Biological Safety Cabinet
11224BBC86
11234BBC86
Service Manual

Version 2017.06

Content

1. Equipment debugging

Inflow is 0.53m/s, downflow is 0.33m/s.

1) Before the safety cabinet leaves the factory, the wind speed has been adjusted to the nominal value of the wind speed of the safety cabinet. If it is found that the wind speed displayed on the display is inconsistent with the nominal wind speed after being transported to the place of use, please check the actual wind speed. If it is found that the actual wind speed value meets the requirements of the nominal value, please adjust the display wind speed according to "Chapter 2. Equipment failure and maintenance fault 12: Pressure difference and wind speed adjustment".

If the actual wind speed value does not match the nominal value, the speed of the fan and the wind panel on the top of the cabinet need to be adjusted.

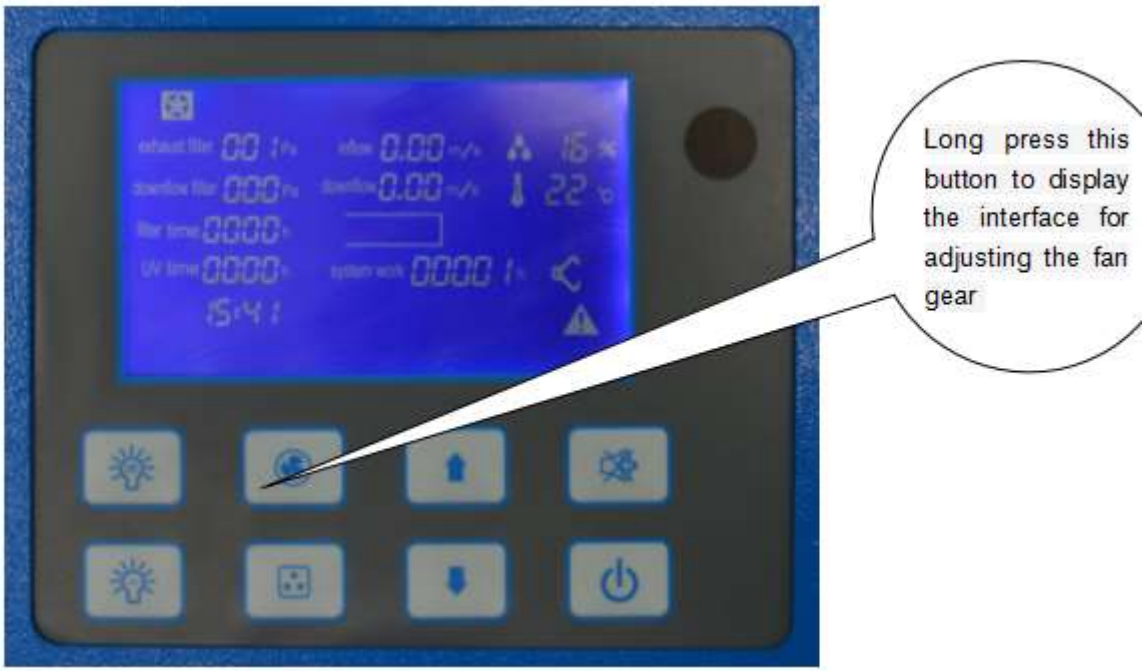


Figure c

Turn on the power and turn on the power lock in the standby state (standby state refers to the situation that the power button is turned on and the power button is not pressed, and the display is not lit); long press the fan button marked in Figure c for about 5 seconds, and the fan speed adjustment interface will appear , As shown in Figure e.

After entering the fan speed adjustment interface, press the mute button to switch between the two numbers 60 and 50 in Figure e. The number 60 is the speed adjustment of the external exhaust fan (the A2 safety cabinet does not need to adjust this number), and the number 50 is the speed adjustment of the internal fan. These two numbers are the internal and external fan gear values, and the effective value is between 1-60. The wind speed adjustment is divided into the following two situations (after the adjustment is completed, follow the "Chapter 2. Equipment failure and maintenance fault 12: pressure difference and wind speed adjustment" to adjust the display wind speed):

a. When the inflow and falling wind speed do not match, that is, the inflow is less than the nominal value and the drop is greater than the nominal value or the inflow is greater than the nominal value and the drop is less than the nominal value. Loosen the fixing bolts of the top adjustment plate as

shown in Figure d, adjust the top adjustment plate, and withdraw the adjustment plate outwards, the airflow velocity at the air inlet will increase, and the downflow velocity will decrease; When the adjusting plate is pushed inward, the airflow velocity at the air inlet decreases, and the descending airflow velocity increases. The inflow and falling wind speeds are matched, and the top fixing bolts are tightened after adjustment.

Figure d

b. If the inflow and falling wind speeds are both greater than or less than the nominal value, you need to adjust the fan gear value, adjust the value at 50, and adjust the size through the up and down buttons. The larger the gear value, the greater the air flow velocity; the smaller the gear value, the smaller the air flow velocity. After adjustment, keep pressing the fan button for about 5 seconds to save.

Figure e

2. Equipment failure and maintenance

⚠ Statement: The following maintenance inspections must be completed by professional personnel for live operation to avoid danger due to improper operation.

Fault 1: The device is not powered on.

The device is not powered on means that the power lock is turned on after the device is powered on, and the device has no response (no alarm, no light on the display, and no response to the keys). The processing methods and steps when dealing with such failures are as follows:

1.1 Determine whether the power supply of the equipment has electricity and whether it is consistent with the electrical parameters required for normal operation of the equipment. Whether the power supply of the multimeter equipment is normal.

1.2 The live wire of the power input port of the equipment is equipped with a fuse. This fuse needs to be removed from the power input socket with a flat screwdriver as shown in Figure 1. Confirm whether the fuse is fused, If the fuse is blown, please replace the fuse with the corresponding label calibrated specification.

Figure 1

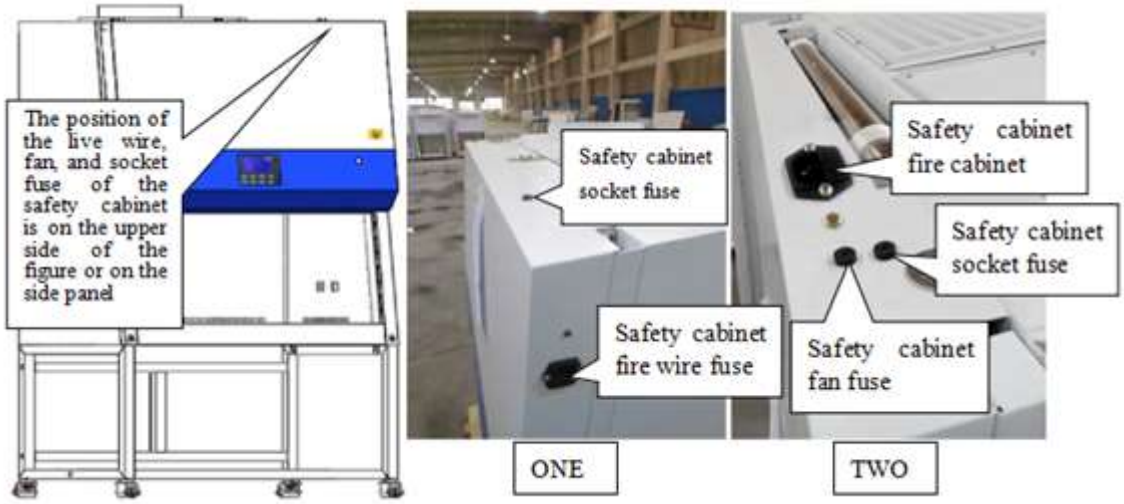


Figure 2

1.3 After confirming that there is no problem with the above items, open the operation panel (the method of opening the operation panel is shown in Figure 3, use the operation panel support frame (fixed on the inner side of the operation panel as shown in the figure) to support the operation panel, pay attention to safety, and the equipment is powered on. Use a multimeter to check the input and output voltage when the power lock is open (the voltage value should be the power supply voltage of the device).

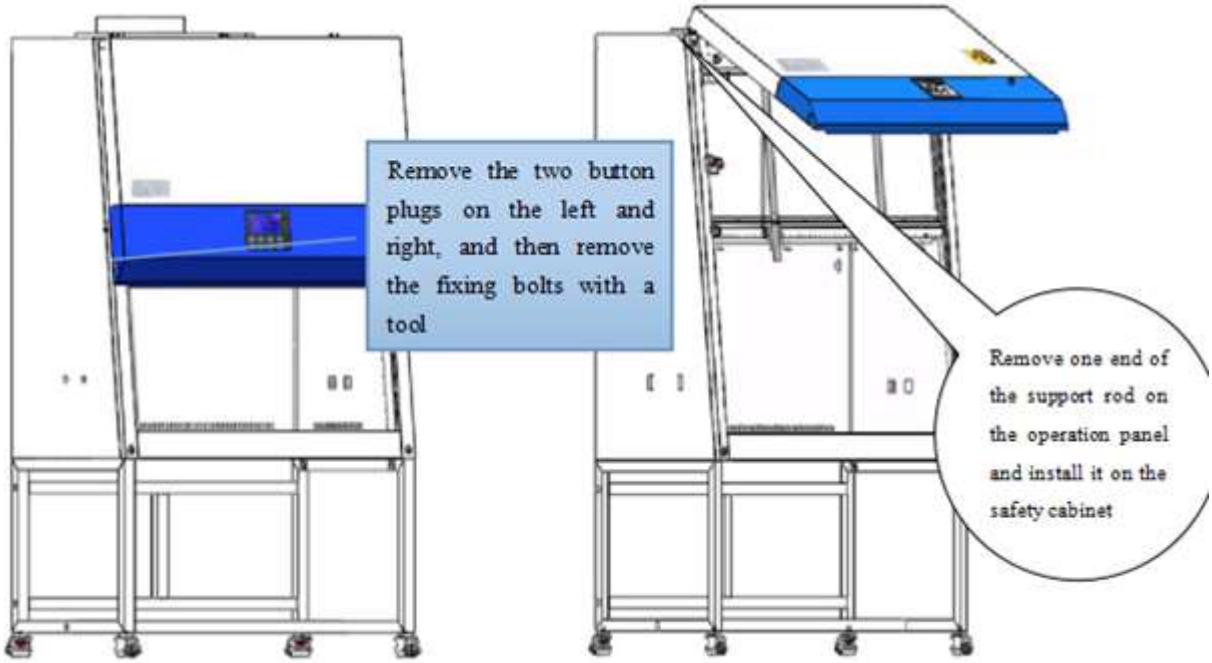
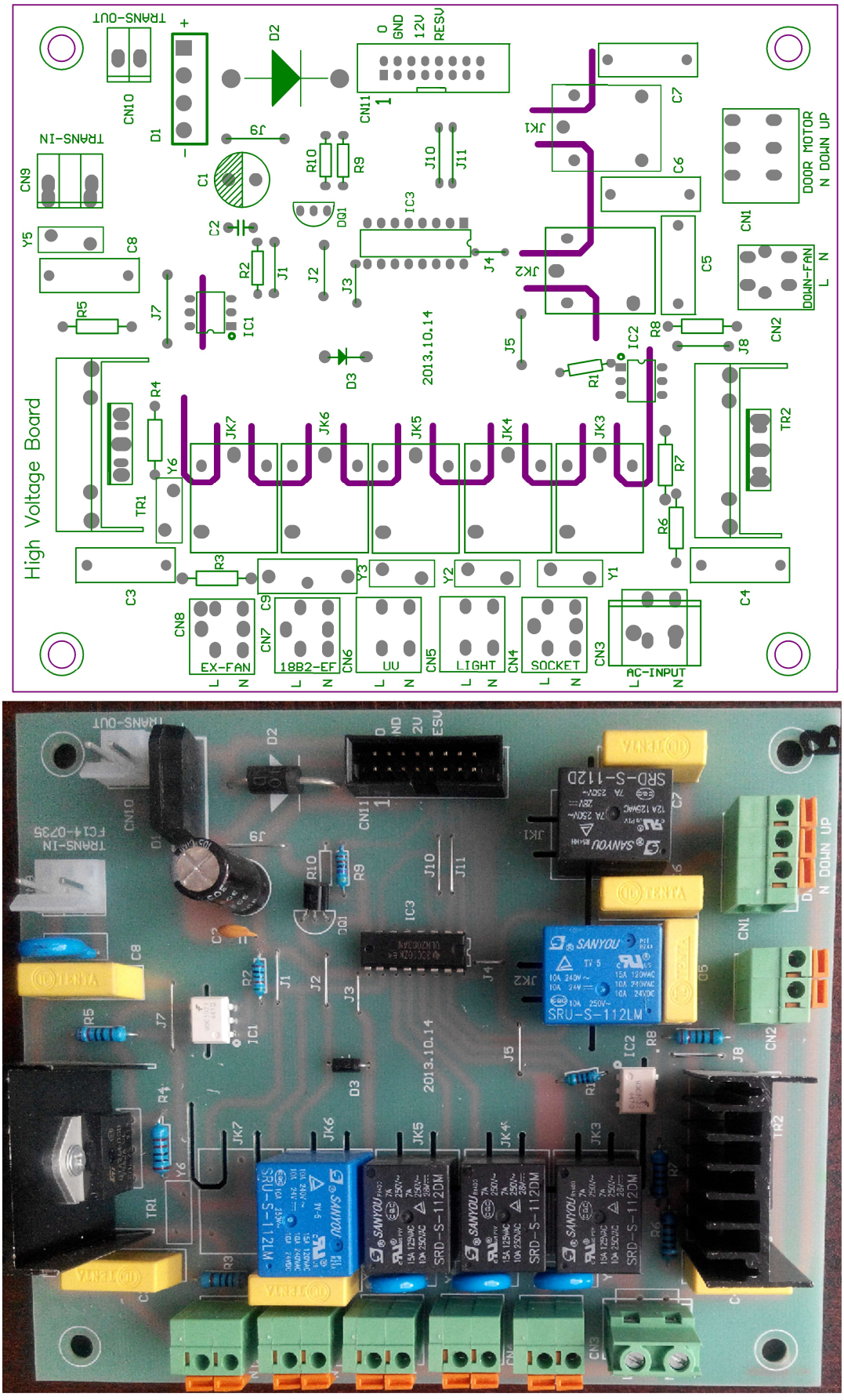
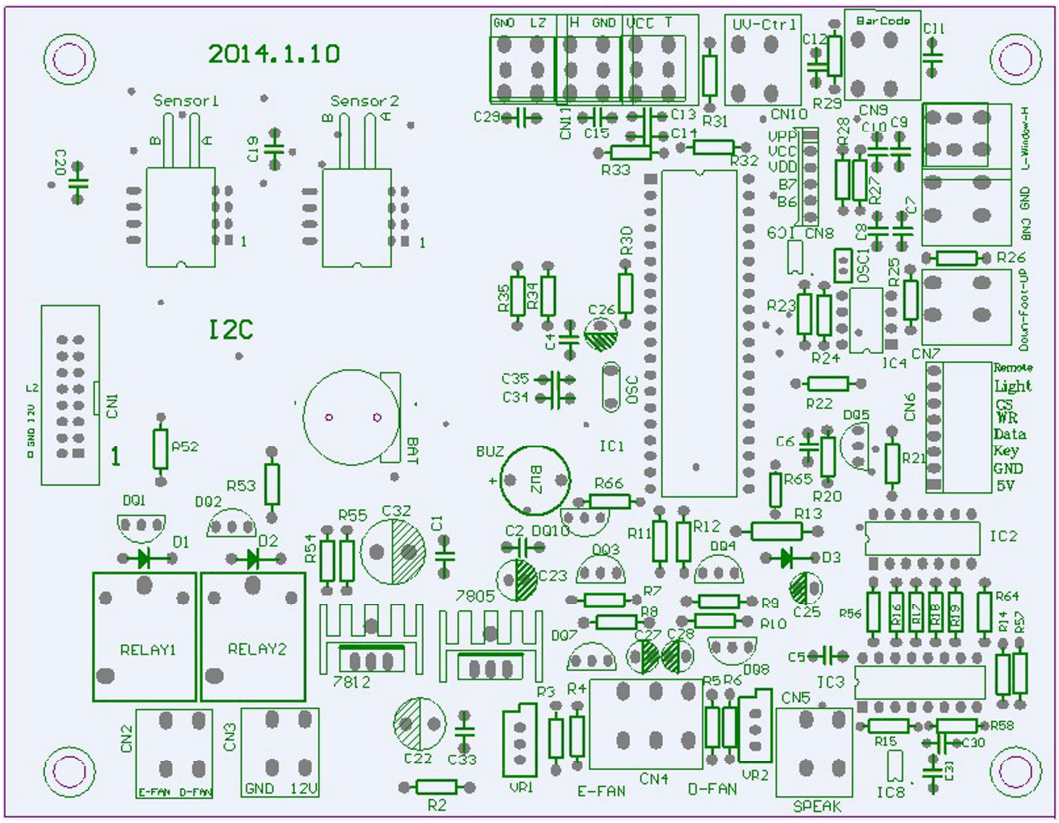
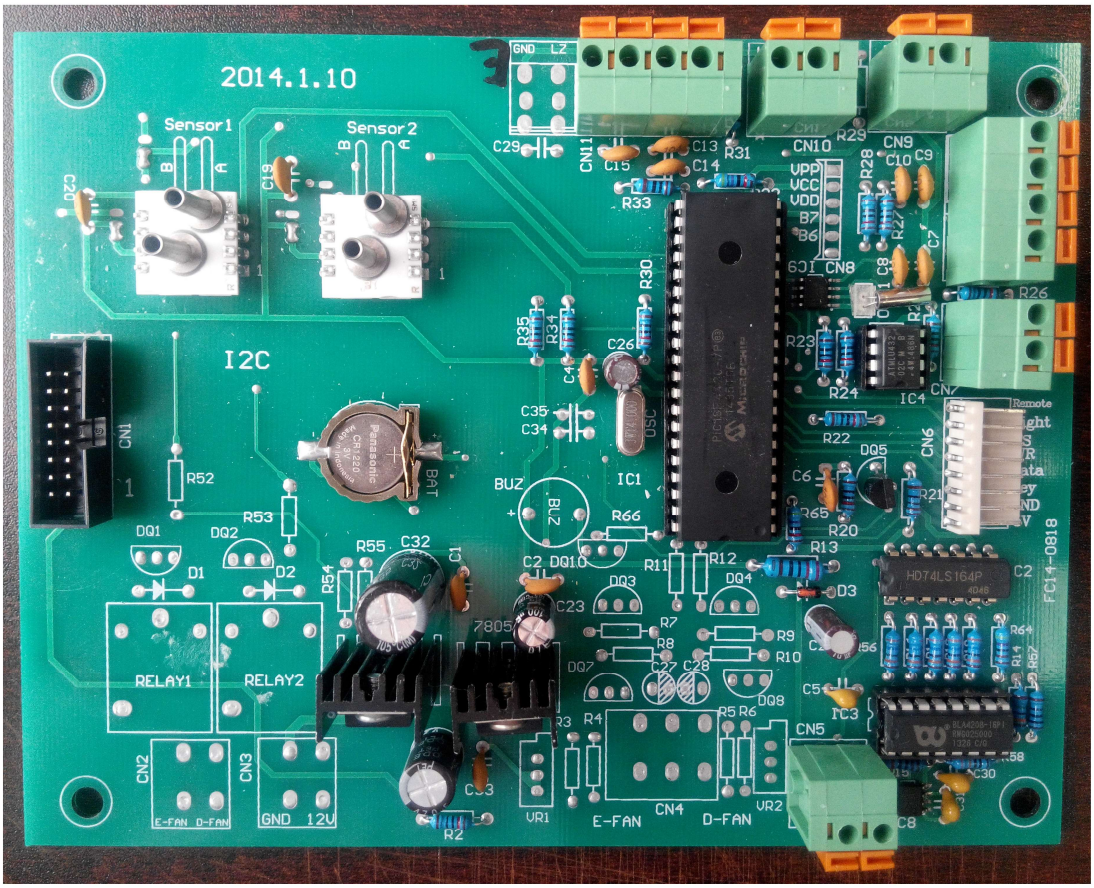


Figure 3

1.4 After confirming that there is no problem with the above items, try a multimeter to detect the input voltage of the transformer (the voltage value should be the supply voltage of the device) and the output terminal voltage (see Figure 4). First, use the multimeter to test whether the two wires at CN9 have voltage. The voltage is the grid voltage. Test the output voltage of the transformer again: use a multimeter to test the voltage between the two wires at CN10 to be between 12V and 14V. This indicates that the voltage output is correct. If there is no voltage in the test, the transformer is broken. Please replace the transformer.


High Voltage Board
2013.10.14
TRANS-OUT
TRANS-IN
CN10
CN9
CN11
CN1
CN2
CN3
CN4
CN5
CN6
CN7
CN8
DOOR MOTOR
N DOWN UP
DOWN-FAN
L N
EX-FAN
18B2-EF
UV
LIGHT
SOCKET
AC-INPUT
L N
D1
D2
D3
IC1
IC2
IC3
TR1
TR2
JK1
JK2
JK3
JK4
JK5
JK6
JK7
SRD-S-112D
SRU-S-112LM
SRD-S-112DM
SANYOU


2014.1.10
Sensor1
Sensor2
I2C
RELAY1
RELAY2
7812
7805
BUZ
BAT
IC1
IC2
IC3
IC4
IC8
CN1
CN2
CN3
CN4
CN5
CN6
CN7
CN8
CN9
CN10
CN11
VR1
VR2
E-FAN
D-FAN
SPEAK
GND 12V
E-FAN D-FAN
GND LZ
H GND VCC T
UV-Ctrl
BarCode
L-Window-H
Down-Foot-UP
Remote
Light
WR
Data
Key
GND
5V


2014.1.10
Sensor1
Sensor2
I2C
RELAY1
RELAY2
7805
BUZ
BAT
IC1
IC3
IC4
CN1
CN2
CN3
CN4
CN5
CN6
CN7
CN8
CN9
CN10
CN11
VR1
VR2
E-FAN
D-FAN
GND 12V
E-FAN D-FAN
GND LZ
HD74LS164P
FC14-0818

1.5 After confirming that there is no problem with the above items, confirm whether the wiring of CN11 in Figure 4 and CN1 in Figure 5 is in good contact. 1.6 After confirming that there is no problem with the above items, please replace the new control board.

Fault 2: The display does not light up (the alarm is normal when the machine is turned on)

The display is not bright (the alarm is normal when the machine is turned on) means that the device is powered on and the power lock is turned on and all the keys are functioning normally, but the display is not bright and has no response. The processing methods and steps when dealing with such failures are as follows:

2.1 Confirm whether the display screen is damaged. If it is damaged, replace it with a new display board.

2.2 Open the operation panel (see Figure 3) and confirm whether the cable connecting the display board and the control board is in poor contact.

2.3 After confirming that there is no problem with the above items, please replace the new control board.

Fault 3: The button does not respond and the display is not bright (Normal alarm when power on)

The button does not respond and the display screen is not bright (turn on alarm) means that the device is powered on and the power lock is turned on and the alarm is issued. The button function does not respond and the display screen is not bright and does not respond. Refer to Fault 2 for the processing methods and steps when dealing with this type of fault.

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.

(BSC-1100 Ⅱ A2-X/BSC-1800 Ⅱ A2-X the power lock type is AR22JR-2A20A; BSC-1300 Ⅱ A2-X/BSC-1500 Ⅱ A2-X the power lock type is LA42Y2P-20B)

Figure 6

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:

5.1When 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.

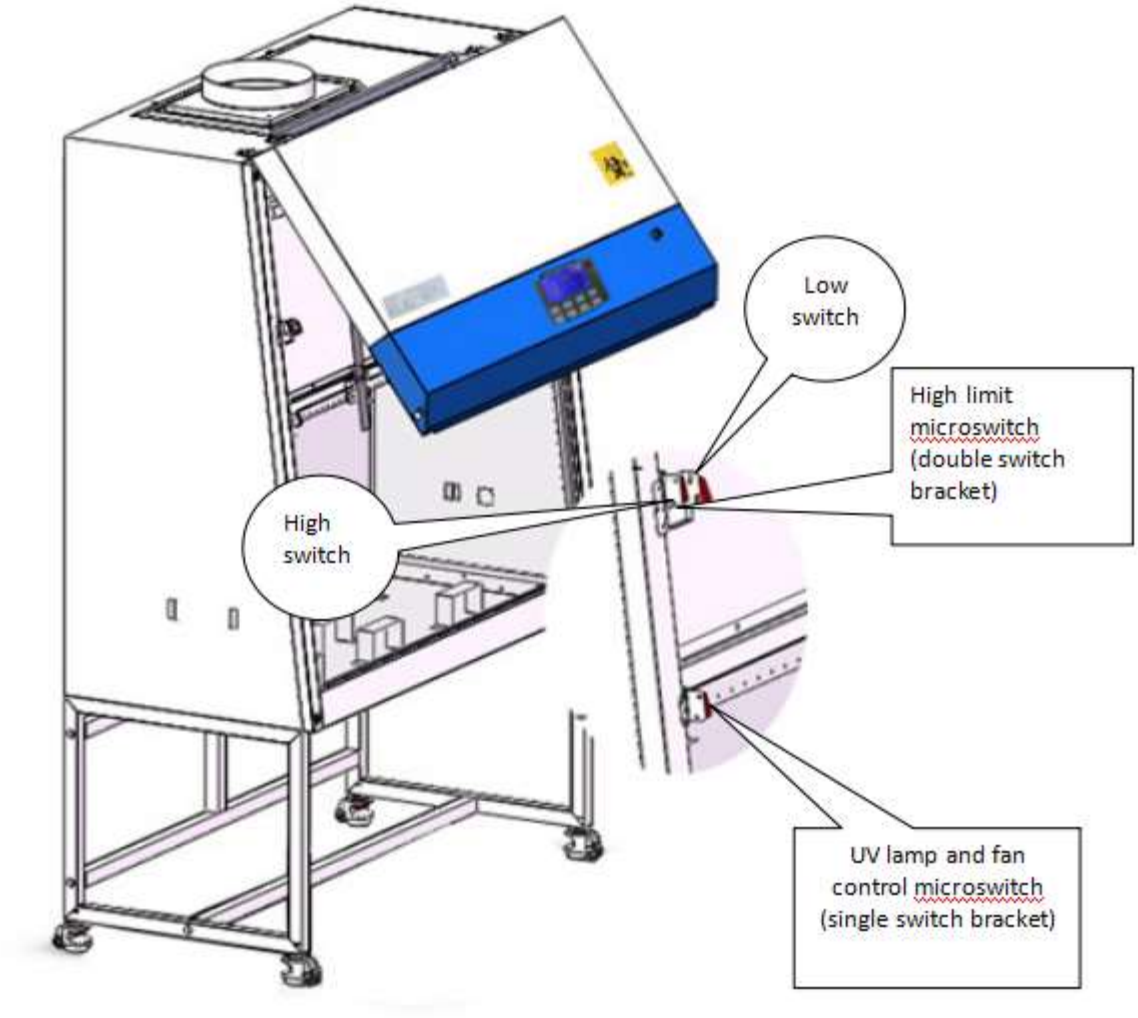


Figure 7

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.

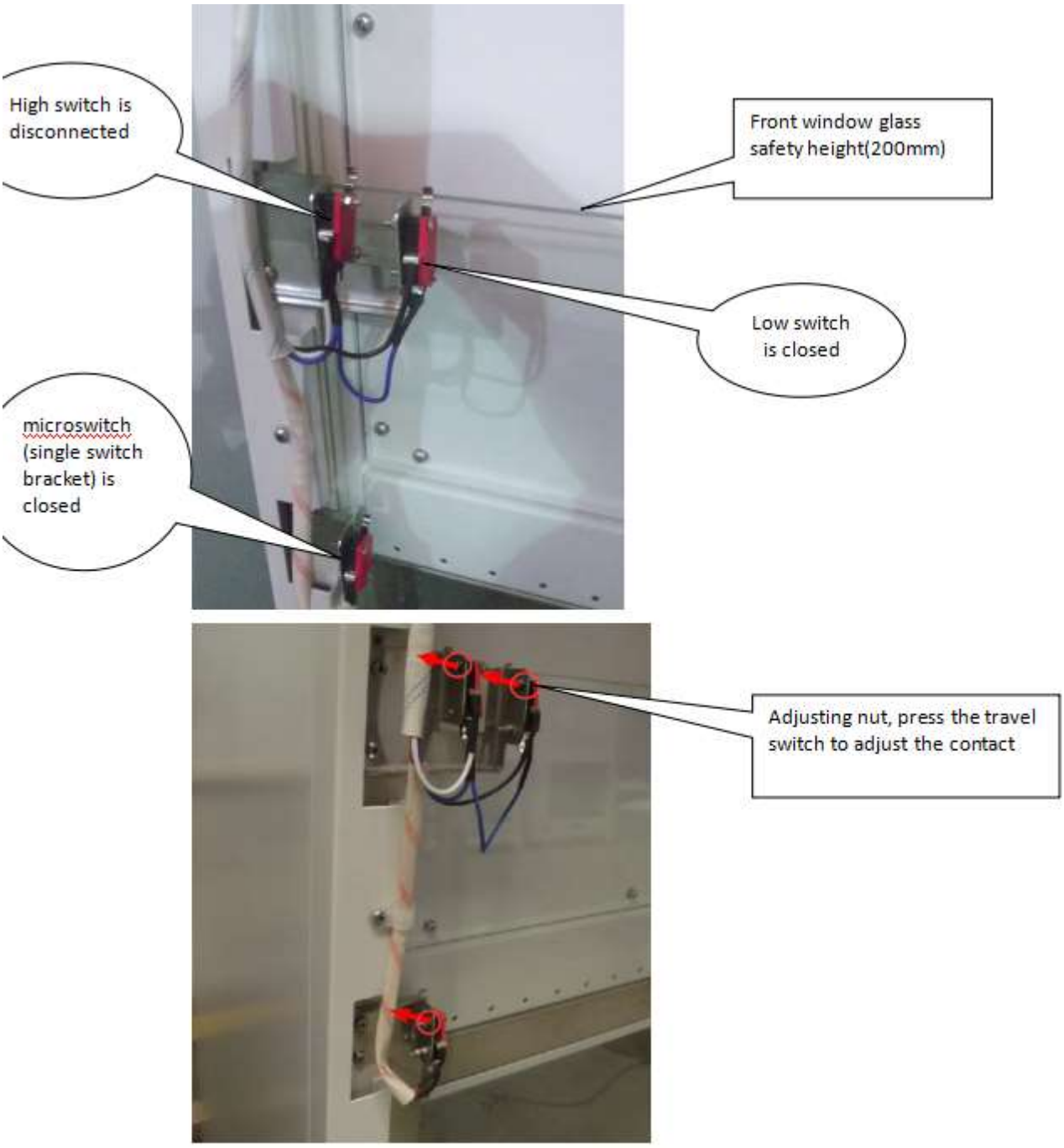


Figure 8&9

5.3 Check wiring connection in ‘CN8’ (as shown in picture5), high switch connect to ‘CN8 H’,low switch connect to the ‘CN8 L’. Single-switch connect to ‘CN10’ (as shown in picture5).

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:

6.1Operation panel’ s buttons no response

Turn on the device,open operation panel (see 1.3,),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 picture4), 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 picture4), 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 picture10).

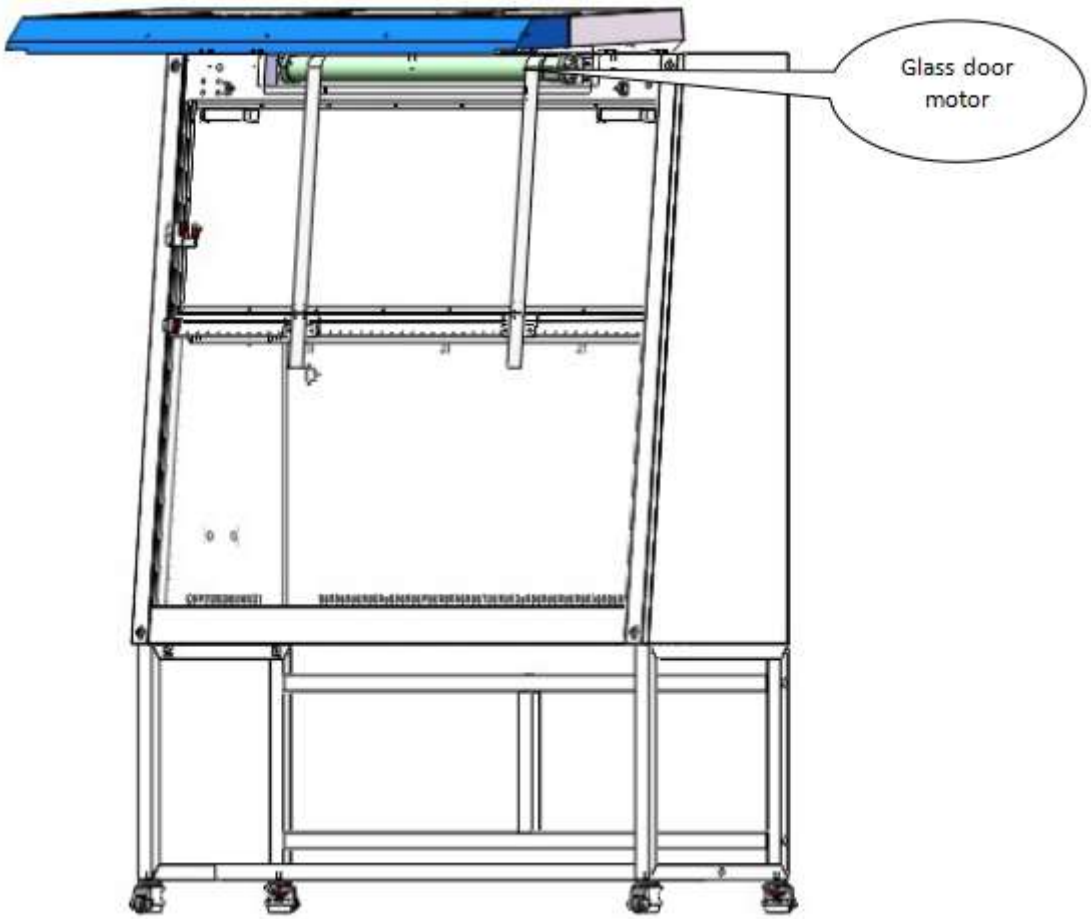


Figure 10

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 Picture5), 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.

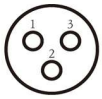


Figure 11

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 picture2) ,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.

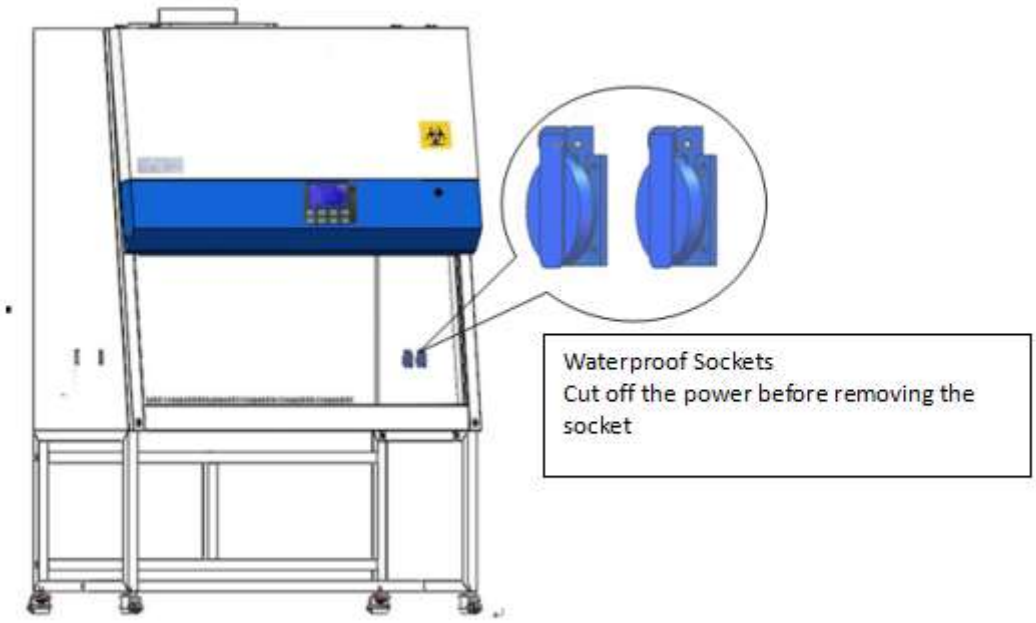


Figure 12

8.3 After confirming that there is no problem with the above items, open the operation panel (see the description in 1.3 for the method). Use a multimeter to check whether the socket circuit is disconnected. If it is disconnected, reconnect the socket cable to CN4 of the strong current board (Figure 4) (Note: Please operate the above inspection circuit when the device is powered off).

8.4 If there is no problem as described above, turn on the power lock of the equipment, press the power button and the socket button in turn, and observe whether the socket icon on the display is lit. If it does not light up, the control board or display board is damaged, please replace with a new set of circuit boards .

8.5 If there is no problem as above, the device is powered on and the power lock is turned on, press

the power button and the socket button in turn, use a multimeter to check whether there is voltage on the CN4 terminal block on the strong current board (Figure 4) (the voltage value should be the power supply voltage of the device), if there is no power, the control board is damaged, replace the control board.

Fault 9: The light does not turn on

The light does not turn on means that the light does not turn on when the light button is activated. The processing methods and steps when dealing with such failures are as follows:

9.1 Confirm whether the lamp holders at both ends of the lamp are in good contact. Remove the lamp and confirm whether the two sides of the lamp are black. If it becomes black, the lighting tube is damaged. Replace the lighting tube of the same specification (the position of the lighting lamp is shown in Figure 13).

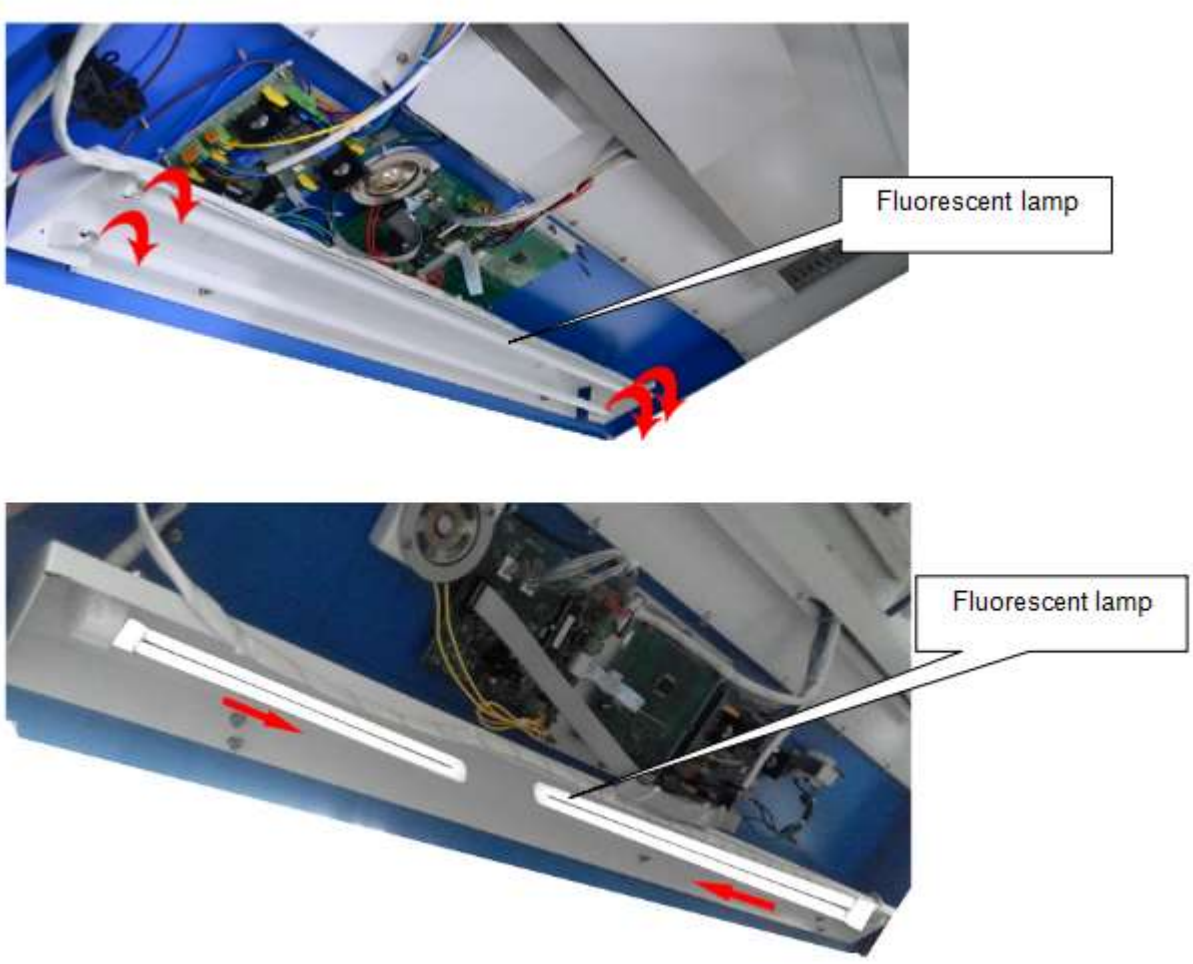


Figure 13

9.2 After there is no problem as above, open the operation panel (see the description in 1.3 for the method), the equipment is powered on and the power lock is turned on, press the power button and the lighting button in turn, and use a multimeter to detect the voltage of the CN5 terminal block of the strong current board (Figure 4) (The voltage value should be the power supply voltage of the equipment). If there is no voltage, the control board is damaged, replace it with a new one.

9.3 After there is no problem as above, sort out the wires between the lighting lamp and the lighting ballast, and the connecting wires between the lighting ballast and the control board. Check if the

connection is loose, if it is loose, reconnect the loose wire (refer to Figure 14 for the ballast position).

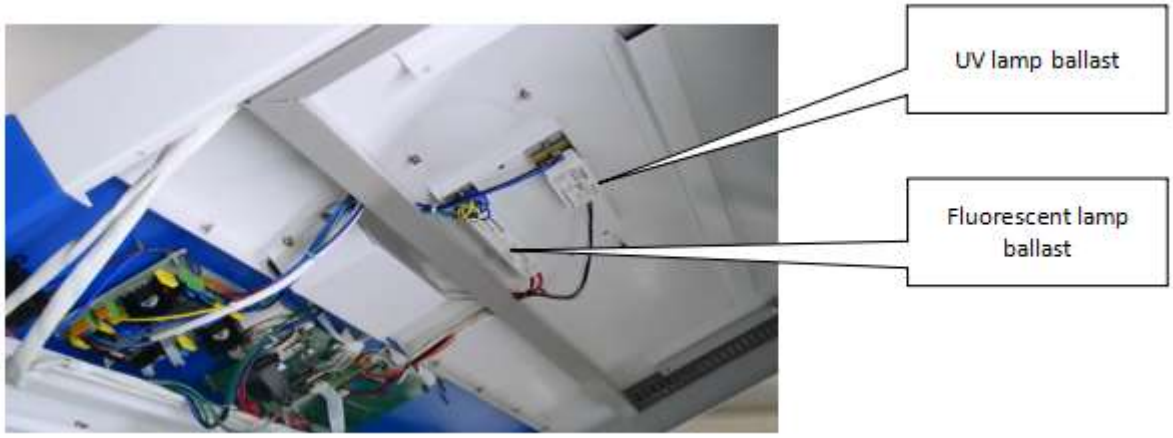


Figure 14

9.4 If there is no problem as above, the ballast is damaged, replace with a new lamp ballast of the same specification.

Fault 10: UV lamp does not turn on

The UV lamp does not light up means that the UV light does not light up when the UV button is activated. The processing methods and steps when dealing with such failures are as follows:

10.1 Confirm that the front window glass door and the fluorescent lamp are completely closed. If they are not completely closed, the UV lamp cannot be started. If it is closed, please follow the next steps to check.

10.2 Confirm whether the lamp pins on both sides are in good contact with the lamp holder, remove the lamp tube to confirm whether the filaments on both sides of the lamp tube are open, such as open circuit, the UV lamp is damaged, replace the UV lamp of the same specification (see Figure 15 for the position of the UV lamp). After the UV lamp is replaced, you need to keep pressing the UV button for about 5 seconds in the standby state, and an alarm will sound to reset the UV usage time.

Figure 15

10.3 After there is no problem as above, open the operation panel (see the description in 1.3 for the method), Check whether the UV interlock travel switch is in the off state (as shown in Figure 16) and whether its wire is damaged. Connect this switch to "CN10" in Figure 5.

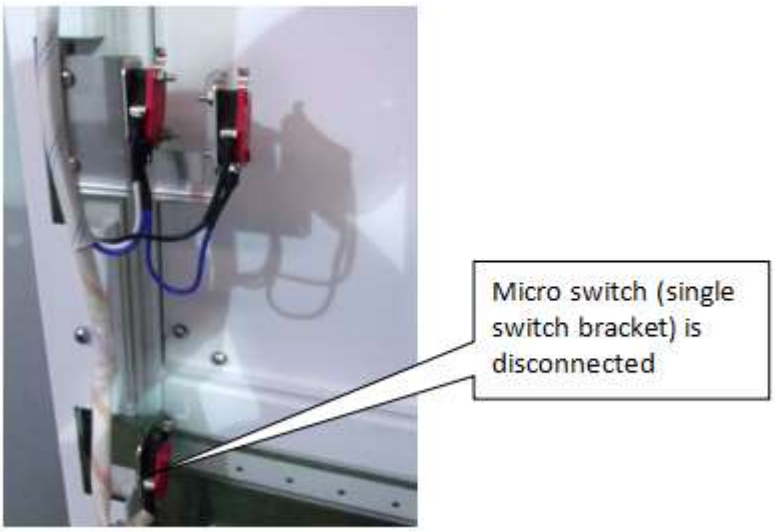


Figure 16

10.4 After there is no problem as above, the device is powered on and the power lock is turned on, press the power button and the UV button in turn, and use a multimeter to detect the voltage of the CN6 terminal block of the strong current board (Figure 4) (the voltage value should be the power supply voltage of the device), If there is no voltage and the control board is damaged, replace it with a new one.

10.5 After there is no problem as above, sort out the wires between the UV lamp and the UV lamp ballast, and the connection wires between the UV lamp ballast and the control board. Check if the connection is loose, if it is loose, reconnect the loose wire (refer to Figure 14 for the ballast position).

10.6 If there is no problem as above, if the ballast is damaged, replace it with a new UV lamp ballast of the same specification.

Fault 11: The fan does not work

Fan not working means that when the fan button is activated, the fan will not start. The processing methods and steps when dealing with such failures are as follows:

11.1 (Note: The fan does not start when the window glass is lowered to the bottom of the factory setting), the device is powered on and the power lock is turned on, press the power button and the fan button in turn to check whether the fan icon on the display is lit. If it is not lit, open the operation panel (see the description in 1.3 for the method), and check whether the UV lamp interlock micro switch is in the closed state or whether the connecting wire is damaged. If it is damaged or malfunctions, replace the micro switch or reconnect the wire or close the switch. Connect the micro switch to "CN10" in Figure 4. If it is lit, use a multimeter to detect the voltage of the CN2 terminal block of the strong current board (Figure 4) (this voltage is between 120V-200V). Check whether the fan fuse is fused and whether the wiring harness on the fuse seat is off (see Figure 1 for description). If it is fused, please replace the fuse of the same model (the fan fuse is only available for BSC-1500IIA2-X and BSC-1800IIA2-X, BSC-1100IIA2-X, BSC-1300IIA2-X without fan fuse).

11.2 After there is no problem as above, connect the fan directly to the power supply of the equipment and observe whether the fan is started. If it does not start, the fan is damaged. Replace the fan with the same model. The fan wire is connected to "CN2" in Figure 4.

11.3 After there is no problem as above, check whether the connection between the fan and the circuit board is loose or open. If the connection is loose or open, reconnect the lead.

Fault 12: Pressure difference and wind speed adjustment

12.1 Before adjusting the wind speed, first check whether the air duct is bent.

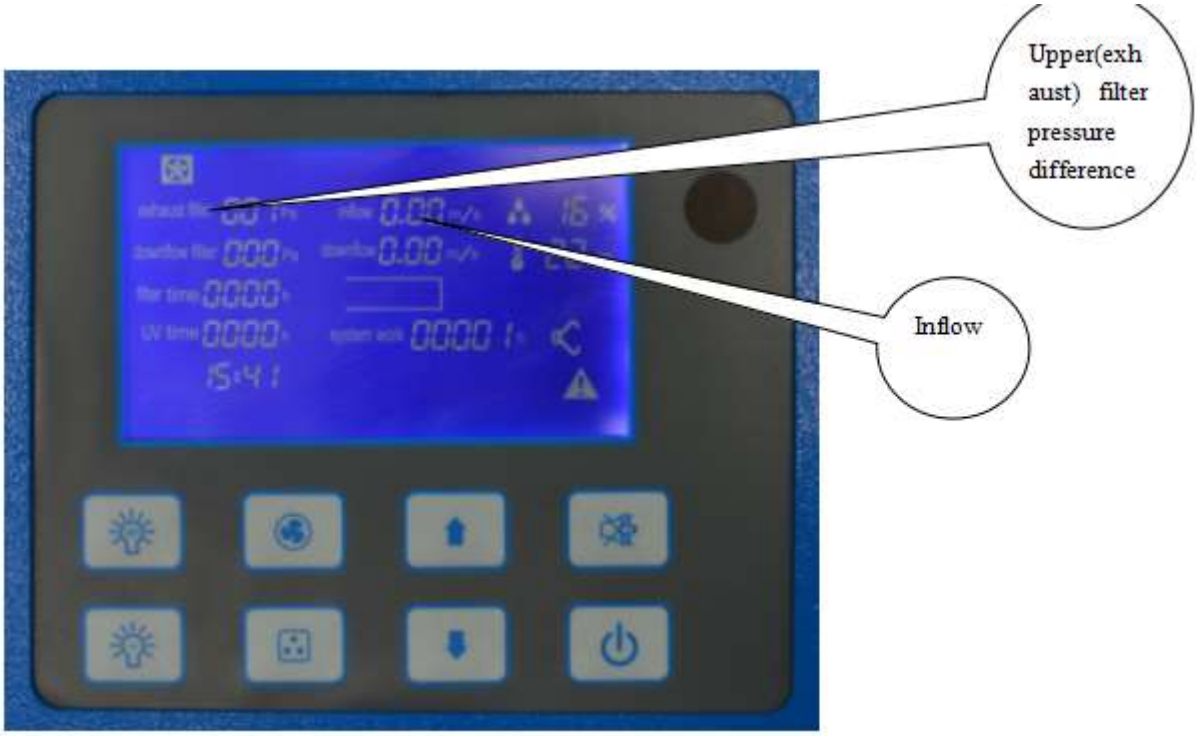


Figure 17

12.2 Pressure setting:

The pressure of the upper and lower filters of the A2 safety cabinet is between 80-110Pa. If the pressure is out of range, it needs to be adjusted. The pressure does not need to be adjusted within the range. The method is as follows:

Turn on the fan, wait for the fan to work for about 5 minutes, press and hold the socket button for about 5 seconds, and then enter the pressure adjustment state after the alarm sounds. First, adjust the pressure drop of the filter (the digital display on the bottom right side of the display flashes, which is 50 in Figure e), press the up and down buttons to adjust the size to the required value; then press the mute button to switch to the external filter pressure adjustment (the digital display at the bottom left of the display flashes, that is, the 60 position in Figure e), through the up , Press the button to adjust the size to the required value. After adjustment, keep pressing the socket button for about 5 seconds to save.

12.3 Wind speed setting:

After the pressure is adjusted, save and exit, the fan is always on, and then adjust the wind speed. Press the UV button for about 5 seconds and then enter the state of adjusting the wind speed after an alarm sound. First, adjust the decreasing wind speed. (The digital display on the right side of the bottom of the display flashes, that is, 50 in Figure e), adjust the size to the nominal value by pressing the up and down buttons; then press the mute button to switch to the inflow wind speed adjustment (The left digital display at the bottom of the screen flashes, that is, at 60 in Figure e), adjust the size to the nominal value by pressing the up and down buttons. After adjustment, keep pressing the UV button for about 5 seconds to save. If the pressure is displayed within the normal range, just turn on the fan and adjust the wind speed directly, without adjusting the pressure.

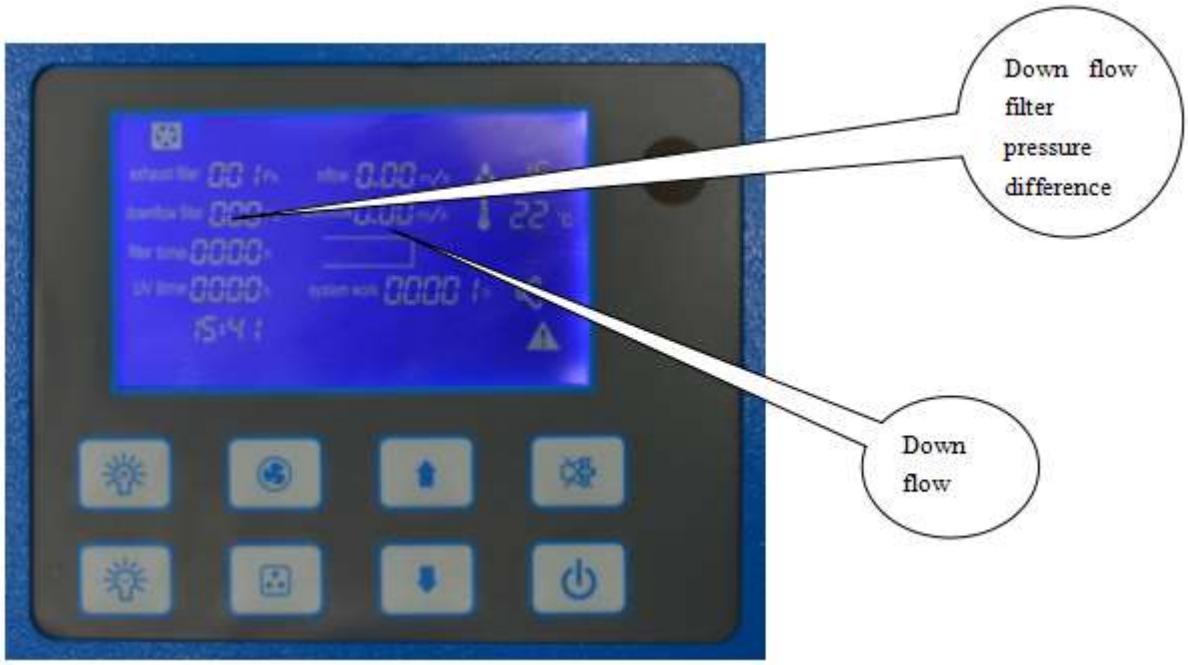


Figure 18

Fault 13: Alarm for excessively high filter pressure difference, replace the filter

When the bar code of the filter displayed on the display screen covers the entire pane, the device prompts an alarm (the "⚠" icon on the display screen flashes and the alarm is displayed at the same time, as shown in Figure 19), and the filter needs to be replaced. After replacing the filter, keep pressing the lighting button in the standby state for about 5 seconds, and then an alarm will sound to reset the filter usage time and re-record the new filter usage time. To replace the filter, refer to the steps of replacing the fan (see the replacement part of the fan and filter).

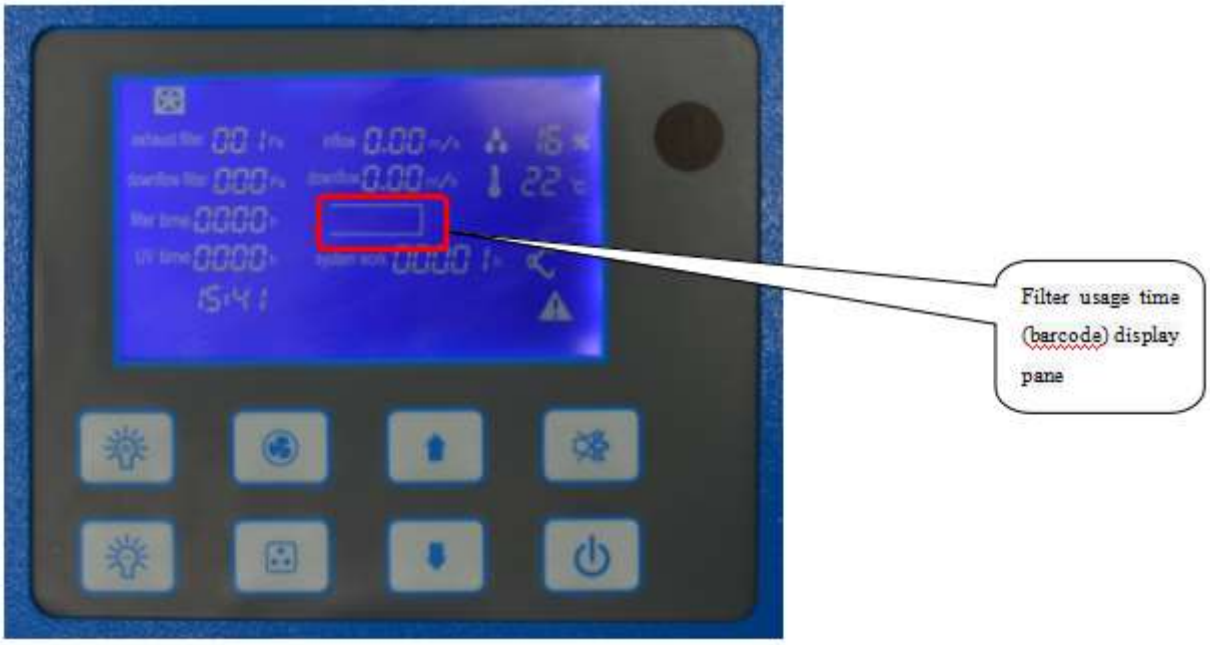


Figure 19

Fault 14: The front window glass is damaged, replace the front window glass

Open the operation panel (see the description in item 1.3 for the method), remove the right decorative strip of the glass as shown in Figure 20, remove the right PVC glass guide rail and backing plate as shown in Figure 20, remove the glass locking buckle as shown in Figure 21, and remove the glass; Just install the front window glass of the same specification, and just return to the installation step to resume.

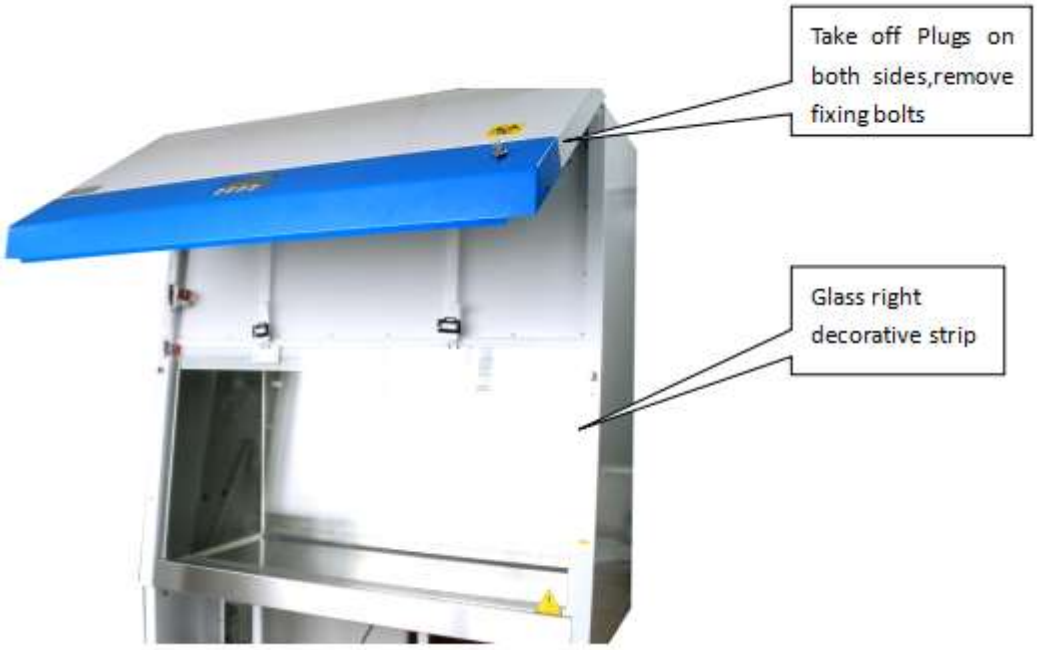


Figure 20

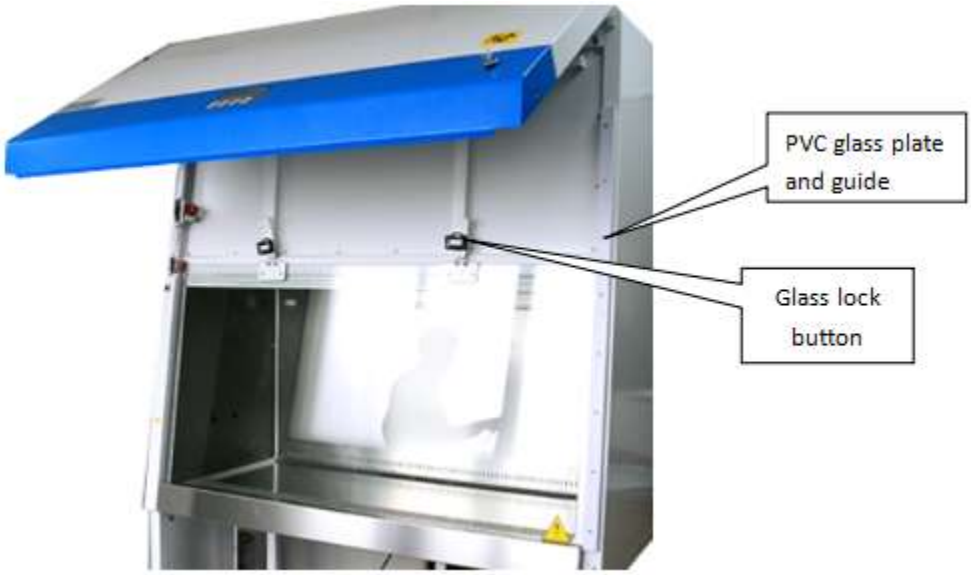


Figure 21

Fault 15: Clock display adjustment

When the power is turned on and the power lock is in standby state, first press the lighting button and then the power button for about 5 seconds, and then enter the clock adjustment state after an alarm sounds, and the minute digit starts to flicker. Use the up and down keys to adjust to the current time, then press the mute key to switch to the hour position and start flashing, and use the up and down

keys to adjust to the current time. After the clock is adjusted, press the illumination key and then the power key for about 5 seconds, and then save the alarm. (See Figure 22).

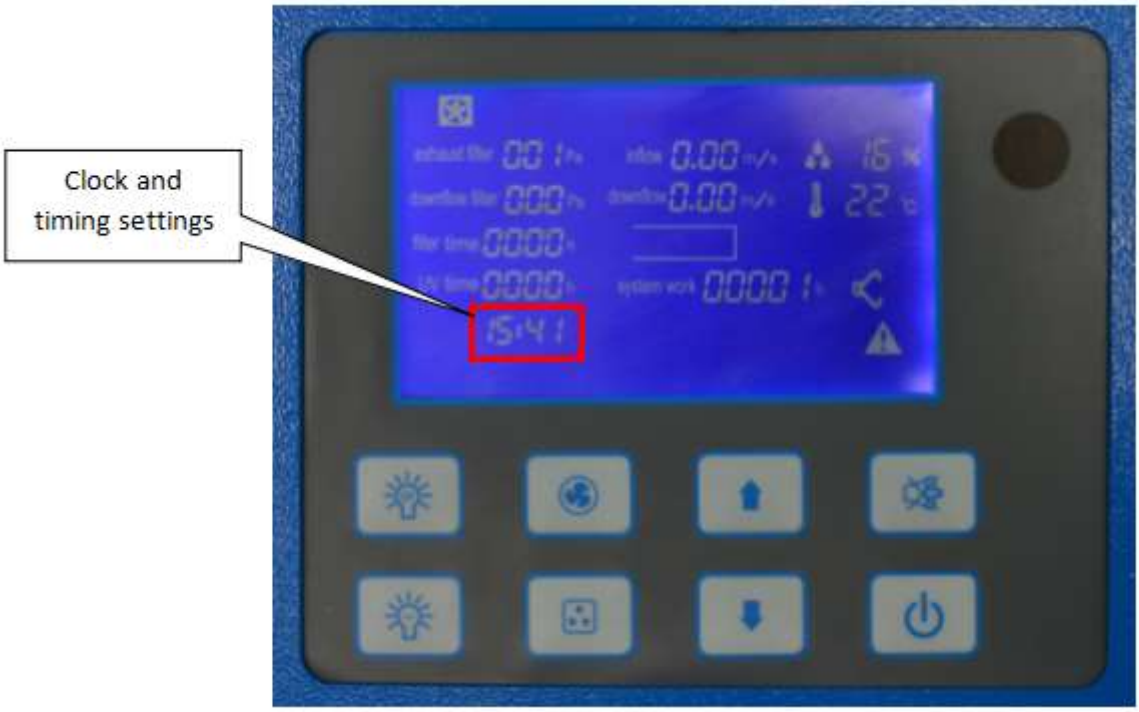


Figure 22

Fault 16: Glass door motor replacement

To replace the glass door motor, first disconnect the conveyor belt, remove the circlip as shown in the figure, pull up the left end of the motor, as shown in Figure 23, move left to remove the tubular motor, and install the glass door motor of the same specification.

Figure 23

Figure 24

Fault 17: Incorrect display of temperature and humidity

The temperature and humidity display in the upper right corner of the display deviates from the actual environment value, troubleshooting is as follows:

1. Check whether the wiring of the temperature and humidity sensor is disconnected or not well connected, see "H, GND, VCC, T" at "CN11" in Figure 5.

2. Check whether the temperature and humidity sensor is faulty. Replace the sensor of the same model. The sensor is located above the uniform air net in the work area. You can see it after removing the uniform air net, as shown in Figure 25 and 26.

Figure 25

Figure 26

3. If there is no problem with the above, the circuit board is faulty and the circuit board needs to be replaced.

Fault 18: Deal with the situation where the inflow wind speed is zero and the falling wind speed is zero

When the inflow wind speed is zero, first judge whether the air duct is discounted, open the operation panel (see the description in item 1.3 for the method), and restore the discounted position

of the air duct; When the descending wind speed is zero, first judge whether the air duct is discounted, open the operation panel (see item 1.3 for the method), and restore the discounted position of the air duct; then judge whether the outer fan is running; then judge whether the inner fan is operating normally, follow fault 11 to deal with it.

3. Replacement of fan and filter

3.1 How to replace the filter and the treatment of the old filter

(1) How to replace the filter

1) Before replacing the filter, the safety cabinet must be fumigated and disinfected

Calculate the amount of formaldehyde and ammonium bicarbonate: multiply the length, width, and height of the safety cabinet to get the total volume of the safety cabinet, and multiply the total volume by 11g/m 3 to determine the quality of formaldehyde required, in order to ensure the complete neutralization reaction , Ammonium bicarbonate weighs out 10% more by mass. Use a formalin fumigator (see its instructions for use) to disinfect the inside of the safety cabinet and use an ammonium bicarbonate neutralizer to neutralize the remaining formaldehyde gas.

2) Open the internal cavity of the equipment to replace the filter

Wear a mask, safety glasses, latex gloves and a positive pressure helmet, and put on a positive pressure suit and shoe covers. The mask must be a mask made of vinyl chloride high-efficiency filter material in my country, and its filtration efficiency can reach 99.9%; the positive pressure helmet is made of metal and plastic, and the inside of the helmet is positive pressure to prevent the entry of microbial aerosols; latex gloves It must be worn outside the sleeves of the laboratory suit; the body-sealed positive pressure suit is made of impermeable materials. It is supplied with fresh air with a vent tube or a gas cylinder. The temperature can be adjusted and the humidity can be adjusted. It must be used after showering and disinfection. Follow the disassembly steps in the fan replacement to remove the fan mounting plate and take out the filter. Replace the same specification filter and reinstall the removed parts (note the sealing treatment of the inner cavity and the outside during installation).

Follow the installation steps of replacing the fan mounting plate. After removing the fan mounting plate, take out the lower filter, as shown in Figure 31, remove the upper filter and replace the upper filter. When installing the upper and lower filters and bottom cabinet filters, pay attention to adjust the airflow direction of the filters and make the nameplate of the filter in front. The detailed disassembly steps are as in 3.2.

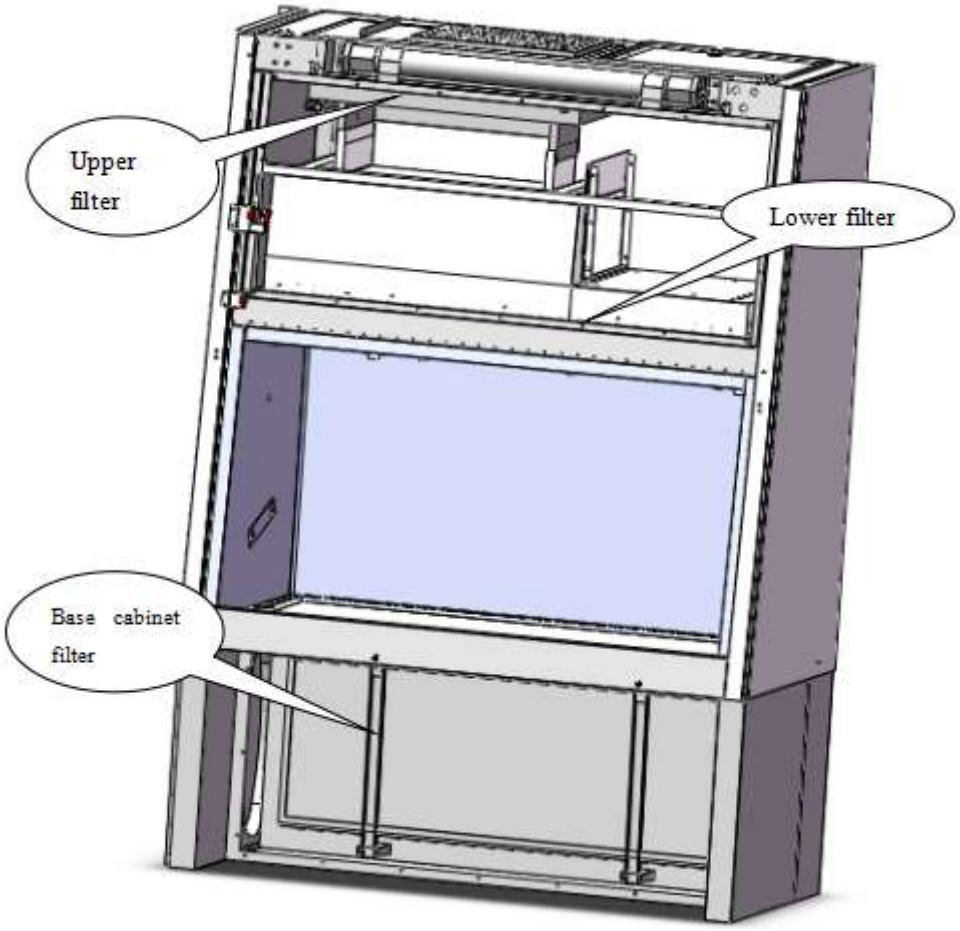


Figure 27

(2) Disposal of the old filter

Carefully remove the filter from its installation position, drop the filter material into a safe special medical waste bag, seal it, and label it with a "hazardous waste" mark, and dispose of it accordingly.

3.2 Steps for replacing fans and filters in the safety cabinet:

a) Place the glass door to the bottom end, cut off the power supply of the safety cabinet, and open the operation panel (see the description in item 1.3 for the method).

b) Remove the glass door conveyor belt fixing buckle shown in Figure 28, loosen the connection between the glass door and the motor, use a tool to remove the limit switch bracket, use a tool to remove all the screws that fix the front plate welding, and take out the front plate welding.

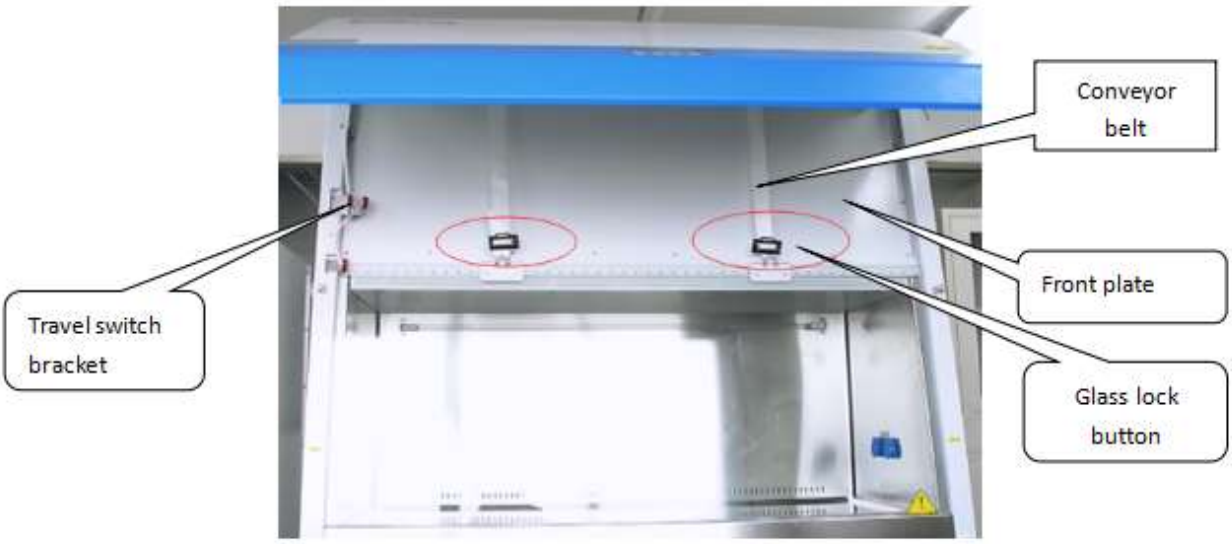


Figure 28

c) The replacement steps are as follows, remove the pressure rod nut.

Figure 29

d) Disassemble the pressure rod and take out the way as shown:

Figure 30

e) Remove the inner front panel, unplug the trachea, record the position.

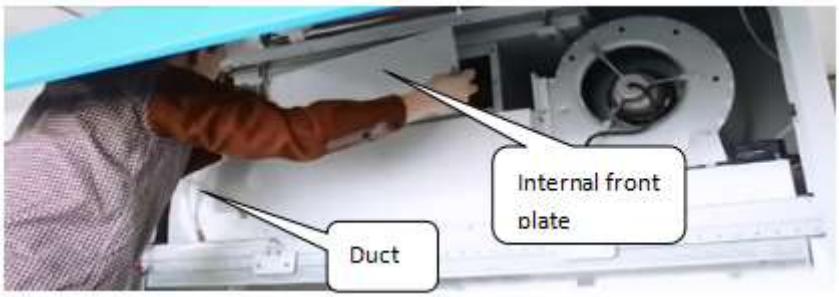


Figure 31

f) Take out the fan mounting plate horizontally, pay attention to the safety of the bottom glass.

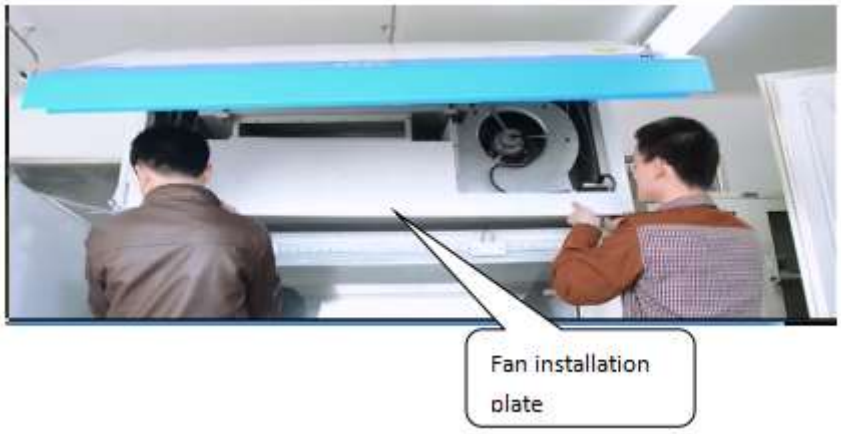


Figure 32

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

Figure 33

h) Remove filter press bar bolt

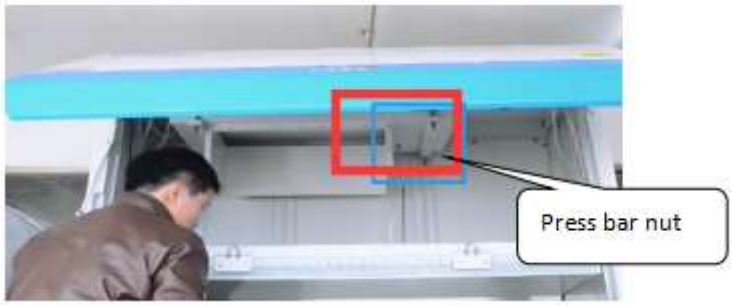


Figure 34

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

Figure 35

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

Figure 36

k) Remove the fan bolts, remove the fan box

Figure 37

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

Figure 38

m) Remove the fan and mounting plate connecting piece

Figure 39

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

Figure 40

o) Install the fan and the fan box

Figure 41

p) Sealant coating

Figure 42

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

Figure 43

r) Install the fan installation board,reconnet ducts.

Figure 44

s) Air duct connection part gluing treatment

Figure 45

t) Reconnect wiring lines.

Figure 46

u) Install inner front panel

Figure 47

v) Install press bars, tighten nuts.

Figure 48

w) Install the front panel and travel switch bracket.

Figure 49

x) Install glass lock button.

Figure 50

y) Put down the operation panel, and replace the fan and filter part of the safety cabinet;

3.3 Steps to replace the bottom cabinet filter:

a) Remove the screws of the base cabinet

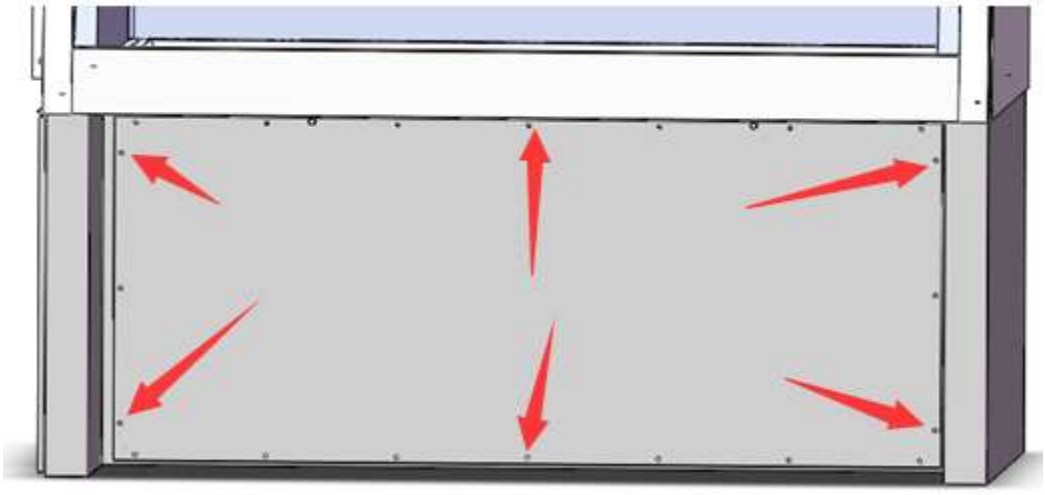


Figure 51

b) Remove the wing nut on the bead, take off the bead, and replace the filter of the model.

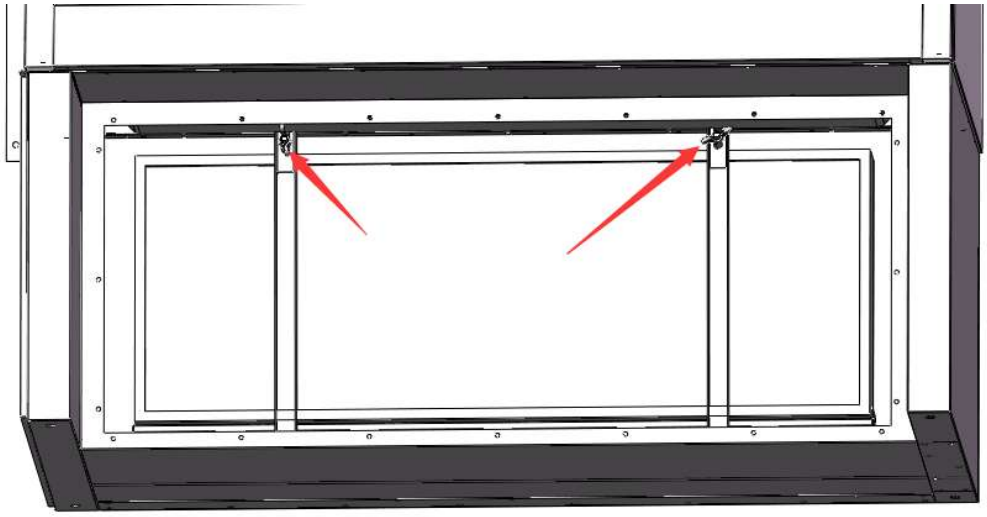


Figure 52

4. Wiring diagram