

Position Sensors

Honeywell



SENSING AND CONTROL

Product Range Guide

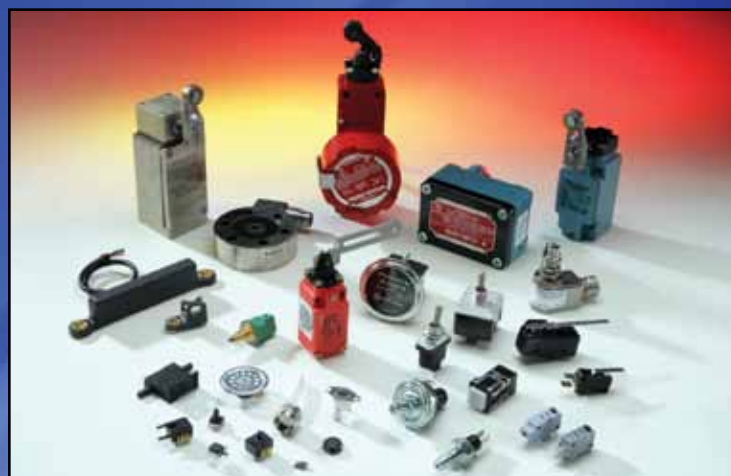
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With more than 50,000 products ranging from snap-action, limit, toggle, and pressure switches to position, speed, pressure, and airflow sensors, Honeywell Sensing and Control (S&C) has one of the broadest sensing and switching portfolios available.

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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-



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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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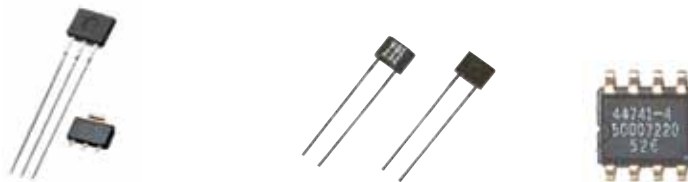
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Magnetic Sensors

First-Level Magnetoresistive Sensor ICs



With a built-in magnetoresistive bridge integrated on silicon and encapsulated in a plastic package, first-level magnetoresistive sensor ICs feature an integrated circuit that responds to low fields at large distances. Potential applications include laptops, material handling equipment, and pneumatic cylinders.



Series	2SS52M/SS552MT	VF401	APS00B
Description	omnipolar magnetoresistive digital sensor IC	2-wire MR fine pitch ring magnet sensor IC	high resolution magnetic displacement sensor IC
Magnetic actuation type	omnipolar	differential bridge	analog, saturated mode
Package material and style	2SS52M: plastic radial leads SS552MT: plastic surface mount (SOT-89)	plastic flat, TO-92-style	plastic surface mount (SO-8)
Supply voltage range	3.8 Vdc to 30 Vdc	4.5 Vdc to 16 Vdc	1 Vdc to 12 Vdc
Supply current	11 mA max.	I _{cc} operate: 16.8 mA max. I _{cc} release: 8.4 mA max.	7 mA max.
Output type	digital sinking	digital current source	sin(2Θ), cos(2Θ)
Operating temperature range	-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)	2SS52M: 4,5 mm x 4,5 mm [0.18 in x 0.18 in] SS552MT: 4,2 mm x 4,5 mm [0.16 in x 0.18 in]	2,8 mm x 2,9 mm [0.11 in x 0.11 in]	4,9 mm x 6,0 mm [0.19 in x 0.24 in]
Features	omnipolar magnetics; sinking output, low gauss operation (25 G max.); operating speed of 0 kHz to over 100 kHz; tape and reel available	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 responding to changes in magnetic field angle; sine and cosine output; accurate to 0,102 mm [0.004 in]; tape and reel available

Magnetic Sensors

First-Level Hall-Effect Digital Sensor ICs

Constructed from a thin sheet of conductive material, first-level 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	SS30AT/SS40A/ SS50AT	SS311PT/SS411P	SS340RT/SS440R
Description	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	bipolar	bipolar	unipolar
Package material and style	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	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	10 mA max at 25 °C [77 °F]	14 mA max.	8 mA
Output type	digital sinking	digital sinking	digital sinking
Operating temperature range	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): -40 °C to 150 °C [-40 °C to 302 °F] SS440R (3 Vdc to 24 Vdc): -40 °C to 150 °C [-40 °F to 302 °F]
Measurements (H x W)	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] SS441P: 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	bipolar magnetics; high output current and speed capability; reverse polarity protection	bipolar magnetics; built-in pull-up resistor; low voltage; enhanced sensitivity	unipolar magnetics; simple activation from a South pole and multiple magnetic sensitivities (high, medium, and low); low voltage; built-in reverse polarity protection



SS345PT/ SS445P	SS351AT/ SS451A	SS361CT/ SS461C	SS361RT/ SS461R	SS400/SS500	SS41/SS51T
unipolar Hall-effect digital sensor IC	low-cost omnipolar Hall-effect digital sensor IC	high sensitivity, bipolar latching Hall-effect digital sensor IC	low-cost Hall-effect digital sensor IC	SS400: Hall-effect digital sensor IC SS500: unipolar/bipolar/bipolar latching Hall-effect digital sensor IC	bipolar Hall-effect digital sensor IC
unipolar	omnipolar	bipolar latching	bipolar latching	unipolar, bipolar, bipolar latching	bipolar
SS345PT: plastic surface mount (SOT-23) SS445P: plastic radial lead	SS351AT: plastic surface mount (SOT-23) SS451A: plastic radial lead	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 (-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	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)	6 mA max.	8 mA	SS400: 10 mA SS500: 8.7 mA at 5 Vdc	15 mA max.
digital sinking	digital sinking	digital sinking	digital sinking	digital sinking	digital sinking
-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]	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]	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); low voltage 2.7 Vdc capability; built-in pull-up resistor	omnipolar (responds to either a North pole or a South pole); built-in reverse polarity protection; thermally balanced integrated circuit; typical operating point of 85 G at 25 °C [77 °F]	enhanced sensitivity; simple activation from a North pole (SS361CT) or a South pole (SS461C); wide operating voltage range; built-in reverse voltage capability	bipolar latching magnetics; enhanced sensitivity; low voltage; built-in reverse polarity protection; robust design	unipolar, bipolar, and bipolar latching; sinking output; multiple operate/release points available	bipolar magnetics; sinking output; high output current; reverse polarity protection

Magnetic Sensors

First-Level Hall-Effect Digital and Linear Sensor ICs



Constructed from a thin sheet of conductive material, first-level 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.



Digital Series	SS421	SS42R
Description	adjustable bipolar Hall-effect digital sensor IC with underspeed detection	bipolar latching dual Hall-effect digital sensor IC with active high/active low complementary output
Magnetic actuation type	bipolar	bipolar latching
Package material and style	plastic radial lead	plastic radial lead
Supply voltage	4.5 Vdc to 16 Vdc	4.5 Vdc to 16 Vdc
Supply current	15 mA max.	11 mA max.
Output type	digital sinking	digital sinking or sourcing
Operating temperature range	-40 °C to 105 °C [-40 °F to 221 °F]	0 °C to 100 °C [32 °F to 212 °F]
Measurements (H x W)	3,6 mm x 5,1 mm [0.14 in x 0.20 in]	3,6 mm x 5,1 mm [0.14 in x 0.20 in]
Features	bipolar magnetics; sinking output; active high and active low versions; adjustable speed trip point	bipolar latching magnetics; sinking or sourcing outputs; reverse polarity protection



Linear Series	91SS	SS490/SS491B
Description	Hall-effect linear sensor IC	Hall-effect linear sensor IC
Magnetic actuation type	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
Supply voltage	8 Vdc to 16 Vdc	4.5 Vdc to 10.5 Vdc
Supply current	19 mA max.	10 mA
Output type	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]
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]
Features	linear magnetics; ratiometric sourcing output; positive temperature coefficient; different styles	linear magnetics; ratiometric sourcing output; positive temperature coefficient; different styles



SS46

bipolar latching Hall-effect digital sensor IC

bipolar latching

plastic radial lead

4.5 Vdc to 24 Vdc

10 mA max.

digital sinking

-40 °C to 150 °C [-40 °F to 302 °F]

3,0 mm x 4,1 mm [0.12 in x 0.16 in]

bipolar latching magnetics; sinking or sourcing output; high output current capability



VF526DT

bipolar latching dual Hall-effect digital sensor IC with speed and direction outputs

bipolar latching

plastic surface mount (SOT-89 style)

3.4 Vdc to 24 Vdc

14 mA max.

digital sinking

-40 °C to 125 °C [-40 °F to 257 °F]

4,2 mm x 4,5 mm [0.16 in x 0.18 in]

bipolar latching magnetics; sinking output; tape and reel available



SS49E/SS59ET

low-cost Hall-effect linear sensor IC

linear

SS49E: plastic radial lead;
SS59ET: plastic surface mount (SOT-89 style)

2.7 Vdc to 6.5 Vdc

10 mA

ratiometric sourcing

-40 °C to 100 °C [-40 °F to 212 °F]

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]

linear magnetics; ratiometric sourcing output; low voltage operation;
tape and reel available



SS94

Hall-effect linear sensor IC

linear

ceramic SIP, ceramic with solder bumps

4.5 Vdc to 12.6 Vdc

30 mA max.

ratiometric sinking or sourcing

-40 °C to 150 °C [-40 °F to 302 °F]

15,2 mm x 7,6 mm [0.60 in x 0.30 in]

linear magnetics; ratiometric sourcing output; standard mounting centers;
linearity ± 1.5 % max.

Magnetic Sensors

Second-Level Value-Added Hall-Effect Sensors



Consists of first-level 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)	1GT
Description	Hall-effect digital position sensor	Hall-effect linear position sensor	Hall-effect sensor
Package material and style	aluminum threaded barrel	aluminum threaded barrel	plastic probe
Magnetic actuation type	unipolar, bipolar, bipolar latching	linear	—
Operation	proximity to external magnet	proximity to external magnet	ferrous metal actuator
Supply voltage range	4.5 Vdc to 24 Vdc	4.5 Vdc to 10.5 Vdc	4.5 Vdc to 26.5 Vdc (inclusive)
Supply current	4 mA to 10 mA (inclusive)	7 mA	20 mA max.
Output type	digital sinking or sourcing (depends on listing)	ratiometric sinking/sourcing	digital sinking
Operating temperature range	-40 °C to 100 °C [-40 °F to 212 °F]	-40 °C to 100 °C [-40 °F to 212 °F]	-40 °C to 150 °C [-40 °F to 302 °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]	Ø 17,9 mm x 31,8 mm L [Ø 0.70 in x 1.25 in L]
Features	unipolar, bipolar, and bipolar 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	sinking output; fast operating speed; reverse polarity and transient protection; EMI resistant



4AV	SR16/SR17	SR3	SR4	VX10/VX80
Hall-effect vane sensor	low-cost Hall-effect vane sensor	Hall-effect digital position sensor	magnetoresistive digital position sensor	Hall-effect solid state switch
plastic dual tower wire exit; plastic dual tower with connector	SR16: plastic dual tower with variety of terminations SR17: plastic side-mount wire exit	plastic threaded barrel	plastic threaded barrel	plunger actuated non-contact switch
–	–	unipolar, bipolar	omnipolar	–
ferrous metal actuator	ferrous metal actuator	proximity to external magnet	proximity to external magnet	plunger actuator
4.5 Vdc to 24 Vdc	3.8 Vdc to 30 Vdc	4.5 Vdc to 24 Vdc	3.8 Vdc to 30 Vdc	4 Vdc to 24 Vdc
18.5 mA max.	10 mA max.	10 mA	11 mA	15 mA
digital sinking	digital sinking	digital sinking	digital sinking	digital sinking
-40 °C to 125 °C [-40 °F to 257 °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]	-40 °C to 75 °C [-40 °F to 167 °F]
19,1 mm H x 10,4 mm W [0.75 in H x 0.41 in W]	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]	15,8 mm H x 28,83 mm L [0.62 in H x 1.135 in L]
sinking output; zero speed capability; on and off times programmable	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	UL/CSA; sinking output; non-con- tact, low-force operation; reverse voltage protection; standard levers and actuators available

Magnetic Sensors

Speed and Direction 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	1GT	GTN	LCZ
Description	single Hall-effect sensor	single Hall-effect sensor	single Hall-effect zero speed sensor
Housing	plastic probe	plastic probe	stainless steel
Supply voltage range	4.5 Vdc to 26.5 Vdc (inclusive)	8 Vdc to 32 Vdc (inclusive)	4.5 Vdc to 26 Vdc
Supply current	20 mA	40 mA	20 mA
Output type	digital sinking (open collector)	digital sinking (open collector)	digital sinking
Operating frequency range	0 Hz to 25 kHz (inclusive)	2 Hz to 9 kHz	0 Hz to 15 kHz
Operating temperature range	-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]
Measurements	Ø 17,9 mm x 31,8 mm L [Ø 0.70 in x 1.25 in L]	Ø 20 mm x probe length (varies) [Ø 0.77 in x probe length (varies)]	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
Features	fast operating speed; reverse polarity and transient protection; EMI resistant	choice of barrel lengths; integrated electronic diagnostics; enhanced operating speed	omni-directional sensor to target; low power consumption; zero speed; digital output



SNDH-T	SNDH-H	SNDJ	ZH10
dual differential Hall-effect quadrature speed and direction sensor	Hall-effect speed sensor	zero speed Hall-effect sensor, differential Hall-effect sensor, dual Hall-effect sensor	single Hall-effect zero speed sensor
stainless steel, plastic	stainless steel, plastic	stainless steel	aluminum
4.5 Vdc to 18 Vdc	4 Vdc to 24 Vdc, 4.5 Vdc to 24 Vdc, 6.5 Vdc to 24 Vdc	8 Vdc to 32 Vdc (inclusive)	4 Vdc to 24 Vdc
18 mA max.	6 mA max., 14 mA max., 20 mA max.	10 mA to 20 mA max. (inclusive)	6 mA
square wave	digital sinking	square wave and one direction signal; square wave signal from NPN output transistor with 2.7 kOhm pull-up; dc-coupled to supply; square wave signal from push-pull stage; dc-coupled to supply	digital sinking
1 Hz to 15 kHz	0 Hz to 12 kHz, 0 Hz to 15 kHz, 2 Hz to 15 kHz	0 Hz to 15 kHz (inclusive)	0 Hz to 15 kHz
-40 °C to 150 °C [-40 °F to 302 °F]	-40 °C to 150 °C [-40 °F to 302 °F] inclusive	-20 °C to 100 °C [-4 °F to 212 °F]	-40 °C to 125 °C [-40 °F to 257 °F]
Ø 15 mm x 45 mm L [Ø 0.6 in x 1.77 in L]	various, depends upon type	Ø 12 mm x 58,7mm L [Ø 0.47 in x 2.31 in L]	Ø 11,9 mm [15/32 in/0.46875 in] x 25,4 mm [1.00 in] L
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	backbiased Hall-effect; direct sensing of ferrous metal target; zero speed sensing; rotational orientation independent of sensor	omni-directional sensor to target; low power consumption; zero speed; digital output

Position Sensors

Linear Potentiometric Sensors



Includes potentiometer sensors for linear, rotary position, or displacement measurement with extended life PTFE bearings and precious metal multi-finger contact wipers. Potential applications include robotic control, marine steering, in-tank sensing, injection molding, and printing.



Series	AQLT	AQMLT	LFII
Description	shaftless, waterproof linear position transducer	shaftless, waterproof linear position transducer	vibration-resistant, plunger-driven linear transducer
Operating temperature range	-40 °C to 80 °C [-40 °F to 176 °F]	-40 °C to 80 °C [-40 °F to 176 °F]	-65 °C to 105 °C [-85 °F to 221 °F]
Supply voltage	30 Vdc max.	30 Vdc max.	30 Vdc max.
Linearity	±1 %	±1 %	±1 %
Starting force (max.)	56,7 g max. [2 oz max.]	28,35 g max. [1 oz max.]	0,45 kg [1 lb] (standard); LFIW: 2,27 kg [5 lb] (water resistant)
Backlash	–	–	0,025 mm [0.001 in] max.
Total resistance	6K Ohm to 38K Ohm	750 Ohm to 18K Ohm	5000 Ohm
Measurement range	127 mm to 965 mm [5 in to 38 in]	12,7 mm to 304,8 mm [0.5 in to 12 in]	152 mm to 1219 mm [6 in to 48 in]
Shaft	–	–	Ø 6,35 mm [Ø 0.25 in]
Total mechanical travel	154,94 mm to 967,74 mm [6.1 in to 38.1 in]	15,24 mm to 307,34 mm [0.6 in to 12.1 in]	154,6 mm to 1221,4 mm [6.09 in to 48.09 in]
Electrical travel	152,4 mm to 965,2 mm [6 in to 38 in]	12,7 mm to 304,8 mm [0.5 in to 12 in]	152,4 mm to 1219,2 mm [6 in to 48 in]
Housing length	electrical travel + 54,87 mm [2.16 in]	electrical travel + 38,1 mm [1.5 in]	electrical travel + 81,02 mm [3.19 in]
Vibration	20 g / 0,75 mm (rms) 5 Hz to 2 kHz	20 g / 0,75 mm (rms) 5 Hz to 2 kHz	20 g / 0,75 mm (rms) 5 Hz to 2 kHz (for vibration levels up to 50 g rms and higher, additional housing clamps are required)
Shock	50 g 11 ms half sine	50 g 11 ms half sine	50 g 11 ms half sine
Expected operating life	one billion dither operations	one billion dither operations	one billion dither operations
Resistance tolerance	±20 %	±20 %	±20 %
Insulation resistance	500 mOhm @ 500 Vdc	500 mOhm @ 500 Vdc	1000 mOhm @ 500 Vdc
Dielectric strength	250 V rms	250 V rms	1000 V rms
Termination	cable	cable	connector, binder series 681
Features	12,7 mm [0.5 in] body diameter; multiple finger-wiper design; anodized extruded aluminum housing; precious metal contact; sealed construction	9,53 mm [0.375 in] body diameter; multiple finger-wiper design; anodized extruded aluminum housing; precious metal contact; sealed construction	vibration-dampened element; precious metal wipers; stainless steel shaft; enhanced dc level output



SLF	LT	MLT	DR
short stroke version of the LFII	plunger-driven linear transducer	plunger-driven linear transducer	DuraStar rodless, space-saving side actuator
-65 °C to 105 °C [-85 °F to 221 °F]	-40 °C to 80 °C [-40 °F to 176 °F]	-40 °C to 80 °C [-40 °F to 176 °F]	-65 °C to 105 °C [-85 °F to 221 °F]
40 Vdc max.	30 Vdc max.	30 Vdc max.	75 Vdc max.
±1 % or ±0.1 %	±1 %	±1 %	0.1 % from 1 % to 100 % of theoretical electrical travel
1 lb (standard) 5 lb (water resistant)	28,35 g max. [1 oz max.] 12 oz max. (water resistant)	28,35 g max. [1 oz max.]	0,45 kg [1.0 lb]
0,025 mm [0.001 in] max.	0,00508 mm [0.0002 in] max.	0,0127 mm [0.0005 in] max.	0,025 mm [0.001 in] max.
1500 Ohm to 9000 Ohm	1000 Ohm to 10000 Ohm	750 Ohm to 9000 Ohm	2000 Ohm to 10000 Ohm
25 mm to 152 mm [1 in to 6 in]	25 mm to 254 mm [1 in to 10 in]	13 mm to 152 mm [0.5 in to 6 in]	102 mm to 1270 mm [4 in to 50 in]
Ø 6,35 mm [Ø 0.25 in]	Ø 3,18 mm [Ø 0.125 in]	Ø 3,18 mm [Ø 0.125 in]	M5 x 0.8 metric thread
30,5 mm to 166,2 mm [1.2 in to 6.15 in]	26,7 mm to 255,3 mm [1.05 in to 10.05 in]	13,97 mm to 153,67 mm [0.55 in to 6.05 in]	106 mm to 1275 mm [4.2 in to 50.2 in]
25,4 mm to 152,4 mm [1 in to 6 in]	25,4 mm to 254 mm [1 in to 10 in]	12,7 mm to 152,4 mm [0.5 in to 6 in]	101,6 mm to 1270 mm [4 in to 50 in]
electrical travel + 77,5 mm [3.05 in]	electrical travel + 38,10 mm [1.50 in]	electrical travel + 30,48 mm [1.2 in]	250 mm to 1418 mm [9.84 in to 55.83 in]
20 g / 0,75 mm (rms) 5 Hz to 2 kHz	20 g / 0,75 mm (rms) 5 Hz to 2 kHz	20 g / 0,75 mm (rms) 5 Hz to 2 kHz	20 g / 0,75 mm (rms) 5 Hz to 2 kHz
50 g 11 ms half sine	50 g 11 ms half sine	50 g 11 ms half sine	50 g 11 ms half sine
one billion dither operations	one billion dither operations	one billion dither operations	one billion dither operations
±20 %	±20 %	±20 %	±20 %
–	500 mOhm @ 500 Vdc	500 mOhm @ 500 Vdc	1000 mOhm @ 500 Vdc
–	1000 V rms	1000 V rms	1000 V rms
connector, binder series 681	cable	cable	Hirschmann GDM
precious metal wipers; 2,06 mm [0.081 in] thick housing with 6 mm [0.25 in] shaft; high level dc output; enhanced performance bearings; shaft seals	12,7 mm [0.5 in] diameter; dual-wiper design; stainless steel shaft; anodized extruded aluminum housing; precious metal contact; shaft seals for spray-or-hose-down environments	9,53 mm [0.375 in] diameter; dual-wiper design; stainless steel shaft; internal spring-loaded ball joint; anodized extruded aluminum housing; precious metal contact; infinite resolution	vibration-dampened element; extended side bearing; precious metal wipers; high dc level output; enhanced performance bearings; NEMA 4 sealing

Position Sensors

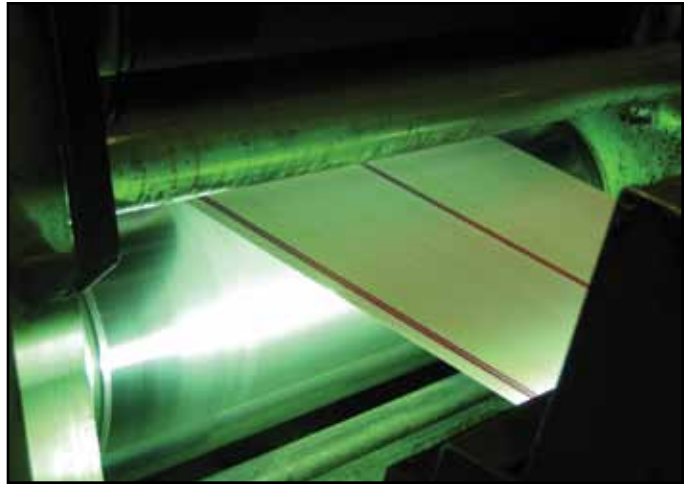
SMART Position Sensors



Superior Measurement. Accurate. Reliable. Thinking. The most accurate linear position sensor available in the industry (0,05 mm [0.002 in]), enabling highly accurate motion control, and improving efficiency and safety. Potential applications include aircraft ram door position, syringe pumps, cutting and slitting machinery, elevator level position, material handling, packaging, plastic molding machines, valve position detection, wafer handling equipment and woodworking machinery.



Series	SPS
Description	non-contacting sensor that uses a patented combination of ASIC technology and a linear array of MR sensors to determine the position of a magnet attached to a moving object
Configuration	75 mm linear
Sensing range	0 mm to 75 mm [0 in to 3.0 in]
Resolution	0,05 mm [0.002 in]
Supply voltage	6 Vdc to 24 Vdc regulated
Supply current	32 mA max.
Output	0 V to 5 V analog
Air gap	3,0 mm \pm 2,5 mm [0.118 in \pm 0.098 in]
Operating temperature range	-40 °C to 125 °C [-40 °F to 257 °F]
Storage temperature range	-40 °C to 150 °C [-40 °F to 302 °F]
Sealing	IP67, IP69K
Housing material	thermoplastic
Approvals	CE
Measurements	28,2 mm H x 145 mm W x 19,7 mm D [1.11 in H x 5.7 in W x 0.78 in D]
Features	resolution of up to 16-bits provides enhanced accuracy; non-contacting technology; small size; self diagnostics; IP67 and IP69K sealing



Position Sensors

Ultrasonic Sensors



Ultrasonic sensors measure time delay between emitted and echo pulses. Available in analog or digital versions for distance or presence/absence sensing. Programmable versions available. May be used in a variety of rugged presence and absence sensing applications.



Series	940-F/947	941-D	942
Range type	from 0,6 m to 3 m [2 ft to 10 ft]	from 0,4 m to 3,5 m [1.3 ft to 11.5 ft]	from 1,5 m to 3,5 m [4.9 ft to 11.5 ft]
Output type	analog or switching	analog or switching	analog and switching
Supply voltage	19 Vdc to 30 Vdc	15 Vdc to 30 Vdc	19 Vdc to 30 Vdc
Housing style	plastic M18 and M30	plastic square housing	plastic M30
Termination type	cable or connector	connector	connector
Beam angle	8°	10°	8°, 10°
Response time	50 ms, 90 ms	150 ms	100 ms
Switching frequency	100 ms, 1 Hz, 8 Hz, 25 Hz	10 Hz	5 Hz to 30 Hz; 5 Hz to 8 Hz
Repeatability	0.3 % or ±1 mm; 0.2 % or ±2 mm	±1 mm	0.4 % or 2 mm; 0.2 % or ±1 mm
Software programmable	no	no	yes
Teach in	no	yes	yes
Remote teach in	no	no	no
Synchronization output	yes	yes	yes
Approvals	–	CE, UL, CSA	–
Measurements	M30 x 1,5 (140,0 mm [5.51 in L])	32,5 mm H x 36 mm W x 101 mm L [1.28 in H x 1.42 in W x 3.978 in L]	M30 x 1,5 (140,0 mm [5.51 in L])
Features	IP67; chemical-resistant epoxy head; synchronizing/hold input; adjustment by potentiometer; micro-processor controlled; temperature compensation	IP67; limit switch style sensor; teach in; M12 connector, 5 pin; visual indication; four output options; synchronizing/hold input; temperature compensation	IP65 (connector), IP67 (front face); four models; stainless steel M30 heads; synchronizing/hold input; beam power adjustable by switch



943	944	946	948
from 0,2 m to 3,5 m [0.7 ft to 11.5 ft]	from 0,4 m to 3,5 m [1.2 ft to 11.5 ft]	from 0,3 m to 6 m [0.93 ft to 19.69 ft]	0,3 m [0.93 ft]
analog or switching	analog and switching	analog and switching	switching
15 Vdc to 30 Vdc	19 Vdc to 30 Vdc	10 V to 30 V	18 Vdc to 30 Vdc
metal M12, plastic M18 and M30	plastic M18 and M30	stainless steel M30	2 pieces square plastic
cable or connector	connector	M12 connector	cable
8°	8°	5°	8°
400 ms	–	21 ms, 65 ms, 145 ms, 195 ms, 285 ms, 850 ms	–
100 ms, 250 ms, 1.2 Hz, 4.7 Hz	0.8 Hz, 1 Hz, 8 Hz	1 Hz, 5 Hz, 15 Hz	150 Hz
0.2 % or ±2 mm	0.4 % or ±2 mm	< 0.1 %	–
no	no	no	no
yes	yes	yes	no
yes	no	no	no
no	no	no	no
–	–	–	–
M18 or M30 (depending upon scanning ranges)	M30 x 1,5 (125,0 mm [4.92 in])	various sizes	2,0 mm H x 20,0 mm W x 30,0 mm L [0.08 in H x 0.79 in W x 1.18 in L]
remote teach-in/auto-tuning; Windows and hysteresis mode; two switching outputs; temperature compensation; connector or cable version	eight models; auto-tuning by one switch; slope direction selection; NO/NC selection; two switching outputs; analog output; temperature compensation	IP65; auto-tuning by four position plug; switching output models; two switching outputs; temperature compensation	IP67; four output configurations; switching frequency of 150 Hz; compact size

Proximity Sensors

Designed to meet demanding temperature, vibration, shock, and EMI/EMP interference specifications. Multiple potential applications are found in aerospace, ordnance, marine, and off-shore equipment.



Series	RDS8004	100 FW	200 FW
Description	rail wheel proximity sensor	one-piece 5/8 in proximity sensor	one-piece 5/8 in proximity sensor
Technology	–	ECKO	hall
Operating frequency	–	–	–
Target material	–	all metals	magnet
Load current	–	120 mA, 50 mA lamp	100 mA, 50 mA lamp
Supply current	–	20 mA max. @ 25 °C	20 mA max. @ 25 °C
Sensing face	–	shielded, unshielded	shielded
Housing material	polymide “Grilamid LKN5H”	stainless steel	stainless steel
Guaranteed actuation distance	–	1 mm to 1,99 mm [0.039 in to 0.0783 in]; 5 mm to 10 mm [0.197 in to 0.394 in]	2 mm to 2,99 mm [0.0787 in to 0.1177 in]
Operating temperature range	-40 °C to 80 °C [-40 °F to 176 °F]	-55 °C to 125 °C [-67 °F to 257 °F]	-54 °C to 100 °C [-65.2 °F to 212 °F]
Supply voltage	10 Vdc to 30 Vdc	18 Vdc to 32 Vdc	18 Vdc to 32 Vdc
Output type	–	normally open, current sinking	normally open/closed, current sinking
BITE	–	–	–
Short circuit	–	–	–
Pressure proof	–	–	–
Reverse polarity	–	–	–
MTBF (hours)	–	–	–
Oscillating frequency	230 kHz ±10 % 160 kHz ±10 %	–	–
Output current	supply voltage and load dependent; 2 mA/8 mA	–	–
Operating frequency	> 400 Hz	–	–
Vibration	Sinusoidal 10 Hz to 2 kHz, 20 g for 30 min, IEC 68-2-2	–	–
Nom. sensing distance	26,5 mm, 35 mm	–	–
Approvals	IP67	FM Class 1, Division 2, Groups A, B, C, D	FM Class 1, Division 2, Groups A, B, C, D
Measurements	55,0 mm H x 60,0 mm W x 110 mm L [2.16 in H x 2.36 in W x 4.33 in L]	sensing face: 5/8 in x 63,5 mm L [2.5 in L]	sensing face: 5/8 in x 63,5 mm L [2.5 in L]
Features	two-wire dc inductive; available in high and low frequency versions; output of 8 mA when no wheel is detected, and 2 mA when a wheel is detected	all metal sensing; shielded three-wire dc sinking (NPN); high level of electronics protection; lead wire or connector termination	Hall-effect, magnetic field sensitive; high-frequency switching; shielded three-wire dc sinking (NPN); high level of electronics protection



300 FW	21 FW	23 FW	5 FW
two-piece proximity sensor	one-piece 12 mm proximity sensor	one-piece 22,2 mm proximity sensor	target, special, proximity sensor
ECKO	Hall	Hall	magnet
–	2000 Hz	2000 Hz	–
ferrous metals	–	–	–
750 mA	20 mA	20 mA	–
65 mA max.	25 mA	25 mA	–
shielded	stainless steel	stainless steel	stainless steel
stainless steel	stainless steel	stainless steel	stainless steel
1,78 mm to 3,3 mm [0.07 in to 0.130 in]	250 gauss	250 gauss	–
-77 °C to 125 °C [-106.6 °F to 257 °F]	-55 °C to 150 °C [-67 °F to 302 °F]	-55 °C to 125 °C [-67 °F to 257 °F]	-55 °C to 150 °C [-67 °F to 302 °F]
18 Vdc to 32 Vdc	18 Vdc to 32 Vdc	18 Vdc to 32 Vdc	–
normally open/closed, current sinking	normally open, current sinking	normally open, current sinking	–
–	yes	yes	–
–	no	no	–
–	no	no	–
–	no	no	–
–	35000	115000	–
–	–	–	–
–	–	–	–
–	–	–	–
–	–	–	–
–	–	–	–
MIL-STD-810B	MIL-STD-461E	MIL-STD-461E	–
Ø 11,2 mm x 31,8 mm L [Ø 0.44 in x 1.25 in L]	Ø 12 mm [Ø 0.47 in]	Ø 22,2 mm [Ø 0.9 in]	Ø 12 mm [Ø 0.47 in]
ferrous metal sensing; two-piece construction; reverse polarity	Hall-effect magnetic field sensitive; single channel; three-wire dc	Hall-effect magnetic field sensitive; triple channel; nine-wire dc	Hall-effect magnetic field sensitive

Proximity Sensors

922, M12, M18, & M30

Designed to meet demanding temperature, vibration, shock, and EMI/EMP interference specifications. Multiple potential applications are found in aerospace, ordnance, marine, and off-shore equipment.



Series	922AA2Y-A6P0Z722A	922FS2-A6N-Z735A	ZS-00361
Description	one-piece 15/32 in proximity sensor	one-piece 12 mm proximity sensor	one-piece M12 proximity sensor
Dimension	11,7 mm [0.46 in]	12 mm [0.47 in]	–
Operating frequency	2000 Hz	2000 Hz	80 mA
Load current	250 mA	250 mA	crastin (plastic)
Gd (mm)	3,6	2,8	2,91
Guaranteed actuation distance	2 mm to 2,99 mm [0.0787 in to 0.1177 in]	1 mm to 1,99 mm [0.039 in to 0.0783 in]	1 mm to 1,99 mm [0.039 in to 0.0783 in]
Operating temp. range	-55 °C to 85 °C [-67 °F to 185 °F]	-55 °C to 85 °C [-67 °F to 185 °F]	-25 °C to 85 °C [-13 °F to 185 °F]
Shock	6 g 11 ms ABD 0007	6 g 11 ms ABD 0007	400 g 11 ms
Supply voltage	14 Vdc to 32,5 Vdc	14 Vdc to 32,5 Vdc	14 Vdc to 33 Vdc
BITE	no	no	no
Short circuit	yes	yes	yes
Pressure proof	no	yes	no
Reverse polarity	no	no	yes
Insulation resistance	–	–	50 mOhm @ 500 Vdc
Output type	normally open, current sourcing	normally open, current sourcing	normally open/closed, current sourcing
Measurements	15/32 in 51 mm L [2.01 in]	12 mm 50 mm L [1.97 in]	M12 x 1 72 mm L [2.83 in L]
Features	stainless steel; high frequency switching; high level of electronics protection; lead wire or connector termination	stainless steel; high pressure capability (> 350 bar); high level of electronics protection; lead wire or connector termination	Hall-effect, magnetic field sensitive; stainless steel; high level of electronics protection; high frequency switching



932AB2W	ZS-00351-01	932AA3W	ZS-00240-03B	ZS-00341
one-piece M12 proximity sensor	one-piece M18 proximity sensor	one-piece M18 proximity sensor	one-piece M30 proximity sensor	one-piece underwater proximity sensor
–	–	–	–	–
200 mA	100 mA	≤ 200 mA up to 85 °C to 100 mA at 100 °C	200 mA	≤ 120 mA
ceramic	ceramic	ceramic	stainless steel	stainless steel
6,8	7,27	8,5	ceramic	stainless steel
3 mm to 3,99 mm [0.118 in to 0.157 in]	4 mm to 4,99 mm [0.1574 in to 0.19646 in]	4 mm to 4,99 mm [0.1574 in to 0.19646 in]	5 mm to 10 mm [0.197 in to 0.394 in]	ZS-00341-01: ≥ 0.8 mm; ZS-00341-02: ≥ 21.84 mm
-40 °C to 100 °C [-40 °F to 212 °F]	-35 °C to 63 °C [-31 °F to 145 °F]	-40 °C to 100 °C [-40 °F to 212 °F]	-55 °C to 85 °C [-67 °F to 185 °F]	-55 °C to 90 °C [-67 °F to 194 °F]
100 g 6 ms	500 g 0.5 ms	100 g 6 ms	100 g 6 ms	6 g 11 ms
20 Vdc to 33 Vdc	12 Vdc to 32 Vdc	20 Vdc to 323 Vdc	14 Vdc to 33 Vdc	14 Vdc to 32.5 Vdc
no	yes	no	no	no
yes	yes	yes	yes	yes
no	no	no	no	yes
yes	yes	yes	yes	yes
> 50 mOhm @ 500 Vdc	10 mOhm @ 500 Vdc	> 50 mOhm @ 500 Vdc	–	–
normally open, current sourcing	normally open, current sinking	normally open, current sourcing	normally open/closed, current sourcing	normally open, current sourcing
M12 x 1 77 mm L [3.03 in L]	M18 x 1 73 mm L [2.87 in L]	M18 x 1 80 mm L [3.15 in L]	M30 x 1,5 55 mm L [2.17 in L]	Ø 23 mm x 64 mm L [Ø 0.91 in x 2.52 in L]
stainless steel; high level of electronics protection; high frequency switching; lead wire or connector termination	stainless steel; high level of electronics protection; built-in test function (BITE); lead wire or connector termination	Hall-effect, magnetic field sensitive; stainless steel; high level of electronics protection; high frequency switching	Hall-effect, magnetic field sensitive; stainless steel; high level of electronics protection; high frequency switching	ferrous metal sensing; high level sealing by overmolding; enhanced performance sealed and shielded cable

Rotary Position Sensors

Encoders & Non-Contact Hall-Effect Pots



Mechanical versions with 2-bit and 4-bit gray code outputs for potential use in incremental and absolute electrical reference applications. Optical versions are manually operated, rotary devices. Available with PC terminals or cable leads. Potential applications include controls for audio and lighting, level, cursor, frequency, temperature, time, and position sensing.



Encoder Series	388E	510E	600
Type	mechanical	mechanical	optical
Pulse per revolution	6, 4	16, 9, 6, 4	128
Output	2-bit grey code	2- or 4-bit grey code	quadrature square wave
Dome switch	yes	no	no
Expected rotational life	100K cycles	100K cycles	10 million revolutions
Operating speed	30 rpm max.	50 rpm max.	300 rpm max.
Terminals	pcb pins	pcb pins	pcb pins or cable with/without connector
Measurements	body: 12,7 mm [0.5 in] square; bushing: 6,35 mm [0.25 in] x 32 NEF-2A x 6,35 mm [0.25 in] L	body: 21,08 mm [0.83 in] square; bushing: Ø 9,52 mm [Ø 0.375 in] x 6,35 mm [0.25 in] L	body: Ø 34,93 mm [Ø 1.375 in]; bushing: Ø 9,52 mm [0.375 in] x 9,52 mm [0.375 in] L
Features	various bushing and shaft sizes; several mounting styles	eliminates need for A/D converters; positive detent feel; continuous electrical travel	eliminates need for A/D converter; cable and printed circuit terminations available; outputs are TTL compatible



Non-Contact Hall-Effect	HRS100	RPN
Description	Hall-effect, stainless steel package	plastic package
Supply voltage	5 Vdc ±5 %	range: 5 Vdc to 30 Vdc
Output type	analog voltage	single or dual outputs available, V and mA
Expected rotational life	10 million cycles	–
Package style	stainless steel shaft and brass bushing	plastic package
Temperature range	-40 °C to 85 °C [-40 °F to 185 °F]	-40 °C to 125 °C [-40 °F to 257 °F]
Supply current	5 mA (max. at 25 °C [77 °F]), exclusive of load	20 mA max.
Electrical taper	linear	–
Measurements	bushing: 9,52 mm [0.375 in] FMS, excludes C-ring	38 mm H x 63 mm W [1.5 in H x 2.48 in W]
Features	90° degree rotation; maximum ESD sensitivity of ±7 kV; slotted shaft	single or dual outputs available; eight operating ranges, up to 360°; variety of supply voltages and output configurations; rugged sealed package with integral connector; IP67 or greater

Rotary Position Sensors

Cermet and Wirewound Potentiometers



Compact and rugged thick film devices, these potentiometers are stable over a range of operating temperatures. Provides high power dissipation and improved resistance temperature coefficient. Potential applications include joysticks, lighting, audio, telecom, manual, medical, and marine equipment, welding, and heating.



Series	309/409	389	43/RA20
Type	309: compact modular housing 409: sealed for board washing	multiple sections available	RA20 meets MIL-R-19
Expected rotational life	25K cycles	25K cycles	10K cycles
Element type	cermet	cermet	wirewound
Power rating	1 W	1 W	2 W
Terminal type	PC, solder hook	PC, solder hook	solder lug
Resistance range	100 Ohm to 5 mOhm	linear: 5 Ohm to 5 mOhm; tapered: 100 Ohm to 2 mOhm	43: 10 Ohm to 50 kOhm; RA20: 50 Ohm to 15 kOhm
Bushing type	standard	standard	standard, locking
Potentiometer type	industrial	industrial	industrial
Electrical taper	linear, tapered	linear, tapered	linear
Measurements	body: 12,7 mm [0.5 in] square; bushing: 6,35 mm [0.25 in] x 32 NEF-2A x 6,35 mm [0.25 in] L	6,35 mm [0.25 in] x 32NEF- 2A standard; 9,53 mm [0.375 in] x 32NEF-2A optional	body: Ø 28,6 mm [Ø 1.125 in]; bushing: 9,53 mm [0.375 in] x 32 NEF-2A x 9,53 mm [0.375 in] L
Features	modular package; enhanced performance	stackable; rotary, push-pull, and momentary options	linear taper; lock-style bushing available



Series	58/RA30	591	73
Type	RA30 meets MIL-R-19	multiple sections available	10-turn construction
Expected rot. life	25K cycles	25K cycles	50K cycles
Element type	wirewound	cermet	wirewound
Power rating	4 W	1 W	2 W
Terminal type	solder lug	PC, solder hook	solder lug
Resistance range	58: 50 Ohm to 50 kOhm; RA30: 25 Ohm to 25 kOhm	500 Ohm to 100 kOhm	100 Ohm to 100 kOhm
Bushing type	standard, locking	standard	standard
Potentiometer type	industrial	commercial	precision
Electrical taper	linear	linear	linear
Measurements	body: Ø 42,93 mm [Ø 1.69 in]; bushing: 9,53 mm [0.375 in] x 32 NEF-2A x 9,53 mm [0.375 in] L	body: 12,7 mm [0.5 in] square; bushing: 6,35 mm [0.25 in] x 32 NEF-2A x 6,35 mm [0.25 in] L	body: Ø 22,23 mm [Ø 0.875 in]; bushing: 9,53 mm [0.375 in] x 32 NEF-2A x 7,92 mm [0.312 in] L
Features	linear taper; lock-style bushing available	temperature stability; linear taper; pc terminals	nickel-plated brass shaft and bushings; linear taper

Rotary Position Sensors

Conductive Plastic Potentiometers



Compact and rugged thick-film devices are available in wide range of resistance values. These devices use precision technology developed for military applications. Potential applications include manual controls, audio and lighting consoles, joysticks, telecommunication, and medical equipment.



Series	308/408	380/53/RV4	381
Type	308: compact modular house; 408: sealed for board washing	RV4 meets MIL-PRF-94	metal case and nickel-plated shaft
Expected rotational life	50K cycles	100K cycles, 25K cycles	25K cycles
Element type	conductive plastic	conductive plastic	conductive plastic
Power rating	0.5 W	2 W	1 W
Terminal type	pc, solder hook	solder lug	solder lug
Resistance range	308: 100 Ohm to 1 mOhm; 408: 500 Ohm to 10 kOhm	100 Ohm to 1 mOhm; 500 Ohm to 10 kOhm	100 Ohm to 5 mOhm
Bushing type	standard, locking	standard, locking	standard, locking
Potentiometer type	industrial	industrial	industrial
Electrical taper	CW audio, linear	linear, tapered	CW audio, linear
Measurements	body: 12,7 mm [0.5 in] square bushing: 6,35 mm [0.25 in] x 32 NEF-2A x 6,35 mm [0.25 in] L	380/53: 50,8 mm L [2 in L] shaft, round; RV4: 22,23 mm [0.875 in L] shaft, slotted	body: Ø 15,88 mm [Ø 0.625 in]; bushing: 6,35 mm [0.25 in] x 32 NEF-2A x 6,35 mm [0.25 in] L
Features	nickel-plated brass shaft and bushings; enhanced performance	solder lug terminals; CW audio and linear tapers available	solder lug terminals; nickel-plated brass shaft and bushings



Series	578	585
Type	variable resistor technology	carbon elements/metal shaft
Expected rotational life	2.5M cycles	10K cycles
Element type	conductive plastic	carbon
Power rating	0.5 W	0.05 W
Terminal type	pc	pc
Resistance range	1 kOhm to 10 kOhm	1 kOhm to 10 kOhm
Bushing type	standard	standard
Potentiometer type	precision	commercial
Electrical taper	linear	CW audio, linear
Measurements	body: Ø 22,86 mm [Ø 0.90 in] bushing: 9,52 mm D & L [0.375 in D & L]	body: 9,5 mm [0.37 in] square bushing: M 7 x 0.75 thread, 7 mm L [0.28 in L]
Features	low mounting profile; quiet electrical output; preci- sion control; pc terminals	horizontal mount; pc terminals; metal shaft and bushings; linear taper



388

392/RV6

574

575

multiple sections available

RV6 meets MIL-PRF-94

low mounting profile

thermoplastic panel mount

50K cycles

50K cycles

50K cycles

50K cycles

conductive plastic

conductive plastic

conductive plastic

conductive plastic

0.5 W

0.5 W

0.5 W

0.5 W

pc, solder hook

pc, solder hook

pc with bracket

pc, solder hook

linear: 100 Ohm to 5 mOhm;
tapered: 500 Ohm to 2 mOhm

100 Ohm to 5 mOhm

1 kOhm to 100 kOhm

1 kOhm to 50 kOhm

standard

standard

standard

standard

industrial

industrial

commercial

commercial

linear, tapered

linear, tapered

linear

linear, tapered

body: 12,7 mm [0.5 in] square;
bushing: 6,35 mm [0.25 in] x 32 NEF-2A x
6,35 mm [0.25 in] L

body: Ø 12,7 mm [Ø 0.50 in]
bushing: 6,35 mm [0.25 in] x 6,35 mm
[0.25 in]

body: 21,08 mm [0.83 in] square
bushing: M9 x 6,35 mm L [0.25 in L]

body: 21,08 mm [0.83 in] square
bushing: 9,35 mm [0.375 in] x
6,35 mm L [0.25 in L]

stackable; up to six modules; single, dual-
concentric, or trimmer configurations

nickel-plated shaft and bushings; pc and
solder hook terminals

reduced mounting profile; quiet electrical
output; pc style mounting

reduced mounting profile; quiet electrical
output; solder hook terminals



590

MKV

SensorCube

TH100

multiple sections available

conductive plastic element

sealed construction

special electrical & mechanical configurations

50K cycles

10 million cycles

10 million cycles

1 million cycles

conductive plastic

conductive plastic

conductive plastic

conductive plastic

0.5 W

1 W

1 W

0.5 W

pc, solder hook

turret

turret

three 20 AWG; 152,4 mm [6.0 in] leads

100 Ohm to 1 mOhm

500 Ohm to 20 kOhm

1 kOhm to 10 kOhm

10000 ohms (total resistance)

standard

no bushing, standard

standard

slotted rotor

commercial

precision

precision

position transducer

linear

linear

linear

linear

body: 12,7 mm [Ø 0.50 in] square
bushing: 6,35 mm D & L [0.25 in D & L]

body: Ø 22,23 mm [Ø 0.875 in];
bushing: 6,35 mm [0.25 in] x 32 NEF-2A

body: Ø 18,92 mm [Ø 0.745 in]; bushing:
9,53 mm [0.375 in] x 32 NEF-2A

38,1 mm W x 45,72 mm L
[1.5 in W x 1.8 in L]

linear taper, pc terminals; brass shaft and
bushings

linearity 0.5 % or less; Servo and bushing
mounting; custom electrical travels

linearity 2 % or less; sealed construction;
custom electrical travels

fully sealed construction; variable resistor
technology

Rotary Position Sensors

Resolvers



Variable transformers in which both rotor and stator usually have two phase windings mechanically displaced by 90°. Typically sine and cosine channel outputs. Provide non-contact measurement for 360° sensing, enhanced accuracy, resolution, and repeatability under severe environmental conditions. Often used in ATOM – gunners site position (azimuth and elevation), forward looking radar, missile guidance, solar panel position, and antenna position applications.



Series	Cased - Brushless Dual Speed	Cased - Brushless Single Speed	Pancake - Brushless Multi-Speed
Type	one-speed and multi-speed resolver and rotary transformer	one-speed, one-pole pair resolver and rotary transformer	multiple pole pairs resolver and rotary transformer
Size diameter	(1/10 in) 30	(1/10 in) 17	(1/10 in) 38 to 63
Speed	1&32	1X	1-64
Accuracy	1&32	1.25 arcmin to 3.50 arcmin	3 arcmin to 30 arcsec (low distortion harmonic)
Transformation ratio	various	various	various
Operating temperature range	-46 °C to 71 °C [-51 °F to 160 °F]	-46 °C to 71 °C [-51 °F to 160 °F]	-46 °C to 71 °C [-51 °F to 160 °F]
Measurements	various	various	various
Features	non-contact measurement for enhanced reliability; 360° sensing range; multi-speed designs available; variety of excitation voltages and frequencies; environmentally sealed and qualified to RTCA DO-160D	non-contact measurement for enhanced reliability; 360° sensing range; multi-speed designs available; variety of excitation voltages and frequencies; environmentally sealed and qualified to RTCA DO-160D	non-contact measurement for enhanced reliability; 360° sensing range; multi-speed designs available; variety of excitation voltages and frequencies; environmentally sealed and qualified to RTCA DO-160D



Pancake - Brushless Dual-Speed

Pancake - Dual-Speed

Pancake - Multi-Speed

Pancake - Single Speed

one-speed and multi-speed resolver and rotary transformer

one-speed and multiple-speed

multiple pole pairs

one-speed, one-pole pair

(1/10 in) 92

(1/10 in) 31 to 130

(1/10 in) 16 to 67

(1/10 in) 24 to 68

1&64

1&8, 1&16, 1&32, 1&36, 2&36, 1&64, 1&128

4, 8, 16, 32, 64

1

(multi-speed) 30 arcsec

(multi-speed) 36 arcsec to 4 arcsec

1 arcmin to 5 arcsec

3 arcmin to 30 arcsec

various

0.45 ±5 %

0.45 ±5 %

various

-46 °C to 71 °C [-51 °F to 160 °F]

-29 °C to 75 °C [-21 °F to 167 °F]

-29 °C to 75 °C [-21 °F to 167 °F]

-29 °C to 75 °C [-21 °F to 167 °F]

various

12 in x 10.5 in

26 in

various

non-contact measurement for enhanced reliability; 360° sensing range; multi-speed designs available; variety of excitation voltages and frequencies; environmentally sealed and qualified to RTCA DO-160D

non-contact measurement for enhanced reliability; 360° sensing range; multi-speed designs available; variety of excitation voltages and frequencies; environmentally sealed and qualified to RTCA DO-160D

non-contact measurement for enhanced reliability; 360° sensing range; multi-speed designs available; variety of excitation voltages and frequencies; environmentally sealed and qualified to RTCA DO-160D

non-contact measurement for enhanced reliability; 360° sensing range; multi-speed designs available; variety of excitation voltages and frequencies; environmentally sealed and qualified to RTCA DO-160D

Safety Electronic Products

Safety Light Curtains



Photoelectric barriers composed of several infrared beams aligned on an emitting column and a receiving column. Separate or self-contained control units, various housing sizes, resolutions, scanning ranges, and protection heights are available. Designed to meet the specifications of potential machine guarding applications from point-of-operation protection, access detection, and presence sensing to electrical-to-machine-circuitry interfacing.



Series	FF-ST2 Standard A	FF-ST2 Standard M	FF-ST4 Basic
Safety category	Type 2 per IEC61496 (similar to SIL2 per IEC61508)	Type 2 per IEC61496 (similar to SIL2 per IEC61508)	Type 4 per IEC61496 (similar to SIL3 per IEC61508)
Application (resolution)	finger (18 mm [0.71 in]) hand (30 mm [1.18 in]) limb and body (80 mm [3.15 in])	finger (18 mm [0.71 in]) hand (30 mm [1.18 in]) limb and body (80 mm [3.15 in])	finger (14 mm [0.55 in] and 18 mm [0.71 in]) hand (30 mm [1.18 in]) limb and body (80 mm [3.15 in])
Scanning range (resolution)	0,25 m to 10 m [0.82 ft to 32.81 ft]	0,25 m to 10 m [0.82 ft to 32.81 ft]	0 m to 3.5 m [0 ft to 11.48 ft] (14 mm [0.55 in]); 0,25 m to 10 m [0.82 ft to 32.81 ft]
Beam separation distance	–	–	–
Product cross section	42 mm x 55 mm [1.65 in x 2.17 in]	42 mm x 55 mm [1.65 in x 2.17 in]	42 mm x 55 mm [1.65 in x 2.17 in]
Protected height (resolution)	200 mm to 1400 mm [7.87 in to 55.12 in] (18 mm [0.71 in]); 200 mm to 1800 mm [7.87 in to 70.87 in] (30 mm [1.18 in] and 80 mm [3.15 in])	200 mm to 1400 mm [7.87 in to 55.12 in] (18 mm [0.71 in]); 200 mm to 1800 mm [7.87 in to 70.87 in] (30 mm [1.18 in] and 80 mm [3.15 in])	200 mm to 1400 mm [7.87 in to 55.12 in] (14 mm [0.55 in] and 18 mm [0.71 in]); 200 mm to 1800 mm [7.87 in to 70.87 in] (30 mm [1.18 in] and 80 mm [3.15 in])
Differentiator	robust housing	robust housing	robust housing
Connectors	M12/5 pole (100 m [328.08 ft])	M12/5 pole (100 m [328.08 ft])	M12/5 pole (100 m [328.08 ft])
Basic interface module	FF-SRE60292	FF-SRE60292	FF-SRL60252 or AS-i Safe
External device monitoring (EDM)	yes	yes	no
Automatic restart	yes	no	yes
Restart interlock	no	yes	no
Muting (or bypass)	–	–	no
1- or 2-beam floating blanking	–	–	no
AS-i safe module	–	–	yes
PSDI¹ module	–	–	yes
Emergency stop auxiliary inputs	–	–	no

¹ For the automatic machine cycle start upon beam clearance (Presence Sensing Device Initiation).



FF-ST4 Standard	FF-ST4 Advanced B	FF-ST4 Advanced M	FF-SYB (point of op.)	FF-SYB (long range)	FF-SYB (short range)
Type 4 per IEC61496 (similar to SIL3 per IEC61508)	Type 4 per IEC61496 (similar to SIL3 per IEC61508)	Type 4 per IEC61496 (similar to SIL3 per IEC61508)	Type 4 per IEC61496 (similar to SIL3 per IEC61508)	Type 4 per IEC61496 (similar to SIL3 per IEC61508)	Type 4 per IEC61496 (similar to SIL3 per IEC61508)
finger (14 mm [0.55 in] and 18 mm [0.71 in]); hand (30 mm [1.18 in]); limb and body (80 mm [3.15 in])	finger (14 mm [0.55 in] and 18 mm [0.71 in]); hand (30 mm [1.18 in])	finger (14 mm [0.55 in] and 18 mm [0.71 in]); hand (30 mm [1.18 in]); limb and body (80 mm [3.15 in])	finger (14 mm [0.55 in]) hand (30 mm [1.18 in])	body (2, 3, or 4 beams)	body (2 beams)
0 m to 3.5 m [0 ft to 11.48 ft] (14 mm [0.55 in]); 0,25 m to 10 m [0.82 ft to 32.81 ft]	0 m to 3.5 m [0 ft to 11.48 ft] (14 mm [0.55 in]); 0,25 m to 10 m [0.82 ft to 32.81 ft]	0 m to 3.5 m [0 ft to 11.48 ft] (14 mm [0.55 in]); 0,25 m to 10 m [0.82 ft to 32.81 ft]	0 m to 6 m [0 ft to 19.69 ft] (14 mm [0.55 in]); 0 m to 20 m [0 ft to 65.62 ft] (30 mm [1.18 in])	0 m to 30 m [0 ft to 98.43 ft] (standard range) 5 m to 80 m [16.40 ft to 262.47 ft] (long range)	0 m to 7 m [0 ft to 22.97 ft] with passive mirrors
–	–	–	–	2-beam: 500 mm [19.69 in] spacing (body/access) 3-beam: 400 mm [15.75 in] spacing (body/access) 4-beam: 300 mm [11.81 in] spacing (body/access)	2-beam: 500 mm [19.69 in] beam spacing (body/access)
42 mm [1.65 in] x 55 mm [2.17 in]	42 mm [1.65 in] x 55 mm [2.17 in]	42 mm [1.65 in] x 55 mm [2.17 in]	42 mm [1.65 in] x 55 mm [2.17 in]	42 mm [1.65 in] x 55 mm [2.17 in]	42 mm [1.65 in] x 55 mm [2.17 in]
200 mm to 1400 mm [7.87 in to 55.12 in] (14 mm [0.55 in] and 18 mm [0.71 in]); 200 mm to 1800 mm [7.87 in to 70.87 in] (30 mm [1.18 in] and 80 mm [3.15 in])	200 mm to 1400 mm [7.87 in to 55.12 in] (14 mm [0.55 in] and 18 mm [0.71 in]); 200 mm to 1800 mm [7.87 in to 70.87 in] (30 mm [1.18 in])	200 mm to 1400 mm [7.87 in to 55.12 in] (14 mm [0.55 in] and 18 mm [0.71 in]); 200 mm to 1800 mm [7.87 in to 70.87 in] (30 mm [1.18 in] and 80 mm [3.15 in])	300 mm to 1800 mm [11.81 in to 70.87 in] (14 mm [0.55 in], 30 mm [1.18 in])	–	–
robust housing, selection through wiring	robust housing, selection through wiring	robust housing, selection through wiring	fully bundled functionality, selections through micro-cards, long scanning ranges	fully bundled functionality, selections through micro-cards	fully bundled functionality, selections through micro-cards
M12/5 and 8 pole (100 m [328.08 ft])	M12/5 and 8 pole (100 m [328.08 ft])	M12/5 and 8 pole (100 m [328.08 ft])	M12/5 and 8 pole (100 m [328.08 ft])	M12/5 and 8 pole (100 m [328.08 ft])	M12/8 pole (100 m [328.08 ft])
FF-SRE60292	FF-SRE60292	FF-SRE60292	FF-SRE60292	FF-SRE60292	FF-SRE60292
yes	yes	yes	yes	yes	yes
yes	yes	yes	yes	yes	yes
yes	yes	yes	yes	yes	yes
no	no	yes	yes	yes	yes
no	yes	no	yes	yes	no
no	no	no	yes	–	–
no	no	no	yes	–	–
no	no	no	yes	yes	yes

Safety Electronic Products

Safety Modules



Provide an interface between safety sensors and machine control circuitry. Module functionality includes safety door monitoring, emergency stop, two-hand control, extension, standstill and low speed monitoring, time delay, and muting.



Series	FF-SRS Emergency Stop	FF-SRST Emerg. Stop (del. contacts)	FF-SR2 Two-hand Controls
Potential applications	emergency stop device; door monitoring	delayed emergency stop device; door monitoring with solenoid key switch	machine cycle start
Safety category	Cat. 2 or 4 per EN954-1	Cat. 3 and 4 per EN954-1	Cat. IIIA and IIIC per EN574
Housing width	22,5 mm [0.89 in] 45 mm [1.77 in] 100 mm [3.94 in]	45 mm [1.77 in]	22,5 mm [0.89 in], 45 mm [1.77 in]
Supply voltage	24 Vdc, 120 Vac, 230 Vac	24 Vac/dc	24 Vdc, 120 Vac, 230 Vac
Output contact	3 NO/1 NC, 6 NO/1 NC	2 NO/1 NC direct, 2 NO/1 NC delayed	2 NO, 2 NO/1 NC, 3 NO/1 NC
Switching capacity	10 mA to 5 A, 1 mA to 10 A	1 mA to 5 A	1 mA to 5 A, 1 mA to 10 A
Embedded functions	input short-circuit and cross- fault detection; manual/auto restart with EDM loop	manual/auto restart with EDM loop; selectable time ranges	0.5 s input time monitoring
Differentiator	removable terminal strips; enhanced switching capacity; ac supply voltages	removable terminal strips	removable terminal strips; enhanced switching capacity; ac supply voltages
Approvals	complies with EU directive for machines 98/37/EC, IEC/EN 60501, DIN VDE 0113, and UL 508	complies with EU directive for machines 98/37/EC, IEC/EN 60501, DIN VDE 0113, and UL 508	complies with machinery direc- tive 98/37/EC and UL 508



FF-SR0 Standstill Monitoring

FF-SRT Delayed Extension

FF-SRL Basic

FF-SRL59022 PSDI

FF-SRM Muting

FF-SRE Extension

motor control	delayed emergency stop device; contact multiplication; current switching capacity	safety device with solid state outputs	automatic machine cycle start	momentary deactivation of the safety light curtain	contact multiplication; current switching capacity
Cat. 1 and 3 per EN954-1	Cat. 1 per EN954-1	Cat. 4 per EN954-1	Cat. 4 per EN954-1	Cat. 4 per EN954-1	Cat. 1 per EN954-1
45 mm [1.77 in]	45 mm [1.77 in]	22,5 mm [0.89 in] 45 mm [1.77 in]	45 mm [1.77 in]	45 mm [1.77 in]	22,5 mm [0.89 in], 100 mm [3.94 in]
24 Vdc, 120 Vac, 230 Vac	24 Vdc	24 Vdc	24 Vdc	24 Vdc	24 Vac/dc, 120 Vac, 230 Vac
2 NO/1 NC, 2 NO/2 NC	1 NO/1 NC	3 NO/1 NC	3 NO	3 NO	4 NO + 2 NC, 7 NO + 1 NC
1 mA to 4 A, 10 mA to 10 A	Up to 8 A	10 mA to 5 A, 1 mA to 10 A	1 mA to 5 A	1 mA to 5 A	10 mA to 5 A, 1 mA to 10 mA
motor back EMF monitoring or rotation frequency measurement	selectable time ranges	manual/auto restart with EDM loop	manual restart with EDM loop; presence sensing device initiation: single or dual stroke with selectable time window	manual/auto restart with EDM loop; 2 or 4 muting inputs; 1 or 2 light curtains; muting lamp; auxiliary emergency stop circuit	redundant relay outputs (pair of safety relays with guided contacts)
removable terminal strips; enhanced switching capacity; ac supply voltages	dual timing circuit	removable terminal strips; enhanced switching capacity	removable terminal strips	removable terminal strips	removable terminal strips; high switching capacity; ac supply voltages
complies with machinery 98/37/EC and UL 508; designed for category 1 emergency stop functions per EN 418 and NFPA79	complies with machinery directive 98/37/EC, IEC 255, VDE 0435 and UL 508	complies with EU machinery directive 98/37/EC, IEC 204, EN 60204, DIN VDE 0113	complies with IEC 61508 and EN 61496-1 European standards; meets applicable parts of the US and Canadian regulations and standards	per the EN 354-1 and EN 61496-1 European standards; meets applicable parts of the US and Canadian regulations and standards ANSI/RIA/OSHA	complies with the machinery directive 98/37/EC, IEC 204, EN 60204, DIN VDC 0113, and UL 508



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. Industry knowledge. Expertise. Standard with every order.

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 Sensing and Control has one of the broadest sensing and switching portfolios available.

SENSORS



Airflow sensors: Advanced microstructure technology. Sensitive and fast response to flow, amount/direction of air or other gas. Proportional output voltage. 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, and ventilation equipment.



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, and wattmeters.



Flexible heaters: Flat, molded-to-shape, spiral wrap, transparent, composite, and high temperature configurations with single, multiple, and variable watt densities. Can be bonded parts or combined. **May be used in:** Airborne valves, outdoor cameras, LCD displays, scanners, and telecommunication.



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, and kidney dialysis machines.



Humidity sensors: Configured with integrated circuitry. Provide on-chip signal conditioning with interchangeability of $\pm 3\%$ accuracy and out-of-the-box reliability. Standardized, platform-based sensors. **May be used in:** Air compressors, food and beverage packaging and processing, HVAC, printing presses, and office equipment.



Infrared sensors: IREDS, 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, and non-invasive medical equipment.



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, and weight sensing.



Position sensors: SMART position sensor: Superior Measurement, Accuracy, Reliability, and Thinking. The most accurate linear position sensor available in the industry (0.05 mm [0.002 in]), enabling highly accurate motion control, and improving efficiency and safety. Non-contact design eliminates mechanical failure mechanisms, reducing wear and tear, improving reliability and durability, and minimizing downtime. Robustness in most harsh environments. Easy to install, reducing set-up costs. Potentiometric sensors withstand harsh chemicals and immersion into oils or water. Extended life PTFE bearings, precious metal multi-finger contact wipers, and MYSTR® conductive plastic thick-film elements. Analog output correlated to location. **May be used in:** Injection molding, printing presses, cylinder positioning, gauges, controls, aircraft, elevators, material handling, packaging, molding, valves, wafer handling, and woodworking machinery.



Pressure sensors - silicon: 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, and refrigeration.



Pressure sensors - stainless steel media isolated: Bonded strain gage technology. Very resistant to effects of shock, vibration, and hostile environments. **May be used in:** HVAC, hydraulic controls, suspensions, agricultural equipment, engines, compressors, robotics, industrial and automotive systems, pressure transmitters, process controls, and medical diagnostics.



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, and door and hatch open/closed monitoring.



Rotary position sensors: Digital and analog Hall-effect, magnetoresistive, and potentiometric devices for sensing presence of a magnetic field or rotary position. Directly compatible with other electronic circuits for application flexibility. **May be used in:** Audio and lighting, frequency, temperature, position, time, medical/instrumentation, computer peripherals, manual controls, joysticks, telecommunication, welding, heating, and aerospace.



Speed sensors: Measure speed, position, and presence detection utilizing magnetoresistive, variable reluctance, Hall-effect, variable inductance, and Spiral technologies. **May be used in:** Cam and crankshafts, transmissions, fans, pumps, mixers, rollers, compressors, industrial process control, engines/motors, wheels, and tachometers.



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, and temperature compensation.



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, and HVAC equipment.



MICRO SWITCH™ pushbutton switches: Lighted or unlighted. 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, computers, medical instrumentation, and aerospace.



MICRO SWITCH™ rocker switches: Wide range of electrical and display design. Many shapes, sizes, 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, and commercial aviation.



MICRO SWITCH™ toggle switches: Wide range of electrical and display design. 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, and military/commercial aviation.



MICRO SWITCH™ aerospace-grade pressure switches: lightweight, compact pressure switches sense changes in gas/pressure. Qualified to MIL-PFR-8805 and its lower operating force provides application versatility with enhanced precision. Design modularity allows for configuration of the switch, facilitating rapid customization to the precise, demanding requirements. **May be used in:** aerospace systems -including engines, fuel pressure, and hydraulic systems, military ground vehicles, ordnance and munitions release systems, military maritime systems.



Pressure and vacuum switches: Feature set points from 0.5 psi to 3000 psi. Rugged components have enhanced repeatability, flexibility, and wide media capability. **May be used in:** Transmissions, hydraulics, brakes, steering, generators/compressors, dental air, embalming equipment, oxygen concentrators, air cleaners, fuel filters, and pool water pressure.

ELECTROMECHANICAL SWITCHES



MICRO SWITCH™ snap-action series: Snap-action precision switches. Compact. Lightweight. Designed for repeatability and enhanced life. Premium and standard snap-action switches: standard, miniature, subminiature, hermetically sealed, and high-temperature versions. **May be used in:** Vending machines, communication equipment, HVAC, appliances, electronic gaming machinery, valve controls, irrigation systems, foot switches, pressure, and temperature controls.



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, and hazardous waste handling facilities.



Key and rotary switches: Used on machinery in harsh environments. 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.



MICRO SWITCH™ limit switches: Broadest and deepest limit switch portfolio. Rugged, dependable position detection solutions. MICRO SWITCH™ heavy-duty limit switches (HDLS) and global limit switches. Hermetically and environmentally sealed switches. **May be used in:** Machine tools, woodworking, textile, and printing machinery, metal fabrication, balers/compactors, forklifts, bridges, robotics, wind turbines, elevators, moving stairs, doors, dock locks/levelers, aerial lifts, cranes, conveyors, rail, shipboards, and dock side.



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, and underwater.

SAFETY PRODUCTS



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.



Safety light curtains: Different resolutions permit detection of an approaching finger, hand, limb, or body. Separate or self-contained control units, various housing sizes, resolutions, scanning ranges, and protection heights. **May be used in:** Point-of-operation protection, access detection, presence sensing, gate monitoring, electrical-to-machine-circuitry interfacing, emergency stop circuits on machines, sliding door protection, conveyors, and transfer lines.

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.

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 control products, call **+1-815-235-6847**, email inquiries to **info.sc@honeywell.com**, or visit **www.honeywell.com/sensing**

Honeywell Sensing and Control

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WARNING

MISUSE OF DOCUMENTATION

- The information presented in this literature is for reference only. **DO NOT USE** this document as product installation information.
- Complete installation, operation and maintenance information is provided in the instructions supplied with each product.

Failure to comply with these instructions could result in death or serious injury.

For products not designed for safety applications:

WARNING

PERSONAL INJURY

DO NOT USE these products as safety or emergency stop devices or in any other application where failure of the product could result in personal injury.

Failure to comply with these instructions could result in death or serious injury.

For products designed for safety applications:

WARNING

RISK TO LIFE OR PROPERTY

Never use this product for an application involving serious risk to life or property without ensuring that the system as a whole has been designed to address the risks, and that this product is properly rated and installed for the intended use within the overall system.

Failure to comply with these instructions could result in death or serious injury.

Honeywell