SENSOR & SWITCH SOLUTIONS FOR HVAC



Honeywell



THE CHART DETAILS VARIOUS HONEYWELL PRODUCT LINES THAT CAN BE USED TO SUPPORT HVAC APPLICATIONS.

**** = FOCUS PRODUCTS***

HVAC Categories	* Board-Mount Pressure Sensors	* Heavy-Duty Pressure Sensors	Airflow Sensors	* Gas Sensors	Basic Switches	Temperature Sensors and Thermostats	Magnetics Speed & Position	Toggle, Rocker, and Pushbutton Switches	Pressure Switches
Demand Control Ventilation	✓			✓	✓	✓	✓	✓	
Variable Air Volume Control	✓		✓			✓	✓		
Air Purification/Filter Monitoring	✓		✓	✓	✓	✓	✓	✓	
Air Conditioning		✓					✓	✓	
Heating System: Residential	✓						✓	✓	
Heating System: Commercial	✓	✓	✓	✓	✓	✓	✓	✓	✓
Refrigeration		✓		✓	✓	✓	✓	✓	✓

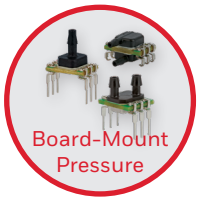
✓ Primary sensor/switch used within application (key design consideration for OEM)

✓ Secondary sensor/switch used within application (not a key design consideration)

DEMAND CONTROL VENTILATION



An efficient ventilation system responds to real-time data to optimize the recirculation of air, thereby, **improving air quality and reducing HVAC running costs**. Demand control ventilator allows buildings to meet the needs of growing trends which calll for more environmentally friendly buildings with better indoor air quality.



Board-Mount Pressure

- Measures differential pressure for static duct pressure and indoor air quality



CO_2 Sensor

- Adjusts ventilation rates as sensor is highly sensitive to carbon dioxide in the air
- Senses CO_2 in demand control & energy recovery ventilation



CO Sensor

- High quality CO detection in residential or commercial environments
- Helps control indoor air quality



Magnetic Sensor IC

- Enable efficient control of the electric motors that drive fans, blowers and pumps



Thermal Sensors

- Used in HVAC temperature controllers and for thermostat control



Basic Switch

- Provides high-performance mechanical switching on direct-acting damper actuators



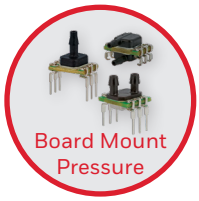
Pushbutton Switch

- Activates or deactivates an element or the entire ventilation system

VARIABLE AIR CONTROL VOLUME

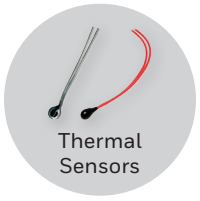


Controls airflow into a room or duct while sensors enable monitor valves to control the air volume to **maximize energy efficiency.** Sensors are critical to identifying the system is working as intended and at its best.



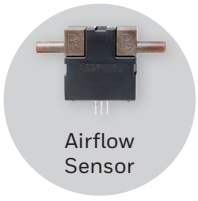
Board Mount Pressure

- Used to monitor and control variable airflow within ducting
- Ensures proper air flow to prevent hot and cold spots within buildings



Thermal Sensors

- Used in HVAC temperature controllers and for thermostat control



Airflow Sensor

- Used to monitor mass airflow for VAV controllers and in-line transmitters
- Balances the airflow in complex HVAC systems

AIR PURIFICATION & FILTER MONITORING

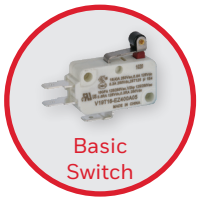


Recent trends point to an **increase importance in having cleaner and healthier air** leading to an increase in the need for air purification and filter monitoring.



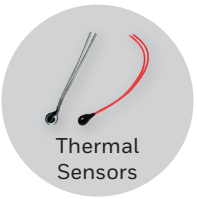
Board Mount Pressure

- Used to monitor differential pressure for clogged filter detection to improve air quality and reduce power consumption



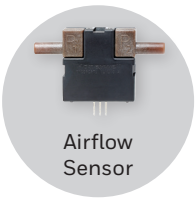
Basic Switch

- Used as air-proving switching assemblies, along with mechanical switching for valve position detection



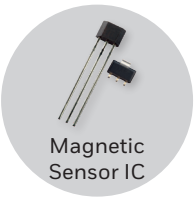
Thermal Sensors

- Used in HVAC temperature controllers and for thermostat control



Airflow Sensor

- Used to monitor mass airflow for VAV controllers and in-line transmitters



Magnetic Sensor IC

- Provides motor and fan control, position sensing, and speed sensing for moving parts

AIR CONDITIONING



An air conditioning may consist of a centralised cooling system that enables the cold air to be distributed throughout a building or a standalone unit that provides air cooling and filtration within a contained space.



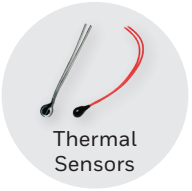
Heavy-Duty Pressure

- Monitors the air con compressor output and input pressure to enhance system efficiency and reduce power consumption



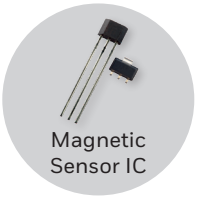
Board Mount Pressure

- Used to monitor differential pressure for clogged filter detection to improve air quality



Thermal Sensors

- Used in HVAC temperature controllers and for thermostat control



Magnetic Sensor IC

- Enable efficient control of the electric motors that drive fans, blowers and pumps

HEATING SYSTEM COMMERCIAL

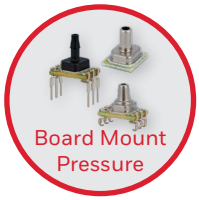


Commercial boilers use combustion to heat water and air, which is sent through pipes or vents throughout a building to provide heat. The biggest needs for boilers are to be energy efficient and safe. Honeywell sensors provide **efficiency while also detecting faults and leaks.**



Heavy-Duty Pressure

- Monitors the boiler water/ steam output and input pressure to enhance system efficiency and reduce power consumption



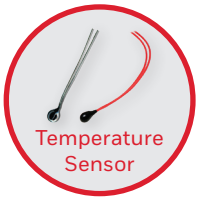
Board Mount Pressure

- Monitors the flow of warm air or water within the heating system to enhance system efficiency



CO Sensor

- Used to measure CO levels. During incomplete combustion, part of the carbon is not completely oxidized, producing soot or carbon monoxide. Any gas-burning products pose a risk of giving off CO gases



Temperature Sensor

- Placed on gas pilots to shut off the flow of gas if the pilot goes out



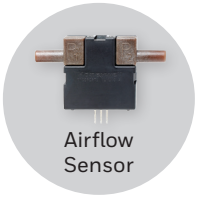
Pressure Switch

- Used to monitor steam pressure (overpressure or low pressure indication) in boilers to pre-vent a potentially explosive situation



Limit Switch

- Monitors the position of a damper or valve, and when the damper or valve is fully open, it starts the program sequence



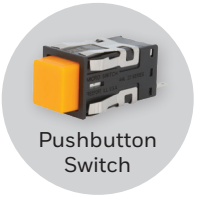
Airflow Sensor

- Used to monitor mass airflow for VAV controllers and in-line transmitters



Magnetic Sensor IC

- Enable efficient control of the electric motors that drive fans, blowers and pumps



Pushbutton Switch

- Activates or deactivates an element or the entire ventilation system



Basic Switches

- Used as air-proving switching assemblies or as a float switch for indicating pipe flow backup

HEATING SYSTEM RESIDENTIAL



Residential heating systems, heat air or water which is distributed throughout the build to provide heat. These systems need to be energy efficient, reliable and safe. Honeywell sensors are used to **improve efficiency and detecting faults and leaks.**



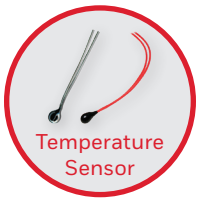
Board Mount Pressure

- Used to control the follow of warm air or water within the build and detect for leaks



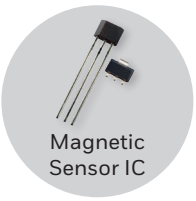
CO Sensor

- Used to detect incomplete combustion. Carbon monoxide is an odorless, colorless gas formed by the incomplete combustion of fuels.



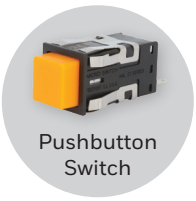
Temperature Sensor

- Used in smart thermostats to efficienty manage the HVAC system while improving occupant comfort



Magnetic Sensor IC

- Enable efficient control of the electric motors that drive fans, blowers and pumps



Pushbutton Switch

- Activates or deactivates an element or the entire ventilation system

REFRIGERATION SYSTEMS

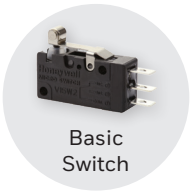


Refrigeration cools a space, substance or system to lower and/or maintain its temperature below the ambient one. New refrigerants improve the efficiency of the system, and require durable sensors and switches with stable temperatures and burst pressures.



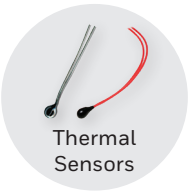
Heavy-Duty Pressure

- Monitors the refrigeration compressor output and input pressure to enhance system efficiency and reduce power consumption



Basic Switch

- Presence detection, on/off function, function monitoring and end-of-travel in a Zone 2 hazardous location



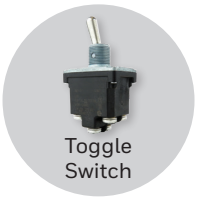
Thermal Sensors

- Used in temperature controllers and for compressor temperature monitoring in refrigeration



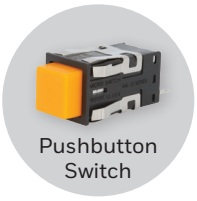
Magnetic Sensor ICs

- Enable efficient control of the electric motors that drive fans, blowers and pumps



Toggle Switch

- Activates or deactivates an element or the entire system



Pushbutton Switch

- Activates or deactivates an element or the entire system



Pressure Switch

- Used to monitor overpressure or low pressure indication to prevent a potentially explosive situation

PRESSURE SENSORS AND TRANSDUCERS



Board Mount Pressure Sensors, Basic ABP/ABP2 Series

- Pressure range: 1 inH_2O to 175 psi
- High accuracy, TEB: 1.5 %FSS
- Temp compensated: -40°C to 110°C
- Temp operating: -40°C to 110°C
- Extensive media compatibility
- Analogue & digital (I^2C/SPI)
- Best for **configurability & value**



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

- Pressure range: 0.5 inH_2O to 150 psi
- High accuracy, TEB: 1.0 %FSS
- Temp compensated: -40°C to 85°C
- Temp operating: -40°C to 85°C
- Outstanding EMI/EMC performance
- Analogue & digital (I^2C/SPI)
- Best for **accuracy, stability & performance**



Heavy Duty Pressure Transducers, MIP Series

- Pressure range: 15 psi to 900 psi
- High accuracy, TEB: 0.75 %FSS
- Temp operating: -40°C to 125°C
- Compatible with a wide range of fluids and gases
- Rugged stainless steel 304L construction
- Outstanding EMI/EMC performance
- Best for **accuracy, stability & performance**

HALL-EFFECT AND MAGNETORESISTIVE SENSOR ICs



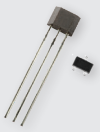
Linear Hall-Effect Sensor ICs, SS490 Series

- 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
- Responds to either positive or negative gauss
- Quad Hall sensing element for stable output



Magnetoresistive Sensor ICs, Nanopower Series (SM351LT/SM353LT); Standard Power Series (SM-351RT/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/ /SM-351RT/SM451R); 14 G typ., 20 G max. (SM353LT/SM353RT/SM453R)
- Omnipolar sensing activates with either pole from a magnet



High Sensitivity Latching Hall Sensors (SS360ST/NT/PT and SS460S for BLDC commutation)

- Fastest response time in its class
- No chopper stabilization
- High sensitivity; operates from only 30 gauss typ.
- Bipolar latching magnetics
- Can be supplied on tape-and-reel

TEMPERATURE SENSORS



Thermistors, 192/194 Series

- High quality, low-cost, resistance temperature-matched interchangeable units
- Dissipation constant in still air: 0,75 mW/°C
- Time constant in air: 15.0 s
- Maximum diameter: 2,413 mm [0.095 in]
- Resistance temperature curve, interchangeability, enhanced stability and life, epoxy coated

GAS SENSORS



Carbon Dioxide Gas Sensor, CRIR-M1 Series

- Single channel, non-dispersive infrared (NDIR) sensor for detecting Carbon Dioxide
- Small size
- Maintenance free for normal indoor applications
- Enhanced long term stability
- Higher accuracy: ±40 ppm ±3 % of reading
- Consistency and repeatability
- Auto baseline correction (ABC)



Carbon Monoxide Gas Sensor, ECOSURE X

- Cost-effective two-electrode electromechanical cell designed for the detection of carbon monoxide i a domestic/residential CO detection, industrial fire detection and ventilation control
- Unique design for use in extreme environments
- Suitable for use in BS, EN, UL, LPC, VDS and TÜV accredited products
- Features an integrated active filter to eliminate false alarms caused by common household vapors

AIRFLOW SENSORS



AWM3300 Series

- Small size
- Amplified signal conditioning
- 30 SCCM to 5 mBar
- Analog output
- 50 mW typ. power consumption
- -25°C to 85°C [-13°F to 185°F] range

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
- 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

- 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, UKCA, ENEC, and CQC approvals



MICRO SWITCH Explosion-Proof Basic Switches, V15W2 Series

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



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 or ratings, actuation, termination and operating characteristics
- UL/CSA, cUL, ENEC, and CE approvals

MICRO SWITCH 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]

MICRO SWITCH PUSHBUTTON SWITCHES



Operator Interface Switches and Indicators, AML Series

- Pushbuttons, paddles, rockers, key-actuated, and indicators within AML Series for coordinated panel appearance
- Less than 1.75 inch panel depth
- Two or three positions and maintained or momentary action
- One-, two-, or four-poles with double throw available for most switches

PRESSURE SWITCHES



Extended Duty Pressure Switches, 5000 Series

- Specifically designed to stand up to extended duty applications
- Factory set but capable of field adjustment
- Direct action blade contact
- Burst pressure: : 750 psi for 0.5 psi to 24 psi set point range; 1250 psi for 25 psi to 150 psi set point range

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 acknowledgment 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.**

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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.

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