

Hazardous Area Humidity Assembly



Overview

Models AH71_, AH72_, and AH73_ series are 2-wire temperature compensated humidity transmitters that are FM and CFM approved for use in hazardous locations. Intrinsically safe models are available with an optional temperature transmitter output. The AH73 is also available with an optional digital display for remote indication of relative humidity and temperature.

The transmitters utilize a thin film capacitive humidity sensor which provides outstanding sensitivity and chemical robustness. The 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 optional temperature loop produces 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 leads that supply power also carry the current signal.

- Accuracy of $\pm 2.5\%$ RH
- Temperature compensated
- Temperature output option
- Two-point field calibration
- NIST traceable calibrations

Applications

Building automation systems (HVAC), hospitals, food storage, warehouses, clean rooms, pharmaceutical, drying equipment, and emissions monitoring.

Specifications

Output(s):

Humidity: 4 to 20 mA DC = 0% to 100% RH.
Temperature: 4 to 20 mA DC over specified range (optional)

Humidity Range: 0 – 100% RH

Sensing Element:

Humidity: Thin film capacitive element.
Temperature: 1000 ohm platinum RTD, 0.00385 TCR

Temperature Effect: $\pm 0.03\%$ RH/ $^{\circ}\text{C}$ $\pm 1\%$ from 10°C to 85°C

Operating Temperature:

Transmitter:

- 40 to 176°F (-40 to 80°C), non-condensing.
- 4 to 176°F (-20 to 80°C), non-condensing, model AH73.

Sensor:

- 40 to 302°F (-40 to 150°C).

Storage Temperature:

-58 to 185°F (-50 to 85°C), non-condensing.

Supply voltage:

9.5 to 28 VDC for intrinsically safe (IS) models.
16.5 to 28 VDC for explosionproof (XP) models.

Voltage effect: $\pm 0.001\%$ of span/volt from 9.5 to 28 VDC.

Loop resistance: The maximum allowable resistance of the signal-carrying loop, including extension wires and load resistors, is given by this formula:

IS: $R_{\text{loopmax}} = (V_{\text{supply}} - 9.5)/0.02$ AMPS. For example, if supply voltage is 24 VDC, the loop resistance must be less than 725 Ω .

XP: $R_{\text{loopmax}} = (V_{\text{supply}} - 16.5)/0.02$ AMPS. For example, if supply voltage is 24 VDC, the loop resistance must be less than 375 Ω .

Specifications subject to change

Accuracy: Includes linearity, hysteresis, repeatability, and voltage effects.
 Humidity: $\pm 2.5\%$ from 10% to 80% RH @ 25°C, $\pm 3.5\%$ from 80% to 90% RH @ 25°C.
 Temperature: $\pm 0.5^\circ\text{F}$ (0.27°C) @ 77°F (25°C) or $\pm 0.75\%$ of span, whichever is greater.

Adjustments: Zero and Span field adjustments, non-interacting.

Time Constant: 50 seconds in slow moving air.

Connections: Screw terminals (22-14 AWG wire).

Weight:

AH71_ 2.84 lbs (1.29 kg).
 AH72_, AH73_ 4.46 lbs (2.02 kg).

Min. output current: 3.8 mA.

Max. output current: 22 mA.

Filter: 60 micron stainless-steel sintered filter (replacement P/N : AC103512)

Factory Mutual Approvals:

Explosionproof with intrinsically safe sensor:
 Suitable for the following hazardous area locations:
 Class I, Division 1, 2, Groups B, C, D
 Class II, Division 1, 2, Groups E, F, G
 Class III, Division 1, 2

Intrinsically safe installation:
 Suitable for the following hazardous area locations:
 Class I, Division 1, 2, Groups A, B, C, D
 Class II, Division 1, 2, Groups E, F, G
 Class III, Division 1, 2
 Class I, Zone 0, AEx ia IIC T4

Non-Incendive:
 Suitable for the following hazardous area locations:
 Class I, Division 2, Groups A, B, C, D
 Class II, Division 2, Groups F, G
 Class III, Division 2

Transmitter entity parameters:
 $V_{max} = 28$ volts; $I_{max} = 100$ mA; $C_i = 0.037$ μF and $L_i = 0$ mH.

Transmitter ranges:

Code	Transmitter range
NT	No temperature transmitter
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

Accessories:

Sintered Filter Replacement	Part Number: AC103512
Slotted Filter Replacement	Part Number: AC103513
Pipe Mounting Kit for AH72/AH73	Part Number: AC102765
Wall Mounting Kit for AH71	Part Number: AC103168
Duct Mounting Kit for AH71	Part Number: AC103253

Specification and order options

AH73	Model number AH71 Industrial grade humidity transmitter with optional temperature transmitter, CH106 connection head, display NA AH72 Industrial grade humidity transmitter with optional temperature transmitter, XIHMF connection head, display NA AH73 Industrial grade humidity transmitter with optional temperature transmitter, XIHMF connection head, display available		
1	Probe diameter 1 = 0.375"		
P3	Pipe Thread Code	Process	Conduit
	P3	1/2 - 14NPT	1/2 - 14NPT
	P4	1/2 - 14NPT	3/4 - 14NPT
	P5	G1/2A	1/2 - 14NPT
	P6	G1/2A	3/4 - 14NPT
L120	Probe length L60 = 6" L120 = 12"		
T1	Filter type T1 = Sintered stainless steel T2 = Slotted stainless steel		
HT490	Transmitter model number HT480 = Explosionproof with intrinsically safe sensor (transmitter code NT only) HT490 = Intrinsically safe		
F	Display C = Display, metric units (AH73_series only) F = Display, English units (AH73_series only) N = No display (AH71_ and AH72_ series only)		
1	Signal output 1 = 4 to 20mA		
N25	Calibration accuracy (humidity transmitter) N25 $\pm 2.5\%$ from 10% to 80% (25°C) with NIST certificate S25: $\pm 2.5\%$ from 10% to 80% (25°C)		
EN	Temperature transmitter range from table		
AH731P3L120T1HT490F1N25EN = Sample part number			

HVAC SENSORS

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Specifications subject to change

