BIOBASE®

Biological Safety Cabinet

Class III

BSC-1500IIIX

User Manual

BIOBASE GROUP

Version 2020.07

Preface

Thank you very much for purchasing our Class III Biosafety Cabinet.

Please read the “Operating Instructions” and “Warranty” before operating this unit to assure proper operation. After reading these documents, be sure to store them securely together with the “Warranty” within touch for future reference.

 Warning: Before operating the unit, be sure to read carefully and fully understand important warnings in the operating instructions.

Disclaimer

Biobase shall not be liable for any equipment failure or damage, or for any direct or indirect damage that may occur during the use of the equipment.

1. Malfunction or damage due to violation of the instructions, precautions, and intended use of this manual.
2. Malfunction or damage caused by repair or alteration of the other company.
3. Malfunction or damage caused by use instruments of other company at the same time .
4. Malfunction or damage caused by operating environment not corresponding to the specified operating environment (power conditions, installation environment, etc).
5. Malfunction or damage caused by natural disasters such as earthquakes and floods.
6. Malfunction or damage caused by the company unaware of the movement or transfer (transport) after installation.

Content

I. Application Range

Class III Biosafety Cabinet is totally enclosed and gas-tight, it also can meet the requirement of operating Class I,II,III,IV pathogenic factor. It can be used in P3,P4 laboratory.

Work is performed with enclosed long-sleeved gloves that connected with Biosafety Cabinet. The cabinet is kept under negative pressure of at least 120 Pa.Supply air is filtered through high-quality filters before enter to the cabinet. Exhaust air is double-filtered through high-quality filters before enter to outdoor.Experimental article passes through the safety cabinet from two-door delivery box to ensure that it is not be contaminated.It is suitable for high-risk biological testing.

Class III Biosafety Cabinet are designed to protect the operator, the laboratory environment and work materials. It can avoid the operator to contact with potentially infectious aerosols and spills when operating pathogenic factor test materials.It is the necessary equipment in the laboratory in the search of microbiology, biomedical, DNA recombinant, animal experiment, and biological products, especially in the occasion that operator need to adopt protective measure, such as medical and health, pharmacy, medical research. Our equipment provides a safety working environment which don't have bacterial and dust in the process of bacterial culture.

Working environment:

(1)Only is suitable for indoor;
(2)Ambient temperature: 15℃～35℃;
(3)Relative Humidity: ≤75%;
(4)Atmospheric pressure range: 70 kPa～106 kPa;
(5)Power Supply: AC 220V±10%, 50Hz±1 Hz；

II. Technical Parameters

The safety cabinet belongs to class Ⅲ biological safety cabinet.
Production specification: BSC-1500III-X
External dimension: 1790*880*2080mm
Internal work area: 1165*650*650mm
Gloves quantity: 2
Gloves type and dimension: Butyl rubber gloves, length:800mm
Air cleanliness of work area:
Main filter: Air supply filter:Efficiency 99.99% at 0.3 m
First exhaust filter:Efficiency 99.99% at 0.3 m
Second exhaust filter:Efficiency 99.99% at 0.3 m
Pre-Filter: Replaceable cleaning parts
Noise: Initial fan speed setting is less than 65dBA
Illumination:Average illumination≥650lux
Main structure: 304 stainless steel 3mm steel plate overall welding, external surface adopts electrostatic spraying
Front window: Colorless and transparent 8mm toughened explosion-proof glass.
Work Zone: Overall 304 wire drawing stainless steel surface
Power supply:800W，220V，50Hz
Pass Box Size: Internal Size: 430*330*355mm
External Size: 575*425*495mm

III. Performance Index

The performance requirements of this product are as follows:

◆ Air velocity

Remove only one glove and the air velocity through each open glove connection is not less than 0.7m/s. If the glove is connected, the gas volume flow rate of safety cabinet for per cubic meter is not less than 0.05m3/s.

◆ Cabinet tightness

If cabinet pressurized to 500Pa, the pressure should be no less than 450 Pa after 30 min.

◆ Integrity of HEPA Filter

Scan and detect the HEPA filter, the leakage rate at any point should not be ＞0.01%.

Do not Scan and detect the HEPA filter, the leakage rate at any point should not be ＞0.005%.

◆ Vibration amplitude

The net vibration amplitude between frequency 10Hz and 10KHz is no more than 5μm (rms).

◆ Noise

The noise is no more than 67dB

◆ Illumination

The average illumination is no less than 650 lux, each illuminance measured value is not less than 430lx.

◆ Pressure Difference Display:

The figure displayed on the LCD shows the pressure in the operating area, and the sensor's error is ≤ 5%.

◆ Withstand voltage

Increases to 1390V (AC) in 5s and keep for another 5s without breakdown.

◆ Grounding resistance

≤0.1Ω

IV. Introduction of Functions and Structure

4.1 Product function and features:

4.1.1 LCD Display

LCD Display is the output part for human-machine exchange.We can know the size of the LCD (latticed liquid crystal) screen is 128*64mm, white character and blue background.it is real-time display to reflect the equipment working condition, such as effective working state of the filter, which is more intuitive.

4.1.2 Control panel

There are five touch buttons on the control panel film: UV lamp button, fan control button, socket button, fluorescent lamp button, power button, as shown in Figure 1. The round port on the upper left corner is a remote control receiving window that receives instructions from the remote control.

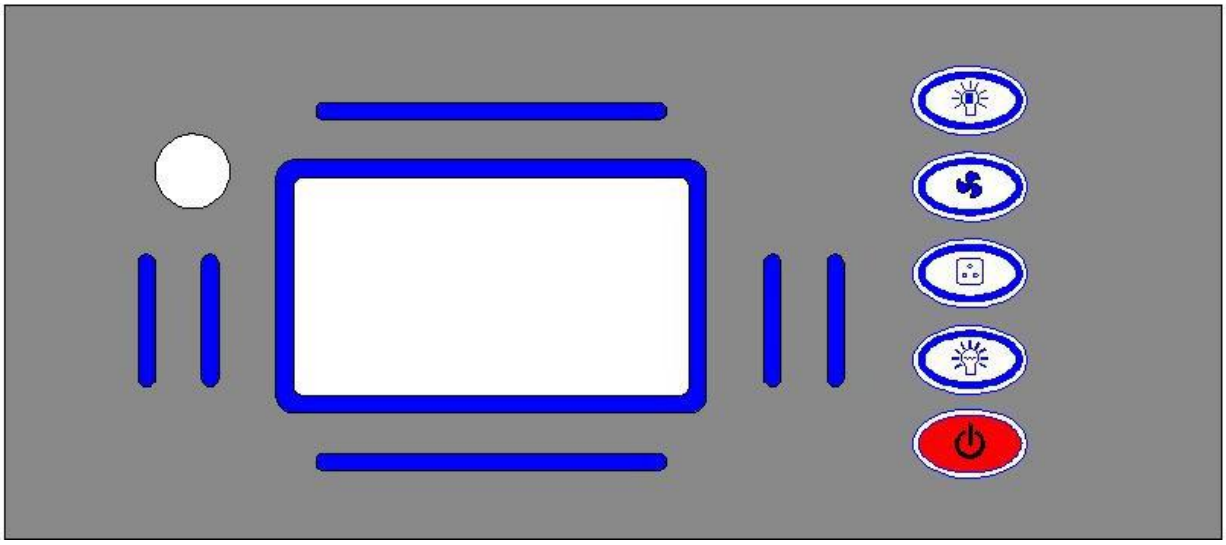


Figure 1

The main operation of the device can be carried out by touching the soft touch button. In the case of remote control failure, the device can achieve the most basic functions through the role of the button.
Power button : In addition to the appointment function, the master switch that controls the other function buttons;
Fluorescent lamp button: The control button of the fluorescent lamp. The lamp state and the indicated state on VFD change from on to off or off to on once at every press on the button;
UV lamp button: The control button of the UV lamp. The UV lamp state and the indicated state on VFD change from on to off or off to on once at every press on the button;
Socket button: The control button of the socket, The socket state and the indicated state on VFD change once at every press on the button;
Fan control button：The control button of the fan’s working state. The working state and the indicated

state on VFD change once at every press on the button.

4.1.3Warning

Digital pressure difference display, electronic alarm system. Alarm situation is as following：
1. Alarm when the filter fails. When any filter in the safety cabinet fails, it will alarm and prompt the filter needs to be replaced so that the personnel can replace it in time to ensure safety in all aspects.
2. Alarm when the operating area of the safety cabinet has negative pressure.When the negative pressure value in the operating area is greater than 120 Pa,it deems to be safe. When the value is lower than this value, the safety cabinet will alarm to prompt the laboratory operator to pay attention to checking the fault and handling with the fault immediately.

4.2 Introduction of the product structure

4.2.1Air filter system

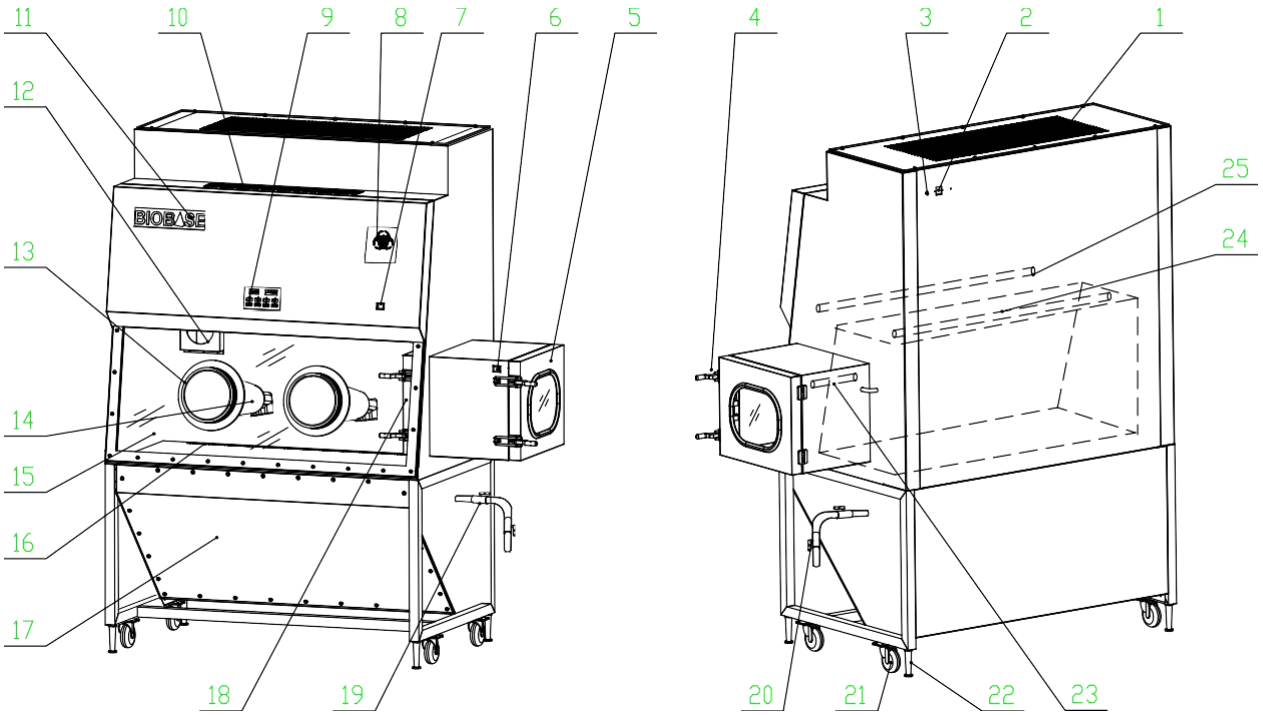
The unique horizontal laminar flow design continues to provide clean air to the operating area to prevent the deposition of contaminated particles in the dead ends. The vertical laminar flow through the HEPA filter flows through the operating area to ensure product/sample protection.
Air filtration system is the most important system to ensure the performance of this equipment. It consists of an air supply air filter and two sets of exhaust air filters and exhaust fans. The main function of the air filtration system is to continuously let the clean air go into the operating area, ensuring that the down-flow rate and the cleanliness in the operating area as well as the cleanliness of the exhaust air meet the standard requirements.
The air is double-filtered after passing through a high-quality, HEPA filter (for particles with diameter of 0.3 μ m, the filtration efficiency is 99.99%), thus ensuring the safety protection of products/samples, operators, and laboratory environments and avoiding the harm of biological infectious agents that use air as the route of transmission. The use of a built-in primary filter helps to extend the life of the main filter.

4.2.2Structure characteristic

1)The glove is made up of butyl rubber, more wear resistance and anticorrosion. Each glove need to be strictly porosity testing. The design of the gloves is not only for the easy changing but also for the safety function.
2)The design of the cabinet is in line with the human body engineering. Its front glass window could decrease the light reflection. All this could increase the operator’s comfort.
3)The work area is made up of the 304 stainless steel, easy to clean. There is collecting tank under the worktop for the waste liquor, which is convenient for the collecting and treatment of the wast liquor in the process of operation.
4)Dual series of sewage valve design, more secure, easy to discharge the waste of internal operation.
5)Built-in fluorescent lamp and UV lamp. The illumination intensity is fit for the sight. The location of the UV lamb is convenient for the sterilization of the work area.
6)It adopts AC blower. Lower noise, stable performance and high efficiency.

7)Perfect welding of the main body to protect the sealing performance and supply higher safety protection to the operator, sample and environment.
8)The pass box adopts interlock structure. There is UV lamp inside to protect the safety of the samples in the course of passing as well as the safety of the operator and the environment.

4.3Diagram of the structure and the accessory



1. Exhaust air net 2. Power Socket 3. Power fuse
4. Pass box handle 5. Pass box door 6. Pass box UV switch
7. Total power switch 8. Biohazard mark 9. Control panel
10. Pre-filter 11. Company logo 12. Pressure indicator
13. Glove access 14. Glove 15. Front glass window
16. Worktop 17.The down front plate 18. Pass box inside door
19. First drain valve 20. Second drain valve 21. Foot Caster
22. Foot stay bolt 23. Pass box UV 24. Working area UV
25. Fluorescent lamp

- ✧ UV Lamp
- ✧ UV Lamp is located at the inside of the working area, to protect all the working area have complete sterilization.
- ✧ Fluorescent lamp

LED lamp is used for lighting, to ensure the average lighting intensity could reach the standard requirement.

- ✧ Fuse

The cabinet has a main power fuse, which lies at the back top of the cabinet, beside the outlet of the power cord.

- ✧ Drain outlet
- ✧ Drain outlet lies at the inside corner of collecting tank.
- ✧ Please avoid to blocking the drain outlet when putting items in the safety cabinet.
- ✧ Butyl glove

The glove is made up of butyl rubber, more wear resistance and anticorrosion. Each glove need to be strictly porosity testing. The design of the gloves is not only for the easy changing but also for the safety function.

Please check the glove before experiment. Avoid it is scratched by sharp object during the usage.

V.Installation and Usage

5.1 Installation

The installation of this safety cabinet is undertaken by trained and recognized technicians by our company.

1. Location.

For biological safety cabinet, attention should be paid to the the relationship between the exhaust airflow and the indoor ventilation airflow. The exhaust airflow is discharged from the top of the cabinet, therefore, when placing the safety cabinet, it should not avoid its exhaust airflow.The biological safety cabinet should be located downstream of the direction of air flow and must have at least 300mm of space on each side of the cabinet for inspection.

2. The pre-treatment before installation

1) Inspecting the package carefully to see whether it has been broken.

2) If it is transported on cold weather, the cabinet should be placed on the heating received area for 24 hours before it is transported to the destination.

3) Before unpacking, the cabinet should be moved near from the installation point

3. Move to the door of destination.

4. Dismantle the package and carry it to the installation site.

⚠ Clear the cabinet after un-packing, as any fragment may cause damage to the blower and the HEPA filter.

5.Installation,checking and debugging

Installation,checking and debugging should be completed by after-sales engineer.

6. Training

After the installation is finished, after-sales engineer should train operators on basic operating functions, procedures, and precautions.Users should carefully read the user manual before using it.

⚠ Those who are trained can be able to operate this equipment.

5.2Usage

1. Connecting the Power, AC 220V, 50Hz
2. Turn on the main power button, the display screen will light and black for 3 times, meanwhile the cabinet buzzers 3 times.
3. The cabinet will do self-test at beginning of connecting power, to test whether its safety and all functions are in proper state. If the air supply filter and the exhaust filter could not reach the requirement, the cabinet will have visual and audible alarm to warn the operator to change the filter.
4. After self-test, the cabinet will go to standby mode to wait for the operators' commands.
5. When the operator presses the “Power” button on the control panel, the system starts to display the each peripheral state and dynamically displays the contents of each acquisition parameter.

6.Only after the operator press the “power” button, the other functions could work, such as the “Fluorescent lamp”, “UV lamp”, “Fan”, “Timing”. But the function of “Appointment” must be pressed before pressing the power button.

The intensity of UV lamp should be tested according to the manufacture’s requirement. We suggest do this test once a quarter and change it timely if it does not pass the test.

7.Power on the fan for idling for 30 minutes, then the operator could start to do the experiment.

8.For the usage of the remote control, please refer to Introduction of Functions and Structure (remote control) .

9. After finishing the experiment, sterilize the cabinet for more than 30 minutes, then turn off the power.

VI. Preventive Maintenance

The operability and safety of this equipment are guaranteed only if they are inspected, maintained and repaired by personnel and units with sufficient capability.

f power before maintenance

2. The statistics of the working time will affect the maintenance frequency, so we suggest the operator prepare a detailed record of the operation hour for reference

3. Exhaust bellow and exhaust pipe should be checked and maintained regularly.

6.1 Total preventive maintenance period

One year or 1000 hours

6.2 Recommended maintenance and service methods

1. Surface Cleaning

1) Stainless Steel part:

a) Non-work area:

Usually, clean the cabinet surface with soft tissue soaked in the condensed soap water at first. Then wipe it with another piece of cotton cloth or towel soaked in clean hot or warm water, the foam on the surface can be cleaned with dry cloth or towel.

b) Work area: Contaminated or traced work surfaces, fluid collection tanks, etc. are wiped with medical alcohol.

The detergent should not cause damage to the 304 stainless steel.

2) Coating part: Use any kind of home-use detergent to clean it at first. Then dry it with soft cloth or towel.

2. Daily and weekly cleaning.

1) Clean and sterilize the working area.

2) Clean and sterilize the control panel.

3) Clean the exterior surface and glass of cabinet with soft detergent or glass-specific detergent.

4) Check all functions according to the user manual.

5)Check the glove carefully, change it if find any damage.

6) Record the maintenance .

3. Monthly cleaning

1) Clean the whole exterior surface with detergent.

2) Use 70% alcohol and 1：100 diluted home bleaching agent (0.05% sodium hypochlorite) to clean the work surface, interior sides (not include diffuse board of air supply filter) and window inside. After that, clean it again by sterile water to remove the remaining chlorine.

3) Check all regular functions.
4) Check the glove carefully, change it if find any damage.
5) Record the maintenance.
4. Annual maintenance
Make a comprehensive maintenance to the cabinet, especially checking the safety functions carefully.
1) Checking if the gloves,UV lamp and fluorescent lamp are intact
2) Checking all the functions of the cabinet to protect it's safety, and the cost shall be borne by the users.
3) Record the maintenance .

6.3 Repair

1. The preparation work before repairing.
Make sure whether the cabinet have been had well earth connection. It's important to secure the safety during the regular and repair work. Check whether there are any cable disconnect, short circuit, if any mentioned malfunction occurred, solve the problem first.

2. Simple trouble shooting

No.	Malfunction	Check position	Solve measurement
1	Lamp does not work	Power supply	Assure the power supply is connected well and the fuse tube is good
		Lamp holder	Tighten the light holder
		Light tube	Change the light tube
2	Lamp is shining or turns to be red	Light tube	Change the light tube
3	No electricity	Fuse tube	If fuse tube is broken, change a new one
		Power supply	The power supply is not connected

1.All maintenance above must be done by qualified electrician under safety condition (cut off power).
2.When the malfunction of the cabinet cannot be found in the table above, and the operator cannot solve it immediately, please contact our repair department timely. For safety reason, do

not repair it by yourself.
3.The repairing job shall only be done by the engineers authorized by BIOBASE.
4.If any accessories need to be purchased, please record the registration number ofthe accessories and contact out sales department.

VII. Notes

1.Before connecting to AC power supply, make sure the power is stable and the same voltage with the cabinet requirement, the rated load power outlet of the power socket is no less than requirement. This cabinet uses ground type plug, this plug have 3 wires which only matches 3 wire power sockets, it is a safety device. If the plug cannot be inserted in the socket, change the socket to match the plug.
2.Move Slowly: in order to prevent circuit condition from being effected, operators should keep the airflow complete when moving arms inside the cabinet, the arms should move vertically and slowly. The arms should stay in the cabinet for 1 minute to let the air flows above the surface of arms before any experiment. All materials involved in the experiment should been put in the cabinet before experiment as much as possible to reduce the times that arms pass through the window.
3.The principle of samples moving: if any two or more samples need to be moved, in order to avoid the pollution in wide area caused by highly polluted material. The sample moving must obey the rule that only move lower polluted samples to higher polluted one. Meanwhile the movement of any material must be slow.
4.Horizontal position of materials: in order to prevent materials from cross contamination, all materials should be put in a straight line horizontally, to avoid cross contamination during the reverse air flow and avoid block back reverse air grid and influence normal wind road at the same time.
5.During the usage of cabinet, do not put soft and small materials (e.g. tissue) on the surface, to avoid being inhaled into the negative hole or the blower..
6. The maximum weight of material inside the cabinet should no more than 23kg/ 25×25cm2;
7.Avoid shaking: do not use shaking devices (e.g. centrifuge, shaking mixer) as much as possible, because the shaking devices may shake off the particulates which may reduce the cleanliness class inside the working zone.
8.Forbidden fire: Any open flame is forbidden in the cabinet. The open flame may disturb the air flow and damage the filter. If the high temperature sterilizing is required during the experiment, we strongly recommend use infrared ray sterilizer.
9.HEPA filter and its use life: With the extension of the filter life, dust and germs gathering in the filter, that will lead to high pressure of HEPA filter. Contact us to change the HEPA filter when the air pressure alarm, otherwise it will decrease the safety class of the cabinet. The old filter should be disposed as biohazard waste.
10. The fan and the steel plate underneath is the plenum cover, the wind tube had strict air tightness treatment at the factory to keep its leaking tightness. Operators should not loose or remove the screws, for special request, contact our after sale department for repairing.
11.The air grille close to the front window on the worktop is designed for air intake. When do experiment, do not block it. There is access for the pollution liquid under the worktop, it connected with two exhaust tap at the cabinet exterior. Please do not block the pollution liquid access
12.Cross contamination may occur when cabinet is used for long time (HEPA filter, cabinet angle etc), in order to reduce the pollution of biological safety cabinet, we recommend sterilize the cabinet every 500 hours by formalin sterilizer, then use fumigation sterilizer to clean inside of the cabinet. During the sterilizing, avoid the sterilized air from leaking out of the cabinet.

13. The storage period of cabinet is one year. If exceed one year, the cabinet should be examined by our technician to confirm its safety.
14. The inside and outside door of the pass box are mechanical interlocks, please don't failure the interlock functions intended and open the two doors together.
15. The gloves are made of butyl rubber. It pass strict leak proof test before out of the factory. In order to avoid the pollution leakage, please do not use sharp items scratch the gloves.

DECLAREATION: we declare that we are not responsible for any risk or damage caused by irregular operation.

VIII. Label Description

1. Company logo

BIOBASE

Figure 3

2. Biohazard sign

Figure 4

3. Fuse label

F10AL250V

Figure 5

4. Grounding wire label

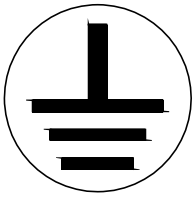
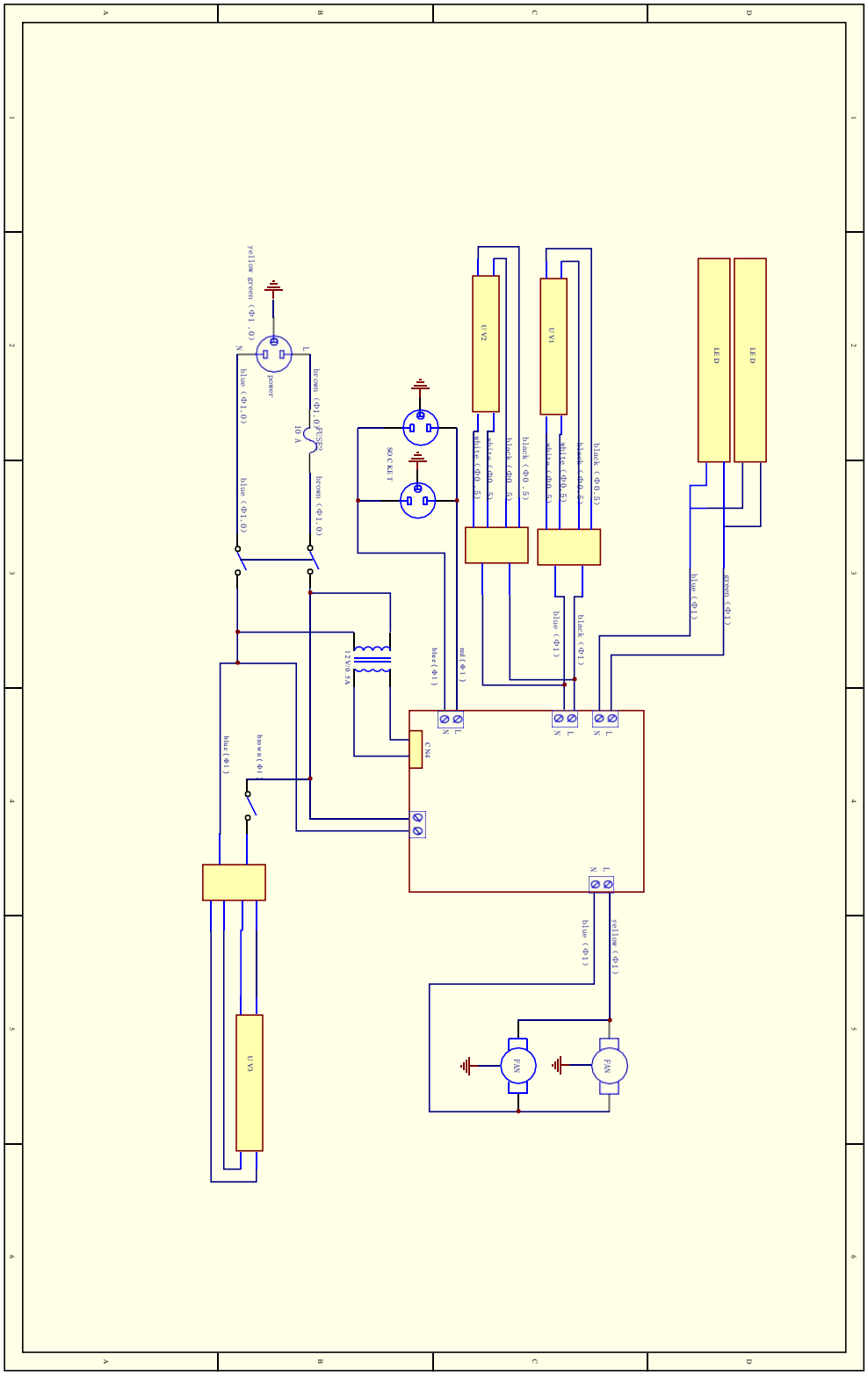
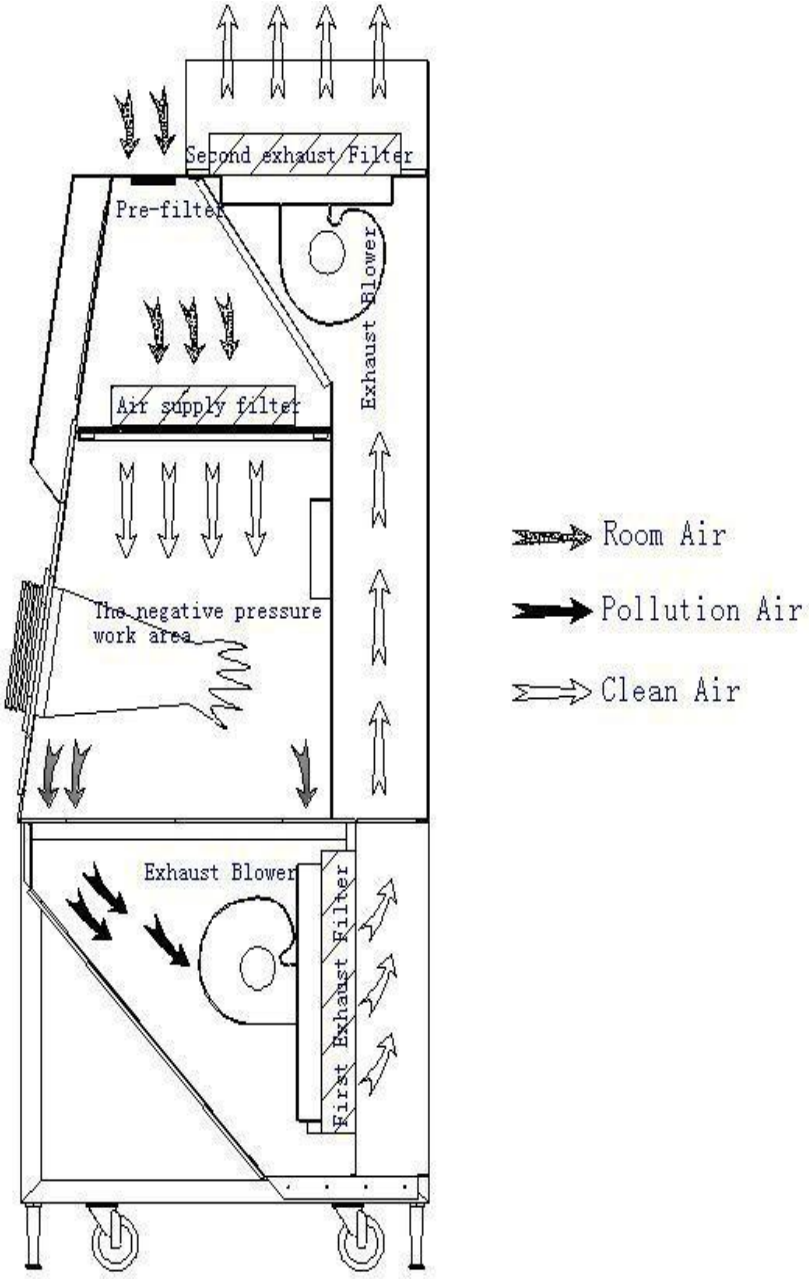


Figure 6

IX.Circuit Diagram



X. Airflow Pattern



XI. Warranty

1) Warranty is 12 months from EX-factory date (excluding consumable accessories, UV and Fluorescent lamp, fuse).
2) We will take no responsibility for risks caused by improper operation and man-made damages.
3) After the expiration of warranty, our company is also responsible for repairs, but the corresponding maintenance cost should be charged.
4) We can provide equipment drawings and necessary technical data for maintenance companies or personnel trained by our company.

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