



# **PRODUCT TRAINING MODULE**

## **HIH-5030 and HIH-5031 Series Humidity Sensors**

*March 2010*

**Honeywell**

## Summary Of What You'll Learn

- **Product Overview**
- **Value to Design Engineers**
- **Features and Benefits**
- **Key Specifications**
- **Potential Applications**
- **Summary**
- **Resources**



## Product Overview

- The HIH-5030/5031 Series Humidity Sensors are surface mount devices (SMD) designed specifically for high volume OEMs (Original Equipment Manufacturers)
- They are Complementary Metal Oxide Semiconductor (CMOS)-based humidity sensors that use capacitive technology to provide an analog voltage output in a solderable SMD package
- They are available in two package styles:

HIH-5030



Covered integrated circuit  
humidity sensor

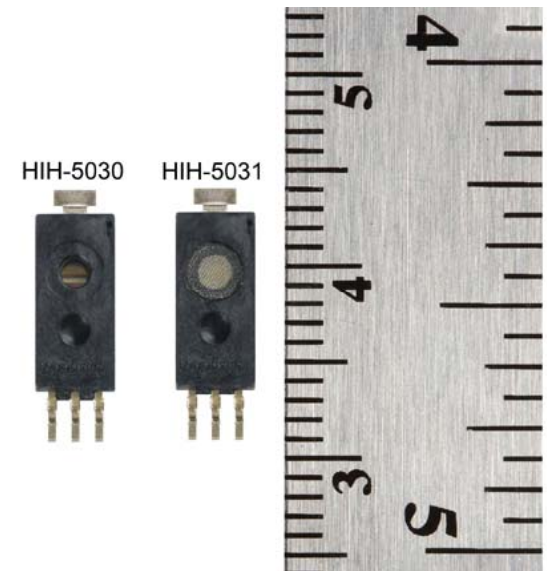
HIH-5031



Covered, condensation-resistant, integrated  
circuit humidity sensor that is factory-fitted  
with a hydrophobic filter allowing for use in  
condensing environments

## Value to Design Engineers

- **Support demanding system performance requirements**
  - Enhanced stability, accuracy, and response time over the entire humidity range of 0~100% RH support demanding system performance requirements
    - Stability is  $\pm 1.2$  typical % RH <sup>1</sup>
- **Tight humidity control**
  - Tight system control of humidity, even in many condensing environments, enhances accuracy and response time
    - Total accuracy including interchangeability is  $\pm 3$  % RH <sup>2</sup>
    - Response time is 5 s 1/e in slow moving air
- **Flexible**
  - Small housing profile eases fit in space-restricted applications
  - Sensors' low supply voltage and low current draw allow for use in low-current-drain, battery-operated systems
    - Operate down to 2.7 V, often ideal where the supply voltage is a nominal 3 V <sup>3</sup>



<sup>1</sup> At 50% RH in 5 years; includes stress outside of recommended operating zone

<sup>2</sup> 11 % RH to 89 % RH

<sup>3</sup> Device tested at 3.3 Vdc at 25 °C [77 °F]

## Value to Design Engineers

- **Cost effective**
  - SMD packaging on tape and reel (1,000 per reel) allows for use in automated, high-volume, lower-cost pick-and-place manufacturing
  - Eliminates lead misalignment to printed circuit board through-holes
- **Durable**
  - Sensing element's multilayer construction provides excellent resistance to many application hazards such as condensation, dust, dirt, oils and common environmental chemicals
- **High performance**
  - Direct input to a controller or other device is made possible by the sensor's near linear voltage output that provides instrumentation-quality performance



## Features and Benefits

- **Features and benefits**  
(in addition to those listed in Value to Design Engineers)
  - **Cost effective**
    - Tight sensor interchangeability reduces or eliminates OEM production calibration costs
  - **Accurate, durable**
    - Laser trimming offers a high degree of sensor interchangeability and accuracy
    - Multi-layer thermoset polymer capacitive sensing element with on-chip integrated signal conditioning enhances durability
  - **Durable**
    - Molded thermoset plastic housing enhances durability in many harsh environments



# Key Specifications

Parameter	Specification
Package Type	Surface Mount
Operating Temperature	-40 °C to 85 °C [-40 °F to 185 °F]
Operating Humidity Range	0 % RH to 100 % RH
Interchangeability (first order curve) 0% RH to 10T RH, 90% RH to 100% RH 11% RH to 89% RH	± 7% RH ± 3% RH
Accuracy (best fit straight line) 11% RH to 89 % RH	± 3% %RH
Hysteresis	2 % RH
Response Time	5 s 1/e in slow moving air
Repeatability	±0.5 % RH
Settling Time	70 ms max.
Supply Voltage	2.7 min Vdc, 5.5 Vdc max
Supply Current	200 µA typical, 500 µA
Stability at 50% RH	±1.2 % RH
Output Signal	Analog voltage
Covered Device	Yes
Moisture/Dust Filter	Yes (HIH-5031)
Combined Humidity/Temperature Sensor	No
Calibration and Data Printout	No

## Potential Medical Applications

- Hospital air compressors
- Infant incubators
- Microenvironments
- Sleep apnea equipment
- Treadmill stress monitoring equipment



Photo source: Wikipedia





## Potential Industrial Applications

- Air compressors
- Battery-powered systems
- Drying equipment
- HVAC: air conditioning/movement, thermostats, humidistats, humidifiers/dehumidifiers, enthalpy sensing
- OEM assemblies
- Office automation and process equipment
- Refrigeration (bulk and transport systems)
- Telecommunications cabinets
- Weather stations and meteorology equipment



## Important Things to Remember

### HIH-5030/5031 Series Humidity Sensors

1. Their enhanced **accuracy** supports many demanding system performance requirements.
2. Their small size and low current drain increase application **flexibility**.
3. Their SMD packaging on tape and reel and excellent interchangeability **help reduce production costs**.
4. Their multi-layer construction and hydrophobic filters enhance **durability**.
5. Their linear output provides instrumentation-quality **performance**.

**Accurate. Flexible. Cost-effective. Durable. High performance.**



# Resources

**Honeywell**

## Summary of Resources

- **Value to Design Engineers – Summary**
  - Industrial applications
  - Medical applications
- **Product Training**
- **Product Samples**
- **Online Resources**
- **Customer Service**



## HH-5030/31 Series' Value to Design Engineers: Industrial

For (customer):	<b>SEGMENT:</b> Industrial
	<b>POTENTIAL APPLICATIONS:</b> HVAC equipment (e.g., air conditioning, air movement, thermostats, humidifiers/dehumidifiers, humidistats, enthalpy sensing, refrigeration systems (e.g., bulk and transport); air compressors, telecommunications cabinets, weather stations and meteorology equipment, office automation and industrial process equipment
... that need	tight system control of humidity
... Honeywell's	<b>Humidity Sensors</b> HH-5030 Series, HH-5031 Series

### CUSTOMER BENEFITS

- Prolongs maximum system life
- Provides enhanced accuracy/response time
- Allows for application flexibility
- Allows for use in low-current-drain, battery-operated systems
- Allows for use in automated, high-volume, lower-cost pick-and-place manufacturing
- Provides resistance to condensation and contaminants
- Provides instrumentation-quality performance

Reliable

Accurate

Flexible

Cost-effective

Durable

High performance

### HOW HONEYWELL DELIVERS

- Reliable, stable output over many demanding environmental conditions
- Tight system control of humidity, even in many condensing environments
- Small housing profile
- Low current draw
- Surface mount device (SMD) packaging on tape and reel
- Multi-layer construction and a hydrophobic filter
- Near linear output

## HIH-5030/31 Series' Value to Design Engineers: Medical

For (customer): **SEGMENT:** Medical

**POTENTIAL APPLICATIONS:** Sleep apnea machines, treadmill stress monitoring machines, infant incubators, microenvironments, and hospital air compressors

... that need the delivery of a specified level of humidified air with an accurate dew-point and absolute humidity/moisture measurement, improving patient comfort

... Honeywell's **Humidity Sensors** HIH-5030 Series, HIH-5031 Series

### CUSTOMER BENEFITS

- Supports demanding system performance requirements, even in many condensing environments
- Allows for application flexibility
- Allows for use in low-current-drain, battery-operated systems
- Allows for use in automated, high-volume, lower-cost pick-and-place manufacturing
- Provides enhanced resistance to condensation and contaminants
- Provides instrumentation-quality performance

Accurate

Flexible

Cost-effective

Durable

High performance

### HOW HONEYWELL DELIVERS

- Enhanced stability, accuracy, and response time over the entire humidity range of 0~100% RH
- Small, space-saving housing profile
- Low current draw
- Surface mount device (SMD) packaging on tape and reel
- Multi-layer construction and a hydrophobic filter
- Near linear output

## Training

- **Training is available from Honeywell's product management team**

- Valerie Rothermel-Nelson, Sr. Product Manager, +1 815-266-3143, [valerie.rothermel@honeywell.com](mailto:valerie.rothermel@honeywell.com)
- Denise Sorn, Product Specialist, +1 815-235-6453, [denise.sorn@honeywell.com](mailto:denise.sorn@honeywell.com)
- John Fontes, Applications Engineer for North America, +1 401-762-6879, [john.fontes@honeywell.com](mailto:john.fontes@honeywell.com)
- Alex Geddes, Applications Engineer for Europe, +44 (1698) 481434, [alex.geddes@honeywell.com](mailto:alex.geddes@honeywell.com)
- David Rong, Applications Engineer for Asia-Pacific, +86 755 3332 0006, [david.rong@honeywell.com](mailto:david.rong@honeywell.com)



**Contact our product experts.**



## Product Samples

- **Sample packs are available**
  - HIH-5030-001S:
    - Covered integrated circuit humidity sensor, SMD, five units on tape
  - HIH-5031-001S:
    - Covered, filtered integrated circuit humidity sensor, SMD, five units on tape
- **Contact an Authorized Honeywell Distributor or Sales Representative**
  - Visit the [Sensing and Control](http://Sensing and Control) website to locate an Authorized Distributor or Sales Rep in your area

### Honeywell Sensing and Control

> Home > Global Sales & Service

#### Global Sales & Service

Use the Global Locator Map to find Sensing and Control sales offices, affiliates, distributors, or customer service departments around the world.  
If you have any problems with this locator service or have a comment on this Global Locator Map or on any of the contacts it provides click here to contact us.

Back

#### SELECT LOCATION

Texas  
Distributor  
Sales Rep  
Offices

For Test and Measurement products, click here

**Samples are available now.**



## Online Resources

- Honeywell has developed many resources to help educate you about the **HIH-5030/5031 Series Humidity Sensors**
  - [Webpage with Rollovers](#)
  - [Product Webpage](#)
  - [Humidity Sensors in Medical Applications Brochure](#)
  - [Thermal Sensors Product Range Guide](#)
  - [Humidity Sensors Line Guide](#)
  - [Product Data Sheet](#)
  - [Additional Documentation](#)



Webpage with Rollovers

## About Honeywell Sensing and Control Products

- **For more information about Honeywell Sensing and Control products:**
  - Visit [www.honeywell.com/sensing](http://www.honeywell.com/sensing)
  - Call our Customer Service team at +1-815-235-6847 or +1 800-537-6945
  - Email inquiries to [info.sc@honeywell.com](mailto:info.sc@honeywell.com)





# **Warranties, Remedies, and Warnings**

**Honeywell**

## Warnings and Remedies

### **WARNING**

#### **PERSONAL INJURY**

DO NOT USE these products as safety or emergency stop devices or in any other application where failure of the product could result in personal injury.

**Failure to comply with these instructions could result in death or serious injury.**

#### **WARRANTY/REMEDY**

Honeywell warrants goods of its manufacture as being free of defective materials and faulty workmanship. Honeywell's standard product warranty applies unless agreed to otherwise by Honeywell in writing; please refer to your order acknowledgement or consult your local sales office for specific warranty details. If warranted goods are returned to Honeywell during the period of coverage, Honeywell will repair or replace, at its option, without charge those items it finds defective. **The foregoing is buyer's sole remedy and is in lieu of all other warranties, expressed or implied, including those of merchantability and fitness for a particular purpose. In no event shall Honeywell be liable for consequential, special, or indirect damages.**

While we provide application assistance personally, through our literature and the Honeywell web site, it is up to the customer to determine the suitability of the product in the application.

Specifications may change without notice. The information we supply is believed to be accurate and reliable as of this printing. However, we assume no responsibility for its use.

### **WARNING**

#### **MISUSE OF DOCUMENTATION**

- The information presented in this document is for reference only. Do not use this document as a product installation guide.
- Complete installation, operation, and maintenance information is provided in the instructions supplied with each product.

**Failure to comply with these instructions could result in death or serious injury.**