

TROUBLESHOOTING GUIDES

This section of the manual contains:

- Temperature Problem Diagnostic Worksheets (does not apply to 427R-2 refrigerator section)
- Error Code Tables and the Error Code Troubleshooting Guides
- General Troubleshooting Guide (Wine storage and 427R-2 Refrigerator Section)
- Sealed System Diagnostic Tables
- Membrane Switch/Ribbon Cable Test Procedures

Temperature Problem Diagnostic Worksheet (does not apply to 427R-2 refrigerator section)

The Diagnostic Worksheets on the following three pages are designed to help identify the cause of temperature problems in a wine storage unit. To fill out the worksheet, familiarity with Diagnostic Mode and Temperature Log Recall Mode is required (See section 3 of this manual).

NOTE: Diagnostic Worksheet do not apply to temperature problems in the refrigerator section of a 427R-2.

Follow the steps below and fill out a diagnostic worksheet before referencing the General Troubleshooting Guide.

- Write down temperatures shown on display.
 - If unit is OFF, switch unit ON and go to step #2 below.
 - If unit will not run, but display is functioning, go to step #3 below.

NOTE: "EE" displayed in place of either compartment temperature indicates a compartment thermistor error. Thermistor errors cause power to the compressor and fans to be cut.
 - If unit will not run and display will not operate, go directly to General Troubleshooting Guide.
- Write down the set-points, keeping in mind that the initial key stroke will change the true set-point by a one degree increment or decrement, depending on choice of WARMER, or COLDER key, respectively.
- Initiate Diagnostic Mode by pressing and holding either COLDER key and the UNIT ON/OFF key, then write down any Error codes that may appear and the temperature readings for each thermistor location. (See Thermistor Location Code Table at right.)
 - If error codes appear, go directly to Error Code Troubleshooting Guide.
 - If "EE" is displayed in place of temperature, this indicates a thermistor error in that location.
- Initiate Temperature Log Recall Mode by pressing and holding the desired compartment WARMER key and the UNIT ON/OFF key, then toggle through the indexes, writing down the temperature of each index for both compartments. If the "BELL ON" or "SERVICE" indicators light up during an index, circle it on the worksheet.
 - By observing the temperatures logged, it will be possible to see if any warming or cooling trends occurred, whether this trend was in one or both compartments, and if there was a power interruption ("BELL ON" illuminate), or that the unit was switched OFF ("SERVICE" illuminates).
 - If double dashes (- -) are displayed, the control board is defective.

NOTE: To see the index/time correlation, refer to the Temperature Log Index Chart on last page of section 3 of this manual.
- Use the information gathered on the worksheet in conjunction with the General Troubleshooting Guide.

Wine Storage Thermistor Location Codes	
MODELS 424-2, 427-2, 427R-2, 430-2	
THERMISTOR LOCATION	CODE
Upper Evaporator	UE
Lower Evaporator	LE
Upper Compartment	UP
Lower Compartment	LO



TEMPERATURE PROBLEM DIAGNOSTIC WORKSHEET

Temperature Displayed: Lower _____ Upper _____

Set-Point: Lower _____ Upper _____

Diagnostic Mode Thermistor Readings: EC (Error Codes) _____

UE (Upper Evap) _____ LE (Lower Evap) _____ UP (Upper Cmppt) _____ LO (Lower Cmppt) _____

Index	Logged Temp.		Indicator Lit (Circle below if present)
	Lower	Upper	
1			BELL ON / SERVICE
2			BELL ON / SERVICE
3			BELL ON / SERVICE
4			BELL ON / SERVICE
5			BELL ON / SERVICE
6			BELL ON / SERVICE
7			BELL ON / SERVICE
8			BELL ON / SERVICE
9			BELL ON / SERVICE
10			BELL ON / SERVICE
11			BELL ON / SERVICE
12			BELL ON / SERVICE
13			BELL ON / SERVICE
14			BELL ON / SERVICE
15			BELL ON / SERVICE
16			BELL ON / SERVICE
17			BELL ON / SERVICE
18			BELL ON / SERVICE
19			BELL ON / SERVICE
20			BELL ON / SERVICE
21			BELL ON / SERVICE
22			BELL ON / SERVICE
23			BELL ON / SERVICE
24			BELL ON / SERVICE
25			BELL ON / SERVICE
26			BELL ON / SERVICE
27			BELL ON / SERVICE
28			BELL ON / SERVICE
29			BELL ON / SERVICE
30			BELL ON / SERVICE
31			BELL ON / SERVICE
32			BELL ON / SERVICE

Index	Logged Temp.		Indicator Lit (Circle below if present)
	Lower	Upper	
33			BELL ON / SERVICE
34			BELL ON / SERVICE
35			BELL ON / SERVICE
36			BELL ON / SERVICE
37			BELL ON / SERVICE
38			BELL ON / SERVICE
39			BELL ON / SERVICE
40			BELL ON / SERVICE
41			BELL ON / SERVICE
42			BELL ON / SERVICE
43			BELL ON / SERVICE
44			BELL ON / SERVICE
45			BELL ON / SERVICE
46			BELL ON / SERVICE
47			BELL ON / SERVICE
48			BELL ON / SERVICE
49			BELL ON / SERVICE
50			BELL ON / SERVICE
51			BELL ON / SERVICE
52			BELL ON / SERVICE
53			BELL ON / SERVICE
54			BELL ON / SERVICE
55			BELL ON / SERVICE
56			BELL ON / SERVICE
57			BELL ON / SERVICE
58			BELL ON / SERVICE
59			BELL ON / SERVICE
60			BELL ON / SERVICE
61			BELL ON / SERVICE
62			BELL ON / SERVICE
63			BELL ON / SERVICE
64			BELL ON / SERVICE

TEMPERATURE PROBLEM DIAGNOSTIC WORKSHEET

Temperature Displayed: Lower _____ Upper _____

Set-Point: Lower _____ Upper _____

Diagnostic Mode Thermistor Readings: EC (Error Codes) _____

UE (Upper Evap) _____ LE (Lower Evap) _____ UP (Upper Cmppt) _____ LO (Lower Cmppt) _____

Index	Logged Temp.		Indicator Lit (Circle below if present)
	Lower	Upper	
1			BELL ON / SERVICE
2			BELL ON / SERVICE
3			BELL ON / SERVICE
4			BELL ON / SERVICE
5			BELL ON / SERVICE
6			BELL ON / SERVICE
7			BELL ON / SERVICE
8			BELL ON / SERVICE
9			BELL ON / SERVICE
10			BELL ON / SERVICE
11			BELL ON / SERVICE
12			BELL ON / SERVICE
13			BELL ON / SERVICE
14			BELL ON / SERVICE
15			BELL ON / SERVICE
16			BELL ON / SERVICE
17			BELL ON / SERVICE
18			BELL ON / SERVICE
19			BELL ON / SERVICE
20			BELL ON / SERVICE
21			BELL ON / SERVICE
22			BELL ON / SERVICE
23			BELL ON / SERVICE
24			BELL ON / SERVICE
25			BELL ON / SERVICE
26			BELL ON / SERVICE
27			BELL ON / SERVICE
28			BELL ON / SERVICE
29			BELL ON / SERVICE
30			BELL ON / SERVICE
31			BELL ON / SERVICE
32			BELL ON / SERVICE

Index	Logged Temp.		Indicator Lit (Circle below if present)
	Lower	Upper	
33			BELL ON / SERVICE
34			BELL ON / SERVICE
35			BELL ON / SERVICE
36			BELL ON / SERVICE
37			BELL ON / SERVICE
38			BELL ON / SERVICE
39			BELL ON / SERVICE
40			BELL ON / SERVICE
41			BELL ON / SERVICE
42			BELL ON / SERVICE
43			BELL ON / SERVICE
44			BELL ON / SERVICE
45			BELL ON / SERVICE
46			BELL ON / SERVICE
47			BELL ON / SERVICE
48			BELL ON / SERVICE
49			BELL ON / SERVICE
50			BELL ON / SERVICE
51			BELL ON / SERVICE
52			BELL ON / SERVICE
53			BELL ON / SERVICE
54			BELL ON / SERVICE
55			BELL ON / SERVICE
56			BELL ON / SERVICE
57			BELL ON / SERVICE
58			BELL ON / SERVICE
59			BELL ON / SERVICE
60			BELL ON / SERVICE
61			BELL ON / SERVICE
62			BELL ON / SERVICE
63			BELL ON / SERVICE
64			BELL ON / SERVICE



TEMPERATURE PROBLEM DIAGNOSTIC WORKSHEET

Temperature Displayed: Lower _____ Upper _____

Set-Point: Lower _____ Upper _____

Diagnostic Mode Thermistor Readings: EC (Error Codes) _____

UE (Upper Evap) _____ LE (Lower Evap) _____ UP (Upper Cmppt) _____ LO (Lower Cmppt) _____

Index	Logged Temp.		Indicator Lit (Circle below if present)
	Lower	Upper	
1			BELL ON / SERVICE
2			BELL ON / SERVICE
3			BELL ON / SERVICE
4			BELL ON / SERVICE
5			BELL ON / SERVICE
6			BELL ON / SERVICE
7			BELL ON / SERVICE
8			BELL ON / SERVICE
9			BELL ON / SERVICE
10			BELL ON / SERVICE
11			BELL ON / SERVICE
12			BELL ON / SERVICE
13			BELL ON / SERVICE
14			BELL ON / SERVICE
15			BELL ON / SERVICE
16			BELL ON / SERVICE
17			BELL ON / SERVICE
18			BELL ON / SERVICE
19			BELL ON / SERVICE
20			BELL ON / SERVICE
21			BELL ON / SERVICE
22			BELL ON / SERVICE
23			BELL ON / SERVICE
24			BELL ON / SERVICE
25			BELL ON / SERVICE
26			BELL ON / SERVICE
27			BELL ON / SERVICE
28			BELL ON / SERVICE
29			BELL ON / SERVICE
30			BELL ON / SERVICE
31			BELL ON / SERVICE
32			BELL ON / SERVICE

Index	Logged Temp.		Indicator Lit (Circle below if present)
	Lower	Upper	
33			BELL ON / SERVICE
34			BELL ON / SERVICE
35			BELL ON / SERVICE
36			BELL ON / SERVICE
37			BELL ON / SERVICE
38			BELL ON / SERVICE
39			BELL ON / SERVICE
40			BELL ON / SERVICE
41			BELL ON / SERVICE
42			BELL ON / SERVICE
43			BELL ON / SERVICE
44			BELL ON / SERVICE
45			BELL ON / SERVICE
46			BELL ON / SERVICE
47			BELL ON / SERVICE
48			BELL ON / SERVICE
49			BELL ON / SERVICE
50			BELL ON / SERVICE
51			BELL ON / SERVICE
52			BELL ON / SERVICE
53			BELL ON / SERVICE
54			BELL ON / SERVICE
55			BELL ON / SERVICE
56			BELL ON / SERVICE
57			BELL ON / SERVICE
58			BELL ON / SERVICE
59			BELL ON / SERVICE
60			BELL ON / SERVICE
61			BELL ON / SERVICE
62			BELL ON / SERVICE
63			BELL ON / SERVICE
64			BELL ON / SERVICE

Wine Storage Error Code Troubleshooting Guide Instructions

Error Codes indicate problems registered by specific components. If error codes are registered, they will appear before temperature readings while in Diagnostic Mode.

1. Initiate Diagnostic Mode by pressing and holding either COLDER key, and press the UNIT ON/OFF key, then release both keys.
2. Check for Error Codes on the display, making sure to toggle through all possible readings by pressing either COLDER key or either WARMER key. (See Error Code Table Below)
3. If Error Codes appear are displayed, follow the Error Code Troubleshooting Guide on next page.
 - a. The left column of the Error Code Troubleshooting Guide lists the error codes.
 - b. The right column of the Error Code Troubleshooting Guide explains what tests and/or corrective actions to perform.

NOTE: If error codes are observed, the SERVICE indicator will appear constant when Diagnostic Mode ends, indicating error codes are logged. To clear this and the error codes from the software memory, the problem must be corrected and the unit must be ON. Then, press and hold the bell key for fifteen (15) seconds. The control will emit a short “beep” when the SERVICE indicator and error codes are cleared.

WINE STORAGE ERROR CODE TABLE

CODE	INDICATION
05	<i>Upper Cabinet Thermistor read open or shorted for 10+ seconds, or repeatedly read erratic temp's</i>
06	<i>Upper Evaporator Thermistor read open or shorted for 10+ seconds, or repeatedly read erratic temp's</i>
07	<i>Lower Cabinet Thermistor read open or shorted for 10+ seconds, or repeatedly read erratic temp's</i>
08	<i>Lower Evaporator Thermistor read open or shorted for 10+ seconds, or repeatedly read erratic temp's</i>
10	<i>Upper Cabinet Warm Temperature alarm</i>
11	<i>Upper Cabinet Cold Temperature alarm</i>
12	<i>Lower Cabinet Warm Temperature alarm</i>
13	<i>Lower Cabinet Cold Temperature alarm</i>
15	<i>Sealed System Fault (evap temperature cannot drop 5° in 5 minutes, 3 consecutive valve activations)</i>

Wine Storage Thermistor Location Codes

MODELS 424-2, 427-2, 427R-2, 430-2

THERMISTOR LOCATION	CODE
<i>Upper Evaporator</i>	UE
<i>Lower Evaporator</i>	LE
<i>Upper Compartment</i>	UP
<i>Lower Compartment</i>	LO



WINE STORAGE ERROR CODE TROUBLESHOOTING GUIDE

Error Code	Test / Action
05	<ol style="list-style-type: none"> Check upper compartment thermistor electrical connections and continuity from thermistor to J2 on control board. Reconnect / repair connections. Check resistance of upper compartment thermistor for 30,000 to 33,000 ohms at 32°F / 0°C. Replace if defective.
06	<ol style="list-style-type: none"> Check upper compartment evaporator thermistor electrical connections and continuity from thermistor to J2 on control board. Reconnect / repair connections. Check resistance of upper compartment evaporator thermistor for 30,000 to 33,000 ohms at 32°F / 0°C. Replace if defective.
07	<ol style="list-style-type: none"> Check lower compartment thermistor electrical connections and continuity from thermistor to J2 on control board. Reconnect / repair connections. Check resistance of lower compartment thermistor for 30,000 to 33,000 ohms at 32°F / 0°C. Replace if defective.
08	<ol style="list-style-type: none"> Check lower compartment evaporator thermistor electrical connections and continuity from thermistor to J2 on control board. Reconnect / repair connections. Check resistance of lower compartment evaporator thermistor for 30,000 to 33,000 ohms at 32°F / 0°C. Replace if defective.
10 or 12	<ol style="list-style-type: none"> Check room ambient temperature. Unit performs best between 60°F / 16°C - 90°F / 32°C Check for door obstructions, door seal and door adjustment issues; Remove obstruction, align door. Check switch depressor; Reposition or replace. Check cleanliness of condenser; Clean condenser. Check for obstructions at appropriate compartment fan blade; Remove obstruction. Check appropriate compartment evaporator fan blade spacing. Adjust if needed. Check appropriate fan motor and fan switch connections; Repair or replace. Check resistance of appropriate compartment thermistor for 30,000 to 33,000 ohms at 32°F / 0°C. Replace if defective. Initiate manual valve activation mode for appropriate compartment: <ol style="list-style-type: none"> Check for proper voltage from J3 on board to appropriate evaporator fan motor. Replace or repair defective components. If <u>opposite</u> evaporator temperature drops, check for proper wiring at valve; repair wire connections. If wiring is correct, replace valve assembly. Check AMP draw of compressor. If high by 15% or more, replace compressor. Check sealed system for leaks; Repair replace defective parts.
11 or 13	<ol style="list-style-type: none"> Check room ambient temperature. Unit performs best between 60°F / 16°C - 90°F / 32°C Check for door obstructions, door seal and door adjustment issues; Remove obstruction, align door. Check appropriate compartment thermistor electrical connections and continuity from thermistor to J2 on control board. Reconnect / repair connections. Check resistance of appropriate compartment thermistor for 30,000 to 33,000 ohms at 32°F / 0°C. Replace if defective.
15	<ol style="list-style-type: none"> Initiate manual valve activation mode for <u>upper</u> compartment: <ol style="list-style-type: none"> Check for proper voltage from J3 on board to appropriate evaporator fan motor. Replace or repair defective components. If <u>lower</u> evaporator temperature drops, check for proper wiring at valve; repair wire connections. If wiring is correct, replace valve assembly. Initiate manual valve activation mode for <u>lower</u> compartment: <ol style="list-style-type: none"> Check for proper voltage from J3 on board to appropriate evaporator fan motor. Replace or repair defective components. If <u>upper</u> evaporator temperature drops, check for proper wiring at valve; repair wire connections. If wiring is correct, replace valve assembly. Check AMP draw of compressor. If high by 15% or more, replace compressor. Check sealed system for leaks, or restrictions; Repair replace defective parts.

NOTE: After repairs, always clear Error Codes by pressing Bell ON/OFF key for 15 seconds.

Model 427R-2 Refrigerator Error Code Troubleshooting Guide Instructions

Error Codes indicate problems registered by specific components. If error codes are registered, they will appear before temperature readings while in Diagnostic Mode.

1. Initiate Diagnostic Mode by pressing and holding the COLDER key, and press the UNIT ON/OFF key, then release both keys.
2. Check for Error Codes on the display, making sure to toggle through all possible readings by pressing the COLDER key or WARMER key. (See Error Code Table Below)
3. If Error Codes appear are displayed, follow the Error Code Troubleshooting Guide on next page.
 - a. The left column of the Error Code Troubleshooting Guide lists the error codes.
 - b. The right column of the Error Code Troubleshooting Guide explains what tests and/or corrective actions to perform.

NOTE: If error codes are observed, the SERVICE indicator will appear constant when Diagnostic Mode ends, indicating error codes are logged. To clear this and the error codes from the software memory, the problem must be corrected and the unit must be ON. Then, press and hold the bell key for fifteen (15) seconds. The control will emit a short “beep” when the SERVICE indicator and error codes are cleared.

NOTE: If Error Codes appear with a flashing “SERVICE” annunciator prior to initiating Diagnostic Mode, the unit experienced excessive compressor run condition that may or may not be associated with the Error Codes displayed.

427R-2 REFRIGERATOR COMPARTMENT ERROR CODE TABLE

CODE	INDICATION
05	Refrig. cabinet thermistor read open or shorted for 10+ seconds, or repeatedly read erratic temp's
06	Refrig. evaporator thermistor read open or shorted for 10+ seconds, or repeatedly read erratic temp's
50	Excessive Refrigerator Compressor Run

Refrigerator Thermistor Location Codes

MODEL 427R-2 Only

THERMISTOR LOCATION	CODE
Refrigerator Compartment	r
Refrigerator Evaporator	E

**427R-2 REFRIGERATOR COMPARTMENT ERROR CODE TROUBLESHOOTING GUIDE**

EC	TEST / ACTION
05	<p>A. If “EE” for refrigerator compartment was displayed and “SERVICE” flashing, check the following:</p> <ol style="list-style-type: none">1. Thermistor electrical connections and continuity from thermistor to control board. Reconnect / repair.2. Resistance of thermistor - 30,000 to 33,000 ohms at 32°F. Replace if defective. <p>B. If “EE” for refrigerator compartment was <u>NOT</u> displayed, problem is intermittent thermistor error:</p> <ol style="list-style-type: none">1. Door not closing properly. Correct door closing problem.2. Fan switch, light switch, wiring & electrical connections. Repair wiring / connections or replace switch.3. Thermistor electrical connections and continuity from thermistor to control board. Reconnect / repair.4. Resistance of thermistor - 30,000 to 33,000 ohms at 32°F. Replace if defective. <p>C. If “EC 05” and “SERVICE” were flashing before initiating diagnostic mode, unit also experienced excessive compressor run condition that may or may not be associated with the “05” Error Code. See Error Code 50 below.</p>
06	<p>A. Initiate Diagnostic Mode. If “EE” is displayed for refrigerator evaporator thermistor, check the following:</p> <ol style="list-style-type: none">1. Thermistor electrical connections and continuity from thermistor to control board. Reconnect / repair.2. Resistance of thermistor - 30,000 to 33,000 ohms at 32°F. Replace if defective. <p>B. Initiate Diagnostic Mode. If “EE” is <u>NOT</u> displayed for refrigerator evaporator thermistor, problem is intermittent:</p> <ol style="list-style-type: none">1. Door not closing properly. Correct door closing problem.2. Fan switch, light switch, wiring & electrical connections. Repair wiring / connections or replace switch.3. Thermistor electrical connections and continuity from thermistor to control board. Reconnect / repair.4. Resistance of thermistor - 30,000 to 33,000 ohms at 32°F. Replace if defective. <p>C. If “EC 06” and “SERVICE” were flashing before initiating diagnostic mode, unit also experienced excessive compressor run condition that may or may not be associated with the “06” Error Code. See Error Code 50 below.</p>
50	<p>A. Check for obstructions to refrigerator drawer closing, including drawer closer position. Remove obstruction/Trip drawer closer forward.</p> <p>B. Check resistance of refrigerator compartment thermistor - 30,000 to 33,000 ohms at 32°F. Replace if defective.</p> <p>C. Check refrigerator compartment fan blade position and for obstructions. Reposition if incorrect/Remove obstruction.</p> <p>D. With unit running and light switches depressed:</p> <ol style="list-style-type: none">1. Check for 115 V AC from control board to evaporator fan motor. Repair wiring/Replace defective motor. <p>E. Check sealed system for leaks, restrictions or inefficient compressor.</p>

NOTE: After repairs, always clear Error Codes by pressing Bell ON/OFF key for 15 seconds.

General Troubleshooting Guide

The Table of Contents below indicates how the General Trouble Shooting Guide is arranged.

1. As close as possible, match the complaint, or description of the problem the unit is experiencing with those in the table of contents below.
2. To the left of the problem description below, take note of the letter.
3. Locate that letter in the left column of the General Troubleshooting Guide.
 - a. In the center column of the General Troubleshooting Guide is a list of possible causes for the problem.
 - b. The information in the right column explains what tests and/or corrective actions to perform.

NOTE: If the complaint, or problem is warm temperatures, or temperatures too cold, in a wine storage compartment, be sure to complete a Temperature Problem Diagnostic Worksheet on the preceding pages before continuing.

NOTE: All key strokes necessary to help in diagnosing a problem are explained in section 3 of this manual.

Wine Storage Troubleshooting Guide Table of Contents

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PROBLEM	POSSIBLE CAUSE	TEST / ACTION
A. "SERVICE" FLASHING	See Error Code Troubleshooting Guide	See Error Code Troubleshooting Guide
B. WARM TEMPERATURE IN BOTH WINE STORAGE COMPARTMENTS	Control Set Too Warm	Check set-points. Adjust set-points COLDER
	Unit in Showroom Mode	Adjust set-points colder, listen for compressor & condenser fan operation. If they do not run, switch unit OFF, then press and hold <u>upper</u> COLDER & WARMER keys while pressing UNIT ON/OFF key.
	Unit Recently Energized	Allow time for unit to pull down
	Unit Recently Stocked with Wine	Instruct customer
	High Room Ambient	Instruct Customer that unit performs best between 60°F / 16°C - 90°F / 32°C
	Door Ajar a. Wine Rack Obstruction b. Door out of Adjustment c. Door or Cabinet Hinge Problem	a. Adjust wine rack b. See Door Adjustment procedure in section 2 of this manual. c. Check hinges. Replace if defective.
	Condenser Air Flow / Fan Fault a. Dirty Condenser b. Fan Blade Loose or Obstructed c. Fan Motor Disconnected or Malfunctioning	a. Check/clean condenser. b. Tighten blade or move obstruction. c. Check fan motor operation. Check fan motor electrical connections back to compressor. Check for 115V AC from fan motor to compressor. Reconnect or repair wires, or replace motor if defective.
	Evaporator Fan Circuit Fault a. Fan Switch(es) Disconnected or Malfunctioning b. No Power from Control Board	a. Check fan switch electrical connections. Check for 115V AC to and from switch. Reconnect or replace switch if defective. b. Check for 115V AC at J3 on control board. (NOTE: Unit must be running and not in Showroom Mode) If no power, replace board.
	No Power from Control Board to Compressor	Initiate Manual Valve Activation Mode, check for 115V AC at E2 on the control board. If no power, replace board.
	Compressor Fault a. Compressor Electricals Disconnected or Malfunctioning b. Compressor Inefficient, or Locked	a. Check integrity of compressor electricals. Check continuity back to control board. Check for 115V AC at E2 on control board. Correct wiring problems or replace compressor electricals if defective. If no power between at E2, replace control board. b. Check AMP draw on compressor. If high by 15% or more, replace compressor.
	Sealed System Leak or Restriction	SEE SEALED SYSTEM DIAGNOSTIC INFORMATION

PROBLEM	POSSIBLE CAUSE	TEST / ACTION
C. WARM TEMPERATURE IN ONLY ONE WINE STORAGE COMPARTMENT	Control Set Too Warm	Check/adjust set-points.
	Unit Recently Energized	Allow time for unit to pull down
	Unit Recently Stocked with Wine	Instruct customer
	High Room Ambient	Instruct Customer that unit performs best between 60°F / 16°C - 90°F / 32°C
	Door Ajar a. Wine Rack Obstruction b. Door out of Adjustment c. Door or Cabinet Hinge Problem	a. Adjust wine rack b. See Door Adjustment procedure in section 2 of this manual. c. Check hinges. Replace if defective.
	Thermistor Fault a. Evaporator Thermistor Location b. Evaporator Thermistor Wiring / Connections problem c. Evaporator or Compartment Thermistor Misread	a. Move to correct location. b. Initiate Diagnostic Mode. If "EE" is displayed in place of evap temp, check electrical connections back to J2 on control board. Repair wiring or connections. c. Check thermistor ohms = 30,000 - 33,000 at 32°F / 0°C. Replace if defective.
	Condenser Air Flow / Fan Fault a. Dirty Condenser b. Fan Blade Loose, or Obstructed c. Fan Motor Disconnected or Malfunctioning	a. Check/clean condenser. b. Tighten blade or move obstruction. c. Check fan motor operation. Check fan motor electrical connections back to compressor. Check for 115V AC from fan motor to compressor. Reconnect or repair wires, or replace motor if defective.
	Evaporator Fan / Fan Circuit Fault a. Fan Blade out of Position or Obstructed c. Fan Switch Disconnected or Malfunctioning b. Fan Motor Disconnected or Malfunctioning d. No Power from Control Board	a. Check fan blade position. Reposition blade or move obstructions. b. Check fan switch electrical connections. Check for 115V AC to and from switch. Reconnect or replace switch if defective. c. Check fan motor electrical connections, and check for 115V AC to motor. Repair connections, replace motor if defective. d. Check for 115V AC from J3 on control board. (NOTE: Unit must be running and not in Showroom Mode) If no power, replace board.
	Refrigerant Valve Fault a. Solenoid Disconnected, Mis-Wired, or defective b. Refrigerant Valve Stuck	a. Initiate Manual Valve Activation Mode. 1. If valve inoperative: a. Check electrical connections. b. Check solenoid resistance for 680 ± 10% ohms. Replace if defective. 2. Toggle through temp readings, if opposite evap temp drops, switch electrical connections. b. Initiate Manual Valve Activation Mode for one side, then the other, while observing evap temps. If only one side of valve activates, replace valve.



PROBLEM	POSSIBLE CAUSE	TEST / ACTION
D. ACTUAL VS. DISPLAYED TEMPERATURE OVER 10° DIFFERENT	Wrong Units of Measure Selected, (Fahrenheit - °F vs. Celsius - °C)	Initiate Temperature Units Selection Mode to check units of measure (°F or °C) selected.
	Compartment Thermistor Fault (Misread), or Control Board Fault	Check thermistor ohms = 30,000 - 33,000 at 32°F / 0°C. Replace if defective. If thermistor is OK, replace control board.
E. ACTUAL VS. DISPLAYED TEMPERATURE LESS THAN 10° DIFFERENT	Control Board DC Offset Out of Adjustment	Contact Factory for DC Offset Adjustment Procedure.
F. EXCESSIVELY COLD TEMPERATURES IN BOTH WINE STORAGE COMPARTMENTS	Room Temperature Below Set-Point	Instruct Customer.
	Control Set Too Cold	Check set-points. Adjust set-points WARMER
	Door Ajar a. Wine Rack Obstruction b. Door out of Adjustment c. Door or Cabinet Hinge Problem	a. Adjust wine rack b. See Door Adjustment procedure in section 2 of this manual. c. Check hinges. Replace if defective.
	Compartment Thermistor Fault (Misread), or Control Board Fault	Check thermistor ohms = 30,000 - 33,000 at 32°F / 0°C. Replace if defective. If thermistor is OK, replace control board.
G. EXCESSIVELY COLD TEMPERATURES IN ONLY ONE WINE STORAGE COMPARTMENT	Room Temperature Below Set-Point	Instruct Customer.
	Control Set Too Cold	Check set-point. Adjust set-points WARMER
	Door Ajar a. Wine Rack Obstruction b. Door out of Adjustment c. Door or Cabinet Hinge Problem	a. Adjust wine rack b. See Door Adjustment procedure in section 2 of this manual. c. Check hinges. Replace if defective.
	Refrigerant Valve Stuck	Initiate Manual Valve Activation Mode for one side, then the other, while observing evap temps. If only one side of valve activates, replace valve.
H. LIGHTS STAY ON	Display Lighting Activated (ON 100%)	Press & release LIGHTS ON/OFF key.
	Fan & Light Switch Wiring Crossed	Check wiring at fan & light switch, and at control board. Rewire if incorrect.
	Light Switch Malfunction	Press & release LIGHTS ON/OFF key, then depress light switch. Repeat steps. If no effect, replace switch.
I. NO LIGHTS	Unit in Sabbath Mode	Press & release UNIT ON/OFF key.
	Light Switch Disconnected or Malfunctioning	Check switch operation and electrical connections. Check for 115V AC to and from switch. Reconnect wires or replace switch if defective.
	Light Strip Burned-out	If power from switch, replace light strip.
	No Power from Control Board	Check for 115V AC at E3 of control board. If no power, replace board.



PROBLEM	POSSIBLE CAUSE	TEST / ACTION
J. CONTROL PANEL KEYS MALFUNCTIONING	Control Panel Ribbon Cable Plugged in Wrong	Check control panel ribbon cable at control panel (silver area of terminal <u>away from</u> control board). Plug in correctly if incorrect.
	Control Panel or Ribbon Cable Defective (OR) No Signal Read at Control Board	SEE CONTROL PANEL TEST PROCEDURE AT BACK OF TROUBLESHOOTING GUIDE SECTION.
K. NO LED's	Unit Switched OFF	Press UNIT ON/OFF key
	LED Ribbon Cable Plugged in Wrong	Check LED ribbon cable. Plug in correctly if incorrect.
	No Data from Control Board	Replace Control Board
L. <u>ALL</u> LED's LIT	Bad Data from Control Board	Replace Control Board
M. SAME LED SEGMENTS MISSING FROM BOTH DISPLAY WINDOWS	Bad Data from Control Board	Replace Control Board
N. LED SEGMENTS MISSING FROM ONLY ONE DISPLAY WINDOWS	Bad LED Board in Control Panel	Replace Control Panel Assembly
O. DOOR / UNIT UN-LEVEL	SEE SECTION 2 OF THIS MANUAL	SEE SECTION 2 OF THIS MANUAL



PROBLEM	POSSIBLE CAUSE	TEST / ACTION
P. "EE" Displayed in place of Refrigerator Temperature with "SERVICE" Flashing	Refrigerator Compartment Thermistor Disconnected, Shorted, or misread	Check refrigerator compartment thermistor electrical connections from thermistor to control board. Reconnect / repair connections. Check resistance of refrigerator compartment thermistor for 30,000 to 33,000 ohms at 32°F. Replace if defective.
Q. Warm or Normal Temperatures Displayed with "SERVICE" Alone Flashing	Excessive Compressor Run	Initiate Diagnostic Mode and see Error Code Troubleshooting Guide
	Evaporator Thermistor Disconnected, Shorted, or misread	Check evaporator thermistor electrical connections from thermistor to control board. Reconnect / repair connections. Check resistance of evaporator thermistor for 30,000 to 33,000 ohms at 32°F. Replace if defective.
R. Warm or Normal Temperatures Displayed with non-flashing "SERVICE" Displayed	Error Codes Observed in Diagnostic Mode, but not Cleared from Memory	Enter diagnostic mode to observe error codes. See Error Code Troubleshooting Guide. Verify unit was repaired for error codes displayed. Press and hold alarm key for 15 seconds to clear error codes.
S. Erratic Temperatures with or without "SERVICE" Flashing	Control Board Configured for Wrong Model	<i>Initiate Manual Model Configuration Mode and reconfigure to correct model.</i>
T. Warm Refrigerator Temperatures, "SERVICE" <u>not</u> displayed or Flashing	No Power to Unit	Check power to unit, plug unit in or switch supply circuit breaker ON.
	Unit Switched OFF	Check for "OFF" displayed at LCD. If off, press UNIT ON/OFF key.
	Unit in Show Room Mode	Press UNIT ON/OFF key to OFF, then press and hold WARMER& COLDER keys, and press UNIT ON/OFF key.
	Control Set Too High	Check set-point. If high, adjust.
	Warm Food Load	Check contents of freezer for warm food load. Instruct customer.
	High Room Ambient	Instruct customer unit performs best between 60°F(16°C) and 90°F(32°C).
	Drawer Ajar a. Food product obstruction b. Drawer closer tripped backwards	a. Move obstruction. b. Trip drawer closer forward
	Faulty Light Switch	Check operation of light switches, lights off when switch is depressed. Replace switch if defective. (NOTE: Two light switches in unit)
(Continued)		

PROBLEM	POSSIBLE CAUSE	TEST / ACTION
(Continued) T. Warm Refrigerator Temperatures, “SERVICE” not displayed or Flashing	Refrigerator Compartment Fan Fault a. Fan blade obstructed or out of position b. Evaporator fan motor disconnected c. Power to Fan Fault, or Fan Motor Defective	a. Move obstruction or reposition blade. b. Check electrical connections & continuity from control board to motor. Reconnect / repair bad connections. c. With light switches depressed, check for 115V AC from control board to fan motor. Replace control board if defective, or Replace motor if defective.
	Compartment Thermistor Disconnected, Shorted, or misread	Check refrigerator evaporator thermistor electrical connections from thermistor to control board. Reconnect / repair connections. Check resistance of refrigerator evaporator thermistor for 30,000 to 33,000 ohms at 32°F. Replace if defective.
U. Product Temperature 10° or More Colder than Displayed Temperature	Compartment Thermistor Misread	Check resistance of compartment thermistor for 30,000 to 33,000 ohms at 32°F. Replace if defective.
V. 1. “Extremely” Cold Temperatures Displayed • 1° to 7° in Refrigerator 2. If outside US - “Extremely” Warm Temperatures Displayed • 34° to 45° in Refrigerator	1. Control Set to Display Celsius 2. If Outside US - Control Set to Display Fahrenheit	1. Change temperature units of measure to Fahrenheit. Switch unit OFF, then ON, then press & hold Bell key and UNIT ON/OFF key for 10 seconds. 2. If Outside US - Change temperature units of measure to Celsius. Switch unit OFF, then ON, then press & hold Bell key and UNIT ON/OFF key for 10 seconds.
W. No LCD	Unit in Sabbath Mode	Exit Sabbath Mode, press UNIT ON/OFF key.
	Display Wire Harness Disconnected or Faulty	Check display wire harness and connections, including wires behind refrigerator duct cover. Reconnect, repair, replace bad wiring.
	Control Panel Assembly Defective (OR) No Signal Read at Control Board	See Membrane Switch/Ribbon Cable Test Procedures. If membrane switch fails any test, replace entire control panel assembly. If switch passes all tests, replace control board.



PROBLEM	POSSIBLE CAUSE	TEST / ACTION
X. No Lights	No power to unit	Check / correct power supply to unit.
	Unit switched OFF	Switch unit ON, press UNIT ON/OFF key.
	Unit in Sabbath Mode	Exit Sabbath Mode, press UNIT ON/OFF key.
	Defective or loose light bulb(s)	Install a known good light bulb.
	Light Switch Disconnected or Defective	Check wire connections at light switch. Reconnect/repair. Check for 115V AC to and from light switch. Replace switch if defective.
	Lighting System Wiring Disconnected or Defective	Check continuity from light sockets to switch. Reconnect/repair or replace defective components.
	No Power From Control Board (NOTE: See Unit in Sabbath Mode above.)	Check for 115V AC from control board. Replace board if defective. (NOTE: See Unit in Sabbath Mode above.)
Y. Lights Stay ON when Drawers Closed - (May be Accompanied by /Drawer Ajar Alarm Bell)	Door or Drawer Ajar a. Food product obstruction b. Drawer closer tripped backwards	a. Move obstruction. b. Trip drawer closer forward
	Faulty Light Switch	Check operation of light switches, lights off when switch is depressed. Replace switch if defective. (NOTE: Two light switches in unit)
Z. Drawers Not Able to Close Completely	Food Product Obstruction	Move obstruction.
	Drawer Closer Tripped Backwards	Trip drawer closer forward
AA. Drawers Uneven	Improper Drawer Panel Installation	The drawers are non-adjustable. Instead, the drawer panels must be adjusted if there is an alignment problem. Refer to the Installation Manual and/or installation video for panel installation and adjustment.
	Unit Not Level	Check levelness of unit. If un-level, turn front leveling legs counterclockwise to raise front or clockwise to lower it. Rear levelers are adjusted from front of base by turning adjusting screw clockwise to raise rear or counterclockwise to lower it. Refer to the Installation Manual and/or installation video for complete installation and leveling instructions.

SEALED SYSTEM DIAGNOSTIC INFORMATION

NOTES:

- The temperature/pressure table at right and the normal operating pressures listed below are for reference only. A unit's temperature/pressure correlation and normal operating pressures may differ from those listed due to: variations in evaporator thermistor location, set-points, where the sealed system is in the refrigeration cycle, ambient temperature, gauge calibration, etc.
- If a unit is experiencing temperature problems, it is recommended to reference the Error Code Troubleshooting Guide and General Troubleshooting Guide before accessing the sealed system. After all mechanical and electrical components have been ruled out, sealed system pressures can be checked and compared against those listed in the tables below.
- Whenever entering the sealed system, always use solder-on process valves. Do **NOT** use bolt-on process valves as they are prone to leak.
- Whenever servicing the sealed system, the valve assembly (includes high-side filter-drier) must be replaced.
- Pressures listed below are based on a 70°F (21°C) Ambient and 38°F (3°C) set-points.

TEMPERATURE / LOW-SIDE PRESSURE CORRELATION	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

NORMAL OPERATING PRESSURES (70°F/21°C Ambient / 38°F/ 3°C Set-Point)

Model	Normal Low Side Pressures	Normal High Side Pressures
424-2	0-12 PSI to 30-45 PSI	75 psi to 120 psi
427-2	0-12 PSI to 30-45 PSI	75 psi to 120 psi
427R-2	(Wine) 0-12 PSI to 30-45 PSI	75 psi to 120 psi
	(Ref) 0-12 PSI to 30-45 PSI	75 psi to 120 psi
430-2	0-12 PSI to 30-45 PSI	75 psi to 120 psi

PRESSURE INDICATIONS

If low side pressure is	& high side pressure is	possible problem is
NORMAL	NORMAL	MECHANICAL (see General Troubleshooting Guide)
LOW	LOW	LEAK
LOW	HIGH	RESTRICTION
HIGH	LOW	INEFFICIENT COMPRESSOR
HIGH	HIGH	OVER CHARGE

WINE STORAGE MEMBRANE SWITCH / RIBBON CABLE TEST PROCEDURE

The membrane switch is that part of the control panel assembly consisting of the function keys used for all input functions to the electronic control system. (See Figure 7-1)

Perform the eight continuity checks below if the integrity of the membrane switch and/or its ribbon cable is suspect. To perform these continuity checks, the ribbon cable must be disconnected from the control board.

NOTE: The wires of the ribbon cable are exposed at the back side of the terminal housing. With an Ohm Meter, check for continuity at these exposed points/pins. Pin #1 is at top of the terminal housing, closest to the arrow on the housing (see Figure 8-1).

1. Pressing no keys on the membrane switch, check for continuity across all pin combinations. With no keys pressed, there should be no continuity.
2. With UNIT ON/OFF key pressed, there should be continuity across pins #4 & #6 only.
3. With lower wine storage COLDER key pressed, there should be continuity across pins #2 & #3 only.
4. With lower wine storage WARMER key pressed, there should be continuity across pins #3 & #4 only.
5. With upper wine storage COLDER key pressed, there should be continuity across pins #2 & #6 only.
6. With upper wine storage WARMER key pressed, there should be continuity across pins #5 & #7 only.
7. With LIGHTS ON/OFF key pressed, there should be continuity across pins #5 & #6 only.
8. With alarm bell key pressed, there should be continuity across pins #3 & #7 only.

NOTE: If the membrane switch fails any of the above tests, the control panel assembly should be replaced. If all tests are passed and the control panel is still inoperable, replace the control board.

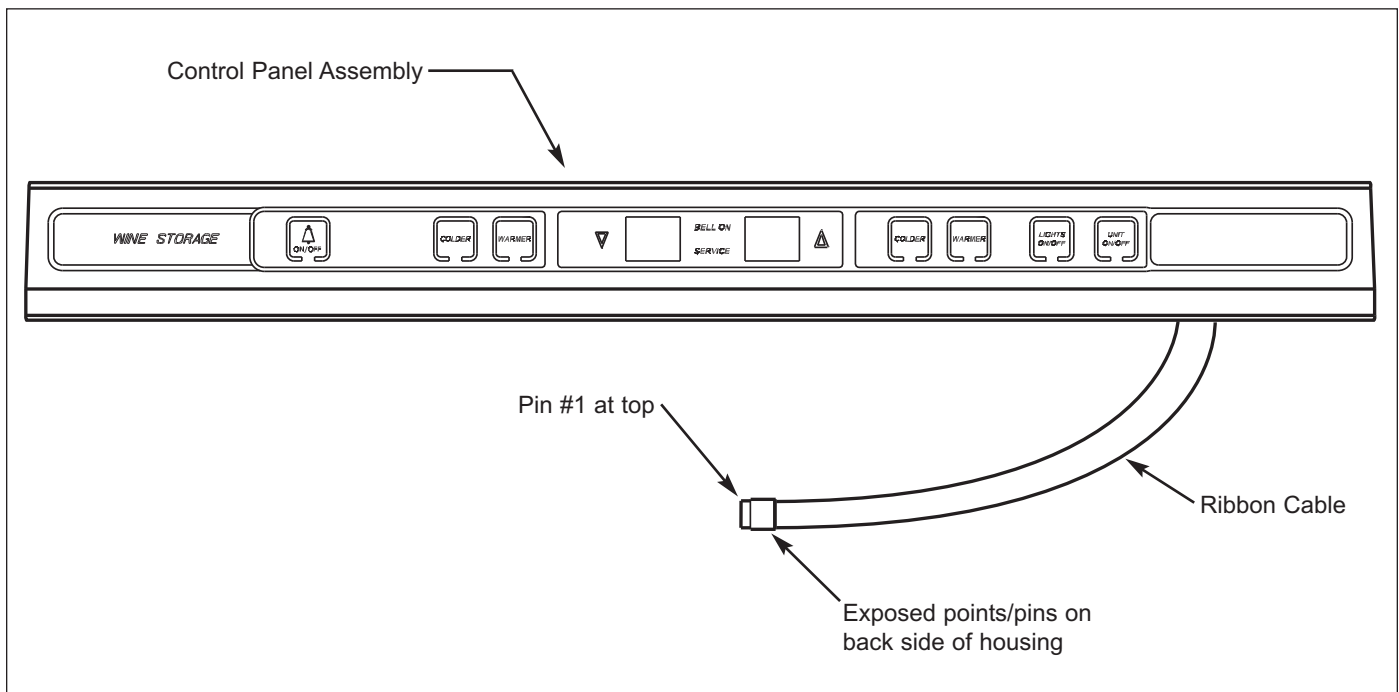


Figure 7-1. Control Panel / Membrane Switch

MODEL 427R-2 REFRIGERATOR MEMBRANE SWITCH / RIBBON CABLE TEST PROCEDURE

If the integrity of the refrigerator control panel assembly is suspect, continuity tests should be performed at the membrane switch ribbon cable terminal housing. Begin by removing the control panel assembly from the unit and place it on a solid surface. Disconnect the ribbon cable from control panel PC board.

How To Identify Pin 1 on Terminal Housing

The ribbon cable wires are exposed at the back of the terminal housing, but since there are two vendors of the membrane switch, determining the location of pin 1 is not always easy. To identify the pins, follow these guidelines:

1. If terminal housing is BLUE, then pin 1 is closest to arrow on housing.
2. If terminal housing is BLACK, check for continuity between first and third pins at each end of housing while pushing refrigerator WARMER key. If there is continuity, then pin 1 is at that end.

700BCI-3 Membrane Switch/Ribbon Cable Test Procedure

1. Press no keys on membrane switch. Check for continuity between all pin combinations. With no keys pressed, there should be no continuity between any pins.
2. Press UNIT ON/OFF key, there should be continuity across pins 3 & 4.
3. Press Door Ajar Alarm ON/OFF key, there should be continuity across pins 2 & 4.
4. Press Refrigerator WARMER key, there should be continuity across pins 4 & 5.
5. Press Refrigerator COLDER key, there should be continuity across pins 1 & 3.

NOTE: If any of the tests show failure, replace entire control panel assembly.

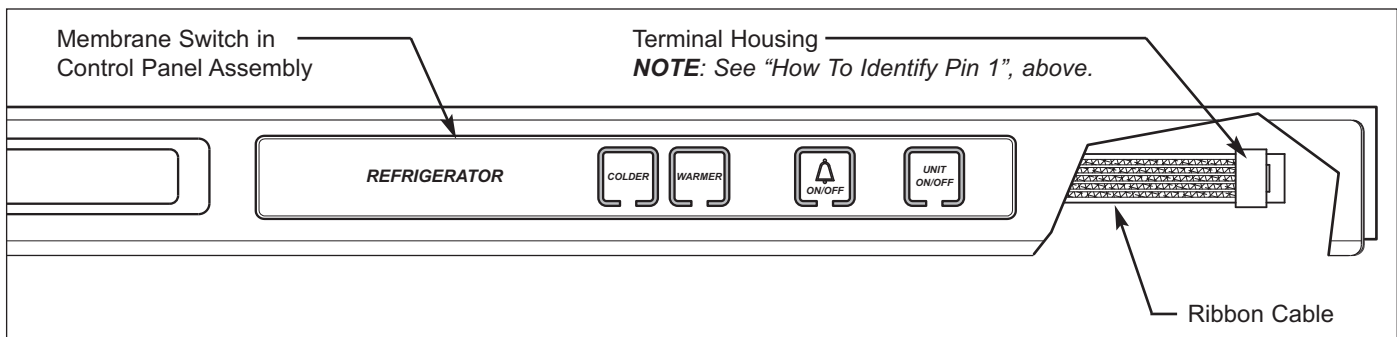


Figure 7-2. Refrigerator Control Panel Assembly with Cut-Away View to Show Ribbon Cable