



**Honeywell**

THE POWER OF **CONNECTED**

# Speed Sensors

Product Range Guide

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

With more than 50,000 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.

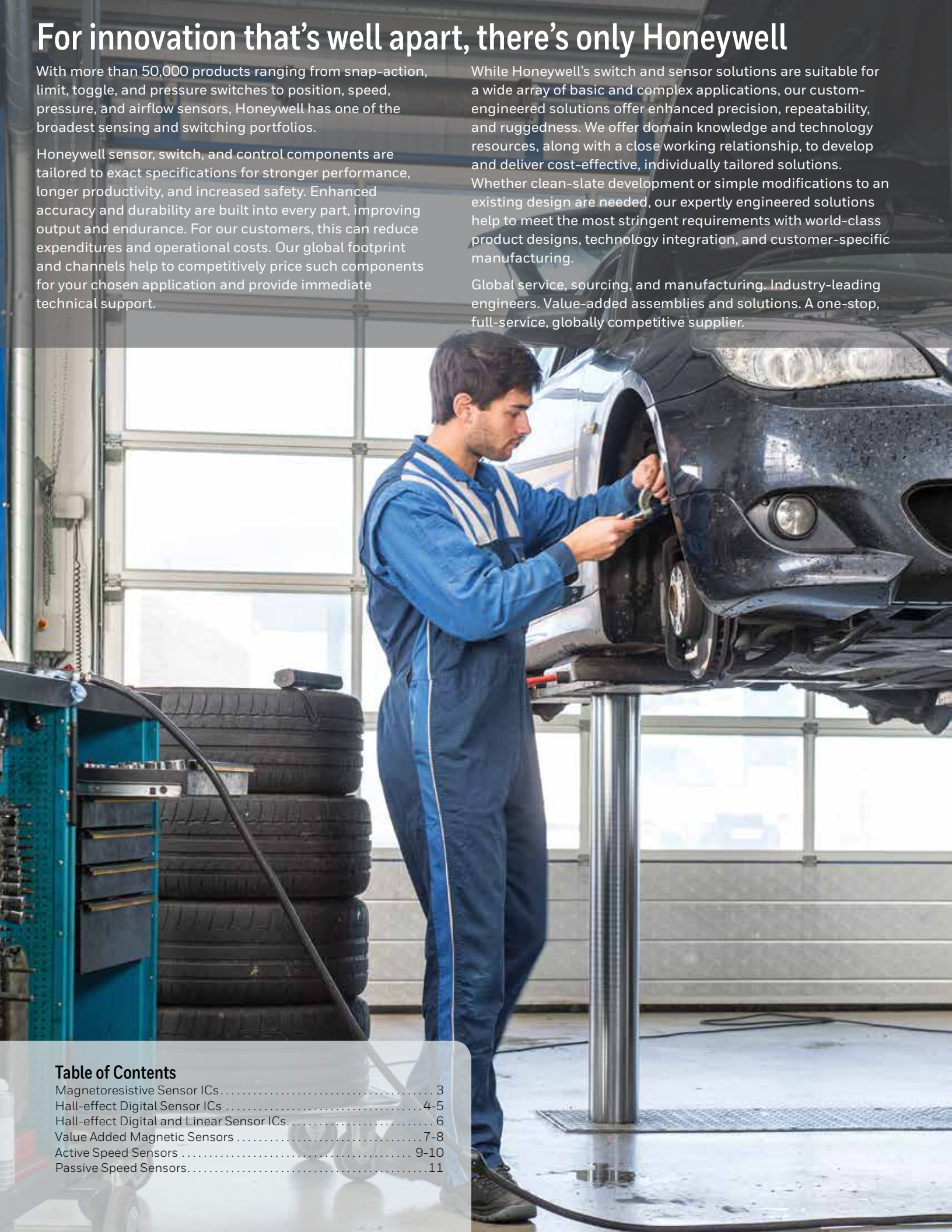
Honeywell sensor, switch, and control components are tailored to exact specifications for stronger performance, longer productivity, and increased safety. Enhanced accuracy and durability are built into every part, improving output and endurance. For our customers, this can reduce expenditures and operational 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.

## Table of Contents



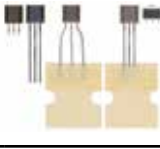


Magnetoresistive Sensor ICs.....	3
Hall-effect Digital Sensor ICs.....	4-5
Hall-effect Digital and Linear Sensor ICs.....	6
Value Added Magnetic Sensors.....	7-8
Active Speed Sensors.....	9-10
Passive Speed Sensors.....	11



# 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.



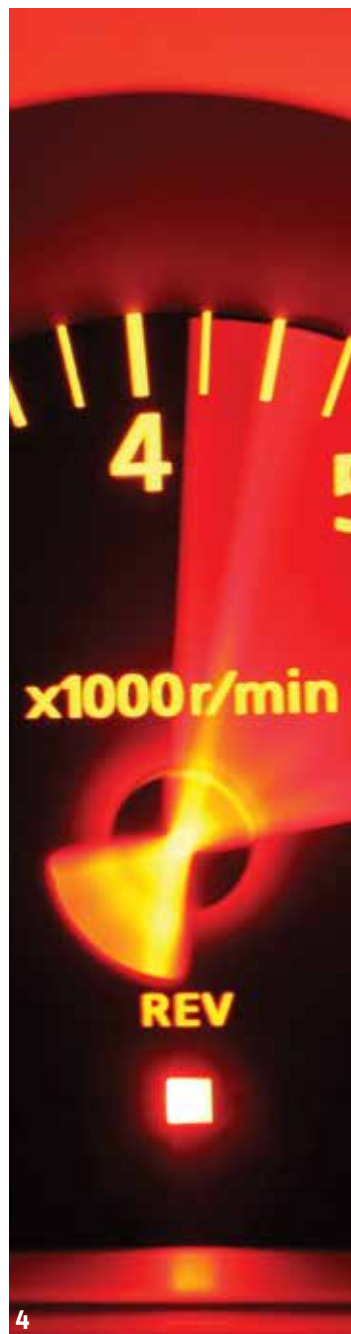
					
	<b>Nanopower Series</b>	<b>Standard Power Series</b>	<b>2SS52M Series</b>	<b>VF401</b>	<b>APS00B</b>
<b>Description</b>	omnipolar MR sensor IC	omnipolar MR sensor IC	omnipolar MR digital sensor IC	2-wire MR fine pitch ring magnet sensor IC	high resolution magnetic displacement sensor IC
<b>Magnetic actuation 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>	<b>low:</b> 0.03 V typ. <b>high:</b> $V_s - 0.03$ V typ.	digital sinking	digital sinking	digital sourcing	$\sin(2\Theta)$ , $\cos(2\Theta)$
<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	<b>VF526DT</b>
<b>Description</b>	latching dual Hall-effect digital sensor IC with speed and direction outputs
<b>Magnetic actuation type</b>	latching
<b>Package style<sup>1</sup></b>	SOT-89B (pocket tape and reel)
<b>Supply voltage</b>	3.4 Vdc to 24 Vdc
<b>Supply current</b>	14 mA max.
<b>Output type</b>	digital sinking
<b>Operating temperature range</b>	-40°C to 125°C [-40°F to 257°F]
<b>Features</b>	latching magnetics, sinking output, tape and reel available



Linear	<b>SS490 Series</b>	<b>SS39ET, SS49E, SS49E-F, SS49E-L, SS49E-T2, SS49E-T3, SS59ET</b>
<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

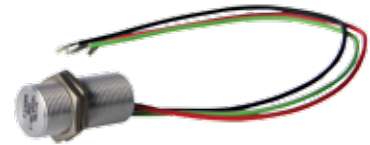
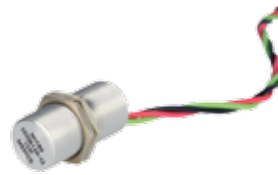
<sup>1</sup>Dimensions:

- **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)



## Magnetic Sensors | Value Added

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	magnetoresistive 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





# Speed Sensors | Active

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 output	quadrature speed and direction sensor with 4-wire output	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>	Ø15 mm x 35 mm L [0.6 in x 1.38 in L] Ø15 mm x 45 mm L [0.6 in x 1.77 in L]	Ø15 mm x 45 mm L [0.6 in x 1.77 in L]	various, depends upon individual catalog listing
<b>Features</b>	design and manufacturing platform-based approach 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]