Haier

SERVICE MANUAL

Semi-conductor Wine Cooler

HVUE06

2006

Brief introduction to the cooling system

1. Both the HVW18 series are in-direct cooling single-system wine coolers.

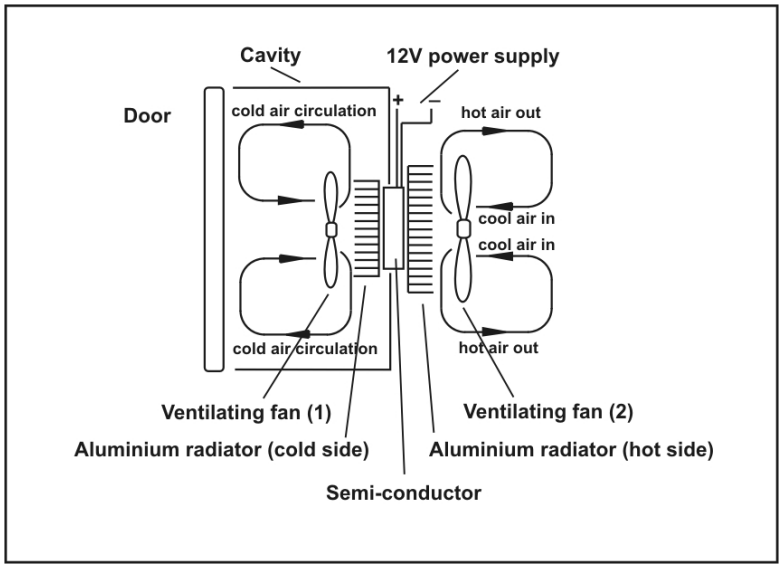
2. A semi-conductor type cooling system is built into the unit. This system is also called “Thermo-electric” cooling system; or “Peltier” system.

3. The core element in the system is a piece of special semi-conductor module. When a direct current passing through this semi-conductor module, one surface of the conductor becomes cold while another surface become hot.

4. General speaking, the temperature difference (the temperature ratio) between the 2 surfaces of the semi-conductor is a constant value. When the temperature on 1 surface is changed, the temperature on another surface is changed respectively.

5. When the “semi-conductor” cooling element is applied onto the wine cooler, the cold surface will be located inside the cavity of the cooler, and the hot surface will be located at outside.

6. Both the “cold” side and the “hot” side of the semi-conductor equipped with a aluminium radiator and a fan. Inside the cavity, the fans can help to provide a better air circulation and to bring the air to draw the “cold” from the radiator. And; on outside, the fan can help to diffuse or evaporate the heat on the “hot” aluminium radiator..



PRODUCT MODEL NUMBER INTRODUCTION

HVUE06ABS / HVUE06ABB / HVUE06BSS

HV - H = Haier; V = Wine Cellar

U - Counter Tope

E - Electronic

06 - 6 Botles Capacity

A,B - Production Series

BB - Black body and black frame

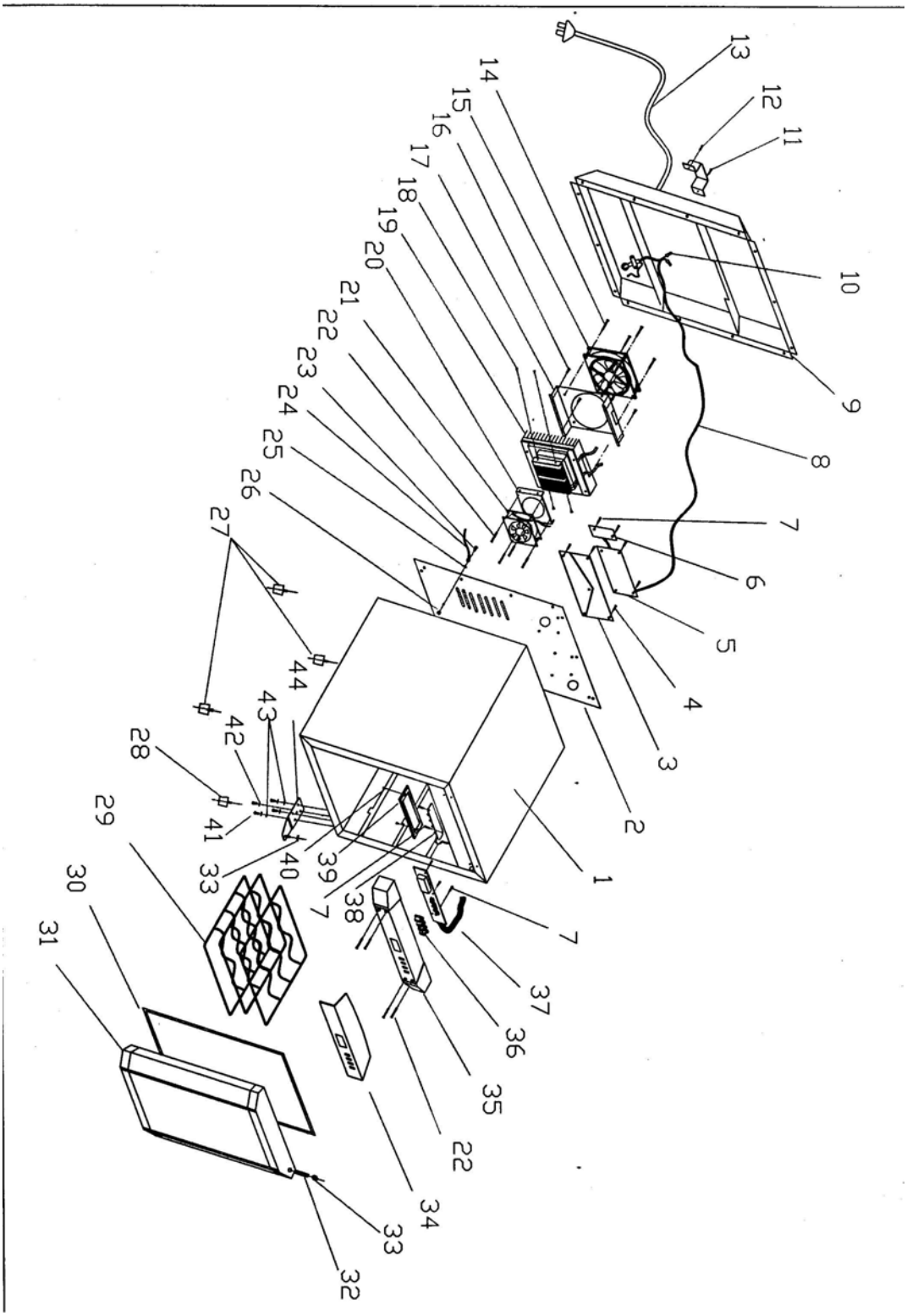
BS - Black body and silver frame

SS - Silver body and silver frame

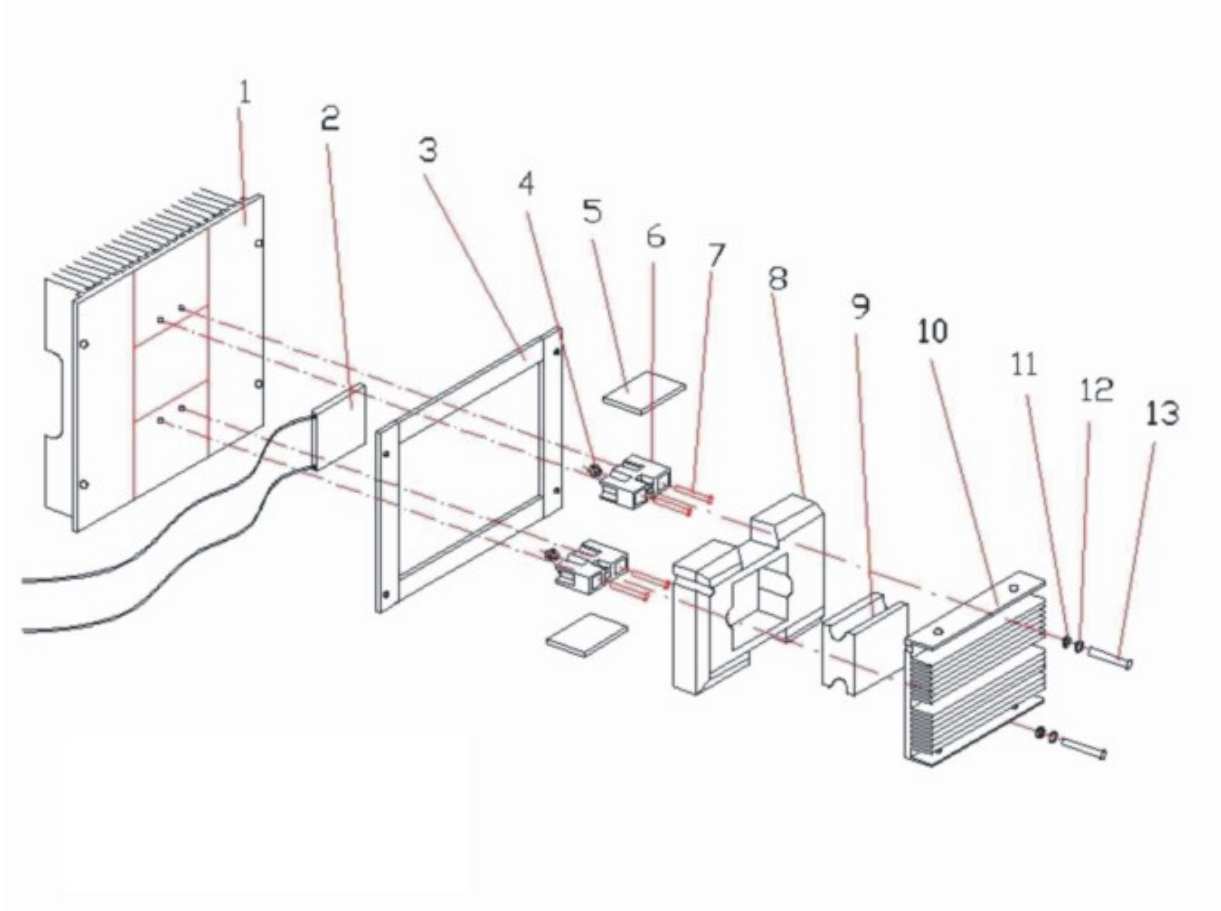
SPECIFICATION

Model	HVUE06
Capacity	20 Litre
Power Supply	110V~60Hz
Rated Input Power (W)	50W
Power Consumption (KW.H/Year)	182.5KwH / Yr
Net Weight (KG)	10.80 KG
Gross Weight (KG)	13.10 KG
Unit Dimension (W x D x H) – cm	27.9 x 56 x 43 cm
Packing dimension (W x D x H) – cm	33 x 59.4 x 46.5 cm
Container Quantity (40’ HQ)	800 pcs.
Container Quantity (40’ Regular)	700 pcs.

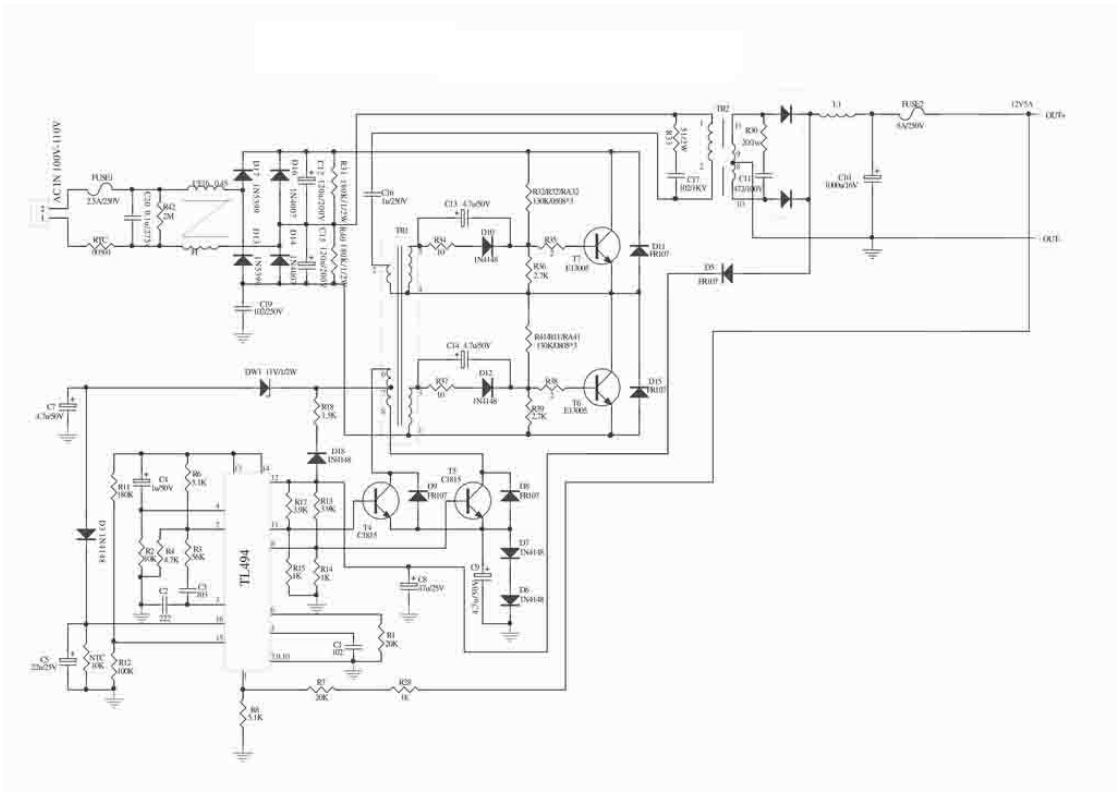
Exposed Diagram (Totoal Unit)

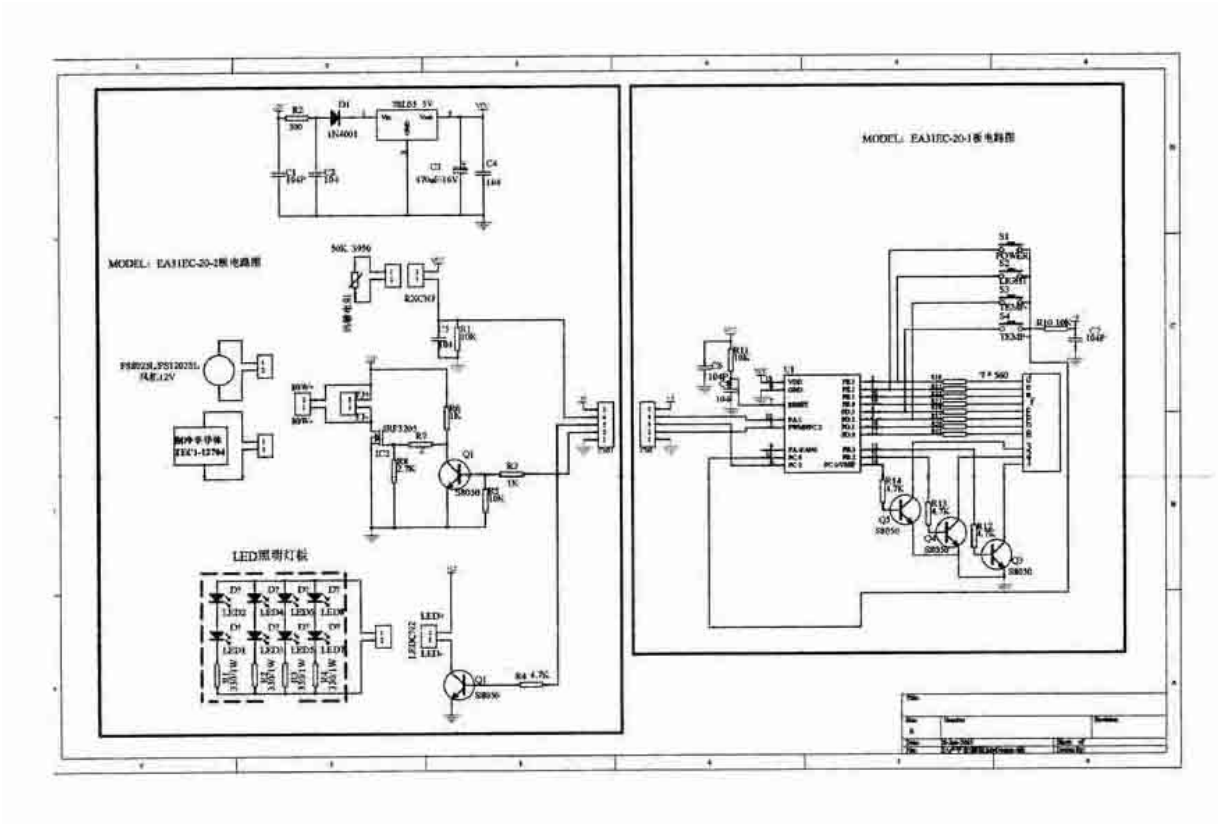


Exposed Diagram (Cooling Module)

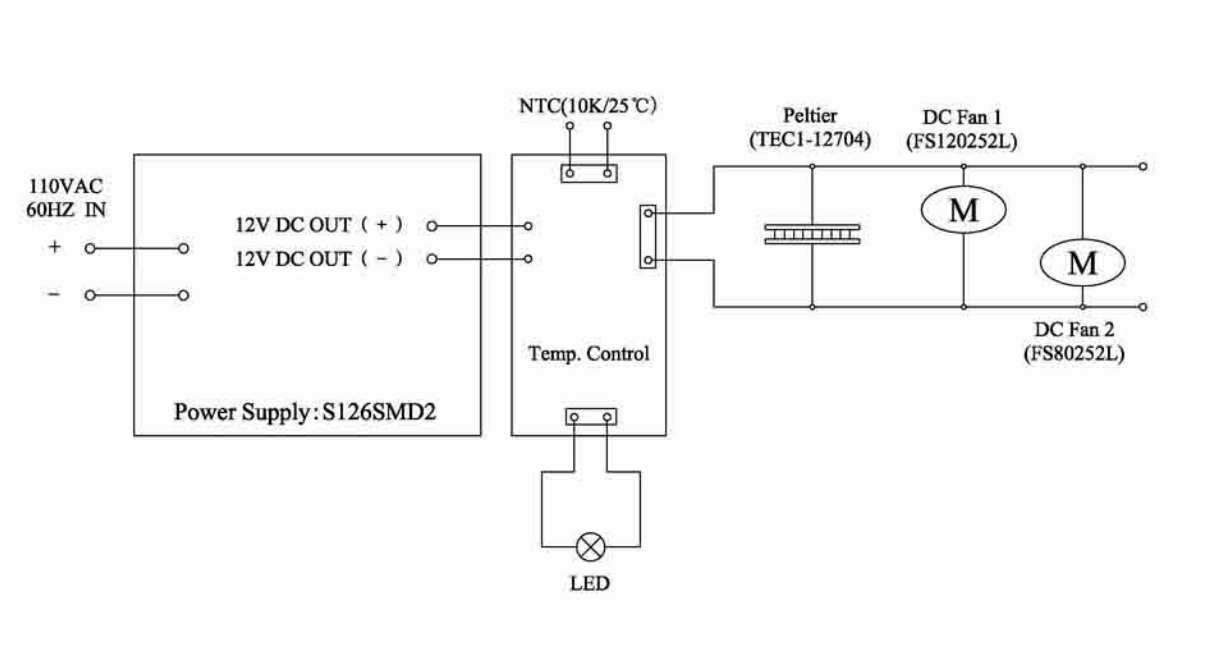


Circuit Diagam (Total Unit)





Wiring Diagram (Total unit)



TROUBLE SHOOTING

1. Normal Phenomena – Should not be considered as the trouble of the unit

a. Wine cooler does not operate

- Check if the unit is plugged in.
- Check if there is power at the power outlet by checking the circuit breaker.
- Check if the ambient temperature is lower than the unit's pre-set temperature.
  (Preset lowest temperatue – 39 degree F; Preset highest temperature – 72 degree F)

b. Wine appears too warm

- May be caused by frequent door openings.
- Cooling time is too short to cool down the wine.
- The door is not closed properly.
- The temperature is set too high. Adjust to a lower temperature setting if necessary.
- The ambient temperature is too high.

c. Wine temperature is too cold

- The wine cooler temperature is set too low. Adjust to a higher temperature setting if necessary.
- The ambient temperature is too low.

d. Wine cooler is runs too frequently

- This may be normal to maintain constant temperature during high temperature and humid days.
- Doors may have been opened frequently or for an extended period of time.
- Check gasket of the door for proper seal. (re-adjust the door position if necessary. For details, please refer to the "door replacement" diagram).
- Check to see if doors are completely closed.

e. Moisture build up on interior or exterior of the wine cooler:

- This is normal during high humidity period.
- Prolonged or frequent door openings.
- Check door gaskets for proper seal. (re-adjust the door position if necessary. For details, please refer to the "door replacement" diagram).

f. Wine cooler door does not shut properly

- Level the wine cooler.
- Check for the blockages. For example, wine bottles, shelves ..etc..

2. To discover the common trouble in Semi-conductor Wine Cooler

Causes for troubles occurring in this type of Wine Cooler are closely related to the quality of components and workmanship in assembling by manufacturers and whether the unit are properly used and maintained. The parameters generally used to express the working conditions of a wine cooler include the temperature inside the unit, electric power consumption, noise level, and other functional indexes. If any one of these parameters is beyond its permissible range, this indicates that there is a fault or trouble in the unit.

In troubleshooting, the first thing you must do is to determine where the trouble comes from --- the control system or the cooling system. There is general no trouble indicating instrument mounted on the domestic wine cooler, locations and natures of troubles should be determined according to their respective features, therefore, experience in servicing is very important to troubleshooting. Service technicians with rich experience can correctly locate them and take reasonable remedy measures based on their comprehensive analysis of trouble characteristics as well as operating conditions of the unit.

Checking

Equipment used for checking and maintenance

1/ Set of Phillips head, flat head, cross head screwdrivers
2/ Pliers
3/ Electronic Multi meter
4/ Electrical soldering iron and tin solder
5/ Wire strippers
6/ Scissors
7/ Clamping tools for closed-end wire connector

A. Visual checking

It is the most simplest way to check the unit.

Any of the following points found can tell the unit is in trouble.

- The fan inside the cavity (internal fan) is not running during the operation;
- The fan on the rear housing (external fan) is not running during the operation;
- The wire is loosed from it original position / connection;
- The gasket along the door is damaged or air gap can be seen along the edge of the cooler body.
- Any part on the unit is deformed.

B. Touching, Listening and Feeling

Should be done by qualified technician since it can only be checked during the unit is connected to mains supply.

Any of the following points found can tell the unit is in trouble.

- Abnormal sound is detected (for example, from fans, from PCB);
- Abnormal temperature inside the cavity is measured (for example, it is not cold; or, too cold);
- Abnormal temperature on the rear alunimium radiator is measure (no heat; or, too hot);
- Vibration on the unit is detected.
- No current is detected even when the unit is plugged.

3. Analysis of Troubles and Remedy

A. When Abnormal sound is detected

Normally, you can only detect the “wind” sound from the fan. And it is only at a very low noise level. Other than this, there should be two possibilities that the abnormal sound will be detected:

a. The sound from the fan(s)

Analysis

Either **fan** is blocked; or the fan blade is broken.

When the “external” fan’s is not running properly, it will affect the heat radiation / diffusion of the aluminium radiator which located at the rear housing of the unit. Finally, higher temperature in the cooler’s cavity will be recorded.

If the “internal” fan is not running properly, the air circulation inside the cavity is not smooth. When there is in-sufficient air to pass through the “cold” radiator, it becomes over–cold. Finally, ice will be accumulated on the “cold” radiator. As a result, “higher” temperature inside the cooler’s cavity is recorded.

When the fan is not running properly, both the loading of the fan and the power supply become higher. Gradually, the product life will be reduced.

Remedy

Need to be replaced immediately since the fan is one of the core elements to the unit.

Due to the consideration of “cost and effectiveness”, suggesting to use a new fan.

Procedure:

Mark the original assembly and the wire connection information; use the tool to dis-assemble the defective fan. Assemble the new fan to the original position and re-connect all wires.

b. The sound from **PCB**.

Analysis

It seldom happened! It is critical when the sound from PCB is detected. There must be the failure of the component used on the PCB and may cause the safety issue.

Remedy

Need to replace it immediately.

Since it is complicated to check all components on PCB, suggesting to replace it with a new one.

Procedure:

Mark the original assembly and the wire connection information; use the tool to dis-assemble the defective PCB. Assemble the new PCB to the original position and re-connect all wires.

B. Poor performance

Poor performance means even when the cavity is operated, the temperature is always higher then it should be.

a. Gasket on the door

When the gasket on the door does not “seal” the cavity well, the “cold” will escape from the cavity. As a result, the temperature can’t be lowered and mist will be formed on the internal side of the glass window.

Analysis

The gasket may be damaged; or it may be aged and become hardened. Or, there is an air gap between the gasket of the door and the edge of the body.

Remedy

When the air is found, align the position of the door by loosing the screws of the door hinge. When the gasket is aged or damaged, need to replace the door. It is difficult to replace the gasket only since the door is sealed by silicon-rubber.

b. Either fan is failure. Or both fans are failure

When either fan is out of function, the temperature inside the cavity can’t be decreased to a desired level.

It may be caused by the loosed connection of the fan’s wire to the power supply unit; or, the fan is failure.

<u>Fan wire connection failure</u>

Analysis

Check if the wire connection is loosed.

Remedy

If yes, fix it. If not, check the fan(s).

Fan failure

Analysis

Detaching the fan wires from the closed-end connector and re-connect it to an independent 12V power supply. If the fan does not work, it is down.

Remedy

Marking the assembly and the wiring information, detaching the defective fan from the mounting bracket, installing a new fan onto the original position.

c. When the fans, the PCB, or the semi-conductor become aged

Analysis

Both components are still working. However, since the unit has been used for a long period of time, or because of many other factors, the component in the unit become aged and its efficiency become lower.

Remedy

Mark the original wire connection of each component, detach the old component and replace it with a new one. After the re-installation is done, check if the unit becomes a better performance.

C. **The temperature inside the cavity can't be decreased at all**.

Both fans are running. But the temperature inside the cavity does not decrease.

The semi-conductor

Analysis

Check if the wire connection of the semi-conductor is loosed. If yes, fix it.

If the connection is good, then there must be the semi-conductor failure.

Remedy

Unless the repairing is operated by an experienced technician, it is not suggest the change the semi-conductor only since accurate installation is involved. For the reason of "cost and effectiveness", suggesting to change the whole cooling module.

Procedure:

Mark all the wiring connection and mounting position, detach the cooling module from the cooling housing carefully. Attach the new module onto the original position. Reconnect the wires.

D. Always at the lowest temperature level, and it can not be adjusted by the rotary switch

Analysis

The rotary switch is failure, total current pass through the switch.

Dis-connect the rotary switch from the main circuit. To ensure the switch is down, test it with a electronic multi-meter.

Remedy

Change a new rotary switch.

E. The unit stopped – no function

The total unit is stop even when it is plugged-in

a. Power input connection

Check if the plug is well fitted into the mains socket. If no, fit it well and re-test the unit. If yes, check if the power input cable is well connected to the PSU input terminal. If yes, check all the wire connection.

b. All wire connection

Check if all wire connection is connect well. If yes, check the PSU.

c. Thermistor (NTC)

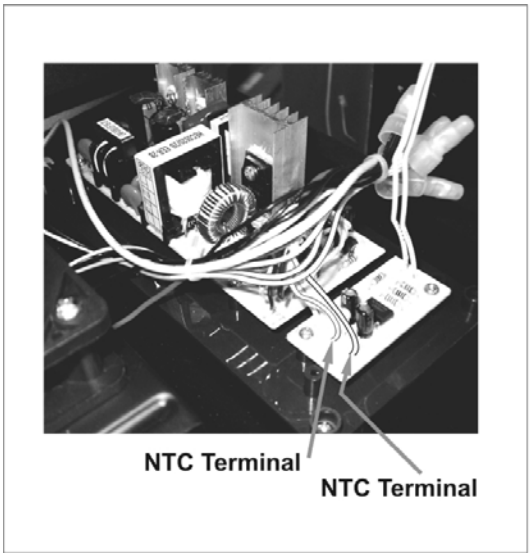
If the thermistor is down, the power of the total unit will hold.

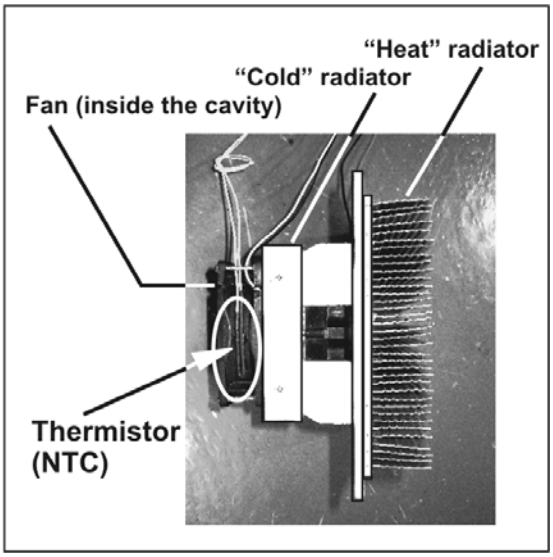
Analysis

Check if the thermistor is normal by measuring the resistance between both terminals of the thermistor. For the measuring position, please refer to the diagram in below.

When “open-circuit” is measured, the thermistor is down. Must be replaced (For the position of the thermistor, please refer to the diagram in below).

NTC terminals NTC Position





d. The Power Supply Unit (PSU)

Analysis

Check if the aluminium radiator (on the rear housing) is "hot"; or the aluminium radiator inside the cavity is "cold". If yes, the PSU is normal. If no, check the output of PSU itself by the electronic multi-meter (around 12V should be measured on the output terminal). When there is no output measured, the PSU is down.

Remedy

Check if the fuse is not burnt. If yes, change the fuse carefully. If the fuse is normal, because of the reason of safety and the "cast and effectiveness", suggest to change a new PSU according to the point 3.A.b.

END