Position Sensors

Honeywell



SENSING AND CONTROL

Product Range Guide

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

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

While Honeywell's switch and sensor solutions are suitable for a wide array of basic and complex applications, our custom-engineered solutions offer enhanced precision, repeatability, and ruggedness. We offer domain knowledge and technology resources, along with a close working relationship, to develop and deliver cost-effective, individually tailored solutions. Whether clean-slate development or simple modifications to an existing design are needed, our expertly engineered solutions help to meet the most stringent requirements with worldclass product designs, technology integration, and customer-specific manufacturing.

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

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

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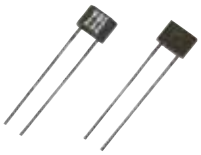
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Magnetic Sensors
Magnetoresistive Sensor ICs



With a built-in magnetoresistive bridge integrated on silicon and encapsulated in a plastic package, magnetoresistive sensor ICs feature an integrated circuit that responds to low fields at large distances. Potential applications include laptops, material handling equipment, 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.	Icc operate: 16.8 mA max. Icc 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]
Measure-ments (H x W)	2SS52M: 4,5 mm x 4,5 mm [0.18 in x 0.18 in] SS522MT: 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 pat-tern independent of gap between target and sensor; improved insensitivity to run-out, tilt, and twist; reverse polarity protection	dual analog voltages respond-ing to changes in magnetic field angle; sine and cosine output; accurate to 0,102 mm [0.004 in]; tape and reel available

Magnetic Sensors
Hall-Effect Digital Sensor ICs



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






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

						
SS345PT/ SS445P	**SS351AT/ SS451A/ SS551AT**	**SS360NT/ SS360ST/ SS460S**	**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	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	bipolar latching	unipolar, bipolar, bipolar latching	bipolar
SS345PT: plastic surface mount (SOT-23) SS445P: platic radial lead	SS351AT: plastic surface mount (SOT-23) SS451A: plastic radial lead SS551AT: plastic surface mount (SOT-89B)	SS360NT/SS360ST: plastic surface mount (SOT-23); SS460: plastic radial lead	SS361CT: plastic surface mount (SOT-23) SS461C: plastic radial lead	SS361RT: plastic surface mount (SOT-23) SS461R: plastic radial lead	SS400: plastic radial lead SS500: plastic surface mount (SOT-89)	SS41: plastic radial lead SS51T: plastic surface mount (SOT-89)
2.7 Vdc to 7.0 Vdc	SS351AT/SS551AT (-40 °C to 125 °C [-40 °F to 257 °F]): 3 Vdc to 24 Vdc SS351AT (150 °C [302 °F]): 3 Vdc to 12 Vdc SS451A (-40 °C to 150 °C [-40 °F to 302 °F]): 3 Vdc to 24 Vdc	3 Vdc to 24 Vdc	4 Vdc to 24 Vdc	3 Vdc to 18 Vdc, except SS361RT >125 °C [247 °F]: 3 Vdc to 12 Vdc	3.8 Vdc to 30 Vdc (inclusive)	4.5 Vdc to 24 Vdc
14 mA	5 mA max. at 25 °C [77 °F] (3 V); 6 mA max. at 25 °C [77 °F] (5 V)	8 mA max.	6 mA max.	8 mA	SS400: 10 mA SS500: 8.7 mA at 5 Vdc	15 mA max.
digital sinking	digital sinking	digital	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]	-40 °C to 125 °C [-40 °F to 257 °F]	SS361RT (3 V to 12 V) & SS461R: 40 °C to 150 °C [-40 °F to 302 °F]; SS361RT (3 V to 18 V): -40 °C to 125 °C [-40 °F to 257 °F]	-40 °C to 150 °C [-40 °F to 302 °F]	-40 °C to 150 °C [-40 °F to 302 °F]
SS345PT: 2,8 mm x 2,9 mm [0.11 in x 0.11 in] SS445P: 3,0 mm x 4,1 mm [0.12 in x 0.16 in]	SS351AT: 2,8 mm x 2,9 mm [0.11 in x 0.11 in] SS451A: 3,0 mm x 4,1 mm [0.12 in x 0.16 in] SS551AT: 4,2 mm x 4,5 mm [0.16 in x 0.18 in]	SS360NT/SS360ST: 2,8 mm x 2,9 mm [0.11 in x 0.11 in]; SS460S: 3,0 mm x 4,1 mm [0.12 in x 0.16 in]	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; built-in reverse polarity protection; thermally balanced integrated circuit; typical operating point of 85 G at 25 °C [77 °F]	fastest response time in class; no chopper stabilization; SS360NT is turned ON by a North pole while the SS360ST and SS460S are turned ON by a South pole	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
Hall-Effect Digital and Linear Sensor ICs



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





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



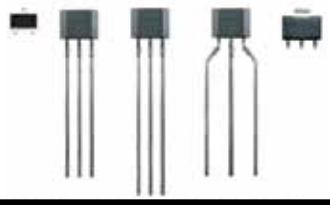


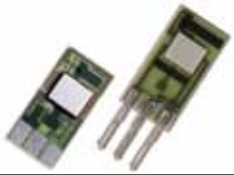
Linear Series	91SS	SS490/SS491B
Description	Hall-effect linear sensor IC	Hall-effect linear sensor IC
Magnetic actuation type	linear	linear
Package material and style	ceramic SIP, ceramic with solder bumps	SS490: plastic radial lead, plastic surface pack, ammopack styles T2 and T3; SS491B: plastic radial 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	VF526DT
bipolar latching Hall-effect digital sensor IC	bipolar latching dual Hall-effect digital sensor IC with speed and direction outputs
bipolar latching	bipolar latching
plastic radial lead	plastic surface mount (SOT-89 style)
4.5 Vdc to 24 Vdc	3.4 Vdc to 24 Vdc
10 mA max.	14 mA max.
digital sinking	digital sinking
-40 °C to 150 °C [-40 °F to 302 °F]	-40 °C to 125 °C [-40 °F to 257 °F]
3,0 mm x 4,1 mm [0.12 in x 0.16 in]	4,2 mm x 4,5 mm [0.16 in x 0.18 in]
bipolar latching magnetics; sinking or sourcing output; high output current capability	bipolar latching magnetics; sinking output; tape and reel available





SS39ET/SS49E/SS59ET	SS94
Hall-effect linear sensor IC	Hall-effect linear sensor IC
linear	linear
SS39ET: plastic surface mount (SOT-23) SS49E: plastic radial lead (SOT-92-style) SS59ET: plastic surface mount (SOT-89)	ceramic SIP, ceramic with solder bumps
2.7 Vdc to 6.5 Vdc	4.5 Vdc to 12.6 Vdc
10 mA max.	30 mA max.
ratiometric sourcing	ratiometric sinking or sourcing
-40 °C to 100 °C [-40 °F to 212 °F]	-40 °C to 150 °C [-40 °F to 302 °F]
SS39ET: 2,8 mm x 2,9 mm [0.110 in x 0.114 in] SS49E: 3,0 mm x 4,1 mm [0.12 in x 0.16 in] SS59ET: 4,2 mm x 4,5 mm [0.16 in x 0.18 in]	15,2 mm x 7,6 mm [0.60 in x 0.30 in]
linear magnetics; ratiometric sourcing output; low voltage operation; tape and reel available	linear magnetics; ratiometric sourcing output; standard mounting centers; linearity ±1.5 % max.

Magnetic Sensors
Value-Added Hall-Effect Sensors



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





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









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

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	LCZ
Description	single Hall-effect sensor	single Hall-effect zero speed sensor
Housing	plastic probe	stainless steel
Supply voltage range	4.5 Vdc to 26.5 Vdc (inclusive)	4.5 Vdc to 26 Vdc
Supply current	20 mA	20 mA
Output type	digital sinking (open collector)	digital sinking
Operating frequency range	0 Hz to 25 kHz (inclusive)	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]
Measurements	Ø 17,9 mm x 31,8 mm L [Ø 0.70 in x 1.25 in L]	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	omni-directional sensor to target; low power consumption; zero speed; digital output







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

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); LFIIW: 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.

Honeywell's SMART Position Sensors are some of the most durable and adaptable position devices available in the industry today. These sensors use a patented combination of ASIC (Application-Specific Integrated Circuit) technology and an array of MR (magnetoresistive) sensors to provide absolute position sensing with enhanced speed and accuracy. Their simple, non-contact design eliminates mechanical failure mechanisms, reduces wear and tear, improves reliability and durability, enhances operation efficiency and safety, and minimizes downtime. Linear configuration potential applications: Industrial: valve position, material handling, plastic molding, wafer handling, CNC machines; Transportation: passenger bus level position, truck-mounted crane outrigger position, heavy equipment attachment identification, hydraulic cylinders (225 mm version), marine motors; Medical: syringe pumps; Aerospace: aircraft actuators.



Series	SPS Linear
Description	measures linear movement of a magnet attached to a moving object
Configuration	linear
Sensing range	75 mm: 0 mm to 75 mm [0 in to 3.0 in] 225 mm: 0 mm to 225 mm [0 in to 8.86 in]
Actuator sensing location on arc	–
Resolution	75 mm analog: 0,05 mm [0.002 in] 225 mm analog: 0,14 mm [0.0055 in] 225 mm digital: 0,0035 mm [0.000137 in]
Supply voltage	6 Vdc to 24 Vdc
Supply current	75 mm analog: 32 mA max. 225 mm analog: 34 mA max. 225 mm digital: 88 mA max.
Output	75 mm and 225 mm analog: 0 Vdc to 5 Vdc 225 mm digital: RS232 type
Air gap	3,0 mm ±2,5 mm [0.118 in ±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]
Termination	flying leads
Sealing	IP67, IP69K
Housing material	thermoplastic
Approvals	CE
Measurements	75 mm: 145 mm L x 18,0 mm W x 28,2 mm H [5.7 in x 0.71 in x 1.1 in] 225 mm: 287,3 mm L x 18,0 mm W x 28,2 mm H [11.3 in x 0.71 in x 1.1 in]
Features	analog or digital output; small size; self diagnostics; IP67 and IP69K sealing

Arc Configuration potential applications: Transportation: aerial work lift platform, front end loader and digger/excavator boom position, scissor lift position, refuse truck lift and automatic reach arm position, mobile crane steering, timber harvester/ processor equipment cutter arm angle, on-board loader weighing system position; Industrial: telescoping conveyor elevation, power generation contact angle, rail-road crossing arms position; Military: remote weapon systems elevation, chassis suspension systems position height, military vehicle door position; Aerospace: ground-based solar panels elevation and azimuth, ground-based satellite dish elevation and azimuth; Medical: robotically-assisted surgery equipment position, patient bed elevation.

Rotary Configuration potential applications: Transportation: steering angle, articulation angle, boom arm detection; Industrial: solar panels, wind turbines.





SPS Arc	SPS Rotary
measure angular movement of a magnet attached to a moving object	measures rotary movement of a magnet attached to a moving object
arc	rotary
100°: 0° to 100° 180°: 0° to 180°	0° to 360°
100°: inside or outside 180°: inside	–
100° inside and outside: 0.06° 180° inside: 0.11°	0.01°
100° inside: 6 Vdc to 24 Vdc, 18 Vdc to 24 Vdc 100° outside: 5 Vdc 180° inside: 6 Vdc to 24 Vdc, 18 Vdc to 24 Vdc	12 mA to 30 mA
100° inside: 45 mA max. 100° outside: 30 mA max. 180° inside: 45 mA max.	90 mA max.
0.5 Vdc to 4.5 Vdc	4 mA to 20 mA
100° inside: 7,8 mm ±2,5 mm [0.307 in ±0.098 in] 100° outside: 9,2 mm ±2,5 mm [0.36 in ±0.098 in] 180° inside: 8,5 mm ±2,5 mm [0.338 in ±0.098 in]	3,0 ±2,0 mm [0.118 ±0.079 in]
-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]
100° inside: 4-pin M12 connector, 18 AWG flying leads 100° outside: Ampseal 16 connector 180° inside: 4-pin M12 connector	M12 connector (male 5-pin)
IP67, IP69K	IP69K
thermoplastic	aluminum with powder coating
CE	CE
100°: 183 mm L x 86 mm W x 31 mm H [7.20 in x 3.39 in x 1.22 in] 180°: 222 mm L x 107 mm W x 31 mm H [8.74 in x 4.21 in x 1.22 in]	113,5 mm x 106,5 mm x 22,0 mm [4.46 in x 4.19 in x 0.87 in]
analog output; self diagnostics; IP67 and IP69K sealing	analog output, 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

Inertial Measurement Unit (IMU)



Inertial Measurement Units (IMU) are high-end position sensors with sensitive multi-axis motion control. These sensors measure the motion of the equipment onto which they are attached and deliver the data to the equipment's control module, allowing the operator to focus on other equipment functions, enabling more precise control than can be achieved by using only the human eye, thus increasing safety, stability and productivity.



	6DF Series
Description	6 degrees of freedom, 6-D motion variant
Supply voltage	7 V to 32 V
Supply current	350 mA max.
Startup time	700 ms typ.
Output type	SAEJ1939 CAN 29
Operating temperature range	-40 °C to 85 °C [-40 °F to 185 °F]
Accelerometer	2 g, 6 g
Sealing	IP67, IP69K
Housing material	aluminum
Approvals/testing/ qualifications	EMI/EMC, ESD, mechanical and thermal shock, random vibration, humidity, salt spray, chemical compatibility, automotive grade
Measurement	130 mm L x 96,3 mm W x 66,0 mm H [5.12 in L x 3.80 mm W x 2.60 mm H]
Features	designed to Six Sigma standards; industry-leading durability, accuracy, voltage input flexibility, application expertise, customization, and temperature performance; eases integration; automotive-grade qualified, long term stability, no calibration needed

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	300 FW
Description	rail wheel proximity sensor	one-piece 5/8 in proximity sensor	one-piece 5/8 in proximity sensor	two-piece proximity sensor
Technology	–	ECKO	hall	ECKO
Target material	–	all metals	magnet	ferrous metals
Load current	–	120 mA, 50 mA lamp	100 mA, 50 mA lamp	750 mA
Supply current	–	20 mA max. @ 25 °C	20 mA max. @ 25 °C	65 mA max.
Sensing face	–	shielded, unshielded	shielded	shielded
Housing material	polymide “Grilamid LKN5H”	stainless steel	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]	1,78 mm to 3,3 mm [0.07 in to 0.130 in]
Operating temp. 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]	-77 °C to 125 °C [-106.6 °F to 257 °F]
Supply voltage	10 Vdc to 30 Vdc	18 Vdc to 32 Vdc	18 Vdc to 32 Vdc	18 Vdc to 32 Vdc
Output type	–	normally open, current sinking	normally open/closed, current sinking	normally open/closed, current sinking
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	MIL-STD-810B
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]	Ø 11,2 mm x 31,8 mm L [Ø 0.44 in x 1.25 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	ferrous metal sensing; two-piece construction; reverse polarity

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 and Non-Contact Hall-Effect Sensors



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	510E	600
Type	mechanical	optical
Pulse per revolution	16, 9, 6, 4	128
Output	2- or 4-bit grey code	quadrature square wave
Expected rotational life	100K cycles	10 million rotations min.
Operating speed	50 rpm max.	300 rpm max.
Terminals	pcb pins	PC type B-66, PC type C-24, cable, cable/connector
Measurements	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	eliminates need for A/D converters; positive detent feel; continuous electrical travel	eliminates need for A/D converter; cable and printed circuit terms; outputs TTL compatible





Non-Contact Hall-Effect	RTY	HRS100
Sensing range	50° (±25°), 60° (±30°), 70° (±35°), 90° (±45°), 120° (±60°), 180° (±90°), 270° (±135°), 360° (±180°)	90° ±2°, 180° ±2°
Redundant ver.	no	no
Input voltage	LV: 5 Vdc ±0.5 Vdc HV: 10 Vdc to 30 Vdc	5 Vdc ±10%
Output	LV: 0.5 V to 4.5 V ratiometric; HV: 0.5 V to 4.5 V non-ratiometric	5% to 95% of applied Vdd, approx. (ratiometric)
Input current (max.)	LV: 20 mA to 25 mA; HV: 32 mA to 47 mA	5 mA typ.
Life	35 M cycles	10 M cycles
Sealing	IP67	–
Operating temp. range	-40 °C to 125 °C [-40 °F to 257 °F]	-40 °C to 85 °C [-40 °F to 185 °F]
Measurements	55 mm L x 43 mm W x 41 mm H [2.17 in L x 1.69 in W x 1.61 in H]	32,27 mm H x 27,79 mm W [1.3 in H x 1.1 in W]
Features	variety of supply voltages and output configurations; rugged sealed package with integral connector	90° degree rotation; maximum ESD sensitivity of ±7 kV

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
Type	309: compact modular housing 409: sealed for board washing	multiple sections available
Expected rotational life	25K cycles	25K cycles
Element type	cermet	cermet
Power rating	1 W	1 W
Terminal type	PC, solder hook	PC, solder hook
Resistance range	100 Ohm to 5 mOhm	linear: 5 Ohm to 5 mOhm; tapered: 100 Ohm to 2 mOhm
Bushing type	standard	standard
Potentiometer type	industrial	industrial
Electrical taper	linear, tapered	linear, tapered
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
Features	modular package; enhanced performance	stackable; rotary, push-pull, and momentary options

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
Type	308: compact modular house; 408: sealed for board washing	RV4 meets MIL-PRF-94
Expected rotational life	50K cycles	100K cycles, 25K cycles
Element type	conductive plastic	conductive plastic
Power rating	0.5 W	2 W
Terminal type	pc, solder hook	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
Bushing type	standard, locking	standard, locking
Potentiometer type	industrial	industrial
Electrical taper	CW audio, linear	linear, tapered
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
Features	nickel-plated brass shaft and bushings; enhanced performance	solder lug terminals; CW audio and linear tapers available





Series	578	590
Type	variable resistor technology	multiple sections available
Expected rotational life	2.5M cycles	50K cycles
Element type	conductive plastic	conductive plastic
Power rating	0.5 W	0.5 W
Terminal type	pc	pc, solder hook
Resistance range	1 kOhm to 10 kOhm	100 Ohm to 1 mOhm
Bushing type	standard	standard
Potentiometer type	precision	commercial
Electrical taper	linear	linear
Measurements	body: Ø 22,86 mm [Ø 0.90 in] bushing: 9,52 mm D & L [0.375 in D & L]	body: 12,7 mm [Ø 0.50 in] square bushing: 6,35 mm D & L [0.25 in D & L]
Features	low mounting profile; quiet electrical output; precision control; pc terminals	linear taper, pc terminals; brass shaft and bushings







381	388	392/RV6
metal case and nickel-plated shaft	multiple sections available	RV6 meets MIL-PRF-94
25K cycles	50K cycles	50K cycles
conductive plastic	conductive plastic	conductive plastic
1 W	0.5 W	0.5 W
solder lug	pc, solder hook	pc, solder hook
100 Ohm to 5 mOhm	linear: 100 Ohm to 5 mOhm; tapered: 500 Ohm to 2 mOhm	100 Ohm to 5 mOhm
standard, locking	standard	standard
industrial	industrial	industrial
CW audio, linear	linear, tapered	linear, tapered
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	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]
solder lug terminals; nickel-plated brass shaft and bushings	stackable; up to six modules; single, dual-concentric, or trimmer configurations	nickel-plated shaft and bushings; pc and solder hook terminals







MKV	SensorCube	640
conductive plastic element	sealed construction	special electrical & mechanical configurations
10 million cycles	10 million cycles	1 million cycles
conductive plastic	conductive plastic	conductive plastic
1 W	1 W	0.5 W
turret	turret	three 20 AWG; 152,4 mm [6.0 in] leads
500 Ohm to 20 kOhm	1 kOhm to 10 kOhm	10000 ohms (total resistance)
no bushing, standard	standard	slotted rotor
precision	precision	position transducer
linear	linear	linear
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]
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	Honeywell Hawk™ 1-inch	Cased - Brushless Dual Speed	Cased - Brushless Single Speed
Type	fully housed	one-speed and multi-speed resolver and rotary transformer	one-speed, one-pole pair resolver and rotary transformer
Size diameter	1.06 in	(1/10 in) 30	(1/10 in) 17
Speed	1X	1&32	1X
Accuracy	±7 arcmin	1&32	1.25 arcmin to 3.50 arcmin
Transformation ratio	–	various	various
Operating temperature range	50.8 °C to 93.3 °C [-60 °F to 200 °F]	-46 °C to 71 °C [-51 °F to 160 °F]	-46 °C to 71 °C [-51 °F to 160 °F]
Measurements	1.06 in dia. x 2.77 in L	various	various
Features	non-contact magnetic technology eliminates mechanical contact, reducing wear and improving reliability and durability by enhancing operation in harsh environments; meets multiple military/aerospace specifications: DO-160D, MIL-STD-202G, MIL-STD-810G, MIL-STD-81963B, MIL-STD-461F; complies with space outgassing requirement SP-R0022	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 Multi-Speed	Pancake - Brushless Dual-Speed	Pancake - Dual-Speed	Pancake - Multi-Speed	Pancake - Single Speed
multiple pole pairs resolver and rotary transformer	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) 38 to 63	(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&64	1&8, 1&16, 1&32, 1&36, 2&36, 1&64, 1&128	4, 8, 16, 32, 64	1
3 arcmin to 30 arcsec (low distortion harmonic)	(multi-speed) 30 arcsec	(multi-speed) 36 arcsec to 4 arcsec	1 arcmin to 5 arcsec	3 arcmin to 30 arcsec
various	various	0.45 ±5 %	0.45 ±5 %	various
-46 °C to 71 °C [-51 °F to 160 °F]	-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	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	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



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, board mount 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, board mount and stainless steel media isolated pressure sensors, force sensors, safety light curtains, push-pull switches, and MICRO SWITCH™ basic switches, hazardous area switches, safety switches, key and rotary switches, limit switches, sealed and high-accuracy switches, pushbutton, rocker, toggle switches, and relays.

Transportation

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

Honeywell products for transportation applications include Hall-effect rotary position sensors, inertial measurement units, infrared sensors, keyless entry sensors, magnetic position sensors, pressure sensors, speed and direction sensors, ultrasonic sensors, thermostats, temperature probes, 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. Analog or digital output. Thin-film, thermally isolated bridge structure consists of a heater and temperature sensing elements. **May be used in:** HVAC, respirators, process control, oxygen concentrators, gas metering, chromatography, leak detection equipment, medical/ analytical instrumentation, 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: Digital or analog versions. onfigured with integrated circuitry. Provide on-chip signal conditioning with interchangeability of ±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/R, incubators/micro-environments, 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: The **SMART position sensor** measures linear, angular, or rotary position of a magnet attached to a moving object so that the object's position can be determined or controlled. Its simple, non-contact design eliminates mechanical failure mechanisms, reduces wear and tear, improves reliability and durability. **May be used in**: valve position, material handling, plastic molding, passenger bus level position, truck-mounted crane outrigger position, aerial work lift platform, front loader and digger/excavation boom position. **Potentiometer sensors** measure linear, rotary position or displacement. Honeywell's proprietary conductive plastic delivers extensive temperature range and infinite resolution, and provides precision position measurement. **May be used in**: robotic motion control, marine steering, and in-tank level sensing. **Ultrasonic sensors** measure time delays between emitted and echo pulses, often accurately determining the sensor-to-target distance. **May be used in**: level measurement, height and thickness sensing, and diameter control.



Pressure sensors – board mount: Full line of industrial-grade sensors: media-isolating design, multiple ports and outlets, and electrical configurations. **May be used in:** Pneumatic controls, air compressors, process monitoring, hydraulic controls, VAV controls, clogged filter detection, presence/absence of flow, and transmissions.



Pressure sensors – heavy duty: Small, allowing use on their own in tight packages or as the building block for a complete transducer. Developed for potential use in pressure applications that involve measurement of hostile media in harsh environments compatible with 316 stainless steel. **May be used in** industrial controls, process control systems, and industrial automation.



Pressure transducers – heavy duty: Provide a complete amplified and compensated pressure measurement solution. Choice of ports, connectors, outputs and pressure ranges, engineered to be resistant to a wide variety of media for use in most harsh environments. **May be used in:** Industrial HVAC/R and air compressors; general system and factory automation pump, valve and fluid pressure; and transportation (heavy equipment and alternative fuel vehicles) system, pneumatics, and hydraulics.



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/hatch monitoring.



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



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.

ELECTROMECHANICAL SWITCHES



MICRO SWITCH™ basic switches: Snap-action precision switches. Compact. Lightweight. Designed for repeatability and enhanced life. Basic switches: large, standard, miniature, subminiature, hermetically sealed, water-tight, and high-temperature versions. **May be used in:** Vending machines, communication equipment, HVAC, appliances, automotive, electronic gaming machinery, valve controls, irrigation systems, foot switches, pressure, 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: Environmentally sealed, 2-3-4 position switches. O-rings help keep dirt and moisture out and prolong life. **May be used in:** All-terrain vehicles, golf carts, snowmobiles, scissor lifts, telehandlers, construction and marine equipment, skid loaders, agricultural equipment, material handlers.



MICRO SWITCH ™ limit switches: Broadest and deepest limit switch portfolio. Rugged, dependable position detection solutions. MICRO SWITCH™ heavy-duty limit switches (HDLS). medium-duty, and global limit switches. Hermetically and environmentally sealed switches. **May be used in:** Machine tools, woodworking, textile, 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.



MICRO SWITCH™ pushbutton switches: Lit or unlit. Wide range of electrical and display design, pushbuttons, and manual switches. Many shapes, sizes, and configurations. Easy to apply, operate, and maintain. **May be used in:** Control boards and panels, industrial and test equipment, flight decks, medical instrumentation, and process control.



MICRO SWITCH™ sealed and stanard rocker switches: Wide range of electrical and display design. Many shapes, sizes, buttons, and configurations to enhance manual operation. **May be used in:** Transportation, agricultural and construction equipment, test equipment, heavy-duty machinery, marine equipment, small appliances, telecom, medical instrumentation, and commercial aviation.



MICRO SWITCH™ toggle switches: Hermetic and environmentally sealed options. Enhanced reliability. Center pin for ultimate stabilization Available in many shapes, sizes, and configurations. **May be used in:** Aerial lifts, construction equipment, agriculture and material-handling equipment, factory-floor controls, process control, medical instrumentation, test instruments, and military/commercial aviation.



MICRO SWITCH™ aerospace-grade pressure switches: lightweight, compact pressure switches. Meets military and DO-160 standards. Lower operating force provides application versatility with enhanced precision. Design modularity allows for configuration of the switch, facilitating rapid customization. **May be used in**: aerospace systems: engines, fuel pressure, and hydraulic systems, military ground vehicles, ordnance and munitions release systems, military maritime systems.



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

LIMITLESS™ WIRELESS SOLUTIONS



Limitless™ switches and receivers: Combines the best of MICRO SWITCH™ limit switches with commercial wireless technology. Beneficial for remote monitoring where wiring/maintenance is not physically possible or economically feasible. Used for position sensing and presence/absence detection. **Limitless™ Operator Interface:** Adds a human interface device to the product-driven interfaces of Limitless™ switches and receivers. Choose and install a desired operator or utilize one of Honeywell's pushbuttons. **May be used in:** valve position, crane boom/jib/skew position, lifts, material handling, presses, construction/ag machines, conveyors, industrial environments, remote/temporary equipment, grain diverters or flaps, and door position.

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, bailers, compactors, aircraft bridges, telescopic handlers, refuse vehicles.

Warranty/Remedy

Honeywell warrants goods of its manufacture as being free of defective materials and faulty workmanship. Honeywell's standard product warranty applies unless agreed to otherwise by Honeywell in writing; please refer to your order acknowledgement or consult your local sales office for specific warranty details. If warranted goods are returned to Honeywell during the period of coverage, Honeywell will repair or replace, at its option, without charge those items it finds defective. **The foregoing is buyer's sole remedy and is in lieu of all other warranties, expressed or implied, including those of merchantability and fitness for a particular purpose. In no event shall Honeywell be liable for consequential, special, or indirect damages.**

While we provide application assistance personally, through our literature and the Honeywell web site, it is up to the customer to determine the suitability of the product in the application.

Specifications may change without notice. The information we supply is believed to be accurate and reliable as of this printing. However, we assume no responsibility for its use.

Find out more

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

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000709-15-EN IL50 GLO Printed in USA
February 2013
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