LABDEX

Vertical Laminar Flow Cabinet LX2OLFC

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1. Introduction

It is designed for a particle-free working environment by taking air through a filtration system and exhausting it across a work surface in a laminar or unidirectional air stream. It is equipped with a 0.3 µm HEPA filter providing a sterile working environment. It has LCD display and with waterproof socket. It is widely used in medical research laboratories, hospitals, manufacturing facilities, and other research and production environments.

2. Features

- LCD display to show airflow velocity, UV timer, real-time, UV and system work time
- High-efficient HEPA filter of over 0.3 µm filtering ratio
- One operator applicable station
- 2 Water proof sockets are located in the side panel
- Having 5 mm toughened side glass windows provides a bright and open working environment
- UV lamp provides an emission of 253.7 nanometers for the most efficient decontamination

3. Specifications

Model No.	LX20LFC
Internal Dimension **(W x D x H)**	1200 x 645 x 610 mm
External Dimension **(W x D x H)**	1300 x 750 x 2040 mm
Work Surface Height	750 mm
Display	LCD Display
Airflow Velocity	Average of 0.3~0.5m/s
Work table material	304 stainless steel
Main body material	Cold-rolled steel with anti-bacteria powder coating
Front and side window orientation	5mm toughened glass, anti-UV
Pre-filter	Polyester fiber, Washable
HEPA Filter	99.999% efficiency at 0.3μm
Noise	≤65dB
Front Window	Motorized
Max Opening	430 mm
LED Lamp	12W x 1
UV Lamp	30W x 1
UV lamp emission	253.7 nanometers
Consumption	400 W
Waterproof Socket	Two, total load ≤ 500 W
Caster	Universal caster with leveling feet
Power Supply	AC 220V ±10%, 50/60Hz; 110V ±10%,60Hz
Package Size (W x D x H)	1460 x 1070 x 1650 mm
Gross Weight	230 Kg

4. Applications

Laminar flow cabinet is widely used in medical research laboratories, hospitals, and other research and production environments.

5. Instrument Introduction

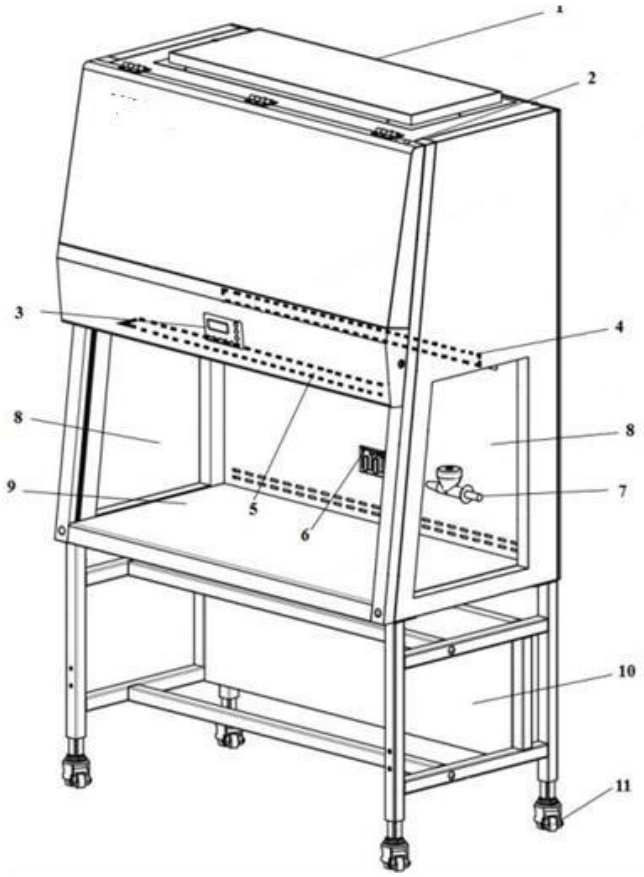

Figure-1

1. Primary effect filter
2. Host power cord
3. Display
4. Ultraviolet lamp
5. Fluorescent lamp
6. Socket
7. Air faucet
8. Side window glass
9. Front window glass
10. Adjustable base
11. Fume caster

5.1 Structure Description

1) Glass door drive system

The front glass door drive system is composed of a door motor, front glass door, traction mechanism, etc.

2) Air filtration system

- The air filtration system is the most important system to ensure the performance of this equipment. It consists of a fan and an air filter.

- The main function of the air filtration system is to continuously bring clean air into the operation area to ensure that the airflow velocity in the operation area and the cleanliness in the operation area meet the standard requirements.

3) UV light source

The ultraviolet tube is located inside the operation area to ensure that ultraviolet light can be fully irradiated to all spaces in the operation area and fully disinfected.

4) Lighting source

The lighting uses UL-certified LED tubes to ensure that the average illuminance in the operating areas is the standard requirement.

5.2 Control Panel

1) Gear display

Through the gear display, the user can understand the wind speed gear status of the equipment when it is working.

2) Touch buttons

The operation of the device is carried out by touching the button.

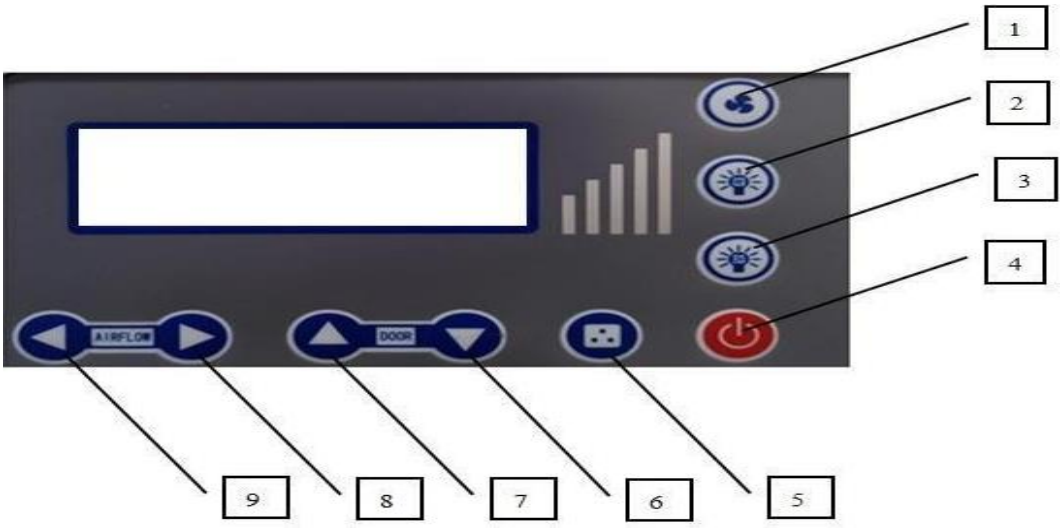

Figure-2

1. Fan button
2. Illumination button
3. UV button
4. Power button
5. Socket button
6. Glass door down button
7. Glass door up button
8. Air volume reduction key
9. Air volume increase

	Power button	Press the power button, the equipment will switch between suspension mode and working mode.
	Fan button	To control fan working status. The fan has a memory function, that is, at the time of starting up the fan, it can display the gear when it was shut down last time, by which, there is no need to adjust the fan gear every time. (**Note:** It will not work if the front window is fully closed)
	Lighting button	To control LED lamps.
	UV lamp button	To control UV lamp (UV lamp, fan, LED lamp, and front window interlock; it won't work when LED lamp, fan, and front window are open).
	Socket button	To control socket power status.
	Function setting debugging button	Press the glass Down button, glass window will fall. Each time you press, the buzzer will sound; hold down this button, and the glass window will continue to decline; release the button, and the glass window will stop declining.
	Function setting debugging button	Press the glass UP button, glass window will rise. Each time you press, the buzzer will sound; hold down this button, the glass window will continue to rise; release the button, and the glass window will stop rising.
	Airflow adjustment button	To increase the fan speed. When the fan is on and if the number is less than 8, each time you press the button, wind speed will be increased by a gear, and the buzzer will ring until it appears. Press this button when you use the UV lamp, UV lamp timing increases, and the maximum time is 90 minutes. Set time can be remembered.
	Airflow adjustment button	To decrease the fan speed. When the fan is on and if the number is more than 1, each time you press the button, wind speed will be reduced by a gear, and the buzzer will ring once until appears. Press this button when you use the UV lamp, UV lamp timing decreases, and the minimum time is 10 minutes. Set time can be remembered.

3) LCD display

When powered ON, from top to bottom, the FAN 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.

4) Clock adjustment

- In standby mode, press the light button continuously to enter the clock setting mode after a buzzer alarm.
- Firstly, the minute position will flash, press UP and DOWN to adjust to the present time then press the blower button switching to the hour position and adjusting to the present time.
- After that press the light button again, and data will be saved after a buzzer alarm.

5.3 UV lamp timing

- In standby mode when the front window is lowered to a minimum, press the UV lamp control button then the UV lamp will open.
- After opening the UV lamp the display will show the status of the UV lamp timing.
- By pressing the blower speed down button, the setting time will be reduced by one minute each time and by pressing the blower speed up button the setting time will be increased by one minute each time.
- You can set the time as needed (the UV lamp timing range is 0.90 min, and the max factory setting is 90 min).

1) Motorized glass door control

The front window is motorized with the touch of a button which can be controlled freely.

2) Waterproof socket

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

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.

4) Control of the front window

The front window is motorized.

5) Structure

- The cabinet body is built of 1.2mm cold-rolled steel with an anti-bacterial powder coating. Strong and steady.
- The Worktable is fully made up of 304 stainless steel which looks beautiful and with corrosion resistance performance.
- The base stand is made up of cold-rolled steel with an anti-bacterial powder coating.
- Soft touch type control panel, easy to handle, and beautiful appearance.

6. Installation

6.1 Unpacking

1) Choose the proper tools and unpacking method as shown in the below picture.
2) For the wooden box the necessary tool for unboxing is an electric drill with a hexagon dead M8.

Figure-3

3) Method 2 Use an M8 Wrench to unpack.

Figure-4

4) Remove the screws as shown in the below diagram, then remove the wooden sheet to the right and left of the wooden box.

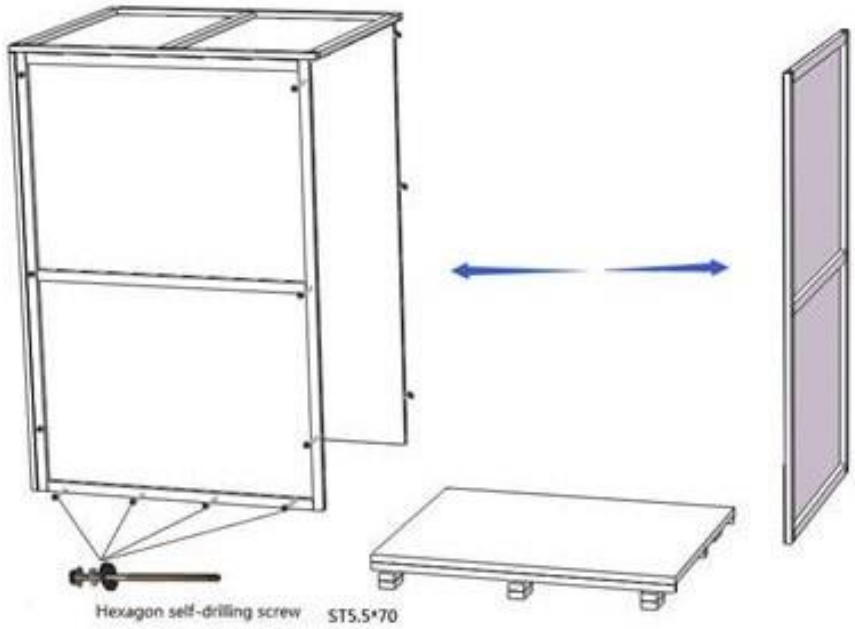

Figure-5

6.2 Working environment

1) The Laminar Flow Cabinet shall be placed in the protective area of an air stream and the working area of the Laminar Flow Cabinet cannot be near the door or window and should be away from the air outlet to prevent the airflow from the ventilation system, air conditioning, door, window, and personnel.
2) **Ambient temperature:** 15° C to 35° C.
3) **Relative Humidity:** ≤75%.
4) **Atmospheric pressure range:** 70KPa～106KPa
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.
7) The voltage between life and ground should equal the voltage of the local electrical grid, and the voltage between neutral and ground should equal 0.
8) Otherwise, the power supply is not grounded correctly.

6.3 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) Confirm the complement of accessories according to the list.
4) Before removing the packing material move all the equipment to the place where it is going to be installed.
5) Connect the base stand with the main body.

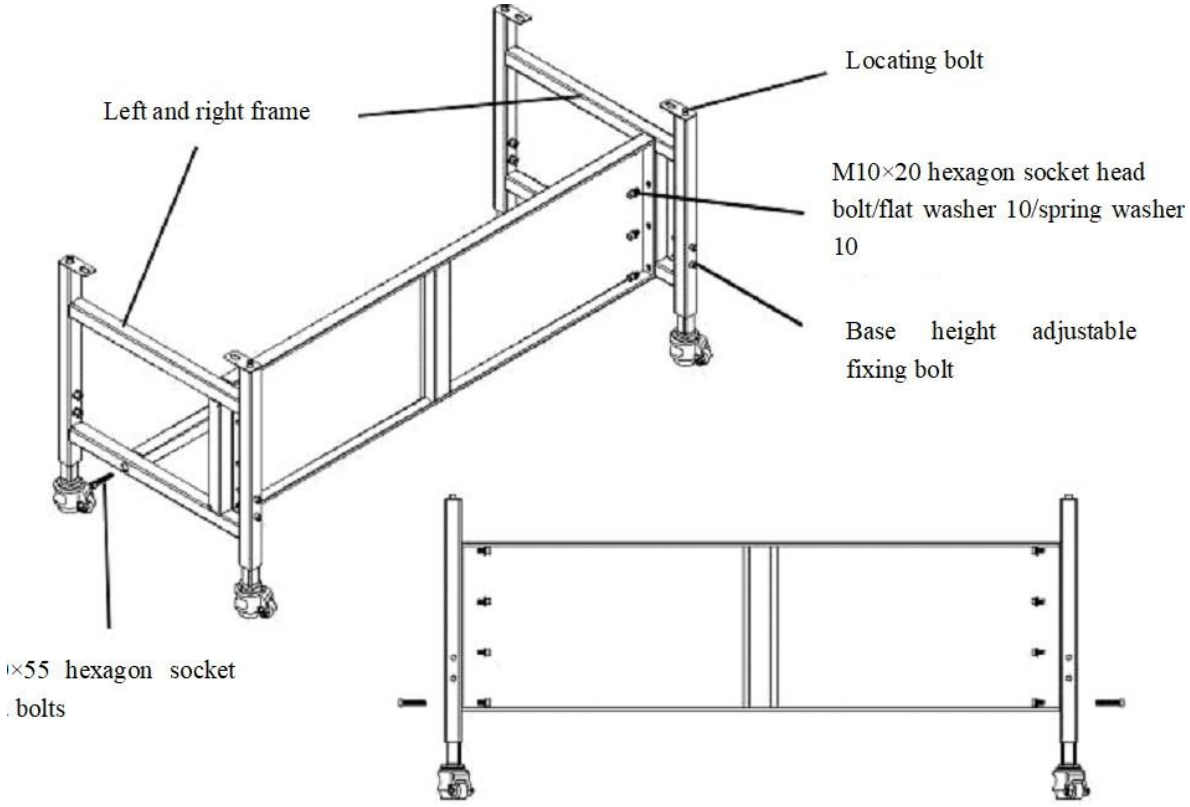

Figure-6

6) Unscrew the 2 M10×55 hexagon socket head bolts on the left and right sides of the cross brace, 8 M10×20 hexagon socket head bolts, 8 flat washers 10, and 8 spring washers 10 on the left and right mouth frames, as shown in the figure Show installation, tighten the screws.

6.4 Fume caster adjustment

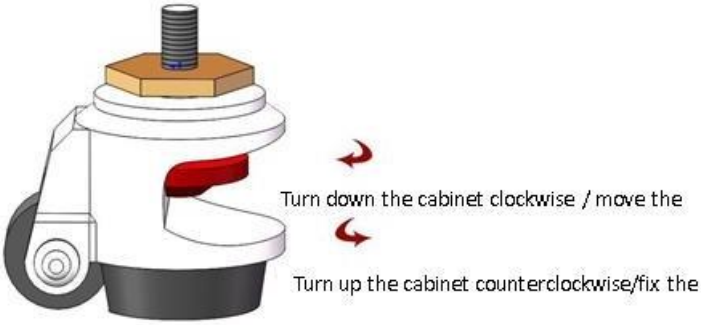

Figure-7

1) Rotate the red part of the casters clockwise to lower the corresponding base feet and lower the cabinet height.
2) The four casters can be lowered at the same time to move the cabinet position and rotate the red part of the casters counterclockwise to raise the corresponding base feet.
3) To increase the height of the cabinet, the four casters can be adjusted simultaneously to fix the cabinet; the four casters can be adjusted at the same time to make the cabinet in a horizontal and stable state.

6.5 Connect the host and base

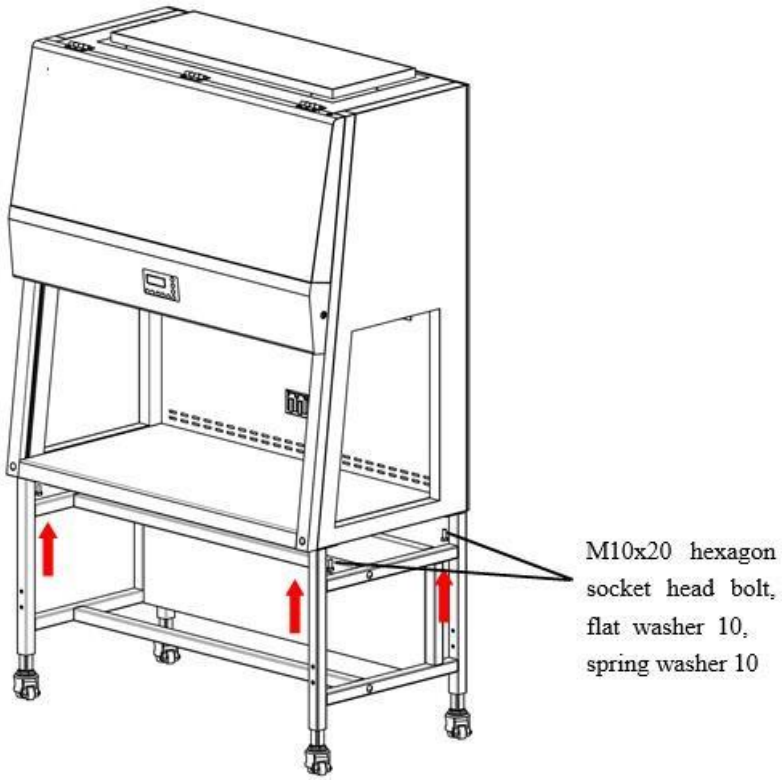

Figure-8

1) First, move the upper cabinet to the base, and align the cabinet positioning bolts in the positioning holes at the bottom of the left and right panels of the upper cabinet.
2) Then use 4 pc M10×20 hexagon socket head bolts, flat washers 10, and springs.
3) The Gasket 10 passes through the base and the side plate from bottom to top and is fastened firmly.

6.6 Assembly of gas

1) Pick up the gas (water) tap from an accessory kit, first, unscrew the tap and nut, and find the Mounting holes at the side of the cabinet glass.
2) The Tap needs to be fixed as shown in the picture. The water mouth of the tap should be inside the cabinet's operating zone.
3) The other end of the tap which has threading on the pipe should be inserted through the glass hole, and the threaded pipe should be fastened with a washer and nut outside the glass and need to be tightened with a wrench.
4) Refer to the below figure to carry out the tap fixing to the cabinet.

Figure-9

Figure-10

5) After the above steps are completed, move the cabinet slightly to a suitable position and whether the power cord is in good condition.

6.7 Installation inspection

Check whether the voltage on the nameplate of the equipment is constituent with the actual supplied voltage, power ON the equipment, and turn ON the display switch.

Checking Items	Normal working status
Fan motor	Running normally.
UV Lamp	The lamp lights up after pressing the button.
Screen buttons	All buttons can be used.
Socket	Use a multimeter to test voltage output after pressing the socket button.

7. Operations

7.1 Function

Work/airflow mode protection area

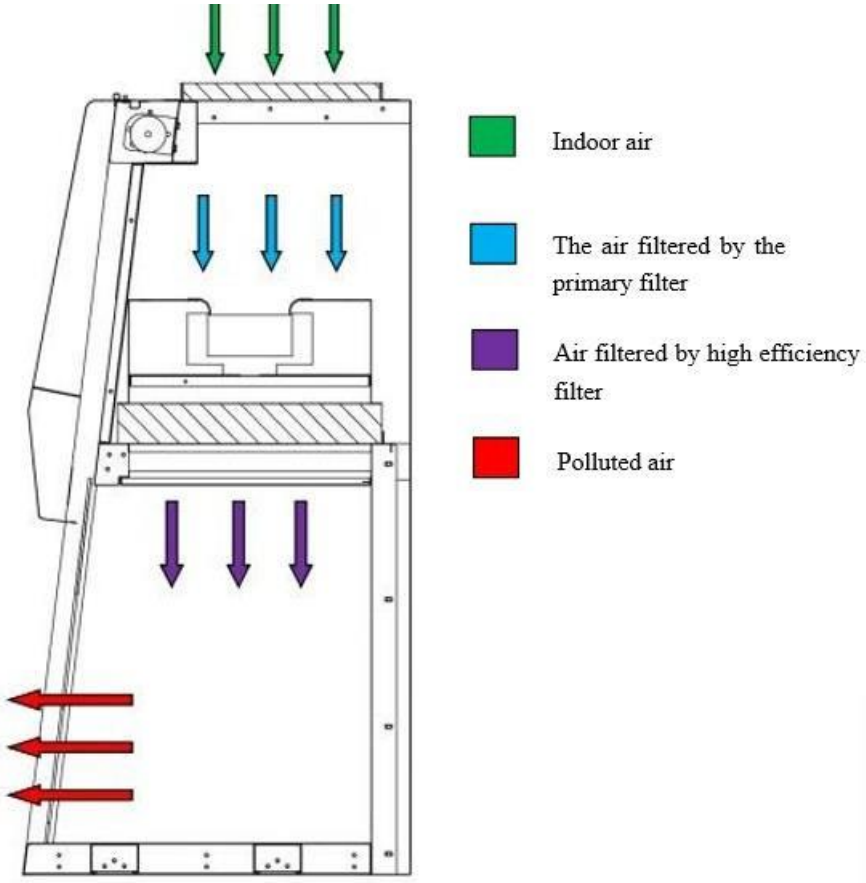

Figure-11

7.2 Normal operation

1) Make sure the input voltage is correct and stable. The rated load of the main power socket should be higher than the cabinet consumption. The plug must be well grounded.
2) 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.
3) The weight of items placed in the cabinet should not be more than 23 kg/25×25cm2.
4) 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.
5) **No flame:** No flame is allowed inside the cabinet. The use of fire will lead to airflow disorder and filter damage. If sterilization is required during the experiment, an infrared sterilizer is highly recommended.

6) **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.
7) The steel plate is under the fan, which is sealed strictly in the factory. The operator is not allowed to remove or loose screws of those parts
8) The maximum storage period is one year. If the period is more than one year, a performance test should be done.

7.3 Operation process

- Connect to a suitable power supply.
- Press the relevant key functions (related keys, function, and operation of the 2.2.2 in the description); check the function keys and the operation results are consistent
- According to the above clean table technical parameters of the test whether the normal start and wind speed are up to the standard requirements, lighting, and the ultraviolet lamp are normal work.
- The cabinet should be sterilized by a UV lamp for at least 30 minutes with the window fully closed before any experiment.
- Move up the front window to a suitable height above the worktable and turn on the fan.
- Make sure the experiment is started after the fan has been working for at least 30 minutes.
- After finishing the experiment close the front window and make sure to sterilize the cabinet with a UV lamp for 30 minutes before turning off the cabinet.

8. Maintenance

8.1 Daily maintenance

1) Clean the surface of the working zone

- Wipe the entire surface with a soft cotton cloth that has been soaked with concentrated liquid soap.
- For contaminated or dirty work surfaces and sumps, use 70% rubbing alcohol or other disinfectant to wipe.

2) Clean the external surface and front window

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

8.2 Maintenance method

1) Weekly or daily maintenance

- Disinfect and clean the operating area.
- Clean the external surface and front window around the operating area.
- Check the various functions of the cabinet.
- Record the maintenance result.

2) Monthly maintenance

- Clean the external surface and front window.
- Use a towel with 70% rubbing alcohol or 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 (exclude the top wind grid).
- Use another towel with sterile water to wipe that area to erase the remaining chlorine.
- Check the various functions of the cabinet.
- Record the maintenance result.

3) Annual maintenance

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

4) Storage condition

The laminar flow cabinet should be stored in a warehouse with a relative humidity of not more than 75% and a temperature lower than 40°C.

9. Troubleshooting

Failure	Checking Part	Suggestion
LED lamp fails to work	Lamp holder	Connect the tube and lamp holder tightly
	Lamp	Replace the lamp
	Circuit	Check the circuit
	LED stand plug	Connect the plug and stand tightly
	LED stand	Replace stand
	Ballast	Replace the ballast
	Control panel	Replace the control panel
UV lamp fails to work	Interlock	Make sure the front window is fully closed; the LED lamp and the blower are not in work.
	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
		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 fail to work	Connection	Connection winding displacement
	Display screen	Check whether the screen is in good condition
	Control panel	Replace the control panel
Front windows fail to work	Circuit	Check the circuit
	Front window	Check the front window motor
	Transmission	Check the transmission connection and lead rail
	Control panel	Replace the control panel

10. Accessories

Standard Accessories

Accessory No	Specifications
1	LED Lamp
2	UV Lamp X 2
3	Base Stand
4	Gas Tap
5	Waterproof Socket X 2

Optional Accessories

Accessory No	Specifications
1	Electric height adjustable stand

11. Replacement

11.1 Replace Fuse

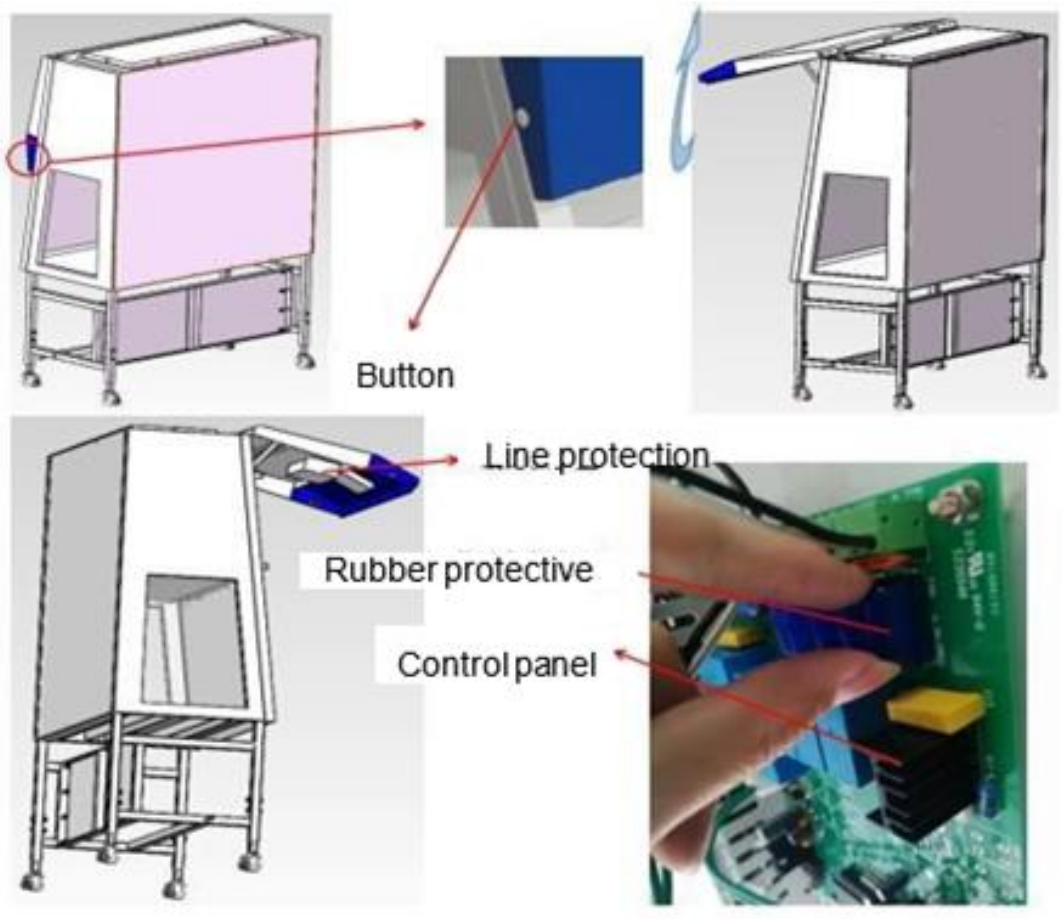

Figure-12

1) The round fuse of the cabinet is determined according to the label and is F2.5A φ5×20 mm, F6.3A φ5×20 mm, and F12.5A φ5×20 mm.
2) When you need to replace the fuse holder and the fuse, first turn off the power and unplug the plug, remove the button plugs on the left and right sides of the operation panel, then use a Phillips screwdriver to remove the two screws inside and lift the operation panel by hand.
3) Make the support frame on the operation panel support the operation panel. On the back of the operation panel, there is a circuit protection box.
4) Use a wrench to remove the screw and remove the circuit protection box. Users can see the control panel inside.
5) The corresponding fuse rubber protective sleeve can be removed to replace the corresponding fuse, and the cabinet body can be restored after the replacement.

11.2 LED lamp replacement

1) When the LED lights of the clean bench need to be replaced, disconnect the power supply.
2) Then unscrew and remove the lamp, replace it with a new one, and screw it in place.

Figure-13

10.3 Replace the UV lamp

1) The life of the UV disinfection lamp equipped on the product is 600 hours of cumulative working time.
2) To achieve a good disinfection effect, it is recommended that you regularly test the UV intensity. Users can use the UV intensity test card to confirm whether the UV lamp needs to be replaced.
3) When replacing the ultraviolet disinfection lamp, disconnect the power supply, twist the ultraviolet lamp tube, remove the lamp tube from the lamp holder, and replace it with a new ultraviolet disinfection lamp.
4) For the method see how to replace the LED lamp.

12. Circuit Diagram