Labotronics

Ducted Fume Hood

LB-11DFH

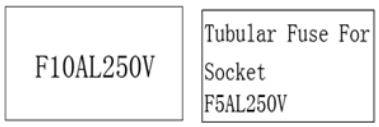
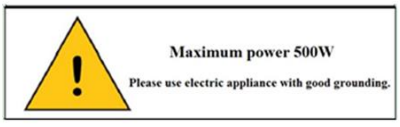
Index

1. Safety Measures

1.1 Precautions before operation

- Check the input voltage to ensure it is correct and stable. The main power socket's rated load should be higher than the cabinet's consumption. The plug must also be well grounded.
- The equipment should be powered off and unplugged before any parts, such as UV and fluorescent lamps, are replaced.
- The front window is made of explosion-proof toughened glass. To keep the front window clean and clear, wipe it with a wet soft cloth and keep it away from hydrofluoric acid.
- The air deflector and other internal accessories should be cleaned according to the use of the Fume Hood.
- The air duct and the blower of the Fume Hood should be cleaned and maintained regularly in a proper way.
- Fume Hood should be placed in a position where there should be no other equipment or machine within 150mm of the front window.
- Do NOT place any soft or tiny materials (such as soft tissue) on the worktable during the operation to prevent the breakdown of the blower caused by sucking those materials.
- The packed Fume Hood should be stored in a warehouse with a relative humidity of no more than 75% and a temperature lower than 40℃. The warehouse should have good ventilation performance without acid, alkali, or other corrosive gases.

1.2 Label Description

	• Operating area 5A socket fuse label, located under the socket fuse holder. • 10A power fuse label, located under the power connector.
	Ground label
	Maximum power 500W.

2. Introduction

Ducted Fume Hood LB-11DFH is a floor mounted, dual layered unit made of exterior cold-rolled steel and interior melamine board. Built-in centrifugal blower controls air stream speed. UV lamps aids in efficient decontamination. LED digital screen displays airflow level. Standard PVC exhaust duct removes toxic fumes and provide excellent chemical resistance.

3. Features

1. Adjustable air speed (9 Level)
2. Motor regulated front glass window (height adjustment)
3. Remote controllable water and gas tap
4. Exterior material with antibacterial power coating
5. Interior material with acid alkali resistance
6. UV- lamp perform chamber sterilization
7. Two water proof socket
8. Active carbon filter (optional)

4. Specifications

Model No.	LB-11DFH
Internal dimensions	1020 × 670 × 730 mm
External dimensions	1240 × 800 × 2200 mm
Work surface height	850 mm
Maximum opening	520 mm
Air velocity	0.3 m/sec ~ 0.8 m/sec
Front window	5 mm toughened glass
UV emission	253.7 nanometers
LED lamp	12 W × 1
Exhaust duct length	4 meters
Exhaust duct diameter	300 mm
Pipe strap	1
Noise	≤ 68 dB
Power consumption	400 W
Power supply (AC)	220 V ±10 %, 50 / 60 Hz 110 V ± 10 %, 60 Hz
Main body dimensions	1390 × 990 × 1690 mm
Base cabinet dimensions	1390 × 990 × 980 mm
Weights	317 kgs

5. Applications

Used to completely remove chemical fumes (potential toxics) from laboratories and protects the lab environments. Used during general chemical applications.

6. Instrument Introduction

6.1 Structural composition

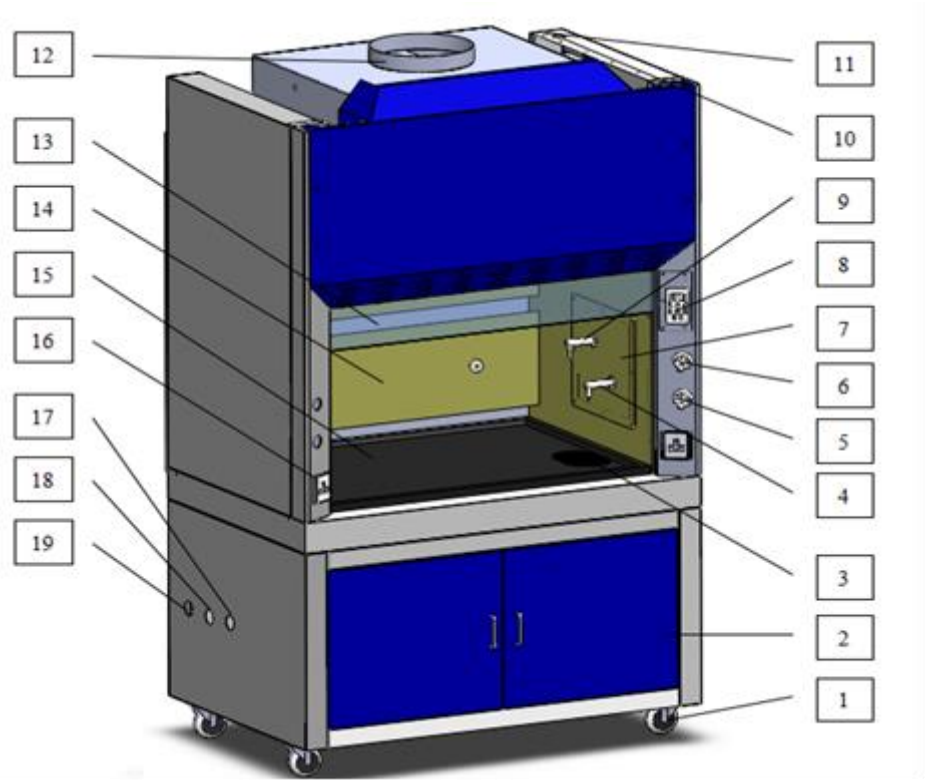


Figure-1

1) Caster
2) Base cabinet
3) Water sink
4) Water tap
5) Water tap control knob
6) Gas tap control knob
7) Access panel
8) Control panel
9) Gas tap
10) Power socket
11) Fuse holder
12) Exhaust outlet
13) Front window
14) Phenolic compact laminate
15) Work table
16) Socket
17) Gas inlet
18) Water inlet
19) Drain hose

6.2 Structure introduction

1) **Driving system of front window**
   The driving system consists of a tubular motor, front window, and hauling mechanism (hauling sash).
2) **UV lamp**
   The entire work zone could be sterilized effectively by the UV lamp located at the top of the work zone. Emission of 253.7 nanometers could ensure the most efficient decontamination.
3) **Fluorescent light**
   The Fume Hood is equipped with an LED lamp tube, which ensures the standard requirement of average illumination (400 lux) is met. The measured value at any point inside the working zone should be greater than 350 lux.
4) **Socket**
   The socket, located on the two sides beside the front opening, could supply electricity power for devices used in experiments and could be controlled by the  button.
   Note: Ens**u**re the total load of sockets should be ≤ 500W.
5) **Fuse protector**
   Fuse holders are installed on the top right of the equipment (refer to **Figure 1**).
   The fuse of the live wire is inside the power cord connector. The socket (working zone) fuse holder and neutral wire (power source) fuse holder are beside the connector. The specification of each fuse tube complies with the label right below the fuse holder. Refer to the label when replacing the fuse tube.
6) **Structure**
   - The external case body adopted 1.0 mm cold-rolled steel in a double-layer structure with electrostatic coating and rust-proof treatment. The structural strength and stability are enhanced.
   - The inner wall of the work area is fully made of Phenolic Compact Laminate which provides corrosion resistance as well as an attractive appearance; the work table is made of solid chemical-resistant laminate which is easy to clean and wash.
   - Fume hood front window adopted 5 mm toughened glass.
   - The control panel adopted soft-touch buttons and a microprocessor control system that makes the operation easy to be controlled.
   - The electronic control system could prevent overload of the circuit and electric shock, stabilize the performance, protect the equipment, and extend the use life of the Fume Hood.
   - The sockets (at the working zone) adopted non-flammable PC material that is specialized for laboratory use.

7. Installation

7.1 Unpacking of main body

Choose a proper unpacking method according to the actual situation.

7.1.1 For wooden box

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

Figure-2

2) Method 2 Use an M8 wrench to unpack.

Figure-3

The following diagram demonstrates quick unpacking procedures (**Figure 4**). Remove the screws shown in the diagram below, then move the wooden pieces to the right and left.

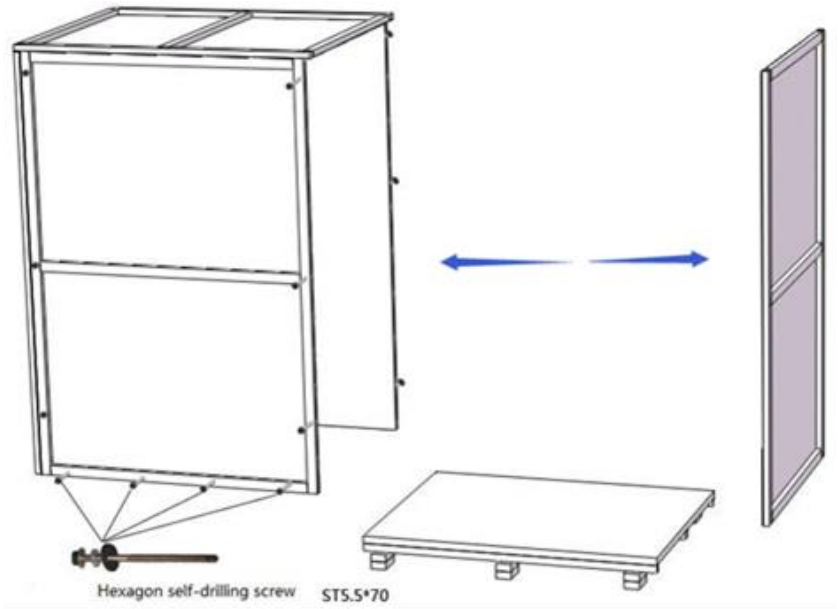


Figure-4

7.1.2 For carton box

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

Figure-5

7.2 Unpacking of base cabinet

Choose a proper unpacking method according to the actual situation.

7.2.1 For wooden box

Refer to the main body unpacking method (of the wooden box) in the previous pages, use M8 electric drill or M8 wrench to remove the screws and unpack the box.

Figure-6

7.2.2 For carton box

Refer to the main body unpacking method (of carton box) in the previous pages, use scissors to cut the packing tape, take off the package cover, and move up the box body.

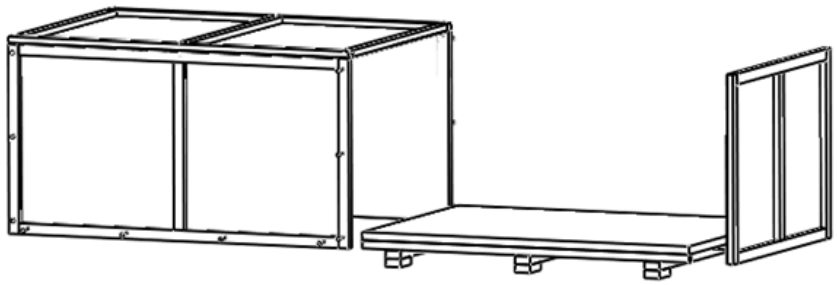


Figure-7

7.3 Installation conditions and operating environment

7.3.1 Location requirements

To avoid disturbances to the Fume Hood and its operator, follow the guidelines below while determining a suitable location for the equipment.

1) Fume hoods should not be installed in positions where they are likely to be affected by other items or equipment. Windows, doorways, fans, room air supply diffuser, or ventilation outlet should be away from the Fume hood.

2) The distance from the front window to any circulation space or air-handling equipment should be at least 1000 mm, to preserve a zone undisturbed by anyone other than the operator.
3) The position of a Fume hood should satisfy the spatial requirements (e.g. vision, lighting, and convenience of access) of the operator and personnel working nearby.
4) When a Fume Hood is installed on a benchtop, the leading edge should be flush with or slightly overhanging the edge of the benchtop.

7.3.2 Environmental requirements

1) Only applicable to indoor operation.
2) **Ambient temperature:** 15℃-35℃.
3) **Relative humidity:** ≤75%.
4) **Atmospheric pressure range:** 70 kPa-106 kPa

7.3.3 Electrical requirements

1) Electrical parameters: consistent with the rated voltage of the Fume Hood (refer to specifications).
2) The power supply needs to be grounded (Judging method: test the live wire and the neutral wire of the main socket with 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.)
3) Test the voltage stability before using. If the voltage is unstable, use a voltage regulator to adjust. Otherwise, the control panel and transformer may be easily damaged.

7.4 Instrument Installation

1) Remove all the package materials.
2) Check the surface of the base cabinet and the main body to make sure there are no scratches, deformation, or foreign bodies.
3) Move the whole equipment as close as possible to the final installation place.
   Note: Do NOT turnover, disassemble, or slant the cabinet during transportation.
4) Position the base cabinet to the final location where an appropriate power supply is nearby and break the caster to stabilize the base cabinet.
5) Ensure the voltage and frequency of the power supply is the same as the required value which is shown on the label. Take out the power cord from the packaging box and connect it to the power cord connector on the main body. Plug in the other end to connect a power supply.
6) Press the "  " button on the control panel to power the equipment. Afterward, press the "  " button to raise the front window, take out the accessories from the operating area, and remove the work table as shown in the figure below. Lastly, power off the equipment and prepare for installation.

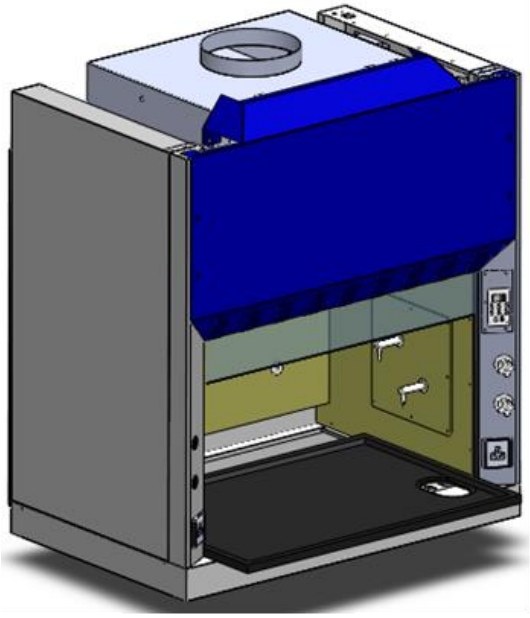


Figure-8

7) **Connect the base cabinet with the main body**
   - Lift the main body and place it on the base cabinet. Ensure each side is in alignment. Besides, also ensure the mounting holes of the bolt (as shown in **Figure 10**) at the bottom of the main body are in alignment with the holes on the top plate of the base cabinet.
   - Ensure the main body and base cabinet are stable enough to prevent side slip. Open the doors of the base cabinet and take out the components.
   - Stainless steel hexagon socket head cap screw M10×20
   - Stainless steel hexagon nut M10
   - Stainless steel flat washer 10 and spring washer 10
   - Insert the hexagon socket head cap screws (M10×20) into the holes at the bottom of the main body (refer to **Figure 9**). These screws should pass through the main body and the base cabinet. Use flat washer 10, spring washer 10, and nut M10 to fasten the screws and nuts. Ensure the base cabinet is well connected with the main body.

Figure-9

8) **Installation of water tap and gas tap**
   - Insert the worktable and mount the water sink on the reserved sinkhole.
   - Connect the laboratory water pipe and gas pipe (inflow) with the lower end of the taps.
   - Pass the drainpipe (provided) through the reserved hole at the side of the base cabinet (refer to **Figure 11**) and connect it with the sewer pipe in the laboratory room (the water sink and drainpipe have been connected in the factory.

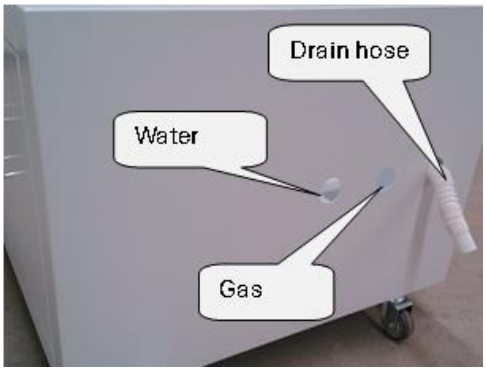


Figure-10

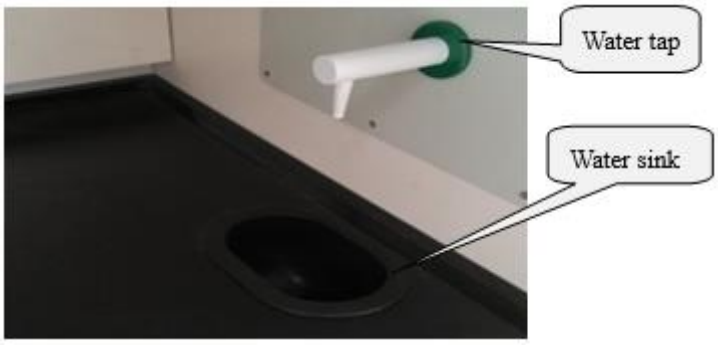


Figure-11

9) **Installation of exhaust duct**
   Take out the duct clamp and the exhaust duct. Put the clamp on the exhaust duct and then connect the exhaust duct with the air exhaust outlet on top of the Fume Hood. Afterwards, use Slotted screwdriver to fasten the duct clamp firmly. The other end of the exhaust duct should be fixed outside the laboratory room and in the open air.

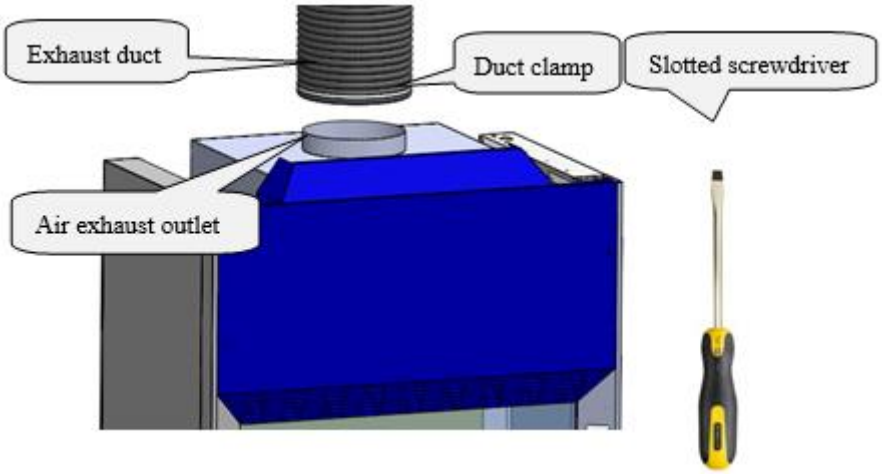


Figure-12

7.5 Inspection after Installation

Check the following items after powering on the Fume Hood.

Checking Items	Normal working status
Power status	Equipment could be powered on/switched off when pressing the power button
Fan	Runs normally after pressing the Fan button; speed could be adjusted by pressing the adjusting button
Front window	The front window could be moved smoothly by pressing the UP and DOWN buttons.
Fluorescent lamp	The lamp lights up after pressing the button.
UV Lamp	The lamp lights up after pressing the button.
Socket	Use a multimeter to test voltage output after pressing the socket button.

8. Working Principle

Operating principle/airflow pattern:

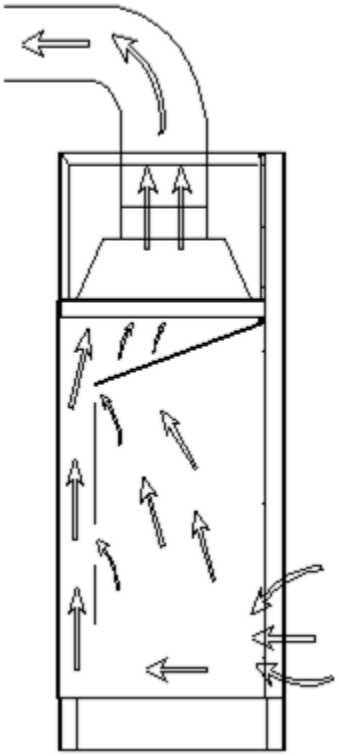


Figure-13

9. Operations

9.1 Control Panel

9.1.1 Soft touch buttons

Main functions could all be executed by pressing the relevant button. There are a total of 8 common buttons on the control panel (refer to **Figure 14**). The indicator light above each button shows the working status of the relevant function. The small LED display shows the speed level of the blower.

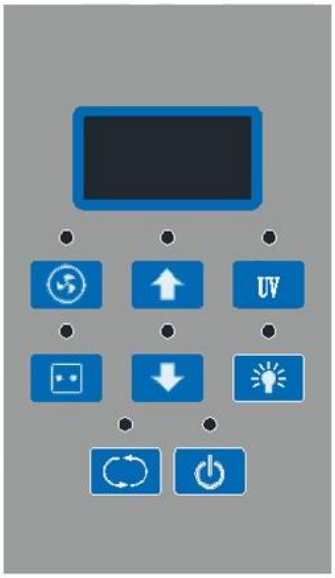


Figure-14

	The power button, the main switch of the Fume Hood
	A fluorescent lamp, press to turn on the light, interlocked with UV lamp.
	UV lamp only works when both the blower and the fluorescent lamp are turned off.
	Front window up, press and hold to continuously raise the window.
	Blower (Fan), press to turn on the blower, interlocked with the UV lamp
	Front window down, press and hold to continuously lower the window.
	Socket power, press to activate the sockets in the working zone
	Adjust fan speed, press to adjust the speed of the blower (fan) from F1 to F9.

9.1.2 Control of the front window

The height of the front window could be adjusted by pressing the  and  buttons. The window will be moved continuously when pressing the button and it will stop moving immediately when the button is released.
Ensure the height of the front window is within the safety height range (520 mm).

9.1.3 Control of the fan speed

The blower (fan) could be turned on by pressing  button (only when the UV lamp is turned off).
The speed of the fan could be adjusted by pressing the button. 9 speed levels could be selected. The relevant speed level would be displayed on the LED screen.
When turning off the blower or power off the Fume Hood, the level of fan speed is memorized by the equipment and would be resumed when turning on the blower again.

9.1.4 UV sterilization

UV light could be turned on by pressing the UV button. Ensure the window is fully closed before starting UV sterilization. An interlock function was adopted between the UV light and the blower/fluorescent light. UV light could be automatically turned off when either the blower or fluorescent light is turned on. During sterilization, people should leave the room for the safety of their eyes and skin.

9.2 Operation Process

1) **Connect to a suitable power supply.**
2) Power on the Fume Hood by pressing the power switch under the working zone, the LED screen will be lighted as "  ".
3) Press the POWER button  on the control panel to enable all functions (fluorescent lamp, UV lamp, blower, socket, front window). The LED screen would display the accumulated operating time of the blower (if the optional active carbon filter is ordered and equipped, the LED screen would display the accumulated operating time of the filter).
   Note: The displayed figure needs to be multiplied by 10 to get the actual operating time. The unit is an hour.
4) Press the UP button  to raise the front window to a proper height.
5) Press the FAN button  to turn on the blower. The LED screen would display the speed level of the fan memorized from the last time of operation. The indicator light above the FAN button would be turned on to show the working status of the blower. Ensure the blower runs at least FIVE minutes before starting any experiment.
   Note: The blower will be turned off automatically when the UV lamp is turned on.
6) Press the LAMP button  to turn on the fluorescent light. The indicator light above the button would be turned on to show the working status of the fluorescent light. Refer to the actual condition of illumination in the laboratory room to decide whether the fluorescent light is needed.

7) After finishing the experiment, turn off the blower and the fluorescent light and press the DOWN button  to close the front window.
8) Press the UV button  to turn on the UV light. The indicator light above the button would be turned on to show the working status of the UV lamp. Ensure the sterilization is at least 30 minutes. Press the UV button again to turn off the UV lamp.
9) **Note:**
   - When the UV light is in working status, people should leave the room to protect their skin and eyes.
   - UV lamps should be replaced regularly according to the frequency of use. The service life of a UV lamp is about 600 hours.
10) Press the POWER button  to power off the Fume Hood after all functions have been turned off. Press the power switch to disconnect the power before plugging it out.
11) If a power failure happens during the operation caused by an interruption of the electricity supply dropping off a plug or other abnormal situations, the equipment could memorize the current operating status automatically and resume those functions when power is on again.

10. Maintenance

Regular maintenance:
A detailed daily record of operating time is recommended, as the accumulated time will directly affect the plan of maintenance.
Note:

- To avoid electric shock, cut off all power before applying maintenance for the equipment!
- The blower and the exhaust duct should be inspected and maintained regularly.
- The accumulated operating time is a vital factor in deciding when maintenance is needed. A comprehensive record of operation is highly recommended to be taken down after each time of operation.

1) **Overall maintenance period**
   Comprehensive maintenance is recommended to be carried out for 1000 working hours or one year; weekly and monthly maintenance is also required to optimize the performance of the Fume hood.
2) **Preparation before maintenance**
   Material needed: Soap, hot water or warm water, a piece of soft cotton cloth, a piece of dry cloth or towel, rubbing alcohol or other disinfectants, 1:100 dilution of household bleach, abrasive household cleaners, sterile water.
3) **Clean the equipment surface**
   (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. Afterward, 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.
   For the contaminated or dirty work surface and sump, use 70% rubbing alcohol or other disinfectant to wipe.
   Note: Disinfectants used for wiping should not damage the 304 stainless steel.
   (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.
4) **Maintenance records**
   (1) **Weekly and 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 those areas to erase the remains of chlorine.
   - Check the various functions of the Fume Hood.
   - Record the maintenance result.

   (2) **Annual maintenance**
   - Check the two lifting belts (sash) of the front window tubular motor and ensure both of them are well connected to the motor with the same tightness.
   - Check the UV lamp and fluorescent lamp, replace it if needed.

- Apply for an overall performance test of the cabinet annually to ensure that the safety performance has met the requirements. The user is responsible for testing costs.
- Record the maintenance result.

5) **Storage conditions**

Fume Hood should be stored in a warehouse with a relative humidity of no more than 75% and a temperature lower than 40℃. The warehouse should have good ventilation performance without acid, alkali, or other corrosive gases. The storage period shall not exceed one year. Fume Hood stored for more than one year needs to be unpacked and checked before selling and using.

11. Troubleshooting

Confirm that the power is well connected, the power cord, the circuit, and the fuses are in good condition (without any damage) before troubleshooting the following problems.

Failures	Checking Part	Suggestion
Fluorescent lamps fail to work.	Fluorescent lamp tube	Replace the fluorescent lamp tube
	Circuit	Check the circuit
	Control panel	Replace the control panel.
UV lamp fails to work.	Fluorescent lamp and blower	Ensure the fluorescent lamp and the blower are turned off
	Lamp holder	Connect the tube and lamp holder tightly.
	Ballast	Replace the ballast
		Checking according to the fluorescent lamp failure step, then confirm.
The button fails to work.	Control panel	Ensure the power is well connected and the fuse is in good condition
		Check if the button is broken.
		Ensure 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 the socket	Socket fuse	Check if the socket fuse is broken
	Socket	Check if the socket is broken.
	Circuit	Check the circuit
	Control panel	Replace the control panel.
The front window fails to work.	Transmission part	Check the transmission connection and lead rail
	The motor of the front window	Check the front window motor.
	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 cord	Check whether the power cord is in good condition.
	Fuse	Check if the fuse is damaged.
	Potential transformer	Check whether the transformer works normally.
	Control panel	Replace the control panel.
The display fails to work.	Signal transmission line	Check whether the signal transmission line is well-connected.
	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.
- The troubleshooting and repair of this equipment only could be undertaken by trained and recognized technicians.

12. Replacement

12.1 Replace the fuse

The fuse of the socket and fuse of the neutral wire is located on top of the equipment (refer to **Figure 15**). 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. A live wire fuse is also located on top of the equipment, inside the connector. To replace the live wire fuse, turn off the power and disconnect the plug. Use a Slotted screwdriver to lever up the fuse holder to open it. Replace the fuse inside the fuse holder and then, press the fuse holder back.
The parameters of the fuse tubes in the round fuse holders are required to conform to labels, that are F5A φ5×20 mm and F10A φ5×20 mm.

Figure-15

12.2 Replace the fluorescent lamp

To replace the lamp tube, press the UP button to rise the front window to the highest position, then turn off the power and disconnect the plug. Remove the power cord of the lamp tube refer to **Figure 16**. Then remove the lamp tube by pulling the small slice on the tube base as shown in **Figure 16**. Install a new lamp tube by pushing it in and connecting it with the power cord.

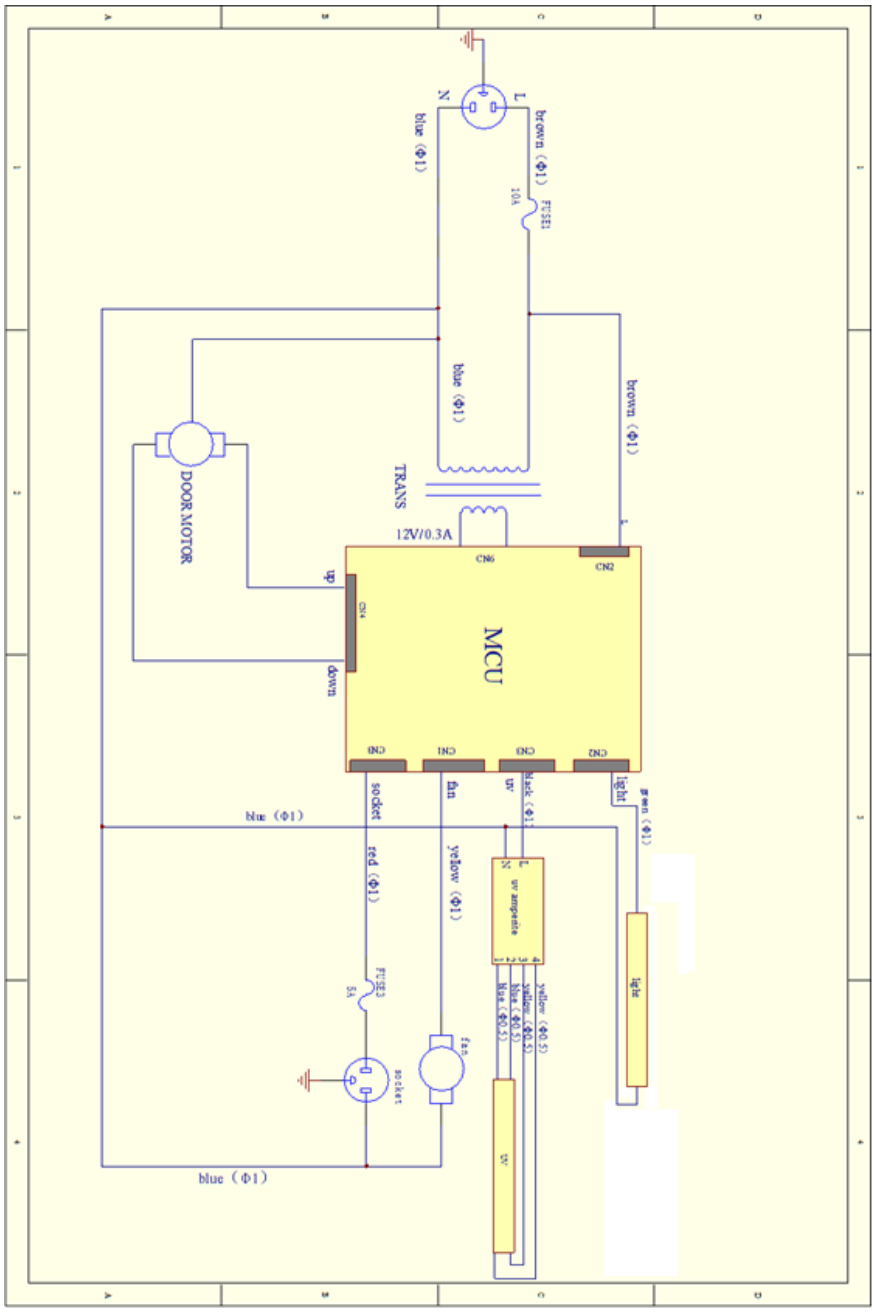
Figure-16

12.3 Replace the UV lamp

The UV lamp tube should change regularly, for example, every 600 hours. To replace the lamp tube, press the UP button to rise the window to the highest position, then turn off the power and disconnect the plug. Rotate the tube for 90° to remove it and then install a new UV lamp tube by rotating in the reverse direction.

Figure-17

13. Circuit Diagram



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