Bottom Mount Refrigerator---Technical Information

⚠ WARNING

Electrical Shock Hazard
Disconnect power before servicing.
Replace all parts and panels before operation.
Failure to do so can result in death or electrical shock.

No-Load Performance, Controls in Normal Position						
	Kw/24 hr ±0.4	Percent Run Time ±10%	Cycles/24 hr ±25%	Refrigerator Center Compartment Average Food Temperature ±3°F	Freezer Compartment Average Food Temperature ±3°F	
Ambient °F	70° 90° 110°	70° 90° 110°	70° 90° 110°	70° 90° 110°	70° 90° 110°	
Mid Level Electronic	1 1.6 2.3	30 50 65	39 35 24	38 36 35	0 0 0	

Temperature Relationship Test Chart						
	Evaporator Outlet ±3°F	Evaporator Inlet ±3°F	Suction Line ±7°F	Average Total Wattage ±10%	Suction Pressure ±2 PSIG	Head Pressure ± 5 PSIG
Ambient °F	70° 90°	70° 90°	70° 90°	70° 90°	70° 90°	70° 90°
Mid Level Electronic	-20 -17	-20 -17	85 105	125 130	6"(Vac.) 1	85 135

Component Specifications

Component	Specifications all parts 115VAC/60HZ unless noted	
Compressor run capacitor	Volt..... 210 VAC Capacitance..... 15 µfd ± 10%	180 VAC or 210 VAC 12 µfd ± 10%
Compressor	With GE PTC Relay	With Embraco TSD Relay
	BTUH..... 695 BTUH Watt..... 60 Hz / 124 watts Current Lock rotor..... 13.3 amps± 15% Current Full load..... 2.0 amps± 15% Resistance Run windings..... 3.6 ohms± 15% Resistance Start windings..... 5.3 ohms± 15%	695 BTUH 60 Hz / 121 watts 13.3 amps± 15% 2.00 amps± 15% 3.6 ohms± 15% 5.3 ohms± 15%
Electric damper control	Maximum closing time..... 8 seconds Temperature Rating..... 20°F- 110°F RPM..... 5	
Thermistor	Temperature..... Resistance 77°F..... 10,000 ohms± 1.8% 36°F..... 29,500 ohms± 1.0% 0°F..... 86,300 ohms± 1.8%	
Condenser motor	Rotation (facing end opposite shaft)..... Clockwise RPM..... 1120 RPM Watt..... 3.4 watts±15%@115VAC Current..... 0.085 amps± 15%@115VAC	
Evaporator fan motor	Rotation (facing end opposite shaft)..... Clockwise RPM..... 2800 RPM Watt..... 6.0±15% watts@115 VAC Note: Fan blade must be fully seated on shaft to achieve proper airflow.	
Overload/Relay	Ult. trip amps @ 158°F (70°C)..... 2.60 amps± 15% Close temperature..... 140°F ±18° Open temperature..... 239°F ±9° Short time trip (seconds)..... 14 seconds ±4 Short time trip (amps @77°F (25°C)..... 12 amps ±2amps	3.06 amps± 15% 142°F ±16° 221°F ±9° 5-15 seconds 14.5 amps ±2amps
Thermostat (Defrost)	Volt..... 120/240 VAC Watt..... 495 watts Current..... 5.8/2.9 amps Resistance across terminals: 56 K ohms Above 42°F ±5°..... Open Below 12°F ±7°..... Closed	
Evaporator heater	Volt..... 115 VAC Wattage..... 435 ±5% watts @ 115VAC(22 cubic ft. models) 470 ±5% watts @ 115VAC(25 cubic ft. models) Resistance..... 29 ±5% ohms	
Control board	Volt..... 120VAC, 60 HZ See Control board troubleshooting section	
Dual Water Valve	Watts..... Blue side 35w,Yellow side 20w	
Ice Box Fan	Rotation (facing end opposite shaft)..... Clockwise RPM..... 3000 RPM Watt..... 5.5 .9±15% watts@12 VDC Note: Fan blade must be fully seated on shaft to achieve proper airflow.	
Light switch	Type..... SPDT NO/NC Volt..... 125/250 VAC Current..... 8/4 amps	

Control board Troubleshooting

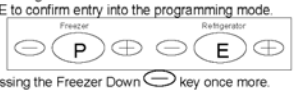
Programming Mode:

Note: The Program Code is located on the Serial Plate on this unit after the word Code.

1. Open the Fresh Food door and hold the Fresh Food door light switch closed while pushing the Freezer Temperature Down ⊖ Key pad 3 times consecutively.

Note: The 3 Keystrokes must be done consecutively and within 10 seconds.

2. Release the Fresh Food door light switch.
3. The control will display PE to confirm entry into the programming mode.



4. Entry is confirmed by pressing the Freezer Down ⊖ key once more.

Note: All control functions will be turned off (Compressor, Defrost, Evaporator Fan, the damper will remain in its current position).

Control board Troubleshooting (continued)

5. The control will display the current Program Code. This value should be validated with the Program Code printed on the unit serial plate.

Note: If the Program Code is correct, the Programming Mode is exited by closing the Refrigerator door(s).

6. To set the desired Program Code number press the Freezer and Refrigerator UP ⊕ keys. The corresponding digit will be advanced with each key press.
7. Once the desired Program Code is displayed, press the Freezer DOWN ⊖ Key until the Program Code begins flashing indicating it has been saved.

Note: If you attempt to enter an invalid Program Code the control will not save the new code, but will flash the old code and this will be displayed. (The unit will NOT run with a Program Code of 00).

8. Once the Program Code has been saved the Programming Mode is exited by closing the Refrigerator door(s). If the new code is incorrect this process should be repeated after closing the Refrigerator door(s).

The Programming mode can be exited at any time by closing the Refrigerator Door(s).

Defrost Operation:

The Control Board adapts the compressor run time between defrosts to achieve optimum defrost intervals by monitoring the length of time the defrost heater is on.
After initial power up, defrost interval is 4 hours compressor run time. Defrost occurs immediately after the 4 hours.
Note: Once unit is ready to defrost there is a 4 minute wait time prior to the beginning of the defrost cycle.
Optimum defrost is 15 minutes. Each additional minute the defrost thermostat remains closed, 1 hr. is subtracted from the previous defrost interval. Each minute the thermostat opens prior to optimum defrost, it extends the next defrost interval 1 hr. When defrost thermostat opens there is a 4-6 minute drip time before compressor restarts or Control Board will terminate defrost at 25 minutes if defrost thermostat has not opened and will reset the defrost interval to the 8 hr. minimum setting.
4 hours of continuous compressor run resets the next defrost interval to 8 hours and will initiate a defrost, if 8 hours of compressor run time has also occurred.

Forced Defrost Mode:

The forced defrost function is performed using the refrigerator display and keypad. Enter the Forced Defrost Mode by performing the following sequence of events:

1. Hold the refrigerator door light switch closed.
2. Press the Refrigerator Temperature Down ⊖ keypad 3 times consecutively.

Note: The 3 keystrokes must be consecutive and within 10 seconds.

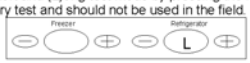
3. Release the refrigerator door light switch.
4. The control will display Fd to confirm entry into the Forced Defrost Mode.

5. Entry is confirmed by pressing the Refrigerator Down ⊖ key once more. The unit is off and in the Defrost Mode.

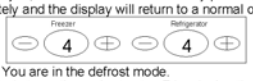
Note: All control functions will be turned off (Compressor, Defrost, Evaporator Fan, the damper will remain in its current position).

6. The control will default to the short run period test as shown here.

Note: You can toggle between the (S)hort and (L)ong test mode by pressing the Refrigerator UP ⊕ Key. Long Test mode is used for factory test and should not be used in the field.



7. Once the desired mode is displayed, confirm the forced defrost by pressing the Refrigerator ⊖ down Key once. The defrost will begin immediately and the display will return to a normal operating display with set point values.



8. Close the Refrigerator door(s). You are in the defrost mode.

Note: Forced Defrost mode can be exited at any time prior to step 7 by closing the Refrigerator Door(s).

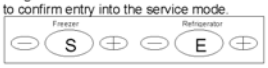
Service Test Mode:

The service test functions are performed using the refrigerator display and keypad. Enter the Service Test Mode by performing the following sequence of events:

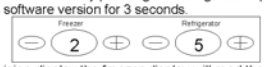
1. Hold the refrigerator door light switch closed.
2. Press the Refrigerator Temperature Up ⊕ keypad 3 times consecutively.

Note: The 3 Keystrokes must be done consecutively and within 10 seconds.

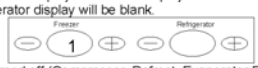
3. Release the refrigerator door light switch.
4. The control will display SE to confirm entry into the service mode.



5. Entry to the Service Menu is confirmed by pressing the Refrigerator Up ⊕ key once more.
6. The control will display its software version for 3 seconds.



7. Following the software revision display the freezer display will read the first test number in the diagnostic tree. The refrigerator display will be blank.



Note: All control functions will be turned off (Compressor, Defrost, Evaporator Fan, the damper will remain in its current position)

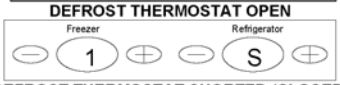
8. You are now in the SERVICES TEST operational mode and may use the diagnostic tests.

The Service Test Mode can be exited at any time by closing the Refrigerator Door(s).

Service Test 1 – Defrost Thermostat & Defrost Circuit Test

When selected this test will display the state of the defrost thermostat. In order to perform this test the defrost heater will be energized. The test is activated and deactivated using the Refrigerator Up ⊕ key. Once activated, this test must be de-activated to move to another test number. The Freezer Up ⊕ / Down ⊖ keys allow selection of the test to be performed.
This test also allows observation and measurement of proper defrost function. You can observe defrost heat and voltages while the test is activated.

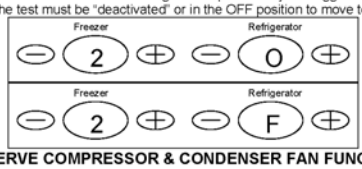
DEFROST THERMOSTAT OPEN



DEFROST THERMOSTAT SHORTED (CLOSED)

Service Test 2 – Compressor/Condenser Fan Test

When selected and activated this test will operate the Compressor/Condenser Fan circuit. You should evaluate proper operation of the compressor and condenser fan. The Refrigerator Up ⊕ key will toggle between "O" / "F" (ON & OFF) the compressor drive circuit. The test must be "deactivated" or in the OFF position to move to another test selection.

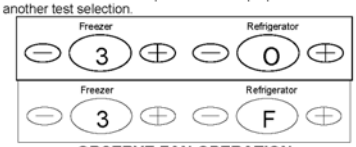


OBSERVE COMPRESSOR & CONDENSER FAN FUNCTION

Control board Troubleshooting (continued)

Service Test 3 – Evaporator/Freezer Fan Test

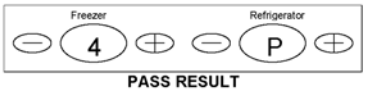
When selected and activated this test will operate the freezer fan. The Refrigerator Up ⊕ key will toggle between "O" / "F" (ON & OFF) the fan drive circuit. You will have to inspect the fan for proper function. The test must be "deactivated" or in the OFF position to move to another test selection.



OBSERVE FAN OPERATION

Service Test 4 – Fresh Food Thermistor Test

When selected and activated this test will display Pass, Open, Short result for a test on the Fresh Food Thermistor circuit as show below. The test is activated and de-activated via the Refrigerator Up ⊕ key, and must be de-activated to move to another test selection.



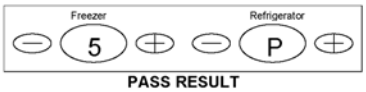
PASS RESULT

OPEN RESULT

SHORT RESULT

Service Test 5 – Freezer Thermistor Test

When selected this test will display Pass, Open, Short result for a test on the Freezer Thermistor circuit as show below. The test is activated and de-activated via the Refrigerator Up ⊕ key, and must be de-activated to move to another test selection.



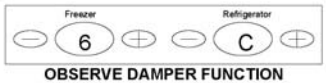
PASS RESULT

OPEN RESULT

SHORT RESULT

Service Test 6 – Open Damper Test

When selected this test will indicate the current position "O" / "C" (OPEN / CLOSED) of the refrigerator damper. The Refrigerator Up ⊕ key will toggle the damper open and closed. You must allow 1 minute for each attempt to change the damper position. You should observe proper damper function.



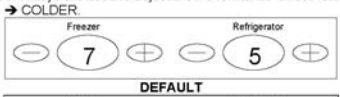
OBSERVE DAMPER FUNCTION

Note: Adjustments of Service Test 7 or Service Test 8 will alter the performance of the unit.

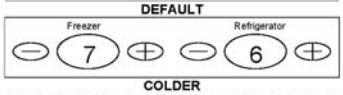
Service Test 7 – FF Performance Adjustment

This test will allow adjustment of the control performance points. Each step will incrementally change the Refrigerator performance warmer 1° (towards 1) or colder 1° towards (9) as adjusted. The default value is 5.

The refrigerator ⊕/⊖ Up/Down keys are used to adjust the Performance Offset value.
WARMER ←(1 2 3 4 (**5**) 6 7 8 9) → COLDER.



DEFAULT



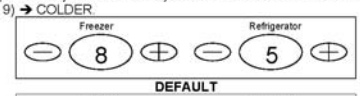
COLDER

The last FF Performance Offset value displayed before leaving test 7 will be saved when the refrigerator door(s) is closed.

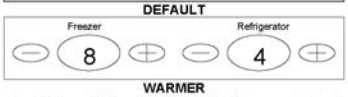
Service Test 8 – FZ Performance Adjustment

This test will allow the adjustment of the control performance points. Each step will incrementally change the Freezer performance warmer 1° (towards 1) or colder 1° towards (9) as adjusted. The default value is 5.

The refrigerator ⊕/⊖ Up/Down keys are used to adjust the Performance Offset value.
WARMER ←(1 2 3 4 (**5**) 6 7 8 9) → COLDER.



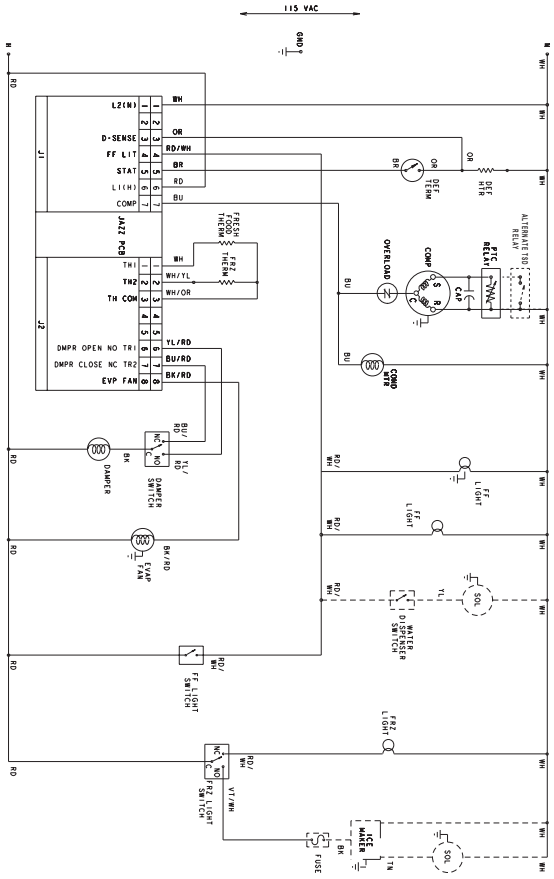
DEFAULT



WARMER

The last FZ Performance Offset value displayed before leaving test 8 will be saved when the refrigerator door(s) is closed.

Schematic



Wiring Diagram