



Models Covered

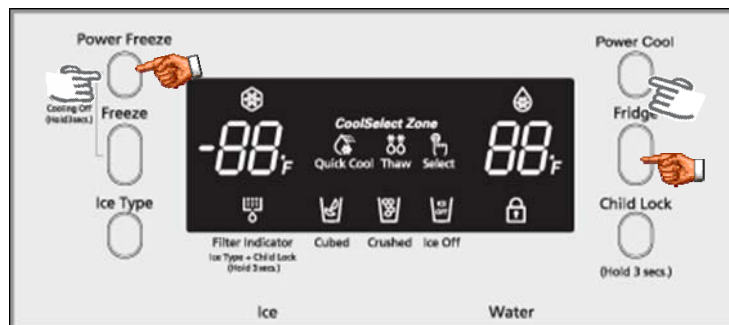
RS277AC**/XAA

Fast Track Troubleshooting

IMPORTANT SAFETY NOTICE – “For Technicians Only” This service data sheet is intended for use by persons having electrical, electronic, and mechanical experience and knowledge at a level generally considered acceptable in the appliance repair trade. Any attempt to repair a major appliance may result in personal injury and property damage. The manufacturer or seller cannot be responsible, nor assume any liability for injury or damage of any kind arising from the use of this data sheet.

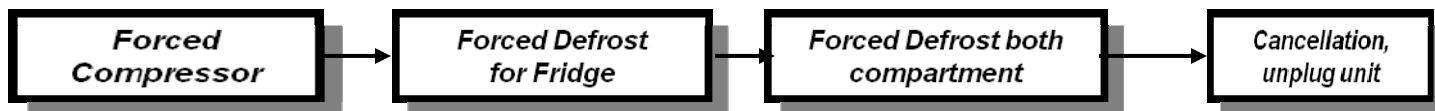
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Self Diagnosis: Press “Power Freeze” and “Power Cool” buttons *simultaneously* for 8-12 seconds (no sound when buttons are pressed in the correct manner). When the display stops blinking, release the buttons and read Fault Codes. This will also cancel the Fault Mode created by self-diagnosis at power up.



Forced Mode: Press “Power Freeze” and “Fridge” buttons *simultaneously* for 8-12 seconds (no sound when buttons are pressed in the correct manner). The display will beep and go blank. Proceed to the following steps:

Wait 5 seconds between button pushes



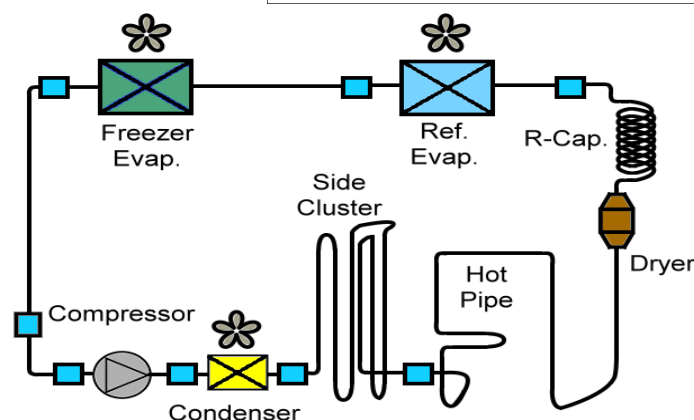
Press the Freezer button one time to force Compressor Run. Measure fan and compressor voltages at main PCB.

Press the Freezer button a second time to Force Fridge Defrost. Measure defrost voltage at main PCB.

Press Freezer button a third time to Force Defrost for Fridge & Freezer,. Measure defrost voltages at main PCB

Sealed System

Refrigerant Charge
R134a 7.76 oz.



Compressor → Condenser → Side Cluster → Hot Pipe → Dryer → R Capillary → R Evaporator → F Evaporator → Suction Pipe → Compressor

Sales Mode, No Compressor Operation

Press Power Freeze & Freezer temp buttons simultaneously for 3 sec (you will hear a “Ding Dong”) to remove or put unit into Sales Mode. When in the Sales Mode, the Display will show “0F” “0F”. Removing power will not cancel this mode.

Component Value Chart

Component	Resistance	Wattage	Voltage
Freezer Defrost Heater	58?	250	120vac
Fridge Defrost Heater	103Ω	140	120vac
Dispenser Heater	2880Ω	5	120vac
Water Tank Heater	3600Ω	4	120vac
Fill Tube Heater	2880Ω	5	120vac
Sensors	2.5kΩ-89kΩ	N/A	1~4.5vdc
Fans	N/A	N/A	7~12vdc

FLEX TRAY Ice Makers

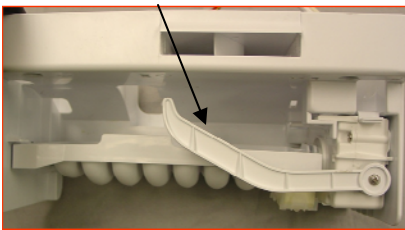
When the initial power is applied, the ice tray will stand by for 2 hours. After the 2-hour standby time, the Ice Maker Sensor will check the temperature. When it is lower than 1.5°F for more than 5 minutes, it will start a harvest, with or without ice in the tray, then fill with water. 58 minutes after water is supplied to the Ice Tray, the Ice Maker Sensor temperature will be checked. When the Ice Maker Sensor maintains lower than 1.5°F for 5 minutes, the icemaker completes the harvest (if the ice bin is not sensed as full).

The thermistor senses temperature to determine water fill on newer units

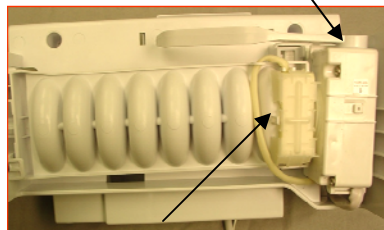
Filling the tray

After the water fill is completed, the ice maker sensor will evaluate the water volume one and a half minutes later. When it detects no or low water level, it will add more water. First supply time will be 1.5 sec, next one will be 1 sec and the last will be 2 sec.

Guide – Bin Full



Ice Maker Test Button



Ice Maker Thermistor

Shattered Ice – Flex Tray

When all ice shatters, it is because of a bad tray or ice cube temp. that is too cold (lower than -5° F). In some areas, there are water issues that can also cause shattered cubes. The temp. in the freezer should not have any effect on this issue, as long as it is below 1.5°F, as a properly installed sensor will not read the freezer temp., only the water/ice temp.

Check the ice tray for defects in the plastic. Ice that is too cold will shatter during harvest. This can happen due to: (1) sensor not reading the correct temp., (2) sensor is not mounted correctly, (3) the icemaker offset value is programmed to a lower number, or (4) the board does not understand the reading.

To check the sensor, you must check the tray temp (not air temp) and compare it to the sensor reading. The sensor should read 3.7 volts at the main board connector when the cube temperature is 1 degree. After the fill, the sensor will read water temp, normally 1.5 to 2.2 volts.

To clear offsets, put unit into Diagnostics mode.

Please note, some shattering is normal for a flex tray icemaker.

FREEZER TEMPERATURE IS CONTROLLED BY THE ICE MAKER

Interior temperature of the freezer will be set to -14 °F until the ice bucket is full. When the ice bucket is full, the freezer will maintain original set temperature. Whenever ice is used and the ice maker begins to produce more ice, the freezer will return to -14 °F. Selecting "Ice Off" allows the freezer to be controlled by the set temperature. Therefore, if no water is hooked up to the refrigerator, the freezer will maintain -14 °F unless "Ice Off" is selected.

Temperature/Resistance/Voltage Chart for Samsung Refrigerators Sensors

Temp.	(Ω)	Volts	Temp.	(Ω)	Volts	Temp.	(Ω)	Volts	Temp.	(Ω)	Volts
-29.2°F	64227	4.326	1.4°F	28021	3.685	32.0°F	13290	2.853	62.6°F	6771	2.019
-27.4°F	61012	4.296	3.2°F	26760	3.64	33.8°F	12749	2.802	64.4°F	6521	1.974
-25.6°F	57977	4.264	5.0°F	25562	3.594	35.6 °F	12233	2.751	66.2°F	6281	1.929
-23.8°F	55112	4.232	6.8°F	24425	3.548	37.4 °F	11741	2.7	68.0°F	6052	1.885
-22.0°F	52406	4.199	8.6°F	23345	3.501	39.2 °F	11271	2.649	69.8°F	5832	1.842
-20.2°F	49848	4.165	10.4°F	22320	3.453	41.0°F	10823	2.599	71.6°F	5621	1.799
-18.4°F	47431	4.129	12.2°F	21345	3.405	42.8°F	10395	2.548	75.2°F	5225	1.716
-16.6°F	45146	4.093	14.0°F	20418	3.356	44.6°F	9986	2.498	77.0°F	5000	1.675
-14.8°F	42984	4.056	15.8°F	19537	3.307	46.4°F	9596	2.449	78.8°F	4861	1.636
-13.0°F	40938	4.018	17.6°F	18698	3.258	48.2°F	9223	2.399	80.6°F	4690	1.596
-11.2°F	39002	3.98	19.4°F	17901	3.208	50.0°F	8867	2.35	86.0°F	4218	1.483
-9.4°F	37169	3.94	21.2°F	17142	3.158	51.8°F	8526	2.301	87.8°F	4072	1.447
-7.6°F	35433	3.899	23.0°F	16419	3.107	53.6°F	8200	2.253	89.6°F	3933	1.412
-5.8°F	33788	3.858	24.8°F	15731	3.057	55.4°F	7888	2.205	91.4°F	3799	1.377
-4.0°F	32230	3.816	26.6°F	15076	3.006	57.2°F	7590	2.158	95.0°F	3547	1.309
-2.2°F	30752	3.773	28.4°F	14452	2.955	59.0°F	7305	2.111	96.8°F	3428	1.277
-0.4°F	29350	3.729	30.2°F	13857	2.904	60.8°F	7032	2.064	100.4°F	3204	1.213

DC FAN MOTORS

Brushless DC Fan motors are used to save energy. The evaporator fans operate at two speeds:

High speed, when the ambient temperature is high and Low speed when the ambient temperature is low. Generally, the motor is operated in the High speed mode during the day-time and in the Low mode at night. This circuit design is to protect the Main PCB from a failed fan motor.



Fan speed information is read by the Main PCB. If the fan speed exceeds 600 RPM, or the speed is too slow or stopped, the fan drive circuit is disabled. After 10 seconds, the circuit tries again with 3 seconds of DC voltage. If the fan continues this activity for 5 cycles, (10 seconds off, 3 seconds on), the fan drive circuit is disabled for 10 minutes.

TO TEST THE FAN CIRCUIT VOLTAGE.

Power the unit off and back on to check the DC voltage to the motor (wait for 10 to 60 seconds for the fan voltage to kick in), and then check fan voltage. The average reading is 9 VDC. If you get 3 seconds of voltage every 10 seconds for the 5 fan power up cycles, then the Main PCB is good.

NOTE: You may need to put the unit into FORCED FREEZE mode to activate the fans/compressor.

If the fan blade is blocked by ice, disconnect the power cord, then defrost and check the motor again.

If the evaporator is blocked with ice, thus blocking the air flow, the fan will run too fast then stop. Remove the ice and check the motor again. If everything is clear around the fan blade, then the motor would be at fault. Continuous fan errors will be displayed on the front panel display.

Samsung 'Refrigerator' Diagnostic Code Quick Guide			
Error Items	LED	TROUBLE	TESTING
I/M-SENSOR (R on Twin I/M units)		Ice Maker Sensor Error- open or short-circuit, connector failure. Cause is also a temperature reading > 122° or < -58 ° F	The voltage at MAIN PCB Sensor between 4.5V~1.0V
R-SENSOR		Refrigerator Room Sensor Error- open or short-circuit, connector failure. Cause is also a temperature reading > 122° or < -58 ° F.	The voltage at MAIN PCB Sensor between 4.5V~1.0V
DEFROST SENSOR OF R ROOM		Ref. Defrost Sensor Error- open or short-circuit, connector failure. Cause is also a temperature reading > 122° or < -58 ° F	The voltage at MAIN PCB Sensor between 4.5V~1.0V
R-FAN ERROR		This error indicates the Refrigerator Evap Fan is not spinning at the correct RPM or the fan feedback line is open.	Fan voltage at MAIN PCB shall be between 7V~12V
I/M FUNCTION ERROR(R on Twin I/M)		This error indicates the Ice tray has not returned to level after an ice harvest. The error is displayed after three failed attempts.	Replace I/M
R-DEFROSTING ERROR		Refrigerator Room defrost heater- open or short-circuit, connector failure, or defective temperature fuse/bi-metal. Defrost on over 80 minutes	Disconnect defrost connector from PCB, check resistance
EXT-SENSOR		Ambient Temp. Sensor Error- open or short-circuit, connector failure. Cause is also a temperature reading > 122° or < -58 ° F	The voltage at MAIN PCB Sensor between 4.5V~1.0V
F-SENSOR		Freezer Compartment Sensor Error- open or short-circuit, connector failure. Cause is also a temperature reading > 122° or < -58 ° F	The voltage at MAIN PCB Sensor between 4.5V~1.0V
F-DEF-SENSOR		Freezer Room Defrost Sensor Error- open or short-circuit, connector failure. Cause is also a temperature reading > 122° or < -58 ° F	The voltage at MAIN PCB Sensor between 4.5V~1.0V
F-FAN ERROR		This error indicates the Freezer Evap. Fan is not spinning at the correct RPM or the fan feedback line is open.	Fan voltage at MAIN PCB shall be between 7V~12V
C-FAN ERROR		This error indicates the Condenser Fan is not spinning at the correct RPM or the fan feedback line is open.	Fan voltage at MAIN PCB shall be between 7V~12V
F-DEFROSTING ERROR		Freezer defrosting heater- open or short-circuit, connector failure, or defective temperature fuse/bi-metal. Defrost on for over 80 minutes	Disconnect defrost connector from PCB, check resistance
ICE PIPE HEATER ERROR		Error is displayed when the ice maker fill pipe heater is open or shorted.	Replace Fill Tube Ass'y

Condenser Fan Operation and the Ambient Temperature Sensor

As the ambient temperature changes, the refrigerator will control the compartment temperatures according to the programming on the Main PCB. Depending on the ambient temperature, the condenser cooling fan (machine room fan) is controlled as shown in the table below. Depending on the room conditions, the cooling fan may operate as soon as the compressor starts, with a 10 minute delay after the compressor starts or it may not operate at all when the compressor is running.

	Temperature Range	Operation
Compressor fan's delay function	Ambient temperature of ~66 °F or higher	When the compressor is turned on, the machine room fan starts to rotate immediately.
	Ambient temperature of ~46 to ~66 °F	When the compressor is turned on, the machine room fan starts to rotate with a 10 minute delay.
	Ambient temperature of 44°F or lower	The machine room fan is turned off regardless of the compressor

Service Tip Water in the water tank is frozen

Symptom: Water will not dispense due to frozen water tank.

Solution: Measure the resistance of the water tank heater. Normal resistance is approximately 3.3 K ohms. If the heater is defective, replace the heater.

If the evaporator cover is damaged due to ice and frost build-up, replace the evaporator cover assembly.

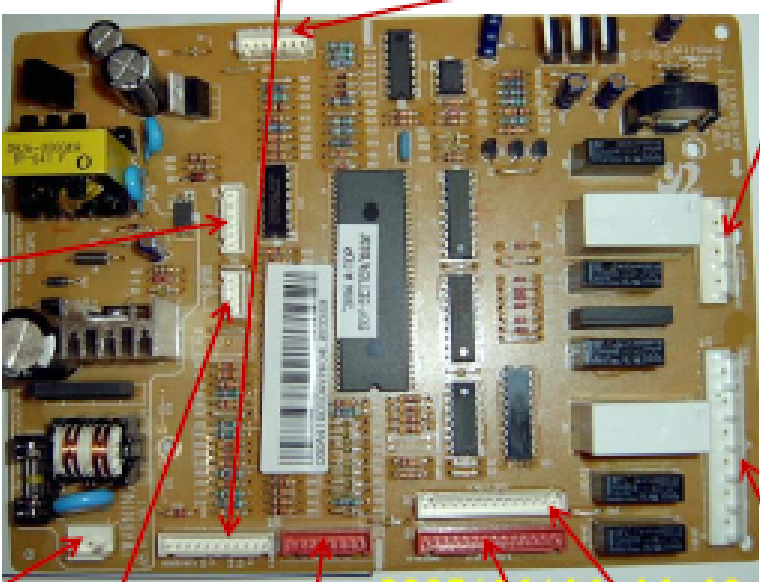


RS277 ***

CN7 1 120vac
 1-(CN70-11) Cutle Solenoid (Yel-Red)
 3-(CN70-11) Auger Mtr (Pnk-Red)
 5-(CN70-11) Ice-Motor Solenoid (Prp-Red)
 7-(CN70-11) Water Solenoid (W/Blk-Red)

CN72
 6-7 F-Fan (Yel-Gry) 7~11vdc
 5-7 R-Fan (Org-Gry) 7~11vdc
 4-7 C-Fan (S/Blu-Gry) 7~11vdc
 3 F-Fan control (Blk)
 2 R-Fan Control (Bm)
 1 C-Fan Control (Red)

CN30
 1-2 F Door SW (W/Red-Bm)
 5-6 R Door SW (W/Blu-Bm)
 3-2 F Sensor (Yel-Bm) 3.5~4.2vdc
 4-2 F-Def Sensor (Blu-Bm) 2.3~4.2vdc
 7-6 R Sensor (Gry-Bm) 2.4~2.8vdc
 8-6 R-Def Sensor (Prp-Bm) 2~4.2vdc
 9-10 Water Sw (Wht-Blk)



CN70 120vac
 1-11 Water Tank (Blu-Red)
 5-11 Compressor & Dispenser Heater (S/Blu-Red)
 9-7 R-Def/Ice Pipe HTR (Wht-Org)
 13-7 F-Def HTR (Bm-Org)

CN50 Panel PCB

CN51 Cool Zone
 13-14 Cool Zone Sensor (W/Red-W/Blu) 2.6~2.8vdc
 12-13 12 VDC (W/Blk-W/Red)

CN90
 1-2 I/M Motor (Red-Blk) 12vdc
 3-4 I/M Sensor (Wht-Wht) 2.3~3.3vdc
 5-8 Test SW (Gry-S/Blu)
 6-8 Horiz check SW (Blu-S/Blu)
 7-8 Ice Check SW (Prp-S/Blu)

CN31
 1-4 Ambient Sensor (Wht-Wht) 1.2~2 vdc
 2-3 Ice SW (Org-Org)

CN10 120vac
 1-3 A/C Line (Blk-Red)

CN73
 1-2 Damper Heater (Blk-Blk) 12vdc
 3-4 Coil Damper Mtr (Wht-Blu)
 5-6 Coil Damper Mtr (Yel-Red)

- BLU-BLUE
- BRN-BROWN
- RED-RED
- GRY-GRAY
- ORG-ORANGE
- PNK-PINK
- E-EARTH
- PRP-PURPLE
- S/BLUE-SKY BLUE
- WHT-WHITE
- YEL-YELLOW
- BLK-BLACK
- W/BLK-WHITE/BLACK
- W/RED-WHITE/RED
- W/BLU-WHITE/BLUE
- W/YEL-WHITE/YELLOW

