HUMIDITY/ TEMPERATURE SENSORS

Honeywell HumidIcon™
Application Note

> **Honeywell HumidIcon™ Digital Humidity/ Temperature Sensors are digital output-type relative humidity (RH) and temperature sensors combined in the same package.**

SOLUTIONS FOR INDUSTRIAL AND MEDICAL APPLICATIONS

Honeywell HumidIcon™ Digital Humidity/ Temperature sensors are available in the following accuracies:

- ±2.0 %RH (HIH8000 Series)
- ±3.0 %RH (HIH7000 Series)
- ±4.0 %RH (HIH6100 Series)
- ±4.5 %RH (HIH6000 Series)

Honeywell HumidIcon sensors provide:

- Enhanced long-term stability
- True temperature-compensated digital I^{2}C or SPI output
- Enhanced reliability
- Energy efficiency

Potential industrial applications for Honeywell HumidIcon sensors include the following:

HVAC/R

May be used to provide precise RH and temperature measurement in air conditioning/air movement systems, enthalpy sensing, thermostats, humidifiers/dehumidifiers, and humidistats to maintain occupant comfort and ideal storage humidity/ temperature while achieving low energy consumption, supporting system accuracy and warranty requirements, maximizing system uptime, and improving overall system quality.

AIR COMPRESSORS

May be used to provide precise RH measurement in compressed air lines, allowing the system to remove condensation; dry compressed air is critical for customer process control measurement.

WEATHER STATIONS

May be used to provide precise RH and temperature measurement in ground-based and airborne weather stations, allowing real time and highly accurate monitoring/reporting of actual weather conditions.

IT SERVERS/TELECOM CABINETS/DATA CENTERS

May be used to provide precise RH and temperature measurement in the IT server/telecom cabinet HVAC system or data centers; maintaining proper temperature and humidity levels in the cabinet provides maximum system uptime and performance.

INDUSTRIAL INCUBATORS/ MICROENVIRONMENTS

May be used to provide optimal temperature and RH levels to support critical processes and experiments, enhancing process efficiency with desired climate conditions.

GRAIN DRYING SYSTEMS

May be used to help the grain bin storage manager uniformly maintain an optimum level of relative humidity and temperature in the silo.

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Potential medical applications for Honeywell HumidIcon sensors include the following:

RESPIRATORY THERAPY

May be used to provide precise RH and temperature measurement in sleep apnea machines and ventilators, enhancing patient comfort, safety and treatment effectiveness with warm and humidified air.

INCUBATORS/MICROENVIRONMENTS

May be used to provide optimal temperature and RH levels to support critical processes and experiments, enhancing process efficiency with desired climate conditions.

HONEYWELL HUMIDICON™ DIGITAL HUMIDITY/ TEMPERATURE SENSORS

SOIC-8 SMD (with filter)
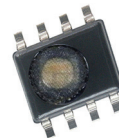
SOIC-8 SMD (without filter)

SIP 4 Pin (with filter)

SIP 4 Pin (without filter)

HIH6100, HIH6000, HIH7000, HIH8000 SERIES FEATURES AND BENEFITS

- **Enhanced long term stability (1.2 %RH over five years):**
  - Minimizes system performance issues
  - Helps support system uptime by eliminating the need to service or replace the sensor during its application life
  - Eliminates the need to regularly recalibrate the sensor in the application, which can be inconvenient and costly

- **Enhanced reliability (MTTF 9,312,507 HR):** Thermoset-polymer capacitive sensing element's multilayer construction provides resistance to most application hazards such as condensation, dust, dirt, oil, and common environmental chemicals, which help provide industry-leading reliability

- **Combined humidity and temperature sensor:** Allows the RH measurement to be temperature compensated, and provides a second, standalone temperature sensor output; allows the user to purchase one sensor instead of two

- **Energy efficient:**
  - Low supply voltage: Can operate down to 2.3 Vdc, which allows use in low energy and wireless-compatible applications to enhance energy savings and prolong system battery life
  - Low power consumption: The sensor goes into sleep mode when not taking a measurement within the application, consuming only 1 A versus 650 A in full operation in a battery operated system; sleep mode helps maximize battery life, reduces power supply size, and reduces the application's overall weight

- **High resolution:** High 14-bit humidity sensor resolution and 14-bit temperature sensor resolution within the application help the user's system detect the smallest relative humidity or temperature change

- **True, temperature-compensated digital I^{2}C or SPI output:** True, temperature-compensated digital I^{2}C or SPI output often prevents problems that could occur from having multiple signal conditioning components across the PCB, as well as simplifies integration to the microprocessor, eliminating the need for customer-implemented, complex signal conditioning

- **Housing style:** SOIC-8 SMD (Surface Mount Device) or SIP 4 Pin; allows for flexibility of use within the application; industry standard design simplifies design-in

- **Filter:** Available with hydrophobic filter and condensation-resistance, allowing for use in many condensing environments, or without hydrophobic filter, non-condensing

- **Tape and reel:** Allows for use in high volume, automated pick-and-place manufacturing, eliminating lead misalignment to the PCB and helping the customer to reduce manufacturing costs

- **Wide operating temperature range:** Allows for use in many applications

- **Optional one or two %RH level alarm outputs:** Provides the ability to monitor whether the RH level has exceeded or fallen below pre-determined and critical levels within the application

- **Multi-function ASIC:** Delivers flexibility within the application by lowering or eliminating the risk and cost of OEM calibration

- RoHS and WEEE compliant, halogen-free

WARRANTY/REMEDY

Honeywell warrants goods of its manufacture as being free of defective materials and faulty workmanship during the applicable warranty period. 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 that Honeywell, in its sole discretion, 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 Honeywell may provide application assistance personally, through our literature and the Honeywell web site, it is buyer's sole responsibility 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 writing. However, Honeywell assumes no responsibility for its use.

For more information
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