TrueRH™ Series HE-67xx Humidity Element with Temperature Sensors

Product Bulletin

HE-67xx

The HE-67xx Series Humidity devices house both a humidity and a temperature sensor in a wall or duct mount style. The humidity sensor is capable of measuring Relative Humidity (RH) over the entire range of 0 to 100%, and its All-Polymer™ construction provides improved resistance to chemical corrosion. The TrueRH™ product line delivers devices with RH accuracy of either ±2% or ±3% RH.

TrueRH humidity elements produce voltage output signals proportional to measured humidity for humidity indication. Temperature sensors are available in thin-film nickel, thin-film platinum, and silicon. The Elements are powered with 14 to 30 VDC or 20 to 30 VAC and feature a user-selectable humidity output of 0 to 10 VDC or 0 to 5 VDC.
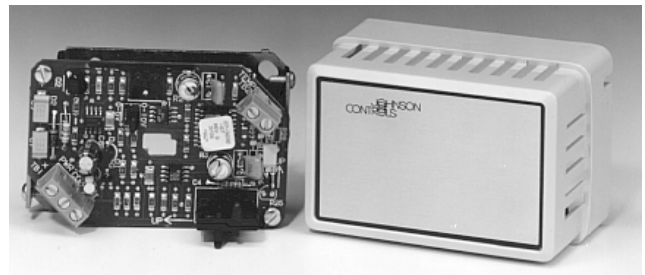
Figure 1: HE-67xx-0N0BT Wall Mount Humidity Element and the HE-67xx-0N00P Duct Probe Humidity Element

Table 1: Features and Benefits

Features	Benefits
TrueRH	Circuitry and calibration techniques for which patent protection is pending
All-Polymer Humidity Sensor	Patented sensing element provides accurate and reliable humidity sensing
National Institute of Standards and Technology (NIST) Traceable Calibration	Tested, verified, and audited per NIST standards
The 2% RH accurate model includes a NIST certificate of conformance	Documents higher precision for 2% models
Humidity and Temperature Sensors in One Unit	Eliminates the need for separate sensors and reduces installation time and cost
User-selectable Output Voltage Range	Allows choice of standard voltage outputs for use with systems in service or new systems
All-Plastic Material for Duct Probe	Improves thermal performance and complies with Underwriters Laboratories Inc.® (UL) flammability ratings for plenum use; complies with Blue Angel (Germany) and TCO'95 (Sweden) environmental regulations

Johnson Controls

Product Overview

> **IMPORTANT:** The HE-67xx Series Humidity Elements with Temperature Sensor are designed for use only as operating controls. Where failure or malfunction of the HE-67xx could lead to an abnormal operating condition that could cause personal injury or damage to the equipment or other property, other devices (limit or safety controls) or systems (alarm or supervisory) intended to warn of, or protect against, failure or malfunction of the HE-67xx must be incorporated into and maintained as part of the control system.

The HE-67xx humidity elements provide independent humidity and temperature signals for use in a wide range of sensing applications, and are suitable for use with most Heating, Ventilating, and Air Conditioning (HVAC) controllers.

The humidity elements are a durable, cost-effective solution for humidity sensing. They are easy to install and factory calibrated to NIST standards. The ±2% models ship with NIST certificates of conformance to validate Johnson Controls use in demanding HVAC applications. The elements can operate in areas with little or no airflow, and recover after loss of power or saturation.

The patented All Polymer humidity element is capable of sensing over the entire range of 0 to 100% RH; its construction provides resistance to corrosion in typical HVAC environments. The temperature sensor is isolated from and operates independently of the humidity sensor.

The elements are available with three types of temperature sensors:

* thin-film nickel sensor that provides 1000 ohms of resistance at 70°F (21°C).

* silicon sensor that provides 1035 ohms of resistance at 77°F (25°C).

* thin-film platinum sensor that provides 1000 ohms of resistance at 32°F (0°C).

The temperature and humidity information from the elements can be used to calculate enthalpy, important in determining an energy-efficient and cost-effective strategy.

Space and duct humidity are also important factors in overall indoor air quality. The elements allow monitoring and comparing of humidity levels with those recommended in ASHRAE Standard 62-1999.
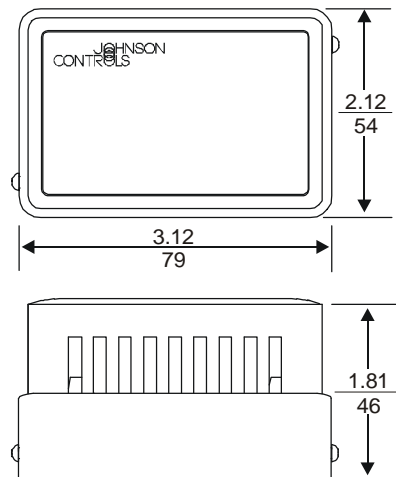
See Figure 3 for the resistance versus temperature relationship for a nickel, silicon, or platinum temperature sensor.
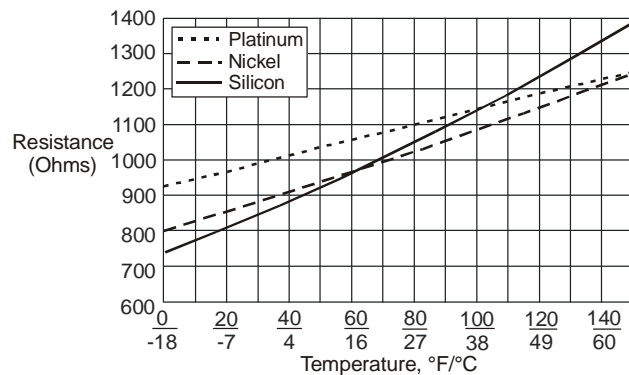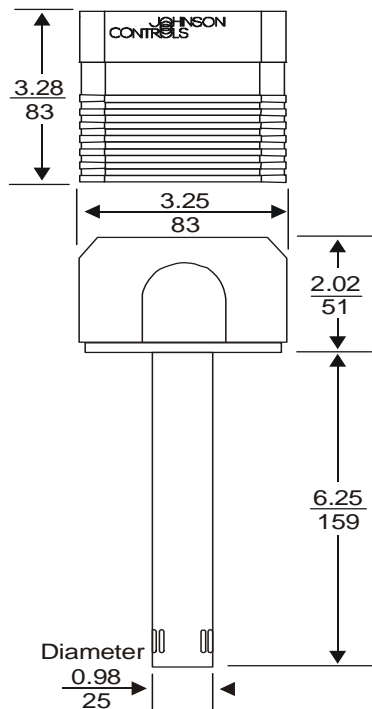

Figure 2: Resistance Versus Temperature

Dimensions

See Figure 4 or 5 for humidity element dimensions.

Figure 3: Wall Mount Humidity Element Dimensions, in. (mm)

Figure 4: Duct Probe Humidity Element Dimensions, in. (mm)

Repair Information

The wall mount and duct probe humidity elements are not field repairable. Refer to the Ordering Information section to order a replacement.

Ordering Information

Contact the nearest Johnson Controls representative to order a humidity element, and specify the desired product code number from Table 1. Refer to Table 2 for accessories available for the wall mount humidity elements. (There are none for the duct probe models.)

Table 2: Humidity Elements

Product Code Number	Description	RH Accuracy	
		2%	3%
HE-67P2-0N0BT	Wall mount humidity element with thin-film platinum temperature sensor	X	
HE-67S2-0N0BT	Wall mount humidity element with silicon temperature sensor	X	
HE-67N2-0N0BT	Wall mount humidity element with thin-film nickel temperature sensor	X	
HE-67P2-0N00P	Duct probe humidity element with thin-film platinum temperature sensor	X	
HE-67S2-0N00P	Duct probe humidity element with silicon temperature sensor	X	
HE-67N2-0N00P	Duct probe humidity element with thin-film nickel temperature sensor	X	
HE-67P3-0N0BT	Wall mount humidity element with thin-film platinum temperature sensor		X
HE-67S3-0N0BT	Wall mount humidity element with silicon temperature sensor		X
HE-67N3-0N0BT	Wall mount humidity element with thin-film nickel temperature sensor		X
HE-67P3-0N00P	Duct probe humidity element with thin-film platinum temperature sensor		X
HE-67S3-0N00P	Duct probe humidity element with silicon temperature sensor		X
HE-67N3-0N00P	Duct probe humidity element with thin-film nickel temperature sensor		X

Table 3: Accessories for the Wall Mount Humidity Elements

Product Code Number	Description
GRD10A	plastic Guard with Baseplate and Mounting Ring
T-4000-119	Allen-head ADjustment Tool (30/bag)
TE-1800-9600	Wall Plate Adaptor Kit required for wallbox mounting

Technical Specifications

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Product		TrueRH Series HE-67xx Humidity Element with Temperature Sensor
Power Requirements		14 to 30 VDC or 20 to 30 VAC at 50/60 Hz, Class 2
Current Draw		3 mA with no load, 25 mA maximum
Acceptable Wire Gauge		16 to 24 AWG (18 AWG recommended)
Humidity Element at 77°F (25°C)	Signal:	0 to 5 VDC or 0 to 10 VDC, 1,000 ohm maximum load

	Accuracy:	**HE-67x2**: ±2% RH for 20 to 80% RH at 77°F (25°C)
		                 ±4% RH for 10 to 20% and 80 to 90% RH at 77°F (25°C)
		HE-67x3: ±3% RH for 20 to 80% RH at 77°F (25°C)
		                 ±5% RH for 10 to 20% and 80 to 90% RH at 77°F (25°C)

	Temperature Coefficient:	0.1 to 0.05% RH/°C at 5°C (41°F) to -0.07 to -0.21% RH/°C at 65°C (149°F)
Temperature Sensors	Thin-film Nickel:	Accuracy: ±0.34°F (0.18°C) at 70°F (21°C) Reference Resistance: 1000 ohms at 70°F (21°C) Resistance Change: Approximately 3 ohms/°F (5 ohms/°C)
	Silicon:	Accuracy: ±1°F (0.6°C) at 70°F (21°C) Reference Resistance: 1035 ohms at 77°F (25°C) Resistance Change: Approximately 4 ohms/°F (8 ohms/°C)
	Thin-film Platinum	Accuracy: ±0.65°F at 70°F (±0.36°C at 21°C) Reference Resistance: 1000 ohms at 32°F (0°C) Resistance Change: Approximately 2 ohms/°F (4 ohms/°C)
Electrical Connections		3-position and 2-position screw terminal blocks
Ambient Operating Conditions		32 to 140°F (0 to 60°C) 0 to 100% RH, 85°F (29.4°C) maximum dew point
Survival Operating Conditions		-20 to 140°F (-29 to 60°C) 0 to 100% RH, 85°F (29.4°C) maximum dew point
Ambient Storage Conditions		-40 to 140°F (-40 to 60°C) 0 to 100% RH, 85°F (29.4°C) maximum dew point
Materials	Wall Mount:	Beige plastic cover with metal base and metal foil face plates
	Duct Probe:	Blue plastic cover, housing, and probe
Dimensions	Wall Mount (H x W x D)	1.81 x 2.12 x 3.12 in. (46 x 54 x 79 mm)
	Duct Probe (H x W x D)	3.28 x 3.25 x 8.27 in. (83 x 83 x 210 mm)
	Probe (L X D)	6.25 x 0.98 in. (159 x 25 mm)
Shipping Weight		0.6 lb (0.3 kg)
Compliance	Duct Probe Material	94-5V flammability rated per UL 94
	United States	UL Listed, File E107041, CCN PAZX, Under UL 916, Energy Management Equipment
	Canada	UL LIsted, File E107041, CCN PAZX7, Under CAN/CAS C22.2 No. 205, Signal Equipment
	Europe	CE Mark, EMC Directive 2004/108/EC
	Australia and New Zealand	C-Tick Mark, Australia/NZ Emissions Compliant

The performance specifications are nominal and conform to acceptable industry standard. 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.

North American Emissions Compliance

United States Emissions Compliance

Compliance Statement (Part 15.19)

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

1. This device may not cause harmful interference, and

2. This device must accept any interference received, including interference that may cause undesired operation.

Warning (Part 15.21)

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Canadian Emissions Compliance

Industry Canada Statement

The term **IC** *before the certification/registration number only signifies that the Industry Canada technical specifications were met.*

Le terme « IC » précédant le numéro d'accréditation/inscription signifie simplement que le produit est conforme aux spécifications techniques d'Industry Canada.