HD2

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⚠ WARNING

HAZARD OF ELECTRIC SHOCK, EXPLOSION OR ARC FLASH

- Apply appropriate personal protective equipment (PPE) and follow safe electrical work practices. See NFPA 70E or CSA Z462.
- This equipment must only be installed and serviced by qualified electrical personnel.
- Turn off all power supplying this equipment before working on or inside equipment.
- Always use a properly rated voltage sensing device to confirm power is off.
- Replace all devices, doors and covers before turning on power to this equipment.

Failure to follow these instructions can result in death, serious injury or equipment damage.

This product is intended for use in HVAC and building environmental control applications.
It is not intended for direct medical monitoring of patients.
It is not intended for life-safety applications.
Read and understand these instructions before installing this product.
The installer is responsible for all applicable codes.
If this product is used in a manner not specified by the manufacturer, the protection provided by the product may be impaired. No responsibility is assumed by the manufacturer for any consequences arising out of the use of this material.

HD2 Analog Series

Duct Mount Humidity Sensors

Product Overview

HD2 Analog Series Humidity Transmitters provide an ideal solution for measuring relative humidity in a wide range of conditions. All models are equipped with a solid state capacitive humidity sensor that is easy to replace in the field and a solid state temperature sensor for high accuracy measurements.

HD2 is an all-in-one device combining humidity and temperature sensing. Intended for duct mount applications, the device ensures a building's optimum temperature and humidity levels, resulting in greater energy efficiency.

Each device is an active sensor that converts a humidity or temperature measurement into 4-20 mA, 0 to 5 Vdc or 0 to 10 Vdc analog output.

Different models are available based on application requirements for lower-cost installations.

Product Identification

	User Interface	*Output*	*RH Accuracy*	*Temp.*
HD2	[X]	[A]	[ ]	[A]
	X = None	A = Analog output	2 = 2% X = None*	A = Transmitter only. B = 100R Platinum, RTD C = 1000 PT RTD D = 10K T2 Thermistor G = 10K CPC Thermistor H = 10K T3 Thermistor K = 10K Curve G/11K Shunt M = 20K NTC Thermistor N = 1.8K TAC Thermistor R = 10K Curve G

**For temperature transmitter models only.*
Note: Replaceable RH and temperature modules available to be ordered separately per table below.

Replaceable RH Elements & Temperature and Humidity Calibration Modules

Model	Description	Temp. Calibration	RH Calibration
HS1N	Replaceable RH sensor, 1% with NIST certificate	N/A	2-point calibration
HS2N*	Replaceable RH sensor, 2% with NIST certificate	N/A	2-point calibration
HS2X	Replaceable RH sensor, 2%	N/A	2-point calibration
TS2**	Replaceable temperature module with 2-point calibration certificate	2-point calibration	N/A
THS2**	Replaceable temperature and humidity module with 2-point calibration certificate	2-point calibration	2-point calibration

**Not for use with HO2 Series outdoor humidity sensors. **For use on temperature transmitter models only.*
Note: For instructions on installing replaceable elements, see Z208535-0x, Replacement Humidity and Temperature Sensors Installation Guide.

Specifications

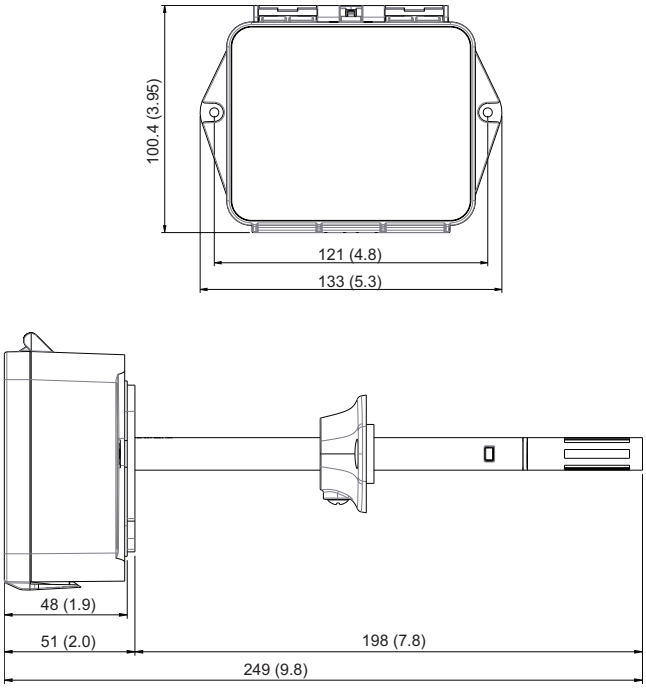
	OPERATING / STORAGE ENVIRONMENT
Operating Temp. Range	-35 to 60 °C (-31 to 140 °F)
Operating Humidity Range*	0 to 95% RH (non-condensing)
Storage Temp. Range	-35 to 70 °C (-31 to 158 °F)
Storage Humidity Range	0 to 95% RH (non-condensing)
Power Supply	3-wire volt mode: 20 to 30 Vdc, 24 Vac, 50 to 60 Hz; loop powered 20 to 30 Vdc
Output	Selectable 4 to 20 mA, 0 to 5 Vdc, 0 to 10 Vdc
Power Consumption	See Maximum Power Consumption table, page 6
Output Load	Voltage mode ≥ 5K Ohms Current mode ≤ 250 Ohms
Tube Length	200 mm
Medium	Neutral gas, air
Housing Material	Polycarbonate; flammability rating UL 94 V0
Mouting Location	For indoor use only. Not suitable for wet locations.
IP Rating	IP65
Protection Class	Class III
	RH SENSOR
Sensor Type	Solid state capacitive, replaceable
Accuracy**	±2% from 10 to 80% RH @ 25 °C (77 °F) ±1%, ±2% NIST and 2% replaceable option
Hysteresis	1.5% typical
Linearity	Included in accuracy specification
Stability	±1% @ 20°C (68 °F) annually for 2 years
Output Range	0 to 100% RH
Temperature Coefficient	±0.1% RH/°C above or below 25 °C (77 °F) typical
	TEMPERATURE SENSOR
Sensor Type	Solid state, integrated circuit
Temp. Sensing Element	See Product Identification section on page 1 for available temp sensing elements
Time Constant	Air velocity 1.5 m/s. approx. 72 s; Air velocity 3.0 m/s. approx. 52 s
Accuracy***	±0.2 °C (±0.4 °F) typical typical at 25 °C
Resolution	0.1 °C (0.1 °F)
Range	-35 to 60 °C (-31 to 140 °F)*
	WIRING TERMINALS
Terminal Blocks	Screwless terminal block with spring actuator, 16-24 AWG
	WARRANTY
Limited Warranty	5 years
	COMPLIANCE INFORMATION
Agency Approvals	UL 916 European Conformance CE: EN 60730-1, EN 61000-6-2, EN 61000-6-3, EN 61000 Series - Industrial Immunity, EN 61326-1 FCC Part 15 Class A, Green Premium (REACH, RoHS), RoHS 2 (China), RCM (Australia), ICES-001 (Canada), UKCA (UK)

**Duct mount model with temperature and humidity only.*

***Humidity sensor measurement uncertainty should include: accuracy, hysteresis, temperature coefficient and stability. Humidity accuracy up to -20°C.*

****±0.5 °C accuracy from 0 to 60°C, ±1°C accuracy from -35 to 0°C.*

Dimensions
mm (in.)



Installation

NOTICE

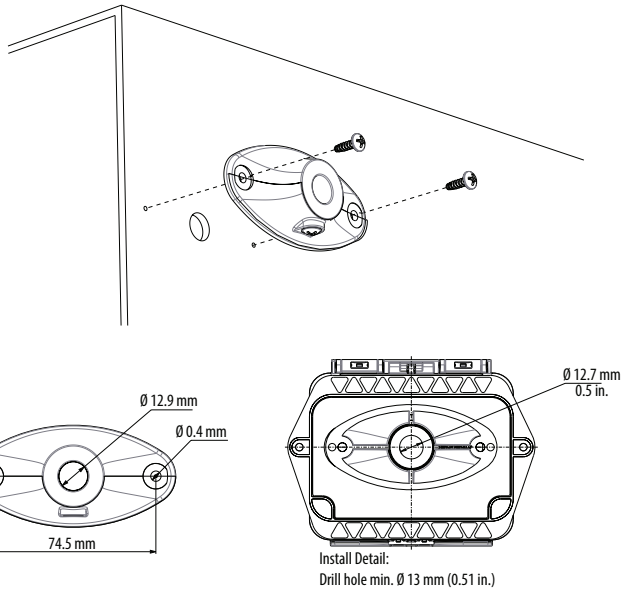
PRODUCT DAMAGE DUE TO ELECTRO-STATIC DISCHARGE
Circuit boards and components can be damaged by static electricity or electro-static discharge (ESD). Observe the following electro-static precautions when handling this product and cables and components connected to the product.

- Keep static-producing material such as plastic, upholstery, carpeting, etc. out of the immediate work area
- Store the product in ESD-protective packaging when it is not installed in the panel
- When handling the product or a conductive cable/ESD-sensitive component connected to the product, wear a conductive wrist strap connected to ground through a minimum of 1 MΩ resistance
- Do not touch exposed conductors and component leads with skin or clothing

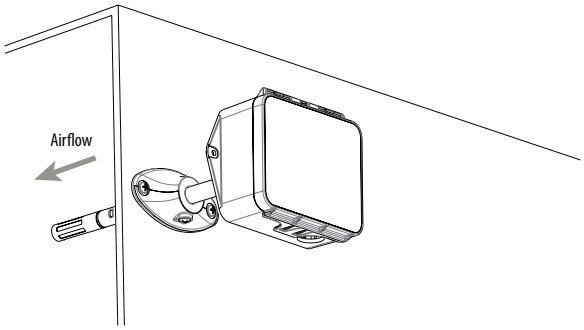
Failure to follow these instructions can result in equipment damage.

Installation (cont.)

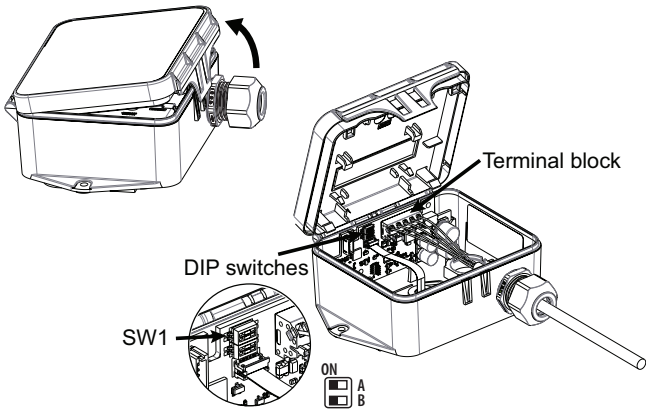
1. Prepare the duct for installation by drilling holes to accommodate the probe tube. Ensure the gasket on the back is depressed to prevent leakage between the product and the duct. Do not over-tighten the screws.



2. Ensure the probes are installed in the direction of the air flow. Install the probe in the middle of the duct and away from any restrictions to allow proper air flow.



3. Release the latch on the lid to access the DIP switches and terminal block.



Installation (cont.)

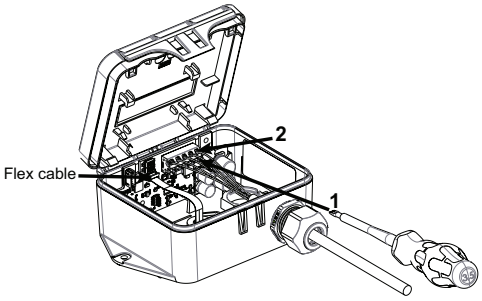
4. Wire the connections per the diagram in the Wiring section below. This device features spring terminals for screwless termination. Open the terminal point by inserting a screwdriver, then insert the wire above. Release the screwdriver to hold the wire in place. Details on wiring and configuration are contained in the next sections of this document.

NOTICE

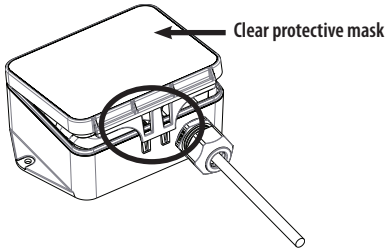
MISSING TEMPERATURE AND HUMIDITY READINGS

- Ensure flex cable is in place after wiring.

Failure to follow these instructions can result in no temperature or humidity readings.



5. Secure the latch-on cover in the closed position and remove the clear protective mask on the front label of the device.



Wiring

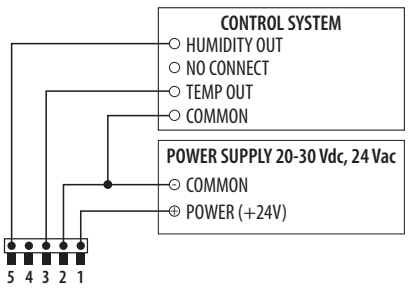
NOTICE

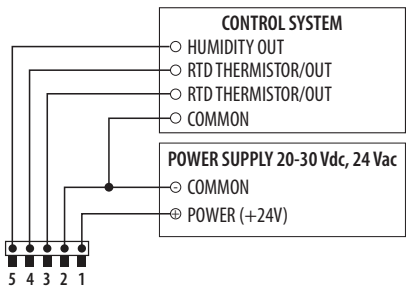
INACCURATE READINGS

- Do not run wiring in the same conduit as AC power wiring. Close proximity to AC power may influence accuracy.
- In current output mode do not use AC voltage, use 20-30V DC Volts.

Failure to follow these instructions can result in reduced accuracy and incorrect readings.

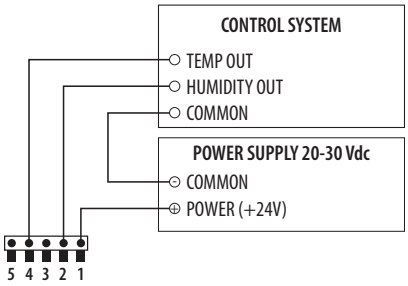
Voltage Mode Wiring Diagrams

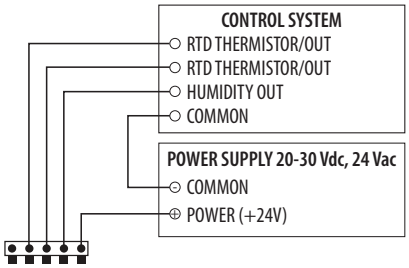




Wiring (cont.)

Current Mode Wiring Diagrams

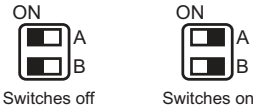




Configuration

Set the DIP switches.

White squares indicate switch position:



Switch	Function	Description
A	Output mode	ON - 4-20mA output mode enabled OFF - Voltage output mode enabled
B	Voltage output	ON - 0-5V output range enabled OFF 0-10V output range enabled

Maximum Power Consumption

Series	LCD	Temp/RH	Max. Power
HD2 Analog	No	Yes	0.8VA @ 24VAC Voltage Mode 0.96W @ 24VDC Current Mode

Thermistor Table

Standard RTD and Thermistor Values - Ohms (Ω)

°C	°F	100 Ohm RTD (PTC)	1000 Ohm RTD (PTC)	1800 Ω (NTC) Thermistor (NTC)	10k Type 2 Thermistor (NTC)	10k CPC Thermistor (NTC)	10k Type 3 Thermistor (NTC)	10k "G" US Thermistor (NTC)	20k NTC Thermistor (NTC)
-50	-58	80.306	803.06	63,880	670,600		441,300	441,200	1,267,600
-40	-40	84.271	842.71	35,680	336,600	336,052	239,800	239,700	643,800
-30	-22	88.222	882.22	20,720	177,000	176,785	135,200	135,300	342,000
-20	-4	92.16	921.6	12,460	97,120	96,999	78,910	78,910	189,080
-10	14	96.086	960.86	7,733	55,340	55,301	47,540	47,540	108,380
0	32	100	1,000.00	4,940	32,660	32,650	29,490	29,490	64,160
10	50	103.903	1,039.03	3,240	19,900	19,902	18,790	18,780	39,440
20	68	107.794	1,077.94	2,177	12,490	12,493	12,260	12,260	24,920
25	77	109.735	1,097.35	1,800	10,000	10,000	10,000	10,000	20,000
30	86	111.673	1,116.73	1,496	8,058	8,056	8,194	8,194	16,144
40	104	115.541	1,155.41	1,049	5,326	5,325	5,592	5,592	10,696
50	122	119.397	1,193.97	749.7	3,602	3,601	3,893	3,893	7,234
60	140	123.242	1,232.42	545.3	2,488	2,487	2,760	2,760	4,992
70	158	127.075	1,270.75	403.1	1,751	1,751	1,990	1,990	3,512
80	176	130.897	1,308.97	302.5	1,256	1,256	1,458	1,458	2,516
90	194	134.707	1,347.07	230.2	916	916.0	1,084	1,084	1,833
100	212	138.506	1,385.06	177.5	679.2	678.4	816.8	816.8	1,356
110	230	142.293	1,422.93	138.6	510.8	509.8	623.6	623.6	1,016
120	248	146.068	1,460.68	109.5	389.4	388.3	481.8	481.8	770
130	266	149.832	1,498.32	87.4	300.6	-	376.4	376.4	591
Sensor Codes		B	C	N	D	G	H	R	M

Note: Sensor Code K includes a 10K Curve 9 (Sensor Code R) in parallel with an 11kΩ resistor.

China RoHS Compliance Information

Environment-Friendly Use Period (EFUP) Table

部件名称	有害物质 - Hazardous Substances					
Part Name	铅 (Pb)	汞 (Hg)	镉 (Cd)	六价铬 (Cr (VI))	多溴联苯 (PBB)	多溴二苯醚 (PBDE)
电子件 Electronic	X	O	O	O	O	O

本表格依据SJ/T11364的规定编制。
O: 表示该有害物质在该部件所有均质材料中的含量均在GB/T 26572规定的限量要求以下。
X: 表示该有害物质至少在该部件的某一均质材料中的含量超出GB/T 26572规定的限量要求。
（企业可在此处，根据实际情况对上表中打 "X" 的技术原因进行进一步说明。）

This table is made according to SJ/T 11364.
O: indicates that the concentration of hazardous substance in all of the homogeneous materials for this part is below the limit as stipulated in GB/T 26572.
X: indicates that concentration of hazardous substance in at least one of the homogeneous materials used for this part is above the limit as stipulated in GB/T 26572

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