


**Laminar Flow Cabinet
BBS-V1300&BBS-V1800
Maintenance Manual**

Version 2018.08

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I Failure and Maintenance

 Note: The following maintenance testing for the live operation must be completed by the professionals to avoid the risk of improper operation.

Failure 1: The device is not powered.

It means that the device is not working when the switch is turned on. (the display does not shine, the button no reaction).

The troubleshooting methods and procedures are as follows:

1.1 Judge whether the power supply of the device is powered, and whether it is consistent with the electrical parameters required for normal operation of the device. Use a multimeter to check whether the power supply of the equipment is normal.

1.2 The live line and zero line are equipped with fuse where the power-input port located (as Figure 1). After confirming that there is no problem about the above items, then confirm whether the two fuses are blown. If the fuses are blown, please replace the fuses with the corresponding labels.

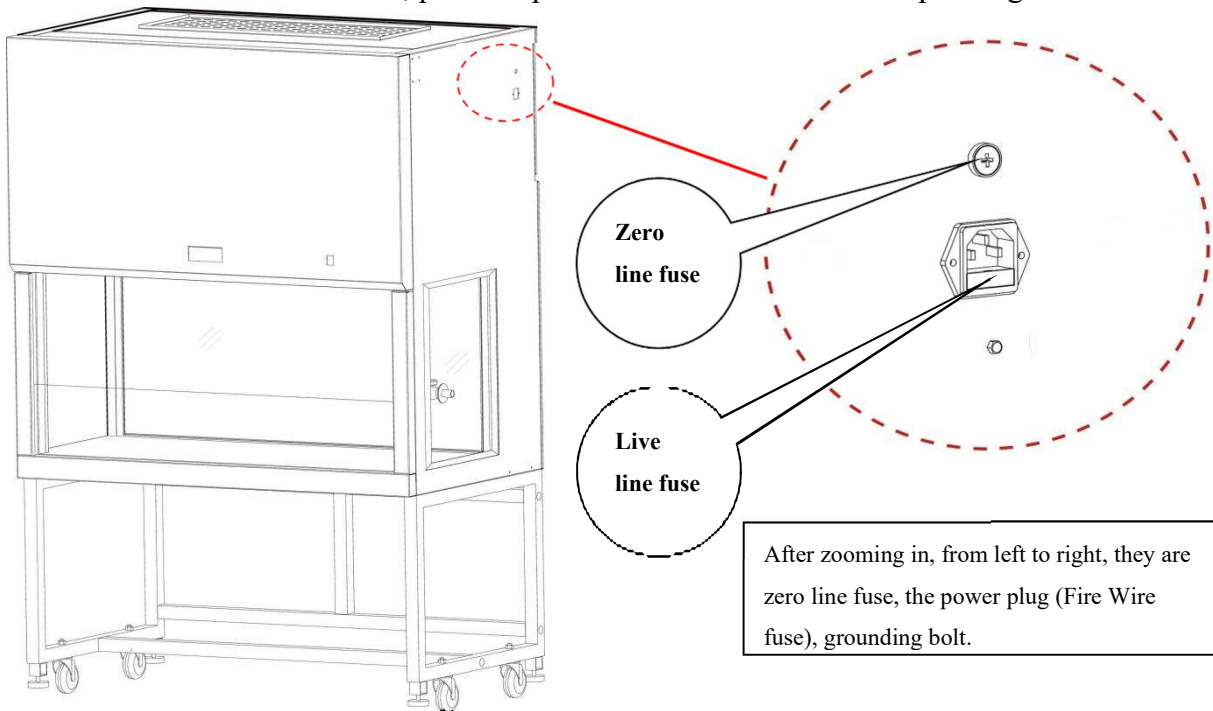




Figure 1 Fuse location and replacement

1.3 Open the front panel (Figure 2) to view the boat switch (Figure 3).

1.3.1 How to open the front panel

Remove the self-tapping screws on the left and right sides of operation panel with the cross screwdriver and put the self-tapping screws in the tool box. Lift up the control panel with your hand and remove the cable attached by the black binding at one end of the support and place the support on the welding screws on the left and right panels

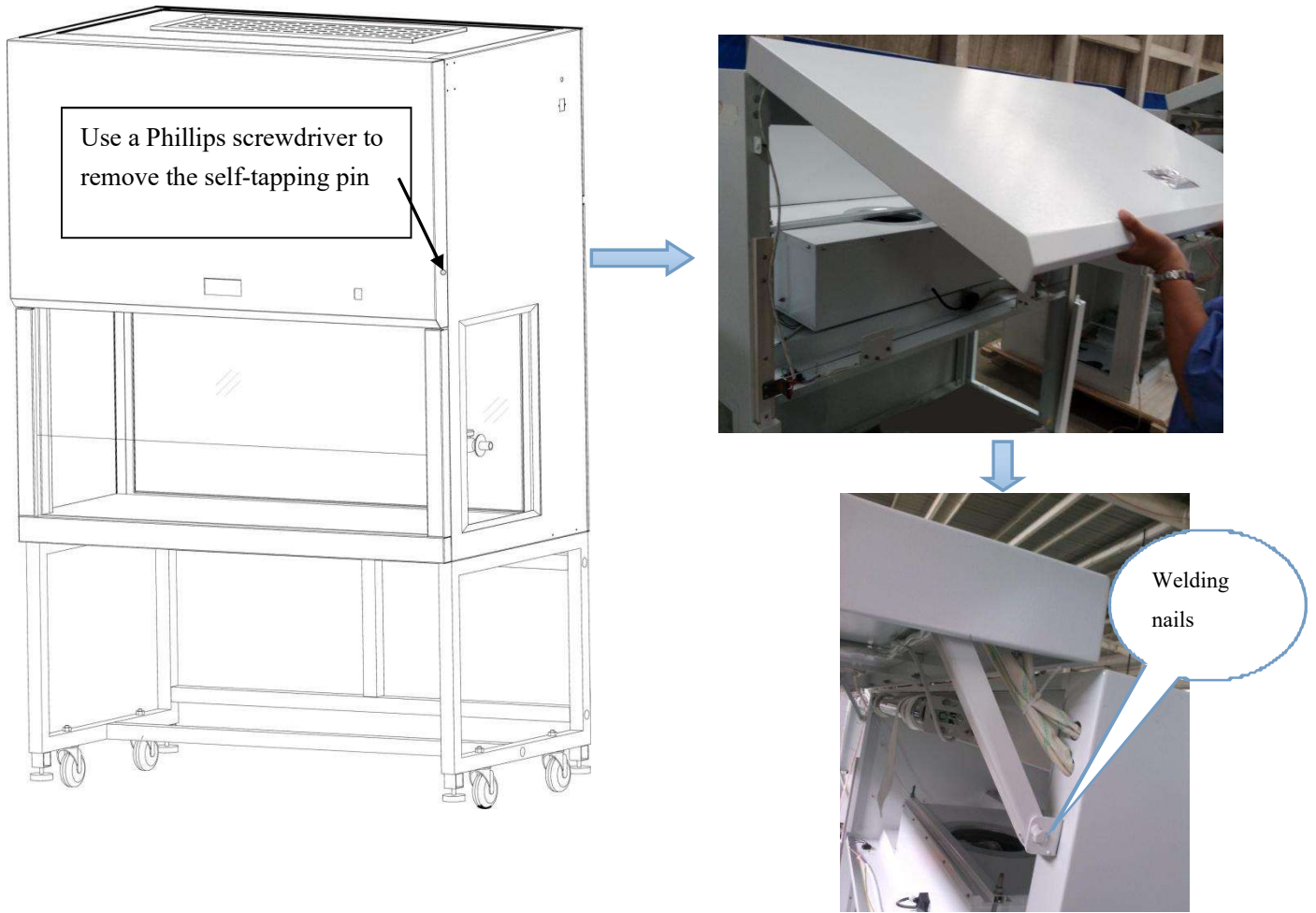


Figure 2 Support panel

1.3.2 Check the ship switch wiring. Open the operation panel, checking the switch on the back of the operation panel is damaged or the wiring is off, and confirm the wiring is solid using hand.

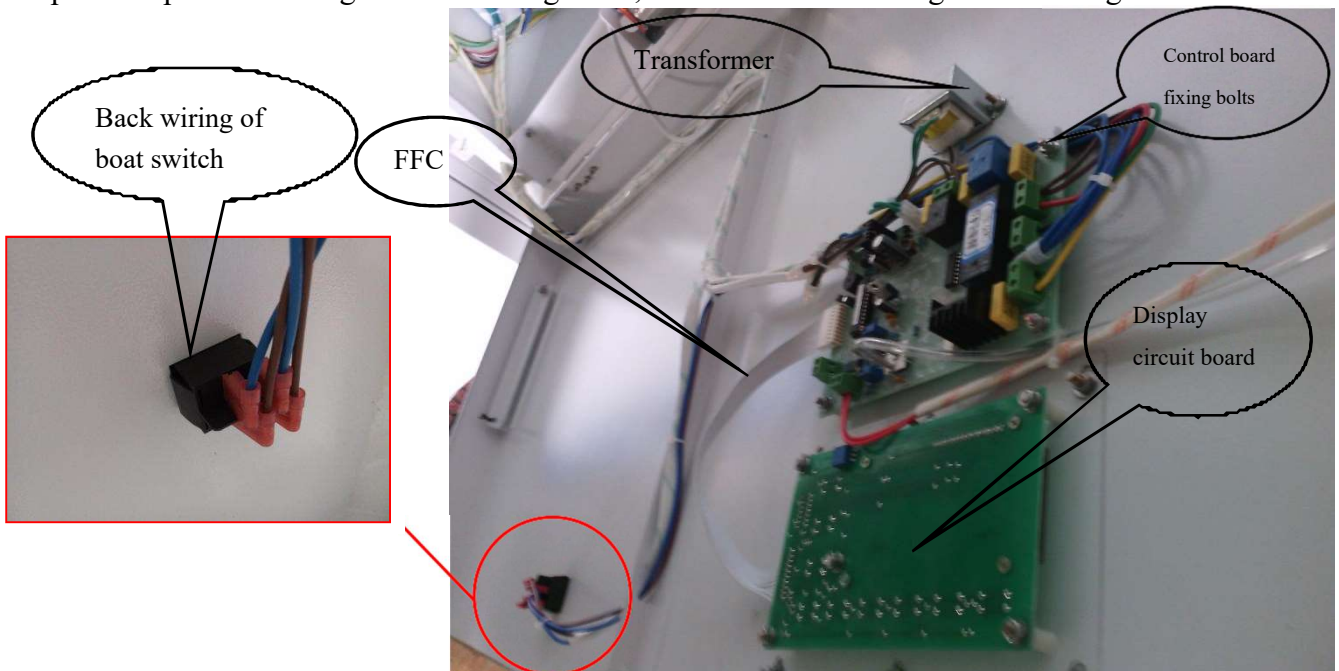
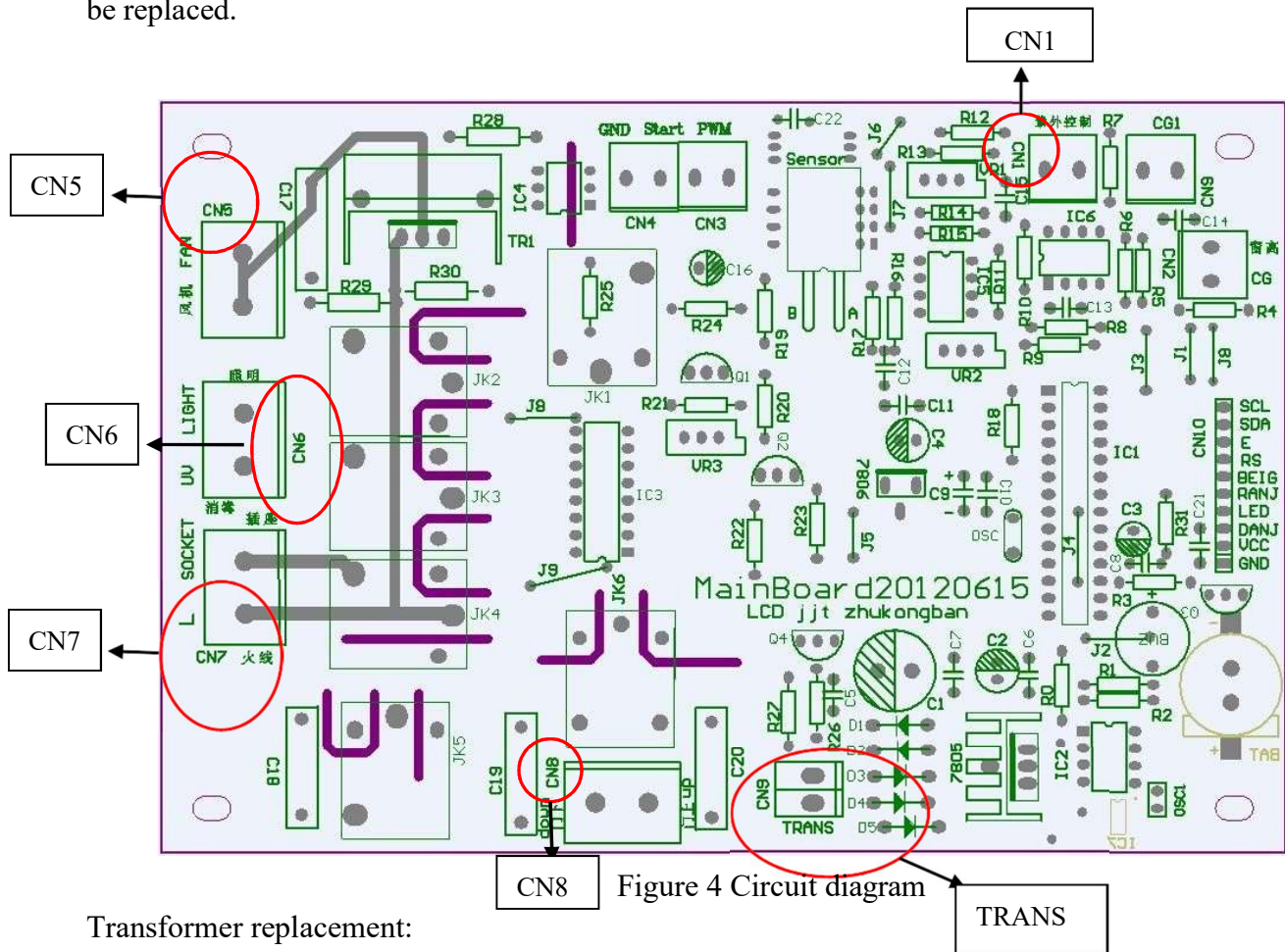


Figure 3 Rear display and control panel

1.4 Use a multimeter to detect whether the input-voltage is normal when switch is open. Test the transformer put-put voltage, the corresponding position in circuit board is TRANS (see Figure 4, the voltage is AC 12V-14V), if the voltage value is lower than 10V, the transformer is faulty and needs to be replaced.



Transformer replacement:

Disconnect the cabinet power supply, supporting the panel as Figure 2. At first, take a picture to record the wirings' position surrounding of the transformer, then remove the connection from the transformer, using a wrench to remove the nut fixed with transformer. After placing the nuts, pads, bottoms into the tool box, remove it and install the new one, then power test.

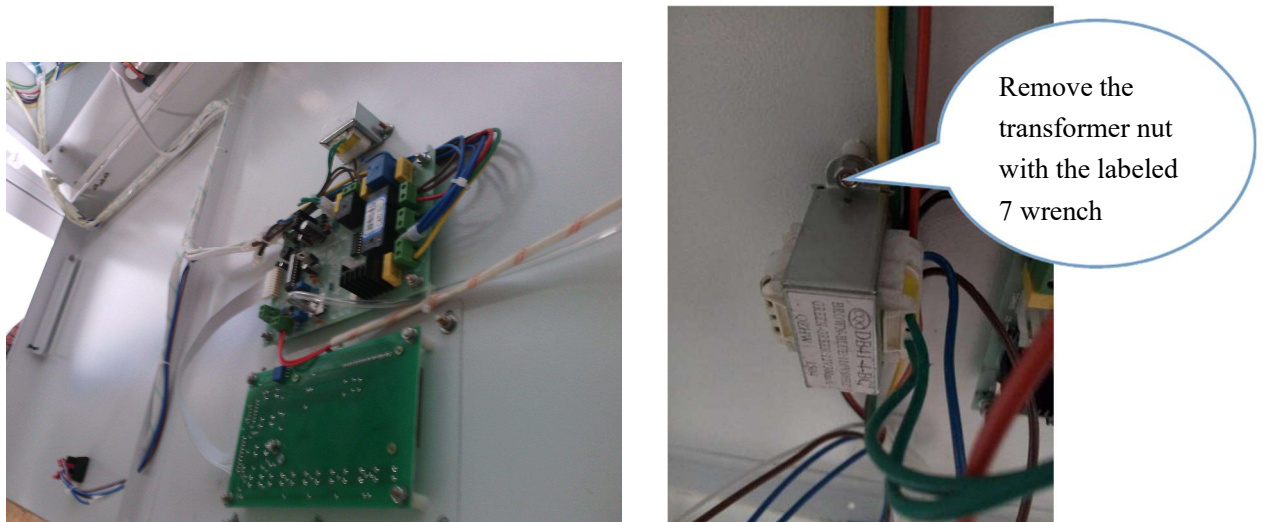


Figure 5 The back of the front panel and transformer

1.5 After confirming that there is no problem in the above items, make sure that the output terminal of transformer is in good contact with the control board connector.

1.6 If no problem, please replace the new control panel. After the power is cut off, take the picture of connection position of the cable, the trachea and the line firstly and then remove it. Then remove the nut that used to fix control board, replacing the defective with the new and fixing the new one using the nut, flat pad, elastic pad (as Figure 3), according to the previous location as records. At last, power test.

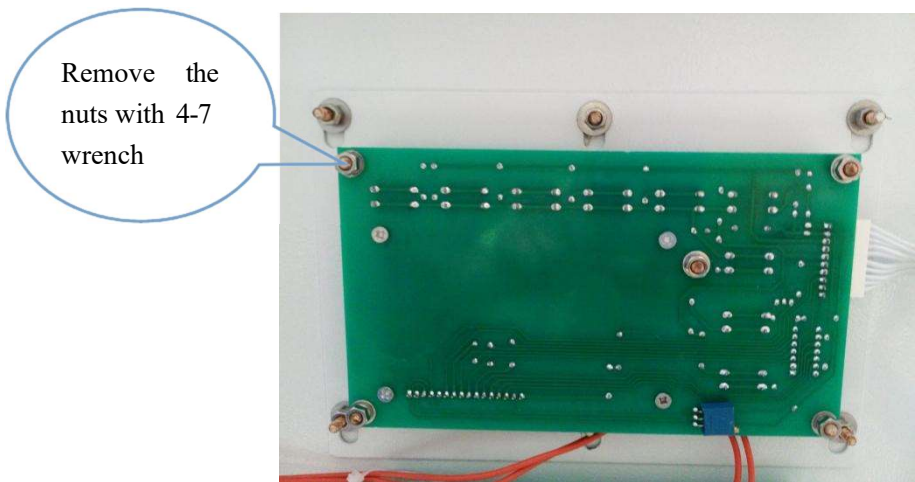
Failure 2:Display or button is not working

It means that when the device is powered on and the power switch is turned on, the display does not work, or display confusion or key operation is not normal.

The troubleshooting methods and steps are as follows:

2.1 Open the front panel (as Figure 2), checking the FFC to connect display board and main control board on the back of Operation panel is inserted, no break or fall off.

2.2 LCD panel is damaged and replaced. After the power is off, take a picture of the connection positions between the display circuit board and the main control board(As Figure 3), then remove the connections cables. After that, remove the fixed nuts of the display circuit board with a 4-7 wrench(as Figure 6) and replace the old circuit board with the new one as the connection pictures. At last, power test.



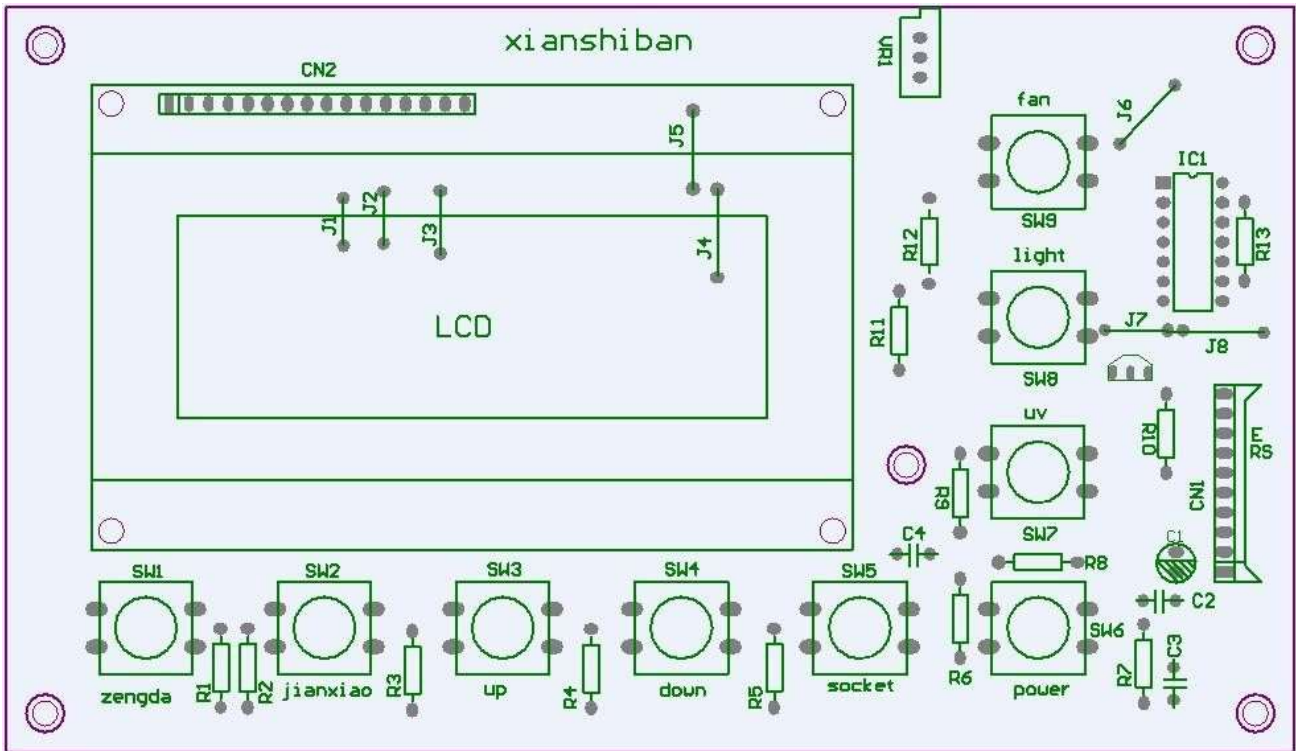


Figure 6 The back of the display screen and circuit diagram

Failure 3: Buzzer does not ring

It refers to that when the device is powered on, the buzzer does not ring after the power switch is turned on and no alarm when the button is pressed.

For such problems, pls directly replace the new control panel.

Failure 4: Front window lift failure

Open the operation panel (as Figure 2) to see the glass door motor. After powered on and switched on the device, press the on-off button, then keep pressing the UP button, using a multimeter to detect the voltage between binding post CN8 (UP) (as Figure 4) and the neutral line (the blue one) of the power switch. The voltage value shall be the power supply voltage of the device. Then, pressing the down to detect the voltage between binding post CN8 (DOWN) (as Figure 4) and the neutral line (the blue one) of the power switch. The voltage value shall also be the power supply voltage of the device. If the multimeter does not show the voltage, the control panel is damaged. If the voltage is normal, connect the brown line that is close to CN8 (Fig. 4) on the control board and the neutral or black line of the motor directly to the AC. If the tubular motor does not operate, it is damaged, so pls replace the tubular motor. Replacement method see Failure 12, pls.

Failure 5: The socket in operation-area is not powered.

After pressing the socket button in control panel and powered on, but the socket in work area is still no electricity. The troubleshooting methods and steps are as following:

5.1 Turning on the power switch of the device, press the on-off key and the socket key in turn to observe whether the socket mark on the display is shown or not. If not, the control board or the display panel is damaged, replace the new circuit board.

5.2 Opening the operation panel (as Figure 2), the device is powered on and the power switch is turned on, then press the power button and socket button in turn, using the multimeter to test voltage between the "socket" terminal on the CN7 (Figure 4) and Zero line(the blue one). In normal, the voltage values should be the supply voltage of the device), if no electricity, control panel damaged and replace the control panel, pls.

5.3 After confirming that there is no problem in the above items, remove the splash proof socket in the operation area, and measure the voltage of wire which is connected to socket using a multimeter(The voltage value should be the supply-voltage of the equipment) and judge whether the socket is damaged or not.

If the voltage is normal, the splash proof socket is damaged, and replace the splash proof socket, pls. If the voltage is not normal, after the device being powered off, detect whether the wire is disconnected between socket Fire Wire and "socket" end on CN7 (Figure 4) control panel. Then detect whether the wire is disconnected between zero line of socket and the power switch. If broken, please check the middle conductor to find the circuit breaker and reconnect.

How to replace the socket ?

When it is power off, open the control panel (Figure 2) and take a photo to record the wiring position, then remove the wiring and the screws around the socket with a Phillips screwdriver, then install the new socket in the corresponding position and fix it firmly, finally, according to the wiring position picture, put down the operation panel, and powered on to test.

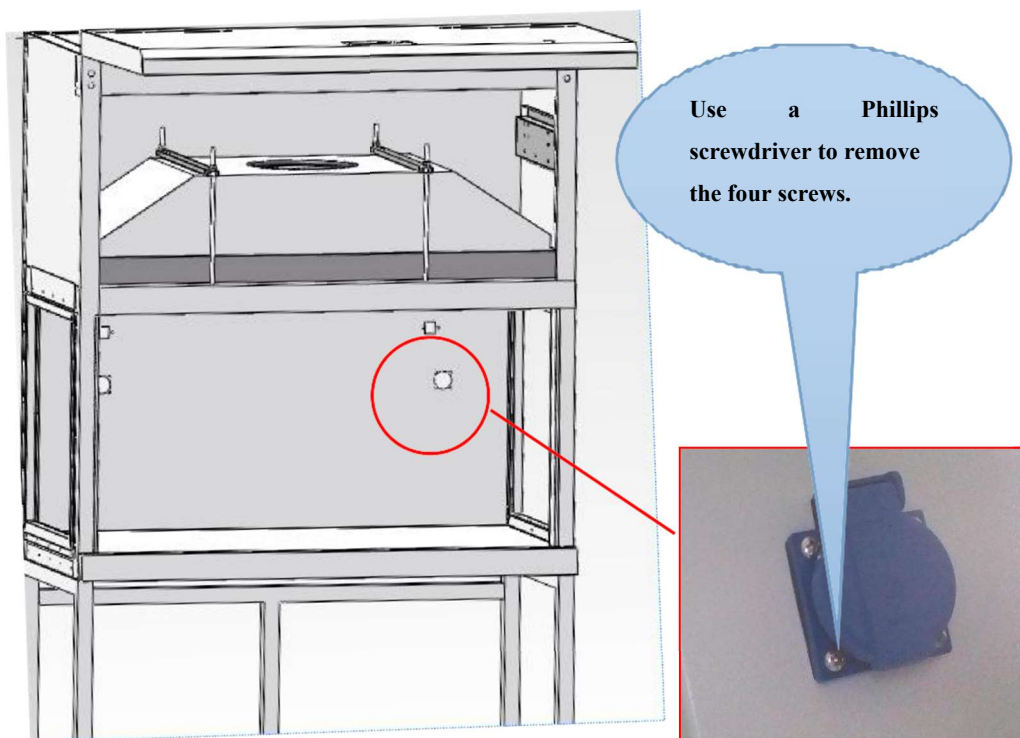


Figure 7 Front and back view

Failure 6:Fluorescent lamp fails to work.

It means that when open the light, it does not work.

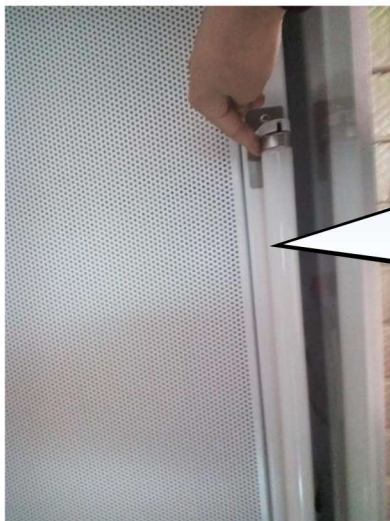
The troubleshooting methods and steps are as following:

6.1 Confirm the two terminals of lamp and the holders are in good contact. Removing the lamp to confirm whether the lamp tube is black, if it is black, the light is damaged, and replace the same lamp. (as Figure 8)

6.2 If ok for the above item, opening the operation panel (as Figure 2), when the device is powered on and the power switch is turned on, press the power button and the illumination button, and use the multimeter to detect the voltage between the "light" terminal on the CN6 control board(as Figure 4) and the zero line (blue line) of the power switch. The voltage value should be the supply voltage of the equipment. If there is no voltage, the control board is damaged and replace the new control board, pls.

6.3 After checking the above items, if no problem, combing the wirings between lighting lamps and lighting ballasts, lighting ballasts and control panels. Verify whether the connection is loose or not, if loose, reconnect it, pls.

6.4 If all is ok, the ballast is damaged, replace it with new one, please. (Figure 9)



Place your hands on both ends of the lamp, close to the lamp holders of both sides, and then rotate the lamp clockwise (or counterclockwise) by 90 degrees with both hands, then remove the lamp as shown in the figure. After the new tube is inserted into the lamp holder, rotate the tube clockwise (or anticlockwise) by 90 degrees according to the above method, and the installation is completed. At last, the power-on test can be performed.



Figure 8 UV lamp, fluorescent lamp

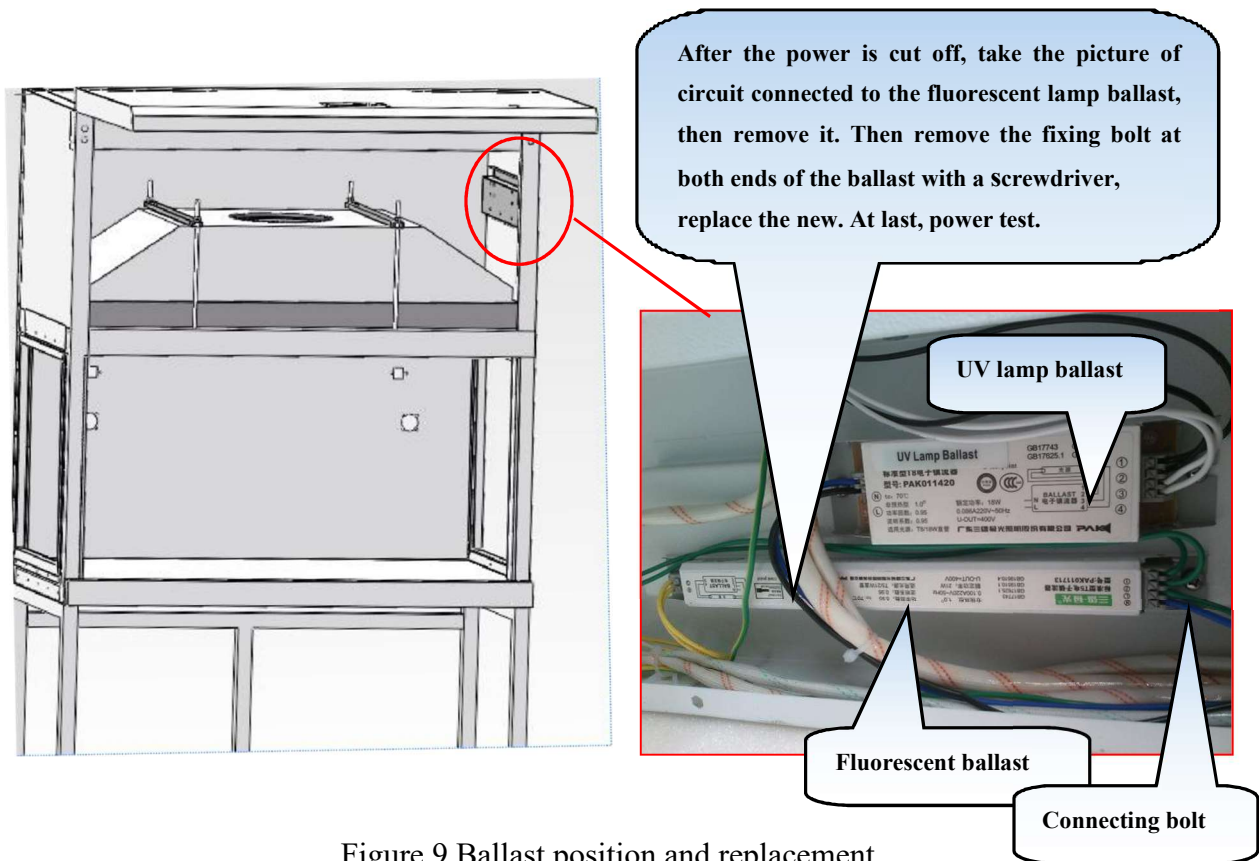


Figure 9 Ballast position and replacement

Failure 7:UV lamp fails to work.

When the UV lamp is turned on, but it can be turned. The treatment methods and procedures are as follows:

7.1 Confirm that the lamp legs on both sides are in good contact with the lamp holder, and remove the lamp to confirm whether the internal filament on both sides of the lamp is disconnected or not. If the circuit is broken, the UV lamp is damaged, then replace it. (The replacement method is same as fluorescent lamp, as Figure 8).

7.2 If there is no problem occurred as described above, open the control panel (The details are shown in Figure 2), check whether the UV control interlocking microswitch (Figure 10) and the wire are damaged or broken. Connect the wire to the CN1 of the circuit board (Figure 4). If the microswitch is not able to contact the front window glass at the top of the limited stroke, the microswitch is replaced.(see Figure 10)

7.3 If there is no problem occurred as described above, when the device is powered on and the power switch is turned on, press the power button and UV button, and use the multimeter to detect the voltage between the "UV" terminal on the CN6 control board(as Figure 4) and the zero line (blue line) of the power switch. The voltage value should be the supply voltage of the equipment. If there is no voltage, the control board is damaged and replace the new control board, pls.

7.4 If everything is working fine, comb the wire between the ultraviolet lamp and the ultraviolet lamp ballast, the connection of wire between the ultraviolet lamp ballast and the control board. If the wire is loose, reconnect the wire.

7.5 If everything is working fine, Ballast is damaged, replace the new ultraviolet lamp ballast of the same specification.(The same method of replacing the fluorescent lamp ballast, See figure 9)

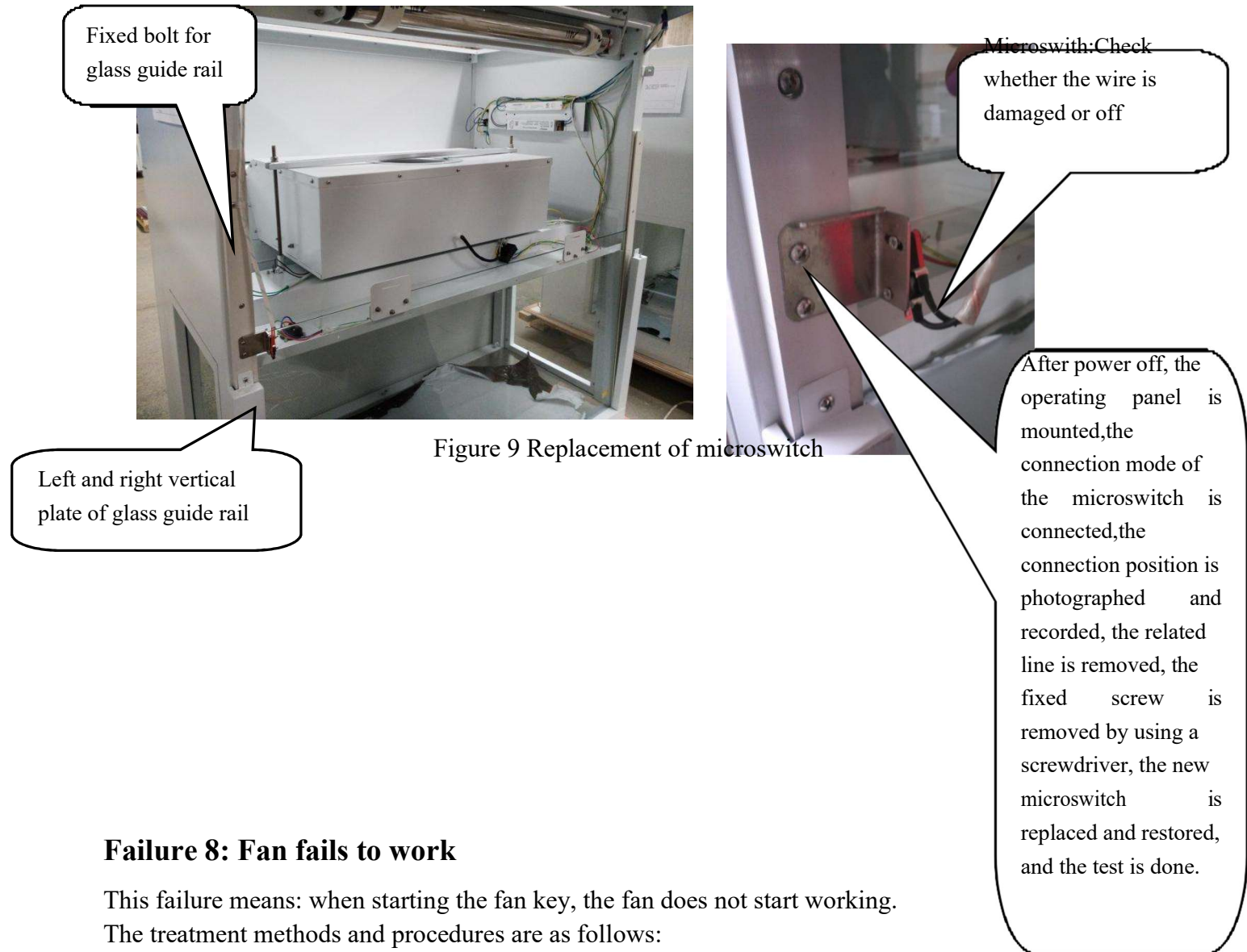


Figure 9 Replacement of microswitch

Failure 8: Fan fails to work

This failure means: when starting the fan key, the fan does not start working. The treatment methods and procedures are as follows:

8.1(Note : Factory setting :The fan does not start when the window falls to the bottom),The equipment is powered on and the power switch is turned on. Press the power supply key and fan key in turn to see if the fan sign is displayed on the display screen.If not displayed, open the operating panel to check if the UV light interlocking microswitch (figure 6) or its connecting wire is damaged or broken, if has been damaged or broken, replace stroke switches or reconnect wires. If it is lit, use a multimeter to detect the voltage between the "FAN" end of the control board CN5 (as shown in figure 4) and the zero (blue line) of the power switch, if no voltage or voltage is too low (the voltage value should not be less than half of the supply voltage of the equipment), and the control board is damaged, replace a new control panel.

82 If there is no problem occurred as described above,connect the zero line of the fan fire line directly to the city electricity, observe whether the fan starts or not. If the fan is not started, the fan is damaged and need to replace the same type of fan

83 If everything is working fine, combing and detecting whether the connection wire between the fan and the circuit board is loose or broken. If the connection is loose or broken, reconnect the wire.

Failure 9: Air velocity adjustment

91 Zero setting: Turn off the fan, When the fan stops running, test both ends of the voltage of Capacitance C9 (note positive and negative poles), Should be between 0.4-0.45V, If it deviates from this value, adjust the potentiometer VR1. (it has been adjusted when leave the factory)

92 Adjustment of Airflow Velocity: Open fan and when the fan runs stably, when there is a difference between the display airflow velocity and the measured airflow velocity, the VR2 of the potentiometer is adjusted to make the displayed airflow velocity as measured value. (this is the only step you can do if there is an exception.)

93 The Airflow Velocity is too large.: When the airflow velocity is too large and is far above the normal range, it means that the trachea is bent. Check according to the trachea line (Fig. 10), if slightly bent, the alignment can be continued. If damaged, replace a new trachea.

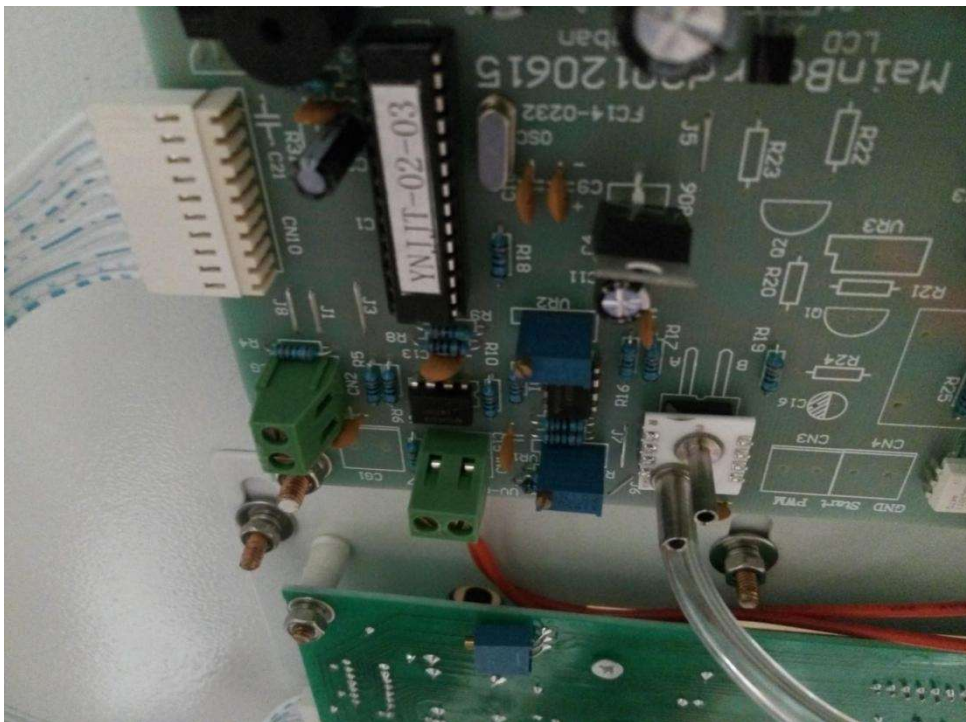


Figure 10 Connection between trachea and control panel

Failure 10: Front window Replacement

10.1 Firstly, put the glass to the minimum height, when it reaches the work table, cut off the power, and then support the panel, like Figure 2

10.2 Remove the screws on the right glass guide and vertical plate, As shown in figure 9, Place the unloaded screws in the tool box and remove the glass rails on one side.

10.3 Loosen belt adjustment lock fastening, Remove the glass from the right side, then remove the fixed bolt of the glass splint, replace a new equivalent glass, Finally, follow the above steps to restore, adjust the left and right side of the glass conveyor belt to ensure the horizontal rise and fall of the glass, like Figure 11

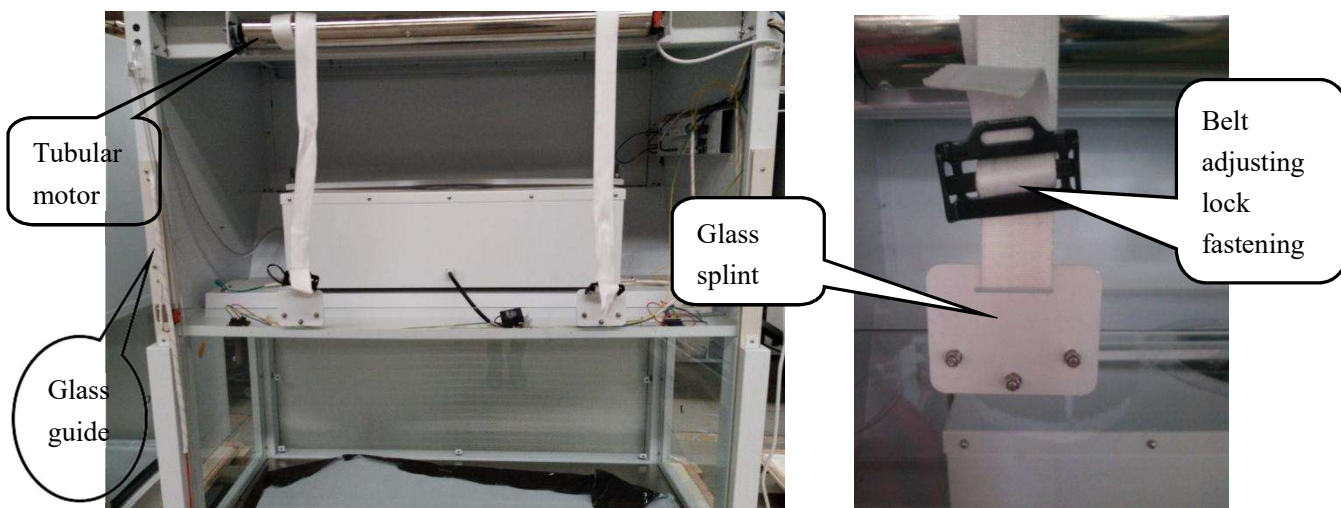


Fig. 11 location and replacement of front window glass

Failure 11: Side Glass Replacement

From the inside of the cabinet, remove the fixed screws around glass frame, put the screws in the tool box, Then remove the glass frame and replace the glass, finally install it again (figure 12).

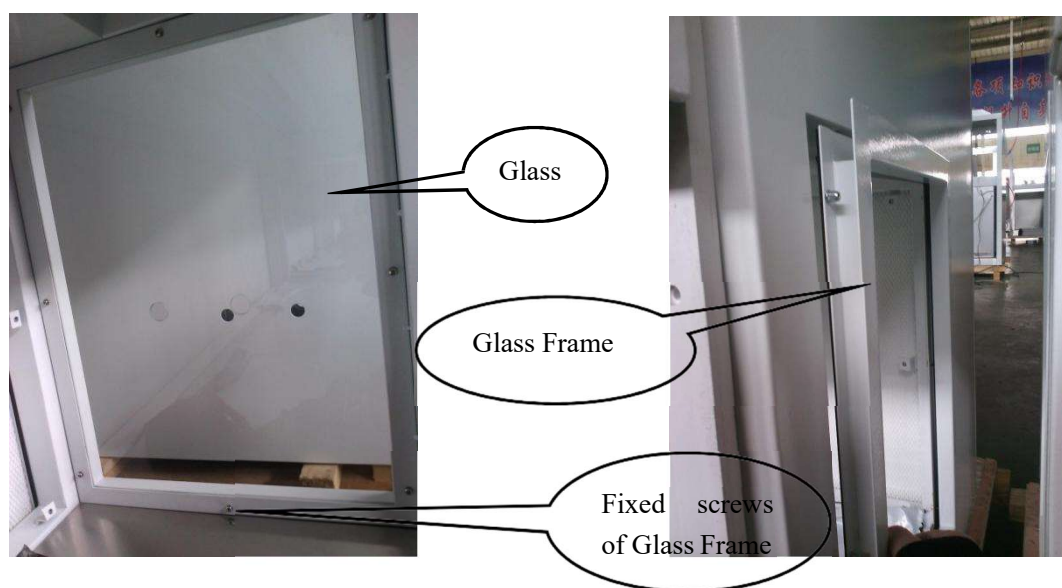


Fig. 12 Side window

Failure 12: Motor replacement

12.1 Firstly, put the glass to the minimum height, when it reaches the work table, cut off the power, and then support the panel, like Figure 2

12.2 Record the connection position of the tubular motor by photo, Then remove the connection between the tubular motor and the main control board, loosen belt adjustment lock fastening, separate the conveyor belt from the glass.

12.3 Release the mounting screws on both sides of the tubular motor (Tightness degree: The scaffold can move freely.) , Remove the fixed pin at one end of the tubular motor, And move both sides of the scaffold to both sides, Finally, remove the tubular motor , replace the new tubular motor of the same

size,install glass, Power on and test, as shown in Figure 13

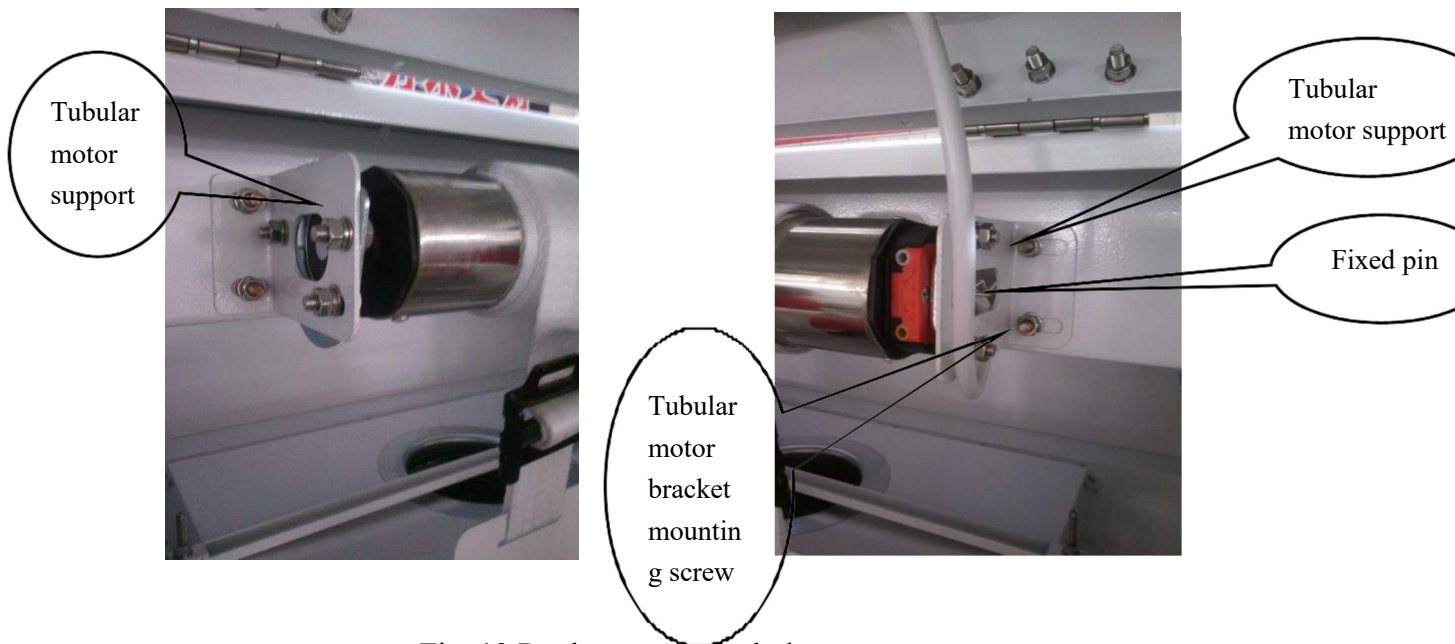


Fig. 13 Replacement of tubular motor

Note: after replacing the glass door motor, the glass stroke needs to be readjusted as follows:
 Adjustment of glass stroke: First, open the front panel (figure 2),Switch (the power) on, firstly,press the glass up button ,Hold down until the glass reaches its highest point, if it below the specified height,adjusting the lower side regulating hole by hexagonal adjusting rod of tubular motor in counterclockwise rotation; If the lifting height of the glass exceeds the specified height, then regulate upper side regulating hole of tube motor in clockwise rotation; Press the glass down button until the glass falls to the bottom, If the glass can not drop to the bottom , regulate upper side regulating hole of tube motor in counterclockwise rotation; If a long part of the belt leaks out after the glass falls to the bottom, then regulate lower side regulating hole of tube motor in clockwise rotation,Until the front window is in the same position as before it is replaced. As Figure 14

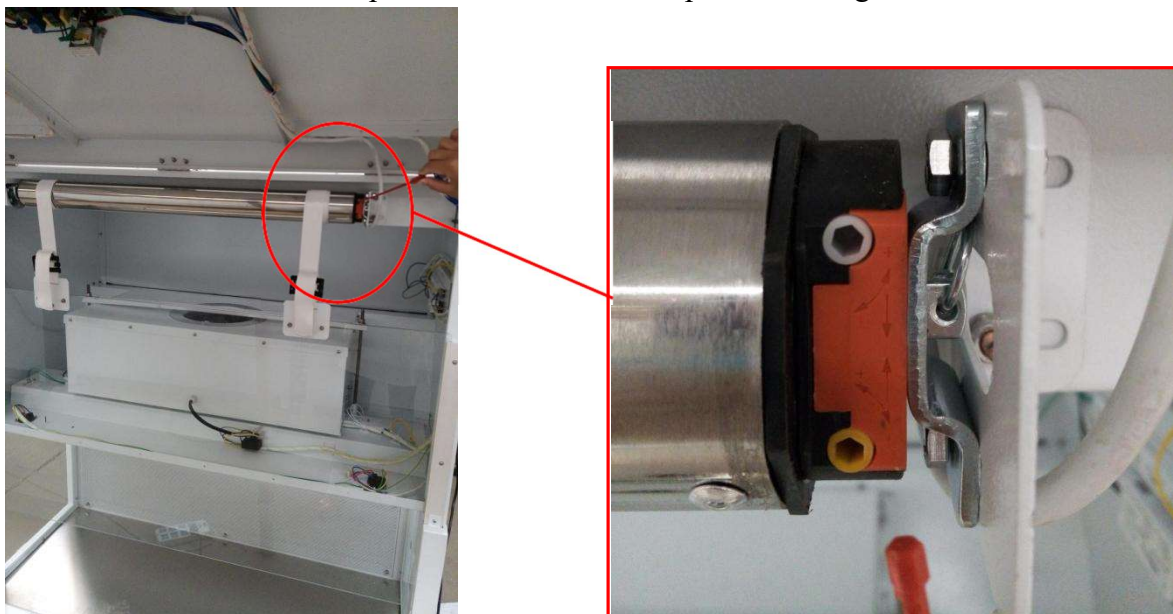


Figure 14

Failure 13:Water tap and gas tap replacement

13.1 First, remove the pipe which gas tap (or water tap) connected, etc.

13.2 Use a wrench to gently remove the glass external nut,put disassembled nut, gasket in tool box, then can take gas tap (or water tap) out of the cabinet,be careful that do not damage the glass, Figure 15

13.3 After cleaning the glass, install the same gas tap(or water tap)according to the instructions, and connect firmly.



Figure 15

II Fan and filter replacement

After replacing the fan or filter, first use an anemometer to test whether the airflow velocity is within the normal range. If the airflow velocity is satisfied, you can use it. If the airflow velocity is not within the normal range, then adjust the airflow velocity according to the manual and let the airflow velocity within a normal range.

1. Fan replacement

1 when the cabinet is out of power, support the operating panel, take pictures and record the connection of the fan, and remove the connection of the lead from the fan, as shown in figure 2

1.2 Use the No.17 wrench to unscrew the fixed nut of the fan's presser, Take off the nut, flat pad, elastic pad in the tool box, take off the fan pressure rod, and screw out the wire rod in the front side, See figure 16.

B Pull up the fittings of the fan installation board and separate the diagonal angle to the cabinet., see Figure 16, Unscrew the nuts on the left and right sides of the fan mounting plate with a wrench ,Place the unloaded nuts, flat mats and bomb pads in the tool box, see Figure 17, remove the fan mounting plate 2 from the fan mounting plate .

Spin out the stud between the fan and the fan mounting plate 2 with a wrench marked 10 , Replace prepared fans of the same specifications, finally restore and reinstall the wire according to the connection recorded in the previous photo, switch on it to test.

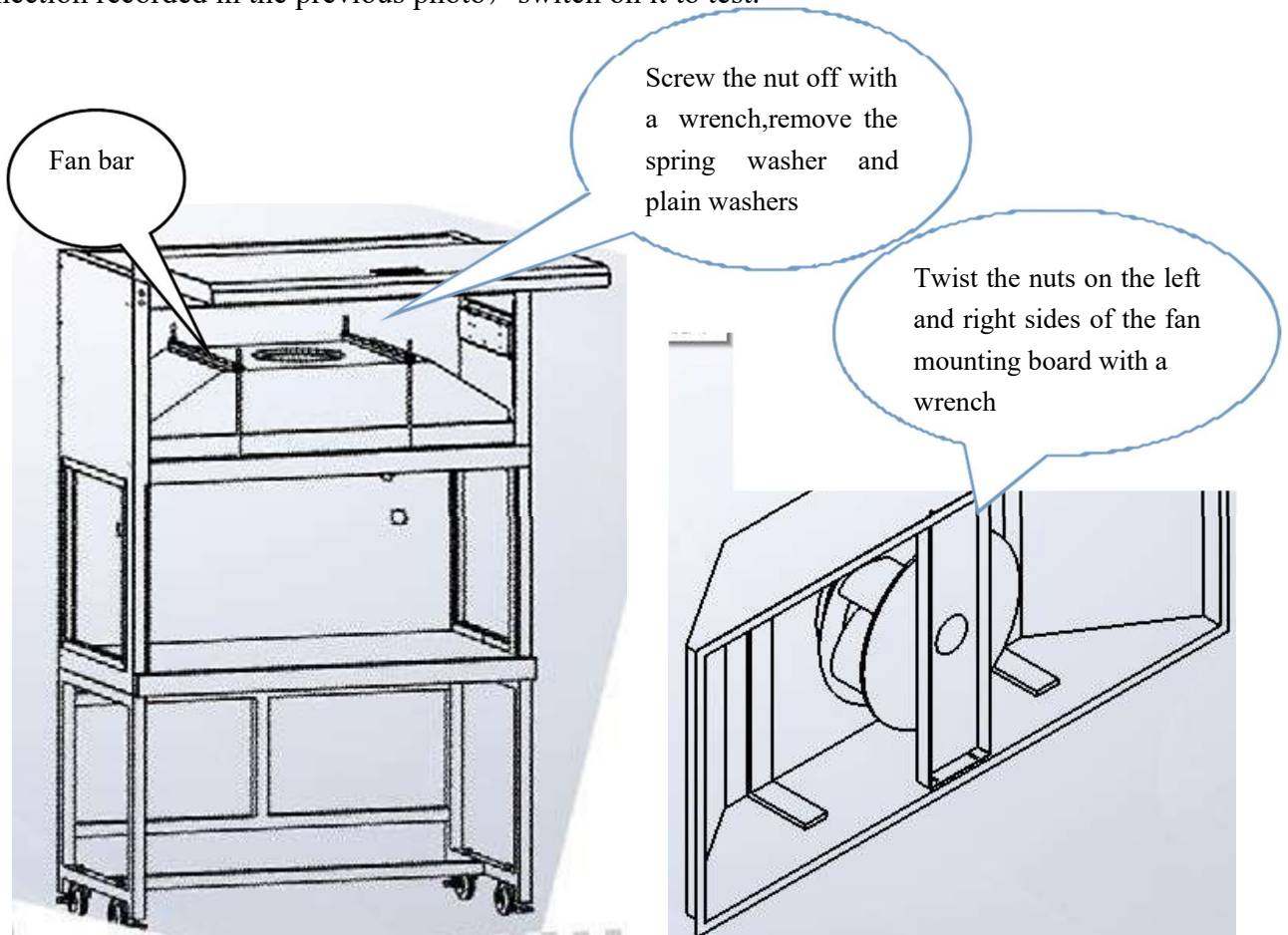


Figure 16 Dismantlement of Fan mounting board



Figure 17 Dismantlement of Fan

2. Filter replacement under the conditions

1. The wind speed is still not up to the standard requirements after the normal operation of the fan and adjustment of the fan gear;
2. According to the specific environment and frequency of use, the dust particles are detected beyond the normal range (or dew point).
3. Exceed the normal service life of high efficiency filter

The method for replacing the filter is as follows

Note: Pls make sure that laboratory tests are stopped before replacing the filter, Turn off the power supply, working staff wear isolation clothe.

1. Take out the fan and set it aside according to step 1 / 2 / 3 (figure 18);
2. Pull the filter up and tilt the filter out of the front at a certain angle, replace the new filter, install the filter in the prepared bag, and follow the above steps to restore the filter.

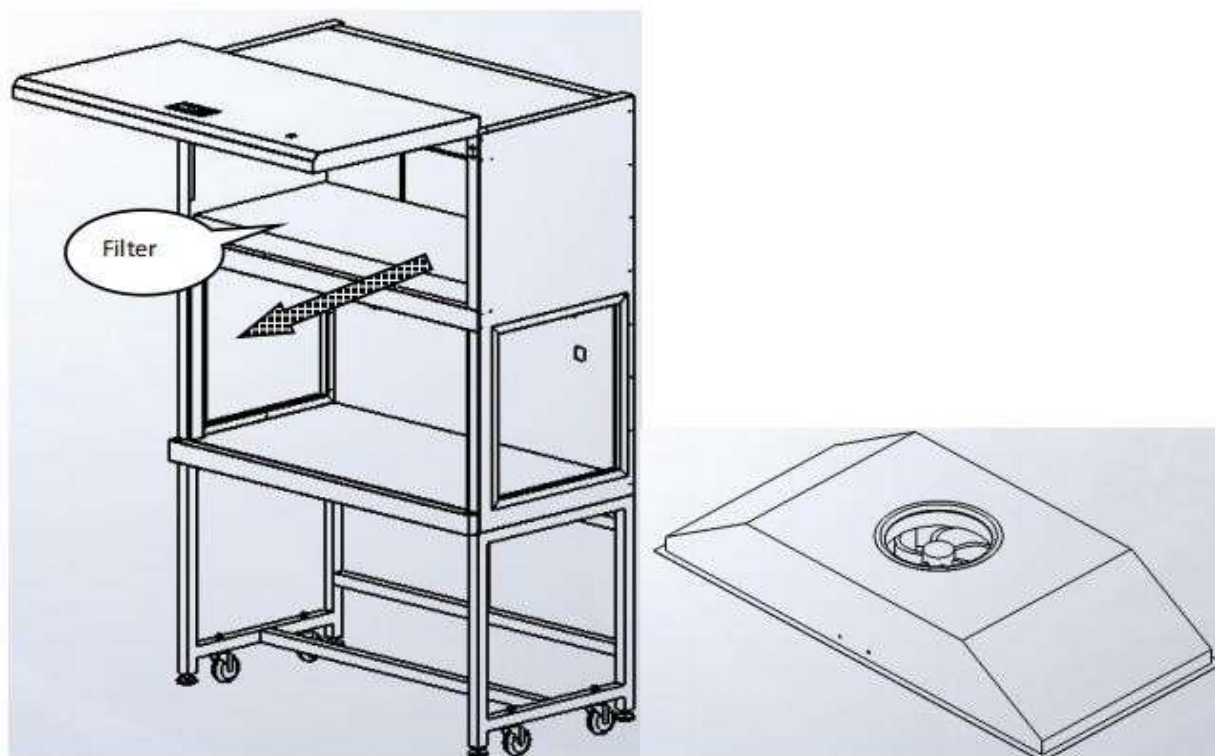


Figure 18

After the filter is replaced, turned on the switch and the display screen,adjust the air volume of filter, and the normal air volume is within 0.45 ~ 0.4m / s.(as shown in figure 19) (Due to different cabinets, the gears are different, as long as the air volume is 0.45 ~ 0.4m / s after 5 minutes' operation.)



Figure 19

3. Pre-filter replacement

Due to too much dust and other debris, when the pre- filter is damaged, pls replace it.(figure 20)

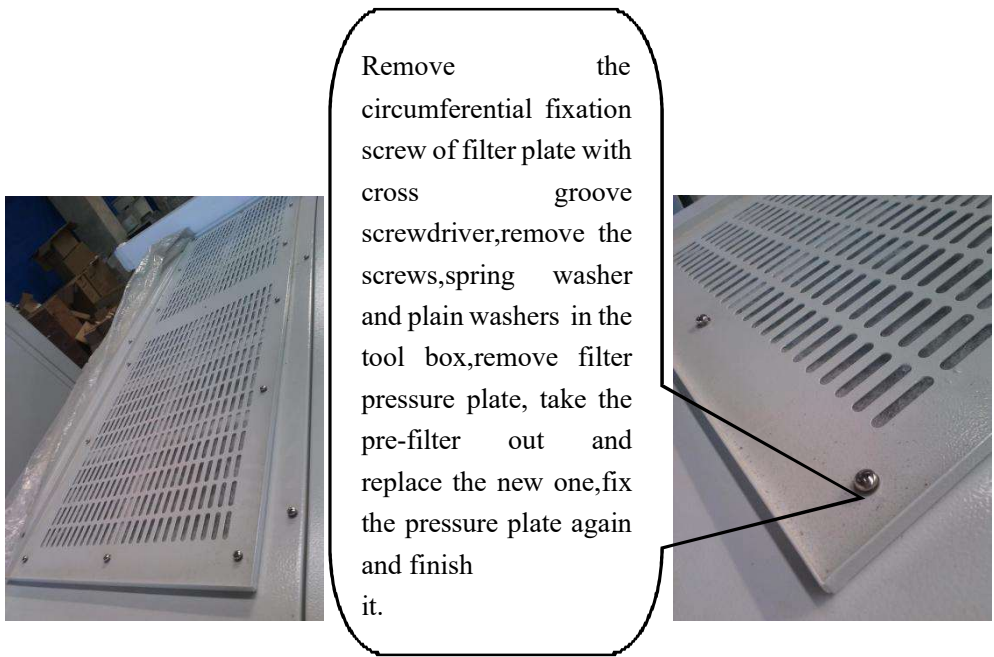


Figure 20