

TROUBLESHOOTING GUIDES

This section of the manual contains:

- The Error Code Structure Table
- Error Code Troubleshooting Guide
- Sealed System Troubleshooting / Diagnostic Tables

HOW TO USE THE ERROR CODE TROUBLESHOOTING GUIDE

Error codes, or faults are logged when electrical errors are detected. Depending on the error's severity, the error may appear on the display when the door is opened or only when in diagnostic mode. See Error Severity Explained below.

To clear the error codes, the problem must be corrected and the unit must be ON. Then, press the Clear Faults key in diagnostic mode.

Error Severity Explained

Low	1 = Error is logged and only readable through service menu, no indication to user, no chime
	2 = <u>Splash screen to user upon door opening, error logged in service and user menu. No chime</u>
Med	3 = Steady on screen to user upon door opening, error logged in service and user menu, No chime
	4 = Steady on screen to user upon door opening, error logged in service and user menu, with chime when door open
Critical	5 = Steady on screen to user upon door opening, error logged in service and user menu, with chime when door closed

POSSIBLE INSTRUCTION AND ERROR/FAULT INDICATORS
Code Structure

Device/System		Zones		Failures	
10	Thermistor Faults	0	Misc	00	Open
15	Relay Faults	1	Zone 1	01	Short/Closed
20	Defrost Heater Faults	2	Zone 2	02	Unstable
30	Ice/Water/Accessory Faults	3	Zone 3	05	Miswire Normal Temps
35	Fan Faults	4	Defrost System	06	Miswire Overheat
40	Runtime Faults	5	Control System	07	Bad Ohms
44	Glass Heater Faults	6	Compressors	09	Too Warm/Large Temp Differential
45	Lighting Faults	7	Ambient	10	Second Device Open
50	Flow Meter Faults	8	Icemaker	11	Second Device Short/Closed
60	Load/Component Faults	9	Dispenser	12	Second Device Unstable
90	Control Faults	A	Air Filter	20	Third Device Open
95	Diagnostics	L	Lighting	21	Third Device Short/Closed
98	Power Faults	U	Water System	22	Third Device Unstable
		H	High Voltage System	25	Diagnostics Failure
		C	Condenser	30	Valve Enabled Too Long
		b	Baffle	33	Speed Setting Too Low
				34	Speed Setting Too High
				35	Fan Speed Error
				36	Fan Current Too Low
				37	Fan Current Too High
				38	FET Power Output Fault
				39	DC Output Fault
				40	Excessive Runtime
				42	Primary Heater Fault
				43	Secondary Heater Fault
				44	Door Heater Output Fault
				45	Burned Out Light
				46	No Position/State Detect
				50	Open Heater
				55	Triac Open
				56	Triac Short
				60	No Load/Load Open
				65	Stuck at Dispenser Water Valve Out
				66	Stuck at Ice Water Valve Out
				70	Bad Flash Write
				71	Flash Initialized
				72	Flash Memory Bad
				73	Flash Memory Not Present
				74	Invalid E2 Checksum
				75	Invalid Model E2 Checksum

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Device/System		Zones		Failures	
10	Thermistor Faults	0	Misc	80	No Communication
15	Relay Faults	1	Zone 1	81	Communications Timeout
20	Defrost Heater Faults	2	Zone 2	82	Partial Communications
30	Ice/Water/Accessory Faults	3	Zone 3	83	Bad Micro Communication
35	Fan Faults	4	Defrost System	84	Micro Initialization
40	Runtime Faults	5	Control System	85	Display Failure
44	Glass Heater Faults	6	Compressors	86	Flow Too Slow
45	Lighting Faults	7	Ambient	87	No Flow
50	Flow Meter Faults	8	Icemaker	90	Framing Errors
60	Load/Component Faults	9	Dispenser	92	Excessive Collisions
90	Control Faults	A	Air Filter	93	Data Overrun
95	Diagnostics	L	Lighting	95	FMEA Error
98	Power Faults	U	Water System	96	Calibration or Low Signal Error
		H	High Voltage System	97	Quantum SPI
		C	Condenser	98	Brownout
		b	Baffle	99	Other

ERROR CODE TROUBLESHOOTING GUIDE			
CODE	SEVERITY	FAULT DESCRIPTION	DETAILS/TEST/ACTION
10 C 00	2	Condenser Thermistor Open	Check ohms and verify temperature readings.
10 C 01	2	Condenser Thermistor Short	Check ohms and verify temperature readings.
10 C 02	2	Condenser Thermistor Unstable	Check for bad connections and/or damaged wires.
10 1 00	2	Zone 1 Cabinet Thermistor Open	Check ohms and verify temperature readings.
10 1 01	2	Zone 1 Cabinet Thermistor Short	Check ohms and verify temperature readings.
10 1 02	2	Zone 1 Cabinet Thermistor Unstable	Check for bad connections and/or damaged wires.
10 1 10	2	Zone 1 Evaporator Thermistor Open	Check ohms and verify temperature readings.
10 1 11	2	Zone 1 Evaporator Thermistor Shorted	Check ohms and verify temperature readings.
10 1 12	2	Zone 1 Evaporator Thermistor Unstable	Check for bad connections and/or damaged wires.
10 2 00	2	Zone 2 Cabinet Thermistor Open	Check ohms and verify temperature readings.
10 2 01	2	Zone 2 Cabinet Thermistor Short	Check ohms and verify temperature readings.
10 2 02	2	Zone 2 Cabinet Thermistor Unstable	Check for bad connections and/or damaged wires.
10 2 10	2	Zone 2 Evaporator Thermistor Open	Check ohms and verify temperature readings.
10 2 11	2	Zone 2 Evaporator Thermistor Shorted	Check ohms and verify temperature readings.
10 2 12	2	Zone 2 Evaporator Thermistor Unstable	Check for bad connections and/or damaged wires.
10 3 00	2	Zone 3 Cabinet Thermistor Open	Check ohms and verify temperature readings.
10 3 01	2	Zone 3 Cabinet Thermistor Short	Check ohms and verify temperature readings.
10 3 02	2	Zone 3 Cabinet Thermistor Unstable	Check for bad connections and/or damaged wires.

ERROR CODE TROUBLESHOOTING GUIDE			
CODE	SEVERITY	FAULT DESCRIPTION	DETAILS/TEST/ACTION
10 3 10	2	Zone 3 Evaporator Thermistor Open	Check ohms and verify temperature readings.
10 3 11	2	Zone 3 Evaporator Thermistor Shorted	Check ohms and verify temperature readings.
10 3 12	2	Zone 3 Evaporator Thermistor Unstable	Check for bad connections and/or damaged wires.
10 7 00	1	Ambient thermistor on control board open	Replace control board
15 1 00	5	Zone 1 compressor relay stuck open	Error is thrown if no current detected, could be no load, or open relay. Also could be the inverter or harness. Check all wiring, compressor, inverter and control board connections. Possibly issue with control board or inverter.
15 1 01	5	Zone 1 compressor relay is stuck closed. Verify and replace control board. 120V to compressor at all times.	Verify and replace control board. 120V to compressor at all times.
15 2 00	5	Zone 2 compressor relay stuck open	Error is thrown if no current detected, could be no load, or open relay. Also could be the inverter or harness. Check all wiring, compressor, inverter and control board connections. Possibly issue with control board or inverter.
15 2 01	5	Zone 2 compressor relay is stuck closed. Verify and replace control board. 120V to compressor at all times.	Verify and replace control board. 120V to compressor at all times.
15 3 00	5	Zone 3 compressor relay stuck open	Error is thrown if no current detected, could be no load, or open relay. Also could be the inverter or harness. Check all wiring, compressor, inverter and control board connections. Possibly issue with control board or inverter.
15 3 01	5	Zone 3 compressor relay is stuck closed. Verify and replace control board. 120V to compressor at all times.	Verify and replace control board. 120V to compressor at all times.
15 4 00	2	Defrost relay stuck open	Verify and replace control board. No power to defrost heater
15 4 01	3	Defrost relay stuck closed	Verify and replace control board. 120V to defrost heater at all times.

ERROR CODE TROUBLESHOOTING GUIDE

CODE	SEVERITY	FAULT DESCRIPTION	DETAILS/TEST/ACTION
15 C 00	1	AC Condenser Fan Relay Stuck open	Verify and replace control board. No power to condenser
15 C 01	1	AC Condenser Fan Relay Stuck closed	Verify and replace control board. Power (AC or DC) to compressor at all times.
15 U 00	1	Water valve no current detected	No current change detected for a activated call for water or dispense. Possible stuck open relay, or failed valve. Check all valves and proper voltage from control output
15 U 01	4	Water valve current detected	After valid dispense or ice maker fill, current is still detected for a water call. Check for shorted relay. Replace control board.
20 2 00	2	Defrost Bi-metal stuck open	Verify the bi-metal is open circuit below 40F. Replace if necessary.
20 2 01	2	Defrost Bi-metal stuck closed	Verify the bi-metal is closed above 70F. Replace if necessary.
20 2 05	1	Defrost Bi-metal Mis-wire w/ normal temps	Normal defrost temps, but inappropriate response from bi-metal. Check wiring and bi-metal mounting.
20 2 06	2	Defrost Bi-metal Mis-wire w/ overheat	High temps during defrost, and inappropriate response from bi-metal. Check wiring and bi-metal mounting.
20 2 50	2	Defrost heater open / Check Ohms	Verify wiring and heater. Check heater ohms. Replace heater if necessary.
30 8 05	1	Icemaker no water valve in signal	No signal from icemaker for fill. Check wiring and power to ice maker.
35 1 00	2	Zone 1 Evap Fan Open	Check Control Board and Fan
35 1 33	1	Zone 1 Fan Speed Set Too Low	Verify fan not shorted - the fan is running faster than it's setting
35 1 34	1	Zone 1 Fan Speed Set too High	Check fan for obstructions that could cause too not be able to achieve full speed
35 2 00	2	Zone 2 Evap Fan Open	Check Control Board and Fan
35 2 33	1	Zone 2 Fan Speed Set Too Low	Verify fan not shorted - the fan is running faster than it's setting
35 2 34	1	Zone 2 Fan Speed Set too High	Check fan for obstructions that could cause too not be able to achieve full speed
35 3 00	2	Zone 3 Evap Fan Open	Check Control Board and Fan
35 3 33	1	Zone 3 Fan Speed Set Too Low	Verify fan not shorted - the fan is running faster than it's setting

ERROR CODE TROUBLESHOOTING GUIDE			
CODE	SEVERITY	FAULT DESCRIPTION	DETAILS/TEST/ACTION
35 3 34	1	Zone 3 Fan Speed Set too High	Check fan for obstructions that could cause too not be able to achieve full speed
35 A 00	1	Air Filter Fan Open	Check Control Board and Fan
35 C 00	1	DC Condenser Fan open	Check wiring and power to condenser fan.
35 C 33	1	DC Condenser Fan Set Too Low	Verify fan not shorted - the fan is running faster than it's setting
35 C 34	1	DC Condenser Fan Set too High	Check fan for obstructions that could cause too not be able to achieve full speed
40 1 00	1	Zone 1 Stepper Current Fault	No current detected
40 1 40	3	Zone 1 Excessive runtime	Verify performance of unit and check for door leaks, door ajar, proper charge in system, and icing of evap.
40 1 87	1	Zone 1 Stepper Cooling Fault	No cooling Detected
40 2 00	1	Zone 2 Stepper Current Fault	No current detected
40 2 40	3	Zone 2 Excessive runtime	Verify performance of unit and check for door leaks, door ajar, proper charge in system, and icing of evap.
40 2 87	1	Zone 2 Stepper Cooling Fault	No cooling Detected
40 3 40	3	Zone 3 Excessive runtime	Verify performance of unit and check for door leaks, door ajar, proper charge in system, and icing of evap.
40 9 40	1	Dispenser Max Time	Dispenser active for maximum fill time. Verify no stuck keys or flooding. Reset after 30 days, allows service time to review if any issues occurred / usage.
40 b 00	1	Baffle current fault	Baffle Stepper current fault.
40 b 87	1	Baffle Cooling Fault	Baffle Cooling / position fault
45 1 00	1	Lights open circuit	Main lights relay open
45 1 01	1	Lights short circuit	Main lights relay closed
45 2 00	1	Lights open circuit	Main lights relay open
45 2 01	1	Lights short circuit	Main lights relay closed
90 5 80	1	No UIM communications	Check wiring and key performance of User Interface Module.

ERROR CODE TROUBLESHOOTING GUIDE

ERROR CODE PROBLEM/CAUSE CODE			
CODE	SEVERITY	FAULT DESCRIPTION	DETAILS/TEST/ACTION
90 H 80	2	High voltage micro (CCM) no communication	Communications problems on main board. Replace board.
90 H 82	1	high voltage micro (CCM) partial comm	Intermittent communications on main board.
90 H 83	2	HV Micro bad (CCM) comm	Communications problems on main board. Replace board.
90 H 84	2	HV Micro (CMM) initialization	Initialization fault. Power cycle unit and verify if code remains active.

SEALED SYSTEM TROUBLESHOOTING / DIAGNOSTICS TABLES

NORMAL OPERATING PRESSURES TABLE NOTES:

- Only enter the sealed system to check pressures if the Error Code Troubleshooting Guide and General Troubleshooting Guide could not pinpoint the cause of the temperature problem.
- Always use solder-on process valves when entering the sealed system. Do NOT use bolt-on process valves as they are prone to leak.
- Whenever servicing the sealed system, the high-side filter-drier MUST be replaced.
- Pressures listed below are not indicative of initial pull down, but rather of a steadily running and properly functioning appliance.
- Pressures listed are for reference only, as actual pressure readings may vary because of one or more of the following reasons:
 1. Ambient temperatures (Pressures are based on a 70°F (21°C) Ambient).
 2. Temperature set-points (Pressures listed below are based on set-points of 0°F (-18°C) in freezers and 38°F (3°C) in refrigerators)
 3. Food load quantity and temperature.
 4. Condenser cleanliness.
 5. Gauge calibration.

NORMAL OPERATING PRESSURES			
Model		Normal Low-Side Pressures	Normal High-Side Pressures
IC-18FI	Freezer	5" Vac - 1 psi to 6 - 12 psi	75 psi to 120 psi
IC24R	Refrigerator	0 - 12 psi to 30 - 42 psi	75 psi to 110 psi
IC24FI	Freezer	5" Vac - 1 psi to 6 - 12 psi	75 psi to 120 psi
IC-30R(ID)	Refrigerator	0 - 12 psi to 30 - 42 psi	75 psi to 110 psi
IC-30FI	Freezer	5" Vac - 1 psi to 6 - 15 psi	75 psi to 120 psi
IC-36R(ID)	Refrigerator	0 - 12 psi to 30 - 42 psi	75 psi to 110 psi
IT-30CI(ID)	Freezer	5" Vac - 1 psi to 6 - 12 psi	75 psi to 120 psi
	Refrigerator	0 - 12 psi to 30 - 42 psi	75 psi to 110 psi
IT-30R(ID)	Refrigerator	0 - 12 psi to 30 - 42 psi	75 psi to 120 psi
IT-30FI	Freezer	5" Vac - 1 psi to 6 - 15 psi	75 psi to 120 psi
IT-36FI	Freezer	5" Vac - 1 psi to 6 - 15 psi	75 psi to 120 psi
IT-36CI(ID)	Freezer	5" Vac - 1 psi to 6 - 12 psi	75 psi to 120 psi
	Refrigerator	0 - 12 psi to 30 - 42 psi	75 psi to 110 psi
IT-36R(ID)	Refrigerator	0 - 12 psi to 30 - 42 psi	75 psi to 110 psi

PRESSURE INDICATIONS		
<i>If low-side pressure is</i>	<i>& high-side pressure is</i>	<i>possible problem is</i>
NORMAL	NORMAL	MECHANICAL (see General Troubleshooting Guide)
LOW	LOW	LEAK
LOW	HIGH	RESTRICTION
HIGH	LOW	INEFFICIENT COMPRESSOR
HIGH	HIGH	OVER CHARGE

EVAPORATOR TEMPERATURE / SEALED SYSTEM LOW-SIDE PRESSURE CORRELATION

NOTE: The temperature/pressure table at right is for reference only. A unit's temperature/pressure correlation may differ from those listed due to: variations in evaporator thermistor location, set-points, where the sealed system is in the refrigeration cycle, etc.

If a unit is experiencing temperature problems, it is recommended that you follow the "Pointers" in the first column of the General Troubleshooting Guide. After all mechanical and electrical components have been ruled out, sealed system pressures can be checked by applying solder-on process valves and referencing the preceding page. Do NOT use bolt-on process valves as they are prone to leak.

This table should only be used as a last quick check before entering the sealed system.

Temperature	Pressure
-30°F / -34°C	10" Vac / -.69 Bar
-25°F / -32°C	7" Vac / -.48 Bar
-20°F / -29°C	4" Vac / -.28 Bar
-15°F / -26°C	0" Vac / 0 Bar
-10°F / -23°C	2 Psi / .14 Bar
-5°F / -21°C	4 Psi / .28 Bar
0°F / -18°C	7 Psi / .48 Bar
5°F / -15°C	9 Psi / .62 Bar
10°F / -12°C	12 Psi / .83 Bar
15°F / -9°C	15 Psi / 1.03 Bar
20°F / -7°C	18 Psi / 1.24 Bar
25°F / -4°C	22 Psi / 1.51 Bar
30°F / -1°C	26 Psi / 1.79 Bar
35°F / 2°C	30 Psi / 2.07 Bar
40°F / 4°C	35 Psi / 2.41 Bar
45°F / 7°C	40 Psi / 2.76 Bar
50°F / 10°C	45 Psi / 3.10 Bar
55°F / 13°C	51 Psi / 3.52 Bar
60°F / 16°C	57 Psi / 3.93 Bar
65°F / 18°C	64 Psi / 4.41 Bar
70°F / 21°C	71 Psi / 4.90 Bar
75°F / 24°C	78 Psi / 5.38 Bar