

**Honeywell** | Sensing and Productivity Solutions

Product Range Guide

## **Speed Sensors**

# For innovation that's well apart, there's only Honeywell S&PS

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 Productivity Solutions (S&PS) has one of the broadest sensing and switching portfolios.

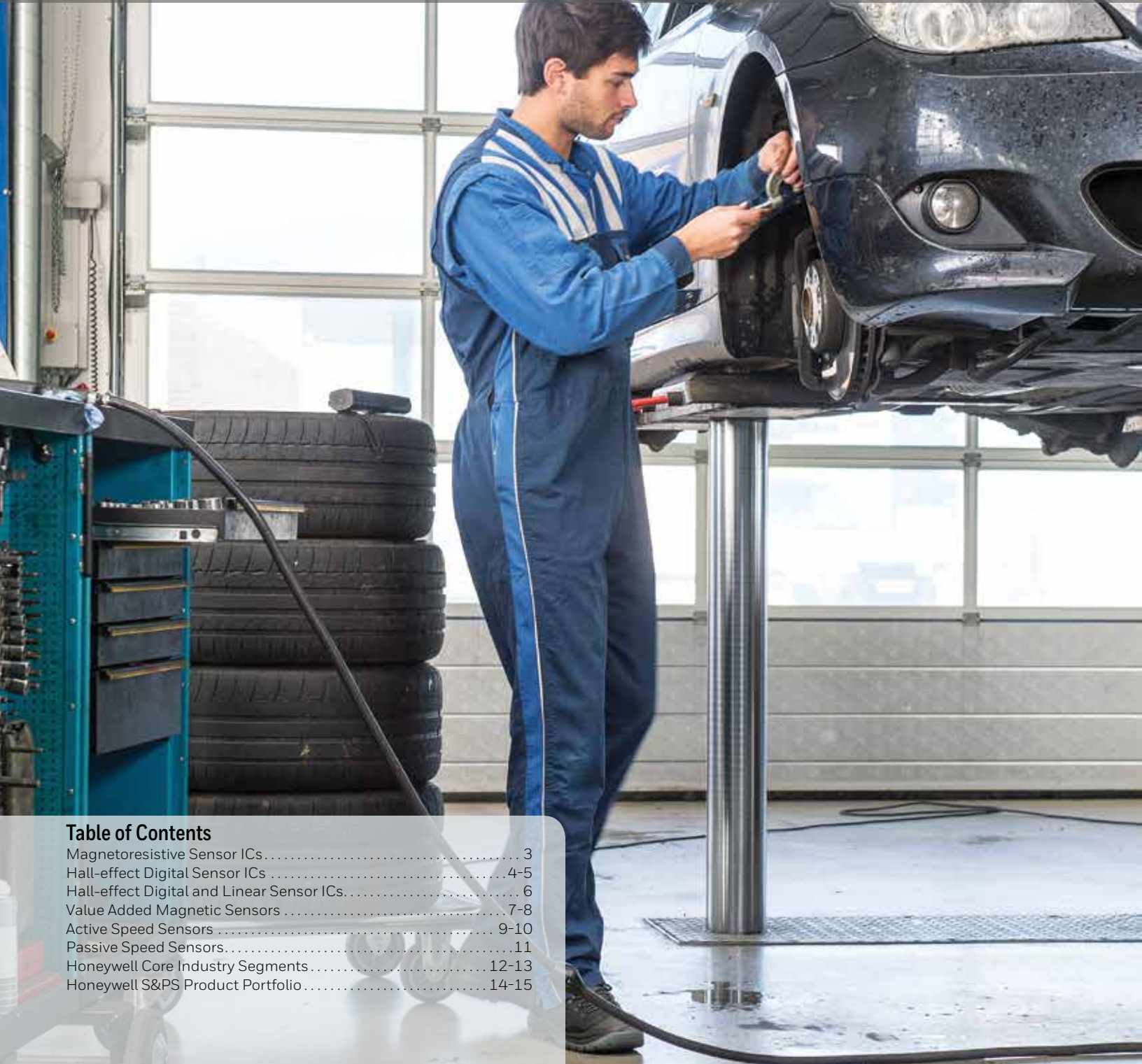
Honeywell sensor, switch, and control components are tailored to exact specifications for stronger performance, longer productivity, and increased safety. Enhanced accuracy and durability are built into every part, improving output and endurance. For our customers, this can reduce expenditures and operational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

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.

Global service, sourcing, and manufacturing. Industry-leading engineers. Value-added assemblies and solutions. A one-stop, full-service, globally competitive supplier.

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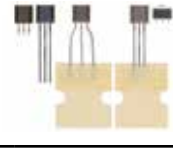


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# Magnetic Sensors | Magneto-resistive Sensor ICs

With a built-in magneto-resistive bridge integrated on silicon and encapsulated in a plastic package, magneto-resistive 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.

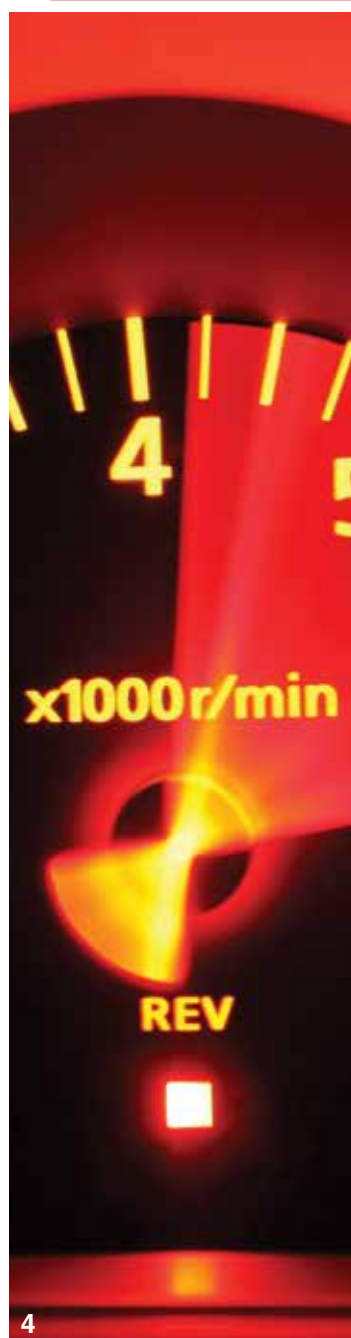


					
	<b>Nanopower Series</b>	<b>Standard Power Series</b>	<b>2SS52M Series</b>	<b>VF401</b>	<b>APS00B</b>
<b>Description</b>	omnipolar MR sensor IC	omnipolar MR sensor IC	omnipolar MR digital sensor IC	2-wire MR fine pitch ring magnet sensor IC	high resolution magnetic displacement sensor IC
<b>Magnetic actuation type</b>	omnipolar	omnipolar	omnipolar	differential bridge	analog, saturated mode
<b>Package style<sup>1</sup></b>	SOT-23	<b>SM351RT, SM353RT:</b> SOT-23 <b>SM451RT, SM453RT:</b> flat TO-92-style	<b>SS552MT:</b> SOT-89B <b>all others:</b> leaded U-Pack in bulk or ammpack	VF-401 flat TO-92-style	SOIC-8
<b>Supply voltage range</b>	1.65 Vdc to 5.5 Vdc	3 Vdc to 24 Vdc	3.8 Vdc to 30 Vdc	4.5 Vdc to 16 Vdc	1 Vdc to 12 Vdc
<b>Supply current</b>	<b>SM351LT:</b> 360 nA typ. <b>SM353LT:</b> 310 nA typ.	8 mA max.	11 mA max.	<b>operate:</b> 16.8 mA max. <b>release:</b> 8.4 mA max.	7 mA max.
<b>Output type</b>	low: 0.03 V typ. high: Vs - 0.03 V typ.	digital sinking	digital sinking	digital sourcing	sin(2Θ), cos(2Θ)
<b>Operating temperature range</b>	-40 °C to 85 °C [-40 °F to 185 °F]	-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]
<b>Features</b>	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	ultra-high sensitivity: 7 Gauss typ., 11 G Gauss max. (SM351RT, SM451R); very high sensitivity: 14 Gauss typ., 20 Gauss max. (SM353RT, SM453R)	omnipolar magnets, sinking output, low Gauss operation (25 G max.), 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]

- <sup>1</sup>Dimensions:
- **SOT-23:** 2,8 mm x 2,9 mm [0.11 in x 0.11 in]
  - **Flat TO-92-style:** 3,0 mm x 4,0 mm [0.12 in x 0.16 in] (not including leads)
  - **VF-401 flat TO-92-style:** 3,0 mm x 4,06 mm [0.12 in x 0.16 in] (not including leads)
  - **SOT-89B:** 4,2 mm x 4,5 mm [0.16 in x 0.18 in]
  - **U-Pack:** 4,5 mm x 4,5 mm [0.18 in x 0.18 in] (not including leads)
  - **SOIC-8:** 4,9 mm x 6,0 mm [0.19 in x 0.24 in]

# Magnetic Sensors | Hall-effect Digital Sensor ICs

Constructed from a thin sheet of conductive material with output connections perpendicular to the direction of current flow. Include bipolar, latching, omnipolar, or unipolar magnetics in a variety of package styles. Energy-efficient micropower version for potential applications with low power requirements and/or battery operation.



	<b>SL353</b>	<b>SS30AT, SS40A, SS50AT</b>	<b>SS311PT, SS411P</b>	<b>SS340RT, SS440R Series</b>
<b>Description</b>	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
<b>Magnetic actuation type</b>	omnipolar	bipolar	bipolar	unipolar
<b>Package style<sup>1</sup></b>	SOT-23 (pocket tape and reel)	<b>SS30AT:</b> SOT-23 (pocket tape and reel) <b>SS40A:</b> flat TO-92-style (bulk) <b>SS50AT:</b> SOT-89B (pocket tape and reel)	<b>SS311PT:</b> SOT-23 (pocket tape and reel) <b>SS411P:</b> flat TO-92-style (bulk)	<b>SS340RT:</b> SOT-23 (pocket tape and reel) <b>SS440R:</b> flat TO-92-style
<b>Supply voltage</b>	2.2 Vdc to 5.5 Vdc	4.5 Vdc to 24 Vdc	2.7 Vdc to 7 Vdc	<b>SS340RT &gt;125 °C [247 °F]:</b> 3 Vdc to 12 Vdc <b>all others:</b> 3 Vdc to 18 Vdc
<b>Supply current</b>	<b>SL353LT:</b> 1.8 m typ. at 2.8 Vdc <b>SL353HT:</b> 0.33 mA typ. at 2.8 Vdc	10 mA max.	14 mA max.	8 mA
<b>Operating temperature range</b>	-40 °C to 85 °C [-40 °F to 185 °F]	<b>SS40A:</b> -40 °C to 125 °C [-40 °F to 257 °F] <b>SS30AT, SS50AT:</b> -40 °C to 125 °C [-40 °F to 257 °F]	-40 °C to 150 °C [-40 °F to 302 °F]	<b>SS340RT (3 Vdc to 24 Vdc):</b> -40 °C to 125 °C [-40 °F to 257 °F] <b>SS340RT (3 Vdc to 12 Vdc), SS440R (3 Vdc to 24 Vdc):</b> -40 °C to 150 °C [-40 °C to 302 °F]
<b>Features</b>	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 North pole (SS340RT) or South pole (SS440R), multiple magnetic sensitivities (high, medium, and low)

<sup>1</sup>Dimensions:

- **SOT-23:** 2,8 mm x 2,9 mm [0.11 in x 0.11 in]
- **Flat TO-92-style:** 3,0 mm x 4,0 mm [0.12 in x 0.16 in] (not including leads)
- **SOT-89B:** 4,2 mm x 4,5 mm [0.16 in x 0.18 in]



**SS345PT,  
SS445P**

**SS351AT,  
SS451A,  
SS551AT**

**SS360NT, SS360ST,  
SS360ST-10K,  
SS460S, SS460S-T2,**

**VF360NT,  
VF360ST,  
VF460S**

**SS360PT,  
SS460P,  
SS460P-T2**

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 Hall-effect digital sensor IC

high sensitivity latching digital Hall-effect sensor IC with built-in pull-up resistor

unipolar

omnipolar

latching

latching

latching

**SS345PT:** SOT-23 (pocket tape and reel)  
**SS445P:** flat TO-92-style (bulk)

**SS351AT:** SOT-23 (pocket tape and reel)  
**SS451A:** flat TO-92-style (bulk)  
**SS551AT:** SOT-89B (pocket tape and reel)

**SS360NT, SS360ST, SS360ST-10K:** SOT-23 (pocket tape and reel)  
**SS460S:** flat TO-92-style (bulk)  
**SS460S-T2:** flat TO-92-style, formed leads (ammopack)

**VF360NT, VF360ST:** SOT-23 (pocket tape and reel)  
**VF460S:** flat TO-92-style (bulk)

**SS360PT:** SOT-23 (pocket tape and reel)  
**SS460P:** flat TO-92-style (bulk)  
**SS460P-T2:** flat TO-92-style, formed leads (ammopack)

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

3 Vdc to 24 Vdc

14 mA

**3 V:** 5 mA max. at 25 °C [77 °F]  
**5 V:** 6 mA max. at 25 °C [77 °F]

8 mA max.

8 mA

10 mA

-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 150 °C  
[-40 °F to 302 °F]

-40 °C to 125 °C  
[-40 °F to 257 °F]

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 its class, no chopper stabilization

qualified to the AEC-Q100 standard for potential use in automotive applications, fastest response time in its class

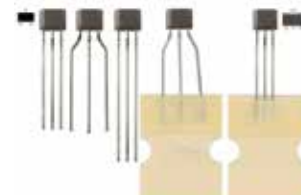
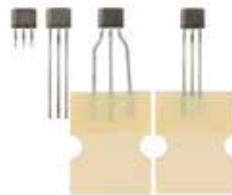
fastest response time in its class, no chopper stabilization, operates from only 30 Gauss typical, at 25 °C [77 °F]

# Magnetic Sensors | Hall-effect Digital and Linear Sensor ICs

Potential applications are many, including closure detection; presence-absence, metering, and displacement sensing in laptops, drug carts and and battery-powered equipment such as hand-held scanners, computers, and water/gas/electricity meters; and speed and RPM sensing in brushless dc motors.



Digital	SS42R	VF526DT
<b>Description</b>	latching dual Hall-effect digital sensor IC with active high/active low complementary output	latching dual Hall-effect digital sensor IC with speed and direction outputs
<b>Magnetic actuation type</b>	latching	latching
<b>Package style<sup>1</sup></b>	4-pin SIP (bulk)	SOT-89B (pocket tape and reel)
<b>Supply voltage</b>	4.5 Vdc to 16 Vdc	3.4 Vdc to 24 Vdc
<b>Supply current</b>	11 mA max.	14 mA max.
<b>Output type</b>	digital.sinking or sourcing	digital.sinking
<b>Operating temperature range</b>	0 °C to 100 °C [32 °F to 212 °F]	-40 °C to 125 °C [-40 °F to 257 °F]
<b>Features</b>	latching magnetics, sinking or sourcing outputs, reverse polarity protection	latching magnetics, sinking output, tape and reel available

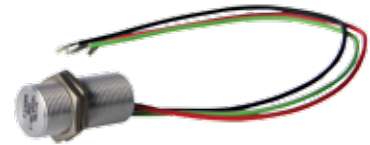
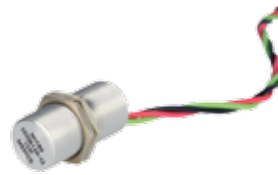


Linear	SS490 Series	SS39ET, SS49E, SS49E-F, SS49E-L, SS49E-T2, SS49E-T3, SS59ET
<b>Description</b>	Hall-effect linear sensor IC	Hall-effect linear sensor IC
<b>Magnetic actuation type</b>	linear	linear
<b>Package style<sup>1</sup></b>	flat TO-92-style, surface mount (pocket tape and reel) flat TO-92-style, standard straight leads (bulk) flat TO-92-style, formed leads (ammopack) flat TO-92-style, standard straight leads (ammopack)	<b>SS39ET:</b> SOT-23 (pocket tape and reel) <b>SS49E:</b> flat TO-92-style, standard straight leads (bulk) <b>SS49E-F:</b> flat TO-92-style, formed leads (bulk) <b>SS49E-L:</b> flat TO-92-style, long straight leads (bulk) <b>SS49E-T2:</b> flat TO-92-style, formed leads (ammopack) <b>SS49E-T3:</b> flat TO-92-style, standard straight leads (ammopack) <b>SS59ET:</b> SOT-89B (pocket tape and reel)
<b>Supply voltage</b>	4.5 Vdc to 10.5 Vdc	2.7 Vdc to 6.5 Vdc
<b>Supply current</b>	10 mA	10 mA max.
<b>Output type</b>	ratiometric sinking or sourcing	ratiometric sourcing
<b>Operating temp. range</b>	-40 °C to 150 °C [-40 °F to 302 °F]	-40 °C to 100 °C [-40 °F to 212 °F]
<b>Features</b>	linear magnetics, ratiometric sourcing output, positive temperature coefficient, different package styles	linear magnetics, ratiometric sourcing output, low voltage operation, different package styles

<sup>1</sup>Dimensions:

- 4-Pin SIP: 3,6 mm x 5,1 mm [0.14 in x 0.20 in]
- SOT-89B: 4,2 mm x 4,5 mm [0.16 in x 0.18 in]
- Flat TO-92-style: 3,0 mm x 4,0 mm [0.12 in x 0.16 in] (not including leads)

Consist of Hall-effect or magnetoresistive sensor ICs packaged in plastic housings for use in corrosive environments, or aluminum housings for non-corrosive use. Include digital or linear position sensors (activated by an external magnet) and vane sensors (activated by a ferrous metal actuator). Choice of cable materials provides application flexibility.



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, 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	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]
Dimensions	Ø11,9 mm x 25,4 mm [15/32-2 x 1.0 in]	Ø11,9 x 25,4 mm [15/32-2 x 1.0 in]
Features	unipolar, bipolar, and latching 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



# Magnetic Sensors | Value Added

Potential applications include position and RPM sensing, cam and crankshaft speed and position, transmissions, tachometers, traction control, and sprocket speed in fitness and information technology, food and beverage environments, chemical plants, and refineries.



Series	SR16/SR17	SR3	SR4
<b>Description</b>	low-cost Hall-effect vane sensor	Hall-effect digital position sensor	magnetostrictive digital position sensor
<b>Package material and style</b>	SR16: plastic dual tower with variety of terminations SR17: plastic side-mount wire exit	plastic threaded barrel	plastic threaded barrel
<b>Magnetic actuation type</b>	-	unipolar, bipolar	omnipolar
<b>Operation</b>	ferrous metal actuator	proximity to external magnet	proximity to external magnet
<b>Supply voltage range</b>	3.8 Vdc to 30 Vdc	4.5 Vdc to 24 Vdc	3.8 Vdc to 30 Vdc
<b>Supply current</b>	10 mA max.	10 mA	11 mA
<b>Output type</b>	digital sinking	digital sinking	digital sinking
<b>Operating temperature range</b>	-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]
<b>Dimensions</b>	24,6 mm x 12,4 mm [0.97 in x 0.49 in]	Ø12,4 mm x 25,4 mm [0.49 in x 1.0 in]	19,0 mm H x 25,4 mm [0.75 in H x 1.0 in]
<b>Features</b>	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





Use multiple technologies to detect a change in a rotating, ferrous metal target such as a gear, shaft or similar mechanism to create an electronic signal for control system interface. No moving parts - speed and direction sensing, or speed sensing only, is accomplished without contacting the target. Dual or single digital output versions available.



Series	SNG-Q	SNDH-T	SNDH-H
<b>Description</b>	quadrature speed and direction sensor with 4-wire quadrature sensor	dual differential Hall-effect quadrature speed and direction sensor	single Hall-effect speed sensor
<b>Housing</b>	PBT	stainless steel, plastic	stainless steel, plastic
<b>Supply voltage range</b>	4.5 V to 26 V	4.5 Vdc to 18 Vdc	4 Vdc to 24 Vdc, 4.5 Vdc to 24 Vdc, 6.5 Vdc to 24 Vdc
<b>Supply current</b>	2 mA normal, 18 mA max.	18 mA max.	6 mA max., 14 mA max., 20 mA max.
<b>Output type</b>	square wave	square wave	digital sinking
<b>Operating frequency range</b>	3 Hz to 20 kHz	1 Hz to 15 kHz	0 Hz to 12 kHz, 0 Hz to 15 kHz, 2 Hz to 15 kHz
<b>Operating temperature range</b>	-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] inclusive
<b>Dimensions</b>	various, depends upon type	Ø15 mm x 45 mm L [0.6 in x 1.77 in L]	various, depends upon type
<b>Features</b>	design and manufacturing uses platform-based approach that enables cost-competitiveness and mechanical and electrical configurability; designed for potential applications where enhanced accuracy is required to detect small target features	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

Provide true zero speed capability 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
Description	single Hall-effect zero speed sensor	single Hall-effect zero speed sensor
Housing	stainless steel	aluminum
Supply voltage range	4.5 Vdc to 26 Vdc	4 Vdc to 24 Vdc
Supply current	20 mA	6 mA
Output type	digital sinking	digital sinking
Operating frequency range	0 Hz to 15 kHz	0 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]
Dimensions	Ø9,5 mm [3/8 in/0.375 in] and Ø15,9 mm [5/8 in/0.625 in], 50,8 mm [2.00 in] and 76,2 mm [3.00 in] lengths	Ø11,9 mm [15/32 in/0.46875 in] x 25,4 mm [1.00 in] L
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



Series	584XX
Description	digital magnetic speed sensor
Housing diameter	3/8, in 5/8 in; various lengths
Supply voltage	5 Vdc to 30 Vdc
Output signal	digital square wave
Output voltage range	Low: 350 mV max. at 20 mA max. current sink High: $(R_L \times V_S) / (R_L + 2.2 \text{ k}\Omega)$
Operating frequency (max.)	10 kHz, 50 kHz
Housing material/style	stainless steel/threaded
Termination	MS3106A-10SL-3S (5/8 only) or preleaded
Vibration	meets MIL-STD 202F, method 204D
Operating temperature range	-40 °C to 107 °C [-40 °F to 225 °F]
Features	produces constant amplitude output signals suitable for direct use in many digital and logic control applications, internal digital signal conditioning


Passive Variable Reluctance Sensors (VRS) 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.



Series	VRS General Purpose	VRS Hazardous Location	VRS High Output
<b>Description/ potential applications</b>	used where medium to high speeds or in electrically noisy environments with relatively small air gaps exist	used where explosion-proof or intrinsically safe sensors are required	used where higher output voltages are needed, perform best at low to medium speeds with medium to high impedance loads (sealed front-end versions for use where the sensor is exposed to fluids, lubricants or adverse environmental conditions)
<b>Output voltage range</b>	8 Vp-p to 40 Vp-p (inclusive)	30 Vp-p to 60 Vp-p (inclusive)	8 Vp-p to 190 Vp-p (inclusive)
<b>Housing diameter</b>	5/8 in, 3/8 in, 1/4 in, 10/32 in; various lengths	3/4 in, 5/8 in; various lengths	5/8 in, 3/8 in; various lengths
<b>Housing material/style</b>	stainless steel/threaded or smooth	stainless steel/ threaded	stainless steel threaded or smooth
<b>Termination</b>	MS3106 connector, preleaded	MS3106 connector, preleaded	MS3106 connector, preleaded
<b>Operating temperature range</b>	-55 °C to 120 °C [-67 °F to 250 °F] (inclusive)	-73 °C to 120 °C [-100 °F to 250 °F] (inclusive)	-55 °C to 150 °C [-67 °F to 300 °F] (inclusive)



Series	VRS High Resolution	VRS High Temperature	VRS Power Output
<b>Description/ potential applications</b>	used where precise timing pulse is required, and/or fine pitch gears are used	used where the sensor is exposed to temperatures up to 260 °C [450 °F] (sealed front-end versions for use where the sensor is exposed to fluids, lubricants or adverse environmental conditions)	used where driving low resistance loads at large air gaps is required, and larger actuators are used
<b>Output voltage range</b>	8 Vp-p to 190 Vp-p (inclusive)	4.7 Vp-p to 125 Vp-p (inclusive)	70 Vp-p (inclusive)
<b>Housing diameter</b>	5/8 in, 3/8 in; various lengths	5/8 in, 3/8 in, 1/4 in; various lengths	5/8 in; various lengths
<b>Housing material/style</b>	stainless steel/threaded or smooth	stainless steel threaded	stainless steel, threaded
<b>Termination</b>	MS3106 connector, preleaded	MS3106 connector, preleaded	MS3106 connector, preleaded
<b>Operating temperature range</b>	-55 °C to 150 °C [-67 °F to 300 °F] (inclusive)	-73 °C to 230 °C [-100 °F to 450 °F] (inclusive)	-55 °C to 120 °C [-67 °F to 250 °F]



# 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 and Defense**

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, board mount and heavy duty pressure sensors/transducers, Hall-effect magnetic position sensors, humidity sensors, flexible heaters, force sensors, thermostats, infrared 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, thermostats, flexible heaters, SMART position sensors, board mount and heavy duty pressure sensors/transducers, force sensors, push-pull switches, and MICRO SWITCH™ basic switches, hazardous area switches, safety switches, key and rotary switches, limit switches, sealed and high-accuracy switches, pushbutton, rocker, toggle switches, and relays.



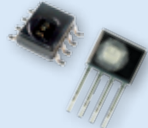



## Transportation

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, SMART position sensors, and MICRO SWITCH™ pushbutton, rocker, and toggle switches.




## SENSORS

	<p><b>Thermostats:</b> Commercial and precision snap-action. Automatic or manual reset options, phenolic or ceramic housings.  <b>May be used in:</b> 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><b>Pressure transducers – heavy duty:</b> 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.  <b>May be used in:</b> 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><b>Magnetic sensors:</b> Digital and analog Hall-effect position ICs, magnetoresistive position ICs, Hall-effect vane and magnetic sensors.  <b>May be used in:</b> 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 • bration • Weight Sensing</p>		<p><b>Humidity sensors:</b> Digital, analog, and combined humidity/temperature sensing versions. Provide on-chip signal conditioning with accuracy capability to <math>\pm 1.7\%</math> RH. Stable, reliable, low-drift performance. Standardized, platform-based sensors.  <b>May be used in:</b> Medical • HVAC/R • Weather Stations • Air Compressors • Telecommunications • Grain Storage • Incubators</p>
	<p><b>Current sensors:</b> Accurate and fast response. Almost no thermal drift or offset with temperature. Adjustable linear, null balance, digital and linear.  <b>May be used in:</b> Variable Speed Drives • Overcurrent Protection • Power Supplies • Ground Fault Detectors • Robotics • Industrial Process Control • Wattmeters</p>		<p><b>Flexible heaters:</b> 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.  <b>May be used in:</b> Medical • HVAC/R • LCD Displays • Power Generation • Telecommunication</p>
	<p><b>Pressure sensors – board mount:</b> Full line of industrial-grade sensors: media-isolating design, multiple ports and outlets, and electrical configurations.  <b>May be used in:</b> Pneumatic Controls • Air Compressors • Process Monitoring • Hydraulic Controls • VAV Controls • Clogged Filter Detection • Presence/Absence of Flow • Transmissions</p>		<p><b>Temperature sensors:</b> Customized probes, thermistors and RTD sensors. Plastic/ceramic, miniaturized, surface-mount housings and printed circuit board terminations.  <b>May be used in:</b> Semi-Conductor Protection • Vending Machines • Power Generation • Hydraulic Systems • Medical • Thermal Management • Temperature Compensation</p>



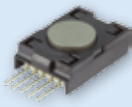




## ELECTROMECHANICAL SWITCHES

	<p><b>MICRO SWITCH™ basic switches:</b> 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.  <b>May be used in:</b> Vending Machines • Communication Equipment • HVAC • Appliances • Automotive • Electronic Gaming Machinery • Valve Controls • Irrigation Systems • Foot Switches • Pressure • Temperature Controls</p>		<p><b>MICRO SWITCH™ sealed and high accuracy switches:</b> Precision “snap action” mechanisms. Wide variety of actuators, terminations, circuitry configurations, electrical ratings, contact materials and operating characteristics.  <b>May be used in:</b> Landing Gear • Flap/Stabilizer Controls • Thrust Reversers • Space Vehicles • Armored Personnel Carriers • De-Icer Controls • Wingfold Actuators • Industrial Environments • Valves • Underwater</p>
	<p><b>MICRO SWITCH™ hazardous area switches:</b> Flame path designed to contain and cool escaping hot gases that could cause an explosion. MICRO SWITCH™ EX, BX, CX and LSX Series.  <b>May be used in:</b> Grain Elevators and Conveyors • Off-Shore Drilling • Petrochemical • Waste-Treatment Plants • Control Valves • Paint Booths • Hazardous Waste Handling Facilities</p>		<p><b>Key and rotary switches:</b> Environmentally sealed, 2-3-4 position switches. O-rings help keep dirt and moisture out and prolong life.  <b>May be used in:</b> All-Terrain Vehicles • Golf Carts • Snowmobiles • Scissor Lifts • Telehandlers • Construction and Marine Equipment • Skid Loaders • Agricultural Equipment • Material Handlers</p>
	<p><b>Pressure and vacuum switches:</b> Feature setpoints from 3 psi to 4500 psi. Rugged components have enhanced repeatability, flexibility and wide media capability. Uses diaphragm or quad seal/piston.  <b>May be used in:</b> Transmissions • Hydraulics • Brakes • Steering • Generators/Compressors • Dental Air • Embalming Equipment • Oxygen Concentrators • Air Cleaners • Fuel Filters • Pool Water Pressure</p>		<p><b>MICRO SWITCH™ toggle switches:</b> Hermetic and environmentally sealed options. Enhanced reliability. Center pin for ultimate stabilization. Available in many shapes, sizes and configurations.  <b>May be used in:</b> 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><b>Limitless™ switches and receivers:</b> 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.  <b>Limitless™ Operator Interface:</b> 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.  <b>May be used in:</b> 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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With more than 50,000 sensing, switching and control products ranging from snap-action, limit, toggle and pressure switches to position, speed, pressure and airflow sensors, Honeywell has one of the broadest sensing and switching portfolios available.

	<p><b>Position sensors:</b> The <b>SMART position sensor</b> 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.  <b>May be used in:</b> 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</p> <p><b>Potentiometer sensors:</b> Measure linear, rotary position or displacement. Honeywell's proprietary conductive plastic delivers extensive temperature range and infinite resolution, and provides precision position measurement.  <b>May be used in:</b> Robotic Motion Control • Marine Steering • In-Tank Level Sensing</p> <p><b>Ultrasonic sensors:</b> Measure time delays between emitted and echo pulses, often accurately determining the sensor-to-target distance.  <b>May be used in:</b> Level Measurement • Height and Thickness Sensing • Diameter Control</p>	
	<p><b>Infrared sensors:</b> IREDS, sensors and assemblies for object presence, limit and motion sensing, position encoding and movement encoding. Variety of package styles, materials and terminations.  <b>May be used in:</b> Printers/Copiers • Motion Control Systems • Metering • Data Storage Systems • Scanning • Automated Transaction • Drop Sensors • Non-Invasive Medical Equipment</p>	 <p><b>Force sensors:</b> Variety of package styles and various electrical interconnects including pre-wired connectors, printed circuit board mounting and surface mounting for flexibility.  <b>May be used in:</b> Infusion and Syringe Pumps • Blood Pressure Equipment • Pump Pressure • Drug Delivery Systems • Occlusion Detection • Kidney Dialysis Machines</p>
	<p><b>Proximity sensors:</b> Designed to meet demanding temperature, vibration, shock and EMI/EMP interference requirements. Number of housing materials and termination styles.  <b>May be used in:</b> Aircraft Landing Gear • Gun Turret Position Control • Door/Hatch Monitoring</p>	 <p><b>Speed sensors:</b> Measure speed, position and presence detection utilizing magneto-resistive, variable reluctance, and Hall-effect technologies.  <b>May be used in:</b> Cam and Crankshafts • Transmissions • Fans • Pumps • Mixers • Rollers • Motors</p>
	<p><b>Airflow sensors:</b> 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.  <b>May be used in:</b> HVAC • Respirators • Process Control • Oxygen Concentrators • Gas Metering • Chromatography • Leak Detection Equipment • Medical/Analytical Instrumentation • Ventilation Equipment</p>	 <p><b>Rotary position sensors:</b> Digital and analog Hall-effect, magneto-resistive and potentiometric devices and resolvers for sensing presence of a magnetic field or rotary position. Directly compatible with electronic circuits for application flexibility.  <b>May be used in:</b> Audio and Lighting • Frequency • Temperature • Position • Medical/Instrumentation • Computer Peripherals • Manual Controls • Joysticks • Telecom • Welding • Heating • Aerospace</p>

	<p><b>MICRO SWITCH™ aerospace-grade pressure switches:</b> 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.  <b>May be used in:</b> Aerospace Systems • Engines, Fuel Pressure and Hydraulic Systems • Military Ground Vehicles • Ordnance and Munitions Release Systems • Military Maritime Systems</p>	 <p><b>MICRO SWITCH™ limit switches:</b> 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.  <b>May be used in:</b> 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><b>MICRO SWITCH™ pushbutton switches:</b> 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.  <b>May be used in:</b> Control Boards and Panels • Industrial and Test Equipment • Flight Decks • Medical Instrumentation • Process Control</p>	 <p><b>MICRO SWITCH™ sealed and standard rocker switches:</b> Wide range of electrical and display design. Many shapes, sizes, buttons and configurations to enhance manual operation.  <b>May be used in:</b> Transportation • Agricultural and Construction Equipment • Test Equipment • Heavy-Duty Machinery • Marine Equipment • Small Appliances • Telecom • Medical Instrumentation • Commercial Aviation</p>

## SAFETY SWITCHES

	<p><b>MICRO SWITCH™ safety switches:</b> For operator point-of-operation protection, access detection, presence sensing, gate monitoring and electrical interfacing. High-quality, dependable, cost-effective solutions.  <b>May be used in:</b> 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 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.

## **Find out more**

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

## **Honeywell Sensing and Productivity Solutions**

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