

Speed Sensors

Honeywell



SENSING AND CONTROL

Product Range Guide

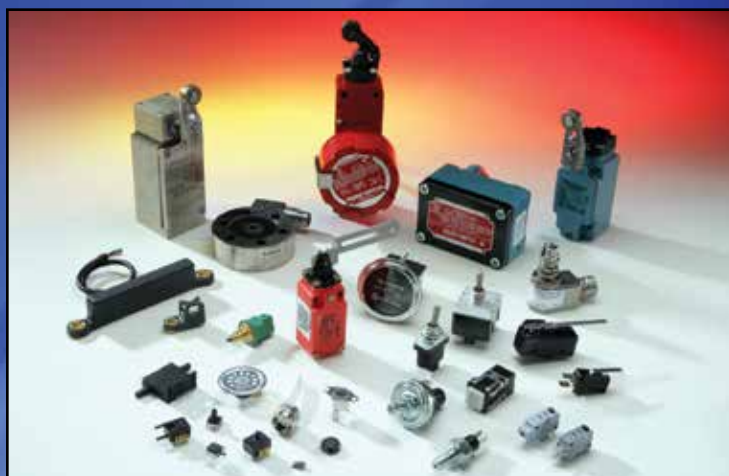
For innovation that's well apart, there's only Honeywell Sensing and Control.

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

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

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

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



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

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

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

Table of Contents

| | | | |
|--------------------------------------|-----|--|-------|
| Magnetoresistive Sensor ICs..... | 3 | Speed and Direction Hall-effect Sensors..... | 10 |
| Hall-effect Digital Sensor ICs..... | 4-6 | Variable Reluctance Speed Sensors..... | 11 |
| Hall-effect Linear Sensor ICs..... | 7 | Honeywell S&C Core Industry Segments..... | 12-13 |
| Value-Added Hall-effect Sensors..... | 8-9 | Honeywell S&C Product Portfolio..... | 14-15 |

Magnetic Sensors

Magnetoresistive Sensor ICs



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



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

Magnetic Sensors

Hall-effect Digital Sensor ICs



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



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



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

Magnetic Sensors

Hall-effect Digital Sensor ICs



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



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

Magnetic Sensors

Hall-effect Linear Sensor ICs



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



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

Magnetic Sensors

Value-Added Hall-effect Sensors



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



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



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

Speed and Direction Hall-effect Sensors



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



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

Variable Reluctance Speed Sensors

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



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





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

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

Aerospace

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

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

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

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

Medical

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

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

Industrial

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

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

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




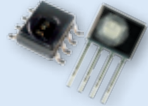





Transportation

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

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




SENSORS


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

ELECTROMECHANICAL SWITCHES

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

LIMITLESS™ WIRELESS SOLUTIONS

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|  | <p>Limitless™ switches and receivers: Combines the best of MICRO SWITCH™ limit switches with commercial wireless technology. Beneficial for remote monitoring where wiring/maintenance is not physically possible or economically feasible. Used for position sensing and presence/absence detection. Limitless™ Operator Interface: Adds a human interface device to the product-driven interfaces of Limitless™ switches and receivers. Choose and install a desired operator or utilize one of Honeywell's pushbuttons. May be used in: Valve Position • Crane Boom/Jib/Skew Position • Lifts • Material Handling • Presses • Construction/Ag Machines • Conveyors • Industrial Environments • Remote/Temporary Equipment • Grain Diverters or Flaps • Door Position</p> |
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|  | <p>Position sensors: The SMART position sensor measures linear, angular or rotary position of a magnet attached to a moving object so that the object's position can be determined or controlled. Its simple, non-contact design eliminates mechanical failure mechanisms, reduces wear and tear, and improves reliability and durability.</p> <p>May be used in: Valve Position</p> <ul style="list-style-type: none"> Material Handling Plastic Molding Passenger Bus Level Position Truck-Mounted Crane Outrigger Position Aerial Work Lift Platform Front Loader and Digger/Excavation Boom Position <p>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.</p> <p>May be used in: Robotic Motion Control • Marine Steering • In-Tank Level Sensing</p> <p>Ultrasonic sensors: Measure time delays between emitted and echo pulses, often accurately determining the sensor-to-target distance.</p> <p>May be used in: Level Measurement • Height and Thickness Sensing • Diameter Control</p> | |
|  | <p>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.</p> <p>May be used in: Printers/Copiers • Motion Control Systems • Metering</p> <ul style="list-style-type: none"> Data Storage Systems Scanning Automated Transaction Drop Sensors Non-Invasive Medical Equipment |  <p>Force sensors: Variety of package styles and various electrical interconnects including pre-wired connectors, printed circuit board mounting and surface mounting for flexibility.</p> <p>May be used in: Infusion and Syringe Pumps • Blood Pressure Equipment</p> <ul style="list-style-type: none"> Pump Pressure Drug Delivery Systems Occlusion Detection Kidney Dialysis Machines |
|  | <p>Proximity sensors: Designed to meet demanding temperature, vibration, shock and EMI/EMP interference requirements. Number of housing materials and termination styles.</p> <p>May be used in: Aircraft Landing Gear • Gun Turret Position Control</p> <ul style="list-style-type: none"> Door/Hatch Monitoring |  <p>Speed sensors: Measure speed, position and presence detection utilizing magnetostrictive, variable reluctance, and Hall-effect technologies.</p> <p>May be used in: Cam and Crankshafts • Transmissions • Fans • Pumps</p> <ul style="list-style-type: none"> Mixers Rollers Motors |
|  | <p>Airflow sensors: Advanced microstructure technology. Sensitive and fast response to flow, amount/direction of air or other gas. Analog or digital output. Thin-film, thermally isolated bridge structure consists of a heater and temperature sensing elements.</p> <p>May be used in: HVAC • Respirators • Process Control • Oxygen Concentrators • Gas Metering • Chromatography • Leak Detection Equipment</p> <ul style="list-style-type: none"> Medical/Analytical Instrumentation Ventilation Equipment |  <p>Rotary position sensors: Digital and analog Hall-effect, magnetostrictive and potentiometric devices and resolvers for sensing presence of a magnetic field or rotary position. Directly compatible with electronic circuits for application flexibility.</p> <p>May be used in: Audio and Lighting • Frequency • Temperature • Position</p> <ul style="list-style-type: none"> Medical/Instrumentation Computer Peripherals Manual Controls Joysticks Telecom Welding Heating Aerospace |

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|  | <p>MICRO SWITCH™ aerospace-grade pressure switches: Lightweight, compact pressure switches. Meets military and DO-160 standards. Lower operating force provides application versatility with enhanced precision. Design modularity allows for configuration of the switch, facilitating rapid customization.</p> <p>May be used in: Aerospace Systems • Engines, Fuel Pressure and Hydraulic Systems • Military Ground Vehicles • Ordnance and Munitions Release Systems • Military Maritime Systems</p> |  <p>MICRO SWITCH™ limit switches: Broadest and deepest limit switch portfolio. Rugged, dependable position detection solutions. MICRO SWITCH™ heavy-duty limit switches (HDLS), medium-duty and global limit switches. Hermetically and environmentally sealed switches.</p> <p>May be used in: Machine Tools • Woodworking • Textile • Printing Machinery</p> <ul style="list-style-type: none"> Metal Fabrication Balers/Compactors Forklifts Bridges Robotics Wind Turbines Elevators Moving Stairs Doors Dock Locks/Levelers Aerial Lifts Cranes Conveyors Rail Shipboards Dock Side |
|  | <p>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.</p> <p>May be used in: Control Boards and Panels • Industrial and Test Equipment • Flight Decks • Medical Instrumentation • Process Control</p> |  <p>MICRO SWITCH™ sealed and standard rocker switches: Wide range of electrical and display design. Many shapes, sizes, buttons and configurations to enhance manual operation.</p> <p>May be used in: Transportation • Agricultural and Construction Equipment • Test Equipment • Heavy-Duty Machinery • Marine Equipment • Small Appliances</p> <ul style="list-style-type: none"> Telecom Medical Instrumentation Commercial Aviation |

SAFETY PRODUCTS

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|  | <p>MICRO SWITCH™ safety switches: For operator point-of-operation protection, access detection, presence sensing, gate monitoring and electrical interfacing. High-quality, dependable, cost-effective solutions.</p> <p>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</p> <ul style="list-style-type: none"> Refuse Vehicles |
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Warranty/Remedy

Honeywell warrants goods of its manufacture as being free of defective materials and faulty workmanship. Honeywell's standard product warranty applies unless agreed to otherwise by Honeywell in writing; please refer to your order acknowledgment or consult your local sales office for specific warranty details. If warranted goods are returned to Honeywell during the period of coverage, Honeywell will repair or replace, at its option, without charge those items it finds defective.

The foregoing is buyer's sole remedy and is in lieu of all other warranties, expressed or implied, including those of merchantability and fitness for a particular purpose. In no event shall Honeywell be liable for consequential, special, or indirect damages.

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

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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