Aprilaire Dehumidifier Troubleshooting Manual
Model 1730A

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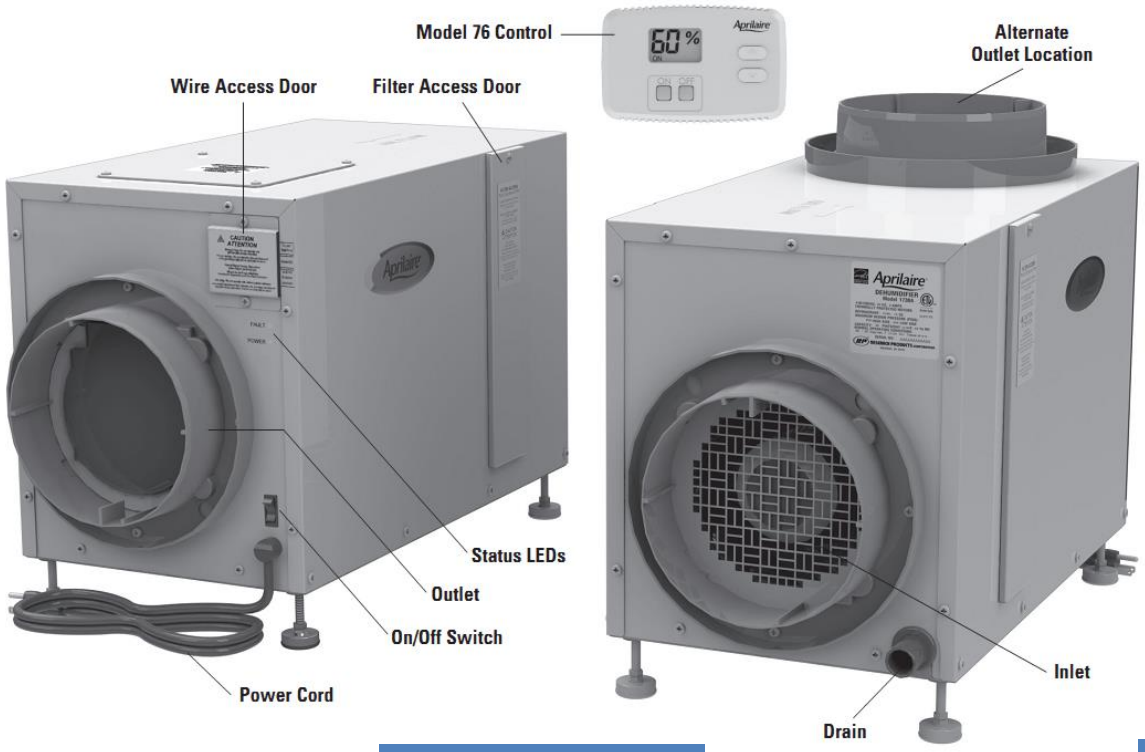
Instruments you will need to complete troubleshooting:

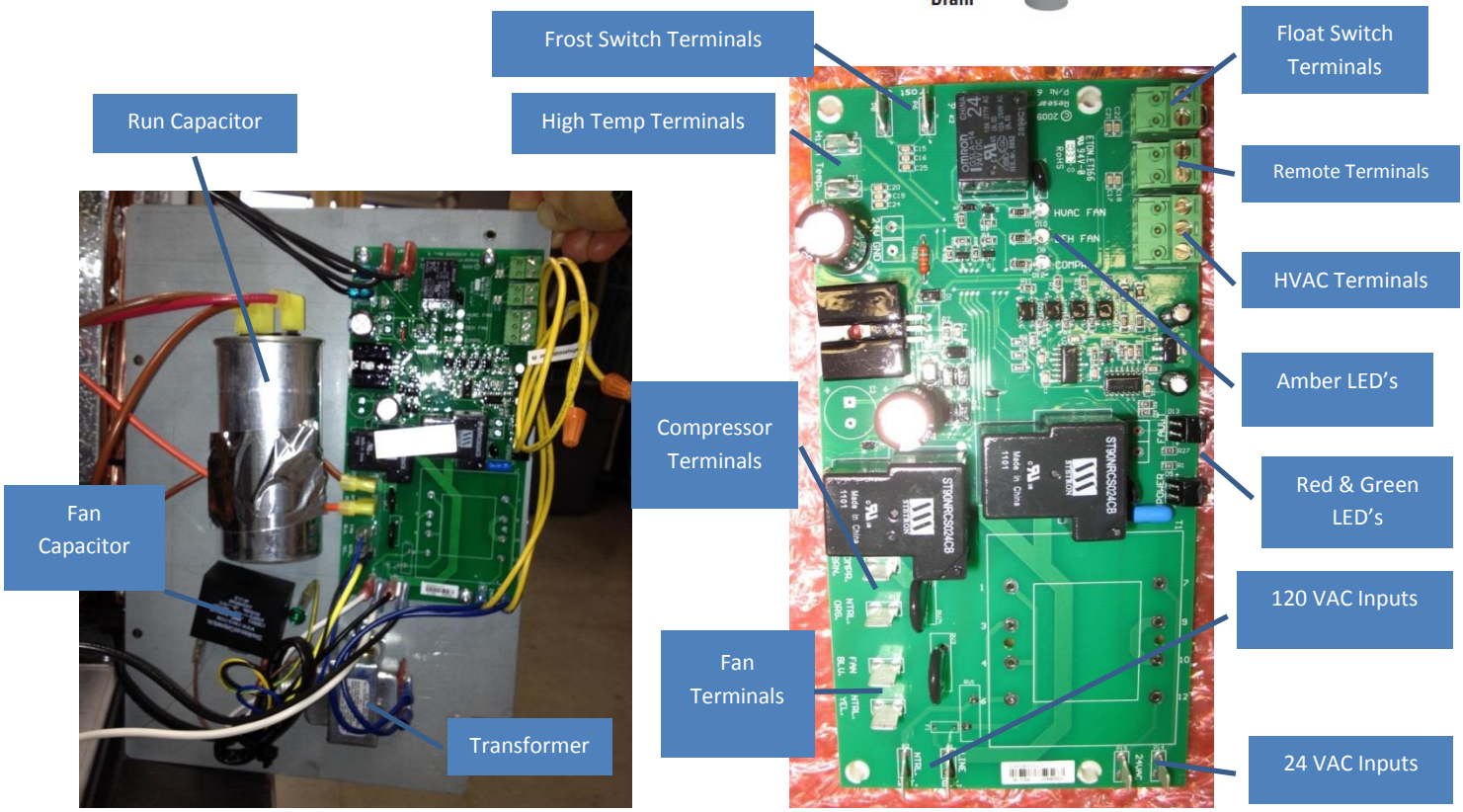
1. Digital Multi-Meter (DMM) capability of measuring
    - AC and DC voltage
    - Resistance
    - Capacitance
2. Temperature Meter for air temperature
3. Humidity Meter for air RH

Minimum tools needed to complete troubleshooting:

1. Phillips screwdriver (#2) or drill driver with #2 Phillips bit
2. Small (terminal) flat head screwdriver
3. Needle nose pliers
4. Level (to troubleshoot water leak claims)

Note: Do not hook up refrigeration gauges to the dehumidifier. Use of gauges will result in refrigerant loss and performance loss.





Electrical Panel **Control Board**

Troubleshooting Fault Codes

A dehumidifier fault can be indicated by the red Fault LED. A Model 75/76 external control error is indicated by the Er code on the Model 75/76 screen.

Note: Observing the amber LED's is only possible if the dehumidifier cover is removed.

Red FAULT LED

Open float switch or high temperature switch.

1. If the blower and compressor are not running (all amber LED's off), it is a float switch fault.
    a. If float switch not installed, confirm a jumper is installed between the FLOAT SWITCH terminals.
    b. If float switch is installed, confirm the switch position. If the switch is open but there is no standing water in the drain pan, replace the switch. If the switch is open due to standing water in the drain pan, verify there are no obstructions in the drain line and/or check for leaks.
2. If the blower is on and the amber HVAC fan and DEH fan LEDs are on, the high temperature switch is open due to high system pressure or high discharge line temperature.
    a. Check for blocked ductwork on inlet and outlet and clear any obstructions.
    b. Check other HVAC system dampers to verify they are not stuck or malfunctioning.
    c. Check that the backflow damper swings freely in the outlet collar.
    d. If flex duct is used, check that it is stretched and straight and that damper does not contact the duct.
    e. Check that the dehumidifier filter is not plugged. Wash or replace(4904) if necessary.
    f. Check inlet air temperature. Inlet air above 95°F will cause the high temperature switch to open.
    g. If there is no airflow restriction and inlet air temperature is below 95°F, disconnect the high temperature switch from the control board and discharge line and verify continuity (resistance near zero) between the two high temperature switch leads. If there is no continuity, the switch (4924) will need to be replaced.

Er shown on Model 75/76 Control

The control has an internal fault and will need to be replaced (76).

Troubleshooting Dehumidifier

1. Verify that no field modifications have been made to the dehumidifier electrical system.
2. Remove the G-STAT, R-HVAC, G-HVAC terminal block.
3. Place a jumper between the FLOAT SWITCH terminals.
4. Place a jumper between the REMOTE terminals.
5. Cap the wires removed from the control with wire nuts (removed from REMOTE terminals).
6. Plug the unit into a known good outlet (no extension cord).
7. Turn the ON/OFF switch to the ON position, begin a timer, and verify the following happen immediately:
    a. Green POWER LED turns on.
    b. Amber HVAC FAN LED turns on.
    c. Amber DEH FAN LED turns on.
    d. Dehumidifier blower turns on.
8. 3 minutes after the dehumidifier was turned on, verify the amber COMPR LED and compressor turn on.
9. If all of the above occurs and the fan and compressor continue to operate for a minimum of 3 minutes of compressor on time, the dehumidifier electrical circuit and components are good. Proceed to Reconnecting External Control, pg. 5.
10. If operation does not follow the above or if the FAULT LED turns on, use the table to determine the next troubleshooting step. Colors represent LED colors.

Green POWER LED	Red FAULT LED	Amber HVAC FAN LED	Amber DEH FAN LED	Amber COMPR LED	Dehumidifier Fan	Dehumidifier Compressor	Cause	Action
OFF	OFF	OFF	OFF	OFF	OFF	OFF	Circuit board not getting 24VAC or bad circuit board	See Troubleshooting Power Circuit, pg. 8
ON	OFF	OFF	OFF	OFF	OFF	OFF	Jumper in REMOTE terminals not properly seated	Re-seat jumper
ON	ON	OFF	OFF	OFF	OFF	OFF	Jumper in FLOAT terminals not properly seated	Re-seat jumper
ON	ON	ON	ON	OFF	ON	OFF	High Temp. switch open	See #2 under Red Fault LED, pg. 3
ON	OFF	ON	ON	OFF	OFF	OFF	Problem with fan circuit	See Troubleshooting Fan Circuit, pg. 9
ON	OFF	ON	ON	OFF	ON	OFF	Low temperature switch is open	See Troubleshooting Defrost Switch, pg. 11
ON	OFF	ON	ON	ON	ON	OFF	Problem with compressor circuit	See Troubleshooting Compressor Circuit, pg 10

Reconnecting External Control

1. Turn the dehumidifier off and reconnect the control to the REMOTE terminals.
2. Turn the ON/OFF switch to the ON position, make a call for dehumidification using the external control (if using an Aprilaire Manual Dehumidistat turn knob to ON), begin a timer, and verify the following happen immediately:
    a. Green POWER LED turns on.
    b. Amber HVAC FAN LED turns on.
    c. Amber DEH FAN LED turns on.
    d. Dehumidifier blower turns on.
3. 3 minutes after the dehumidifier was turned on, verify the amber COMPR LED and compressor turn on.
4. If all of the above occurs and the fan and compressor continue to operate for a minimum of 3 minutes of compressor on time, the dehumidifier control is good. Proceed to Reconnecting HVAC Connections, pg. 5.
5. If operation does not follow the above there is a problem with the control or wiring between the control and the REMOTE terminals. If a Model 75/76 is being used proceed to the **Troubleshooting Model 75/76** section, pg. 6.
6. If an Aprilaire Manual dehumidistat is being used verify the following:
    a. Verify that the knob is turned fully clockwise to ON. (**Note:** Do not leave knob in ON position, dehumidifier will run continuously)
    b. Remove the knob and cover and verify the wire terminals are fully seated on the tab terminals.
    c. Remove the wires from the REMOTE terminals and verify continuity (resistance near zero) between the dehumidistat wires when the control is turned fully clockwise to ON.
        i. If no continuity, the dehumidistat will need to be replaced (4917).
7. If using a third party control, refer to the control's troubleshooting guide.

Reconnecting HVAC Connections

1. Turn the dehumidifier off and reconnect the G-STAT, R-HVAC, G-HVAC terminal block.
2. Verify that the G-STAT wire is connected to the thermostat G terminal.
3. Verify that the R-HVAC wire is connected to the furnace or air handler R terminal.
4. Verify that the G-HVAC wire is connected to the furnace or air handler G terminal.
5. Turn the ON/OFF switch to the ON position, make a call for dehumidification using the external control (if using an Aprilaire Manual Dehumidistat turn knob to ON), begin a timer, and verify the following happen immediately:
    a. Green POWER LED turns on.
    b. Amber HVAC Fan LED turns on.

c. Amber DEH FAN LED turns on.
d. Dehumidifier blower turns on.
e. HVAC fan turns on.

8. Three minutes after the dehumidifier was turned on, verify the amber COMPR LED and compressor turn on.
9. If all of the above occurs and the dehumidifier fan, compressor, and HVAC fan continue to operate for a minimum of 3 minutes of compressor on time, the dehumidifier control and HVAC connections are good.
10. If operation does not follow the above there is a problem with the wiring between the control and the furnace/air handler and/or thermostat. Verify correct wiring and secure connections.

Troubleshooting Model 75/76

The Model 75/76 requires 24VAC to the R and C terminals on the control. This can be provided by the two yellow 24VAC leads from the 1730A, a 24VAC external transformer, or the furnace/air handler R and C terminals.

No Power To The Control

1. Verify that the dehumidifier ON/OFF switch is ON.
2. Verify that the circuit breaker has not tripped.
3. Turn ON/OFF switch OFF and verify wiring and connections between the R and C terminals and the 24VAC source.
    a. If using the yellow 24VAC jumpers from the dehumidifier, remove the dehumidifier cover and verify connections with the transformer on the control board. Replace cover when complete. Remove the cover from the Model 76 and turn the dehumidifier ON/OFF switch ON. Measure the voltage across the R and C terminals on the Model 75/76. Voltage should be between 19.2 – 28.8VAC. If the control is not receiving voltage within this range, replace the dehumidifier transformer (5398).
    b. If using 24VAC from the furnace/air handler, verify that the system switch is on, that the circuit breaker has not tripped, and the transformer is outputting 24VAC.
    c. If using an external 24VAC transformer, verify the transformer is plugged into a functioning outlet and is outputting 24VAC.
4. If all of the connections and circuits are good, turn the ON/OFF switch ON. If the control does not power up, replace the control (76).

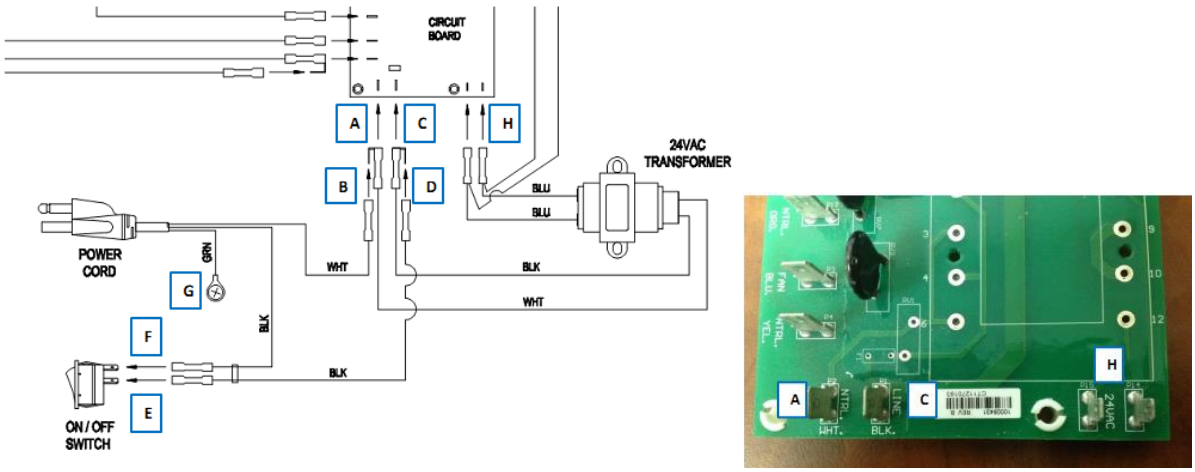
Control Does Not Turn On Dehumidifier Outputs

1. Remove the cover from the control and verify wiring and connections between the DH terminals on the control and the REMOTE terminals on the dehumidifier control board.
2. Replace the control cover, turn the dehumidifier on and use the control to make a call for dehumidification.
3. Verify that when the %RH set point is below the measured %RH, ON begins to flash on the control screen. If it is not possible to set the %RH below the current measured %RH, hold the control ON button for 5 seconds to enter test mode.
4. While ON is flashing on the screen, verify the continuity (resistance near zero) between the REMOTE terminals on the dehumidifier.
    a. If there is not continuity at the REMOTE terminals, the Model 75/76 will need to be replaced (76).
5. If after 3 minutes of fan run time, ON and * blink on the LCD, the control is functioning but the control limits have been exceeded. The dew point measured by the control is below 40°F (recovers at 45°F) or the temperature measured by the control is above 99°F (recovers at 94°F).

Control Display Shows Er

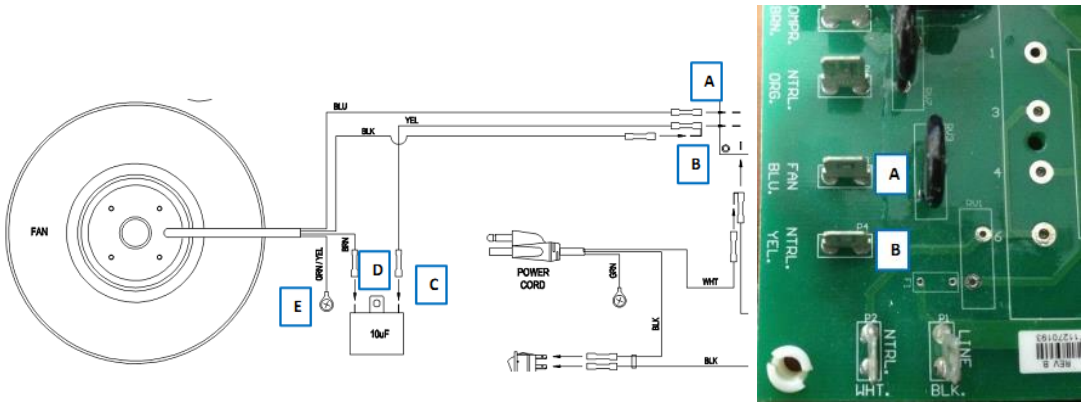
The control suffered an internal error and will need to be replaced (76).

Troubleshooting Power Circuit



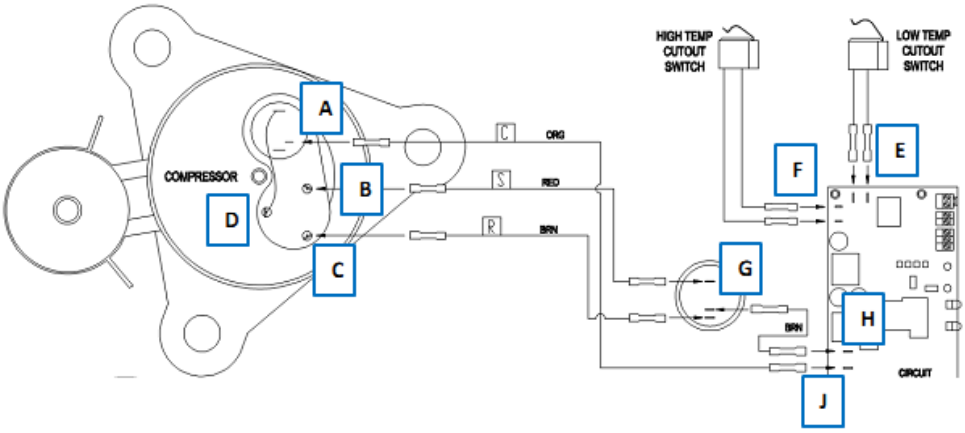
1. Turn the ON/OFF switch OFF and remove the REMOTE terminal block.
2. Remove the dehumidifier cover.
3. Remove the electrical panel.
4. Check all electrical connections using wire color and printing on the control board to verify proper placement and verify all connections are fully seated and secure.
    a. White wire from transformer connected to NTRL WHT terminal on control board, A. White wire from power cord connected to piggy back terminal, B.
    b. Black wire from transformer connected to LINE BLK terminal on control board, C. Black jumper wire from dehumidifier ON/OFF switch to piggy back terminal, D.
    c. Black jumper wire at dehumidifier ON/OFF switch, E.
    d. Black wire from power cord at dehumidifier ON/OFF switch, F.
    e. Green wire from power cord to dehumidifier base with screw and ring terminal, G.
    f. Two blue wires from transformer to 24 VAC terminals on control board, H.
        - Each quick connect terminal will also have yellow wires that supply 24VAC to the external control.
5. Turn the ON/OFF switch ON and measure the voltage at the 120VAC input terminals, NTRL WHT and LINE BLK.
    a. The voltage should be between 103.5 – 126.5VAC.
    b. If the voltage is not within this range, check the ON/OFF switch, power cord, outlet, and circuit breaker.
6. Measure the voltage at the 24VAC input terminals.
    a. The voltage should be between 19.2 – 28.8VAC.
    b. If the voltage is not within this range, replace the transformer (5398).

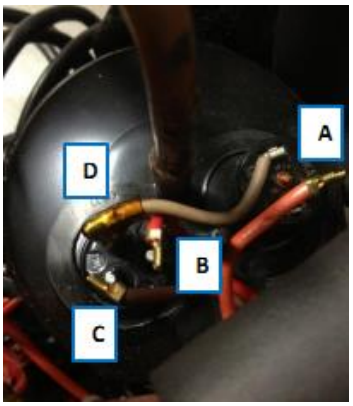
Troubleshooting Fan Circuit

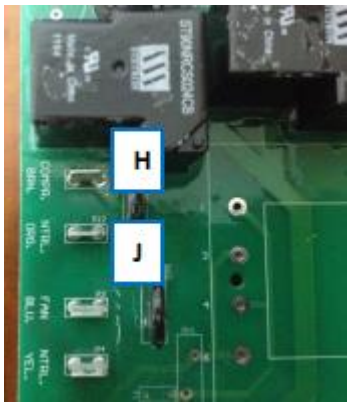


1. Turn the ON/OFF switch OFF and put a jumper between the REMOTE terminals.
2. Remove the dehumidifier cover.
3. Remove the electrical panel.
4. Check all electrical connections using wire color and printing on the control board to verify proper placement and verify all connections are fully seated and secure.
    a. Blue wire from fan to FAN BLU terminal on control board, A.
    b. Black wire from fan to piggy back terminal on yellow jumper wire, to NTRL YEL on control board, B.
    c. The other end of the yellow jumper wire to one side of the 10µF fan capacitor, C.
    d. Brown wire from fan to other side of the 10µF fan capacitor, D.
    e. Green/Yellow wire from fan to electrical plate using screw and ring terminal, E.
5. Turn ON/OFF switch ON and measure the voltage between the FAN BLU and NTRL YEL terminals.
    a. The voltage should be between 103.5 – 126.5VAC. If the voltage is correct, move to next step.
    b. If the voltage is not within this range, replace the control board assembly (4923 or 5329, see parts list on pg. 15).
6. Disconnect the wires from the 10µF fan capacitor and measure the capacitance.
    a. The capacitance should be between 9.5 – 10.5µF.
    b. If the capacitance is not within this range, the capacitor is bad, replace the fan capacitor (5399).

Troubleshooting Compressor Circuit







1. Turn ON/OFF switch OFF and put jumper between REMOTE terminals.
2. Remove the dehumidifier cover.
3. Remove the electrical panel.
4. Remove the compressor cap.
5. Check all electrical connections using wire color and printing on the control board to verify proper placement and verify all connections are fully seated and secure.
    a. Orange wire connected to overload switch on compressor, A.
    b. Red wire connected to S terminal on compressor, B.
    c. Brown wire connected to R terminal on compressor, C.
    d. Brown jumper wire from overload switch to C terminal on compressor, D.
    e. Low temperature switch wires to Frost SW terminals on control board, E.
    f. High temperature switch wires to High Temp SW on control board, F.
    g. Run capacitor connections: brown wire from compressor and brown jumper wire on one pole and red wire from compressor on the other pole, G.
    h. Brown wire from run capacitor to COMPR BRN on control board, H.
    i. Orange wire from compressor to NTRL ORG on control board, J.

6. Turn ON/OFF switch ON and wait for the amber COMPR LED to light (after 3 minutes of dehumidifier fan run time).
7. Measure the voltage between the COMPR BRN and NTRL ORG terminals on the control board.
    a. The voltage should be between 103.5 – 126.5VAC. If the voltage is correct, move to the next step.
    b. If the voltage is not within this range, replace the control board assembly (4923 or 5329, see parts list on pg. 15).
8. Turn the dehumidifier OFF and unplug.
9. Disconnect the compressor overload switch by removing the orange wire from the overload switch (A) and brown jumper wire from switch to compressor terminal (D).
10. Measure the resistance across the switch.
    a. The resistance should be close to zero. If the resistance is correct, move to the next step.
    b. If it is not, replace the overload switch (5324).
11. Disconnect all three wires from the run capacitor. Measure the capacitance across the poles.
    a. The capacitance should be between 52.25 – 55.75µF. If the capacitance is correct a compressor winding is open, dehumidifier will need to be replaced.
    b. If the capacitance is not within this range, replace the 55µF capacitor (4922).

Troubleshooting Defrost Switch

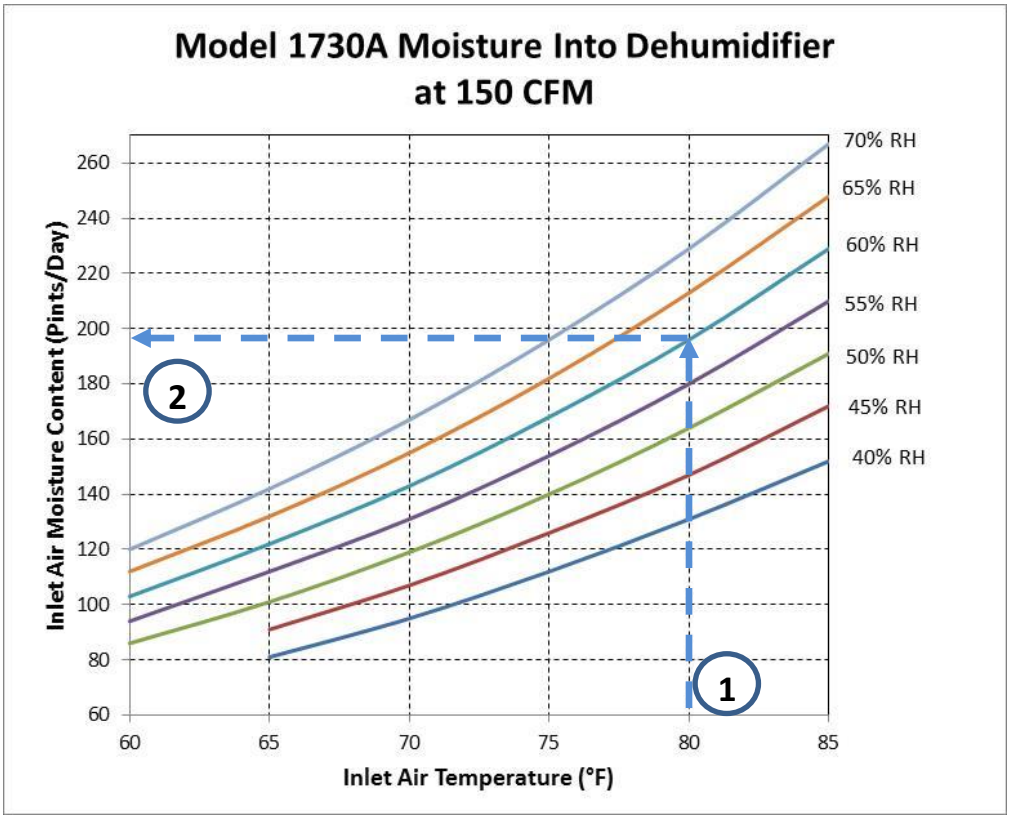
1. Remove the frost switch leads from the control board.
2. Verify continuity (resistance near zero) between the two defrost switch leads. If there is no continuity, the switch (4925) will need to be replaced.

Verifying Capacity

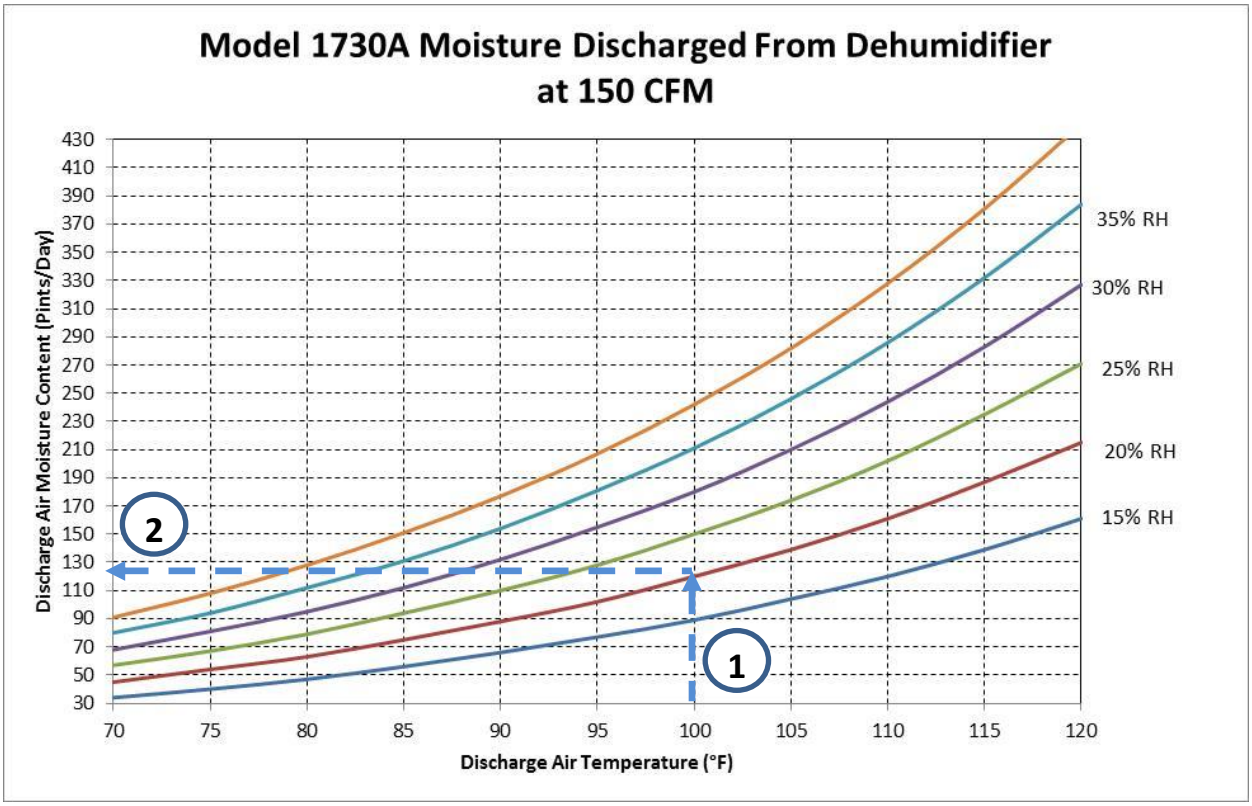
If the unit is functioning properly, and there are no fault codes present, this procedure can be used if there is concern that the dehumidifier is not removing sufficient moisture. After the dehumidifier reaches stable operating conditions (approximately 20 minutes), measure the inlet air temperature and RH and compare it to the outlet air temperature and RH. Use the graphs provided to convert the inlet and outlet air conditions to air moisture content to calculate if the moisture being removed is near the performance levels shown in the table on page 13. If the inlet air conditions are not within those listed on the table, contact Aprilaire Technical Support Monday through Friday from 7:00 a.m. to 5:00 p.m. CST at (800) 334-6011 for assistance in determining performance. The dehumidifier will not remove moisture if the humidity of the inlet air is less than 40% or the dew point of the inlet air is 40°F or lower.

1. Verify that the damper in the outlet collar of the dehumidifier opens/closes freely.

2. Verify that the ductwork is free of obstructions and kinks and that the filter is clean. Remove the filter for this test if dirty.
3. Ensure all panels are in place and assembled with screws. DO NOT REMOVE PANELS DURING THIS TEST.
4. Remove the wire access door. Disconnect all electrical connections to the HVAC equipment by removing the HVAC Equipment terminal block from the control board. Remove the wires going to the REMOTE terminals and replace with a jumper wire between the terminals.
5. Replace the wire access door.
6. Turn the dehumidifier ON/OFF switch ON to initiate a dehumidification call and wait 3 minutes for the compressor to come on.
7. Remove one of the filter doors and insert a temperature/humidity measuring instrument in front of the filter/coil. Close the filter door as much as possible during the reading.
8. Allow time for the measuring instrument to get a good, stable reading.
9. Record the dry-bulb temperature and %RH of the inlet air.
10. Find the inlet air moisture content on the graph below. Locate the inlet air temperature at the bottom of the graph and draw a straight line up until you meet the inlet air RH curve then read the moisture content at the left (196 PPD @ 80°, 60% RH for the example shown).



11. Move the temperature/humidity measuring instrument to the discharge of the dehumidifier.
12. Allow time for the measuring instrument to get a good, stable reading.
13. Record the dry-bulb temperature and RH of the discharge air.
14. Find the discharge air moisture content on the graph below. Locate the discharge air temperature at the bottom of the graph and draw a straight line up until you meet the discharge air RH curve then read the moisture content at the left (128 PPD @ 100°, 21% RH example shown).



15. Subtract the discharge air moisture content from the inlet air moisture content to determine the amount of moisture being removed by the dehumidifier.

Inlet Air Moisture _____ ppd @ ___ °F, ___ % RH
Discharge Air Moisture _____ ppd @ ___ °F, ___ % RH

Dehumidifier Capacity_____ ppd

16. Compare the approximated capacity to the performance listed in the table below. Performance should be within about 20% of the capacity listed below:

Inlet Air RH	Inlet Air Temperature (°F)			
	60	65	70	80
50%	N/A	N/A	43 ppd	60 ppd
60%	N/A	42 ppd	60 ppd	65 ppd

Water Leaks

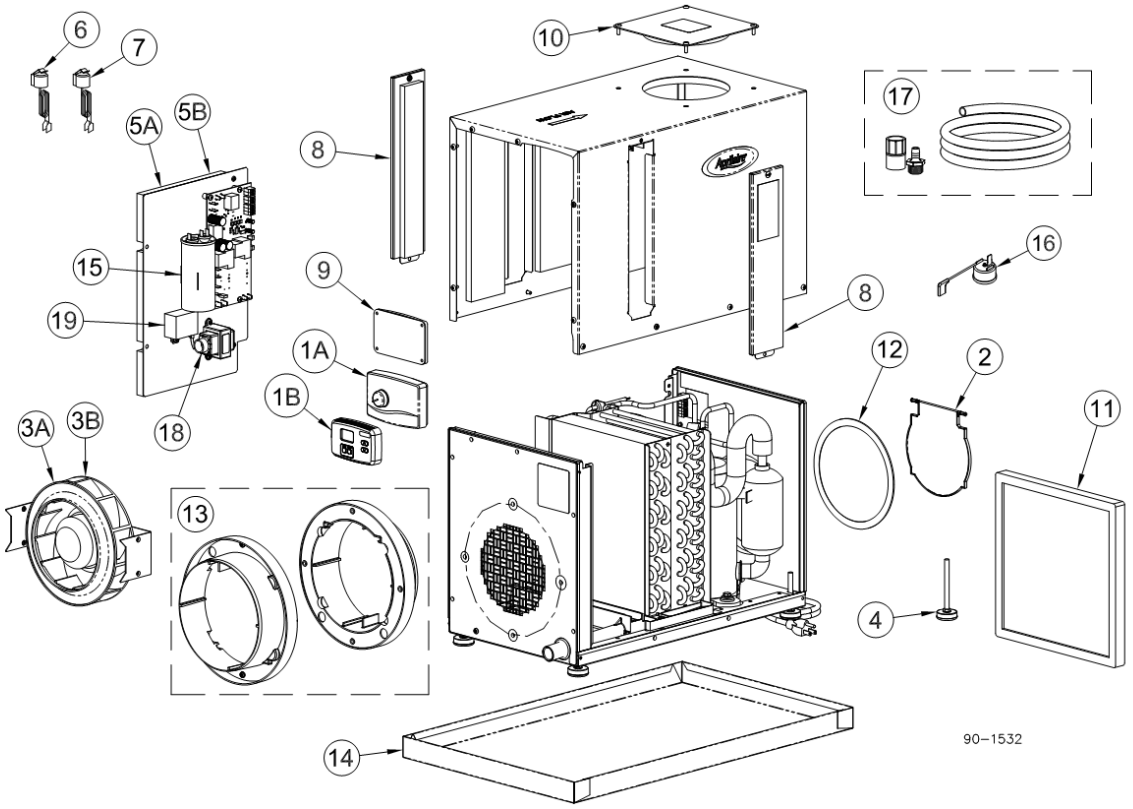
Water collects in the drain pan below the coils and is directed through the drain tube to the drain outlet on the inlet side of the dehumidifier.

1. **Level the unit front to back, and side to side.** The unit may be installed with a slight slope toward the drain outlet, but must be level side to side.
2. Turn the ON/OFF switch OFF then remove the dehumidifier cover and examine the insulation on the base to look for any signs of water inside the cabinet. Wipe up any water that has collected in the base.
3. Inspect and clean the drain tubing. The drain tubing must have a continual downward slope to the drain and be free of kinks.

> **IMPORTANT**: If using ½" vinyl tubing for the drain line, ensure that there are no upward bends in the tube that could act as a trap – this will cause an air-lock that could prevent the flow of water to the drain.

4. With the cover still off, slowly pour a pint of water into the drain pan near the return bends of the coils. The water should flow out the drain tube to the drain.
5. Plug or raise the drain tube sufficiently high to prevent water from pouring out of the drain tube. Slowly pour in an additional pint of water until the drain pan is filled. Allow 15-20 minutes for the water to stand in the drain pan and look for any signs of leaks from the drain pan and drain tube. Unplug the drain and allow the water to drain out.
6. Replace the cover. Remove one filter door and remove the filter.
7. Switch the ON/OFF switch ON, turn the control ON and make a call for dehumidification.
8. After the blower starts, slowly pour another pint of water into the drain pan just below the bottom of the evaporator coil in the area where the removed filter resides. This will show that the unit is draining with positive pressure in the cabinet.

1730A Parts List



NO.	PART DESCRIPTION	QTY/CTN	PART NO.
1A	Dehumidistat Control Assembly	1	4917
1B	Digital Dehumidifier Control	1	76
2	Backflow Damper	1	4918
3A	Impeller with Bracket (Blower Assembly)(Model 1730A Serial No. before 132012A59912)	1	4919
3B	Impeller with Bracket (Blower Assembly)(Model 1730A Serial No. 132012A59912 or later)	1	5332
4	Leveling Foot	1	4920
5A	Control PCB Assembly(Model 1730A Serial No. before 132012A59912)	1	4923
5B	Control PCB Assembly(Model 1730A Serial No. 132012A59912 or later)	1	5329
6	High Temperature Cutout Switch	1	4924
7	Low Temperature Cutout Switch	1	4925
8	Filter Access Door Assembly	1	4926
9	Dehumidistat Hole Cover	1	4927
10	Outlet Cover Plate	1	4928
11	Air Filter	1	4904
12	Inlet/Outlet Screen	1	4930
13	Duct Collars	2	4751
14	Auxiliary drain pan	1	4911
15	Capacitor, 55MF	1	4922
16	Compressor Overload Switch	1	5324
18	10VA Transformer with Wire Harness	1	5398
19	Capacitor, 10MF for Impeller	1	5399
	OTHER PARTS - NOT INCLUDED		
17	Condensate Drain Hose Assembly	1	4863
	Low Profile Condensate Pump (Condensate pump with 20' condensate hose)	1	4856
	Living Space Duct Kit (25' of 8" insulated flex duct with 2 quick install grilles)	1	4857

1730A Wiring Schematic