CAUTION
BEFORE SERVICING THE UNIT,
READ THE SAFETY PRECAUTIONS IN THIS MANUAL.

MODEL: LRFC25750ST
LRFC21755SB
LRFC21755ST
LRFC21755TT

COLOR: WESTERN BLACK
STAINLESS-STEEL
TITANIUM
SAFETY PRECAUTIONS

Please read the following instructions before servicing your refrigerator.

1. Check the refrigerator for current leakage.
2. To prevent electric shock, unplug before servicing.
3. Always check line voltage and amperage.
4. Use standard electrical components.
5. Don't touch metal products in the freezer with wet hands. This may cause frostbite.
6. Prevent water from spilling onto electric elements or the machine parts.

7. Close the top door before opening the bottom door. Otherwise, you might hit your head when you stand up.
8. When tilting the refrigerator, remove any materials on the refrigerator, especially the thin plates (ex. glass shelf or books.)
9. When servicing the evaporator, wear cotton gloves. This is to prevent injuries from the sharp evaporator fins.
10. Service on the refrigerator should be performed by a qualified technician. Sealed system repair must be performed by a CFC certified technician.
# 1. SPECIFICATIONS

21 cu. ft. / 25 cu. ft.

<table>
<thead>
<tr>
<th>ITEMS</th>
<th>SPECIFICATIONS</th>
<th>ITEMS</th>
<th>SPECIFICATIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>DOOR DESIGN</td>
<td>Side Rounded</td>
<td>VEGETABLE TRAY</td>
<td>Opaque Drawer Type</td>
</tr>
<tr>
<td>DIMENSIONS</td>
<td>35 3/4 x 30 x 69 3/4 (WxDxH) 21cu.ft</td>
<td>COMPRESSOR</td>
<td>PTC Starting Type</td>
</tr>
<tr>
<td>(inches)</td>
<td>35 3/4 x 34 1/4 x 69 3/4 (WxDxH) 25cu.ft</td>
<td>EVAPORATOR</td>
<td>Fin Tube Type</td>
</tr>
<tr>
<td>NET WEIGHT</td>
<td>278 (21cu.ft)</td>
<td>CONDENSER</td>
<td>Wire Condenser</td>
</tr>
<tr>
<td>(pounds)</td>
<td>302 (25cu.ft)</td>
<td>REFRIGERANT</td>
<td>R-134a (115 g)</td>
</tr>
<tr>
<td>COOLING SYSTEM</td>
<td>Fan Cooling</td>
<td>LUBRICATING OIL</td>
<td>Freol @ 10G (310 cc)</td>
</tr>
<tr>
<td>TEMPERATURE CONTROL</td>
<td>Micom Control</td>
<td>DEFROSTING DEVICE</td>
<td>SHEATH HEATER</td>
</tr>
<tr>
<td>DEFROSTING SYSTEM</td>
<td>Full Automatic</td>
<td>LAMP</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Heater Defrost</td>
<td>REFRIGERATOR</td>
<td>60 W (2EA)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>FREEZER</td>
<td>40 W (1EA)</td>
</tr>
<tr>
<td>DOOR FINISH</td>
<td>Embossed Metal, VCM, Stainless</td>
<td></td>
<td></td>
</tr>
<tr>
<td>HANDLE TYPE</td>
<td>Bar</td>
<td></td>
<td></td>
</tr>
<tr>
<td>INNER CASE</td>
<td>ABS Resin</td>
<td></td>
<td></td>
</tr>
<tr>
<td>INSULATION</td>
<td>Polyurethane Foam</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
2. PARTS IDENTIFICATION

Digital Sensor Control
Refrigerator Light
Shelves
Optibin Crisper
Keeps fruits and vegetable fresh and crisp
Glide N Serve
Customcube Icemaker
Ice Bin
Durabase
Divider

Dairy Bin
Egg Box
Design-A-Door
Wine Holder
Design-A-Door
Pull out Drawer
Freezer Door Rack (Tilting)
3. DISASSEMBLY

3-1 DOOR

- Refrigerator Door
  1. Remove the hinge cover by pulling it upwards.
  2. Loosen the hex head bolts attaching the upper hinge to the body and lift the freezer door.

3. Pull out the door gasket to remove from the door foam assembly.

- Freezer Door
  1. Loosen the hex head bolts attaching the lower hinge to the body to remove the refrigerator door only.
  2. Pull out the door gasket to remove from the door foam assembly.

Figure 1

Figure 2

Figure 3
3-2 FAN AND FAN MOTOR
1. Remove the freezer shelf. (If your refrigerator has an icemaker, remove the icemaker first)
2. Remove the grille by pulling it out and by loosening a screw.
3. Remove the Fan Motor assembly by loosening 2 screws and disassemble the shroud.
4. Pull out the fan and separate the Fan Motor and Bracket.

3-3 DEFROST CONTROL ASSEMBLY
Defrost Control assembly consists of Defrost Sensor and FUSE–M.
The Defrost Sensor works to defrost automatically. It is attached to the metal side of the Evaporator and senses its temperature. At 72°C, it turns the Defrost Heater off.
Fuse-M is a safety device for preventing over-heating of the Heater when defrosting.
1. Pull out the grille assembly. (Figure 6)
2. Separate the connector with the Defrost Control assembly and replace the Defrost Control assembly after cutting the Tie Wrap. (Figure 7)

3-4 LAMP
3-4-1 Refrigerator Compartment Lamp
1. Unplug the power cord from the outlet.
2. Remove refrigerator shelves.
3. Release the hooks on both ends of the lamp shield and pull the shield downward to remove it.
4. Turn the lamp counterclockwise.
5. Assemble in reverse order of disassembly. Replacement bulb must be the same specification as the original (Max. 60 W2EA).

3-4-2 Freezer Compartment Lamp
1. Unplug refrigerator or disconnect power.
2. Reach behind light shield to remove bulb.
3. Replace bulb with a 40-watt appliance bulb.
4. Plug in refrigerator or reconnect power.

3-5 CONTROL BOX-REFRIGERATOR
1. First, remove all shelves in the refrigerator, than remove the Refrigerator control Box by loosening 2 screws.
2. Remove the Refrigerator Control Box by pulling it downward.
3. Disconnect the lead wire on the right position and separate the lamp sockets.

3-6 MULTI DUCT
1. Remove an upper and lower Cap by using a flat screwdriver, and loosen 3 screws. (Figure 11)
2. Disconnect the lead wire on the bottom position.
4. ADJUSTMENT

4-1 COMPRESSOR

4-1-1 Role
The compressor intakes low temperature and low pressure gas from the evaporator of the refrigerator and compresses this gas to high-temperature and high-pressure gas. It then delivers the gas to the condenser.

4-1-2 Composition
The compressor includes overload protection. The PTC starter and OLP (overload protector) are attached to the outside of the compressor. Since the compressor is manufactured to tolerances of 1 micron and is hermetically sealed in a dust and moisture-free environment, use extreme caution when repairing it.

4-1-3 Note for Usage
(1) Be careful not to allow over-voltage and over-current.
(2) If compressor is dropped or handled carelessly, poor operation and noise may result.
(3) Use proper electric components appropriate to the particular Compressor in your product.
(4) Keep Compressor dry.
If the Compressor gets wet (in the rain or a damp environment) and rust forms in the pin of the Hermetic Terminal, poor operation and contact may result.
(5) When replacing the Compressor, be careful that dust, humidity, and soldering flux don’t contaminate the inside of the compressor. Dust, humidity, and solder flux contaminate the cylinder and may cause noise, improper operation or even cause it to lock up.

4-2 PTC-STARTER

4-2-1 Composition of PTC-Starter
(1) PTC (Positive Temperature Coefficient) is a no-contact semiconductor starting device which uses ceramic material consisting of BaTiO3.
(2) The higher the temperature is, the higher the resistance value. These features are used as a starting device for the Motor.

4-2-2 Role of PTC-Starter
(1) The PTC is attached to the Sealed Compressor and is used for starting the Motor.
(2) The compressor is a single-phase induction motor. During the starting operation, the PTC allows current flow to both the start winding and main winding.

4-2-3 PTC-Applied Circuit Diagram

4-2-4 Motor Restarting and PTC Cooling
(1) It requires approximately 5 minutes for the pressure to equalize before the compressor can restart.
(2) The PTC device generates heat during operation. Therefore, it must be allowed to cool before the compressor can restart.

4-2-5 Relation of PTC-Starter and OLP
(1) If the compressor attempts to restart before the PTC device is cooled, the PTC device will allow current to flow only to the main winding.
(2) The OLP will open because of the over current condition. This same process will continue (3 to 5 times) when the compressor attempts to restart until the PTC device has cooled. The correct OLP must be properly attached to prevent damage to the compressor.
Parts may appear physically identical but could have different electrical ratings. Replace parts by part number and model number. Using an incorrect part could result in damage to the product, fire, injury, or possibly death.

4-2-6 Note for Using the PTC-Starter
(1) Be careful not to allow over-voltage and over-current.
(2) Do not drop or handle carelessly.
(3) Keep away from any liquid.
If liquid such as oil or water enters the PTC, PTC materials may fail due to breakdown of their insulating capabilities.
(4) If the exterior of the PTC is damaged, the resistance value may be altered. This can cause damage to the compressor and result in a no-start or hard-to-start condition.
(5) Always use the PTC designed for the compressor and make sure it is properly attached to the compressor. Parts may appear physically identical but could have different electrical ratings. Replace parts by part number and model number. Using an incorrect part could result in damage to the product, fire, injury, or possibly death.
4-3 OLP (OVERLOAD PROTECTOR)

4-3-1 Definition of OLP

1) OLP (OVERLOAD PROTECTOR) is attached to the Compressor and protects the Motor by opening the circuit to the Motor if the temperature rises and activating the bimetal spring in the OLP.

2) When high current flows to the Compressor motor, the Bimetal works by heating the heater inside the OLP, and the OLP protects the Motor by cutting off the current flowing to the Compressor Motor.

4-3-2 Role of the OLP

1) The OLP is attached to the Sealed Compressor used for the Refrigerator. It prevents the Motor Coil from being started in the Compressor.

2) For normal operation of the OLP, do not turn the Adjust Screw of the OLP in any way.

4-4 TO REMOVE THE COVER PTC

1) Remove the Cover Back M/C.

2) Remove the screw on Cover PTC.

3) Remove two Housings on upper part of Cover PTC.

4) Take out the cover PTC from upper to lower position like ①.

5) Turn 45° in the direction of ② and take it out.

6) Assembly in reverse order of disassembly.

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![Diagram of OLP cross section](image_url)

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Part No. Name

1. Base, phenolic (UL 94 V-0 rated)
2. Movable arm support, plated steel
3. Stationary contact support, plated steel
4. Heater support, plated steel
5. Heater, resistance alloy
6. Disc, thermostatic alloy
7. Movable arm, spring temper copper alloy
8. Contact, movable, silver on copper
9. Contact, stationary, silver on copper
10. Bag, plated steel
11. Cover, polyester (UL 94 V-0 rated)
12. Pin connector, plated copper alloy (To engage 2.33/2.66 mm dia. pin)
13. Quick-connect terminal, brass, conforms to UL 310, MEMA DC-2, DIN 46344

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Figure 13
6. TROUBLESHOOTING

6-1 COMPRESSOR AND ELECTRIC COMPONENTS

1. Power Source.
   - Remove PTC-Starter from Compressor and measure voltage between Terminal C of Compressor and Terminals 5 or 6 of PTC.
   - (Rated Voltage ±10%)?
     - YES
     - (Rated Voltage ±10%)?
     - NO
   - Open or short
     - YES
     - NO
     - Replace OLP.
     - Reconnect.
   - OLP disconnected?
     - YES
     - Replace OLP.
     - NO
     - Check connection condition.
     - Reconnect.
   - No Voltage.
     - YES
     - NO
     - Advise customer that power supply needs to be checked by an electrician.
     - Advising customer that power supply needs to be checked by an electrician.
   - Applied voltage isn't in range of Rated Voltage ±10%.
     - YES
     - NO
     - Replace Compressor.
     - Supply voltage rating with ±10%.
     - YES
     - Did compressor start?
       - YES
       - Compressor is OK
       - NO
       - Replace the compressor
     - NO
     - Compressor is OK
     - NO
     - Replace the compressor
     - Supply voltage rating with ±10%.
     - YES
     - Did compressor start?
       - YES
       - Compressor is OK
       - NO
       - Replace the compressor
     - NO
     - Compressor is OK
     - NO
     - Replace the compressor
     - Supply voltage rating with ±10%.
     - YES
     - Did compressor start?
       - YES
       - Compressor is OK
       - NO
       - Replace the compressor
     - NO
     - Compressor is OK
     - NO
     - Replace the compressor
     - Supply voltage rating with ±10%.
     - YES
     - Did compressor start?
       - YES
       - Compressor is OK
       - NO
       - Replace the compressor
     - NO
     - Compressor is OK
     - NO
     - Replace the compressor
     - Supply voltage rating with ±10%.
     - YES
     - Did compressor start?
       - YES
       - Compressor is OK
       - NO
       - Replace the compressor
     - NO
     - Compressor is OK
     - NO
     - Replace the compressor
     - Supply voltage rating with ±10%.
     - YES
     - Did compressor start?
       - YES
       - Compressor is OK
       - NO
       - Replace the compressor
     - NO
     - Compressor is OK
     - NO
     - Replace the compressor
     - Supply voltage rating with ±10%.
     - YES
     - Did compressor start?
       - YES
       - Compressor is OK
       - NO
       - Replace the compressor
     - NO
     - Compressor is OK
     - NO
     - Replace the compressor
     - Supply voltage rating with ±10%.
     - YES
     - Did compressor start?
       - YES
       - Compressor is OK
       - NO
       - Replace the compressor
     - NO
     - Compressor is OK
     - NO
     - Replace the compressor
     - Supply voltage rating with ±10%.
     - YES
     - Did compressor start?
       - YES
       - Compressor is OK
       - NO
       - Replace the compressor
     - NO
     - Compressor is OK
     - NO
     - Replace the compressor
     - Supply voltage rating with ±10%.
     - YES
     - Did compressor start?
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       - Replace the compressor
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     - Compressor is OK
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     - Replace the compressor
     - Supply voltage rating with ±10%.
     - YES
     - Did compressor start?
       - YES
       - Compressor is OK
       - NO
       - Replace the compressor
     - NO
     - Compressor is OK
     - NO
     - Replace the compressor
     - Supply voltage rating with ±10%.
     - YES
     - Did compressor start?
       - YES
       - Compressor is OK
       - NO
       - Replace the compressor
     - NO
     - Compressor is OK
     - NO
     - Replace the compressor
     - Supply voltage rating with ±10%.
     - YES
     - Did compressor start?
       - YES
       - Compressor is OK
6-2 PTC AND OLP

Normal operation of Compressor is impossible or poor.

Separate PTC-Starter from Compressor and measure resistance between No. 5 and 6 of PTC-Starter with a Tester. (Figure 14)

Observation value is 115V/60Hz : 6.8Ω±30%

The resistance value is 0Ω (short) or ∞ (open).

Replace PTC-Starter.

Separate OLP from Compressor and check resistance value between two terminals of OLP with a Tester. (Figure 15)

Shows continuity

Open

Check another electric component.

Replace OLP.

Observation value is 115V/60Hz : 6.8Ω±30%

Replace PTC-Starter.

Figure 14

Figure 15
6-3 OTHER ELECTRICAL COMPONENTS

▼ Not cooling at all

- Compressor doesn't run.
  - Check for open short or incorrect resistance readings in the following components
    - a. Starting devices → Short, open, or broken.
    - b. OLP → Poor contact or shorted.
    - c. Compressor coil → Coil open or shorted.
    - d. Wiring harness → Poor contact or shorted.
  - Cause
  - Replace indicated component.

▼ Poor cooling performance

- Compressor runs poorly.
  - Check starting voltage.
    - Low voltage.
      - Advise customer that the Power supply needs to be checked by an electrician.
  - Check voltage at starting devices.
    - Poor or broken or open contact.
      - Replace indicated component.
  - Check current flowing in sub-coil of Compressor.
    - Shorted.
  - Check rating of OLP.
    - Lack of capacity.
- Fan motor doesn't run.
  - Check wiring circuit.
    - Wire is open or shorted.
      - Replace indicated component.
  - Check Fan Motor.
    - Coil is shorted or open.
- Heavy frost buildup on EVAPORATOR.
  - Check current flow in the following components:
    - Sensor
    - Fuse-M
    - Check current flow in the Defrost Heater.
    - Open.
      - Replace Defrost Heater.
### 6-4 SERVICE DIAGNOSIS CHART

<table>
<thead>
<tr>
<th>COMPLAINT</th>
<th>POINTS TO BE CHECKED</th>
<th>REMEDY</th>
</tr>
</thead>
<tbody>
<tr>
<td>No Cooling.</td>
<td>• Is the power cord unplugged from the outlet?</td>
<td>• Plug into the outlet.</td>
</tr>
<tr>
<td></td>
<td>• Check if the power switch is set to OFF.</td>
<td>• Set the switch to ON.</td>
</tr>
<tr>
<td></td>
<td>• Check if the fuse of the power switch is shorted.</td>
<td>• Replace the fuse.</td>
</tr>
<tr>
<td></td>
<td>• Measure the voltage of the power outlet.</td>
<td>• If the voltage is low, correct the wiring.</td>
</tr>
<tr>
<td>Cools poorly.</td>
<td>• Check if the unit is placed too close to the wall.</td>
<td>• Place the unit about 4 inches (10 cm) from the wall.</td>
</tr>
<tr>
<td></td>
<td>• Check if the unit is placed too close to the stove, gas cooker, or in direct sunlight.</td>
<td>• Place the unit away from these heat sources.</td>
</tr>
<tr>
<td></td>
<td>• Is the ambient temperature too high or the room door closed?</td>
<td>• Lower the ambient temperature.</td>
</tr>
<tr>
<td></td>
<td>• Check if food put in the refrigerator is hot.</td>
<td>• Put in foods after they have cooled down.</td>
</tr>
<tr>
<td></td>
<td>• Did you open the door of the unit too often or check if the door is sealed properly?</td>
<td>• Don’t open the door too often and close it firmly.</td>
</tr>
<tr>
<td></td>
<td>• Check if the Control is set to Warm position.</td>
<td>• Set the control to Recommended position.</td>
</tr>
<tr>
<td>Food in the Refrigerator is frozen.</td>
<td>• Is food placed in the cooling air outlet?</td>
<td>• Place foods in the high-temperature section. (front part)</td>
</tr>
<tr>
<td></td>
<td>• Check if the control is set to colder position.</td>
<td>• Set the control to Recommended position.</td>
</tr>
<tr>
<td></td>
<td>• Is the ambient temperature below 41°F(5°C)?</td>
<td>• Set the control to Warm position.</td>
</tr>
<tr>
<td>Condensation or ice forms inside the unit.</td>
<td>• Is liquid food sealed?</td>
<td>• Seal liquid foods with wrap.</td>
</tr>
<tr>
<td></td>
<td>• Check if food put in the refrigerator is hot.</td>
<td>• Put in foods after they have cooled down.</td>
</tr>
<tr>
<td></td>
<td>• Did you open the door of the unit too often or check if the door is sealed properly?</td>
<td>• Don’t open the door too often and close it firmly.</td>
</tr>
<tr>
<td>Condensation forms in the Exterior Case.</td>
<td>• Check if the ambient temperature and humidity of the surrounding air are high.</td>
<td>• Wipe moisture with a dry cloth. It will disappear in low temperature and humidity.</td>
</tr>
<tr>
<td></td>
<td>• Is there a gap in the door gasket?</td>
<td>• Fill up the gap.</td>
</tr>
<tr>
<td>There is abnormal noise.</td>
<td>• Is the unit positioned in a firm and even place?</td>
<td>• Adjust the Leveling Screw, and position the refrigerator in a firm place.</td>
</tr>
<tr>
<td></td>
<td>• Are any unnecessary objects placed in the back side of the unit?</td>
<td>• Remove the objects.</td>
</tr>
<tr>
<td></td>
<td>• Check if the Drip Tray is not firmly fixed.</td>
<td>• Fix the Drip Tray firmly in the original position.</td>
</tr>
<tr>
<td></td>
<td>• Check if the cover of the compressor enclosure in the lower front side is taken out.</td>
<td>• Place the cover in its original position.</td>
</tr>
<tr>
<td>Door does not close well.</td>
<td>• Check if the door gasket is dirty with an item like juice.</td>
<td>• Clean the door gasket.</td>
</tr>
<tr>
<td></td>
<td>• Is the refrigerator level?</td>
<td>• Position in the firm place and level the Leveling Screw.</td>
</tr>
<tr>
<td></td>
<td>• Is there too much food in the refrigerator?</td>
<td>• Make sure food stored in shelves does not prevent the door from closing.</td>
</tr>
<tr>
<td>Ice and foods smell unpleasant.</td>
<td>• Check if the inside of the unit is dirty.</td>
<td>• Clean the inside of the unit.</td>
</tr>
<tr>
<td></td>
<td>• Are foods with a strong odor unwrapped?</td>
<td>• Wrap foods that have a strong odor.</td>
</tr>
<tr>
<td></td>
<td>• The unit smells of plastic.</td>
<td>• New products smell of plastic, but this will go away after 1-2 weeks.</td>
</tr>
</tbody>
</table>

Other possible problems:

- Check if frost forms in the freezer.
- The system is faulty.
- The operation of the Thermistor is incorrect.
6-5 REFRIGERATION CYCLE

Troubleshooting Chart

<table>
<thead>
<tr>
<th>CAUSE</th>
<th>STATE OF THE UNIT</th>
<th>STATE OF THE EVAPORATOR</th>
<th>TEMPERATURE OF THE COMPRESSOR</th>
<th>REMARKS</th>
</tr>
</thead>
</table>
| PARTIAL LEAKAGE            | Freezer compartment and Refrigerator don't cool normally. | Low flowing sound of Refrigerant is heard and frost forms in inlet only. | A little higher than ambient temperature. | • Refrigerant level is low due to a leak.  
• Normal cooling is possible by restoring the normal amount of refrigerant and repairing the leak. |
| COMPLETE LEAKAGE           | Freezer compartment and Refrigerator don't cool normally. | Flowing sound of refrigerant is not heard and frost isn't formed. | Equal to ambient temperature. | • No discharging of Refrigerant.  
• Normal cooling is possible by restoring the normal amount of refrigerant and repairing the leak. |
| PARTIAL CLOG               | Freezer compartment and Refrigerator don't cool normally. | Flowing sound of refrigerant is heard and frost forms in inlet only. | A little higher than ambient temperature. | • Normal discharging of the refrigerant.  
• The capillary tube is faulty. |
| WHOLE CLOG                 | Freezer compartment and Refrigerator don't cool. | Flowing sound of refrigerant is not heard and frost isn't formed. | Equal to ambient temperature. | • Normal discharging of the Refrigerant. |
| MOISTURE CLOG              | Cooling operation stops periodically. | Flowing sound of refrigerant is not heard and frost melts. | Lower than ambient temperature. | • Cooling operation restarts when heating the inlet of the capillary tube. |
| COMPRESSION DEFECTIVE     | Freezer and Refrigerator don't cool. | Low flowing sound of refrigerant is heard and frost forms in inlet only. | A little higher than ambient temperature. | • Low pressure at high side of compressor due to low refrigerant level. |
| NO COMPRESSION             | No compressing operation. | Flowing sound of refrigerant is not heard and there is no frost. | Equal to ambient temperature. | • No pressure in the high pressure part of the compressor. |
“Not Cooling” Complaint
All components operating, No airflow problems, Not frosted up as a defrost problem
problem has been isolated to sealed system area

- Frost Pattern?
  - Partial
    - Equalization Test
      - Very Fast
        - Inefficient Compressor
      - Fast
        - Partial Restriction
    - Very Slow
      - Complete Restriction
  - None
    - Equalization Test
      - Very Slow
        - Condenser Temperature
          - Hotter than Normal
            - Room Temperature
              - Trace of Oil
                - Yes
                  - Leak
                - No
                  - Undercharge
              - Air/Low Side Leak
              - Loss of Change
                - Cap Tube Sound
                  - Faint
                    - None to Weak
                      - Compressor Not Pumping
                  - Very Fast
    
(The equalization test is trying to restart a compressor using a start kit after it has been operating.)
7-1 OPERATION PRINCIPLE
7-1-1 Operation Principle of IceMaker

1. Turning the Icemaker stop switch off (O) stops the ice making function.
2. Setting the Icemaker switch to OFF and then turning it back on will reset the icemaker control.
7-2 CONTROL METHOD ACCORDING TO FUNCTIONS

7-2-1 Start Position
1. After POWER OFF or Power Outage, check the EJECTOR’s position with MICOM initialization to restart.
2. How to check if it is in place:
   - Check HIGH/LOW signals from HALL SENSOR in MICOM PIN.
3. Control Method to check if it is in place:
   (1) EJECTOR is in place,
      - It is an initialized control, so the mode can be changed to ice making control.
   (2) EJECTOR isn’t in place:
      A. If EJECTOR is back in place within 2 minutes with the motor on, it is being initialized. If not, go to Step B.
      B. If EJECTOR is back in place within 18 minutes with the heater on (to control Heater on its OFF condition), it is being initialized. If not, it is not functioning. Repeat Step B with Heater and Motor off.

7-2-2 Ice Making Mode
1. Ice Making control refers to the freezing of supplied water in the ice trays. Complete ice making operations by measuring the temperature of the Tray with Ice-Making SENSOR.
2. Ice Making starts after completing fulfilled ice control and initial control.
3. The Ice Making function is completed when the sensor reaches 19°F(-7°C), 60 to 240 minutes after starting.
4. If the temperature sensor is defective, the ice-making function will be completed in 4 hours.

   NOTE : After Icemaker Power is ON, the Icemaker heater will be on for test for 9 sec.

7-2-3 Harvest Mode
1. Ice-removing control refers to the operation of dropping cubes into the ice bin from the tray when ice-making has completed.
2. Ice removing control mode:
   (1) Operates Heater for 30 seconds; then operate MOTOR.
   (2) After performing Step 1 (to control the Heater on its off condition), Ice-Removal control will be back in place within 18 minutes. (Hall SENSOR sign = OV). Ice removal is then complete. Then change the mode to the water supply control. If this control phase fails to start, it is not functioning. Put the Heater and Motor in the off position. Restart every 2 hours. (Refer to fig.1)

   NOTE : If the motor malfunctions and starts before the detect lever rises, MICOM regards the Ice-Removing phase as completed. Water then starts flowing. To prevent this, MICOM doesn’t switch to water-supply mode, but restarts the ice-removing mode. If this happens 3 times, the motor is malfunctioning and you should stop the loads (Heater, Motor). Then restart the Ice-Removing mode every 2 hours. (See Step 2 above.)

* Heater OFF condition
   ① Ice making sensor temperature is 50°F(10°C) or more
   ② Max. 18 minutes
   ③ After detect LEVER rises

<fig1. Harvest mode Process>
7-2-4 Fill / Park Position

1. Once a normal harvest mode has been completed, the water solenoid will be activated.
2. The amount of water is adjusted by pressing the water supply control S/W. This changes the time allowed for fill as illustrated in the chart.

<Water supply amount TABLE>

<table>
<thead>
<tr>
<th>STAGE</th>
<th>TIME TO SUPPLY</th>
<th>INDICATIONS</th>
<th>REMARKS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>6 sec.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>6.5 sec.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>7 sec.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>7.5 sec.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>8 sec.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The water amount will vary depending on the water control Switch setting, as well as the water pressure of the connected water line.

NOTE: Below is an example used by another vendor as an explanation of what is taking place.
7-2-5 Function TEST

1. This is a compulsory operation for TEST, SVC, cleaning, etc. It is operated by pressing the water supply control KEY for 3 seconds.
2. It operates in the Ice Making mode, but not in the Ice-Removing mode or water supply process. (If there is an ERROR, it can only be checked in the TEST mode.)
3. If the water supply control KEY is pressed for 3 seconds in the Ice-Making mode (no matter what condition the Ice-Making tray is in) the Ice-Removing operation starts immediately. Water is not yet frozen, so water is poured instead of ice. If the control doesn’t operate normally in the TEST mode, check and repair as needed.
4. After water is supplied, the normal CYCLE is followed: ice making → Harvest → Fill → Park Position.
5. When Stage 5 is completed in the TEST mode, minimize MICOM in 5 seconds, the time needed to supply water resets to the previous status in the TEST mode.

<Diagnosis TABLE>

<table>
<thead>
<tr>
<th>STAGE</th>
<th>ITEMS</th>
<th>INDICATOR</th>
<th>REMARKS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>HEATER</td>
<td><img src="image" alt="HEATER" /></td>
<td>Five seconds after heater starts, heater will go off if temperature recorded by sensor is 10°C or lever is in up position.</td>
</tr>
<tr>
<td>2</td>
<td>MOTOR</td>
<td><img src="image" alt="MOTOR" /></td>
<td>Five seconds after heater starts, you can confirm that motor is moving.</td>
</tr>
<tr>
<td>3</td>
<td>HALL IC I (detection of position)</td>
<td><img src="image" alt="HALL IC I" /></td>
<td>You can confirm Hall Ic detection of position.</td>
</tr>
<tr>
<td>4</td>
<td>VALVE</td>
<td><img src="image" alt="VALVE" /></td>
<td>Two seconds after detection of initial position, you can confirm that valve is on.</td>
</tr>
<tr>
<td>5</td>
<td>HALL IC II (detection of full-filled Ice)</td>
<td><img src="image" alt="HALL IC II" /></td>
<td>You can check whether hall is sensing Full ice condition. (If there is a full-filled error, the fifth LED is not on.)</td>
</tr>
<tr>
<td>6</td>
<td>Reset</td>
<td><img src="image" alt="Reset" /></td>
<td>Five seconds after fifth stage is completed, the icemaker reset at initial status.</td>
</tr>
</tbody>
</table>

7-3 DEFECT DIAGNOSIS FUNCTION

7-3-1 ERROR CODES shown on Ice Maker water supply control panel

<table>
<thead>
<tr>
<th>NO</th>
<th>DIVISION</th>
<th>INDICATOR</th>
<th>CONTENTS</th>
<th>REMARKS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Normal</td>
<td><img src="image" alt="Normal" /></td>
<td>None</td>
<td>Display switch operates properly</td>
</tr>
<tr>
<td>2</td>
<td>Ice-Making Sensor malfunction</td>
<td><img src="image" alt="Ice-Making Sensor malfunction" /></td>
<td>Open or short-circuited wire</td>
<td>Make sure that the wire on each sensor is connected.</td>
</tr>
<tr>
<td>3</td>
<td>Ice Maker Kit malfunction</td>
<td><img src="image" alt="Ice Maker Kit malfunction" /></td>
<td>When ejector blades don’t reach park position over 18 minutes since Harvest Mode starts.</td>
<td>Check of HALL IC/MOTOR/HEATER/RELAY</td>
</tr>
</tbody>
</table>

ERROR indicators in table can be checked only in TEST mode.
8. DESCRIPTION OF FUNCTION & CIRCUIT OF MICOM

8-1 FUNCTION

8-1-1 Function
1. When the appliance is plugged in, it is set to "37" for Refrigerator and "0" for freezer. You can adjust the Refrigerator and the Freezer control temperature by pressing the ADJUST button.
2. When the power is initially applied or restored after a power failure, it is automatically set to "37" & "0".

8-1-2 How to Change the Temperature Display from °F / °C
1. The temperature display can be toggled between °F & °C by pressing the Refrigerator COLDER key and the Freezer COLDER Key at the same time and holding for more than one second.
2. The initial setting is °F. Whenever the mode is changed, the LED lights are changed.

8-1-3 Control of freezer fan motor
1. Freezer fan motor has high and standard RPMs.
2. High RPM is used when electricity is first on, for express freezing, and when refrigerator is overloaded.
   Standard RPM is used for normal usage.
3. Fan motor stops when refrigerator of freezer door opens.

8-1-4 EXPRESS FREEZING
1. The purpose of this function is to intensify the cooling speed of freezer and to increase the amount of ice.
2. Whenever selection switch is pressed, selection/release, the LED will turn ON or OFF.
3. If there is a power cut and the refrigerator is power on again, EXPRESS FREEZING function will be canceled.
4. To activate this function you need to press the Express Freezing key and the LED will turn ON. This function will remain activated for 24 hrs. The first three hours the compressor and Freezer Fan will be ON. The next 21 hours the freezer will be controlled at the lowest temperature. After 24 hours or if the Express Freezing key is pressed again, the freezer will return to its previous temperature.
5. For the first three hours notice the following cases:
   (1) Compressor and freezer fan(HIGH RPM) continuously operate for three hours.
   (2) If defrost starts during EXPRESS FREEZING, EXPRESS FREZZING operates for the rest of time after defrost is completed, when EXPRESS FREZZING operation time is less than 90 minutes.
   If EXPRESS FREZZING operates for more than 90 minutes, the EXPRESS FREZZING will operate for two hours after defrost is completed.
   (3) If EXPRESS FREZZING is pressed during defrost, EXPRESS FREZZING LED is on but this function will start seven minutes after defrost is completed and it shall operate for three hours.
   (4) If EXPRESS FREZZING is selected within seven minutes after compressor has stopped, the compressor (compressor delays seven minutes) shall start after the balance of the delay time.
   (5) The fan motor in the freezer compartment rotates at high speed during EXPRESS FREZZING.
6. For the rest of 21 hours, the freezer will be controlled at the lowest temperature.

8-1-5. REFRIGERATOR LAMP AUTO OFF
1. To protect the risk of lamp heat, when Refrigerator door opens for 7 min., refrigerator lamp is auto off.
8-1-6 Alarm for Open Door
1. This feature sounds a buzzer when the freezer or refrigerator door is not closed within 1 minute after it is opened.
2. One minute after the door is opened, the buzzer sounds three times each for 1/2 seconds. These tones repeat every 30 seconds.
3. The alarm is cancelled when the freezer or the refrigerator is closed while the buzzer sounds.

<table>
<thead>
<tr>
<th>Freezer Door or Refrigerator Door</th>
<th>Open</th>
<th>Closed</th>
<th>Open</th>
<th>Closed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Buzzer</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Within 1 min.</td>
<td>1 min.</td>
<td>30 sec</td>
<td>30 sec</td>
</tr>
</tbody>
</table>

8-1-7 Buzzer Sound
When the button on the front Display is pushed, a Ding~Dong~ sound is produced.
(Refer to the Buzzer Circuit 7-2-4 No. 2)

8-1-8 Defrosting (removing frost)
1. Defrosting starts each time the COMPRESSOR running time reaches 7 hours.
2. For initial power on or for restoring power, defrosting starts when the compressor running time reaches 4 hours.
3. Defrosting stops if the sensor temperature reaches 46.4°F(8°C) or more. If the sensor doesn’t reach 46.4°F(8°C) in 2 hours, the defrost mode is malfunctioning. (Refer to the defect diagnosis function, 7-1-9.)
4. Defrosting won’t function if its sensor is defective (wires are cut or short circuited)
### 8-1-9 Electrical Parts Are Turned On Sequentially

Electrical parts such as COMP, defrosting heater, freezer FAN, etc. are turned on in the following order to prevent noise and parts damage. Several parts are started at the same time at initial power on and are turned off together when TEST is completed.

<table>
<thead>
<tr>
<th>OPERATING</th>
<th>ORDERS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Initial power on</strong></td>
<td></td>
</tr>
<tr>
<td>Temperature of Defrosting Sensor is 113°F [45°C] or more (when unit is newly purchased or when moved)</td>
<td><strong>POWER</strong> ON in 0.5 sec → <strong>COMP</strong> ON in 0.5 sec → <strong>Freezer FAN</strong> ON</td>
</tr>
<tr>
<td>Temperature of defrosting sensor is lower than 113°F [45°C] (when power cuts, SERVICE)</td>
<td><strong>POWER</strong> ON in 0.5 sec → <strong>Defrosting heater ON</strong> in 10 sec → <strong>Defrost heater OFF</strong></td>
</tr>
<tr>
<td><strong>in 0.5 sec</strong></td>
<td><strong>COMP</strong> ON in 0.5 sec → <strong>Freezer FAN ON</strong></td>
</tr>
<tr>
<td><strong>in 0.5 sec</strong></td>
<td><strong>in 0.5 sec</strong></td>
</tr>
<tr>
<td><strong>Reset to normal operation from TEST MODE</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Total load OFF</strong> in 7 min → <strong>COMP ON</strong> in 0.5 sec → <strong>Freezer FAN ON</strong></td>
<td></td>
</tr>
</tbody>
</table>
8-1-10 Defect Diagnosis Function

1. Automatic diagnosis makes servicing the refrigerator easy.
2. When a defect occurs, the buttons will not operate; but the tones, such as ding, will sound.
3. When the defect CODE removes the sign, it returns to normal operation (RESET).
4. The defect CODE shows on the Refrigerator and Freezer Display.

**Better Model**

![Diagram of Better Model](image)

**ERROR CODE on display panel**

<table>
<thead>
<tr>
<th>NO</th>
<th>ITEM</th>
<th>ERROR CODE</th>
<th>CONTENTS</th>
<th>REMARKS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Failure of freezer sensor</td>
<td>Er-</td>
<td>Fs</td>
<td>Cut or short circuit wire</td>
</tr>
<tr>
<td>2</td>
<td>Failure of Refrigerator sensor</td>
<td>Er-</td>
<td>Rs</td>
<td>Cut or short circuit wire</td>
</tr>
<tr>
<td>3</td>
<td>Failure of defrost sensor</td>
<td>Er-</td>
<td>ds</td>
<td>Cut or short circuit wire</td>
</tr>
<tr>
<td>4</td>
<td>Failure of Room Temperature sensor</td>
<td>When display check mode: Er rt</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Failure of defrost mode</td>
<td>Er-</td>
<td>dh</td>
<td>When defrost sensor doesn’t reach 8°C within 2 hours after starting defrost.</td>
</tr>
<tr>
<td>6</td>
<td>Failure of BLDC Fan Motor at Freezing Compartment</td>
<td>Er-</td>
<td>FF</td>
<td>If there is no fan motor signal for more than 65sec in operation fan motor.</td>
</tr>
</tbody>
</table>

Note 1) Room Temperature Sensor is not indicated on the failure indicating part but indicated in checking Display. (When pressing for more than the warmer key of Refrigerator Temp. and the warmer key of Freezer Temp for more than 1 second).

*LED check function: If simultaneously pressing the warmer key of Refrigerator Temp and the warmer key of Freezer Temp for a second, all display LED graphics on. If releasing the button, the LED graphics displays the previous status.*
8-1-11 TEST Mode

1. The Test mode allows checking the PCB and the function of the product as well as finding out the defective part in case of an error.

2. The test mode is operated by pressing two buttons at Display panel.

3. While in the test mode, the function control button is not recognized, but the recognition tone (beep~) sounds.

4. After exiting the test mode, be sure to reset by unplugging and then plugging in the appliance.

5. If an error, such as a sensor failure, is detected while in the test mode, the test mode is cleared and the error code is displayed.

6. While an error code is displayed, the test mode will not be activated.

<table>
<thead>
<tr>
<th>MODE</th>
<th>MANIPULATION</th>
<th>CONTENTS</th>
<th>REMARKS</th>
</tr>
</thead>
<tbody>
<tr>
<td>TEST1</td>
<td>Push Express Freezing Key and COLDER KEY of Freezer Temp. at the same time over 3 seconds. OR Push TEST S/W (in the main Board) Once.</td>
<td>1) Continuous operation of the COMPRESSOR and the Freezer fan 2) Stepping DAMPER OPEN 3) Defrosting HEATER OFF 4) DISPLAY LED all ON</td>
<td></td>
</tr>
<tr>
<td>TEST2</td>
<td>Push Express Freezing Key and COLDER KEY of Freezer Temp. at the same time over 3 seconds. In TEST MODE 1 OR Push TEST S/W Once in TEST MODE 1</td>
<td>1) Continuous operation of the COMPRESSOR and the Freezer fan 2) Stepping DAMPER CLOSE 3) Defrosting HEATER OFF 4) DISPLAY LED ahows no. 2</td>
<td></td>
</tr>
<tr>
<td>TEST3</td>
<td>Push Express Freezing Key and COLDER KEY of Freezer Temp. at the same time over 3 seconds. In TEST MODE 2 OR Push TEST S/W Once in TEST MODE 2</td>
<td>1) COMPRESSOR and the Freezer fan OFF 2) Stepping DAMPER CLOSE 3) Defrosting HEATER ON 4) DISPLAY LED ahows no. 3</td>
<td>Reset if the Temperature of the Defrosting sensor is 46°F (8°C) or more.</td>
</tr>
<tr>
<td>Reset</td>
<td>Push Express Freezing Key and COLDER KEY of Freezer Temp. at the same time over 3 seconds. In TEST MODE 3 OR Push TEST S/W Once in TEST MODE 3</td>
<td>Reset to the previously setting Before TEST MODE</td>
<td>The compressor will Start after a 7-minute Delay.</td>
</tr>
</tbody>
</table>

* Freezer Fan RPM Variable Check:
  In case the freezer fan is in operation when the WARMER KEY in Refrigerator and Freezer Temp. Control are pressed for more than one second at the same time freezer fan RPM changes. (for example if high speed, to normal speed or if normal speed, to high speed for 30 seconds)
  After 30 seconds, it turns to its original RPM.

* Demonstration MODE:
  1. When the KEY of refrigerator Temp. control or of freezer Temp. control is pushed and held over 5 seconds, warmest temperature's It converts to Demonstration Mode.
  2. In this status, each LED is rotated with 1 second interval.
  3. In this status, all Loads are off (Compressor / Fan / Damper / Heater)
     (Even is Demonstration Mode, the refrigerator Lamp automatic off function works normally and can be demonstrated)
  4. It reset if you do again as clause.
The secondary part of the TRANSFORMER is composed of the power supply for the display, the BLDC FAN Motor drive (15.5 V), the relay drive (12 Vdc) and the MICOM and IC (5 Vdc).

The voltage for each part is as follows:

<table>
<thead>
<tr>
<th>PART</th>
<th>VA 1</th>
<th>CE 3</th>
<th>CE 4</th>
<th>CE 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>VOLTAGE</td>
<td>115 Vac</td>
<td>12 Vdc</td>
<td>15.5 Vdc</td>
<td>5 V</td>
</tr>
</tbody>
</table>

VA1 is a part for preventing over voltage and noise. When 385V or higher power is applied, the inside elements are short-circuited and broken, resulting in blowout of the fuse in order to protect the elements of the secondary part of the TRANSFORMER.
8-2-2 Oscillation Circuit

This circuit generates the base clock for calculating time and the synchro clock for transmitting data from and to the inside logic elements of the IC1 (MICOM). Be sure to use specific replacement parts, since calculating time by the IC1 may be changed. If changed, the OSC1 SPEC will not work.

8-2-3 Reset Circuit

The RESET circuit allows all the functions to start at the initial conditions by initializing various parts, including the RAM inside the MICOM (IC1) when the power is initially supplied or the power supply to the MICOM is restored after a momentary power failure. For the initial 10ms of power supply, LOW voltage is applied to the MICOM RESET terminal. During a normal operation, 5V is applied to the RESET terminal. (If a malfunction occurs in the RESET IC, the MICOM will not operate.)
8-2-4 Load / Buzzer Drive & Open Door Detection Circuit

1. Load Drive Condition Check

- This circuit makes standby power 0 by cutting off power supplied to ISs inside of the fan motor in the fan motor OFF.
- This is a circuit to perform a temporary change of speed for the fan motor and applies DC voltage up to 7.5V ~ 16V to motor.
- This circuit prevents over-driving the fan motor by cutting off power applied to the fan motor in the lock of fan motor by sensing the operation RPM of the fan motor.

<table>
<thead>
<tr>
<th>LOAD TYPE</th>
<th>COMP</th>
<th>DEFROSTING HEATER</th>
<th>LAMP</th>
<th>FRENCH DOOR HEATER 1, 2 / DEW HEATER</th>
</tr>
</thead>
<tbody>
<tr>
<td>Measurement Location (IC6)</td>
<td>NO.12</td>
<td>NO.14</td>
<td>NO.15</td>
<td>NO.13</td>
</tr>
<tr>
<td>Condition</td>
<td>ON</td>
<td>1V or below</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>OFF</td>
<td>12V</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

2. Fan motor driving circuit (freezing compartment fan)

1. This circuit makes standby power 0 by cutting off power supplied to ISs inside of the fan motor in the fan motor OFF.
2. This is a circuit to perform a temporary change of speed for the fan motor and applies DC voltage up to 7.5V ~ 16V to motor.
3. This circuit prevents over-driving the fan motor by cutting off power applied to the fan motor in the lock of fan motor by sensing the operation RPM of the fan motor.

<table>
<thead>
<tr>
<th></th>
<th>a part</th>
<th>b part</th>
<th>c part</th>
</tr>
</thead>
<tbody>
<tr>
<td>MOTOR OFF</td>
<td>2V or less</td>
<td>0V</td>
<td>5V</td>
</tr>
<tr>
<td>MOTOR ON</td>
<td>13V~15V</td>
<td>0V</td>
<td>2V~3V</td>
</tr>
</tbody>
</table>
2. Buzzer Drive Condition Check

![Buzzer Drive Circuit Diagram]

### Measurement Location

<table>
<thead>
<tr>
<th>Condition</th>
<th>Tone (Ding-Dong-) when the button on the display is pushed.</th>
<th>Alarm for open door (beep-beep-beep)</th>
<th>OFF</th>
</tr>
</thead>
<tbody>
<tr>
<td>IC1 (A)</td>
<td><img src="image1.png" alt="Waveform Graph" /></td>
<td><img src="image2.png" alt="Waveform Graph" /></td>
<td>0 V</td>
</tr>
<tr>
<td>IC1 (B)</td>
<td><img src="image3.png" alt="Waveform Graph" /></td>
<td><img src="image4.png" alt="Waveform Graph" /></td>
<td>0 V</td>
</tr>
</tbody>
</table>

3. Open Door Detection Circuit Check

![Open Door Detection Circuit Diagram]

<table>
<thead>
<tr>
<th>Freezer/Refrigerator Door</th>
<th>Measurement Location</th>
<th>(PIN NO.30 &amp; PIN NO.27)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Closed</td>
<td>Closed</td>
<td>5 V</td>
</tr>
<tr>
<td>Open</td>
<td>Open</td>
<td>0 V</td>
</tr>
</tbody>
</table>
8-2-5 Temperature Sensor Circuit

The upper CIRCUIT reads REFRIGERATOR temperature, FREEZER Temperature, and DEFROST-SENSOR temperature for defrosting and the indoor temperature for compensating for the surrounding temperature into MICOM. OPENING or SHORT state of each TEMPERATURE SENSOR are as follows:

<table>
<thead>
<tr>
<th>SENSOR</th>
<th>CHECK POINT</th>
<th>NORMAL (-30°C ~ 50°C)</th>
<th>SHORT-CIRCUITED</th>
<th>OPEN</th>
</tr>
</thead>
<tbody>
<tr>
<td>Freezer Sensor</td>
<td>POINT A</td>
<td>Voltage</td>
<td>0.5 V ~ 4.5 V</td>
<td>0 V</td>
</tr>
<tr>
<td>Refrigerator Sensor</td>
<td>POINT B</td>
<td>Voltage</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Defrosting Sensor</td>
<td>POINT C</td>
<td>Voltage</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Room Temperature sensor</td>
<td>POINT D</td>
<td>Voltage</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

8-2-6 Refrigeration Compartment Stepping Motor Damper Circuit

* The circuit shown below is the damper circuit to regulate the refrigerator temperature.
8-2-7 Key Button Input & Display Light-On Circuit

The circuit shown above determines whether a function control key on the operation display is pushed. It also turns on the corresponding function indication LED (LED Module) SEVEN SEGMENT DISPLAY (SEVEN SEGMENT DISPLAY MODULE). The drive type is the scan type.
### 8-3 RESISTANCE SPECIFICATION OF SENSOR

<table>
<thead>
<tr>
<th>TEMPERATURE</th>
<th>RESISTANCE OF FREEZER SENSOR</th>
<th>RESISTANCE OF REFRIGERATOR &amp; DEFROST SENSOR &amp; ROOM SENSOR</th>
</tr>
</thead>
<tbody>
<tr>
<td>-20 ºC (-4 ºF)</td>
<td>22.3 KΩ</td>
<td>77 KΩ</td>
</tr>
<tr>
<td>-15 ºC (5 ºF)</td>
<td>16.9 KΩ</td>
<td>60 KΩ</td>
</tr>
<tr>
<td>-10 ºC (14 ºF)</td>
<td>13.0 KΩ</td>
<td>47.3 KΩ</td>
</tr>
<tr>
<td>-5 ºC (23 ºF)</td>
<td>10.1 KΩ</td>
<td>38.4 KΩ</td>
</tr>
<tr>
<td>0 ºC (32 ºF)</td>
<td>7.8 KΩ</td>
<td>30 KΩ</td>
</tr>
<tr>
<td>+5 ºC (41 ºF)</td>
<td>6.2 KΩ</td>
<td>24.1 KΩ</td>
</tr>
<tr>
<td>+10 ºC (50 ºF)</td>
<td>4.9 KΩ</td>
<td>19.5 KΩ</td>
</tr>
<tr>
<td>+15 ºC (59 ºF)</td>
<td>3.9 KΩ</td>
<td>15.9 KΩ</td>
</tr>
<tr>
<td>+20 ºC (68 ºF)</td>
<td>3.1 KΩ</td>
<td>13 KΩ</td>
</tr>
<tr>
<td>+25 ºC (77 ºF)</td>
<td>2.5 KΩ</td>
<td>11 KΩ</td>
</tr>
<tr>
<td>+30 ºC (86 ºF)</td>
<td>2.0 KΩ</td>
<td>8.9 KΩ</td>
</tr>
<tr>
<td>+40 ºC (104 ºF)</td>
<td>1.4 KΩ</td>
<td>6.2 KΩ</td>
</tr>
<tr>
<td>+50 ºC (122 ºF)</td>
<td>0.8 KΩ</td>
<td>4.3 KΩ</td>
</tr>
</tbody>
</table>

- The resistance of the SENSOR has a ±5% common difference.
- Measure the resistance of the SENSOR after leaving it for over 3 minutes in the measuring temperature. This delay is necessary due to sensor response speed.
<table>
<thead>
<tr>
<th>POWER SOURCE</th>
<th>PROBLEM INDICATED BY CHECKING METHOD</th>
<th>CAUSE</th>
<th>SOLUTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. The whole DISPLAY</td>
<td>If the DISPLAY is off.</td>
<td>See DEFROSTING</td>
<td>Replace door liner</td>
</tr>
<tr>
<td>2. DISPLAY LED</td>
<td>If LAMP is dim.</td>
<td>Defrosting</td>
<td>Use TEST MODE</td>
</tr>
<tr>
<td>3. The connection of the CONNECTOR</td>
<td>If the display operates abnormally.</td>
<td>Replace TRANS.</td>
<td></td>
</tr>
<tr>
<td>4. Door line contact</td>
<td>If the door is closed.</td>
<td>Check the sealing of the door liner.</td>
<td></td>
</tr>
</tbody>
</table>

---

<table>
<thead>
<tr>
<th>COMPRESSOR</th>
<th>PROBLEM INDICATED BY CHECKING METHOD</th>
<th>CAUSE</th>
<th>SOLUTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. If the COMPRESSOR Locked or blocked.</td>
<td>If less than 7 minutes pass after compressor shuts off.</td>
<td>OLP, PTC</td>
<td>Replace OLP, PTC.</td>
</tr>
<tr>
<td>2. If the CONNECTOR is poor.</td>
<td>If the connecting wire is poor.</td>
<td>Connect the Connecting Wire (CON1).</td>
<td>Replace CONNECTOR (CON1).</td>
</tr>
<tr>
<td>3. If SENSOR RESISTANCE is poor.</td>
<td>If the sensor resistance is poor.</td>
<td>Sensor</td>
<td>Replace SENSOR.</td>
</tr>
<tr>
<td>4. Door line contact.</td>
<td>If the sensor is damaged.</td>
<td>Check the seal when the door is closed.</td>
<td>Replace door liner.</td>
</tr>
</tbody>
</table>

---

<table>
<thead>
<tr>
<th>REFRIGERATOR</th>
<th>PROBLEM INDICATED BY CHECKING METHOD</th>
<th>CAUSE</th>
<th>SOLUTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. FREEZER</td>
<td>If the FREEZER LIGHT is dim.</td>
<td>Defrosting</td>
<td>Use TEST MODE</td>
</tr>
<tr>
<td>2. Door line contact</td>
<td>If the door is closed.</td>
<td>Door liner</td>
<td>Replace door liner.</td>
</tr>
</tbody>
</table>

---

<table>
<thead>
<tr>
<th>COOLING</th>
<th>PROBLEM INDICATED BY CHECKING METHOD</th>
<th>CAUSE</th>
<th>SOLUTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. If COOLING is poor.</td>
<td>If the compressor is locked or blocked.</td>
<td>OLP, PTC</td>
<td>Replace OLP, PTC.</td>
</tr>
<tr>
<td>2. If the connecting wire is poor.</td>
<td>If the connecting wire is poor.</td>
<td>Connect the Connecting Wire (CON1).</td>
<td>Replace CONNECTOR (CON1).</td>
</tr>
<tr>
<td>3. If SENSOR RESISTANCE is poor.</td>
<td>If the sensor resistance is poor.</td>
<td>Sensor</td>
<td>Replace SENSOR.</td>
</tr>
<tr>
<td>4. Door line contact.</td>
<td>If the sensor is damaged.</td>
<td>Check the seal when the door is closed.</td>
<td>Replace door liner.</td>
</tr>
<tr>
<td>Problem</td>
<td>Solution</td>
<td>Cause</td>
<td>Checking Method</td>
</tr>
<tr>
<td>---------</td>
<td>----------</td>
<td>-------</td>
<td>-----------------</td>
</tr>
<tr>
<td>Cooling is poor.</td>
<td>Check the FAN MOTOR</td>
<td>If FAN MOTOR is poor.</td>
<td>TEMPERATURE FUSE is normal.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Make sure that the FAN MOTOR is working properly.</td>
<td>Check FAN MOTOR.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Door does not close.</td>
<td>Remove any obstructions.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Door liner is damaged.</td>
<td>Replace the Door liner.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Door seal is damaged.</td>
<td>Check the Door seal.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Door hinge is damaged.</td>
<td>Replace the Door hinge.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Door is closed improperly.</td>
<td>Replace the GASKET.</td>
</tr>
<tr>
<td>Defrosting is poor.</td>
<td>See DEFOSTING is poor.</td>
<td>DEFROSTING SENSOR is connected.</td>
<td>Replace DEFROSTING SENSOR.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Door does not close.</td>
<td>Make sure that the Door is closed properly.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Door liner is damaged.</td>
<td>Replace the Door liner.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Door seal is damaged.</td>
<td>Check the Door seal.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Door hinge is damaged.</td>
<td>Replace the Door hinge.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Door is closed improperly.</td>
<td>Replace the GASKET.</td>
</tr>
<tr>
<td>Defrosting is too low.</td>
<td>Check DEFROSTING.</td>
<td>DEFROSTING is connected.</td>
<td>Replace DEFROSTING.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Door does not close.</td>
<td>Make sure that the Door is closed properly.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Door liner is damaged.</td>
<td>Replace the Door liner.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Door seal is damaged.</td>
<td>Check the Door seal.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Door hinge is damaged.</td>
<td>Replace the Door hinge.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Door is closed improperly.</td>
<td>Replace the GASKET.</td>
</tr>
<tr>
<td>Heater is not working.</td>
<td>Replace the HEATER.</td>
<td>HEATER is connected.</td>
<td>Replace HEATER.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Door does not close.</td>
<td>Make sure that the Door is closed properly.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Door liner is damaged.</td>
<td>Replace the Door liner.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Door seal is damaged.</td>
<td>Check the Door seal.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Door hinge is damaged.</td>
<td>Replace the Door hinge.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Door is closed improperly.</td>
<td>Replace the GASKET.</td>
</tr>
<tr>
<td>Refrigerator is not cooling.</td>
<td>Replace the GASKET.</td>
<td>Refrigerator door is closed.</td>
<td>Make sure that the Refrigerator door is closed properly.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Door liner is damaged.</td>
<td>Replace the Door liner.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Door seal is damaged.</td>
<td>Check the Door seal.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Door hinge is damaged.</td>
<td>Replace the Door hinge.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Door is closed improperly.</td>
<td>Replace the GASKET.</td>
</tr>
</tbody>
</table>
8-5 MAIN PWB ASSEMBLY AND PARTS LIST

8-5-1 Main PWB Assembly
## 8-5-2 Replacement Parts List

<table>
<thead>
<tr>
<th>No.</th>
<th>P/N/NO.</th>
<th>DESCRIPTION</th>
<th>SPEC</th>
<th>MAKER</th>
<th>REMARK</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>8-5-2B203A</td>
<td>CONNECTOR</td>
<td>BR-777-BRAVIO-P/F</td>
<td>SQ.SAN</td>
<td>1-16</td>
</tr>
<tr>
<td>2</td>
<td>8-5-2B202A</td>
<td>TRANSFORMER</td>
<td>2-7 D22 2900/CW</td>
<td>SAM II</td>
<td>TRANS</td>
</tr>
<tr>
<td>3</td>
<td>8-5-2B201A</td>
<td>TRANSFORMER</td>
<td>2-7 D22 1000/125V</td>
<td>SAM II</td>
<td>TRANS</td>
</tr>
<tr>
<td>4</td>
<td>8-5-2B2011</td>
<td>CONNECTOR</td>
<td>VX200, HD 1.8/1000, HD 900-1.8/110, HD 900-1.8/120</td>
<td>YMN</td>
<td>2100</td>
</tr>
<tr>
<td>5</td>
<td>8-5-2B200A</td>
<td>CONNECTOR</td>
<td>VX200, HD 1.8/1000, HD 900-1.8/110, HD 900-1.8/120</td>
<td>YMN</td>
<td>2100</td>
</tr>
<tr>
<td>6</td>
<td>8-5-2B2001</td>
<td>CONNECTOR</td>
<td>VX200, HD 1.8/1000, HD 900-1.8/110, HD 900-1.8/120</td>
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<td>2100</td>
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<tr>
<td>7</td>
<td>8-5-2B2002</td>
<td>CONNECTOR</td>
<td>VX200, HD 1.8/1000, HD 900-1.8/110, HD 900-1.8/120</td>
<td>YMN</td>
<td>2100</td>
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<td>8</td>
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<td>CONNECTOR</td>
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<td>YMN</td>
<td>2100</td>
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<tr>
<td>9</td>
<td>8-5-2B2004</td>
<td>CONNECTOR</td>
<td>VX200, HD 1.8/1000, HD 900-1.8/110, HD 900-1.8/120</td>
<td>YMN</td>
<td>2100</td>
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<td>CONNECTOR</td>
<td>VX200, HD 1.8/1000, HD 900-1.8/110, HD 900-1.8/120</td>
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<td>2100</td>
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<tr>
<td>11</td>
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<td>CONNECTOR</td>
<td>VX200, HD 1.8/1000, HD 900-1.8/110, HD 900-1.8/120</td>
<td>YMN</td>
<td>2100</td>
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<tr>
<td>12</td>
<td>8-5-2B2007</td>
<td>CONNECTOR</td>
<td>VX200, HD 1.8/1000, HD 900-1.8/110, HD 900-1.8/120</td>
<td>YMN</td>
<td>2100</td>
</tr>
<tr>
<td>13</td>
<td>8-5-2B2008</td>
<td>CONNECTOR</td>
<td>VX200, HD 1.8/1000, HD 900-1.8/110, HD 900-1.8/120</td>
<td>YMN</td>
<td>2100</td>
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<tr>
<td>14</td>
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<td>CONNECTOR</td>
<td>VX200, HD 1.8/1000, HD 900-1.8/110, HD 900-1.8/120</td>
<td>YMN</td>
<td>2100</td>
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<tr>
<td>15</td>
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<td>CONNECTOR</td>
<td>VX200, HD 1.8/1000, HD 900-1.8/110, HD 900-1.8/120</td>
<td>YMN</td>
<td>2100</td>
</tr>
<tr>
<td>16</td>
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<td>CONNECTOR</td>
<td>VX200, HD 1.8/1000, HD 900-1.8/110, HD 900-1.8/120</td>
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<td>2100</td>
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<td>YMN</td>
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<tr>
<td>18</td>
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<td>CONNECTOR</td>
<td>VX200, HD 1.8/1000, HD 900-1.8/110, HD 900-1.8/120</td>
<td>YMN</td>
<td>2100</td>
</tr>
<tr>
<td>19</td>
<td>8-5-2B2014</td>
<td>CONNECTOR</td>
<td>VX200, HD 1.8/1000, HD 900-1.8/110, HD 900-1.8/120</td>
<td>YMN</td>
<td>2100</td>
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<tr>
<td>20</td>
<td>8-5-2B2015</td>
<td>CONNECTOR</td>
<td>VX200, HD 1.8/1000, HD 900-1.8/110, HD 900-1.8/120</td>
<td>YMN</td>
<td>2100</td>
</tr>
</tbody>
</table>
### 8-5-3 PWB Assembly, Display, And Parts List

<table>
<thead>
<tr>
<th>No.</th>
<th>P/NO</th>
<th>DESCRIPTION</th>
<th>SPEC</th>
<th>MAKER</th>
<th>REMARK</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>6875JB0990A</td>
<td>PWB(PF5D)</td>
<td>KS-PJT DISPENSER DISPLAY</td>
<td>DUO SAN</td>
<td>-</td>
</tr>
<tr>
<td>2</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>3</td>
<td>6620JB0055D</td>
<td>WAFER</td>
<td>SMAW250-11</td>
<td>YEON HD CDN101</td>
<td>-</td>
</tr>
<tr>
<td>4</td>
<td>6620JB0064U</td>
<td>-</td>
<td>SMAW250-15</td>
<td>CDN102</td>
<td>-</td>
</tr>
<tr>
<td>5</td>
<td>6600JB0225A</td>
<td>SWITCH,TACT</td>
<td>KPT-1155A</td>
<td>KYUNG IN</td>
<td>SW102-103</td>
</tr>
<tr>
<td>6</td>
<td>6600JR102A</td>
<td>TACT S/W</td>
<td>JTP1280A JIEL 12V DC 50MA JIEL</td>
<td>SW106</td>
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</tr>
<tr>
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<td>6600JB024A</td>
<td>TACT S/W</td>
<td>KPT-1195R</td>
<td>KYUNG IN</td>
<td>SW106</td>
</tr>
<tr>
<td>8</td>
<td>-</td>
<td>TACT S/W</td>
<td>KPT-1195R</td>
<td>KYUNG IN</td>
<td>SW106</td>
</tr>
<tr>
<td>9</td>
<td>6327JB001A</td>
<td>DISPLAY LED ASSEMBLY</td>
<td>N4039-1G6QWS GREEN 2.1V 1.7MCD LEDTECH SEG,SEG5</td>
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</tr>
<tr>
<td>10</td>
<td>DFB00059AA</td>
<td>LED</td>
<td>L19220-41 BCN 2.1V 03 TP GREEN L107-105</td>
<td>-</td>
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</tr>
<tr>
<td>11</td>
<td>0BB41489AA</td>
<td>DIODE,SWITCHING</td>
<td>IN4148 26MM</td>
<td>PYUNG CHANG DELTA</td>
<td>D107-106</td>
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<tr>
<td>12</td>
<td>0DB40040GA</td>
<td>-</td>
<td>IN4004</td>
<td>-</td>
<td>-</td>
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<tr>
<td>13</td>
<td>6804JP0001A</td>
<td>JUMP WIRE</td>
<td>0.6MM 0.2MM TP TAPING SNA10MM</td>
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</tr>
<tr>
<td>14</td>
<td>9VWF0120000</td>
<td>SOLDERING WIRE R50</td>
<td>0.120</td>
<td>HEE SUNG</td>
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</tr>
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<td>15</td>
<td>4911034</td>
<td>SOLDER SOLDERING</td>
<td>H63A</td>
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<tr>
<td>16</td>
<td>59333105</td>
<td>FLUX</td>
<td>SG-D825-9030 KOREA FH-206 KOKI</td>
<td>-</td>
<td></td>
</tr>
</tbody>
</table>
CASE PARTS
CAUTION: Use the part number to order part, not the position number.
FREEZER PARTS

CAUTION: Use the part number to order part, not the position number.
REFRIGERATOR PARTS
CAUTION: Use the part number to order part, not the position number.

* : on some models
DOOR PARTS
CAUTION: Use the part number to order part, not the position number.

* : on some models
ICE & MAKER PARTS
CAUTION: Use the part number to order part, not the position number.