

Wiring Instructions for High-Capacity Steam Humidifiers

**Including Instructions for
Compensating Humidistat
and Safety Control Shutoff**

CONTRACTOR: Read these instructions before installing or servicing humidifier.

HOMEOWNER: Save this manual for future reference.

Model No. _____

Mfg. Date (see label on unit) _____

Installation Date _____

Table of Contents

Connecting to a Power Source.....	3
Wiring the Air Mover.....	4
Installing the Compensating Humidistat.....	6
Installing the Humidistat to Operate Manually	8
System Checkout.....	8
Compensating Humidistat Troubleshooting Guide	9
Installing the Safety Control Shutoff.....	11
Safety Control Shutoff Troubleshooting Guide.....	12

Connecting to a Power Source

READ AND SAVE THESE INSTRUCTIONS.

When selecting a location for mounting the humidifier, **make sure that electrical connections can be made without the use of an extension cord.**



WARNINGS:

This product is for residential applications only and must be installed by a qualified HVAC contractor. Failure to comply could invalidate the product warranty, or result in serious injury or electrocution.

The electrical receptacle must be rated at the correct voltage and amperage, or hazardous conditions could result.

- **120 volt, 1500 watt steam units** require a receptacle rated at 120 VAC, 15 amperes (NEMA configurations 5-15R).
- **240 volt, 2000 watt units** require a receptacle rated at 240 VAC, 15 amperes (NEMA configurations 6-15R).

All wiring must comply with local codes and ordinances.

Wiring the Air Mover

for the 120 Volt, 1500 Watt and 240 Volt, 2000 Watt Steam Humidifiers

NOTE: Blower systems that run continuously and change speed by ramping up and down may require a setting change on the furnace board to prevent the blower from ramping down to its lowest speed. Prolonged minimal airflow can allow condensation to build up in the ductwork.

To guard against condensation buildup, consult the furnace/heat pump manufacturer for procedures to prevent extremely low air flow.

Be sure to read all CAUTIONS and WARNINGS before wiring humidifiers!

Due to the high-capacity design of the steam humidifier, it is necessary that the furnace air mover (blower) be wired to function in cooperation with the humidifier's operation (see Figures 1 and 2, Pages 4A and 4B).

To achieve synchronization and prevent condensation inside the ductwork, a thermostatic sensor for 24-volt thermal fan control applications has been incorporated into the humidifier's design. The sensor/switch, attached to the humidifier wall, is a sealed unit, preset to turn on when the humidifier's water temperature reaches 170°F, and to turn off when it falls below 120°F.

NOTES:

- Humidifier terminals provided on the heating system control board should **NOT** be used for wiring the steam humidifier.

- Even if the heating and cooling system's fan switch is left in the "ON" position, it cannot be assumed that the homeowner will allow constant operation of the fan motor. Therefore, **it is essential that the steam humidifier be wired according to instructions in this manual.**

CAUTION: Do not activate or alter the normal functions of the home's heating and cooling system, except to coordinate the system's air mover with the humidifier. Failure to heed this caution could result in serious damage to the heating and cooling system, and/or to the home.

NOTE Regarding 220 Volt Installations Only:

When attaching the fan safety control shutoff, it is acceptable on 220 volt blower systems to use either power-carrying conductor.

To wire the 120 volt, 1500 watt steam humidifier, proceed to Figure 1 on fold-out page 4A, right. > > >

To wire the 240 volt, 2000 watt steam humidifier, proceed to Figure 2 on fold-out page 4B, right. > > >

FIGURE 1

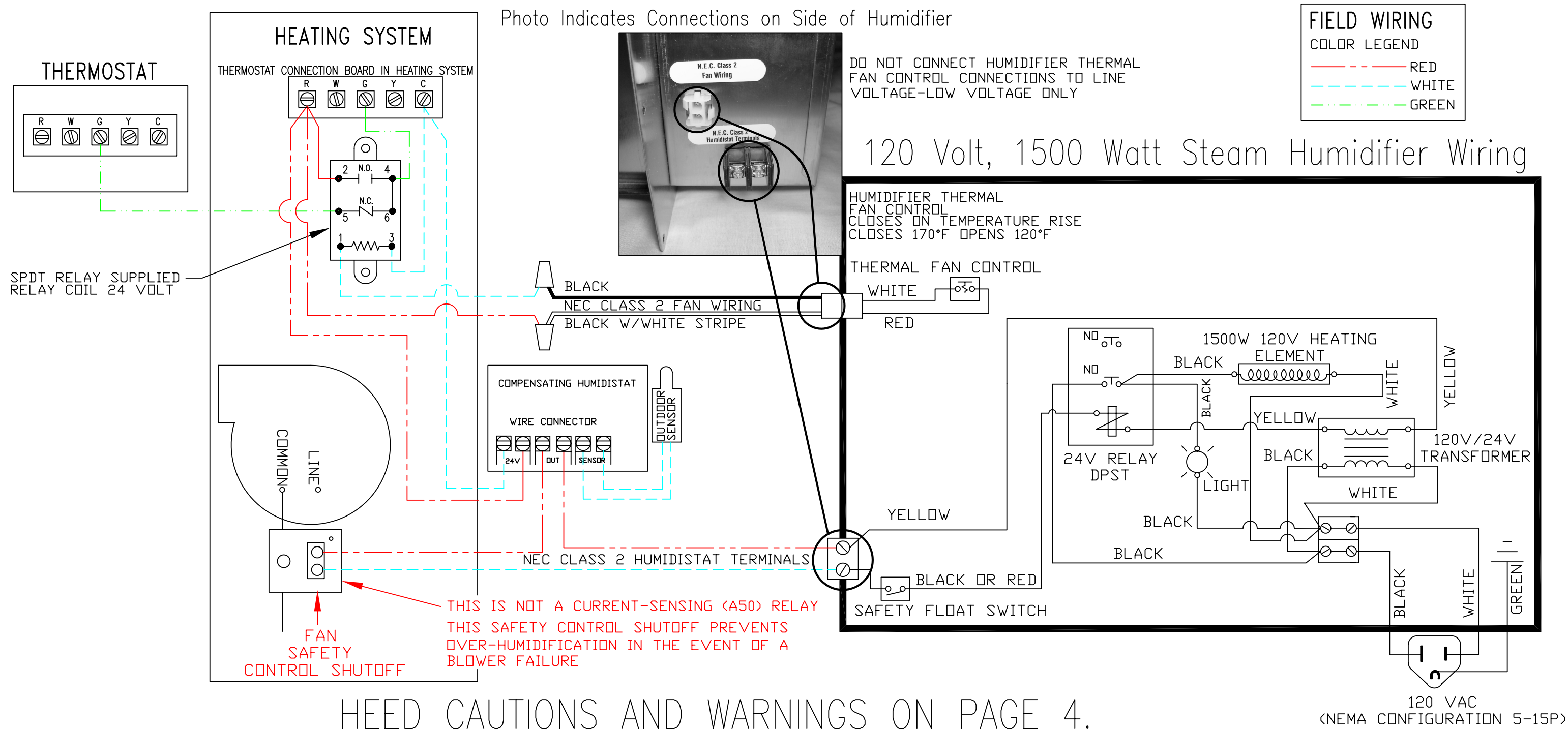
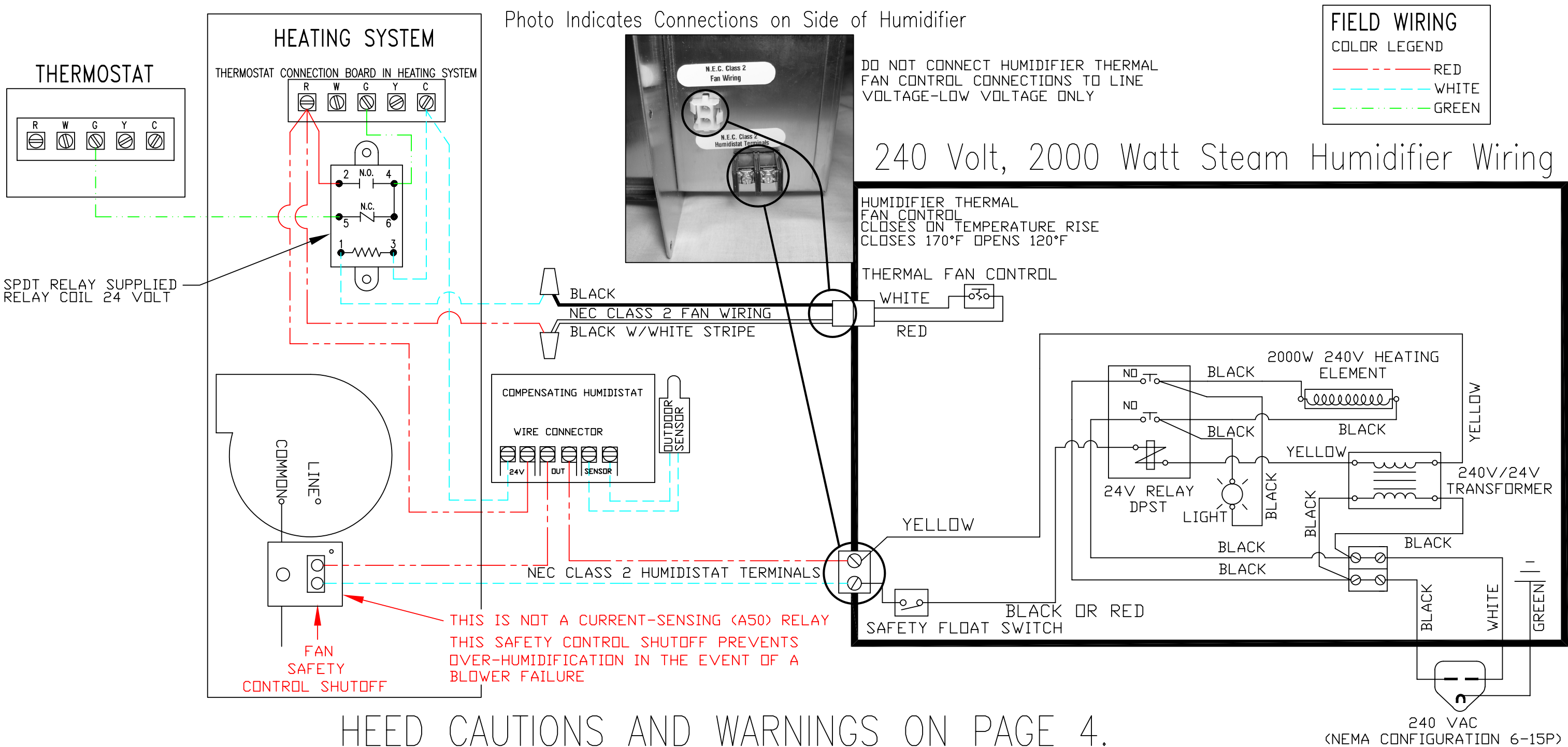


FIGURE 2



IMPORTANT: Once the steam humidifier is completely installed (including plumbing—see the humidifier installation manual), **check the fan control circuit repeatedly to ensure proper operation.** (It may take up to 15 minutes for the humidifier to heat the water and signal the furnace blower to come on.)

NOTE: The compensating humidistat is programmed to prevent operation above 50°F or 45 percent relative humidity. If conditions exceed either of these set points, **it may be necessary to bypass the humidistat to perform this test.**

Installing the Compensating Humidistat

(Automatic Humidifier Control)



DANGER:

- **Disconnect electrical power to the furnace before beginning installation.** Contact with a live electrical wire can cause serious injury or electrocution.
- **Use caution when cutting plenum openings and handling ductwork.** Sharp edges can cause serious cuts and bleeding.

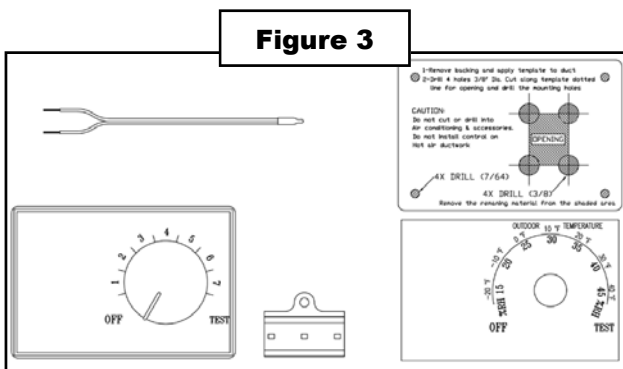
CAUTIONS:

- **Do not mount the compensating humidistat on the supply duct or plenum.** The unit will not withstand supply temperatures.
- **Do not set the humidity so high that condensation forms on windows or walls.** Indoor condensation may result in damage to the home.

STEP 1: Check Contents of the Humidistat Carton

Make sure the following components are enclosed (see Figure 3, below):

- Compensating Humidistat
- Outdoor Temperature Sensor
- Sensor Shield
- Manual Mode Faceplate
- Mounting Template

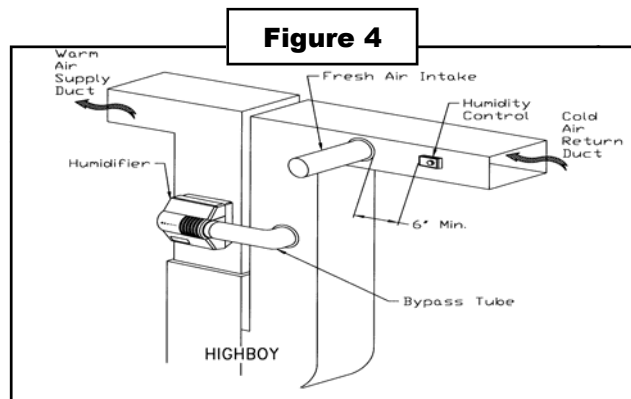


STEP 2: Disassemble the Humidistat

Pull the knob off, then remove the cover by inserting a screwdriver in the slot on the right side of the humidistat.

STEP 3: Mount the Humidistat on the Cold Air Return

Select a location to mount the compensating humidistat that is at least 6 inches upstream from the fresh air intake ductwork, if applicable (see Figure 4, below).



Once a location has been selected, carefully position the compensating humidistat template, then drill and cut the opening. Use four sheet metal screws and the gasket (provided) to mount the unit over the duct opening. Make sure the humidistat is sealed tightly to the duct.

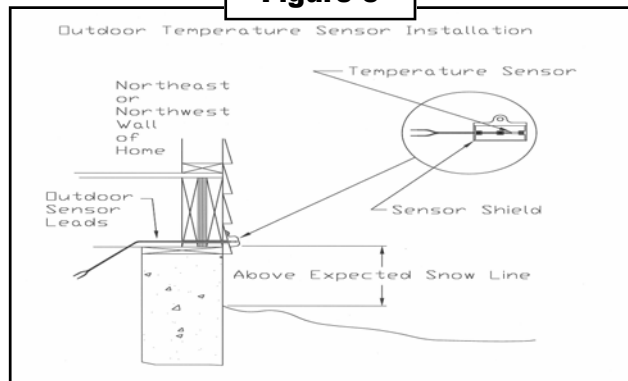
STEP 4: Select an Exterior Location to Mount the Outdoor Temperature Sensor

Placement of the outdoor temperature sensor must meet these requirements:

- It must be mounted on the North, North-east or Northwest side of the house, where direct sunlight will not influence the sensor.
- It must be placed at least 3 feet from all exhaust vents.

- It must be installed above the expected snow line (see Figure 5, below).

Figure 5



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

NOTE: For manual operation, do not install the outdoor sensor wire.

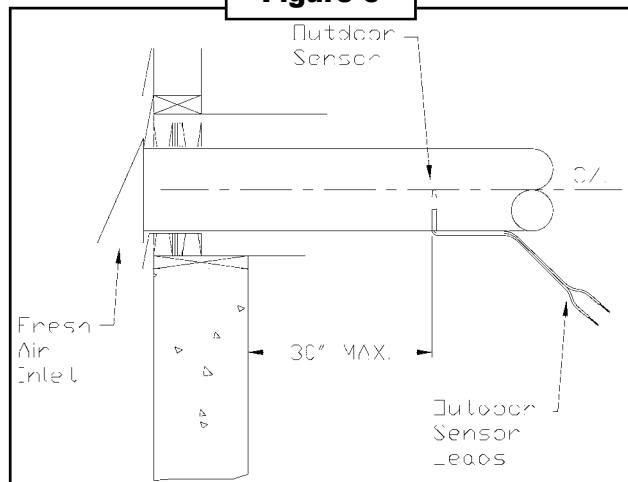
STEP 5: Locate an Existing Indoor/Outdoor Access Hole

If possible, insert the sensor cable through an existing indoor/outdoor access hole for cable TV lines, telephone lines, A/C lines, etc.

WARNING: Make sure there are no active high-voltage wires in the hole.

As an alternative, the sensor can be mounted in the center of a 6-inch fresh air intake duct. However, the sensor bulb must be no further than 30 inches from the outside wall. (See Figure 6, below.)

Figure 6



NOTE: If it is not possible to install the outdoor temperature sensor in either of these configurations, the compensating humidistat can be installed to operate manually. (See “Installing the Compensating Humidistat to Operate Manually”, page 8.)

STEP 6: Route the Sensor Wire to the Selected Location

Run wire between the compensating humidistat and the outdoor sensor lead. If the sensor is outdoors, snap the probe end of the sensor into the sensor shield and attach it to an exterior wall. The probe must be completely covered by the shield.

NOTE: The outdoor temperature sensor wire must not exceed 30 feet in length.

CAUTION: Do not run outdoor temperature sensor wire alongside wires carrying high voltage (120 VAC or higher). Do not run the sensor wire through conduit.

STEP 7: Attach the Sensor Wire to the Humidistat

Strip the connecting wire 1/4 inch and attach the two internal wires to the terminals labeled “Outdoor Temperature Sensor” on the humidistat.

STEP 8: Select a Power Source

Select a source for 24 VAC to power the compensating humidistat, based on either the 120 volt, 1500 watt or 240 volt, 2000 watt wiring diagram on pages 4A and 4B (Figures 1 and 2). **The voltage to the humidistat must be between 22 and 30 VAC.**

NOTE: The compensating humidistat will operate properly only with a continuous power source. A minimum 10 VA (volt amperes) is required.

STEP 9: Connect the Compensating Humidistat to the Humidifier

Strip the wires used for all the humidistat terminal connections 1/4 inch. Wire the humidistat based on the appropriate wiring diagram on page 4A or 4B. **Do not use a current-sensing (A50) relay.**

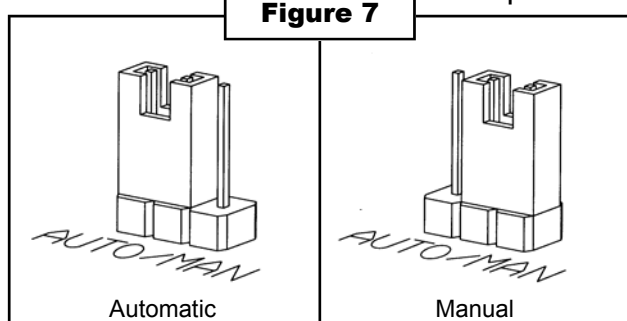
STEP 10: Set the Humidistat

Consult the compensating humidistat homeowner's manual for proper humidity settings.

INSTALLING THE HUMIDISTAT TO OPERATE MANUALLY

If it is not possible to use the outdoor temperature sensor, or if the homeowner wants to control the humidifier manually, the humidistat can be reconfigured for manual operation. (See Figure 7, below.)

1. Locate the three-pin ar-



range ment marked AUTO/MAN, protruding from the control board (directly to the right of the wiring connections).

2. Pull upward to remove the black, two-pin connector from the auto position. Reinstall it in the manual position (on the center and right-hand pins).

CAUTION: Do NOT attach sensor wire to the blue wiring connection block.

3. Follow Steps 8 (Select a Power Source)

and 9 (Connect the Compensating Humidistat to the Humidifier) to complete the wiring. Apply the manual mode faceplate to the compensating humidistat cover. Reattach the cover to the base and reinstall the knob.

SYSTEM CHECKOUT

NOTE: If conditions exceed 50°F or 45 percent relative humidity, it may be necessary to bypass the humidistat to perform this test.

1. To conduct a system test, be sure that 24 VAC is applied to the 24 VAC terminals of the compensating humidistat.
2. Reattach the humidistat cover and knob to the base.
3. Rotate the knob on the humidistat clockwise (↻) to the "Test" position.
 - If everything is set up correctly, the humidifier should begin operating. In "Test" mode, the humidistat will operate for approximately one minute.
 - If the humidifier does not activate properly in "Test" mode, refer to the Troubleshooting Guide on page 9.
4. Set the compensating humidistat.
 - If the home is occupied, set the humidistat knob to "5". (For manual operation, set the knob to "35%".)
 - If the home is vacant, turn the humidistat knob counterclockwise (↺) to "Off".
5. Tell the homeowner to refer to the Compensating Humidistat Operating Instructions for direction regarding initial adjustment.

COMPENSATING HUMIDISTAT

TROUBLESHOOTING GUIDE

(applies to automatic and manual operation, unless otherwise indicated)

PROBLEM:

Humidifier does not operate in “Test” mode

SOLUTION(S):

- Confirm that the outdoor temperature sensor is connected to the “Outdoor Temperature Sensor” terminals on the compensating humidistat. (For manual operation, make sure the jumper pins are positioned correctly.)
- Check the appropriate wiring diagram (Figure 1 or 2) for correct installation.
- Check the voltage at the humidistat “24 VAC” terminals. (Voltage should be between 22 and 30 VAC.)
- Make sure the control knob has not been left in the “Test” position. In “Test” mode, the humidifier will not continue to operate after approximately one minute.

PROBLEM:

Humidifier only operates in “Test” mode

SOLUTION(S):

- Check the resistance of the sensor by removing the leads from the humidistat terminals and measuring the resistance across the wires with an ohmmeter. Compare the reading to the temperature/resistance chart (above, right).

For automatic applications...

- Make sure the outdoor temperature sensor is mounted completely outside the house (i.e., not recessed into the

Temperature/Resistance Chart

100°F	6,000 ohms	38°C
90°F	7,500 ohms	32°C
80°F	9,500 ohms	27°C
70°F	11,500 ohms	21°C
60°F	14,000 ohms	16°C
50°F	18,000 ohms	10°C
40°F	23,000 ohms	4°C
30°F	28,500 ohms	-1°C
20°F	37,000 ohms	-7°C
10°F	46,500 ohms	-12°C
0°F	61,500 ohms	-18°C
-10°F	78,500 ohms	-23°C
-20°F	105,500 ohms	-29°C
-30°F	135,000 ohms	-34°C

hole) on the North, Northeast or Northwest side, away from direct sunlight.

- Make sure the outdoor temperature sensor is mounted at least 3 feet away from all exhaust vents.
- If the outdoor temperature sensor is mounted in the fresh air intake duct, make sure the probe is no further than 30 inches from an outside wall.

NOTES:

- In AUTOMATIC applications, **if the outdoor temperature is greater than +50°F (+10°C) or less than -32°F (-35.6°C), the compensating humidistat will not operate** (except in “Test” mode).
- In both AUTOMATIC and MANUAL applications, if the relative humidity in the home is higher than the knob setting, the compensating humidistat will not operate the humidifier. Similarly,

COMPENSATING HUMIDISTAT TROUBLESHOOTING GUIDE, cont'd.

the humidistat will not operate if the indoor relative humidity exceeds 45 percent.

☹ **PROBLEM:**

Humidifier operates constantly

😊 **SOLUTION(S):**

- Check the humidistat setting. If the relative humidity in the home is less than the knob setting, the humidifier will operate until the humidity level is higher than the knob setting.
- In “Test” mode, verify that the humidifier will shut off after approximately one minute.
- Check the resistance of the sensor. (See previous Problem/Solution.)

For automatic applications...

- Make sure the outdoor temperature sensor is mounted completely outside the house (i.e., not recessed into the hole) on the North, Northeast or Northwest side, away from direct sunlight.
- Turn the compensating humidistat knob counterclockwise(↺) to the “Off” position and observe whether the humidifier turns off. If the humidifier continues to operate, perform the following:
 - Check the appropriate wiring diagram (Figure 1 or Figure 2, pages 4A and 4B).

— Remove the wires from the humidistat’s “Out” terminals. If the humidifier continues to operate, check the humidifier.

☹ **PROBLEM:**

Humidifier or compensating humidistat “chatters” or clicks on and off rapidly

😊 **SOLUTION(S):**

- Use a voltmeter to check for a steady 22-to-30 VAC.
- **For automatic applications...**make sure the outdoor temperature sensor wiring does not run alongside wires carrying high voltage (120 VAC or higher).

☹ **PROBLEM:**

Furnace or heat pump blower system runs continuously; condensation is building up in ductwork

😊 **SOLUTION(S):**

- It may be necessary to make a setting change on the furnace or heat pump board to prevent the blower from shifting down to its lowest idling speed.
- Consult the furnace/heat pump operating manual or contact the manufacturer for procedures to prevent extremely low air flow.

Installing the Safety Control Shutoff*

***This is NOT a fan control relay. It is strictly an automatic shutoff for added safety.**

This safety control shutoff is designed to prevent the humidifier from operating if the furnace blower fails, thereby helping to protect HVAC equipment and the home from water damage and/or mold.

NOTE: New steam humidifier installations that do not include the safety control shutoff are not warranted by the manufacturer if property damage is linked to blower failure.

CAUTIONS:

- The safety control shutoff is intended for use with steam humidifiers only. Other uses may damage the shutoff, the wiring and/or devices to which the shutoff is connected.
- Wiring from other electric devices can interfere with the safety control shutoff's performance. Such devices should be kept as far away from the shutoff as possible—preferably six or more inches.

INSTALLATION INSTRUCTIONS

NOTE: Humidifier fan control wiring must be connected according to instructions in the humidifier installation manual.

1. Remove the screw from the cover of the safety control shutoff. Open the hinged cover and install the shutoff onto the furnace blower common wire. (See Figure 8.)

CAUTION: Place the wire inside the open end of the safety control shutoff so

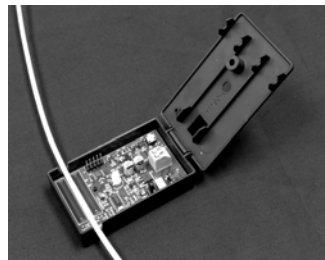


Figure 8

that it runs straight (no slack or bends) through the four flanges designed to hold the wire in place.

NOTE: For small-diameter wire, pass the wire through the flanges, wrap it around the base of the safety control shutoff and pass the wire through the flanges again. This helps ensure a solid contact with the sensor on the shutoff circuit board.

2. Replace the screw to hold the cover in place. (See Figure 9.)

CAUTION:

Make sure all other wires are at least 6 inches away from the safety control shutoff.

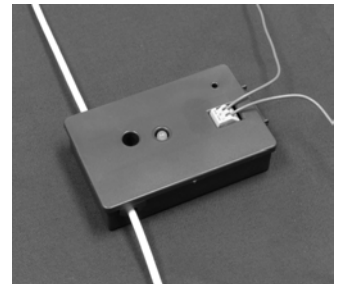


Figure 9

3. Wire the safety control shutoff in series with the humidifier, humidistat and any other control devices installed with the humidifier, as follows (refer to Figures 1 and 2, pages 4A and 4B):
 - a. Connect the wire from the humidistat terminal block to the safety control shutoff, then from the other connection on the safety shutoff to the terminal on the humidistat.
 - b. Connect the remaining humidistat terminal to the remaining humidifier terminal.
4. Verify that the safety control shutoff 30-minute test phase (see Operation and Troubleshooting Guide, page 12) is functioning correctly.

Safety Control Shutoff (SCS)

Operation and Troubleshooting Guide

CONDITION	CAUSE	ACTION REQUIRED
SCS LED (Light-Emitting Diode) shows rapid series of red, green and yellow lights, followed by no LED display.	Condition Normal. SCS processor is powering up and checking internal operation.	No action required.
Humidifier won't operate. No SCS LED display.	Problem! SCS circuit is not closing or humidistat is not calling for humidity.	Check SCS for power; check humidistat operation. If humidity is about 45 percent or outdoor temperature is above 50°F, the humidifier won't operate unless the humidistat is set to Test Mode.
Humidifier operates. SCS LED shows continuous yellow.	Condition Normal. This is a test phase. SCS will wait 30 minutes to detect furnace blower operation. If the furnace blower is detected, the system will function properly.	No action required.
Humidifier won't operate; SCS LED displays continuous red.	Problem! During the 30-minute test phase, the SCS has failed to detect the furnace blower and turned the humidifier off.	Turn the humidistat off, then on again, to reset the system. Although unlikely to happen, this failure/reset process can occur twice before further action is necessary.
Humidifier operates. SCS LED shows continuous green.	Condition Normal. All systems (furnace, humidistat, humidifier and SCS) are operating properly.	No action required.
Humidifier won't operate. SCS LED shows flashing red.	Problem! The SCS has failed to detect the furnace blower for the third time and, as a safety precaution, has locked out the humidifier. This is an indication that some aspect of the system (furnace, humidistat, humidifier or SCS) has malfunctioned.	Contact your HVAC contractor ASAP to check and repair the system. IMPORTANT: Before the SCS can be reset, the system must be checked and repaired by a licensed contractor. To reset the SCS, the contractor must insert a thin, rigid rod, such as an unfolded paperclip, into the smallest hole in the face of the SCS, next to the green connector block. (See Figure 10, left.) Gentle pressure will depress the internal button to reactivate the safety control shutoff. The red light will stop flashing, indicating that the system is reset.

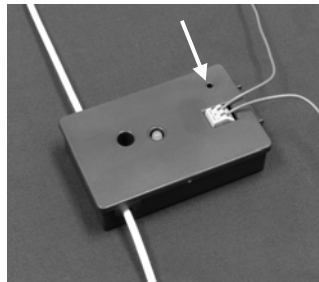


Figure 10