



# Biological Safety Cabinet Maintenance Manual



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

# Index

01 Device Debugging.....	03
02 Failure and Maintenance.....	07
03 The Fan and Filter Replacement.....	23
04 Wiring Diagram.....	47

# 01 Device Debugging

Standard values: inflow 0.53m/s, downflow 0.33m/s  
Adjustment of actual wind speed

Attention:

Safety cabinets before leaving the factory, wind speeds have already adjusted to standard values.

Install and run the device, if wind speeds in screen are inconsistent with standard values, please test the actual wind speed values with anemograph (Test down flow) and weather gauge (Test inflow)

If you do not have the weather gauge, you could also use the anemometer instead.(But accuracy is not guaranteed)



**anemometer**

If test wind speed and standard values are consistent, following the Display pressure and wind speed adjustment in part2 Failure and Maintenance,fault 12.

If the two are inconsistent, need to adjust the speed gears of fan, you need following the The actual wind speed adjustment in part1 first, and then follow the part 2 Failure and Maintenance, fault 12. the steps are as follows :

The actual wind speed adjustment of the new control board A2 type safety cabinet

## Steps:

The wind speed adjustment is divided into two situations(A or B):

A: If the inflow and down flow wind speed are both greater than or less than the nominal value, adjust the setting of the fan gear:

1. Turn on the power to turn on the power lock, Enter the standby interface.  
(Standby state refers to the situation where the power lock is open but the power button  is not pressed. The display screen is not light up)

2. Press The fan key  which is shown in picture 1 for about 5 seconds to enter the adjustment interface of the fan speed.



**Picture 1**

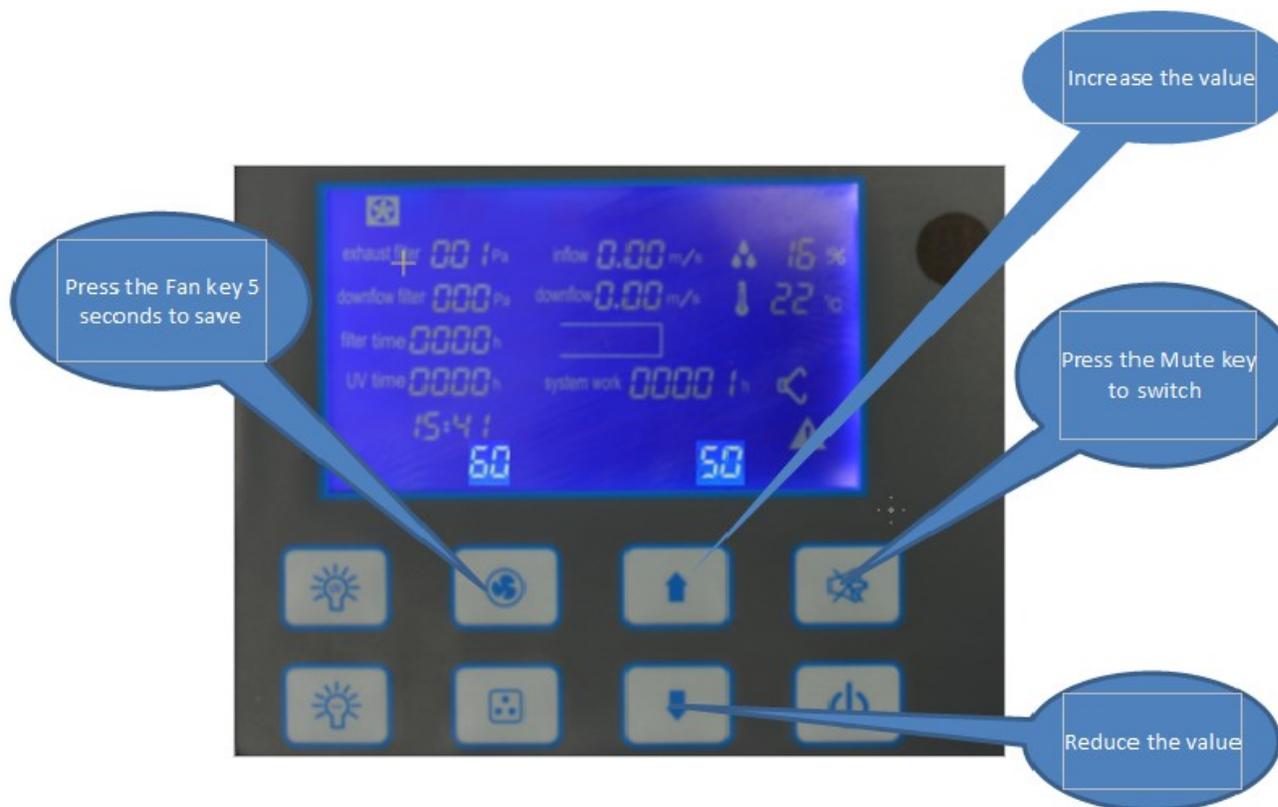
3. After entering the fan speed adjustment interface, you can select to adjust the wind speed of the external exhaust fan (the left side Number) or inner fan (the right side number) by pressing the mute (sound) button .

For example , there are 60(left) and 50(right) Numbers in picture 2 will blink .

The 60 number is the speed adjustment of the external exhaust fan, which is the inflow of wind speed adjustment.

The 50 number is the internal fan speed adjustment, which is the downflow wind speed adjustment.

Value of these two Numbers are for the inner and outer fan gears, The larger the value, the larger the flow velocity, and the smaller the numerical value, the smaller the flow velocity, and by adjusting the two values, the wind speed can reach the nominal value.



**Picture 2**

4. After adjusting (inflow 0.53m/s, downflow 0.33m/s, which is showed on the anemograph), press the fan key for 5 seconds to save.

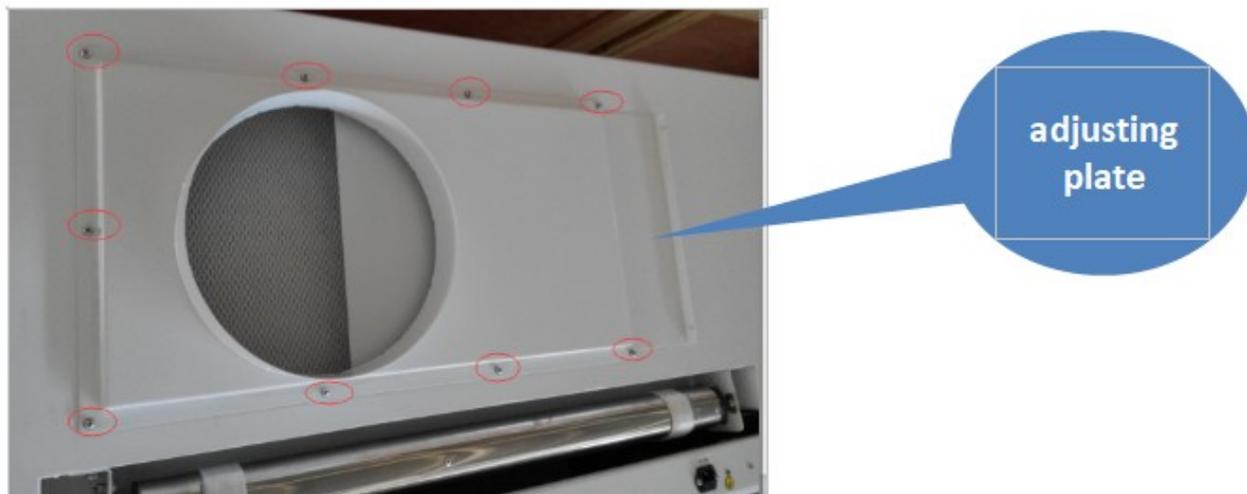
B: When the inflow of wind speed and the down flow wind speed do not match, the inflow wind speed is less than the nominal value and the down flow wind speed is greater than the nominal value, or the inflow of wind speed is greater than the nominal value and the down flow wind speed is less than the nominal value:

1. Loosen the retaining bolt of the top adjusting plate, as shown in figure 3, adjust the adjusting plate at the top:

2. Pull out the adjustment plate, the inlet air flow velocity increases, the down flow velocity decreases;

3. When the adjustment plate is pushed in, the inlet air flow velocity decreases and the down flow velocity increases.

4. To match the inflow wind speed and the down flow wind speed, after adjusting, tighten the retaining bolt at the top.

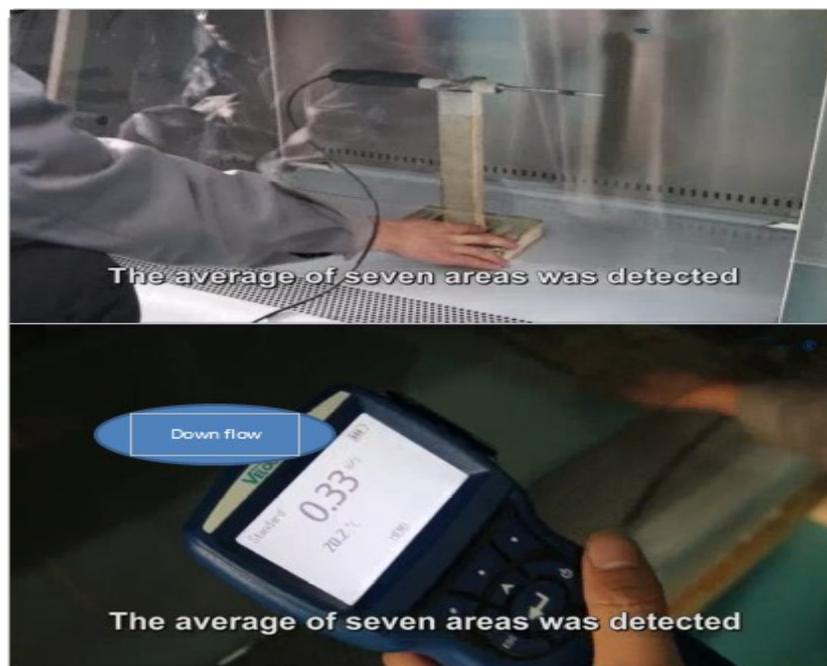


**Picture 3**

Next, you need to adjust the display speed on the display screen. Please refer to Part 2

Attention:

All operations of Part 2 are built on the premise that the actual wind speed has reached the nominal value through the anemometer and the weather gauge.





## 02 Failure and Maintenance

**CAUTION:** All maintenance actions on this equipment must be performed by a qualified technician who is familiar with the proper maintenance procedures required for this equipment. This includes both certification as well as repair.

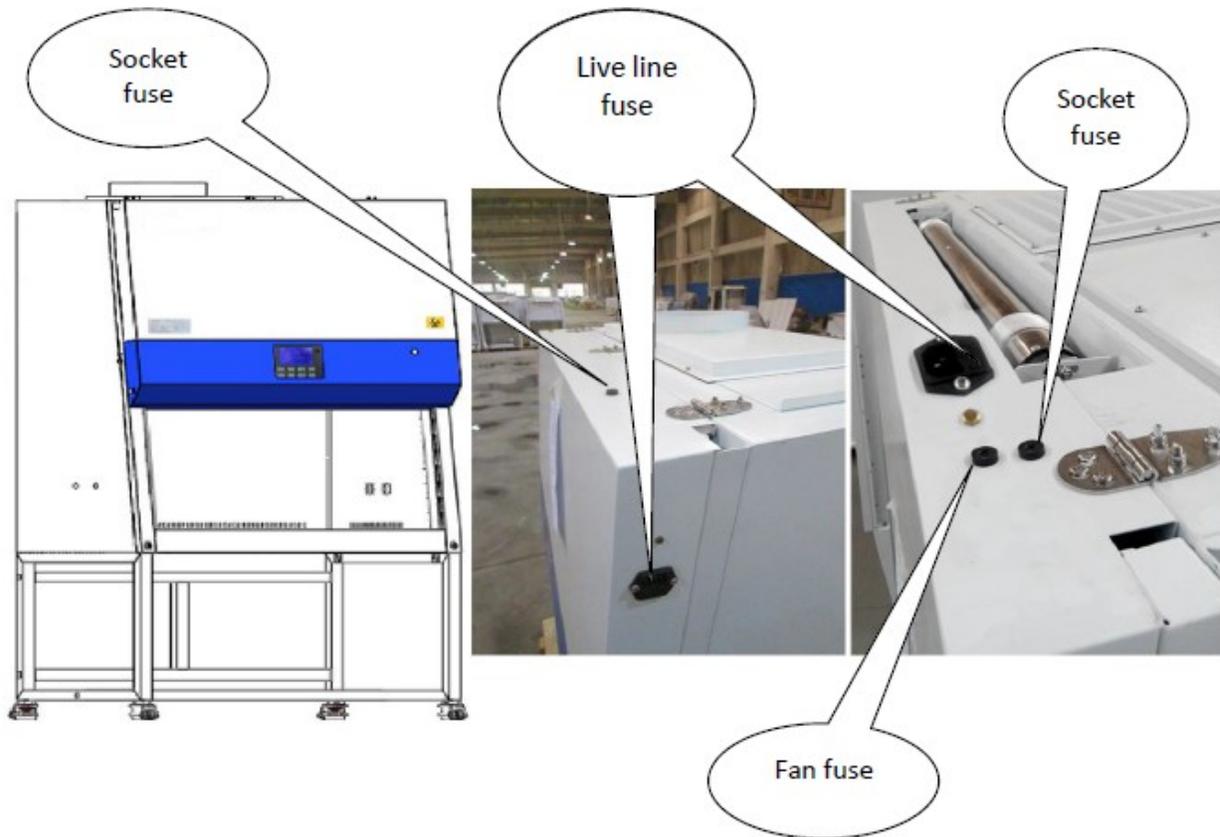
Fault 1 : Equipment no electricity

After electrifying equipment and turn on power lock, equipment did not respond (no alarm, display is not bright, buttons no reaction).

The step deal with this type of problems as follows:

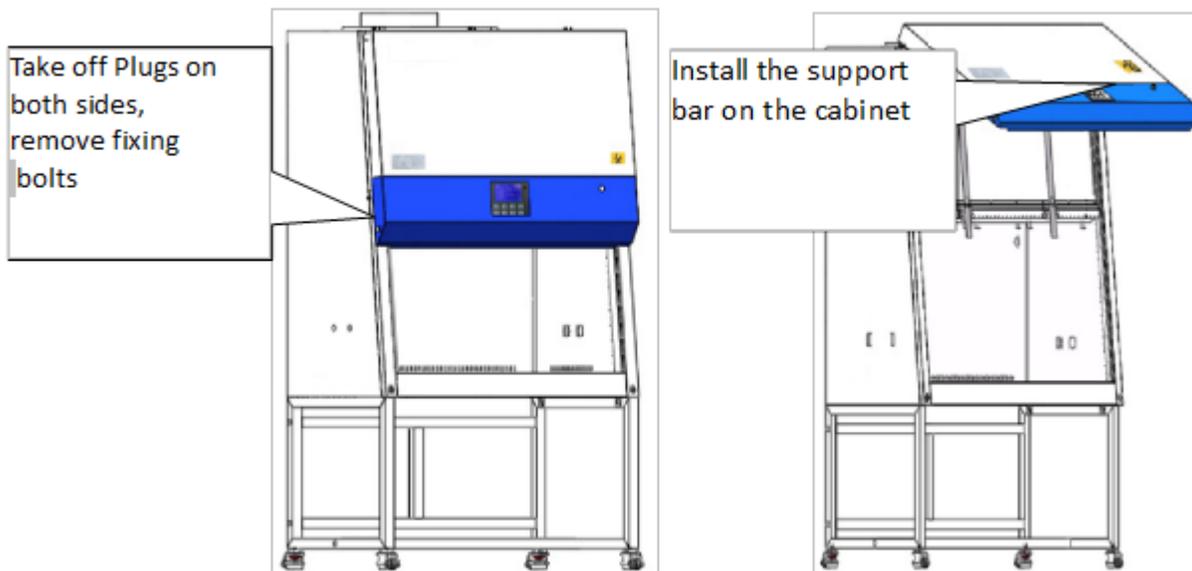
1.1 Ensure the power supply has electric and electrical parameters consistent with equipment requirements. Using a multimeter to test the device power supply is normal.

1.2 Equipment equipped with a fire line fuse. You can remove the fuse with a screwdriver and make sure the fuse is undamaged. If the fuse is damaged, you should replace with the fuse of corresponding specification.



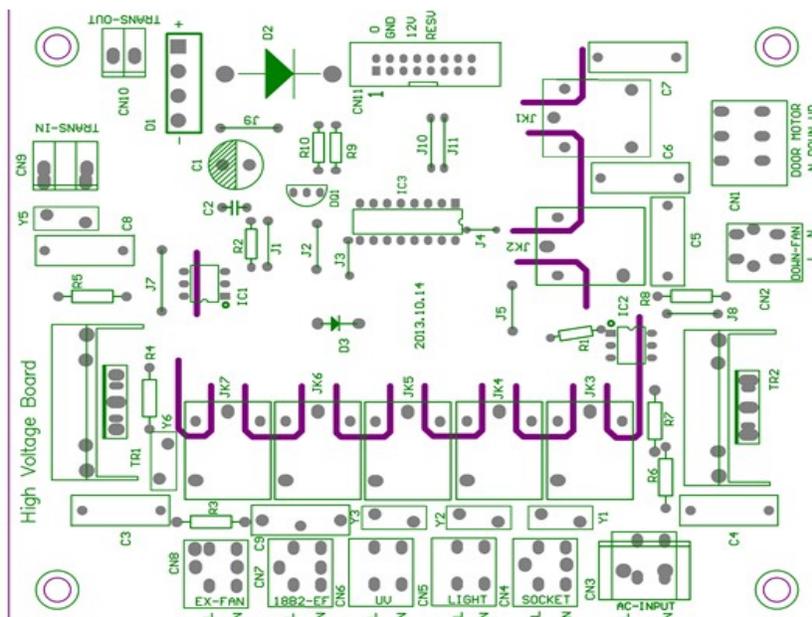
**Picture 4**

1.3 Confirm the above no problem, open the operation panel (as shown in picture5),using the support frame (fixed the operation panel as picture) hold up operation panel in a safe position, using a multimeter to test input and output voltage with power lock opening (voltage should be the power supply voltage).

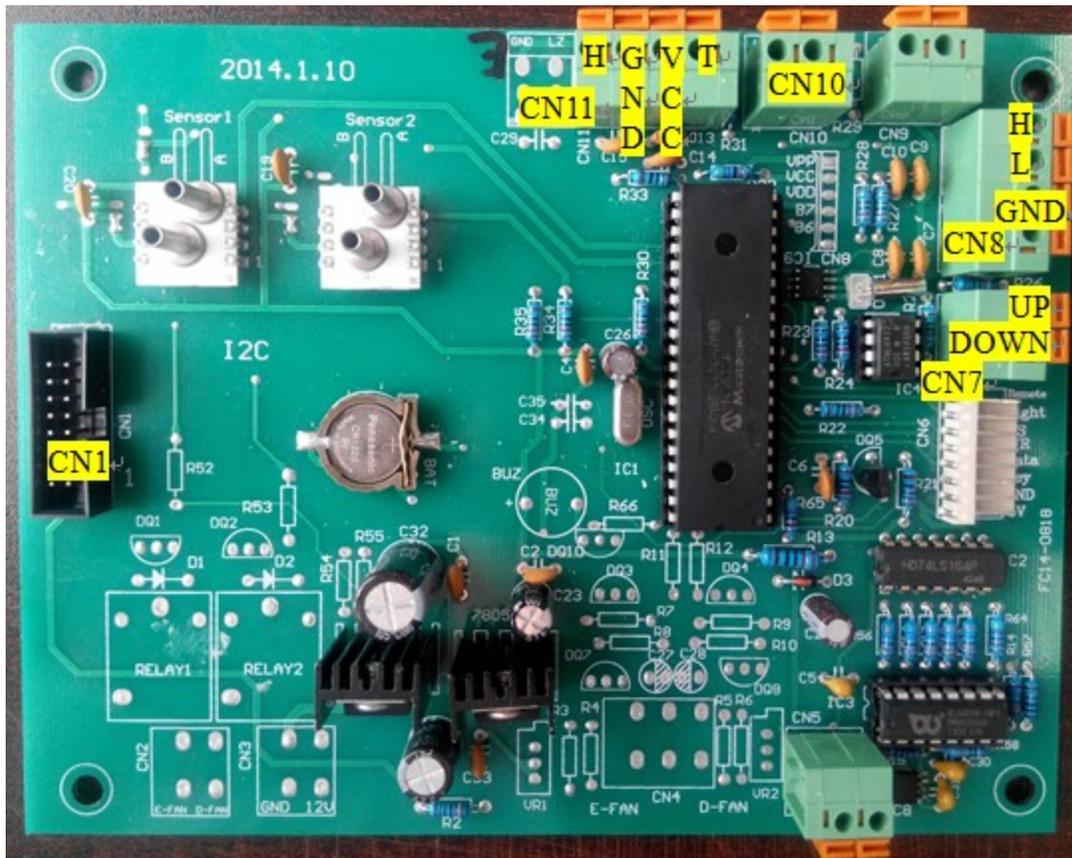


Picture 5

1.4 Confirm the above no problem, use multimeter testing input voltage of transformer (voltage values should be the supply voltage of the device) and the output voltage. First use multimeter test two lines at CN9(as shown in picture6),check whether there have voltage, this voltage is the supply voltage. Then test the transformer out put voltage: AC test with a multimeter, if CN10 voltage is between 12V-14V , indicating it is normal; If there is no voltage, indicating that transformer is damaged, please replace the transformer.







**Picture 7**

1.4 Confirm the above no problem, check the cable connection between CN11(in picture6) and CN1(in picture7).

1.5After confirming the above no problems, please replace control board.

Fault 2: The display is not bright (Normal alarm when power on)

After electrifying equipment and turn on power lock, button functions are normal, the display is not bright. The step deal with this type of problems as follows:

2.1 Check whether the screen is broken, if it is damaged, replace display panels.

2.2 Open the operation panel (picture5), check the cable between display panel and control panel is correctly connected.

2.3 Confirm the above no problem, please replace control board.

Fault 3: Button no response and display is not bright (Normal alarm when power on)

After electrifying equipment and turn on power lock, button functions no response, the display is not bright The step deal with this type of problems consult fault 2

Fault 4 : Power lock is not responding

Power lock is not responding, please replace power lock. Method for removing power lock as shown in picture 8.

( BCBS-201/ BCBS-204 the power lock type is AR22JR-2A20A;

BCBS-202/ BCBS-203 the power lock type is LA42Y2P-20B)



**Picture 8**

Fault 5: No alarm when the front window is not in the safe height

NO alarm when the front window is not in the safe height (Normally higher or below the safe height(200mm) the device will alarm; when front window completely at the bottom, it won't alarm)), the front window will automatically stop and stop alarm when it reaches the safe height during the up and down.

The step deal with this type of problems as follows:

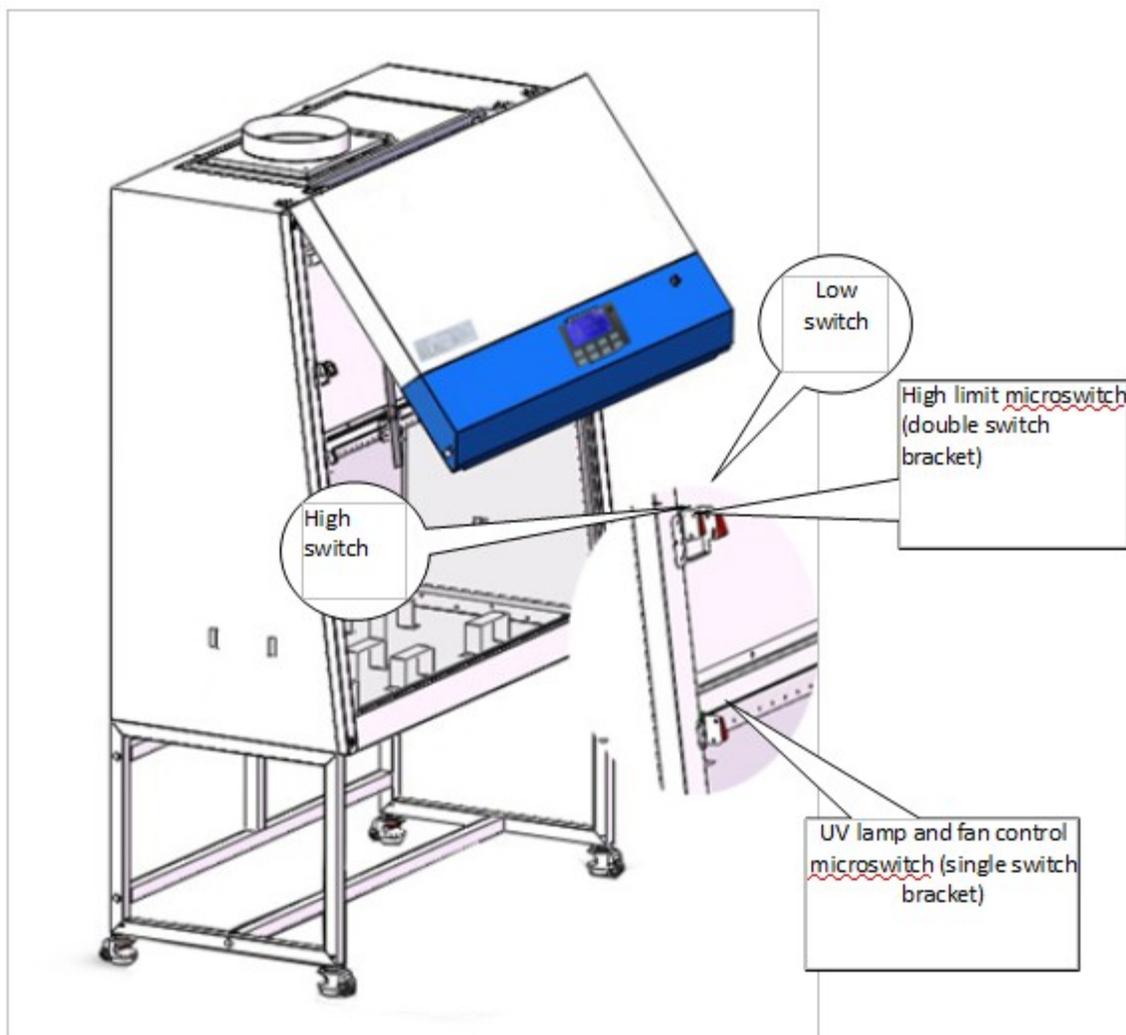
5.1 When the current window is not in the safe height, confirm whether " on the screen is flashing, if the icon is flashing and not in the mute mode, but the device don't alarm, indicating control board needs to be replaced.

5.2 If isn't flashing, open the operation panel (see picture5). Using a multimeter to test whether micro-switches are damaged or short circuit(Test H, L,CN10- Double travel switch/CN10-Single travel switch, see picture7), make sure travel switch lever contact with glass and the switch can be closed.

When front window is in safety height, high limit travel switch of double switch bracket is disconnected, low switch of double switch bracket and travel witch of single switch bracket is closed (as shown in Picture9).

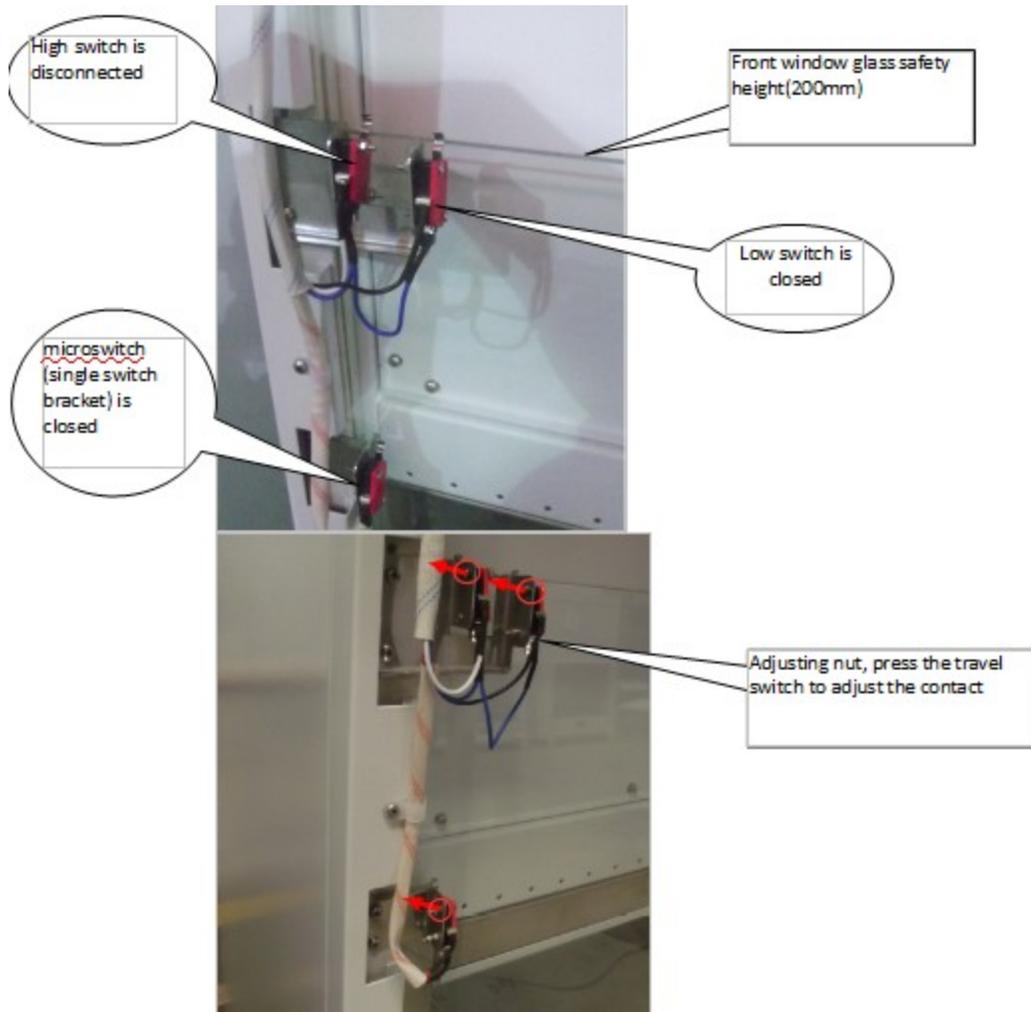
When front window is not in safe height, loose bolts, adjusting travel switch to make double switch bracket of high switch in disconnect mode, low switch and travel switch of single switch bracket is closed (as shown in Picture10).

This method is also applicable the front window reach safe height does not automatically stop.



**Picture 9**

Check whether the welding wiring harness of two micro switch on the double micro switch bracket is firmly connected, check whether the micro switch is damaged, and whether the switch action can be made when the glass is moving.



**Picture 10**

5.3 Check wiring connection in 'CN8' (as shown in picture7), high switch connect to 'CN8 H', low switch connect to the 'CN8 L'. Single-switch connect to 'CN10' (as shown in picture7).

5.4 Confirm the above no problem, please replace control board.

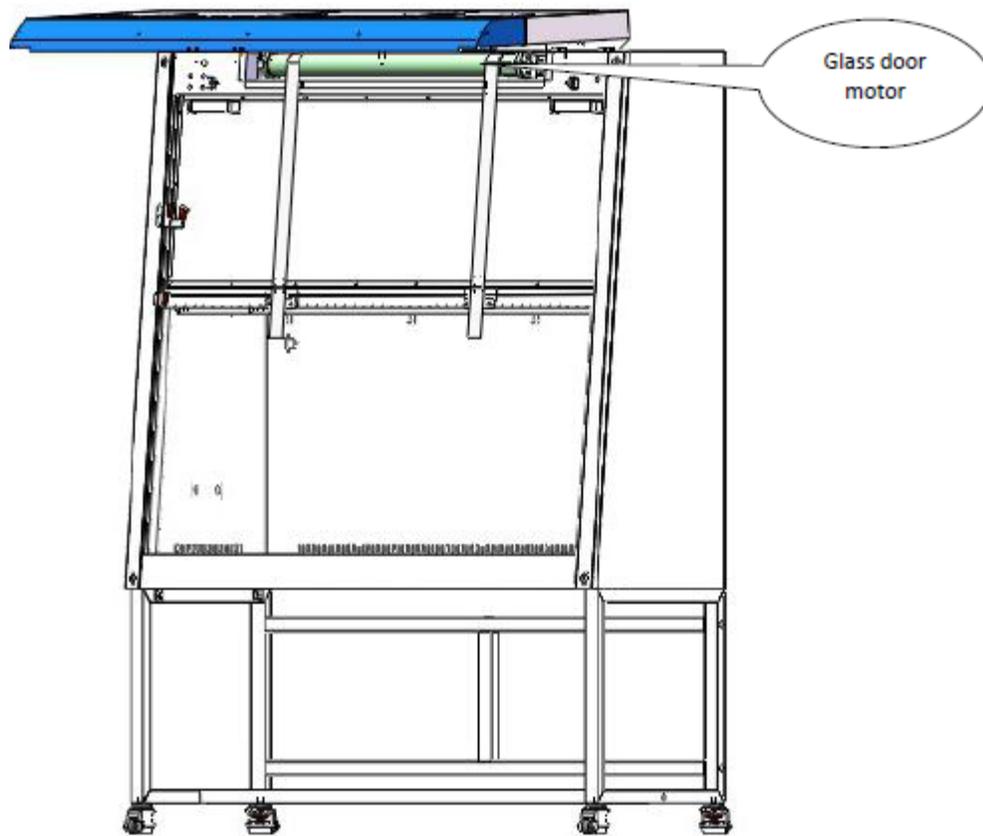
**Fault 6 : Front window failure to up and down**

The front window is not response when press up and down keys. The step deal with this type of problems as follows:

**6.1 Operation panel's buttons no response**

Turn on the device, open operation panel (see 1.3,picture5),hold down the 'up' button, using multimeter test voltage(voltage should be the power supply voltage) of CN1(between blue(white) line and brown(red) line) at strong electric board (as shown in picture7), hold down the 'down' button, using multimeter test voltage(voltage should be the power supply voltage) of CN1(between blue(white) line and black line) at strong electric board (as shown in picture7), if there is no voltage, control panel is damaged, replace the control board.

If above is normal, connected motor to the power supply directly, test whether the motor is working,.If the glass door motor is not working, indicating the motor is damaged, replace the glass door motor (glass door motor position as shown in picture11).



**Picture 11**

**6.2 Remote control button does not respond**

Confirm the remote control have battery . If the remote control have changed battery, device still no response, remote control is damaged,please replace remote control.If using a new remote control still no function,see 6.1.

**6.3 Foot switch does not respond**

Using the multimeter to test whether the foot switch is damaged.( Remove the foot switch and press the two pedal, separately identify the terminals 1 and 2, the 2 and the 3 switches are respectively connected.If the foot switch wire is broken, the foot switch is damaged and please replace the foot switch).

Open the operation panel, check CN8 and CN7(as shown in Picture7), the blue line (GND) and the red line (UP), the black line (DOWN) are good contact on the control panel.If they are good contact,see 6.1.



Foot switch terminal

**Fault 7 : Remote control failure**

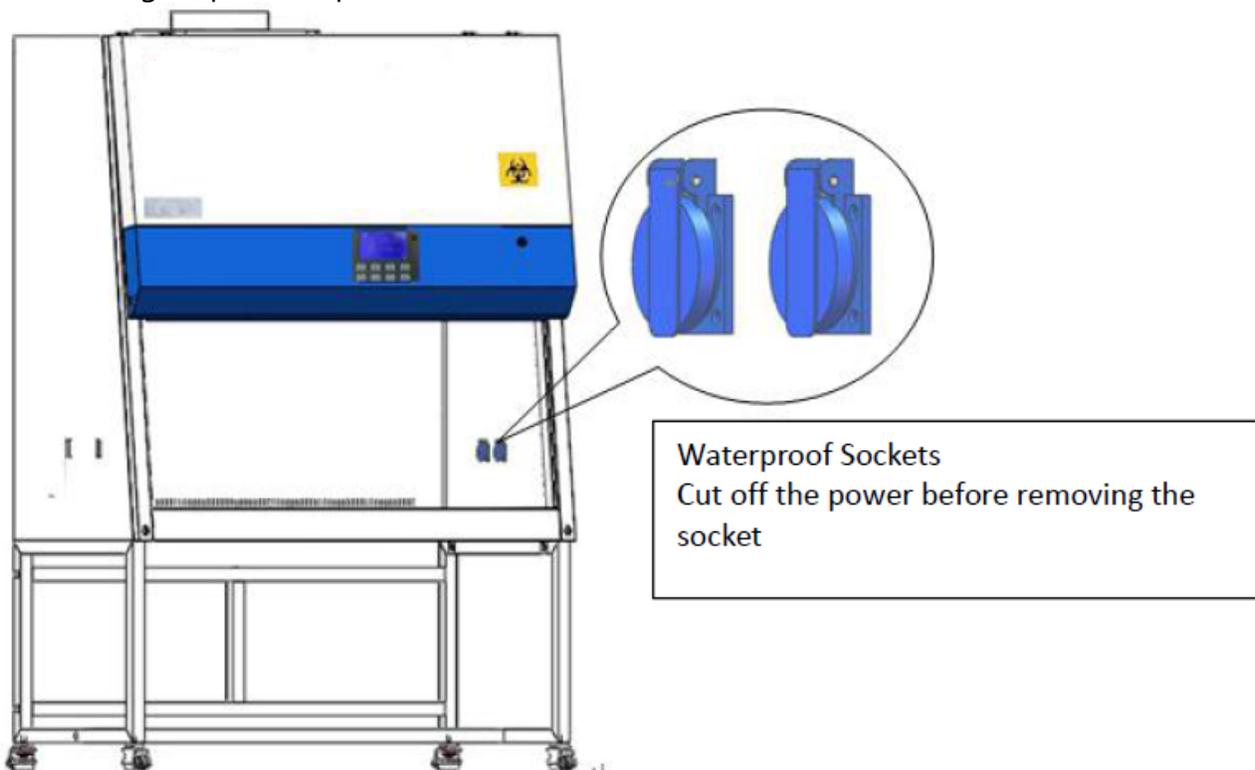
Remote control failure refer to the device no function when press remote buttons. Confirm the remote control have battery. If the remote control have changed battery, device still no response, remote control is damaged, please replace remote control. If using a new remote control still no function, indicating the circuit board is damaged, please replace the circuit board.

**Fault 8 : The socket (operating area) has no electricity**

Sockets (operating area) have no electricity when press socket button. The step deal with this type of problems as follows:

8.1 Check fire line fuse (as shown in picture4), if the fuse is broken, please replace it.

8.2 Remove sockets and check whether the socket is damaged. Press (hold) socket button, using a multimeter test socket voltage between null line and firing line. If the voltage is normal (voltage should be the power supply voltage of the instrument), the Waterproof socket will be damaged, please replace sockets.



**Picture 12**

8.3 Confirm the above no problem, open the operation panel(see 1.3 picture5). Use multimeter to check whether the line is disconnected, if it is, please connect it again. Socket line connect to CN4 in strong electric board (Note: Check circuits under cut off the power).

8.4 If above no problem, electrifying equipment and turn on power lock, press the power button and socket button, observe whether the socket icon is bright, if it is not bright, control board or display board is damaged, replace the circuit board.

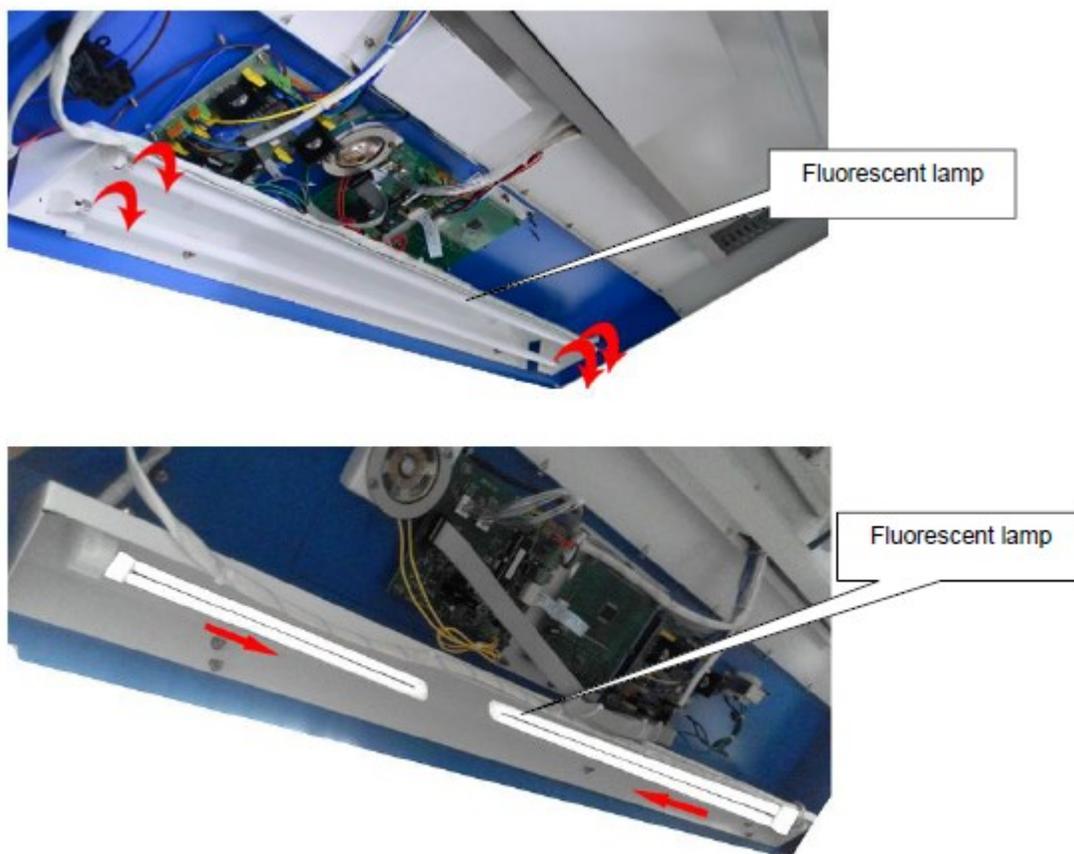
8.5 If above no problem, press the power button and the socket button, using multimeter to

test CN4 voltage(voltage should be the power supply voltage of the instrument) in the control board (as shown in Picture7), if no voltage, control board is damaged, please replace the control board.

Fault 9 : Fluorescent lamp doesn't work

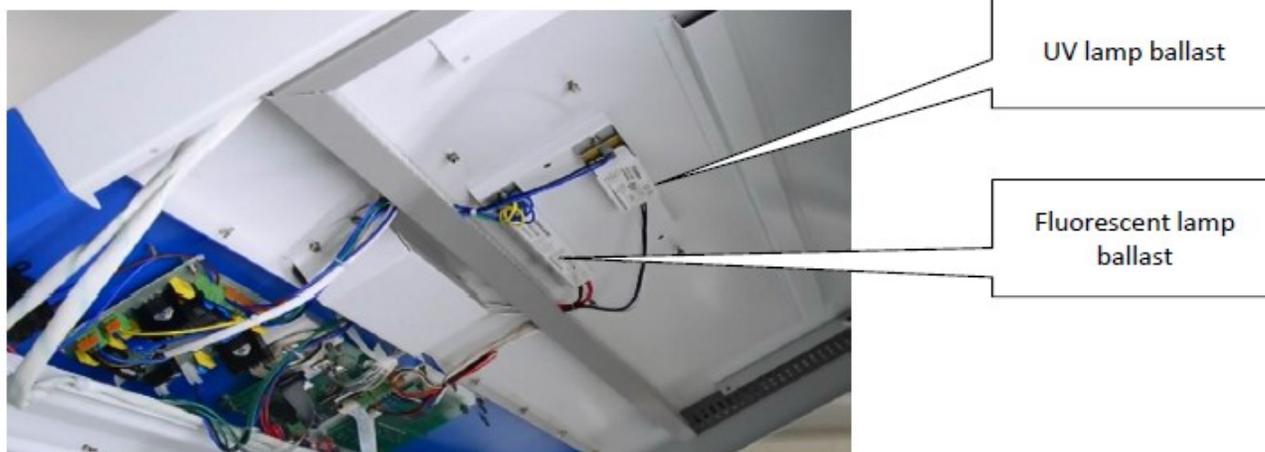
Fluorescent lamp doesn't work when press 'light' key . The step deal with this type of problems as follows:

9.1 Check the contact between lamp and lamp holder is good,.Check whether the lamp is damaged (Confirm whether the tube body on both sides of the lamp is black) ,if the lamp is damaged,please replace the same specification lamp.



9.2 If the above no problem, open the operation panel(see 1.3 picture5), using multimeter to test CN5 voltage(voltage should be the power supply voltage of the instrument) in the control board (as shown in Picture7), if not , control board is damaged, please replace the control board.

9.3 If above no problem, check whether the connection between lamp and ballast is loose ,if loose, reconnect the wires .



**Picture 13**

9.4 If above no problem, ballast is damaged, replace the new same specification lamp ballast.

Fault 10 : UV light does not work

UV light doesn't work when press 'UV' key.

Note: Only in the front window on the bottom ,the UV light is on.The step deal with this type of problems as follows:

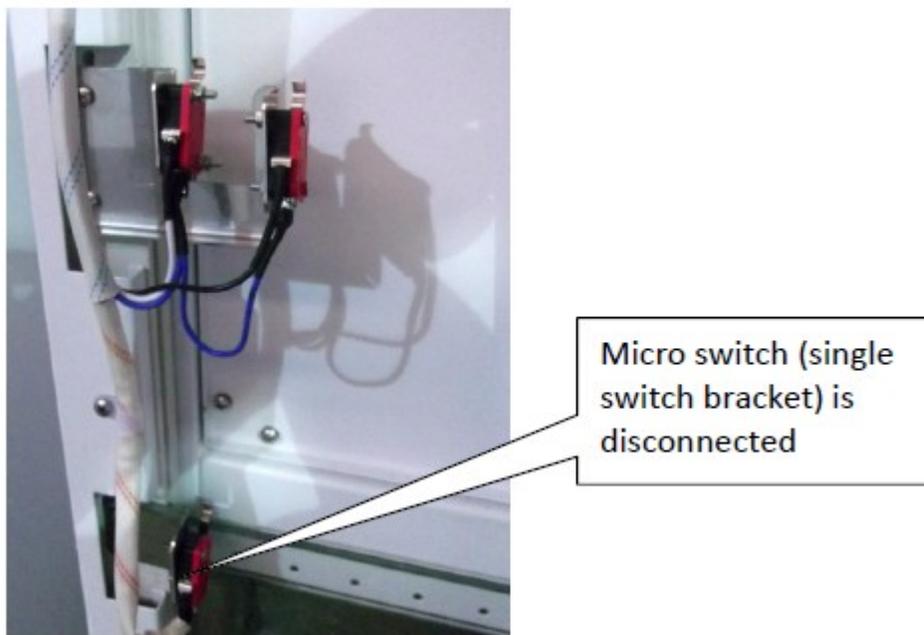
10.1 Check the contact between lamp and lamp holder is good,.Check whether the lamp is damaged,if the lamp is damaged,please replace the same specification lamp.After replacement,press UV botton 5s In standby mode (refer to page2) to reset the UV use time.



10.2 If above no problem,open the operation panel(see 1.3 picture5),check whether control UV interlock switch is in the off state and the wire is disconnected, connect to the " CN10".

10.3 If above no problem,to power the device and turn on the power lock, press the power

button and the UV key in turn .Using multimeter to test CN6 voltage (voltage should be the power supply voltage of the instrument)in the control board (as shown in Picture7), if not control board is damaged, please replace the control board.



**Picture 14**

10.3 If above no problem, check whether the connection between UV lamp and UV ballast is loose ;check whether the connection between control board and UV ballast is loose,If loose, reconnect the wires .

10.4 If above no problem, ballast is damaged, replace same specification UV ballast

Fault 11 : Fan does not work

Fan does not work when press fan key, the fan will not start.

Note: when the glass is drop to the bottom of the instrument, the fan will not start

The step deal with this type of problems as follows:

11.1 Electrifying equipment and turn on power lock, press fan button,check whether the fan icon is bright。 If it isn't bright, open the operation panel(see 1.3 picture5), Check whether the UV lamp interlock microswitch is in a closed state or whether the connection wire is damaged, connect to the " CN10"(picture6).

If bright, using multimeter test voltage(voltage should be in 120V-200V .) of CN2.

Or, check whether the fan insurance tube fuse, and insurance tube seat harness out position (see figure 1), if the fuse break down please replace the same type of insurance.

11.2 If above no problem, connected the fan to the power supply directly and check whether the fan starts, if it is not started, fan is damaged, replace the same model fan, fan wire is connected to the " CN2 ".

11.3 If above no problem, check whether wire connection between the fan and circuit

board are loose, if it is loose connections, reconnect it.

### Fault 12: Display pressure and wind speed adjustment

12.1 Before adjusting the wind speed, first check whether the gas-guide tube is twist or bent

12.2 Setting:

Pressure regulation

The pressure of the filter (air supply filter and exhaust filter) of A2 type safety cabinet is between 80 and 110Pa.

If the pressure is in the range, there is no need to adjust the pressure.

If you do not need to adjust the pressure, simply click the fan key and wait for 5 minutes to start regulating the wind speed.

If the pressure is off, it needs to adjust. The method is as follows:

Steps:

1. Press the fan key  to open the fan.
2. Wait for the fan to work for about 5 minutes, Let the wind speed reach a stable state. long press the socket key  about 5 seconds, after the alarm sound, enter the adjustment pressure state.
3. First, adjust the pressure of the downflow filter (the number on the right side of the screen flashing, for example "50"), and adjust the key to the nominal value through the upper  and lower  keys;
4. And then press the mute(sound)  button, switch to the exhaust filter pressure adjustment (the number on the left side of the screen flashing, for example "60"), through the upper  and lower  keys adjust the minor to the nominal value.
5. After adjustment, press socket key  about 5 seconds to save.

Wind speed adjustment

Steps:

If you do not need to adjust the pressure, simply click the fan key and wait for 5 minutes to start regulating the wind speed.

1. After the pressure adjustment has been completed, the fan has been in a running state. Then adjust the wind speed, press the UV key  for about 5 seconds, then enter the wind speed adjustment state after hearing the alarm sound.

2.First, adjust the downflow wind speed (the number on the right side of the screen flashing, for example "50"), and adjust to the nominal value through the upper  and lower  keys;

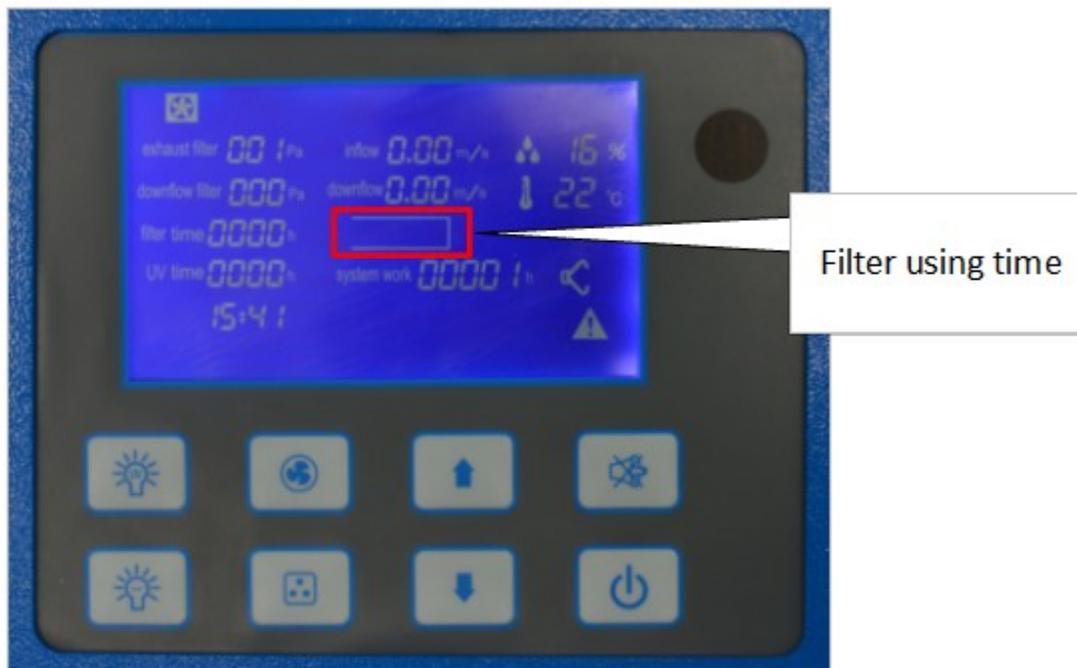
3.Then press the mute(sound) button  to switch to the inflow speed adjustment (the number on the left side of the screen flashing, for example "60"), and adjust to the nominal value through the upper  and lower  keys

After adjusting, press the UV key  for about 5 seconds to save

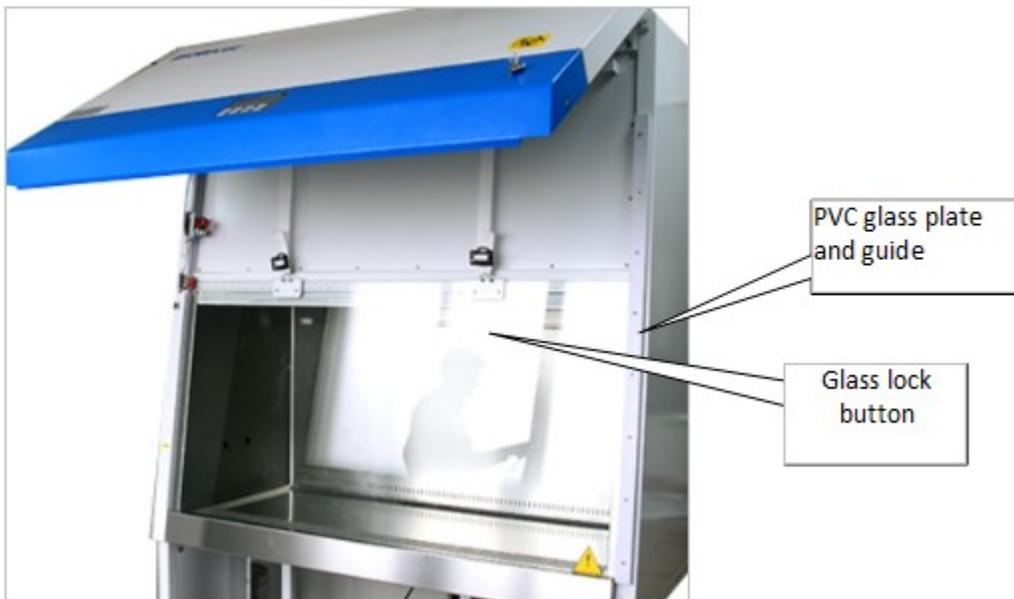
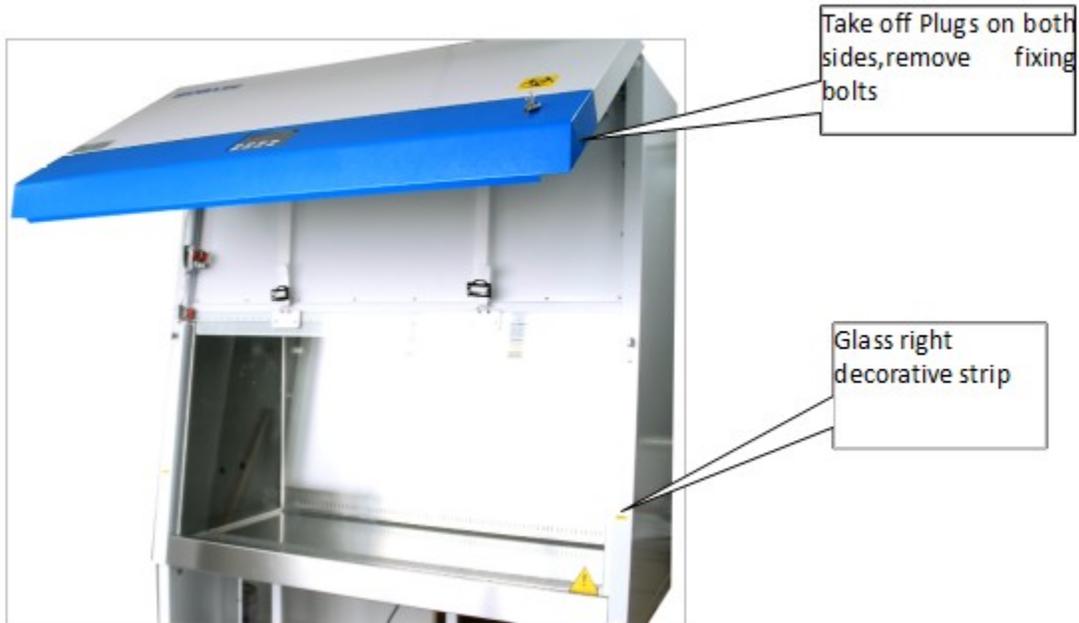
**Fault 13 Filter pressure differential high alarm, replace the filter**

When barcodes is full on the screen, the device will alarm and the filter need to be replaced.

After replacing the filter, pressing the 'light' button 5 seconds(In standby mode, refer to page2) to reset the using time. Steps of filter replace see Part3.The fan and filter replacement.



Fault 14 : Front window broken, replace the front window glass  
Open the operation panel (see 1.3 picture5), remove right glass decoration strip, remove right PVC glass guide (keep upper screws are not removed), take off the glass locking buckle, remove the glass; install a same specification front window.



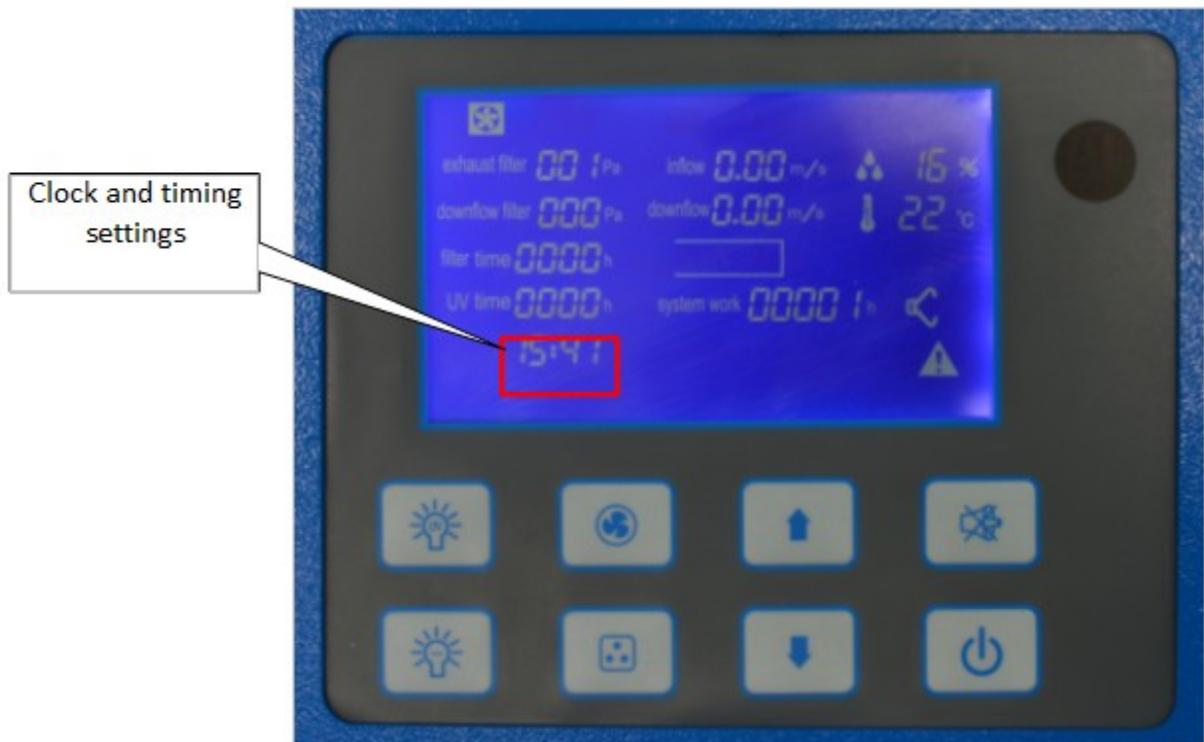
The fault 15 : Adjust display time  
electrifying equipment and turn on power lock, in the standby state(refer to Page2) . Press the

light button first, then press the power button for about 5 seconds. After hearing the alarm, enter the clock adjustment state.

At the beginning, "minutes" flashing, through up and down keys to adjust to the current time;

press the mute button to switch to the "hour", by up and down keys to adjust to the current time.

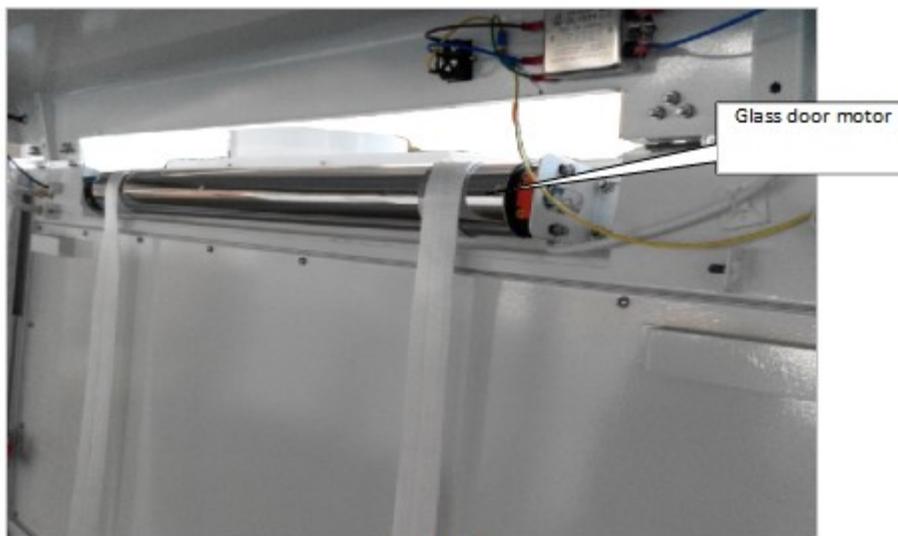
After the clock has been adjusted, Press the light button first, then press the power button for about 5 seconds to save the adjustment.



Picture 20

Fault 16 : Glass door motor replacement

First disconnect the belt, remove the spring as shown, lift the motor of the left, remove the motor. Install the new glass door motor.



Picture21

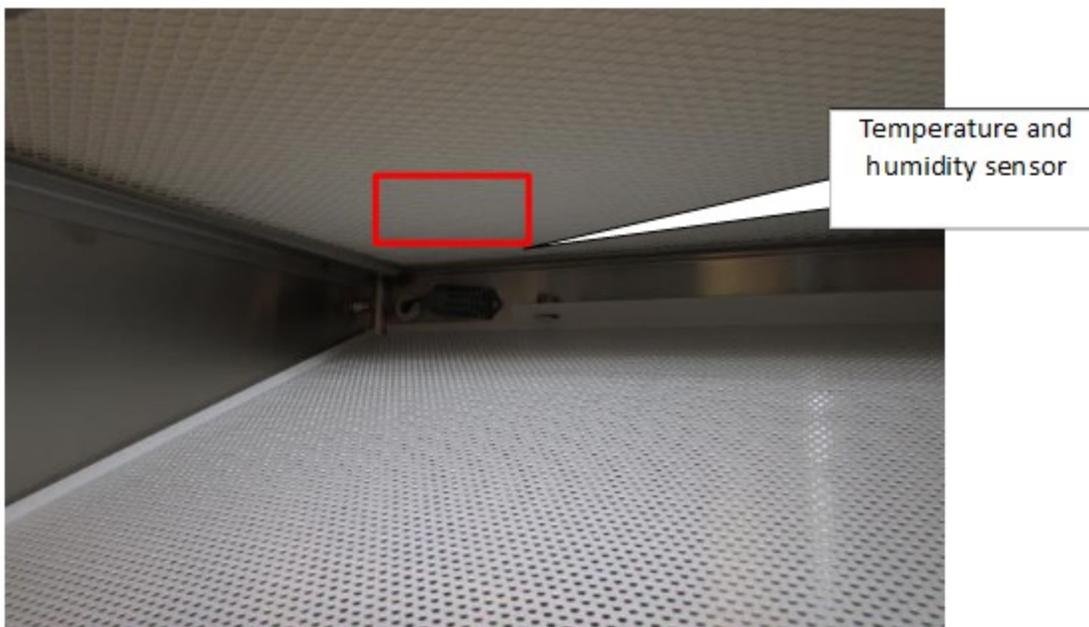


Picture22

**Fault 17 : Temperature and humidity display incorrectly**

Right corner of the screen displays don't fit the actual temperature and humidity. The step deal with this type of problems as follows:

1. Check whether the temperature and humidity sensor wiring is connected, as shown in picture7 " CN11 "H、 GND、 VCC、 T".
2. Check whether temperature and humidity sensor is broken. Replace the same type sensor, as shown in picture 23.



Picture 23

3.If above no problems, indicating circuit board is broken, need to replace the circuit board.

Fault 18: Gas-guide tube replacement instructions

According to the original connection way to reconnect.

**Notice: The gas-guide tube should not be bent or twisted**

Gas-guide tube installation instructions, FIG. A, B, C (three styles):

Black 1 2 3 4 represent the front Gas-guide tube position on the upper right corner of the instrument (after the operation panel of the instrument is opened).

No.	1	2	3	4
Position	Upper filter downstream	Upper filter upstream	<u>Downflow</u> filter upstream	<u>Downflow</u> filter downstream
The wiring position of the circuit board	IB	IA	2A	2B

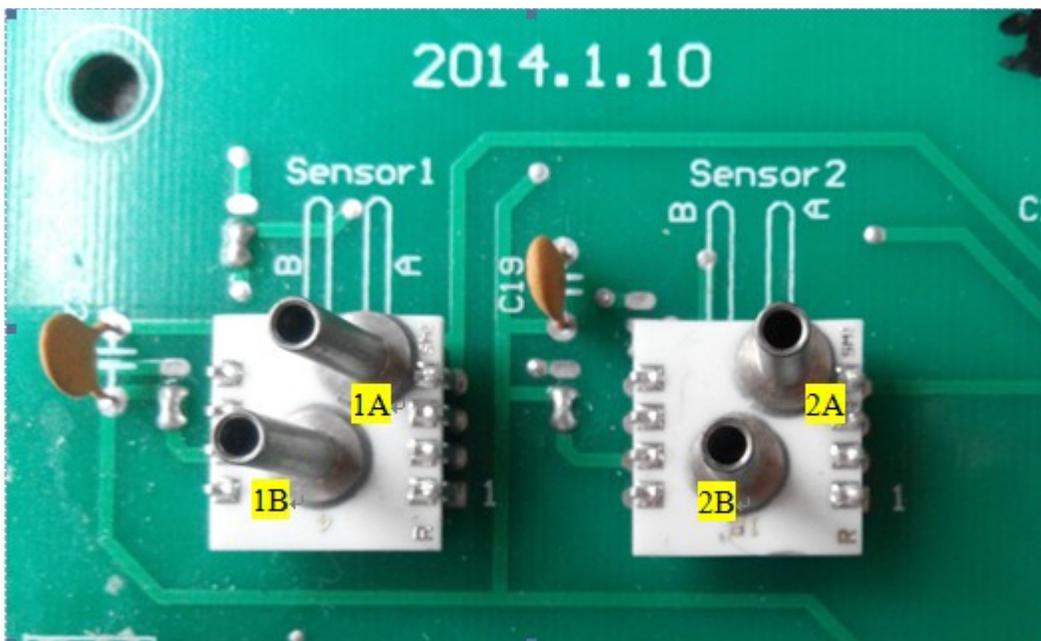
FIG A BCBS-201

No.	1	2	3	4
Position	Upper filter downstream	Upper filter upstream	<u>Downflow</u> filter upstream	<u>Downflow</u> filter downstream
The wiring position of the circuit board	IB	IA	2A	2B

FIG B BCBS-203

No.	1	2	3	4
Position	Upper filter downstream	Upper filter upstream	<u>Downflow</u> filter upstream	<u>Downflow</u> filter downstream
The wiring position of the circuit board	IB	IA	2A	2B

FIG C BCBS-202 and BCBS-204



**Picture24(Sensor Gas-guide tube position)**

Fault 19 : Inflow velocity and down velocity are zero

When the inflow velocity is zero, first determine whether gas-guide ducts are twisted or bent, and open the operation panel(see 1.3 picture5), recovery ducts;Then test whether the fan is working, If the fan doesn't work, according to the fault 11 to deal with.

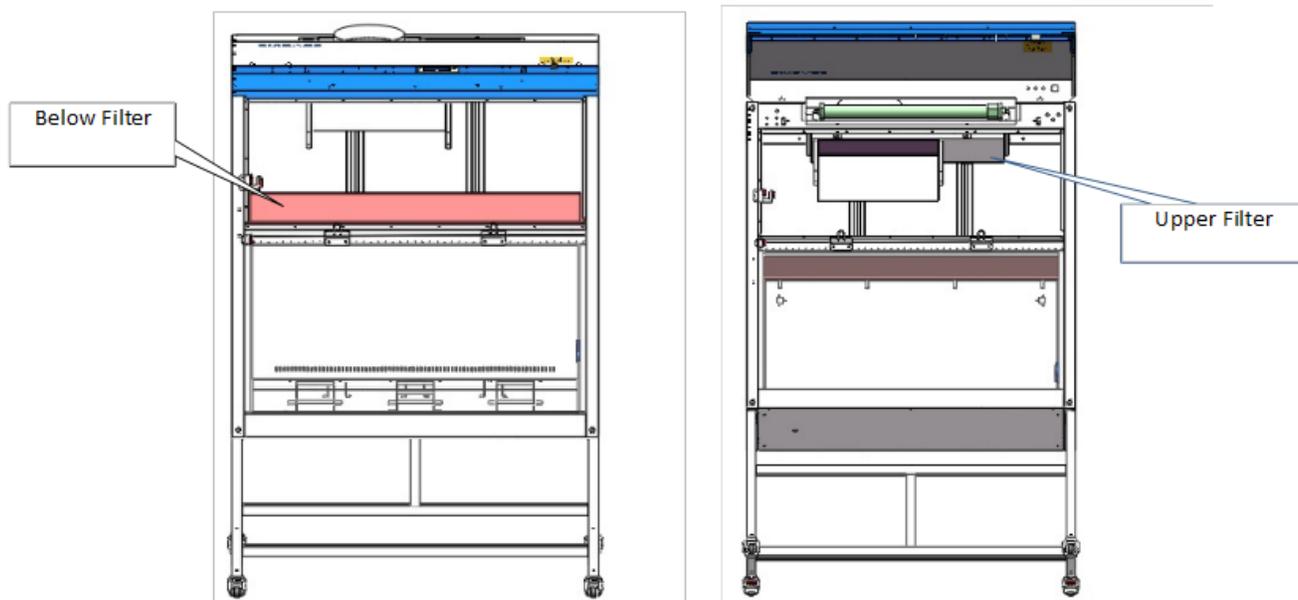
## 03 The Fan and Filter Replacement

### 3.1 Replace filter and the old filter processing

Before replacing the filter, have to fumigate and sterilize the cabinet.

In order to ensure the safety of personnel ,the operating personnel must wear masks, latex gloves, safety glasses and positive pressure helmet, suit and shoes when replacement.

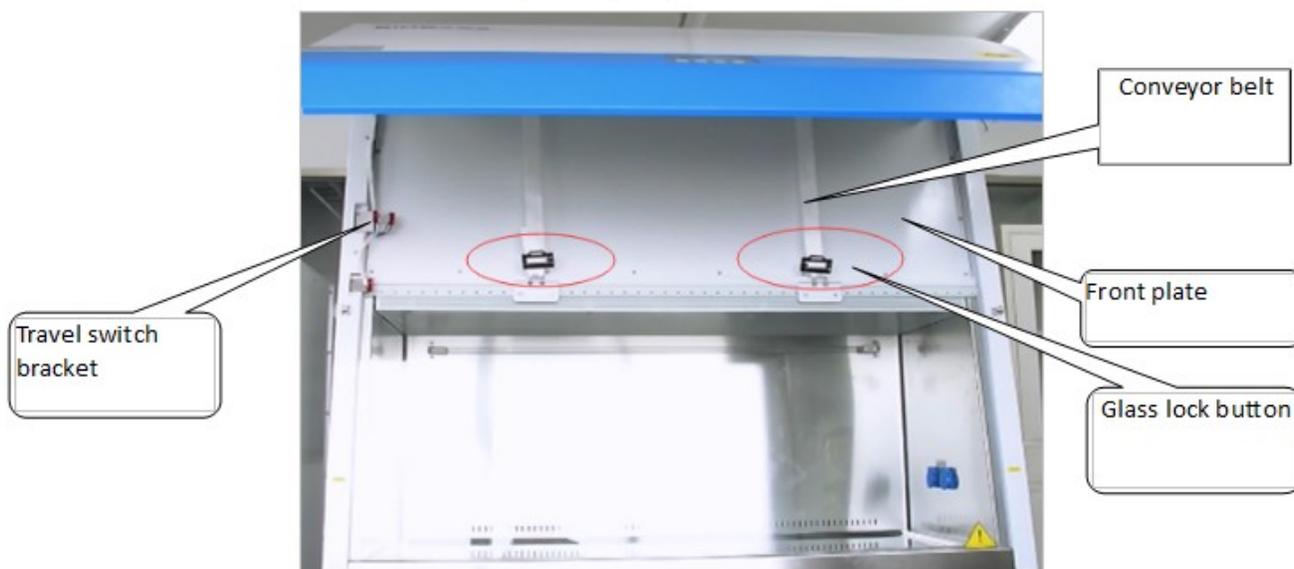
The old filter should be placed in a special bag for medical waste, sealed and labeled with "hazardous waste".



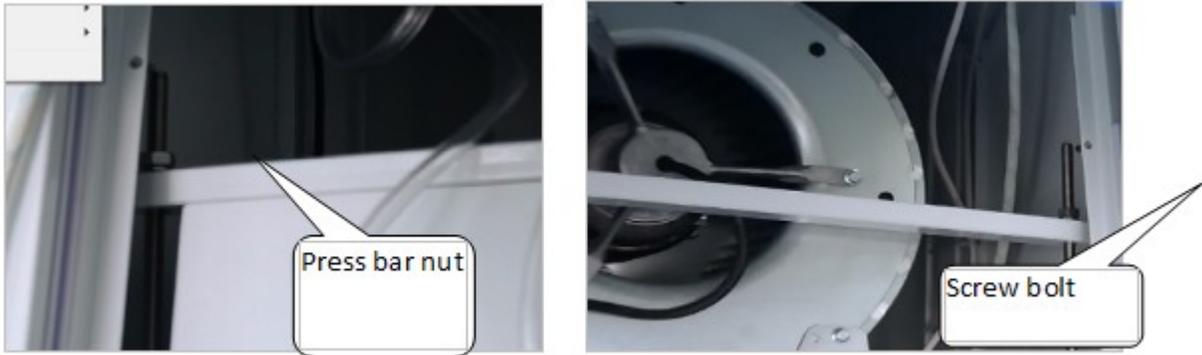
**Picture 25**

3.2 BCBS-203 and BCBS-204 Safety Cabinet replace fan and filter steps:

- a) Place the glass door to the bottom, cut off the power, open the operation panel.
- b) Take off the glass lock button, loosen the conveyor belt, remove travel switch bracket, remove weld screws for securing front panel, remove the front panel.



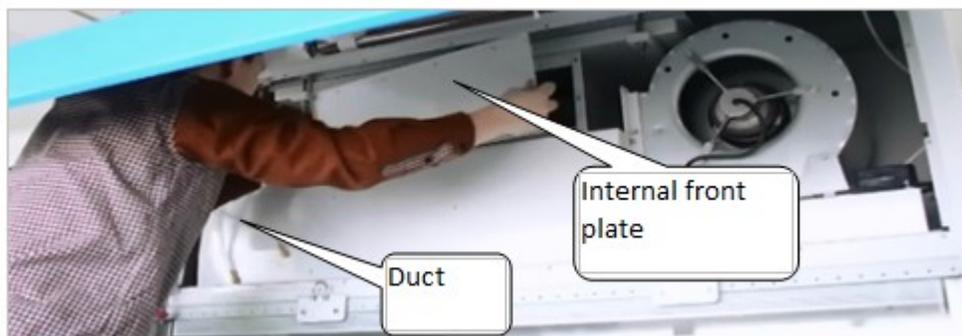
c) Remove press bar nut



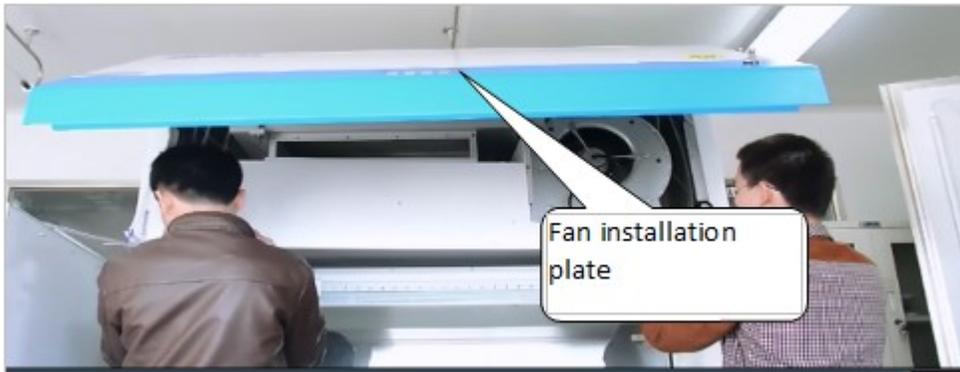
d) Remove compressive bar



e) Remove internal front panel, pull out the ducts, record the position.



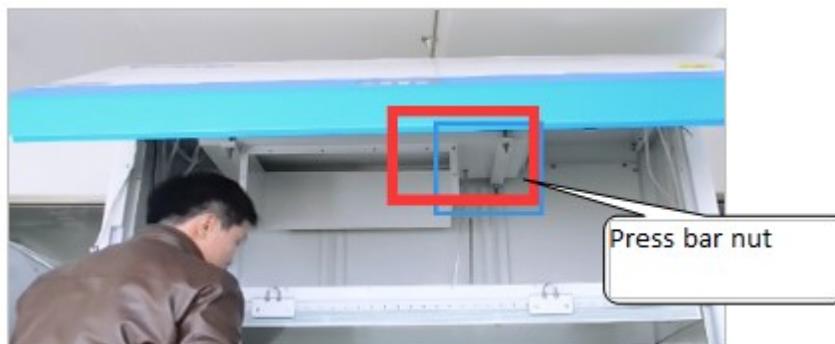
f) Remove the fan installation plate, pay attention to the safety of the bottom glass



g) Remove the filter and replace the filter with the same specification



h) Remove filter press bar bolt



i) Remove ducts, take the filter tray and the filter, pay attention to the arrow direction



j) Replace the same type of upper filter, adjusting tray and filter, reconnect ducts, tighten screw nuts



k) Remove the fan bolts, remove the fan box



l) Cut white porcelain between the fan and fan plate with a blade.



M) Remove the fan and mounting plate connecting piece



n) Replace the same type of fan, install fan mounting plate connector and gluing.



o) Install the fan and the fan box



p) Sealant coating



p) Put in the below filter, pay attention to the direction of the arrow is down



q) Put in the below filter, pay attention to the direction of the arrow is down



r) Install the fan installation board, reconnect ducts.



s) Air duct connection part gluing treatment



t) Reconnect wiring lines.



u) Install inner front panel



v) Install press bars, tighten nuts.



w) Install the front panel and travel switch bracket.



x) Install glass lock button.



3.3BCBS-201 Safety Cabinet replace fan and filter steps:

- a) Place the glass door to the bottom, cut off the power, open the operation panel.
- b) Take off the glass lock button, loosen the conveyor belt, remove travel switch bracket, remove weld screws for securing front panel, remove the front panel.



c) Remove press bar nut



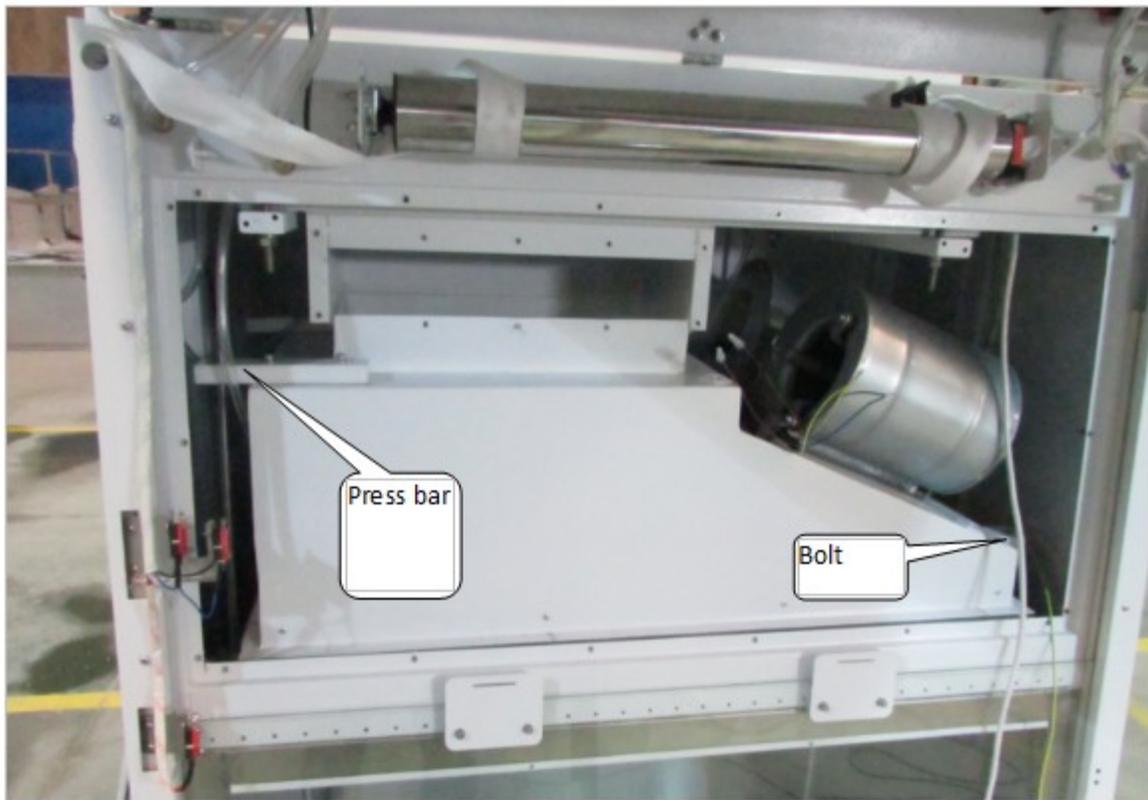
d) Remove air duct connecting plate



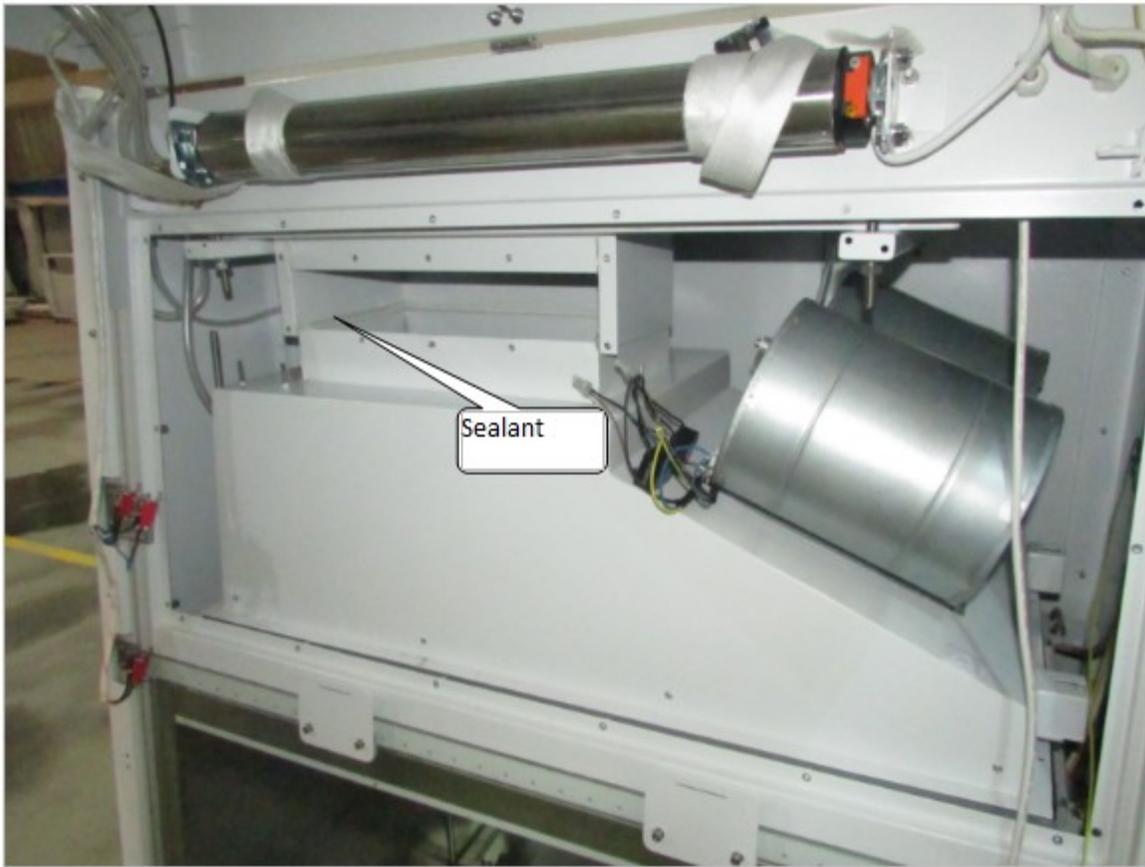
e) Disconnect fan connection



f) Remove press bar and bolt.



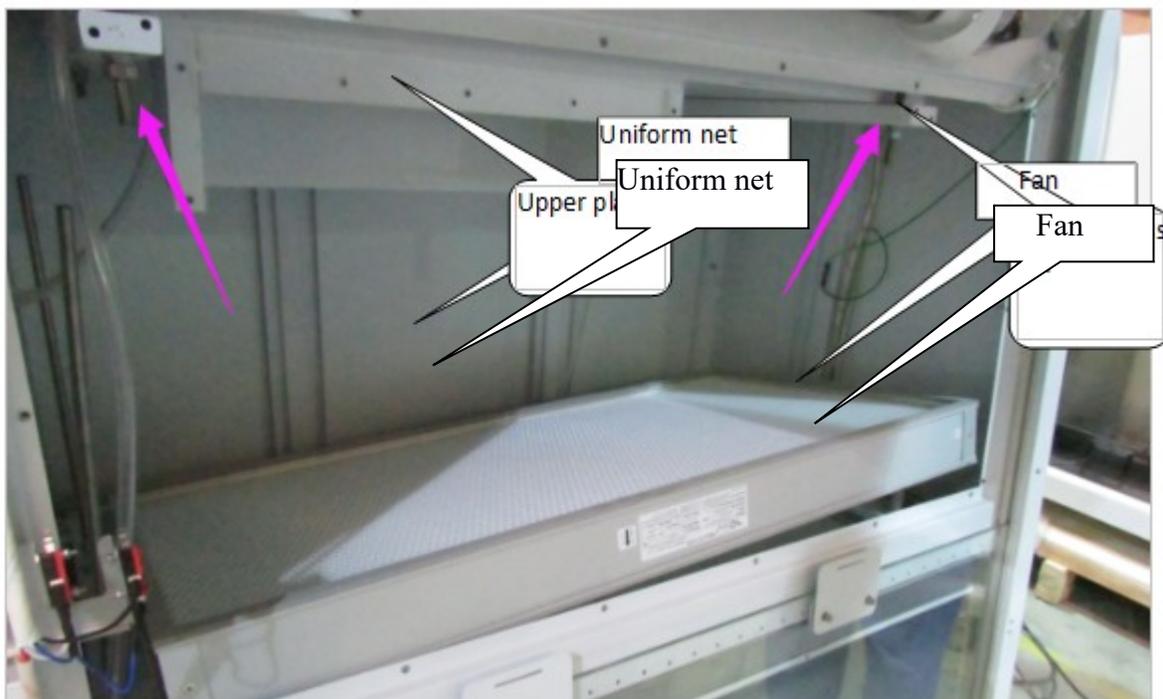
g) Cut white porcelain between the fan and fan plate with a blade



h) Remove the fan installation plate, remove below filter.

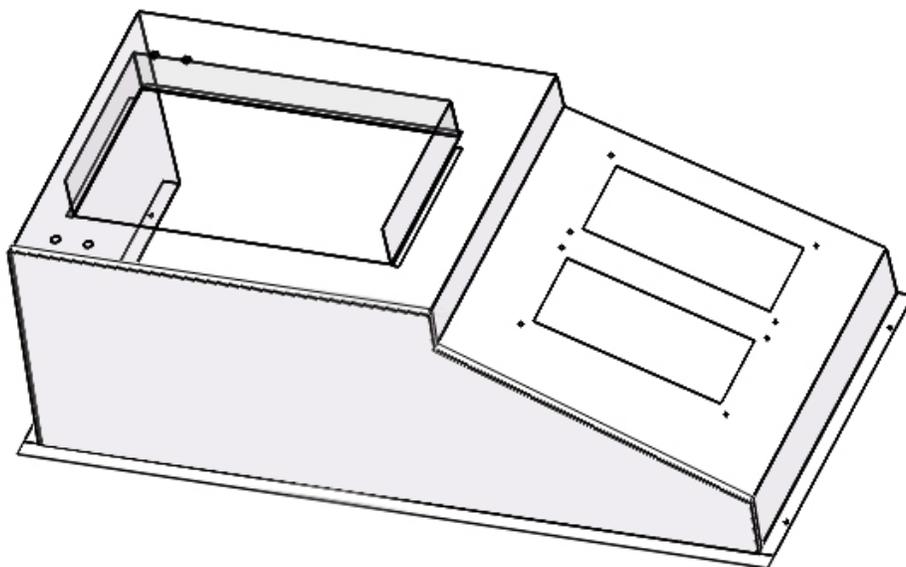


i) Remove upper press bar, remove the upper filter and plate



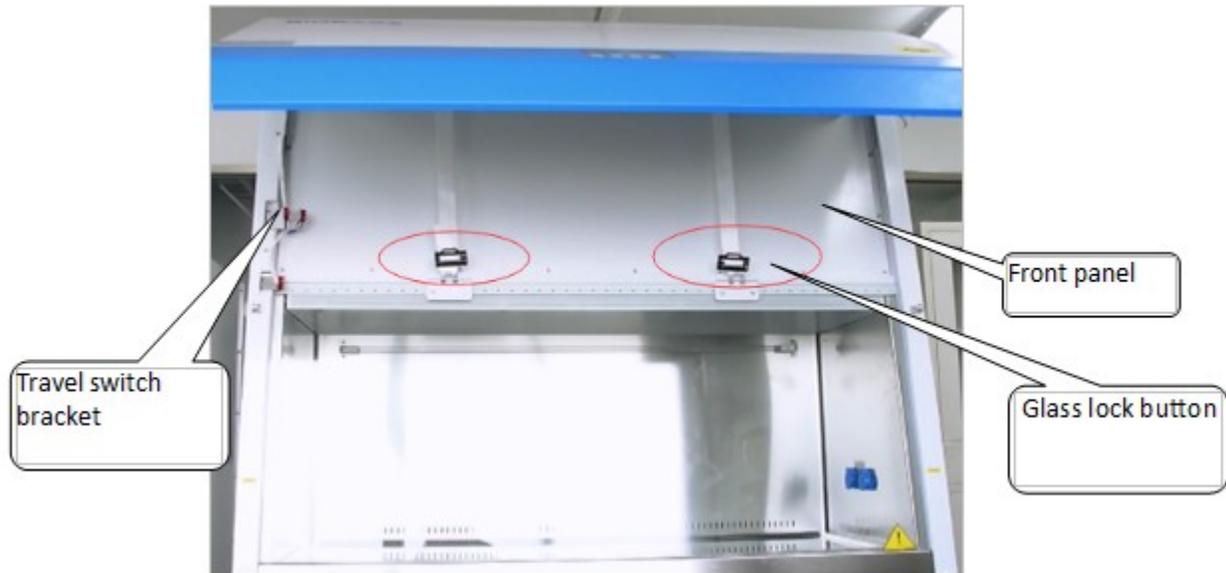
j) After replacing the filter, recover them.

Replace the fan steps: take the fan out of the safety cabinet, According to the following figure, remove the uniform net, unloading fan, replace the same type of fan, reinstall the disassembled components to the device.

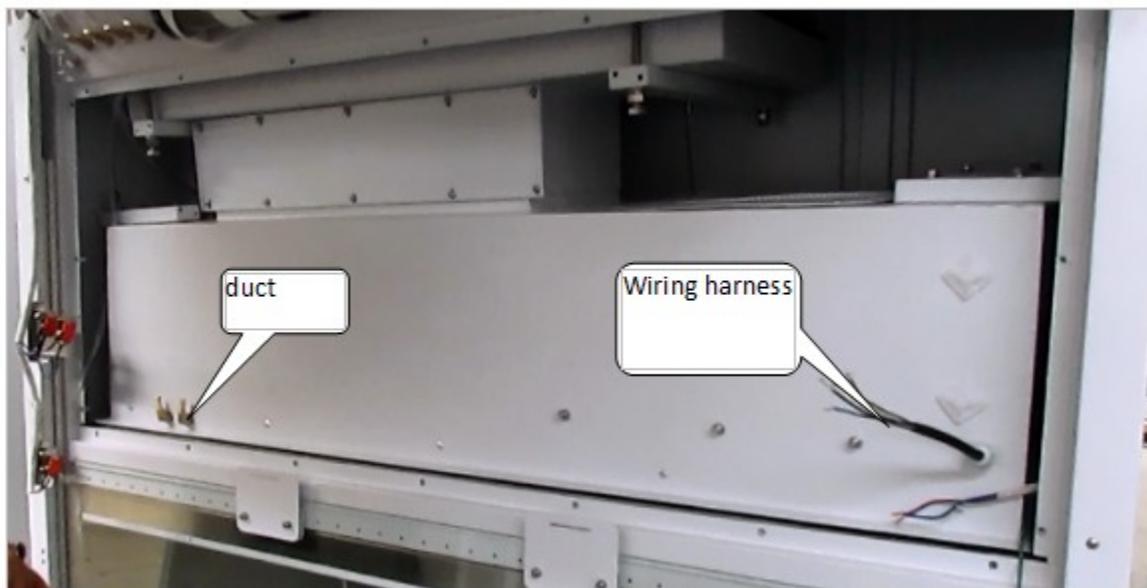


### 3.4 BCBS-202 Safety Cabinet replace fan and filter steps:

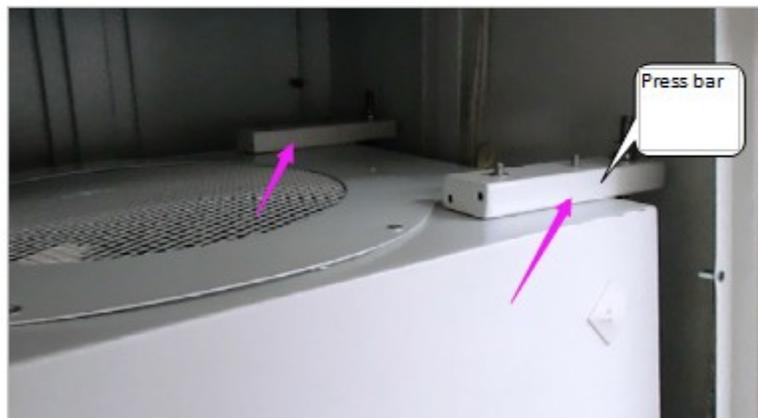
- Place the glass door to the bottom, cut off the power, open the operation panel.
- Take off the glass lock button, loosen the conveyor belt, remove travel switch bracket, remove weld screws for securing front panel, remove the front panel.



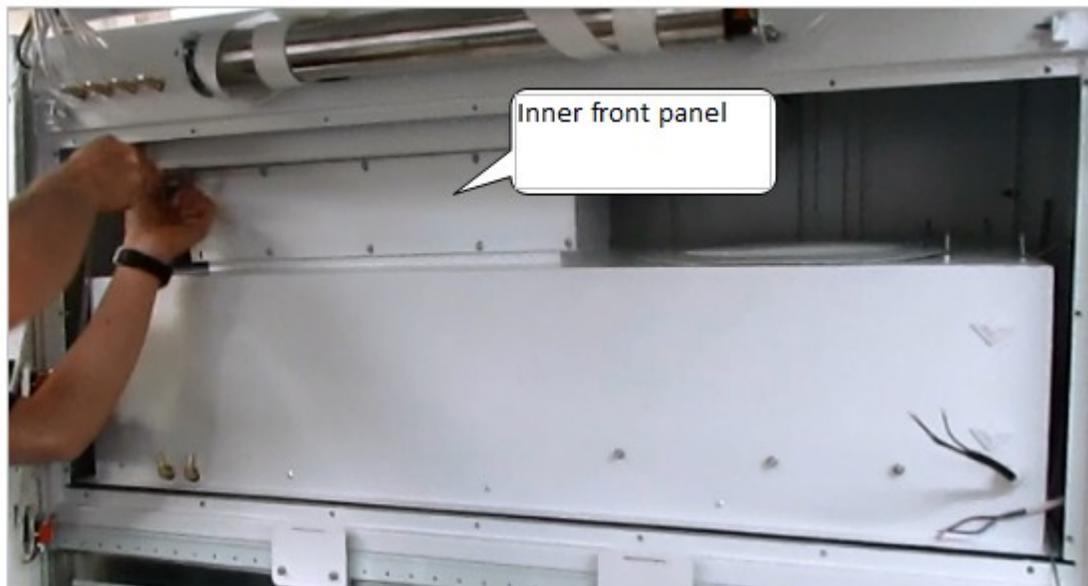
- Remove ducts and wiring harness.



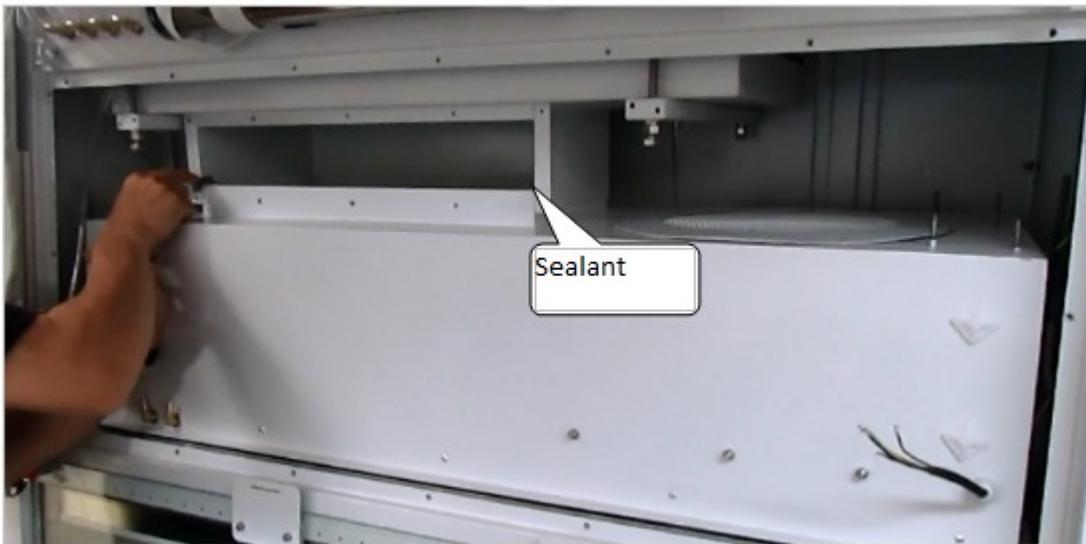
d) Remove press bar.



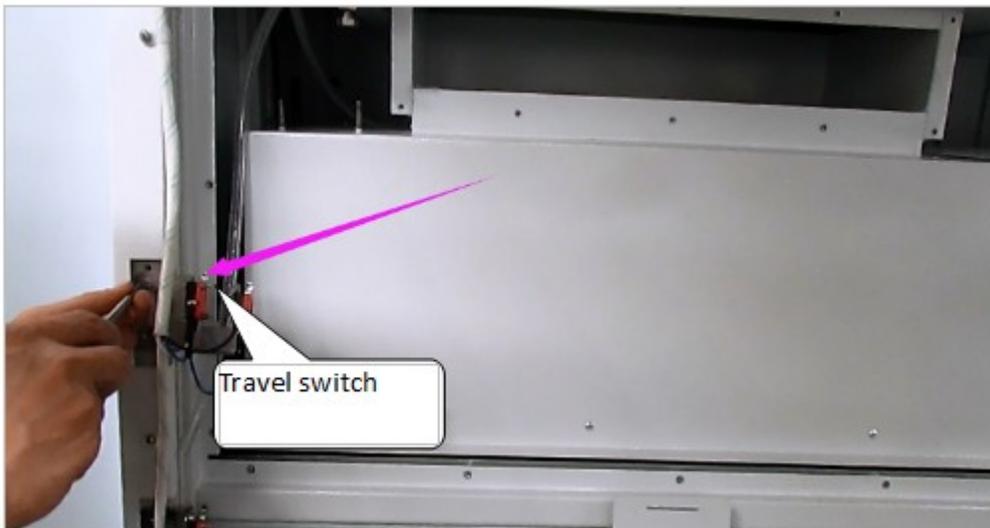
e) Remove inner front panel



f) Cut off air duct sealant with a blade.



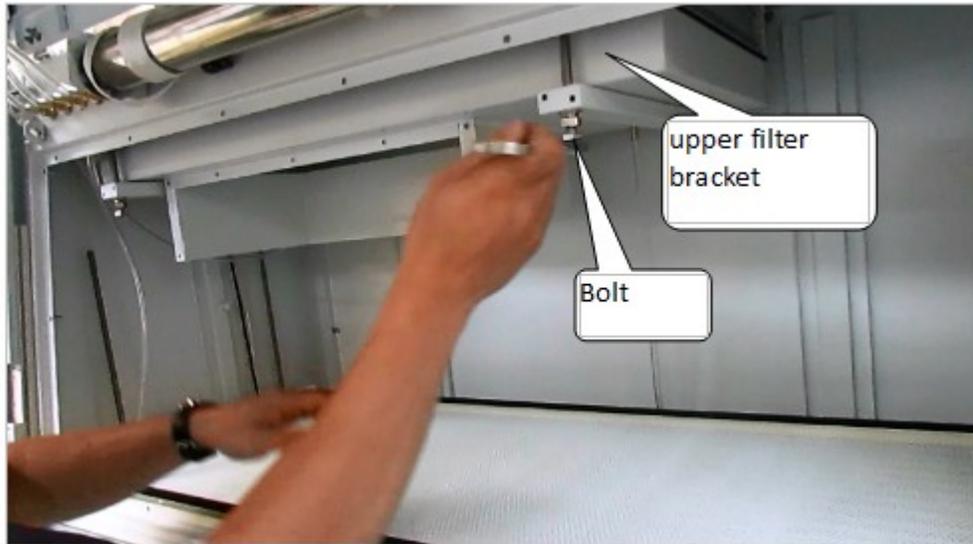
g) Remove travel switch.



h) Remove the fan installation plate



i) Remove upper filter bracket bolt



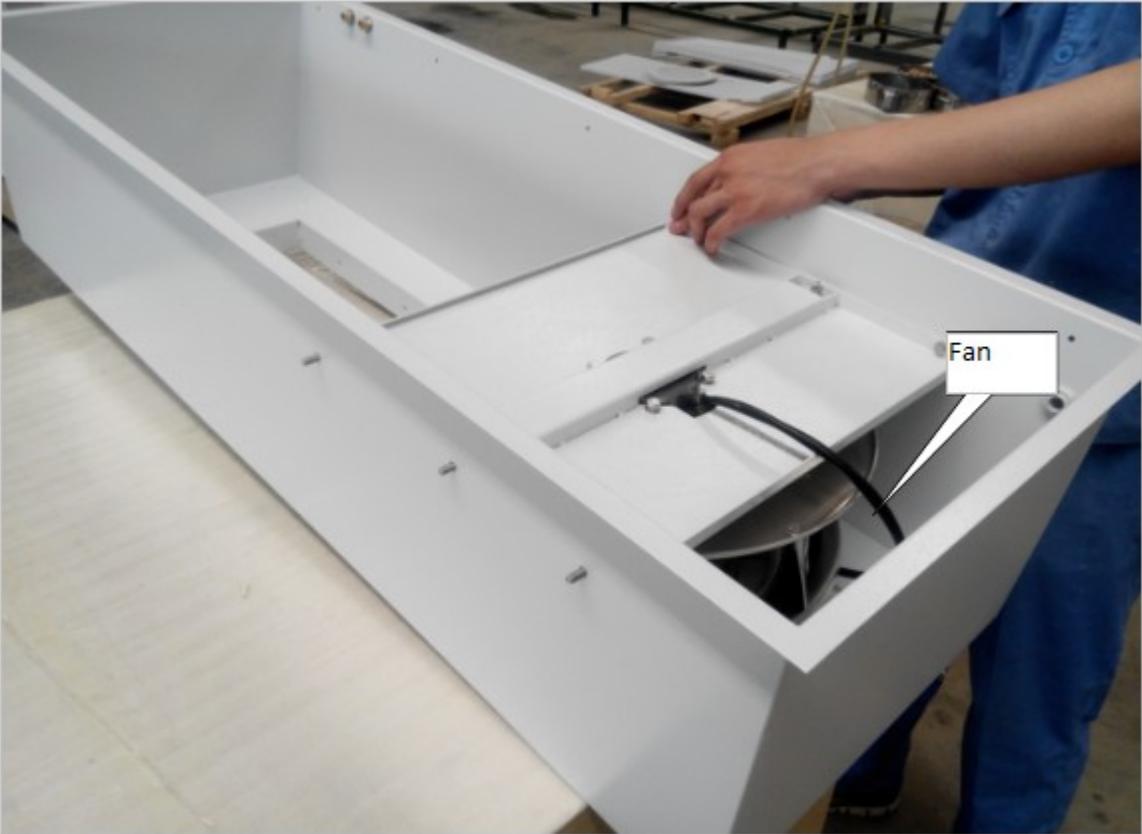
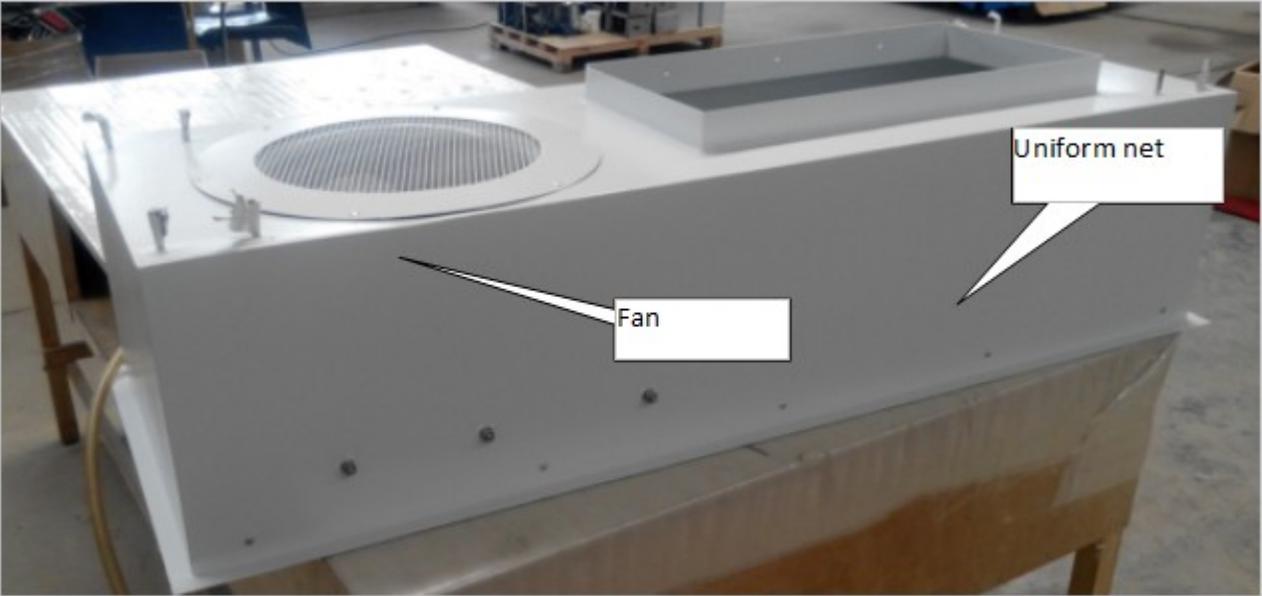
a) Remove upper filter bracket and upper filter.



k) After repla

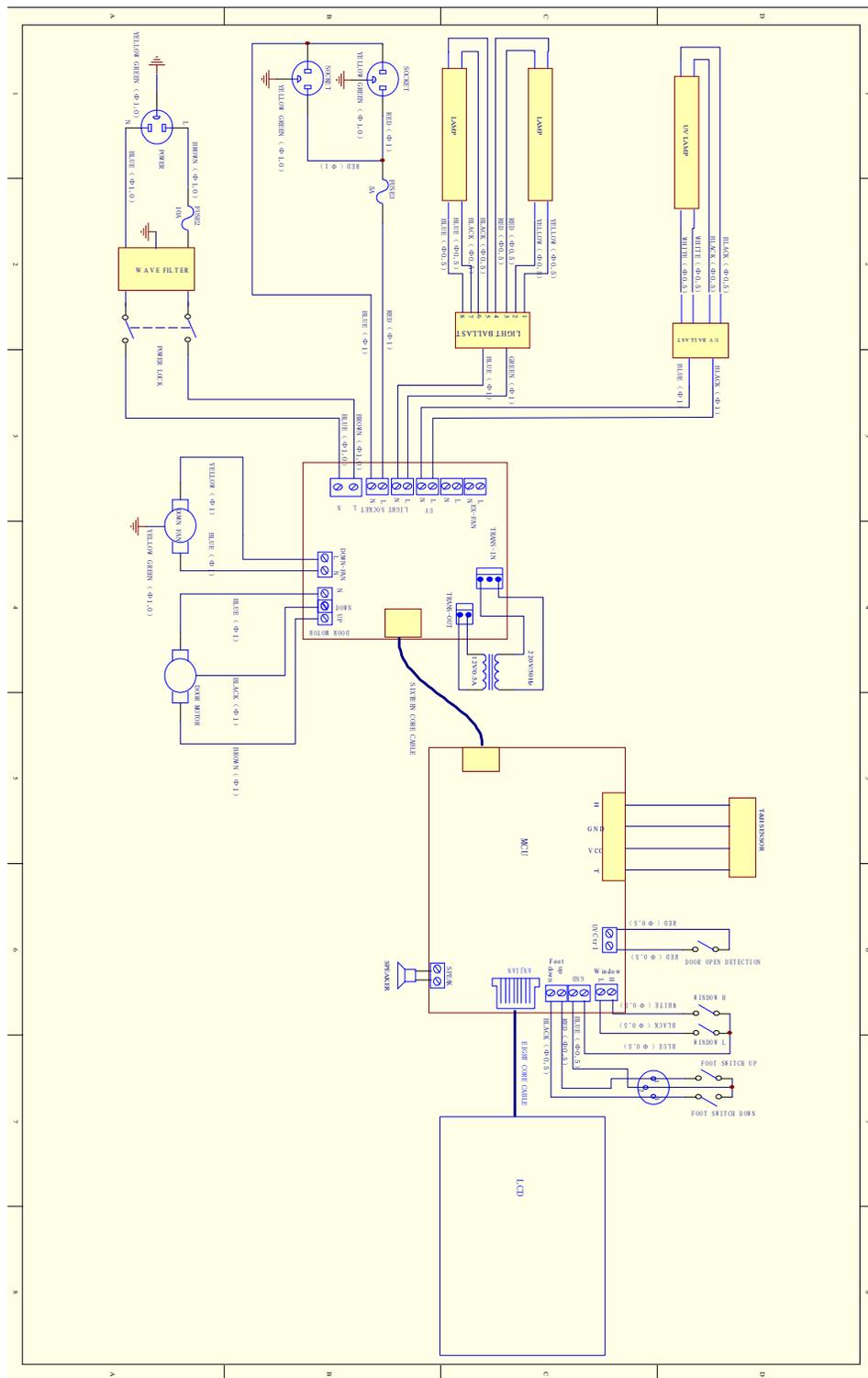
the filter, reinstall the disassembled components to the device

l) Replace the fan, take out the fan from safety cabinet, remove uniform net and fan, replace same type fan

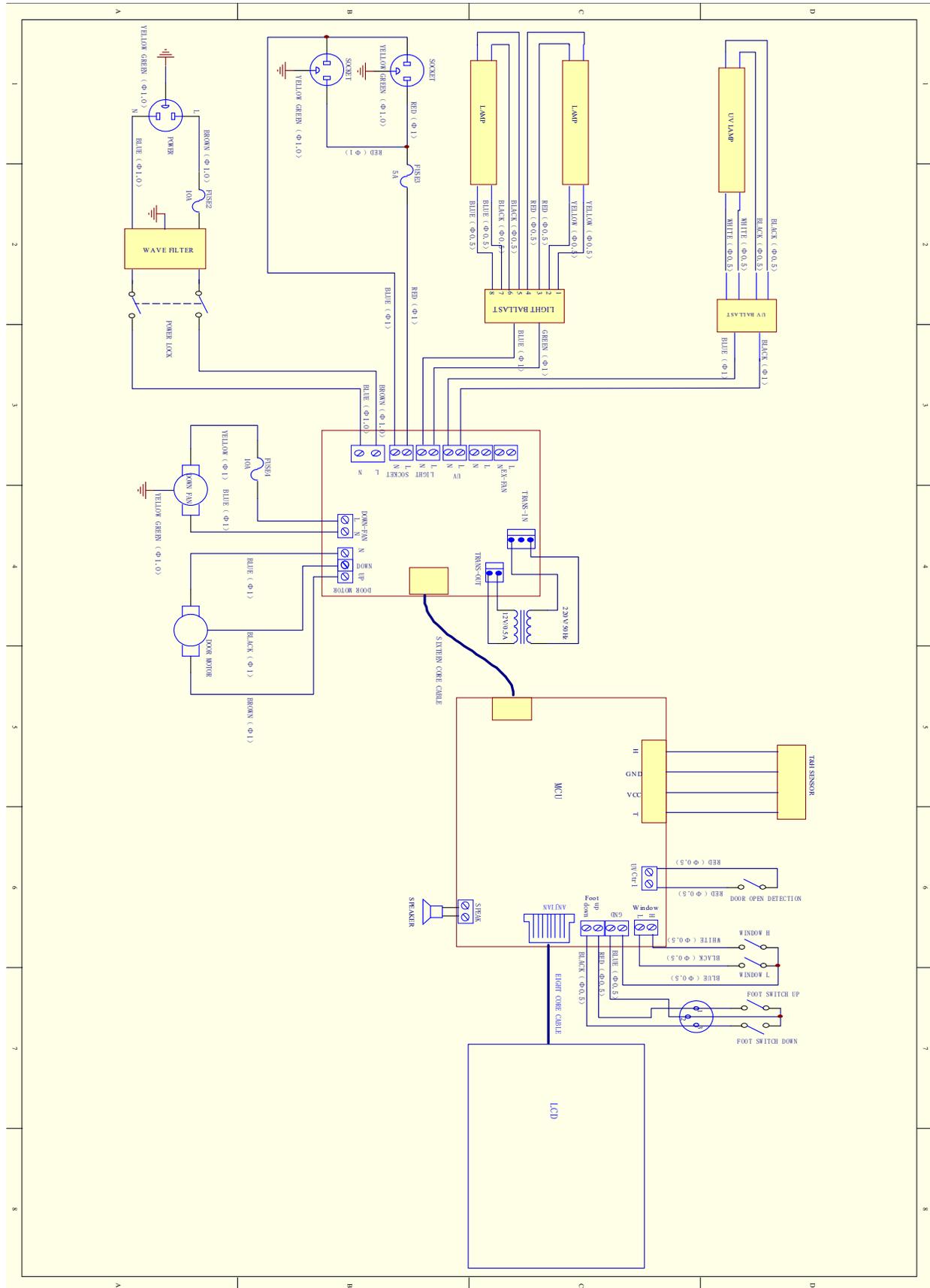


# 04 Wiring Diagram

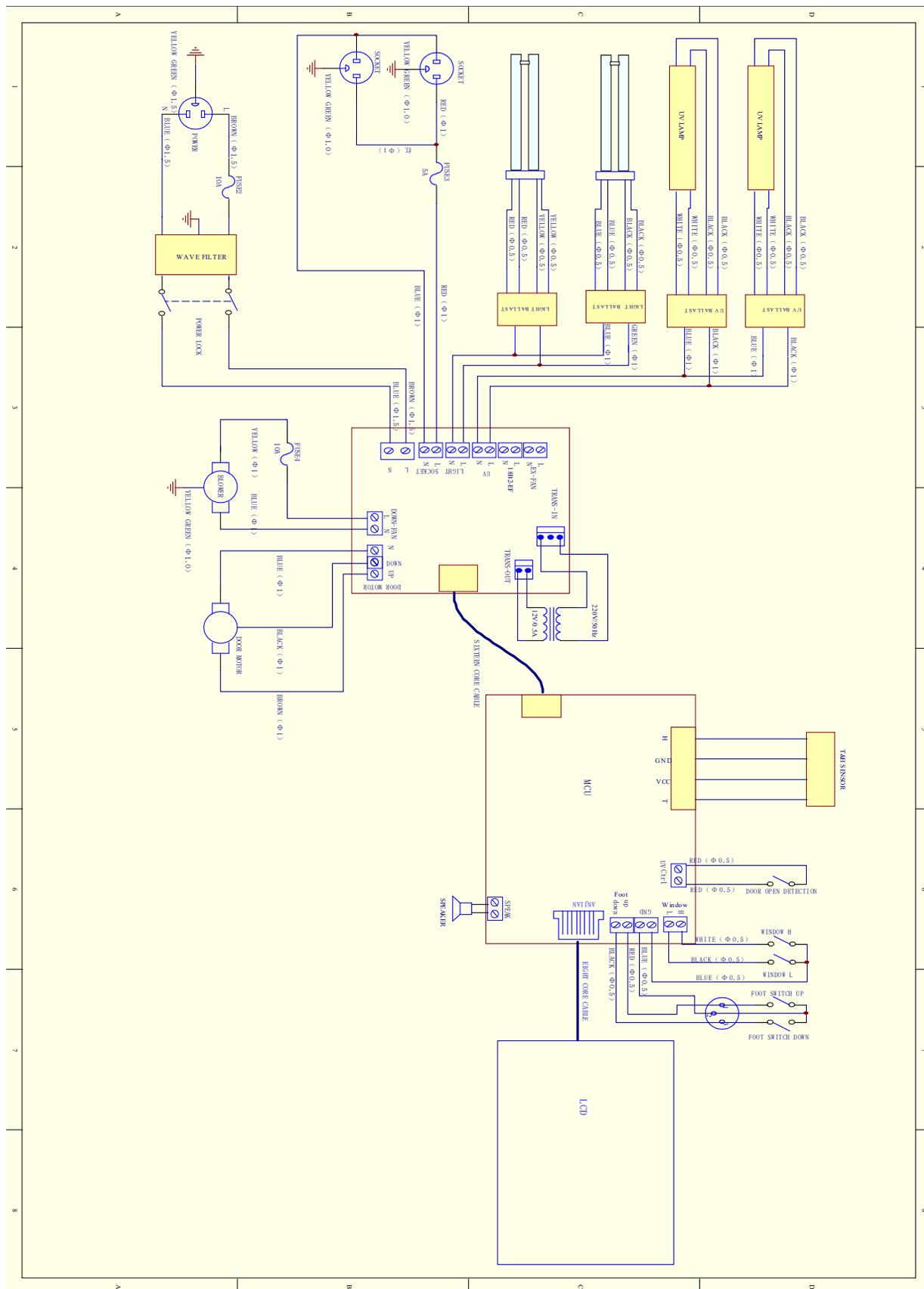
BCBS-201 / BCBS-202 wiring diagram



## BCBS-203 wiring diagram



BCBS-204 wiring diagram





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