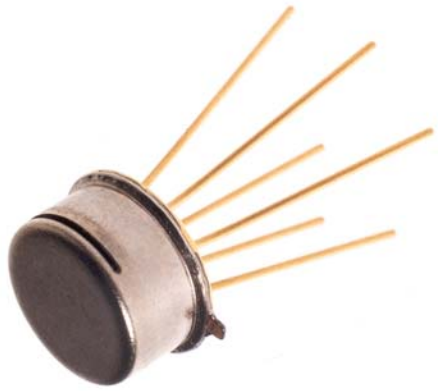
Honeywell

HIH-4602-L Series

Humidity Sensors



DESCRIPTION

HIH-4602-L Series Relative Humidity (RH) sensors are designed to deliver RH sensing in a rugged, low-cost slotted TO-5 can.

The laser-trimmed, thermoset polymer capacitive sensing elements have on-chip integrated signal conditioning, helping to reduce product development times.

A typical current draw of only 200 µA allows use in battery-powered systems.

HIH-4602-L-CP sensors include a calibration and data printout to allow individually matched downstream electronics and ±3.5 %RH total accuracy.

FEATURES

- Near linear voltage output vs %RH
- Laser-trimmed interchangeability
- Enhanced accuracy, fast response
- Chemically resistant
- Stable, low drift performance
- Built-in static protection
- TO-5 can

POTENTIAL APPLICATIONS

- Refrigeration
- Drying
- Meteorology
- Battery-powered systems
- OEM (Original Equipment Manufacturer) assemblies

HIH-4602-L Series

Table 1. Performance Specifications (At 5 Vdc supply and 25 ºC [77 ºF] unless otherwise noted.)

Parameter	Minimum	Typical	Maximum	Unit	Specific Note
Interchangeability (first order curve)	–	–	–	–	–
0% RH to 59% RH	-5	–	5	% RH	–
60% RH to 100% RH	-8	–	8	% RH	–
Accuracy (best fit straight line)	-3.5	–	+3.5	% RH	1
Hysterisis	–	3	–	% RH	–
Repeatability	–	±0.5	–	% RH	–
Settling time	–	–	70	ms	–
Response time (1/e in slow moving air)	–	30	–	s	–
Stability (at 50% RH in one year)	–	1.2	–	% RH	–
Voltage supply	4	–	5.8	Vdc	–
Current supply	–	200	500	µA	–
Output voltage temp. coefficient at 50% RH, 5 V	–	-4	–	mV/°C	–
Voltage output (1st order curve fit)	$V_{OUT} = (V_{SUPPLY})(0.0062(\text{sensor RH}) + 0.16)$, typical at 25 °C				2
Temperature compensation	True RH = (sensor RH)/(1.0546-0.00216T), T in °C				
Operating temperature	-40[-40]	See Figure 1.	85[185]	°C[°F]	–
Operating humidity	0	See Figure 1.	100	% RH	3
Storage temperature	-40[-40]	See Figure 2.	125[257]	°C[°F]	–
Storage humidity	See Figure 2.			% RH	3

Specific Notes:
1. Applies to HIH-4602-L-CP only.
2. Device is calibrated at 5 Vdc and 25 ºC.
3. Non-condensing environment.

General Notes:
- Sensor is ratiometric to supply voltage.
- Extended exposure to ≥90% RH causes a reversible shift of 3% RH.
- Sensor is light sensitive. For best performance, shield sensor from bright light.

Factory Calibration Data
HIH-4602-L-CP Sensors include a calibration and data printout. See Table 2.

Table 2. Example Data Printout

Model	HIH-4602-L-CP
Channel	92
Wafer	030996M
MRP	337313
Calculated values at 5 V V_{OUT} at 0% RH V_{OUT} at 75.3% RH	 0.958 V 3.268 V
Linear output for 3.5% RH accuracy at 25 °C Zero offset Slope RH	 0.958 V 30.680 mV/%RH (V_{OUT} - zero offset)/slope (V_{OUT} - 0.958)/0.0307
Ratiometric response for 0% RH to 100% RH V_{OUT}	 V_{SUPPLY} (0.1915 to 0.8130)

Figure 1. Operating Environment (Non-condensing environment.)

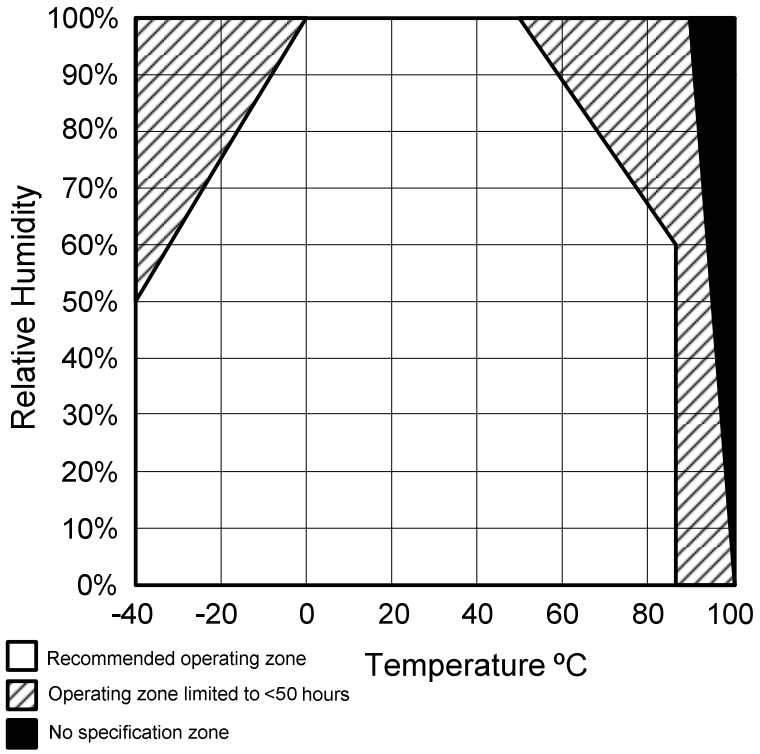
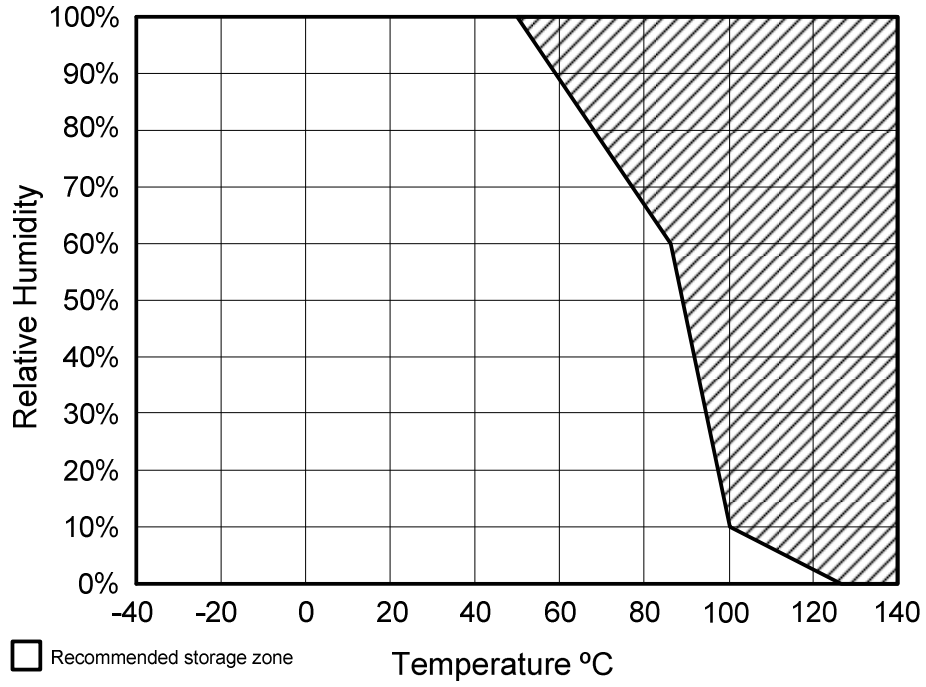


Figure 2. Storage Environment (Non-condensing environment.)



HIH-4602-L Series

Figure 3. Typical Output Voltage vs Relative Humidity (At 5 V and 25 °C.)

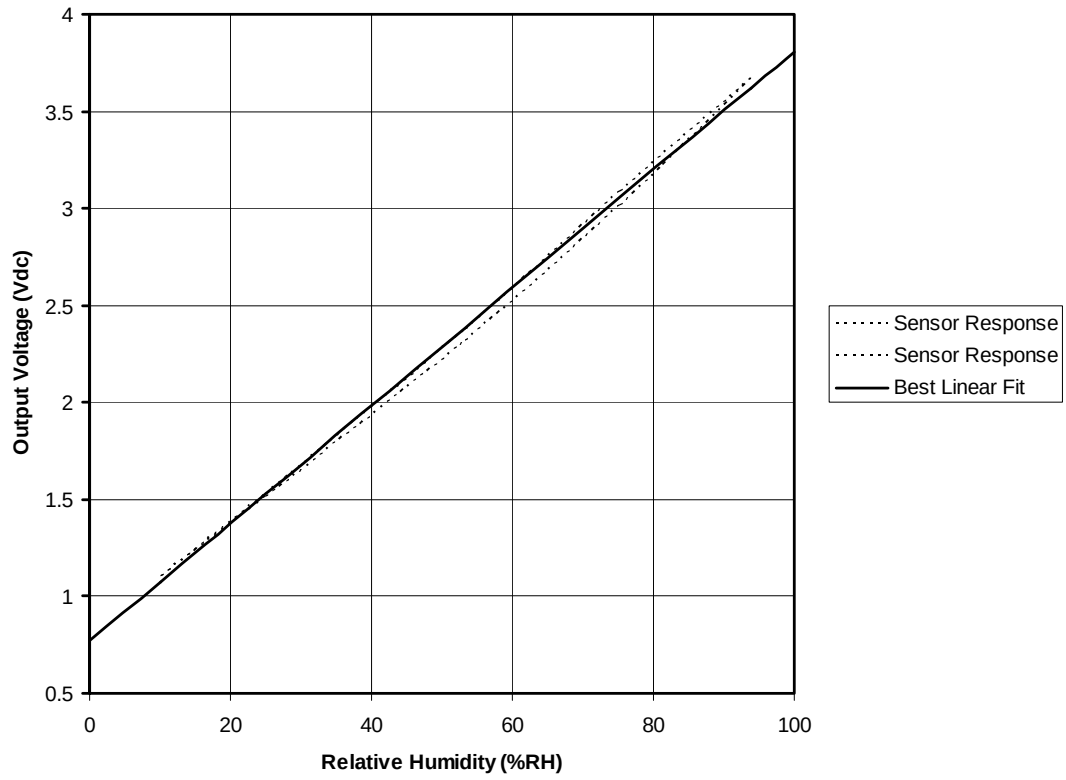


Figure 4. Typical Output Voltage (BFSL) vs Relative Humidity (At 0 ºC, 70 ºC and 5 V.)

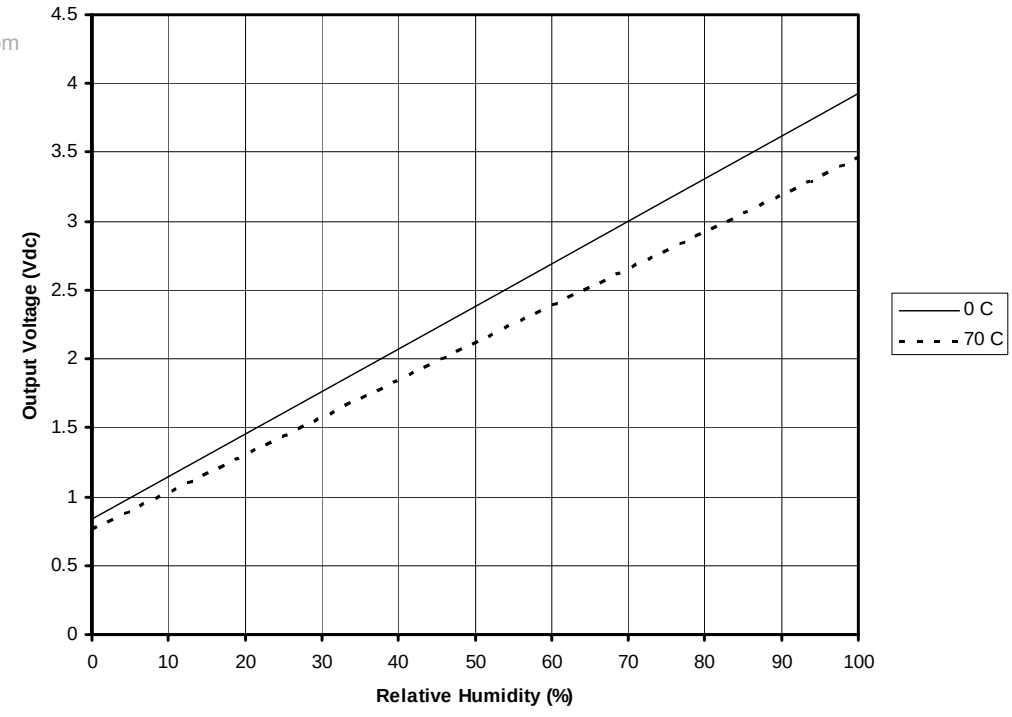
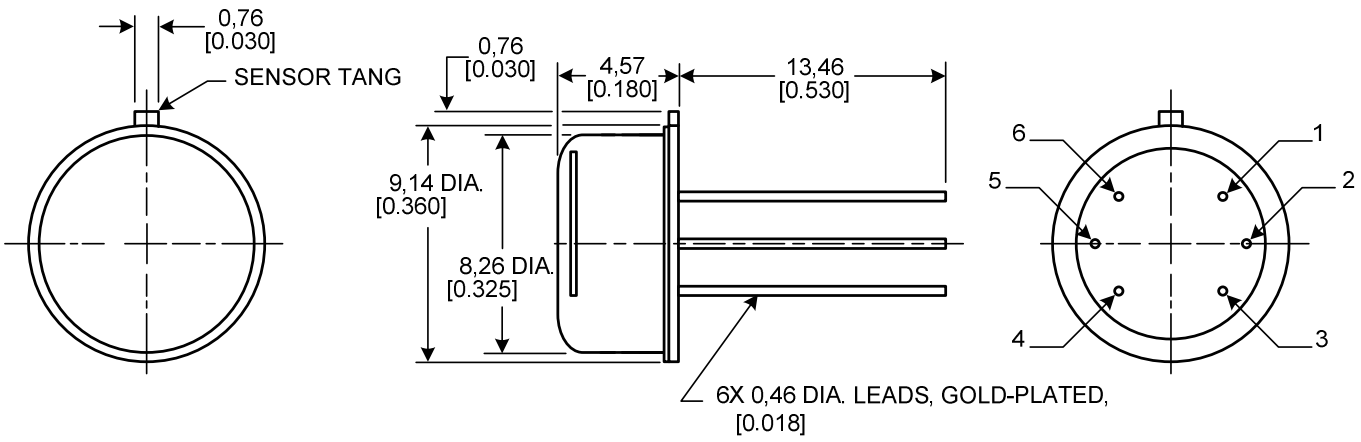


Figure 5. Mounting Dimensions (For reference only. mm/[in])



1. Case ground	4. (+) Vdc supply
2. Vdc out	5. No connection
3. (-) Power or ground	6. No connection

Figure 6. RH Sensor Construction

Sensor construction consists of a planar capacitor with a second polymer layer to protect against most dirt/dust particles, oils and other hazards.

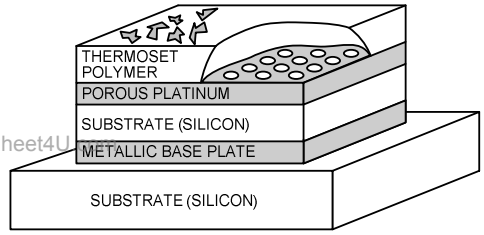
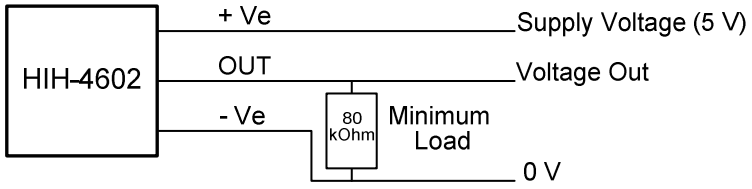


Figure 7. Typical Application Circuit



Order Guide

Catalog Listing	Description
HIH-4602-L	Relative humidity sensor in TO-5 can
HIH-4602-LP	Relative humidity sensor in TO-5 can with calibration and data printout

ADDITIONAL HUMIDITY SENSOR INFORMATION

See the following associated literature at **www.honeywell.com/sensing**:

- Product installation instructions
- Application sheets:
  - Humidity Sensor Performance Characteristics
  - Humidity Sensor Theory and Behavior
  - Humidity Sensor Moisture and Psychrometrics
  - Thermoset Polymer-based Capacitive Sensors

⚠ WARNING

MISUSE OF DOCUMENTATION

- The information presented in this product sheet 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.

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

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.

SALES AND SERVICE

Honeywell serves its customers through a worldwide network of sales offices, representatives and distributors. For application assistance, current specifications, pricing or name of the nearest Authorized Distributor, contact your local sales office or:

E-mail: info.sc@honeywell.com

Internet: www.honeywell.com/sensing

Phone and Fax:

Asia Pacific	+65 6355-2828
	+65 6445-3033 Fax
Europe	+44 (0) 1698 481481
	+44 (0) 1698 481676 Fax
Latin America	+1-305-805-8188
	+1-305-883-8257 Fax
USA/Canada	+1-800-537-6945
	+1-815-235-6847
	+1-815-235-6545 Fax

Automation and Control Solutions
Sensing and Control
Honeywell
1985 Douglas Drive North
Minneapolis, MN 55422
www.honeywell.com/sensing

Honeywell

009043-1-EN IL50 GLO Printed in USA
December 2008