

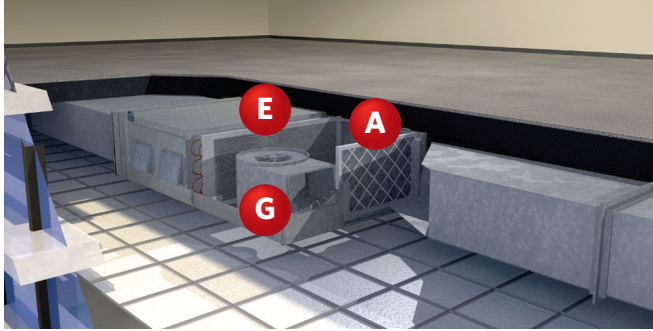
# SOLUTIONS FOR HVAC APPLICATIONS



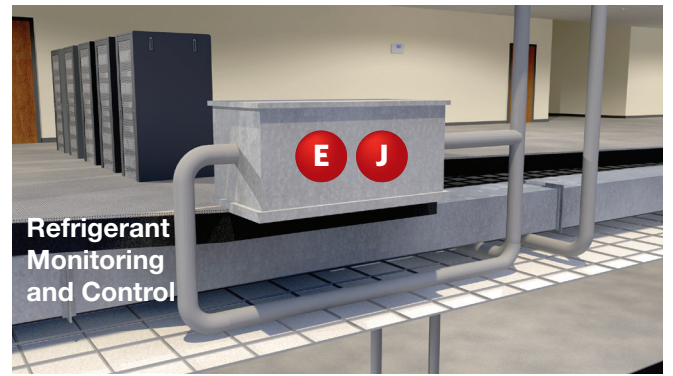
## Work Smarter with Honeywell Switches and Sensors

Due to the high cost of energy, HVAC systems need to be efficient, accurate, and reliable. Honeywell's broad line of sensors and switches covers HVAC control, monitoring, temperature, and more while maintaining energy efficiency and accuracy. Honeywell provides industry-leading products with the latest technology that are easy to install and maintain while providing precise, dependable performance.

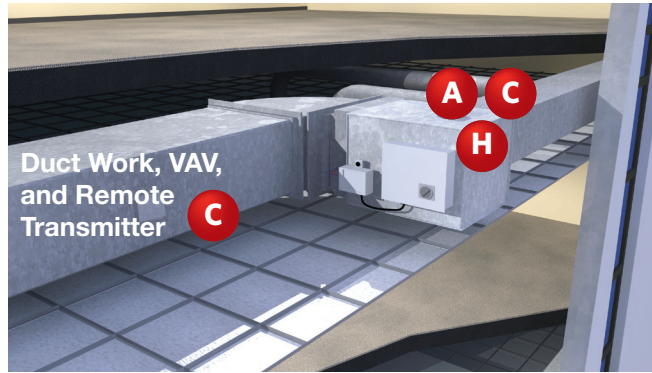
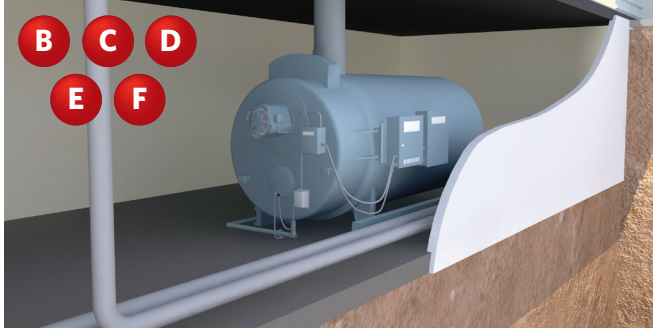
Air Filter, Cooling Coil, and Fan/Blower



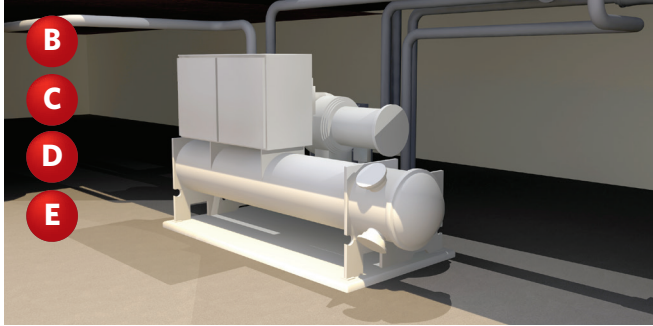
Damper



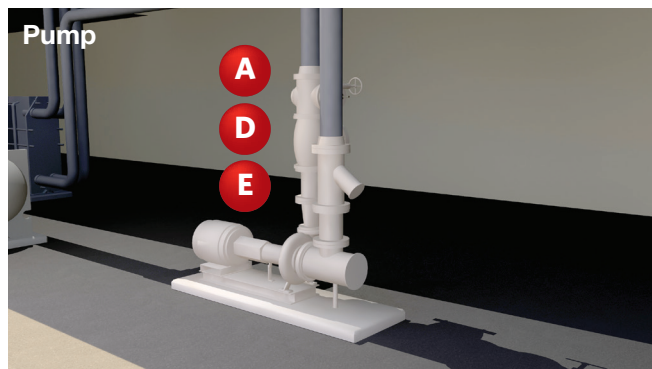
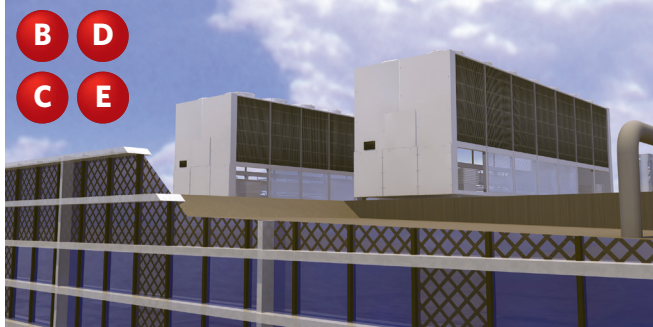
Boiler



Chiller



Cooling Tower



- Measures differential pressure**
- A Board Mount Pressure Sensors:** TruStability™ RSC, HSC and SSC Series; Basic ABP Series

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- B Monitors pressure to prevent a potentially explosive situation**
- Pressure Switches:** HP, HE, ME, LP, LE Series

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- C Maintains occupant comfort for desired humidity and temperature levels**
- Humidity Sensors:** Honeywell HumidCon™: HIH6000, HIH6100, HIH7000, HIH8000 Series

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- D Monitors system performance for proper environmental control**
- Heavy Duty Pressure Transducers:** PX2 Series, PX3 Series, MLH Series, MIP Series

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- E Monitors temperature**
- Packaged Temperature Sensors:** R300 Series, 6655 Series, 500 Series, LTP Series

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- Provides high-performance mechanical switching**
- MICRO SWITCH Large Premium Basic Switches:** BZ, WA Series; DT Series
- MICRO SWITCH V-Basic Miniature Switches:** V19 Series, V15 Series
- F MICRO SWITCH Explosion-Proof Switches:** V15W2 Series
- MICRO SWITCH Subminiature Switches:** SM Series; SX Series; ZM, ZW, ZX Series

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- Enable efficient control of the electric motors that drive fans, blowers and pumps**
- G Hall-effect/MR Sensor ICs:** SS361RT/SS461R, SS30AT/SS40A, SS40F/SS40G, SS42R, APS00B, SS490; Nanopower Series (SM351LT/SM353LT), Standard Power Series (SM351RT, SM451R, SM353RT, SM453R)

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- H Measures and monitors airflow**
- Airflow Sensors:** HAF Series, AWM1000 Series

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- I Provides energy management, amperage draw status, and kilowatt consumption**
- Current Sensors:** CSNX25 Series

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- J Controls power and other functions near flammable hydrocarbon refrigerants**
- MICRO SWITCH Toggle Switch:** NT Series

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- K Provides temperature control or over-temperature protection**
- Commercial Thermostats:** 2450 Series, 2455 Series

# SENSORS AND SWITCHES FOR USE IN HVAC

## PRESSURE SENSORS AND TRANSDUCERS



### Board Mount Pressure Sensors, Basic ABP Series

- Cost effective, energy efficient, calibrated, and temperature compensated
- As small as 8 mm x 7 mm
- Industry-leading long-term stability of  $\pm 0.25\%$
- Industry-leading accuracy of  $\pm 0.25\%$  FSS BFSL
- Total Error Band of  $\pm 1.5\%$  FSS
- Pressure range of 60 mbar to 10 bar | 6 kPa to 1 MPa | 1 to 150 psi
- Wide variety of pressure ranges and package styles available



### Board Mount Pressure Sensors, TruStability™ RSC, HSC and SSC Series

- Industry-leading long-term stability
- Extremely tight accuracy of  $\pm 0.25\%$  FSS BFSL
- Total Error Band as low as  $\pm 0.25\%$  FSS (RSC),  $\pm 1\%$  FSS (HSC), or  $\pm 2\%$  FSS (SSC)
- Pressure range of  $\pm 2.5$  mbar |  $\pm 250$  Pa |  $\pm 1$  inH<sub>2</sub>O to  $\pm 10$  bar |  $\pm 1$  MPa |  $\pm 150$  psi
- Low operating voltage and extremely low power consumption
- Wide variety of pressure ports and package styles available



### Heavy Duty Pressure Transducers, PX3 and PX2 Series

- Designed for configurability - multiple ports, connectors, pressure ranges
- Pressure range: 1 to 50 bar | 15 to 700 psi (PX3); 1 to 70 bar | 100 kPa to 7 MPa | 15 to 1000 psi (PX2)
- Total Error Band of 1 %FSS typ. (PX3); 2 %FSS typ. (PX2)
- Compatible with common HFC refrigerants and low GWP refrigerants such as R32 and R1234ZE, petroleum oils, lubricants, hydraulic/brake fluids, air, water
- Rated IP65 or better for protection in harsh environments



### Heavy Duty Pressure Transducers, MIP Series

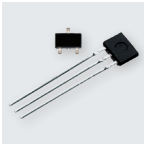
- Rugged stainless steel 304L construction
- Compatible with a wide range of fluids and gases
- Reliable performance over temperature range
- Outstanding EMI/EMC performance
- RoHS, REACH, and CE compliant



### Heavy Duty Pressure Transducers, MLH Series

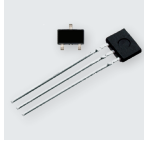
- Compatible with ammonia, common HFC refrigerants, and many low GWP next generation refrigerants such as R32 and R1234ZE
- Pressure range of 50 psi to 8000 psi (inclusive)
- Voltage and current (4 mA to 20 mA) output options
- Rated IP65 or better for protection against harsh environments

## HALL-EFFECT/MAGNETORESISTIVE SENSOR ICs



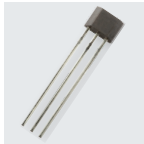
### Bipolar Hall-Effect Position Sensor ICs, SS30AT/SS40A

- Sensitive bipolar magnetics respond to alternating North and South poles
- Miniature (SS40A) and subminiature (SS30AT) sizes fit small spaces
- Durable design with built-in reverse voltage protection
- Thermally balanced integrated circuit for stable operation over full temperature range of -40 to 125 °C [-40 to 257 °F]



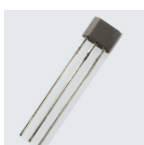
### Latching Hall-Effect Digital Sensor ICs, SS361RT/SS461R

- Small, versatile digital Hall-effect devices operated by magnetic field from a permanent magnet or an electromagnet
- Enhanced sensitivity often allowing use of less expensive magnets
- Miniature package size, built-in reverse voltage protection
- Low voltage: 3 V operation promotes energy efficiency
- Robust design operates up to 150 °C [302 °F]



### Bipolar, Low-Cost Hall-Effect Sensor ICs, SS40F/SS40AF

- Miniature construction in plastic package
- Low power consumption (5 mA max at 4.5 Vdc) for energy efficiency
- Bipolar magnetic for ring magnet applications
- High speed operation range 0 kHz to over 100 kHz
- Broad temperature range -40 °C to 125 °C [-40 °F to 257 °F]



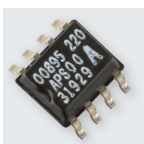
### Linear Hall-Effect Sensor ICs, SS490 Series

- Small size with low power consumption
- Single current sinking or current sourcing linear output
- Built-in laser trimmed thin-film resistors allow sensitivity and temperature compensation
- Rail-to-rail operation provides more usable signal for higher accuracy
- Responds to either positive or negative gauss
- Quad Hall sensing element for stable output



### Magnetoresistive Sensor ICs, Nanopower Series (SM351LT/SM353LT); Standard Power Series (SM351RT/SM451R/SM353RT/SM453R)

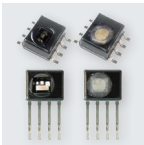
- SOT-23 package (SM351LT/SM353LT/SM351RT/SM353RT); flat TO-92-style (SM451R/SM453R)
- Sensitivity of 7 G typ., 11 G max. (SM351LT/SM351RT/SM451R); 14 G typ., 20 G max. (SM353LT/SM353RT/SM453R)
- Supply voltage of 360 nA typ. (SM351LT), 310 nA typ. (SM353LT), 3 Vdc to 24 Vdc (SM351RT/SM451R/SM353RT/SM453R)
- Omnipolar sensing activates with either pole from a magnet
- Temperature range of -40 °C to 85 °C [-40 °F to 185 °F]
- Does not require external pull-up resistor (SM351LT/SM353LT)
- Non-chopper stabilized design (SM351LT/SM353LT)



### Magnetoresistive High-Res Magnetic Displacement Sensor ICs, APS00B

- Cost-effective, space-efficient solution for high volume OEM designs
- Wide, angular range allows measurements of  $\pm 90^\circ$  without additional components
- Measures only field direction; virtually unaffected by shock, vibration, magnetic-source gap variations
- Low power consumption (5 V at 4 mA Vdc) promotes energy efficiency
- Tape and reel packaging

## HUMIDITY/TEMPERATURE SENSORS



### Digital Humidity/Temperature Sensors, Honeywell HumidCon™ HIH6000, HIH6100, HIH7000, HIH8000

- Combined digital output-type relative humidity and temperature sensor
- Industry-leading long term stability (1.2 %RH over five years)
- Industry-leading reliability (MTTF 9,312,507 HR)
- Industry-leading relative humidity accuracy
- Lowest total cost solution; true, temperature-compensated digital I<sup>2</sup>C or SPI output
- Energy efficient; ultra-small package

## FOR MORE INFORMATION

Honeywell Sensing and Internet of Things services its customers through a worldwide network of sales offices and distributors. For application assistance, current specifications, pricing or the nearest Authorized Distributor, visit [sensing.honeywell.com](http://sensing.honeywell.com) or call:

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## PACKAGED TEMPERATURE SENSORS AND THERMOSTATS



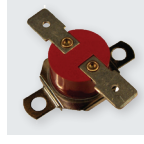
### Immersion Packaged Temperature Sensors, R300 Series

- One-piece passive, resistive temperature device (RTD), high temperature probe
- Excellent reliability, response time, and accuracy
- Working temperature range of -40 °C to 275 °C [-40 °F to 527 °F], continuous
- Durable stainless steel closed tip design



### Surface Packaged Temperature Sensors, 500 Series

- Broad portfolio of air/gas, liquid, and surface temperature probes
- Small, easy-to-install assemblies
- Enhanced reliability, precision, sensitivity, and stability for greater flexibility
- Operating temperature range of -60 °C to 300 °C [-76 °F to 572 °F]
- Wide variety of housing styles and materials; custom options available



### Air, Surface Packaged Temperature Sensors, 6655 Series

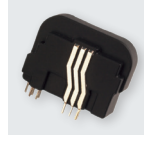
- Thermistor-based NTC temperature sensors
- For use in surface/pipe temperature applications in non-condensing environments
- Wide operating temperature range of -20 °C to 110 °C [-4 °F to 230 °F]
- Extended life and stable output; enhanced accuracy and response time
- Small size; variety of packages, R-T curves, termination styles, and housing materials



### Commercial Thermostats, 2450 Series, 2455 Series

- Affordable, robust, customizable
- Small size with no programming required
- Operating temperature range of 0 °C to 260 °C [32 °F to 500 °F]

## CURRENT SENSORS



### Closed Loop Current Sensors, CSNX25 Series

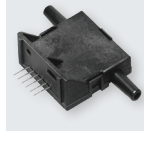
- Current sensing up to 1275 A (depending on product listing)
- Measures ac, dc, and impulse currents
- Competitive cost/performance ratio
- Rapid response and high overload capability
- Industrial operating temperature range, small size, and weight

## AIRFLOW SENSORS



### Honeywell Zephyr™ High Accuracy Airflow Sensors, HAF Series

- Small size with low power consumption
- Single current-sinking or current-sourcing linear output
- Built-in thin-film resistors; laser trimmed for precise sensitivity & temperature comp.
- Rail-to-rail operation provides more usable signal for higher accuracy
- Responds to either positive or negative gauss
- Quad Hall sensing element for stable output



### Signal Conditioning Airflow Sensors, AWM1000 Series

- Accurate, repeatable airflow sensing
- Cost-effective, micro-bridge technology
- Bi-directional sensing capability
- Low differential pressure sensing

## MICRO SWITCH BASIC SWITCHES



### MICRO SWITCH Large Basic Switches, BZ and WA Series; DT Series

- Accepted world-wide standard "Large Basic" switch
- Low operating force and differential travel
- Long mechanical life up to 20,000,000 cycles at 95 % survival
- Elongated mounting hole for easier, more accurate mounting
- Current rating ranges from 15 A to 25 A
- Choice of actuation, termination and operating characteristics
- Two independent single-pole double throw circuits in one housing and actuator (DT)



### MICRO SWITCH V-Basic Miniature Switches, V19 Series

- RoHS/REACH/Cal Prop65 compliant
- UL/CSA, cUL, ENEC, CQC certifications enable global design acceptance and cost savings in agency approvals
- 5 A, 16 A: electrical ratings for design flexibility in one industry standard package
- > 1M mechanical operations



### MICRO SWITCH V-Basic Miniature Switches, V15 Series

- Best suited for lower cost-of-failure applications
- Designed from 10K to 50K operations at a full load or 5M for mechanical life
- World-wide package size acceptance
- Current rating ranges of 10 A and 26 A
- UL/CSA, cUL, ENEC, and CQC approvals



### MICRO SWITCH Explosion-Proof Basic Switches, V15W2 Series

- Approved for use in Zone 2 hazardous locations
- IP67 equivalent
- UL, cUL, ENEC, CQC, IEC Ex approvals
- 5 A electrical rating
- Longer service life: over one million mechanical operations



### MICRO SWITCH Subminiature Switches, SM/SX Series

- Best suited for high cost-of-failure applications
- Small, lightweight; extended operating life
- Elongated mounting hole for easy, accurate mounting
- Choice of actuation, electrical termination, and gold contact options for low energy switching and reliability
- UL/CSA, CE, ENEC approvals



### MICRO SWITCH Subminiature Switches, ZM/ZW/ZX Series

- Best suited for lower cost-of-failure applications
- Small, lightweight, low cost, enhanced life, ample electrical capability
- Choice of low energy or power-duty electrical ratings (gold-plated or silver contacts)
- Choice of ratings, actuation, termination and operating characteristics
- UL/CSA, cUL, ENEC, and CE approvals

## TOGGLE SWITCHES



### MICRO SWITCH Toggle Switches, NT Series

- ISA 12.12.01 certified; designed for use near flammable hydrocarbon refrigerants
- Quick-connect spade terminals
- UL191 electrical rating
- Sealed to NEMA 3, 3R, 4, 13, and IP67
- Operating temperature range: -40 °C to 71 °C [-40 °F to 160 °F]

## PRESSURE SWITCHES



### Premium and Economy Pressure Switches, HP/HE/ME/LP/LE Series

- High, medium, and low pressure switches
- Life cycle rating: up to 2 million; IP67 sealing rating
- Set point factory set or field adjustable 0,24 bar to 310,26 bar [3.5 psi to 4500 psi]
- High burst pressure up to 1379 bar [20000 psi]
- Variety of pressure ports, electrical terminations, and compatibility with many media

**Honeywell**