PCR Cabinet

LMPCR-A103

Index

1. Safety Measures

1.1 Precautions Before Operation

- Ensure the input voltage is correct and stable. The rated load of the main power socket should be higher than the cabinet's consumption. The plug must be well grounded.
- **Moving principles of different samples inside the cabinet:** When two or more samples need to be moved, be sure that low-polluting samples move to high-polluting samples. The movement of items should also follow the principles of moving slowly and stably.
- The weight of items placed in the cabinet should not be more than 23/25×25cm^2.
- **Avoid vibration:** Avoid using vibration equipment (E.g., Centrifuges, vortex oscillators, etc.) inside the cabinet. Vibration would cause lower cleanliness of the operating area and affect operator protection.
- **No flame:** No flame is allowed inside the cabinet. Using fire will lead to airflow disorder and filter damage. If sterilization is required during the experiment, an infrared sterilizer is highly recommended.
- **HEPA filter life:** With the usage time increasing, dust and bacteria accumulate inside the HEPA filter. Filter Resistance is getting bigger, when it reaches the maximum point, the speed requirements can't be met.
- The steel plate is under the fan, which is sealed strictly in the factory. The operator is not allowed to remove or lose screws of those parts.
- The maximum storage period is one year. If the period is more than one year, a performance test should be done.

1.2 Label Description

	**Fuse label** **Note:** 10A power fuse label
	**Ground label**

2. Introduction

PCR Cabinet LMPCR-A103 offers 59-inch chamber ensures ample workspace supporting sensitive experiment. It features regulated airflow between 0.3 to 0.5 m/s, ensuring uniform circulation. Integrated with a UV lamp, enabling thorough sterilization before and after procedures. Equipped with an LCD screen, facilitating real-time tracking and effortless adjustments. Our PCR Cabinet preserves product safety, maintaining contamination levels at 0.5 CFU per cycle.

3. Features

- Advanced Dual-Stage Filtration
- Optimized Cleanliness Standards
- Efficient LED Illumination
- Automated Motorized Glass Door
- Sturdy Construction

4. Specifications

Model No.	LMPCR-A103
Cabinet Size	59 Inches
Airflow Velocity	0.3 to 0.5 m/s
Exhaust Volume	680 to 1135 m^3/h
Maximum Door Opening Height	300 mm
Working Surface Height	750 mm
Glass Door Thickness	Motorized, 5 mm thick (Front and Side)
Pre-Filter	Polyester fiber
HEPA Filter	99.999 % efficiency at 0.3 µm
Cleanliness Class	Class 100
UV Lamp	40 W
Illuminating Lamp	12 W LED Lamp
Illumination	Greater than or equal to 1000 Lux
Display	LCD Display
Noise	Less than 65 dB
Product safety	Less than or equal to 0.5 CFU / time
Power Consumption	600 W
Power Supply	AC 220 / 110 V ± 10 % ; 50 / 60 Hz
Internal Dimension	1400 × 595 × 550 mm
External Dimension	1500 × 700 × 1770 mm
Gross Weight	200 kg

5. Applications

PCR Cabinet LMPCR-A103 is essential for drug development by providing a contamination-free environment for sample processing in pharmaceutical laboratories.

6. Instrument Introduction

6.1 Structural Composition of PCR Operating Cabinet

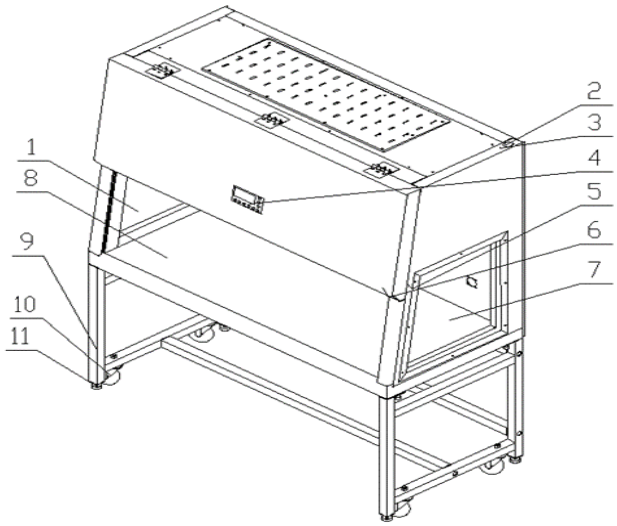

Figure-1

1. Glassdoor
2. Power socket
3. Ground terminal
4. Control panel
5. UV lamp
6. LED light
7. Side window
8. Worktable
9. Base
10. Caster
11. Support foot

1) **Driving system of the front window**
   The driving system consists of a tubular motor, front window, hauling mechanism, and limit switch.
2) **Air filtration system**
   The Air Filtration System is the most important. It consists of a blower and HEPA filter. The function of the Air Filtration System is to transfer filtered air to the work area, ensure airflow velocity, and keep Class 100 cleanness of the work area.
3) **UV lamp**
   The entire work zone could be sterilized effectively by the UV lamp in the work zone. Emission of 253.7 nanometers could ensure the most efficient decontamination.
4) **LED light**
   The PCR operating cabinet is equipped with an LED light, which ensures that the standard requirement of average illumination is met.

6.2 Water Socket

The waterproof socket is arranged in the operating area, within the operating area of the power supply equipment, and in the lighting, lamp installing the front side plate needs to use a socket, open the power supply equipment, press the display of the socket button, the waterproof socket cover, and access to the electricity source plug.

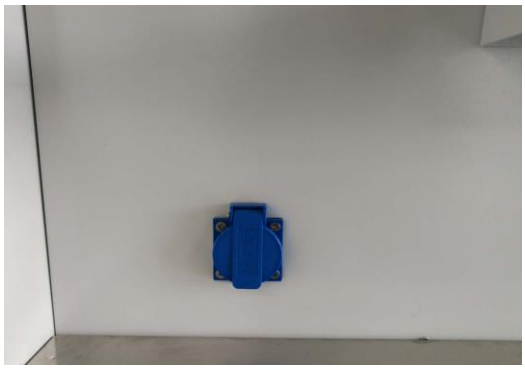

Figure-2

Note:

- Ensure the total load of sockets is ≤500W.
- Waterproof socket only when the front cover is down to the waterproof; when the front cover is opened, the socket cannot be considered a waterproof socket.

6.3 Fuse

The equipment is equipped with a main power fuse, they are located near the power cord's outlet. The fuse label corresponds to the relevant specifications.

7. Installation

7.1 Unpacking

Step 1: Unpack with an M8 wrench.

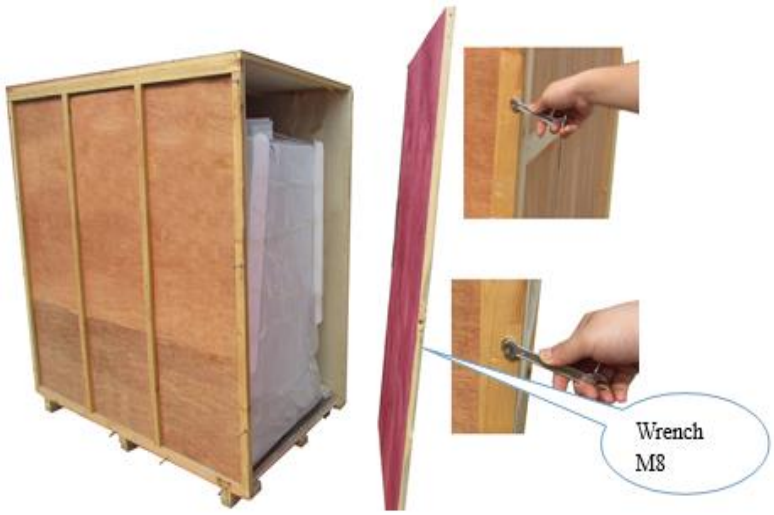

Figure-3

Step 2: Unpack with an electric drill.

Figure-4

Rapid unpacking diagram (Disassemble the screws, as shown in the below figure, then take the wooden box to the left and right.)

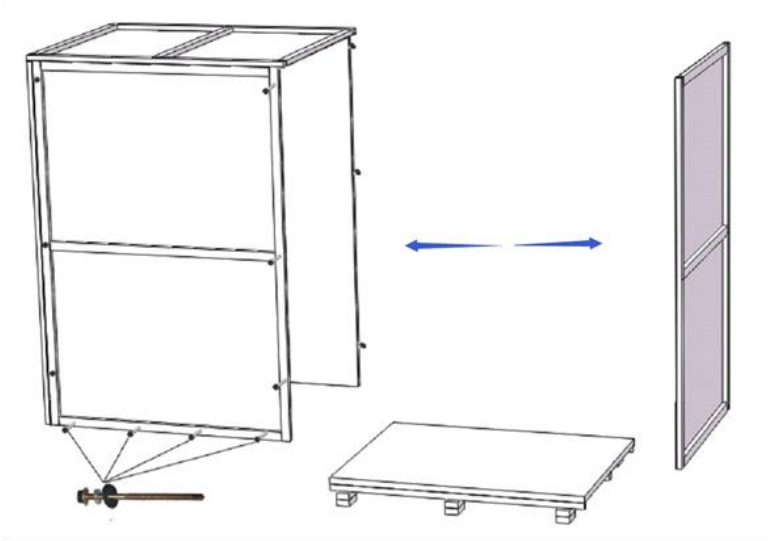

Figure-5

7.2 Installation conditions and operating environment

The PCR Operating Cabinet shall be placed in the protective area of an air stream, and the working area of the PCR Operating Cabinet cannot be near the door or window. It should be away from the air outlet to prevent the airflow from the ventilation system, air conditioning, door, window, and personnel.

Note:

At least a 300mm gap must be kept on the side and back side of the PCR Operating Cabinet for inspection.

7.2.1 Working environment

1) Only applicable for indoor operation.
2) **Ambient temperature:** 15°C-35°C
3) **Relative Humidity:** ≤75%.
4) **Atmospheric pressure range:** 70 Kpa- 106 Kpa.
5) **Electrical parameters:** Adequate power supply to the laminar flow cabinet.
6) The power supply needs to be grounded. (Judging method: Test the live wire and the neutral wire of the socket with a multimeter. The voltage between live and ground should equal the voltage of the local electrical grid, and the voltage between neutral and ground should equal 0. Otherwise, the power supply is not grounded correctly.

7.2.2 Storage

The PCR operating cabinet should be stored in a warehouse with relative humidity not more than 75% and a temperature lower than 40°C. The warehouse should have good ventilation performance without acid, alkali, or other corrosive gases.

7.3 Instrument installation

1) Remove all the packing materials.
2) Check the surface of the main body to make sure there are no scratches, deformations, or foreign bodies.
3) Before removing the packing material, move the entire equipment to the place where it is going to be installed.

The base stand will be packed at the back of the main body. Take it out before installation. Do not invert, disassemble, or tilt the cabinet during transportation.

7.3.1 Assembly of base

Kindly refer to **Figure 6** to assemble the base.

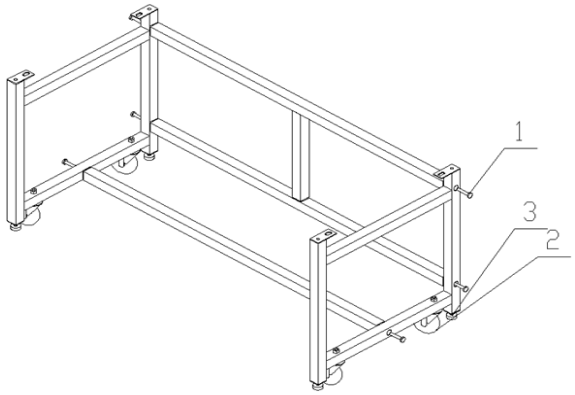

Figure-6

1. M10x55 Hexagon socket head cap bolts
2. Caster
3. Support

Unscrew the M10 × 55 hexagon socket head cap screws on the transverse bracing, both sides and the bottom of the T-shaped frame and install them as shown in the picture, then fasten the screws. Fasten the nuts M10 on both sides of the base frames, then assemble the base by referring to **Figure 6**.
As is shown in the figure, the height of the foot can be adjusted. Counterclockwise rotate the feet, when the feet' height is less than the height of the casters, you can move the cabinet (or base); Clockwise rotate the feet, when the feet' height is greater than the height of the casters, then the base is fixed.

7.3.2 Connect the main body and the base

Refer to **Figure 7** to connect the main body and the base.

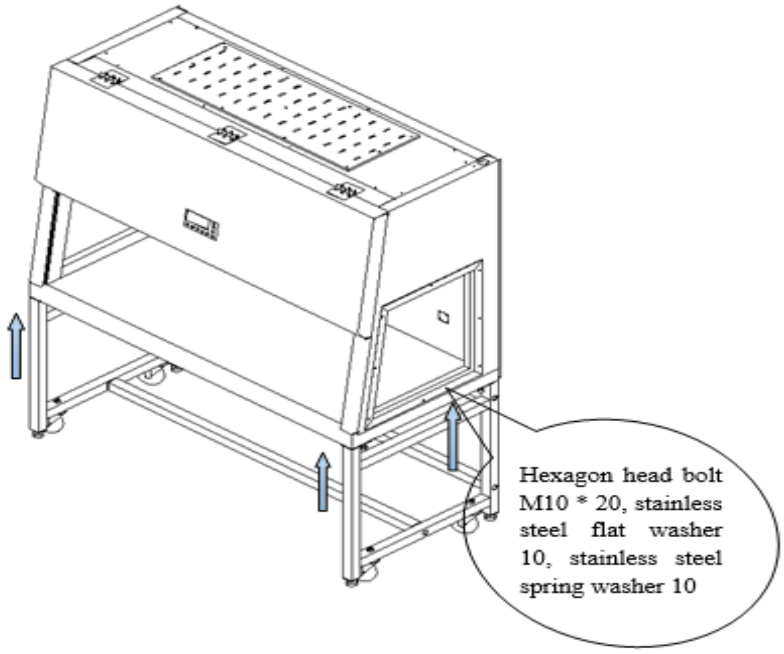

Figure-7

Firstly, put the upper cabinet on the base (as is shown in **Figure 7**), and then align the positioning bolt for cabinet connection in the base with the mounting holes at the bottom of the left and right panels, then let the hexagon head bolt M10 × 20, stainless steel flat washer 10, stainless steel spring washer 10 pass through the base and side panels from bottom to top, and make them be secured.

After the above steps are completed, move the cabinet slightly to the proper position, remove the power cord, and check whether the power cord is intact.

7.4 Check after installation

First, ensure the voltage and frequency are the same as the nameplate shows, and then check the following items with power on：

Front Window	Press the up and down buttons, the window runs normally.
Checking Items	Normal working status.
Fan motor	Running normally.
Fluorescent lamp	The lamp lights up after pressing the button.
UV Lamp	The lamp lights up after pressing the button.
Display screen buttons	All buttons can be used.
Socket	Use a multimeter to test the voltage output after pressing the socket button.

8. Operations

8.1 Operating principle/ Air cleaning system

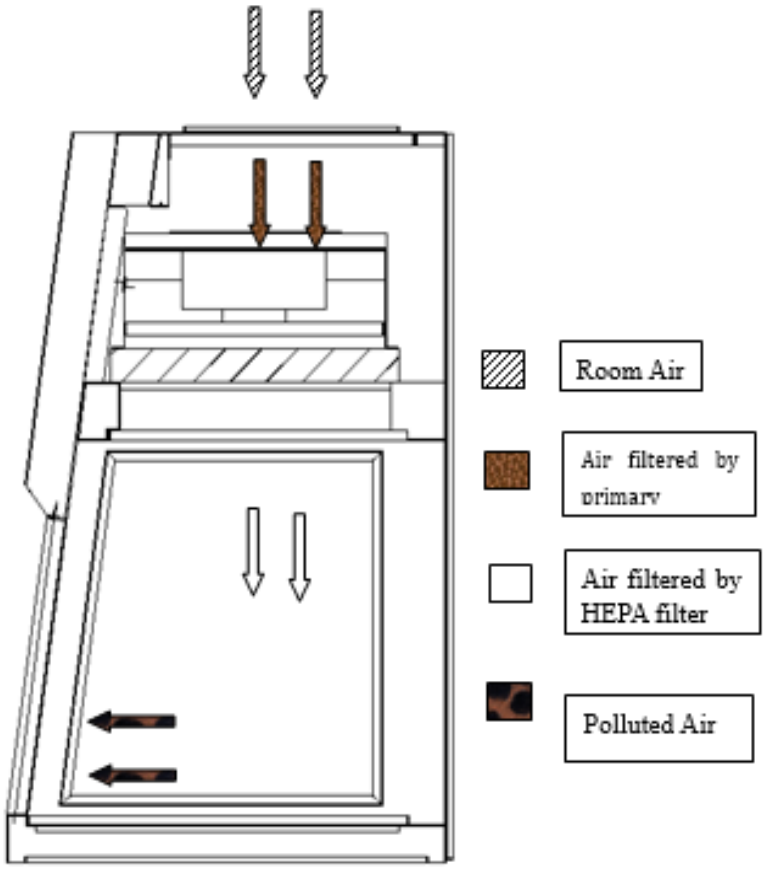

Figure-8

8.2 Control Panel

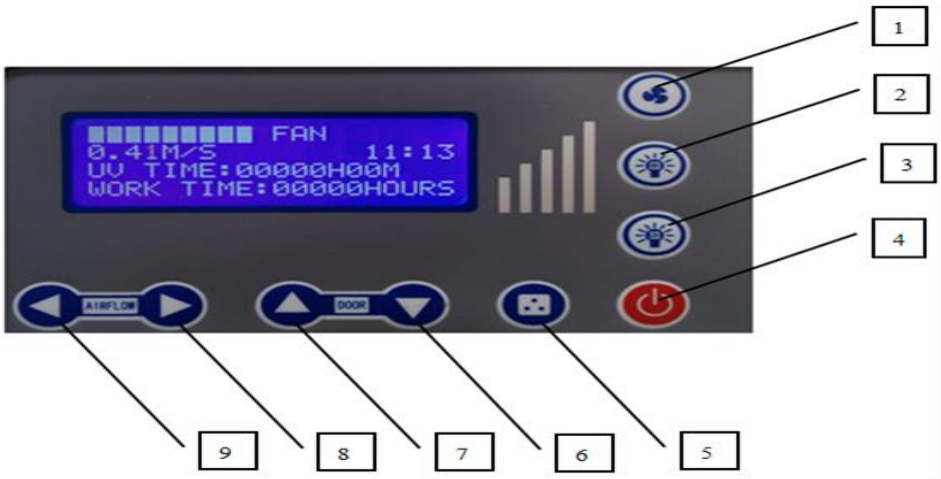

Figure-9

(1) Blower
(2) Fluorescent lamp
(3) UV lamp
(4) Power
(5) Socket
(6) Front window down status
(7) Front window up status
(8) Air volume decreases
(9) Air volume increases

Control of the front window:
The front window is motorized.

1)  : The power button.
2)  : To control the blower's working status. The blower has a memory function, the next boot blower gear shows the last shutdown, to avoid each boot needing to adjust the fan (It will not work when the front window is fully closed.)
3)  : To control fluorescent lamp
4)  : To control UV lamp (UV lamp, blower, fluorescent lamp, and front window interlock, it won't work when the fluorescent lamp, blower, and front window are open)
5)  : To control socket power status.
6)  : Press the Down button, front window will fall. Each time you press the buzzer will sound once; hold this key, and the front window will continue to decline; release the button, and the front window will stop declining.
7)  : Press the UP button, front window will raise. Each time you press the buzzer will sound once; hold this key, and the front window will continue to rise; release the button, and the front window will stop rising.
8)  : To control the blower speed down. When the blower is working, if ■ the number is More than 1, each time you press, the wind speed can go down a gear, and the buzzer rings once.
9)  : To control the blower speed increase. When the blower is working, if ■ the number is less than 9, each time you press, the wind speed can increase one gear, and the buzzer rings once.
10) **LCD display**: When powered on, from top to bottom is ■ ■ ■ ■ ■ ■ ■ ■ ■ FAN, it indicates the strength of the blower wind speed, Shown below is the current state of the Winds; the right of the display is time; UV TIME, UV lamp working time; WORK TIME: HEPA filter working time.
11) Under standby status, press the fluorescent lamp button and then press and hold the power button for 5 seconds. The clock could be adjusted after a buzzer alarm. Press UP and DOWN to adjust the number and press the mute button to switch from minute to hour. After setting the time correctly, press the fluorescent lamp button and then press and hold the power button for 5 seconds. A buzz alarm indicates that the time has been saved.

12) **UV lamp timing:** Under the standby state, decrease the front window to a minimum, press the "UV lamp control button  ", turn on the UV lamp. After the UV lamp is turned on, the display shows the UV lamp timing duration under the current state, by adjusting the "fan speed decrease button  ", the user can decrease the timing time for 1 minute in turn, by adjusting the "fan speed increase button  ", the user can increase the timing time for 1 minute in turn, according to the time required to set the time well (UV lamp time duration range is 0-90M, the factory sets it to be 90M).

8.3 Operation process

1) Connect to a suitable power supply
2) Press the relevant key functions. Check the function keys and that the operation results are consistent, and according to the above, clean the technical parameters of the test, whether the normal start and wind speed are up to the standard requirements, and the lighting and ultraviolet lamp are working normally.
3) The cabinet should be sterilized by a UV lamp for at least 30 minutes with the window fully closed before any experiment.

Note:

- For the safety of eyes and skin, people should leave the room during the UV sterilization.
- UV lamps should be checked regularly. It should be replaced when either the total working time reaches 600 hours or the intensity is lower than the requirement.
- Move up the front window at a suitable height above the worktable and turn on the fan. Ensure the experiment is started after the fan has been working for at least 30 minutes.
- For operating safety, place the experiment materials inside the cabinet before the experiment starts.
- After finishing the experiment, fully close the front window and ensure to sterilize the cabinet with a UV lamp for 30 minutes before turning off the cabinet.

9. Maintenance

9.1 Daily Maintenance

1) **Preparations before maintenance:** Removal of items from the equipment.
2) **Preparation of goods:** Cotton or towel, concentrated soap, hot water, water, medical alcohol or other disinfectants, etc.

9.1.1 Clean the cabinet surface

Clean the surface of the working zone

1) Wipe the entire surface with a soft cotton cloth that has been soaked with concentrated liquid soap. Afterwards, wipe off the foam with another cotton cloth or towel that has been soaked with clean hot/warm water. At the end, wipe the entire surface with a dry cotton cloth or towel rapidly.
2) For the contaminated or dirty work surface and sump, use 70% rubbing alcohol or another disinfectant to wipe.

⚠ Disinfectants used for wiping should not damage the 304 stainless steel.

9.1.2 Clean the external surface and front window

Use a piece of soft cotton cloth or towel to wipe the surface with a non-abrasive household cleanser.

9.1.3 Overall maintenance period

The recommended interval period for comprehensive maintenance is either one year or 1000 working hours.

9.1.4 Maintenance methods

Weekly or daily maintenance

1) Disinfect and clean the operating area.
2) Clean the external surface and front window around the operating area.
3) Check the various functions of the cabinet.
4) Record the maintenance result.

9.2 Monthly maintenance

1) Clean the external surface and front window.
2) Use a towel with 70% rubbing alcohol or a 1:100 dilution of household bleach to wipe the working table, the inner face of the front window, and the inner wall surface of the working area (excluding the top wind grid). Use another towel with sterile water to wipe that area to erase the remaining chlorine.
3) Check the various functions of the cabinet.
4) Record the maintenance result.

9.3 Annual maintenance

1) Check the two lifting belts of the front window tubular motor, and ensure both are well connected to the motor with the same tightness.
2) Check the UV lamp and LED light.
3) Apply for an overall performance test of the cabinet annually to ensure that the safety meets requirements. The user is responsible for testing costs.
4) Record the maintenance result.

 When doing maintenance, pay attention to cutting off the power to avoid an electric shock.

10. Troubleshooting

Kindly confirm that the power is well connected, the cord is in good condition (Without any damage), and the power lock is unlocked before troubleshooting the following problems.

Failure	Checking Part	Suggestion
The fluorescent lamp fails to work	Circuit	Check the circuit
	LED stand plug	Connect the plug and stand tightly
	LED stand	Replace stand
	Control panel	Replace the control panel
The UV lamp fails to work	Interlock	Ensure the front window is fully closed; the fluorescent lamp and the blower are not in use.
	Lamp holder	Connect the tube and lamp holder tightly
	Circuit	Check the circuit
	Ballast	Replace the UV lamp tube
	UV lamp	Check if the micro switch is broken
	Micro Switch	Replace the control panel
	Control panel	Connect the tube and lamp holder tightly
The button fails to work	Control panel	Make sure the power is well connected and the fuse is in good condition
		Check if the button is broken
		Make sure the connecting wire is well-connected
		Replace the control panel
The blower fails to work	Micro switch	Check if the micro switch is broken
	Blower	Replace the blower if it is defective
	Circuit	Check the circuit
	Control panel	Replace the control panel
No electricity in the equipment	Power supply	Check whether the power supply is well-connected
	Power wire	Check whether the power cord is in good condition
	Fuse	Check whether the fuse is damaged
	Power key	Check whether the power key is locked or damaged
	Control panel	Replace the control panel
	Potential transformer	Check whether the transformer works normally
The display fails to work	Connection winding displacement	Connection winding displacement
	Display screen	Check whether the screen is in good condition
	Control panel	Replace the control panel

The front window fails to work	Circuit	Check the circuit
	The motor of the front window	Check the front window motor
	Transmission part	Check the transmission connection and lead rail
	Control panel	Replace the control panel

Note:

- The above troubleshooting methods should be done by qualified electricians under safe conditions (cut-off power supply). Other components should not be removed. The risk caused by failing to follow those instructions would be the responsibility of the user.
- Do not repair the equipment without a qualified electrician.
- The troubleshooting and repair of this equipment can only be undertaken by trained and recognized technicians.

11. Accessories

Standard Accessories

Accessory	Unit	Quantity
Base Stand	Each	1
UV Lamp	Each	1
LED Lamp	Each	1
HEPA Filter	Each	1
Pre-Filter (Polyester Fiber)	Each	1
Power Cord	Each	1

Optical Accessories

Accessory Name	Quantity
Electric height adjustable base stand (Max. Route: 400 mm, Max. Load: 400 kg, Load Speed: 5 mm/s, Power: 100 - 200 W; AC 220 / 110 V ± 10 %; 50 / 60 Hz)	1

12. Replacement

12.1 Replace the fuse

When the fuse on the socket is being replaced, a flat-blade screwdriver should be used to lift and replace the fuse holder, and then press it back.

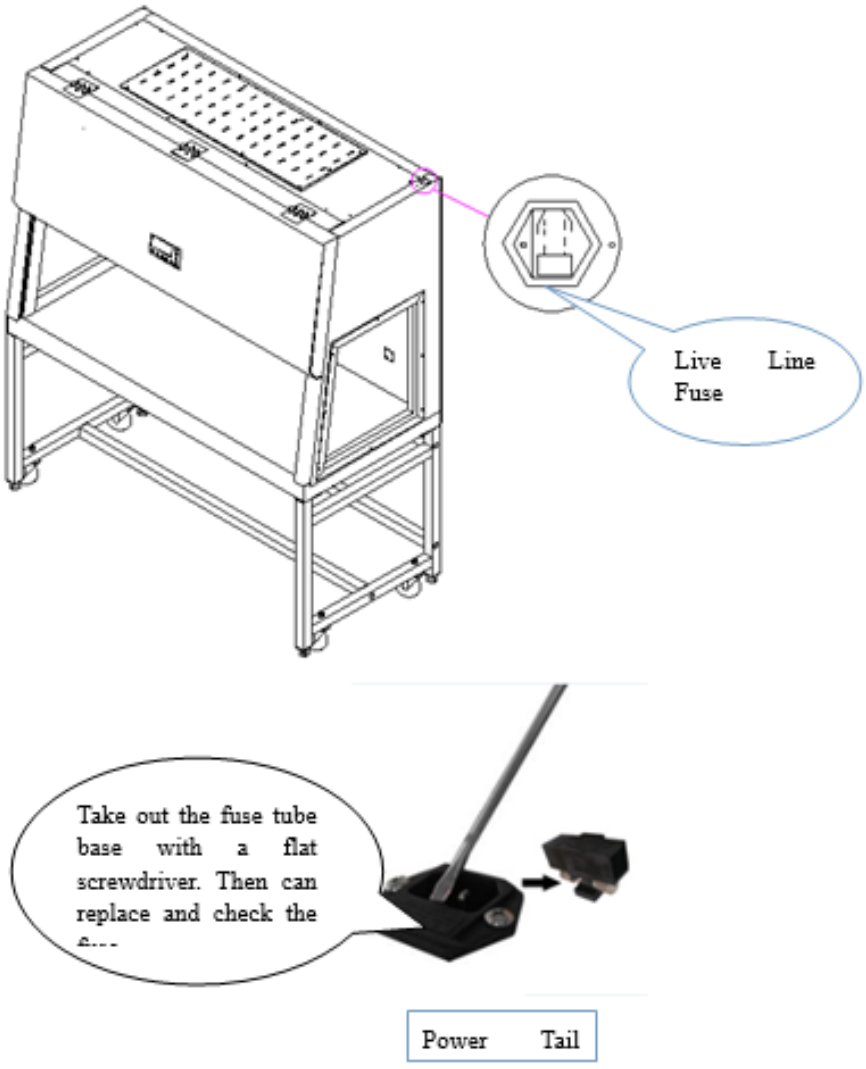

Figure-10

12.2 Replace the fluorescent light

When the fluorescent light needs to be changed, turn off the power. Then remove the LED stand, and unplug the right side, after replacing a new LED stand, inserted into the inclined slot.

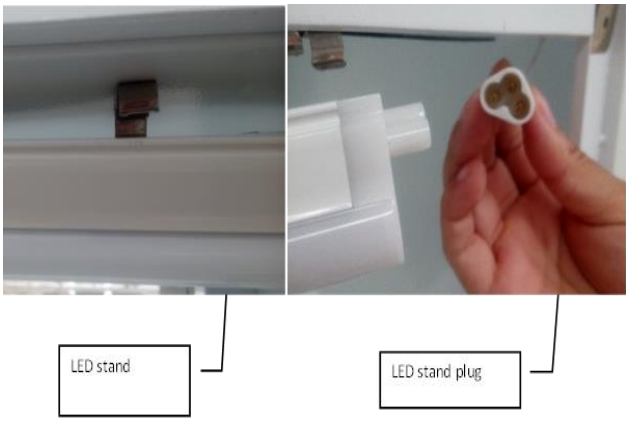

Figure-11

12.3 Replace the UV lamp

The UV lamp lifespan supplied on the product is for a cumulative working hours of 600 hours. To achieve a good disinfection effect, we recommend you regularly test the intensity of UV light. The user can use the UV intensity test card to confirm whether it is necessary to replace the UV lamp. When the UV disinfection lamp is being replaced, turn off the power supply, unscrew the UV lamp, remove the lamp from the lamp holder, and replace a new UV disinfection lamp. The method is shown in the following **Figure 12**:

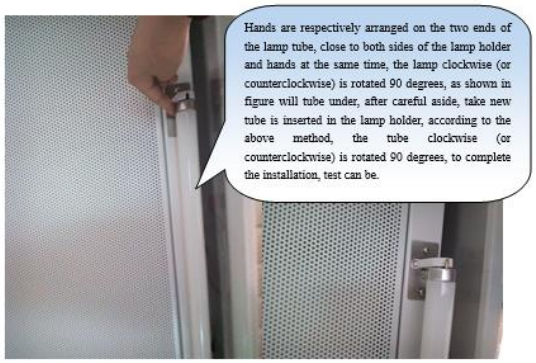

Figure-12

Note: After changing the UV lamp, the UV lamp working time should be reset, you need to press the UV button continuously for about 5 seconds in the standby state to clear the working time of the UV lamp and re-count the working time of the new UV lamp.

13. Circuit Diagram