

# TRANSPORTATION APPLICATIONS

Product Range Guide



Honeywell

# TRANSPORT YOUR BUSINESS TO A BETTER PLACE: LEADING THE RACE

## HONEYWELL IS COMMITTED TO PROVIDING THE RIGHT PRODUCT FOR YOUR APPLICATION.

Whether you need a standard product or a highly customized solution, our sales and engineering teams have decades of experience in the Transportation industry. We understand your applications and work diligently to ensure we provide a solution that optimally meets your technical and financial needs. Our combination of a broad product portfolio, deep technical capabilities and extensive application experience culminates into a powerful ability to meet your design needs.

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# SERVING THE TRANSPORTATION INDUSTRY

## Operator Controls

- Key switch
- Push-pull switch
- Shifter
- Toggle switch
- Turn signal control

## Engine Systems

- Pressure sensor
- Pressure switch
- Speed sensor
- Thermostat

## Fuel Systems

- Pressure transducer
- Temperature sensor

## Vehicle Temperature Sensing, and Engine Testing

- Force sensor
- Pressure sensor
- Torque sensor
- Wireless data telemetry

## Brake Systems

- Pressure sensor
- Pressure switch
- Speed sensing

## Hydraulic Systems

- Pressure sensor
- Pressure switch
- Speed sensor
- Temperature probe

## Wheels and Suspension Systems

- Limit switch
- Position sensor assemblies
- Potentiometer
- Pressure transducer
- Pressure switch
- Resolver
- Sealed switch
- Speed sensor
- Thermostat

## Vehicle Position and Tilt

- Limit switch
- Position sensor
- Sealed switch
- Inertial measurement unit



**Heavy Duty On & Off Road**



**Material Handling Equipment**



**Mining and Construction**



**Sport Vehicle**



**Lawn and Garden**



**Power Generation**

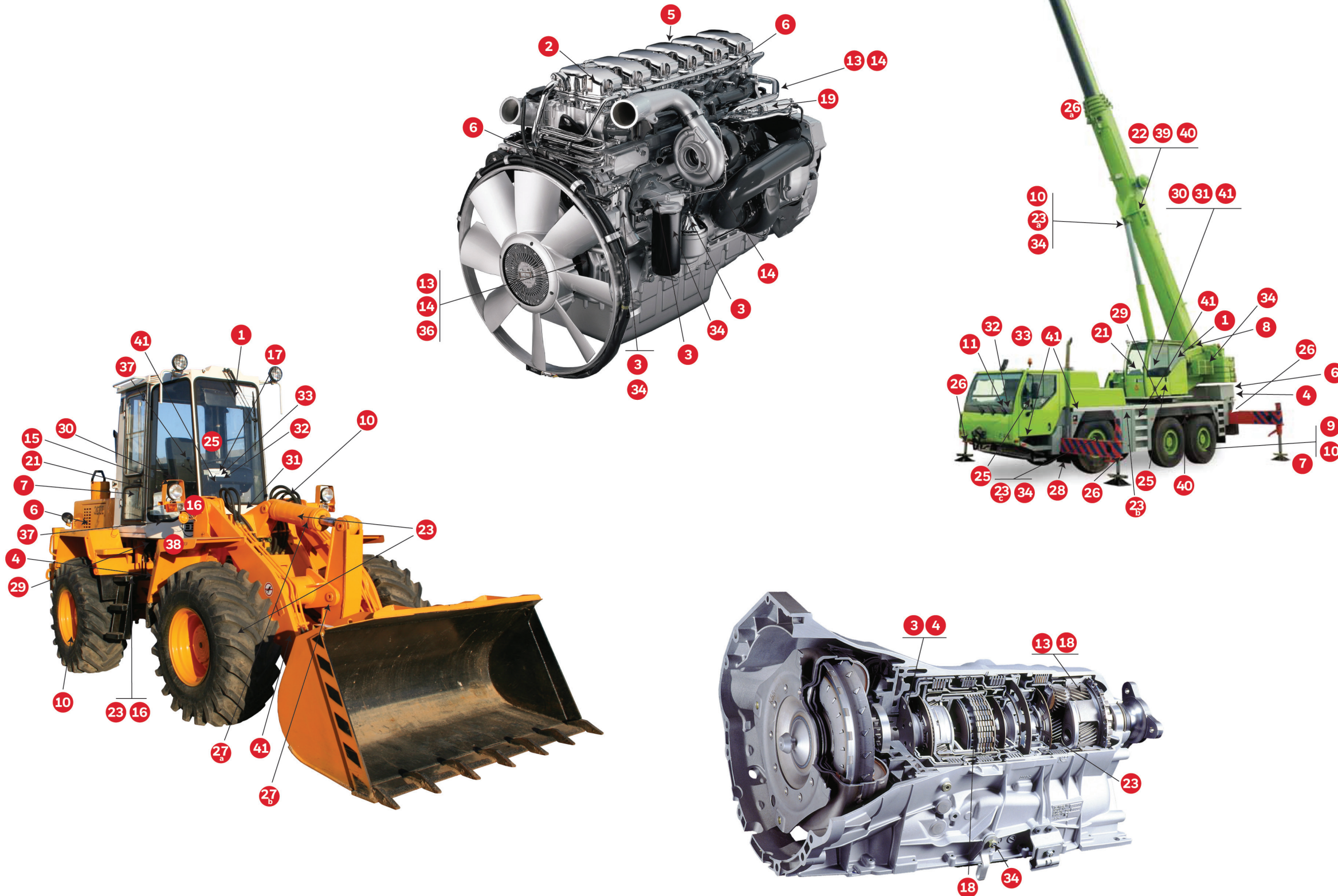


**Rail**



**Agricultural**

# SENSOR, SWITCH & CONTROL APPLICATIONS



	Description
1	<b>Temperature probe</b> (cabin temperature sensing) - 500 Series
2	<b>Temperature probe</b> (air inlet sensing) - 500 Series
3	<b>Temperature probe</b> (oil, coolant, and fuel temperature sensing) - 500 Series
4	<b>Temperature probe</b> (hydraulic oil temp sensing) - 500 Series
5	<b>Temperature probe</b> (exhaust gas recirculation sensing) - 500 Series
6	<b>Thermostat</b> (fan control and fire suppression sensing) - 3000 Series
7	<b>Hall-effect position sensor</b> (jack position sensing) - 103SR & 4AV19F
8	<b>Position sensor</b> (boom angle position sensing) - SPS, RTP & RTY Series
9	<b>Speed sensor</b> (wheel speed sensing) - SNDH, SNG-S Series
10	<b>Speed sensor</b> (wheel and hydraulic pump speed sensing) - SNDH, SNG-S Series
11	<b>Angular or linear Hall-effect position sensor IC</b> (power steering control system sensing) - APS00B, SS490, and RPN Series
12	<b>Hall-effect speed sensor</b> (cam/crankshaft sensor/ABS) - SNDH-H Series
13	<b>Speed sensor</b> (RPM and speedometer/MPH sensing) - VRS, SNDH, SNG-S and LCZ Series
14	<b>Speed sensor</b> (RPM/speedometer/MPH, camshaft/crankshaft, and turbocharger speed sensing) - VG481V1, SNDH-H, SNG-S Series
15	<b>Bipolar Hall-effect sensor IC</b> (power seat motor) - SS400, SS41, SS360/SS460 Series
16	<b>Linear Hall-effect sensor IC</b> (stability control system and remote mirror with memory control) - VF495A1-SP, SS490 Series
17	<b>Angular or linear Hall-effect sensor IC</b> (power steering control system) - APS00B, SS490, SS39ET Series
18	<b>Speed/direction sensor</b> (forward/reverse sensing) - SNDH-T, SNG-Q Series
19	<b>Linear Hall-effect sensor IC</b> (throttle position sensing) - VF495A1-SP, SS490, SS39ET Series
20	<b>Rotary position sensor</b> (gear position detection/throttle by wire) - RTY Series
21	<b>Position sensors Inertial Measurement Units (IMU)</b> - TARS Series
22	<b>SMART position sensor</b> (boom positioning) - SMART Arc 145° Series
23	<b>Heavy-duty pressure transducer</b> 23a. hydraulic sensing; 23b. fuel tank level sensing; 23c. braking system sensing - PX3, PX2, MLH, 13mm, 19mm, SPT Series
24	<b>Handlebar controls</b> (multi-function switch) - 1080HD Series & Custom
25	<b>Smart key</b> (limits function by operator's certification level)
26	<b>Heavy-duty pressure transducer or T&amp;M pressure sensor</b> (Outrigger load sensing - minimum of four; maximum of six) - MLH Series
27	<b>SMART position sensor</b> (vehicle and load sensing) 27a. SPS Linear; 27b. SPS Rotary
28	<b>SMART position sensor</b> (steering angle sensing) - SPS Series
29	<b>Swing angle sensor</b> (precise rotary position sensing) - RTP Series
30	<b>Key switch</b> (on/off)
31	<b>Push-pull switch</b> (emergency stop)
32	<b>Shifter</b> (forward-neutral-reverse) - 81248
33	<b>Turn signal</b> - multi-purpose
34	<b>Pressure switch</b> (hydraulic system and engine oil monitoring) - 5000 Series, LE Series
35	<b>Pressure switch</b> (brake switch indicator) - Series 1000
36	<b>Vacuum switch</b> (airflow monitoring) - 5000 Series
37	<b>MICRO SWITCH limit switch</b> (back-up alarm) - BZE Series
38	<b>MICRO SWITCH limit switch</b> (level sensor for cab position) - GLS Series
39	<b>MICRO SWITCH limit switch</b> (machine position) - HDLS Series
40	<b>MICRO SWITCH limit switch</b> (jib, wheelbock, and outrigger position indicator) - GLS Series
41	<b>MICRO SWITCH toggle switch</b> (manual operator switch) - NT Series
42	<b>MICRO SWITCH basic switch (watertight)</b> (brake switch indicator) - V15W Series

# SENSOR, SWITCH & CONTROL APPLICATIONS



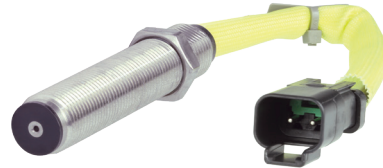
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# SPEED & DIRECTION SENSORS

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. A comprehensive line-up of Hall-effect, magnetoresistive, and variable reluctance sensors.



SERIES	SNG-Q	SNDH-T	SNG-S	SNDH-H	LCZ
<b>Description</b>	quadrature speed and direction sensor with 4-wire output	dual differential Hall-effect quadrature speed and direction sensor	single Hall-effect speed sensor	Hall-effect speed sensor	single Hall-effect zero speed sensor
<b>Housing</b>	PBT	stainless steel, plastic	plastic	stainless steel, plastic	stainless steel
<b>Supply voltage range</b>	4.5 V to 26 V	4.5 Vdc to 18 Vdc	4.5 V to 24 V, 4.8 V to 24 V, 4.8 V to 16 V, 8 V to 16 V	4 Vdc to 24 Vdc, 4.5 Vdc to 24 Vdc, 6.5 Vdc to 24 Vdc	4.5 Vdc to 26 Vdc
<b>Supply current</b>	2 mA normal typ., 18 mA max.	18 mA max.	15 mA, 0 mA max.	6 mA max., 14 mA max., 20 mA max.	20 mA
<b>Output type</b>	square wave	square wave	open collector, square wave	digital sinking	digital sinking
<b>Operating frequency range</b>	3 Hz to 20 kHz	1 Hz to 15 kHz	0 kHz to 15 kHz	0 Hz to 12 kHz, 0 Hz to 15 kHz, 2 Hz to 15 kHz	0 Hz to 15 kHz
<b>Operating temperature range</b>	-40°C to 150°C [-40°F to 302°F]	-40°C to 150°C [-40°F to 302°F]	-40°C to 140°C [-40°F to 284°F]	-40°C to 150°C [-40°F to 302°F] inclusive	-40°C to 125°C [-40°F to 257°F]
<b>Measurements</b>	Probe dimensions: • Ø15 mm x 35 mm L [Ø0.59 in x 1.38 in L] • Ø15 mm x 45 mm L [Ø0.59 in x 1.77 in L]	Ø 15 mm x 45 mm L [Ø 0.6 in x 1.77 in L]	Probe dimensions: • Ø14,91 mm x 24 mm L [Ø0.59 in x 0.94 in L] • Ø13,90 mm x 46 mm L [Ø0.55 in x 1.81 in L] • Ø13,90 mm x 67 mm L [Ø0.55 in x 2.64 in L]	various, depends upon type	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
<b>Features</b>	design and manufacturing platform-based approach enables cost-competitiveness and mechanical and electrical configurability, designed for potential applications where enhanced accuracy is required to detect small target features	advanced performance dynamic offset self calibration; short circuit and reverse voltage protection; low jitter output; near zero speed	IP69K rating, robust electrical noise immunity, O-ring seal enables environmental sealing to mounting surface, wide operating temperature range, cost-competitive, insensitive to orientation (angular rotation) during assembly, zero speed detection	rotationally insensitive versions available; zero speed sensing versions available; range of connector options	omni-directional sensor to target; low power consumption; zero speed; digital output



SERIES	THRUMOLD SERIES - HIGH VOLTAGE OUTPUT	THRUMOLD SERIES - LOW VOLTAGE OUTPUT
<b>Output voltage, min.</b>	39 Vp-p ±9 Vp-p	28 Vp-p ±7 Vp-p
<b>Thread size</b>	M18 X 1.5 6G, 5/8-18 UNF-2A, 3/4-16 UNF-2A, M16 X 1.5 6G	M18 X 1.5 6G, 5/8-18 UNF-2A, 3/4-16 UNF-2A, M16 X 1.5 6G
<b>Housing material</b>	stainless steel, aluminum, anodized aluminum	stainless steel
<b>Termination</b>	Deutsch DT04 connector	Deutsch DT04 connector
<b>Operating frequency</b>	15 kHz typ.	15 kHz typ., 40 kHz typ.
<b>Operating temperature range</b>	-40°C to 120°C [-40°F to 248°F]	-40°C to 120°C [-40°F to 248°F]
<b>Vibration</b>	20 G RMS from 24 Hz to 2000 Hz >50 MOhm	20 G RMS from 24 Hz to 2000 Hz >50 MOhm
<b>Features</b>	self-powered operation; simple installation; no moving parts; operates over wide speed range; customized versions available	

# SMART POSITION SENSORS

Honeywell's SMART Position Sensors are some of the most durable and adaptable position devices available in the industry today. Their simple, non-contact design eliminates mechanical failure mechanisms, reduces wear and tear, improves reliability and durability and enhances operator efficiency and safety, while minimizing downtime.



SERIES	SMART Arc CAN	SPS LINEAR	SPS ARC	SPS ROTARY
<b>Description</b>	utilizes magnetoresistive technology to detect the position of a magnet relative to the sensor, within a sensing range of 0° to 145°	measures linear movement of a magnet attached to a moving object	measure angular movement of a magnet attached to a moving object	measures rotary movement of a magnet attached to a moving object
<b>Configuration</b>	145°	linear	arc	rotary
<b>Sensing range</b>	0° to 145°	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]	100°: 0° to 100° 180°: 0° to 180°	0° to 360°
<b>Resolution</b>	0.02°	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]	100°: 0.06° 180°: 0.11°	0.01°
<b>Supply voltage</b>	9 V to 36 V	6 Vdc to 24 Vdc	6 Vdc to 24 Vdc, 18 Vdc to 24 Vdc	12 mA to 30 mA
<b>Supply current</b>	100 mA	75 mm analog: 32 mA max. 225 mm analog: 34 mA max. 225 mm digital: 88 mA max.	45 mA max.	90 mA max.
<b>Output</b>	CAN-2.0B SAE J1939	75 mm and 225 mm analog: 0 Vdc to 5 Vdc 225 mm digital: RS-232 type	0.5 Vdc to 4.5 Vdc	4 mA to 20 mA
<b>Air gap</b>	<b>Sensor-161:</b> 5,25 mm [0.21 in] <b>Sensor-220:</b> 6,75 mm [0.27 in]	3,0 mm ±2,5 mm [0.118 in ±0.098 in]	100°: 7,8 mm ±2,5 mm [0.307 in ±0.098 in]; 180°: 8,5 mm ±2,5 mm [0.338 in ±0.098 in]	3,0 ±2,0 mm [0.118 ±0.079 in]
<b>Operating temp. range</b>	-40°C to 85°C [-40°F to 185°F]	-40°C to 125°C [-40°F to 257°F]	-40°C to 85°C [-40°F to 185°F]	-40°C to 85°C [-40°F to 185°F]
<b>Storage temp. range</b>	-55°C to 105°C [-67°F to 221°F]	-40°C to 150°C [-40°F to 302°F]	-40°C to 150°C [-40°F to 302°F]	-40°C to 150°C [-40°F to 302°F]
<b>Termination</b>	Deutsch DT06-04	flying leads	M12 connector (4-pin), flying leads	M12 connector (male 5-pin)
<b>Sealing</b>	IP68, IP69K	IP67, IP69K	IP67, IP69K	IP69K
<b>Housing material</b>	RoHS-compliant materials meet Directive 2002/95/EC	thermoplastic	thermoplastic	aluminum with powder coating
<b>Approvals</b>	CE, UKCA	CE, UKCA	CE, UKCA	CE, UKCA
<b>Measurements</b>	Sensor-161: Ø171,5 mm [Ø6.75 in] Sensor-220: Ø233,50 mm [Ø 9.19 in] cable length 1000 mm ±20 mm	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]	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]
<b>Features</b>	145° configuration; linearity down to 0.3 %; CAN-2.0B SAE J1939 output	analog or digital output; small size; self diagnostics; IP67 and IP69K sealing	analog output; self diagnostics; IP67 and IP69K sealing	analog output, IP67 and IP69K sealing

# POSITION SENSORS INERTIAL MEASUREMENT UNITS (IMU)

High-end position sensors with sensitive multi-axis motion control. IMUs 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.



## TARS SERIES

<b>Description</b>	6 degrees of freedom, 6-D motion variant
<b>Angular rate range</b>	-245 deg/s to +245 deg/s
<b>Supply voltage</b>	<ul style="list-style-type: none"> <li>• TARS-LCASS: 4.5 V to 5.5 V</li> <li>• TARS-HCASS: 9 V to 36 V</li> </ul>
<b>Supply current</b>	100 mA max.
<b>Startup time</b>	500 ms min. to 2000 ms max.
<b>Output type</b>	SAEJ1939 CAN 29
<b>Operating temperature range</b>	-40°C to 85°C [-40°F to 185°F]
<b>Accelerometer range</b>	-78.48 m/s <sup>2</sup> to +78.48 m/s <sup>2</sup>
<b>Accelerometer resolution</b>	0.01 m/s <sup>2</sup>
<b>Sealing</b>	IP67, IP69K
<b>Housing material</b>	PBT thermoplastic
<b>Approvals/testing/qualifications</b>	EMI/EMC, ESD, mechanical and thermal shock, random vibration, humidity, salt spray, chemical compatibility, automotive grade
<b>Dimensions (diameter x height)</b>	Ø138 mm x 28 mm [Ø5.433 in x 1.102 in]
<b>Features</b>	high performance IMU; reports vehicle angular rate, acceleration and inclination (6 degrees of freedom); advanced filtering of raw sensor data; improves positioning accuracy; optional metal guard for added protection; may be pre-configured at the Honeywell factory for immediate installation out of the box or be delivered with customizable firmware that allows manufacturers to use a single part number across vehicles and applications; may be customized to best meet application needs using the TARS Configurator Tool (TCT) software to change selected parameters such as broadcast rate, orientation, and filter settings.



# ROTARY POSITION SENSORS NON-CONTACT HALL-EFFECT SENSORS

Respond to the presence or to the interruption of a magnetic field, using a solid-state, Hall-effect IC to sense rotary movement of the actuator shaft and then producing a proportional output. The IC, circuitry and magnets are galvanized with an integral connector – more than a match for the most unforgiving conditions.



	RTY SERIES	RTP SERIES
<b>Sensing range</b>	50° (±25°), 60° (±30°), 70° (±35°), 90° (±45°), 120° (±60°), 180° (±90°), 270° (±135°), 360° (±180°)	50° (±25°), 60° (±30°), 70° (±35°), 90° (±45°), 120° (±60°), 180° (±90°), 270° (±135°), 350° (±175°), 360° (±180°)
<b>Input voltage</b>	<ul style="list-style-type: none"> <li>• <b>low voltage:</b> 5 Vdc ±0.5 Vdc</li> <li>• <b>high voltage:</b> 10 Vdc to 30 Vdc</li> </ul>	<ul style="list-style-type: none"> <li>• <b>low voltage:</b> 5 Vdc ±0.5 Vdc</li> <li>• <b>high voltage:</b> 10 Vdc to 30 Vdc</li> </ul>
<b>Output</b>	<ul style="list-style-type: none"> <li>• <b>low voltage:</b> 0.5 V to 4.5 V ratiometric (standard), 4.5 V to 0.5 V ratiometric (inverted)</li> <li>• <b>high voltage:</b> 0.5 V to 4.5 V ratiometric (standard), 4.5 V to 0.5 V ratiometric (inverted)</li> </ul>	<ul style="list-style-type: none"> <li>• <b>low voltage:</b> 0.5 V to 4.5 V ratiometric (standard), 4.5 V to 0.5 V ratiometric (inverted)</li> <li>• <b>high voltage:</b> 0.5 V to 4.5 V ratiometric (standard), 4.5 V to 0.5 V ratiometric (inverted)</li> </ul>
<b>Input current</b>	<ul style="list-style-type: none"> <li>• <b>low voltage:</b> 20 mA max.; during output to ground short, 25 mA max.</li> <li>• <b>high voltage:</b> 32 mA max.; during output to ground short, 47 mA max.</li> </ul>	<ul style="list-style-type: none"> <li>• <b>low voltage:</b> 20 mA max.; during output to ground short, 25 mA max.</li> <li>• <b>high voltage:</b> 32 mA max.; during output to ground short, 47 mA max.</li> </ul>
<b>EMI/EMC</b>	<ul style="list-style-type: none"> <li>• <b>EMI radiated immunity:</b> 100 V/m from 200 MHz to 1000 MHz per ISO11452-2</li> <li>• <b>EMI conducted immunity:</b> <ul style="list-style-type: none"> <li>- low voltage: 100 mA BCI per ISO11452-4 from 1 MHz to 200 MHz</li> <li>- high voltage: 100 mA BCI per ISO11452-4 from 1 MHz to 400 MHz</li> </ul> </li> <li>• <b>EMC:</b> exceeds CE, UKCA requirements</li> </ul>	<ul style="list-style-type: none"> <li>• <b>EMI radiated immunity:</b> 100 V/m from 200 MHz to 1000 MHz per ISO11452-2</li> <li>• <b>EMI conducted immunity:</b> <ul style="list-style-type: none"> <li>- low voltage: 100 mA BCI per ISO11452-4 from 1 MHz to 200 MHz</li> <li>- high voltage: 100 mA BCI per ISO11452-4 from 1 MHz to 400 MHz</li> </ul> </li> <li>• <b>EMC:</b> exceeds CE, UKCA requirements</li> </ul>
<b>Life</b>	35 M cycles	infinite
<b>Sealing</b>	IP69K	IP69K
<b>Operating temperature range</b>	-40°C to 125°C [40°F to 257°F]	-40°C to 125°C [40°F to 257°F]
<b>Dimensions</b>	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]	59,6 mm L x 43,3 mm W x 17,8 mm H [2.35 in L x 1.70 in W x 0.70 in H]
<b>Features</b>	magnetically biased, Hall-effect IC senses rotary movement of the actuator over a set operating range; activated by integral shaft (available with or without lever)	magnetically biased, Hall-effect IC senses rotary movement of the actuator over a set operating range; activated by a separate magnet (available bare or housed)

# SWING ANGLE SENSOR

A non-contact rotary position sensor with sensing range up to 360°, the Swing Angle Sensor is an extension of Honeywell RTP rotary position sensors. It uses a magnetically biased dual die Hall-effect integrated circuit (IC) to sense rotary movement of an actuator over a set operating range.



## RTP SERIES

<b>Regulated &amp; protected supply voltage (Vdd)</b>	5 Vdc ±0.5 Vdc
<b>Supply current</b>	25 mA max.
<b>Power-up time</b>	20 m sec
<b>Output</b>	Dual output 10 % to 90 % of Vdd (Ratiometric) 270°±5° range. 180° ±2° phase shift
<b>Media compatibility</b>	Diesel fuel, coolant, urea, engine oil, hydraulic oil, washer solvents, (alkaline degreaser), grease tri-sodium phosphate
<b>Ingress protection</b>	IP69K (DIN40050-1993) with mating connector installed
<b>Operating temperature range</b>	-40°C to 105°C
<b>Mechanical vibration</b>	15.32 Grms random, 6 hours per Orthogonal Plane, 18 hours in total
<b>Thermal cycle</b>	100 cycles, -40°C to 105°C, dwell: 60-Min
<b>Dimensions</b>	56 mm H x 3 X 42,0 mm ±0,20 mm (A/F) [2.2 in H x 3 X 1.65 in ± 0.008 in (A/F)]
<b>Features</b>	low cost sensor solution enables precise rotary position sensing, up to 360° in heavy-duty applications; the absence of an actuator shaft allows over-travel in 360° sensing applications. This reduces system wear and tear. The o-ring allows for direct contact with most common transportation fluids without impact to product performance

# PRESSURE & VACUUM SWITCHES

Feature set points ranging from 3.5 psi to 150 psi and 1.1 in-Hg to 22 in-Hg, and enhanced repeatability of set points and wide media capability. IP67 environmental sealing and high proof pressure and burst pressure ratings allow for use in many rugged applications that require the making or breaking of an electrical connection in response to a pressure change.



SERIES	5000	LE	1000	5000 VACUUM
Type	low pressure	low pressure	hydraulic brake pressure switch	direct action blade contact
Set point range	75 psi to 150 psi	3.5 psi to 150 psi	20 psi ±10 psi [1,37 bar ±0,69 bar]	factory set: 1.1 inHg to 22 inHg
Contacts	silver-plated copper	gold plated	silver-plated copper	silver-plated copper
Vacuum	–	–	–	1.1 in-Hg to 22 in-Hg
Oper. pressure	150 psi, 250 psi	250 psi	1400 psi	30 in-Hg max.
Proof pressure	500 psi	500 psi	2973 psi	–
Burst pressure	4000 psi	1250 psi	3500 psi	150 psi
Smart diagnostic technology	no	yes	no	no
Sealing	IP00	IP67 (connectors) IP67 (wire out) IP00 (blade/screw)	IP00	IP65
Connector	1/8-27 NPT male thread	1/4-18 NPT, 1/8-27 NPT, 1/2-20 UNF, 1/8-27 PTF, M12 × 1.5, M14 × 1.5, 9/16-18 UNF, 3/4-16 UNF, G1/8 BSPP, M18 × 1.5, 7/16-20 UNF, R1/8 BSPT, M10 × 1.0, R1/2 BSPT, G1/4 BSPP, R1/4 BSPT	M10 × 1.25 banjo fitting (single or double); M10 × 1; 1/8-27 NPT	1/8-27 NPT male thread standard (others, including metric, available)
Terminals	#8-32 screws, 1/4 in blade, MetriPak 280		1/4 in blade	#8-32 screws, 1/4 in blade, MetriPak 280
Approvals	–	CE, UKCA	–	–

# BOARD-MOUNT PRESSURE SENSORS & HEAVY-DUTY PRESSURE TRANSDUCERS

Complete amplified and compensated pressure measurement. With a choice of ports, connectors, outputs and pressure ranges, transducers can be configured. Heavy-duty pressure transducers are engineering to be resistant to aggressive media in most harsh environments.



SERIES	40PC	MLH	PX2	PX3
<b>Pressure port type</b>	o-ring interface	1/4-18 NPT, 1/8-27 NPT, 7/16-20 UNF 1/4 inch 45° Flare Female Schrader (SAE J512), 1/2-14 NPT, R 1/4-19 BSPT (ISO 7-1 tapered thread), R 1/8-28 BSPT (ISO 7-1 tapered thread)	7/16-20 UNF 1/4 in 45° Flare Female Schrader (SAE J512), 7/16-20 UNF 45° Flare Male (SAE J513), 7/16-20 UNF 37° Flare Male (SAE J514), G1/4 (ISO 1179-3), G1/8 (ISO 1179-3), M12 x 1.5 (ISO 6149-3), 1/4-18 NPT, 1/8-27 NPT, 9/16-18 UNF, (SAE J1926-3), 7/16-20 UNF (SAE J1926-3)	7/16-20 UNF 1/4 inch 45° Flare Female Schrader (SAE J512), G1/4 (ISO 1179-3), M12 x 1.5 (ISO 6149-3), 1/4-18 NPT, 1/8-27 NPT, brazable tube
<b>Measurement type</b>	gage, bidirectional gage, vacuum gage	gage, sealed gage	absolute, sealed gage, vented gage	absolute, sealed gage
<b>Construction</b>	silicon piezoresistive technology	port: 304L stainless steel; diaphragm: Haynes 214 alloy	port and housing: 304 stainless steel, connector: PBT 30% GF	threaded ports: brass C36000 (lead (Pb) content: 3.7% max.) tube port: copper UNS C12200 (lead (Pb) free)
<b>Pressure range</b>	1 psi to 500 psi	0 psi to 50 psi through 0 psi to 8000 psi	1 bar to 70 bar   100 kPa to 7 MPa   15 psi to 1000 psi	1 bar to 50 bar   15 psi to 700 psi
<b>Output signal</b>	Vdc	ratiometric (from 5 Vdc excitation): 0.5 Vdc to 4.5 Vdc regulated: 1 Vdc to 6 Vdc, 0.25 Vdc to 10.25 Vdc, 0.5 Vdc to 4.5 Vdc, 1 Vdc to 5 Vdc current: 4 mA to 20 mA	ratiometric: 5.0 V, 10 %Vs to 90 %Vs; 5.0 V, 5 %Vs to 95 %Vs; 3.3 V, 10 %Vs to 90 %Vs; 3.3 V, 5 %Vs to 95 %Vs regulated: 1 Vdc to 6 Vdc, 0.25 Vdc to 10.25 Vdc, 0.5 Vdc to 4.5 Vdc, 1 Vdc to 5 Vdc current: 4 mA to 20 mA	ratiometric: 0.5 Vdc to 4.5 Vdc, 0.33 Vdc to 2.97 Vdc
<b>Accuracy</b>	linearity & hysteresis: 0.25 % typ.	±0.25 %FSS (±0.5 %FSS on ranges below 100 psi)	±0.25 %FSS	±0.25 %FSS
<b>Total error band</b>	-	±2 %FSS to ±15 %FSS, depending on temp range and termination type	±2 %FSS at -40°C to 125°C [-40°F to 257°F]	±1.0 %FSS at -20°C to 85°C [-4°F to 185°F] ±2.0 %FSS at <-20°C, >85°C [<-4°F, >185°F]
<b>Amplified</b>	yes	yes	yes	yes
<b>Compensated temperature range</b>	-45°C to 85°C [-49°F to 185°F]	ratiometric output: -40°C to 125°C [-40°F to 257°F]; regulated and 4 mA to 20 mA outputs: -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]
<b>Electrical connector type</b>	DIP	Metri-Pack 150, Hirschmann (mates with G4W1F), M12 x 1 (Brad Harrison micro), DIN 43650-C, 8 mm male, AMP Superseal 1.54, Cable (24 AWG, 1 meter), Cable (24 AWG, 3 meter), flying leads (20 AWG, 6 in), Deutsch DTM04-3P (integral)	Metri-Pack 150 (UL 94 HB or V-0 options), Micro M12, DIN, Deutsch, cable harness (1 m, 2 m, 3 m, or 5 m)	Metri-Pack 150 (UL V-0), cable harness (PVC or XLPE)
<b>Measurements (H x W x D)</b>	19,81 mm x 11,18 mm x 30,99 mm [0.78 in x 0.44 in x 1.22 in]	27,0 mm x 27,0 mm x 55 mm [1.06 in x 1.06 in x 2.18 in]	66 mm x 21,5 mm dia. [2.60 in x 0.84 in dia.]	50 mm x 22 mm dia. [2 in x 0.87 in dia.]
<b>Approvals</b>	meets MIL-STD-202 Method 213	UL component recognition for USA/Canada: file no. E258956	IP65 or IP69K, depending on connector	Ingress protection up to IP67, RoHS, REACH, and CE & UKCA compliant

# TEMPERATURE PROBES

Compact, lightweight. Operate with enhanced sensitivity, reliability, and stability under diverse conditions of shock, vibration, humidity, and corrosion. Variety of custom packages available for air, liquid, and solid temperature sensing applications.



SERIES	500	512	526, 535	590
<b>Temp. sensing type</b>	air/gas, immersion, surface, and liquid level	surface	surface	surface
<b>Thermistor type</b>	NTC	NTC	NTC	NTC
<b>Nominal resistance at 25°C [77°F]</b>	200 Ohm to 1,000,000 Ohm (inclusive)	various	various	various
<b>Operating temperature range</b>	-40°C to 300°C [-40°F to 572°F] (inclusive)	-60°C to 204°C [-76°F to 399°F]	-60°C to 160°C [-76°F to 320°F]	-60°C to 125°C [-76°F to 257°F]
<b>Housing material</b>	plastic, aluminum, stainless steel, epoxy filled, tin- or nickel-plated copper, ceramic or kynar-filled tubing	aluminum	aluminum or stainless steel	aluminum or stainless steel
<b>Electrical and mechanical interface</b>	wide variety of connectors, lead types, materials, and insulation	ring tongue #5 with two flying leads	adhesion with two flying leads; bullet housing with two flying leads (termination available)	adhesion with two flying leads; ring tongue (#5, #6, #10) with two flying leads; ring tongue with Molex connector; threaded body with flying leads
<b>Features</b>	wide selection of housing, resistance, and termination options	wide variety of probe assembly styles; choice of custom or existing designs; enhanced sensitivity, accuracy, stability/low drift; RTD linear output available	wide variety of probe assembly styles; choice of custom or existing designs; enhanced sensitivity, accuracy, stability/low drift; RTD linear output available	wide variety of probe assembly styles; choice of custom or existing designs; enhanced sensitivity, accuracy, stability/low drift; RTD linear output available

# KEY & ROTARY SWITCHES AND SHIFTERS

Often used on control panels or machinery in harsh environments, Honeywell key and rotary switches use o-rings to help keep dirt and moisture out of the contact chamber and prolong the switch's life. Custom switches and controls are “standard” for Honeywell.



SERIES	INTEGRAL CONN. (KEY)	SCREW TERMINAL (KEY)	ROTARY/KEYLESS SWITCH
<b>Connector</b>	MetriPak 280 and Sumitomo	screw	MetriPak 280, Sumitomo, screw
<b>Electrical ratings (res.)</b>	12 Vdc, 20 A; 24 Vdc, 8 A	12 Vdc, 20 A; 24 Vdc, 10 A; 48 Vdc, 4 A	12 Vdc, 20 A; 24 Vdc, 8 A
<b>Operating temperature</b>	-40°C to 85°C [-40°F to 185°F]	-40°C to 85°C [-40°F to 185°F]	-40°C to 85°C [-40°F to 185°F]
<b>Cycle life at electrical load</b>	25000 cycles	25000 cycles	25000 cycles
<b>Position</b>	2 position (off-on); 3 position (off-on-start), (off-on-start), magnetoground; 4 position (off-on-pre-heat-start)	2 position (off-on); 3 position (off-on-start); 3 position (on-off-on)	3 position (on-off-on), (off-on-start), (off-on-on); 4 position (off-on-acc-start), (off-ignition-ignition heat-start)
<b>Measurements</b>	Ø 1.62 in x 2.95 in L	Ø 1.62 in x 2.85 in L	Ø 1.62 in x 2.95 in L
<b>Features</b>	can be designed to match existing keys; options for up to 300 unique key codes per part number; environmentally sealed; recoil spring allows momentary positions		environmentally sealed; recoil spring allows momentary positions



SERIES	HEAVY-DUTY SHIFTER	HEAVY-DUTY TURN SIGNAL
<b>Column size</b>	38 mm, 45 mm, 55 mm	38 mm, 45 mm, 55 mm
<b>Neutral lock</b>	none, drop-down	-
<b>Speeds</b>	2, 3, 4, and 6	-
<b>Lights</b>	-	turn signal, head lamp switch/dimmer, flash to pass, hazard warning
<b>Wiper speeds</b>	-	1 speed, hi/lo, intermittent
<b>Buttons</b>	horn, wash, drop-down	wash, horn
<b>Connectors</b>	integral Packard, integral Deutsch, wire harness	
<b>Expected life cycle</b>	1 million (rotary); 500000 (shifter handle)	50000 cycles
<b>Oper. temp. range</b>	-40°C to 85°C [-40°F to 185°F] (0 % to 95 % relative humidity)	
<b>Operating volt. range</b>	3 V to 32 V	3 V to 32 V
<b>Solenoid load</b>	2 A @ 12.8 V with arc suppression	2 A @ 12.8 V with arc suppression
<b>Measurements</b>	Ø 65,02 mm x 220,47 mm L [Ø 2.56 in x 8.68 in L]	Ø 65,02 mm x 232,16 mm L [Ø 2.56 in x 9.14 in L]
<b>Features</b>	IP67; turn signals are built to complement the shifter, or mounted as stand alone	

# MICRO SWITCH SEALED TOGGLE SWITCHES

Hermetic and environmentally sealed toggle switches offer enhanced reliability with MICRO SWITCH technology. Can be used in a variety of applications where a panel-mount switch with an environment-proof rating is needed, including industrial equipment, military and commercial aviation, and agriculture.



	NT	TL
<b>Type</b>	industrial-grade toggle	military-grade toggle
<b>Sealing</b>	IP67/68; NEMA 3, 3R, 4 and 13	qualified to MIL-DTL-3950
<b>Operating temp.</b>	-40°C to 71°C [-40°F to 160°F]	-65°C to 71°C [-85°F to 160°F]
<b>Actuator/lever</b>	standard, locking, special design, tab	standard, special design, tab, paddle, none
<b>Action</b>	2- or 3-position, momentary & maintained	2- or 3-position, momentary & maintained
<b>Mounting</b>	15/32 in bushing	15/32 in bushing
<b>Termination</b>	solder, screw, quick connect	IWTS, solder, screw, quick connect, leadwire
<b>Circuitry</b>	SPST, SPDT, DPST, DPDT, 4PST, 4PDT	SPST, SPDT, DPST, DPDT, 3PST, 3PDT, 4PST, 4PDT
<b>Contacts</b>	silver alloy	silver alloy, gold-plated
<b>Amp rating</b>	up to 20 A (resistive)	up to 20 A (resistive)
<b>Measurements</b>	58,4 mm H x 33,5 mm W x 22,6 mm D [2.3 in H x 1.32 in W x 0.89 in D]	58,4 mm H x 33,5 mm W x 22,6 mm D [2.3 in H x 1.32 in W x 0.89 in D]
<b>Approvals</b>	UL, CSA, CE, UKCA	UL, CSA, CE, UKCA, qualified to MIL-DTL-3950
<b>Features</b>	completely sealed switching chamber; enhanced tactile feedback	environment-proof sealing; qualified to MIL-DTL-3950

# MICRO SWITCH WATER-TIGHT & PREMIUM BASIC SWITCHES

Simple or precision on/off, end of limit, presence/absence, pressure, temperature, and manual operator interface application needs. Water-tight/dust-tight series provide IP67 protection to operate under difficult environmental conditions. Premium series delivers a broad range of ratings, operating actions, and terminations.



	V15W	ZW	ZD	BZ/BA/BM/BE	V7
<b>Type</b>	water-tight	water-tight	water-tight	premium	premium
<b>Amp rating</b>	0.1 A, 5 A, 10 A	0.1 A, 5 A	0.1 A, 3 A	1 A, 5 A, 10 A, 15 A, 20 A, 22 A, 25 A	0.1 A to 25 A
<b>Circuitry</b>	SPDT, SPNO, SPNC	SPDT, SPNO, SPNC	SPDT, SPNO, SPNC	SPDT, SPNO, SPNC	SPDT, SPNO, SPNC
<b>Operating force</b>	15 g, 25 g, 50 g, 100 g, 200 g	1.94 oz to 7.16 oz	130 gf to 195 gf	<1.0 oz to 25 oz <1.0 oz to 28 oz 1.0 oz to 35 oz 2.5 oz to 25 oz	0.7 oz max. to 14.6 oz max.
<b>Terminations</b>	preleaded; terminals: 4,8 mm x 0.8 mm or 4,8 mm x 0.5 mm	quick connect, solder, cable bottom/end, cable side exit	solder, pcb straight, pcb left angle, pcb right angle, pre-wired	quick connect, solder, screw, wire harness with connector	quick connect, pc board, pcb straight angle left
<b>Actuators/levers</b>	pin plunger, straight, roller, sim. roller, special	pin plunger, straight, roller, sim. roller	pin plunger, straight, sim. roller	<ul style="list-style-type: none"> <li>• plunger: pin, high overtravel</li> <li>• panel mount</li> <li>• rigid lever: straight, roller, formed adj.</li> <li>• flexible leaf: straight, roller, formed</li> </ul>	pin plunger, straight, short flag, roller, sim. roller, curved tip, loop, paddle
<b>Voltage</b>	125 Vac, 250 Vac, 30 Vdc, 48 Vdc	125 Vac, 250 Vac	125 Vac, 12 Vdc	125 Vac, 250 Vac, 480 Vac	125 Vac, 250 Vac, 277 Vac
<b>Approvals</b>	UL, cUL, CE, UKCA, ENEC, CQC	UL, cUL, CE, UKCA, ENEC	UL, cUL, CE, UKCA, ENEC	UL, CSA, ENEC, CE, UKCA, FAA-PMA, MIL-PRF-8805 (varies by model)	UL, CSA, CE, UKCA, ENEC
<b>Operating temperature range</b>	-40°C to 85°C [-40°F to 185°F]	-25°C to 80°C [-13°F to 176°F]	-40°C to 85°C [-40°F to 185°F]	-55°C to 85°C [-67°F to 185°F] 121 and 204°C options	-40°C to 150°C [-40°F to 302°F]
<b>Contacts</b>	silver nickel, gold-plated option	silver, gold-plated silver	silver, gold-plated silver	gold, silver, silver-copper-nickel, silver cadmium oxide, silver-tin oxide	silver, silver cadmium oxide, gold
<b>Housing material</b>	PBT polyester thermoplastic	PBT (polyester)	PBT polyester	phenolic: general purpose, heat-resistant, high temperature, mica-filled	PCT polyester thermoplastic
<b>Measurements</b>	15,9 mm H x 10,3 mm W x 33 mm L [0.63 in H x 0.41 in W x 1.3 in L]	9,0 mm H x 6,4 mm W x 19,8 mm L [0.36 in H x 0.25 in W x 0.78 in L]	10,6 mm H x 6,35 mm W x 19,8 mm L [0.42 in H x 0.25 in W x 0.78 in L]	25,4 mm H x 17,5 mm W x 49,3 mm L [1.0 in H x 0.69 in W x 1.94 in L]	15,9 mm H x 10,2 mm W x 28,8 mm L [0.63 in H x 0.4 in W x 1.14 in L]
<b>Features</b>	designed for harsh-duty, wash down areas; high sealing capability with an IP67 rating (pre-leaded only)	IP67 available; low energy or power-duty electrical ratings; gold-plated or silver contacts; PBT polyester housing material	low energy or power-duty electrical ratings; gold-plated or silver contacts; PBT polyester housing material	worldwide standard "large basic" switch; low operating force and travel; extended mechanical life; momentary or maintained actions	extended mechanical and electrical life; custom engineered solutions



# MICRO SWITCH MEDIUM-DUTY GLOBAL & HEAVY-DUTY LIMIT SWITCHES

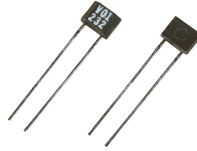
Meet IEC standards for world-wide acceptance – often used in lifts and elevators, electronic assembly, construction and agriculture equipment, material handling, and rail. EN50041 and EN50047 mounting pattern options. Global approvals, support, and sourcing.



	14CE/914CE	NGC	E6/V6	GLA	GLC	GLD	GLE	HDLS
<b>Housing type</b>	–	compact	split housing, side mount; split housing, flange mount	EN 50041	EN 50047 (metal)	EN 50047 (plastic)	EN 50047 compatible	HDLS plug-in and non-plug-in
<b>Sealing</b>	IP65, IP66, IP67; NEMA 1, 3, 4, 6, 6P, 12, 13	NEMA 1, 4, 12, 13; IP67 per IEC 60529 suitable for outdoor applications	E6/V6-RQ: IP40; NEMA 1 E6/V6-RN: IP66; NEMA 1, 3, 4	IP67; NEMA 1, 3, 4, 12, 13	IP66/IP67; NEMA 1, 4, 12, 13	IP66/IP67; NEMA 1, 12, 13	IP66; NEMA 1, 4, 12, 13	IP65/66/67; NEMA 1, 3, 4, 4X, 6, 6P, 12, 13
<b>Temperature range</b>	0°C to 70°C [35°F to 160°F] -40°C [-40°F] low temp (optional)	-25°C to 75°C [-13°F to 167°F] (extended operating temperature options available)	-32°C to 71°C [-25°F to 160°F] -40°C [-40°F] low temp (optional)	-25°C to 85°C [-13°F to 185°F] side rotary: -40°C to 85°C [-40°F to 185°F]	-40°C to 85°C [-40°F to 185°F]	-40°C to 85°C [-40°F to 185°F]	-40°C to 85°C [-40°F to 185°F]	-12°C to 93°C [10°F to 200°F] (standard) -40°C to 121°C [-40°F to 250°F] (low-temp optional)
<b>Housing material</b>	zinc die-cast	metal and plastic options	zinc die-cast	zinc die-cast	zinc die-cast	high-strength thermo-plastic	zinc die-cast	zinc die-cast
<b>Actuators/levers</b>	side rotary, top plunger, roller plunger, pushbutton, wobble	side rotary, top plunger, roller plunger, roller lever arm (with panel-mount options)	top plunger, maint. with reset plunger, wobble, lever actuated	side rotary, top plunger, top roller lever, roller plunger, wobble	side rotary, top plunger, top roller lever, roller plunger, wobble	side rotary, top plunger, top roller, wobble	side rotary, top plunger, top roller, wobble	top plunger, top roller, top rotary, side rotary, side plunger, side rotary, wobble
<b>Termination</b>	cable, micro-connector	Normal cable, PUR cable, special application cable, railway cable, connector, 4-pin male, M12 thread connector, 5-pin male, M12 thread	0.5 in - 14NPT (or NPSM) conduit, mini-connector, cable	0.5 in - 14NPT conduit, 20 mm, PG13.5	0.5 in - 14NPT conduit, 20 mm, PG13.5	0.5 in - 14NPT conduit, 20 mm, PG13.5	0.5 in - 14NPT conduit, 20 mm, PG13.5	0.5 in/0.75 in - 14NPT conduit; 20 mm conduit; PG13.5; 12 ft cable; 4, 5, and 9-pin mini-connector
<b>Approvals</b>	14CE: CE, UKCA, IEC947-5-1, EN60947-5-1 914CE: UL, CE, UKCA, CSA, IEC947-5-1, EN60947-5-1	Conforms to IEC 60947-5-1, IEC 61373, EN45545-2 (metal variants with M12 connectors only)	UL, CSA	UL, CE, UKCA, CSA, CCC, IEC 947-5-1, EN60947-5-1, UL508	UL, CE, UKCA, CSA, CCC, IEC 947-5-1, EN60947-5-1, UL508	UL, CE, UKCA, CSA, CCC, IEC 947-5-1, EN60947-5-1, UL508, UL746-C	UL, CE, UKCA, CSA, CCC, IEC 947-5-1, EN60947-5-1, UL508	UL, CE, UKCA, CSA, CCC, EN60947-1, EN60947-5-1
<b>Circuitry</b>	SPDT	SPDT, DPDT	SPDT, DPDT	SPDT snap action DB, SPDT slow action BBM/MBB, DPDT snap action DB, DPDT sequential, DPDT center neutral, 2NO and 2NC	SPDT snap action DB, SPDT slow action BBM/MBB, 1NC/1NO, 2NC/2NO	SPDT snap action DB, SPDT slow action BBM/MBB, 1NC/1NO, 2NC/2NO	SPDT snap action DB, SPDT slow action BBM/MBB, DPDT snap action DB, 2NO and 2NC	1NC 1NO SPDT, 1NC direct acting, 2NC 2NO DPDT, 2NC 2NO DPDT sequential, 2NC 2NO DPDT center neutral
<b>Contacts</b>	silver, gold	standard: silver alloy; gold: gold-plated	silver	silver, gold	silver, gold	silver, gold	silver, gold	silver, gold
<b>Amp rating</b>	5 A (thermal)	3 A, 6 A	10 A, 15 A, 22 A	10 A (thermal)	10 A (thermal)	10 A (thermal)	10 A (thermal)	10 A (thermal)
<b>Measurements (H x W x D)</b>	49 mm x 40 mm x 16 mm [1.93 in x 1.58 in x 0.63 in]	pin plunger: 55,8 mm x 30 mm x 16,7 mm [2.2 in x 1.19 in x 0.66 in]	63,5 mm x 25,4 mm x 77,2 mm [2.50 in x 1.00 in x 3.04 in]	82,0 mm x 42,0 mm x 42,0 mm [3.23 in x 1.65 in x 1.65 in]	55 mm x 30,5 mm x 30 mm [2.16 in x 1.20 in x 1.18 in]	55 mm x 30,5 mm x 30 mm [2.16 in x 1.20 in x 1.18 in]	50 mm x 65 mm x 30 mm [2.37 in x 2.56 in x 1.18 in]	106,7 mm x 29,4 mm x 44,4 mm [4.20 in x 1.16 in x 1.75 in]
<b>Features</b>	rugged housing; miniature size; pre-leaded or various quick-connect terminations; low-temperature available	can be configured more than 380,000 ways; compact size; positive-opening NC contacts ➡	rugged electrostatic, epoxy-coated housing; side or flange mount; low temperature options; hermetic seal optional; models in service for more than 60 years	positive-opening NC contacts ➡	positive-opening NC contacts ➡	positive-opening NC contacts ➡	positive-opening NC contacts ➡	wide variety of actuators, circuitry options, and connectivity; rugged and dependable, models in service for over 40 years

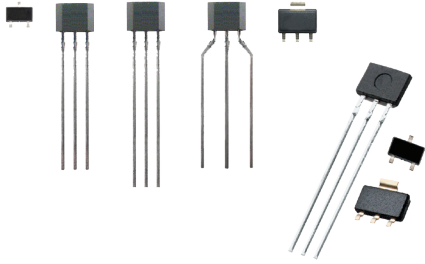
# MAGNETO-RESISTIVE SENSOR ICs

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. Low gauss operation extends sensing distance to one-inch or more, depending on strength of magnetic field.



	2SS52M	VF401	APS00B
<b>Description</b>	omnipolar magnetoresistive digital sensor IC	2-wire MR fine pitch ring magnet sensor IC	high resolution magnetic displacement sensor IC
<b>Magnetic actuation type</b>	omnipolar	differential bridge	analog, saturated mode
<b>Package material and style</b>	2SS52M: plastic radial leads SS522MT: plastic surface mount (SOT-89B)	plastic flat, TO-92-style	plastic surface mount (SOIC-8)
<b>Supply voltage range</b>	3.8 Vdc to 30 Vdc	4.5 Vdc to 16 Vdc	1 Vdc to 12 Vdc
<b>Supply current</b>	11 mA max.	Icc operate: 16.8 mA max. Icc release: 8.4 mA max.	7 mA max.
<b>Output type</b>	digital sinking	digital current source	sin(2θ), cos(2θ)
<b>Operating temperature range</b>	-40°C to 150°C [-40°F to 302°F]	-40°C to 150°C [-40°F to 302°F]	-40°C to 150°C [-40°F to 302°F]
<b>Measurements (H x W)</b>	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]
<b>Features</b>	omnipolar magnetics; sinking output, low gauss operation (25 G max.); operating speed of 0 kHz to over 100 kHz; tape and reel available	wide speed capability; output pattern independent of gap between target and sensor; improved insensitivity to run-out, tilt, and twist; reverse polarity protection	dual analog voltages responding to changes in magnetic field angle; sine and cosine output; accurate to 0,102 mm [0.004 in]; tape and reel available

# HALL-EFFECT DIGITAL & LINEAR SENSOR ICs



**H**oneywell's digital and linear magnetic sensor ICs are constructed from a thin sheet of conductive material. Digital magnetic sensor ICs generate a high or low voltage output in response to a magnetic flux perpendicular to the surface of the sheet. Linear magnetic sensor ICs generate an analog voltage output proportional to the magnetic flux, perpendicular to the surface of the sheet. Quad Hall-elements design minimizes effects of mechanical or thermal stress on output and provide a stable output.

## Linear Sensor IC Features

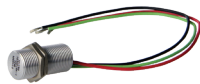
- Package materials and styles include , plastic radial lead, plastic surface pack, ammpack styles T2 and T3, and plastic surface mount (SOT-23, SOT-89B, flat TO-92 style)
- Ratiometric sinking or sourcing output
- Standard mounting centers
- Low-voltage operation
- Tape and reel available

## Digital Sensor IC Features

- Bipolar, latching, unipolar, and omnipolar magnetics
- Non-chopper stabilized design, eliminating noise generated by products using this technique
- Package materials and styles include plastic radial lead, plastic surface pack (SOT-23 and SOT-89B)
- High output current and speed capability
- Reverse polarity protection available
- Digital sinking output
- Built-in pull-up resistor option
- Multiple operate/release points available
- Tape and reel available

## Back-biased Hall Sensor IC Features

- Ferrous gear speed sensing



SERIES	103SR	4AV19F
<b>Description</b>	Hall-effect digital or linear position sensor	vane-operated, integral magnet, position solid state switch
<b>Package material and style</b>	aluminum threaded barrel	plastic
<b>Magnetic actuation type</b>	unipolar, bipolar, bipolar latching, linear	–
<b>Operation</b>	proximity to external magnet	vane operated
<b>Supply voltage range</b>	digital: 4.5 Vdc to 24 Vdc 4.5 Vdc to 10.5 Vdc	4.5 Vdc to 26.5 Vdc
<b>Supply current</b>	digital: 4 mA to 10 mA (inclusive) linear: 7 mA	5 mA to 18.5 mA
<b>Output type</b>	digital: digital sinking linear: ratiometric sinking/sourcing	current sinking
<b>Operating temp. range</b>	-40°C to 100°C [-40°F to 212°F]	-40°C to 150°C [-40°F to 302°F]
<b>Measurements</b>	Ø 11,9 mm x 25,4 mm H [15/32-2 x 1.0 in H]	15,75 mm W x 13,21 H [0.62 in W x 0.52 in H]
<b>Features</b>	color-coded jacketed cable; adjustable mounting	operated by a low cost, easy to fabricate, ferrous vane interrupter; closely controlled differential to predict pulse width

## WARRANTY/REMEDY

Honeywell warrants goods of its manufacture as being free of defective materials and faulty workmanship during the applicable warranty period. 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 that Honeywell, in its sole discretion, 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 Honeywell may provide application assistance personally, through our literature and the Honeywell web site, it is buyer's sole responsibility to determine the suitability of the product in the application.

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USA/Canada	+302 613 4491
Latin America	+1 305 805 8188
Europe	+44 1344 238258
Japan	+81 (0) 3-6730-7152
Singapore	+65 6355 2828
Greater China	+86 4006396841

### Honeywell Sensing and Safety Technologies

830 East Arapaho Road  
Richardson, TX 75081  
[sps.honeywell.com/ast](https://sps.honeywell.com/ast)