



Vertical Laminar Flow Cabinet LMLV-C200

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1. Features

- Intuitive LED screen displays system work function
- Double side work bench with two operator working space
- Microprocessor controller ensures temperature and humidity function
- Manual front door for convenient, one hand operation
- Efficient sterilization is performed at 253.7 nm UV emission
- The glass door has anti-UV radiation for personnel protection
- Washable, polyester pre-filter to persist main filter
- Waterproof sockets for using small devices
- High quality stainless steel gas tap and water tap
- on-corrosive 304 stainless steel work bench

2. Specifications

Model	LMLV-C200
Cabinet Size	56 Inches
Cabinet Type	Double-side Type / Double Person
Airflow Velocity	0.3 - 0.5 m/s
Display	LED Display
Max. Door Opening Height	310 mm
Working Surface Height	750 mm
Pre-Filter	Polyester Fibre Filter
HEPA Filter	99.999 % efficiency at 0.3 µm
Cleanliness Class	Class 100
UV Lamp	30 W
Illuminating Lamp	LED Lamp (16 W)
Noise	< 65 dB
Product Safety	≤ 0.5 CFU / time
Power Consumption	600 W
Power Supply	AC 220 / 110 V ± 10 % ; 50 / 60 Hz
Internal Dimension	1340 x 560 x 545 mm
External Dimension	1440 x 660 x 1770 mm
Gross Weight	186 kg

3. Instrument Introduction

3.1 Structural Composition of LMLV-C200

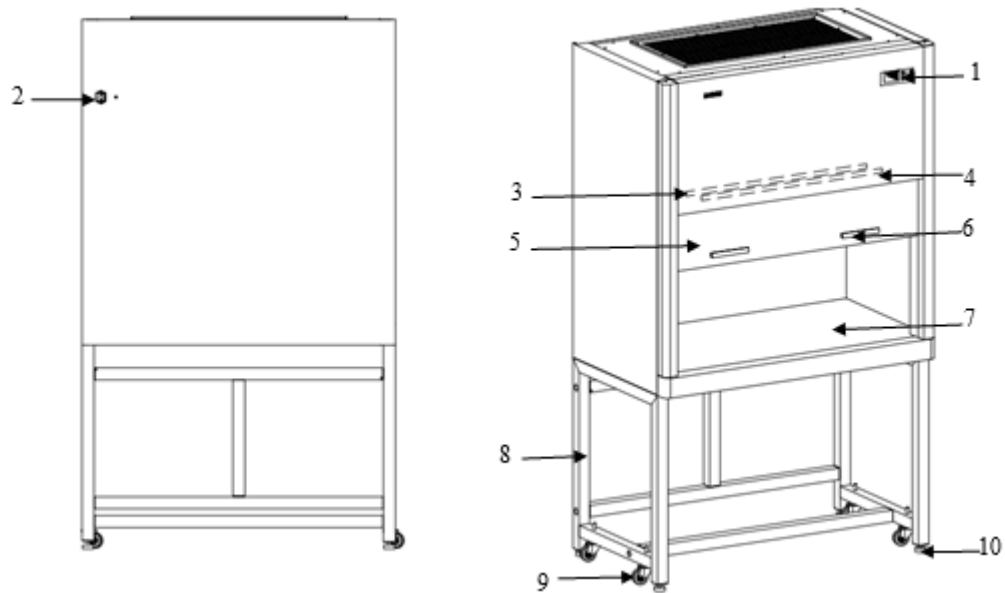


Figure-1

- 1) Control Panel
- 2) Power socket
- 3) UV Lamp
- 4) LED Lamp
- 5) Front window
- 6) Handle
- 7) Worktable
- 8) Base stand
- 9) Leveling feet
- 10)Caster

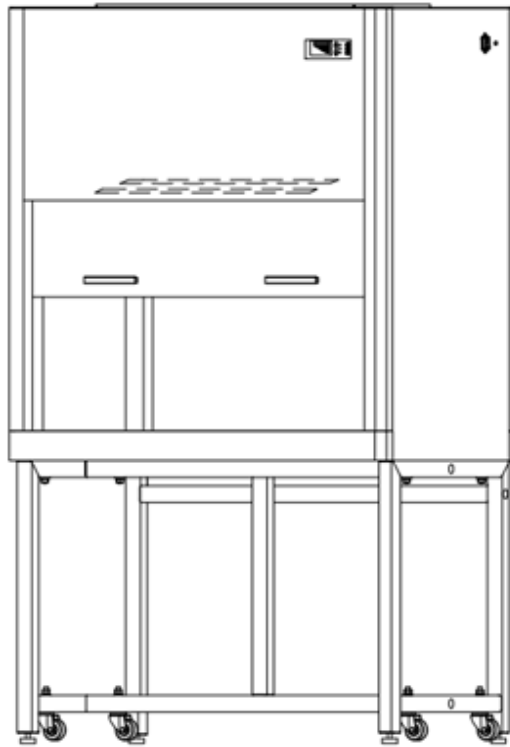


Figure-2

- 1) Control Panel
- 2) Power socket
- 3) UV lamp
- 4) LED Lamp
- 5) Front window
- 6) Doorknob
- 7) Worktable
- 8) Base strand
- 9) Caster
- 10) Leveling feet

3.2 Structure of Introduction

1) Driving system of the front window

The driving system consists of a constant force spring and front window.

2) Air filtration system.

Air filtration is the core system of a laminar flow cabinet. It consists of a blower and filter. The main function of the air filtration system is to transfer filtered air to the work area, ensure the flow velocity, and keep cleanliness of the work area.

3) **UV lamp.**

The UV lamp located at the top of the work zone effectively disinfects the entire work zone by emitting a wavelength of 253.7nm

4) **LED lamp**

The Laminar flow cabinet is equipped with an energy-saving LED lamp, which ensures the standard requirement of average illumination is met.

5) **Control panel**

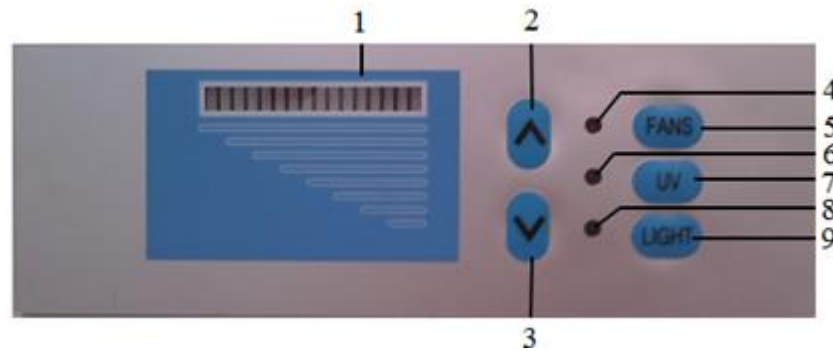


Figure-3

- 1) Gear Indicator
- 2) Increase Air Velocity
- 3) Decrease Air Velocity
- 4) Fan Indicator
- 5) Fans
- 6) UV Indicator
- 7) UV
- 8) Light Indicator
- 9) Light

a) **Gear indicator**

To see the airspeed gears of the equipment through the gear's indicator.

b) **Soft touch buttons**

Main functions all could be executed either by touch pressing.

- **"Light"** is the lighting button, which controls the working state of the LED light. Each press results state of the lighting lamp once and the brightness level of lighting lamp exchange between bright and dark on the control panel. That is "LIGHT" changes from appear to disappear or from disappear to appear. (This key is invalid when the sterilization key is open)
- **"UV"** is an ultraviolet button, which controls the working state of the ultraviolet lamp. Every press will result state of the UV lamp once and the brightness level of the UV lamp is exchanged between bright and dark. That is "UV" changes from appear to disappear or disappear to appear. (This key is invalid when the Lighting key and Fans key are open)
- **"FANS"** is a blower control button, which controls the working state of the blower. Every press will exchange the working state once and the brightness level of Fans exchanged between bright and dark. (This key

is invalid when the Ultraviolet key is open)

6) **Fuse protector**

The cabinet is equipped with a main power fuse. For double-pane window, it is located beside the power cord's outlet. For single glass, they are both located at the back of the power cord's outlet. The fuse label is corresponding to the relevant specifications. **Control of the front window**

The front window is controlled by a constant force spring. It can be stably stopped at any height during the allowed height. It still can be controlled and take out samples inside when the power is off.

7) **Structure**

- a) The cabinet body is made up of 1.2mm cold-rolled steel with an anti-bacterial powder coating. The structural strength and stability are enhanced.
- b) The work area is made up of 304 stainless steel, which provides corrosion resistance and an attractive appearance.
- c) The base stand is made up of metal with an anti-bacterial powder coating.
- d) The control panel adopts soft touch buttons, which provide an attractive appearance and easy operation.

4. Installation

4.1 Unpacking

Choose the proper tools and unpacking method as shown in the below picture.

4.1.1 For wooden box:

1) Method 1 Necessary tools for unpacking: Electric drill with hexagon dead M8



Figure-4

2) Method 2 Use an M8 Wrench to unpack



Figure-5

The following diagram demonstrates quick unpacking procedures (Figure-6)

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

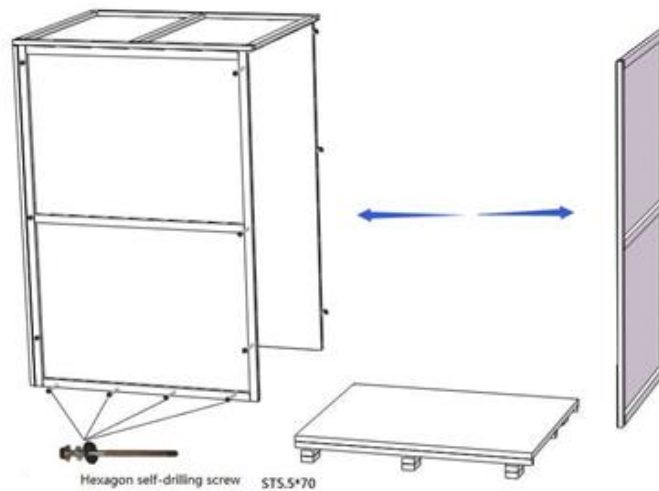


Figure-6

4.1.2 For Cotton Box:

Using scissors to cut the packing tape, take off the package cover, then move up the box body.



Figure-7

4.2 Installation Condition and Operating Environment

- The laminar flow cabinet should be placed in a position where the airflow can be protected.
- Laminar flow cabinet should not be installed opposite to door or window and far away from the air outlet of the air conditioner. It should avoid airflow influence from the ventilating system, air conditioner, door, window, and movement of people.

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At least a 300mm gap must be kept in the side and back side of the Laminar Air Flow for clean operating and inspection.

Working environment:

- 1) Only applicable to 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.

4.3 Installation

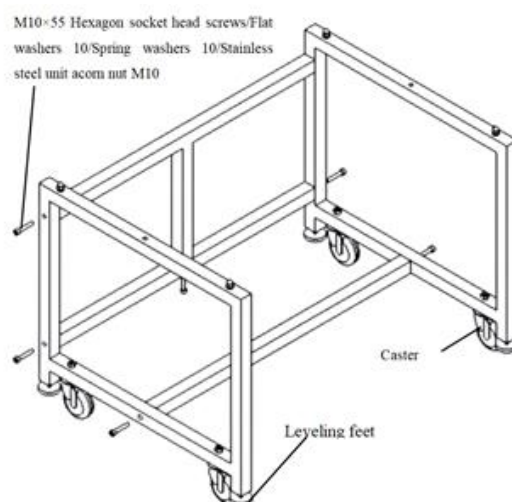
- Remove all the packing materials.
- Check for Physical damage or scratching the surface of the main body during transit. Make sure there is no damage, scratch, deformation, or foreign bodies.
- Carefully check the accessories and materials according to the packing list in the manual.
- Before breaking the package, move the entire equipment to the place where it is going to be installed.

Note:



Direct installation is completed for the base stand part at the time of transport, or it is put at the back of the laminar flow cabinet. The base stand should be taken out before installing: When carrying the laminar flow cabinet, top-for-bottom, dumping place, and dismantling are forbidden.

- Assemble the base stand (if have one)



LMLV-C200 Base stand

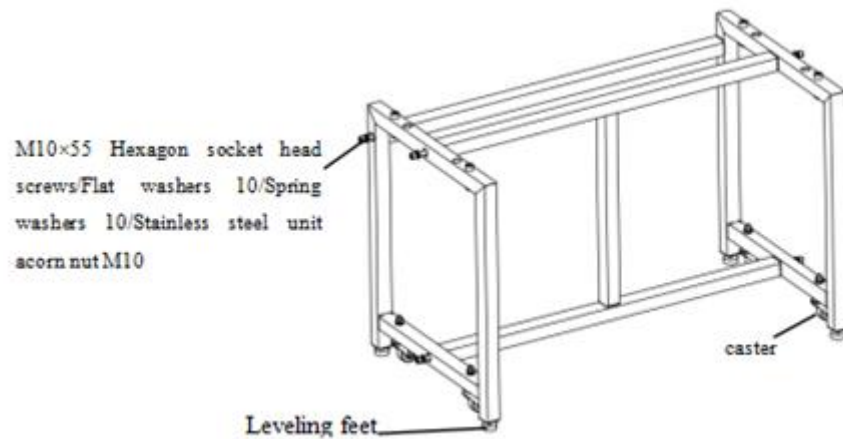
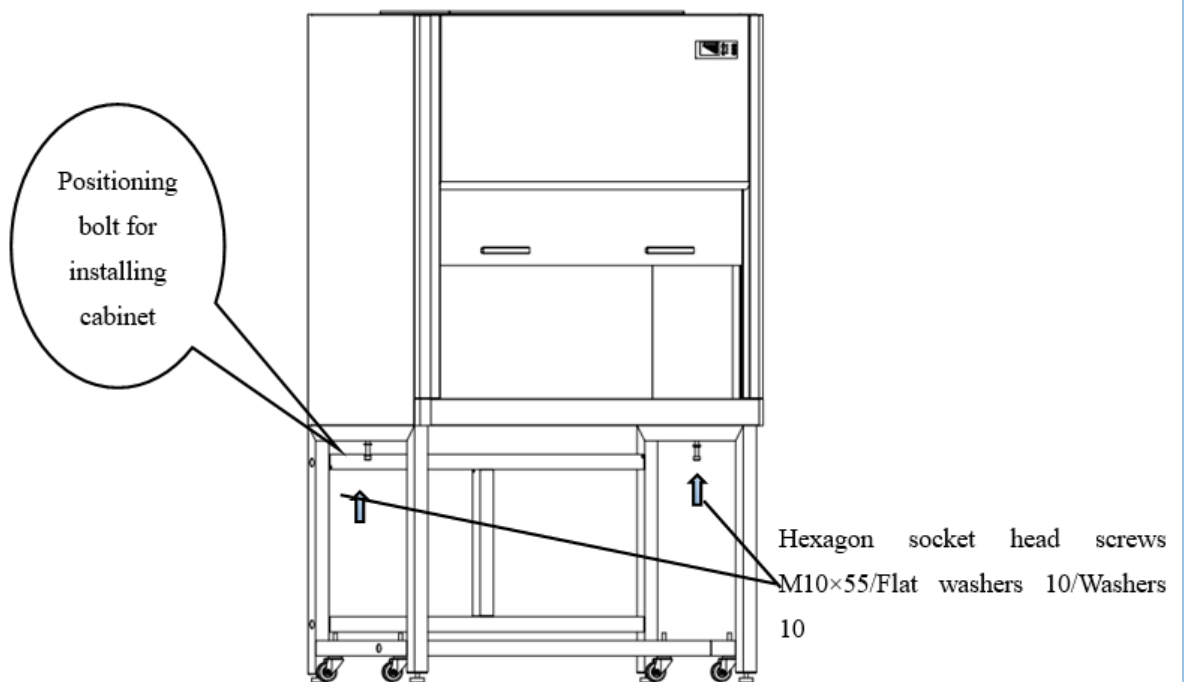


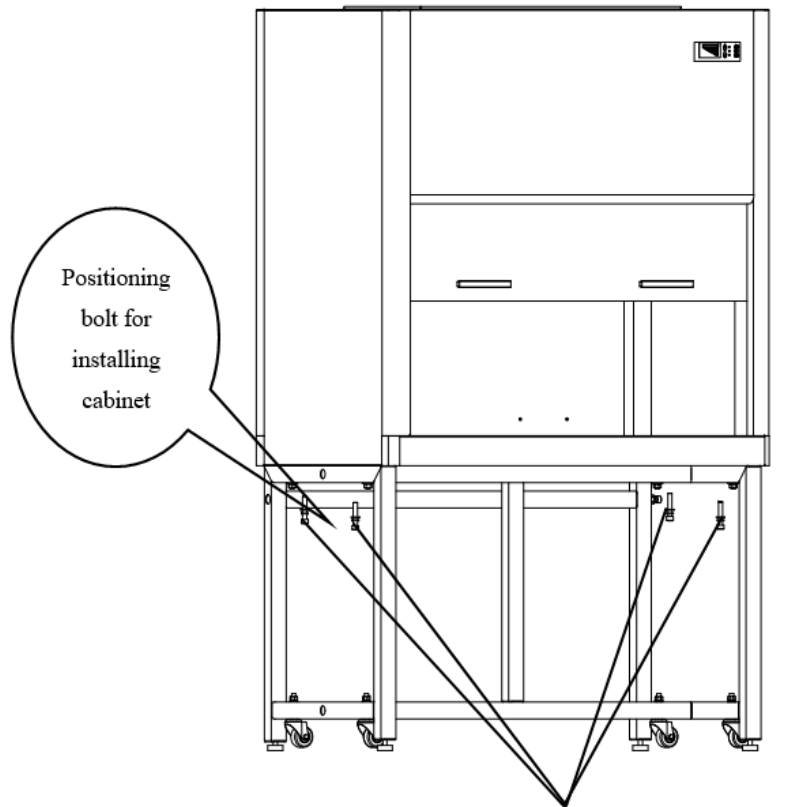
Figure-8

Removing the Hexagon cylinder head bolt on both sides lateral brace and T frame, the bottom of the T frame, assemble referring to the picture, and fasten the screw and Cap nut on both sides of the base stand.

Foot height can be adjusted. Clockwise rotation of feet, when feet height is less than casters, the cabinet can be (or base stand) moved; anticlockwise rotation of feet, when feet height is greater than casters, then plays a fixed role in preventing the cabinet (or base stand) from moving.

- Connect the base stand with the main body
Kindly connect the base stand with the main body referring to Figure 9





Hexagon Socket Head Screws M10×55/Flat

Figure-9

Place the cabinet in the base stand, as shown in Figure 9, The base of the cabinet to install the positioning bolt alignment on the cabinet on the left and right side of the bottom of the installation hole, using M10 × 55 Inner six angle cylinder head bolt, flat washers 10 and spring washers 10 bottom-up through the base stand and side plate and fastened firmly.

- After the above steps, slightly move the cabinet to the proper position, and remove the power line, power line inspection is intact.

4.4 Inspection after Installation

First, check the electrical power supply, make sure the voltage and frequency match with the Instrument power supply rating, and then check the following items with power on:

Checking Items	Normal working status
Fan	Runs normally
LED Lamp	The lamp lights up after pressing the button
UV Lamp	The lamp lights up after pressing the button
Screen Buttons	All buttons work effectively

4.5 Storage Condition

Laminar flow cabinet should be stored in a warehouse with relative humidity no more than 75%, and temperature lower than 40°C. The warehouse should have good ventilation performance, without acid, alkali, and or other corrosive gases. The storage period shall not exceed one year. Laminar flow cabinets stored for more than one year need to be unpacked and checked before selling and use. Only the tested and qualified Laminar Flow Cabinet could be sold.

5. Working Principle

5.1 Product Concept

Laminar Flow Cabinet –LAF Cabinet is only for sample protection.

Laminar Flow Cabinet is a work bench or similar enclosure, which creates 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. The laminar flow cabinet is enclosed on the sides and kept under constant positive pressure to prevent the infiltration of contaminated room air. This model is a vertical laminar flow cabinet.

5.2 Airflow Pattern

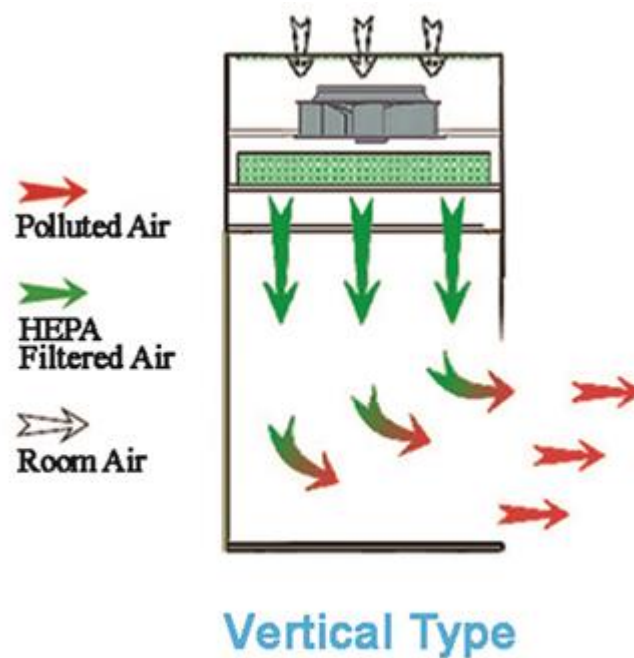


Figure-10 Air flow pattern

6. Operations

6.1 Normal Operation Notice

- Making sure 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. If the socket cannot be plugged in, kindly install a grounding-type power socket by an electrician.
- Moving principles of different samples inside the cabinet: When two or more samples need to be moved in, be sure that low-polluting samples should be moved first then high-polluting samples. The movement of items should also follow the principles of moving slowly and steadily.
- The weight of items placed in the cabinet should not be more than 23 kg/25×25cm².
- Avoiding vibration: avoid using vibration equipment (eg centrifuges, vortex oscillators, etc.) inside the cabinet. The contamination might drop from the HEPA filter and affect the samples and the operator
- NO FLAME: An open flame would create turbulence which disrupts the pattern of HEPA-filtered air supplied to the work surface. 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 used filter should be processed as medical waste.
- The air duct has been sealed strictly. Kindly do not remove or lose the screws of those parts.
- A performance inspection should be done if the storage period exceeds one year.

6.2 Operation Process

- Connect the power
- Press the relevant button (Kindly refer button function and operation). Check if the buttons are under operation results. If the equipment functions normally, air velocity, UV lamp, and LED lamp according to technical parameters.
- 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 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.
- Kindly move up the front window to a reasonable height above the worktable and turn on the blower. Make sure the experiment should be started after the fan working for at least 30 minutes.



Note: For operating safety, kindly put testing materials inside the cabinet in advance

After finishing the experiment, kindly fully close the front window, and make sure to sterilize the cabinet by a UV lamp for 30 minutes before turning off the cabinet.

7. Maintenance

Before maintenance: Kindly remove all the items that are inside the cabinet.

Material needed: A piece of cotton cloth or towel, concentrated soap solution, hot water, clean water, medical alcohol or disinfectant, etc.

7.1 Clean the operating area surface

Wipe the entire surface with a soft cotton cloth that has been soaked with concentrated liquid soap. Afterward, wipe off the foam with another cotton cloth or towel that has been soaked with clean hot, or warm water. At the end wipe the entire surface with a dry cotton cloth or towel rapidly.

For the contaminated or dirty work surface and sump, use medical alcohol or other disinfectant to wipe.



Note: Disinfectants used for wiping should not damage the 304 stainless steel

7.2 Clean the external surface and front window

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

7.3 Comprehensive maintenance period

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

7.4 Maintenance Methods

1) Daily or weekly maintenance

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

2) Monthly maintenance

Clean the external surface and front window

Use a towel with 70% medical 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 lamps and LED lamps.
- 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.

7.5 Label Description

7.5.1 Fuse label



Figure-11

7.5.2 Ground Label



Figure-12

8. 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

Faults	Check parts	Measures
LED lamp fails to work	LED Stand plug	Check if the stand plug and stand are connected tightly
	LED Stand	Change the stand
	Circuit	Check the circuit
	Control panel	Replace the control panel
UV lamp fails to work	Interlock	Check whether the blower and LED are turned off or not
	Lamp holder	Connect the tube and lamp holder tightly
	Circuit	Check the circuit
	UV lamp	Replace the UV lamp
	Ballast	Replace the ballast
	Control panel	Replace the control panel
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	Blower	Replace the blower if it is defective
	Circuit	Check the circuit
	Control panel	Replace the control panel
No electricity in a socket	Power supply	Check if the power supply is broken
	Power cable	Check if the power cable is broken
	Fuse	Check the fuse
	Transformer	Check Transformer
	Control panel	Change the control panel
	Connection wires	Check if connected

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The display fails to work	Display screen	Check whether the screen is in good condition
	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 only could be undertaken by trained and recognized technicians.

9. Accessories

9.1 Standard Accessories

Model No	Name	Quantity	Image
LFHC-06	Base Stand	1	
LFHC-22	LED Lamp	1 (16 W)	
LFHC-28	Universal caster with levelling feet	4	
LFHC-29	UV Lamp	2 (30 W)	

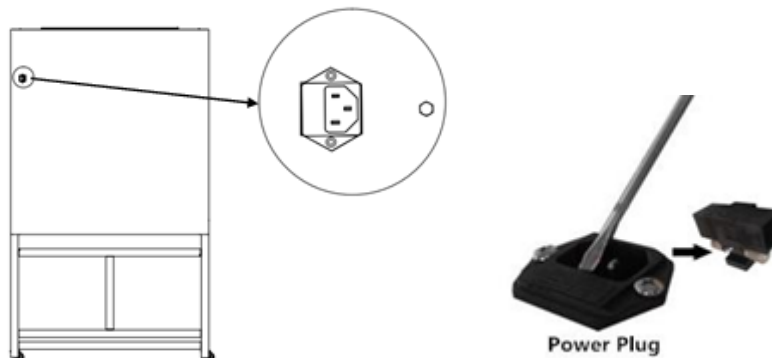
9.2 Optional Accessories

Model No	Name	Quantity	Image
LFHC-10	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 $\pm$ 10 %; 50 / 60 Hz)	1	

10. Replacement

10.1 Replacement of Fuse

For single-side operation laminar flow cabinets, the power input socket is located at the back, for double-side operation ones, the power input socket is located in the side. To replace the fuse, turn off the power and disconnect the plug. Use a Phillips screwdriver and rotate it anticlockwise to unscrew the fuse holder. Replace the fuse inside the fuse holder and then, use a Phillips screwdriver and rotate it clockwise to screw back the fuse holder.



Take out the fuse tube base with a flat screwdriver. Then can replace and check the fuse

Figure-13

10.2 Replacement of LED Lamp

When the LED 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.

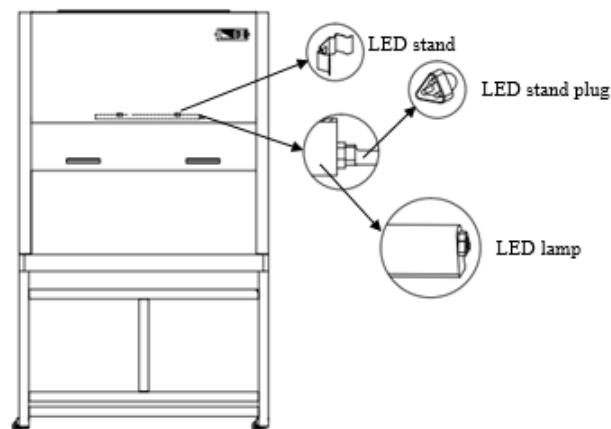


Figure-14

10.3 Replacement of UV Lamp

UV lamps should be replaced regularly according to the frequency of use, when using UV lamps reach the time of 600 hours, we recommend replacing the lamp. UV intensity test card can be used to confirm if need to change the UV lamp. Kindly turn off the power. Screw the lamp to take down from the holder, then replace it with a new one. Refer figure 15.

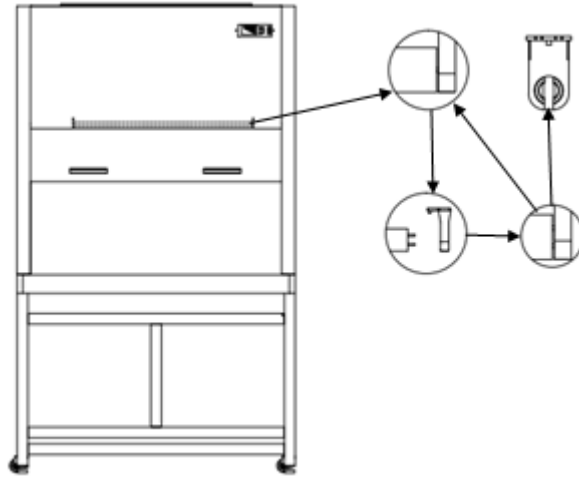
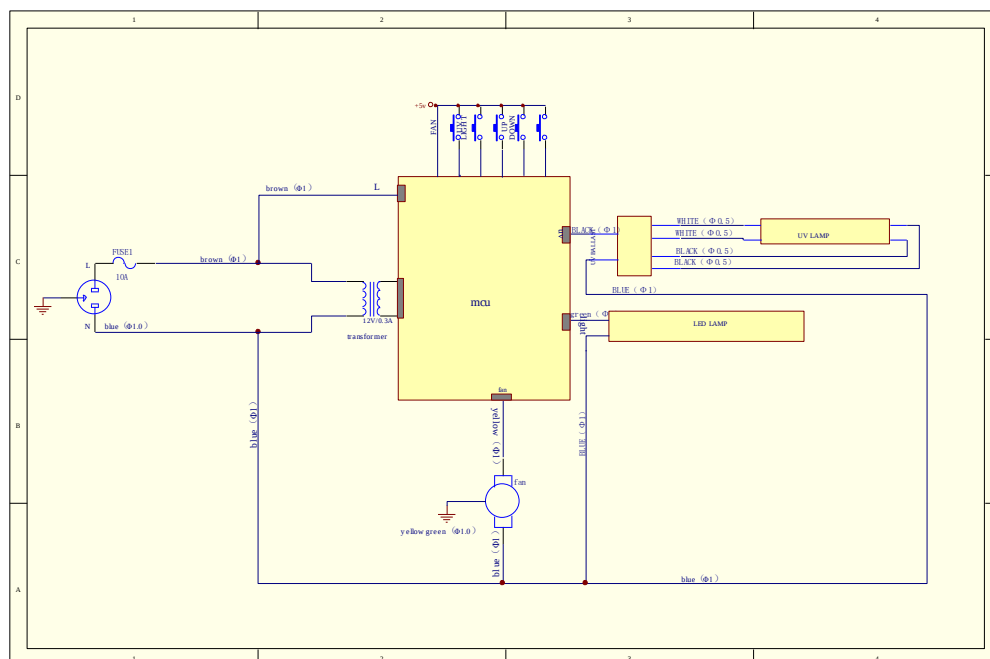


Figure-15

Put hands at the double ends of the lamp, clockwise or anticlockwise screw 90°. the lamp to take down the lamp as shown in the picture. Put aside it carefully. Put a new lamp into the holder, clockwise or anticlockwise screw 90°. Then turn on the power and test it.

11. Circuit Diagram



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