Humidity/measuring sensor
Moisture sensor

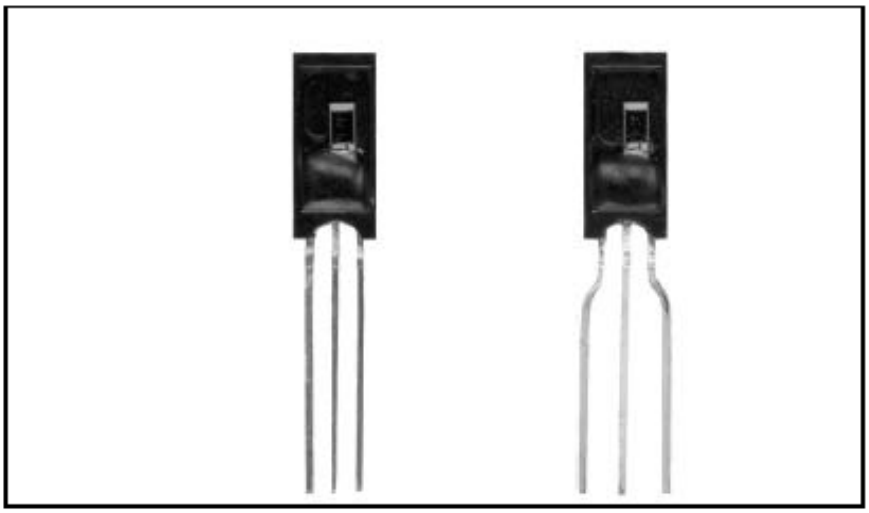
HIH-4000 series

characteristic

- Thermoplastic plastic shell
- Linear voltage output relative to RH% (relative humidity) value
- Laser adjustment interchangeability
- Low power design
- high-accuracy
- Quick response time
- Stable, drift small
- Chemical resistance

Typical applications

- refrigeration plant
- Heating, ventilation and air conditioning equipment
- medical equipment
- drier
- measuring equipment
- Battery power supply system
- Original equipment manufacturer (OEM) assembly



The HIH-4000 series humidity sensors are specifically engineered for mass-produced OEM (Original Equipment Manufacturer) applications. Their linear voltage output enables direct connection to controllers or other devices, requiring only a 200 μA current draw – making them ideal for low-voltage, battery-powered systems. The sensors' high interchangeability reduces or eliminates OEM calibration costs, as single sensor calibration data can be provided.

The HIH-4000 series humidity sensors deliver reliable relative humidity (RH) measurement through a cost-effective, solderable single-in-line package (SIP). These sensors are designed for two-wire configurations with spacing requirements, featuring a thermosetting plastic capacitive sensing element with built-in signal processing capabilities. The multi-layered structure of the sensing element provides exceptional resistance to environmental factors including moisture, dust, contaminants, oils, and common chemicals found in industrial settings.

Table **1**: Performance Specifications

At 5.0 VDC supply voltage and 25°C, unless otherwise specified, RH% performance specifications include test system measurement errors (typically ±0.5%)

parameter	least value	representative value	crest value	unit
Interchangeability (best fit line)				
0 to 60%RH	-5		5	%RH
60% to 100%	-8		8	%RH
Interchangeability (second order curve)		±3.5		%RH
* Accuracy (best fit straight line)		±3.5		%RH
** Precision voltage output (second order curve)		±2.5		%RH
hysteresis quality		3		%RH
repeatability precision		±0.5		%RH
setting time			70	mS
Response time l/e refers to slow flowing air		15		Sec
*** Stability (under conditions of 50%RH for one year)		±1.2		%RH
**** Stability (under 50%RH conditions)				%RH
Power supply requirements		TBD		
service voltage	4		5.8	VDC
supply current			500	μA
Voltage output (first-order combination)	$V_{output} = V_{supply}$ (0.0062(sensor RH) + 0.16)			
Voltage output (two-stage curve fit)	Output of V = 0.00003 (sensor RH) ^{2} + 0.0281 (sensor RH) + 0.820, typical data at 25°C			
temperature compensation	V_{output} = (0.0305+0.000044T-0.0000011T ^{2}) (sensor RH) + (0.9237-0.0041T+0.000040T ^{2}) T= temperature unit is °C			
working temperature	-40	See Figure 1	85	°C
	-40		185	°F
Humidity at work	0	See Figure 1	100	%RH
storage temperature	-40		125	°C
	-40		257	°F
Storage humidity	See Figure 2			%RH

* For HIH-400-003 and-004 only.

** For HIH-400-003 and-004 only (not available at the time of information release, please contact your Honeywell sales representative).

*** Specifications include test data outside the recommended work area.

**** Specifications are only for the recommended work area.

remarks：

1. Sensors should not be exposed to condensation.
2. Exposure to liquid water will cause the sensor output to indicate 0%RH.
3. Sensors are light sensitive equipment. To achieve optimal performance, the sensor should be shielded from strong light.
4. Exposure to>90%RH can cause a reversible drift of 3%RH.
5. The sensor is protected from static electricity. The maximum voltage is 15kV.
6. The sensor output is proportional to the supply voltage.

Figure **1**: Recommended Working Conditions

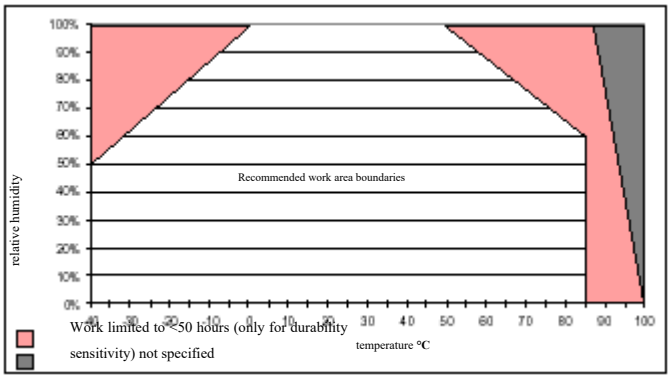
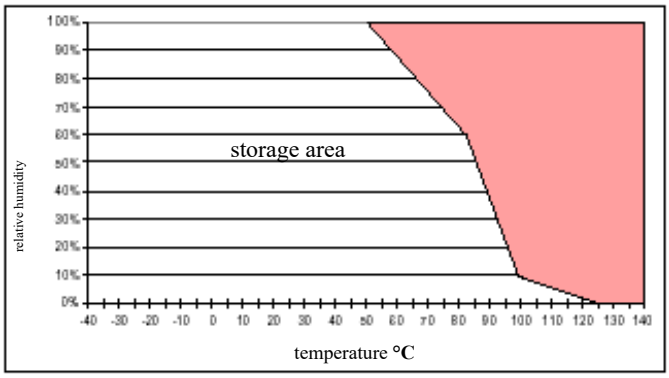


Figure **2**: Storage Environment



Factory calibration data HIH-4000 series sensors can be ordered with a printout of calibration and data (Table 2). See the order instructions below.

Table **2**: List of Data Printouts

model	**HIH-4000-001**
channel	92
wafer	030996M
MRP	337313
The calculated value at 5V $V_{OUT(output)}$, 0% RH $V_{OUT(output)}$, %75.3 RH	 0.958 V 3.268 V
Linear output accuracy at 2% RH at 25°C zero offset gradient RH	 0.958 V 30.680 mV%RH (V_{output} -zero offset)/ (slope)(V_{output} - 0.958)/ 0.0307
The proportional response of V to the percentage of RH between 0 and 100 %	$V_{power\ supply}$ (0.1915–0.8130)

Figure **3**: Typical Best-Fit Straight Line

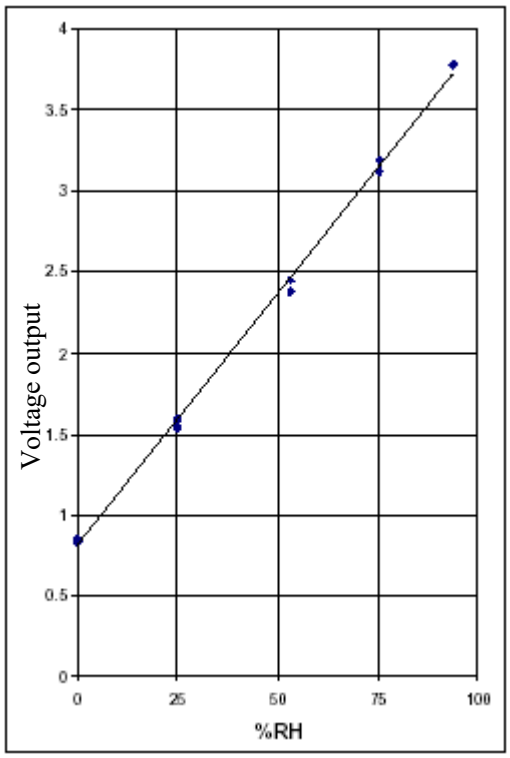
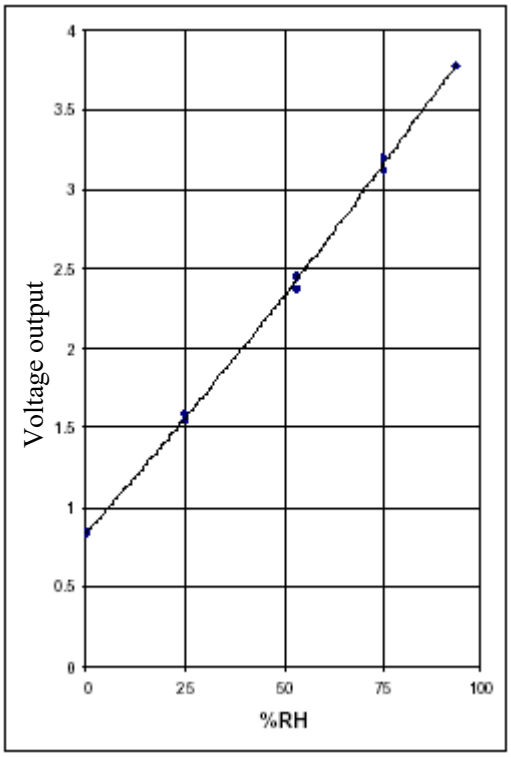


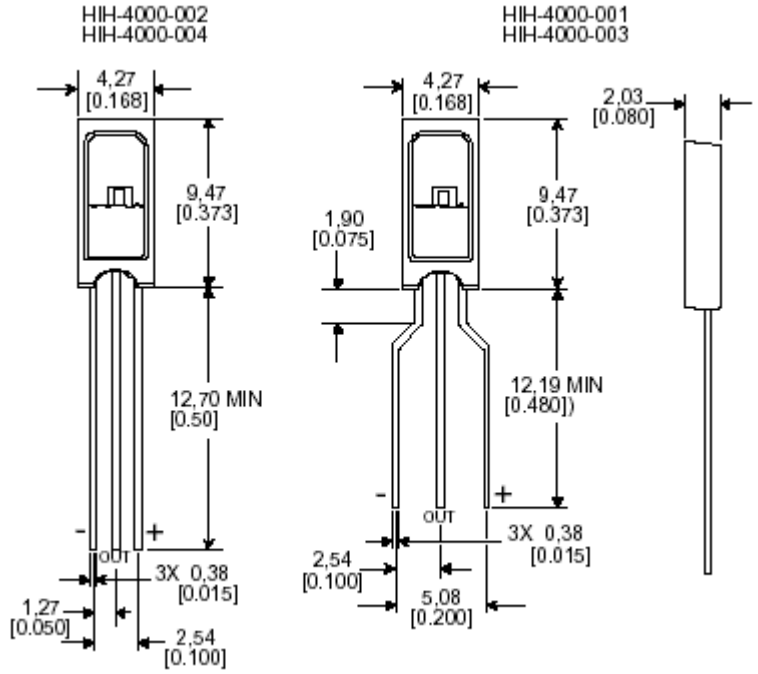
Figure **4**: Typical Second-Order Curve Fit



ordering instruction

Product catalog number	explain
HIH-4000-001	Integrated circuit humidity sensor, single through-hole component (SIP) with 0.100" lead spacing
HIH-4000-002	Integrated circuit humidity sensor, single through-hole component (SIP) with 0.050" lead spacing
HIH-4000-003	Includes a calibrated and data printed integrated circuit humidity sensor, a single plug-in component (SIP) with 0.100" lead spacing
HIH-4000-004	Includes a calibrated and data printed integrated circuit humidity sensor, a single plug-in component (SIP) with 0.050" lead spacing

Figure **5**: Installation Dimensions Are for Reference Only. Unit: **Mm (in)**



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