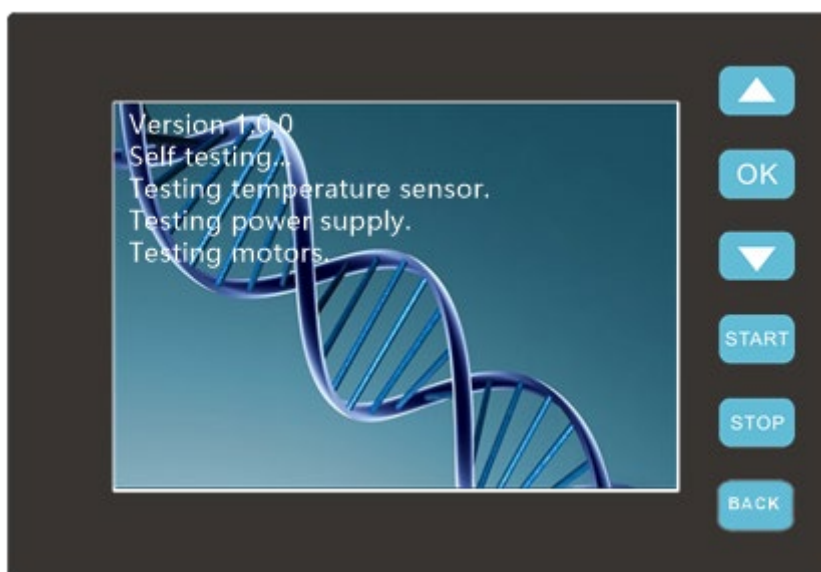
This section includes the function descriptions of the instrument and its operational process. The instrument provides all users with instrument firmware system and the option to add an Android app system. The instrument firmware system is operated by the keypads within the operation area. The Android app system can be operated on a 7-inch screen Android OS based tablet or any phone with Android OS with minimum 7-inch screen.

8.1 INSTRUMENT FIRMWARE SYSTEM




STARTING THE INSTRUMENT

Turn on the power switch at the back side of the instrument, the buzzer will beep twice. As the instrument starts up, the LCD screen will light up and automatically enter the self-test interface for self-test and initialization as shown below:



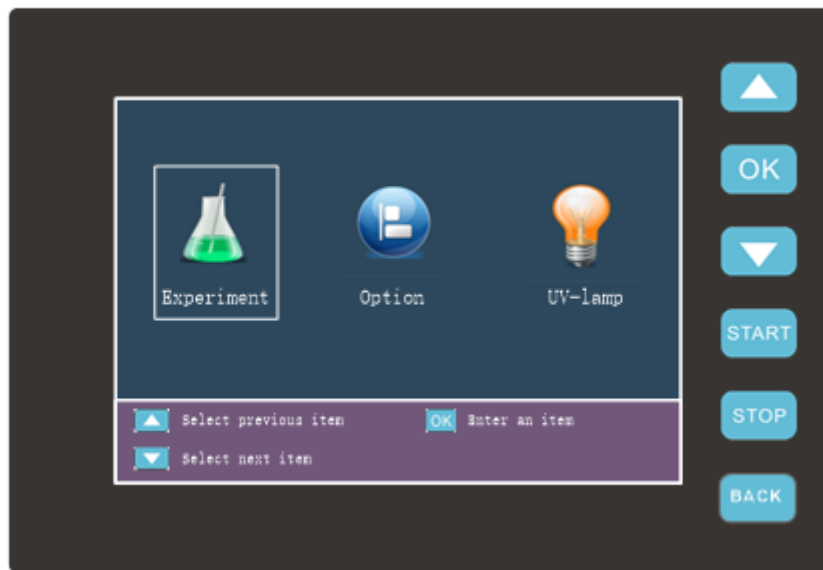


The instrument self-test and initialization includes firmware version querying, power supply testing, temperature control testing, motion device testing, switch device testing, communication device testing and other external connection ports testing. After the initialization, the motion device of the instrument will be at position zero.




-  **Caution:** Please ensure the transport lock is removed before first time usage, then connect the power cord and turn on the power switch.
-  **Warning:** Do not connect the power supply with a non grounded socket or unmatched voltage.
-  **Prohibit:** Never touch the power plug or the power switch in order to avoid instrument damage and operating personnel injury.

After initialization the instrument will automatically enter to the stand-by interface, as shown below:











Three icons are shown:

-  **Experiment:** Select to enter the experiment interface, where the user can choose purification (experiment) programs.
-  **Option:** Select to enter function settings. E.g. disinfection time or key tone.
-  **UV-Lamp:** Users could manually control the disinfection or let the instrument automatically control the disinfection.

Please press the keypads in the right side to operate the functions.










KEYPADS FUNCTIONAL DESCRIPTIONS

-  Select the previous function or purification program.
-  Enter the selected item. Confirm a setting. View a purification program.
-  Select next function or purification program.
-  Start a purification program or a function.
-  Pause or stop a purification program or function.
-  Continue a paused purification program. Return to desktop. Cancel a selected function.

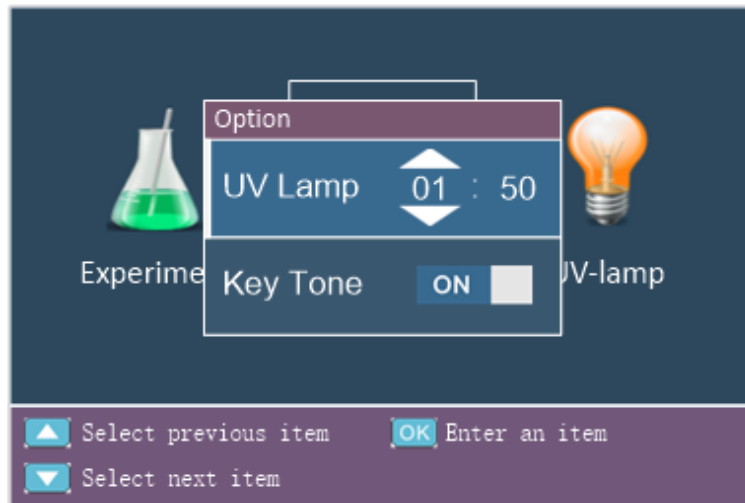
RUN AN EXPERIMENT

SELECT AN EXPERIMENT








Press  **Experiment** to view a list of purification programs. The purification program with the white background is selected, as shown below. Users could press  or  to select a different purification program and then press  to open the selected program. The instrument will automatically store the latest purification program and can store up to 15 programs.

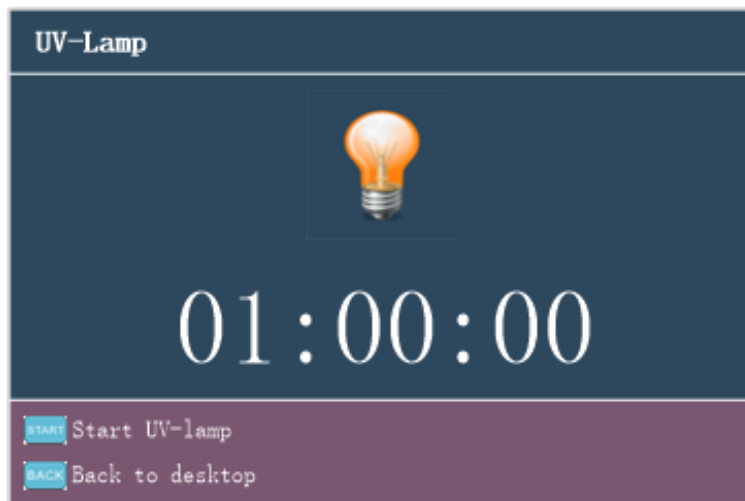
Experiment		
No.	Name	User
1	Demo	guest
2	Virus RNA	guest
3	Whole Blood DNA	guest
4	Virus DNA	guest
5	Isz1z	guest
 Select previous experiment  View an experiment		
 Select next experiment		





UV-LAMP DISINFECTION INTERFACE

Select the  **UV-Lamp** icon by pressing  or  and then press  to enter the UV-lamp disinfection interface. Press  to turn on the UV-lamp. Press  to turn off the UV-lamp. Press  to turn off the UV-lamp and return to the stand-by interface.




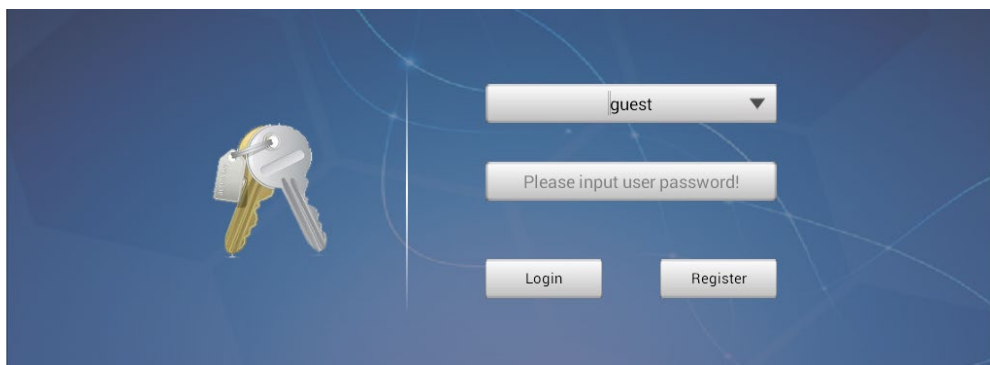
8.2 ANDROID APP SYSTEM (OPTIONALLY)

WI-FI CONNECTION

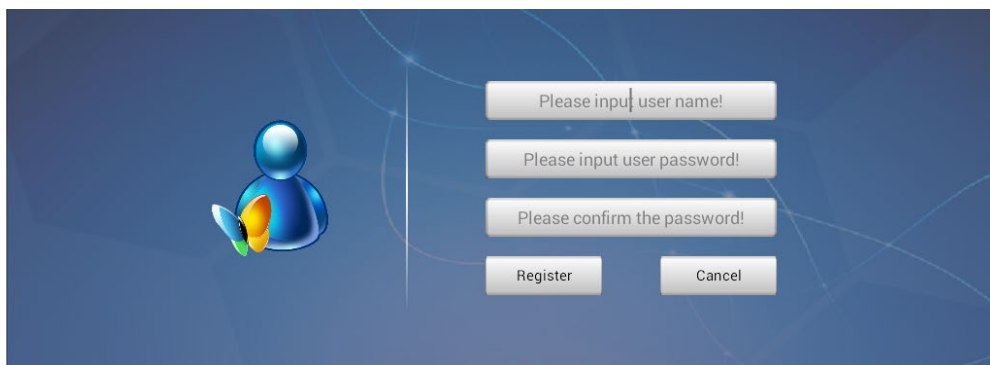
1. Turn on the tablet and turn on the Wi-Fi.
2. Connect to the Wi-Fi of the BasePurifier, which starts with “NP968”
3. Enter the password “tl_np968” to connect to the BasePurifier.

LOGIN AND REGISTER

The first time the user logs into the BasePurifier app  it is necessary to enter the username and password. It is also necessary to enter the user password if the default login user was not set.

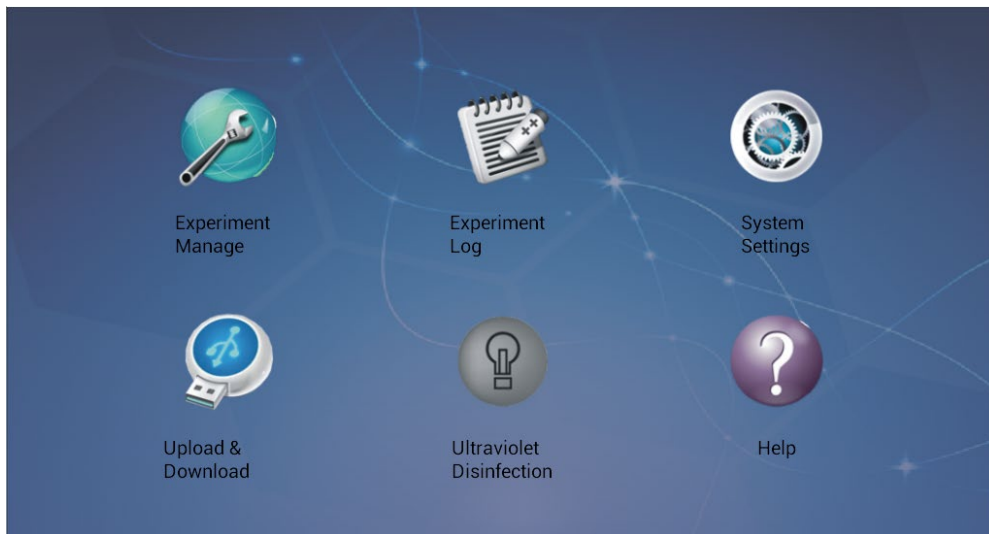








Please, enter the username and its password and press **Login** to enter the main interface. To create a new user account, press **Register**.



MAIN INTERFACE

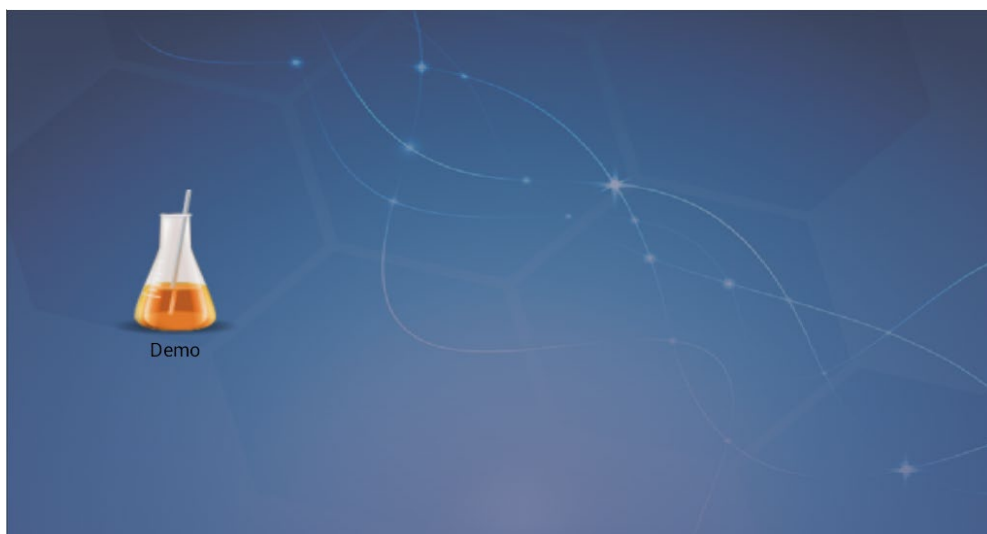
The main interface of the Android app system shown below and includes six function icons:



-  Experiment Manage
-  Experiment Log
-  System Settings
-  Upload & Download
-  Ultraviolet Disinfection
-  Help




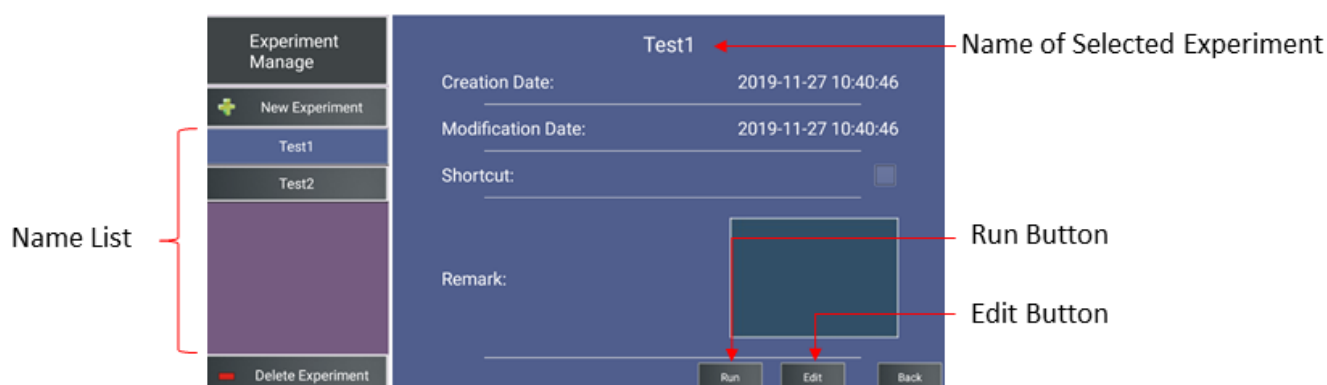
In addition, users could slide the screen to view experiment shortcut icons, as shown below:



⚠ Reminding: In case the user has logged in on the app system as the “guest” user, there is no need for a password. It is not possible to set or modify the password as the “guest” user.

EXPERIMENT MANAGEMENT

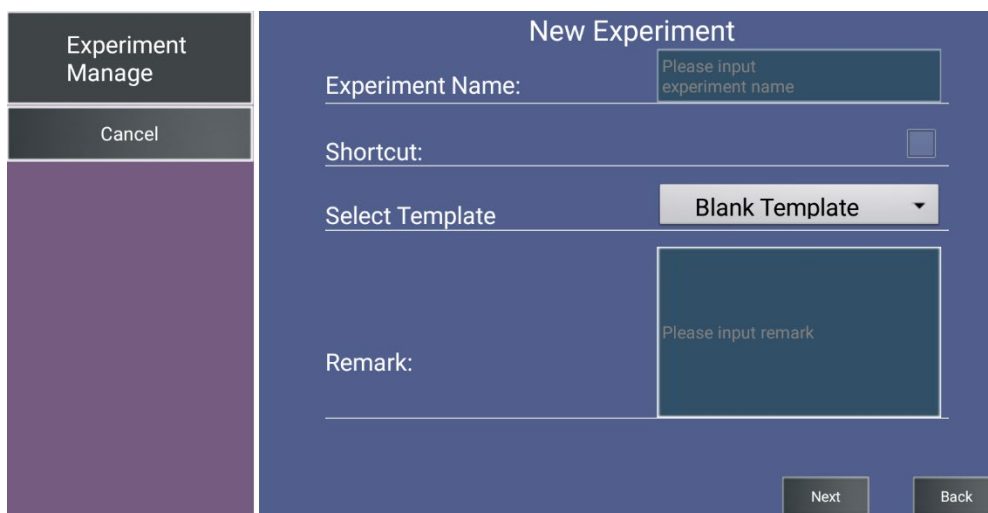
Press the  **Experiment Manage** icon on the main interface to enter the experiment manage interface, as shown below. In this interface, users could create or delete purification (experiment) programs and edit or run a selected purification program.



CREATE A NEW EXPERIMENT PROGRAM

Press  to enter the new experiment interface where the user can:

- Enter experiment (purification) name
- Create a shortcut for the experiment
- Select experiment (purification) template
- Add experimental remarks



Press **Next** to go to the experiment creation interface, where you can:

- **Add Step**
- To delete a step, press the step number, and press **Delete Step**.
- Press **Save**



RUN A PURIFICATION PROGRAM

Select a purification program and press **Run** to enter the running interface of a purification program. On the running interface users could press **Run** to start running and press **Stop** to stop running the purification program.

VirusDNA		No. 1		No. 2	
T1		Lysis		Combine	
T2		Waiting	00:00:00	Waiting	00:00:00
T3		Mixing	00:10:00	Mixing	00:10:00
T4		Magnetic	00:00:00	Magnetic	00:01:30
T5		Well	1	Well	1
T6		Volume	534ul	Volume	534ul
T7		Mixing Mode	7	Mixing Mode	7
T8		Temp Status	Lysis Heating	Temp Status	Close
		Temperature	90°C	Temperature	0°C
Remaining Time	00:36:30	<div>Stop</div> <div>Run</div> <div>Return</div>			

DELETE OR EDIT AN PURIFICATION PROGRAM

Press **Delete Experiment** in the experiment interface to delete the selected purification program.

Press **Edit** to enter the experiment editing interface shown below:

No. 1		No. 2		No. 3	
Lysis		Combine		Washing1	
Waiting	00:00:00	Waiting	00:00:00	Waiting	00:00:00
Mixing	00:10:00	Mixing	00:10:00	Mixing	00:02:00
Magnetic	00:00:00	Magnetic	00:01:30	Magnetic	00:01:30
Well	1	Well	1	Well	2
Volume	534 ul	Volume	534 ul	Volume	500 ul
Mixing Mode	7	Mixing Mode	7	Mixing Mode	7
Temp Status	Lysis Heating	Temp Status	Close	Temp Status	Elution Heating
Temperature	90 °C	Temperature	0 °C	Temperature	80 °C
Experiment Name: Test		<div>Add Step</div> <div>Delete Step</div> <div>Save</div> <div>Back</div>			



The name of each step is shown beneath the step number. Press the name to edit it. Users can also press the settings of **Waiting, Mixing, Magnetic, Well, Volume, Mixing Mode, Temperature Status** and **Temperature**, to edit these settings. Press the **Experiment Name**, to edit or enter an experiment name. Users could also press **Add Step** to add a new step at the end of the purification program, or press **Delete Step** to delete the selected step. Press **Save** to save all the settings of the current program or press **Return** to return to the experiment manage interface without saving the changes.

PARAMETER DESCRIPTIONS

- **Waiting**

Refers to the time after each step where the mixing sleeves are in the air waiting for the magnetic beads to dry (liquid to evaporate). It is suggested to set the waiting time to maximum 30 minutes.

- **Mixing**

Refers to the time where mixing sleeves are mixing the liquid.

- **Magnetic**

The time the magnetic rods can adsorb magnetic beads. It is generally recommended to set this time to at least 30 seconds.

- **Well**

Refers to the well position on the 96-well plate or the 6-strip. Users can choose position 1-6 according to their experiment requirements.

- **Volume**

Refers to the reaction volume in the 96-well plate or the 6-strip. Based on the volume, the instrument will adjust the amplitude of the mixing sleeves in the mixing step and the altitude of the mixing sleeves in the magnetic adsorption step.

- **Mixing Mode**

Refers to different mixing speeds. Users can choose a speed from 1-7.



- **Temperature Status**

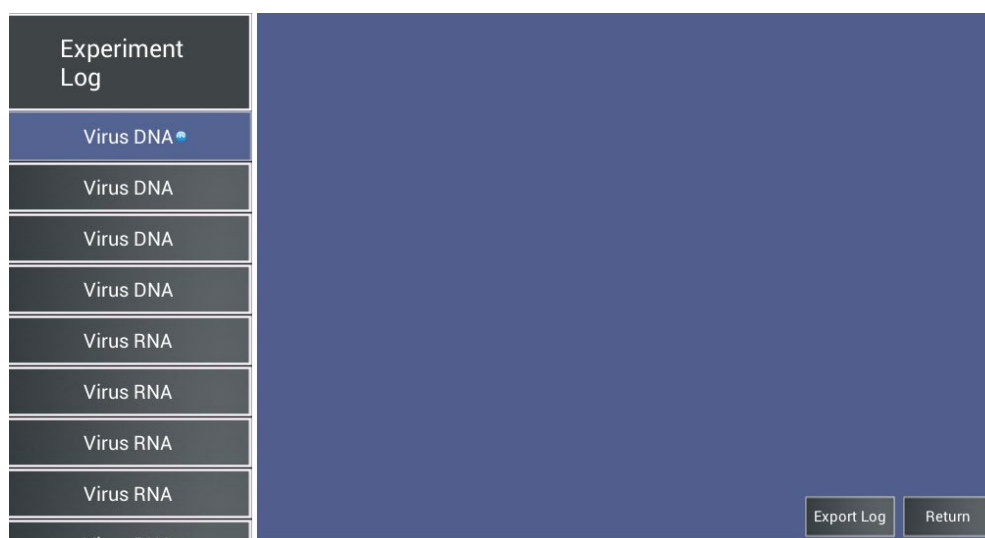
Refers to the temperature of the step. There are three options: **Close**, **Lysis Heating** and **Elution Heating**. When the instrument is at heating states the temperature status of well 1 can only be set to **Lysis Heating**, while other well positions only can be set to **Elution Heating**.

- **Temperature**

Refers to the temperature of the current step.

EXPERIMENT LOG

Press the **Experiment log** icon on the main interface to enter the experiment log interface. Users can view, delete and export experiment logs in this interface.



Press an experiment name to view its experiment log. Hold down on the experiment name to get the option to delete this experiment log. Users could also press **Export Log** to export the selected experiment log to a specific file direction.



Reminding: In order to view the experiment log, the tablet needs to be connected to the instrument via WIFI.

SYSTEM SETTINGS

Press the **System Settings** icon on the main interface to enter the system setting interface.





The following settings can be made in this interface:

- **Disinfection Setting**

Set the UV-lamp disinfection time.

- **Network Setting**

Connect to Wi-Fi.

- **User Setting**

Set the current user as the default login and change the password.

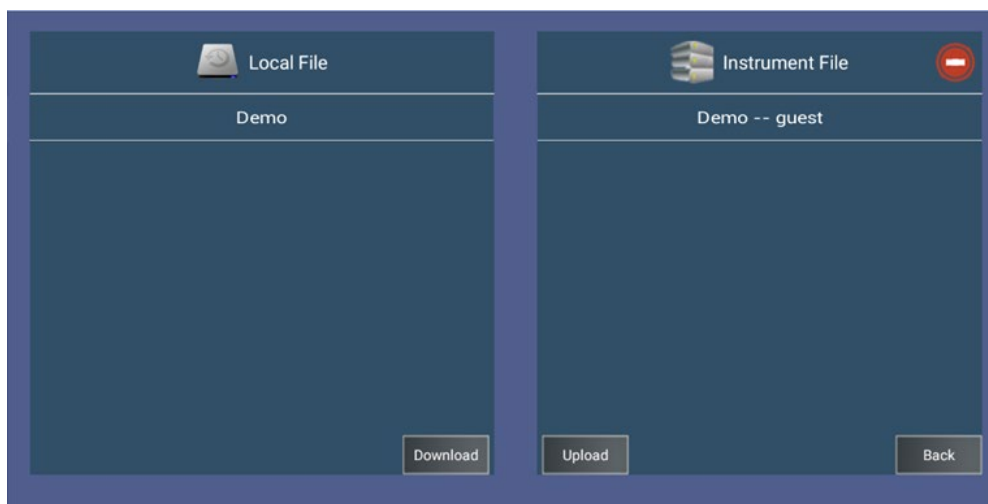


Reminding: It is only necessary to set the login user as default login one time. Next time the BasePurifier app is used the password is not needed.



UPLOAD & DOWNLOAD

To transfer files between the instrument and the Android app, press the **Upload & Download** icon on the main interface.



- **Upload**
Transfer files from the instrument to the app and view or edit the files in the app System.
- **Download**
Transfer files from the app to the instrument and run the files on the instrument.

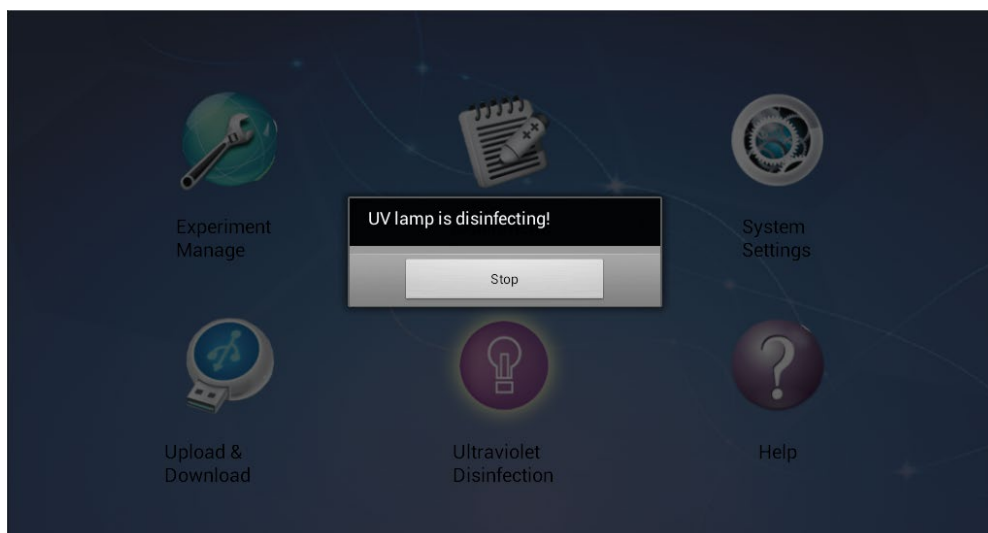
Instrument files can be deleted by pressing the red **delete button** followed by pressing the red cross that will appear after each experiment on the list.

- ❗ **Reminding:** The instrument can store a maximum of 15 purification programs. If more files are attempted to download from the app, a message will remind the user to delete files from the instrument or discontinue the download.

UV-DISINFECTION

The UV-lamp for disinfection can also be controlled by the app when connected to the instrument via Wi-Fi. Press the **Ultraviolet Disinfection** icon on the app main interface to turn on the UV-lamp. Press stop to turn of the UV-lamp.





HELP

Press the **Help** icon for information about:

- **About**
Information about the current machine and software version.
- **Contact Us**
Get detailed contact information of our company.

8.3 SHUTDOWN

The power switch is located at the back of the instrument. Switch the power switch to the 'O' position to turn off the power switch.

! Reminding:

- a. In case the instrument is running and show no signs of malfunction or accidents, please do not cut the power supply to avoid affecting the running experiment.
- b. Please do not frequently switch the power switch on and off during the use of the instrument.
- c. Please shut down the instrument when you finish your daily experimental work.
- d. Immediately stop the experiment program in case of any accidents such as liquid spills in the experiment cabin.
- e. Please unplug the power cord if the instrument is not used for a longer time period.





Caution:

- a. If you want to move the instrument, please turn off the instrument and unplug the power cord first. Fix transportation lock.
- b. In case of electric failure immediately cut off the power supply and stop using the instrument.

9 MAINTENANCE

9.1 REGULAR MAINTENANCE

The instrument requires little maintenance under proper conditions. However, it should be cleaned and maintained on a regular schedule for optimal, long and constant usage. Correct maintenance of the instrument helps to prolong its lifespan. This section includes the information on cleaning and maintenance of the instrument:

1. For daily maintenance, please keep the instrument clean and free from liquid residues.
2. Please clean the instrument surface on a regular schedule. It is suggested to clean the instrument with a piece of moist cloth and mild detergent. Please do not clean the instrument surface with strong detergent/acid/alkali/, organic solvents or with alcohol with a concentration $>75\%$, as such solutions may damage the surface coating of the instrument.
3. In case there is any salt, acid, alkali solution or organic solvents spill on the instrument, please immediately clean in order to protect the instrument.
4. It is recommended to clean the instrument LCD screen with a piece of soft cloth, using 70% ethyl alcohol or routine laboratory detergent. Please do not directly spray any liquid on the screen or keypads.
5. Please always keep the experiment cabin free of dust and liquid residues. Clean the plate area and base plate regularly (at least once a week) with SDS solution, 70% ethyl alcohol or the like.



6. Never pour any liquid into the experiment cabin. Please use absorbent cotton or cotton cloth moistened with detergent solution to clean the experiment cabin. Remember to cut off power supply before cleaning the instrument, in order to avoid instrument damage or personnel injury.
7. Please clean the magnetic rod frame and mixing sleeve frame with SDS solution, 70% ethyl alcohol or the like. Please avoid the usage of metal objects to protect magnetic rods from damage.
8. In case the instrument will not be used for a long time, please unplug its power cord and cover the device with a piece of soft cloth or a plastic bag to prevent dust from entering the instrument.
9. It is suggested to power on the instrument and run an experimental program without plates every 30 days to ensure normal performance of the instrument in case the instrument has not been used for a long time.



Caution:

- The instrument contains a permanent magnetic field. Anyone who has a cardiac pacemaker or metal prosthetic device is not allowed to clean the instrument. The magnetic field may affect the cardiac pacemaker or metal prosthetic device which could lead to personnel injuries.
- Even though the instrument has passed the security certification and testing, in order to avoid instrument damage or personnel injuries, it is prohibited to clean the instrument while it is still running or when it is connected to the power supply.




9.2 DISINFECTION TREATMENT

In case of any liquid spill or splash in the experiment cabin, please make sure to disinfect all involved parts within the experiment cabin.

The specific operation instructions are as follow:

1. Wear protective clothing and medical disposable gloves.
2. Prepare the disinfectant in advance (general experimental disinfectant).
3. Power off the instrument and remove all the consumables from the experiment cabin.
4. Gently wipe the experiment cabin interior (including plate placing area, magnetic rods, magnetic rod frame, mixing sleeve frame) with a cotton cloth moisten in the disinfectant.
5. When the cabin interior is dry, please clean it again with 70% ethyl alcohol. At the same time, please clean the instrument surface with general detergent.
6. When the experiment cabin interior and the instrument surface are dry, please turn on the instrument and switch on the UV-lamp for disinfection. It is suggested to set the disinfection time for 2 hours.
7. Please fill the disinfection certificate.

 **Warning:** Only trained professionals can perform the disinfection treatment, which should be performed in a well-ventilated environment.

9.3 SENDING FOR REPAIR

In case it is needed to send the instrument back to the distributor or the after-sale department, please follow the instructions below for packaging and transportation.

1. Disconnect the instrument from the power supply
2. Thoroughly clean and disinfect the instrument as described in the previous section and provide the disinfection certificate.
3. Install the transport lock.



4. Wrap the instrument in a plastic bag.
5. Inform the after-sale department what kind of biohazards that has been used.
6. Inform the after-sale department about the error that has occurred and the parts that need to be repaired. Please send photo or video documentation when possible.
7. Pack the instrument with the original packing to avoid damage of the instrument. Any damage applied during the transportation will result in extra repair cost.
8. For transport and storage conditions please also refer to chapter 5.3 Technical parameters and 6.5 Instrument transportation.






10 TROUBLESHOOTING AND AFTER-SALE SERVICE

In case any abnormality or error occurs while the instrument is running, it is suggested to stop the current running step. Please wait until the abnormality or error is solved, and then start to run the experimental program again from the beginning. The main possible errors of the BasePurifier and their corresponding corrective instructions are listed in the table below.

Phenomena	Possible Causes	Corrective Instructions
No display on the screen after power on	Unstable power cord connection	Connect the power cord again or replace it
	Broken fuse	Replace the fuse
	Other	Contact us or distributor
Unable to enter the stand-by interface while starting up	Message “Error code: EM0.EM1.EM2.”	Contact us or distributor
	Message “Test passed”	Restart the instrument. Contact us or the distributors in case this situation occurs again.
Firmware upgrade failed	Unable to recognize the USB flash disk	Plug the USB flash disk again or replace the USB flash disk
Abnormal noise of the instrument	The transport lock has not been removed	Remove the transport lock
	The mixing sleeves are at inappropriate positions.	Plug the mixing sleeve again
	The 96-well plate or 6-strip is in incorrect position.	Place the 96-well plate or 6-strip in correct position.



Temperature does not rise during the heating process	Check temperature control setting	Reset the experimental program temperature and download it to instrument.
	Other	Contact us or the distributors
UV lamp does not work	UV lamp is disconnected	Reinstall the UV lamp.
	The UV lamp is damaged	Change the UV lamp.
	The experiment cabin door is open	Close the experiment cabin door
Magnetic rods are misbehaving	The magnetic rods move without up and down motions	Press  to stop the program, press  to restart the program.
	Other	Contact us or distributor
Magnetic rods are dropped		Contact us or distributor
System crashed or is uncontrollable	Improper operation	Turn of the power and restart the instrument
	Other	Contact us or distributor

 **Reminding:** The fuse type of the BasePurifier is F10AH250V and it is installed between the power socket and the switch at the backside of the instrument. Users could change the fuse following the steps below:

- a. Turn off the instrument.
- b. Unplug the power cord.
- c. Open the fuse socket and take out the fuse.
- d. Check the integrity of the fuse and change it if it is broken.
- e. Insert the fuse in the socket and plug the power cord.



11 CONTACT INFORMATION

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