

Speed Sensors

Honeywell



SENSING AND CONTROL

Product Range Guide

For innovation that's well apart, there's only Honeywell Sensing and Control.

With more than 50,000 products ranging from snap-action, limit, toggle, and pressure switches to position, speed, pressure, and airflow sensors, Honeywell Sensing and Control (S&C) has one of the broadest sensing and switching portfolios available.

Honeywell sensor, switch and control components are tailored to exact specifications for stronger performance, longer productivity, and increased safety. Enhanced accuracy and durability are built into every part, improving output and endurance. For our customers, this can reduce expenditures and operational costs. Our global footprint and channels help to competitively price such components for your chosen application and provide immediate technical support.

Our expertise in aerospace and defense, transportation, medical, and industrial industries means we offer products and solutions for a wide range of applications. But, an impressive product line is only one part. We possess unique engineering expertise and value-added capabilities.

While Honeywell's switch and sensor solutions are suitable for a wide array of basic and complex applications, our custom-



engineered solutions offer enhanced precision, repeatability, and ruggedness. We offer domain knowledge and technology resources, along with a close working relationship, to develop and deliver cost-effective, individually tailored solutions. Whether clean-slate development or simple modifications to an existing design are needed, our expertly engineered solutions help to meet the most stringent requirements with world-class product designs, technology integration, and customer-specific manufacturing.

With a 75-year legacy in the switch and sensor business, Honeywell S&C has earned a reputation for reliability and excellence. Our strong product designs, Six Sigma Plus manufacturing environment, and robust testing facilities help provide quality out of the box, as well as enhanced, sustainable performance down the line.

Global service, sourcing, and manufacturing. Industry-leading engineers. Value-added assemblies and solutions. Construction to required specifications. A one-stop, full-service, globally competitive supplier... Honeywell Sensing and Control.

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Magnetic Sensors

Magnetoresistive Sensor ICs



With a built-in magnetoresistive bridge integrated on silicon and encapsulated in a plastic package, magnetoresistive sensor ICs feature an integrated circuit that responds to low fields at large distances. Potential applications include laptops, material handling equipment, pneumatic cylinders, and battery-powered equipment including hand-held scanners, computers, and water/gas/electricity meters.



Series	Nanopower	2SS52M	SS552MT	VF401	APS00B
Description	omnipolar MR sensor IC	omnipolar MR digital sensor IC	omnipolar MR digital sensor IC	2-wire MR fine pitch ring magnet sensor IC	high resolution magnetic displacement sensor IC
Magnetic actuation type	omnipolar	omnipolar	omnipolar	differential bridge	analog, saturated mode
Package style	SOT-23	U-Pack	SOT-89	flat, TO-92-style	SOIC-8
Supply voltage range	1.65 Vdc to 5.5 Vdc	3.8 Vdc to 30 Vdc	3.8 Vdc to 30 Vdc	4.5 Vdc to 16 Vdc	1 Vdc to 12 Vdc
Supply current	SM351LT: 360 nA typ. SM353LT: 310 nA typ.	11 mA max.	11 mA max.	operate: 16.8 mA max. release: 8.4 mA max.	7 mA max.
Output type	low: 0.03 V typ. high: Vs -0.03 V typ.	digital sinking	digital sinking	digital sourcing	sin(2Θ), cos(2Θ)
Operating temperature range	-40 °C to 85 °C [-40 °F to 185 °F]	-40 °C to 150 °C [-40 °F to 302 °F]	-40 °C to 150 °C [-40 °F to 302 °F]	-40 °C to 150 °C [-40 °F to 302 °F]	-40 °C to 150 °C [-40 °F to 302 °F]
Measurements (H x W)	2,80 mm x 2,90 mm [0.110 in x 0.114 in]	4,5 mm x 4,5 mm [0.18 in x 0.18 in]	4,2 mm x 4,5 mm [0.16 in x 0.18 in]	4,06 mm x 3,00 mm [0.160 in x 0.118 in]	4,9 mm x 6,0 mm [0.19 in x 0.24 in]
Features	high sensitivity: 7 Gauss typ., 11 Gauss max. (SM351LT), 14 Gauss typ., 20 Gauss max. (SM353LT); designed to accommodate applications with large air gaps, small magnetic fields and low power requirements	omnipolar magnetics; sinking output, low gauss operation (25 G max.); operating speed of 0 kHz to over 100 kHz; tape and reel available	Low gauss operation (25 G max.) extends sensing distance to one inch or more, depending on size, operating speed of 0 kHz to over 100 kHz	wide speed capability; output pattern independent of gap between target and sensor; improved insensitivity to run-out, tilt, and twist; reverse polarity protection	dual analog voltages respond to changes in magnetic field angle; sine and cosine output; accurate to 0,102 mm [0.004 in]; tape and reel available

Magnetic Sensors

Hall-effect Digital Sensor ICs



Constructed from a thin sheet of conductive material, Hall-effect sensor ICs have output connections perpendicular to direction of current flow. Potential applications are many, including speed and RPM sensing, brushless dc motors, and fan/motor/robotics.



Series	SL353	SS30AT/ SS40A/ SS50AT	SS311PT/ SS411P	SS340RT/ SS440R
Description	micropower omnipolar Hall-effect digital sensor IC	low-cost bipolar Hall-effect digital sensor IC	low-cost bipolar Hall-effect digital sensor IC with built-in pull-up resistor	low-cost unipolar Hall-effect digital sensor IC
Magnetic actuation type	omnipolar	bipolar	bipolar	unipolar
Package material and style	plastic surface mount (SOT-23)	SS40A: plastic radial lead SS30AT/SS50AT: plastic surface mount (SOT-23 & SOT-89)	SS311PT: plastic surface mount (SOT-23) SS411P: plastic radial lead	SS340RT: plastic surface mount (SOT-23) SS440R: plastic radial lead
Supply voltage	2.2 Vdc to 5.5 Vdc	4.5 Vdc to 24 Vdc	2.7 Vdc to 7 Vdc	3 Vdc to 18 Vdc, except SS340RT >125 °C [247 °F]: 3 Vdc to 12 Vdc
Supply current	SL353LT: 1.8 μ typ. @ 2.8 Vdc; SL353HT: 0.33 mA typ. @ 2.8 Vdc	10 mA max. at 25 °C [77 °F]	14 mA max.	8 mA
Operating temperature range	-40 °C to 85 °C [-40 °F to 185 °F]	SS40A: -40 °C to 125 °C [-40 °F to 257 °F] SS30AT/SS50AT: -40 °C to 125 °C [-40 °F to 257 °F]	-40 °C to 150 °C [-40 °F to 302 °F]	SS340RT (3 Vdc to 24 Vdc): -40 °C to 125 °C [-40 °F to 257 °F] SS340RT (3 Vdc to 12 Vdc) & SS440R (3 Vdc to 24 Vdc): -40 °C to 150 °C [-40 °C to 302 °F]
Measurements (H x W)	2,8 mm x 2,9 mm [0.11 in x 0.11 in]	SS30AT: 2,8 mm x 2,9 mm [0.11 in x 0.11 in] SS40A: 3,0 mm x 4,1 mm [0.12 in x 0.16 in] SS50AT: 4,2 mm x 4,5 mm [0.16 in x 0.18 in]	SS311PT: 2,8 mm x 2,9 mm [0.11 in x 0.11 in] SS411P: 3,0 mm x 4,1 mm [0.12 in x 0.16 in]	SS340RT: 2,8 mm x 2,9 mm [0.11 in x 0.11 in] SS440R: 3,0 mm x 4,1 mm [0.12 in x 0.16 in]
Features	low supply voltage combined with very low average current reduces power consumption	high output current and speed capability; reverse polarity protection	built-in pull-up resistor; low voltage; enhanced sensitivity	simple activation from a South pole and multiple magnetic sensitivities (high, medium, and low)



SS345PT/ SS445P	SS351AT/ SS451A/ SS551AT	SS360NT/ SS360ST/ SS460S	SS360PT/ SS460P	SS361CT/ SS461C	SS361RT/ SS461R	SS400/ SS500	SS41/ SS51T
unipolar Hall-effect digital sensor IC with built-in pull-up resistor	low-cost omnipolar Hall-effect digital sensor IC	high sensitivity, latching Hall-effect digital sensor IC	high sensitivity latching digital Hall-effect sensor IC with built-in pull-up resistor	high sensitivity, latching Hall-effect digital sensor IC	low-cost Hall-effect digital sensor IC	SS400: Hall-effect digital sensor IC SS500: unipolar/bipolar/latching Hall-effect digital sensor IC	bipolar Hall-effect digital sensor IC
unipolar	omnipolar	latching	latching	latching	latching	unipolar, bipolar, latching	bipolar
SS345PT: plastic surface mount (SOT-23) SS445P: plastic radial lead	SS351AT: plastic surface mount (SOT-23); SS451A: plastic radial lead; SS551AT: plastic surface mount (SOT-89B)	SS360NT/SS360ST: plastic surface mount (SOT-23); SS460: plastic radial lead	SS360PT: plastic surface mount (SOT-23) SS460P: plastic radial lead (flat TO-92-style)	SS361CT: plastic surface mount (SOT-23) SS461C: plastic radial lead	SS361RT: plastic surface mount (SOT-23) SS461R: plastic radial lead	SS400: plastic radial lead SS500: plastic surface mount (SOT-89)	SS41: plastic radial lead SS51T: plastic surface mount (SOT-89)
2.7 Vdc to 7.0 Vdc	SS351AT/SS551AT (-40 °C to 125 °C [-40 °F to 257 °F]): 3 Vdc to 24 Vdc; SS351AT (150 °C [302 °F]): 3 Vdc to 12 Vdc; SS451A (-40 °C to 150 °C [-40 °F to 302 °F]): 3 Vdc to 24 Vdc	3 Vdc to 24 Vdc	3 Vdc to 24 Vdc	4 Vdc to 24 Vdc	3 Vdc to 18 Vdc, except SS361RT >125 °C [247 °F]: 3 Vdc to 12 Vdc	3.8 Vdc to 30 Vdc (inclusive)	4.5 Vdc to 24 Vdc
14 mA	5 mA max. at 25 °C [77 °F] (3 V); 6 mA max. at 25 °C [77 °F] (5 V)	8 mA max.	10 mA	6 mA max.	8 mA	SS400: 10 mA SS500: 8.7 mA at 5 Vdc	15 mA max.
-40 °C to 150 °C [-40 °F to 302 °F]	-40 °C to 150 °C [-40 °F to 302 °F]	-40 °C to 125 °C [-40 °F to 257 °F]	-40 °C to 125 °C [-40 °F to 257 °F]	-40 °C to 125 °C [-40 °F to 257 °F]	SS361RT (3 V to 12 V) & SS461R: 40 °C to 150 °C [-40 °F to 302 °F]; SS361RT (3 V to 18 V): -40 °C to 125 °C [-40 °F to 257 °F]	-40 °C to 150 °C [-40 °F to 302 °F]	-40 °C to 150 °C [-40 °F to 302 °F]
SS345PT: 2,8 mm x 2,9 mm [0.11 in x 0.11 in] SS445P: 3,0 mm x 4,1 mm [0.12 in x 0.16 in]	SS351AT: 2,8 mm x 2,9 mm [0.11 in x 0.11 in]; SS451A: 3,0 mm x 4,1 mm [0.12 in x 0.16 in]; SS551AT: 4,2 mm x 4,5 mm [0.16 in x 0.18 in]	SS360NT/SS360ST: 2,8 mm x 2,9 mm [0.11 in x 0.11 in]; SS460S: 3,0 mm x 4,1 mm [0.12 in x 0.16 in]	SS360PT: 2,8 mm x 2,9 mm [0.11 in x 0.11 in] SS460P: 3,0 mm x 4,1 mm [0.12 in x 0.16 in]	SS361CT: 2,8 mm x 2,9 mm [0.11 in x 0.11 in] SS461C: 3,0 mm x 4,1 mm [0.12 in x 0.16 in]	SS361RT: 2,8 mm x 2,9 mm [0.11 in x 0.11 in] SS461R: 3,0 mm x 4,1 mm [0.12 in x 0.16 in]	SS400: 3,0 mm x 4,1 mm [0.12 in x 0.16 in] SS500: 4,2 mm x 4,5 mm [0.16 in x 0.18 in]	SS41: 3,0 mm x 4,1 mm [0.12 in x 0.16 in] SS51T: 4,2 mm x 4,5 mm [0.16 in x 0.18 in]
simple activation from a North pole (SS345PT) or a South pole (SS445P)	built-in reverse polarity protection; typical operating point of 85 G at 25 °C [77 °F]	fastest response time in class; no chopper stabilization	fastest response time in its class, no chopper stabilization, operates from only 30 Gauss typical, at 25 °C [77 °F]	enhanced sensitivity; built-in reverse voltage capability	enhanced sensitivity; built-in reverse polarity protection; robust design	multiple operate/release points available	high output current; reverse polarity protection

Magnetic Sensors

Hall-effect Digital Sensor ICs



Constructed from a thin sheet of conductive material, Hall-effect sensor ICs have output connections perpendicular to direction of current flow. Potential applications are many, including speed and RPM sensing, brushless dc motors, and fan/motor/robotics.



Series	SS42R	VF526DT
Description	bipolar latching dual Hall-effect digital sensor IC with active high/active low complementary output	bipolar latching dual Hall-effect digital sensor IC with speed and direction outputs
Magnetic actuation type	bipolar latching	bipolar latching
Package material and style	plastic radial lead	plastic surface mount (SOT-89)
Supply voltage	4.5 Vdc to 16 Vdc	3.4 Vdc to 24 Vdc
Supply current	11 mA max.	14 mA max.
Output type	digital sinking or sourcing	digital sinking
Operating temperature range	0 °C to 100 °C [32 °F to 212 °F]	-40 °C to 125 °C [-40 °F to 257 °F]
Measurements (H x W)	3,6 mm x 5,1 mm [0.14 in x 0.20 in]	4,2 mm x 4,5 mm [0.16 in x 0.18 in]
Features	bipolar latching magnetics; sinking or sourcing outputs; reverse polarity protection	bipolar latching magnetics; sinking output; tape and reel available

Magnetic Sensors

Hall-effect Linear Sensor ICs



Constructed from a thin sheet of conductive material, Hall-effect sensors have output connections perpendicular to direction of current flow. Potential applications are many, including speed and RPM sensing, brushless dc motors, and fan/motor/robotics.



Series	91SS	SS490/ SS491B	SS39ET/ SS49E/ SS59ET	SS94
Description	Hall-effect linear sensor IC	Hall-effect linear sensor IC	Hall-effect linear sensor IC	Hall-effect linear sensor IC
Magnetic actuation type	linear	linear	linear	linear
Package material and style	ceramic SIP, ceramic with solder bumps	SS490: plastic radial lead, plastic surface pack, ammpack styles T2 and T3; SS491B: plastic radial lead	SS39ET: plastic surface mount (SOT-23) SS49E: plastic radial lead (flat SOT-92-style), straight or formed SS59ET: plastic surface mount (SOT-89)	ceramic SIP, ceramic with solder bumps
Supply voltage	8 Vdc to 16 Vdc	4.5 Vdc to 10.5 Vdc	2.7 Vdc to 6.5 Vdc	4.5 Vdc to 12.6 Vdc
Supply current	19 mA max.	10 mA	10 mA max.	30 mA max.
Output type	ratiometric sourcing	ratiometric sinking or sourcing	ratiometric sourcing	ratiometric sinking or sourcing
Operating temp. range	-40 °C to 150 °C [-40 °F to 302 °F]	-40 °C to 150 °C [-40 °F to 302 °F]	-40 °C to 100 °C [-40 °F to 212 °F]	-40 °C to 150 °C [-40 °F to 302 °F]
Measurements (H x W)	15,2 mm x 7,6 mm [0.60 in x 0.30 in]	3,0 mm x 4,1 mm [0.12 in x 0.16 in]	SS39ET: 2,8 mm x 2,9 mm [0.110 in x 0.114 in] SS49E: 3,0 mm x 4,1 mm [0.12 in x 0.16 in] SS59ET: 4,2 mm x 4,5 mm [0.16 in x 0.18 in]	15,2 mm x 7,6 mm [0.60 in x 0.30 in]
Features	linear magnetics; ratiometric sourcing output; positive temperature coefficient; different styles	linear magnetics; ratiometric sourcing output; positive temperature coefficient; different styles	linear magnetics; ratiometric sourcing output; low voltage operation; tape and reel available	linear magnetics; ratiometric sourcing output; standard mounting centers; linearity ±1.5 % max.

Magnetic Sensors

Value-Added Hall-effect Sensors



Consists of sensors packaged in a variety of housings. Includes vane sensors, digital position sensors, and solid-state switches. Potential applications include position and RPM sensing, cam and crankshaft speed and position, transmissions, tachometers, traction control, and sprocket speed.



Series	103SR (digital)	103SR (linear)
Description	Hall-effect digital position sensor	Hall-effect linear position sensor
Package material and style	aluminum threaded barrel	aluminum threaded barrel
Magnetic actuation type	unipolar, bipolar, bipolar latching	linear
Operation	proximity to external magnet	proximity to external magnet
Supply voltage range	4.5 Vdc to 24 Vdc	4.5 Vdc to 10.5 Vdc
Supply current	4 mA to 10 mA (inclusive)	7 mA
Output type	digital sinking or sourcing (depends on listing)	ratiometric sinking/sourcing
Operating temperature range	-40 °C to 100 °C [-40 °F to 212 °F]	-40 °C to 100 °C [-40 °F to 212 °F]
Measurements	Ø 11,9 mm x 25,4 mm H [15/32-2 x 1.0 in H]	Ø 11,9 x 25,4 mm H [15/32-2 x 1.0 in H]
Features	unipolar, bipolar, and bipolar latch magnetics; sinking or sourcing output; aluminum housing; color-coded jacketed cable; adjustable mounting	linear magnetics; ratiometric sinking/sourcing output; aluminum housing; color-coded jacketed cable; adjustable mounting



1GT	SR16/SR17	SR3	SR4
single Hall-effect sensor	low-cost Hall-effect vane sensor	Hall-effect digital position sensor	magnetoresistive digital position sensor
plastic probe	SR16: plastic dual tower with variety of terminations SR17: plastic side-mount wire exit	plastic threaded barrel	plastic threaded barrel
–	–	unipolar, bipolar	omnipolar
ferrous metal actuator	ferrous metal actuator	proximity to external magnet	proximity to external magnet
4.5 Vdc to 26.5 Vdc (inclusive)	3.8 Vdc to 30 Vdc	4.5 Vdc to 24 Vdc	3.8 Vdc to 30 Vdc
20 mA	10 mA max.	10 mA	11 mA
digital sinking (open collector)	digital sinking	digital sinking	digital sinking
-40 °C to 150 °C [-40 °F to 302 °F]	-20 °C to 85 °C [-4 °F to 185 °F]	-40 °C to 85 °C [-40 °F to 185 °F]	-40 °C to 85 °C [-40 °F to 185 °F]
Ø 17,9 mm x 31,8 mm L [Ø 0.70 in x 1.25 in L]	24,6 mm H x 12,4 mm W [0.97 in H x 0.49 in W]	Ø 12,4 mm x 25,4 mm L [Ø 0.49 in x 1.0 in L]	19,0 mm H x 25,4 mm L [0.75 in H x 1.0 in L]
fast operating speed; reverse polarity and transient protection; EMI resistant	sinking output; non-contact position sensing; environmentally sealed; three terminations	NEMA 3, 3R, 3S, 4, 4X, 12 and 13; unipolar and bipolar magnetics; sinking output; frequencies exceeding 100 Hz	NEMA 3, 3R, 3S, 4, 4X, 12 and 13; omnipolar magnetics; sinking output

Speed and Direction Hall-effect Sensors



Provides true zero speed capability, direction sensing, and precise switch point measurement. Speed sensor diagnostics provide information on air gap and sensor failure for increased reliability and functionality. Potential applications include cam/crank shafts, transmissions, tachometers, traction control, dynamometers, process control, and factory automation.



Series	LCZ	ZH10	SNDH-T	SNDH-H
Description	single Hall-effect zero speed sensor	single Hall-effect zero speed sensor	dual differential Hall-effect quadrature speed and direction sensor	Hall-effect speed sensor
Housing	stainless steel	aluminum	stainless steel, plastic	stainless steel, plastic
Supply voltage range	4.5 Vdc to 26 Vdc	4 Vdc to 24 Vdc	4.5 Vdc to 18 Vdc	4 Vdc to 24 Vdc, 4.5 Vdc to 24 Vdc, 6.5 Vdc to 24 Vdc
Supply current	20 mA	6 mA	18 mA max.	6 mA max., 14 mA max., 20 mA max.
Output type	digital sinking	digital sinking	square wave	digital sinking
Operating frequency range	0 Hz to 15 kHz	0 Hz to 15 kHz	1 Hz to 15 kHz	0 Hz to 12 kHz, 0 Hz to 15 kHz, 2 Hz to 15 kHz
Operating temperature range	-40 °C to 125 °C [-40 °F to 257 °F]	-40 °C to 125 °C [-40 °F to 257 °F]	-40 °C to 150 °C [-40 °F to 302 °F]	-40 °C to 150 °C [-40 °F to 302 °F] inclusive
Measurements	9,5 mm [3/8 in/0.375 in] and 15,9 mm [5/8 in/0.625 in] diameters; 50,8 mm [2.00 in] and 76,2 mm [3.00 in] lengths	Ø 11,9 mm [15/32 in/0.46875 in] x 25,4 mm [1.00 in] L	Ø 15 mm x 45 mm L [Ø 0.6 in x 1.77 in L]	various, depends upon type
Features	omni-directional sensor to target; low power consumption; zero speed; digital output	omni-directional sensor to target; low power consumption; zero speed; digital output	advanced performance dynamic offset self calibration; short circuit and reverse voltage protection; low jitter output; near zero speed	rotationally insensitive versions available; zero speed sensing versions available; range of connector options

Variable Reluctance Speed Sensors

Variable Reluctance Sensors are passive sensors that deliver direct conversion of actuator speed to an analog frequency. Transportation applications include engine, transmission, and wheel speed sensing. Industrial applications include electric motor speed, plant floor machinery, and pump RPM.



Variable Reluctance Speed Sensors	3000 Series Industrial VRS	584 Series 584XXHV High Voltage	584 Series 584XXLV Low Voltage
Housing diameter	10/32, 1/4, 3/8, 5/8, 3/4	5/8	3/8, 5/8
Supply voltage	–	10 Vdc to 30 Vdc @ 15 mA max.	5 Vdc to 15 Vdc @ 15 mA max.
Output signal: square wave (low)	analog sine wave	digital square wave	digital square wave
Output voltage range	4.7 Vp-p to 15 Vp-p; 30 Vp-p to 70 Vp-p; 125 Vp-p to 300 Vp-p	Low: 350 mV max. @ 20 mA maximum current sink High: $\frac{RL \times Vs}{RL + 2.2K}$ RL = load resistance in K ohms; Vs = supply voltage in Vdc	
Operating frequency (max.)	15 kHz; 40 kHz; 50 kHz; 60 kHz	10 kHz	10 kHz; 50 kHz
Housing material/style	stainless steel potted, threaded	300 stainless steel/threaded	400 stainless steel/threaded
Termination	MS3106 connector; leads	MS3106A-10SL-3S or preleaded	MS3106A-10SL-3S (5/8 only) or preleaded
Vibration	–	meets MIL-STD 202F, method 204D	meets MIL-STD 202F, method 204D
Operating temp. range	-55 °C to 120 °C [-67 °F to 248 °F]; -73 °C to 93 °C [-99 °F to 199 °F]; -73 °C to 230 °C [-99 °F to 446 °F]	-40 °C to 107 °C [-40 °F to 225 °F]	-40 °C to 107 °C [-40 °F to 225 °F]
Features	industrial VRS sensor; passive sensor with analog output; simple installation; operates over wide speed and temperature ranges	senses moving ferrous metal, output signal of integrated circuit allows for direct use in digital equipment; eliminates the need for interface circuitry, reducing installation and maintenance costs; enhanced stability due to precisely matched components; extremely precise relationship between the physical position of any sensed object and the electrical signal produced provides improved accuracy to timing and positioning applications; enhanced sensitivity with the capability to produce full output of 5 V to 30 V at speeds as low as 3 in/second at gaps of 0.050 in, or 1 in/second at gaps of 0.005 in; constant output amplitude independent of speed, and air gap (within sensing range) allows for full output at almost zero speeds	





As one of the world's leading providers of sensors and switches, Honeywell understands and meets the requirements of a wide variety of industries.

Honeywell Sensing and Control is a global leader in providing reliable, cost-effective sensing and switching solutions for our customers' applications. We serve thousands of customers in four core industry segments: industrial, medical equipment, transportation, and aerospace/military products.

Aerospace

Aerospace applications are among the most demanding for any type of product. Rigorous FAA requirements, extreme environments (temperature, shock, vibration, the need for hermetic sealing), and the ability to customize devices are just a few of the parameters often required of sensors and switches in these applications. Aerospace customers typically value speed in prototyping and development, and Honeywell's vertically integrated, AS9100-approved manufacturing locations enhance our ability to produce devices in a wide variety of packages. The precision output of our products helps reduce risk and cost in key applications while also minimizing the need for unscheduled maintenance.

Honeywell's in-depth aerospace engineering experience allows us to work with customers in the design and development of

products that best meet the specified requirements of their individual applications. Making products simple to install makes the job easier every step of the way. And, the odds are that Honeywell is already on the list of trusted suppliers for many aerospace companies, underscoring the decades of experience we bring to this field.

Honeywell products for this industry (many of them PMA-certified) include force sensors, load cells, potentiometers, pilot controls, pressure sensors, pressure switches, resolvers, sensor/actuator assemblies for systems ranging from aerostructures to fuel control to flight surfaces, speed sensors, temperature probes, thermostats, torque sensors, y-guides for cargo systems, MICRO SWITCH™ sealed and high-accuracy switches, MICRO SWITCH™ pushbutton switches, and MICRO SWITCH™ rocker and toggle switches.

Medical

Medical applications typically require sensors and switches that are highly stable and extremely reliable to enhance patient safety and comfort. Stability is often essential to minimize long term drift, reduce the need for recalibration, and improve ease of use for medical equipment operators. Reliability enhances patient safety in life-critical applications, reduces downtime, and improves test throughput in applications such as clinical diagnostics. The product needs to be easy to use and easy to design into a system, so Honeywell's extensive customization and built-in calibration/amplification capabilities are strong benefits. Confidence in Honeywell's product performance, reliability, and availability provide peace of mind for medical equipment manufacturers who choose Honeywell.

Honeywell offerings for this industry include airflow sensors, silicon and stainless steel media isolated pressure sensors, Hall-effect magnetic position sensors, humidity sensors, flexible heaters, force sensors, thermostats, commercial solid state sensors, infrared sensors, oxygen sensors, pressure and vacuum switches, potentiometers and encoders, MICRO SWITCH™ pushbutton, rocker, and toggle switches, and hour meters.

Industrial

The industrial arena can be a rough one. From high-speed food processing to high-force stamping applications, reliable and cost-effective sensors and switches often help minimize repair costs, maximize system life, and reduce overall system expense. Durability can mean the difference between smooth-running processes and expensive downtime. Accurate, repeatable sensor or switch output can reduce the need for calibration once the device is applied. Because of the wide variety of potential applications, Honeywell's ability to deliver a customized product that can meet virtually any size, weight, and power requirement – as well as any packaging stipulations for tough, harsh environments – often makes it easy to incorporate and use our

devices. Safety is another important consideration for industrial users, and our products meet a wide variety of regulatory safety requirements.

Honeywell's industrial product line includes airflow sensors, current sensors, humidity sensors, fiber-optic and liquid-level sensors, linear position sensors, oxygen sensors, pressure sensors, potentiometers and encoders, speed sensors, temperature probes, ultrasonic sensors, wirewound resistors, thermostats, commercial solid state sensors, flex heaters, SMART position sensors, silicon and stainless steel media isolated pressure sensors, force sensors, safety light curtains, push-pull switches, and MICRO SWITCH™ snap-action switches, hazardous area switches, safety switches, key and rotary switches, limit switches, sealed and high-accuracy switches, pushbutton, rocker, toggle switches, and relays.

Transportation

Getting from Point A to Point B is often challenging for end-customers of transportation providers – Honeywell aims to make the trip easier with highly reliable, cost-effective switches and sensors. Our products are designed to support rigorous engine requirements, and their efficiency can also help optimize engine performance. Customization is often required to allow a switch or sensor to be mounted in tight or challenging environments including vibration, temperature extremes, and road contamination. The durability of Honeywell products enhances system reliability, which is also boosted by the stable, accurate output of our devices. All of these capabilities allow demanding customers to rely on Honeywell's many years of experience in the transportation industry.




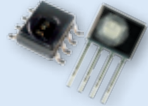





Honeywell products for transportation applications include Hall-effect rotary position sensors, inertial measurement units, infrared sensors, keyless entry sensors, magnetic position sensors, pressure sensors, speed and direction sensors, ultrasonic sensors, thermostats, temperature probes, commercial solid state sensors, SMART position sensors, and MICRO SWITCH™ pushbutton, rocker, and toggle switches.



Sensing and Control Product Portfolio — Product reliability

With more than 50,000 sensing, switching and control products ranging from snap-action, limit, toggle and pressure switches to position, speed and temperature sensors.

SENSORS


	<p>Thermostats: Commercial and precision snap-action. Automatic or manual reset options, phenolic or ceramic housings. May be used in: Telecommunications • Battery Heater Controls • Computers • Copy Machines • Fax Machines • Food Service • Food Carts • Small and Major Appliances • Heat and Smoke Detectors • HVAC Equipment</p>		<p>Pressure transducers – heavy duty: Provide a complete amplified and compensated pressure measurement solution. Choice of ports, connectors, outputs and pressure ranges, engineered to be resistant to a wide variety of media for use in most harsh environments. May be used in: Industrial HVAC/R and Air Compressors • General System and Factory Automation Pump, Valve and Fluid Pressure • Transportation (Heavy Equipment and Alternative Fuel Vehicles) System • Pneumatics • Hydraulics</p>
	<p>Pressure sensors – heavy duty: Small, allowing use on their own in tight packages or as the building block for a complete transducer. Developed for potential use in pressure applications that involve measurement of hostile media in harsh environments compatible with 316 stainless steel. May be used in: Industrial Controls • Process Control Systems • Industrial Automation</p>		<p>Humidity sensors: Digital, analog, and combined humidity/temperature sensing versions. Provide on-chip signal conditioning with accuracy capability to ± 1.7 %RH. Stable, reliable, low-drift performance. Standardized, platform-based sensors. May be used in: Medical • HVAC/R • Weather Stations • Air Compressors • Telecommunications • Grain Storage • Incubators</p>
	<p>Current sensors: Accurate and fast response. Almost no thermal drift or offset with temperature. Adjustable linear, null balance, digital and linear current sensors. May be used in: Variable Speed Drives • Overcurrent Protection • Power Supplies • Ground Fault Detectors • Robotics • Industrial Process Control • Wattmeters</p>		<p>Flexible heaters: Flat or custom geometry configurations with single, multiple and variable watt densities. Stable, uniform heating. Can be bonded parts or combined in value-added assemblies. May be used in: Medical • HVAC/R • LCD Displays • Power Generation • Telecommunication</p>
	<p>Pressure sensors – board mount: Full line of industrial-grade sensors: media-isolating design, multiple ports and outlets, and electrical configurations. May be used in: Pneumatic Controls • Air Compressors • Process Monitoring • Hydraulic Controls • VAV Controls • Clogged Filter Detection • Presence/Absence of Flow • Transmissions</p>		<p>Temperature sensors: Customized probes, thermistors and RTD sensors. Plastic/ceramic, miniaturized, surface-mount housings and printed circuit board terminations. May be used in: Semi-Conductor Protection • Vending Machines • Power Generation • Hydraulic Systems • Thermal Management • Temperature Compensation</p>
	<p>Magnetic sensors: Digital and analog Hall-effect position ICs, magnetoresistive position ICs, Hall-effect vane, gear-tooth and magnetic sensors. May be used in: Speed and RPM Sensing • Motor/Fan Control • Magnetic Encoding • Disc Speed • Tape • Flow-Rate Sensing • Conveyors • Ignitions • Motion Control/Detection • Power/Position • Magnetic Code Reading • Vibration • Weight Sensing</p>		

ELECTROMECHANICAL SWITCHES

	<p>MICRO SWITCH™ basic switches: Snap-action precision switches. Compact. Lightweight. Designed for repeatability and enhanced life. Basic switches: large, standard, miniature, subminiature, hermetically sealed, water-tight and high-temperature versions. May be used in: Vending Machines • Communication Equipment • HVAC • Appliances • Automotive • Electronic Gaming Machinery • Valve Controls • Irrigation Systems • Foot Switches • Pressure • Temperature Controls</p>		<p>MICRO SWITCH™ sealed and high accuracy switches: Precision “snap action” mechanisms. Wide variety of actuators, terminations, circuitry configurations, electrical ratings, contact materials and operating characteristics. May be used in: Landing Gear • Flap/Stabilizer Controls • Thrust Reversers • Space Vehicles • Armored Personnel Carriers • De-Icer Controls • Wingfold Actuators • Industrial Environments • Valves • Underwater</p>
	<p>MICRO SWITCH™ hazardous area switches: Flame path designed to contain and cool escaping hot gases that could cause an explosion. MICRO SWITCH™ EX, BX, CX and LSX Series. May be used in: Grain Elevators and Conveyors • Off-Shore Drilling • Petrochemical • Waste-Treatment Plants • Control Valves • Paint Booths • Hazardous Waste Handling Facilities</p>		<p>Key and rotary switches: Environmentally sealed, 2-3-4 position switches. O-rings help keep dirt and moisture out and prolong life. May be used in: All-Terrain Vehicles • Golf Carts • Snowmobiles • Scissor Lifts • Telehandlers • Construction and Marine Equipment • Skid Loaders • Agricultural Equipment • Material Handlers</p>
	<p>Pressure and vacuum switches: Feature setpoints from 3 psi to 4500 psi. Rugged components have enhanced repeatability, flexibility and wide media capability. Uses diaphragm or quad seal/piston. May be used in: Transmissions • Hydraulics • Brakes • Steering • Generators/Compressors • Dental Air • Embalming Equipment • Oxygen Concentrators • Air Cleaners • Fuel Filters • Pool Water Pressure</p>		<p>MICRO SWITCH™ toggle switches: Hermetic and environmentally sealed options. Enhanced reliability. Center pin for ultimate stabilization. Available in many shapes, sizes and configurations. May be used in: Aerial Lifts • Construction Equipment • Agriculture and Material-Handling Equipment • Factory-Floor Controls • Process Control • Medical Instrumentation • Test Instruments • Military/Commercial Aviation</p>

LIMITLESS™ WIRELESS SOLUTIONS

	<p>Limitless™ switches and receivers: Combines the best of MICRO SWITCH™ limit switches with commercial wireless technology. Beneficial for remote monitoring where wiring/maintenance is not physically possible or economically feasible. Used for position sensing and presence/absence detection. Limitless™ Operator Interface: Adds a human interface device to the product-driven interfaces of Limitless™ switches and receivers. Choose and install a desired operator or utilize one of Honeywell's pushbuttons. May be used in: Valve Position • Crane Boom/Jib/Skew Position • Lifts • Material Handling • Presses • Construction/Ag Machines • Conveyors • Industrial Environments • Remote/Temporary Equipment • Grain Diverters or Flaps • Door Position</p>
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	<p>Position sensors: The SMART position sensor measures linear, angular or rotary position of a magnet attached to a moving object so that the object's position can be determined or controlled. Its simple, non-contact design eliminates mechanical failure mechanisms, reduces wear and tear, and improves reliability and durability. May be used in: Valve Position • Material Handling • Plastic Molding • Passenger Bus Level Position • Truck-Mounted Crane Outrigger Position • Aerial Work Lift Platform • Front Loader and Digger/Excavation Boom Position Potentiometer sensors: Measure linear, rotary position or displacement. Honeywell's proprietary conductive plastic delivers extensive temperature range and infinite resolution, and provides precision position measurement. May be used in: Robotic Motion Control • Marine Steering • In-Tank Level Sensing Ultrasonic sensors: Measure time delays between emitted and echo pulses, often accurately determining the sensor-to-target distance. May be used in: Level Measurement • Height and Thickness Sensing • Diameter Control</p>	
	<p>Infrared sensors: IREs, sensors and assemblies for object presence, limit and motion sensing, position encoding and movement encoding. Variety of package styles, materials and terminations. May be used in: Printers/Copiers • Motion Control Systems • Metering • Data Storage Systems • Scanning • Automated Transaction • Drop Sensors • Non-Invasive Medical Equipment</p>	 <p>Force sensors: Variety of package styles and various electrical interconnects including pre-wired connectors, printed circuit board mounting and surface mounting for flexibility. May be used in: Infusion and Syringe Pumps • Blood Pressure Equipment • Pump Pressure • Drug Delivery Systems • Occlusion Detection • Kidney Dialysis Machines</p>
	<p>Proximity sensors: Designed to meet demanding temperature, vibration, shock and EMI/EMP interference requirements. Number of housing materials and termination styles. May be used in: Aircraft Landing Gear • Gun Turret Position Control • Door/Hatch Monitoring</p>	 <p>Speed sensors: Measure speed, position and presence detection utilizing magnetoresistive, variable reluctance, and Hall-effect technologies. May be used in: Cam and Crankshafts • Transmissions • Fans • Pumps • Mixers • Rollers • Motors</p>
	<p>Airflow sensors: Advanced microstructure technology. Sensitive and fast response to flow, amount/direction of air or other gas. Analog or digital output. Thin-film, thermally isolated bridge structure consists of a heater and temperature sensing elements. May be used in: HVAC • Respirators • Process Control • Oxygen Concentrators • Gas Metering • Chromatography • Leak Detection Equipment • Medical/Analytical Instrumentation • Ventilation Equipment</p>	 <p>Rotary position sensors: Digital and analog Hall-effect, magnetoresistive and potentiometric devices and resolvers for sensing presence of a magnetic field or rotary position. Directly compatible with electronic circuits for application flexibility. May be used in: Audio and Lighting • Frequency • Temperature • Position • Medical/Instrumentation • Computer Peripherals • Manual Controls • Joysticks • Telecom • Welding • Heating • Aerospace</p>

	<p>MICRO SWITCH™ aerospace-grade pressure switches: Lightweight, compact pressure switches. Meets military and DO-160 standards. Lower operating force provides application versatility with enhanced precision. Design modularity allows for configuration of the switch, facilitating rapid customization. May be used in: Aerospace Systems • Engines, Fuel Pressure and Hydraulic Systems • Military Ground Vehicles • Ordnance and Munitions Release Systems • Military Maritime Systems</p>	 <p>MICRO SWITCH™ limit switches: Broadest and deepest limit switch portfolio. Rugged, dependable position detection solutions. MICRO SWITCH™ heavy-duty limit switches (HDLS), medium-duty and global limit switches. Hermetically and environmentally sealed switches. May be used in: Machine Tools • Woodworking • Textile • Printing Machinery • Metal Fabrication • Balers/Compactors • Forklifts • Bridges • Robotics • Wind Turbines • Elevators • Moving Stairs • Doors • Dock Locks/Levelers • Aerial Lifts • Cranes • Conveyors • Rail • Shipboards • Dock Side</p>
	<p>MICRO SWITCH™ pushbutton switches: Lit or unlit. Wide range of electrical and display design, pushbuttons and manual switches. Many shapes, sizes and configurations. Easy to apply, operate and maintain. May be used in: Control Boards and Panels • Industrial and Test Equipment • Flight Decks • Medical Instrumentation • Process Control</p>	 <p>MICRO SWITCH™ sealed and standard rocker switches: Wide range of electrical and display design. Many shapes, sizes, buttons and configurations to enhance manual operation. May be used in: Transportation • Agricultural and Construction Equipment • Test Equipment • Heavy-Duty Machinery • Marine Equipment • Small Appliances • Telecom • Medical Instrumentation • Commercial Aviation</p>

SAFETY PRODUCTS

	<p>MICRO SWITCH™ safety switches: For operator point-of-operation protection, access detection, presence sensing, gate monitoring and electrical interfacing. High-quality, dependable, cost-effective solutions. May be used in: Packaging and Semi-Conductor Equipment • Plastic-Molding Machinery • Machine Tools • Textile Machines • Lifts • Industrial Doors • Balers • Compactors • Aircraft Bridges • Telescopic Handlers • Refuse Vehicles</p>
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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 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.

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To learn more about Honeywell's sensing and control products, call **+1-815-235-6847**, email inquiries to **info.sc@honeywell.com**, or visit **sensing.honeywell.com**

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