

FOR SERVICE TECHNICIAN'S USE ONLY

NOTE: This sheet contains important Technical Service Data

Do Not Remove Or Destroy

⚠ DANGER

Electrical Shock Hazard

Only authorized technicians should perform diagnostic voltage measurements.

After performing voltage measurements, disconnect power before servicing.

Failure to follow these instructions can result in death or electrical shock.

⚠ WARNING

Electrical Shock Hazard

Disconnect power before servicing.

Replace all parts and panels before operating.

Failure to do so can result in death or electrical shock.

Voltage Measurement Safety Information

When performing live voltage measurements, you must do the following:

- Verify the controls are in the off position so that the appliance does not start when energized.
- Allow enough space to perform the voltage measurements without obstructions.
- Keep other people a safe distance away from the appliance to prevent potential injury.
- Always use the proper testing equipment.
- After voltage measurements, always disconnect power before servicing.

Component Specifications

Component	Specifications all parts - 115 VAC/60 Hz unless noted	
Cooling		
Compressor	BTU/H	921 BTU/H VTX1116Y
	Watt	169 W
	Current lock rotor	2.53 A
	Current full load	0.9 A (Ambient Temperature < 85°C), 1.0 A (Ambient Temperature < 80°C)
	Resistance full windings	24.7 Ω (no starting winding for VCC)
	Resistance start windings	N/A
Electric Damper Control*	Maximum closing time	10 seconds
	Temperature rating	-30°C to 45°C
Condenser Motor NOTE: Fan blade must be fully seated on shaft to achieve proper airflow.	RPM	333
	Rotation (facing name plate side)	Clockwise
	RPM	1500
Refrigerator Evaporator Fan Motor (Only applicable to the dual evaporator models)	Watt	2.0 ± 15% W @ 12.7 VDC
	Rotation (facing name plate side)	Clockwise
	RPM	1900
Freezer Evaporator Fan Motor	Rotation (facing name plate side)	Counter-Clockwise
	RPM	1700
	Watt	5.6 ± 15% W @ 12.7 VDC
Freezer Evaporator Heater	Wattage	310 ± 5% W @ 115 VAC
	Resistance	42.7 ± 5% Ω
Refrigerator Evaporator Heater (Applicable only for certain models)	Wattage	125 ± 5% W @ 115 VAC
	Resistance	105.8 ± 5% Ω
Controls		
Control Board	Voltage	120 ± 10% VAC
	Temperature	Resistance
Thermistor	77°F (25°C)	2.69 kΩ
	36°F (2.2°C)	7.83 kΩ
	0°F (-18°C)	22.77 kΩ
	Type	Reed Switch (Magnetic)
Light Switch*	Voltage	5 VDC
	Current	0.5 ADC Maximum
	*IEC 60079-15 certified for use in explosive atmosphere.	

Component	Specifications all parts - 115 VAC/60 Hz unless noted	
Ice and Water		
Dual Water Valve	Wattage	20 W at 23°C and 120 VAC
Isolation Valve	Wattage	20 W at 23°C and 120 VAC
Ice Box Fan (Only applicable to in-door-ice models)	Rotation (facing name plate side)	Counter-clockwise
	RPM	3000
	Wattage	3.28 ± 1.51 W @ 12.7 VDC

Control Board Troubleshooting

Accessing Service Mode



To Enter Service Diagnostics Mode:
The service test functions are performed using the Refrigerator Temperature Display and keypad.
Enter the Service Test Mode by performing the following sequence of events: Press and release any 3 keypad buttons, three times: 1,2,3; 1,2,3; 1,2,3.
NOTE: The 3 selected keypad buttons must be pressed consecutively and within 8 seconds.
To exit Service Test Mode, press first selected button for 3 seconds.

Button	Press Duration	Navigation Action
1st button	Short	Confirm the execution step
	3 seconds	Back
	5 seconds	Return to main menu
2nd button	Short	Decrement
	3 seconds	Fast decrement
	5 seconds	No action
3rd button	Short	Advance
	3 seconds	Fast advance
	5 seconds	No action

Service Test - 10 Service Sensor Freezer Compartment (FC) Evaporator Sensor
 ■ Reads the current thermistor temperature in either °C or °F, depending on the state the user has selected prior to entering service mode, and displays to the service technician.
 ■ If the result is higher than the maximum threshold value, should display OPEN Circuit.
 ■ If the result is higher than the minimum threshold value, it should display SHORT Circuit.
 ■ Threshold values must be component dependent.

Service Test - 12 Service Sensor FC Sensor
 ■ Reads the current thermistor temperature in either °C or °F, depending on the state the user has selected prior to entering service mode, and displays to the service technician.
 ■ If the result is higher than the maximum threshold value, should display OPEN Circuit.
 ■ If the result is higher than the minimum threshold value, it should display SHORT Circuit.
 ■ Threshold values must be component dependent.

Service Test - 13 Service Sensor Refrigerator Compartment (RC) Sensor
 ■ Reads the current thermistor temperature in either °C or °F, depending on the state the user has selected prior to entering service mode, and displays to the service technician.
 ■ If the result is higher than the maximum threshold value, should display OPEN Circuit.
 ■ If the result is higher than the minimum threshold value, it should display SHORT Circuit.
 ■ Threshold values must be component dependent.

Service Test - 15 Service Sensor ICEMAKER 2 Sensor
 ■ Reads the current thermistor temperature in either °C or °F, depending on the state the user has selected prior to entering service mode, and displays to the service technician.
 ■ If the result is higher than the maximum threshold value, should display OPEN Circuit.
 ■ If the result is higher than the minimum threshold value, it should display SHORT Circuit.
 ■ Threshold values must be component dependent.

Service Test - 17 Service Sensor Pantry Sensor
 ■ Reads the current thermistor temperature in either °C or °F, depending on the state the user has selected prior to entering service mode, and displays to the service technician.
 ■ If the result is higher than the maximum threshold value, should display OPEN Circuit.
 ■ If the result is higher than the minimum threshold value, it should display SHORT Circuit.
 ■ Threshold values must be component dependent.

Service Test - 25 Service Sensor Ambient 0 Sensor
 ■ Reads the current thermistor temperature in either °C or °F, depending on the state the user has selected prior to entering service mode, and displays to the service technician.
 ■ If the result is higher than the maximum threshold value, should display OPEN Circuit.
 ■ If the result is higher than the minimum threshold value, it should display SHORT Circuit.
 ■ Threshold values must be component dependent.

Service Test - 29 Service Sensor Humidity 0 Sensor
 ■ Reads and displays the current Relative Humidity percentage.
NOTE: If the sensor measurement is smaller than the sensor range (See Component Datasheet), the UI shall show Open Circuit. If the value is higher than the sensor range, the UI shall show Short Circuit.

Service Test - 41 Service Door RC Left, RC Right or FC Door
 ■ Polls the feedback signal state of the door switch.
 ■ Displays the state of the door switch, the following designation shall be used.
 ■ UI shall display if Door is Open or Closed.

Service Test - 61 Service Defrost Forced FC Defrost
 ■ Entering the test, the display shows the forced defrost state of the unit in the related compartment. Upon exiting Service Mode the forced defrost routine shall be executed.

Service Test - 72 Service Compressor Cooling Test Compressor
 ■ For all configurations, run the compressor at 100%.
 ■ For Single Evaporator Models.
 ■ After entering, the compressor + condenser fan will be turned ON and will be turned OFF when leaving the step.

Service Test - 75 Service Compressor Set Speed Compressor
 ■ Compressor will run at the speed selected by the technician by the use of Enter Button (HMI only) to increase speed. It will have a fast increase mode with the rate of change, size of the step change. Minimum and maximum value of compressor speed will follow compressor parameters.

Service Test - 80 Service Damper RC Damper
 ■ Runs continuous operation of the air baffle and polls the feedback signal of the air baffle home position. Compartment fan will also be turned on. If feedback is available and functional or the damper doesn't have feedback, HMI will display the state of the damper as Opening or Closing. If the feedback is available but not working, the HMI will display that damper has Feedback Fault.

Service Test - 81 Service Damper Pantry Damper
 ■ Runs continuous operation of the air baffle and polls the feedback signal of the air baffle home position. Compartment fan will also be turned on. If feedback is available and functional or the damper doesn't have feedback, HMI will display the state of the damper as Opening or Closing. If the feedback is available but not working, the HMI will display that damper has Feedback Fault.

Service Test - 91 Service Light FC Light
 ■ Turn on the lighting output for the FC.

Service Test - 92 Service Light RC Light
 ■ Turn on the lighting output for the RC.

Service Test - 111 Service Fan FC Fan
 ■ Turns on the FC fan operating at 100% duty cycle.

Service Test - 113 Service Fan Condenser Fan
 ■ Turns on the Condenser fan operating at 100% duty cycle.

Service Test - 131 Service Heater Defrost FC Heater
 ■ Turns on the defrost heater operating at 100% duty cycle.
NOTE: As a protection to the defrost system, and to avoid thermofuse failure, the technician should not run the defrost heater for more than 5 minutes. Following this time duration, the defrost heater should be turned off.

Service Test - 134 Service Heater Flipper Heater
 ■ Turns on the heater operating at 100% duty cycle.

Service Test - 144 Service Heater Ice maker (IM) Fill Tube 2 Heater
 ■ Turns on the heater operating at 100% duty cycle.

Service Test - 181 Service IM Harvest IM2 Ice Maker
 ■ Inside this step, a technician forces the ice maker module to execute a homing and harvest cycle.
 ■ Display will indicate "on", while the test is running.

Service Test - 200 Service UI LED All ON UI
 ■ Light all LED indicators and icons in all available UIs in the system.
NOTE: To protect boards, step will timeout after 30 seconds and return to main menu.

Service Test - 240 Service Filter (Water Filtration Capacity Remaining in Gallons)
 ■ Entering this step allows technicians to read the remaining capacity of the water filter in gallons. Gallons remaining will be subtracted from the parameter found in the flashmap/setting file.
NOTE: The allowable range is 0 to 999. The actual maximum value is found within the flashmap/setting file.

Service Test - 241 Service Filter (Water Filtration Capacity Remaining in Days)
 ■ Entering this step allows technicians to read the remaining capacity of the water filter in days. Days remaining will be subtracted from the parameter found in the flashmap/setting file.
NOTE: The allowable range is 0 to 999. The actual maximum value is found within the flashmap/setting file.

Service Test - 243 Filter Water Number of resets
 ■ Entering this step allows the technician to view how many times the user has reset their water filters.

ERROR CODES				
CODE	ENG. CODE	PRIORITY	TYPE	DESCRIPTION
F3E1	0	16	-	Refrigerator Compartment Temperature Sensor
F3E2	0	15	-	Freezer Compartment Temperature Sensor
F3E4	0	13	-	Freezer Compartment or Main Evaporator In Sensor
F3E6	0	14	-	Refrigerator Compartment or Evaporator In Sensor
F3E8	0	22	-	External RH Sensor
F3E9	0	21	-	Ambient Temperature Sensor
F3EB	0	18	-	Pantry/CC Temperature Sensor
F4E1	0	3	TYPE 1	Freezer Compartment or Main Evaporator Heater
F4E2	0	4	TYPE 1	Refrigerator Compartment or Evaporator Heater
F6E1	0	1	-	Compressor Failure Between ACU 1 and HMI 1
F7E1	0	2	TYPE 2	Compressor Not Functioning
FAE1	0	6	TYPE 2	Refrigerator Evaporator Fan
FAE2	0	5	TYPE 2	Freezer Evaporator Fan
FAEB	0	7	DAMPER FAIL	Damper 1 (RC Damper)
FAEB	1	8	BLOCKED FAIL	Damper 1 (RC Duct)
FAEB	2	9	LEAKAGE FAIL	Damper 1 (RC Leakage)
FAEC	0	10	DAMPER FAIL	Damper 2 (Pantry Damper)
FAEC	1	11	BLOCKED FAIL	Damper 2 (Pantry Duct)
FAEC	2	12	LEAKAGE FAIL	Damper 2 (Pantry Leakage)
FBE1	0	17	-	Ice Box Sensor
FBE2	0	19	-	Ice Maker Temperature Sensor 1
FBEB	0	20	-	Ice Maker Temperature Sensor 2

VOLTAGE TABLE					
ACU	Connector Port	From	To	Voltage	Conditions
THESEUS	P1	P1-1	P1-2	115 VAC	CONSTANT 115 VAC
		P2-5	P1-2		FC ICE MAKER VALVE 115 V
		P2-6	P1-2		RC WATER DISP VALVE 115 V
	P2	P2-7	P1-2		FC DEFROST HEATER 115 V
		P4-1	P4-4	12.7 VDC	POWER SUPPLY CH.1 12.7 VDC
	P4	P4-3			WIN DATA
		P5-1	P5-2	5 VDC	RC THERMISTOR OUTPUT = 1.5 VDC-5 VDC MAXIMUM
	P5	P5-3	P5-4	5 VDC	FC EVAPORATOR THERMISTOR OUTPUT = 1.5 VDC-5 VDC MAXIMUM
		P8-1	P8-2	12.7 VDC	INTERNAL DISPENSER PADDLE 12.7 VDC WHEN ACTIVATED
	P8	P8-3	P8-2	12.7 VDC	RC LEFT, RC RIGHT AND FC DOOR REED SWITCHES. 12.7 VDC WHEN ALL CLOSED
		P8-6	P8-4	12.7 VDC	FC EVAPORATOR FAN POWER SUPPLY 12.7 VDC
P8-6		P8-5	12.7 VDC	FC EVAPORATOR FAN SIGNAL OUTPUT = 5 VDC-12.7 VDC MAXIMUM	
P8-8		P8-7	12.7 VDC	COMPRESSOR's VCC DRIVER SIGNAL 5 VDC-12.7 VDC MAXIMUM	
P9-1		P9-3	12.7 VDC	CONDENSER FAN POWER SUPPLY 12.7 VDC	
P9	P9-1	P9-2	12.7 VDC	CONDENSER FAN SIGNAL OUTPUT = 5 VDC-12.7 VDC MAXIMUM	
	P10-1	P10-2	12.7 VDC	FC POINT LED 350 mA	
	P10-4	P10-5	12.7 VDC	RC SKYLIGHT LED 12.7 VDC STRIP LEDs 12.7 VDC	
P10	P10-6	P10-7	5 VDC	FC THERMISTOR OUTPUT = 1.5 VDC-5 VDC MAXIMUM	
	P11-1	P11-2	12.7 VDC	STEPPER C-, C+ FOR ICE MAKER MOTOR 12.7 VDC	
	P11-4	P11-3	12.7 VDC	RC/FC DAMPER HEATER 12.7 VDC	
P11	P11-4	P11-5	12.7 VDC	FC FILL TUBE HEATER 12.7 VDC	
	P12-1	P12-2	12.7 VDC	STEPPER D+, D- for PANTRY DAMPER MOTOR 12.7 VDC	
	P12-3	P12-4	12.7 VDC	STEPPER E+, E- for PANTRY DAMPER MOTOR 12.7 VDC	
	P12-5	P12-6	12.7 VDC	PANTRY DAMPER HEATER 12.7 VDC 1 W MAXIMUM	
P70	P70-1	P70-2	5 VDC	PANTRY THERMISTOR OUTPUT = 1.5 VDC-5 VDC MAXIMUM	
	P70-3	P70-4	12.7 VDC	ICE MAKER TAC SWITCH FOR MOTOR FEEDBACK	
	P70-5	P70-6	12.7 VDC	STEPPER A+, A- for PANTRY DAMPER MOTOR 12.7 VDC	
	P70-7	P70-8	12.7 VDC	STEPPER A+, A- for PANTRY DAMPER MOTOR 12.7 VDC	
	P70-9	P70-4	5 VDC	FC ICE MAKER THERMISTOR OUTPUT = 1.5 VDC-5 VDC MAXIMUM	

