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. ODS-A burned out.	C20
12. OD fan runs but does not change speed in clg mode (21C151619 controls ONLY)	C1, C21, C22, C23, C6, C7, C8
13. SCROLL compressor does not operate.	C1, C24
14. No 30 second off delay at defrost initiation on SCROLL bearing unit.	C25
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 ONLY. 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: B to T1 greater than 10VAC?	NO: A16 YES: A15
C21: Check OD fan wiring from defrost control to fan motor. Miswired?	YES: A17
C22: Short LOW_FAN pin to TEST_COMMON pin. Does fan go to or stay on low rpm?	NO: A18
C23: Remove short from LOW_FAN pin to TEST_COMMON pin. Does fan go to high speed for at least 4 seconds?	NO: A18
C24: Check protection devices in YO circuit. 24V YO-B present after 30 seconds?	NO: A8 or A18 as appropriate
C25: 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

(INFORMATION CONTINUED ON BACK OF PAGE)

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: Check low voltage wiring for miswire, repair wiring, replace ODS-A with kit RES00118.
A16: Check for short in low voltage wiring, repair wiring, replace ODS-A with kit RES00118.
A17: Repair OD fan motor circuit wiring.
A18: Replace defrost control.

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 = 46K ohms
This sensor is good since the measured value is relatively close to the chart value.

TEMP °F	RESISTANCE
86	7.85K
81	8.85K
75	10.24K
70	11.59K
65	13.14K
59	15.32K
55	16.93K
50	19.41K
45	22.20K
41	24.76K
36	28.45K
32	31.84K
25	37.50K
19	46.44K
14	53.94K
10	57.64K
5	67.06K
0	78.05K

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 (20 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.

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