Duct and Outside Air Humidity(H200-H300)
4 to 20mA/0to5V w/Optional Temperature Sensor

Installation and Operating Instructions

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Overview

The BA/♦(H200, H300) is a humidity transmitter which comes in 2% or 3% accuracies and an optional temperature sensor. The temperature sensor can be either a Thermistor or RTD. It can be ordered for either Duct or Outside air applications with enclosures rated for NEMA-3R or NEMA-4 (IP66). The transmitter can be wired for either a 0-5VDC output or a loop powered 4-20mA output. The unit is powered with 10 to 35VDC. The 0-5VDC output transmitter can also operate with 12 to 24VAC power.

Product Indentification & Mounting

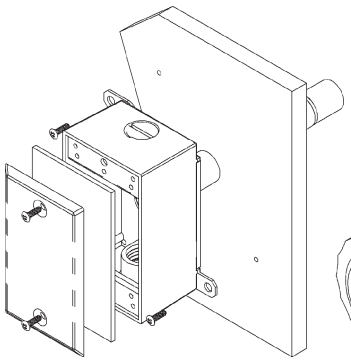

Fig. 1: Duct Humidity.NEMA-3R Rated

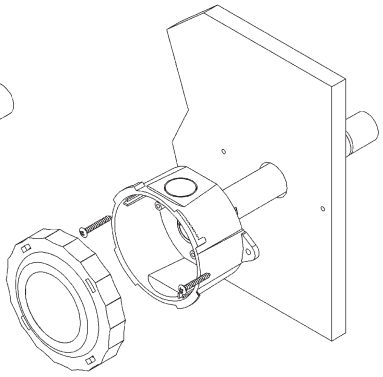

Fig. 2: Duct Humidity/IP66 Rated

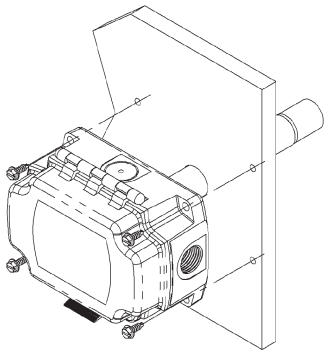

Fig. 3: Duct Humidity/BAPI-Box, IP66 Rated

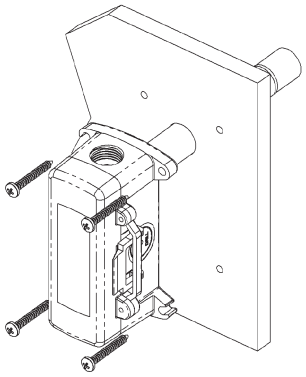

Fig. 4: Duct Humidity/ BAPI-Box 2, IP66 Rated

Mount at least 3 duct diameters from humidifiers in the center of the duct wall. Drill a 1 inch hole for the probe in the duct and use two number 8 sheet metal screws to attach the sensor to the duct. Center the probe in its mounting hole. Be sure that the foam seals the hole, do not over tighten the screws.

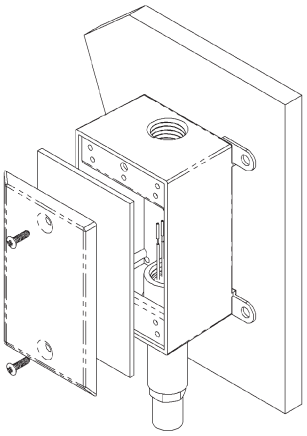

Fig. 5: Outside Humidity/ Weatherproof

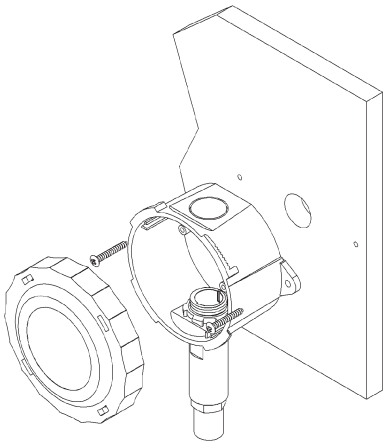

Fig. 6: Outside Humidity/ Weatherproof

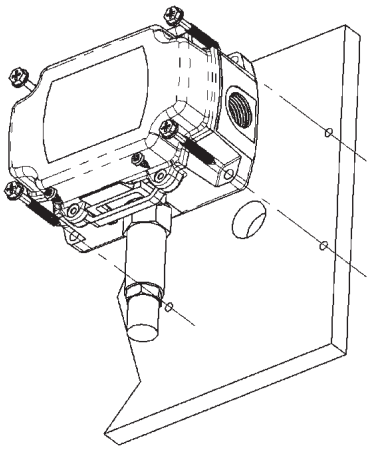

Fig. 7: Outside Humidity/ BAPI-Box, IP66 Rated

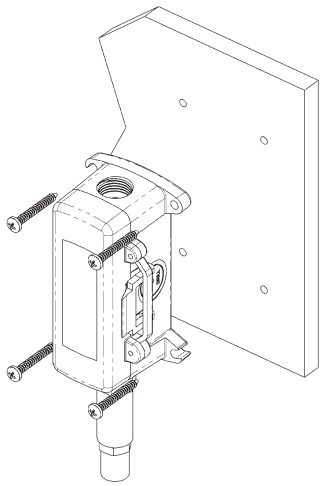

Fig. 8: Outside Humidity/ BAPI-Box 2, IP66 Rated

Mount in a permanently shaded area away from windows and doors. Do not mount in direct sunlight. Mount with the sensor probe pointed down. Drill a hole large enough for your sensor cable through your mounting surface. Mount the unit to the surface with the wiring knock out centered over the wiring hole. Pull the wiring into the unit and terminate using sealant filled connectors. Best practice is to caulk the wiring hole after the wiring is installed. Be sure that the foam on the back of the unit makes a good weather tight seal.

Wiring and Termination

Table 1: Humidity Transmitter Terminations

Wire color	Purpose	Note
Yellow	Temperature Sensor	Factory connection, no customer connection allowed
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Blue	HumiditySensor	Factory connection, no customer connection allowed
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White	Voltage output	0 to 5VDC, To Analog Input of Controller
Black	GND (Common)	0 to 5VDC Output to Ground; (AC or DC Power) 4 to 20mA output, To Analog Input of Controller
Red	Power	10 to 35VDC, (12 to 24 VAC for 0-5 VDC Output)

NOTE: *BAPI's 2% and 3%, humidity transmitters* ***ARE*** *polarity sensitive as well as reverse polarity protected.*

Table 2: Optional Sensor Lead Wire Colors (Standard Etched Teflon)

Thermistor @ 25C		**RTD** @ 0C, Pt-Platinum		
Type	**Two Wire Color**	**Type**	**Two Wire Color**	**Three Wire Color**
1.8K	Orange/Red	**100Ω [385]**	Red/Red	Red/Red/Black
3K	Yellow/Black	**1KΩ [375]**	Orange/Orange	Org/Org/Black
10K-2	Yellow/Yellow	**1KΩ [375]**	Black/Black	N/A
10K-3	Yellow/Red			
10K3[11K]	Yellow/Blue	**RTD @ 70F, Ni-Nickel**		
20K	White/White	**1KΩ [Ni]**	Green/Green	N/A
100K	Yellow/White			

NOTE: *Plenum rated and FEP wire is Red/Black for all 2 wire sensors and Red/Red/Blk for 3 wire sensor.*

Fig. 7: Humidity Transmitter with 2-wire Thermistor or RTD Temperature Sensor

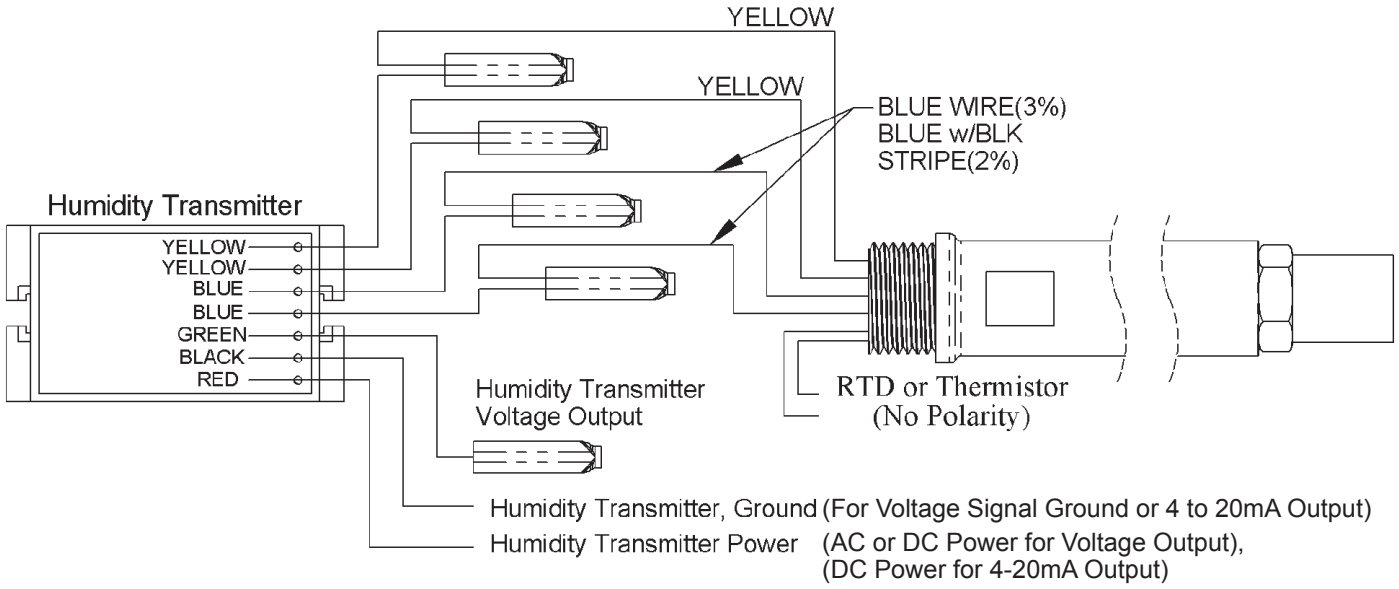
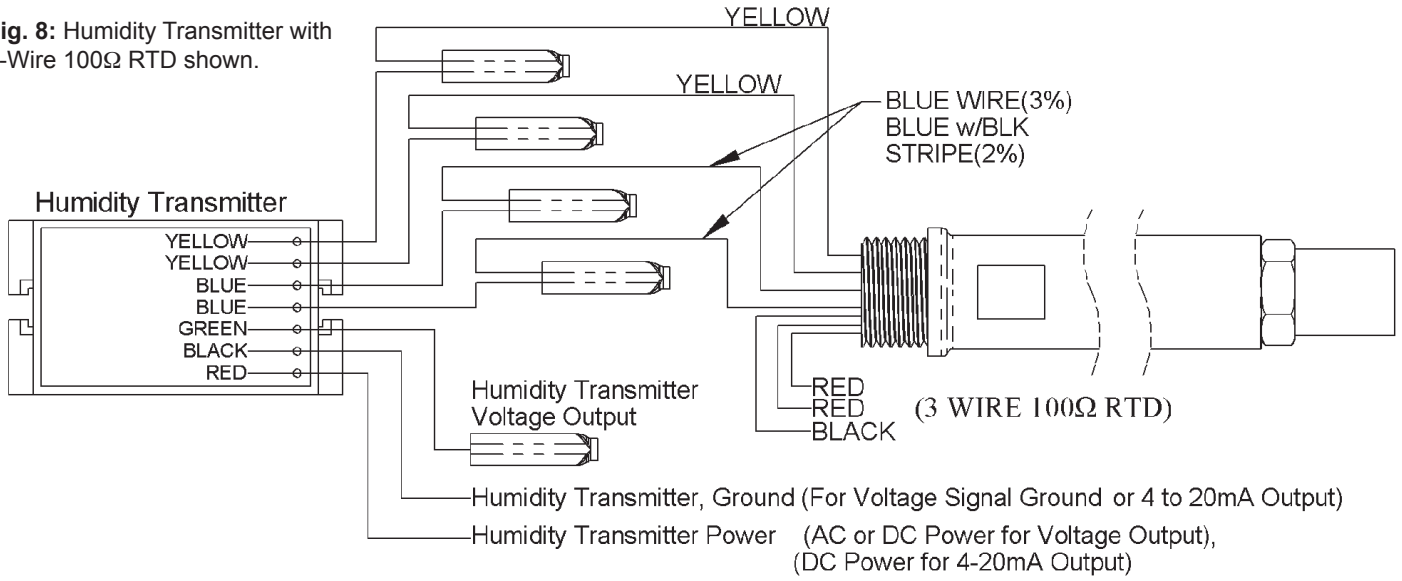


Fig. 8: Humidity Transmitter with 3-Wire 100Ω RTD shown.



Humidity Diagnostics

Possible Problems:
Unit will not operate

Possible Solutions:
- Check power supply/controller voltage supply.
- Disconnect transmitter from controller and check wires for proper operation with a meter

Humidity reading in software appears to be off more than specified accuracy

- Check all software parameters- If available, check the sensor against a calibrated control such as a hygrometer
- Use the 4 to 20mA or 0 to 5V signal formula to calculate the output at the transmitter with a meter.
- Determine if the sensor is exposed to an external source different from the measured environment. (Draft)

Output	Humidity Formula
4 to 20 mA	%RH = (mA - 4)/0.16
0 to 5 VDC	%RH = V/0.05

Temperature Diagnostics

Temperature Sensor Diagnostics

Possible Problems:
Controller reports Incorrect temperature

Possible Solutions:
- Confirm the input is set up correctly in the controller's software
- Verify that the sensor wires are not physically shorted or open
- Check wiring for proper termination
- Measure the temperature at the temperature sensor's location using an accurate temperature standard. Disconnect the temperature sensor wires and measure the temperature sensor's resistance with an ohmmeter. Compare the temperature sensor's resistance to the appropriate temperature sensor table on the BAPI web site. If the measured resistance is different from the temperature table by more than 5%, call BAPI technical support. BAPI's web site is found at www.bapihvac.com; click on the button labeled SENSORS on the left of the screen and then click on the type of sensor you have.

Filter Care

A sintered filter protects the humidity sensor from various airborne particles and may need periodic cleaning. To do this, gently unscrew the filter from the probe. Rinse the filter in warm soapy water and rinse until clean. A nylon brush may be used if necessary. Gently replace the filter by screwing it back into the probe. The filter should screw all the way into the probe, or at the most having only one or two threads showing. Hand tighten only. If a replacement filter or replacement probe is needed, call ***BAPI*** .

BA/HDOFS Stainless Steel Sintered Filter Replacement

Specifications

Power:
10 to 35 VDC, 22mA max (4 to 20 mA or 0 to 5 VDC output)
12 to 24 VAC, 0.53VA max (0 to 5 VDC output)

Sensor:

Humidity	Resistive
Opt. Temp.	Passive RTD or Thermistor

Filter:

OSA	100 micron sintered stainless steel filter
Duct	100 micron porous plastic, plenum rated UL94 V-0

Accuracy:

210	2%, 15% to 95% @77ºF
310	3%, 15% to 95% @77ºF
Thermistor	±0.36ºF (0.2ºC) from 32 to 158ºF (0 to 70ºC)
RTD	±0.55ºF (0.31ºC) @ 32ºF (0ºC)
	High accuracy units available

Output:

Humidity	0-10VDC = 0-100%RH
Opt.Temp.	Resistance RTD or Thermistor

Humidity Impedance:

Current	700Ω@ 24VDC
Voltage	10KΩ

Enclosures material:

WP	Cast Aluminum
EU	ABS plastic, UV resistant
BB, BB2	Polycarbonate, UV resistant

Enclosures Ratings:

WP	NEMA-3R
EU	IP66, UL94V-0
BB, BB2	NEMA-4, IP66, UL94V-0

Ambient Range:
-22º to 158ºF, (-30º to 70ºC)
0% to 100%