Hisense

# Refrigerator

# Service Manual

**Model: (RS-18WC4SJA/CPA1) BD-140WY/HC4(E)**
**(RS-18WC4SFA/CPA2) BD-140WYA/HC4(E)**
**(RS-24WC4SJA/CPA1) BD-176WY/HC4(E)**
**(RS-24WC4SFA/CPA2) BD-176WYA/HC4(E)**

# Contents

# 1. Warning and precautions for safety

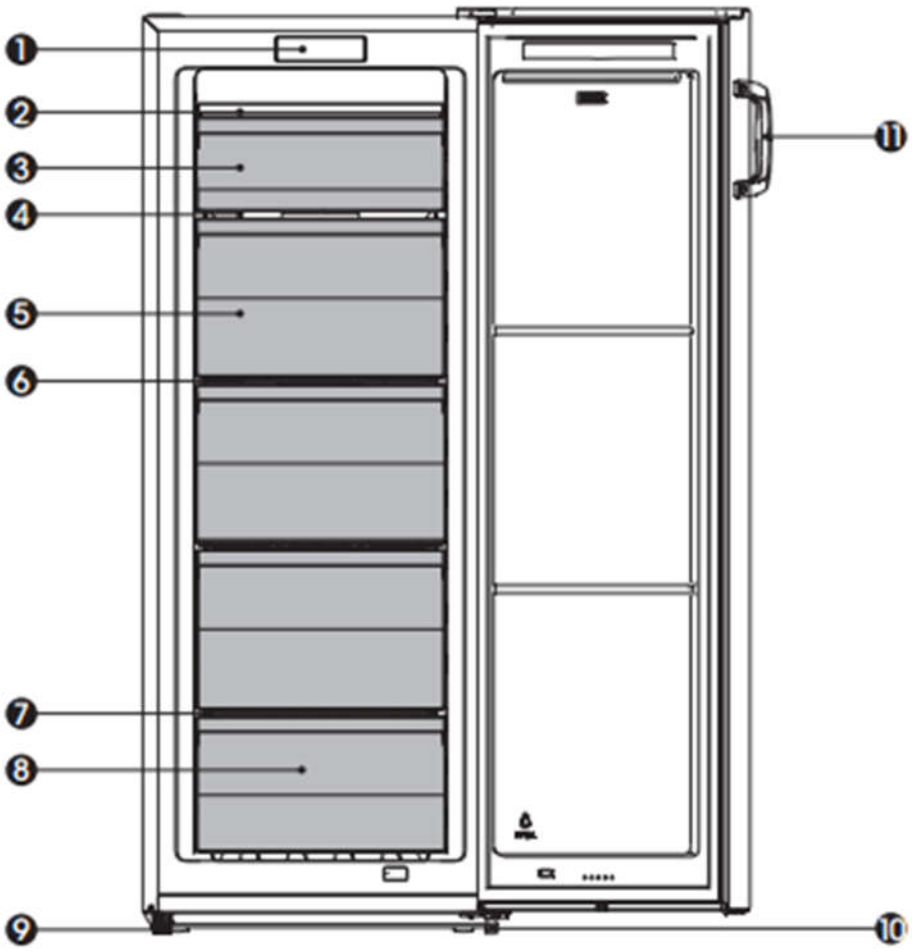
Please observe the following safety precautions in order to use safely and correctly the refrigerator and to prevent accident and danger during repair.

1. Be care of an electric shock. Disconnect power cord from wall outlet and wait for more than three minutes before replacing PCB parts. Shut off the power whenever replacing and repairing electric components.
2. When connecting power cord, please wait for more than five minutes after power cord was disconnected from the wall outlet.
3. Please check if the power plug is pressed down by the refrigerator against the wall. If the power plug was damaged, it may cause fire or electric shock.
4. If the wall outlet is over loaded, it may cause fire. Please use its own individual electrical outlet for the refrigerator.
5. Please make sure the outlet is properly earthed, particularly in wet or damp area.
6. Use standard electrical components when replacing them.
7. Make sure the hook is correctly engaged. Remove dust and foreign materials from the housing and connecting parts.
8. Do not fray, damage, machine, heavily bend, pull out or twist the power cord.
9. Please check the evidence of moisture intrusion in the electrical components. Replace the parts or mask it with insulation tapes if moisture intrusion was confirmed.
10. Do not let the customers repair, disassemble and reconstruct the refrigerator for themselves. It may cause accident, electric shock, or fire.
11 Do not store flammable materials such as ether, benzene, alcohol, chemicals, gas, or medicine in the refrigerator.
12. Do not put flower vase, cup, cosmetics, chemicals, etc., or container with full of water on the top of the refrigerator.
13. Do not put glass bottles with full of water into the freezer. The contents shall freeze and break the glass bottles.
14. When you scrap the refrigerator, please disconnect the door gasket first and scrap it.

# 2. Appearance and structure

## 2.1 View of the appliance

View of the appliance
(RS-18WC4SJA/CPA1 and RS-18WC4SFA/CPA2）



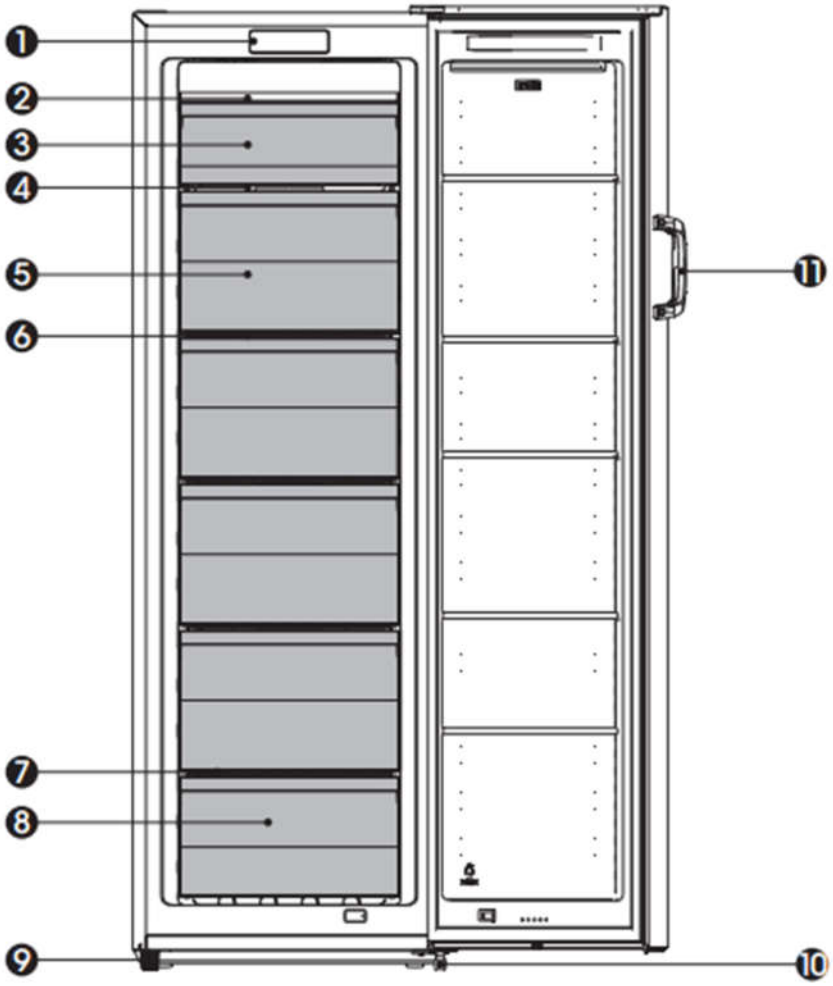

| | |
|---|---|
| ❶ Control panel | ❼ Lower wire shelf |
| ❷ Wind channel | ❽ Lower drawer |
| ❸ Flap | ❾ Left adjustable bottom foot |
| ❹ Glass shelf | ❿ Right adjustable bottom foot |
| ❺ Middle drawers | ⓫ Door handle |
| ❻ Middle wire shelves | |

- Due to unceasing modification of our products, your appliance may be slightly different from this instruction manual, but its functions and using methods remain the same.
- If remove a drawer, please turn the wire under the drawer 180 degrees to get the best energy efficiency.

# 2. Appearance and structure

View of the appliance

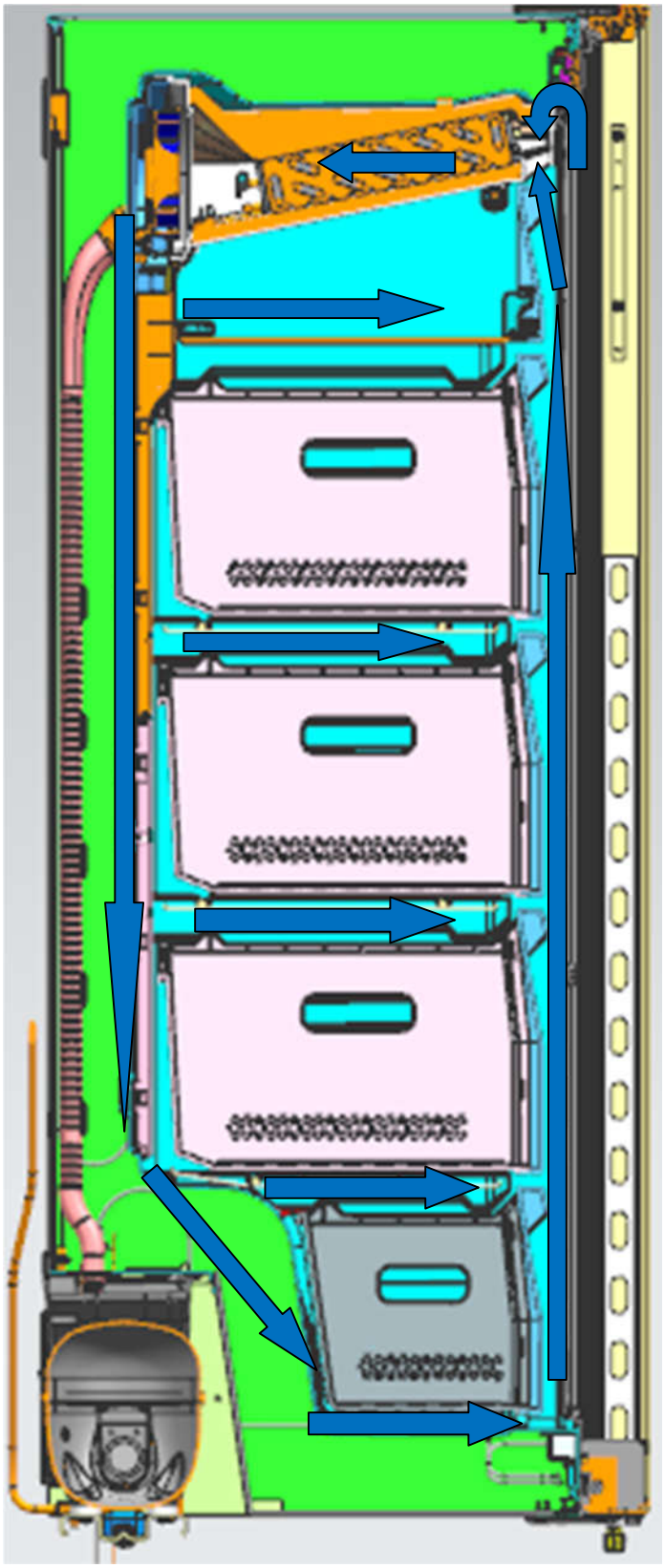
(RS-23WC4SJA/CPA1 and RS-23WC4SFA/CPA2）




1 Control panel
2 Wind channel
3 Flap
4 Glass shelf
5 Middle drawers
6 Middle wire shelves
7 Lower wire shelf
8 Lower drawer
9 Left adjustable bottom foot
10 Right adjustable bottom foot
11 Door handle

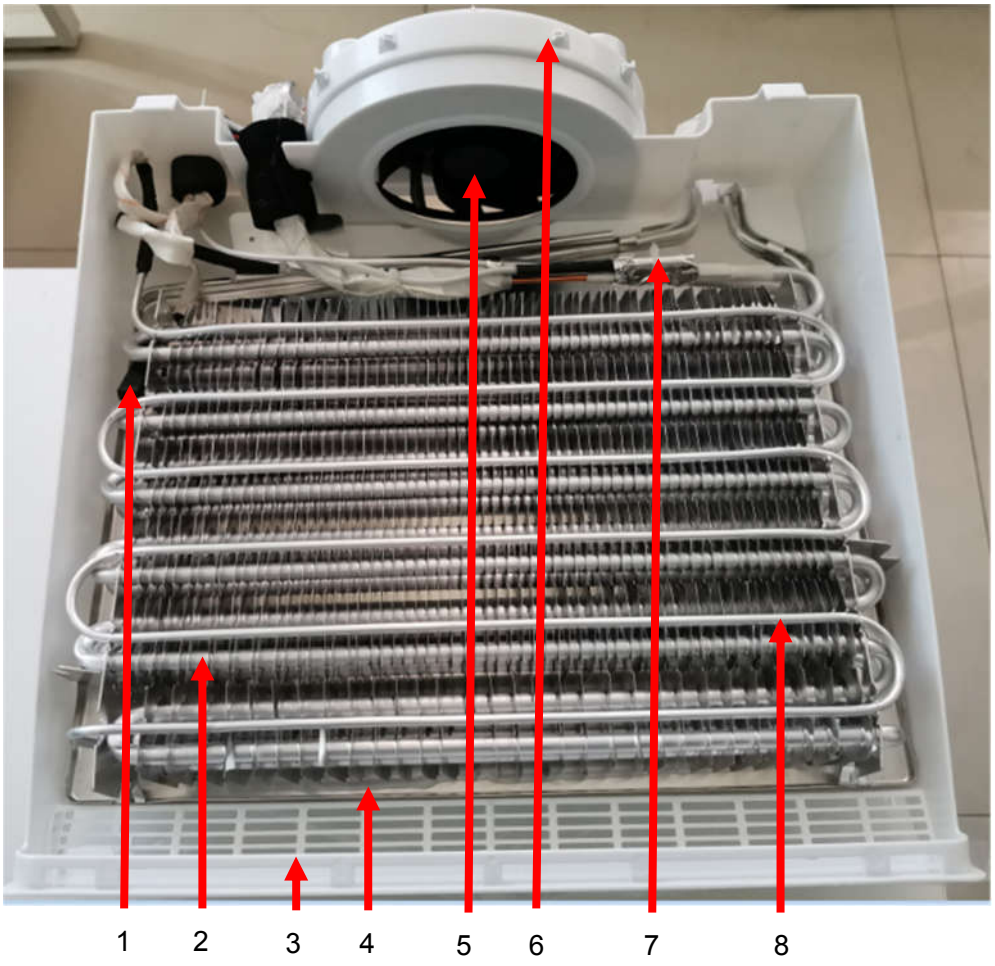
- Due to unceasing modification of our products, your appliance may be slightly different from this instruction manual, but its functions and using methods remain the same.
- If remove a drawer, please turn the wire under the drawer 180 degrees to get the best energy efficiency.

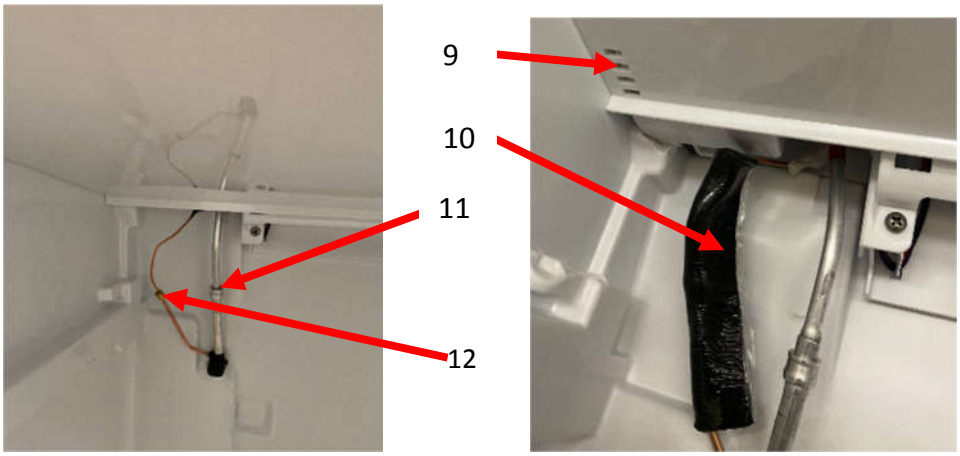
## 2.2 Wind channel structure



# 2. Appearance and structure

## 2.3 Freezer wind channel and evaporator structure

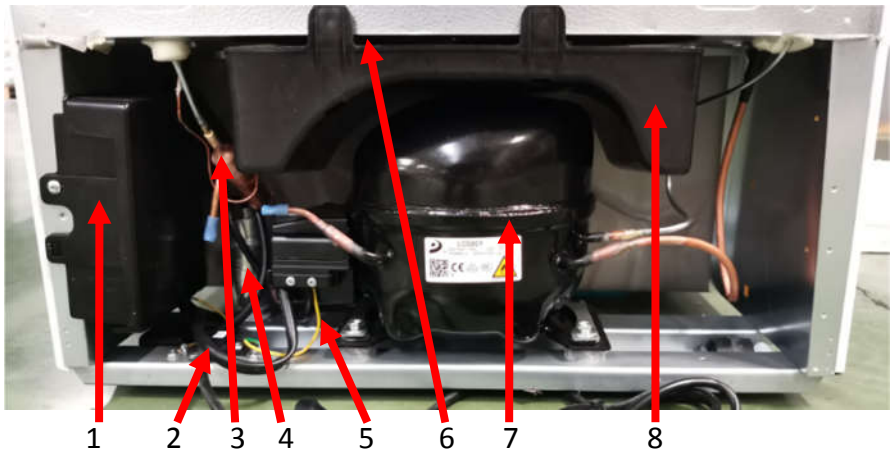



| | | | |
|---|---|---|---|
| 1 | Temperature fuse | 2 | Wing slice evaporator par |
| 3 | wind channel cover | 4 | Water drain |
| 5 | DC motor | 6 | back fan motor cover |
| 7 | Defrost sensor part | 8 | Heater |
| 9 | Temperature sensor part | 10 | Damping cement |
| 11 | Welding of evaporator outlet | 12 | Welding at the inlet of evaporator |

# 2. Appearance and structure

## 2.4 Compressor room structure




| | | | |
|---|---|---|---|
| 1 | Mainboard part (inside) | 2 | Power cord |
| 3 | Dry filter | 4 | Capacitor |
| 5 | Compressor grounding wire | 6 | Pipe lid(install at the drain spout) |
| 7 | Compressor | 8 | Evaporator dish |

# 3. Basic parameters

| Content | Unit | RS-18 WC4S JA | RS-18 WC4S FA | RS-23 WC4S JA | RS-18 WC4S FA |
|---|---|---|---|---|---|
| Voltage/frequency | V/HZ | 220/ 50Hz | | | |
| Net capacity | L | 147 | | 186 | |
| Climate class SN=10~32℃,N=16~32℃, ST=16~38℃,T=16~43 ℃ | | N/ST/T | | N/ST/T | N/ST |
| Freezer compartment star rating | | 4 Star | | | |
| Energy consumption / year | kWh/year | 235 | 184 | 262 | 197 |
| Energy efficiency class | | EU A+ | EU A++ | EU A+ | EU A++ |
| Energy consumption (EN153) per 24 h (A/A+) | kWh/24 h | 0.643 | 0.504 | 0.717 | 0.539 |
| Freezing capacity / 24 hours | kg/24 h | 12 | | 15 | |
| Max noise level | dB(A) | 43 | | | |
| RATED defrost power | W | 100 | | | |
| RATED CURRENT | A | 1 | 0.8 | 1 | 0.6 |
| Kind of coolant /Charge ( 134 /R600a)/ grammes | R / g | R600a/33g | | R600a/35g | |
| Certifications ( CE / ISO 9001/2 / LGA etc.) | | CE | | | |

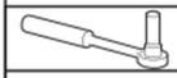
# 4. Operation and functions

## 4.1 Reversing the door

The side at which the door opens can be changed, from the right side (as supplied) to the left side, if the installation site requires.

**Warning!** When reversing the door, the appliance must not be connected to the mains. Ensure that the plug is removed from the mains socket.

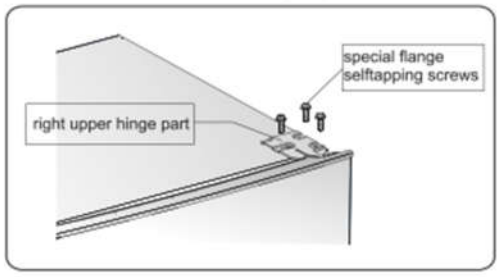
**Tools you will need**

| Not provided | | |
|---|---|---|
|  |  |  |
| 8mm socket wrench | Thin-blade screwdriver | Putty knife |
|  |  |  |
| Cross-shaped screwdriver | Monkey wrench | 8mm wrench |
| Additional parts(in the plastic bag) | | |
|  | | |
| Left Hinge Cover | | |

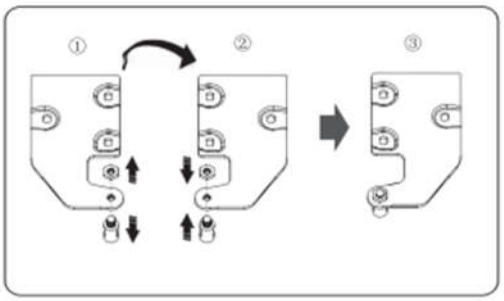
Note: If required you may lay the refrigerator on its back in order to gain access to the base, you should rest it on soft foam packaging or similar material to avoid damaging the backboard of the refrigerator. To reverse the door, the following steps are generally recommended.

1. Use a putty knife or thin-blade screwdriver to prize the screw hole cover which is at the top left corner of the refrigerator, and the upper hinge cover which is at the top right corner of the refrigerator.


2. Unscrew the special flange self-tapping screws which are used for fixing the right upper hinge part by a 8mm socket driver or a spanner (please support the upper door with your hand when doing it).

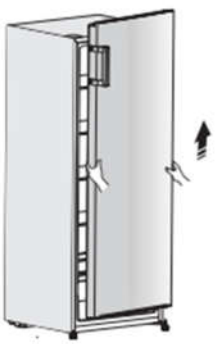



3. Remove the upper hinge axis, transfer it to reversed side and tighten securely, then put it in a safe place.



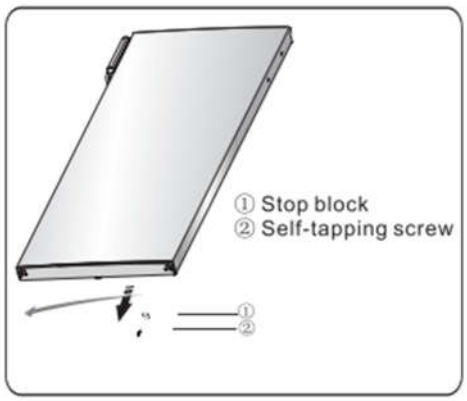

4. Remove the door from the lower hinge.

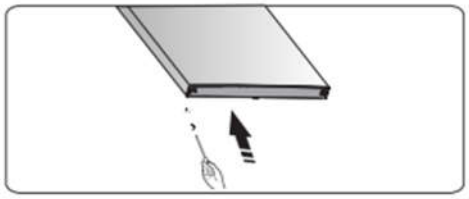
**NOTE :** When removing the door,watch for washer(s) between the lower hinge and the bottom of the lower door that may stick to the door. Do not lose.



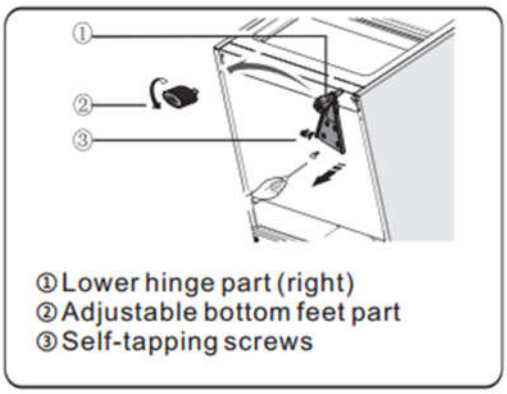
# 4. Operation and functions

5. Place it on a smooth surface with its panel upwards. Loose screw② and pard ①, then install them to the left side and tighten securely.

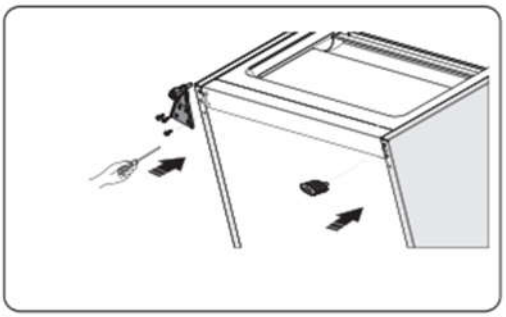


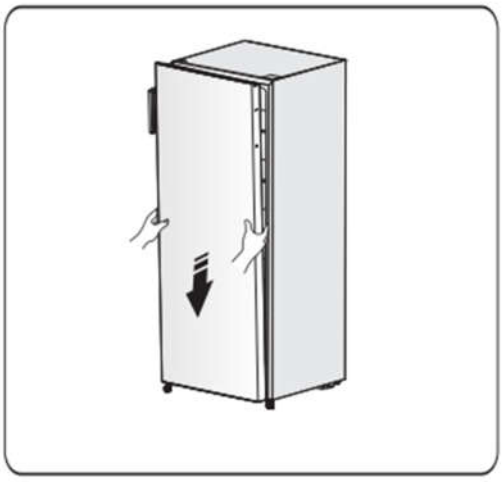
6. Lay the refrigerator on soft foam packaging or similar material. Remove both adjustable bottom feet parts, and the lower hinge part by unscrewing the special flange self-tapping screws.



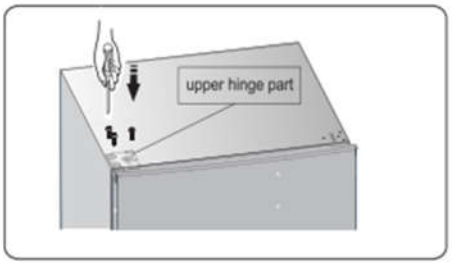

7. Replace the lower hinge part to the left side and fixing it with the special flange self-tapping screws. Replace the adjustable bottom feet parts to another side and fixing it .



8. Transfer the door to the property position, adjust the lower hinge part, make the hinge axis into the lower hole of the door.

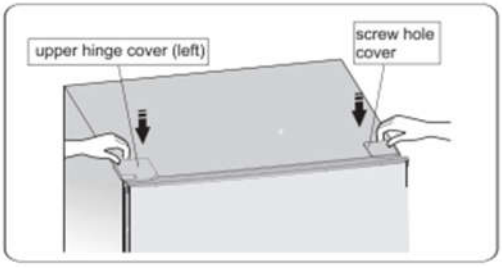


9.Transfer the upper hinge part and make the upper hinge axis into the upper hole of the door, and adjust the position of the door (please support the door with your hand when doing it), fixing the upper hinge part with the special flange self-tapping screws.

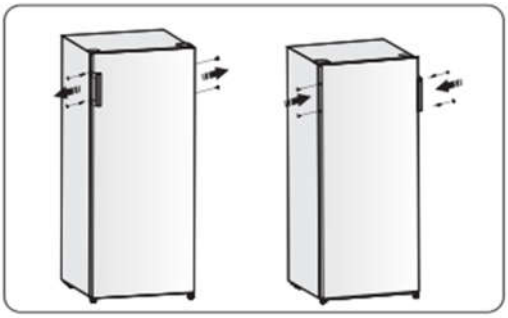


# 4. Operation and functions

10.Install the screw hole cover on the top right corner of the refrigerator. Install the upper hinge cover (which is in the plastic bag) on the left corner. Put the other upper hinge cover into the plastic bag.




11. Move the handle from the left side of door to the right side .



**Warning!**
When changing the side at which the door opens, the appliance must not be connected to the mains. Remove plug from the mains beforehand.

## Warning!

**When changing the side at which the door opens, the appliance must not be connected to the mains. Remove plug from the mains beforehand.**

## 4.2 Display controls

The display panel that controls the temperature inside the freezer compartment is located inside the freezer. Use your appliance according to the following control regulations, your appliance has the corresponding functions and modes as the display panel showed in the picture below. When the appliance is powered on for the first time, the backlighting of the icons on display panel starts working. The door are closed, the back lighting will turn off.


**Controlling the temperature**
Important!-Normally we recommend you set the temperature for the freezer to -18℃. If you want to change the temperature, follow the instructions below.
**Caution!** When you set a temperature, you set an average temperature for the whole refrigerator cabinet. Temperatures inside compartment may vary from the temperatures displayed on the panel, depending on how much food you store and where you place it. High or low room temperature may also affect the actual temperature inside the appliance.

## Mode

# 4. Operation and functions

**Super Freeze**

Super Freeze will quickly lower the temperature within the freezer so food will freeze faster. This can lock in the vitamins and nutrients of fresh food and keep food fresh longer.

●Press “TEMP℃/Super freeze 3$^{sec}$” button after 3 seconds to select the Super Freeze function. The screen display "-24" and the indicator will be on.

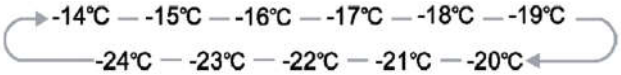
●For the maximum amount of food to be frozen, Several hours before placing fresh food in the freezer compartment, switch on super freezing to prevent an unwanted temperature rise.

●If the freezing capacity according to the rating plate is to be used, switch on super freezing 24 hours before the fresh products are placed in the freezer compartment, Super freeze automatically quit after some time.

●To switch off the "super freezing", press the " TEMP℃/Super freeze 3$^{sec}$" button. If super freezing is switched off, the super indicator will shut off simultaneity, and the appliance automatically switches to the temperature set prior to super freezing mode.

**TEMP℃**

●You can press the “TEMP℃/Super freeze 3$^{sec}$” button to activate the mode to control the freezer temperature. When you press the button continuously, the temperature will be set as the following sequence.




**Door Alarm**

●If the door of freezer is open for over 1 minutes, the door alarm will sound and the indicator begin to flash. The buzzer will stop alarming by press "ALARM" button and the indicator will be on but will stop flashing.

●To save energy, please avoid keeping the door open for a long time when using the appliance. The door alarm can be cleared by closing the door.

## 4.3 Defrost mode

--Press and hold the“ALARM”and“TEMP℃”keys more than 3 seconds , enter the special function selection, the temperature display area is flashing display " 01", press the button "ALARM" continuously, the special function mode will be set as the following sequence: "01: maintenance detection - > 02: room actual temperature query - > 04: all evaporator forced defrosting - > 05: not used - > 06: display the version number of the display panel and the mainboard - > 07: not used - > 08: not used - > 09: Unused - > 10: evaporator actual temperature inquiry - > 01: maintenance detection "cycle; the selected time number flashes, no key is pressed within 10s, the setting takes effect, enters the corresponding special functions (maintenance detection mode, forced defrosting can only be

entered within 10 minutes after power on), exits the special function selection state. In the special function selection state, press other keys to exit the special function selection state.
-- Within 10 minutes since the power on, when function 04 is selected, enter forced defrosting.

## 4.4 Error display

**Sensor & communication error display:**
Error code will not be displayed any more after 4 hours upon power on, all error codes from mainboard will be displayed except for communication receiving error. Mainboard sensor error & communication sending error won't be shown in case of communication receiving error. Error code will display after 10 seconds in case of communication receiving error upon power-on, error code will be disappear while communication is working well. One code of E8->E3->E4->Ec->F1->E8 will be displayed circularly per 3 seconds; Corresponding error code won't be displayed in case of no error during circular displaying; E1、E3、E4、Ec & F1 won't be displayed in case of Er.

| No. | Fault Code | Problems | Analysis | Solutions |
|---|---|---|---|---|
| 1 | the temperature display area displays "Er". | The display panel communication receiving failure (no communication receiving from mainboard to display panel within 10 s or 3 min). | 1. The connecting line from the mainboard to the display panel is faulty<br>2. The display panel is failure.<br>3. The mainboard is failure. | 1. Use a Multimeter checking the connection is well or not.<br>2. Replace the display panel.<br>3. Replace the mainboard. |
| 2 | the temperature display area displays "E8". | Humidity Sensor failure | 1. The Humidity Sensor is open or short circuit.<br>2. The Humidity Sensor is failure.<br>3. The mainboard is failure. | 1. Use a Multimeter with the voltage switch to measure the voltage of sensor or checking the connection is well or not.<br>2. Replace the sensor.<br>3. Replace the mainboard. |

| | | | | |
|---|---|---|---|---|
| 3 | the temperature display area displays "E3". | Temperature Sensor failure | 1. The Temperature Sensor is open or short circuit.<br>2. The Temperature Sensor Sensor is failure.<br>3. The mainboard is failure. | 1. Use a Multimeter with the ohm switch to measure the resistor of sensor or checking the connection is well or not.<br>2. Replace the sensor.<br>3. Replace the mainboard. |
| 4 | the temperature display area displays "E4". | Evaporator Defrost Sensor failure | 1. The Evaporator Defrost Sensor is open or short circuit.<br>2. The Evaporator Defrost Sensor is failure<br>3. The mainboard is failure. | 1. Use a Multimeter with the ohm switch to measure the resistor of sensor or checking the connection is well or not.<br>2. Replace the sensor.<br>3. Replace the mainboard. |
| 5 | the temperature display area displays "Ec". | The display panel communication sending failure (no communication sending response from display panel to mainboard within 3 min). | 1. The connecting line from the display panel to the mainboard is faulty<br>2. The display panel is failure.<br>3. The mainboard is failure. | 1. Use a Multimeter checking the connection is well or not.<br>2. Replace the display panel.<br>3. Replace the mainboard. |
| 6 | the temperature display area displays "F1". | The Fan Motor failure | 1. The Fan motor is open or short circuit.<br>2. The Fan motor is failure<br>3. The mainboard is failure | 1. Use a Multimeter with the ohm switch to measure the resistor of Fan motor or checking the connection is well or not.<br>2. Replace the Fan motor.<br>3. Replace the mainboard. |

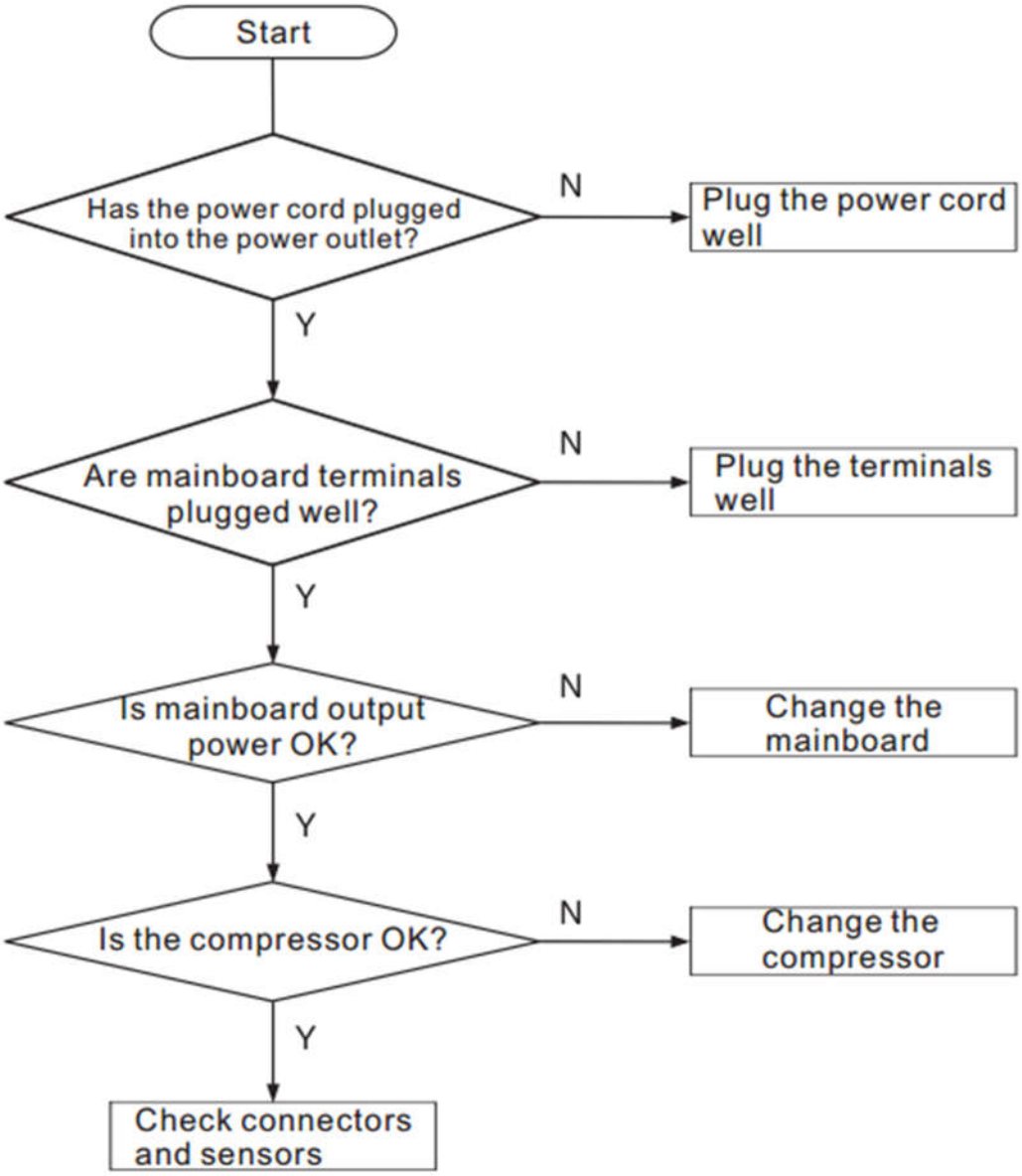
# 5. Troubleshooting

## 5.1 Common problem and checking

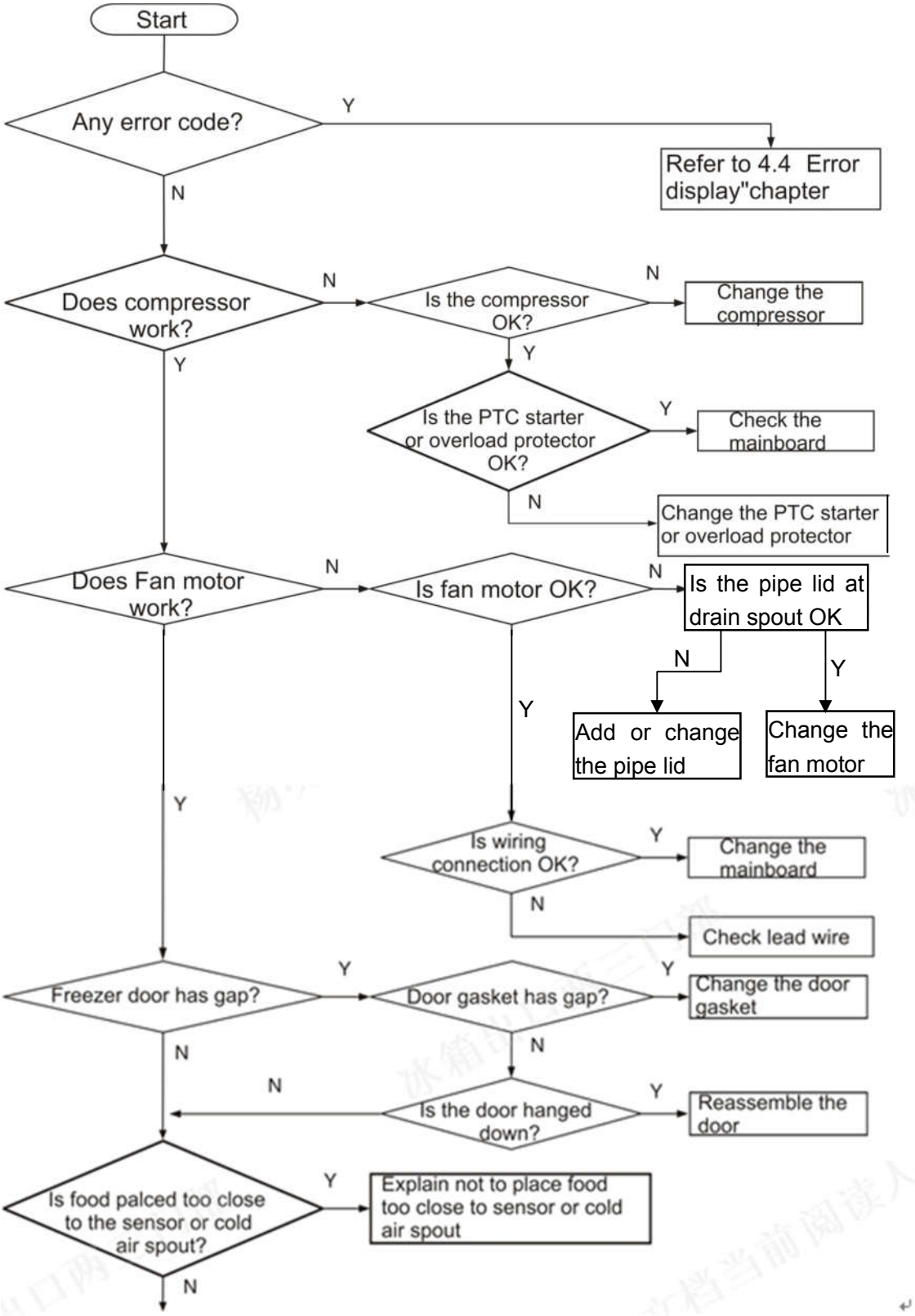
| Problem | Possible cause & Solution |
|---|---|
| Appliance is not working correctly | Check whether the power cord is plugged into the power outlet properly. |
| | Check the fuse or circuit of your power supply, replace if necessary. |
| | The ambient temperature is too low. Try setting the chamber temperature to a colder level to solve this problem. |
| | It is normal that the freezer is not operating during the automatic defrost cycle, or for a short time after the appliance is switched on to protect the compressor. |
| | The refrigeration system blocked by ice or dirty, or the gas has leaked, please stop and restart after 10 minutes to see if the compressor can start. |
| Odours from the compartments | The interior may need to be cleaned |
| | Some food, containers or wrapping cause odours. |
| Noise from the appliance | The sounds below are quite normal:<br>•Compressor running noises.<br>•Air movement noise from the small fan motor in the freezer compartment or other compartments.<br>•Gurgling sound similar to water boiling.<br>•Popping noise during automatic defrosting.<br>•Clicking noise before the compressor starts. |
| | Other unusual noises are due to the reasons below and may need you to check and take action:<br>The cabinet is not level.<br>The back of appliance touches the wall.<br>Bottles or containers fallen or rolling. |
| The motor runs continuously | It is normal to frequently hear the sound of the motor, it will need to run more when in following circumstances:<br>• Temperature setting is set colder than necessary<br>• Large quantity of warm food has recently been stored within the appliance.<br>•The temperature outside the appliance is too high.<br>•Door is kept open too long or too often.<br>•After your installing the appliance or it has been switched off for a long time. |
| A layer of frost occurs in the compartment | Check the pipe lid at the outlet of the drain is OK; Check that the air outlets are not blocked by food and ensure food is placed within the appliance to allow sufficient ventilation. Ensure that door is fully closed. To remove the frost, please refer to cleaning and care chapter. |
| Temperature inside is too | You may have left the door open too long or too frequently; or the door are kept open by some obstacle; or the |

| | |
|---|---|
| warm | appliance is located with insufficient clearance at the sides, back and top; or the fan motor isn't work properly; or the pipe lid at the outlet of the drain is off. |
| Temperature inside is too cold | Increase the temperature by following the "Display controls" chapter. |
| Door can't be closed easily | Check whether the top of the refrigerator is tilted back by 10-15mm to allow the door to self-close, or if something inside is preventing the door closing. |
| Water drips on the door | The evaporator dish( located at the rear bottom of the cabinet) may not be properly leveled, or the drain is blocked. |

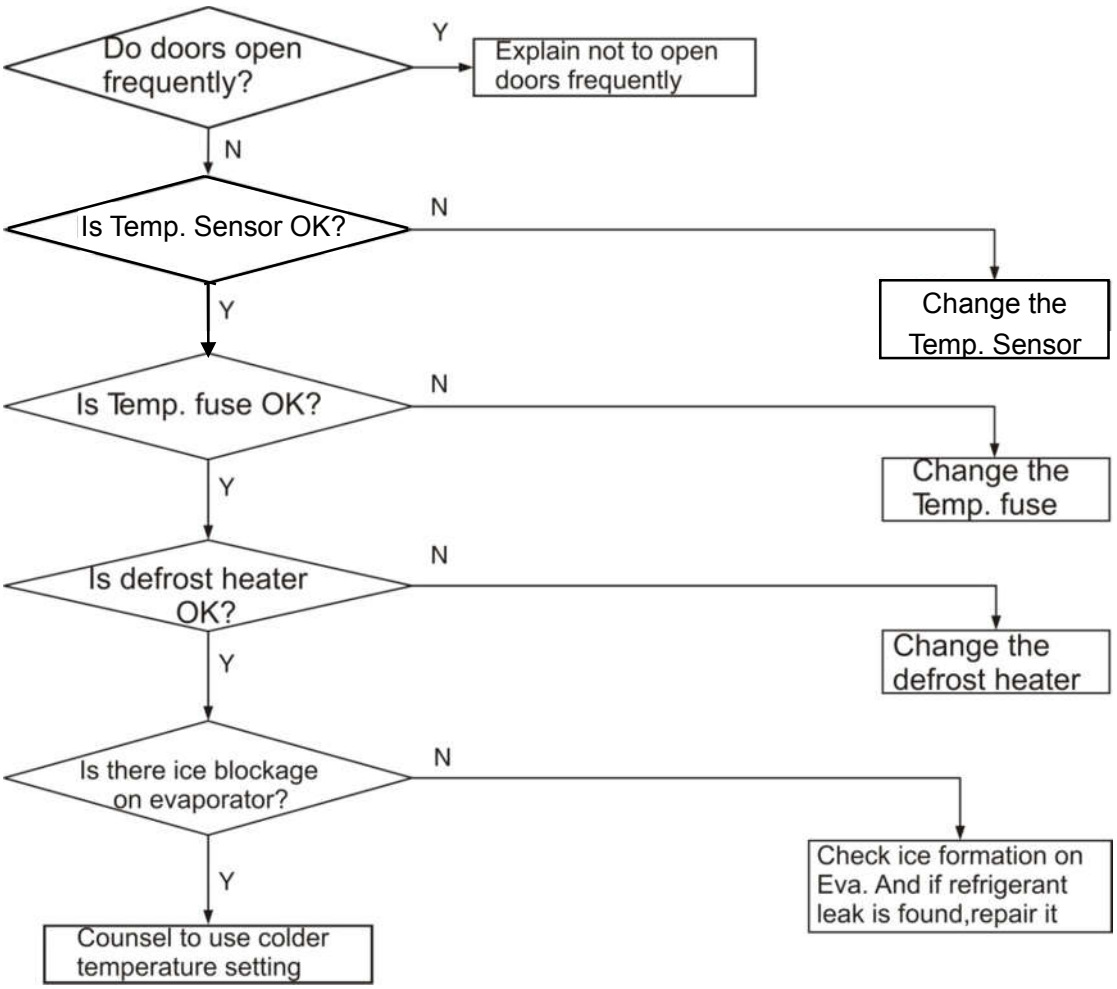
## 5.2 Faulty start



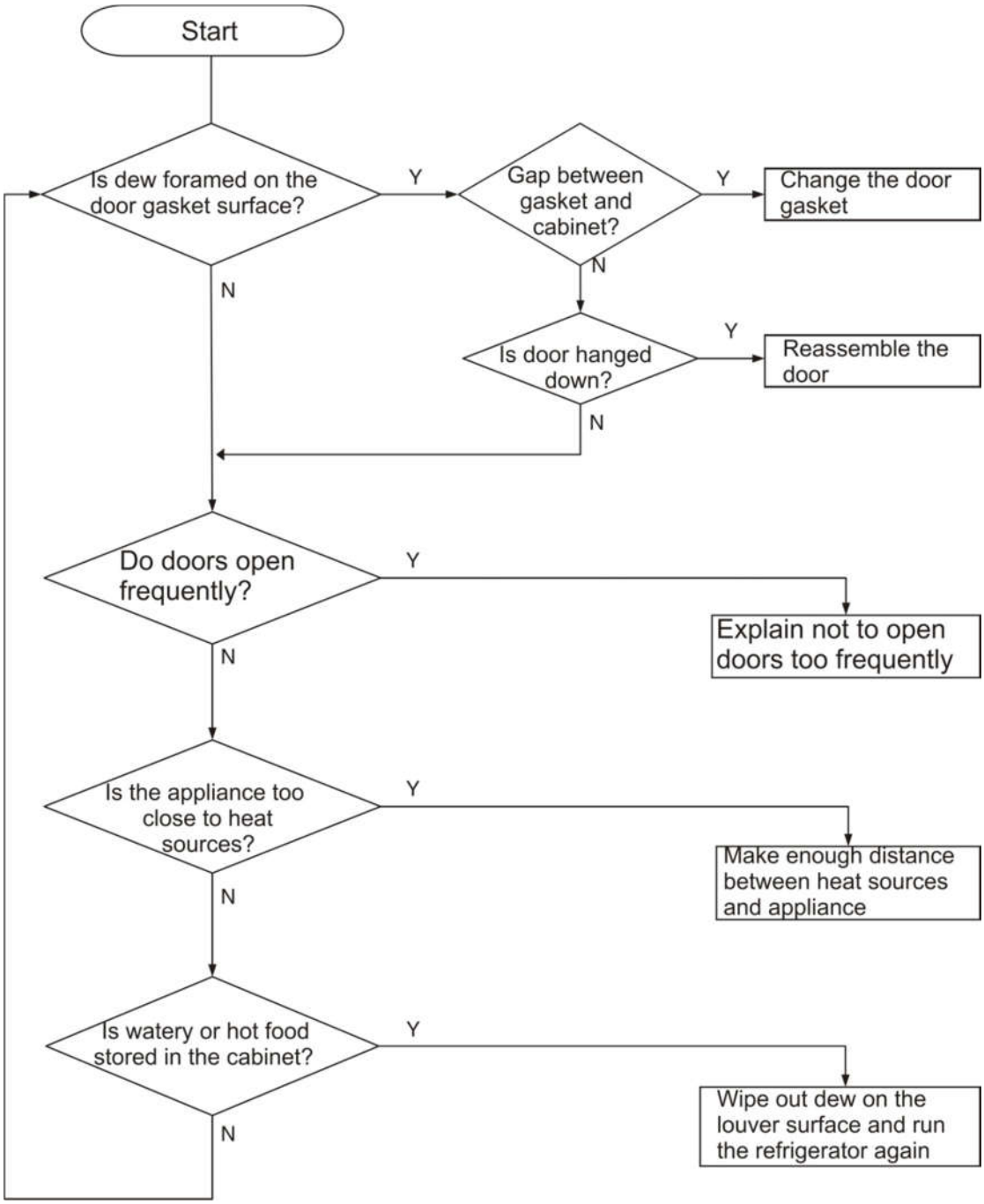
## 5.3 Refrigeration failure



# 5. Troubleshooting



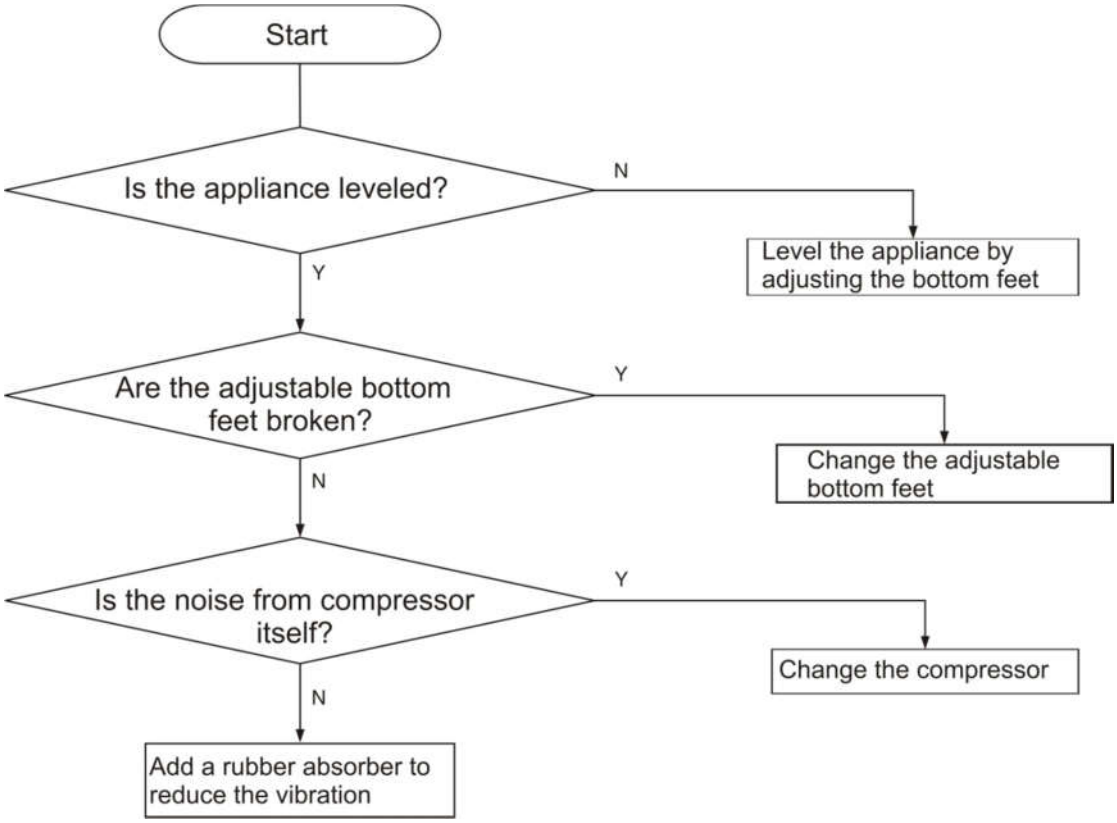
## 5.4 Thick frost in freezer compartment



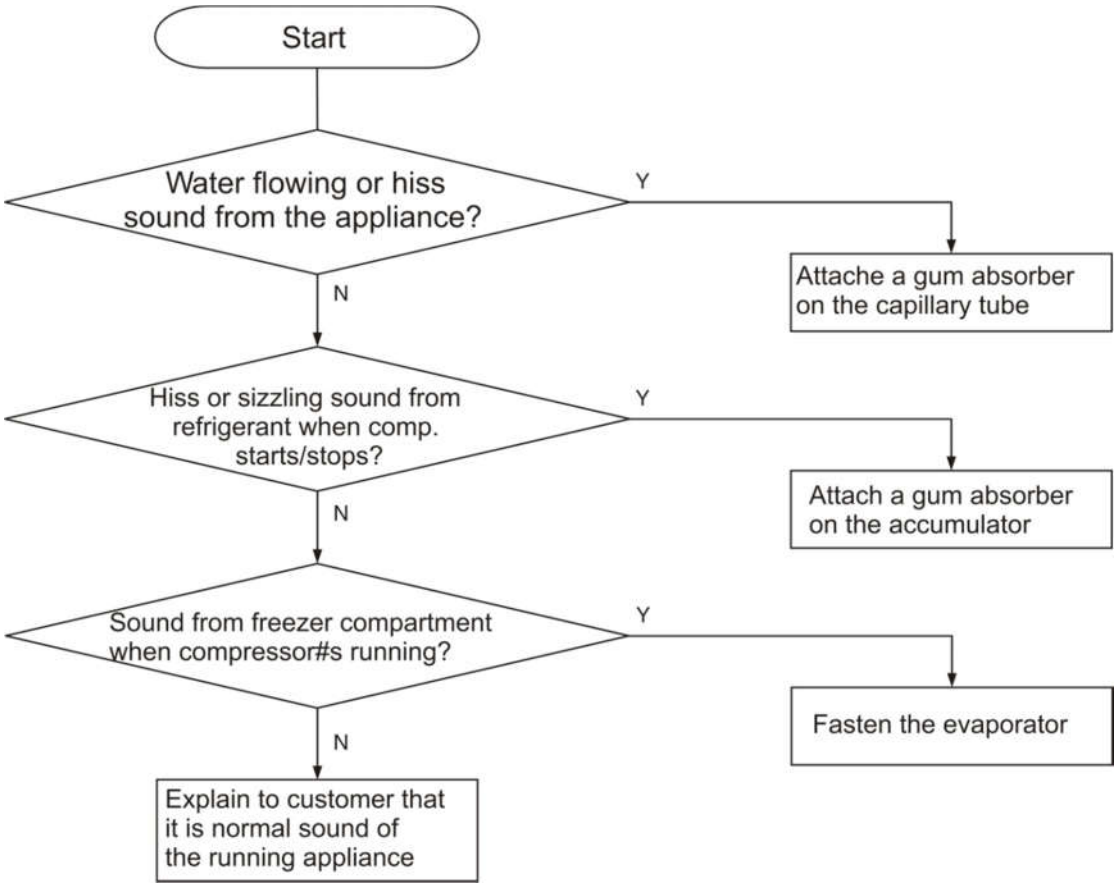

## 5.5 Noise

### 5.5.1 Compressor noise

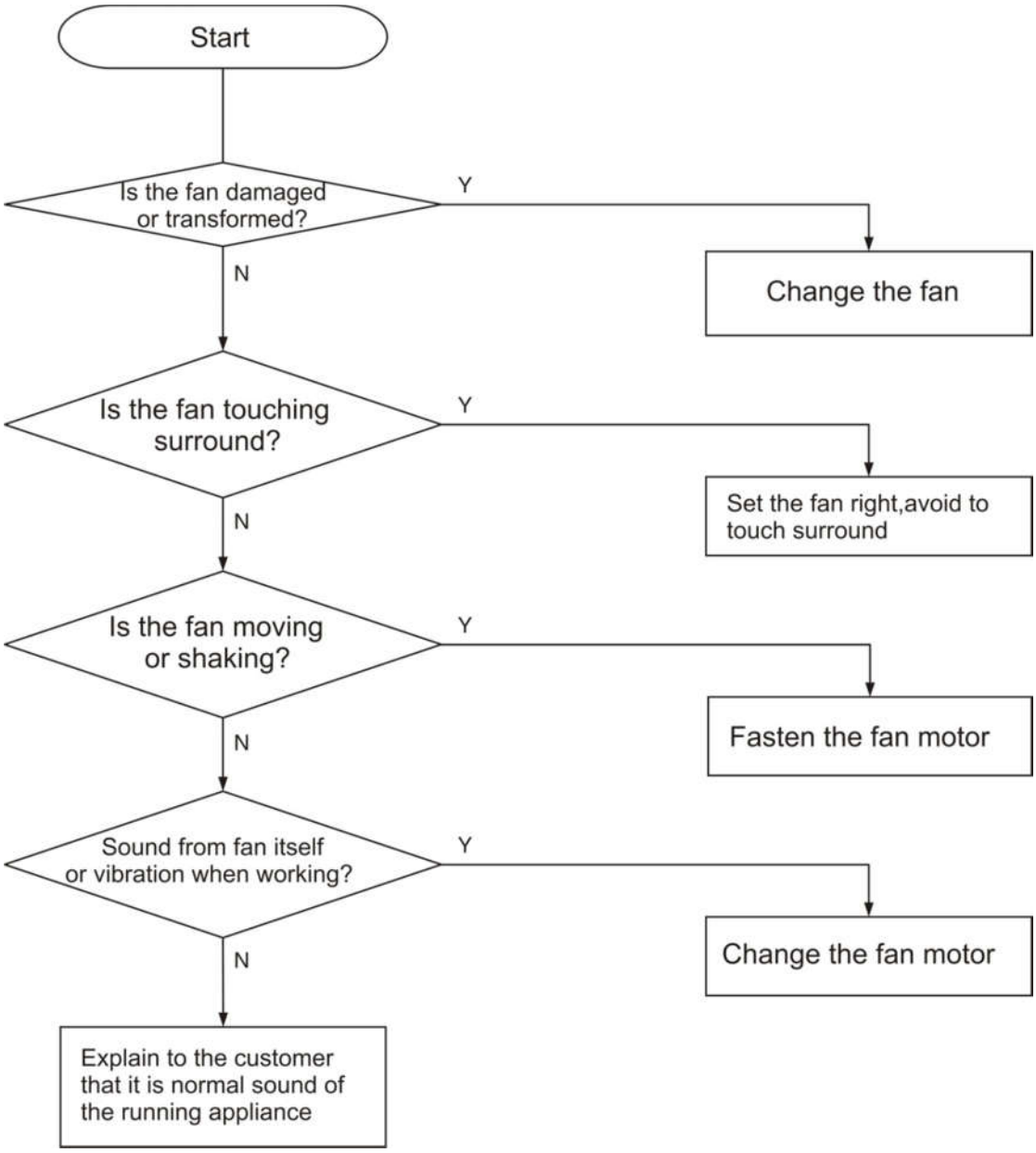
# 5. Troubleshooting



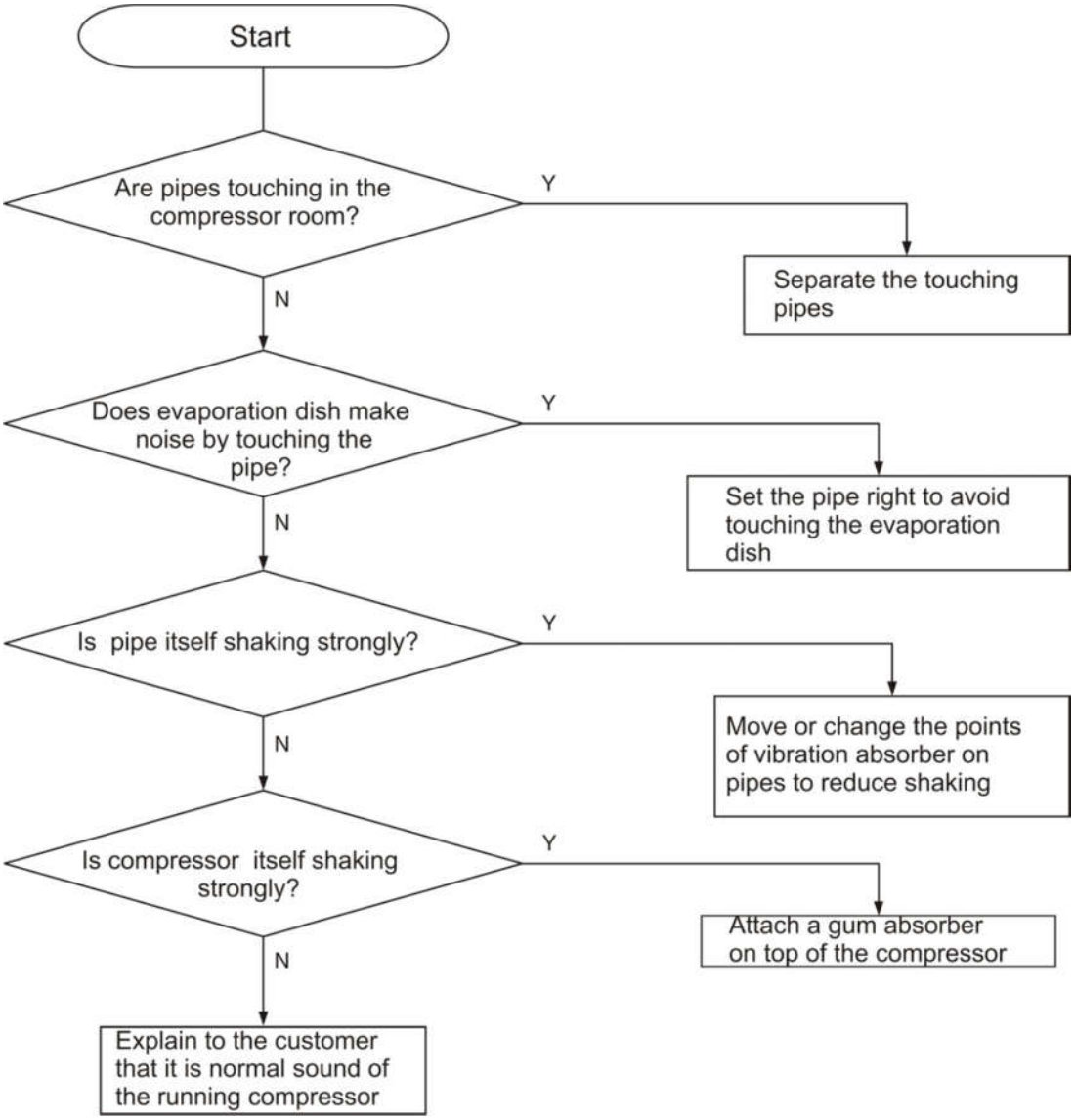

## 5.5.2 Refrigerant flowing noise



### 5.5.3 Fan motor noise

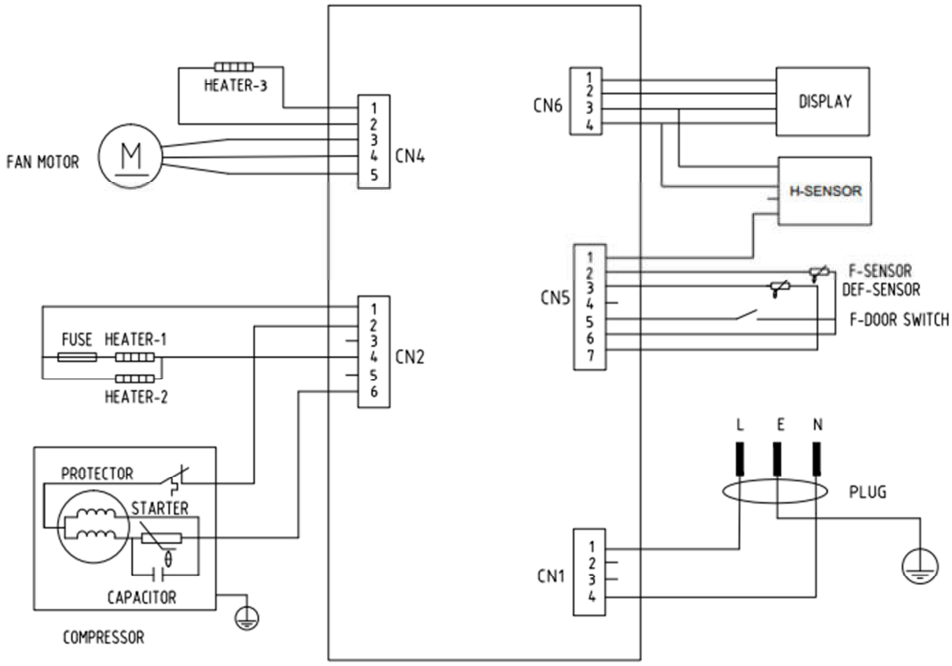


### 5.5.4 Pipe noise



# 6. Circuit and checking

## 6.1 Circuit diagram



## 6.2 Mainboard

### 6.2.1 Checking method

If the problem is probably caused by mainboard, check it directly to confirm.

### 6.2.2 Removing the mainboard

1. Unplug the appliance.
2. Remove the screw of electric box cover by screwdriver, as picture 1.
3. Remove the electric box cover, as picture 2.
4. Unplug the terminals on the mainboard, as picture 3.
5. Remove the mainboard and take it out, as picture 4.

| | |
|---|---|
|  |  |
| Picture 1 | Picture 2 |
|  |  |
| Picture 3 | Picture 4 |

## 6.3 Display panel

### 6.3.1 Basic parameters

Rated voltage: DC5V
Rated power: 0.5w

### 6.3.2 Checking method

1. Check the connecting wiring between display panel and mainboard. Pin No.1 to No.4 of CN6 connector on the mainboard is connected to display panel.
2. Check the output voltage between pin No.3 and No.4 on CN6 connector of the mainboard, If the voltage is between 4V DC and 5V DC, the mainboard is OK, change the display panel. If not, change the mainboard.

### 6. 3.3 Removing the display panel (display panel inside)

1. Unplug the appliance.
2. Tilt the display panel as picture 1.
3. Unplug the terminal as picture 2.
4. Unscrew the screw as picture 3.
5. Take the display panel out as picture 4.

<table>
<tr><td> 
</td><td>  </td></tr>
<tr><td>Picture 1</td><td>Picture 2</td></tr>
<tr><td>  </td><td>  </td></tr>
<tr><td>Picture 3</td><td>Picture 4</td></tr>
</table>

## 6.4 Fan motor

### 6.4.1 Basic parameters

Rated voltage: DC12V
Rated input power: 2W

### 6.4.2 Checking method

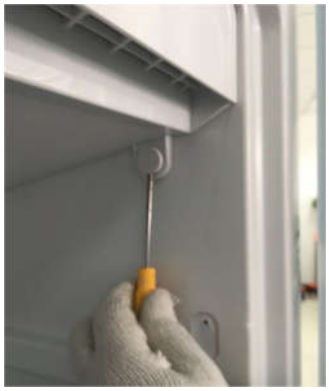
1. Check the connecting wiring of fan motor is well or not, repair if it is broken. The freezer fan motor corresponding pin No.3~5 on CN4 connector of mainboard, 2.Pin No.4 connect 12V power and pin No.5 connect GND, if the freezer fan motor works normally, change the mainboard; if not, change the fan motor.

### 6.4.3 Removing the fan motor

1. Unplug the appliance.
2. Remove the screw cover as picture 1.
3. Remove the screw by screwdriver as picture 2.
4. Remove the wind cover as picture 3.
5. Remove the screw by screwdriver as picture 4.
6. Remove the glass shelf as picture 5.
7. Remove the cover as picture 6.
8. Remove the screw by screwdriver as picture 7.
9. Pull the fan motor cover as picture 8.
10. Check the assembly of the fan motor is in place as picture 9; if not, change it in the following way.
11. Remove the fixed holder as picture 10.
12. Pull and take out the wind channel component as picture 11.
13. Unplug the terminal as picture 12 and picture 13.
14. Pull and take out the fan motor as picture 14.

| | | |
|---|---|---|
|  |  |  |
| Picture 1 | Picture 2 | Picture 3 |

# 6. Circuit and checking

| | | |
|---|---|---|
|  |  |  |
| Picture 4 | Picture 5 | Picture 6 |
|  |  |  |
| Picture 7 | Picture 8 | Picture 9 |
|  |  |  |
| Picture 10 | Picture 11 | Picture 12 |
|  |  | |
| Picture 13 | Picture 14 | |

## 6.5 Defrost heater

### 6.5.1 Basic parameters

Input voltage: AC 230V
Rated power: 100W

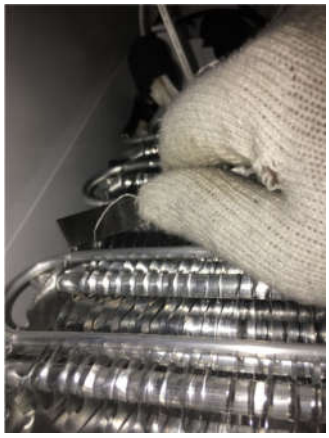
### 6.5.2 Checking method

1. Enter compulsory defrost mode, use a multimeter to measure the voltage between pin No.1 and No.4 on CN2 connector of the mainboard, if the voltage isn't equal to electric supply power, it means the mainboard is broken, change it.
2. Unplug the appliance, then use a multimeter to measure resistance of the heater, if the value isn't 529Ω ± 5%, it is broken, change the heater.

### 6.5.3 Removing the defrost heater

1. Unplug the appliance.
2. Refer to the picture 1 to picture 6 of the way of removing fan motor, then pull and take out the wind channel components as picture 1, take out the top wind channel foam as picture 2.
3. Unplug the terminals as picture 3.
4. Remove the temperature fuse as picture 4(The fuse is integrated with the defrost heater).
5. Cut the self-locking ties which fastening the defrost sensor as picture 5 and picture 6(The defrost sensor is integrated with the defrost heater).
6. Remove the aluminum water drain as picture 7 to picture 9.
7. Remove the heater as picture 10 and picture 12.

| | | |
|---|---|---|
|  |  |  |
| Picture 1 | Picture 2 | Picture 3 |

| | | |
|---|---|---|
|  |  |  |
| Picture 4 | Picture 5 | Picture 6 |
|  |  |  |
| Picture 7 | Picture 8 | Picture 9 |
|  |  |  |
| Picture 10 | Picture 11 | Picture 12 |

## 6.6 Temperature fuse

### 6.6.1 Basic parameters

Max fusing-off temperature: 72°c
Load voltage: 250V
Load current: 10A

### 6.6.2 Checking method

Use a multimeter to measure resistance between the two terminals of the temperature fuse, if it is open circuit, change the defrost heater (The fuse is integrated with the defrost heater).

### 6.6.3 Removing the temperature fuse

The same as removing the defrost heater.

## 6.7 Evaporator Defrost Sensor

### 6.7.1 Basic parameters

R(5℃)=5K06±2%

### 6.7.2 Checking method

1. Check the connecting wiring of Defrost Sensor is well or not, repair if it is broken. The Defrost Sensor corresponding pin No.3 and No.7 are connecting on CN5 connector of mainboard.
2. Use a Multimeter with the ohm switch to measure the resistor of sensor, if it is open circuit or short circuit, it means the sensor is broken, change the defrost heater(The defrost sensor is integrated with the defrost heater); If not, change the mainboard.

### 6.7.3 Removing the Defrost Sensor

The same as removing the defrost heater.

## 6.8 Temperature Sensor

### 6.8.1 Basic parameters

R(5℃)=5K06±2%

### 6.8.2 Checking method

1. Check the connecting wiring of Temperature Sensor is well or not, repair if it is broken. The Temperature Sensor corresponding pin No.2 and No.6 are connecting on CN5 connector of mainboard.
2. Use a Multimeter with the ohm switch to measure the resistor of sensor, if it is open circuit or short circuit, it means the sensor is broken, change the sensor; If not, change the mainboard.

### 6.8.3 Removing the Temperature Sensor

# 6. Circuit and checking

1. Unplug the appliance.
2. Referring to the picture 1 to picture 6 of the way of removing fan motor, then pull and take out the wind channel components as picture 1, take out the top wind channel foam as picture 2.
3. Unplug the terminals as picture 3.
4. Remove the bottom wind channel foam as picture 4.
5. Remove the temperature sensor as picture 5 and picture 6 by pulling the terminals in picture 3.

| | | |
|---|---|---|
|  |  |  |
| Picture 1 | Picture 2 | Picture 3 |
|  |  |  |
| Picture 4 | Picture 5 | Picture 6 |

## 6.9 Door switch

### 6.9.1 Basic parameters

Input voltage: DC 24V
Rated current: 0.05A

### 6.9.2 Checking method

1. Check the connecting wiring of door switch is well or not, repair if it is broken. Door switch corresponding pin No.3~4 is on CN8 connector of the mainboard.
2. Normally, when the door is closed, the two pins of door switch should be

short circuit; when the freezer door is open, the two pins should be open circuit. If the result is abnormal, Use small iron sheet or small magnet to touch the door liner area shown as picture 1, circled in red: if the sheet or magnet they can't be gravitated toward to door liner, replace the door, or change the door switch.

3. If all above is OK, change the mainboard.

### 6.9.3 Removing the door switch

1. Unplug the appliance.
2. Use a screwdriver to pry the door switch cover, as picture 2.
3. Take out the switch, as picture 3.
4. Unplug the terminal as picture 4.


Picture 1

Picture 2

Picture 3

Picture 4

## 6.10 Humidity Sensor

### 6.10.1 Basic parameters

R(5℃)=5K06±2%

### 6.10.2 Checking method

1. Check the connecting wiring of Humidity Sensor is well or not, repair if it is broken. The Humidity Sensor corresponding pin No. 10 and No. 13 which are

connecting on CN7 connector of the mainboard.
2. Use a Multimeter with the ohm switch to measure the resistor of sensor, if it is open circuit or short circuit, it means the sensor is broken, change the sensor; If not, change the mainboard.

### 6.10.3 Removing the Humidity Sensor

1. Unplug the appliance.
2. Remove the humidity sensor cover by a cross screwdriver as picture 1 and picture 2.
3. Take out the switch as picture 3.
4. Unplug the terminal as picture 4.

| | |
|---|---|
|  |  |
| Picture 1 | Picture 2 |
|  |  |
| Picture 3 | Picture 4 |

# 6. Circuit and checking

## 6.11 Pipe lid

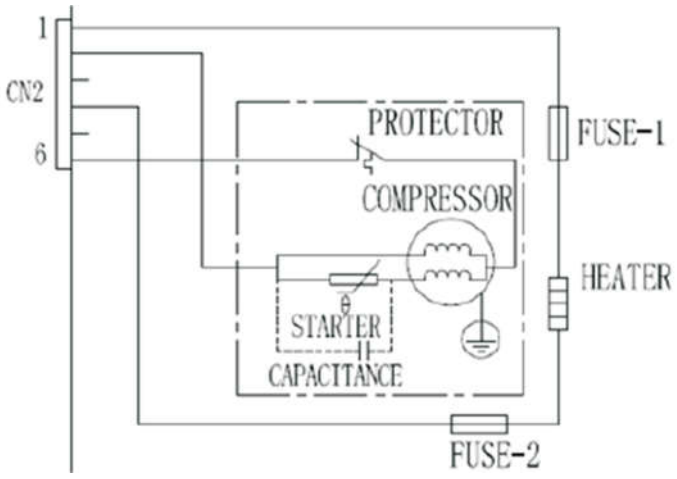
If there is no pipe lid at the drain spout which is on the top of the compressor, the fan motor will get a lot of ice, and the temperature inside won't meet the requirements. The inspection and removal of the pipe lid are as follows:

1. Unplug the appliance.
2. Use a screwdriver to pry the evaporation dish, as picture 1.
3. Check whether the pipe lid is at the drain spout, as picture 2, circled in red.

| | |
|---|---|
|   |  |
| Picture 1 | Picture 2 |

## 6.12 Compressor

### 6.12.1 Circuit diagram of compressor




### 6.12.2 Basic parameters

Input voltage:220-240V, input frequency:50Hz

### 6.12.3 Checking method

1. Compressor will start 10 seconds after power-on, if it starts unsuccessfully,

remove the mainboard box cover and check.
2. Check the connecting wiring between compressor and mainbord, repair if it is broken.
4. Use a multimeter to measure voltage between pin NO.2 and No.6 on CN2 connector of mainbord, if the voltage is equal to electric supply power, it means the compressor is broken, change it, if not, change the mainbord.

### 6.12.4 Removing the PTC starter and overload protector

The method is suitable for removing the following specifications of compressor: HYB69MKUa, SZ59E1HL.
1. Unplug the appliance.
2. Remove the screw of the protector cover by screwdriver, as picture1.
3. Remove the protector cover, as picture2.
4. Hold the overload protector and the PTC starter, pull it out as picture 3 and 4

| | |
|---|---|
|  |  |
| Picture 1 | Picture 2 |
|  |  |
| Picture 3 | Picture 4 |

### 6.12.5 Removing the PTC starter and overload protector

The method is suitable for removing the following specification of compressor: TE1090YA.
1. Unplug the appliance.
2. Remove the screw of the protector cover by screwdriver, as picture1.
3. Remove the protector cover, the direction of screwdriver force as picture 2

and 3.

4. Hold the overload protector and the PTC starter, pull it out as picture 4.

Picture 1

Picture 2

Picture 3

Picture 4

## 6.12.6 Removing the PTC starter and overload protector

The method is suitable for removing the following specifications of compressor: LC58CY.

1. Unplug the appliance.
2. Remove the screw of the protector cover by screwdriver, as picture1.
3. Remove the protector cover, the direction of screwdriver force as picture 2 and 3.
4. Hold the overload protector and the PTC starter, pull it out as picture 4.

Picture 1

Picture 2

Picture 3

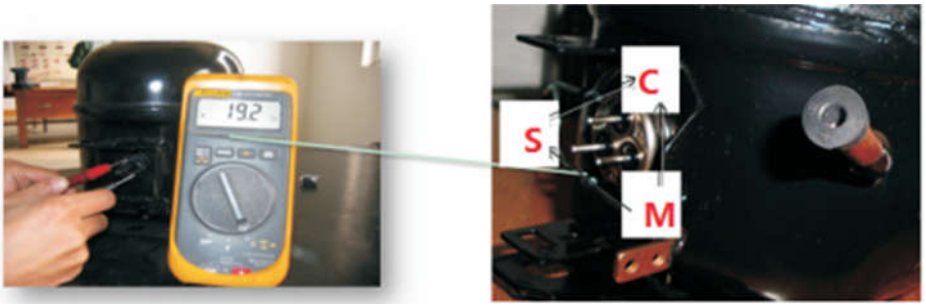
Picture 4

### 6.12.7Basic parameters

Input voltage:220-240V, input frequency:50Hz

### 6.12.8 Compressor checking

1. Unplug the appliance.
2. Use a multimeter to measure the resistance between C&M, C&S and S&M of compressor, as the picture below:




These resistance values apply to compressor: HYB69MKUa.
Normal range of C&M: About 34.2 Ω
Normal range of C&S: About 25 Ω
Normal range of S&M: About 59.2 Ω

These resistance values apply to compressor: LC58CY.
Normal range of C&M: About 38 Ω
Normal range of C&S: About 26.3 Ω
Normal range of S&M: About 64.3 Ω

These resistance values apply to compressor: SZ59E1HL.
Normal range of C&M: About 39.15 Ω
Normal range of C&S: About 13.95 Ω
Normal range of S&M: About 53.1 Ω

These resistance values apply to compressor: TE1090YA
Normal range of C&M: About 34.1 Ω
Normal range of C&S: About 28.2 Ω

Normal range of S&M: About 62.3Ω
If the measure result is not in the range, it means the inner coil has some problem and the compressor can not work properly.

### 6.12.9 Compressor PTC starter test

Use a multimeter to measure the resistance between the two ends of PTC starter, if the result is between about 12-20Ω (this resistance values apply to compressor: TE1090YA, HYB69MKUa, SZ59E1HL), if the result is between about ∞ or MΩ (this resistance values apply to compressor: LC58CY) at room temperture, it is OK, otherwise, the PTC starter is broken, change it.

### 6.12.10 Compressor protector test

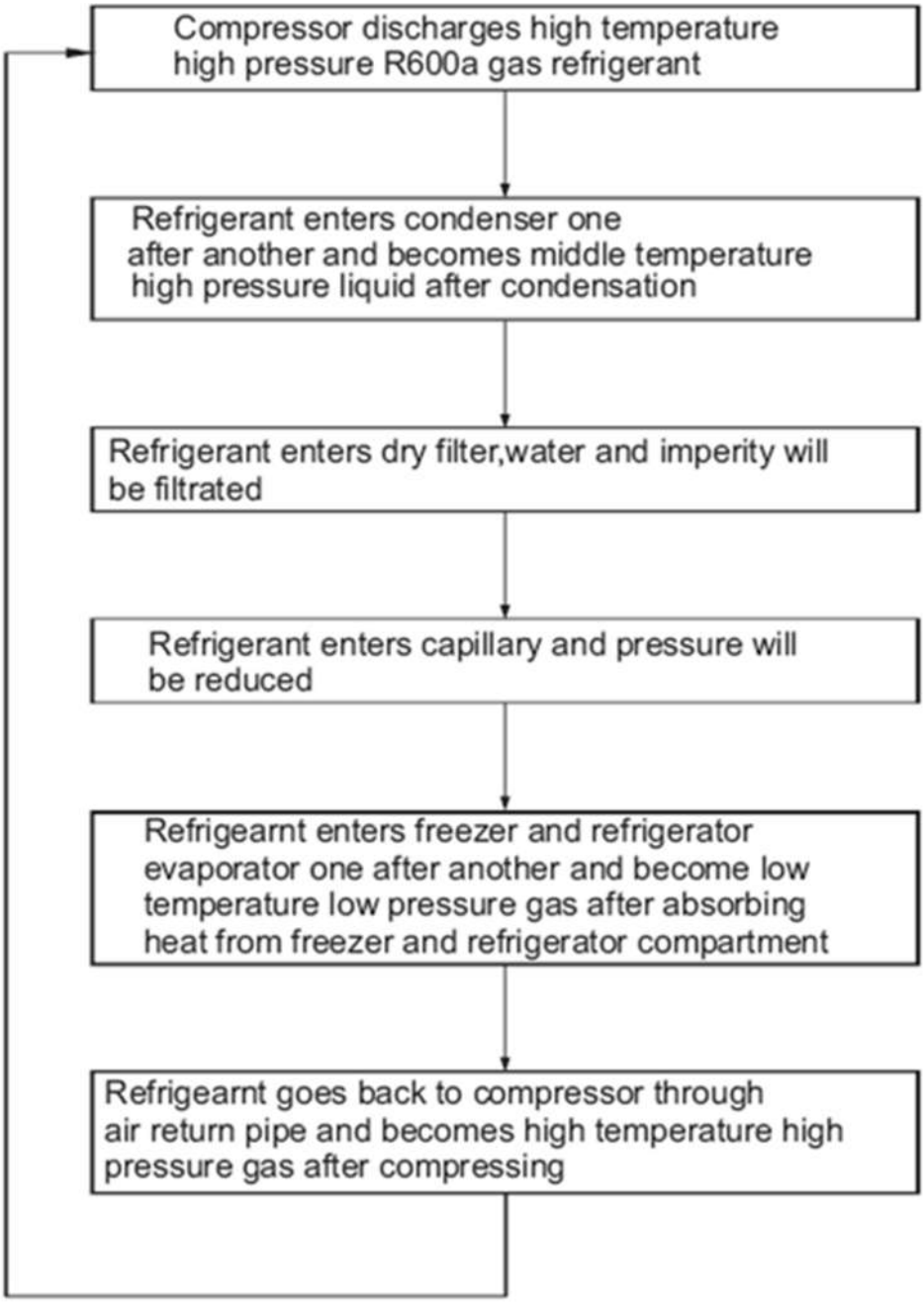
Use a multimeter to measure the resistance between the two end of protector, if it show 0Ω or almost 0Ω then it is OK, if there is no response then it is broken.

| | |
|---|---|
|  |  |
| PTC starter test | protector test |

# 7. Cooling system repairing

## 7.1 Refrigeration system

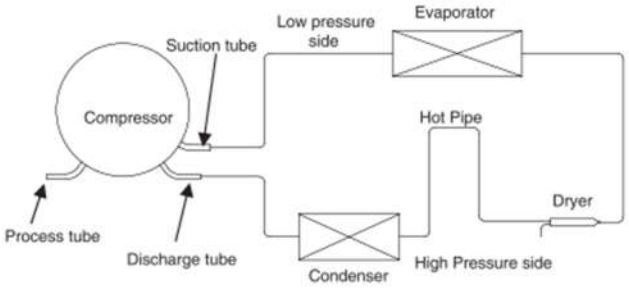
The refrigeration system is single cycle direct cooling system:



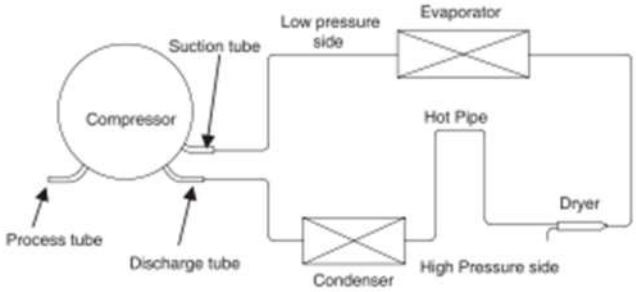
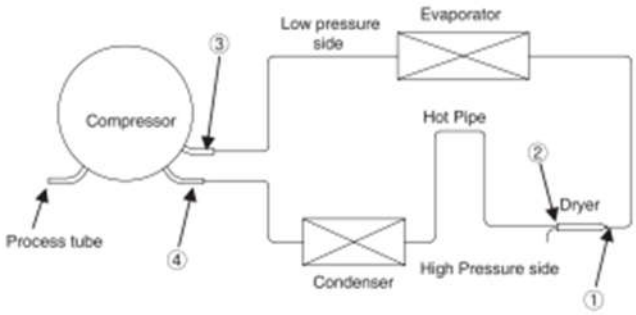
## 7.2 Summary of repair

| Process | Contents | Tools |
|---|---|---|
| Remove refrigerant Residuals | * Cut charging pipe ends (Comp. & Dryer) and discharge refrigerant from drier and compressor. | * Nipper, side cutters |
| Parts replacement and welding | * Confirm refrigerant (R-134a or R-600a) and oil for compressor and drier.<br>* Confirm N2 sealing and packing conditions before use. Use good one for welding and assembly.<br>* Repair in a clean and dry place. | * Pipe Cutter, Gas welder, N2 gas |
| Vacuum | * Evacuate for more than forty minutes after connecting manifold gauge hose and vacuum pump to high (drier) and low (compressor) pressure sides. | * Vacuum pump , Manifold gauge. |
| Refrigerant charging and charging inlet welding | * Weigh and control the bombe in a vacuum conditions with electronic scales and charge through compressor inlet (Process tube).<br>* Charge while refrigerator operates).<br>* Weld carefully after inlet pinching. | * Bombe (mass cylinder), refrigerant manifold gauge, electronic scales, punching off flier, gas welding machine |
| Check refrigerant leak and cooling capacity | * Check leak at weld joints.<br>Note :Do not use soapy water for check.<br>* Check cooling capacity<br>→ Check condenser manually to see if warm.<br>→ Check hot pipe manually to see if warm.<br>→ Check frost formation on the whole surface of the evaporator. | * Electronic Leak Detector, Driver. |
| Compressor compartment and tools arrangement | * Remove flux from the silver weld joints with soft brusher wet rag. (Flux may be the cause of corrosion and leaks.)<br>*Clean tools and store them in a clean tool box or in their place. | * Copper brush, Rag, Tool box |
| Transportation and installation | * Installation should be conducted in accordance with the standard installation procedure. (Leave space of more than 5 cm from the wall for compressor compartment cooling fan mounted model.) | |

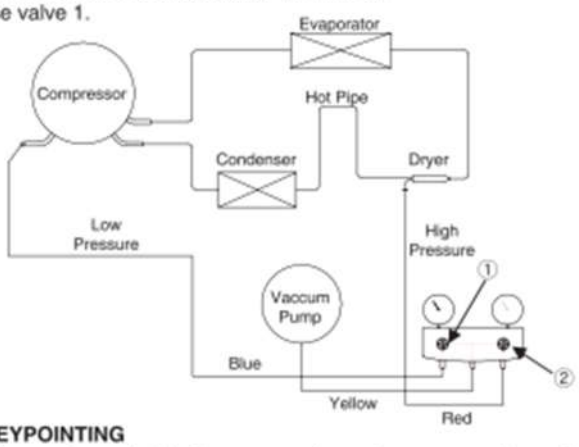
## 7.3 Regulation of repair

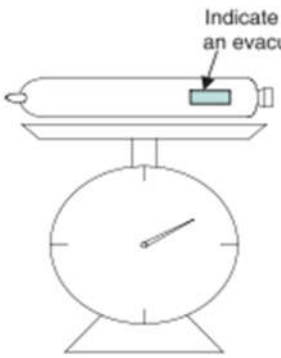
| Items | Precautions |
|---|---|
| Use of tools. | 1) Use special parts and tools for R-134a or R-600a |
| Removal of retained refrigerant. | 1) Remove retained refrigerant more than 5 minutes after turning off a refrigerator. (If not, oil will leak inside.)<br>2) Remove retained refrigerant by cutting first high pressure side (drier part) with a nipper and then cut low pressure side. (If the order is not observed, oil leak will happen.)<br>  |
| Replacement of drier. | 1) Be sure to replace drier when repairing pipes and injecting refrigerant. |
| Nitrogen blowing welding. | 1) Weld under nitrogen atmosphere in order to prevent oxidation inside a pipe. (Nitrogen pressure : 0.1~0.2 kg/cm2.) |
| Others. | 1) Nitrogen only should be used when cleaning inside of cycle pipes inside and sealing.<br>2) Check leakage with an electronic leakage tester.<br>3) Be sure to use a pipe cutter when cutting pipes.<br>4) Be careful not the water let intrude into the inside of the cycle. |

## 7.4 Practical work of repair

| Items | Precautions |
|---|---|
| 1. Removal of residual refrigerant. | 1) Remove residual refrigerant more than 5 minutes later after turning off the refrigerator. ( If not, compressor oil may leak inside.)<br>2) Remove retained refrigerant slowly by cutting first high pressure side (drier part) with a nipper and then cut low pressure side.<br>  |
| 2. Nitrogen blowing welding. |  <br>*** When replacing a drier:**<br>Weld 1 and 2 parts by blowing nitrogen (0.1~0.2kg/cm2) to high pressure side after assembling a drier.<br>*** When replacing a compressor:**<br>Weld 3 and 4 parts by blowing nitrogen to the low pressure side.<br>Note) For other parts, nitrogen blowing is not necessary because it does not produce oxidized scales inside pipe because of its short welding time.<br><br>**- KEYPOINTING**<br>Welding without nitrogen blowing produces oxidized scales inside a pipe, Which affect on performance and reliability of a product. |

## 7.5 Practical work of repair

<table>
<tr><th>Items</th><th>Precautions</th></tr>
<tr><td>3.Vacuum degassing.</td><td>
* Pipe Connection<br>
Connect a red hose to the high pressure side and a blue hose to the low pressure side.<br>
* Vacuum Sequence<br>
Open 1,2 valves and evacuate for 40 minutes.<br>
Close valve 1.<br>


<br>
※ KEYPOINTING<br>
1) If power is applied during vacuum degassing, vacuum degassing shall be more effective.<br>
2) Operate compressor while charging refrigerant. (It is easier and more certain to do like this.)
</td></tr>
<tr><td>4.Refrigerant charging.</td><td>
* Charging sequence<br>
1) Check the amount of refrigerant supplied to each model after completing vacuum degassing.<br>
2) Evacuate bombe with a vacuum pump.<br>
3) Measure the amount of refrigerant charged.<br>
- Measure the weight of an evacuated bombe with an electronic scale.<br>
- Charge refrigerant into a bombe and measure the weight. Calculate the weight of refrigerant charged into the bombe by subtracting the weight of an evacuated bombe.<br>


<br>
- KEYPOINTING<br>
1) Be sure to charge the refrigerant at around 25C.<br>
2) Be sure to keep -5g in the winter and +5g in summer.<br>
Calculation of amount of refrigerant charged<br>
the amount of refrigerant charged<br>
= a weight after charging<br>
- a weight before charging<br>
(a weight of an evacuated cylinder)
</td></tr>
</table>

## 7.6 Brazing reference drawing