


DEMAND DEFROST CONTROL CHECKOUT	
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COVER SHEET ONLY - SEE ATTACHED
SHEETS 2 AND 3 FOR DETAILS

DEMAND DEFROST CONTROL CHECKOUT

IMPORTANT --- This document is customer property and is to remain with this unit. Please return to service information pack upon completion of work.

SYMPTOMS	CHECKS (see Check List)
1. LED off.	C1, C2
2. LED flashing greater than 4 times/sec or on continuously.	C3
3. Control does not initiate a defrost on its own.	C4, C5, C1, C6, C7, C8, C9
4. Control does not initiate a forced defrost.	C1, C9
5. Defrost initiates manually but terminates in less than 10 sec.	Replace defrost control: A18
6. Defrost initiates manually but terminates on time.	C6, C7, C11, C10, C12
7. Defrost initiates on 15 minute intervals.	C13, C11, C14, C10
8. Defrost initiates on 30 minute intervals.	C15, C5, C6, C7, C8, C16, C18, C10, C19
9. OD fan runs during defrost.	Replace defrost control: A18
10. No SOV delay on defrost termination.	C17
11. OD fan runs but does not change speed in clg mode (21C151619 controls ONLY)	C1, C21, C22, C23, C6, C7, C8
12. SCROLL compressor does not operate.	C1, C24
13. No 30 second off delay at defrost initiation on SCROLL bearing unit.	C25
14. No 30 second off delay at defrost termination with SCROLL bearing unit.	C25
15. Outdoor unit does not run with thermostat signal on "Y"	C26
CHECK LIST	ACTIONS (see Action List)
C1: 24V R-B AT BOARD and 24V Y-B AT BOARD?	NO: A1
C2: Short FRC_DFT pin to TEST_COMMON pin. Defrost cycle initiated?	NO: A18 YES: A2
C3: TEST_COMMON pin shorted to TST pin?	NO: A18 YES: A3
C4: Are the required conditions for defrost met? (OD Temp. below 49F, OD Coil Temp. below 35F, deltaT increasing)	NO: A10
C5: Visually check sensor locations; ambient sensor in air stream, coil sensor inside sensor well mounted on OD coil circuit. Sensor(s) out of place?	YES: A4
C6: De-energize 24V Y-B and R-B signals. Place a DC multimeter between TEST_COMMON and TST. Energize 24V R-B <u>ONLY</u> . Does the voltage remain below 3.5VDC for a few seconds and then jump up to over 4.5VDC?	NO: A6 YES: A5
C7: Do the sensors make a loose connection with the pins on the board?	YES: A7
C8: Check sensors for correct resistance according to attached chart. Resistance in range?	NO: A9
C9: Short FRC_DFT pin to TEST_COMMON pin. Does a defrost cycle commence?	NO: A18 YES: A8
C10: Does OD fan cycle off in defrost?	NO: A18
C11: Coil sensor reading open circuit or very high resistance?	YES: A9
C12: Windy weather preventing normal termination on temperature?	YES: A12
C13: Verify that OD coil is clear of ice.	
C14: Ambient sensor reading shorted or less than normal?	YES: A9
C15: TEST_COMMON pin shorted to TST pin?	YES: A3
C16: Verify correct system charge.	A11
C17: Has J1 been cut or removed?	NO: A18 YES: A13
C18: Does a forced defrost terminate in less than 15 minutes?	NO: A18
C19: Does SOV operate properly?	NO: A1 or A14 as appropriate
C20: Check OD fan wiring from defrost control to fan motor. Miswired?	YES: A17
C21: Short LOW_FAN pin to TEST_COMMON pin. Does fan go to or stay on low rpm?	NO: A18
C22: Remove short from LOW_FAN pin to TEST_COMMON pin. Does fan go to high speed for at least 4 seconds?	NO: A18
C23: Check protection devices in YO circuit. 24V YO-B present after 30 seconds?	NO: A8 or A18 as appropriate
C24: Place an AC voltmeter between terminals 2 and 7 of the control and force a defrost cycle. Is 24V present for 30 seconds and then 0V thereafter?	NO: A18
C25: At defrost termination is there 24VAC for 30 seconds between terminals 2 and 7 and then 0 VAC thereafter?	NO: A16
C26: Verify that the Ambient Sensor is connected and within range using the Temperature/Resistance chart. Is the resistance of the Ambient Sensor within range?	NO: A17
<p>Note: 14/15"e" defrost controls have a selectable defrost termination temperature. As shipped, defrost will terminate at 47F and follow Demand Defrost logic. For a higher termination temperature, cut Jumper 2 to achieve 70F when at or below 30F ambient. At temperatures below 6F the control forces defrost every 3 hours for 12 minutes.</p>	

(INFORMATION CONTINUED ON BACK OF PAGE)



WARNING

THIS INFORMATION IS INTENDED FOR USE BY INDIVIDUALS POSSESSING ADEQUATE BACKGROUNDS OF ELECTRICAL AND MECHANICAL EXPERIENCE. ANY ATTEMPT TO REPAIR A CENTRAL AIR CONDITIONING PRODUCT MAY RESULT IN PERSONAL INJURY AND OR PROPERTY DAMAGE. THE MANUFACTURER OR SELLER CANNOT BE RESPONSIBLE FOR THE INTERPRETATION OF THIS INFORMATION, NOR CAN IT ASSUME ANY LIABILITY IN CONNECTION WITH ITS USE.

ACTION LIST
A1: Repair low voltage wiring
A2: LED is bad but control will still function.
A3: Remove short.
A4: Correct the positioning of the sensors.
A5: Both sensors are reading in-range by the control.
A6: One of the sensors is reading either open or shorted. Clean sensor pins on board if necessary.
A7: Repair bent contacts inside sensor connectors or replace sensors if unrepairable.
A8: Y-B signal or control may be intermittent.
A9: Replace defective sensor.
A10: Check refrigerant circuits for balanced distribution of refrigerant if OD coil is frosting and deltaT is not increasing.
A11: Adjust as needed.
A12: Block unit from wind without obstructing airflow to the coil.
A13: The soft-switch time is defeated when J1 is cut.
A14: Replace SOV if necessary.
A15: Repair OD fan motor circuit wiring.
A16: Replace defrost control.
A17: Replace the Ambient Sensor. Note: 14/15 SEER R410A scroll (3.5-5 ton) defrost controls turn OFF the compressor at 0°F and resume compressor heat above 5°F.

If none of these "ACTIONS" restore proper operation, contact your local Field Service Representative or Dealer Support Specialist.

Procedure:

Measure the temperature the subject sensor is exposed to. If the sensor is mounted on a tube, place the lead on an Annie A-8 (or equiv.) temp. tester on the same tube near the sensor and insulate the bulb.

Unplug the sensor and measure the resistance with a good quality ohm meter (Simpson 260 or equiv.). Read the value as quickly as possible to prevent the meter current from changing the resistance reading.

Using the chart on the right, locate (as close as possible) the actual sensor temperature. The measured resistance should be relatively close to the resistance value shown in the chart.

Example:

Sensor temp = 19°F

Measured Resistance = 46.5K ohms

This sensor is good since the measured value is relatively close to the chart value.

TEMP °F	RESISTANCE
86	7.9K
81	8.9K
75	10.3K
70	11.6K
65	13.2K
59	15.3K
55	17.0K
50	19.4K
45	22.2K
41	24.8K
36	28.5K
32	31.9K
25	39.0K
19	46.5K
14	54.0K
10	60.9K
5	71.1K
0	83.2K

FLASH RATE INDICATIONS:

1 — Flash/Second = Normal operation

2 — Flashes/Second = Fault A (low delta T) i.e.: Inoperative Compressor, loss of charge, open amb. sensor, shorted coil sensor.

3 — Flashes/Second = Fault B (10 defrosts terminated on time)

Fault C (High— delta T) i.e.: SOV stuck in heating, shorted amb. sensor, open coil sensor, closed TXV, OD fan motor failure, OD fan on in defrost, undercharged unit.

4 — Flashes/Second = Fault A & C or A & B

For additional information consult Pub. No. 34-1001 Heat Pump Defrost Controls.