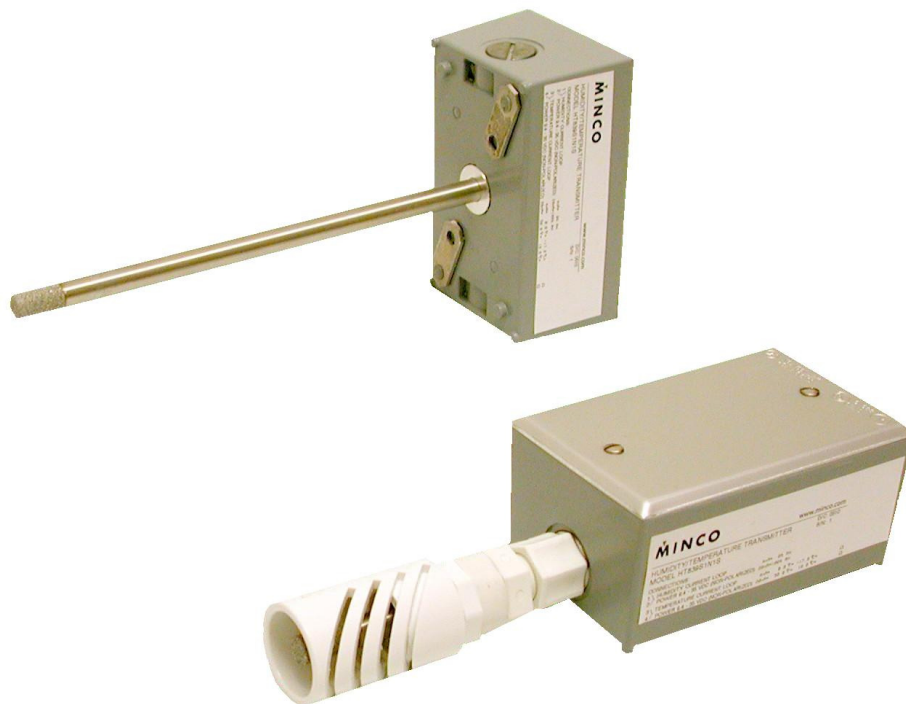




AH440 Humidity and Temperature Transmitter Installation and Operating Instructions



Description

Model AH440 is humidity / temperature assembly consisting of separate 2-wire temperature compensated humidity and temperature transmitters, as well as a rugged sensing probe. The assembly utilizes a Honeywell HIH series monolithic IC humidity sensor, which provides excellent stability and chemical resistivity. The humidity transmitter converts the humidity sensor's signal into a 4 to 20 mA DC current, which changes proportionally from 4 mA at 0% RH to 20 mA at 100% RH. The leads that supply power also carry the current signal. The additional temperature transmitter provides a second 4 to 20 mA DC output where the current changes from 4 mA at the lowest temperature of the range, to 20 mA at the top of the temperature range. The range of the temperature transmitter can be re-scaled via dip-switches. These transmitters have non-interacting, field adjustable zero and span pots and are available in duct mount, wall mount, outside air (OSA), and space mount configurations.

Specifications

Output(s):	Humidity: 4 to 20 mA DC = 0% to 100% RH. Temperature: 4 to 20 mA DC over specified range.
Sensing Element:	Humidity: Capacitive monolithic IC. Temperature: 1000 ohm platinum; 2 lead RTD.
Ambient Temperature:	
Operating:	Room: -10 to 150°F (-23 to 65°C), non-condensing. Duct/Wall/OSA: -10 to 185°F (-23 to 85°C), non-condensing.
Storage:	Room: -58 to 150°F (-50 to 65°C), non-condensing. Duct/Wall/OSA: -58 to 185°F (-50 to 85°C), non-condensing.
Supply voltage:	9.5 to 35 VDC, non-polarized.
Voltage effect:	.001% of span/volt from 9.5 to 35 VDC.
Loop resistance:	The maximum allowable resistance of the signal-carrying loop, including extension wires and load resistors, is given by this formula: $R_{loopmax} = (V_{supply} - 9.5) / 0.02 \text{ AMPS}$. For example, if supply voltage is 24 VDC, the loop resistance must be less than 725Ω.
Accuracy:	Includes temperature, linearity, hysteresis, repeatability, and voltage effects.
Humidity:	±1% from 10% to 80% RH @ 25 to 35°C or ±2% from 0% to 90% RH @ 25°C. (±3% from 0% to 90% RH @ 15 to 50°C). (±5% from 0% to 90% RH @ 0 to 82°C).
Temperature:	± 0.75% of span for 32 to 122°F ambient ± 1.5% of span for -13 to 185°F ambient
Adjustments:	Zero and Span field adjustments, non-interacting.
Time Constant:	50 seconds in slow moving air.
Connections:	Screw terminals (22-14 AWG wire).
Weight:	1.77 lb (0.81 kg).
Minimum output current:	3.5 mA.
Maximum output current:	23 mA.

Installation Do's and Don'ts

Do:

- Check the label and verify the model number of the unit.
- Confirm the required power and signal wires are available at installation site.
- Avoid electrical interference with other signals by using twisted pair wiring. Do not run signal leads near or parallel to line voltage or other power leads.
- Mount the unit on an interior wall located away from air drafts coming from forced air heating/cooling vents, within the wall and/or the wiring conduit.

Don't:

- Do not touch or manipulate the sensors.
- Do not expose the sensor to direct light during installation. This causes a false reading. Should this occur, shade the sensor. It will self-adjust and yield an accurate reading in less than two minutes.
- Do not expose the sensor or transmitter to static electricity. This device incorporates CMOS components which are vulnerable to damage via static charges.

Mounting

Installation of the AH440 consists of mounting the transmitter and connecting it to power.

Duct/Wall/OSA Mounting: Models AH440D... AH440O... AH440W

1. For the duct mount model AH440D only, drill ½" hole into sheet metal of duct. (Probe is 3/8" in diameter.)
2. Remove the rubber cap from the end of the probe.
3. Using the fold-out tabs on bottom of housing, mount housing to sheet metal.
4. Remove transmitter cover and connect power wires to the transmitter by 2 screw terminals located near the edge of the circuit board (Figure 2). Power supply must not exceed 35 VDC.
5. Re-install cover.

Humidity Transmitter Wiring Diagram

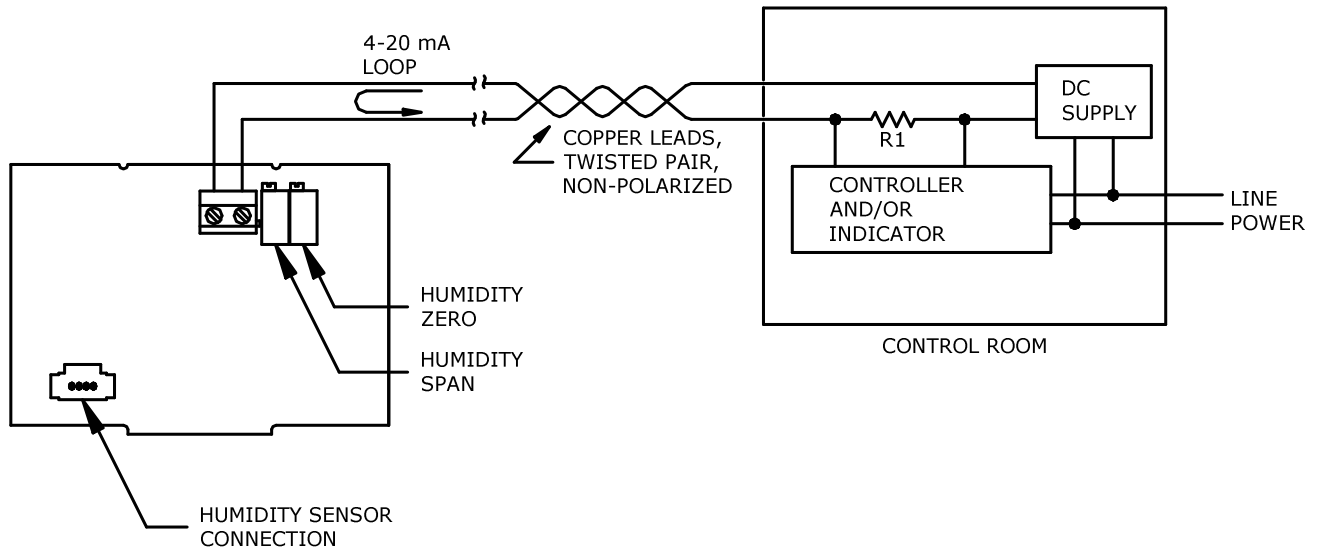


Figure 1

Temperature Transmitter Wiring Diagram

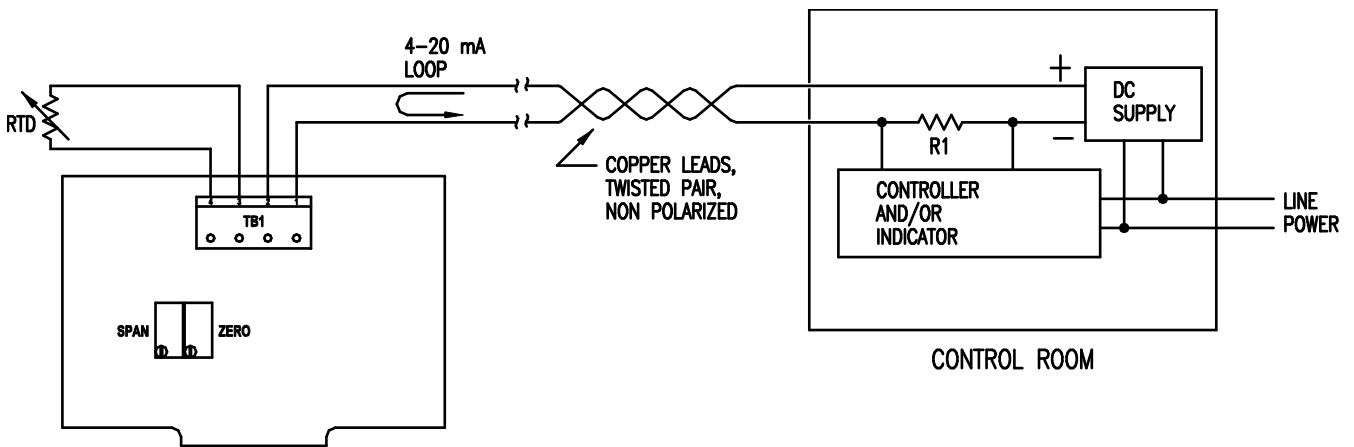


Figure 2

Power Supply

DC power supply requirements are determined by the humidity and temperature transmitter's minimum voltage requirement and voltage drop across the load resistor and installation lead wires.

Example: The transmitter requires 9.5 Volts minimum. A typical 250 ohm load resistor drops 5.0 Volts @ 20 mA. Allowing a margin of 0.5 Volts for the supply permits 25 ohms of lead wire resistance for remote installation. Totaling these, we get a minimum power supply requirement of 15.0 VDC.

Using a 24 VDC power supply will take care of nearly all installations, but the AH440 will operate at voltages up to 35 VDC.

Humidity Transmitter Calibration

Calibration of the humidity transmitter can be done in a number of ways; comparison to another calibrated RH instrument, using saturated salts, or in a controlled environment using a humidity chamber. The humidity and temperature transmitters have non-interacting zero and span pots for field calibration.

Comparison method

To compare the calibration of the AH440 to another calibrated RH instrument, both sensors should be within 2" to 3" of each other with a fan blowing on both sensors for at least 10 minutes. This will equalize the temperature of both sensors and emulsify the moisture content of the air. If adjustment is needed, adjust the humidity zero (HZ) pot only. Refer to wiring diagrams 1-4 for location of the adjustment pots. Do not adjust the span control.

Saturated Salts

Calibration is accomplished using saturated salt calibration cells as humidity standards. The cells are designed for field use in constant temperature conditions. Various types of cells and their respective relative humidity values are available. The cells must accept a 3/8" diameter probe. If adjustment is needed, and you're performing a single point calibration, adjust the humidity zero (HZ) pot only. For 2 point calibrations, use the humidity zero (HZ) pot to adjust the low humidity calibration point and the humidity span (HS) pot to adjust the high humidity calibration point.

Humidity Chamber

Follow the instructions of the humidity chamber for simulating humidity and temperature under controlled conditions. If adjustment is needed, and you're performing a single point calibration, adjust the humidity zero (HZ) pot only. For 2 point calibrations, use the humidity zero (HZ) pot to adjust the low humidity calibration point and the humidity span (HS) pot to adjust the high humidity calibration point. If the humidity span (HS) pot is adjusted, go back and verify that unit is still within calibration at the low humidity calibration point.

Temperature Transmitter Calibration

Temperature Chamber/bath

Follow the instructions of the temperature chamber or bath simulating temperature under controlled conditions. If adjustment is needed, and you're performing a single point calibration, adjust the temperature zero (TZ) pot only. For 2 point calibrations, use the temperature zero (TZ) pot to adjust the low temperature calibration point and the temperature span (TS) pot to adjust the high Temperature calibration point. If the temperature span (TS) pot is adjusted, go back and verify that unit is still within calibration at the low temperature calibration point.

Warranty

Items returned within one year from the date of sale, transportation prepaid, which Minco Products, Inc. (the "seller") reasonably determines to be faulty by reason of defective materials or faulty workmanship will be replaced or repaired at the seller's discretion, free of charge.

This remedy is to be the sole and exclusive remedy available to the buyer in the event of a breach by the seller. Items that show evidence of mishandling or misapplication may be returned by the seller at the customer's expense.

Furthermore, the seller is not to be held responsible for consequential damages caused by this product except as required under Minnesota Statutes, Section 336.1-719 (3).

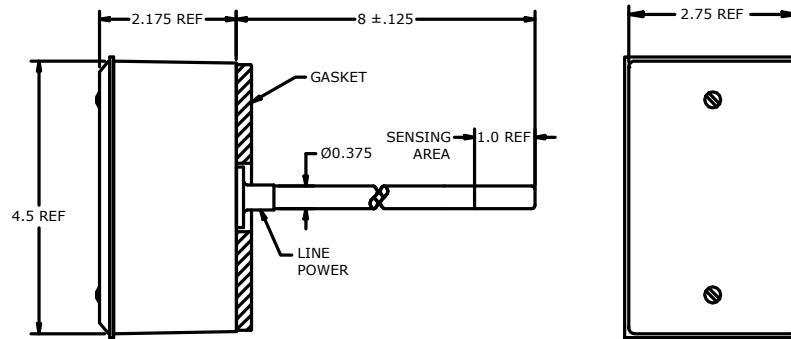
This warranty is in lieu of any other expressed warranty or implied warranty of merchantability or fitness for a particular purpose, and of any other obligations or liability of the seller or its employees or agent.

How to Order AH440

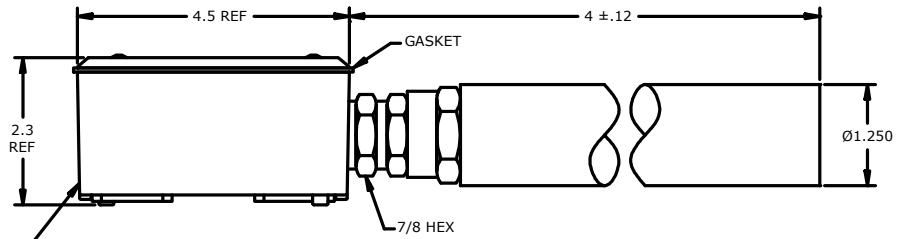
AH440	Model Number: AH440 – Dual Board Humidity / Temperature Transmitter
D	Enclosure: D = Duct mount, 8" probe length O = Outside Air/Wall mount, 4" probe length with shield, weather resistant enclosure W = Wall mount, 4" probe length, weather resistant enclosure
1	Output: 4 to 20 mA DC
N10	Calibration Accuracy: (Humidity Transmitter) N10 = ±1% from 10% to 80% (25 to 35°C) with NIST certificate N20 = ±2% from 0% to 90% (25°C) with NIST certificate S20 = ±2% from 0% to 90% (25°C)
S	Temperature Transmitter range: EN = -20°F to 140°F S = 0°F to 100°F A = 20°F to 120°F BI = 30°F to 130°F KK = 30°F to 180°F N = 32°F to 122°F H = 40°F to 90°F Consult factory for other possible ranges.
T1	Sensing Element Cover (omitted on "S" space mount models) T0 = Sintered stainless steel; pressed on cover T1 = Sintered stainless steel; screw on cover T2 = Slotted stainless steel; screw on cover (not available on "O" outside air models)
AH440D1N10ST1 ← Sample part number	

Dimensions

Duct

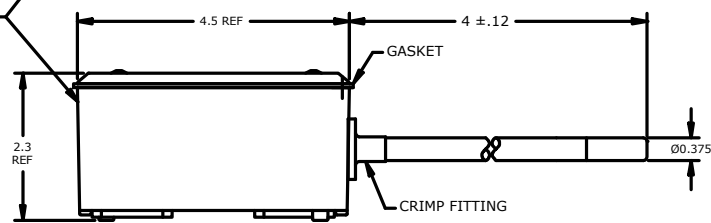


OSA



Wall

WEATHERPROOF CONNECTION BOX MODEL CH317



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