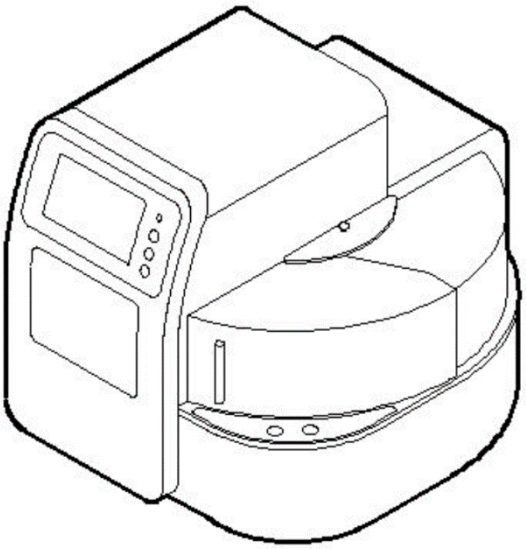
# Phoenix-Pure96

## Nucleic Acid Purification System

Operation Manual
v1.0



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## Foreword

Thank you for purchasing the Phoenix-Pure 96 Nucleic Acid Purification System. This manual describes the function and operation of then instrument. In order to use the instrument properly, please read this manual carefully before operating the device. Keep it with your device in case you encounter handling issues while operating.

## Opening Check

Please check the instrument and accessories according to the packing list when you first open the packing case. If anything is wrong or missing, please contact

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## Safety Warnings and Guidelines

**1. Important information for safe use**
Users should have a clear understanding of how to use this instrument before operation, please read this manual carefully prior to operation. Any improper operation may cause injury or electric shock.
Please read the manual carefully and operate safely according to the guidelines.

**2. Security**
The operation and maintenance and of the instrument should comply with the basic guidelines and warnings below. Incorrect operation or maintenance will have effect on using life, performance, and safety features of the instrument.

- The instrument is a normal indoor instrument which conforms to class I of GB 4793.1 standard. Please read this manual carefully before operation.
- The device must be used by experienced personnel with appropriate training.
- The operator should not repair the instrument in case any injury or out of warranty. If service required, please contact Procomcure Biotech for repair.
- Before powering on, please make sure the voltage of the power supply is consistent with the required voltage. Make sure the rated load of the power outlet is not less than required by the instrument.
- If the power cord is damaged, replace it with the same type and specification power cord.
- Do not cover anything on the instruments when using.
- Do not touch the heating bock during operation to avoid injury.

- The instrument should be kept in an area with minimal dust, away from wet areas and direct sunlight. Additionally, the installation location should have sufficient ventilation and be protected
- from electromagnetic interference and heat sources.
- Do not cover the vent of the instrument as this can cause overheating.
- When several instruments are used at the same time, the distance between each instrument should be more than 100 cm.
- Power off when not in use. If the instrument will not be used for a long period of time, cover it with a cloth or plastic to protect it from dust.
- Disconnect the power cord from the jack at once in the following cases, and contact Procomcure Biotech:
    - Liquid enters the instrument.
    - Instrument was rained or watered.
    - Abnormal operation: such as abnormal sound or smell.
    - Instrument dropping or outer shell damaged.
    - The function has obviously changed.

**3. Maintenance**

The instrument should be cleaned regularly using a soft cloth damp with a small amount of alcohol. If any stain on the surface of the instrument, wipe it with soft cloth damp with cleansing cream.

**4. Transportation and Storage Requirements**

Ambient temperature: 10℃ ~ 35℃
Relative humidity: ≤ 70%
Atmosphere pressure range: 500 ~ 1060 hpa
Locate it in a well-ventilated room, away from corrosive gas.

# Contents

## Chapter 1 Introduction

Phoenix-Pure96 Nucleic Acid Purification System is a newly launched automatic extraction and purification system for DNA/RNA, proteins and cells. It can absorb, transfer and release magnetic beads by magnetic rod and magnetic rod sleeve to separate magnetic beads and samples. The operation is automatic, fast, and simple. Users can extract 1 to 96 samples simultaneously with special kits. Phoenix-Pure96 can extract samples of animal/plant tissue, blood and body fluids, etc with different kinds of magnetic bead nucleic acid extraction reagents. It is mainly used for the extraction and purification of nucleic acid from human body samples.

### 1. Application

This instrument is suitable for the extraction and purification of nucleic acids in animal and plant tissues, blood and body fluids and other samples (mainly used in human body samples).

### 2. Contraindication

No contraindication.

### 3. Service Life

Service life of the instrument is five years.
For production date, please see the label on back of the instrument.

## Chapter 2 Specifications

### 1. Working Conditions

Environmental Temperature: 10°C -35°C
Relative Humidity: ≤ 70%
Input Voltage: AC 100-240V, 50Hz/60Hz

### 2. Basic Parameters

| | |
|---|---|
| **Instrument** | Phoenix-Pure 96 |
| **Principle** | Magnetic Particle Method |
| **Sample Volume** | 50 μL—1000 μL |
| **Throughput** | 96 |
| **Stability** | CV ≤ 5% |
| **Extraction time** | 10 ~ 60 min/time |
| **Temperature control module** | Room temperature to 120°C for lysis and elution |
| **Temp. Accuracy** | ±1°C |

| | |
|---|---|
| **Vibrate and mix** | 10 different speeds |
| **Operation** | 7-inch color touch screen, mouse can be connected |
| **Programs** | 8 groups of programs can be preset, and can store 100 groups of programs |
| **Program management** | Including create, edit, delete and protocol mode |
| **Extension interface** | With USB port and Ethernet port |
| **Network** | Extended Ethernet remote control, WiFi function. |
| **Power Supply** | AC100-240V, 50Hz/60Hz, 250VA |

### 3. Overall Dimensions

Unit: mm

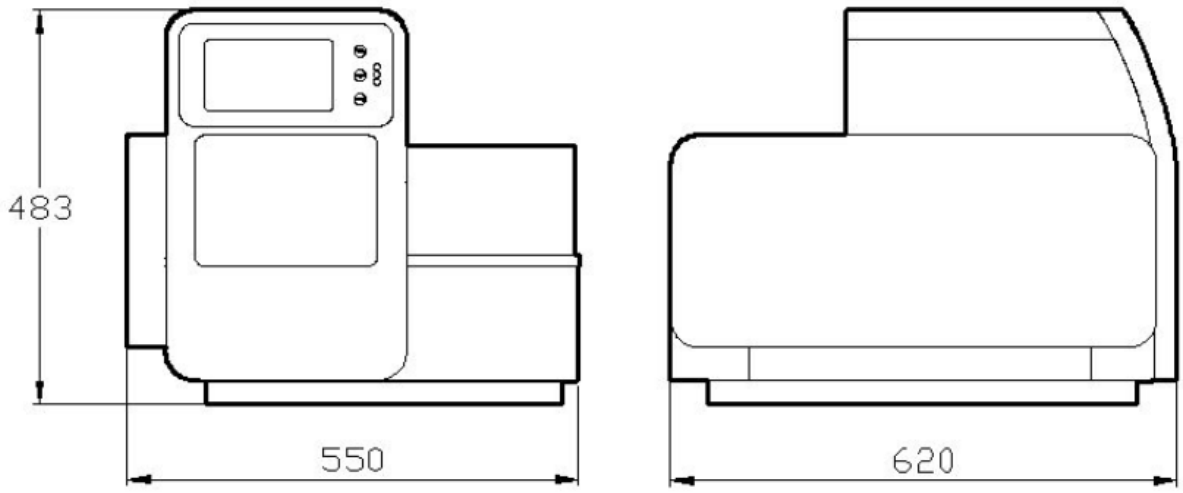


Fig 1

## Chapter 3 Basic Operating Instructions

This chapter mainly introduces structures, basic operation keys, displays as well as preparations before starting up. Please read this chapter carefully before using this instrument.

**1. Structures**
**1.1. Front**

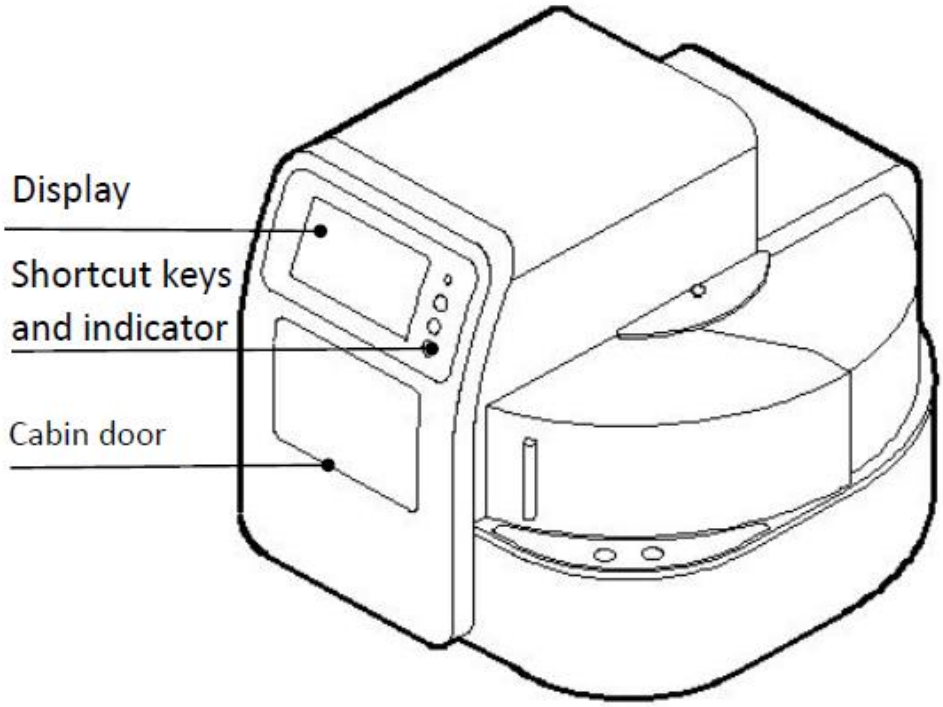


Fig 2

**1.2 Back**

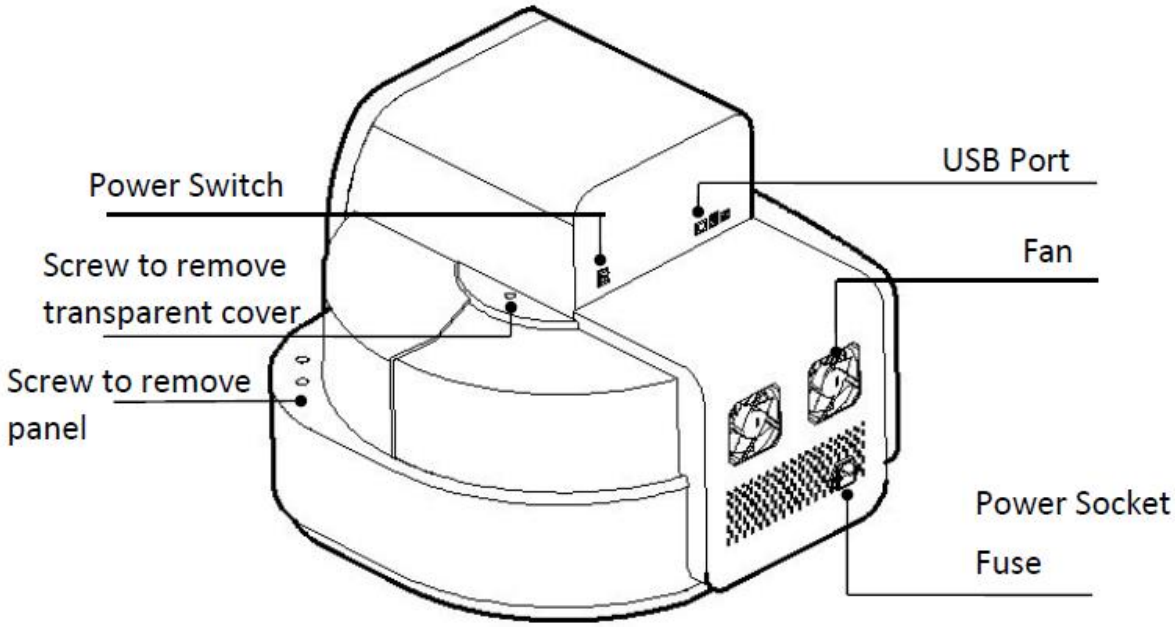


Fig 3

**1.3. Cabin Door**

The cabin door of Phoenix-Pure96 can be opened which is convenient for cleaning and maintenance.

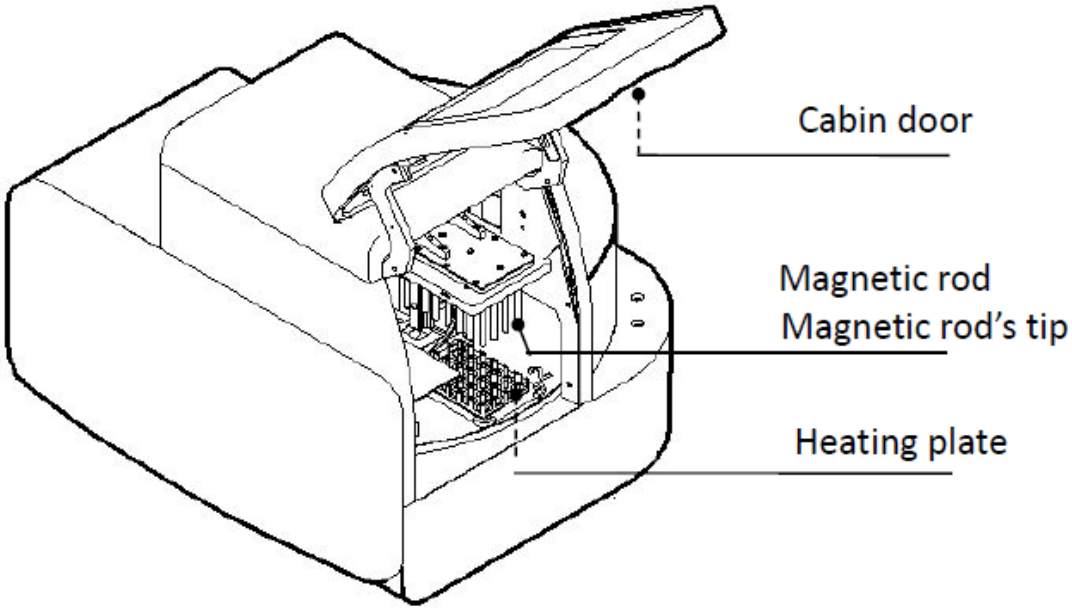


Fig 4

**1.4. Transparent Cover**

The transparent cover on the right side of the instrument is for placing or taking out kits. The cover can be removed to make it compatible with automatic liquid transfer workstations.

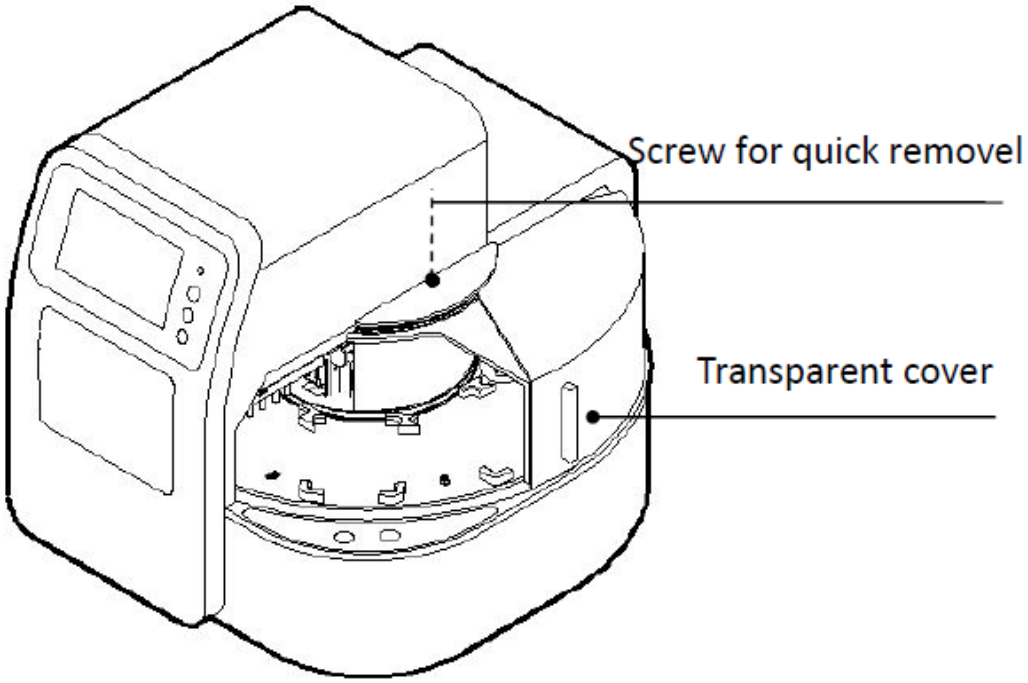


Fig 5

**2. Touch Screen**
Display screen: Touch screen, mouse also can be connected for operation.
TAB: Select shortcut program.
RUN: Start the shortcut program and run the instrument.
STOP: Stop the operation.

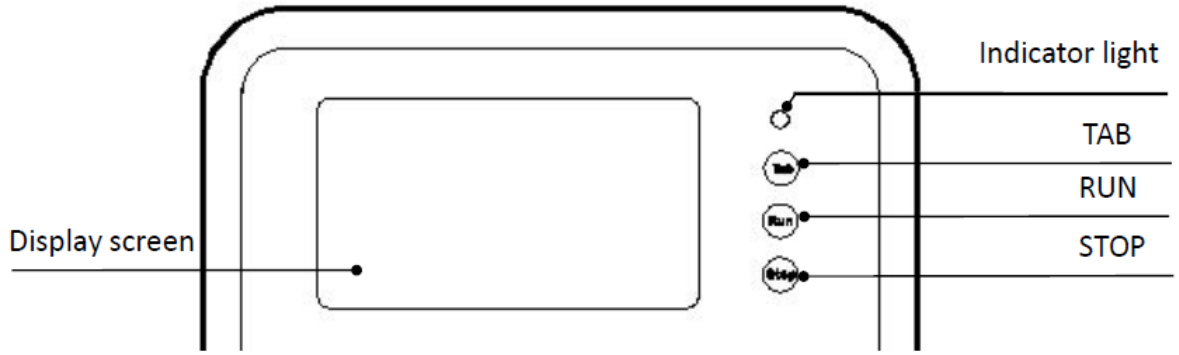


Fig 6

## Chapter 4 Operations

**1. Power Connection**
AC 100 - 240V

**2. Kits Installation**
Open the cabin door, put kits on the plate position of the rotary table, press position button to turn the rotary table and place all the kits in turn.

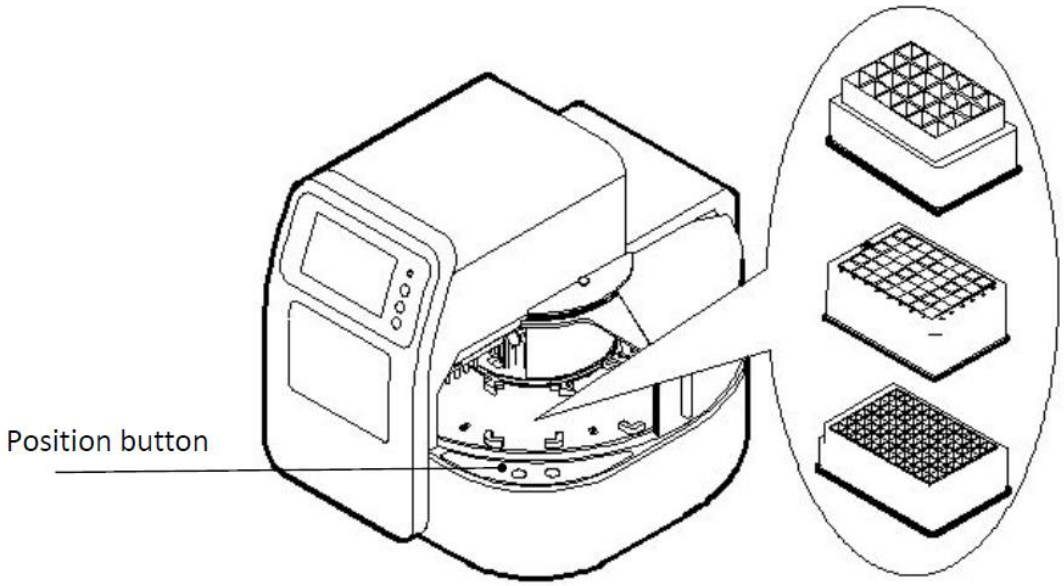


Fig 7

## 3. Detailed Operations

### 3.1. Start-up Interface

Turn on the instrument and make sure the door is closed before start. The start-up interface will come up.

Fig 8

Then, it will enter "Run Prog." interface.

### 3.2. Run Program Interface

This interface including two modes: "shortcut" mode and "list mode", as shown in below Fig 9 and Fig 10.

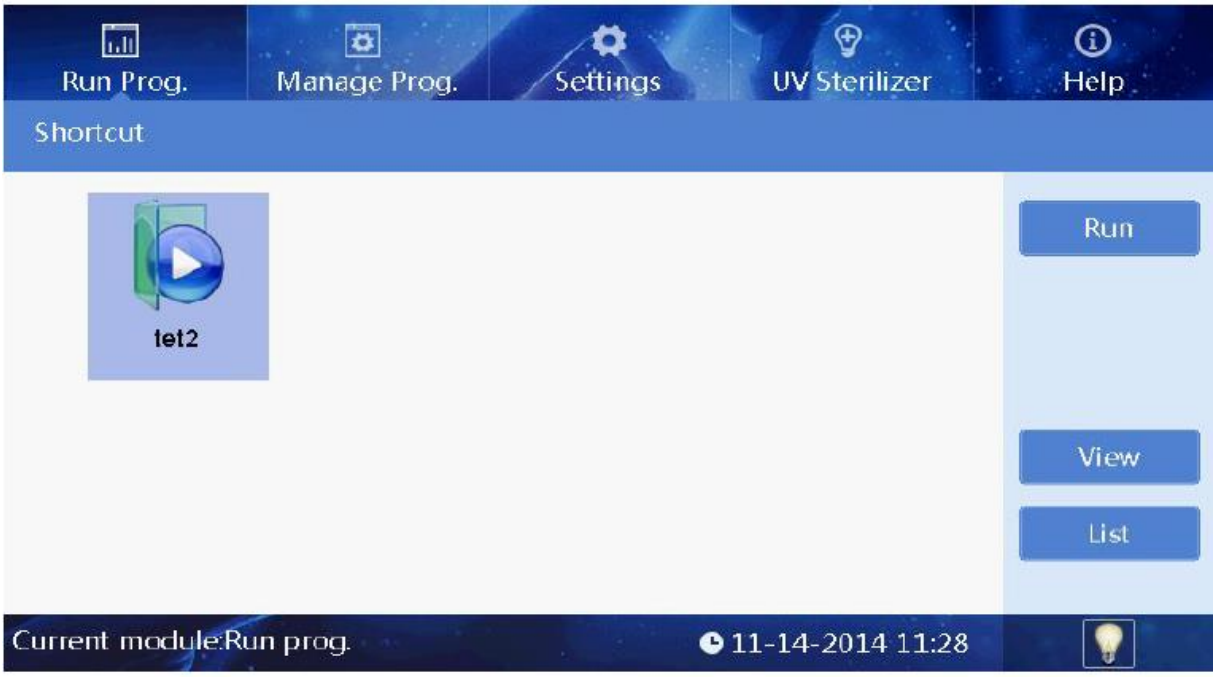


Fig 9

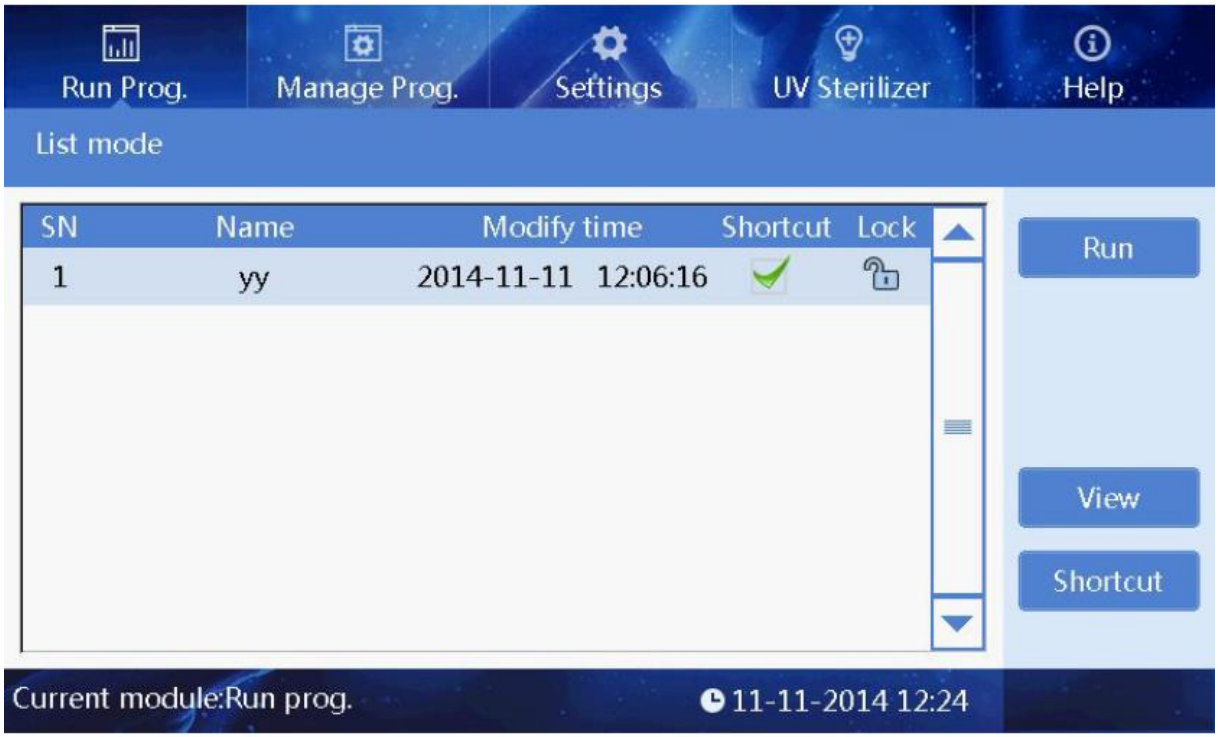


Fig 10

In the "List mode" interface, if one program selected/activated in "Shortcut" column, the icon of the program can be displayed on shortcut interface. 8 different programs can be activated in total at the same time
"SN", "Name", "Modify time" and "Lock" are non-editable options.

### 3.2.1. Run Interface

In "List mode" or "Shortcut" mode, select required program and click "Run" to enter into run interface.
When running the program, the instrument will first detect the presence of the kit on the rotary table. If no kit is found on the board of the setup program, the program will prompt to confirm whether the following steps can be continued, as shown in the figure below.

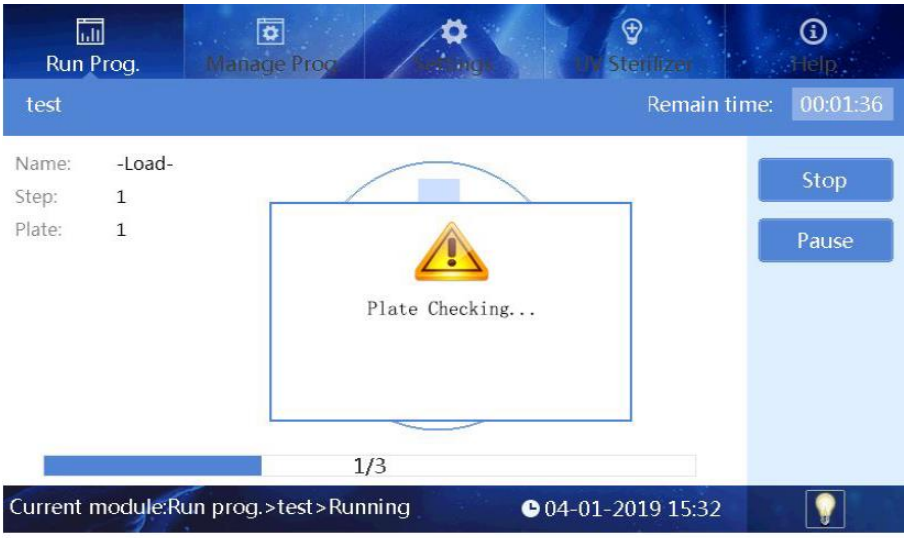


Fig 11


Fig 12

The instrument will install the magnetic rod sleeves automatically. If rod sleeves are already installed on the current magnetic rod sleeve rack, „Sleeve loaded, continue?" will pop up. If no magnetic rod sleeve is detected after installing the magnetic rod sleeve, „No sleeve, continue?" will appear.

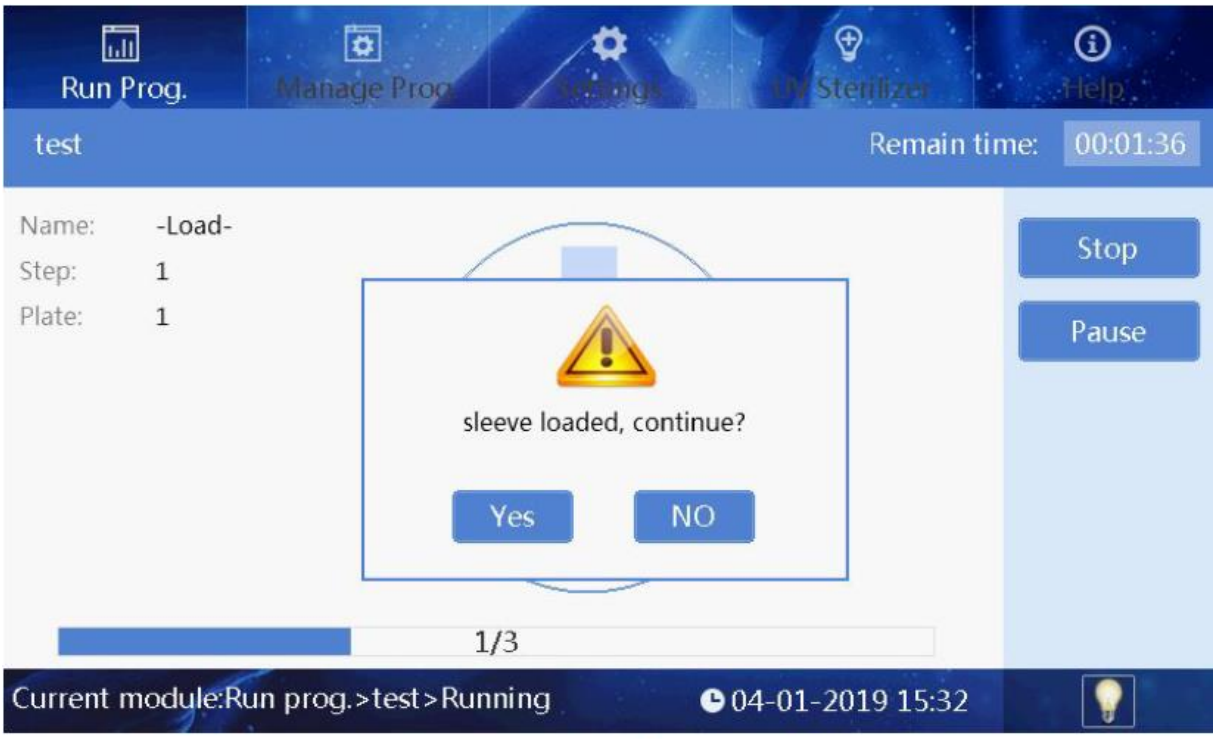


Fig 13

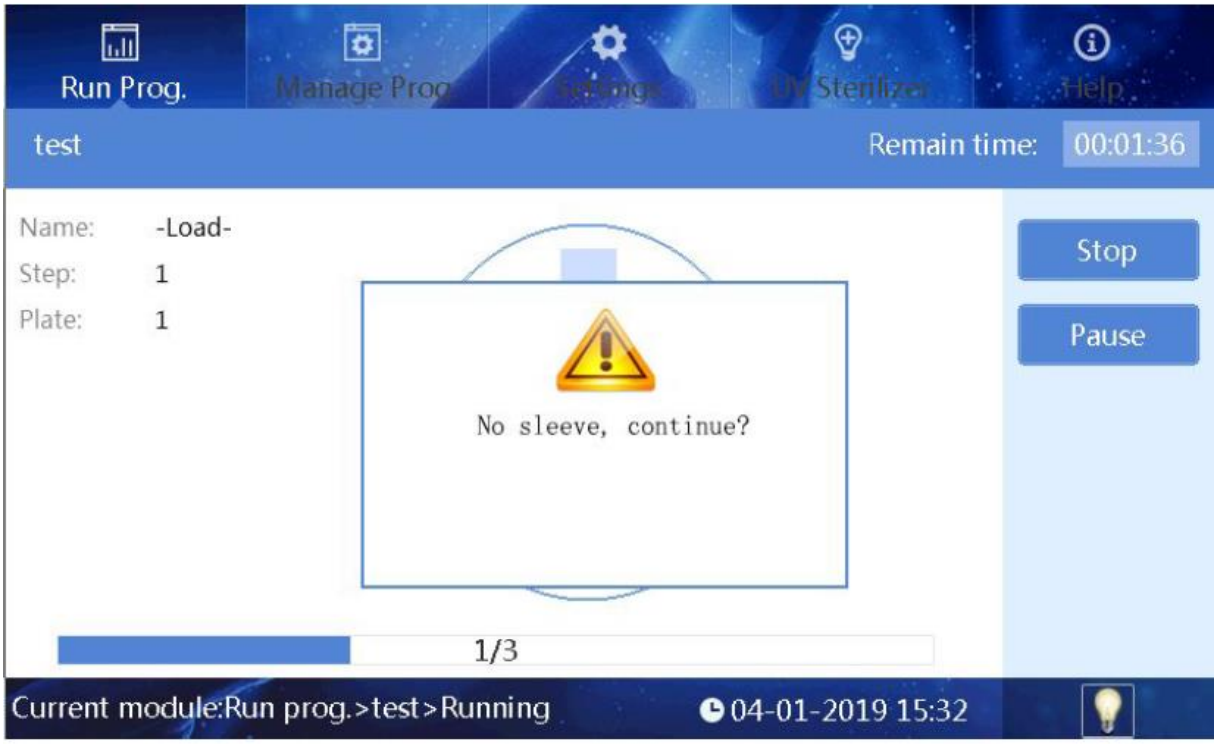


Fig 14

After the magnetic rod sleeve is successfully installed, the instrument automatically performs the following steps, please see Fig 15.

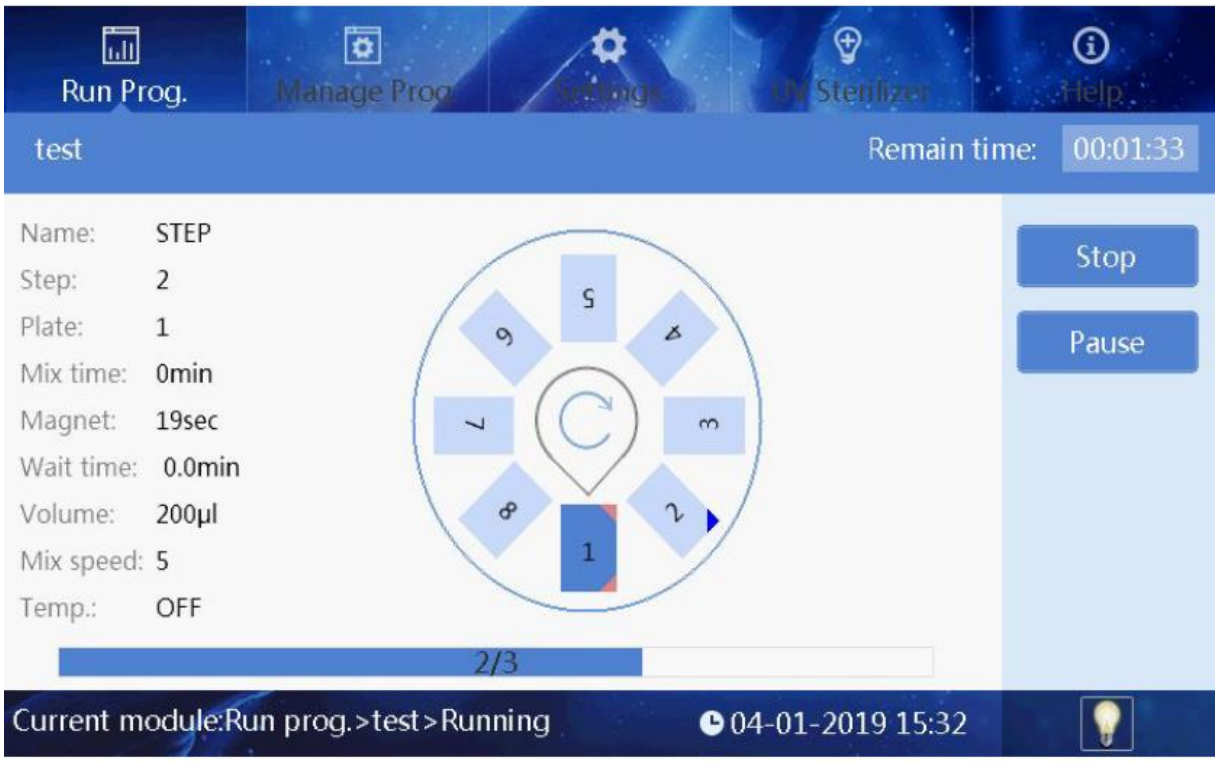


Fig 15

In the running interface, users can stop, pause, continue or run the program again. The plate with **dark blue color**, number 1, is the working plate, the **red corner** marks on it means the plate is running or already finished running, while **blue corner mark** means

the plate is ready to run. **One corner mark** means one running and two means two runs. A corner mark represents the plate position used once in the whole program. After the completion of the operation, the No. 8 plate position will be automatically moved to the transparent cover on the right side.

### 3.2.2. View

In the „List mode“ or „Shortcut“ mode, select the required program, and click “View” button to enter the view interface (See Fig 16). Users can view each parameter settings of the program.

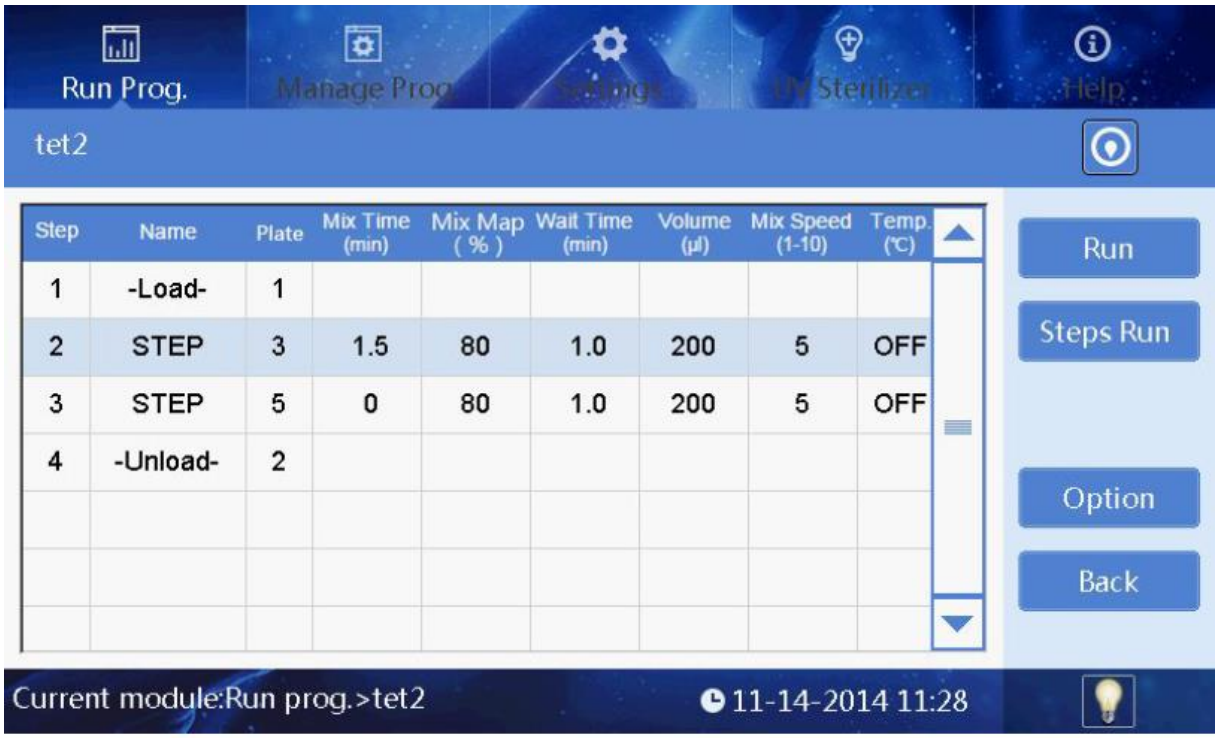


Fig 16

Users can click  button in the upper right corner to switch to the graphic display. Highlight displays the plate position corresponding to the selected step, please see Fig 17 as below.


Fig 17

Click  button to magnetic parameter absorption interface which displays magnetic parameters of selected step as shown in Fig 18.
"Steps Run": runs the program starting from currently selected step.
"Option": view settings of the program, please see Fig 19.

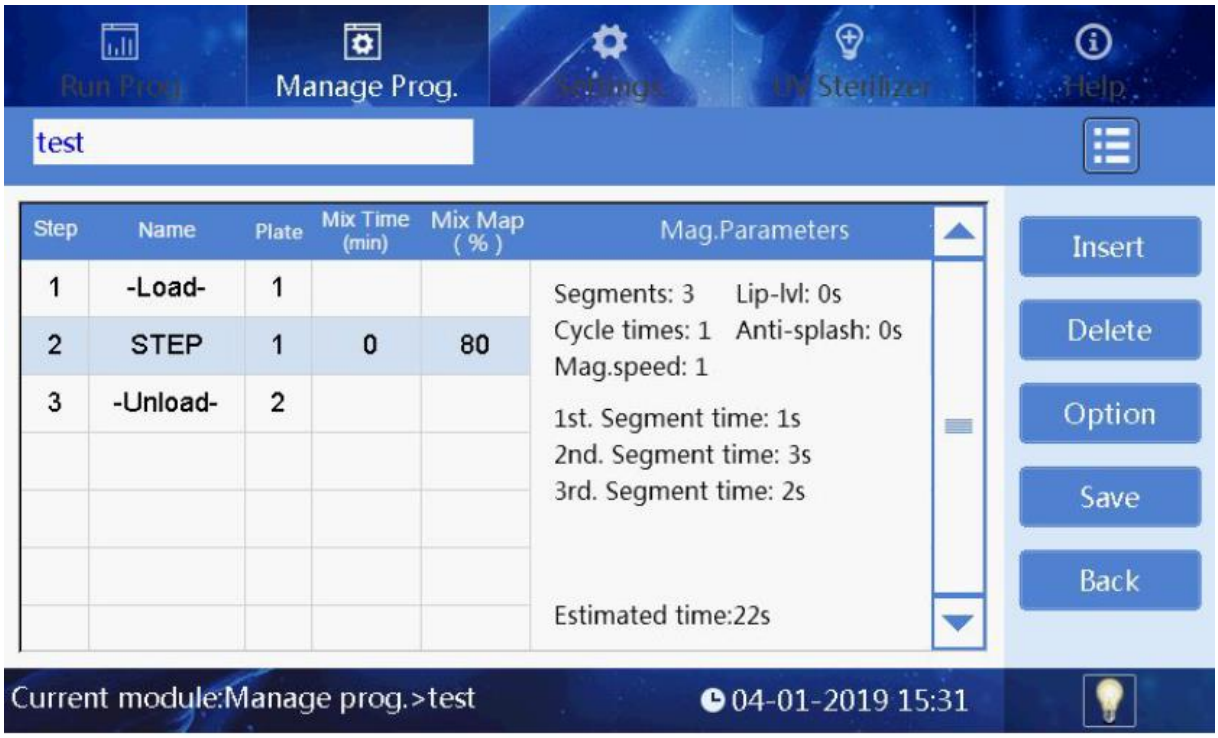


Fig 18

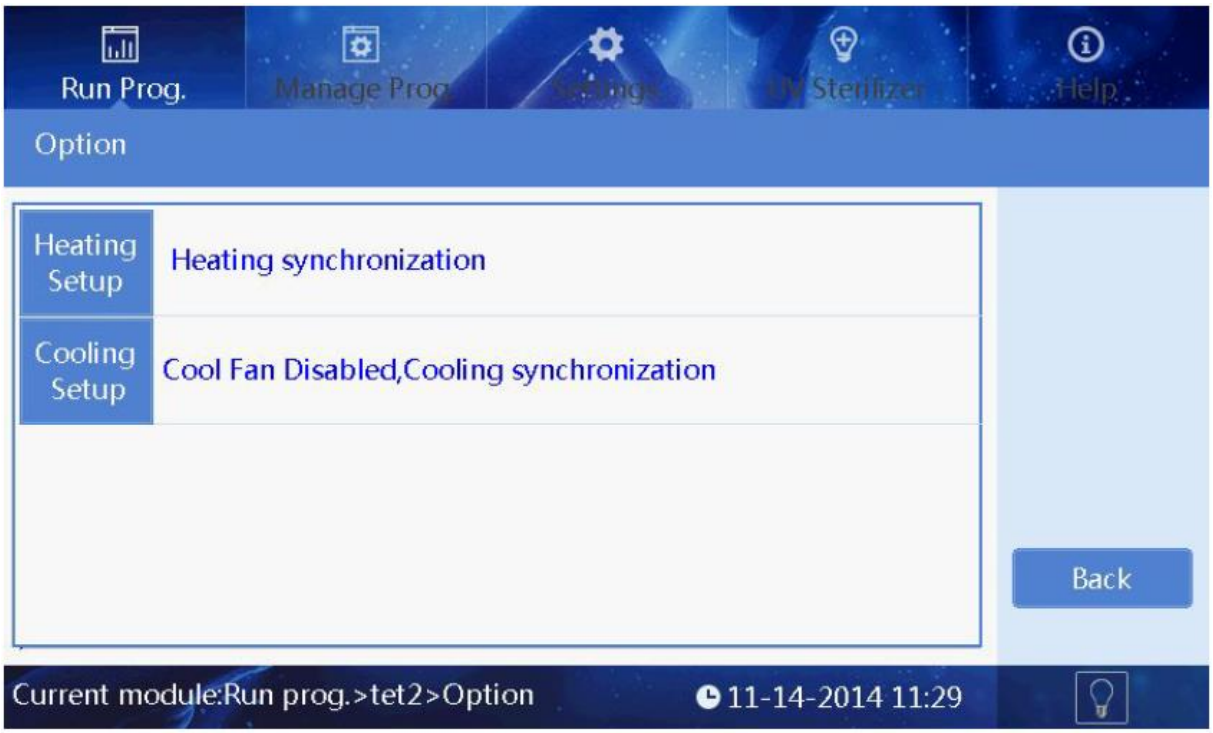


Fig 19

### 3.3. Manage Program

Users can manage all programs in "Manage Prog." interface.

#### 3.3.1. Management Interface

Management interface is similar to the list interface in program operation, except that locking column is non-operable option in the program run interface while it's an operable option in management interface. Click the lock icon to switch lock and unlock. Programs cannot be edited, saved, or deleted if in lock state, please make the change in unlock state.

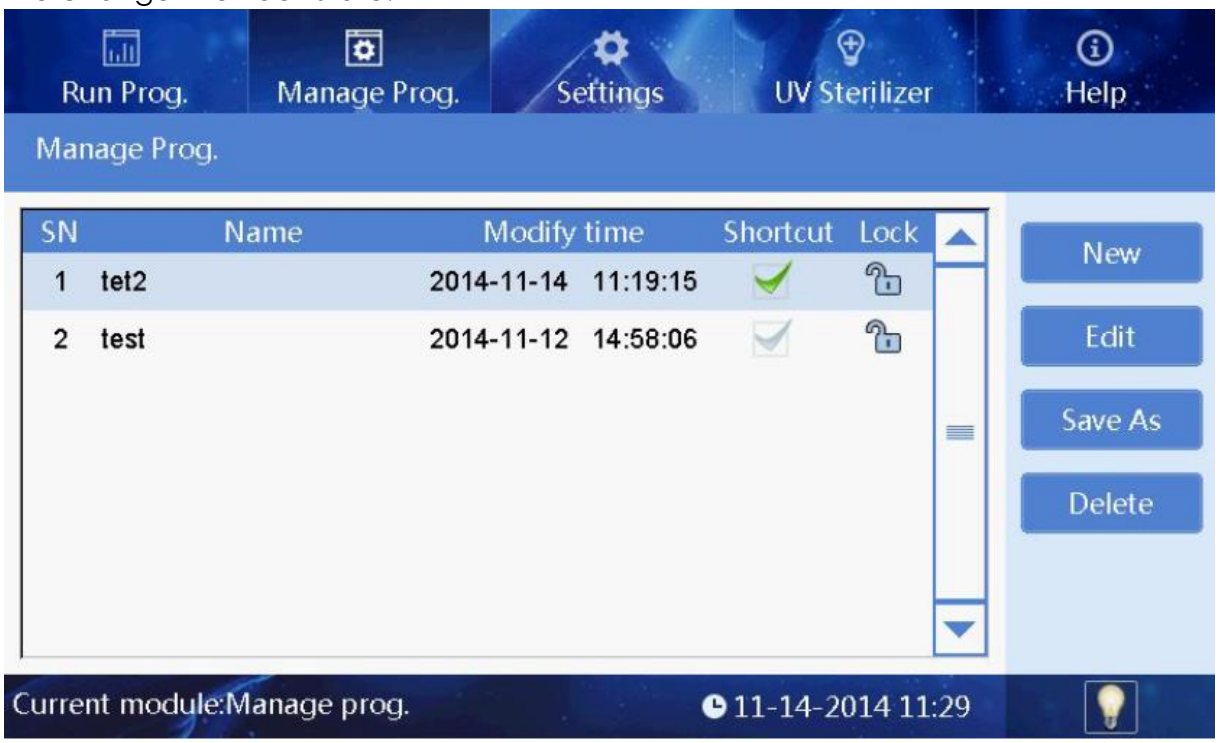


Fig 20

### 3.3.2. New/Edit interface

When the users click the "New" or "Edit" button, interface of Fig 23 will appear, the main difference between "New" interface and "Edit" interface is whether the program name exists or not, other operations are similar. This interface mainly includes five buttons:

**"Insert", "Delete", "Option", "Save" and "Back".**

INSERT: click "Insert" to add a new program with default parameters next to the current selected program, the new program should be with a valid name.

DELETE: delete the selected program.

OPTION: Option is the high-level parameter setting which applies to the entire program scope.

SAVE: save the program file, please note a valid program name is necessary.

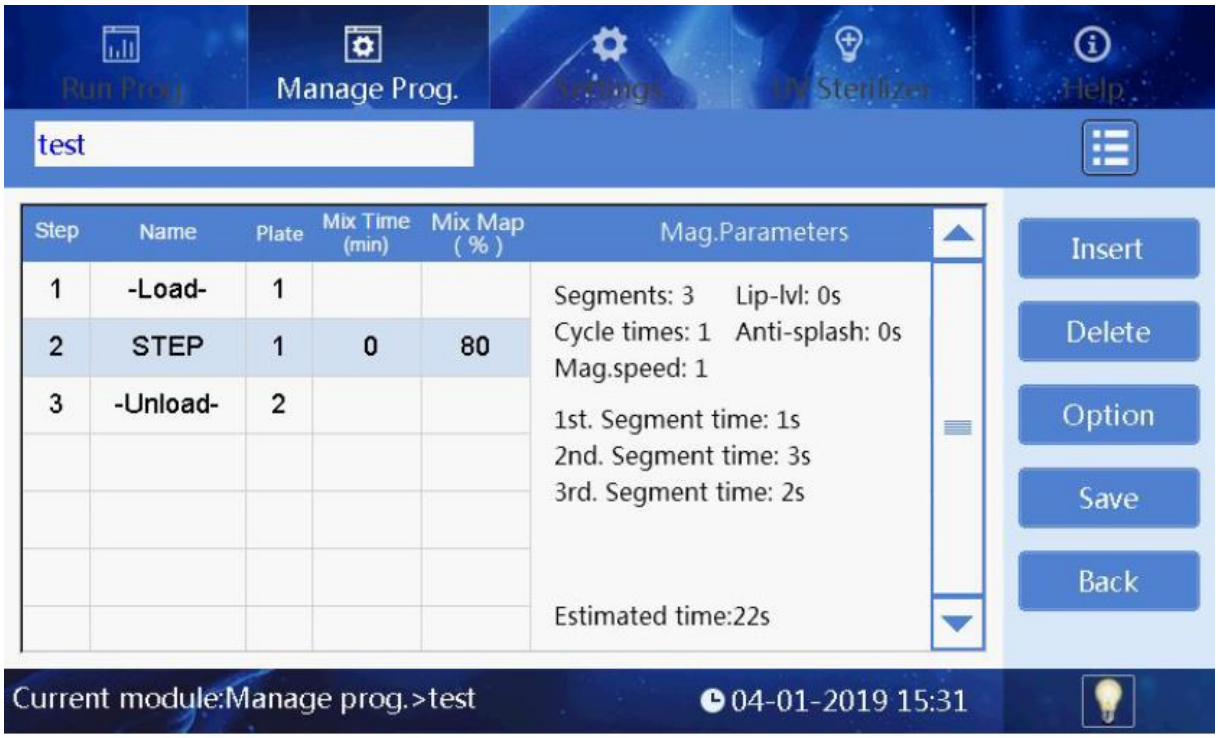


Fig 21

"Insert" interface as Fig 22.


Fig 22

PLATE: select a plate position for the coming operation
NAME: set a name of the step
MIX TIME: the mixing time for selected plate.
MIX AMP: mix amplitude, the range is from 1 to 100%.
WAIT TIME: interval time between two steps.
VOLUME: The volume is automatically converted to the amplitude of mixing according to the formula.
MIX SPEED: 10 kinds of mix speeds from 1 to 10. The higher the value is, the faster the mixing speed will be.
TEMP.: The temperature can be set according to actual requirements, only No.2 and 8 wells can be set.

Click " >> " to enter parameter settings of magnetic absorption, see below picture please.

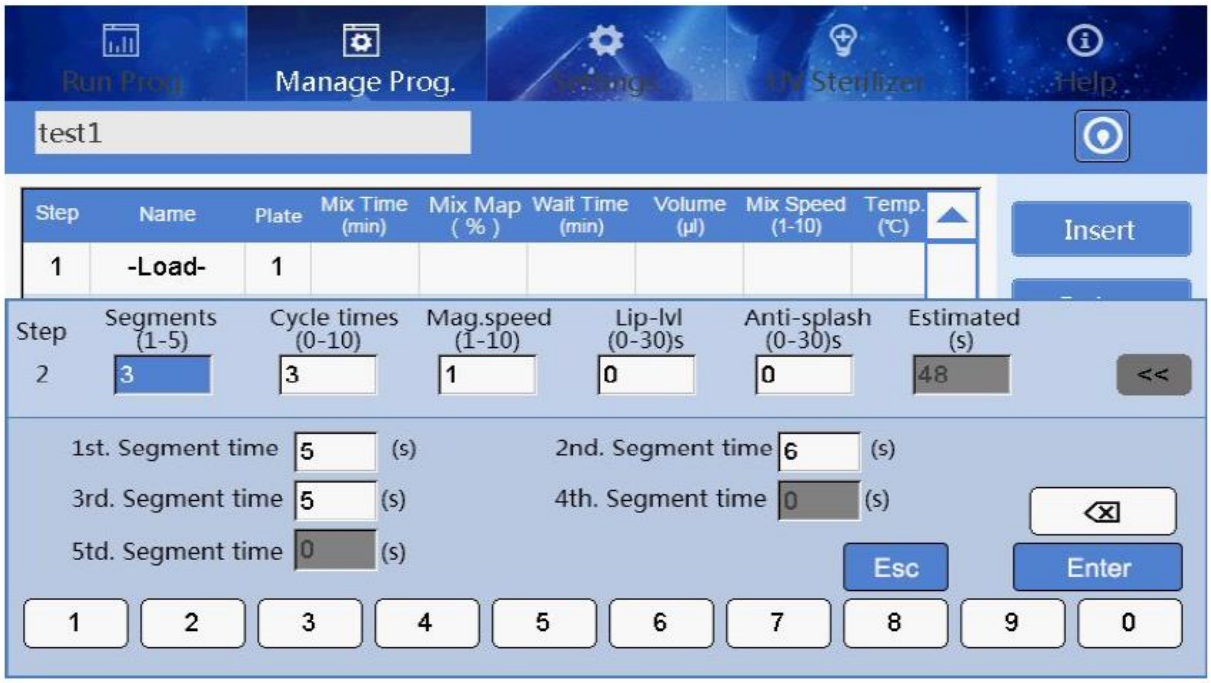


Fig 23

SEGMENTS: setting range is 0 - 5, it can stop to do magnetic absorption for each segment, magnetization function will be closed if set it to 0.

CYCLE TIMES: repeat magnetic absorption times.

MAG.SPEED: the magnetic absorption speed when magnetic rod moves under the liquid level. 1 is the slowest, 10 the fastest.

LIP-LVL: the waiting time when magnetic rods closing to liquid level after finishing magnetic absorption which is for magnetic beads gathering in case beads falling off due to liquid surface tension.

ANTI-SPLASH: the waiting time when magnetic rods pull away from liquid level after finishing magnetic absorption. This can prevent cross contamination caused by liquid splashing.

1-5 SEGMENT TIME: independent magnetic absorption time of each segment, the maximum time is 999 seconds.

ESTIMATED: The estimated magnetic absorption time of the software. It can only be displayed on the next entry after exiting the interface.

### 3.3.3. Option

In program „new" or „edit" interface, click the "Option" to enter the option interface. The parameters in the option are applied to the whole program as shown in the figure below.

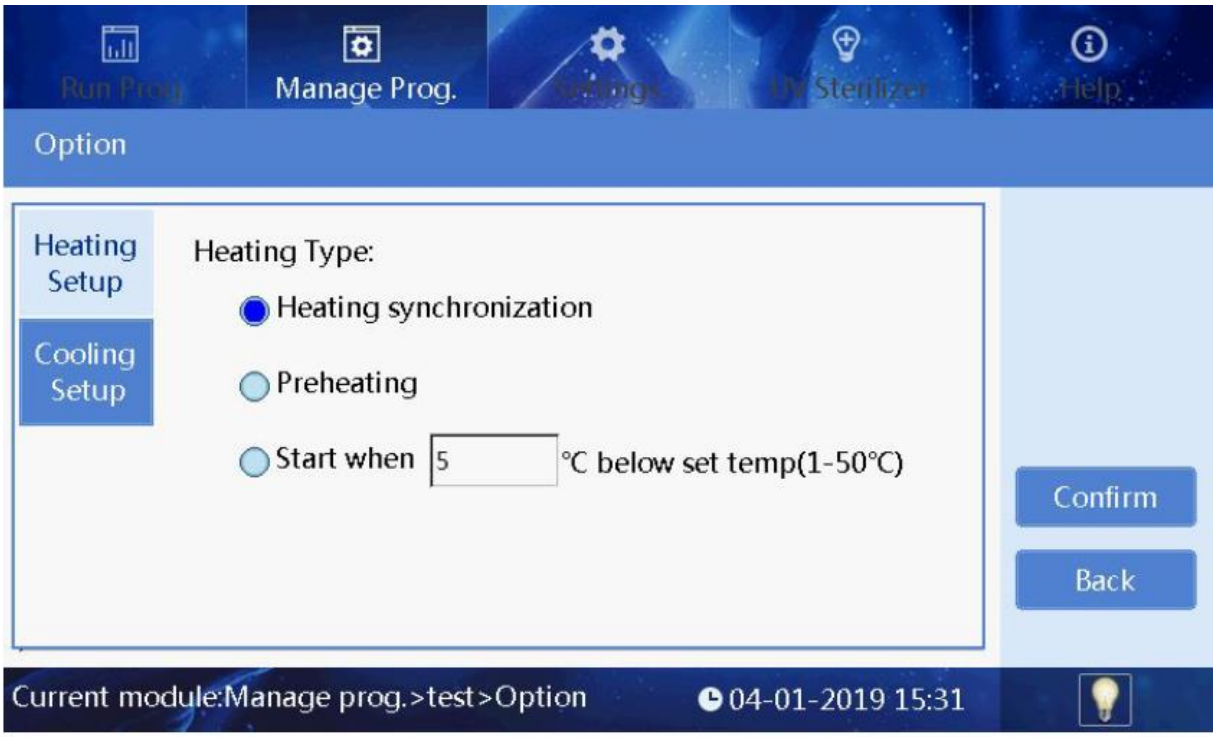


Fig 24

CONFIRM: Save all settings and exit.
BACK: Not save all settings and exit.
HEATING SETUP: It is used to set the heating type.

- Heating synchronization: It indicates that the heating and magnetic rod sleeve action are synchronous.
- Preheating: It indicates that the heating board will rise to the set temperature first, and then the magnetic rod sleeve frame starts to work.
- Start when: It indicates that the magnetic rod sleeve frame starts to work when the temperature reached the set temperature.

COOLING SETUP: It is used to set the cooling type.

### 3.3.4. Save As/Delete

In the "Manage prog" interface, click the save as button to save the file, and click the delete button to delete the file.

## 3.4. System Settings

In system setting interface, "Instrument", "Date&time", "Language", "Air ejector fan", "Im&export" and "Upgrade" can be modified.


Fig 25

### 3.4.1. System Time

Click "Date & time" button to enter modification interface, as shown in the figure below.


Fig 26

The date and time can be adjusted by "+" or "-" buttons.

### 3.4.2. Language Settings

Two options: Chinese and English.

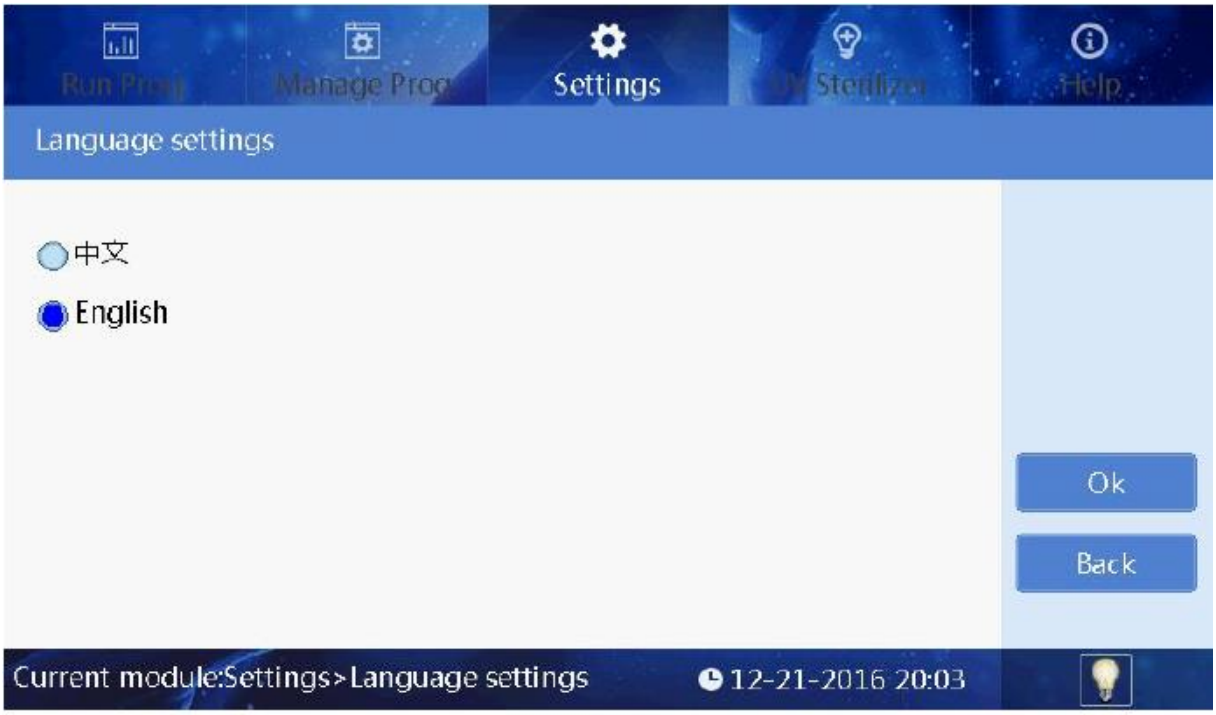


Fig 27

Select the language , press "Ok " to save the modification.

**3.4.3. Fan**

Click "Air Ejector Fan" to choose "On" or "Off".

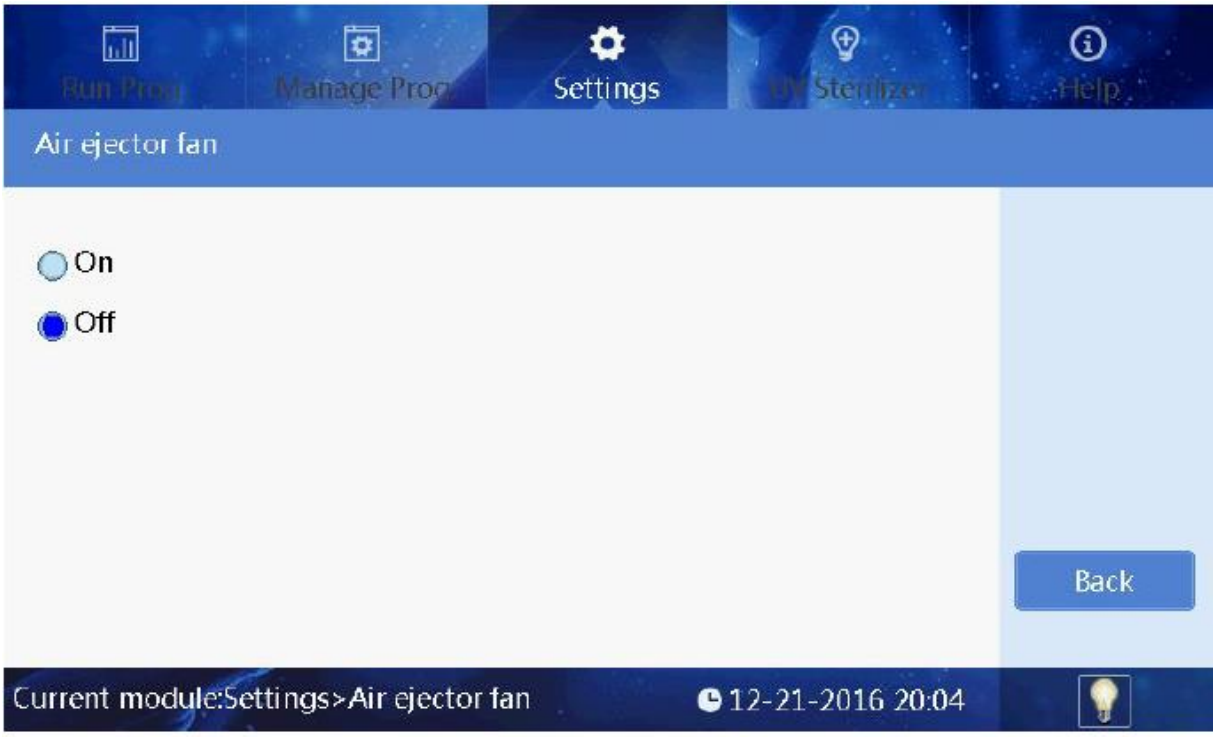


Fig 28

### 3.4.4. Import and Export

Click the "Im&export" to below interface.


Fig 29

Press „Import„ to enter directory and then select the program needed, press „Ok" to import.

Press „Export"to enter the system directory, select programs and then „Ok" to export files to the USB disk.

### 3.4.5. Software Upgrade

Click „Upgrade" to upgrade interface, see Fig 30 please.

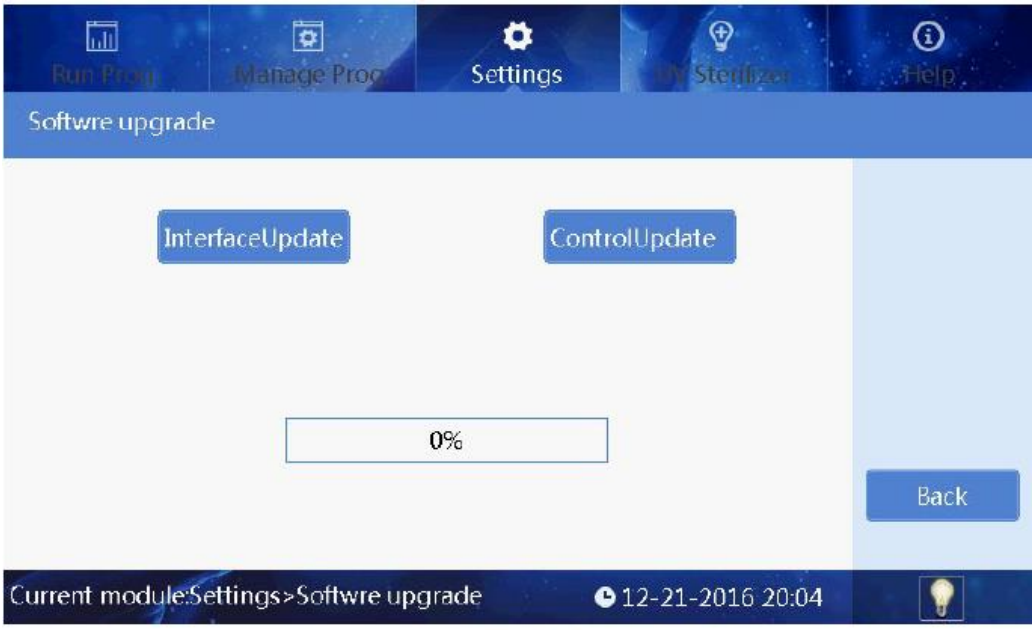


Fig 30

Insert the USB drive with the latest software in, and then upgrade the interface software or control software of the instrument.

### 3.4.6. Operation Record

Each run of the program automatically generates a running record.


Fig 31

Users can trace records by "Search" button, see Fig 32 please.

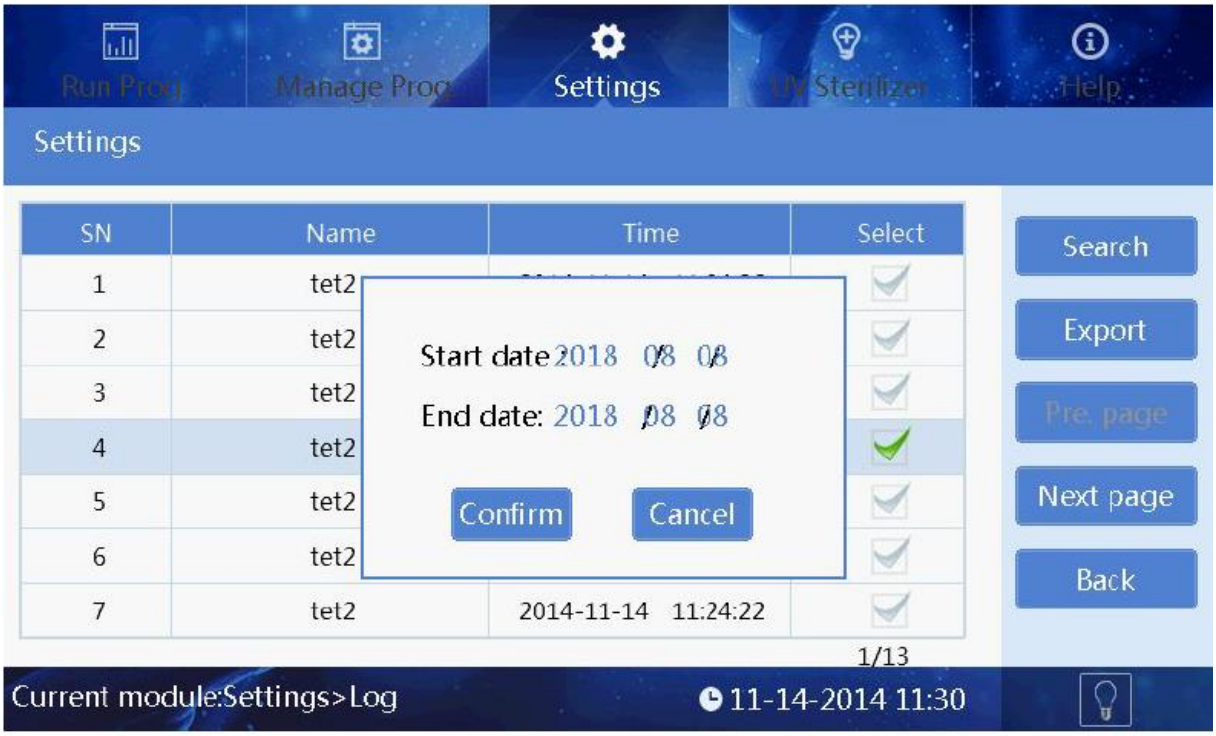


Fig 32

Log exports can be done through the export function.

### 3.4.7. Lighting

At the right bottom of the screen, if the icon “  ” appears, it means the lighting is on. Lighting is off if the icon displays “  ”. Users can click the icon to switch between on and off.

### 3.5. UV Sterilization

The UV disinfection interface is mainly used for the opening and closing of the UV lamp. The time can be set by pressing “+” or “ -” button. The program can automatically determine half of the set time to sterilize the half circle of the rotary table, with a minimum of 2 min, as shown in
the figure below.

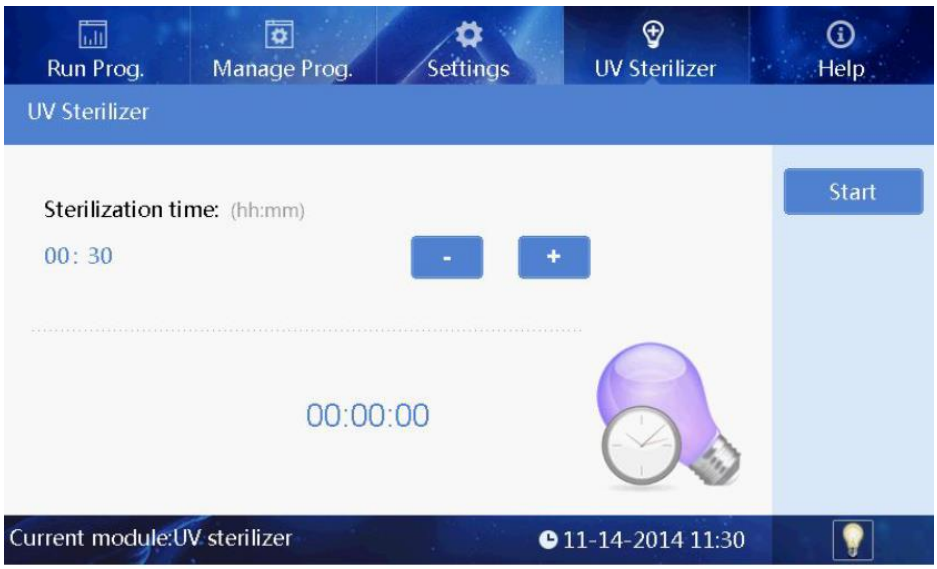


Fig 33

### 3.6. Help

Help interface displays help information and version as shown in the figure below.

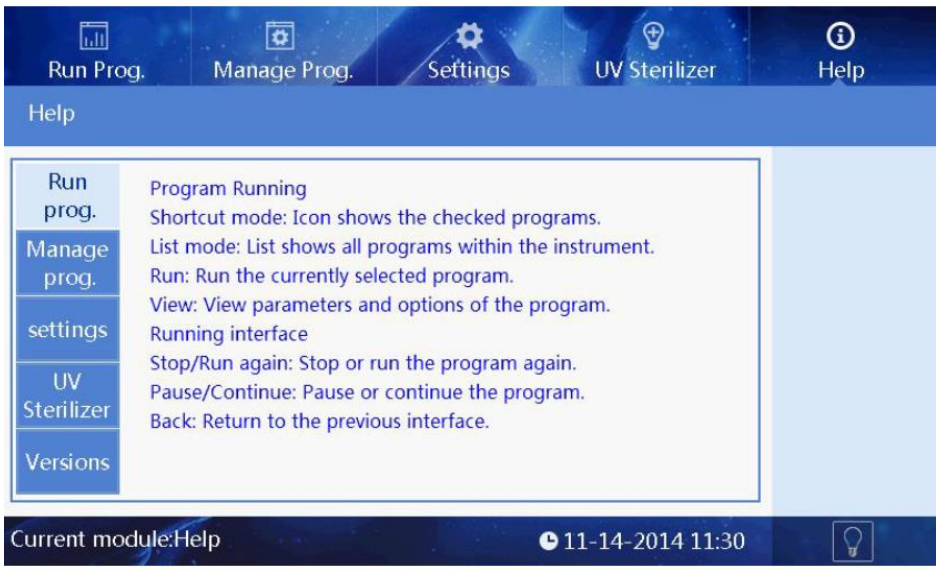


Fig 34

## Chapter 5 Trouble Shooting

### 1. Troubleshooting

| No. | Error | Causes | Solution |
|---|---|---|---|
| 1 | No display after switch on | Power not connected | Check power |
| | | Switch failure | Replace Switch |
| | | Fuse failure | Replace Fuse (5X20 250V 8A) |
| | | Others | Contact PCC |
| 2 | No UV light | UV light failure | Replace light tube Contact PCC |
| 3 | No Light | Light failure | Replace light tube Contact PCC |
| 4 | Cannot stop automatically after opening the door. | Sensor failure | Contact PCC |
| 5 | Big variance between actual and display temperature | Sensor failure | Contact PCC |
| 6 | No heating for heating strip | Sensor failure | Contact PCC |
| | | Heater failure | |
| 7 | Instrument cannot run | Controller failure | Contact PCC |
| | | Motor failure | |
| 8 | Abnormal sound during working | Guide rail installed incorrectly | Contact PCC |
| | | Motor failure | |
| | | Synchronous belt abrasion | |
| 9 | Press button not working | Press button failure | Contact PCC |

### 2. Software Error Alarm List

| Error Type | Error Name | Error Code |
|---|---|---|
| Temperature (Code: 0) | T1 Overheat | E011 |
| | T1 Open circuit | E015 |
| | T1 Short circuit | E016 |
| Electric machinery stroke position (Code: 4) | Baffle motor sensor | E404 |
| | Rotary motor sensor damaged | E405 |
| | Lifting platform motor sensor damaged | E406 |
| | Push rod motor sensor damaged | E407 |
| | Motor position sensor of magnetic rod sleeve damaged | E425 |
| | Magnetic rod motor position sensor damaged | E415 |
| LCD, Crystal oscillator, Storage (Code: 7) | The clock crystal fault | E702 |
| | Memory chip E2P damaged<br>Setting parameters lost | E703 |
| | New instrument, instrument type hasn't been set | |
| | Zero has not been calibrated. | |
| Communication (Code: 8) | Moving parts online failure | E801 |
| | Rotary parts online failure | E802 |

## Chapter 6 Accessory

| No. | Name | Specs. | Unit | Qty. |
|---|---|---|---|---|
| 1 | Power Cord | | Pc | 1 |
| 1 | Mouse | Logitech | Pc | 1 |

## Chapter 7 Abbreviations and Tags

### 1. Abbreviations

The following abbreviations are for reference and will appear in this operation manual.

| Abbreviation | Meaning |
|---|---|
| A | ampere |
| AC | alternating current |
| V | volt |
| Hz | hertz |
| W | watt |
| USB | universal serial bus |
| SD | secure digital card |
| WiFi | wireless fidelity |
| kg | kilogram |
| mm | millimeter |
| μl | microliter |
| hpa | hectopascal |
| °C | degree centrigrade |
| cv | stability |
| TAB | tab |
| RUN | run |
| STOP | stop |

### 2. Tags

Following marks appear on the instrument

| | |
|---|---|
|  | Warning label |
|  | Heating label |
|  | CONFORMITE EUROPEENNE |
|  | Be careful of hands |