



ohmic instruments co.

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INDUSTRIAL & ENVIRONMENTAL SENSORS, INSTRUMENTS & CONTROLS SINCE 1969

HS SERIES HUMIDITY SENSORS (DUNMORE SENSORS) HIGH RESOLUTION NARROW SPAN RESISTIVE ELEMENTS

- 11 NARROW SPANS AVAILABLE
- $\pm 1\%$ RH ACCURACY
- HIGH SENSITIVITY & FAST RESPONSE
- EXCELLENT REPEATABILITY
- INTERCHANGEABLE
- NEGLIGIBLE LONG TERM DRIFT
- NIST TRACEABLE CERTIFICATION AVAILABLE



HS Series sensors are assembled in a perforated anodized aluminum jacket. The male pins enable direct connections to sockets and probe fittings.

APPLICATIONS

HVAC Controls	Cable
Humidistats	Wave Guides & Antennas
Appliances	Greenhouses
Compressed Air	Dry Boxes
Telecommunications	

TIME PROVEN HUMIDITY SENSORS FOR OEM APPLICATIONS

Originally developed at the National Institute of Standards & Technology, HS-Series sensors are widely used in air-conditioning and compressed air systems. Excellent interchangeability, repeatability and economical costs have made these sensors an industry standard. HS Series sensors are used in applications ranging from precision air-conditioning controls for computer rooms, to alarms that indicate when excess water vapor conditions exist in pressurized telecommunications cable and breathing air systems. Since HS Series sensors are highly interchangeable and repeatable, the signal conditioning circuitry can be calibrated independently of the sensor. This results in a field replaceable element that does not require calibration. The accuracy of each sensor is confirmed by testing to NIST traceable standards (certification is available). The table at the right provides the range of each type of sensor from 10 M Ω to 1K Ω at 80°F with 3Vac/100 Hz excitation. The RH range table was developed with OHMIC's Model HCL and SC signal conditioning cards. See Model HCLSC data sheet .

Model #	Color Code	%RH Range 909K load	%RH Range 20K load
HS-00-1	White	0.7-4.4 %	2.7- 17.0%
HS-00	White	2.0- 6.0%	4.0- 20.0%
HS-0	Black	3.5- 9.0%	8.0- 28.0%
HS-1	Brown	5.0- 15%	10.0- 36.0%
HS-2	Red	10.5- 22.0%	17.0- 51.0%
HS-3	Orange	19.0- 32.0%	26.0- 61.0%
HS-4	Yellow	27.0- 42.0%	37.0- 70.0%
HS-5	Green	41.0- 58.0%	52.0-81.0%
HS-6	Blue	54.0- 73.0%	67.0- 99.0%
HS-7	Violet	70.0- 88.0	82.0- 99.0%
HS-8	Gray	80.0-97.0%	93.0-99.0%

WARRANTY: All products manufactured by OHMIC Co. are warranted to be free of defects in material and workmanship for one year after delivery. Any equipment found to be defective within this period will be repaired or replaced free of charge.

PRINCIPLE OF OPERATION: MODEL HS SERIES

HS Series humidity sensors consist of a dual winding of Palladium wire on a Polystyrene cylinder coated with a mixture of Polyvinyl Alcohol and Lithium Chloride or Lithium Bromide. When excited with a low level (1-6V) symmetrical AC excitation voltage, HS Series sensors vary electrical impedance, with respect to temperature, in an inverse logarithmic function proportional to relative humidity.

The basic measuring circuit consists of an oscillator, current to voltage rectifying amplifier and filtering components to provide a voltage output which is essentially the inverse of the sensor's impedance. A given resistor in series with the sensor creates a voltage divider.

Data reduction for the HS sensors may be accomplished by look up tables or curves. With the advent of microprocessors, direct readout and linearization of the sensor's %RH response is facilitated by the sensor's equation.

The general sensor equation is expressed as:

$$\%RH = A(CZ)^{(T+459.7)/D(T+459.7)+B)}$$

***A, B, C & D** = Constants Related to Specific Sensors

Z = Impedance in MΩ

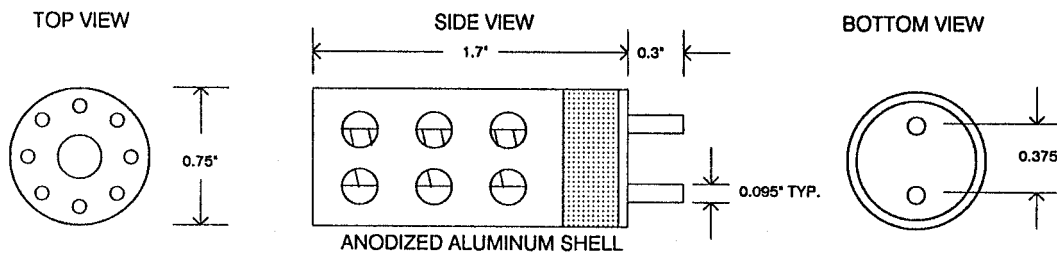
T = Temperature in °F

*Request technical data which includes constants for each range.

Since HS Series sensors are excited with AC, impedance is being measured. The reactive and capacitive components are negligible compared to the resistance, therefore the two terms: impedance and resistance are interchangeable.

HS Series sensors are not recommended for use where exposure to condensation or liquids occurs. The sensor should not be used in environments where corrosive or reactive chemical vapors are present nor should they be installed in oil-mist without a prefilter. **The sensors should never be connected to a DC source (including most multimeters) and the temperature limits should not be exceeded.** Exposure to these types of conditions result in a permanent shift in the sensor's response. When the above conditions are avoided, HS sensors have been shown to maintain their accuracy specifications for many years.

SPECIFICATIONS - HS SERIES



Accuracy	±1% RH	Repeatability	±1% RH
Interchangeability	<2% RH	Long Term Drift	<2% RH/7 Years
Hysteresis	<0.2% RH	Operating Temperature	0-160°F
Response Time	5 Seconds/63% Step	Temperature Coefficient	Approx -0.15% RH/°F
Excitation Voltage	1-6 Vac (No DC Bias)	Excitation Frequency	33 Hz to 1KHz
Dimensions	0.75" Dia x 2" Long	Jacket	Perforated Anodized Aluminum

ENGINEERING SUPPORT: OHMIC Instruments Co. designs and manufactures a full line of sensors, environmental and bio-medical instruments and controls. Many of our products are custom designed to meet specific requirements. Our engineers will be pleased to discuss your application.



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