

# Aprilaire® HUMIDIFIER CONTROL

Safety and Installation Instructions

**READ COMPLETE INSTALLATION INSTRUCTIONS AND TEMPLATE BEFORE STARTING.**

**Attention Installer:** **WARNING** This product must be installed by a qualified heating and air conditioning contractor. Failure to do so could result in serious injury from electrical shock.

## WARNING

- 120 volts may cause serious injury from electrical shock. Disconnect electrical power to the furnace before starting installation.
- Sharp edges may cause serious injury from cuts. Use care when cutting plenum openings and handling ductwork.

## CAUTION

- Do not set humidity higher than recommended. Condensation damage may result.
- Do not set humidity up to recommended levels if there is condensation on the inside of windows of any unheated living space. Condensation damage may result.
- Do not mount Humidifier Control on supply plenum or duct. The unit will not withstand supply temperatures.
- When installing Humidifier Control on downflow furnaces, ensure blower continues to run after a heat call is satisfied to eliminate high temperatures from damaging the Humidifier Control.
- Do not mount Humidifier Control downstream of the bypass outlet. False humidity conditions will cause humidifier to operate incorrectly.

**THESE INSTALLATION INSTRUCTIONS ARE FOR THE APRILAIRE HUMIDIFIER CONTROL ONLY!**  
For Aprilaire® Humidifier installation, follow Aprilaire Humidifier Installation Instructions.

### STEP 1: Unpack the Humidifier Control Carton

Make sure all components are present (see Figure A):

- |                               |                              |
|-------------------------------|------------------------------|
| A. Humidifier Control         | D. Manual Mode Faceplate     |
| B. Outdoor Temperature Sensor | E. Manual Mode Resistor Case |
| C. Sensor Shield              |                              |

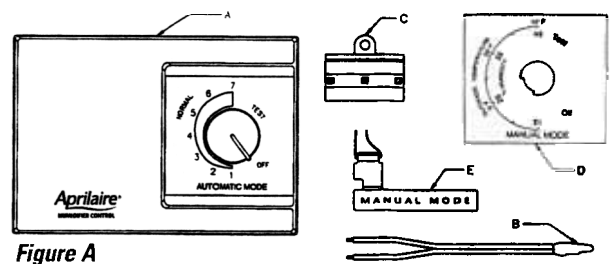


Figure A

### STEP 2: Disassemble the Humidifier Control

To do so, first remove knob, then pull cover off the base.

### STEP 3: Check the Jumper Blocks

With the cover removed, notice 5 pins coming up from the base. Make sure the 2 sets of jumper blocks are correctly set for the type of humidifier being installed (see Figure B).

### STEP 4: Determine Location for Humidifier Control and Mount It

Humidifier Control must be mounted in the Return Duct. For proper operation, the Humidifier Control must be at least 6 inches upstream of any of the following:

- Humidifier
- Humidifier Bypass Ductwork (if applicable)
- Fresh Air Intake Ductwork (if applicable) (see Figure C)

After location for Control is selected, use the perforated Humidifier Control template (attached to these instructions) to mark the duct opening and cut it. Use 4 sheet metal screws (not provided) to mount the Control in the duct opening and make sure Control is sealed tightly to duct.

### STEP 5: Determine Location for Outdoor Temperature Sensor

The location of the Outdoor Temperature Sensor must meet these three requirements:

- Must be mounted on North, East or West side of house out of direct sunlight
- Must be at least 3 feet from all exhaust vents
- Must be above expected snow line (See figure D)

Incorrect humidity levels will result if these requirements are not met.

### STEP 6: Locate Existing Access Hole to Outside

A convenient way to get the Sensor wire outside is to make use of unused wires running to the A/C condensing unit (if applicable). Other ways are to use existing holes for Cable TV lines, telephone lines, A/C lines, etc. Read all equipment instructions beforehand for possible conflicts and warnings.

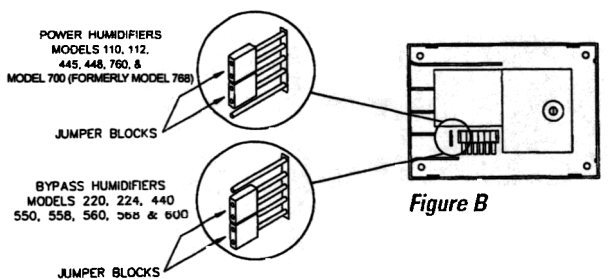


Figure B

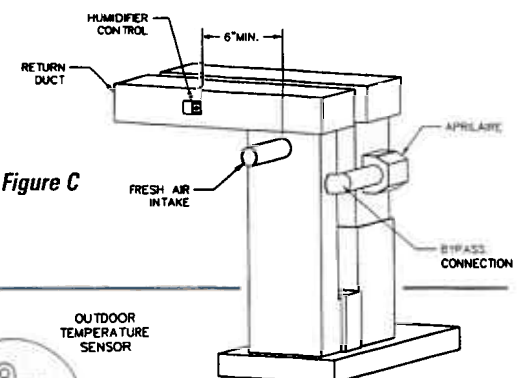


Figure C

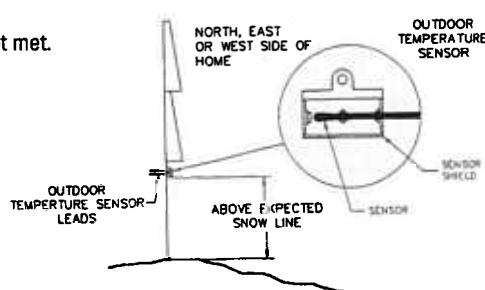


Figure D

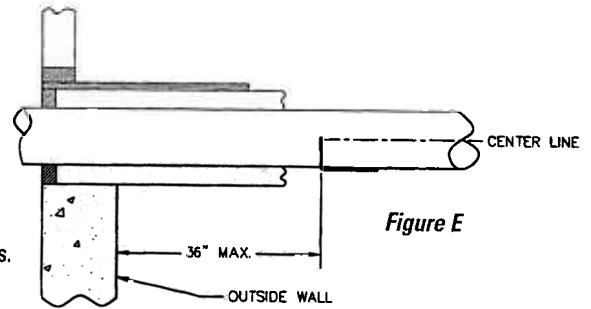
## STEP 7: Alternate Location for Outdoor Temperature Sensor

The Sensor can also be mounted in the center of either:

- 2 inch PVC fresh air intake pipe for the furnace  
**OR**
- 6 inch fresh air intake duct

In both cases, the Sensor must be no further than 3 feet from the outside wall. See Figure E.

If it is not feasible to use the Outdoor Temperature Sensor in any of the ways described, the Humidifier Control can be installed for Manual Operation. See box below and Figure G for details.



## STEP 8: Route the Wire to Chosen Sensor Location

Run wire to the Outdoor Temperature Sensor. If sensor is outdoors, snap the probe end of the Sensor into the Sensor Shield, and attach to the house. Tip of Sensor must be completely covered by the Shield. The Outdoor Temperature Sensor is not affected by lead length.

In either case, do not run Outdoor Temperature Sensor wire alongside wires carrying high voltage (120 VAC or higher).

## STEP 9: Attach Sensor Wire to Humidifier Control

Strip wire 1/4 inch, and insert the wires from the Sensor into the terminals labeled "Outdoor Temperature Sensor" on the Humidifier Control. See Figure F for location of terminals.

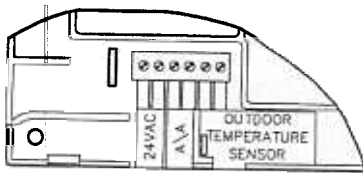


Figure F

## Installing the Humidifier Control for Manual Operation

If it is not feasible to use the Outdoor Temperature Sensor, the Humidifier Control can be installed in Manual Mode.

1. Insert the Manual Mode Resistor Case into the terminals labeled "Outdoor Temperature Sensor" on the Humidifier Control.
2. Snap the Resistor Case into the slot provided so that Resistor Case sticks out from the bottom edge of the base.
3. Follow Steps 10 and 11 to complete the wiring. Apply the Manual Mode Faceplate into the recessed area of the cover. Return the cover to the base and re-install knob.

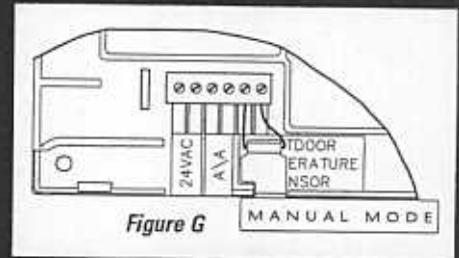


Figure G

## STEP 10: Determine Power Source for Humidifier Control

Determine where you will get 24 VAC to power the Humidifier Control based on the 2 options below:

**OPTION 1: FURNACES WITH ACCESSORY TERMINALS.** If the accessory terminals provide:

- 24 VAC, wire these directly to the "24 VAC" terminals on the Humidifier Control.
- 120 VAC, wire to a 24 VAC transformer, which in turn would be, connected to the "24 VAC" terminals on the Humidifier Control.

In either case, the voltage to the Humidifier Control must be between 22 VAC – 30 VAC.

**OPTION 2: EXTERNAL 24 VAC TRANSFORMER:**

Wire into a power source other than the furnace blower circuit. The transformer can be powered off the 120 VAC line at the junction box before it enters the furnace. The 24 volt side of the transformer is connected to the "24 VAC" terminals on the Humidifier Control.

- NOTES:**
- The Humidifier Control will operate properly with either a switched or continuous power source.
  - Whether using ACCESSORY TERMINALS OR an EXTERNAL TRANSFORMER, the minimum VA required if the following is; 2.0 VA for Power Humidifiers (Models 110, 112, 445, 448, 700, 760, 768); or 10.0 VA for Bypass Humidifiers (Models 220, 224, 440, 550, 558, 560, 568, 600)

## STEP 11: Humidifier Wiring

Strip the wires used for all the Humidifier Control terminal connections 1/4 inch.

- If FURNACE ACCESSORY TERMINALS are used, wire the solenoid valve in series with the "A/A" terminals on the Humidifier Control without using a Model 50 Relay. See furnace manual for operation of accessory terminals.
- If an External Transformer is used, a Model 50 Current Sensing Relay must be connected to the solenoid valve and the "A/A" terminals on the Humidifier Control to allow the humidifier to operate only when the blower does. This is shown in Figure H for Bypass Humidifiers and Figure I for Power Humidifiers.

Wire the Model 50 Relay into the "A/A" circuit only.

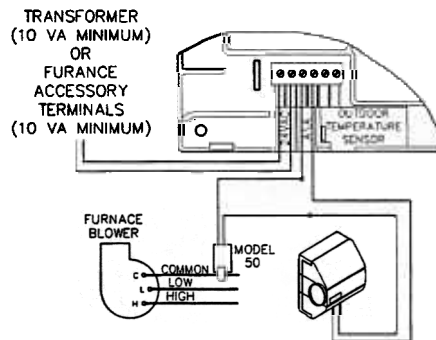


Figure H  
Bypass Humidifiers

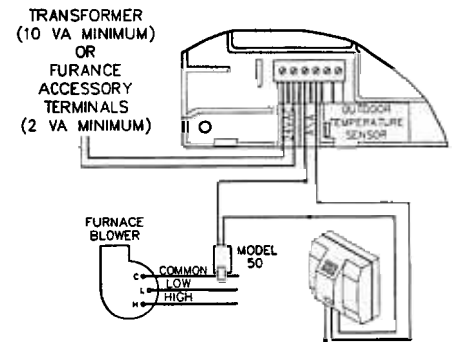


Figure I  
Power Humidifiers

## System Checkout

1. For system test, be sure that 24 VAC is applied to the 24 VAC terminals of Humidifier Control.
2. Put the cover and knob back onto Humidifier Control base.
3. Activate furnace blower and be sure thermostat is calling for heat.
4. Rotate the control knob of Humidifier Control clockwise to the "Test" position.
5. If all is set up properly, you should be able to hear the solenoid valve click open. In "Test" mode, the Aprilaire Humidifier will operate for 1 minute.
6. If the humidifier does not activate with the Humidifier Control in the "Test" position, refer to troubleshooting guide.
7. Setting the Humidifier Control:
  - If home is occupied, set Humidifier Control to "Normal" (For Manual Operation, set to 35%)
  - If home is vacant, set Humidifier Control to "Off"
8. Inform homeowner to refer to the Aprilaire Owner's Manual for the initial adjustment period.

Applies to both Automatic and Manual Operation unless indicated otherwise.

## TROUBLESHOOTING PROCEDURE

- Make sure furnace blower is operating and thermostat is calling for heat.
- Make sure the Outdoor Temperature Sensor is connected to the "Outdoor Temperature Sensor" terminals of the control. (For Manual Operation, make sure Resistor Case is in place of the Sensor).
- Check main wiring diagram for correct Humidifier Control installation.
- Check voltage at Humidifier Control 24 VAC terminals. Voltage should be 22 VAC minimum – 30 VAC maximum.
- Check Humidifier Control for correct installation of jumper blocks.
- Check Model 50 Current Sensing Relay (if used) for correct installation (see Model 50 instructions). Do not use Model 50 Relay in transformer circuit or "24 VAC" circuit of Humidifier Control. Model 50 relay is to be used in the "A/A" circuit only.
- In "Test" mode, humidifier will operate for 1 minute only. **DO NOT LEAVE IN TEST MODE AS HUMIDIFIER WILL NOT OPERATE.**

Humidifier operates only  
in "Test" mode

TABLE 1

Outdoor Temperature	Resistance
100° F	6,000 OHMS
90° F	7,500 OHMS
80° F	9,500 OHMS
70° F	12,000 OHMS
60° F	15,500 OHMS
50° F	20,000 OHMS
40° F	26,000 OHMS
30° F	34,500 OHMS
20° F	46,000 OHMS
10° F	62,000 OHMS
0° F	84,500 OHMS
-10° F	116,500 OHMS
-20° F	162,500 OHMS
-30° F	229,500 OHMS

# Humidifier Control Troubleshooting Guide

Applies to both Automatic and Manual Operation unless indicated otherwise.

## SYMPTOM

## TROUBLESHOOTING PROCEDURE

Humidifier operates constantly

- If the humidity level in the home is less than the knob setting, the Humidifier Control will operate the Humidifier until the humidity level is higher than the knob setting.
- In the "Test" mode, verify unit will operate for approximately one minute.
- Check the resistance of the sensor by removing the wires of the Outdoor Temperature Sensor and measuring the resistance across the wires with an ohmmeter. Confirm reading to outdoor temperature in Table 1. (For Manual Operation, verify that resistance across the leads of Resistor Case is between 37,000 and 41,000 ohms.)
- Make sure the Outdoor Temperature Sensor is mounted completely outside the house on the North, East, or West side of the house and out of direct sunlight. (Automatic Mode Only).
- Rotate the Humidifier Control knob counterclockwise to the "Off" position, and observe whether the humidifier turns off. If the humidifier still operates in the "Off" position, perform the following:
  1. Check summary wiring diagram for correct Humidifier Control Installation.
  2. Remove wires from Humidifier Control's "A/A" terminals. If Humidifier continues to operate, replace solenoid valve.

TABLE 1

Outdoor Temperature	Resistance
100° F	6,000 OHMS
90° F	7,500 OHMS
80° F	9,500 OHMS
70° F	12,000 OHMS
60° F	15,500 OHMS
50° F	20,000 OHMS
40° F	26,000 OHMS
30° F	34,500 OHMS
20° F	46,000 OHMS
10° F	62,000 OHMS
0° F	84,500 OHMS
-10° F	116,500 OHMS
-20° F	162,500 OHMS
-30° F	229,500 OHMS

Humidifier or Humidifier Control "chatters" or clicks ON and OFF rapidly

- Check for steady 22 VAC – 30 VAC with voltmeter.
- Make sure Outdoor Temperature Sensor wiring is not run alongside wires carrying high voltage (120 VAC or higher). (Automatic Only)



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