

**REFRIGERATOR 3-DOOR F6FBM36S1 - F6FBM36S2
SERVICE MANUAL****REVISION HISTORY**

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1. GENERAL SAFETY WARNINGS

- Children must not play with the device. Cleaning and user maintenance must not be performed by the children unless they are supervised by an adult.
- If the product is out of order, it must not be operated before being repaired by the authorised service! Risk of electric shock!
- Connect the product to a grounded socket which is being protected by a fuse conforming to the values on the Type Label. Have the grounding installation made by a qualified electrician. Our company shall not be liable for any damages which may arise if the machine is used without a proper grounding which conforms to the local regulations.
- Unplug the product if it is not in use.
- Never wash the product by spraying or pouring water on it! Risk of electric shock!
- Never touch the plug with wet hands! Do not grab the power cord to unplug the machine, always unplug it by grasping the plug.
- If the outlet is loose, never plug the appliance into the outlet.
- Never connect your refrigerator to electricity-saving electronic systems. These systems will damage the device.
- Product must be unplugged during the installation, maintenance, cleaning and repair processes.
- Installation and repair works must always be performed by Authorised Service agents. The manufacturer cannot be held liable for the damages which may arise from the operations performed by unauthorised persons.
- Do not eat the cone ice cream, ice cubes, etc. right after they are taken from the freezer compartment! This may cause frostbite in your mouth!
- Do not touch frozen food by wet hands! They may stick to your hands!
- Do not place the bottled and canned liquid beverages in the freezer compartment. They may blow!
- Never use steam and steam cleaners for cleaning and defrosting processes on your refrigerator. Steam might contact the electrical parts of your refrigerator and cause short circuit or electric shock!
- Do not use mechanical devices or methods other than those recommended by the manufacturer to expedite defrosting process.
- Never use the parts on refrigerator such as its door and drawers as a support or step. Otherwise, you may cause the product to tip over or parts of it get damaged.
- Do not damage the cooling circuit, where the refrigerant is circulating, by using cutting or pointing tools. The refrigerant that will spray out if the gas channels of the evaporator, pipe extensions or surface coatings are punctured may cause skin irritations and eye injuries.
- Do not cover or block the ventilation holes in the refrigerator with any material.
- Place the beverages with higher proofs tightly closed and vertically.
- Do not use pressurised flammable gaseous sprays near the product to avoid the risk of a potential fire or explosion.
- Do not store the flammable products or products containing flammable gases (spray, etc.) and explosive substances in the refrigerator.
- Do not place containers with liquid on top of the product. If water splashes onto an electrical part, this may cause electric shocks or risk of fire.
- Do not store the products that need a precise temperature control (vaccines, heat-sensitive medicine, scientific materials, etc.) in the refrigerator.
- If you will not operate the product for a long period of time, unplug and unload the food inside.
- If the product is equipped with blue light, do not look into it by optical appliances.
- Exposing the product to rain, snow, sun and wind is dangerous with respect to electrical safety.
- Do not overload the product. It may fall when the door is opened and may harm you or damage the product. Similar problems may occur in case of putting items on the product.
- If the product's door is equipped with a handle, do not pull by the handle when changing the place of the product. The handle may be dislocated.
- Be careful about not to let the moving parts inside the product to entrap your hands or other parts of your body.

1.1.HCA warning

- If the product has a refrigeration system containing R600a gas, make sure that the refrigeration system and piping are not damaged during usage and transportation. This gas is flammable. If the refrigeration system is damaged, keep the product away from potential fire sources that may cause it to catch fire and immediately ventilate the room where the unit is placed.

	<p>Ignore this warning if the product is equipped with a cooling system that contains R134a.</p>
	<p>You can learn about the gas used in manufacturing of the product on the tag located on the inner left part.</p>
	<p>WARNING: Never dispose the product in fire.</p>

1.2. For products with water dispenser

- Pressure of the supply water must not be less than 1 bar. Pressure of the supply water must not be more than 8 bars.
- Use only drinking water.

1.3. Intended use

- This product is intended for indoor use only. It is not suitable for commercial use and it must not be used out of its intended use.
- The product must only be used for the preservation of the food.
- The manufacturer shall not accept any liability due to any damage arising from misuse or handling.
- Service life of the product you purchased is 10 years. This is the course of time specified for spare parts to be available in order for the product to operate as specified.

1.4.Child safety

- Packaging materials is hazardous for the children. Keep packaging materials in a safe place out of the reach of children.
- Electrical appliances are dangerous for children. When the product is operating, keep the children away and do not allow them to play with the appliance.
- If the product has a door lock, keep the key out of the reach of children.

1.5.Compliance with the WEEE directive and disposal of the waste product

- This product does not contain the harmful and prohibited substances which are described in the "Directive for Controlling Waste Electrical and Electronic Equipment" issued by the Ministry of Environment and Urban Planning. Complies with the WEEE Directive. This product has been manufactured from high quality parts and materials which are recyclable and reusable. For this reason, do not dispose the product with domestic and other wastes at the end of its service life. Take the product to a collection point for the recycling of the electric and electronic equipment. Check with local authority in your area about these collection points. Help with preserving the environment and natural resources by delivering the used products to the recycling points. Before disposing your appliance, cut out its power cord and if there are any locks on the door, make them inoperable for children's safety.

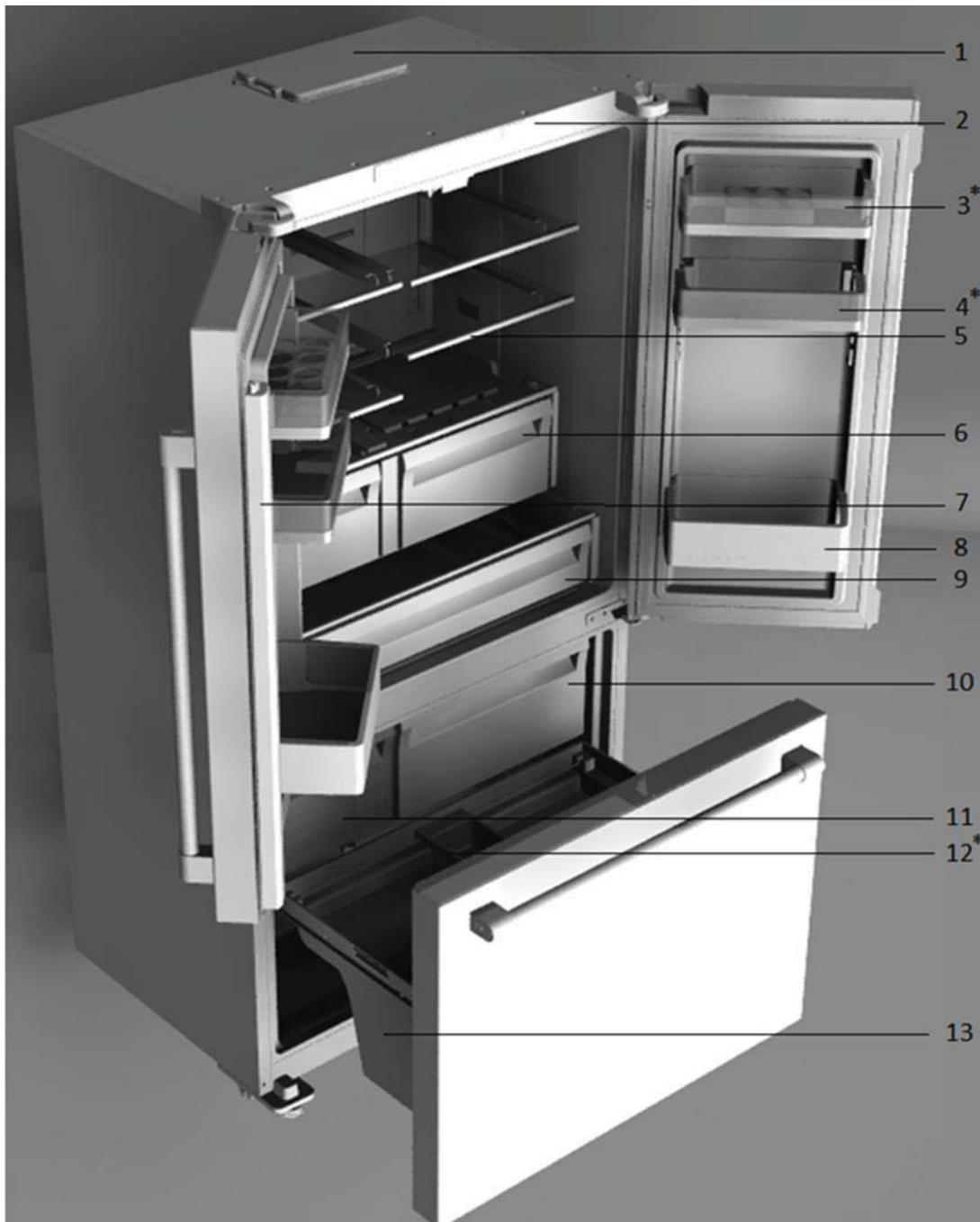
1.6.Packaging information

- Packaging of the product was manufactured from the recyclable materials in accordance with our national legislation. Do not dispose the package waste along with the domestic or other wastes, take them to the collection points which are specified by the local authorities.

1.7.Disposal of the waste product

- This product has been manufactured from high quality parts and materials which are recyclable and reusable. For this reason, do not dispose the product with domestic and other wastes at the end of its service life. Take the product to a collection point for the recycling of the electric and electronic equipment. Check with local authority in your area about these collection points. Help with preserving the environment and natural resources by delivering the used products to the recycling points.

2.General appearance of the product

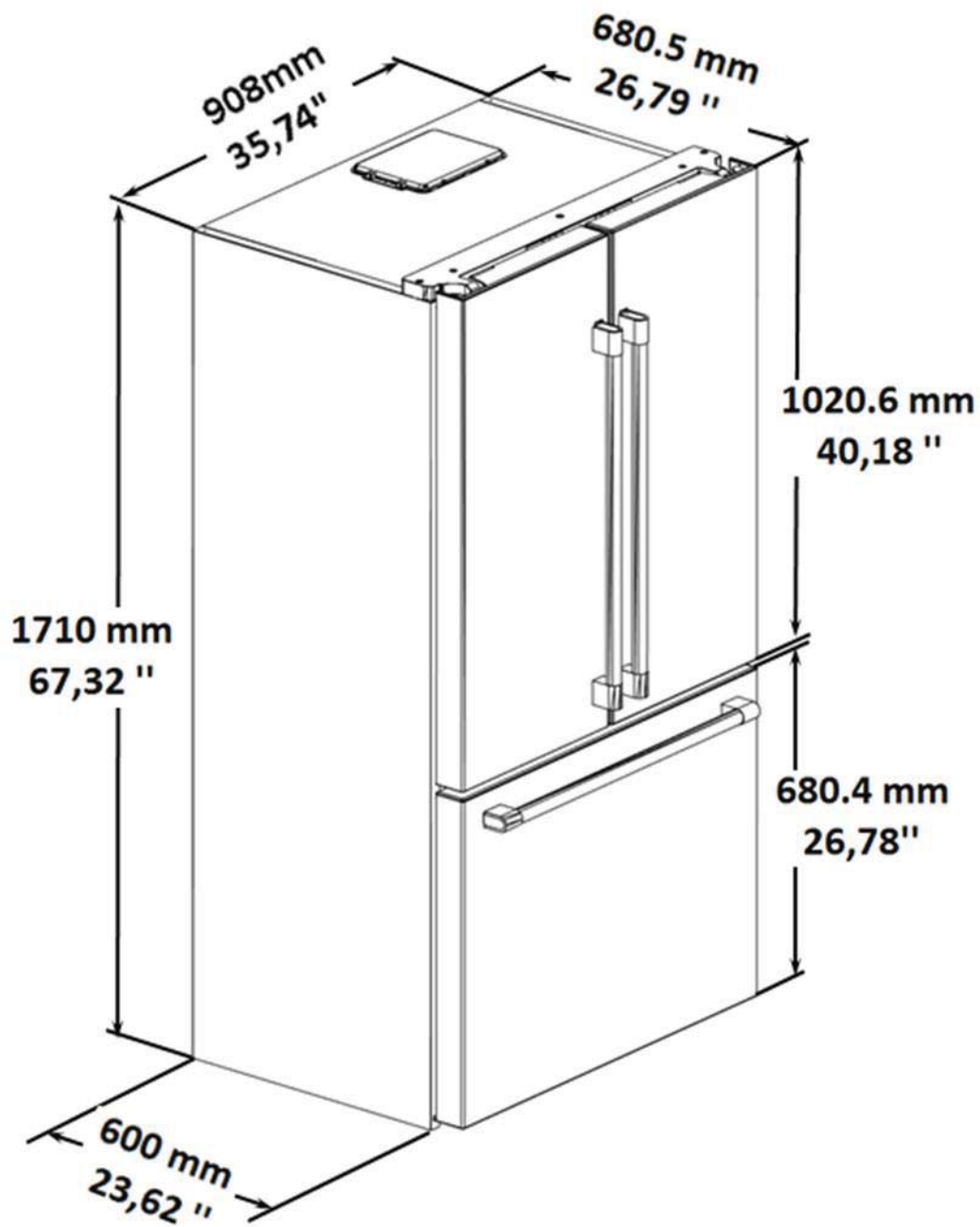


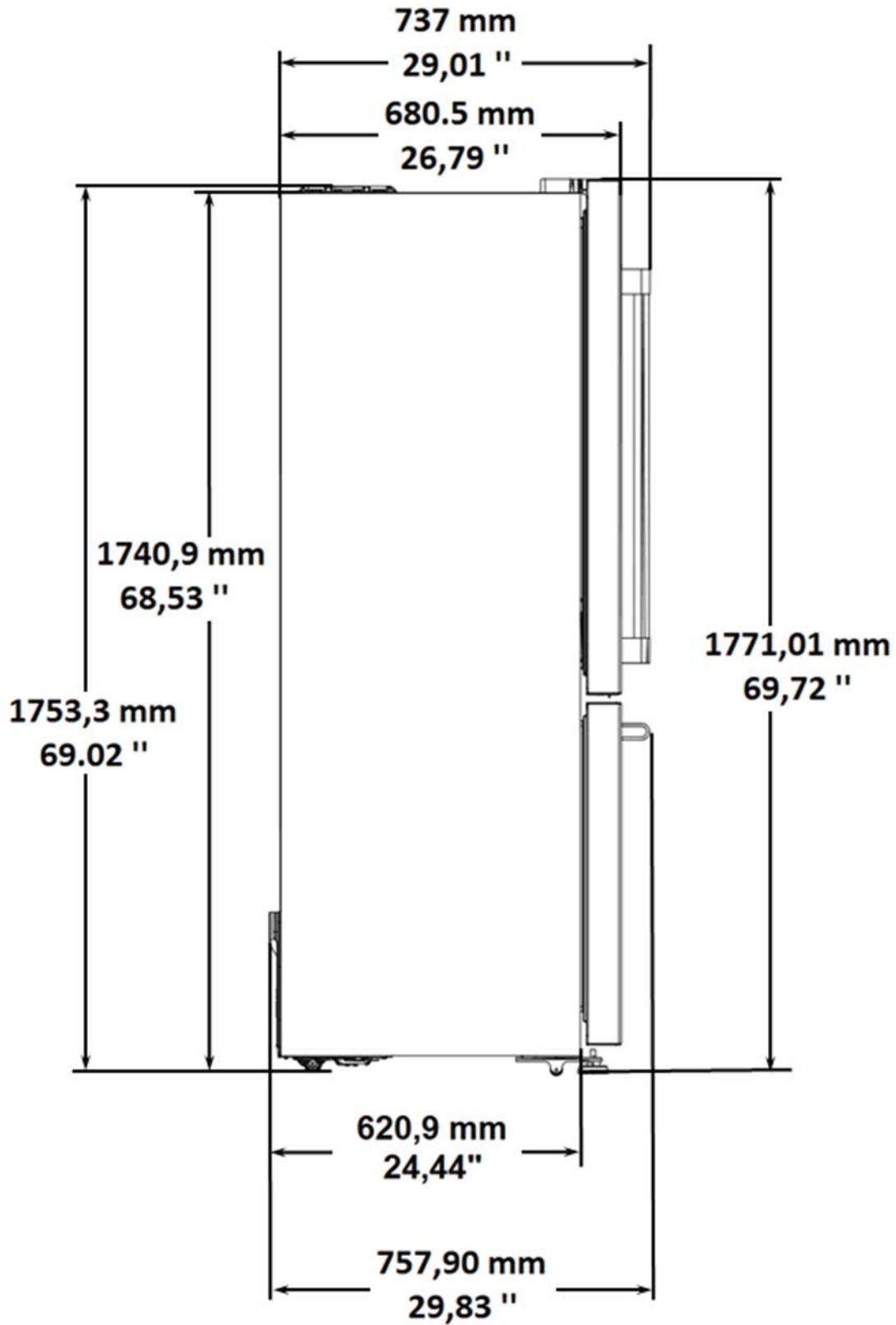
- | | |
|--|--------------------------------------|
| 1- Electronic card unit | 7- Movable middle section guide |
| 2- Control and indicator panel (Display) | 8- Door shelf suitable for gallon |
| 3- Cooler compartment 70 mm door shelf
Optional | 9- Chiller snack compartment |
| 4- Movable door shelf | 10- Freezer compartment upper shelf |
| 5- Cooler compartment detachable glass
shelves | 11- Ice drawer |
| 6- Crisper | 12- Freezer compartment separator |
| | 13- Freezer compartment lower drawer |



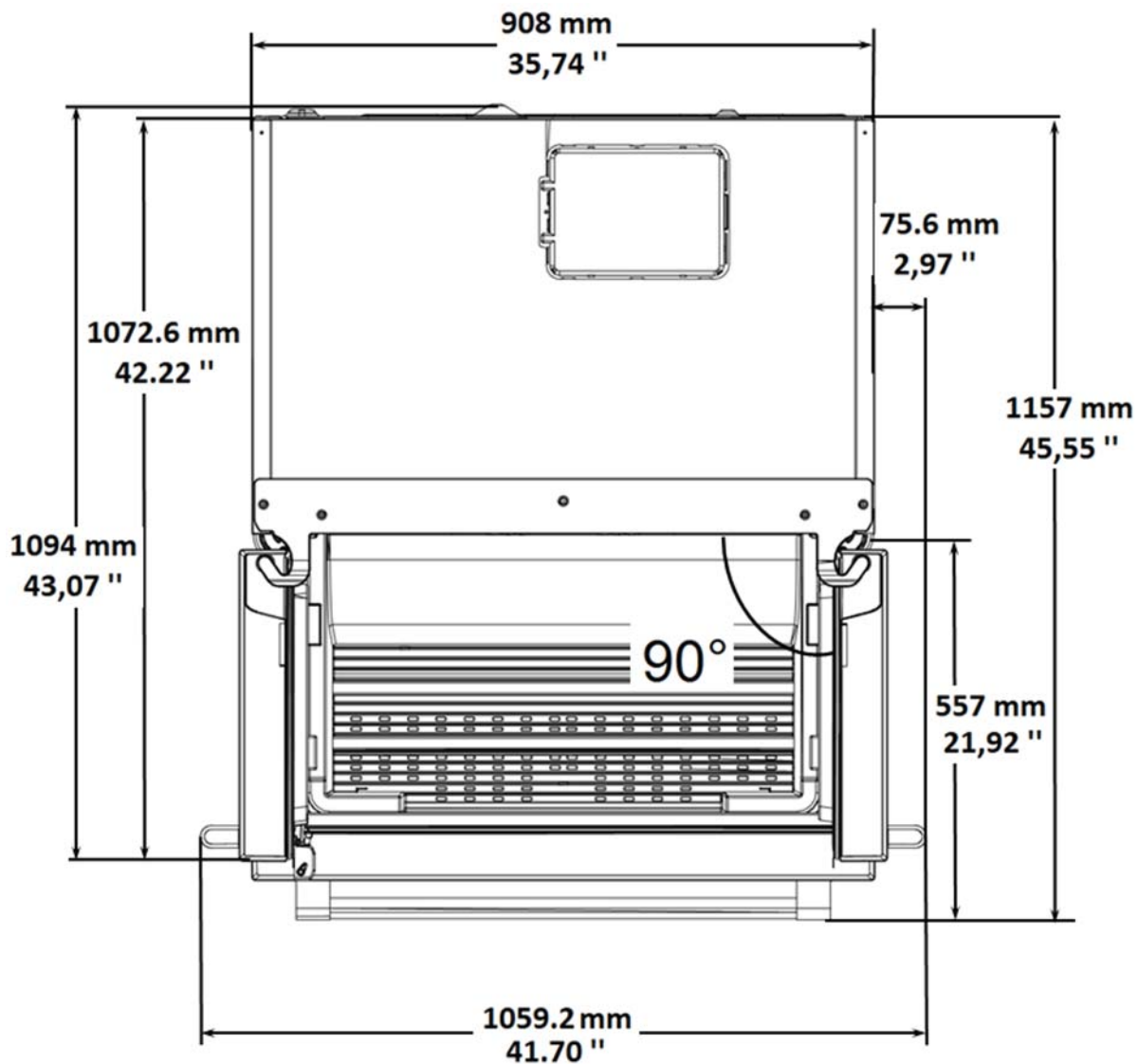
The figure given is for schematic purposes and may not be exactly the same with the product. If the relevant parts are not available in the product, it applies to other models.

2.1.General Dimensions of the Product

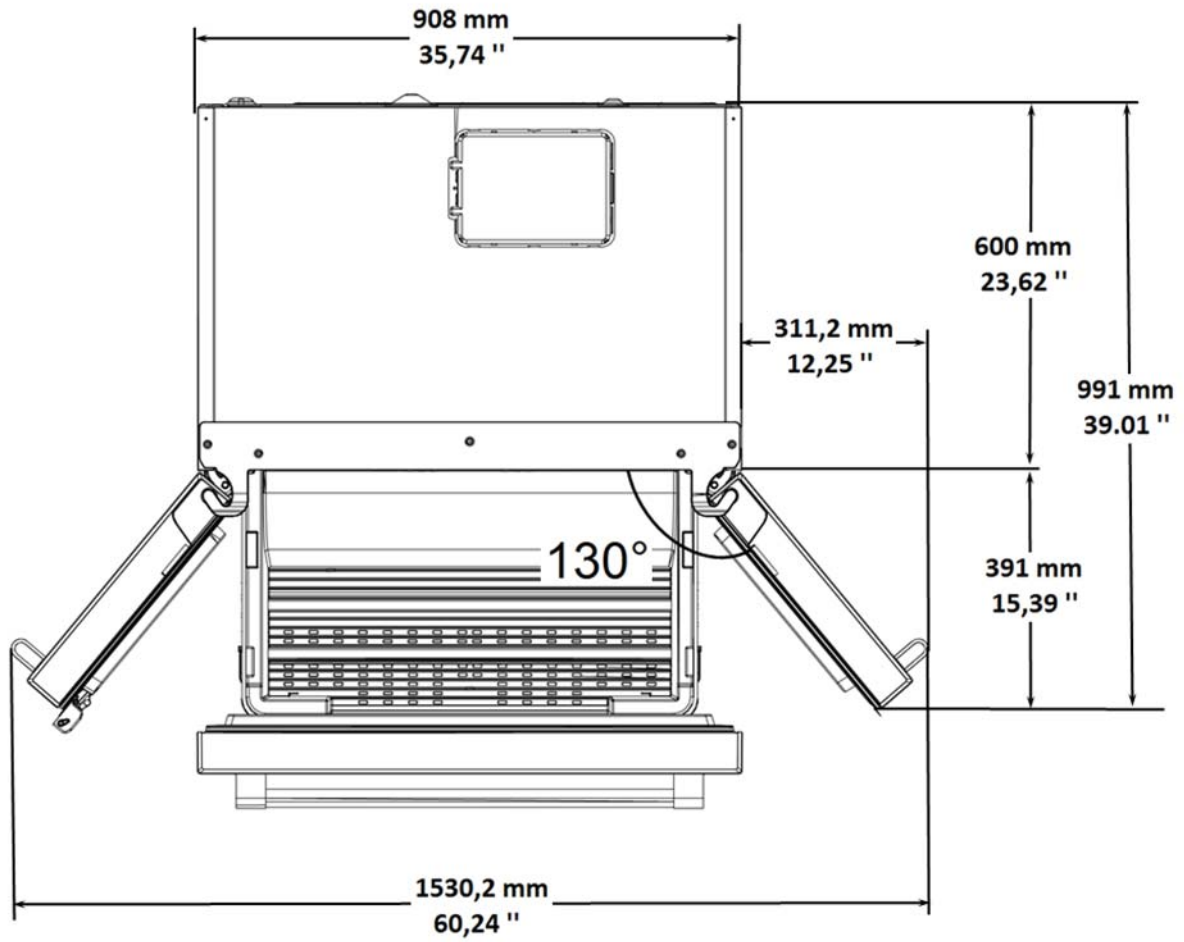




2.2.Opened View of Product at 90°



2.3. Maximum Opened View of the Product



3. INSTALLATION

3.1. Handling Instructions

1. This appliance must be transported only in upright position. Shipping package must not be damaged during transportation.
2. If the appliance is to be transported in horizontal position, it must only be leaned towards right-hand side when you are facing the front of the appliance. After bringing it to upright position, it must be left for at least 4 hours without being operated in order to have it settled.
3. Failure to obey above instructions may result in damage on the appliance. In case of failure to obey these instructions, the manufacturer shall not be held responsible.
4. The appliance must be protected against rain, humidity and other atmospheric effects.
5. Pay attention not to damage your floor, the pipes, wall coverings and etc., while installing your appliance. The appliance must not be handled by pulling from the door or door handle.
6. Discharge the water in the drain tray before moving the appliance. For detailed information, see "Cleaning and Maintenance" section in the operation manual.
7. Do not sit on or climb to the appliance since the design of the appliance is not suitable for such actions. You may injure yourself or damage the appliance.

IMPORTANT! To prevent cutting or damaging the power cable, make sure that the cable is not pinched under the appliance during and after moving it.

3.2 Installation Instructions

1. Volume of the room where the product will be installed must not be less than 10 cubic meters.
2. Do not place the appliance in a cold room where the temperature is likely to fall below 10°C at nights and/or especially in winter season.
This refrigerator/deep freezer is designed to operate in ambient temperatures between 10°C and +43°C.
3. Do not place the appliance near ovens or radiators or under direct sunlight since they will cause the appliance to operate more difficultly. In case of placing the appliance near a heat source or freezer, ensure that the following minimum clearances are provided.

From ovens: 50 mm (2")
From radiators: 400 mm (12")
From freezers: 25 mm (1")
From the wall: 50 mm (2")

4. Mount the 2 plastic wedges supplied in a bag in the refrigerator onto the rear ventilation cover as illustrated in the following figure. To do this, remove the screws on it and attach the screws given in the same pouch. Plastic wedges are for the required distance between your refrigerator and the wall in order to allow the air circulation.

3.3.Appropriate place for installation



WARNING: If the door of the room where the refrigerator will be placed is too narrow to let the product to pass through, the doors of the unit must be dismantled and the appliance must be passed in a horizontal position.

- Place your product on a place that allows ease of use.
- Install the product at least 30 cm away from heat sources such as hobs, ovens, central heaters and stoves and at least 5 cm away from electrical ovens. The appliance must not be exposed to humidity and direct sunlight after installation.
- There must be appropriate air circulation around in order for the product to run efficiently. If the refrigerator will be placed around a recessed wall, make sure that there is at least 5 cm clearance between the ceiling and side walls.
- Do not place the product on materials such as carpet or rug.
- Place the refrigerator on a flat surface to avoid any swaying.



If two refrigerators are placed side by side, there must be at least a distance of 4 cm between them.

3.4.Installing the plastic wedges

Plastic wedges are used in order to maintain the clearance that will provide the air circulation between the product and the wall. Insert the 2 plastic wedges supplied with the product onto the rear ventilation cover as illustrated in the figures. In order to mount the wedges, remove the screws on the product and use the screws available in the same bag along with the wedges.





- Screws on the upper side of the rear cover are unscrewed.
- The installation is ensured by screwing the ventilation support wedges provided in the product on the as directed areas.

3.5. Electrical Connection

Connect the product to a grounded socket which is protected by a fuse conforming to the values on the Type Label. Our company shall not be liable for any damages which may arise if the machine is used without a proper grounding which conforms to the local regulations.

- The connection must be in compliance with national regulations.
- The power cable plug must be easily accessible after installation.
- Voltage and allowable fuse protection are specified in the type label adhered to the inner part of the appliance. If the current value of the fuse in your house does correspond to the values specified in its rating plate, request a licensed electrician to connect an appropriate fuse.
- The specified voltage must be equivalent to your mains voltage.
- Do not set any connection with extension cables or multiple outlets.


	WARNING: Damaged power cords must be replaced by an Authorised Service agent.
	WARNING: If the product is out of order, it must not be operated without being repaired. Risk of electric shock!

3.5. Floor level adjustment

If your refrigerator is unbalanced;

You can balance your refrigerator by turning the front legs as illustrated in the figure. The corner where the leg exists is lowered when you turn in the direction of black arrow and raised when you turn in the opposite direction. Taking help from someone to slightly lift the refrigerator will facilitate this process.



	WARNING: First disconnect the electrical connection of the product. While the legs are being adjusted, the product must not be plugged in. There is risk of electric shock!
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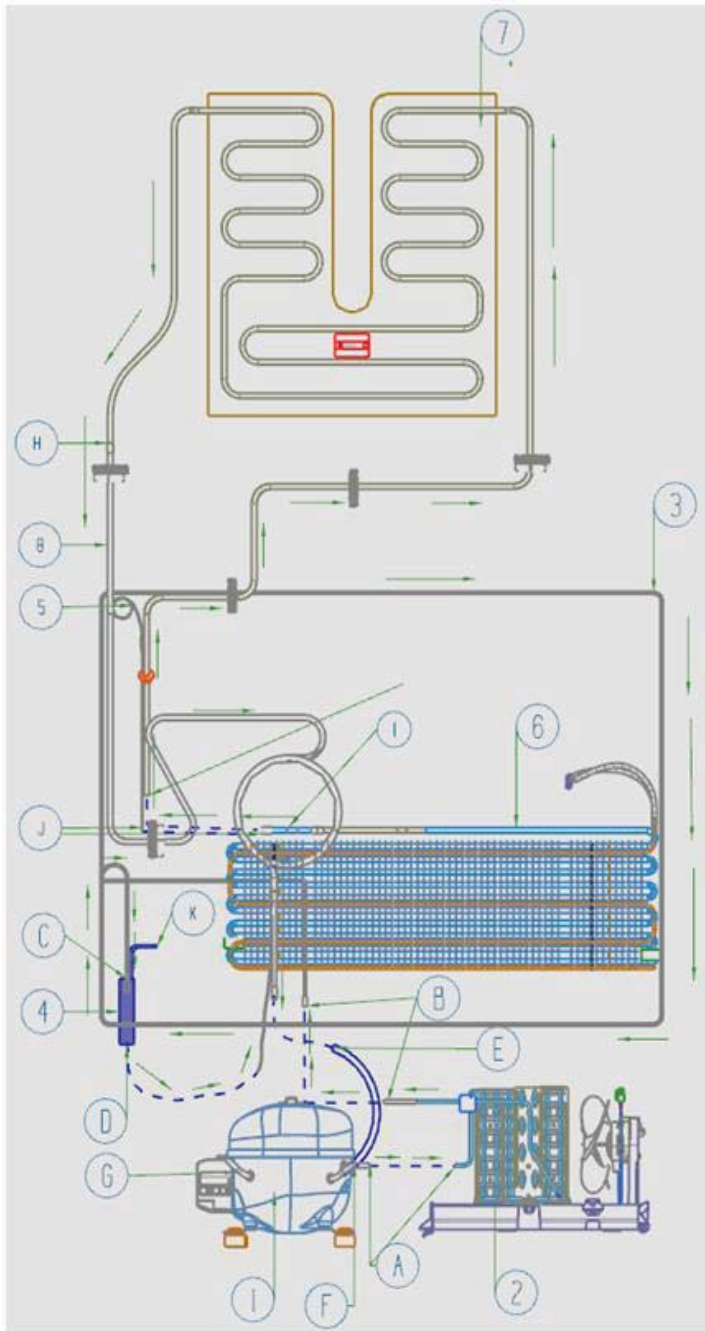
4.PRODUCT USE

- For air circulation in the place where the refrigerator is located, necessary clearance must be allocated under, top, right and left of the unit.
- As the water inlet is at the rear side of the refrigerator for products equipped with water dispenser, make sure that the hose is not kinked or squeezed.
- If the refrigerator is equipped with an Icematic supplied from mains, area required for the mains system must be reserved.
- Plug your refrigerator always into a grounded socket. Pay attention not to damage the power cable during transportation.
- Do not place devices such as radiators, heaters and etc. close to the refrigerator.
- The place where the refrigerator will be placed must be at an appropriate distance to the place of mains connection.
- Refrigerator must not be exposed to the direct sunlight.
- Floor levelling adjustment must be made according to the area where refrigerator is placed.
- Adequate area must be allocated in order for the doors of the refrigerator to opened easily.
- Position of the refrigerator must be appropriate for servicing and maintenance.
- Do not use the refrigerator on wet floors. There is the risk of electric shock in terms of safety.

5.General Operation Principle

Electronic NF refrigerator is composed of fridge and freezer compartments. It is a micro-processor controlled no-frost refrigerator. All functions and temperature controls of the refrigerator are made in line with the desire of the user thanks to the microprocessor. The software in the microprocessor controls the cooling and water system elements (compressor, fans, heaters, valves, icebox, solenoids, ice crusher motor and ioniser, etc.) of the refrigerator. Cooling of the refrigerator is provided through passing the air inside continuously over the evaporators by means of the fan and circulating it for the Freezer and the FF separately. No frosting or icing forms inside the usable areas of no-frost refrigerators as is the case with conventional refrigerators. The frosting that forms on the evaporator which is out of the usable area is melted by means of heaters automatically activated under the control of the microprocessor at certain intervals to be determined by the control algorithm. In that way the frost and the ice accumulated on the evaporator are melted without requiring the user making any operation for enabling the refrigerator to operate more efficiently.

6. Gas Flow Diagram and Parts



Cooling system parts

- 1- Compressor / KMP.MTS200MT
- 2- Coil Condenser
- 3- Freezer heating pipe
- 4- Dryer
- 5- Capillary (Capillary pipe)
- 6- Freezer evaporator group
- 7- Cooler evaporator group
- 8- Return Pipe

Welding Points

- A- Compressor - Coil Condenser
- B- Coil Condenser - Flange Heater
- C- Flange Heater - Dryer
- D- Dryer - Capillary tube
- E- Return pipe - Connector
- F- Connector - Compressor
- G- Service pipe
- H- Cooling evaporator – Return pipe
- I- Freezing evaporator - Cooling evaporator
- J- Capillary tube - Freezing evaporator
- K- Dryer - L Service tube

7.ELECTRONIC AND CONTROLLING SYSTEM

7.1.Component List and Operating Principles

	Component
1	Compressor
2	Defrosting heater
3	DC Speed Freezer fan
4	DC Speed Condenser fan
5	Sensors (Frz Eva, Frz Air, FF Eva, FF Air, Icematic)
6	DC Fresh Food Fan
7	Flange Heater
8	FF Eva heater
9	Thermal fuse
10	PTC relay
11	Thermal
12	Door Reed Switch (FRZ, FF)
13	DC Led Bar and DC ATK Led Board
14	Ioniser
15	DC Blue LED board (optional)
16	Icematic motor
17	Water pipe heater
18	Supply line filter
19	Capacitor
20	Electronic control board
21	Indicator Card
22	Ice-cream machine
23	Everfresh compartment valve

Compressor: Refrigerant gas circulation is provided through the compressor. Power supply is provided over a thermal protector. The auxiliary coil which is activated for a short time during first start-up of the compressor is deactivated by PTC.

Freezer fan motor (Freezer Compartment Fan Motor): It is mounted on the inner body of refrigerator behind the rear cover of evaporator. It ensures circulation of the freezer compartment air in the freezer compartment by passing it continuously over the evaporator.

Condenser fan motor: It is located at the bottom of the cabin. It prevents excessive heating of the condenser and drops condensation pressure to increase the efficiency of the fridge. It is connected parallel to the compressor, runs when the compressor starts and stops when it stops.

Sensors: It has a characteristic that its resistance decreases as the temperature rises. Sensors on the refrigerator body detect the temperature of their surrounding area and transmit it to the electronic control board.

Freezer sensor (Freezer Compartment Sensor): It detects the temperature in the freezer compartment and transmits it to the microprocessor. Values taken from this sensor are compared with the cut-in and cut-out values of the temperature set for the freezer compartment to run or stop the compressor and the freezer compartment fan motor.

FF sensor (Fridge Compartment Sensor): It detects the temperature in the fridge compartment and transmits it to the microprocessor. Values taken from this sensor are compared with the cut-in and cut-out values of the temperature set for the fridge compartment to run or stop the compressor, the fridge compartment fan motor and the fridge compartment rear wall heater.

Eva sensor (Fridge Compartment Eva Sensor): It is used to detect the tail Evaporator temperature of the fridge compartment.

Defrost sensor: It is located on the evaporator at the capillary outlet. It detects the temperature on the evaporator and transmits it to the microprocessor. Defrost is terminated according to the temperatures received from this sensor.

Freezer defrost heater: The heater under the freezer evaporator is activated and deactivated by the electronic board at times of defrost. In this way, it periodically defrosts icing accumulated on the evaporator.

Door Heater: It is used to prevent condensation on the contact surface of Freezer Door seals.

Thermal fuse: It is located on the evaporator. In case of any malfunction, it cuts the current to the heater to deactivate the defrost heater in order to prevent the defrost heater from remaining activated continuously and causing any damage to the refrigerator, environment and foods inside. Thermal fuse is disposable and therefore must be replaced once it is blown.

Thermal relay: It has a characteristic that its resistance increases as the temperature rises. It ensures primary start-up of the compressor by activating the compressor's auxiliary coil, then it deactivates the auxiliary coil by being heated with the current flowing over it.

Thermal switch: It is a component that becomes open circuit when heated. It opens the circuit at a certain temperature and cuts the current to the compressor in order to protect the compressor coils against excessive heating. When the temperature of the compressor drops below a certain value, it re-completes the circuit to restart the compressor.

Door hinge cover Reed Switch: Reed switches are used in the upper hinge cover with display. Normally, when the cooling doors are closed it is in closed circuit. When the cooling doors are open, a signal is transmitted to the control board and thus, FF illumination units are lit and disabled if the fan is running. When the door is closed, lamps are turned off and the fan starts running if needed.

Led Bar and DC ATK Led Board 6 units of 12V DC LED boards are used for the illuminating fridge compartment. These LED boards are activated by the reed switch and control board when the fridge compartment door is opened. 1 unit of 12V DC LED boards are used for the illuminating the fridge compartment. This LED board is activated by the reed switch and control board when the freezer compartment door is opened.

Electronic Control Board: The control board is placed in the plastic box towards the rear wall on the upper part of the refrigerator. FRZ is used as the main board which controls the electronic systems which are controlled by the display on the door.

Ice sensor: It is a sensor with flexible body under the icebox. It detects freezing of the water in the icebox and transmits the info to the microprocessor. Thus the motor of the icematic is rotated according to the temperatures detected from the sensor.

Ice Sensor: The icematic accessory in the freezer compartment is used to detect the ice quantity in the icebox.

Ice motor: It ensures discharging of the ice formed in the icebox into the ice container. Ice formation is determined with the information received from the icematic sensor; icebox motor is activated according to the amount of ice formation and the ices are poured into the ice container. Icematic arm detects when the ice container is full and it does not pour more ice into the ice container than its capacity.

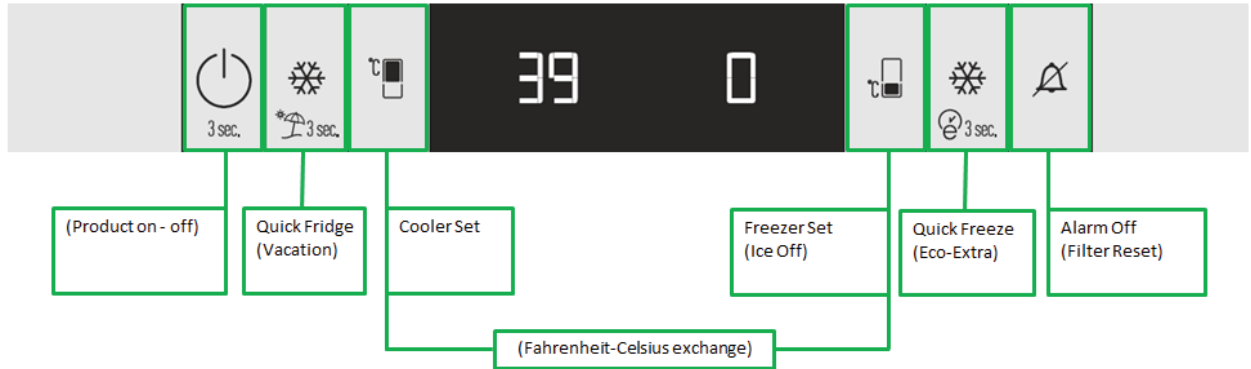
Blue light LED board: Blue light LEDs are used to ensure longer preservation of vegetables. It is used along with the rear illumination units of cooler compartment on the lower section.


Ionizer: It periodically spreads ions into the FF compartment in order to clean the air inside the compartment. It is located on the upper section of the fridge compartment and behind the fridge eva cover.

8.ELECTRONIC CONTROL SYSTEM

**8.1.U4 CONTROL CARD FOREVER DISPLAY DEALER MODE
DEALER MODE ACTIVATION**

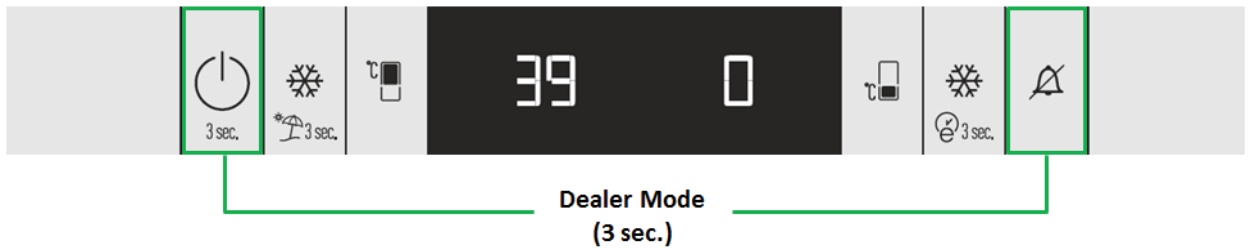
- The display board we use in the refrigerator has a six-key system.
- Set values are shown on the display.

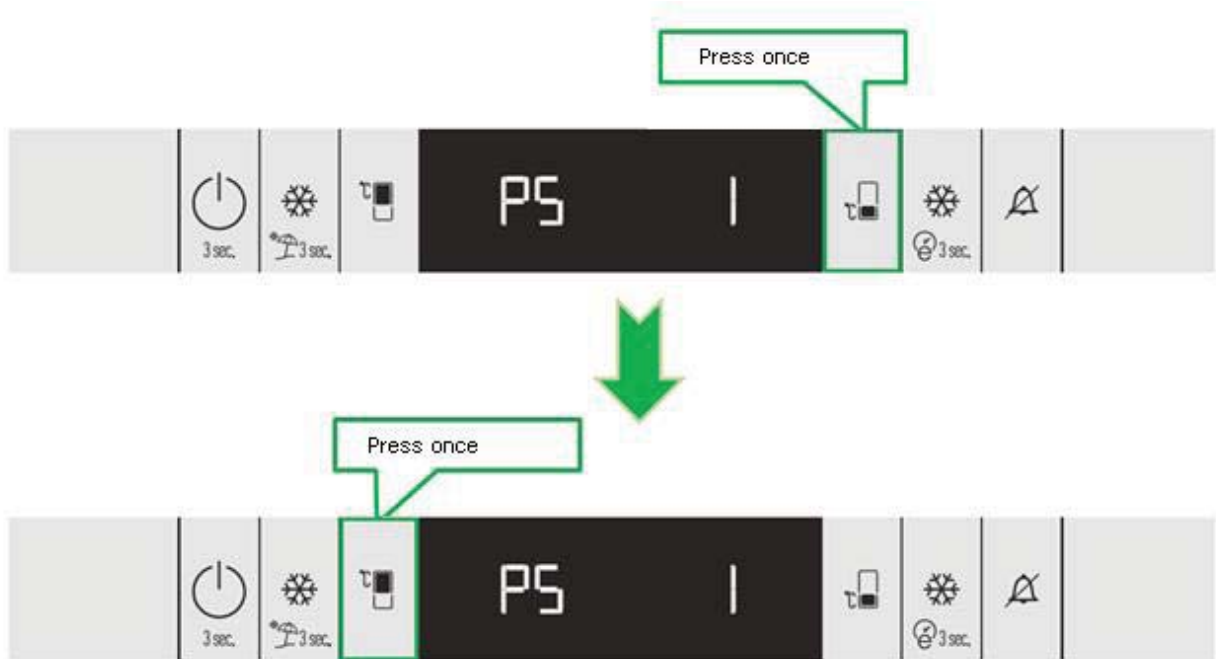


 The figure given is for schematic purposes and may not be exactly the same with the product. If the relevant parts are not available in the product, it applies to other models.

*(pressing for 3 seconds)

Step 1: Press and hold On/Off and Alarm Off buttons for 3 sec anytime after energizing to switch to password entry screen.



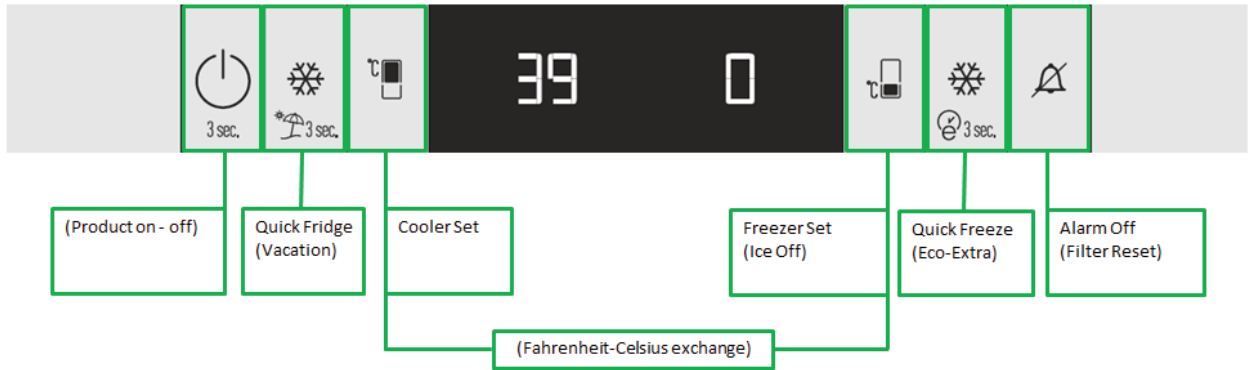


- If the key configuration is pressed correctly, dealer mode is enabled with a buzzer sound. Alarm icon lights continuously.
- Related icons light as the display button is pressed; no cooling is made.
- If the door is opened, "door open" alarm is heard, and pressing any button deactivates the active "door open" alarm.
- After failure energy, Dealer mode is still remembered. Pressing and holding On/Off and Alarm Off buttons for 3 sec will cancel dealer mode.



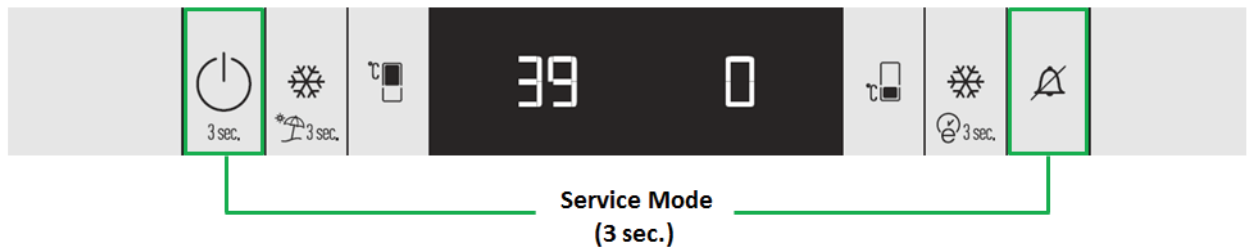
**8.2.U4 CONTROL CARD FOREVER DISPLAY SERVICE TEST
ACTIVATION OF SERVICE TEST**

- The display board we use in the refrigerator has a six-key system.
- Set values are shown on the display.



*(pressing for 3 seconds)

Step 1: Press and hold On/Off and Alarm Off buttons for 3 sec anytime after energizing to switch to password entry screen.



- Service test is entered by pressing the freezer set button for once.



**8.3.U4 CONTROL CARD FOREVER DISPLAY SERVICE TEST
VERSION NUMBER DISPLAY**

- Once entered in the service test, icons work for ON for 0.5 sec. and OFF for 0.5 sec.



- Once any button is pressed, Step 1 is terminated.

Step 2: Firstly, the display software version info is shown on the FF compartment and the revision info is shown on the FRZ compartment.

- Shown on Forever displays as version - revision 0-0.



- When any key is pressed, control board version info is shown on the FF compartment and the revision info is shown on the FRZ compartment.



NOTE: To see updated version revision info, control board and display technical drawings must be checked.

**8.4.U4 CONTROL CARD FOREVER DISPLAY SERVICE TEST
SENSOR TEMPERATURES DISPLAY**

Step 3: When any button is pressed, sensor display step is entered. Sensor display is as follows.

View (Value-Sensor) :

Sensor value and sensor code



Sensor value at FRZ compartment, at FF compartment:



FH: Fridge Air
FE: Fridge Eva
rH: Freezer Air
rE: Freezer Eva
IS: Icematic sensor-1
IS: Icematic sensor-2

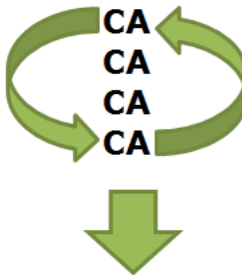


View (Value-Cabin Code) :

Sensor value and cabin code abbreviation "CA"



Sensor value at FRZ compartment, at FF compartment:

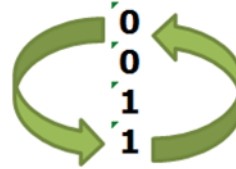


CA: Cabin



View (Value-Cabin Code) :

Sensor value and cabinet code



CA: 0 Fridge_
CA: 1 Freezer

- Switch between sensors can be made by pressing Fridge Set button in forward direction and Quick Fridge button in backward direction.
- When the product On/Off and Alarm Off buttons are shortly pressed simultaneously together, setting mode switches between reading, concurrent on/off of fans and illuminations, component driving, water intake time, and dispenser light time after each press.

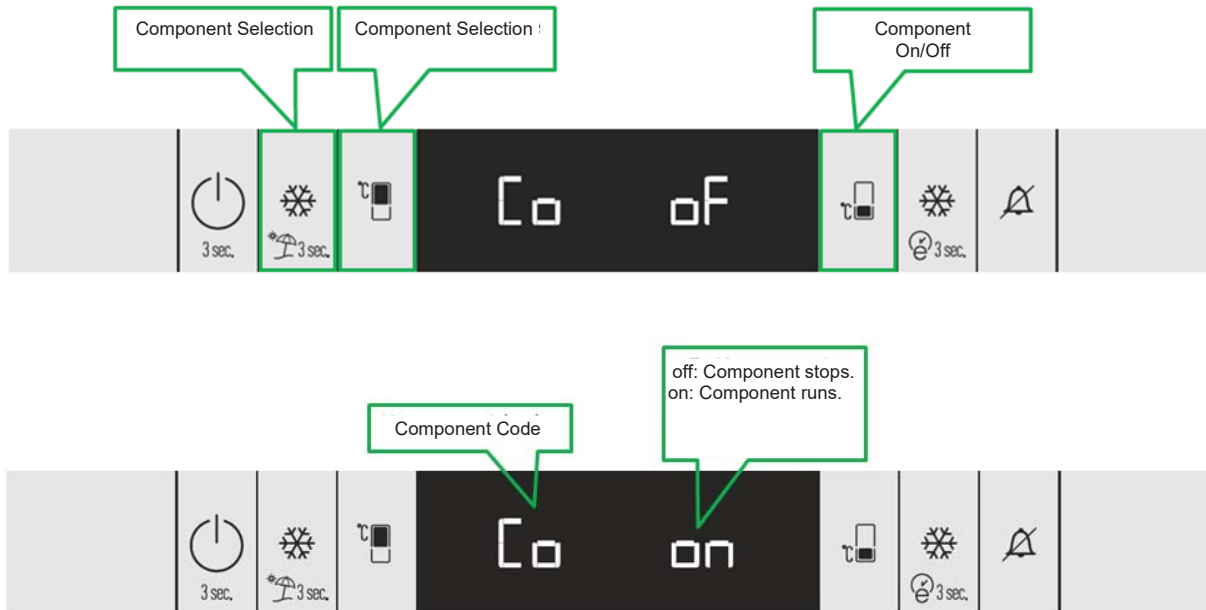


Step 4: Concurrent on/off step of fans and illuminations: When Frz Set button is pressed, FF Fan, Frz Fan, Condenser Fan, FF Illumination, Frz Illumination, Blue Ray components are turned on or off.



**8.5.U4 CONTROL CARD FOREVER DISPLAY SERVICE TEST
COMPONENT DRIVE STEP**

Step 5: Product ON/OFF and Alarm Off buttons are shortly pressed simultaneously to switch to the component drive step.

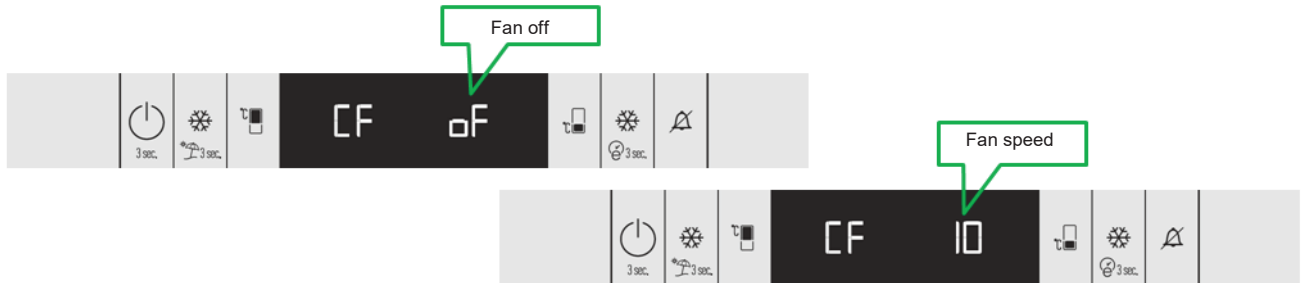


Component Name	Component Code	Component Name	Component Code
FF Fan	FF	Water Valve	dU
FF Heater	FO	Ice Valve	bU
Ioniser	Io	Water Pipe Heating	Sb
Blue Light	bA	Ice Selector	IS
FF Illumination	FL	Ice Shutter	IH
Frz Fan	rF	Ice Pusher	IP
Frz Eva heater	rE	Condenser Fan	CF
Frz Illumination	rL	Compressor	Co
Icematic	Ir		
Main Water Valve	AU		

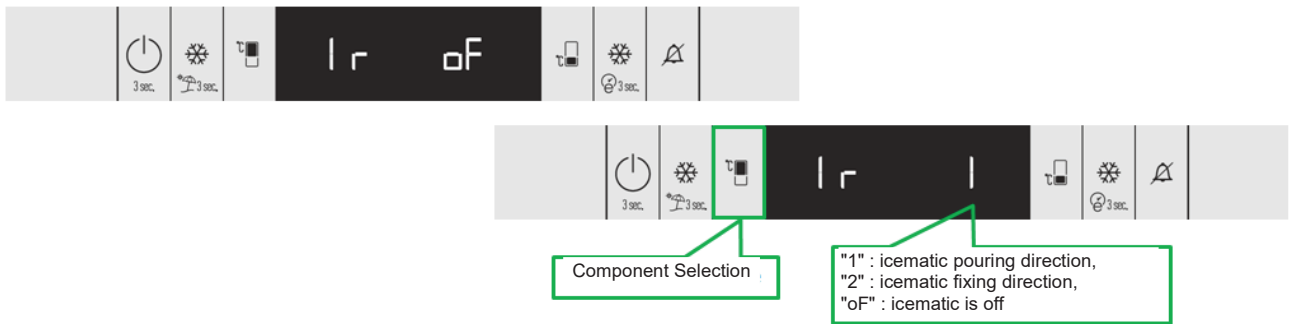
Optional

- Frz Fan and Condenser Fan speeds may be changed during the service mode. To perform this change, while the rF and CF are pressed during component selection phase, it can be set

to OFF-22-14-OFF... with FRZ setting button. Fan speed could be different for different products.



- When Icematic 'lr' is selected, Icematic is rotated in pouring direction by selecting '1' using FRZ Set button and in the correction direction when '2' is selected.
- Pressing OFF stops icematic motor



Step6: On/Off and Alarm Off buttons are shortly pressed simultaneously to switch to the component driving step. *(Opsiyonel):*

- Setting Icematic water intake time:
- within the range of 1 sec. - 9.9 sec.



- Setting Dispenser light On time:
- within the range of 1 sec. - 9.9 sec.



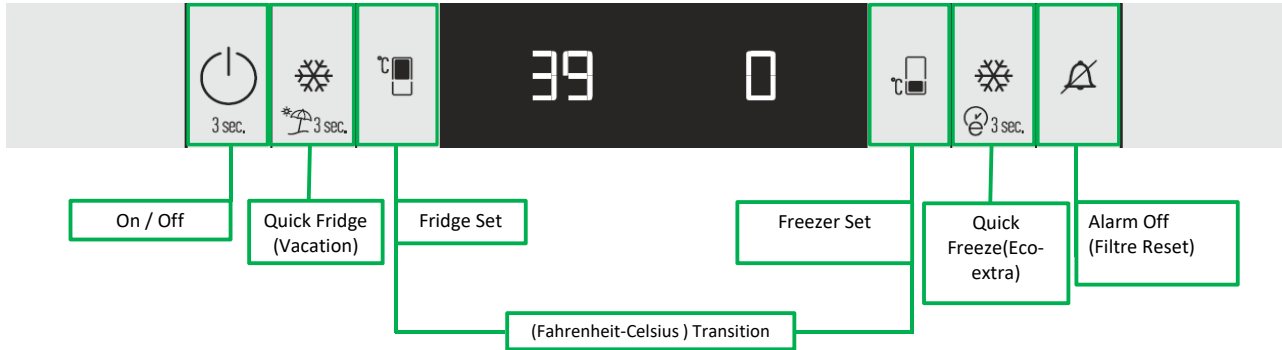
8.6.Termination of Service Mode:

SUBJECT

**U4 CONTROL BOARD FOUREVER 3 DOOR TOP TRIM DISPLAY
SERVICE TEST ACTIVATION**

LESSON NO:

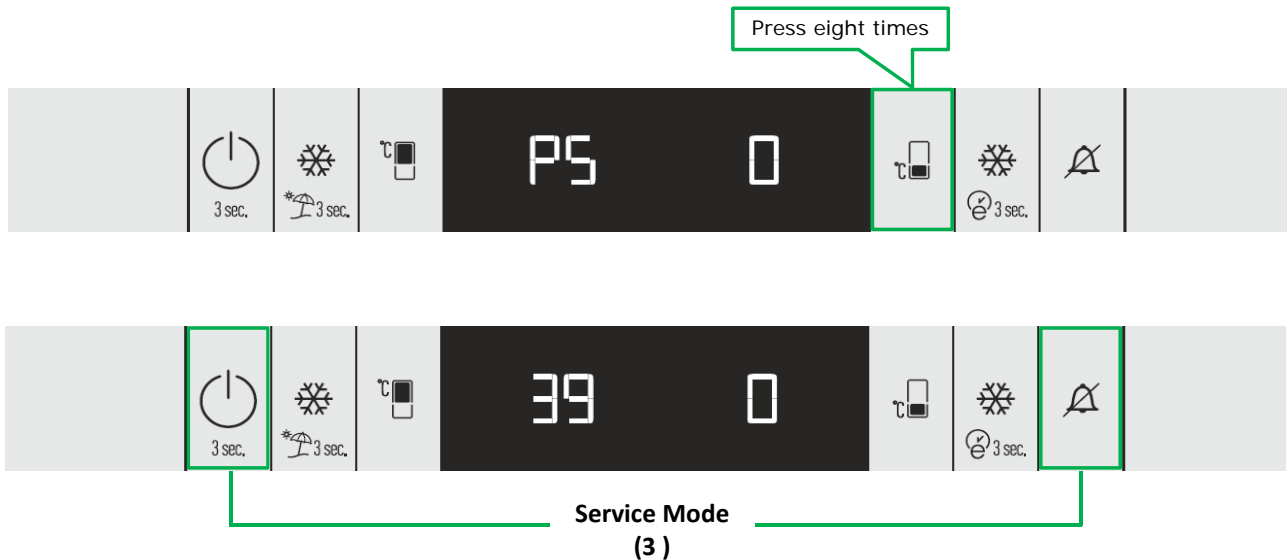
The forever top trim display board we use in the refrigerator has an six-key system.
Set values are shown on the display.



*(3 sec pressing)

Step 1: Switch to password entry screen by pressing On / Off and Alarm Off keys simultaneously for 3 after the refrigerator is energised.

8 password is entered by pressing the freezer set button 8 times.





SUBJECT

**U4 CONTROL BOARD FOUREVER 3 DOOR TOP TRIM DISPLAY
SERVICE TEST ACTIVATION**

LESSON NO:

The Fridge set button is pressed once.

Press one times



The buzzer mode is activated with the buzzer sound. The display shows the set values and the warning icon does not illuminate.



When the Display button is pressed, the relevant icons are light, cooling is not performed.
If the door is opened, the door open alarm is given, the active door open alarm is terminated by pressing any button.
The service mode is remembered after a power outage. The fair mode can be ended by pressing the refrigerator On / Off and pressing the Alarm Off button for 3 seconds.



MAINTENANCE



QUALITY



ISIG



PROCESS

Page No: 2/2

PREPARED BY (NAME/SURNAME): Tacettin Ekici

220007

PREPARED ON: 04.09.2018

TEAM: _____

Electronic Control Management

28530

MACHINE CODE: _____

If the following states occur, service test is aborted.

- Power failure
- Product on-off and Alarm Off buttons are pressed simultaneously
- Operating in service test for 30 minutes

8.7.PRODUCTION TEST OF THE CONTROL CARD (4934262300)



- When the refrigerator is energised, it starts with production test as long as it is not switched to service test or dealer mode.
- No sensor failure must be present to start production test.

Time Measurement		Component to be commanded	Withdrawn Power W		Notes
0.2	2.0	FF Heater			
0.2	4.0	FF Fan			If the FF and FRZ door is not open
4.2	6.0	Ioniser + Blue Light			
6.2	8.0	Defrost Heater			
6.2	10.0	Frz Fan			If the FRZ door is not open
10.2	12.0	FF Illumination + FRZ Illumination			
12.2	14.0	Icematic Valve			
12.2	16.0	Condenser Fan			
16.2	18.0	2 Water pipe heaters - HAB Heater			
18.2		Compressor			

8.8.PRODUCTION TEST OF THE CONTROL CARD (4934262800)

Time Measurement		Component to be commanded	Withdrawn Power W		Notes
0.2	2.0	FF Heater			
0.2	4.0	FF Fan			If the FF and FRZ door is not open
4.2	6.0	Ioniser + Blue Light			
6.2	8.0	Defrost Heater			
8.2	10.0	Frz Fan			If the FRZ door is not open
10.2	12.0	FF Illumination + FRZ Illumination			
12.2	14.0	Icematic Valve			

14.2	16.0	2 Water pipe heaters - HAB Heater			
16.2		Compressor			

8.9.CONTROL CARD GR U4 G91629NE FOUVER V0b (4934262300)

I/O type	I/O	I/O name	ID	Connector name
Analogue (LV)	INPUT	Fridge Air Sensor	KN6-1,2	KN6
	INPUT	Fridge Eva Sensor	KN6-3,4	
	INPUT	Freezer Air Sensor	KN6-5,6	
	INPUT	Freezer Eva Sensor	KN6-7,8	
	INPUT	Ice Sensor 2	KN6-9,10	

Analogue (LV)	INPUT	Ice Sensor 1	KN4-14,15	KN4
	INPUT	Ice Switch	KN4-9,10	
	INPUT	Dispenser Switch	KN4-12,13	

110V AC	INPUT	Line	KN5-1	KN5
	INPUT	Neutral	KN5-3	

110V AC	OUTPUT	FRZ Defrost Heater	KN5-5	KN5
		FF Heater	KN5-6	
		Ioniser	KN5-7	
		Main Water Valve	KN5-8	
		Water Pipe Heater	KN5-9	
		Water valve	KN5-10	
		Ice valve	KN5-11	

110V AC	OUTPUT	Compressor	KN7-2	KN7
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12V DC OUTPUT	OUTPUT	ICEMATIC MOTOR -	KN4-7	KN4
		ICEMATIC MOTOR +	KN4-8	

12V DC OUTPUT	Frz Fan Power	KN10-1	KN10
	Frz Fan	KN10-2	
	Frz FG	KN10-3	
	Condenser Fan Power	KN10-4	
	Condenser Fan	KN10-5	
	FG	KN10-6	
	FF Fan	KN10-7	
	GND	KN10-9	
	12V Blue Led	KN10-10	
	12V Blue Led	KN10-11	
	FF/FRZ Light	KN10-12	

	FF/FRZ Light	KN10-13	
	Fan	KN10-14	
	GND	KN10-15	

Analogue (LV)	INPUT	DC FF Door	KN9-1,2	<u>KN9</u>
	INPUT	DC FRZ Door	KN9-4,5	

12V DC OUTPUT	VALVE B -	KN11-6	<u>KN11</u>
	VALVE A -	KN11-7	
	12 VDC	KN11-8	
	VALVE B +	KN11-9	
	VALVE A +	KN11-10	

5V DC OUTPUT	DISPLAY	KN12-1...6	<u>KN12</u>
---------------------	---------	------------	--------------------

8.10.CONTROL CARD GR U4 G91629NE V0b A+ TR (4934262800)

I/O type	I/O	I/O name	ID	Connector name
Analogue (LV)	INPUT	Fridge Air Sensor	KN6-1,2	<u>KN6</u>
	INPUT	Fridge Eva Sensor	KN6-3,4	
	INPUT	Freezer Air Sensor	KN6-5,6	
	INPUT	Freezer Eva Sensor	KN6-7,8	
	INPUT	Ice Sensor 2	KN6-9,10	

Analogue (LV)	INPUT	Ice Sensor 1	KN4-14,15	<u>KN4</u>
	INPUT	Ice Switch	KN4-9,10	
	INPUT	Dispenser Switch	KN4-12,13	

110V AC	INPUT	Line	KN5-1	<u>KN5</u>
	INPUT	Neutral	KN5-3	

110V AC	OUTPUT	Compressor + Condenser Fan	KN5-4	<u>KN5</u>
		FRZ Defrost Heater	KN5-5	
		FF Heater	KN5-6	
		Ioniser	KN5-7	
		Main Water Valve	KN5-8	
		Water Pipe Heater	KN5-9	
		Water valve	KN5-10	
		Ice valve	KN5-11	

110V AC	OUTPUT	AC FAN	KN7-2	<u>KN7</u>
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12V DC OUTPUT	OUTPUT	ICEMATIC MOTOR -	KN4-7	<u>KN4</u>
		ICEMATIC MOTOR +	KN4-8	

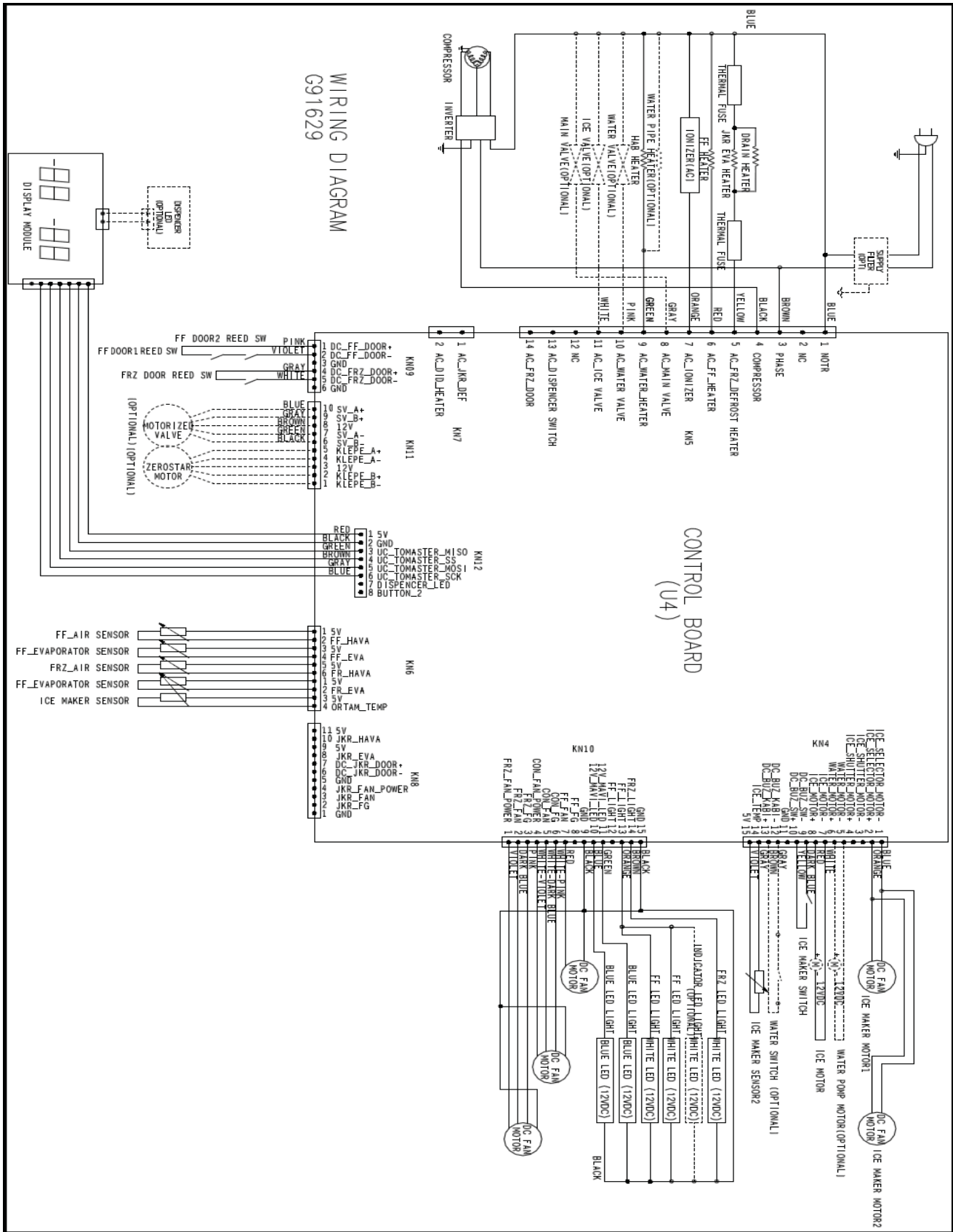
12V DC OUTPUT	FF Fan	KN10-7	<u>KN10</u>
	GND	KN10-9	
	12V Blue Led	KN10-10	
	12V Blue Led	KN10-11	
	FF/FRZ Light	KN10-12	
	FF/FRZ Light	KN10-13	
	Fan	KN10-14	
	GND	KN10-15	

Analogue (LV)	INPUT	DC FF Door	KN9-1,2	<u>KN9</u>
	INPUT	DC FRZ Door	KN9-4,5	

12V DC OUTPUT	VALVE B -	KN11-6	<u>KN11</u>
	VALVE A -	KN11-7	
	12 VDC	KN11-8	
	VALVE B +	KN11-9	
	VALVE A +	KN11-10	

5V DC OUTPUT	DISPLAY	KN12-1...6	<u>KN12</u>
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8.11. Electric Circuit Diagram

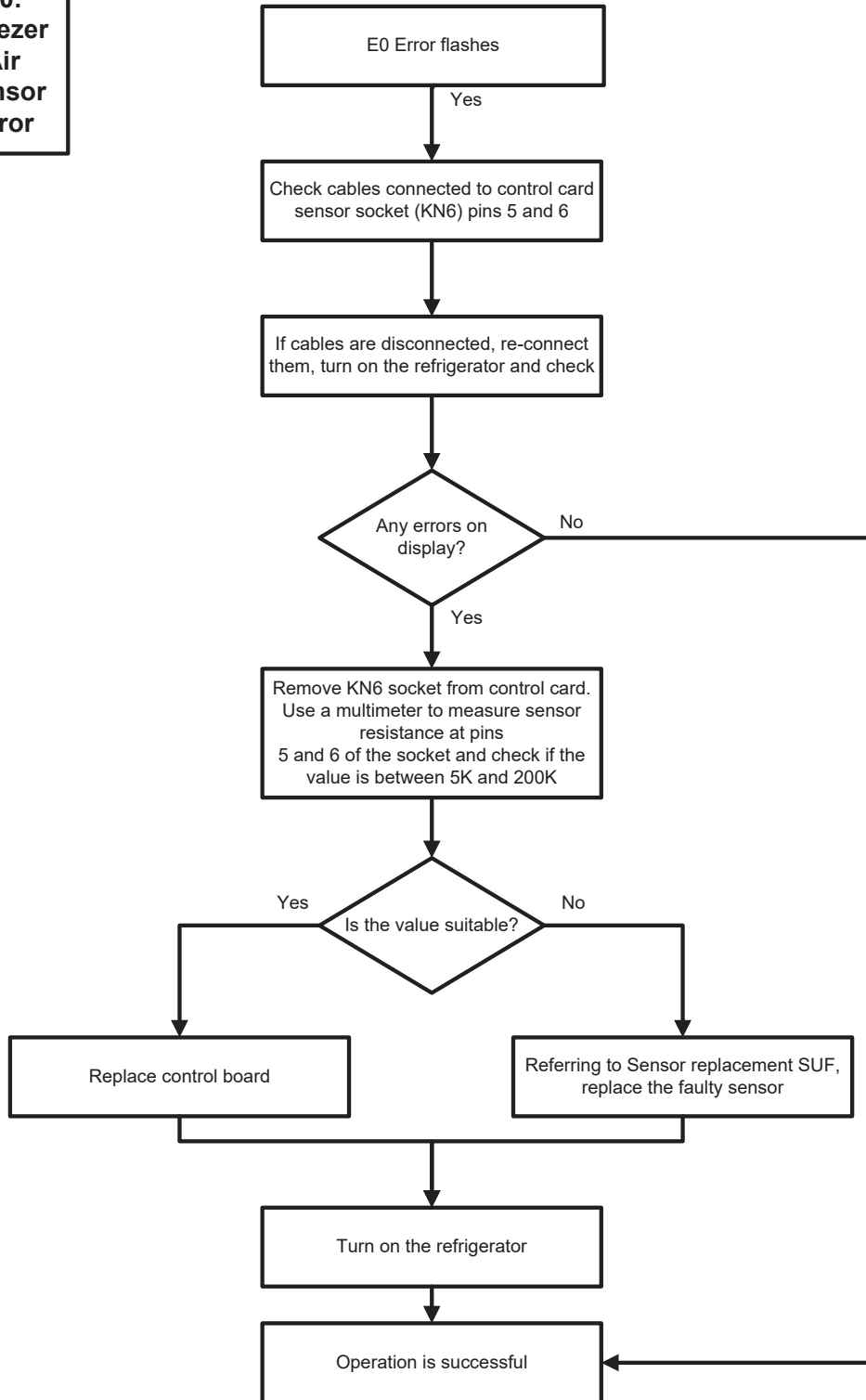


9.U4 MALFUNCTION ERROR CODES

ERROR CODE	ERROR DEFINITION
E0	Freezer Compartment Air Sensor Error
E1	Freezer Compartment Evaporator Sensor Error
E2	Fridge Compartment Evaporator Sensor Error
E3	Fridge Compartment Air Sensor Error
E4	Freezer Compartment Defrost Heater Error
E8	Icematic Air Sensor Error
E9	Icematic Failure
E13	Speed Frz Fan Error
E15	Speed Condenser Fan Error
Warning icon	High Temperature Error
-	Cooling failure due to electrical issues
-	Freezing error due to electrical issues

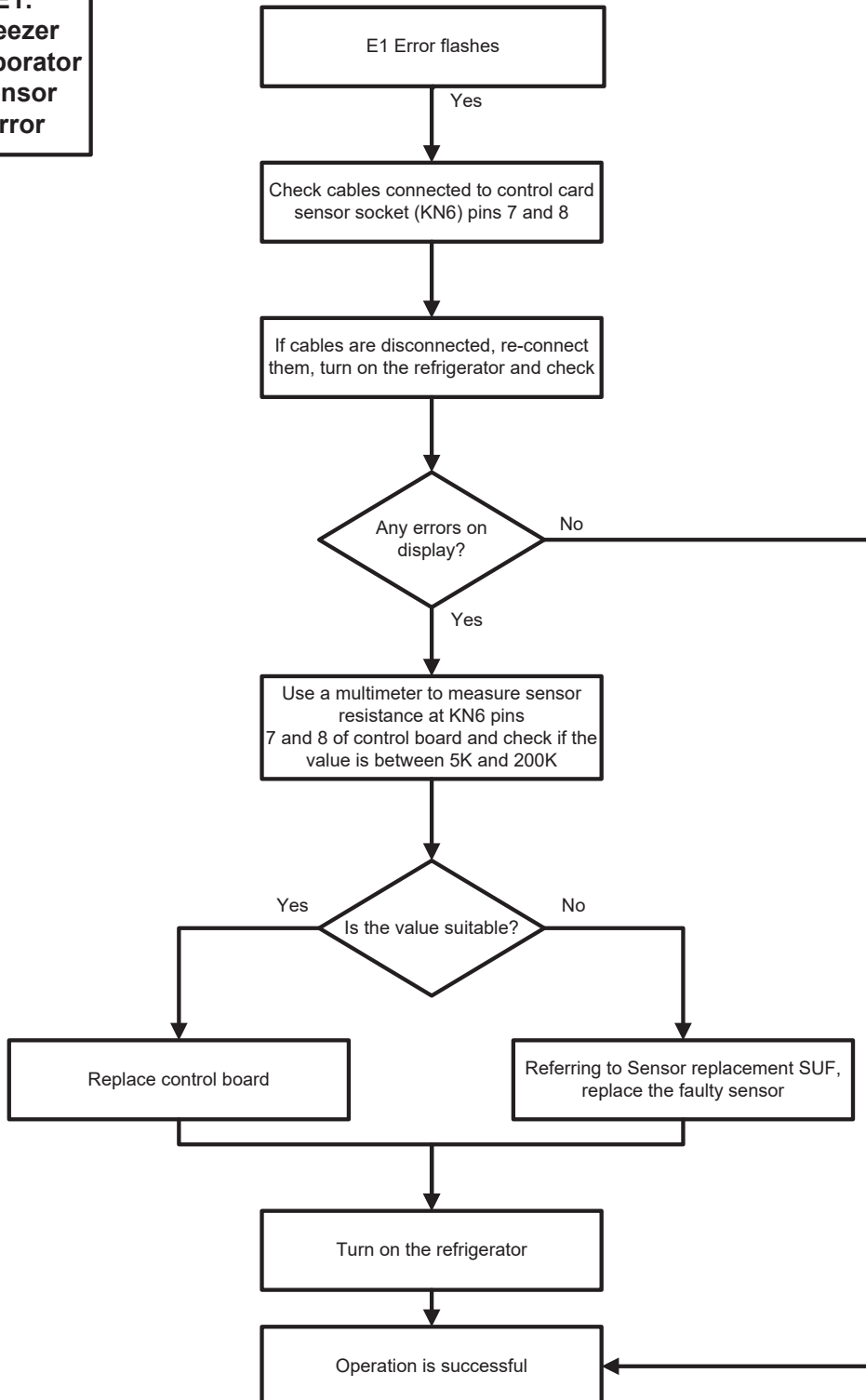
9.1.E0 Freezer Air Sensor Error

**E0:
Freezer
Air
Sensor
Error**



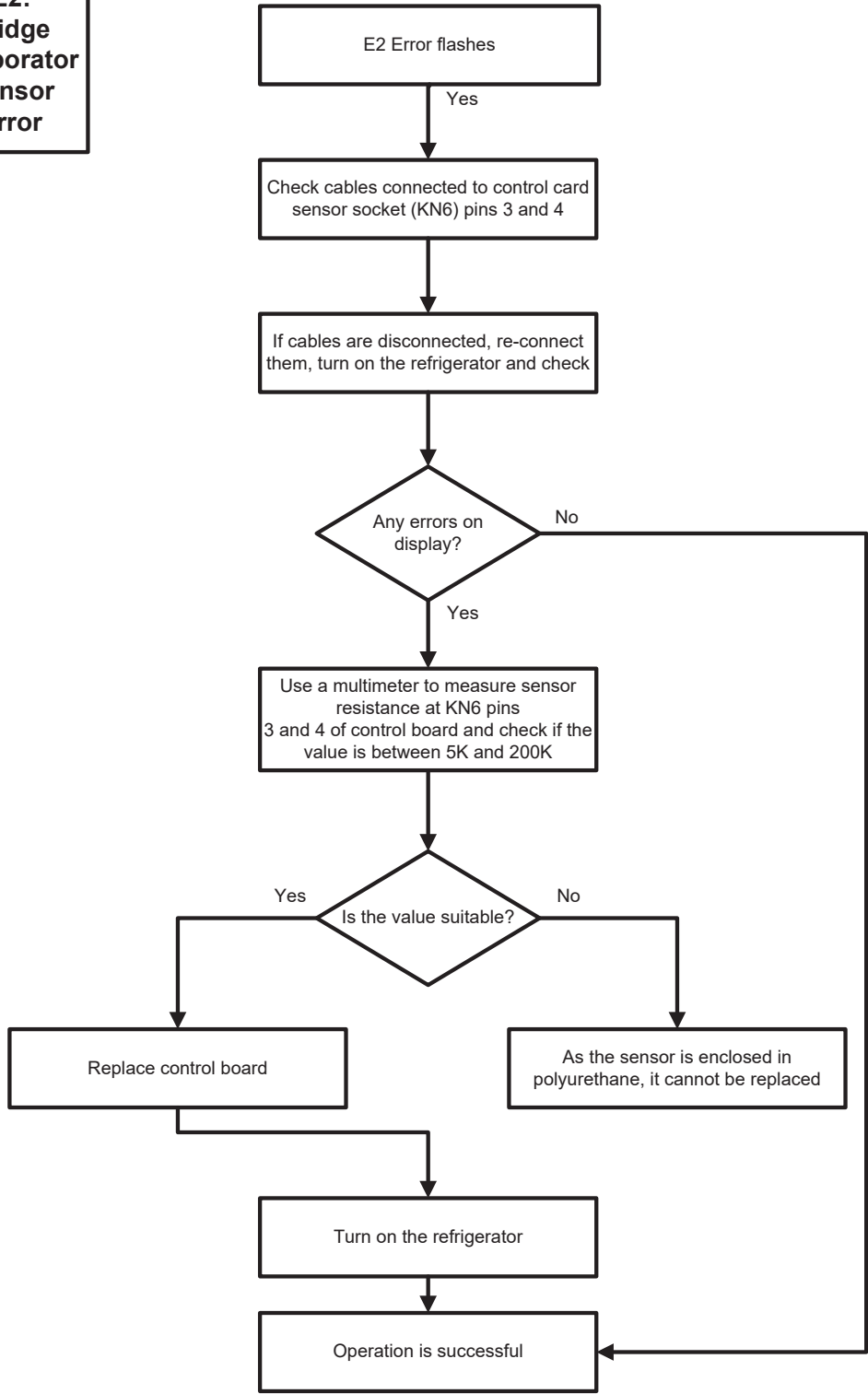
9.2.E1 Freezer Evaporator Sensor Error

**E1:
Freezer
Evaporator
Sensor
Error**



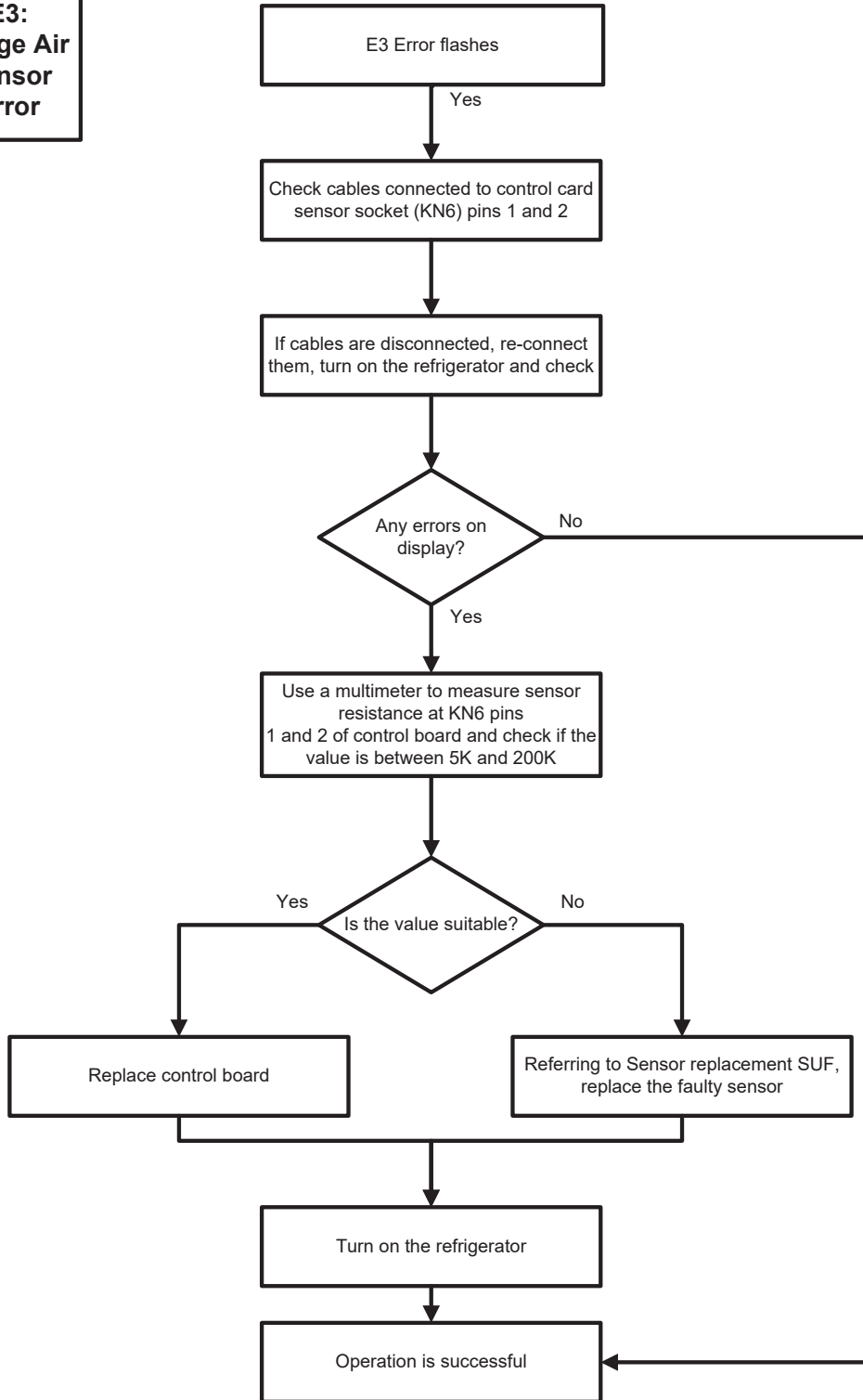
9.3.E2 Fridge evaporator sensor error

**E2:
Fridge
Evaporator
Sensor
Error**



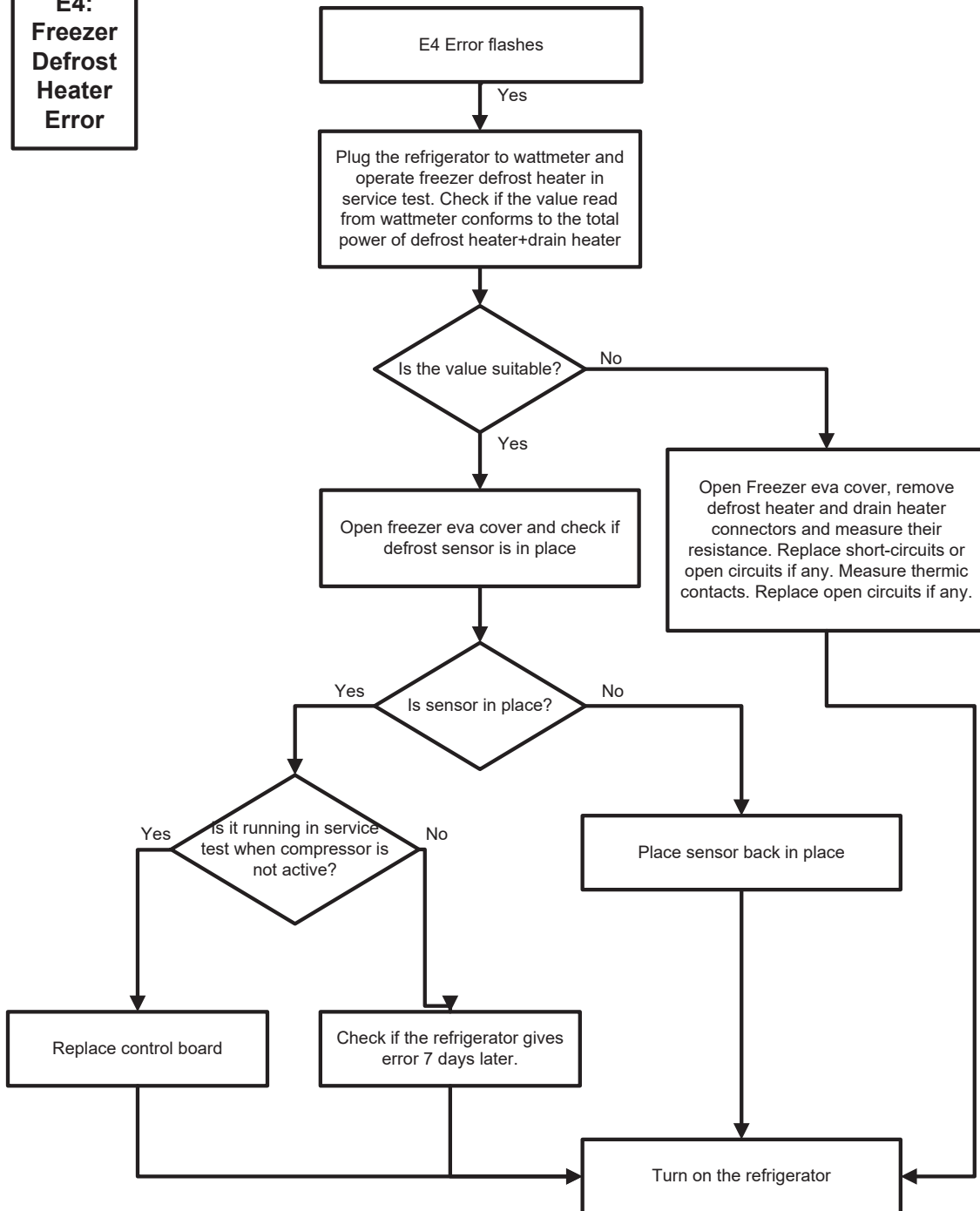
9.4.E3 Fridge Air Sensor Error

**E3:
Fridge Air
Sensor
Error**



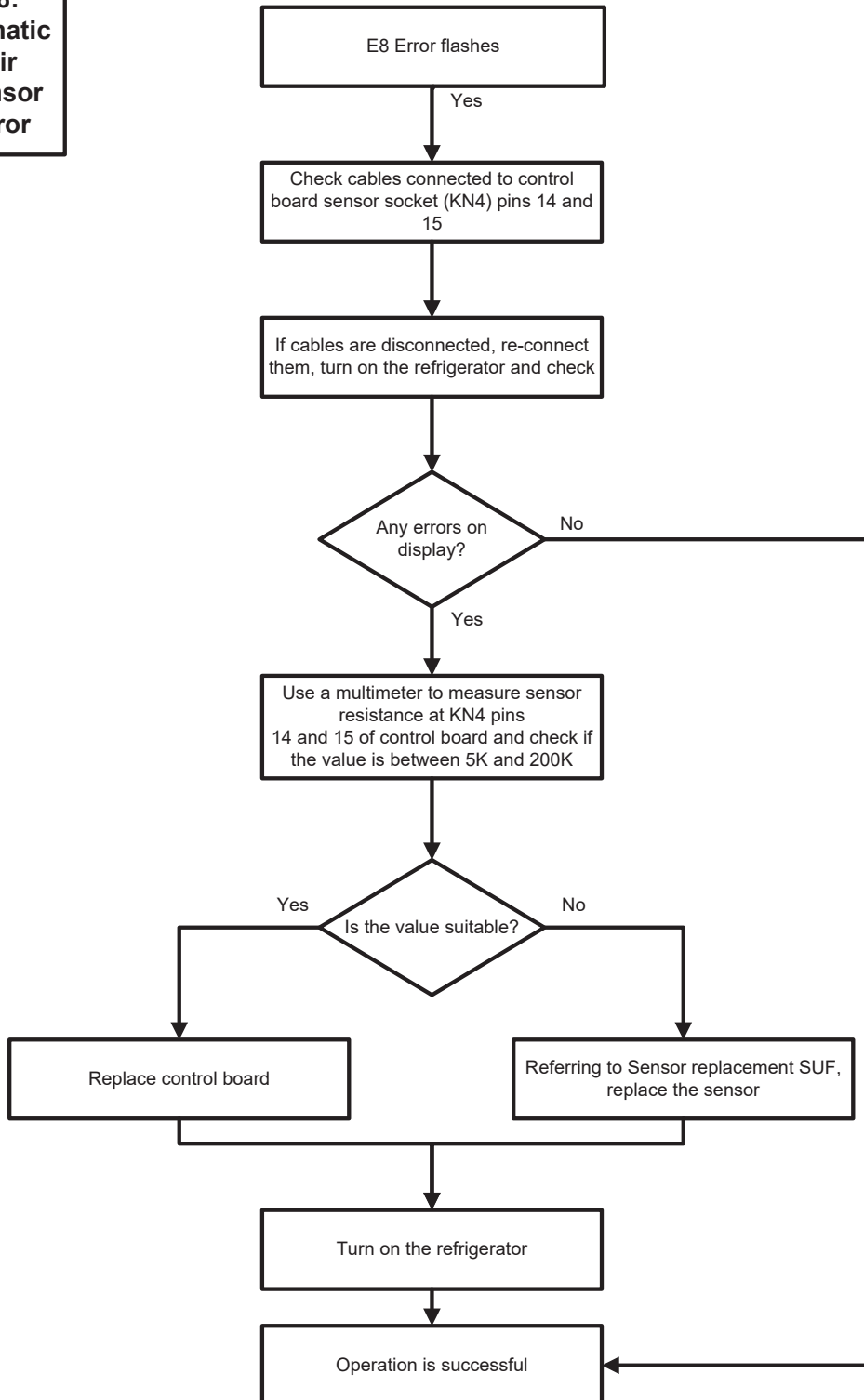
9.5.E4 Freezer Defrost Heater Error

**E4:
Freezer
Defrost
Heater
Error**



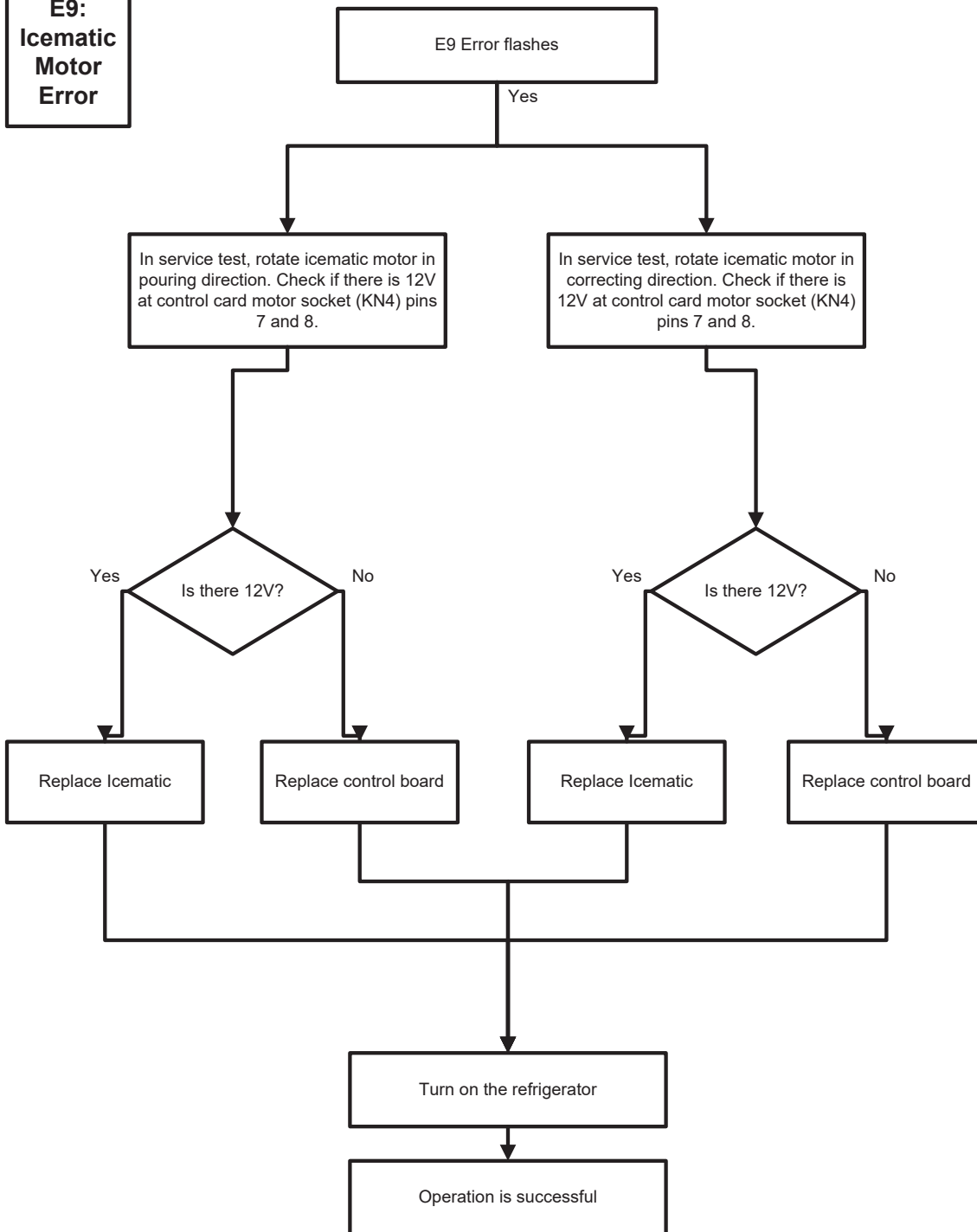
9.6.E8 Icematic Air Sensor Error

**E8:
Icematic
Air
Sensor
Error**



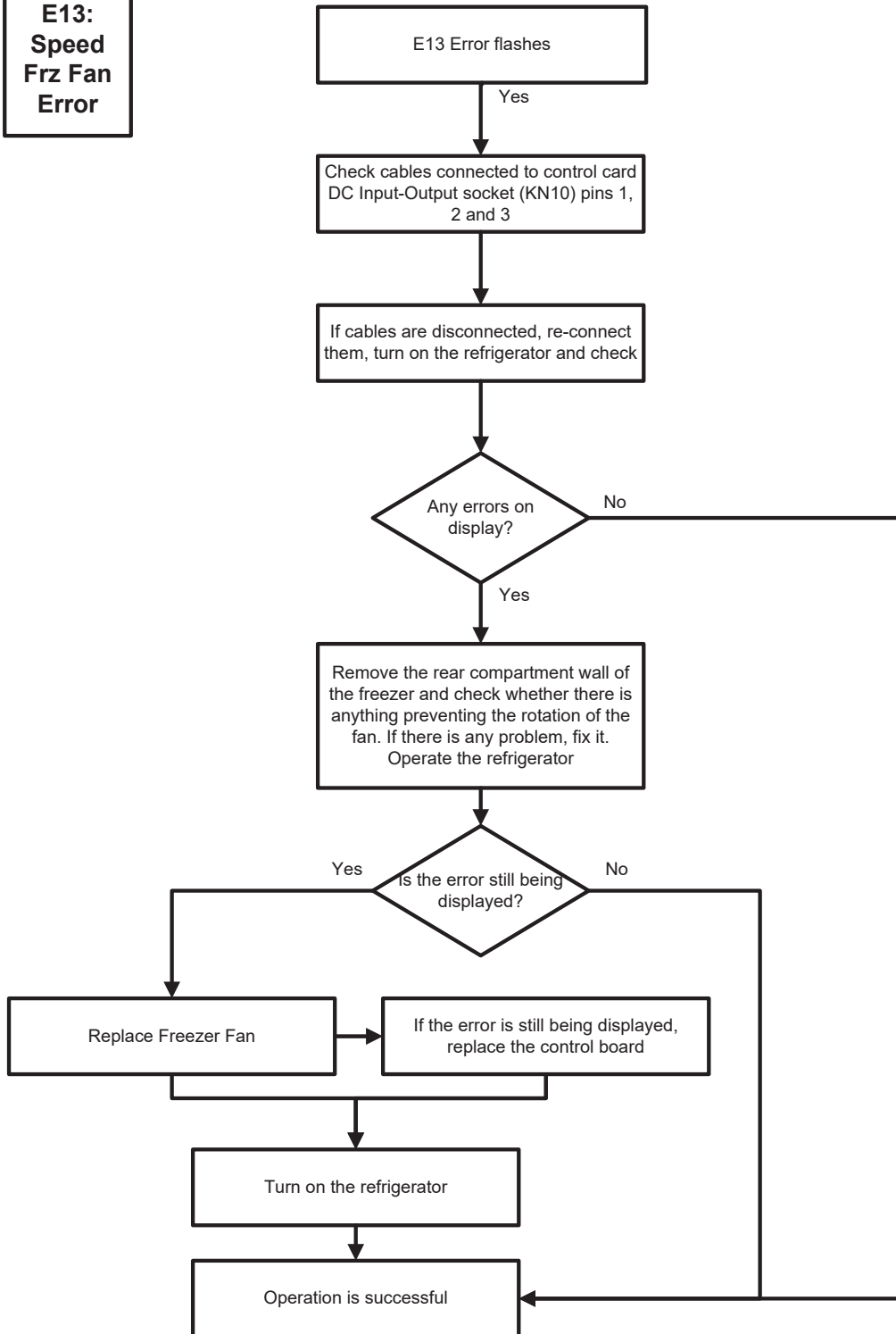
9.7.E9 Icematic Motor Error

**E9:
Icematic
Motor
Error**



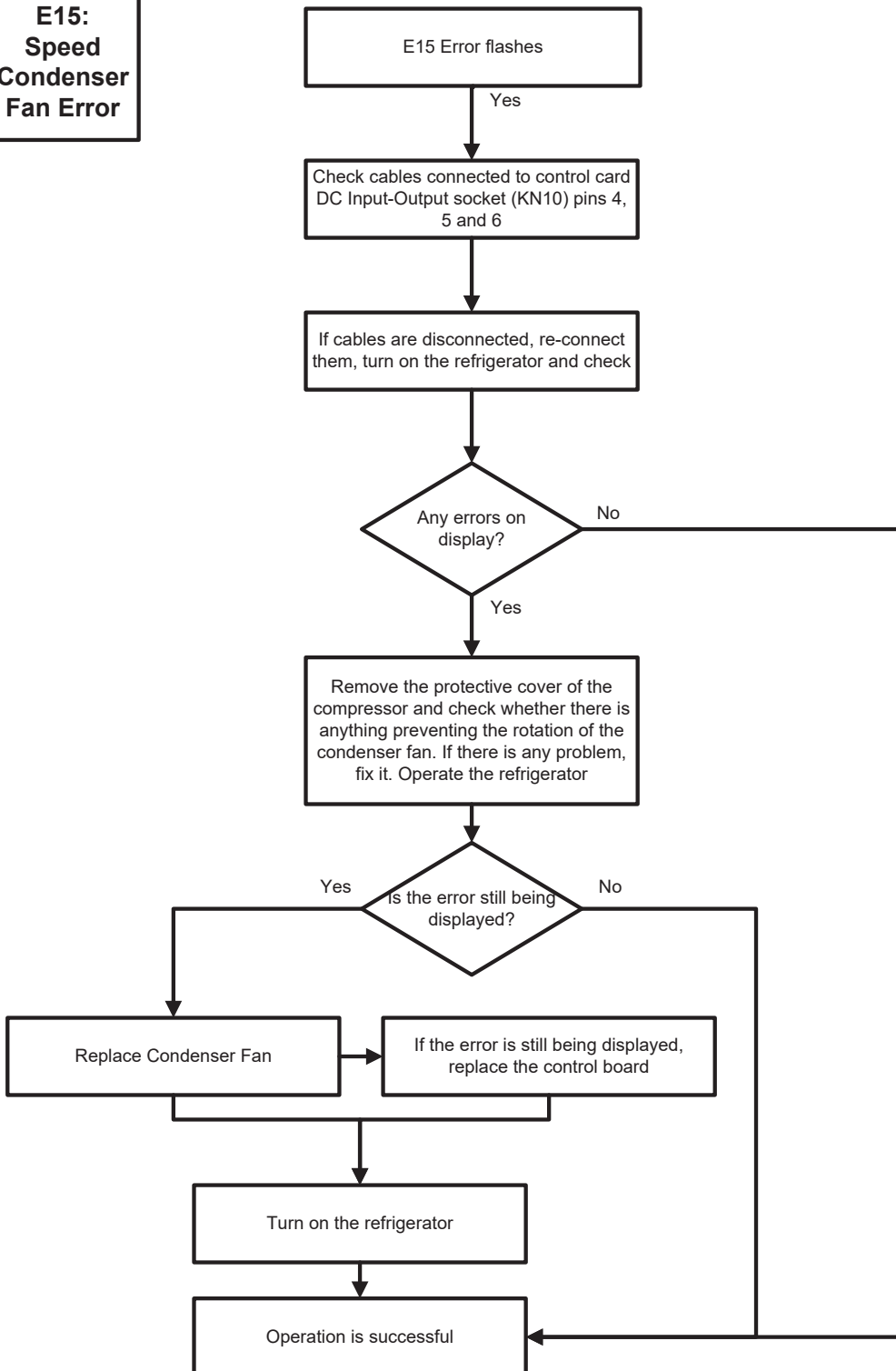
9.8.E13 Cyclic freezer fan error

**E13:
Speed
Frz Fan
Error**

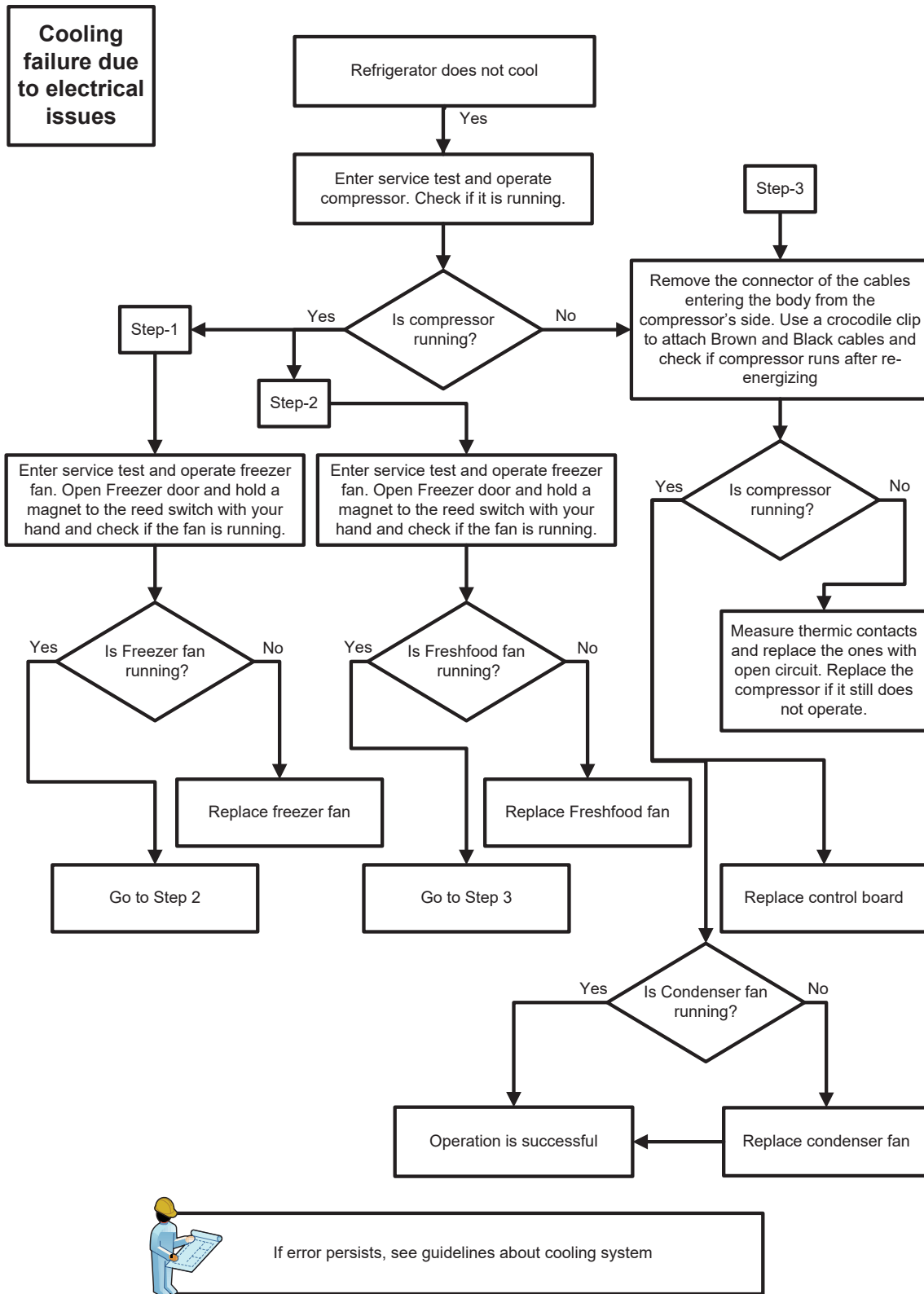


9.9.E15 Speed Condenser Fan Error

**E15:
Speed
Condenser
Fan Error**

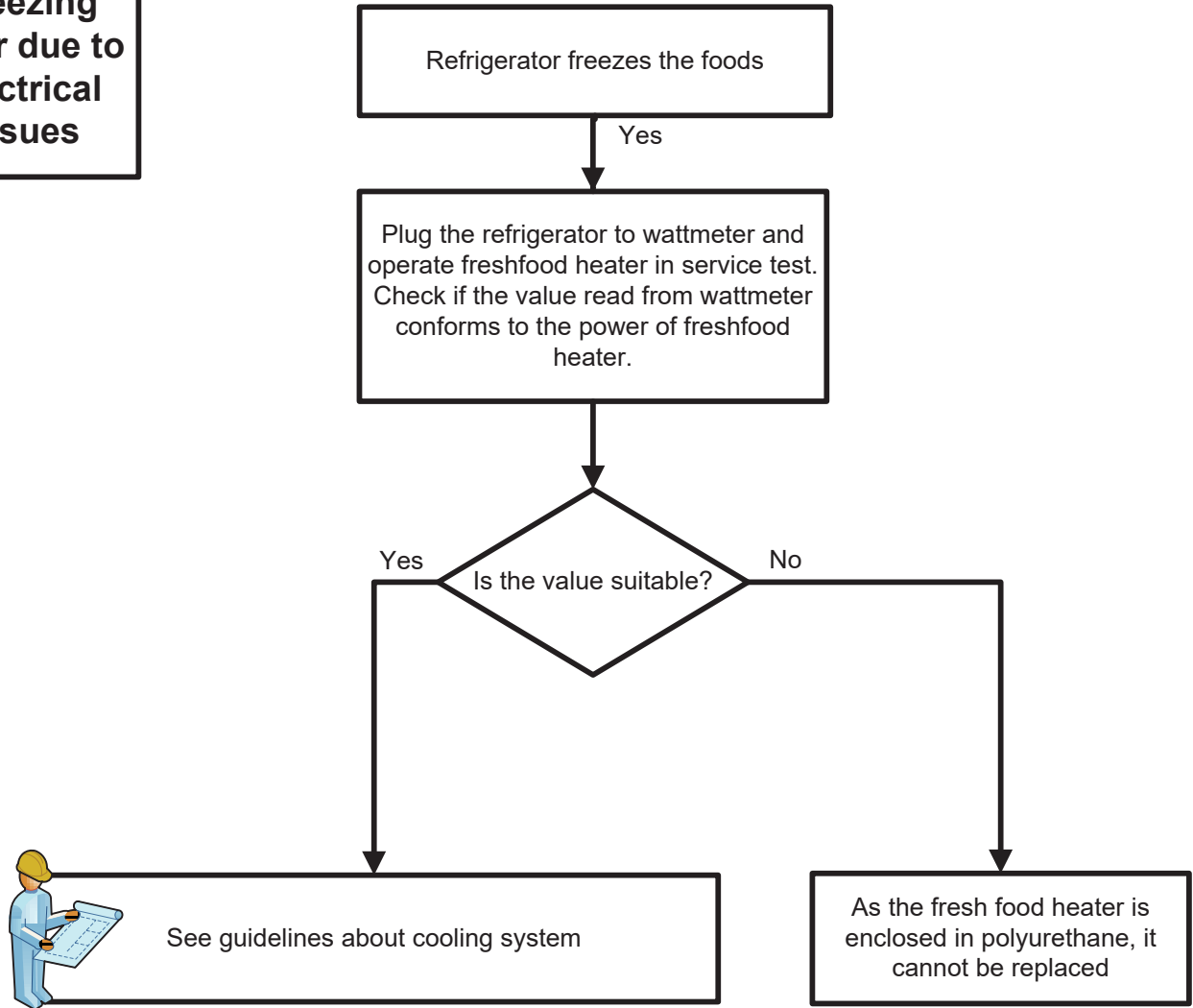


9.10. Cooling failure due to electrical issues



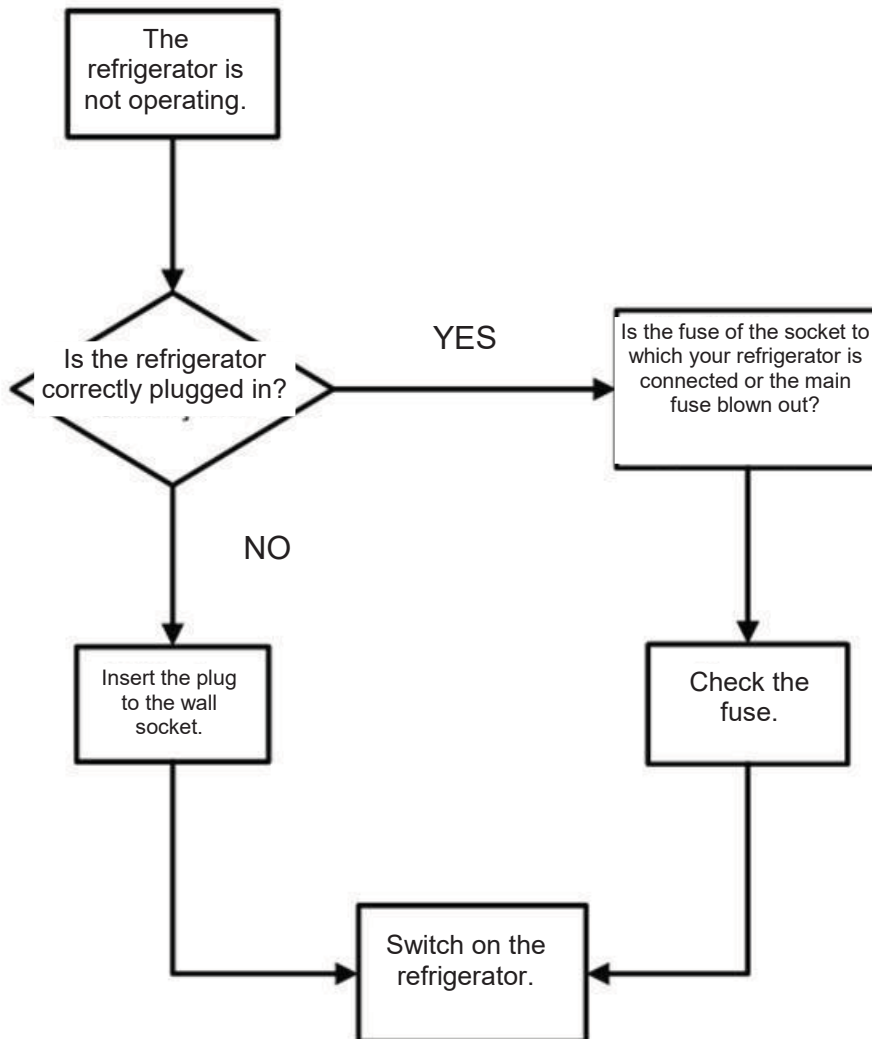
9.11. Freezing error due to electrical issues

Freezing error due to electrical issues

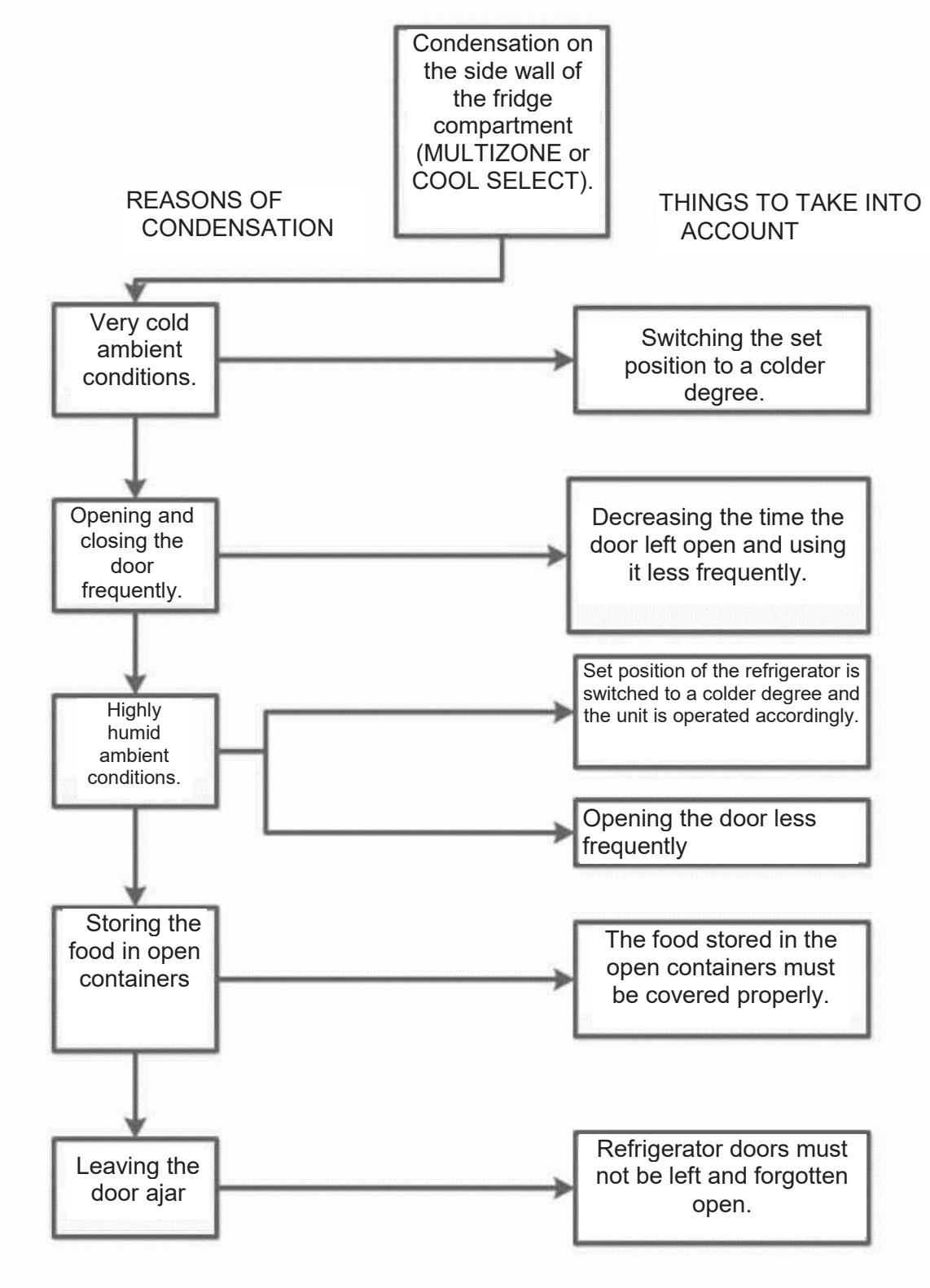


10.TROUBLESHOOTING

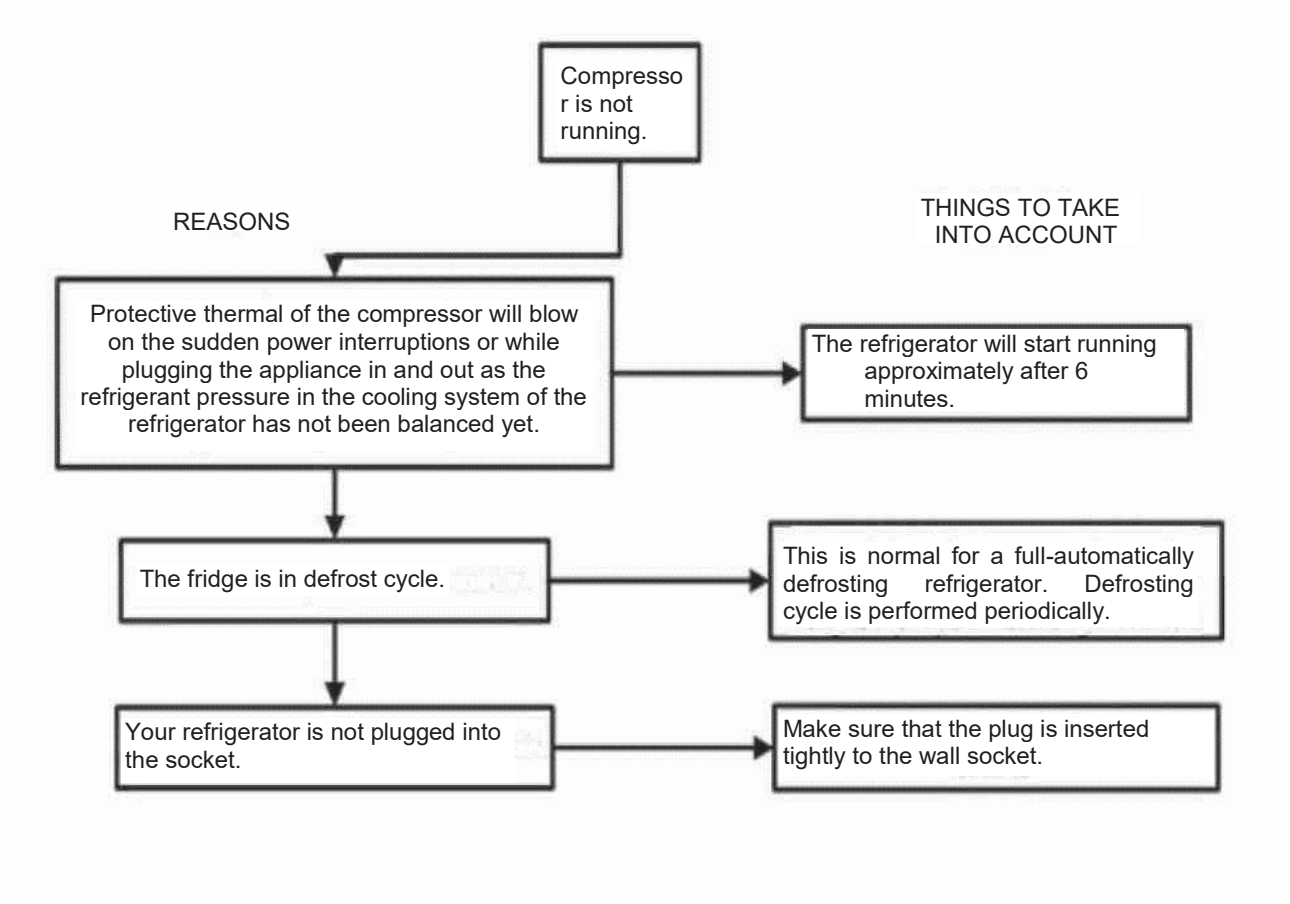
10.1.The refrigerator is not operating



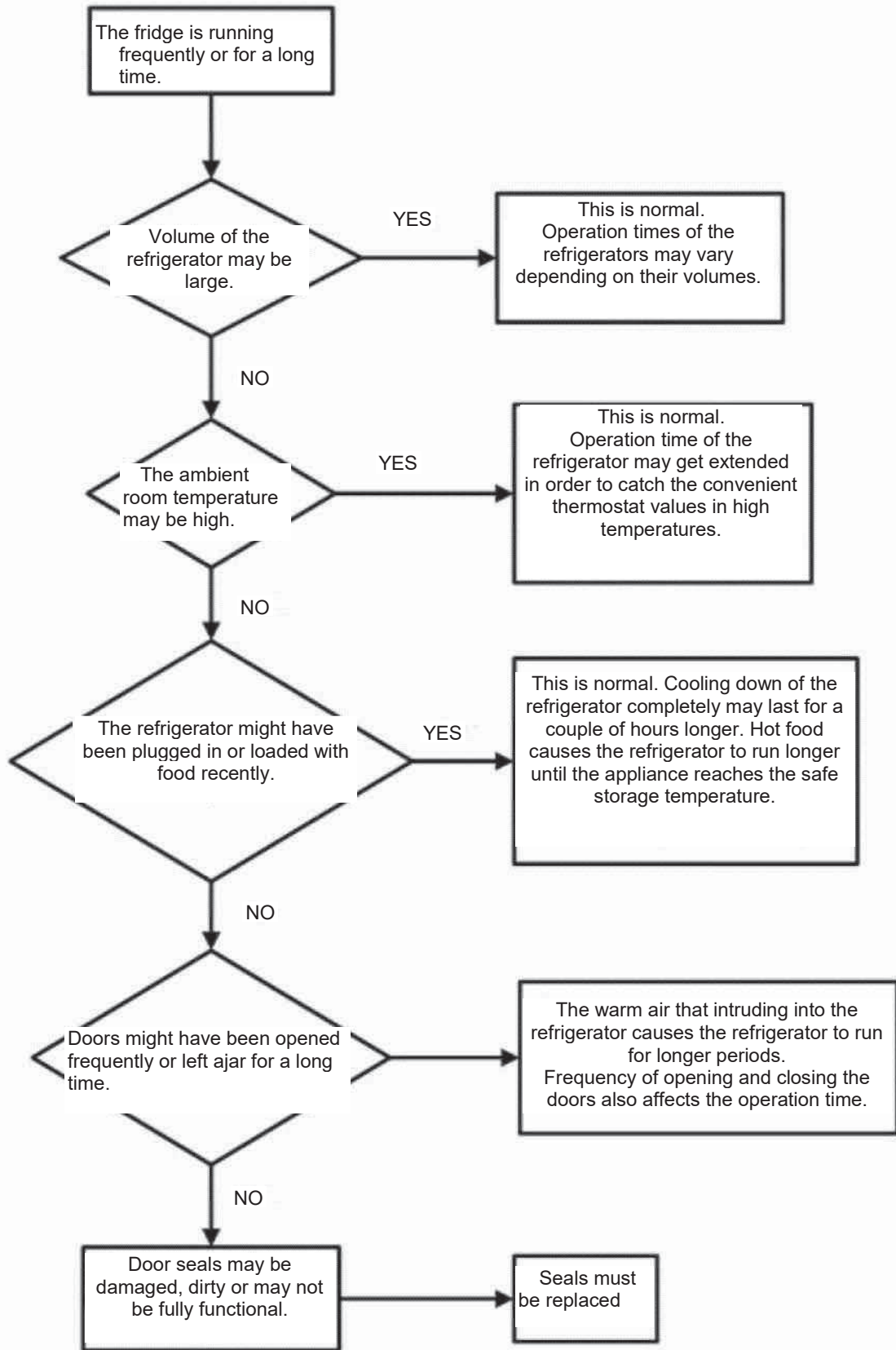
10.2. Condensation in the Fridge Compartment



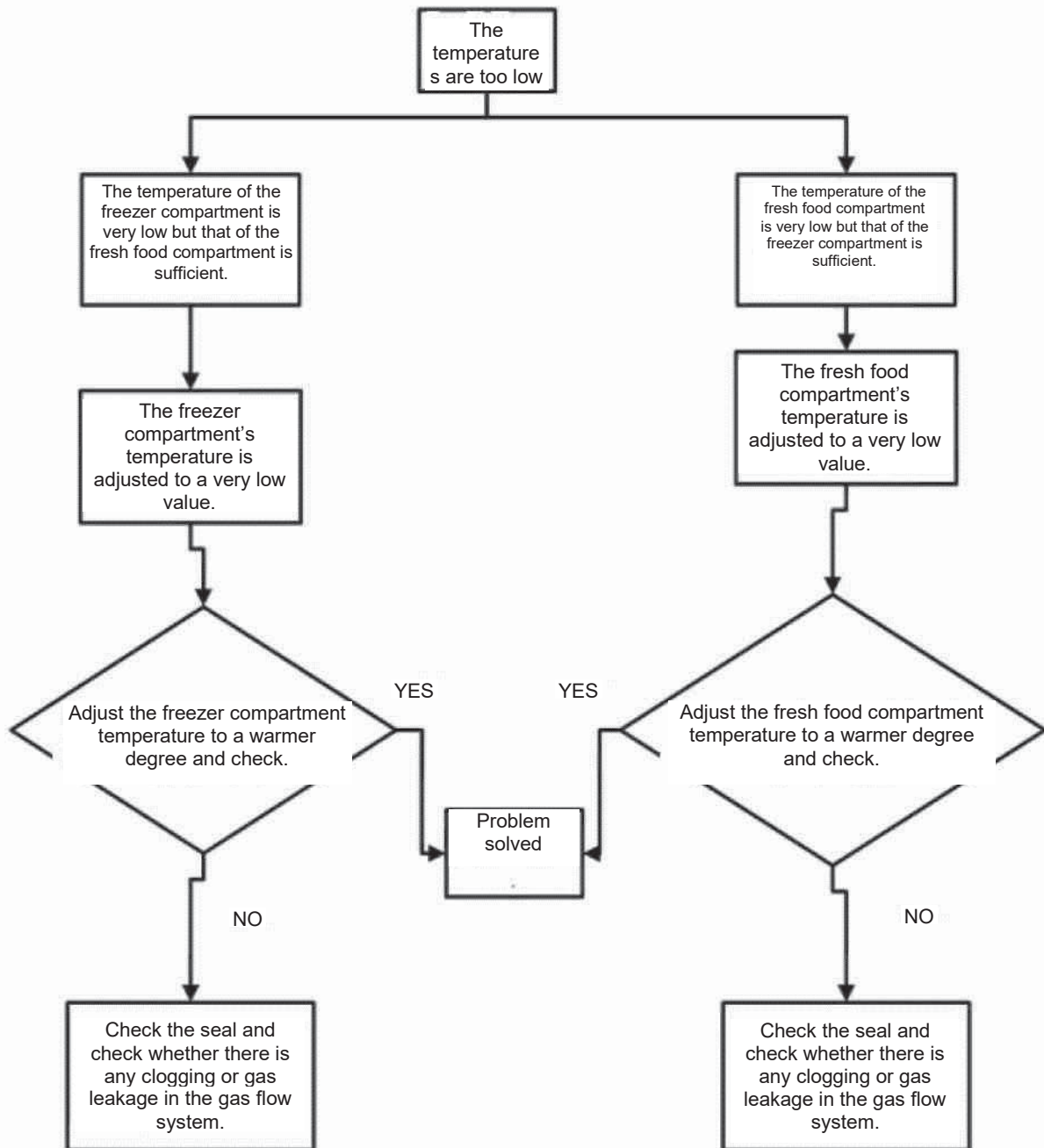
10.3.Compressor is not running



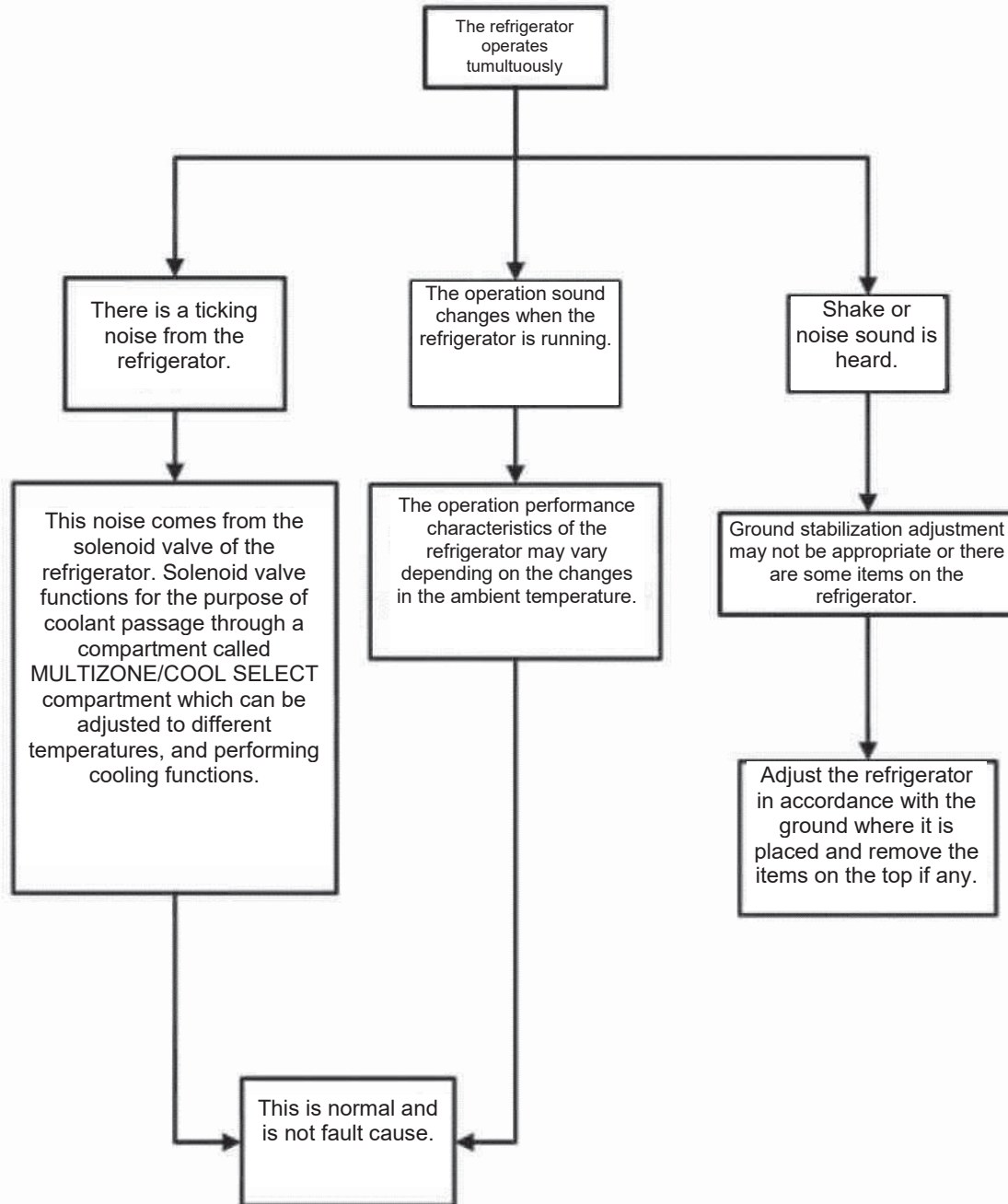
10.4.Refrigerator runs either frequently or for a long time



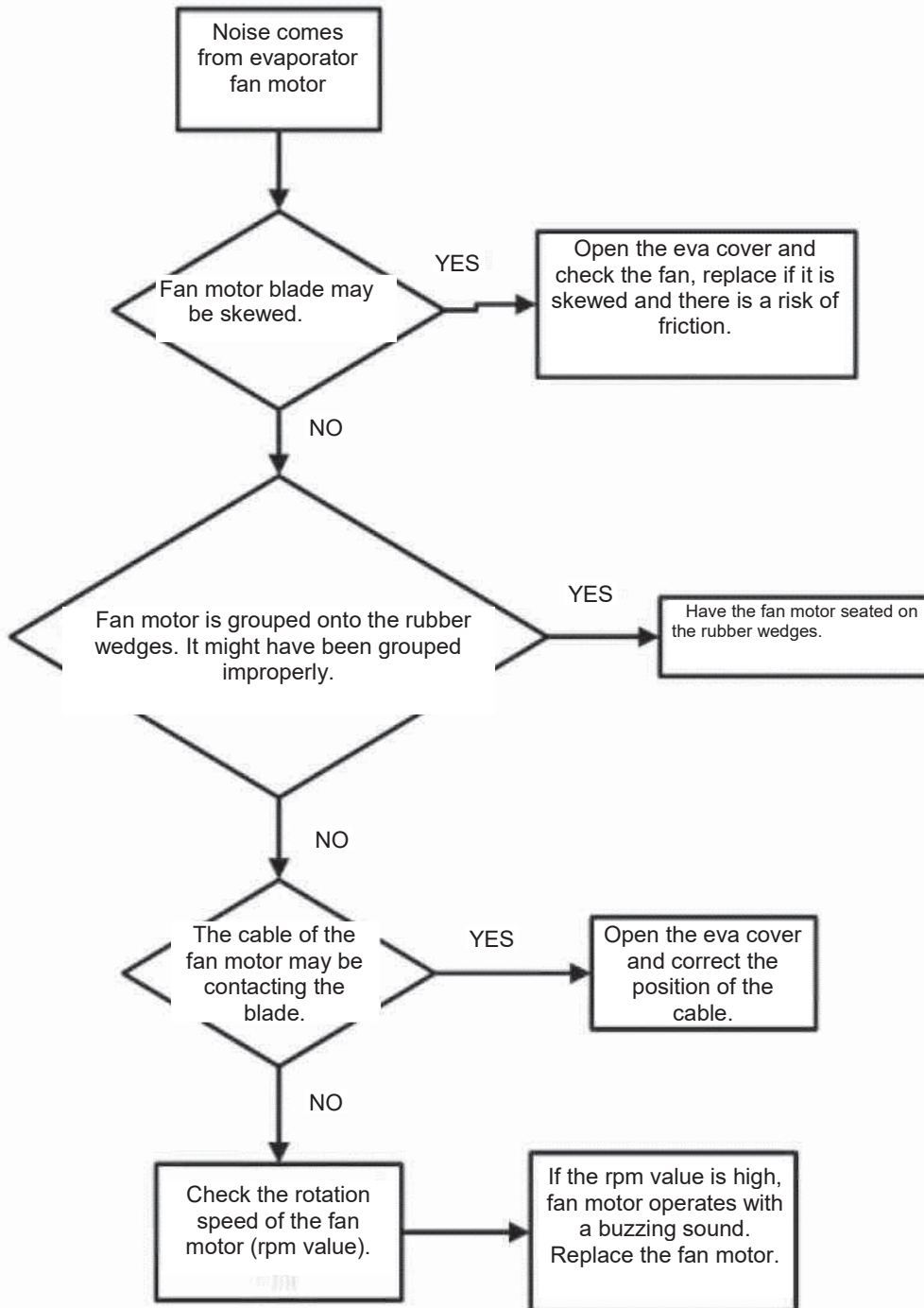
10.5. Temperatures are too low



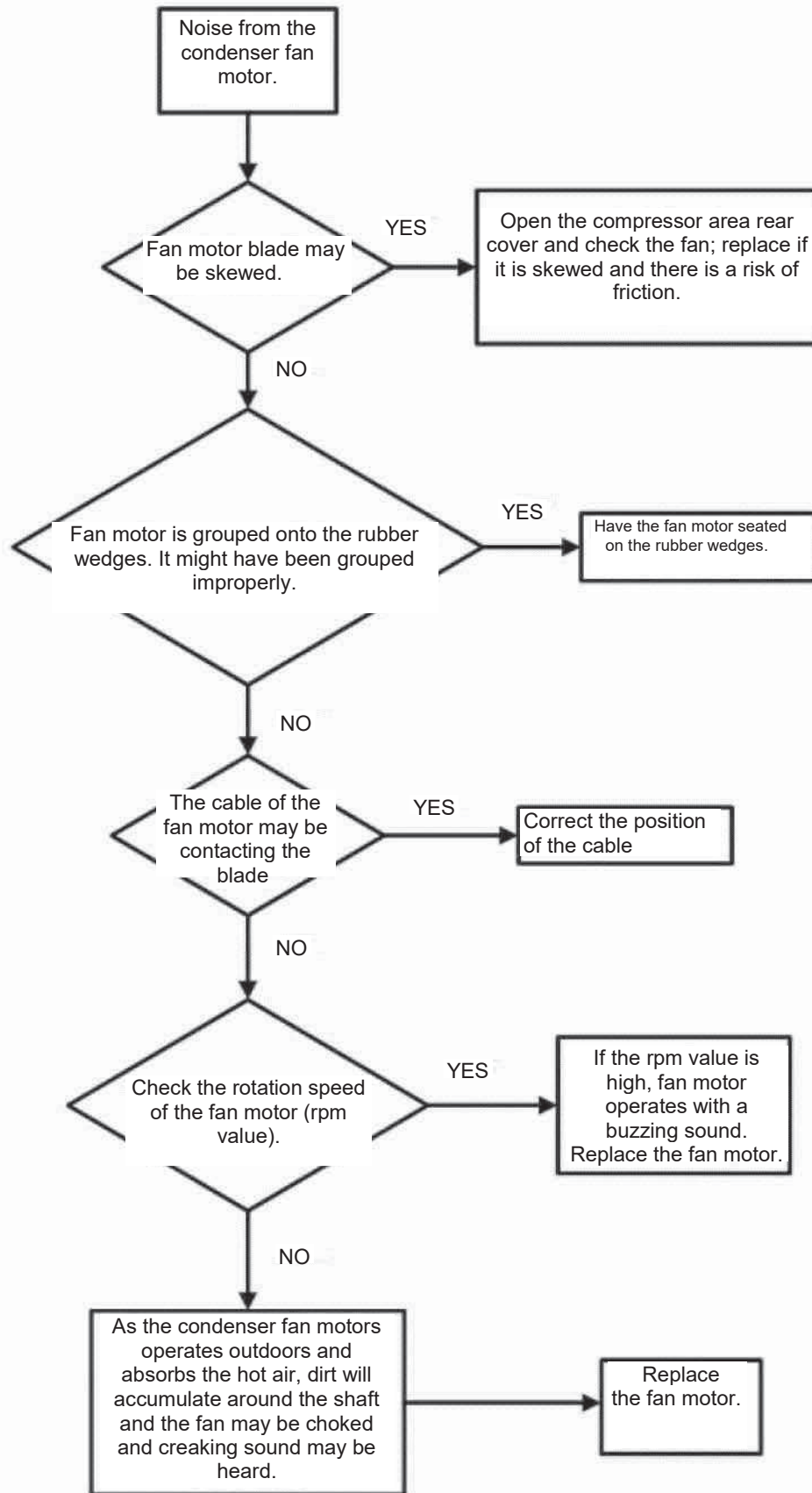
10.6. The refrigerator operates tumultuously



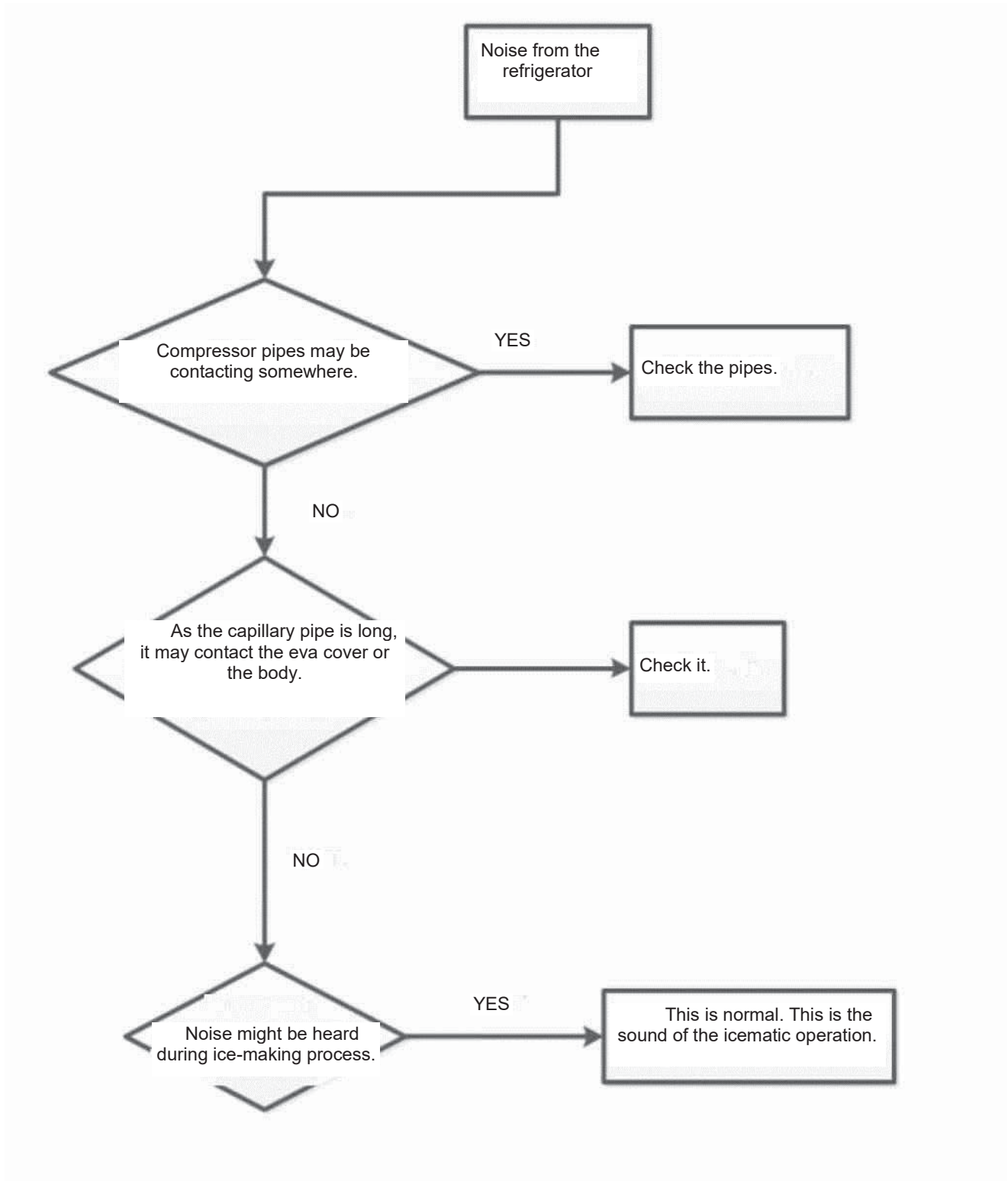
10.7.Noise from the evaporator fan motor



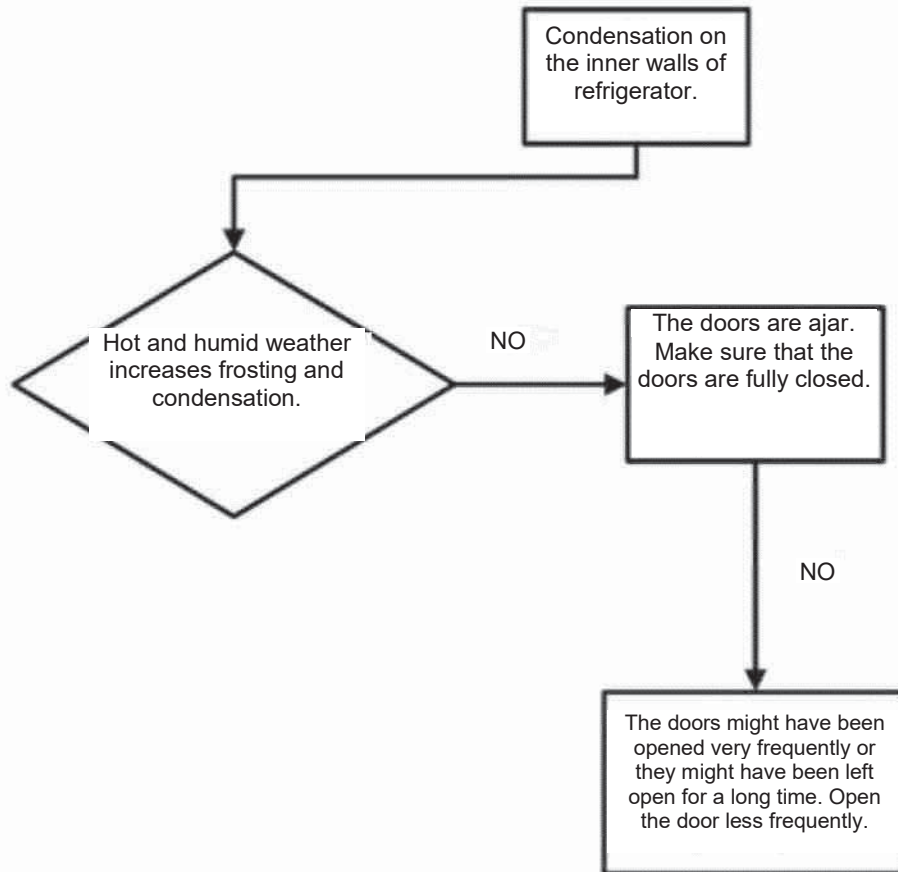
10.8.Noise from the condenser fan motor



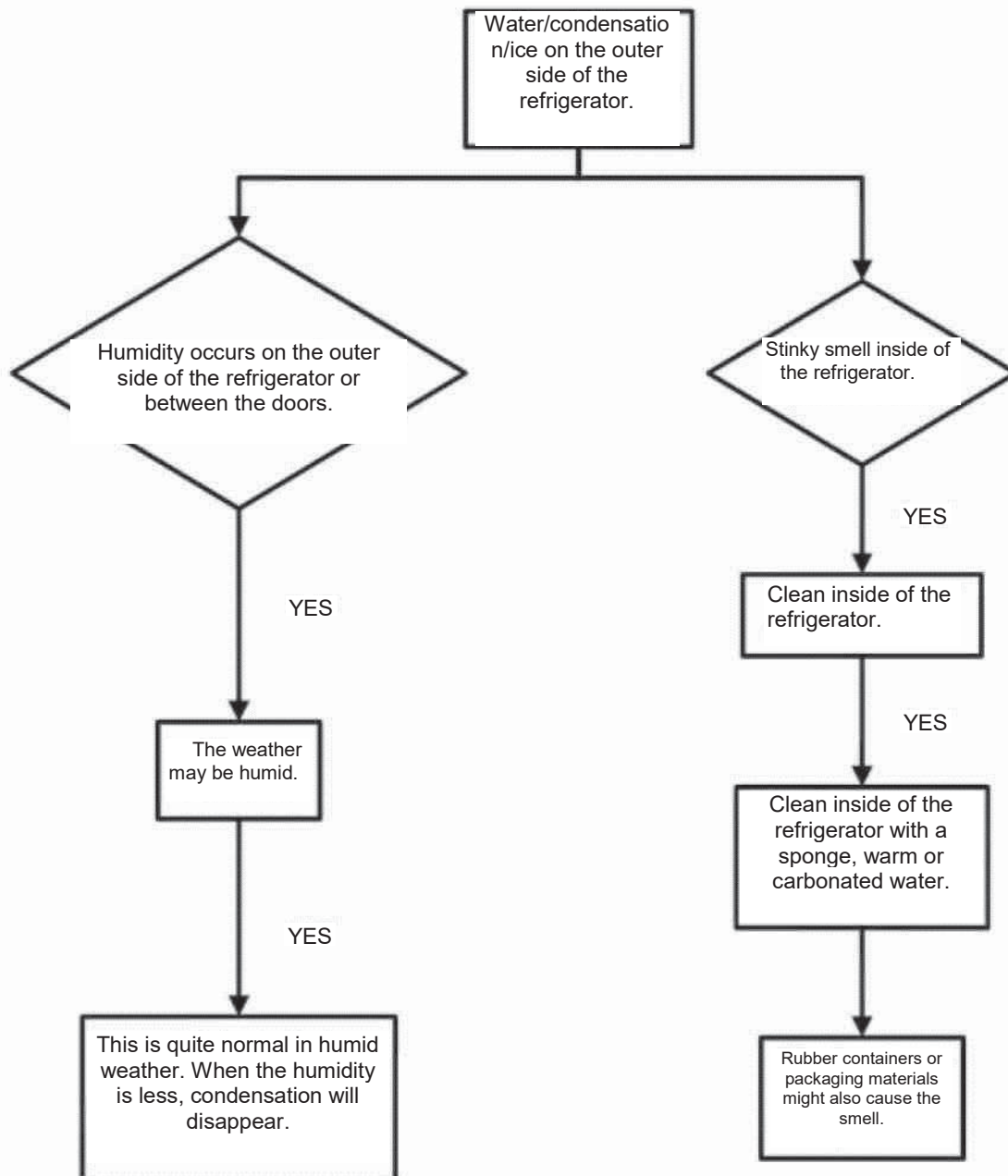
10.9.Noise from the refrigerator



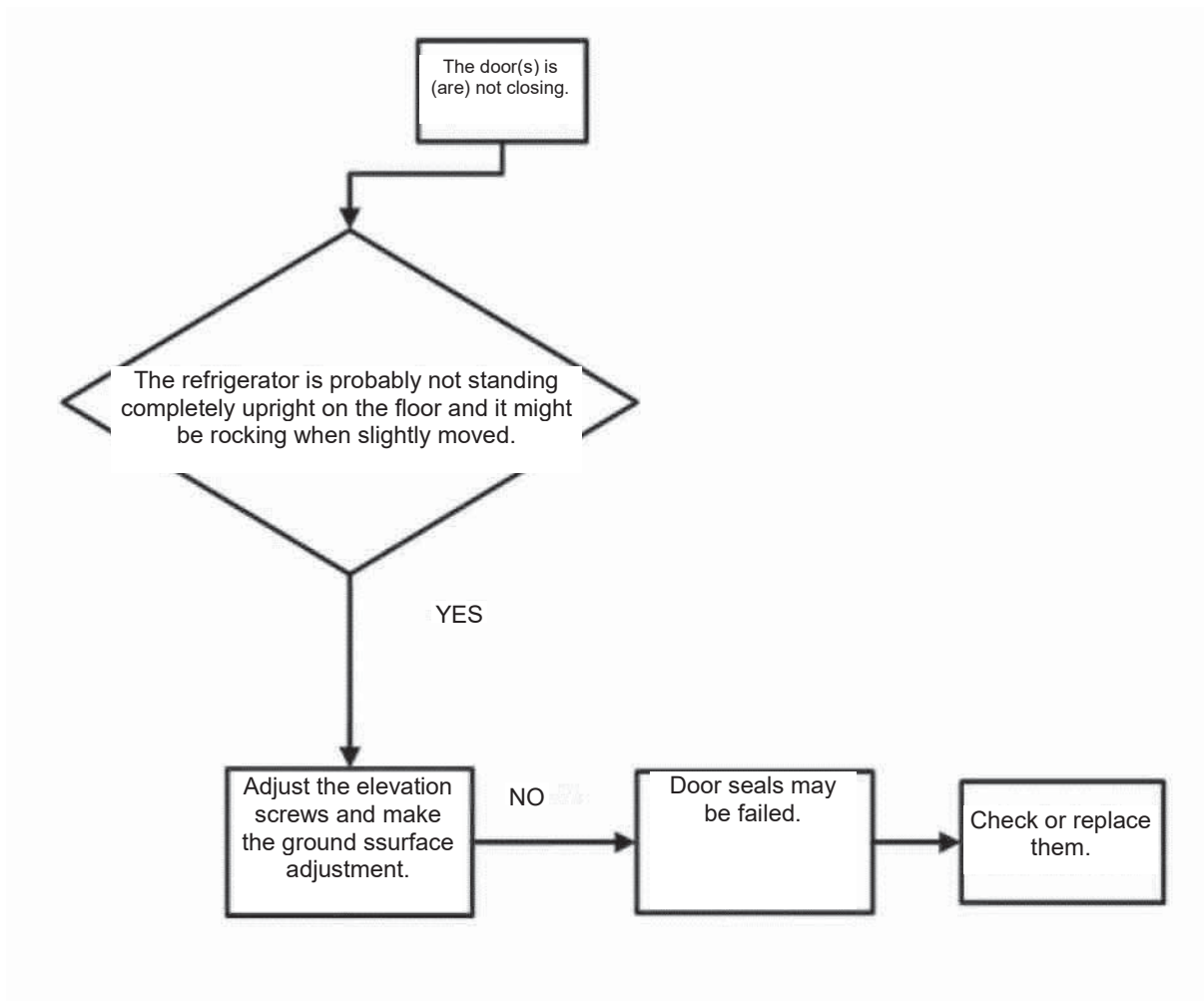
10.10. Condensation on the inner walls of the refrigerator



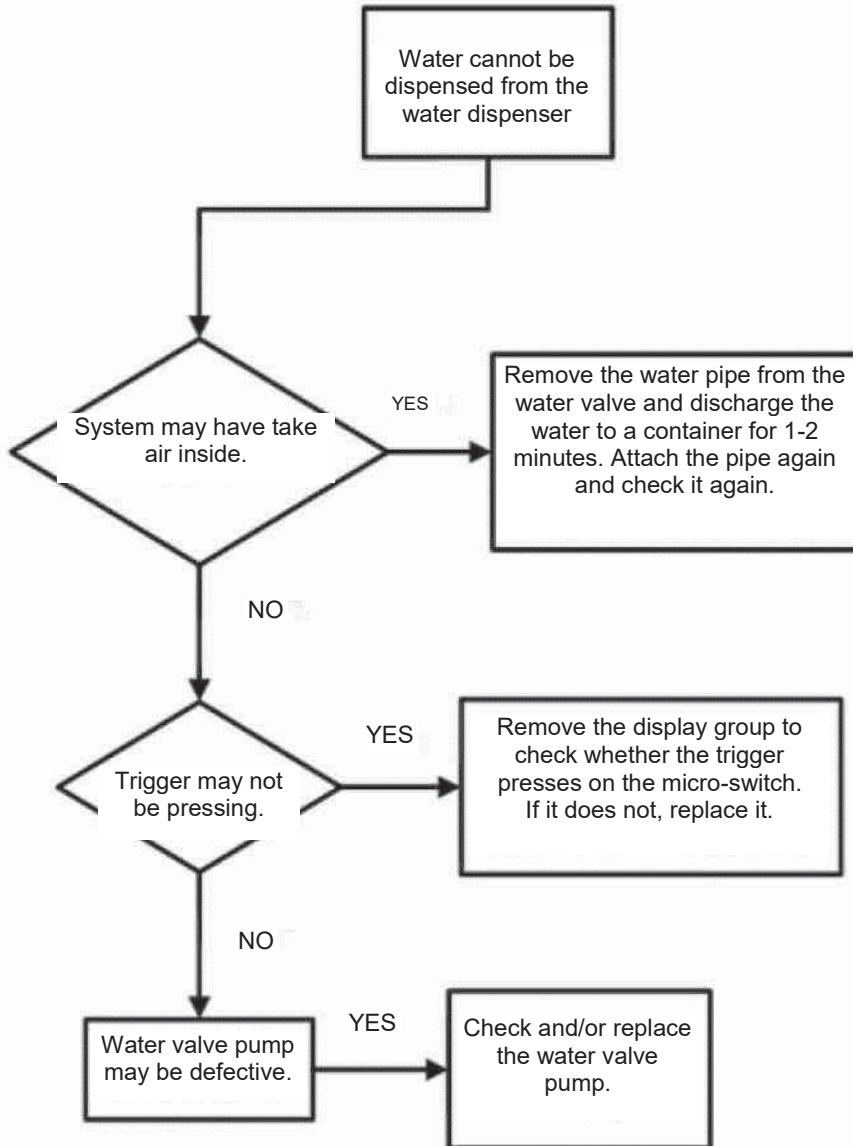
10.11. Condensation on the outer side of the refrigerator



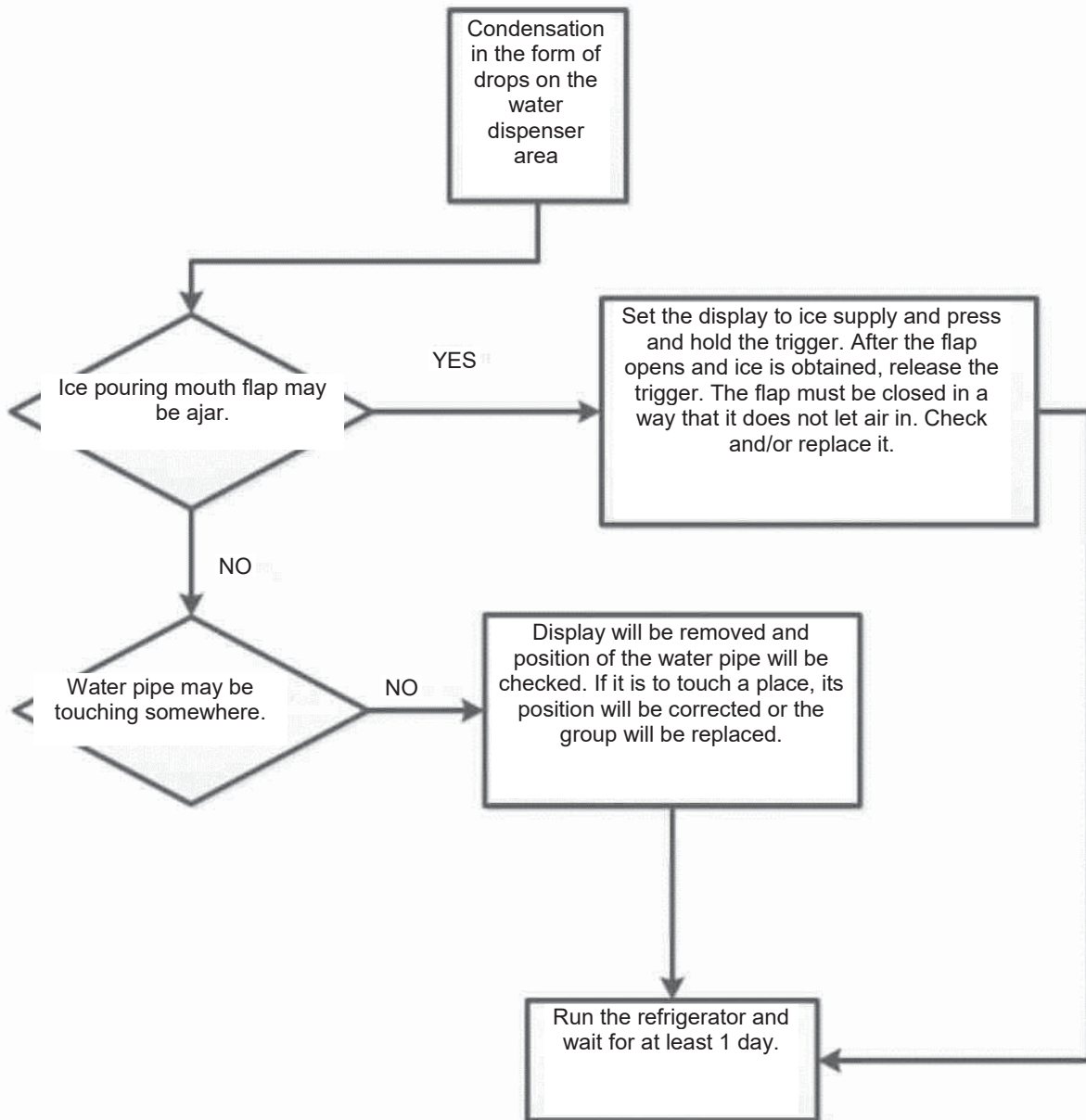
10.12.The doors cannot be closed



10.13. Water cannot be dispensed from the water dispenser



10.14. Condensation in the form of drops on the water dispenser area



Note: In very humid environments, condensation is normal along the water line especially at the corners. This is not a problem.

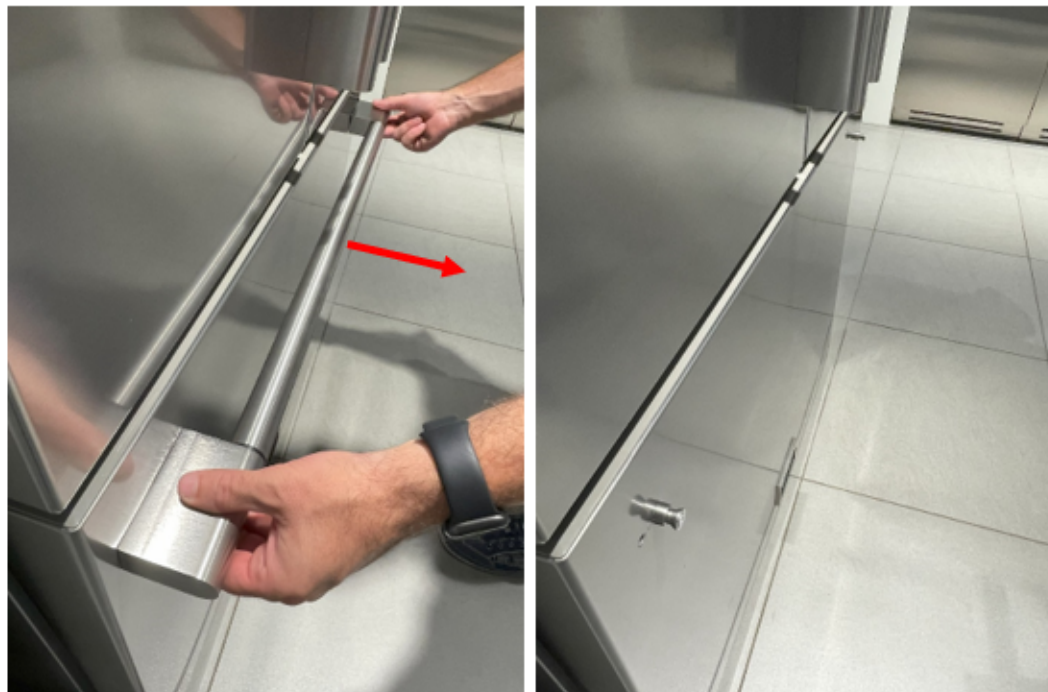
11.MOUNTING/DEMOUNTING PROCESSES OF THE PARTS

11.1.FULGOR MLANO door handle



- Handle kit is used on the product.
- To dismount the handles loosen the two allen screws.
- Then pull out the handle.

11.2.FULGOR MLANO lower drawer handle



- Handle kit is used on the product.
- To dismount the handles loosen the two allen screws.
- Then pull out the handle.

11.3.Rear cover



As the waterspouts are on transition point, do not tighten a screw.



- Rear cover and rears are fixed by 5 screws and insertion at the bottom.
- Remove the screws to take the cover out.

11.4.Service hatch



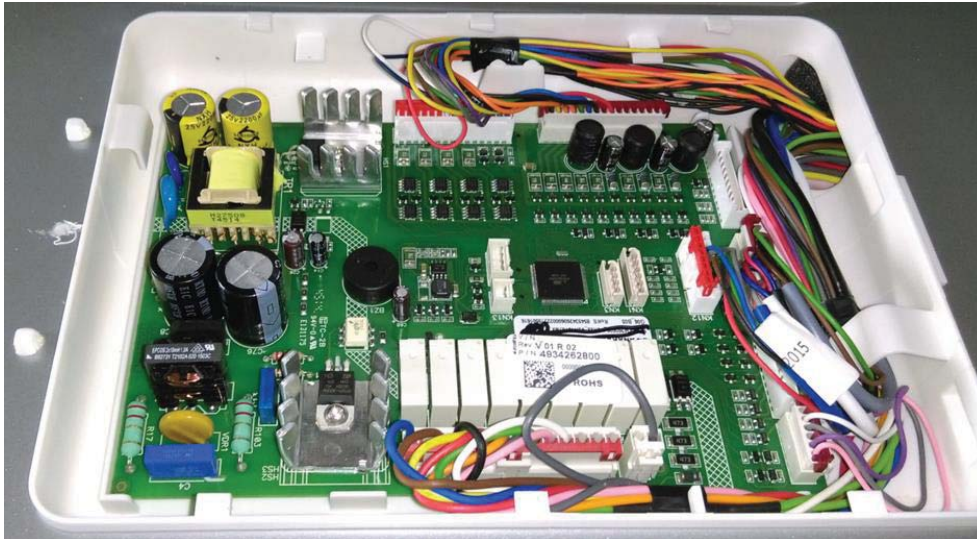
- The service hatch used on the rear wall section of the product is fixed to the rear wall by insertion to plate and 1 screw.
- Remove the screws to take the cover out.

11.5.Card cover



- The electronic card board used on the top plate is fixed by insertion and 1 screw.
- Screw is removed off and the board is detached according to the arrow direction.

11.6.Electronic Card



- Electronic card is fixed in the housing with bench stops. Afterwards, socket connections are made.
- Card is removed by detaching from bench stops after socket connections are made.

11.7. Front leg plate group and the lid



- Front leg plate group is fixed by overlapping to the product and 1 screw. Remove the screws to take the group out.

11.8. Rear leg plate group



- It is fixed with 4 screws. Rear leg plate is detached by removing the screws.

11.9.Door shelf 70 mm



- 70-Gallon Door Shelf is used on the upper section of cooling left and right doors.
- Detached by moving onto the arrow direction.
- *Optional

11.10.TPK shelf



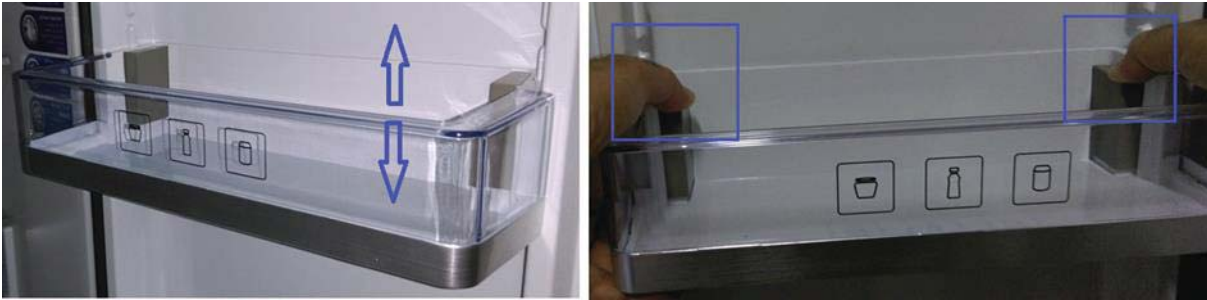
- Gallon Door Shelf is used on the upper section of cooling left and right doors.
- Detached by moving onto the arrow direction.

11.11.Door shelf 90 mm (for gallon)



- Gallon Door Shelf is used on the upper section of cooling left and right doors.
- Detached by moving onto the arrow direction.

11.12.Sliding door shelf



- Gallon Door Shelf is used on the upper section of cooling left and right doors.
- Can be moved up and down by arrow directed motions.
- The buttons located on the inner section of the shelf are pressed simultaneously in movement is required.

11.13.Adjustable glass shelves



- Adjustable glass shelves are inserted to the channels on the aluminium profiles on the rear section.
- Glass shelves are detached by moving on the direction indicated by arrow.

11.14. Aluminium adjustable glass shelf profiles

- The aluminium profiles on which the adjustable glass shelf profiles are grouped are fixed by 2 screws.
- Profiles are detached by removing off the screws.

11.15. Fridge crisper-top glass shelf

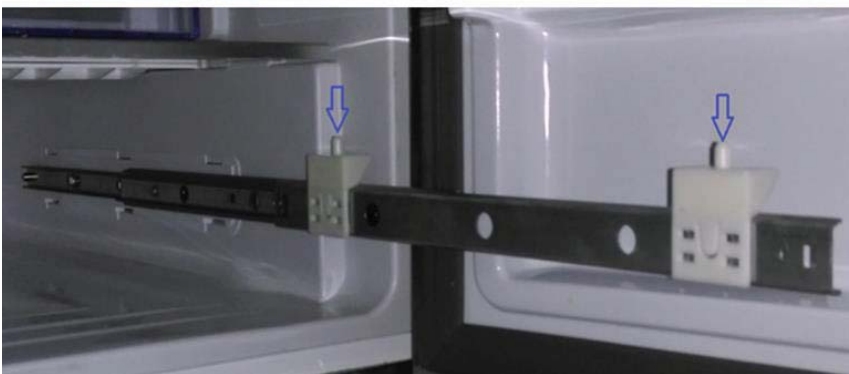
- The glass shelf on the crisper is slightly lifted upwards and detached by pulling.

11.16.Crispers



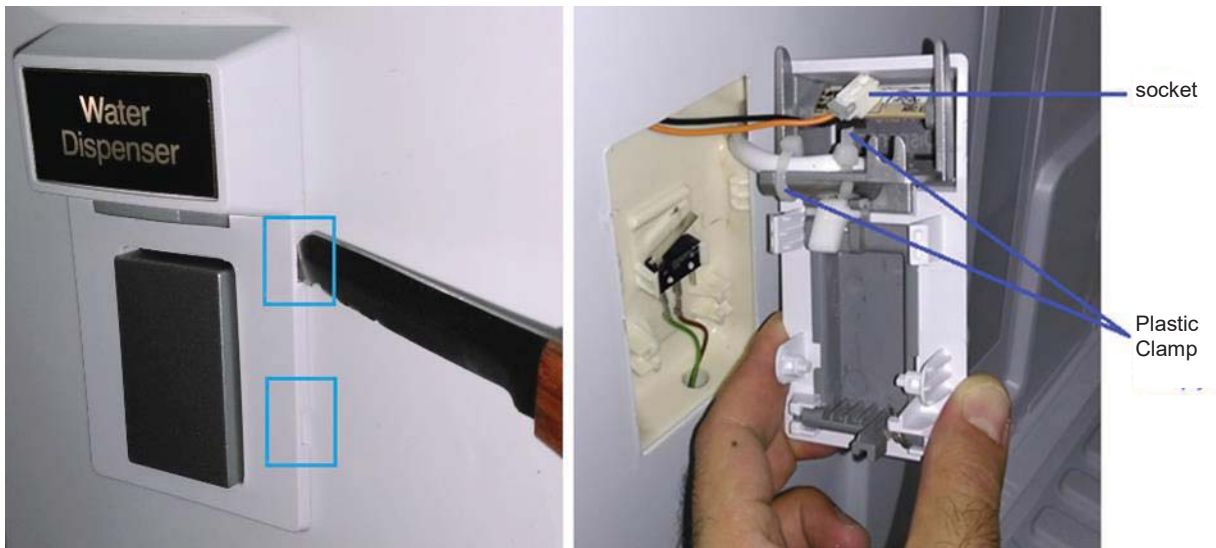
- Crisper are pulled from their rails and removed.

11.17.Chiller compartment



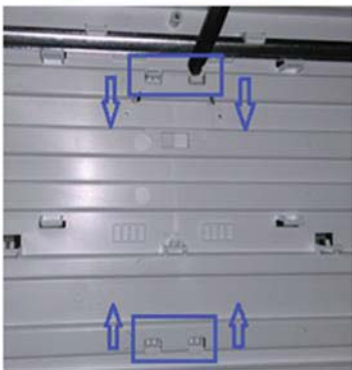
- Chiller compartment is pulled, got free from the pins on the telescopic rail, slightly lifted upwards and detached.

11.18. Water dispenser trigger group



- Water dispenser trigger group is located on the inner left section.
- Remove by getting free from bench stops using a thin-edged apparatus.
- The led socket connection is detachable, plastic clamps are cut off and the water pipe is removed.

11.19. Crisper sheathing group and water container middle rail group



- The water container pipes through water valve and water dispenser are detached.
- Crisper cover group is fixed to the body by a screw on the rear wall. Screw is removed off, crisper cover and medium rail group are detached by pulling.
- The medium rail group fixed by 4 clamps are detached by slightly pushing. The pushing direction is as indicated in the image.

11.20. Waterspout closer lids



- They are comprised of two parts.
- Removed by removing 2 screws starting with the longer one.
- Then the other covering part is removed which is fixed to the rear wall by 3 screws.

11.21.Middle rail group and water container

- The rails on the right and the left of the middle rail group chassis are fixed by clamps. Rails are detached by removing the screws and getting loose from the clamps.
- 5 screws are removed off from the chassis holding water container.

11.22. Water valve and waterspouts

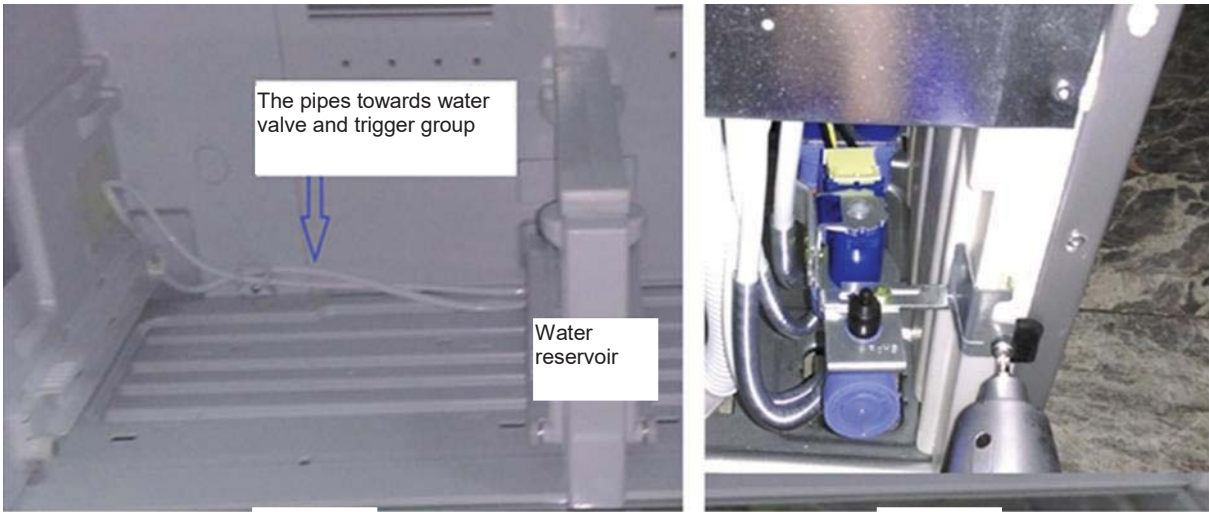


IMAGE 1



IMAGE 2



IMAGE 3



IMAGE 4



IMAGE 5



IMAGE 6

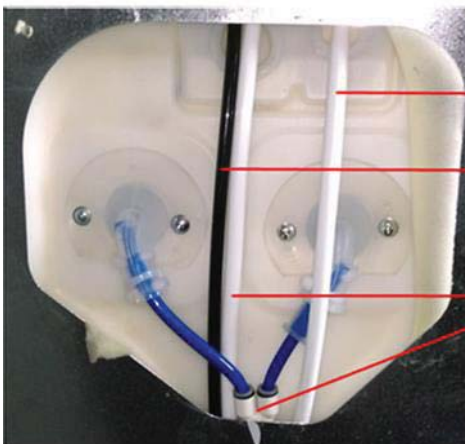


IMAGE 7

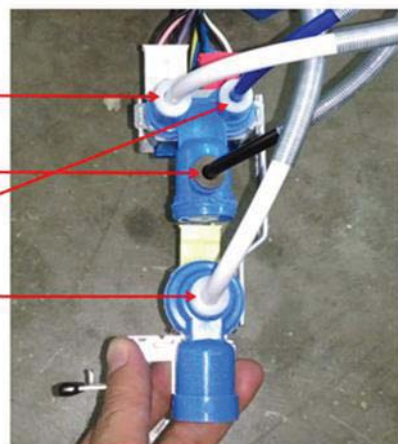
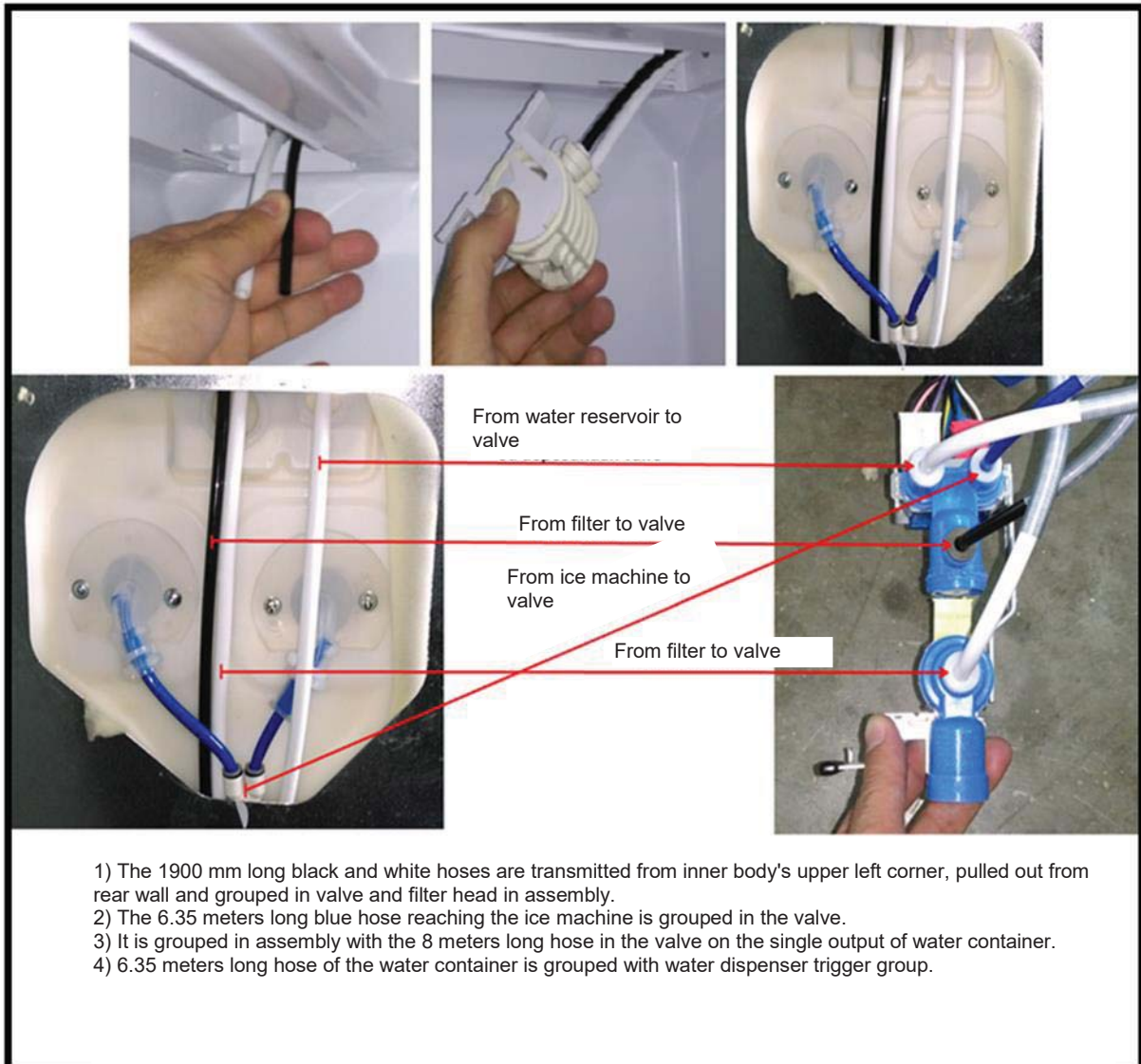


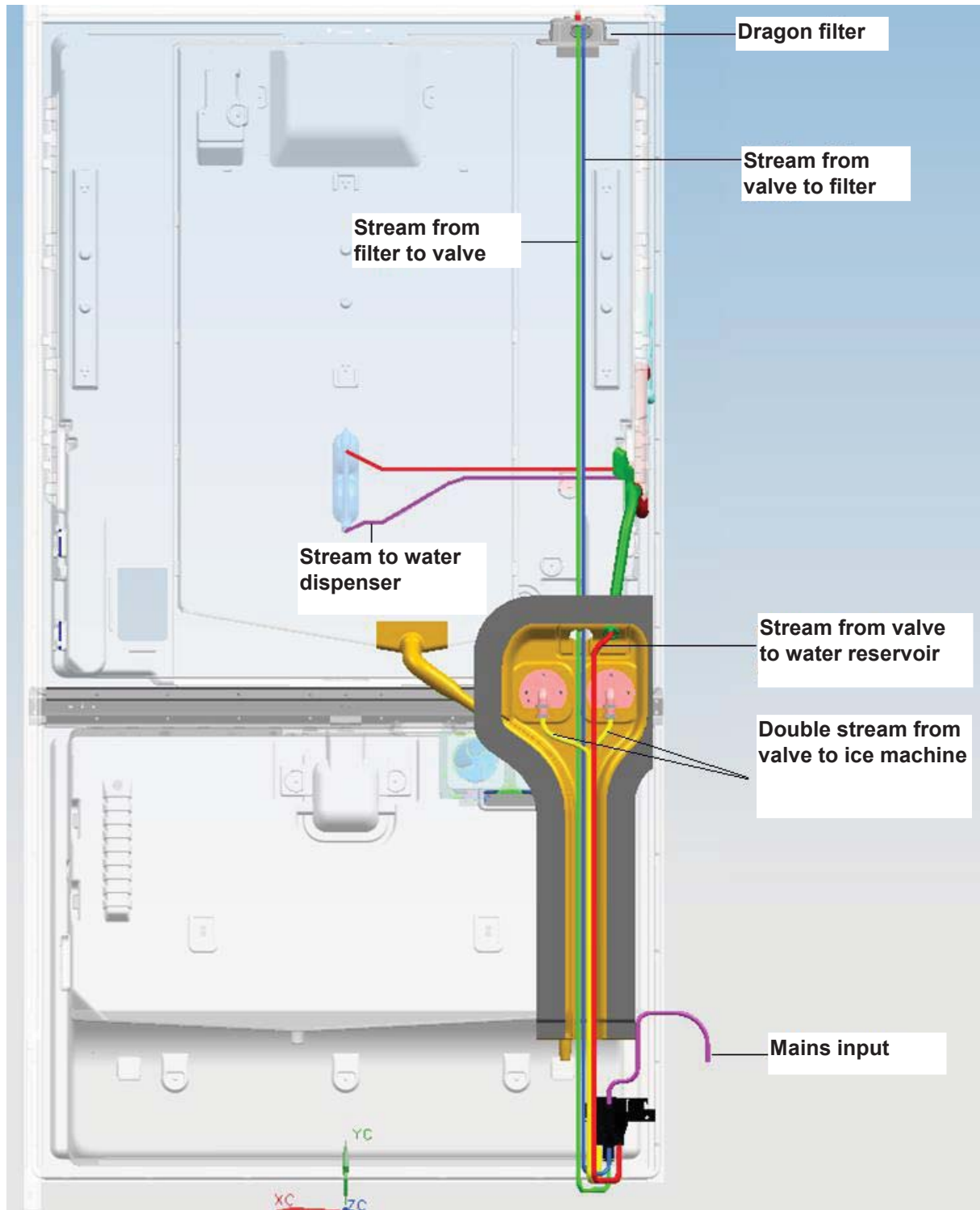
IMAGE 8

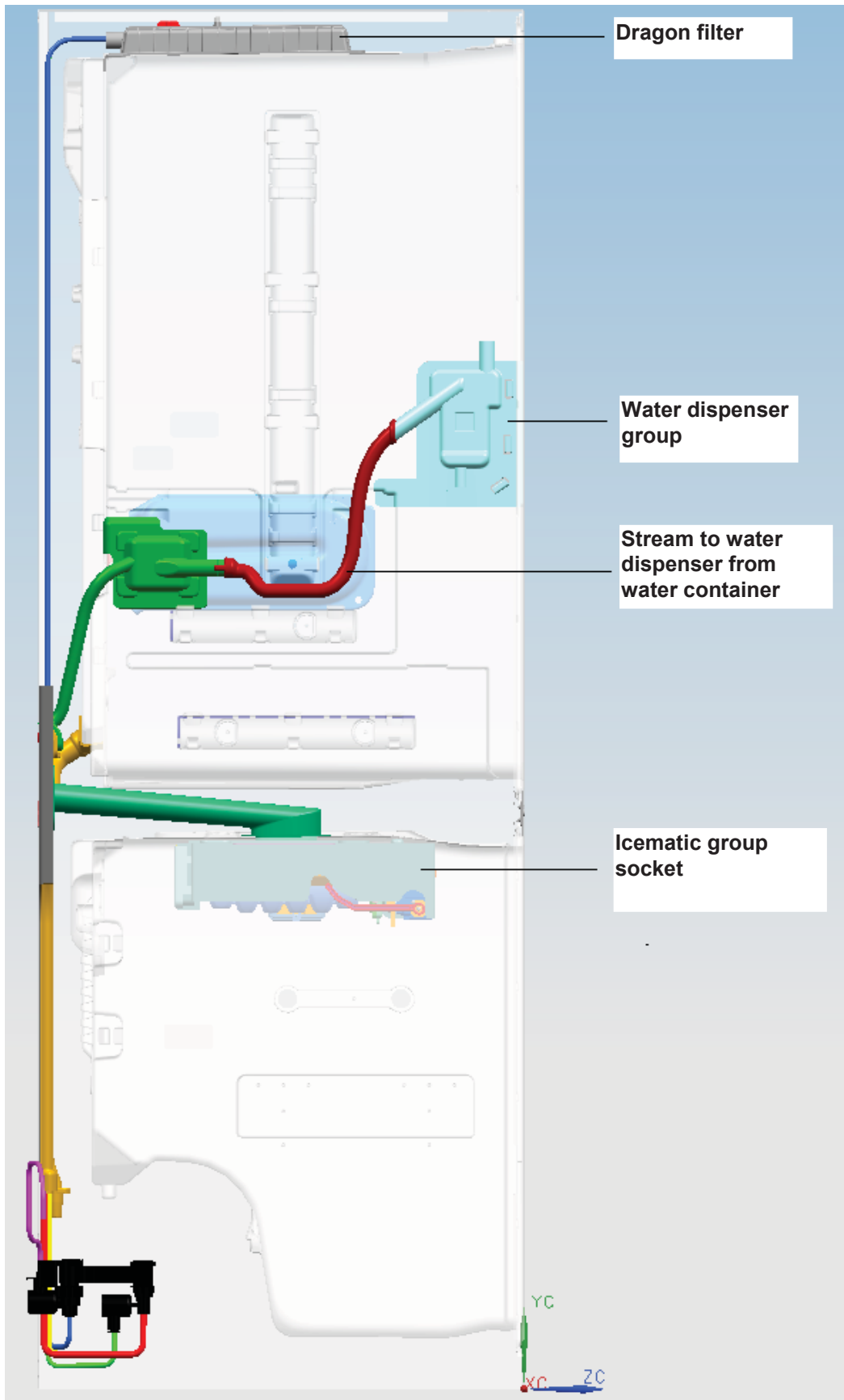
- The pipes towards water valve and trigger group are shown in image 1.
- The rear cover located on the rear part of the fridge is detached, the 1 screw fixing the water container is removed and water valve is detached. Water container middle rail group is removed by this way and water container may be changed.
- The 1900 mm long black and white hoses shown in image 3 and 4 are transmitted from inner body's upper left corner, pulled out from rear wall and grouped in valve and filter head in assembly.
- The 6.35 meters long blue hose reaching the ice machine shown in image 5 is grouped in the valve.
- It is grouped in assembly with the 8 meters long hose in the valve on the single output of water container.
- 6.35 meters long hose of the water container is grouped with water dispenser trigger group.

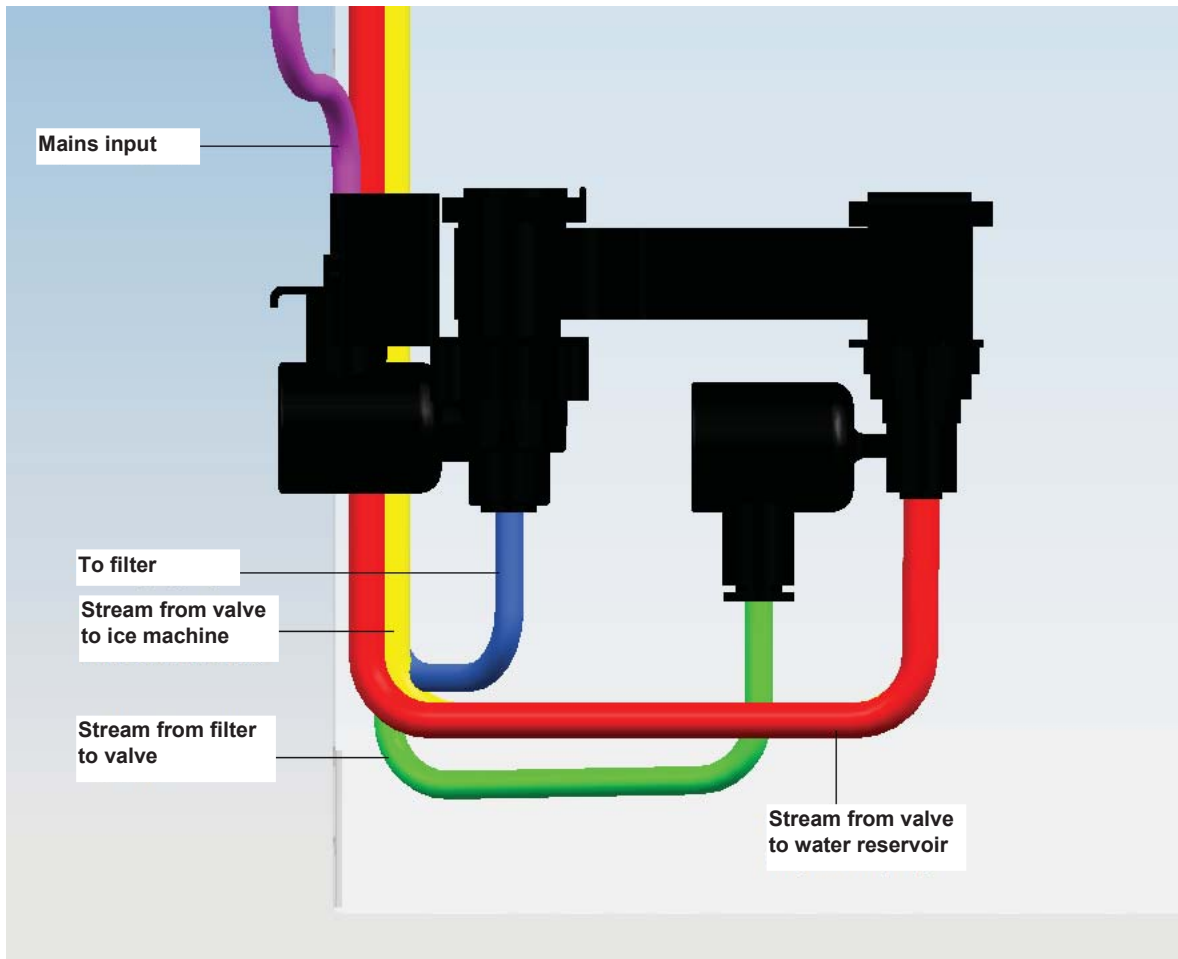
NOTE: Trial is implemented by quenching into the system. Please ensure that there are no leakages.

11.23. Water system connection









11.24.Crisper rails



- Remove by getting free from bench stops using a thin-edged apparatus.

11.25. Telescopic rail and rail gripper



- Telescopic rails used in chiller, ice drawer and freezer upper drawer are fixed to rail gripper with 3 screws.
- Firstly, the telescopic ray is opened totally ajar for the screws to be completely seen and then they are removed off.
- Afterwards, the rail is closed, the screw on the front is removed of and the is detached from its place.
- The rail gripper which the telescopic rail is fixed is grouped in assembly with the clamps. Remove by getting free from the gripper using a thin-edged apparatus.

11.26. Cooler rear illumination glass group

- The cooling compartment is used in both right and left. This group is fixed on the body by means of clamps.
- Can be removed by using a thin-edged apparatus.
- Socket connection is removed from its housing by disassembling.

11.27. Cooler ceiling illumination glass

- Used on fridge compartment middle shelf. This group is fixed on the body by means of clamps.
- Can be removed by using a thin-edged apparatus.
- The illumination glass is removed from its place and the affixed led card is detached.

11.28.Fridge illumination glass and LED card

- Used in cooling chiller compartment's right and left sides.
- Illumination glass can be removed by using a thin-edged apparatus.
- The led card which is grouped in angled situation can be detached by needle nose pliers.
- When placing the new led card, firstly the socket part is mounted and then the card is grouped in assembly by the clamps.

11.29.Filter cover group

- Filter cover group is used in the upper left corner in freezer compartment.
- The group is pulled on the direction of the arrow and detached by moving downwards.

11.30. Bypass cover / water filter



- Bypass cover grouped in assembly within the filter head is detached.
- Water filter is inserted instead upon preference.

11.31. Filter head



- It is fixed with 1 screw.
- Remove the screws and pipe connections to take the cover out.

11.32. Cooler evaporator cover screw plug



- Two units of eva cover screw plugs are used, one at the right and one at the left side. Remove the pipe holders by using a flat-tipped screwdriver.

11.33. Cooler evaporator cover



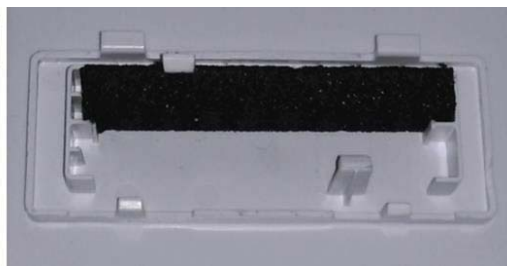
- The cooling eva cover is grouped in assembly with the clamps by 2 screws.
- 2 screws are removed off by using a thin-edge apparatus and the eva cover is half-open.
- Eva cover is detached manually by holding from the right and left sides in balance.
- Finally the squared fan socket connection is removed and eva cover is detached from the housing.

11.34. Square fan group

- Four tabs around the fan fixing frame are removed with a flat-tip screwdriver. After the fan and the protective silicon are removed, remove the fan.

11.35. Ioniser group

- Ioniser cooler is used behind the fridge eva cover.
- Can be detached by removing off 1 screw and socket connection.

11.36. Carbon filter cover and carbon filter

- Fridge eva cover is used on the lower part.
- This group is fixed on the body by means of clamps. Remove by getting free from bench stops using a thin-edged apparatus.

11.37. Ioniser illumination cover (Ion fresh)



- Ioniser illumination cover is fixed at the bottom and top by two clamps.
- Can be detached by slightly pulling with hands.

11.38.Sensor cover



- Sensor cover is mounted with tabs. Remove the pipe holders by using a flat-tipped screwdriver.

11.39. Moving middle compartment group



- Movable middle section group it is used in the fridge's left door.
- It is affixed by 2 screws each in lower hinge and the skid on the lower hinge.
- The skid is removed by slightly sliding on the direction of the arrow after the screws are removed off.
- HAB group is dismantled by disassembling the socket connection.

11.40. Hab guide



- Used on Fridge Compartment Middle Shelf and
- Removed by removing 1 screw.

11.41.Hand plate display group

- The hand plate display group is grouped as to cover the hinges on the upper plate.
- 6 screws are removed off from the upper section and get loosened from the clamps on the hinge.
- Socket connections are dismantled and detached from housing.

11.42.Display group



- It is fixed with 3 screws on the hinge cover.
- Remove the screws and socket connection to detach from housing.

11.43. Freezer compartment lower drawer / Separator / Separator wire



- The freezer compartment is removed by holding from rear handles.
- Separator is used on 2 wires.
- Separator wires are click-fit to right and left with silicones.

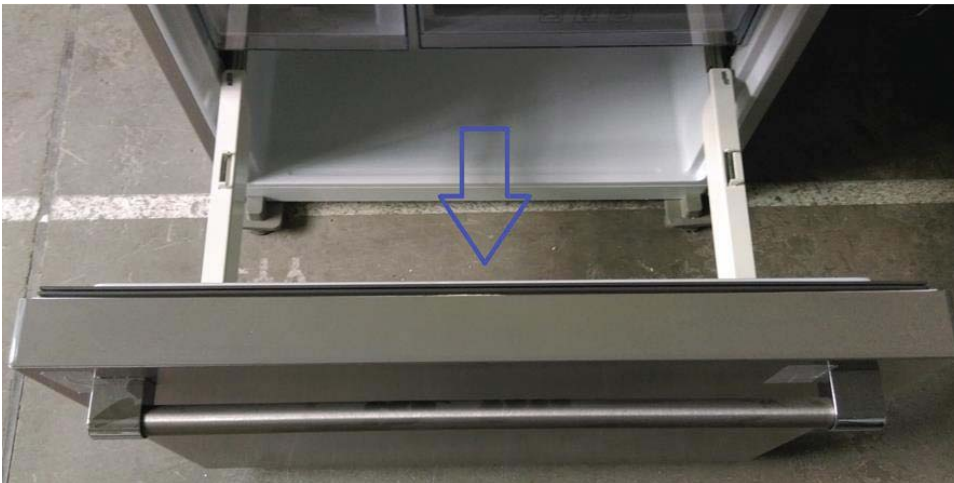
11.44. Freezer compartment upper drawer



- Freezer compartment upper drawer is grouped in assembly by means of telescopic rails in right and left sides.
- Can be detached by lifting slightly up and pulling.

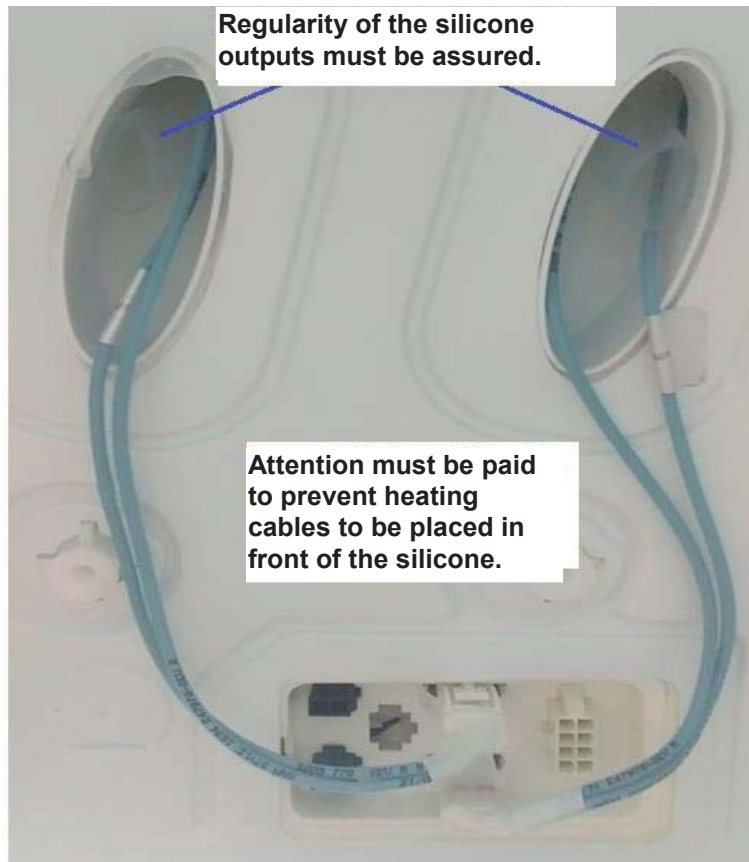
11.45. Ice compartment

- Freezer compartment upper drawer is grouped in assembly by means of telescopic rails in right and left sides.
- Can be detached by lifting slightly up and pulling.

11.46. Freezer door

- The door is opened by pulling the freezer door, the lower drawer is removed and the reinforcement connecting the telescopic rails with the door comes forth.
- 1 screw on the stiffener is removed off.
- Can be detached by lifting the door slightly up and pulling.
- The 6 torque screws are removed off from each side to detach reinforcements from the door.

11.47.Freezer group



- Icematic group is used in the upper left corner in freezer compartment.
- Can be detached by slightly pulling with hands.
- The icebox group affixed by hanger pins is removed by slightly pulling.

Note: The silicone outputs enabling water inlet are to be checked before placing the icebox group.

11.48. Freezer separator wire



- Wire is removed by pulling.

11.49. Freezer middle rail group



- The freezer compartment is in the chassis holding the telescopic rails supporting ice drawer and upper drawer as an assembly.
- Among the freezer middle rail group, the icebox group must be removed at first.
- Then 6 screws are removed off from the middle rail group and the front clamps are pushed backwards to detach.

11.50. Ice drawer and freezer drawer rails



- There are 4 rails used for freezer drawers.
- Can be detached by removing 2 screws placed on each.
- Rail grippers can be detached by bare hands as they are only inserted.

11.51. Freezer door rail



- Freezer door rails are used with synchronization wire in an assembly group.
- Rails are affixed with 7 screws on each side.
- The rails are pulled after the screws are removed off and rail group is detached after the screws at the bottom section are removed off.

11.52. Freezer evaporator sockets service cover



- The freezer eva is affixed by 1 screw and clamps on the cover.
- The screws are removed off using a thin-edged apparatus and the sockets are reached.

11.53. Freezer evaporator cover

- Fixed with the freezer evaporator cover using 1 screw.
- Remove the screws to take the cover out as shown in related images.

11.54. Wired fan shield

- Removed by turning left on the eva cover.

11.55.Freezer fan group

- Firstly, remove the Freezer eva cover.
- Remove the 2 screws off fixing the fan group.
- Socket connection is removed from its housing by disassembling.

NOTE: Make sure that it is not possible that the cable touches the propeller and the evaporator.

11.56.Thermal fuse

- It is assembled on the return pipe.

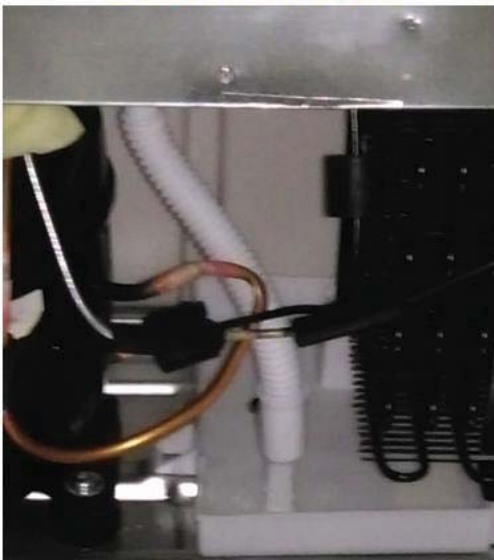
11.57.Heated pipe group



- Once the service hatch is opened, 4 screws on the silicones are removed off and the heating pipe group is pulled as to detach.

11.58.Discharge groups

Freezer draining group



Fridge water drain group



- Freezer draining group is used in between compressor and coil condenser.
- Fridge water drain group is used by the condenser fan.

11.59.Middle hinge group and pin



- It is fixed with 3 screws. Remove the screws to take the cover out.
- Middle hinge pin is detached by pliers.

11.60.The metal door puller mechanism



- It is used under the lower covers of the fridge and freezer doors. It is fixed with two screws. Remove the screws off to take the cover out.

11.61. The condenser fan motor

- It is grouped onto the right side of the coil condenser in the compressor area. It is fixed to steam container with two screws.
- The screws and socket connection are removed, the fan group is dismantled from the housing.

11.62. Sound damper

- Sound damper is assembled onto the pipes of the compressor area and absorbs the sounds and ensures that the refrigerator runs quietly.

11.63. Service hatch

- Terminal cover is mounted to the compressor with tabs.

12. Service equipment

1. Blade
2. Different bit set
3. Star bit
4. Torque bit
5. Chargeable gun
6. Flat-tipped screwdriver
7. Phillips screwdriver
8. Side cutter
9. Long nose pliers
10. Box wrench set



13. MAINTENANCE AND CLEANING

Service life of product extends and frequently experienced problems will be reduced if it is cleaned at regular intervals.



WARNING: Before cleaning the unit, unplug it.

- Never use gas, gasoline or similar substances for cleaning purposes.
- Never use any sharp and abrasive tools, soap, household cleaners, detergent and wax polish for cleaning.
- Melt a teaspoon soda in half a litre water. Damp a cloth in this water and wring it well. Wipe inside of the refrigerator with this cloth and then dry it off.
- Make sure that no water enters the lamp housing and other electrical items.
- If the refrigerator is not going to be used for a long period of time, unplug it, remove all food and drinks inside it, clean it and leave its door ajar.
- Check regularly whether the door seals are clean or not. Clean them if necessary.
- To remove door racks, remove all the contents and then simply push the door rack upwards. After you clean and dry them, replace by sliding them from upwards to downwards.

Avoiding bad odours

No materials that may cause odour are used in the production of our refrigerators. However, due to inappropriate food preserving conditions and not cleaning the inner surface of the refrigerator as required can bring forth the odours. Pay attention to following to avoid this problem:

- Keeping your refrigerator clean is important. Food residuals, stains, etc. can cause odour. So, clean the refrigerator with carbonated water in every 15 days. Never use detergents or soap.
- Keep the food in closed containers. Micro-organism spreading out from uncovered containers will cause unpleasant odours.
- Never keep the food that has expired best before dates and spoiled in the refrigerator.



Tea is one of the best deodorants. Open hydroxyl (OH) ends of Catechin substance molecules in the tea hold the odour creating volatile organics to remove unpleasant odours. Put the pulp of the tea you prepared in your refrigerator in an uncovered container and keep it there for maximum 12 hours. If you leave it in the refrigerator for more than 12 hours, it may become the source of the odour as it will collect the micro-organisms that cause the odour.

Protecting the plastic surfaces

Do not put liquid oils or oil-cooked meals in your refrigerator in unsealed containers as they damage the plastic surfaces of the refrigerator. In case of spilling or smearing oil on the plastic surfaces, clean and rinse the relevant part of the surface at once with warm water.