



# SECTION 8

# TROUBLESHOOTING GUIDES

## WINE STORAGE DIAGNOSTIC WORKSHEET INFORMATION & INSTRUCTIONS:

The 400 Series Wine Storage Troubleshooting Guide is supplied with several copies of the Diagnostic Worksheet. The information gathered on this worksheet will assist in narrowing the search for the cause of suspected temperature problems. To fill out the worksheet, you will need to be familiar with the Diagnostic Mode and the Temperature Log Recall Mode (See section 3 of this manual).

**NOTE:** *The diagnostic worksheet does not apply to temperature problems in the refrigerator section of a 427R. Go straight to the 427R Refrigerator General Troubleshooting Guide.*

### Diagnostic Worksheet Instructions:

Whenever servicing a 400 Series Wine Storage unit for temperature problems, follow the steps below and fill out the diagnostic worksheet before referencing the Wine Storage General Troubleshooting Guide.

1. Register the displayed temperatures.
  - a. *If "EE" is displayed for either compartment temperature with "SERVICE" flashing, the thermistor in that compartment is disconnected or defective.*
  - b. *If the unit is OFF, switch unit ON and go on to step #2 below.*
2. Register the set-points, keeping in mind that the initial key stroke will change the set-point by a one degree increment or decrement depending on your choice of WARMER key or COLDER key, respectively.
3. Initiate Wine Storage Diagnostic Mode by pressing and holding either COLDER key and the UNIT ON/OFF key, then register the temperature readings for each thermistor location.
  - a. *If "EE" is displayed for any of the locations, the thermistor in that location is disconnected or defective.*
4. Initiate Temperature Log Recall Mode by pressing and holding the desired compartment WARMER key and the UNIT ON/OFF key, then register the temperature of each index for both wine storage compartments. If "BELL ON" or "SERVICE" illuminate during an index, indicate which one by circling it on the worksheet.
  - a. *By observing the temperatures logged, you should be able to notice any warming or cooling trends, whether this trend was in one or both compartments, whether there was a power interruption ("BELL ON" illuminate) and whether the unit was switched OFF ("SERVICE" illuminates).*
  - b. *If double dashes ("- -") are displayed, the control board is defective.*

**NOTE:** *To see the index/time correlation, reference Temperature Log Index Chart on page 3-23 of this manual.*

5. Reference the General Troubleshooting Guide with the information gathered on the worksheet.

**WINE STORAGE DIAGNOSTIC WORKSHEET**

Temperature Display: Lower \_\_\_\_\_ Upper \_\_\_\_\_

Set-Point: Lower \_\_\_\_\_ Upper \_\_\_\_\_

Diagnostic Mode Thermistor Readings:

\_\_\_\_\_ *UE* (Upper Evap) \_\_\_\_\_ *LE* (Lower Evap) \_\_\_\_\_ *UP* (Upper Cmprt) \_\_\_\_\_ *LD* (Lower Cmprt)

Index	Logged Temp.		Annunciator Lit
	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.		Annunciator Lit
	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 DIAGNOSTIC WORKSHEET**

Temperature Display: Lower \_\_\_\_\_ Upper \_\_\_\_\_

Set-Point: Lower \_\_\_\_\_ Upper \_\_\_\_\_

Diagnostic Mode Thermistor Readings:

\_\_\_\_\_ **UE** (Upper Evap) \_\_\_\_\_ **LE** (Lower Evap) \_\_\_\_\_ **UP** (Upper Cmprt) \_\_\_\_\_ **LD** (Lower Cmprt)

Index	Logged Temp.		Annunciator Lit
	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
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15			BELL ON / SERVICE
16			BELL ON / SERVICE
17			BELL ON / SERVICE
18			BELL ON / SERVICE
19			BELL ON / SERVICE
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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

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	Lower	Upper	
33			BELL ON / SERVICE
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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 DIAGNOSTIC WORKSHEET**

Temperature Display: Lower \_\_\_\_\_ Upper \_\_\_\_\_

Set-Point: Lower \_\_\_\_\_ Upper \_\_\_\_\_

Diagnostic Mode Thermistor Readings:

\_\_\_\_\_ *UE* (Upper Evap) \_\_\_\_\_ *LE* (Lower Evap) \_\_\_\_\_ *UP* (Upper Cmprt) \_\_\_\_\_ *LD* (Lower Cmprt)

Index	Logged Temp.		Annunciator Lit
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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

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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 DIAGNOSTIC WORKSHEET

Temperature Display: Lower \_\_\_\_\_ Upper \_\_\_\_\_

Set-Point: Lower \_\_\_\_\_ Upper \_\_\_\_\_

Diagnostic Mode Thermistor Readings:

\_\_\_\_\_ **UE** (Upper Evap) \_\_\_\_\_ **LE** (Lower Evap) \_\_\_\_\_ **UP** (Upper Cmprt) \_\_\_\_\_ **LD** (Lower Cmprt)

Index	Logged Temp.		Annunciator Lit
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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
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31			BELL ON / SERVICE
32			BELL ON / SERVICE

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	Lower	Upper	
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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

**GENERAL TROUBLESHOOTING GUIDE:**

The alphabetical list below indicates how the General Troubleshooting Guide is arranged. Letters "A" through "P" pertain to the wine storage units, letters "Q through "AA" pertain to the 427R Refrigerator section only.

If servicing a 400 Series unit for temperature problems, it is recommended that a Wine Storage Diagnostic Worksheet be completed before referencing this General Troubleshooting Guide (See Page 8-2.). The information gathered on this worksheet will assist in narrowing the search for the cause of suspected temperature problems.

**NOTE:** The diagnostic worksheet does not apply to temperature problems in the refrigerator section of a 427R. See "Q" through "BB" below.

**NOTE:** All key strokes necessary to help in diagnosing a problem in a 400 Series unit are explained in section 3 of this manual.

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<i>(NOTE: Before serial #1728753, the Drawer Location Annunciators will flash)</i>	
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<i>(NOTE: Before serial #1728753, the Drawer Location Annunciators will flash)</i>	
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PROBLEM	POSSIBLE CAUSE	TEST / ACTION
<b>A. WARM TEMPERATURE IN BOTH WINE STORAGE COMPARTMENTS</b>	Control Set Too Warm	Check set-points. Adjust set-points COLDER
	Unit in Showroom Mode	Adjust set-points colder and listen for compressor & condenser fan operation. If they do not run, switch unit OFF then press and hold <u>upper</u> compartment 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
	<b>Door Ajar</b> 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.
	<b>Condenser Air Flow / Fan Fault</b> a. Dirty Condenser b. Condenser Fan Blade Loose or Obstructed c. Fan Motor Disconnected or Malfunctioning d. Defective or disconnected fan relay (427R after serial #1944319 Only)	a. Clean condenser. Clean if needed. b. Check fan blade. Tighten or remove obstruction. c. Check fan motor operation. Check fan motor electrical connections back to compressor. Check for 115V AC from compressor to motor. Reconnect or repair wires or replace motor if defective. d. Check electrical connections and power at 427R condenser fan relay. Reconnect or replace relay if defective.
	<b>Evaporator Fan Circuit Fault</b> a. Fan Switch(es) Disconnected or Malfunctioning b. 427 / 427R Top Hinge Cover Missing c. No Power from Control Board (Prior to serial #1944319 Only)	a. Check fan switch electrical connections. Check for 115V AC to and from switch. Reconnect or replace switch if defective. b. Replace top hinge cover. c. Check for 115V AC between P5 & P10 of J3 on control board. (NOTE: make sure unit is not in showroom Mode) If no power between P5 & P10, replace board.
	<b>Compressor Fault</b> a. Compressor Electricals Disconnected or Malfunctioning b. Compressor Inefficient c. Compressor Locked	a. Check integrity of compressor electricals. Check continuity back to control board. Check for 115V AC between P10 of J3 and E2 on control board. Correct wiring problems or replace compressor electricals if defective. If no power between J3 and E2, replace control board. b. Check AMP draw on compressor. If high by 15% or more, replace compressor. c. Check AMP draw on compressor. If extremely high, replace compressor.
<b>Sealed System Leak or Restriction</b>	SEE SEALED SYSTEM DIAGNOSTIC INFORMATION FOLLOWING THIS GENERAL TROUBLESHOOTING GUIDE.	



PROBLEM	POSSIBLE CAUSE	TEST / ACTION
<b>B. WARM TEMPERATURE IN ONLY ONE WINE STORAGE COMPARTMENT</b>	Control Set Too Warm	Check set-points. Adjust set-points COLDER
	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
	<b>Door Ajar</b> 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.
	<b>Evaporator Thermistor Fault</b>	Initiate Diagnostic Mode. If "EE" is displayed for either evap temp, check thermistor electrical connections back to control board. Correct wiring problems. If wiring is OK, verify thermistor is in correct location. Relocate if needed. Check thermistor ohms = 30,000 - 33,000 at 32°F / 0°C. Replace if defective.
<b>Condenser Air Flow / Fan Fault</b> a. Dirty Condenser b. Condenser Fan Blade Loose or Obstructed c. Fan Motor Disconnected or Malfunctioning d. Defective or disconnected fan relay (427R after serial #1944319 Only)	a. Clean condenser. Clean if needed. b. Check fan blade. Tighten or remove obstruction. c. Check fan motor operation. Check fan motor electrical connections back to compressor. Check for 115V AC from compressor to motor. Reconnect or repair wires or replace motor if defective. d. With a compressor running, check electrical connections and power at 427R condenser fan relay. Reconnect or replace relay if defective.	
<b>Evaporator Fan / Fan Circuit Fault</b> a. Fan Blade out of Position or Obstructed b. Fan Motor Disconnected or Malfunctioning c. Fan Switch Disconnected or Malfunctioning d. No Power from Control Board (Prior to serial #1944319 Only)	a. Check fan blade position. (See section 5 of this manual.) Reposition blade or remove obstructions. b. Check fan motor operation by pressing fan switch. Check fan motor electrical connections. Also check for 115V AC to motor. Reconnect or repair wires or replace motor if defective. c. Check fan switch electrical connections. Check for 115V AC to and from switch. Reconnect or replace switch if defective. d. Check for 115V AC between P5 & P10 of J3 on control board. (NOTE: make sure unit is not in showroom Mode) If no power between P5 & P10, replace board.	

(Continued)

PROBLEM	POSSIBLE CAUSE	TEST / ACTION
<p>(Continued)  <b>B. WARM TEMPERATURE IN ONLY ONE WINE STORAGE COMPARTMENT</b></p>	<p><b>Refrigerant Valve Solenoid Fault</b>                      a. Solenoid Disconnected or Malfunctioning                       b. Refrigerant Valve Stuck Closed, or Restricted at Cap Tube End</p>	<p>a. Initiate Manual Valve Activation Mode to verify operation. If inoperative, toggle to other evap temp reading to verify valve wiring is not crossed. Check solenoid electrical connections back to control board. Check for 115V AC between P8 &amp; P10 (upper) or P6 &amp; P10 (lower) of J3 on the control board. Correct wiring problems or replace solenoid if defective. If no power between points mentioned above, replace board.                       b. If solenoid checks OK, but temperatures do not drop while in Refrigerant Valve Activation Mode, replace defective or restricted valve. (NOTE: restriction is most likely in cap tube attached to valve. Check this after removing valve.)</p>
	<p><b>Compressor Fault</b>                      a. Compressor Electricals Disconnected or Malfunctioning                       b. Compressor Inefficient or Locked</p>	<p>a. Check integrity of compressor electricals. Check electrical connections back to control board. Replace defective electricals or repair wiring. Check for 115V AC between P10 of J3 and E2 on the control board. Correct any wiring problems or replace compressor electricals if defective. If no power from control board to compressor, replace board.                       b. Check AMP draw on compressor. If high by 15% or more, replace compressor.</p>
	<p><b>Sealed System Leak or Restriction</b></p>	<p>SEE SEALED SYSTEM DIAGNOSTIC INFORMATION FOLLOWING THIS GENERAL TROUBLESHOOTING GUIDE.</p>
<p><b>C. PRODUCT TEMPERATURE IS 10° OR MORE COLDER THAN DISPLAYED TEMPERATURE</b></p>	<p><b>Compartment Thermistor Fault (Misread)</b></p>	<p>Check thermistor ohms = 30,000 - 33,000 at 32°F / 0°C. Replace if defective. If thermistors are OK, replace control board.</p>
<p><b>D. COLD TEMPERATURES IN BOTH WINE STORAGE COMPARTMENTS</b></p>	<p><b>Room Temperature Below Set-Point</b></p>	<p>Instruct Customer.</p>
	<p><b>Control Set Too Cold</b></p>	<p>Check set-points. Adjust set-points WARMER</p>
	<p><b>Door Ajar</b>                      a. Wine Rack Obstruction                      b. Door out of Adjustment                       c. Door or Cabinet Hinge Problem</p>	<p>a. Adjust wine rack                      b. See Door Adjustment procedure in section 2 of this manual.                      c. Check hinges. Replace if defective.</p>

PROBLEM	POSSIBLE CAUSE	TEST / ACTION
E. 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 Solenoid Fault (Stuck Open)	Initiate Manual Valve Activation Mode on <u>opposite</u> valve as that suspected. Toggle to evaporator temp readings associated with suspected valve to verify it is closed. If it's open, Check solenoid electrical connections to make sure they're not crossed. Unplug solenoid to see if valve closes. If valve closes, replace solenoid. If valve does not close, replace valve.
F. 1. "EXTREMELY" COLD TEMPERATURES DISPLAYED (3° TO 18°) 2. <i>If outside US - this could be</i> "EXTREMELY" WARM TEMPERATURES DISPLAYED (38° TO 65°)	1. Control Set to Display Celsius but Customer Thought it Was Fahrenheit 2. <i>If Outside US - Control Set to Display Fahrenheit but Customer Thought it Was Celsius</i>	1. Initiate Temperature Units Selection Mode and select Fahrenheit units of measure. 2. Initiate Temperature Units Selection Mode and select Celsius units of measure.
G. "SERVICE" FLASHING	SEE PAGE 8-2 OF THIS MANUAL	SEE PAGE 8-2 OF THIS MANUAL
H. "EE" DISPLAYED FOR EITHER WINE STORAGE COMPARTMENT WITH "SERVICE" FLASHING	Compartment Thermistor Fault	Check thermistor electrical connections back to control board. Correct wiring problems. Check thermistor ohms = 30,000 - 33,000 at 32°F / 0°C. Replace if defective.
I. LIGHTS STAY ON IN EITHER WINE STORAGE COMPARTMENT	Lights Switched "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.
J. LIGHTS WILL NOT ENERGIZE IN ONE OR BOTH WINE STORAGE COMPARTMENTS	Unit in Sabbath Mode	Press & release UNIT ON/OFF key.
	Lights Burned-out	Plug in known good lights. If they work, replace defective lights.
	Light Switch Disconnected or Malfunctioning	Check light switch operation and electrical connections. Check for 115V AC to and from switch. Reconnect wires or replace switch if defective.
	No Power from Control Board	Check for 115V AC between P10 of J3 and E3 on control board. (NOTE: make sure unit is not in Sabbath Mode) If no power, replace board.

PROBLEM	POSSIBLE CAUSE	TEST / ACTION
K. CONTROL PANEL KEYS INOPERABLE OR MAL-FUNCTIONING	Control Panel Ribbon Cable Plugged in Wrong	Check control panel ribbon cable (silver area on the ribbon cable terminal should be facing away from the 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.
L. LED's DO NOT ILLUMINATE	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
M. ALL LED's STAY ILLUMINATED	Bad Data from Control Board	Replace Control Board
N. SAME SEGMENT(S) MISSING FROM BOTH DISPLAY WINDOWS	Bad Data from Control Board	Replace Control Board
O. SEGMENT(S) MISSING FROM ONLY ONE DISPLAY WINDOWS	Bad LED Board in Control Panel	Replace Control Panel Assembly
P. DOOR / UNIT UN-LEVEL	SEE SECTION 2 OF THIS MANUAL	SEE SECTION 2 OF THIS MANUAL

PROBLEM	POSSIBLE CAUSE	TEST / ACTION
<p><b>Q. WARM TEMPERATURE IN REFRIGERATOR COMPARTMENT</b></p> <p><i>Troubleshooting pointer:</i></p> <p>After checking the first six possible problems in column 2, open drawer to energize compressor.</p> <p>With compressor running, depress Reed switch to see if evap fan energizes, If not, see Evaporator Fan Fault.</p> <p>If fan checks OK, then release switch and observe evaporator temperatures for five minutes with drawer open and compressor running.</p> <p>1. If evap temp pulls down to 15°F / -9°C, see:</p> <ul style="list-style-type: none"> <li>• Evaporator Fan Fault (a. fan blade position)</li> <li>• Sealed System Leak or Restriction</li> </ul> <p>2. If evap temp cannot pull down to 30°F / -1°C, see:</p> <ul style="list-style-type: none"> <li>• Condenser Air flow / Condenser Fan Fault</li> <li>• Compressor Fault</li> <li>• sealed system leak or restriction</li> </ul>	<p><b>Control Set Too Warm</b></p>	<p>Check set-points. Adjust set-points COLDER</p>
	<p><b>Unit Recently Energized</b></p>	<p>Allow time for unit to pull down</p>
	<p><b>Unit Recently Stocked with Food</b></p>	<p>Instruct customer</p>
	<p><b>High Room Ambient</b></p>	<p>Instruct Customer that unit performs best between 60°F / 16°C - 90°F / 32°C</p>
	<p><b>Unit in Showroom Mode</b></p>	<p>Open drawer, adjust set-points colder &amp; listen for compressor operation. If compressor does not energize after 5 minutes with drawer open, switch refrigerator OFF then press &amp; hold COLDER &amp; WARMER keys while pressing UNIT ON/OFF key.</p>
	<p><b>Drawer Ajar</b></p> <ul style="list-style-type: none"> <li>a. Food Product Obstruction</li> <li>b. Drawer Not Installed Correctly</li> <li>c. Drawer Closer Tripped Forward</li> </ul>	<ul style="list-style-type: none"> <li>a. Move obstruction</li> <li>b. Reinstall drawer.</li> <li>c. Trip closer forward, or replace if defective.</li> </ul>
	<p><b>Evaporator Fan Fault</b></p> <ul style="list-style-type: none"> <li>a. Fan Blade out of Position or Obstructed</li> <li>b. Reed Switch Disconnected or Malfunctioning</li> <li>c. Fan Motor Disconnected or Malfunctioning</li> <li>d. No Power from Control Board</li> </ul>	<ul style="list-style-type: none"> <li>a. Check fan blade position. (See section 5 of this manual.) Reposition blade or remove obstructions.</li> <li>b. Check Reed switch operation and electrical connections. Check for 5V DC to and from switch. Reconnect wires or replace Reed switch if defective.</li> <li>c. Check fan motor operation by pressing either Reed switch. Check fan motor electrical connections. Also check for 115V AC to motor. Reconnect or repair wires or replace motor if defective.</li> <li>d. Check for 115V AC between P5 &amp; P8 on control board. (NOTE: make sure unit is not in showroom Mode) If no power between P5 &amp; P8, replace board.</li> </ul>
<p><b>Condenser Air Flow / Fan Fault</b></p> <ul style="list-style-type: none"> <li>a. Dirty Condenser</li> <li>b. Condenser Fan Blade Loose or Obstructed</li> <li>c. Fan Motor Disconnected or Malfunctioning</li> <li>d. Defective or disconnected fan relay (427R after serial #1944319 Only)</li> </ul>	<ul style="list-style-type: none"> <li>a. Clean condenser. Clean if needed.</li> <li>b. Check fan blade. Tighten or remove obstruction.</li> <li>c. Check fan motor operation. Check fan motor electrical connections back to compressor. Check for 115V AC from compressor to motor. Reconnect or repair wires or replace motor if defective.</li> <li>d. Check electrical connections and power at 427R condenser fan relay. Reconnect or replace relay if defective.</li> </ul>	
<p><b>(Continued)</b></p>	<p><b>Compartment Thermistor Fault (Misread)</b></p>	<p>Check thermistor ohms = 30,000 - 33,000 at 32°F / 0°C. Replace if defective.</p>

PROBLEM	POSSIBLE CAUSE	TEST / ACTION
<p><i>(Continued)</i>  <b>Q. WARM TEMPERATURE IN REFRIGERATOR COMPARTMENT</b>   <i>(See Pointers on previous page)</i></p>	<p><b>Compressor Fault</b>                      a. Compressor Electricals Disconnected or Malfunctioning                       b. Compressor Inefficient or Locked</p>	<p>a. Check integrity of compressor electricals. Check electrical connections back to control board. Replace defective electricals or repair wiring. Check for 115V AC between P5 &amp; P14 on the control board. Correct any wiring problems or replace compressor electricals if defective. If no power at between P5 &amp; P14, replace board. (NOTE: Compressor will not energize unless evaporator is above 40°F / 4°C.)                      b. Check AMP draw on compressor. If high by 15% or more, replace compressor.</p>
	<p><b>Sealed System Leak or Restriction</b></p>	<p>SEE SEALED SYSTEM DIAGNOSTIC INFORMATION FOLLOWING THIS GENERAL TROUBLESHOOTING GUIDE.</p>
<p><b>R. "EE" and "SERVICE" FLASHING</b>  <i>(Before serial #1728753, the Drawer Location Annunciators will flash)</i></p>	<p><b>Compartment Thermistor Fault</b></p>	<p>Check electrical connections to thermistor and check thermistor ohms = 30,000 - 33,000 at 32°F / 0°C. Repair connections or replace if defective.</p>
<p><b>S. "EO" OR "E3" and "SERVICE" FLASHING</b>  <i>(Before serial #1728753, the Drawer Location Annunciators will flash)</i></p>	<p><b>Control Cable Disconnected or Faulty</b></p>	<p>Check control cable and connections between control panel and Methode connector on back duct. Reconnect, repair or replace if defective.</p>
<p><b>T. "SERVICE" ALONE FLASHING</b>  <i>(Before serial #1728753, the Drawer Location Annunciators will flash)</i></p>	<p><b>Disconnected or Faulty Wiring between Back Duct and Electronic Control Board</b></p>	<p>Check wiring from Methode connector on back duct to electronic control board. Reconnect, repair or replace if defective.</p>
<p><b>T. "SERVICE" ALONE FLASHING</b>  <i>(Before serial #1728753, the Drawer Location Annunciators will flash)</i></p>	<p><b>Faulty Control Panel or Electronic Control Board</b></p>	<p>If unit passes all tests above, replace control panel and electronic control board.</p>
<p><b>T. "SERVICE" ALONE FLASHING</b>  <i>(Before serial #1728753, the Drawer Location Annunciators will flash)</i></p>	<p><b>Evaporator Thermistor Fault</b></p>	<p>Initiate Diagnostic Mode. If "EE" is displayed for evap temp, check thermistor electrical connections back to control board. Correct wiring problems. If wiring is OK, verify thermistor is in correct location. Relocate if needed. Check thermistor ohms = 30,000 - 33,000 at 32°F / 0°C. Replace if defective.</p>
<p><b>U. PRODUCT TEMPERATURE IN REFRIGERATOR 10° OR MORE COLDER THAN DISPLAYED TEMPERATURE</b></p>	<p><b>Compartment Thermistor Fault (Misread)</b></p>	<p>Check thermistor ohms = 30,000 - 33,000 at 32°F / 0°C. Replace if defective. If thermistors are OK, replace control board.</p>
<p><b>V. COLD TEMPERATURE DISPLAYED IN REFRIGERATOR COMPARTMENT</b></p>	<p><b>Control Set Too Cold</b></p>	<p>Check set-points. Adjust set-points WARMER</p>
<p><b>V. COLD TEMPERATURE DISPLAYED IN REFRIGERATOR COMPARTMENT</b></p>	<p><b>Drawer Ajar</b>                      A. Food Product Obstruction                      B. Drawer Not Installed Correctly                      C. Drawer Closer Tripped Forward</p>	<p>a. Move obstruction                      b. Reinstall drawer.                      c. Trip closer forward, or replace if defective.</p>



PROBLEM	POSSIBLE CAUSE	TEST / ACTION
<b>W. 1. "EXTREMELY" COLD TEMPERATURES DISPLAYED IN REFRIGERATOR (1° TO 7°)</b> <b>2. If outside US - this could be "EXTREMELY" WARM TEMPERATURES DISPLAYED IN REFRIGERATOR (34° TO 45°)</b>	<b>1. Control Set to Display Celsius but Customer Thought it Was Fahrenheit</b>  <b>2. If Outside US - Control Set to Display Fahrenheit but Customer Thought it Was Celsius</b>	<b>1. Initiate Temperature Units Selection Mode and select Fahrenheit units of measure.</b>  <b>2. Initiate Temperature Units Selection Mode and select Celsius units of measure.</b>
<b>X. LIGHTS STAY ON WITH DRAWER CLOSED</b>	<b>Reed Switch Wiring</b>	Check wiring between Reed switch and control board. Rewire if incorrect.
<b>Y. LIGHTS WILL NOT ENERGIZE</b>	<b>Unit in Sabbath Mode</b>	Press & release UNIT ON/OFF key.
	<b>Lights Burned-out</b>	Plug in known good lights. If they work, replace defective lights.
	<b>Reed Switch Disconnected or Malfunctioning</b>	Check Reed switch operation and electrical connections. Check for 5V DC to and from switch. Reconnect wires or replace switch if defective.
	<b>No Power from Control Board</b>	Check for 115V AC between P7 and P5 on control board. (NOTE: make sure unit is not in Sabbath Mode) If no power, replace board.
<b>Z. CONTROL PANEL KEYS &amp;/OR LCD INOPERABLE OR MALFUNCTIONING</b>	<b>Control Cable Disconnected or Faulty</b>	Check control cable and connections between control panel and Methode connector on back duct. Reconnect, repair or replace if defective.
	<b>Disconnected or Faulty Wiring between Back Duct and Electronic Control Board</b>	Check wiring from Methode connector on back duct to electronic control board. Reconnect, repair or replace if defective.
	<b>Faulty Control Panel or Electronic Control Board</b>	If unit passes all tests above, replace control panel and electronic control board.
<b>AA. DRAWER(S) / UNIT UN-LEVEL</b>	<b>SEE SECTION 2 OF THIS MANUAL</b>	<b>SEE SECTION 2 OF THIS MANUAL</b>

## SEALED SYSTEM DIAGNOSTIC INFORMATION:

Before troubleshooting the sealed system with the information below, see pages 8-2 through 8-15 in this manual.

**NOTE:** Whenever entering the sealed system, always use solder-in process valves. Do NOT use bolt-on process valves as they are prone to leak.

**NOTE:** Whenever servicing the sealed system, the high-side filter-drier must be replaced.

NORMAL OPERATING PRESSURES		
Model	Normal Low Side Pressures	Normal High Side Pressures
424	8 psi to 38 psi	90 psi to 100 psi
427	8 psi to 38 psi	90 psi to 100 psi
427R - Wine Storage	8 psi to 38 psi	90 psi to 100 psi
427R - Refrigerator	10 psi to 40 psi	90 psi to 100 psi
430	8 psi to 38 psi	90 psi to 100 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

**NOTE:** The 427R Refrigerator Sealed System Service Procedures for 134a are the same as those in the table at right, except for the "NOTE" in the second column of the table.





## WINE STORAGE SEALED SYSTEM REPAIR PROCEDURES

Problem	Service Procedures
<p><b>Non-Operating, Inefficient, Noisy Compressor</b></p> <p>(NOTE: To check for a non-operating compressor, a hard start kit can be used)</p>	<p>a. Capture refrigerant  b. Replace Compressor  c. Replace filter-drier  d. Evacuate or sweep charge system</p> <p><b>NOTE:</b> If evacuating the sealed system, you must evacuate from both the low &amp; high sides, due to the refrigerant valves. If sweep charging the sealed system, you must energize each refrigerant valves during the sweeping procedure. (See Manual Valve Activation Mode in Section 3)</p> <p>e. Recharge system with Virgin 134a refrigerant.</p>
<p><b>High Side leak</b></p>	<p>a. Capture refrigerant.  b. Repair leak.  c. Replace filter-drier.  d. Evacuate or sweep charge system.</p> <p><b>NOTE:</b> If evacuating the sealed system, you must evacuate from both the low &amp; high sides, due to the refrigerant valves. If sweep charging the sealed system, you must energize each refrigerant valves during the sweeping procedure. (See Manual Valve Activation Mode in Section 3)</p> <p>e. Recharge system with Virgin 134a refrigerant.</p>
<p><b>Low Side Leak</b></p>	<p>a. Capture refrigerant.  b. Repair leak (if at solder joint) or replace part.  c. Back flush high side of sealed system.  d. Replace compressor.  e. Replace filter-drier.  f. Evacuate or sweep charge system.</p> <p><b>NOTE:</b> If evacuating the sealed system, you must evacuate from both the low &amp; high sides, due to the refrigerant valves. If sweep charging the sealed system, you must energize each refrigerant valves during the sweeping procedure. (See Manual Valve Activation Mode in Section 3)</p> <p>g. Recharge system with Virgin 134a refrigerant.</p>
<p><b>Contaminated Sealed System</b></p> <p>Examples:  &gt; Burned out compressor  &gt; Excessive moisture from leak in condensate loop or in low side  &gt; Plugged capillary tube</p>	<p>a. Capture refrigerant.  b. Repair leak (if at solder joint) or replace part.  c. Back flush high side of sealed system.  d. Replace compressor.  e. Replace filter-drier.  f. Replace heat exchanger if cap tube is clogged.  g. Install a low side drier on suction line.  h. Evacuate or sweep charge sealed system.</p> <p><b>NOTE:</b> If evacuating the sealed system, you must evacuate from both the low &amp; high sides, due to the refrigerant valves. If sweep charging the sealed system, you must energize each refrigerant valves during the sweeping procedure. (See Manual Valve Activation Mode in Section 3)</p> <p>i. Recharge with Virgin 134a refrigerant.</p>
<p><b>Restriction</b></p> <p>(NOTE: If restriction is due to sealed system being contaminated, see Contaminated Sealed System above.)</p>	<p>a. Capture refrigerant.  b. Locate and remove restriction or locate and replace part.  c. Back flush high side of sealed system.  d. Replace filter-drier.  e. Evacuate or sweep charge system.</p> <p><b>NOTE:</b> If evacuating the sealed system, you must evacuate from both the low &amp; high sides, due to the refrigerant valves. If sweep charging the sealed system, you must energize each refrigerant valves during the sweeping procedure. (See Manual Valve Activation Mode in Section 3)</p> <p>f. Recharge system with Virgin 134a refrigerant.</p>
<p><b>Overcharge</b></p>	<p>a. Capture refrigerant.  b. Replace filter-drier.  c. Evacuate or sweep charge system.</p> <p><b>NOTE:</b> If evacuating the sealed system, you must evacuate from both the low &amp; high sides, due to the refrigerant valves. If sweep charging the sealed system, you must energize each refrigerant valves during the sweeping procedure. (See Manual Valve Activation Mode in Section 3)</p> <p>d. Recharge system with Virgin 134a refrigerant.</p>

**WINE STORAGE MEMBRANE SWITCH / RIBBON CABLE TEST PROCEDURE**

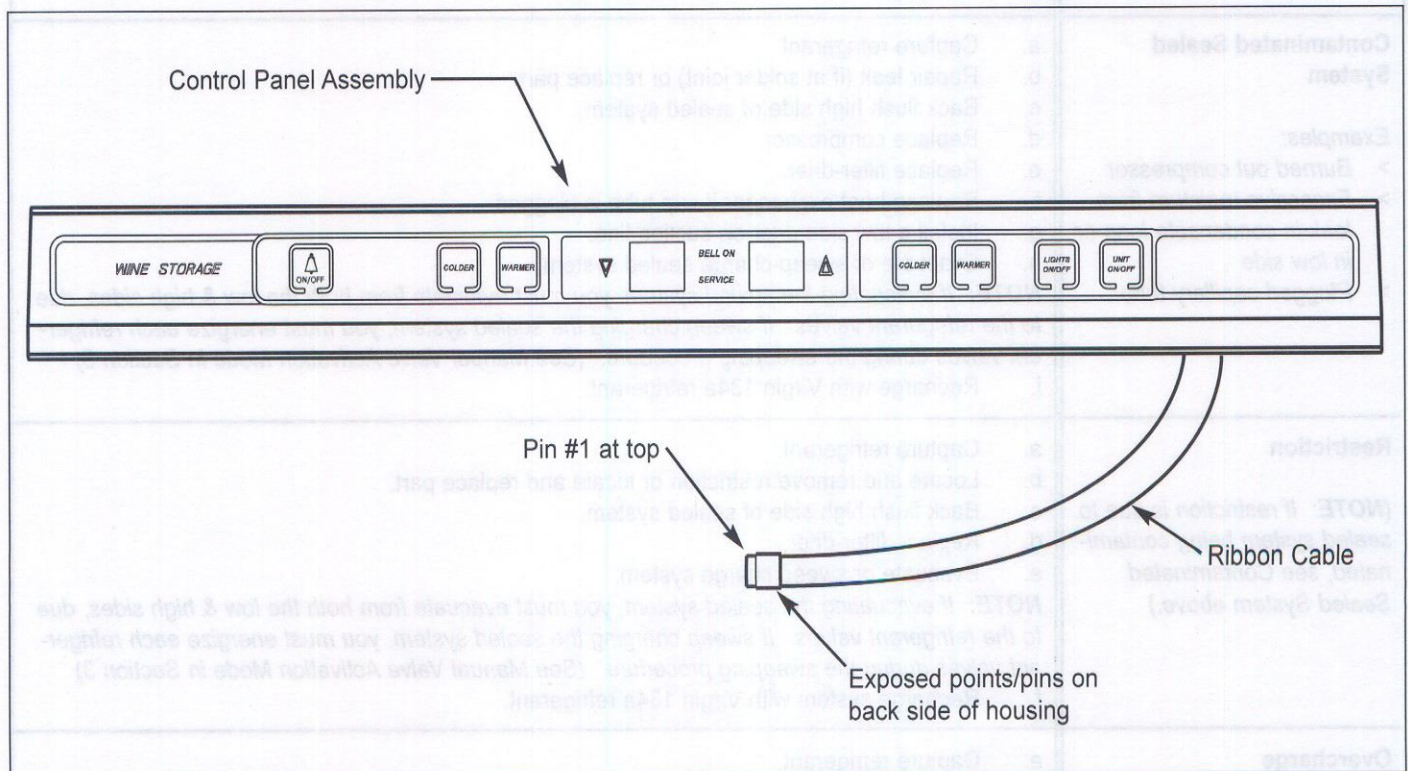
The membrane switch is that part of the control panel assembly consisting of the function keys used for all input functions to the electronic control system. (See Figure 8-1)

Below is the procedure to follow if the integrity of the membrane switch and/or its ribbon cable is suspect. To perform these tests, the ribbon cable terminal housing 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 the top of the terminal housing, closest to the arrow on the housing (see Figure 8-1).

1. Without pressing any of the keys on the membrane switch, check for continuity across all pin combinations. With no keys pressed, there should be no continuity.
2. With the UNIT ON/OFF key depressed, there should be continuity across pins #4 & #6 only.
3. With the lower wine storage COLDER key depressed, there should be continuity across pins #2 & #3 only.
4. With the lower wine storage WARMER key depressed, there should be continuity across pins #3 & #4 only.
5. With the upper wine storage COLDER key depressed, there should be continuity across pins #2 & #6 only.
6. With the upper wine storage WARMER key depressed, there should be continuity across pins #5 & #7 only.
7. With the LIGHTS ON/OFF key depressed, there should be continuity across pins #5 & #6 only.
8. With the alarm bell key depressed, there should be continuity across pins #3 & #7 only.

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



**Figure 8-1. Membrane Switch**