			重 要 度	

		产 品 名称:	冷藏冷冻箱
		产 品 型号:	BC-237/HC4(E) BC-237A/HC4(E)
		文 件 名称:	售后服务技术资料
		文 件 编号:	**B08082023**
		编 制 日期:	**2019 年 8 月 8 日**
借(通)用件登记			

						家电开发中心
旧底图总号						
底图总号	A					售后服务技术资料
	版本	更改单编号	签字	日期	重 量	比例
出图审查	设计		审核			
	标准化				共 张	第 张
日 期	批准					B08082023

Hisense

Refrigerator

Service Manual

Contents

1. Warning and precautions for safety

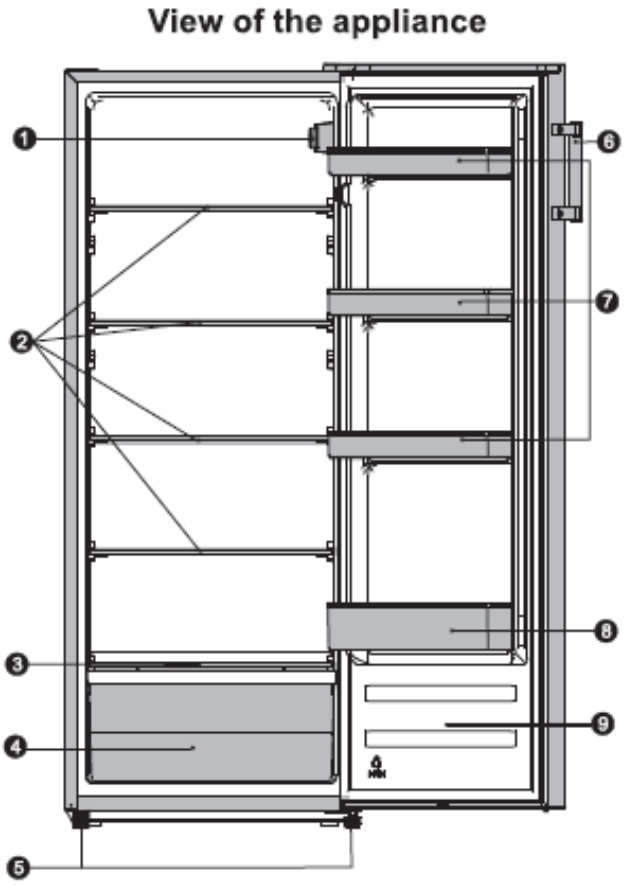
Please observe the following safety precautions in order to use safely and correctly the refrigerator and to prevent accident and danger during repair.

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 touch the ice maker with hands or tools to confirm the operation of geared motor.
11. Do not let the customers repair, disassemble and reconstruct the refrigerator for themselves. It may cause accident, electric shock, or fire.
12. Do not store flammable materials such as ether, benzene, alcohol, chemicals, gas, or medicine in the refrigerator.
13. Do not put flower vase, cup, cosmetics, chemicals, etc., or container with full of water on the top of the refrigerator.
14. Do not put glass bottles with full of water into the freezer. The contents shall freeze and break the glass bottles.
15. When you scrap the refrigerator, please disconnect the door gasket first and scrap it.

2. Appearance and structure

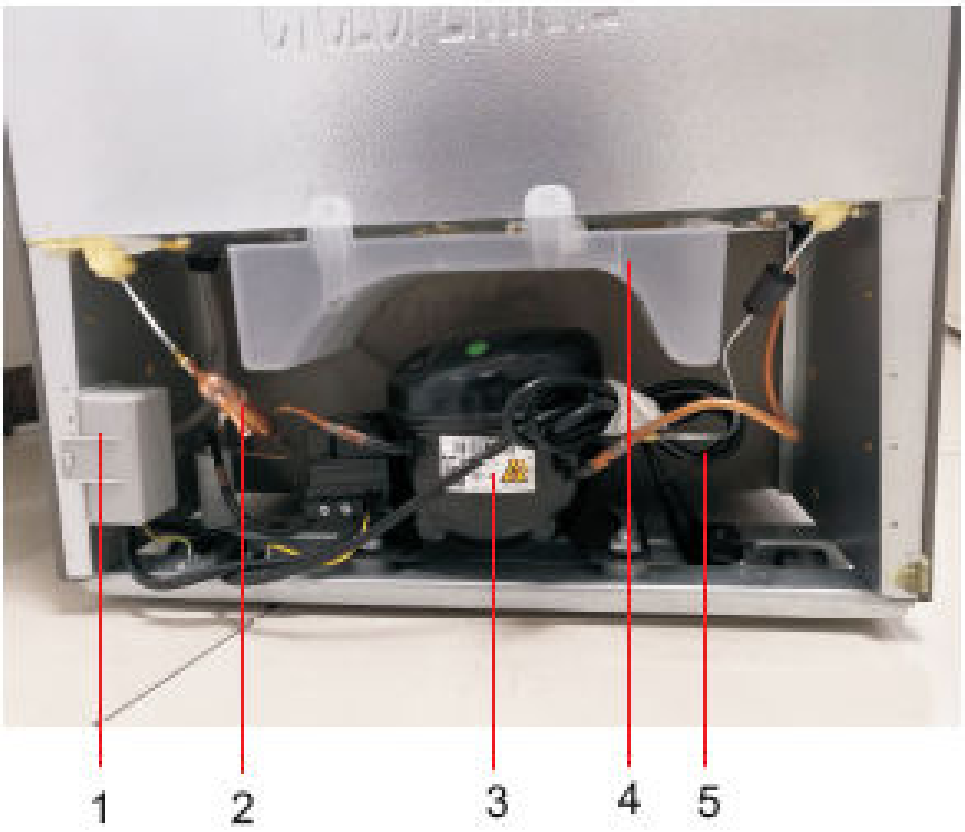
2.1 View of the appliance

1.Controller box and LED light
2.Refrigerator shelf
3.Vegetable drawer cover
4.Vegetable drawer
5.Adjustable bottom feet
6.Handles
7.Upper door shelf
8.Lower door shelf
9.Refrigerator door



Note: Due to unceasing modification of our products, your refrigerator may be slightly different from this instruction manual, but its functions and using methods remain the same.

2.2 Compressor room structure



1.Junction box
2.Dry filter
3.Compressor
4.Evaporator dish
5.Power line

3. Basic parameters

Content	Unit	RS-31DL4SVA /CPA1-001	RS-31DL4SBA /CPA2-001
Voltage/frequency	V/Hz	220-240V /50Hz	220-240V /50Hz
Rated input current	A	0.5	0.5
Rated input power	W	70W	70W
LED wattage	W	2W	2W
Net capacity	L	242	242
Energy efficiency class		A+	A++
Climate class(SN=10~32℃,N=16~32℃, ST=16~38℃,T=16~43 ℃)		N/ST	N/ST
Freezer compartment star rating		/	/
Energy consumption / year	kWh/year	128	101
Energy consumption (EN153) per 24 h (A/A+)	kWh/24 h	0.351	0.276
Max noise level	dB(A)	40	40
Certifications		CB；CE+GS	CB；CE+GS
Kind of coolant / Charge (R134/R600a)/ grammes	R/g	R600a/32g	R600a/32g

4. Operation and functions

Starting up and temperature regulation

- insert the plug of the connection lead into the plug socket with protective eath contact. when the refrigerator compartment door is opened, the internal lighting is switched on. After the fridge has been placed in position, wait for 5 minutes before electricity is supplied. Don't store anything until the temperature inside the fridge becomes low enough.
- The temperature selector knob is located on the right of the refrigerator compartment.

Setting 0 means:

Off.

Clockwise rotate the Knob to turn on the appliance.

Setting 1 means:

Highest temperature, warmest setting.

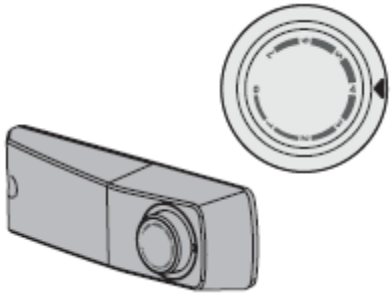
Setting 7(end-stop) means:

Important! Normally we advise you seklect

setting of 2 or 3 or 4, if you want the temperature higher or colder please turn the knob to warmer or setting accordingly. When you turn the Knob to colder which can lead to the more energy efficiency-Otherwise, it would result in more energy-consuming.

Important! High ambient temperatures (e.g. on hot summer days) and a cold setting (position 6 to 7) may cause the compressor to run continuously or even non-stop!

Reason:when the ambient temperatures is high, the compressor must run continuously to maintain the low temperature in the appliance.

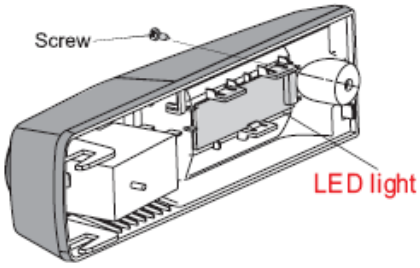


Changing the LED light

Warning! If the LED light Is damaged. DO NOT CHANG IT BY THE USER!

Changing the LED light carry out by inexperienced persons may cause injury or serious malfunctioning. It must be replaced by a qualified persons in order to avoid a hazard. Contact your local Service Force Center for help.

- Before changing the LED light, switch off the appliance and unplug it, or pull the fuse or the circuit breaker.
- LED light data: 220-240V, MAX 2W
- Unplug the mains plug.
- To change the LED light, undo the screw.
- Changing the defective LED light.
- Put the refrigerator back into operation.



5. Troubleshooting

5.1 Common problem and checking

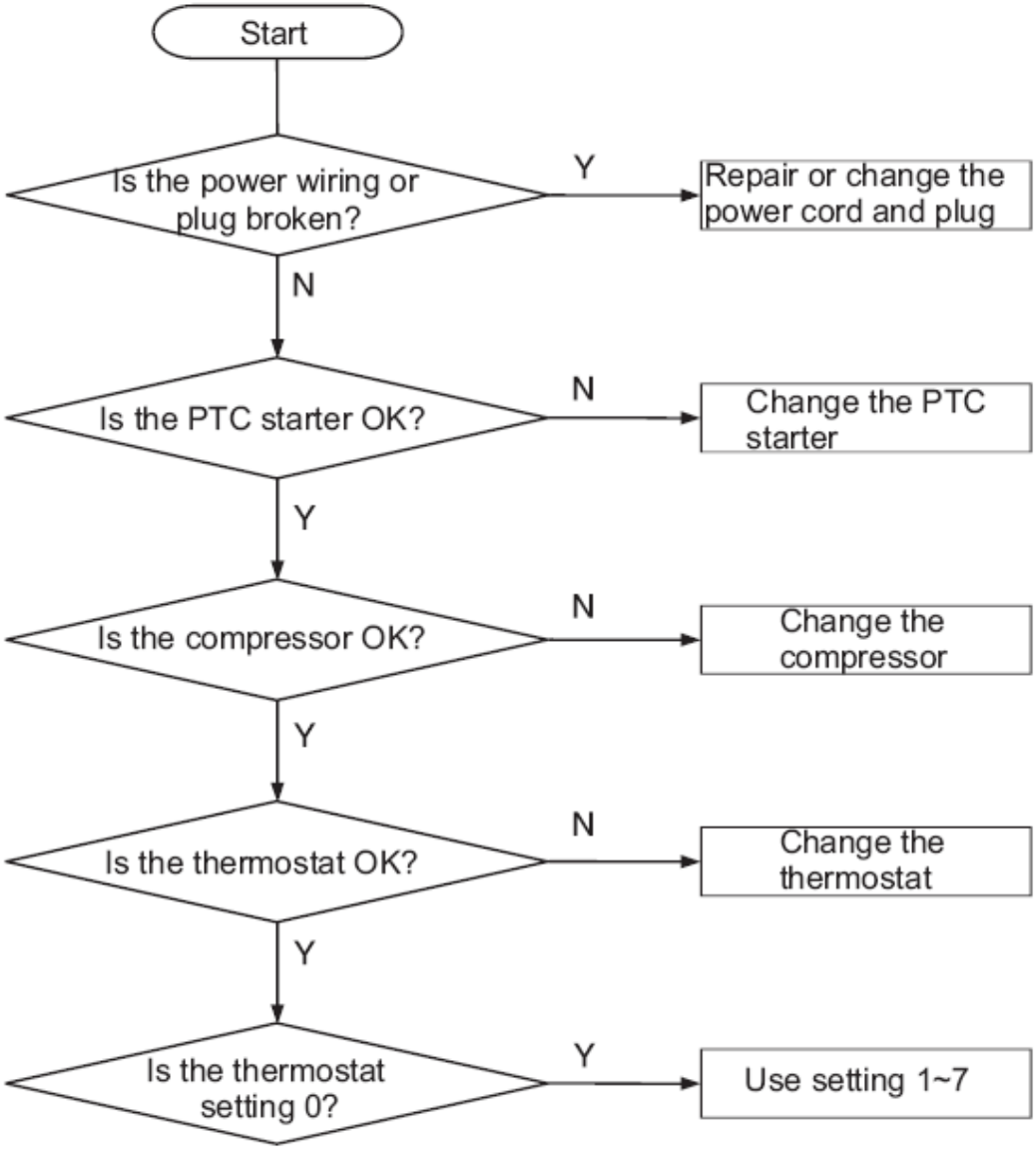
Problem	Possible cause & Solution
Appliance is not working correctly	Check whether the power cord is plugged into the power outlet properly.
	Check the fuse or circuit of your power supply, replace if necessary.
	The ambient temperature is too low. Try setting the chamber temperature to a colder level 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.
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: •Compressor running noises. •Air movement noise from the small fan motor in the freezer compartment or other compartments. •Gurgling sound similar to water boiling. •Popping noise during automatic defrosting. •Clicking noise before the compressor starts.
	Other unusual noises are due to the reasons below and may need you to check and take action: •The cabinet is not level. •The back of appliance touches the wall. •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: • Temperature setting is set colder than necessary • Large quantity of warm food has recently been stored within the appliance. •The temperature outside the appliance is too high. •Doors are kept open too long or too often. •After your installing the appliance or it has been switched off for a long time.
A layer of frost occurs in the compartment	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 warm	You may have left the doors open too long or too frequently; or the doors are kept open by some obstacle; or the appliance is located with insufficient clearance at the sides, back and top
Temperature inside is too cold	Increase the temperature by following the “Display controls” chapter.

5.1 Common problem and checking

Problem	Possible cause & Solution
Doors can't be closed easily	Check whether the top of the refrigerator is tilted back by 10-15mm to allow the doors to self close, or if something inside is preventing the doors from closing.
Water drips on the floor	The water pan (located at the rear bottom of the cabinet) may not be properly leveled, or the draining spout （located underneath the top of the compressor depot） may not be properly positioned to direct water into this pan, or the water spout is blocked. You may need to pull the refrigerator away from the wall to check the pan and spout.
The light is not working	•The LED light may be damaged. Refer to replace LED lights in cleaning and care chapter. •The control system has disabled the lights due to the door being kept open too long, close and reopens the door to reactivate the lights.

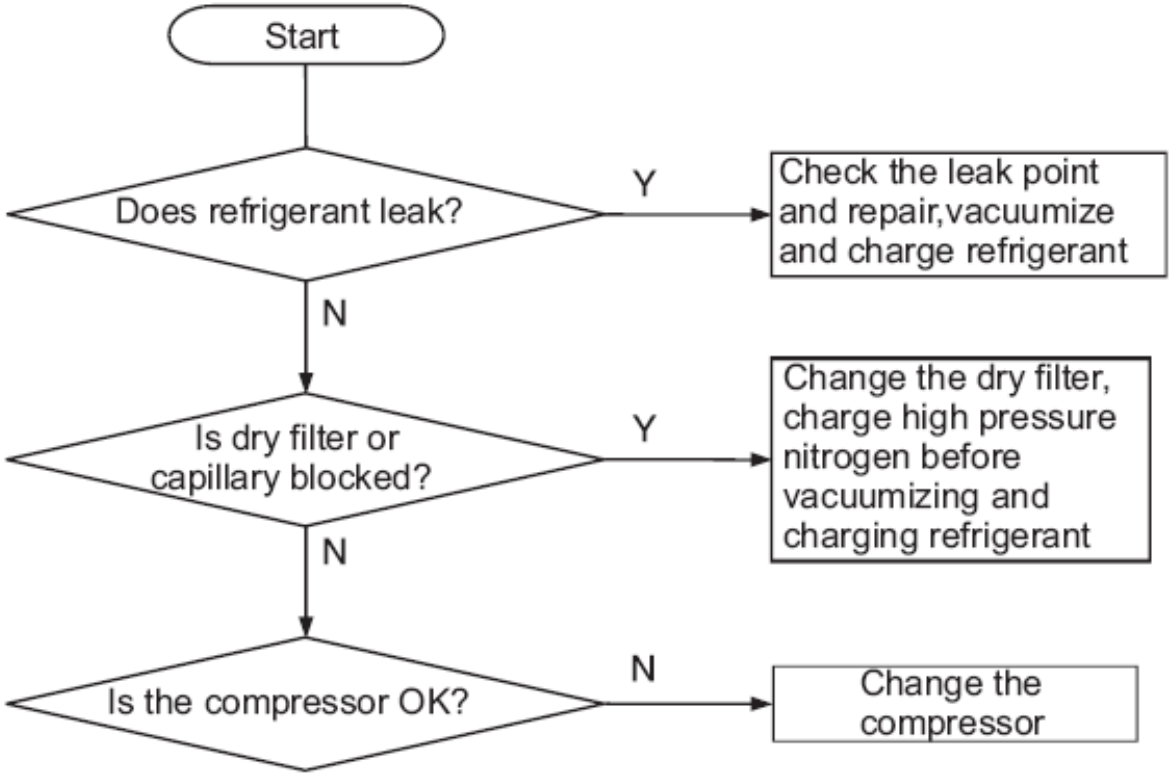
5.2 Rrfrigeration failure

5.2.1 Compressor doesn't work

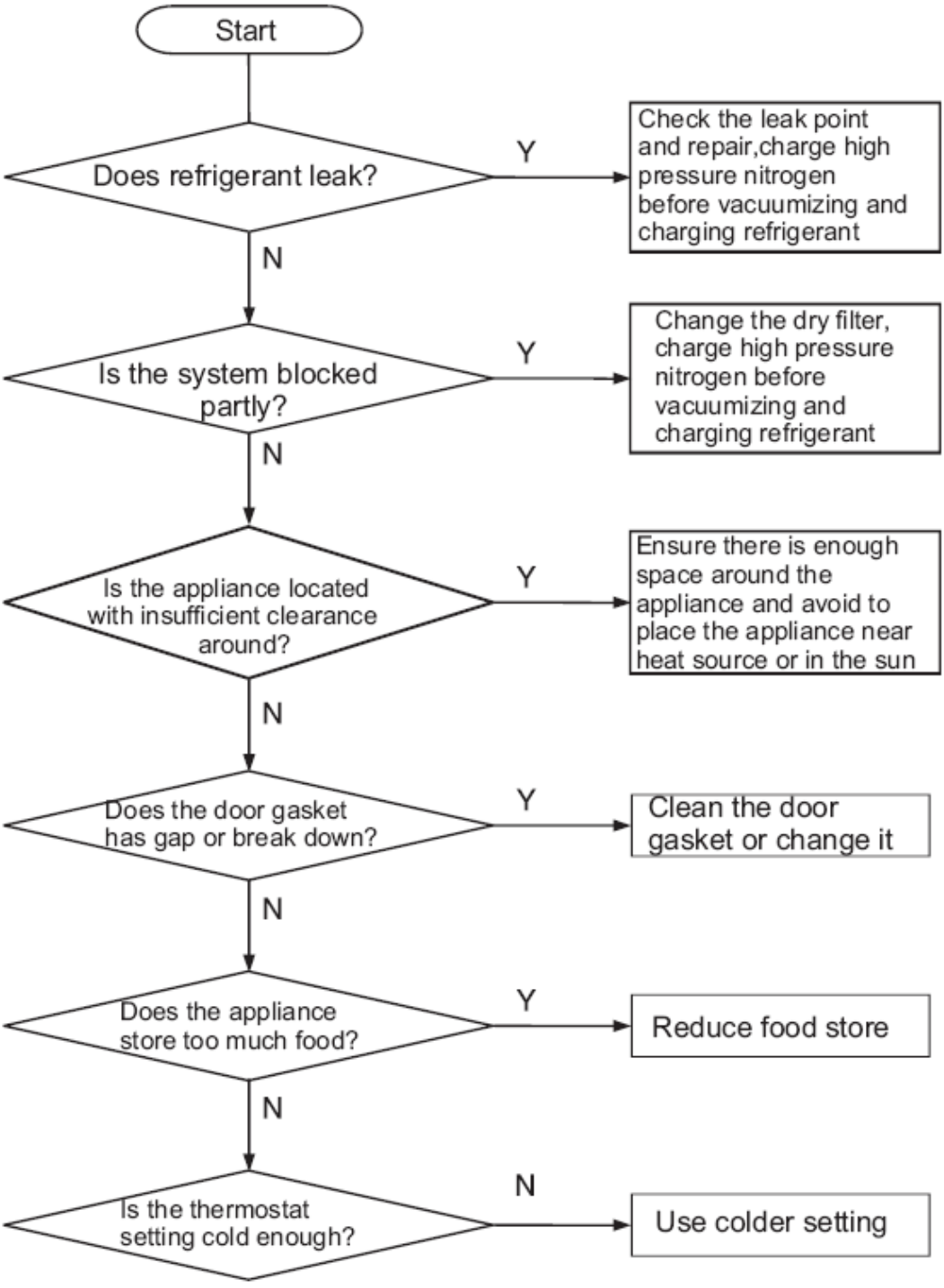


5.2 Rrfrigeration failure

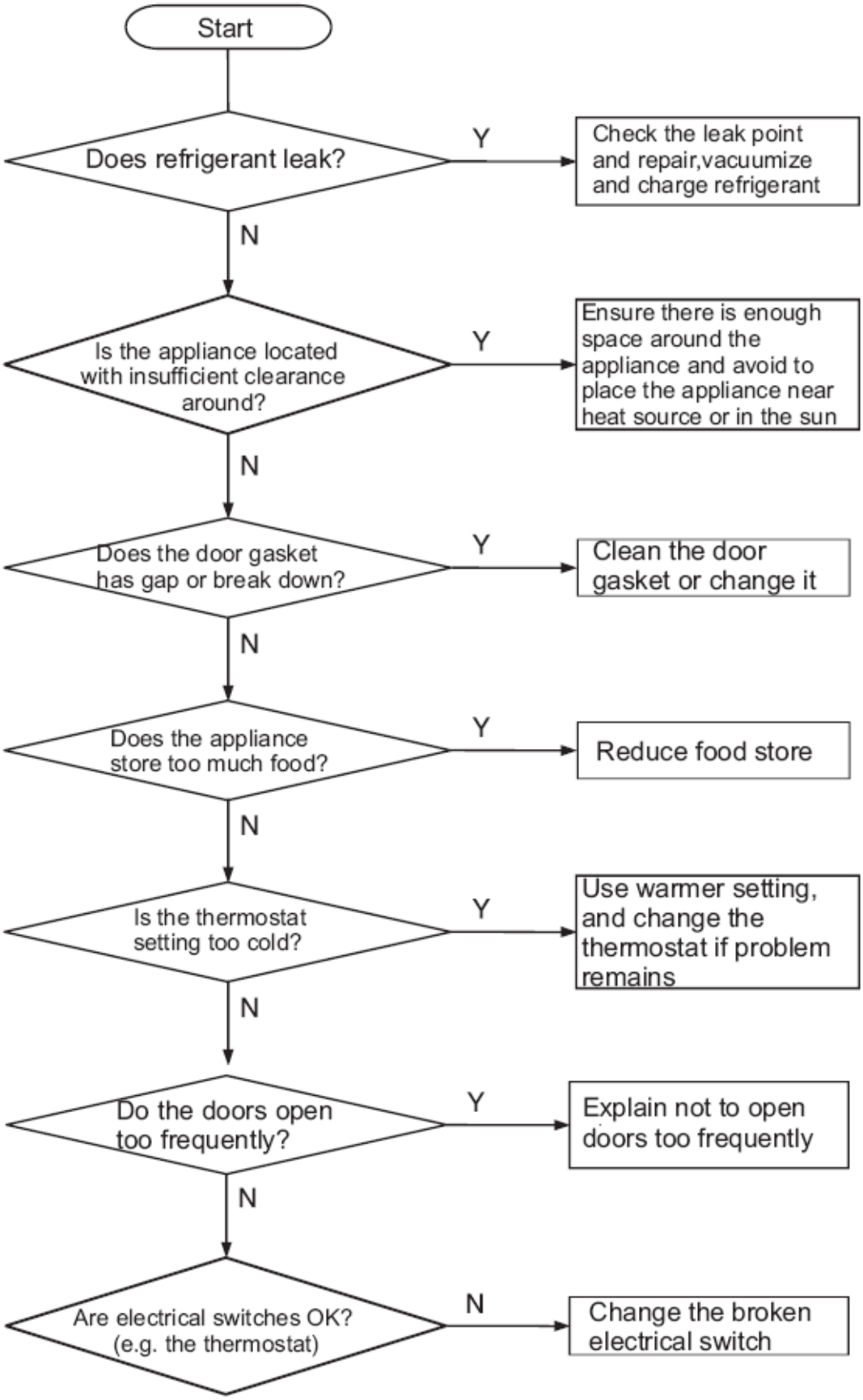
5.2.2 Compressor work



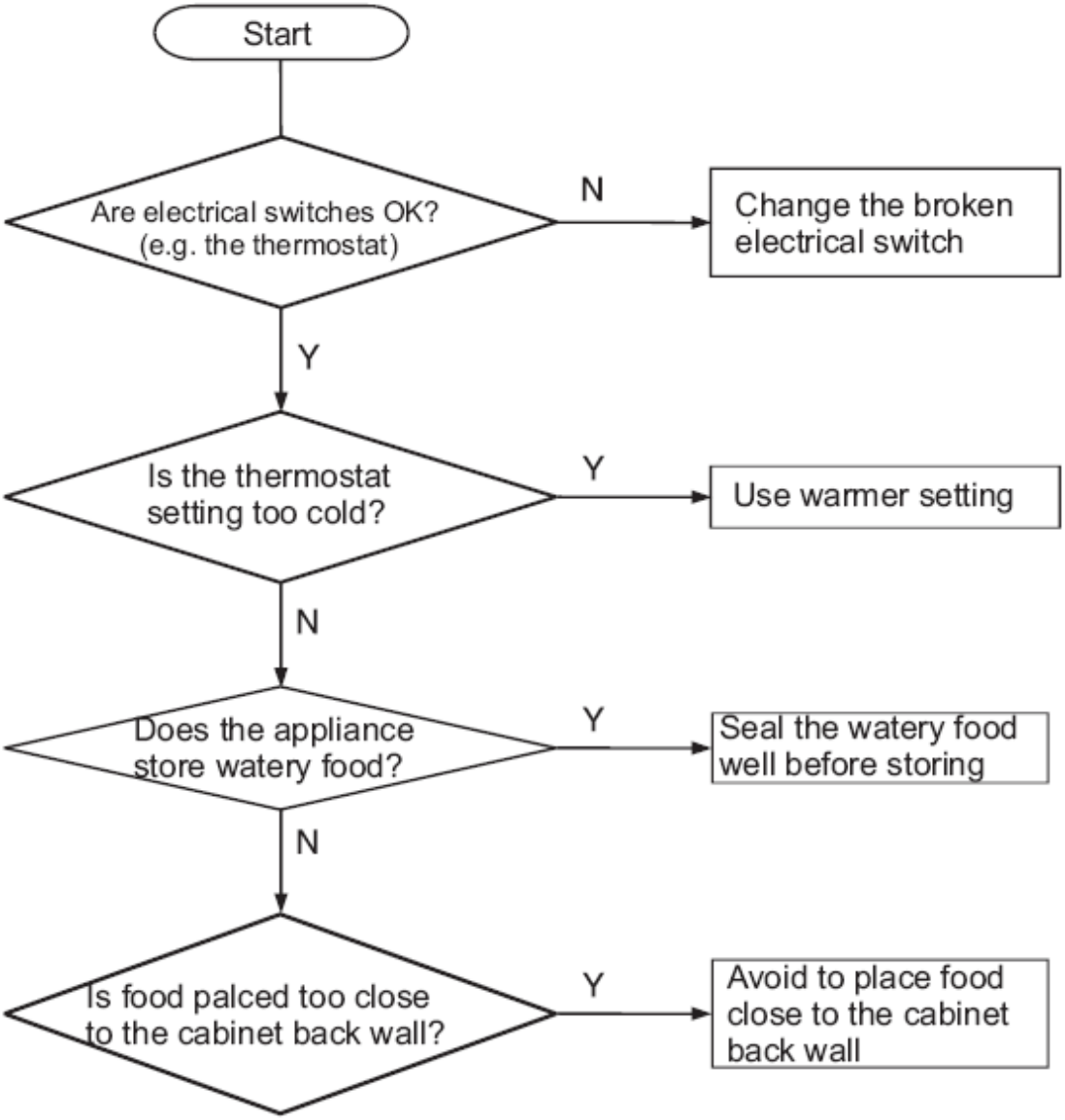
5.3 Bad refrigeration sffect



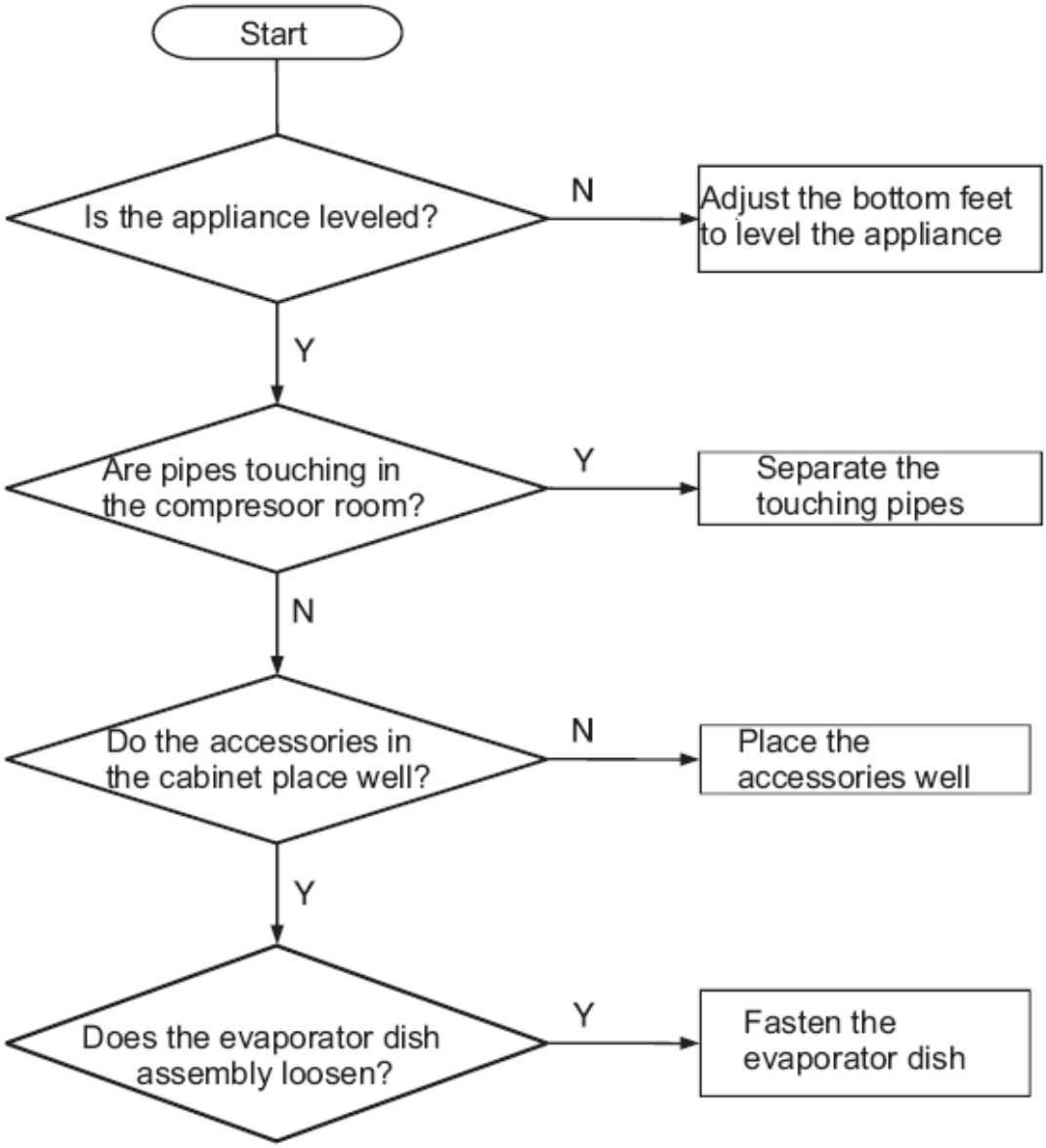
5.4 Non-stop or high running rate



5.5 Frozen food in refrigerator compartment

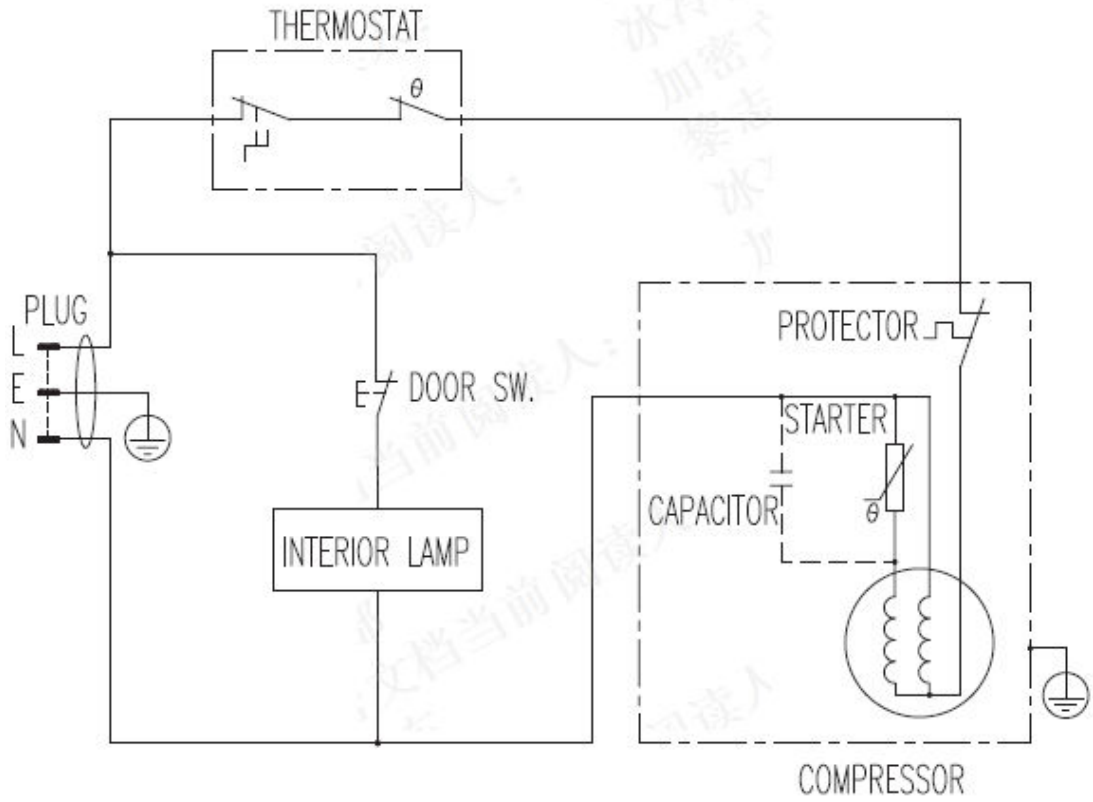


5.6 Noise


Start
Is the appliance leveled?
N
Adjust the bottom feet to level the appliance
Y
Are pipes touching in the compresoor room?
Y
Separate the touching pipes
N
Do the accessories in the cabinet place well?
N
Place the accessories well
Y
Does the evaporator dish assembly loosen?
Y
Fasten the evaporator dish

6. Circuit and checking

6.1 Circuit diagram



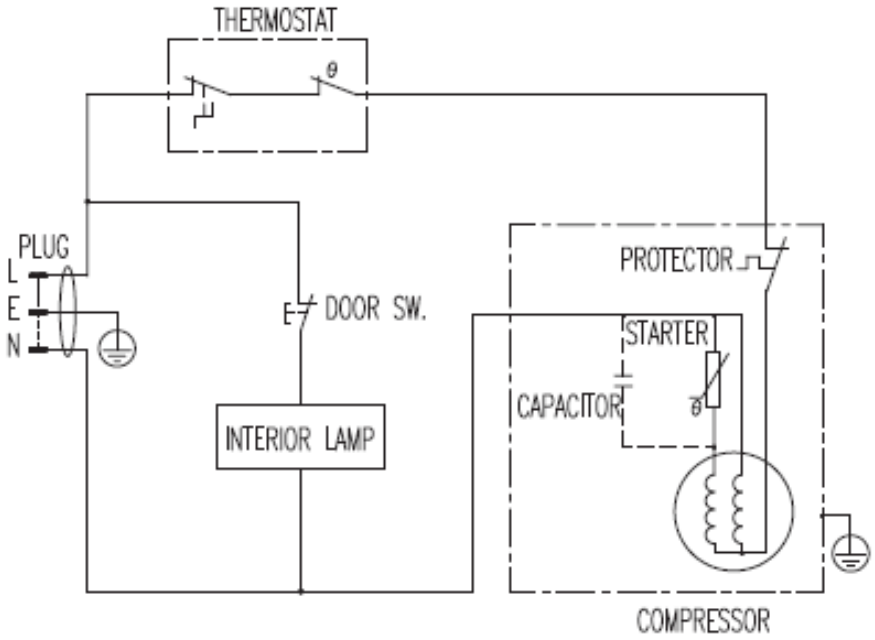
6.2 Thermostat

6.2.1 Basic parameters

	Cold point	Warm point
On（℃）	5.5±1	5±1
Off（℃）	-30±2	-8±2

6.2.2 Checking method

1.Use a multimeter to measure resistance between C,H,L three ends of he thermostat,as the diagram right:



1.1 Measure the resistance between L&C:
It is normal if the multimeter shows 0,when thermostat setting is from 1 to 7;Oppositely,if the multimeter shows other result,it means the thermostat is off and compressor doesn't work.

1.2 When the thermostat is off,measure resistance between L&H, C&H:
If the multimeter shows nothing,it is normal.

1.3 When the thermostat is on,measure resistance of L&H,C&H:
The multimeter shows value,it is normal.

2.When compressor is running,adjust the thermostat setting from 7 to 0,if the compressor doesn't stop,it means the thermostat is broken, change it.

6.2.3 Removing the controller

Refer to "4.Operation and functions".

6.3 Light

6.3.1 Basic parameters

Input voltage:AC220-240V

Rated power:2W

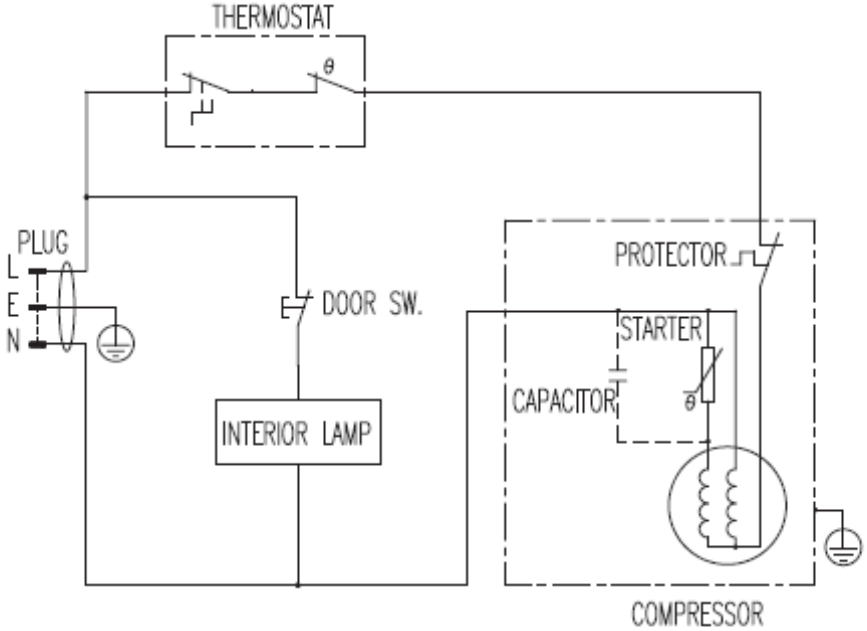
6.3.2 Checking method

1.Check the power connection is well or not.

2.Check the supply voltage is 220V or not.

3.When power-on and door switch is connected,use a mutimeter to measure the voltage between the two ends A&B , as circuit diagram below,if the value is 220V,it is OK.

4.If all above are OK,problem reamins,change the thermostat.



6.3.3 Removing the light

Refer to "4.Operation and functions".

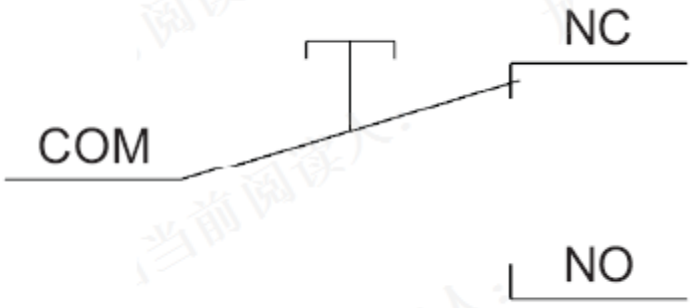
6.4 Door switch

6.4.1Basic parameters

Input voltage:220-240V
Rated current:0.5A

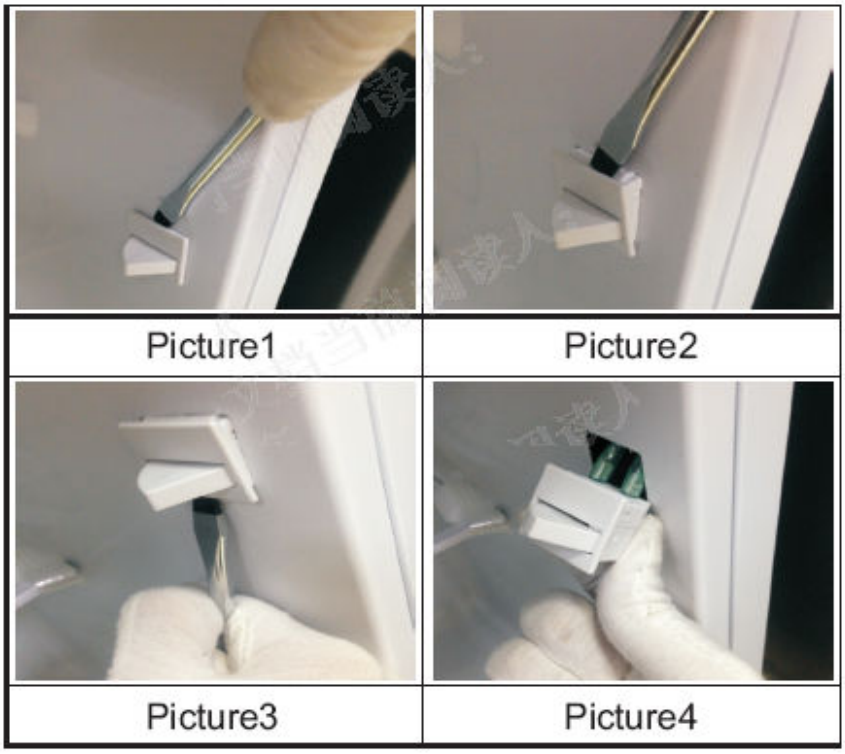
6.4.2 Checking method

1. The door switch use COM end and NC end, as the drawing below.
2. When switch is off, Use a mutimeter to measure COM and NC， the circuit should be coducting.
3.When switch is on, use a mutimeter to measure COM and NC, the circuit should be open.
4. If the measure result is abnormal, it means the door switch is broken, change it.



6.4.3 Removing the door switch

1.Unplug the appliance
2.Insert the screwdriver into the gap between door switch and cabinet from upside,as picture 1.
3.Pry up the door switch by the screwdriver,as picture 2.
4.Pry up the door switch from underneath too,as picture 3.
5.Hold the door switch and pull it out,as picture 4.



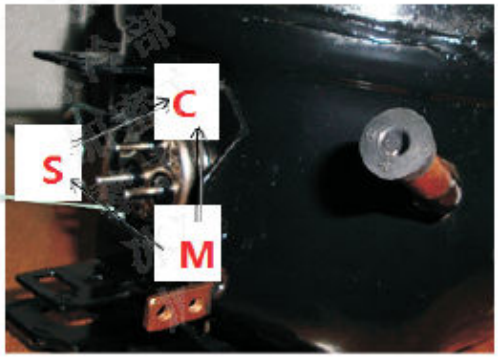
6.5 Compressor

6.5.1 Basic parameters

Input Voltage/ frequency: 220V-240V/50Hz

6.5.2 Checking method

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



Normal range of C&M : About 10-30Ω
Normal range of C&S : About 10-32Ω
Normal range of S&M : About 20-60Ω
If the measure result is not in the range,it means the compressor has problem,change the compressor.

2.Use a multimeter to measure the resistance between the two ends of PTC starter,as the picture below:

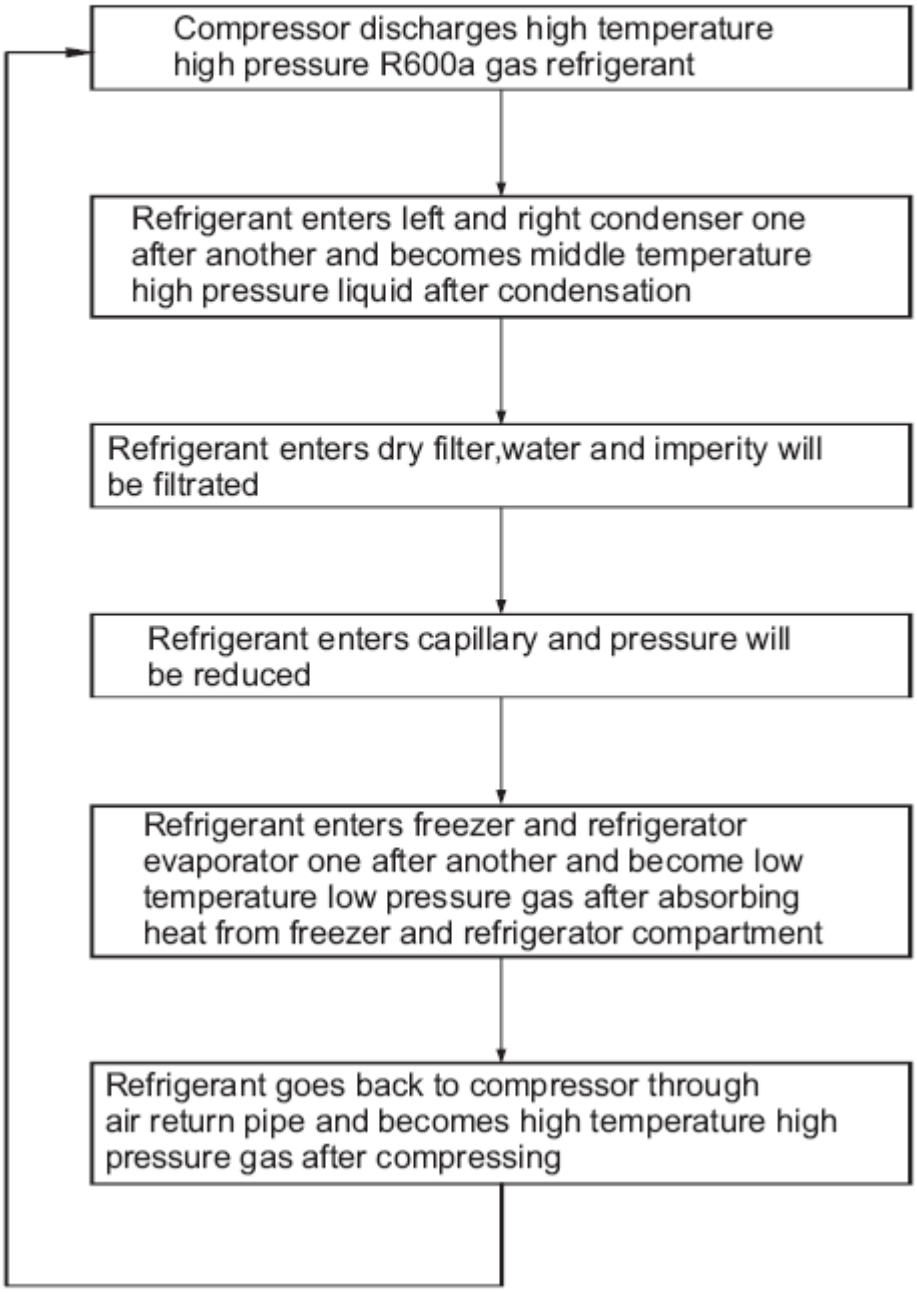
If the result is between about 12-18 Ω at room temperature, it is OK. Otherwise,the PTC starter is broken, change it.

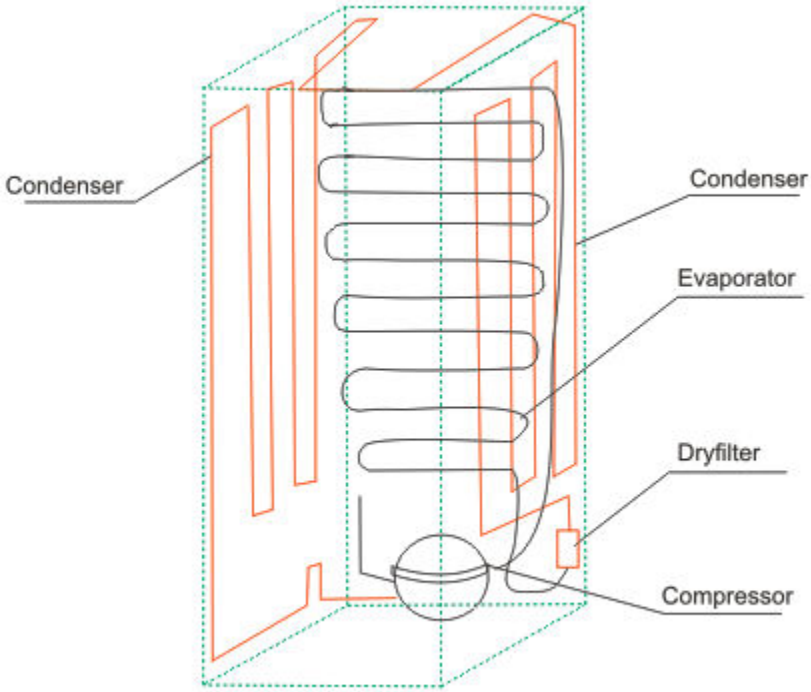
7. Refrigeration system repair

7 Refrigeration system repair

7.1 Refrigeration system

The refrigeration system is single cycle direct cooling system:

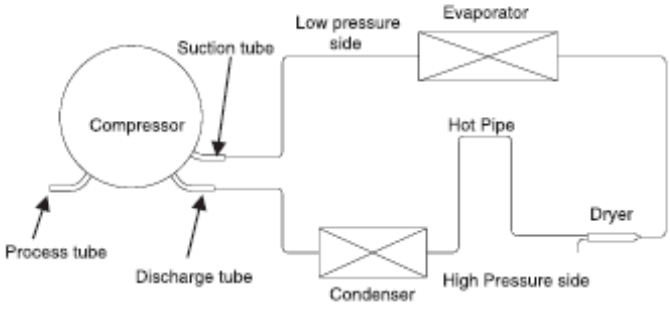



Condenser
Condenser
Evaporator
Dryfilter
Compressor

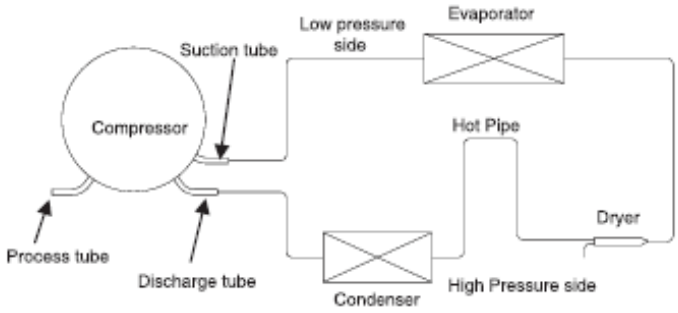
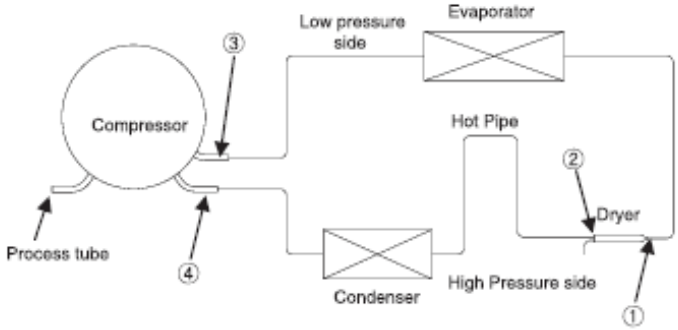
7.2 Summary of repair

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. * Confirm N2 sealing and packing conditions before use. Use good one for welding and assembly. * 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). * Charge while refrigerator operates). * 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. Note :Do not use soapy water for check. * Check cooling capacity → Check condenser manually to see if warm. → Check hot pipe manually to see if warm. → 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.) *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.)	

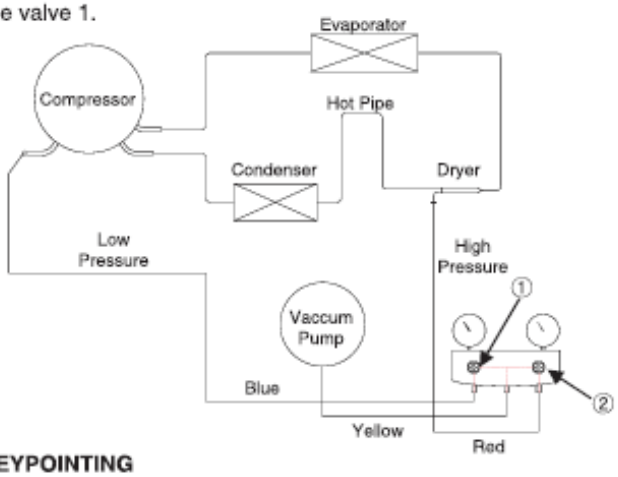
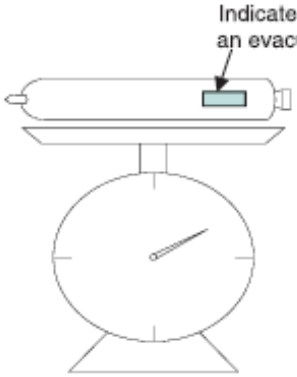
7.3 Regulation for repair

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.) 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.) 
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. 2) Check leakage with an electronic leakage tester. 3) Be sure to use a pipe cutter when cutting pipes. 4) Be careful not the water let intrude into the inside of the cycle.

7.4 Practical work for 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.) 2) Remove retained refrigerant slowly by cutting first high pressure side (drier part) with a nipper and then cut low pressure side. 
2. Nitrogen blowing welding.	 *** When replacing a drier:** Weld 1 and 2 parts by blowing nitrogen (0.1~0.2kg/cm2) to high pressure side after assembling a drier. *** When replacing a compressor:** Weld 3 and 4 parts by blowing nitrogen to the low pressure side. Note) For other parts, nitrogen blowing is not necessary because it does not produce oxidized scales inside pipe because of its short welding time. **- KEYPOINTING** Welding without nitrogen blowing produces oxidized scales inside a pipe, Which affect on performance and reliability of a product.

7.4 Practical work for repair

Items	Precautions
3.Vacuum degassing.	*** Pipe Connection** Connect a red hose to the high pressure side and a blue hose to the low pressure side. *** Vacuum Sequence** Open 1,2 valves and evacuate for 40 minutes. Close valve 1.  **※ KEYPOINTING** 1) If power is applied during vacuum degassing, vacuum degassing shall be more effective. 2) Operate compressor while charging refrigerant. (It is easier and more certain to do like this.)
4.Refrigerant charging.	*** Charging sequence** 1) Check the amount of refrigerant supplied to each model after completing vacuum degassing. 2) Evacuate bombe with a vacuum pump. 3) Measure the amount of refrigerant charged. - Measure the weight of an evacuated bombe with an electronic scale. - 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.  **- KEYPOINTING** 1) Be sure to charge the refrigerant at around 25C. 2) Be sure to keep -5g in the winter and +5g in summer. Calculation of amount of refrigerant charged the amount of refrigerant charged = a weight after charging - a weight before charging (a weight of an evacuated cylinder)