

Operation Manual



BCBS-103

Biological Safety Cabinet Class I

Thank you very much for Choosing Biolab products. Please read the "Operating Instructions" and "Warranty" before operating this unit to assure proper operation.

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01 Unpacking Installation and Debugging

Please firstly check if packing box is in good condition. If the packing box is damaged, please take photos.

1.1 Unpacking

Choose the proper unpacking method according to the actual situation.

Method 1 Use M8 Wrench to unpack



Picture 1

Method 2 Necessary tools for unpacking: Electric drill with hexagon dead M8



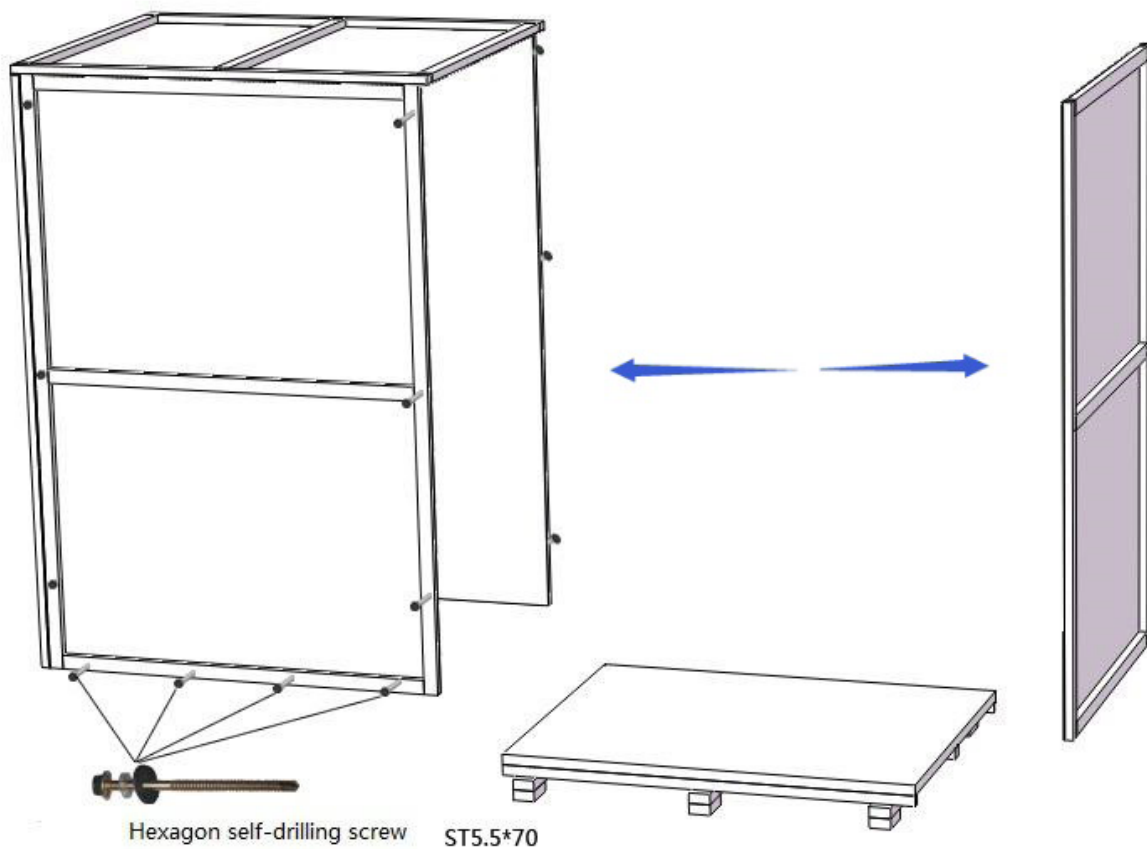
Electric Drill



M8 Sleeve

Picture 2

Rapid unpacking diagram (Picture 3). Disassemble the screws shown in the below Picture, then move the wooden pieces to right and left.



Picture 3

1.2 Accessories checking

Items	Quantity	Location
BCBS-103 Main Body	1 unit	Wooden Case
Power cord	1 pc	Packing bag
Fuse (5A)	1 pc	Document pouch
UV Lamp (T6 20W)	1 pc	Paper Packing
User manual	1 pc	Document pouch

1.3 Installation conditions and using environment

The machine should be placed in a area of air flow protection. Front window operation opening couldn't be opposite the door and window. Machine should be located far away from ventilating system and air-conditioning vents, in case of Biological safety cabinet affected by airflow which come from ventilating system, air-condition, door, window and people move.

Biological safety cabinet should not located in the place near door and walls around the corner.

Working environment:

- (1) Only is suitable for indoor;
- (2) Ambient temperature: 15°C~5°C;
- (3) Relative Humidity: ≤75%;
- (4) Atmospheric pressure range: 70 kPa~106 kPa, without strong air flow.
- (5) Electrical parameters: Consistent with the rated voltage of the technical parameter. (See 2.1.4 technical parameter performance index);
- (6) Power supply need to be grounded; (Judging method: testing the fire wire and the zero line of the power supply with multimeter, the fire wire to ground voltage should be grid voltage and the zero line to ground voltage should be 0, otherwise the power supply ground is bad);

1.4 Installation

- a. Remove all the package materials;
- b. Inspect the surface of main body to make sure whether there is scratch, deformation or uncorrelated things;
- c. Checking the accessories and documents based on packing list in User Manual;
- d. Move the item to a place where is as close as possible to the final location and easy to install.

1.5 Check after installation finished

Please check if the voltage displayed in nameplate is coincidence with the actual voltage. When the machine power on, push ON button of the display and check the following items:

Items	Normal Condition
Fan Running	Normally
LED Lamp	Light on when press the corresponding button
UV Lamp	Light on when press the corresponding button
Display screen buttons	All buttons can be used

Please contact your engineer to debug it if there are any problems. Debug method is displayed in the After sale service manual.

02 User Instruction

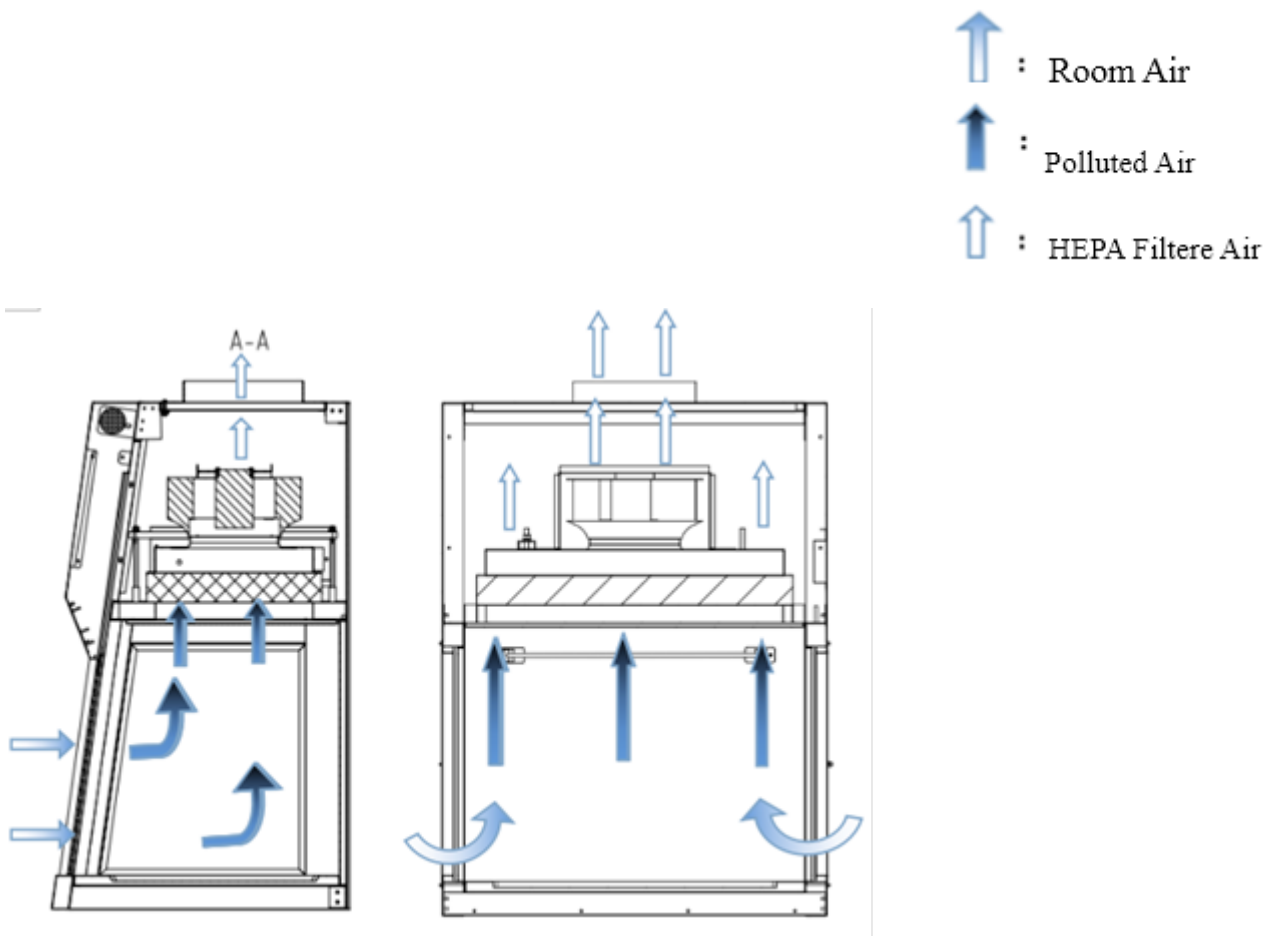
2.1 Functions

2.1.1 Product Concept

With the developing of medical technology, human's cognition of microorganism protection keep improving as well. Laboratory safety become more comprehensive and standard. Meanwhile, the requirement of lab equipment come to a higher stage. Aerosol particle would be produced during experimental operation in clinical laboratory of medical institution and research laboratory, such as specimen pre-treatment of mixing, stir, grinding, communication, centrifugal and Pathogen inoculating loops firing. When dirt in a high pressure heat up and exhausting, aerosol could be produced. Biological biosafety cabinet Class I could protect personnel and environment from the harm of aerosol pollution sufficiently.

Biological safety cabinet Class I is a kind of negative pressure filtration system, front opening which air flow inward have protection function for operator. The polluted air flow become pure after processed by HEPA filter. Biological safety cabinet Class I could be placed in any place and easy to operate, meanwhile, it protecting operator and environment when experimental operation.

2.1.2 Working theory/Air flow pattern and protected area



Picture 4

2.1.3 Protected Objects

Biological safety cabinets Class I are designed to protect the operator, the laboratory environment and work materials from exposure to infectious aerosols and splashes that may be generated when manipulating materials containing infectious agents.

2.1.4 Technical Parameters

Model Parameters	BCBS-103	
Power Supply AC	220V±10%	110V±10%
Frequency	50 Hz	60Hz
External Size(W*D*H)	900*713*1250 mm	
Working Zone Size(W*D*H)	800*635*600 mm	
Consumption	≤400 W	
Average airflow	>0.3m/s	
LED fluorescent lamp Consumption	T5 8W	
UV Lamp Consumption	20Ws	
HEAP Filter	99.985 (Diameter:0.3μm)	
Noise	≤60 dB(A)	

Notes: Our company reserve the right for changing the products, if we need to change and re-design.

1) Illuminance: Average illuminance ≥ 500 lux

2) Electrical performance:

Withstand voltage: voltage values up to AC 1390V within 5s, keep not breakdown in 5s.

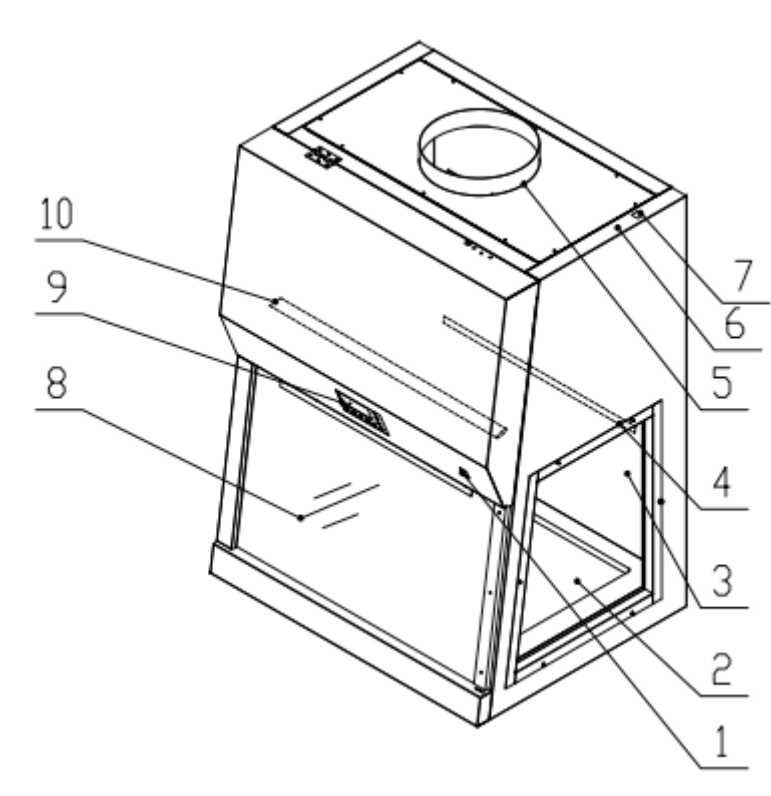
Ground resistance: $\leq 0.1\Omega$

3) Vibration Amplitude:

The vibration net amplitude of frequency between 10Hz and 10Khz no more than 10μm(rms).

2.2 Product Structure

2.2.1 Structural Composition



Picture 5

- | | | | | | |
|---------------------|-----------------|-----------------|------------------|----------------------|----|
| 1. Ship type switch | 2. Countertop | 3. Side window | 4. UV lamp | 5. Chimney fan | 6. |
| Ground terminal | 7. Power socket | 8. Front screen | 9. Control panel | 10. Fluorescent Lamp | |

2.2.2 Structure Introduction

1) Front glass door:

Front glass door is made of toughened glass, which have little damage to human when cracking. Front window was controlled by motor, it could up and down by adjusting direction switch.

2) Air Filtration System

Air Filtration System is the most important system of this machine. It consists of blower, purify air filter and air flue. Aerosol produced during experiment operation enter Biosafety cabinet Class I with the air outside, then Filtration System will filter the dust particle or infectant and exhaust the purified air to external environment. Air Filtration System use the HEPA filter, which make sure the cleanliness of air outlet.

Note: Though Biological biosafety cabinet could protect operator and environment from harm, it couldn't make sure the samples used in experiment won't be polluted by the air in lab. It couldn't foreclose the possibility of cross-infection.

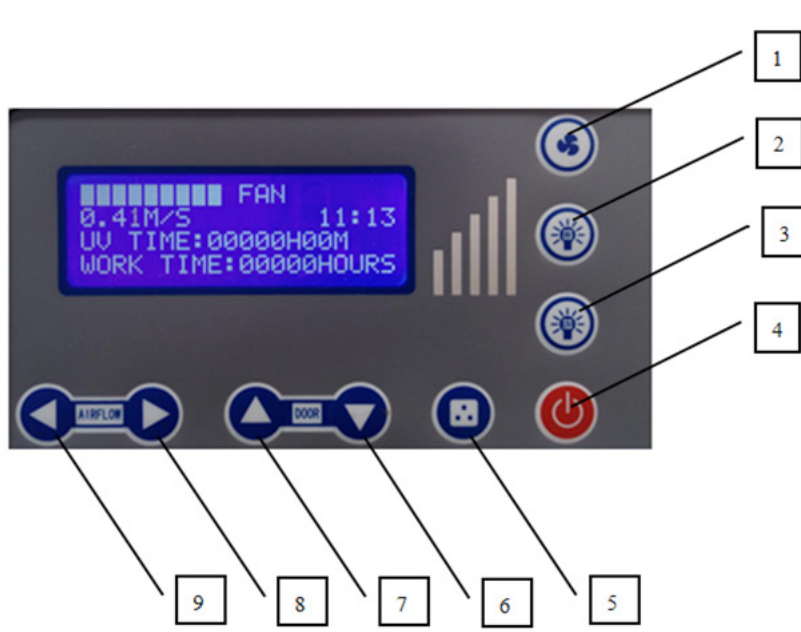
3) UV light:

UV lamp was used to sterilize. They located in interior of work area, and fixed at the top of operating area, where could make sure all space of work surface sufficiently exposure to the UV light.

4) Fluorescent light:

Fluorescent light can make sure illumination inside work area. LED lamp located in the top of operating area, keeping the illuminance inside work area no less than 500Lux. Easy to change.

5) Operation Panel:




- | | | |
|--------------------|----------------------|----------------------|
| 1. Blower | 2. Fluorescent Lamp | 3. UV Lamp |
| 4. Power | 5. Socket | 6. Glass window down |
| 7. Glass window up | 8. Air-flow decrease | 9. Air-flow increase |


a. Screen Display

The air-flow working status of the equipment can be seen on the screen.


b. Soft touch button


Operation of equipment could be executed by touch-buttons.


(1).  Power Button: Power button: control other function buttons. For each time pressing, buzzer will be ringing, and the status of LCD display will be changed at the same time (Turning lighter or darker). The system would be switched between standby mode and work mode.


(2).  Blower button: control the working status of blower. For each time pressing, the blower's work status and indicator light displayed on LCD will be changed. Blower memory function make sure that it will maintain the work status same with last time power off. Blower could not be start


when glass door closed.


(3).  To Control Fluorescent Lamp: For each time pressing, LED lamp's status and indicator light displayed on LCD will be changed (Turning on or off).

(4).  To Control UV Lamp: For each time pressing, UV lamp's status and indicator light displayed on LCD will be changed (Turning on or off). UV lamp, blower, fluorescent lamp and front window are interlocking. UV lamp will be auto switched off when fluorescent lamp, blower and front window are opened.

(5).  Glass window down button: For each time pressing, buzzer will be ringing. Glass window will keep going down when this button was pressed. Glass window stop going down when button was released.

(6).  Glass window up button: For each time pressing, buzzer will be ringing. Glass window will keep going up when this button was pressed. Glass window stop going up when button was released.

(7).  Air-flow decrease button: When blower is working, if the quantity of \square are more than one, operator could press this button to decrease the air-flow. For each time press, the air-flow will be decreased by one gear with buzzer ringing for one time, until the quantity of \square is one.

(8).  Air-flow increase button: When blower is working, if the quantity of \square are less than nine, operator could press this button to increase the air-flow. For each time press, the air-flow will be increased by one gear with buzzer ringing for one time, until " $\square\square\square\square\square\square\square\square$ " was displayed.

(9). LCD display: Power on. Display content from top to bottom: $\square\square\square\square\square\square\square\square$ FAN (show air-flow when blower is working). Current status of air-flow, time is displayed on right side (Time adjusting will be introduced next). UV TIME (Work time of UV lamp. For time resetting, please check 3.4). WORK TIME (Work time of the filter).

(10). Clock adjustment: In standby mode, continue to press the Fluorescent Lamp button and one alarm sound means clock set condition is ready, then minutes position start to blink, the Decrease button and Increase button could adjust minutes. Then press Blower button, hour position starts to blink, the Decrease button and Increase button could adjust hours. When finished, continue to press the Fluorescent Lamp button and one alarm sound means time reserved.

6). Ship type switch.

Main switch of equipment, have Power On and Power Off two status. When power on, only when the Ship type switch ON, the control panel could start and work.

7). Structure.

a. Cabinet body is built of 1.2mm cold-rolled steel with anti-powder coating. Strong and steady.

b. Work area is fully made of 304 stainless steel and with corrosion resistance performance.

c. Soft touch type control panel, easy to handle and beautiful appearance.

2.3 Operating Considerations & Operating Procedures

2.3.1 Operating Consideration

1) Before AC power connecting, make sure input voltage is correct and stable. The rated load of main power socket should be higher than cabinet consumption. BCBS-103 adopt grounded plug, which only could be used with grounded socket. This is a kind of safety device. If the plug cannot be inserted into the socket, please ask electrician to install grounded socket.

2) The weight of items placed in the cabinet should be no more than 23Kg/25×25cm²

3) Samples placed in parallel: Samples should be placed in the cabinet parallelly to avoid cross-contamination between samples.

4) In order to avoid samples being sucked into the negative passage or the blower, do not place soft and slight samples (for example: soft tissue) on the surface during experiment.


5) Avoid vibration: avoid using vibration equipment inside the cabinet. Vibration would cause particulate matter shake off from filter membrane, causing lower cleanliness of operating area.

6) No flame: No flame is allowed inside the cabinet. Using of fire will lead to airflow disorder, and filter damage. If sterilization is required during the experiment, infrared sterilizer is highly recommended.

7) HEPA filter life: With the usage time increasing, dust and bacteria accumulate inside HEPA filter. Filter Resistance is getting bigger, when it reaches the maximum point, there will be audible alarm. Please replace new HEPA filter, otherwise it will affect the safety performance of the equipment. Interior components shouldn't be abandoned at random when the equipment is maintained or scraped. There are biological hazards of components, please processed based on local laws and regulations.

8) Blower and underside steel plate are static pressure, back door is dam-board of negative pressure air passage, which is sealed strictly in factory. The operator is not allowed to remove or loose screws of those parts. If necessary, please contact service personal.

9) The maximum storage period is one year. If the period is more than one year, performance test should be done by technical staff. Then it could be put into operation if qualified.


 **Serious declaration:** we will take no responsibility for risks caused by improper operation and man-made damages!

2.3.2 Operating Procedures

a. Connect the same AC power supply as required of equipment;

b. Open the ship type switch, electrify the equipment. Pressing the relevant function button (Introduction and operation of function buttons, please check 2.2.2) to check if the function buttons are accordance with operating result and check the blower start and air-flow, fluorescent lamp and UV lamp based on the above Technical Parameters.

c. Before using, please make the front window down to bottom and sterilize the cabinet for more than 30 minutes by UV lamp.

 (1) For safety of eyes and skin, people should leave room during the UV sterilization, avoiding the damage from exposing to UV light.

(2) UV lamp intensity should be tested regularly based on manufacture's specification. Working time of UV lamp reaches to 600 hours regularly.

d. Please move the front window at an appropriate height, turn on the fan, experiment operation could be start normally after fan working 5 minutes.

e. UV lamp, fluorescent lamp and blower are interlocking: STERILIZATION button is invalid when fluorescent lamp and blower are starting. Other buttons are invalid when UV lamp opening.

 For operating safety, please put testing materials inside the cabinet in advance.

2.4 Daily Maintenance

Preparations before maintenance: clean the objects stored in cabinet.

Preparation items: cotton cloth or towel, concentrated liquid soap, hot water, clean water, medical alcohol or other disinfectants.

2.4.1 Clean the operating area surface

Wipe the entire surface with a soft cotton cloth or towel soaked with concentrated liquid soap, then wipe up the soap with another cotton cloth or towel soaked with clean hot or warm water, and then wipe the surface with a dry cotton cloth or towel rapidly.

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

 Disinfectants used for wiping should not damage 304 stainless steel.

2.4.2 Clean the external surface

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

2.4.3 Overall maintenance period

We suggest comprehensive maintenance period is one year or 1000 working hours.

2.4.4 Maintenance methods

1) Weekly or daily maintenance

- a. Disinfect and clean operating area (2.4.1);
- b. Clean the external surface around the operating area (2.4.2);
- c. Check the various functions of equipment ;
- d. Record this maintenance result

2) Monthly maintenance

- a. Clean the external surface (2.4.2).
 - b. Wipe the working table, inner wall surface of operating area (excluding the wind distributing grid of operating area) with 70% medical alcohol or household bleach diluted 1:100 (i.e, 0.05% sodium hypochlorite). Then wipe again with sterile water in order to eliminate the rest chlorine.
 - c. Check the various functions of equipment;
 - d. Record this maintenance result;
- 3) Annual maintenance
- a. Check the UV lamp and fluorescent lamps.
 - b. Record this maintenance result.

 When doing maintenance, please pay attention to cut off the power.

2.4.5 Storage conditions

BCBS-103 should be stored in a relative humidity no more than 75%, the temperature is below 40°C, in the warehouse with good ventilation performance, no acid, no alkali and no other corrosive gases, storage period shall not exceed one year, safety cabinet for more than a year needs to be unpacked and checked. Only the tested and qualified safety cabinet can be sold.

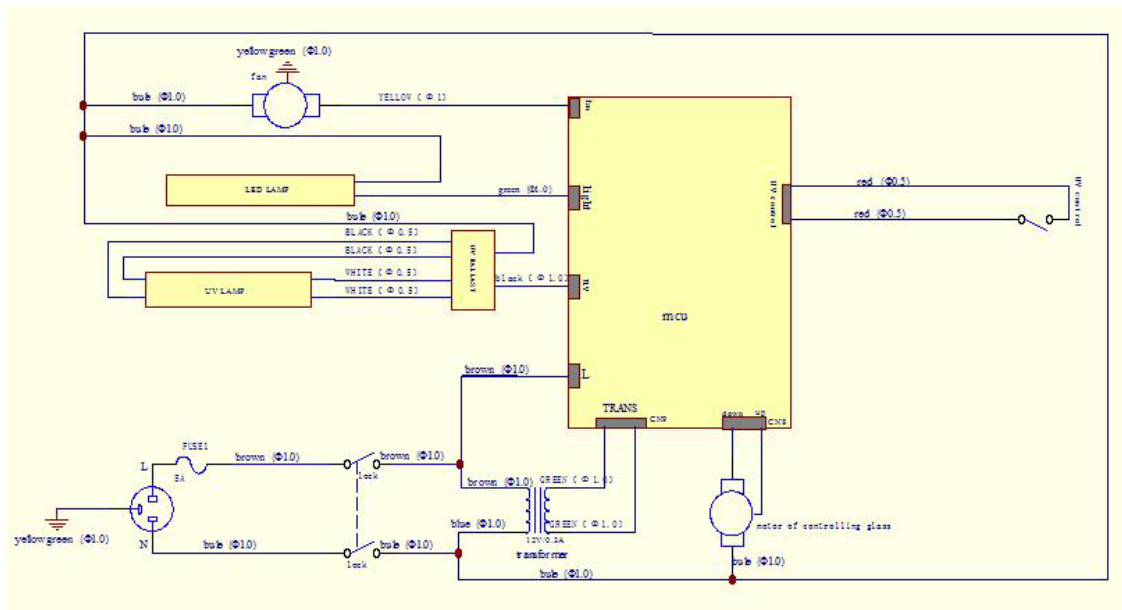
2.5 Parts List Replacement

2.5.1 Parts List Replacement (Following table used for purchasing accessories)

BCBS-103 replacement parts list

No.	Name	Specification
CX-01	Fuse	5A
CX-02	Lamp holder T8	LG13-01A
CX-03	UV Lamp	T6 20W
CX-04	LED Lamp	T5 8W
CX-05	UV lamp ballast	1*TL8-18W
CX-06	HEPA	740*420*69
CX-07	Fan	FH320A
CX-08	Control Panel	Clean Bench (LCD) Control Panel
CX-09	Front Window	818*520*5
CX-10	Side Window	(409.6+485.5) *540*5
CX-11	Tubular Motor	TMN45-10/17
CX-12	Travel Switch	'RV-156-1C25

2.6 Wiring Diagram



03 Common Faults & Soution

3.1 Common Faults

Please confirm whether the power is connected or not, whether the power cord is obvious damaged or not, whether the fuse is good or not, and whether the power locks are in the open state or not before the fault diagnosis.

Faults	Check parts	Measures
LED lamp doesn't work	LED lamp holder plug	Check if the holder plug connect well with holder
	LED lamp holder	Change it
	Control Panel	Change it

UV lamp doesn't work	Lamp Holder	Tube and lamp holder is connected securely.
	UV Lamp	Change it
	Ballast	Change it
	Circuit	Check circuit
	Chain	Check the front window, fluorescent lamp and the blower is open or not.
	Travel Switch	Check if it is off
	Control panel	Change it
Button doesn't work	Control panel	Make sure the power connects well and the fuse is well
		Check if the button is broken
		Make sure the connecting wire is connected well
		Change control panel
Blower doesn't work	Travel Switch	Check if it is closed
	Blower	If blower is broken, change it
	Circuit	Check circuit
	Control panel	Change it
No electricity in equipment	Power supply	Check power supply connects well
	Power wire	Check whether power wire has obvious damage
	Power key	Check if power key is open, is broken or not.
	Fuse	Check if the fuse is good
	Transformer	Check whether the transformer works normally
	Control panel	Change it
Display doesn't work	Connect wiring	Check whether connecting wire is connected well
	Display	Check whether display is in good condition
	Control panel	Change wiring board

Front window doesn't work	Transmission part	Check transmission connection and lead rail
	Motor of front window	Check front window motor
	Circuit	Check circuit
	Control panel	Change it

NOTES:

- (1) The above electrical parts must be operated by a qualified electrician in safety conditions (cutting off power supply). The other parts are not allowed to remove; otherwise the user should take responsibility for them.
- (2) When above failures are not occur, and the operator can't solve, please notify our maintenance department immediately. For your safety, please do not maintain equipment by yourself.
- (3) The maintenance of this equipment is undertaken by trained and recognized technicians.
- (4) If you need to order parts, contact the agent or our technical service department, and please indicate the model and serial number of the cabinet purchased.

3.2 Fuse Replacement

Fuse of BCBS-103 is F5A $\phi 5 \times 20$ mm, which is determined according to label. Fuse is located in the power plug as Picture 8. show. When replace them, turn off the power and disconnect plug, use a flat head screwdriver to draw out fuse holder from power plug, remove the fuse out and replace a new fuse, and then pressing fuse holder back.

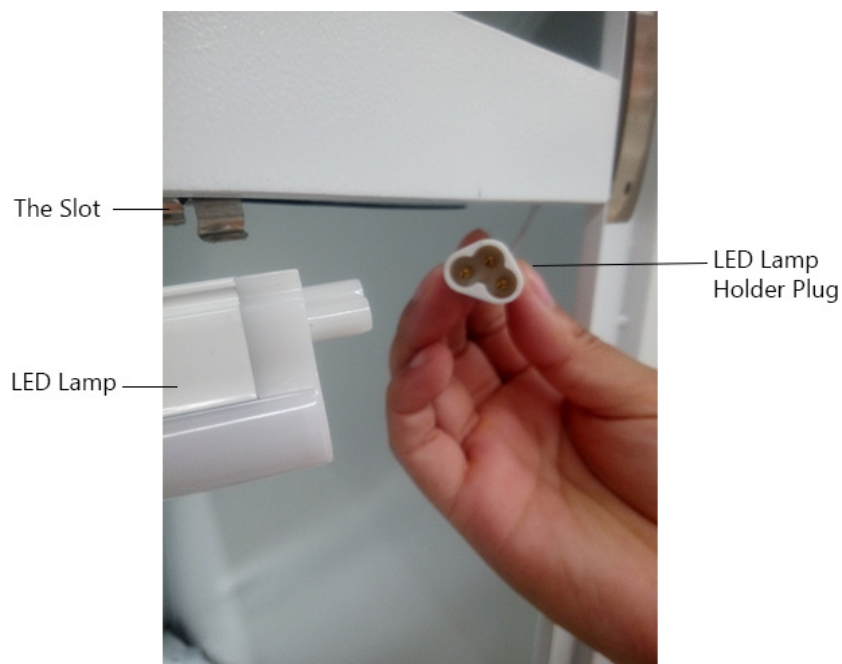
**Power Plug**

Picture 8

Note: Use flat head screwdriver to draw out fuse holder from power plug, then fuse could be took out directly. Easy to change and check.

3.3 LED Lamp Replacement

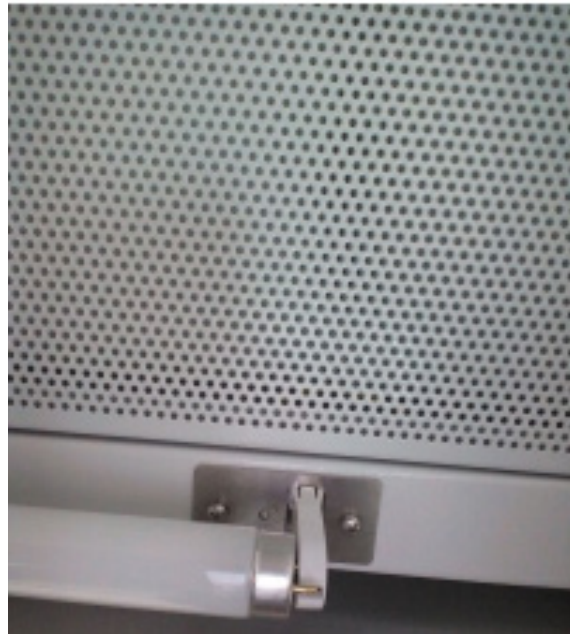
When replacing lights, please up the front window to top position, and disconnect power. Then removing the LED lamp unibody holder slantly, pulling the LED lamp holder plug off from right side and replacing the new holder into the slot . Please check the Picture 9 for instruction. Check Picture 5 for the location of fluorescent light.



Picture 9

3.4 UV Lamp Replacement

Working life of UV lamp are 600 hours, we recommend to test the UV intensity regularly for better disinfection effect. UV intensity test card could be used to confirm if it's necessary to change the UV lamp. When replacing, first make sure the power is off, then holds the two sides of lamp gently and screw the lamp 90 °clockwise(or anticlockwise) to take it off, then take the correspondence type of lamp, and put it to the lamp holder and screw 90 °clockwise(or anticlockwise). Please check the Picture 10 for instruction. Check Picture 5 for the location of fluorescent light.



Picture 10

Note: Hands placed in both sides of lamp separately, close to lamp holder, then screw the lamp 90° clockwise (or anticlockwise) at the same time to take lamp off as picture show and place away carefully. Then place the new lamp into lamp holder and installing as above methods. When installation finished, power-on testing.

3.5 Label Description

3.5.1 Fuse label

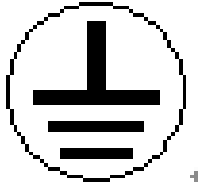
Voltage of $110V \pm 10\%$, label shows as below:

F5AL

Voltage of $220V \pm 10\%$, label shows as below:

F5AL 250V

3.5.2 Ground label (Picture 11):



Picture 11

04 Warranty

4.1.1. Warranty is 12 months from EX-factory date (excluding lamps, fuse).

4.1.2. We will take no responsibility for risks caused by improper operation and man-made damages during warranty period.


4.1.3. After the expiration of warranty, our company is also responsible for repairs, but the corresponding maintenance cost should be charged.

4.1.4. Life time of this biosafety cabinet is 8 years from production date on the label.

4.1.5. We can provide equipment drawings and necessary technical data for maintenance companies.



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