PRODUCT BULLETIN

Hx-67x3 Series Outdoor Relative Humidity Transmitter

Johnson Controls Hx-67x3 Series offers a full line of outdoor Relative Humidity (RH) transmitters for measuring and transmitting RH levels from 0 to 100%. The RH transmitters provide excellent reliability, long-term stability, and fast, accurate response to changes in humidity. Certain models come equipped with a temperature transmitter.

The humidity sensor is impervious to dust and most chemicals, and it is unaffected by condensation. The unique weather shield protects the sensors from solar radiation and precipitation without affecting performance. The multiple discs have a unique profile that permits easy passage of air. The disc material is especially formulated for high reflectivity, low thermal conductivity, and maximum weather resistance. This rugged enclosure will ensure a long life, even under extreme weather conditions.

The sensor and shield function as one unit for optimal performance. The RH transmitter can be easily mounted on a roof, pole, or side of a building utilizing its preassembled mounting bracket. It requires no routine maintenance or recalibration.

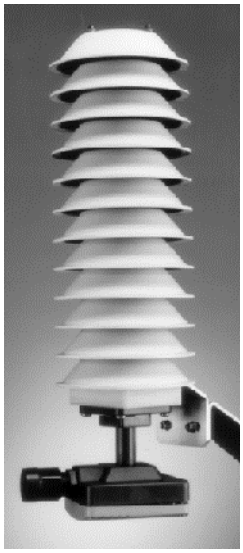

Figure 1: Outdoor Relative Humidity Transmitter

Features and Benefits	
❑ **0 to 100% RH Measurement**	Offers a full range of accurate RH measurement
❑ **Rugged Shield Construction with Multiple-plate Design**	Protects sensors from solar radiation and precipitation without affecting performance while multiple plates allow for maximum airflow to generate precise measurements
❑ **No Routine Maintenance or Calibration**	Saves on cost
❑ **Two-wire Current Loop or Voltage Operation**	Gives a variety of output and power types
❑ **Polymer, Thin-film Sensor with Excellent Long-term Stability**	Omits inaccuracies due to dust, water vapor, harsh environments, and most chemicals
❑ **Negligible Temperature Coefficient**	Generates accurate RH measurements regardless of changes in temperature
❑ **Accurate RH Measurement**	Saves on building energy costs

Product Overview

The outdoor RH transmitters incorporate an advanced-capacitive, thin-film humidity sensor designed for demanding humidity measurement applications where high accuracy is important. The thin polymer film either absorbs or releases water vapor as the relative humidity of the ambient air rises or drops. The dielectric properties of the polymer film depend on the amount of water contained in it: as the relative humidity changes, the dielectric properties of the film change, so the capacitance of the sensor changes. The electronics of the instrument measure the capacitance of the sensor and convert it into a humidity reading. The repeatability, stability, and performance of the sensors have been proven in many industrial control processes under extremely harsh conditions.

The shield provides a rugged, weatherproof enclosure for the transmitter while maintaining accurate performance. The multiple-plate design allows for maximum airflow for precise measurements. The disc material is especially formulated for high reflectivity, low thermal conductivity, and maximum weather resistance. This enclosure will ensure a long life, even under extreme weather conditions. Additionally, each unit comes with a 3-year warranty.

Why Measure Relative Humidity?

Humidity is an important aspect of any climate control system. The significance of indoor air quality to our health has become evident. Humans are best suited to and feel most comfortable within a fairly narrow range of humidity and temperature, whereas extremes, high or low, cause discomfort.

Accurate outdoor humidity measurement allows the necessary steps to be taken indoors to ensure a quality air environment.

Energy Savings

The right humidity level optimizes energy consumption. In energy management projects with hundreds of setpoints, it is normal to have only one outdoor humidity sensor. If that sensor is not accurate, energy costs may rise, and the building occupants' comfort may suffer. The maintenance-free, accurate, long-lasting performance of these transmitters will keep energy costs low and building comfort levels high. These transmitters are compatible with most energy management systems.

In an economizer application, the enthalpy switchover cycle uses the outdoor RH reading. It chooses whether the mixed air system should be using outdoor air for free cooling, return air by measuring the total heat content, or enthalpy of each air stream. Thus this application maximizes energy efficiency within the system.

Optional Features

Temperature Sensors

Models HE-67P3 and HT-67P3 come with a temperature sensor. Enclosed within the weather shield, these temperature sensors will give accurate outdoor measurements in the worst weather conditions. The sensors measure a wide temperature range from 14 to 140°F (-10 to 60°C) with a ±0.55°F (±0.3°C) accuracy at 77°F (25°C). They accurately convert the temperature reading to a corresponding 4 to 20 mA output or 0 to 10 VDC output.

Repair and Replacement

To order a replacement, refer to the *Ordering Information* section.

Ordering Information

Contact the nearest Johnson Controls representative to order a RH transmitter, and specify the desired product code number from Table 1.

Table 1: Selection Chart

Product Code Number	Description
HE-6703-0N0GO	Outdoor RH Transmitter 0 to 10 VDC Output
HT-6703-0N0GO	Outdoor RH Transmitter, 4 to 20 mA (DC) Output
HE-67P3-0N0GO	Outdoor RH and Temperature Transmitters, 0 to 10 VDC Outputs
HT-67P3-0N0GO	Outdoor RH and Temperature Transmitters, 4 to 20 mA (DC) Outputs

Technical Data

Product		HE-6703, HT-6703, HE-67P3, and HT-67P3 Outdoor Humidity Transmitters
Relative Humidity	**Analog Output**	HE-67x3: 0 to 10 VDC and 0 to 1 VDC for 0 to 100% RH HT-67x3: 4 to 20 mA (DC) for 0 to 100% RH
	Measuring Range	10 to 90% RH
	Accuracy at 68°F (20°C)	±3% RH
	Temperature Dependance	<±1.5% RH from 14 to 140°F (-10 to 60°C)
	Operating Temperature Range	-4 to 140°F (-20 to 60°C)
	Output Resolution	0.1% RH
Temperature (for HE-67P3 and HT-67P3 models only)	**Sensor Type**	Platinum 1000, IEC751, Class B
	Analog Output	HE-67P3: 0 to 10 VDC for -40 to 140°F (-40 to 60°C) HT-67P3: 4 to 20 mA (DC) for -40 to 140°F (-40 to 60°C)
	Measuring Range	14 to 140°F (-10 to 60°C)
	Operating Temperature Range	-40 to 140°F (-40 to 60°C)
	Accuracy at 77°F (25°C)	±0.55°F (±0.3°C)
	Linearity	Better than 0.1°C
	Temperature Dependance	0.01°C/°C
	Output Resolution	0.1°C
General	**Stability**	±2% RH over 2 years
	Storage Temperature Range	-40 to 140°F (-40 to 60°C)
	Humidity Range	0 to 100% RH (Non-condensing)
	Power Requirements	HE-67x3: 20 to 30 VAC, or 18 to 30 VDC, Class 2 HT-67x3: 18 to 28 VDC, Class 2
	Current Consumption	HE-67x3: 10 mA with DC Supply and 23 mA with AC Supply HT-67x3: 27 mA (DC) Maximum Per Output
	Maximum Output	HE-67x3: 13 VDC HT-67x3: 27 mA (DC) per Output
	Load Resistance	HE-67x3: >20 k ohms HT-67x3: 50 ohms + [(Power Supply Voltage – 8)/0.02]
	Warm-up Time	Instantaneous
	Housing Material	ABS plastic
	Housing Classification	IP65 NEMA 4 Housing
	Shipping Weight	4.2 lb (1.9 kg)

The performance specifications are nominal and conform to acceptable industry standards. For application at conditions beyond these specifications, consult the local Johnson Controls office. Johnson Controls, Inc. shall not be liable for damages resulting from misapplication or misuse of its products.

JOHNSON CONTROLS

Controls Group
507 E. Michigan Street
P.O. Box 423
Milwaukee, WI 53201

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www.johnsoncontrols.com