Hisense

Refrigerator

Service manual

NO FROST

MODEL:RQ-70WC*(BCD-536WY)

NOTE: product specifications are subject to change.

Comtents

Warnings 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 icemaker 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.

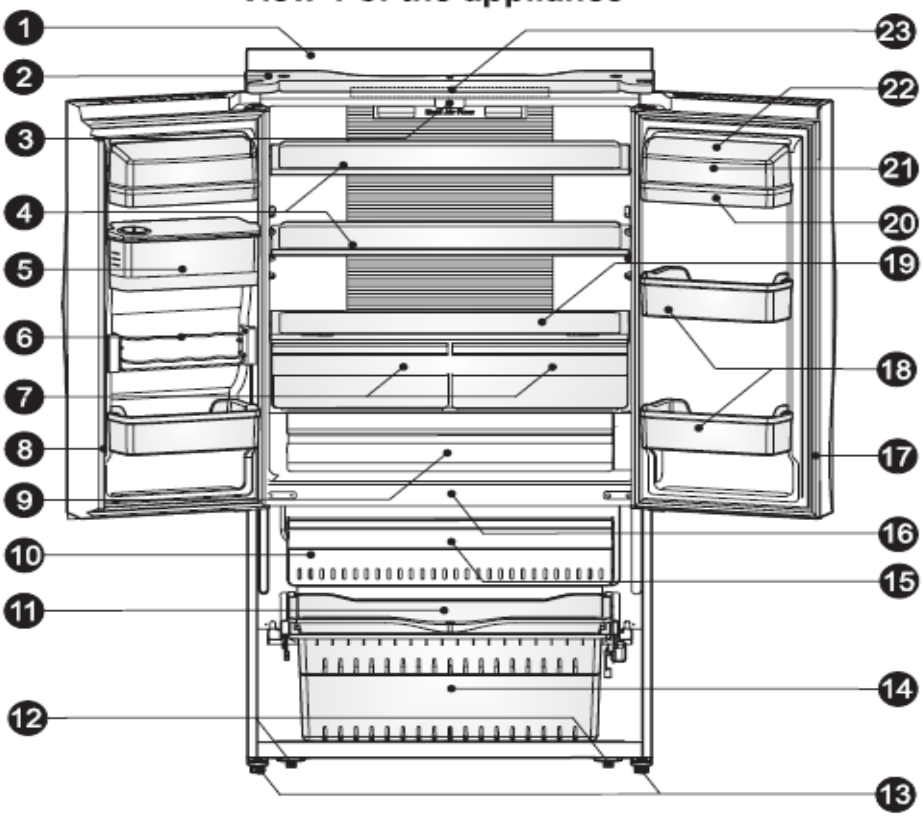
The contents shall freeze and break the glass bottles.

15. When you scrap the refrigerator, please disconnect the door gasket first and scrap it

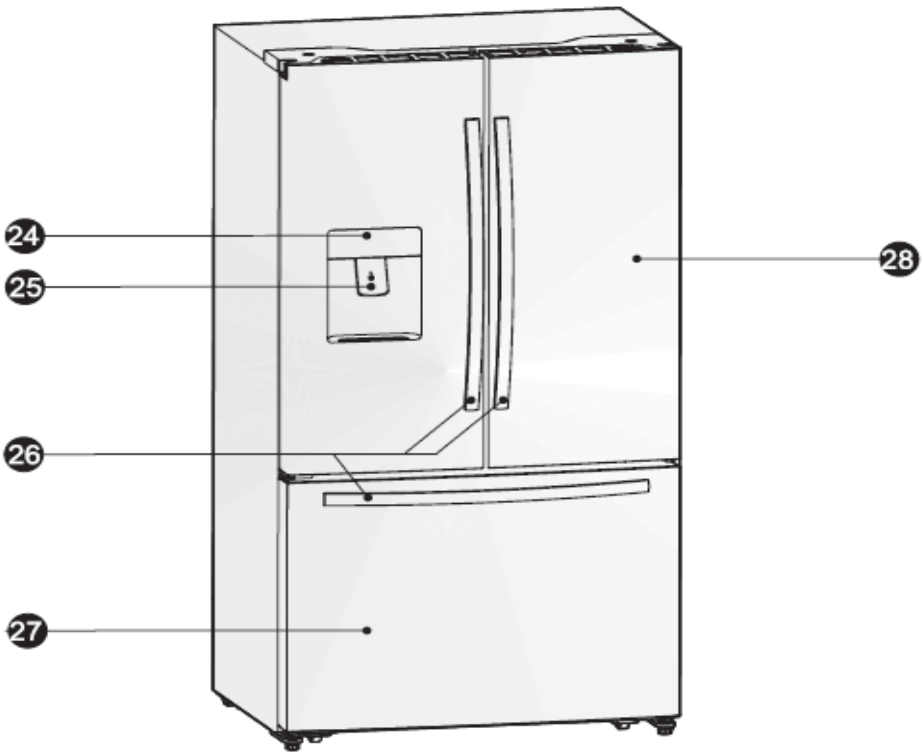
Parts Description

1 Cabinet
2 Top cover
3 Vertical baffle guide block
4 Glass shelf
5 Water storage box
6 Flexible pop can rack
7 Fruit and vegetables crisper
8 Vertical baffle part
9 My fresh choice
10 Twistable ice tray (inside)
11 Serving tray
12 Rollers
13 Adjustable bottom feet
14 Lower freezer drawer
15 Upper freezer drawer
16 Freezer LED light (inside)
17 Refrigerator door seal
18 Lower rack
19 Crisper cover
20 Upper rack
21 Egg tray (inside)
22 Rack cover
23 Refrigerator LED light (inside)
24 Display board
25 Cold water dispenser
26 Handles
27 Freezer door
28 Refrigerator door

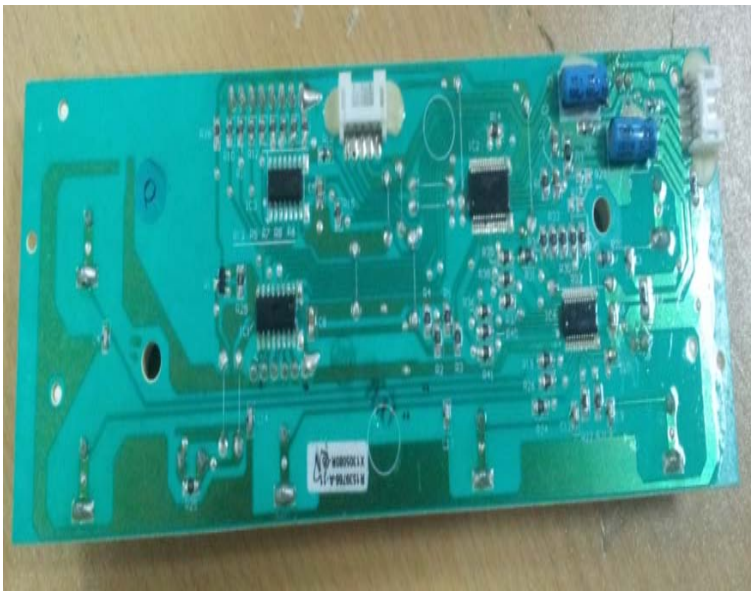
View 1 of the appliance



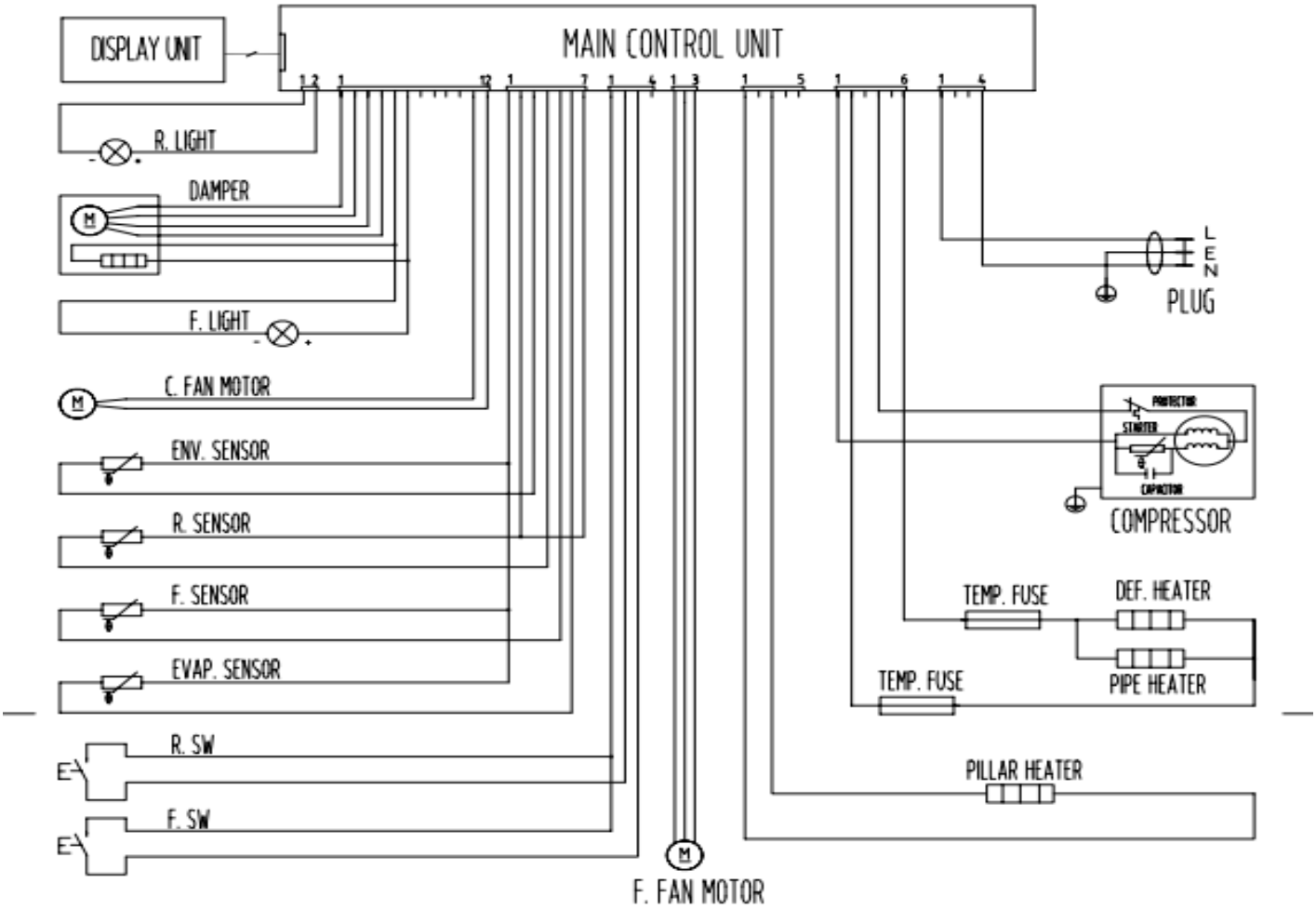
View 2 of the appliance



Main control board



Circuit diagrams and parameters



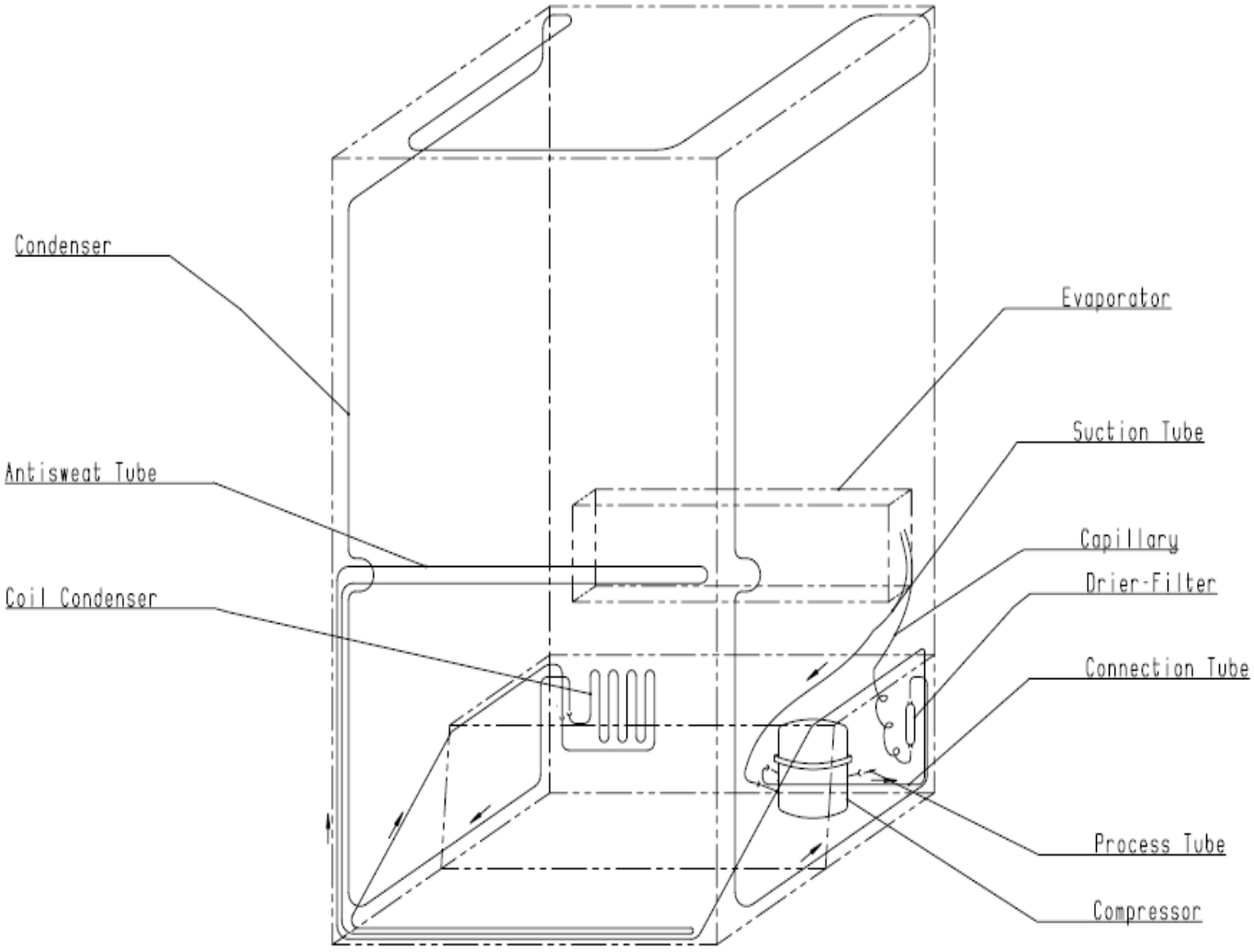
Basic features		
Voltage / frequency		
Net capacity	l	563
Refrigerator: Net/Gross(L)	l	414
Freezer: Net/Gross(L)	l	122
Energy efficiency class		
Climate class (SN=10~32°C, N=16~32°C, ST=16~38°C, T=16~43°C)		10~43°C
Freezer compartment star rating		4 Star
Freezing capacity / 24 hours	kg/24 h	
Max noise level	dB(A)	43
Kind of coolant / Charge (R134a/R600a) / grammes	R / g	R600a/65
Foaming components (R141b / C-P)	PU/	C-P

Certifications (CE / ISO 9001⁄2 / LGA etc.)		CE/GS/CB
Net (With handle)	Width/mm	912
	Depth /mm	765
	Height/mm	1776
Hisense Packing (With handle)	Width/mm	988
	Depth /mm With handle /not With handle	799
	Height/mm	1889

Detailed parameters, circuit diagram please prevail

Part name	Parameters
Heater(evaporimeter)	220V~240V ， <300W About 173Ω
Heater（R door）	220V~240V，13W
Fan Motor（freeze）	DC12V,2W,
Fan Motor（condensation）	DC12V,1.56W,
LED light（R）	DC12V,<4W
LED light（F）	DC12V,0.6W
main control board	220V~240V
display board	DC12V
sensor	DC5V . 25℃ 2KΩ
Electric Wind Gate	DC12V
Compressor	220V,<160W

Cooling diagram



Faults and maintenance of Self test

1、Fault display

If the machine have problem, you can continuously press key 3 (freezer temperature control key) ten seconds , if the displaying b area shows "Er", then we can judge the machine have the receiving communication fault.

If the machine has the following fault, each time when you open the refrigerator door, displaying b area will display fault codes for 3 seconds.

Fault code	Fault name
Ec	Master PCB receive communication failure
EF	Fan motor failure
E1	Fridge room sensor failure
E3	Freezer room sensor fault
E4	Evaporator sensor fault

2、Failure definition

Sensor failure:

——When the sensor temperature ≥ 50 or ≤ -50 ℃, we can judge the corresponding sensor failure.

——Sensor fault, Running the corresponding fault handle process.

Communication failures:

——Continuously 3 minutes, display and Control Board does not receive valid data, then we can judge it is the communication failure.

Fan motor failure:

——When Control the fan motor running for continuously 10 seconds no feedback signal, then we judge the fan motor have fault.

——If fan motor has failure, stop for 5s then run for 60s drive recycling.

Defrost fault

——When defrost heating time is more than 49 minutes, we judge the faults is from defrosting.

3、 Repair and self test

When the refrigerator door is open, press key 3 consecutive (freezer temp.control key) ten seconds enter repair and self test:

——Enter the repair and self test process, each time press the key 3 (freezer tem. control key), the displayed values change according to the following table:

Number of key	Refrigerater display	Freezer display
0	C: the compressor running -: The compressor stop status	DF: in the process of defrosting --: Not in the process of defrosting
1	d	Display version code
2	p	Main control panel version code
3	0	"E0" (standby, used in other models)
4	1	Fridge room temperature after adjustment (such fault displays "E1")
5	3	Freezer room temperature after adjustment (such as fault displays "E3")
6	4	Evaporator temperature adjustment (such fault displays "E4")
7	5	Multifunctional fresh-keeping modified temperature, such as failure displays "E5"
8	H	If defrost fault , it will show "Ed", otherwise display "--"
9	F	If fan motor trouble, it will show "EF", otherwise display "--"
10	Exit this repairing and self test process, back to normal display	

Stop press key 4 (refrigerator temp.control) after 30s, it will unconditionally exit repair and self test mode, back to normal display.

Compulsory defrost

Connecting power within 1 minute, refrigerater or freezer door open situation, press Fridge and Quick frozen 3 seconds, enter the compulsory defrosting process:

——--After entering the compulsory defrosting, we can run the defrosting same as the normal automatic defrosting process.

——Under the compulsory defrosting process, displaying b area (99-00)second cycle display.

After exiting the entire compulsory defrosting process, press the normal operation and display.

The setting of control panel

Controlling the temperature

We recommend that when you start your refrigerator for the first time, the temperature for the refrigerator is set to 5°C and the freezer to -18°C. 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 each compartment may vary from the temperature values displayed on the panel, depending on how much food you store and where you place them. Ambient temperature may also affect the actual temperature inside the appliance.

1. Fridge

Press ″Fridge″ button repeatedly to set your desired fridge temperature between 8°C and 2°C, the tempera-ture will increase 1°C degrees with each press and the fridge tempera-ture indicator will display correspond-ing value according to the following sequence.

8°C – 7°C – 6°C – 5°C
2°C – 3°C – 4°C

2. Super Cool

Super Cool can refrigerate the food quicker and keep food fresh for a longer period.

●Press "Super Cool" button to activate this function. The Super Cool icon will light up and the Fridge temperature indicator will display 2°C.

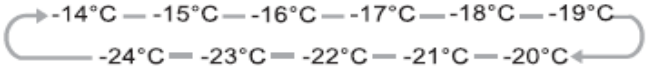
Super cool automatically switches off after 6 hours.

●Press "Super Cool" or "Fridge" to cancel super cool mode and revert to previous temperature settings.

3. Freeze

Press "Freezer" button to set the freezer temperature between -14°C and -24°C to suit your desired temperature, and the

freezer temperature indicator will display corresponding value according to the following sequence.



4. Super Freeze

Super Freeze can rapidly lower frozen temperature and freeze your food substant substantially faster than usual. This feature also helps to keep the vitamins and nutrition of fresh food for longer period.

- Press "Super Freeze" button to activate the super freeze function. The Super Freeze light will be illuminated and the freezer temperature setting will display -24°C.
- For first time use, or after a period of inactivity, allow 6 hours of normal operation before using Super Freeze mode. This is particularly important if a large amount of food is placed in the freezer.
- Super freeze automatically switches off after 26 hours of usage and the freezer temperature goes to below -20°C.
- Press "Super Freeze" or "Freezer" to cancel Super Freeze mode and revert to previous temperature settings.

Note: When selecting the Super Freeze function, ensure there are no bottled or canned drinks (especially carbonated drinks) in the freezer compartment. Bottles and cans may explode.

5. Holiday

This function is designed to minimise the energy consumption and electricity bills while the Fridge is not in use for a long period of time. You can activate this function by pressing "Holiday" button for 3 sec until the Holiday light icon is illuminated.

Important! Do not store any food in the refrigerator chamber during this time.

- When the holiday function is activated, the temperature of the refrigerator is automatically switched to 15°C to minimise the energy consumption. The refrigerator temperature setting displays "-" and the freezer compartment remains on.
- Press any button to cancel Holiday mode and revert to previous temperature settings.

6.Alarm

In case of alarm, "Alarm" icon will light up and a buzzing sound will start.

Press "Alarm" button to stop alarm and buzzing then "Alarm" icon will turn off.

Caution! When the refrigerator is turned on after a period of inactivity, the Alarm may be activated. In this case, press "Alarm" button to cancel it.

Door Alarm

The alarm light on and a buzzing sound indicate abnormal conditions, such as accidentally a door left open or that a power interruption to the unit has occurred.

- Leaving any door of refrigerator or freezer open for over 2 minutes will activate a door alarm and buzzer. The buzzer will beep 3 times per minute for 10 minutes. Closing the door cancels the door alarm and buzzer.
- To save energy, please avoid keeping doors open for a long time when using refrigerator. The door alarm can also be cleared by closing the doors.

Temperature alarm

This is an important feature that alerts users of potential damage to stored food. If a power failure occurs, for example a blackout in your area of residence while you are away, the temperature alarm will memorize the temperature of the freezer when power was restored to the unit; this is likely to be the maximum temperature reached by frozen items.

A temperature alarm condition will be indicated by Alarm light and buzzer when the temperature reading is warmer than -9ºC, then

a- The Alarm icon lights up;

b- The freezer temperature indicator displays "H";

c- The buzzer beeping 10 times when the alarm is triggered and stop automatically.

Child Lock

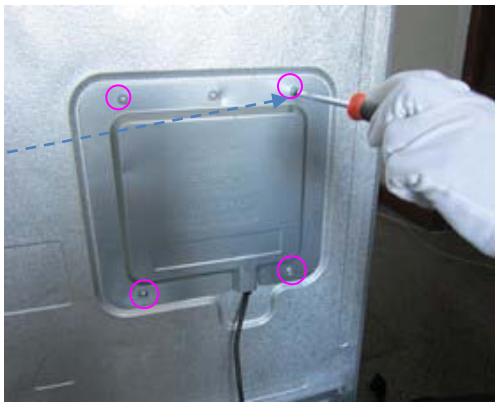
Press and hold the "Alarm" button for 3 seconds to activate the child lock.

This will disable the display to prevent accidental changes to settings. Meanwhile, the "Child Lock" icon will be illuminated.

● To turn the child lock off, press and hold the "Alarm" button for 3 seconds. The "Child Lock" icon will be turned off.

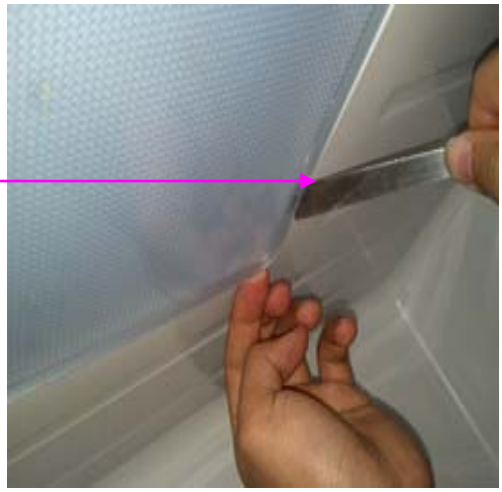
The guide for Disassembly Common parts of Refrigerator

◆The instruction of replacing the main board

1. The location of the electrical main board. **2. Unscrew electrical box cover (screws).**		
3. Remove the electrical cover. **4. Remove the screw fixing the main board(screws).**		

5. Finger pressing buckle 6. Remove the main board		
7. main board		

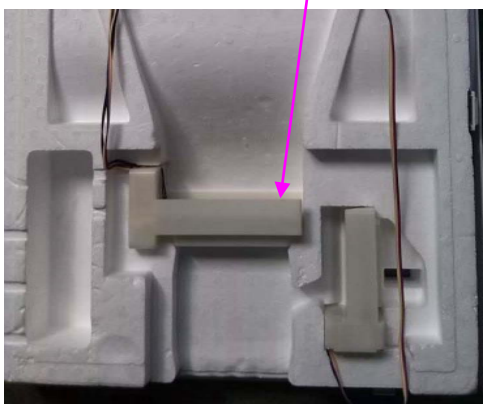
◆The instruction of of replacing lamp

1. The location of the lamp. 2. Buckle with a screwdriver to pry lamp cover		

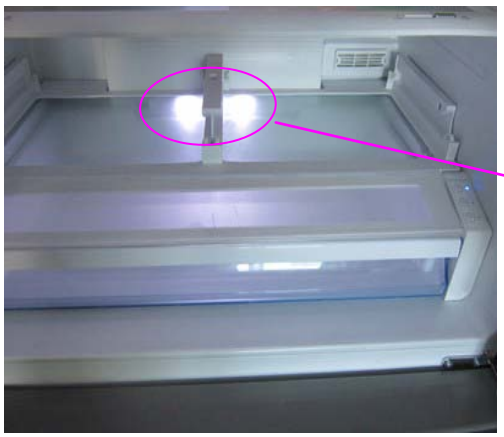
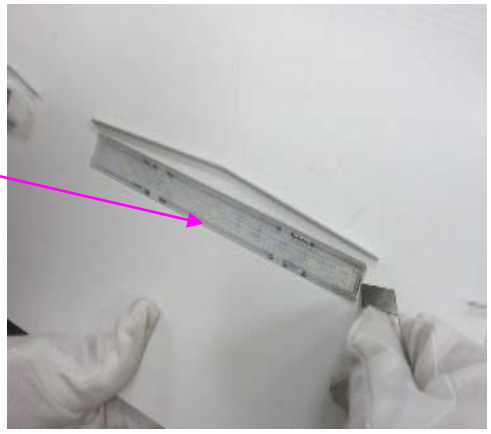
3. Remove the lamp cover. 4. Remove the LED lamp fixing screw.		
5. Unplug the electrical wires. 6. LED lamp.		

◆The instruction of replacing electric w ind gate **and sensor（refrigerator）**

electric wind gate is installed in the refrigerating chamber air plate.		
1. Remove the air inlet plate by hand.		

2. Remove air duct plate fixation screws.		
3. Remove the air duct cover plate.		
4.Disassembly insulation cotton 5. electric wind gate		
The location of the sensor（refrigerator）.		

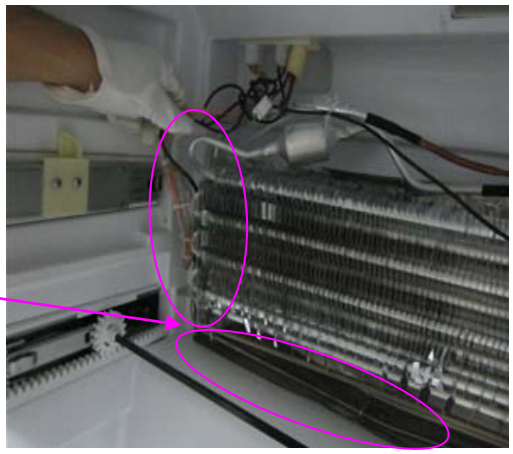
◆The instruction of of replacing lamp（refrigerator 0 degrees room）

1.The position of the lamp. 2. With a knife pry lamp cover.		
3. Remove the lamp cover. 4. o degrees room lamp.		

◆The instruction of of replacing fan motor and temperature fuse and heater

1. Remove the drawer door is fixed at the left and right screw. 2. Remove the drawer door.		

1. The location of the fan motor and remove the freezer drawers. 2. Unscrew two screws of the wind channel part in freezer chamber.		
3. Remove the wind channel cover plate 4. Unplug the electrical wires and remove the fan motor part.		
5. Open air wind channel 6. Remove the fan blade		

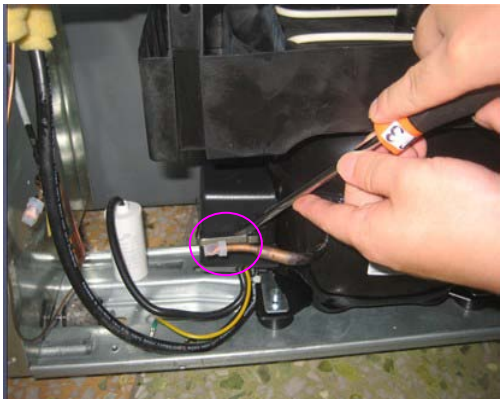
7. Unscrew the fixing screws of the fan motor and replace it.		
The instruction of of replacing temperature fuse and heater and defrosting sensor		

◆The instruction of replacing Door switch and environmental sensor

the light switch in the top cover 1. Remove the cover screw. 2. Remove the top cover.		

3. Unplug the electrical wires and replacing Door switch and environmental sensor.		

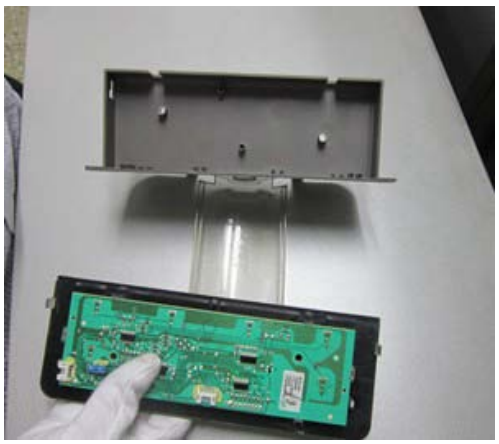
◆The instruction of replacing PTC Starting relay and Overload protector and cooling fan motor

1. Remove the rear cover plate.		
1. The location of the PTC Starting relay and Overload protector.		
2. Disconnect the connecting wire of the PTC Starting relay and Overload protector.		

1.Remove the fan motor retaining screws.		
2.Unplug the connector and remove fan motor		

◆The instruction of replacing Display board

1. The location of the display board . 2. Use both hands to pull out, and good control of force.		

3. Remove display board part. Note! buckle fracture		
4.Unplug the display board wires and remove the screws fixing .		

Troubleshooting

◆The solution for digital display code problem

No.	Problems	analysis	Solutions
1	The digital display window show "E0"	1.The environmental sensor is bad . Sensor is open circuit or short circuit. 2.The control PCB is bad.	1.Using a Mult imeter with the ohm switch to measure the resistor of sensor or checking the connect ing is well or not. 2.Change the sensor 3.Change the control PCB
2	The digital display window show "E1"	1. The refrigerator chamber Tem. Sensor is open circuit or short circuit. 2. The refrigerator chamber Tem. Sensor is bad. 3. The control PCB is bad.	1. Using a Multimeter with the ohm switch to measure the resistor of sensor or checking the connecting is well or not. 2. Change the sensor 3. Change the control PCB
3	The digital display window	1. The freezer chamber Tem.	1. Using a Multimeter with the ohm

	show "E3"	Sensor is open circuit or short circuit. 2. The freezer chamber Tem. Sensor is bad. 3. The control PCB is bad.	switch to measure the resistor of sensor or checking the connecting is well or not. 2. Change the sensor 3. Change the control PCB
4	The digital display window show "E4"	1. The Evaporator Defrost Sensor is open circuit or short circuit. 2. The Evaporator Defrost Sensor is bad. 3. The control PCB is bad.	1. Using a Multimeter with the ohm switch to measure the resistor of sensor or checking the connecting is well or not. 2. Change the sensor 3. Change the control PCB
5	The digital display window show "EC"	1. The receive communication fault between the main electrical PCB and the display PCB. 2. The control PCB is bad. 3. The display PCB is bad.	1. Check the wire terminal is well or not between the main electrical PCB and display PCB. 2. Change the main electrical PCB. 3. Change the display PCB.
7	The freezer digital display window show "EF"	1. The Fan motor is open circuit or short circuit. 2. The Fan motor is bad. 3. The control PCB is bad.	1. Using a Multimeter with the ohm switch to measure the resistor of Fan motor or checking the connecting is well or not. 2. Change the Fan motor 3. Change the control PCB

Note:

1. The digital display window light will be off after 1 min without any touching.

2. When there is any code problem happen, pass any keys of the control panel, the code will be showed on the digital display window again.

3. The location of all Sensors:

3.1 The refrigerator chamber Tem. Sensor is on the right side of the refrigerator chamber.

3.2 The Evaporator Defrost Sensor is on the right up side of the Evaporator in the freezer chamber.

3.3 The freezer chamber Tem. Sensor is in the wind channel part in freezer chamber.

Using the multimeter with the ohm switch to measure the resistor of sensor, normally at surrounding 25℃ the resistor should be about 2kohm and every with the temperature decreases 1℃ the corresponding resistor value would increase about 450hm.If the measured value is not within the normal scope, the sensor is bad and needs to repair or change.

◆The common problem judging method

Problem	Cause
Refrigerator can't start	1.1 Is the power cord connecting well? 1.2 Is the power voltage too low? 1.3 Is the sensor irrational setting? 1.4 Is the ambient temperature too low? 1.5 Is the circuit on power?

	1.6 Is there some default in compressor 1.7 Is the refrigeration system blocked by ice or dirty, please stop the unit and restart after 10 minutes to see if the compressor can start.
Weak cooling effects	2.1 Is there any heat source around the refrigerator? 2.2 Is there enough space around the refrigerator for rejection of heat? 2.3 Is the setting of the temperature appropriate? 2.4 Is there too much food or overheating food in it? 2.5 Does there open the door frequently? 2.6 Is the door completely closed? 2.7 Does the gasket destroyed or distort? 2.8 Does the gas leak?
The unit can not stop running	3.1 Is there any heat source around the refrigerator? 3.2 Is there enough space around the refrigerator for rejection of heat? 3.3 Is the setting of the temperature appropriate? 3.4 Is there too much food or overheating food in it? 3.5 Does there open the door frequently? 3.6 Is the door completely closed? 3.7 Does the gasket destroyed or distort? 3.8 Is the thermostat good operation? 3.9 Does the gas leak?
Ice up in the freezing chamber	4.1 Is the setting of the temperature appropriate? 4.2 Is there multi-moisture food and too close to the back wall of the refrigerator? 4.3 Is the ambient temperature too low? 4.4 Is the electric parts on good condition, specially the thermostat wich will cause the unit non-stopping .
Abnormal noise	5.1 Is the refrigerator stably placed? 5.2 Does the refrigerator bump other objects? 5.3 Whether the internal accessory of the refrigerator is in the right place. 5.4 Whether the water plate of compressor is fall from the unit. 5.5 Does the tube of the refrigeration system bump each other? 5.6 The noise sound likes Water flow inside the refrigerator ,in fact ,it is normal, which is caused both when refrigerator start and shut-down; in addition, frost-dissolving causes this sound, too, which is a normal phenomenon. 5.7 There will be a cracking sound in the cabinet ,when the cabinet or cabinet accessory contracting or expanding, this sound will be made, which is normal. 5.8 The motor operation sound in the compressor is appears to be louder at night or begin starting. which is a normal phenomenon; also the uneven placing would lead to too much running noise.
There is a peculiar smell in the units	6.1 Is the food with special smell sealed tight? 6.2 Does it have long time storing food or degenerated food? 6.3 Whether the internal cabinet needs cleaning.
the forefront or the middle cabinet heats	7.1 As fridge Anti-condensation tube is placed here and caused the above phenomenon, which is normal.
Refrigerator's two	8.1 As condensation tube is placed here and caused the above phenomenon, which is

sides or the back heat	normal.
the cabinet surface condensation	9.1 Air humidity is too large.

◆The solution for the common problem

1.Cooling is not enough good (Many reasons might cause that cooling not enough good, as blow :)		
Reason	analysis	Solutions
1) Leakage of Gas	If some gas leaked unit will work not well. Phenomenon of failure: a. lower pressure of liquid cycle system b. high temperature of copper tube of discharging gas, hand feels very hot. C. much noise, sounds like "ZZZZZ", comes from outlet of capillary. d. the temperature fell down very slowly.	First find out the point of leaking on tube, and then sealed it, vacuuming it, finally recharge with Gas. Note: If you find oil on somewhere, it is possible that leakage point is there.
2)The quantity of Gas is too much	If too much Gas was charged into the cycle system, the extra gas will occupy some space of evaporator, so that the area of heat exchange becomes less, unit will work not well. Phenomenon of failure: a, higher pressure of liquid cycle system than norm. b, higher temperature of condenser. c, larger electric current of compressor d, there maybe ice on the suction tube. e, when gas is too much, some gas liquid might goes back into compressor, compressor will be damaged by liquid.	First stop unit for several minutes, and then open charging tube, discharge all of gas. Change a new filter, and then recharge gas, finally sealed the system.
3) There is air in the liquid cycle system	The air in system will cause lower efficiency of cooling. Phenomenon of failure: a, higher pressure of liquid cycle system than norm, but the pressure is not over the limit. b, higher temperature of discharging tube. C, much noise	First stop unit for several minutes, and then open charging tube, discharge all of gas. Change a new filter, and then recharge gas, finally sealed the system.
4)Low working efficiency of compressor	General when a compressor works for many years, some parts of compressor were wear, so that compressor discharge less gas out, unit does not work strongly. Phenomenon of failure: a, lower pressure of discharging, check the	Change a new compressor.

	pressure of system with pressure meter to see if it is normal. b, higher temperature of compressor surface. C, cut off the discharging tube, to see if you can block the gas coming out of the tube when compressor is working.	
5) There is something that blocked the liquid cycle system	Some time there is something blocked the filter of liquid cycle system, so that unit is not cold. Phenomenon of failure: a, lower pressure of discharging b, lower temperature of discharging.	Change a new filter
2.NO COOL (Popular failure reasons are below):		
Reason	analysis	Solutions:
1) Leakage of gas	Phenomenon of failure: a, leaking fast b, leaking slowly c, no voice of liquid flowing d, cut off charging tube, no gas goes out.	First find out the point of leaking on tube, and then sealed it, vacuuming it, finally recharge with gas. Note: If you find oil on somewhere, it is possible that leakage point is there.
2)There is some thing that blocked the liquid cycle system	A,Ice blocking Sometime because unknown reason water comes into liquid cycle system, the capillary will be blocked by water after unit runs for period of time. Phenomenon of failure: The unit works well in the inception, after period of time the ice appears in the capillary and becomes more and more, till blocks the hole of capillary completely. In the moment you can find the ice on the evaporator defrosts. The noise of liquid flow disappears. The pressure of absorbing becomes negative. The phenomenon above will appear again and again. The way to check ice blocking: Warm the capillary with a hot towel, after a while the ice in the capillary melt, you can hear a sound of gas flow comes from the capillary abruptly. The pressure of absorbing becomes higher. It is Ice blocking.	First stop unit for several minutes, and then open charging tube, discharge all of gas. Blow the cycle system with gas of nitrogen, and then recharge Gas, finally sealed the system.
	B, there is offal block the capillary Phenomenon of failure:	First stop unit for several minutes, and then open charging tube, discharge all of

	If the capillary is blocked by something such as offal etc., the sound of liquid flow disappears. The ice on the evaporator defrosts The pressure of absorbing becomes negative. Higher temperature of discharging tube The way to check offal blocking: If you warm capillary with the way of checking ice blocking, there is no change. It must be offal blocking.	gas. Blow the cycle system with gas of nitrogen. Change a new capillary and filter, and then recharge Gas, finally sealed the system.

COMPRESSOR NEVER STOPS:	
Reason	Solutions
1)The setting temperature is not reasonable.	Readjust the temperature setting.
2) the sensor is bad.	Replace the sensor.
3)Seal of door is damaged.	Replace the gasket
4)Too much food in the refrigerator	Please put the food properly.
5)Wind door is broken.	Replace wind door.
6)Fan motor is broken.	Replace fan motor

Note:

- Before doing these operations above, disconnect the main power supply. Failure to do so could result in electrical shock or personal injury.
- In case of any detailed technical information please check with the technical specifications.