



## Service Manual for VT-DS300SS-2Z and VT-DS300SS-2Z-L

This wine cooler should be serviced by a qualified technician.

**Be sure to have the unit *unplugged* while repairing the unit.**

### Tools Required:

1. Tool for Electrical Apparatus Troubles: multi-meter, split-core type meter, power meter, Philips screwdriver, long flat nose pliers, vice, power board, control board, etc.
2. Tool for Cooling Troubles: suds, brush, R134a gas, nitrogen, oxygen/acetylene soldering set, oxygen, acetylene,  $\varnothing 6 \times 0.7$  copper tube,  $\varnothing 4 \times 0.7$  copper tube, silver-copper brazing alloy, scaling powder, etc.

### Troubleshooting & Maintenance:

#### I. Troubleshooting for Electric Control:

1. Unworking Display. Display does not appear to be working, Display does not appear to be working after the appliance is turned on.

(1) Please refer to the clearance procedures below:

No display in the control panel.

Check if the electricity is available in the socket. →No. →Repair the socket.

Yes. →Open the terminal box lid of the medium air duct pane.

Yes. →Check if the wires of terminals are connected rightly.

Loose →Connect the terminals rightly or change it. →Inspect it with power-on. → OK. → Trouble clearing. → Still not normal.

OK. → Change with a normal control panel.

Inspect it with power-on →OK. →Change the control panel. → Inspect it with power-on. → OK. → Trouble clearing. → Still not normal.

Not normal. → Change the PC board.

Inspect it with power-on. →OK. →Change the PC board. → Inspect it with power-on. → OK. → Trouble clearing. → Still not normal.

Not normal. → Change the PC board and the control panel.

Inspect it with power-on. →OK. →Change the PC board and the control panel. → Inspect it with power-on. →OK. → Trouble clearing. → Still not normal.

Not normal. → Check if each 7P terminal is short circuit or open circuit.

Repair 7P terminals.

Inspect it with power-on. → OK. → Trouble clearing. → Still not normal.

(2) Disassembly inspection for the median air duct panel

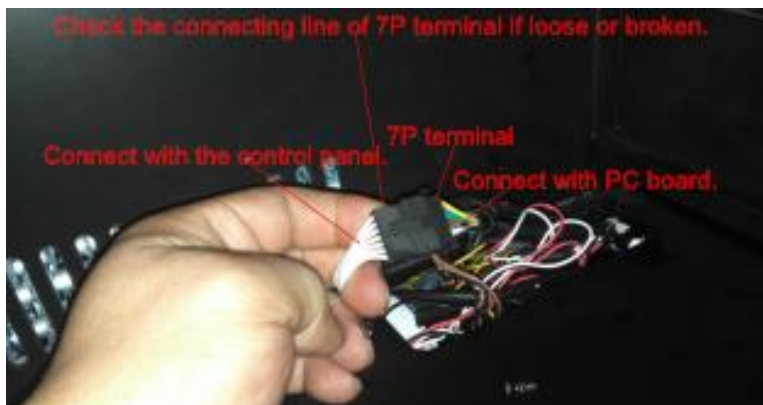
1. Remove the two shelves on top of the median air duct panel



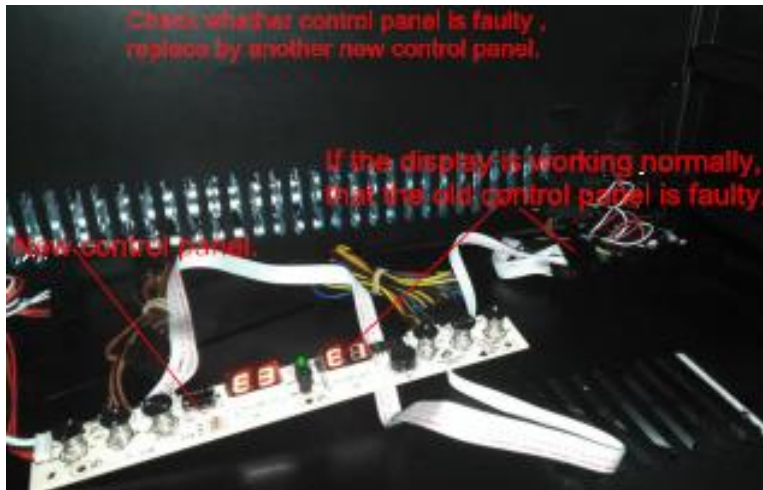
2. Remove the connecting line box cover by removing the screw from the left side with a Philips screwdriver. Check the connecting line box cover.



3. Check the connecting line of 7P terminal if loose or broken. Connect with the control panel. Check the 7P terminal. Connect with PC board.

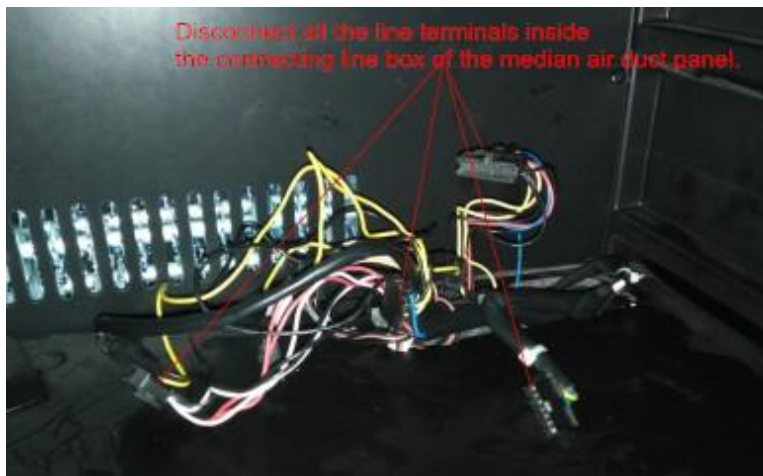


4. Check whether the control panel is faulty by replacing it with another new control panel. If the display is working normally, then the old control panel is faulty. New control panel.

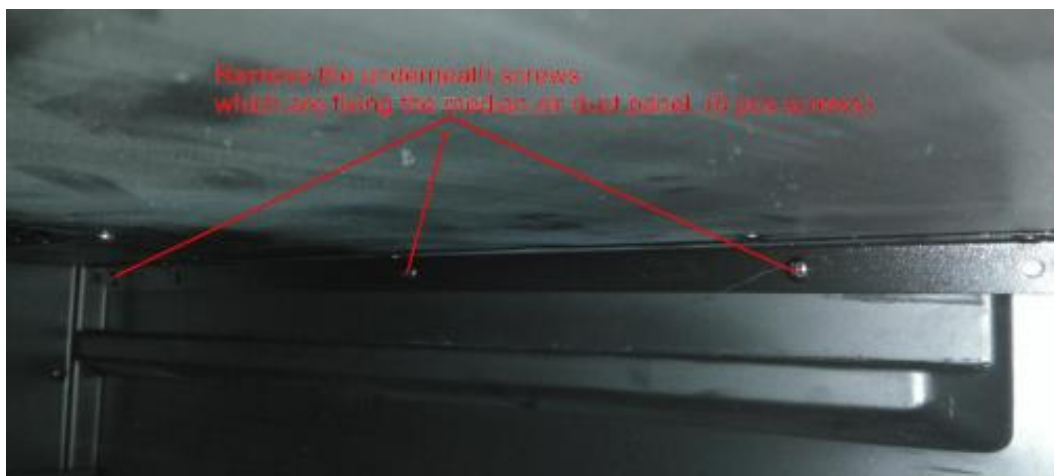


### (3) Replace control panel

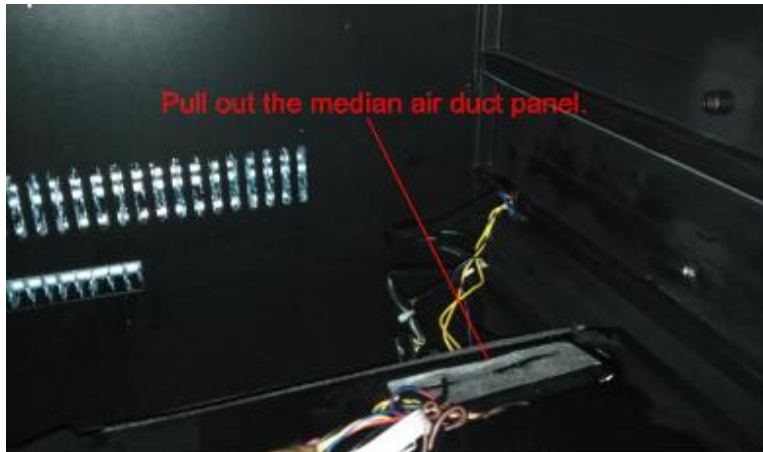
1. Disconnect all the line terminals inside the connecting line box of the median air duct panel.



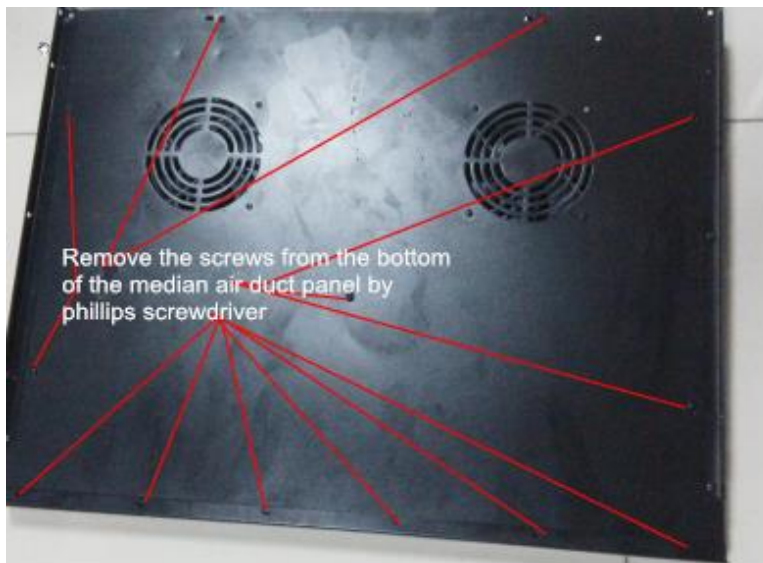
2. Remove the underneath screws which are fixing the median air duct panel. (6 pcs screws)



3. Pull out the median air duct panel



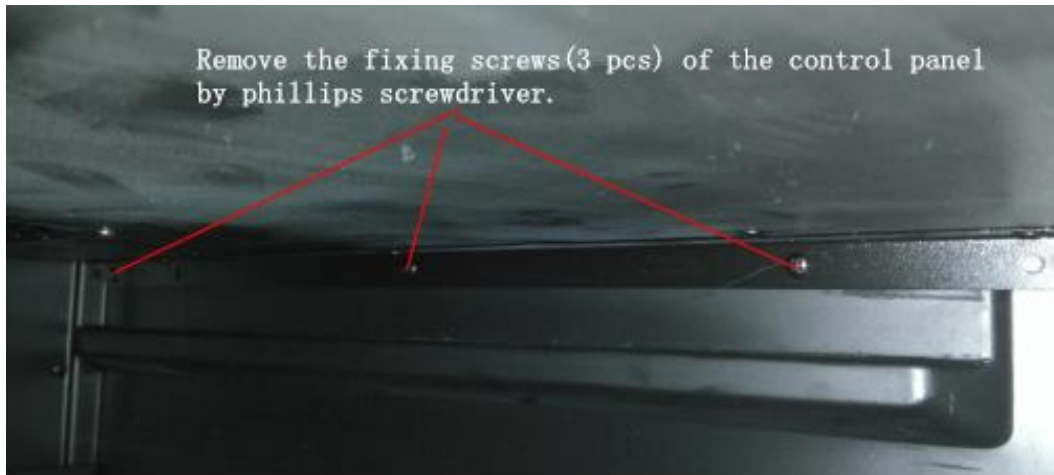
4. Remove the screws from the bottom of the median air duct panel with a Philips screwdriver.



5. Divide the upper and lower of the median air duct panels. Be sure to observe the position of the wires. After replacing the control panel, fix the wires by aluminum-foil paper in the original position.



6. Remove the screws (3 pcs) which are fixing the control panel with a Philips screwdriver.



7. Loosen the control panel, remove the screws (5 pcs) with a Philips screwdriver. Keep the small hose sideward.



After maintenance, install the median air duct component as the opposite disassembling procedures.

(4) Replace the power board (Power board is inside of the compressor cabin)

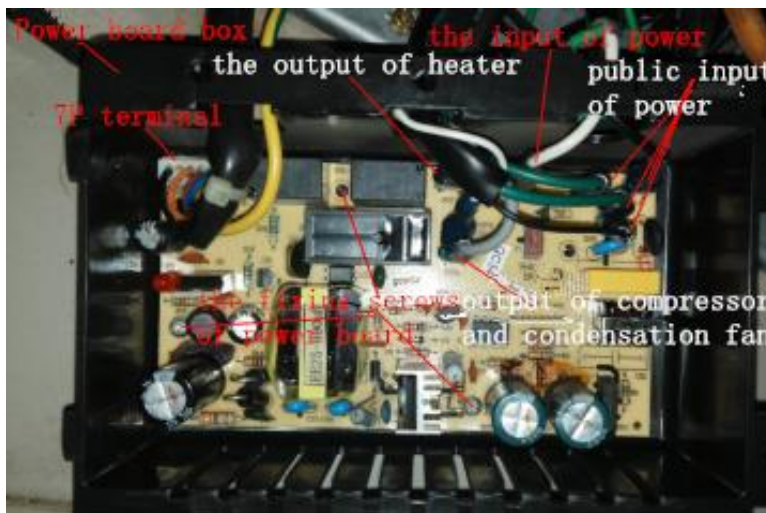
1. Remove the fixing screws (2 pcs) of the power board with a Philips screwdriver.



2. Remove the power board box by hand.



Power board box, 7P terminal, the output of heater, the input of power, public input of power, the fixing screws of power board, output of compressor and condensation fan.



2. Display not working or other display fault, replace the control panel as with the same disassembling method, check if it solves the fault after assembling.
3. Unworking Compressor: if the temperature of the inside is higher than the setting temperature 3°C above, the compressor does not appear to be working.

(1) Please refer to the clearance procedures below:

Unworking compressor.

Check the control display if working. → No. → Inspection procedure as no display troubleshooting.

Yes. → Check the compressor power supply. → Yes. → Check the starter protector of the compressor if working normally and the coil winding if turned off. → Replace the damaged starter, protector, or compressor. → Inspect it with power-on. → Normal. → Trouble clearing. → Still not normal.

No. → Remove the PC board box, check the output of compressor if there is voltage outputted.

Check the PC board if there is voltage out-putter from the compressor. → Yes. → Check the lead and terminal of the compressor if turn off. → Replace the defective lead or terminal. → Inspect with power-on. → OK. → Trouble clearing. → Still not normal.

No. → Replace the PC board.

Inspection with power-on. → OK. → Replace the PC board. → Inspection with power-on. → OK. → Trouble clearing. → Still not normal.

Still not normal.

Replace the control panel.

Inspection with power-on. → OK. → Replace the control panel. → Inspection with power-on. → OK. → Trouble clearing. → Still not normal.

Still not normal

Replace the PC board and the control panel.

Inspection with power-on. → OK. → Replace the PC board and the control panel. → Inspection with power on. → OK. → Trouble clearing. → Still not normal.

Still not normal.

## (2) Disassembly of the connecting line and terminal for the compressor

1. Pry up the buckle from connecting line box of compressor with a screwdriver

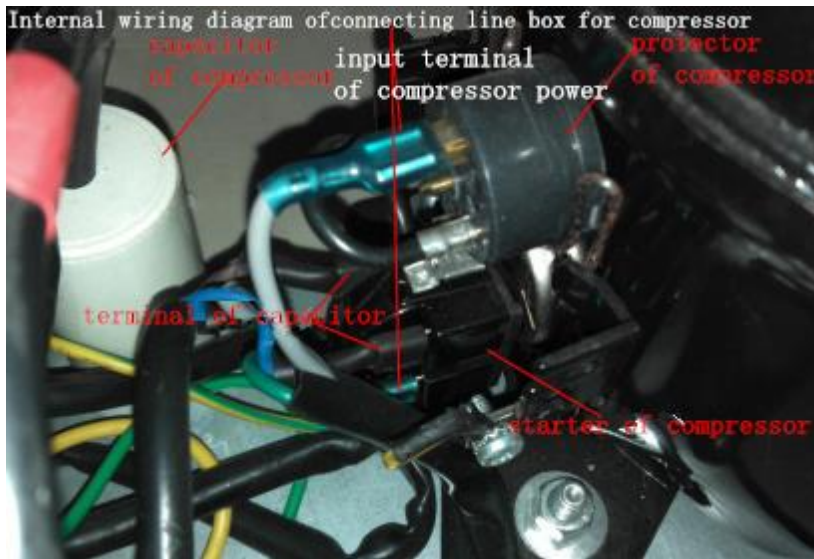


2. Remove the connecting line box by hand.



### 3. Internal wiring diagram of connecting line box for compressor

Capacitor of compressor, terminal of capacitor, input terminal of compressor power, protector of compressor, starter of compressor



4. Controlling temperature is faulty: If the temperature is different by 4°C from setting the temperature when cooling, that is out of control. It is caused by the fault from the broken sensor, heater or the fan.

(1) Please refer to the clearance procedures below:

Displays faulty temperature (can freeze)

If the temperature of the lower compartment couldn't be set to above 15°C?

Is the temperature of the upper compartment normal? →Yes. → Deal with the fault as per the lower compartment couldn't be set to above 15°C (and the setting temperature is above 15°C).

No. → Check according to the logical table of the fan operating in the compartment.

Check if each fan runs seamlessly in the compartment. →No. → Check the terminal of the abnormal fan.

→① Broken. → Repair the terminal. → Inspection with power-on. →OK. →Trouble clearing.

→② No damage. → Check the voltage of the fan terminal with power-on (12VDC). →Normal.

→ Change the fan. → Inspection with power-on. → OK. →Trouble clearing.

→③ No. → Open the terminal box lid of the medium air duct panel to check the corresponding terminal of the fans. → Check the voltage of the fan terminal with power-on (12VDC). →Normal →Repair the bad contact. →Inspect with power-on. →OK. → Trouble clearing.

→④ No DC voltage output. → Change the electric control board.

→Inspect it with power-on. →OK. → Trouble clearing.

Yes.

Check if the evaporator is frozen heavily. (Frozen is normal.)

Frozen heavily

Check if there is a gap in the door seal. → Change or repair the door seal to make sure there is no air coming through the door and it's sealed strictly. → Inspection with power-on. →OK.



→Trouble clearing.

Check the sensor of defrosting. →OK.

Change the sensor of defrosting.

Inspection with power-on (Frozen heavily). →Frozen heavily  
OK.

Trouble clearing.

(2) If the temperature of the lower chamber doesn't reach 15°C above (setting temperature 15°C above), please refer to the clearance procedures below:

Remark: (a) If the temperature of the lower chamber of the wine cooler is different by 3°C above from the setting temperature, maintain 3 hours above (full wine loading after switch on unit overnight, then checking the temperature difference), that is abnormal temperature to be inspected; (b) When the ambient temperature is very low (For example: ambient temperature is 0°C), the temperature of the unit inside appear to be abnormal, it cannot reach 15°C above when the ambient temperature is very low. That is normal.

Problem with the temperature of the lower chamber is higher than 15°C.

Check if the ambient temperature is too low. →Yes. → Trouble clearing.

No. →Check if the setting temperature is higher than 15°C. →No. → Setting the temperature to 18°C. →Check it after 3 hours with power-on. →OK. → Trouble clearing.

Yes. →Check the fans inside after 1.5 hours. →No. →Check the connecting of the abnormal fan. →

①Abnormal →Repair it. → Inspection with power-on → OK. →Trouble clearing.

②No damage. →Check input power of the fan (12VDC) → OK. →Replace the fan. → Inspection with power-on. → OK. →Trouble clearing.

③No. → Remove the connecting line box from the medium air duct panel, and check the terminal of the fan. →Check input power of the fan (12VDC) → OK. →Repair the bad contact. → Inspection with power-on. → OK. →Trouble clearing. → Still not normal

④No DC voltage output. →Replace the control panel. →Inspection with power-on. → OK. →Trouble clearing. → Still not normal

Check if the control board has voltage output after 1.5 hours with the power-on →No. → Replace the PC board. → Inspection with power-on → OK.

→Trouble clearing. → Still not normal

Yes.

Check the terminal and PTC heater. → Not normal. →Repair the terminal or replace the PTC heater. →Inspection with power-on. → OK.

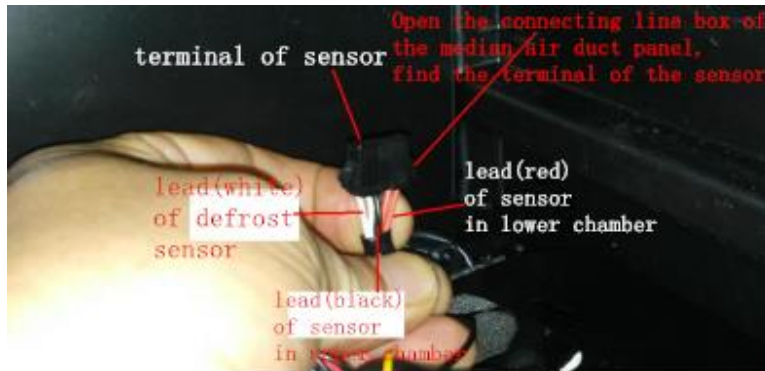
→Trouble clearing. → Still not normal

Normal.

(3) Check the resistance value of the sensor

- (a) Open the connecting line box of the median air duct panel, find the terminal of the sensor component, check the resistance value of each connecting line by multi-meter. If it's close to the comparison table of temperature/resistance value, then it's good. If the appliance is turned off or has an open circuit, the sensor is broken and needs to be replaced.

Terminal of sensor, lead (white) of defrost sensor, lead (black) of sensor in upper chamber, lead (red) of sensor in lower chamber



- (b) The comparison table of temperature/resistance value for the sensor  
Temperature resistance value for the sensor

温度	感温头电阻值 (k $\Omega$ )
-21	48.7795
-20	45.9650
-19	43.3963
-18	41.0339
-17	38.8468
-16	36.8103
-15	34.9050
-14	33.1155
-13	31.4294
-12	29.8370
-11	28.3304
-10	26.9032
-9	25.5501
-8	24.2667
-7	23.0494
-6	21.8948
-5	20.8000
-4	19.7624
-3	18.7794
-2	17.8487
-1	16.9680
0	16.1350
1	15.3475
2	14.6032
3	13.9001
4	13.2359
5	12.6086
6	12.0161
7	11.4563
8	10.9272
9	10.4268
10	9.9534

- (c) Position of the sensors::

The position of the sensor for the upper chamber



The position of the sensor for the lower chamber



(2) Replace the sensor: Please replace with a new one when you determine the sensor is broken.

1. Remove the fixing screws (2 pcs) of the sensor box cover with a Philips screwdriver.



2. Disconnect the line of the broken sensor with scissors, then replace a new sensor for the lead connection, and then bind up with tape.



3. Put the new sensor into the neck of the sensor box.

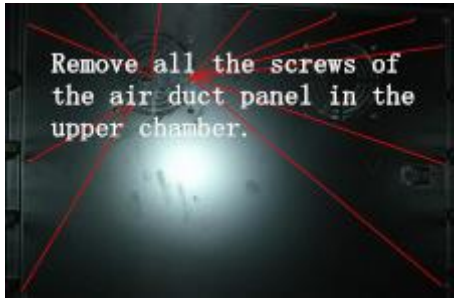


4. Fix the screws to the original position.

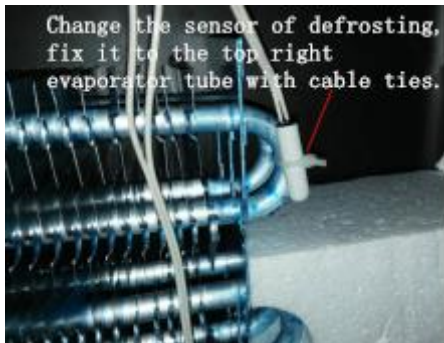


5. The change of the defrosting sensor.

(1) Remove all the screws of the air duct panel in the upper chamber.



(2) Change the defrosting sensor, fix it to the top right evaporator tube with cable ties.



(3) Wrap up the fixed defrosting sensor with the aluminum foil tape.



(4) Fix the screws in the air duct panel.

5. The evaporator of the air duct panel is frozen.

This problem is caused by two problems.

- (1) There is a gap in the door seal, please check it. If the door seal is out of shape, it could be repaired with a hair dryer. If it's broken, please change the door seal.
- (2) The problem of the defrosting sensor. Deal with the problem as per 4 (2) to check and change the faulty defrosting sensor.

6. The lights do not work.

(1) Refer to the clearance procedures below:

If an individual light does not work, please disassemble the lamp panel, change the bad LED light, or change the lamp panel. If all the lights in one side or two sides do not work, please check the light circuit.

(2) Inspection Procedures about the light circuit.

Problem with the lights not working.

Check if the light button in the control panel works fine. → Does not work. → Change the control panel. →After repair. →Check the button. →Lights work. →Trouble clearing. →Still not normal.

Work. →Check if there is voltage output in the light terminals connecting the box of the air duct panel. →No. →Change the control panel →After repair. →Check the button. →Lights work. →Trouble clearing. →Still not normal.

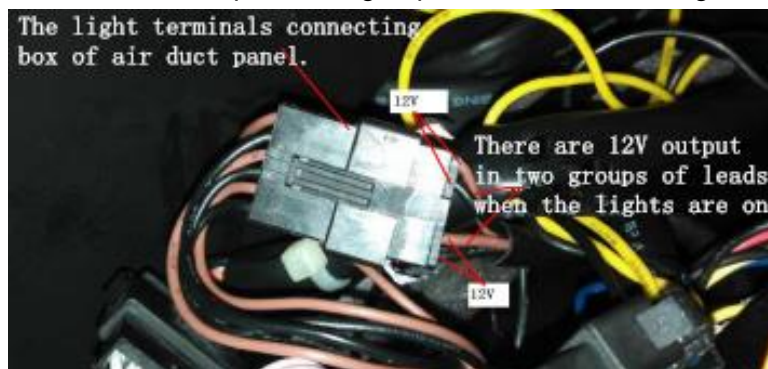
Disassemble the top light panel to check if there is voltage output and the terminals are connected well.

Check if the voltage and the terminals are connected. →Normal voltage. →Change the top light panel. →Inspect it with the power-on. →OK. →Trouble clearing. →Still not normal.

(4) Disassembling inspection for the relative components. The light terminals connecting to the box of air duct panel.

12V

There are 12V output in two groups of leads when the lights are on. 12V



1. Use a straight screwdriver to pry open the light panel from the edge.

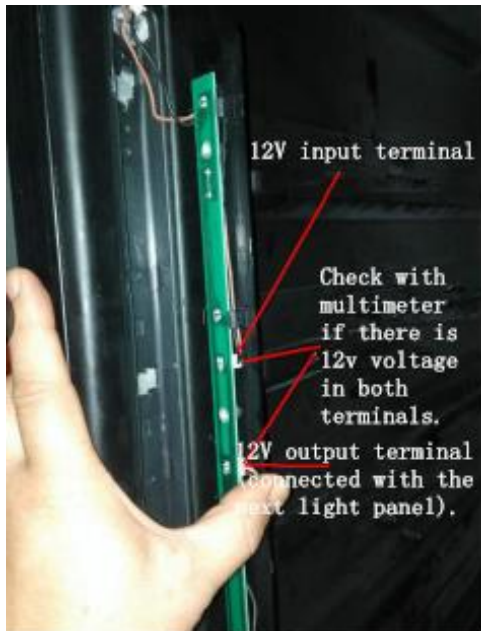


2. Open the whole light panel by hand

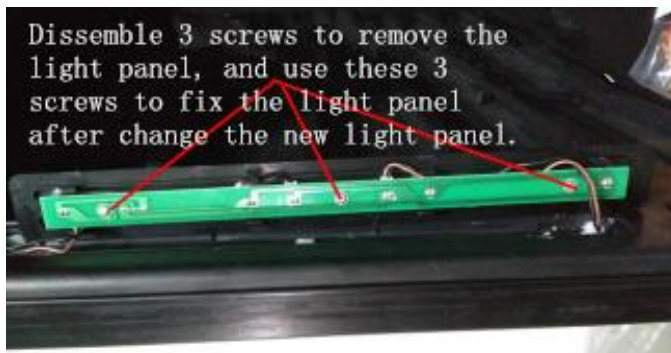


3. 12V input terminal

Check with multi-meter if there is a 12V voltage in both terminals.  
12V output terminal (connected with the next light panel).



4. Disassemble 3 screws to remove the light panel, and use these 3 screws to fix the light panel after changing the new light panel.



5. Install the light cover panel in the reverse order of disassembling it. Please flatten out the light cover panel by hand.

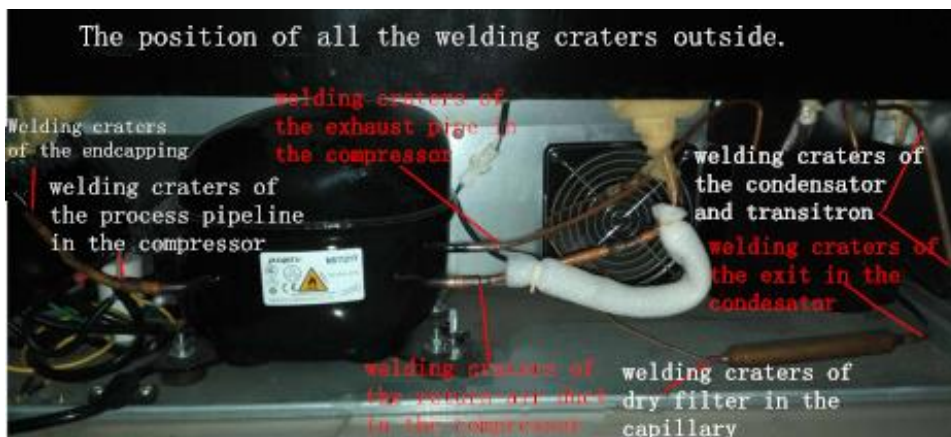


II. Troubleshooting for cooling:

1. The pipe welding crater

(2) The position of all the welding craters are outside.

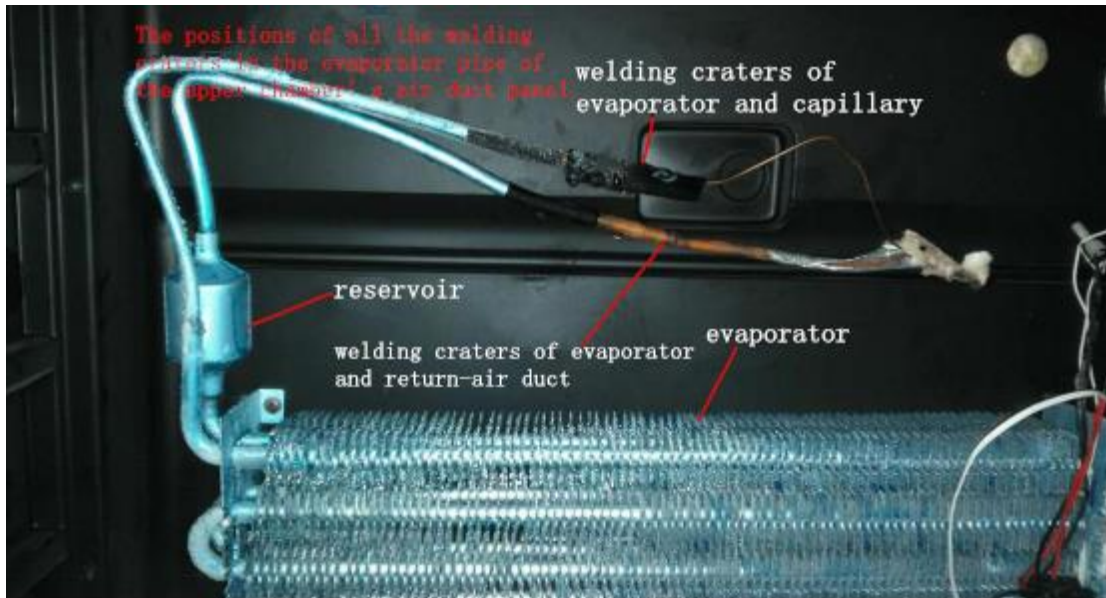
Welding craters of the end capping, welding craters of the process pipeline in the compressor, welding craters of the exhaust pipe in the compressor, welding craters of the return-air duct in the compressor, welding craters of dry filter in the capillary, welding craters of the condensator and transitron, welding craters of the exit in the condensator.



The positions of all the welding craters in the evaporator pipe of the upper chamber's air duct panel.

Reservoir, welding craters of evaporator and return-air duct, welding craters of evaporator and capillary, evaporator.





2. The judgement method of a problem with the cooling system, check the power of the whole machine, you could judge the problem of cooling system when the power of compressor running is smaller than 150W or larger than 280W.

3. Problems with the cooling system are caused by the leakage of refrigerant or blockage in the ducts, usually it's the blockage of a capillary. It's caused by leakage of refrigerant when the power is low. And it's the blockage of a capillary when the power is high, so it will cause an overload protection in the compressor.

4. The checking of refrigerant leakage.

(1) Cut off the end capping, fully drain the refrigerant in the duct.

(2) Weld a new end capping.

(3) Pour 1.2Mpa dry nitrogen to the end capping, check all the welding craters in compressor chamber and evaporators of the air duct with suds to find the leaking welding crater.

(4) Braze the leaking welding crater after fully draining the nitrogen in the duct, replacing with a new dry filter. Check again by pouring 1.2Mpa dry nitrogen to the end capping and check all welding craters with suds to make sure it won't leak in all the leaking welding craters.

5. Checking the duct blockage.

(1) Cut off the end capping, fully drain the refrigerant in the duct.

(2) Weld a new end capping.

(3) Tip off the dry filter.

(4) Pour 1.2Mpa dry nitrogen to the end capping, check if there is nitrogen blown out in the condensator and the capillary exit.

(5) If there is no nitrogen blown out in the condensator, it's because there is blockage in

the welding craters of exhaust pipe, the condensator and transitron or inside the condensator. Please check each welding crater to find the blockage, and re-weld the blocking welding crater or change the condensator. Replace with a new dry filter after welding. Check again by pouring 1.2Mpa dry nitrogen to the end capping and check all welding craters with suds to make sure it won't leak or block in all the welding craters.

(6) If there is no nitrogen blown out in the entry of capillary (the welding crater with the dry filter), it's because there is blockage in the welding craters of the return-air duct in the compressor, evaporator and return-air duct, or the evaporator and capillary. Please check each welding crater to find the blockage, and re-weld the blocking welding craters or change the evaporator. Replace a new dry filter after welding. Check again by pouring 1.2Mpa dry nitrogen to the end capping and check all welding craters with suds to make sure it won't leak or block in all the welding craters.

(7) If there is nitrogen and pressure in the duct of the capillary entry (the welding crater with the dry filter) or in the exit condensator, and it will spray out oil or water, it's because there is greasy or ice blockage in the duct. Please pour 1.2Mpa dry nitrogen to the end capping continuously to flush out the oil or ice for over 8 mins. Check if there is still oil or water after flushing. If yes, continue to flush till there isn't oil or water. If no, continue to flush for 5 mins. Change with a new dry filter after flushing finishes. Check again by pouring 1.2Mpa dry nitrogen to the end capping and check all the welding craters with suds to make sure it won't leak or block in all the welding craters.

#### 6. Refrigerant re-charging

(1), Re-vacuum the duct, vacuum from the end capping for over 30mins in repair mode.

(2), Refrigerant re-charging, refrigerant from the end capping in repair mode, charge 115g refrigerant. Check if there is operating power of the whole machine (check after 10mins with power-on).

#### 7. Checking refrigeration performance

(1) Set the temperature of the upper compartment 5°C, and the lower compartment 12°C. Check the temperature in the compartments after running for 1.5 hours, it should reach the setting temperature range.