

# Speed Sensors Line Guide



**Speed and reliability.** Honeywell Sensing and Internet of Things offers electronic speed sensors designed for enhanced reliability and an extended life. Honeywell uses multiple technologies to detect a change in magnetic field and create an electronic signal for control system interface. These technologies offer the ability to detect speed, direction, or position of a moving ferrous metal or magnetic target. Sensing is accomplished without contacting the target, and there are no

moving parts. This eliminates mechanical wear of the sensor or target. Honeywell offers a comprehensive line-up of Hall-effect, magnetoresistive, and passive variable reluctance sensors (VRS) which provide electrical compatibility to most control system interfaces. We also offer a variety of sensor package types designed to enable mounting flexibility and wire harness interface compatibility. The Honeywell Speed Sensor portfolio has been developed to support potential transportation and industrial customer application requirements.

## FEATURES

### ACTIVE SPEED SENSORS

#### SNG-Q Series.

**Features:** Wide operating temperature range: -40 °C to 150 °C [-40°F to 302°F]

- Environmental sealing: Moisture ingress protection rated to IP69K
- Robust electrical noise immunity: Electrical noise radiated immunity (EMC) rated to 100 V/m
- High frequency switching capability: 3 Hz to 20 kHz
- Direction information from phase-shifted dual output signals
- O-ring seal: Enables environmental sealing to mounting surface
- Supply voltage range: 4.5 V to 26 V
- CE certified

**Benefits:** Design and manufacturing use platform-based approach that enables cost-competitiveness and mechanical and electrical configurability. Provides both speed and direction information: speed from digital square wave outputs; direction using a quadrature output with signals 90° phase shifted from each other, target direction determined by output lead/lag phase shifting. Designed for applications where enhanced accuracy is required to detect small target features. Enhanced accuracy enabled by dual differential Hall-effect

sensor IC technology. Designed for wide operating temperature range, robust electrical noise immunity and environmental sealing capability. Potential industrial applications include power control in heavy duty vehicle ac induction motors and speed and position control in escalators and elevators. Potential transportation applications include power regulation control of hybrid electric transmissions and engines in heavy duty vehicles, and wheel speed detection in material handling, agriculture and construction machines.

#### SNDH-T Series.

**Features:** Advanced performance dynamic offset self calibration

- Short circuit and reverse voltage protection

- Air gap up to 2 mm [0.08 in]
- Low jitter output
- Near zero speed
- EMI hardened
- High frequency switching capability
- Multiple connector options including wire harness and integral connector versions using AMP super seal or AMP Jr.
- Probe-style package
- Integrated circuit packaging provides output phase shift tolerancing with enhanced accuracy

**Benefits:** Provides speed and direction information using quadrature output with signals 90 degree phase shifted from each other. BiCMOS Hall-effect technology, using advanced digital signal processing for dynamic off-set cancellation, designed to provide enhanced air gap performance and phase shift accuracy over most conditions. Package design includes O-ring seal for pressure applications and a fixed mounting flange. Robust, automotive under-the-hood grade packaging for most environmental conditions as well as EMI hardened. Designed for potential applications where extremely high resolution is required at wide frequency ranges, and large air gaps.

#### LCZ Series.

**Features:** Stainless steel package

- Low cost
- Omni-directional sensor to target orientation
- Low power consumption
- Small size
- Zero speed
- Digital output
- Durable, cost-effective sensing solution
- Screw-in-style package

**Benefits:** Available in several diameters and lengths for application flexibility. Stainless steel package simple to install/

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## Engineering excellence.

Honeywell speed sensors are expertly engineered to meet a variety of application needs, including speedometer input, engine timing, transmission input and output, traction and chassis control, wheel speed sensing, RPM indication, industrial process control, and more. True solid state design; extended life (30 billion operations in keyboard module test programs); enhanced speed operation (over 100 kHz possible); operate with stationary input (zero speed); logic-compatible input and output; broad temperature range (-40°C to 150°C, [-40°F to 302°F]); repeatable operation.

**Custom solutions.** As a leader in speed and direction sensor customization, our internal design capabilities can incorporate magnetic modeling and mold flow-modeling services into a unique and tailored product. Customize your product from our variety of speed sensor platforms that are designed to perform in some of the most demanding environments.

**Problem solved.** Count on Honeywell speed sensors for enhanced durability, quality, reliability and performance.



### Active speed sensors

	SNG-Q Series	SNDH-T Series
<b>Description</b>	Hall-effect speed and direction sensor with quadrature output	Hall-effect speed and direction sensor with quadrature output
<b>Housing material</b>	PBT	stainless steel and plastic
<b>Housing length</b>	45 mm [1.77 in], 35 mm [1.38 in]	35 mm [1.38 in]
<b>Supply voltage range</b>	4.5 V to 26 V	4.5 Vdc to 18 Vdc
<b>Supply current</b>	2 mA normal, 18 mA max.	18 mA max.
<b>Output type</b>	square wave	square wave
<b>Operating frequency range</b>	3 Hz to 20 kHz	1 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]



### Active speed sensors

	LCZ Series	ZH10 Series
<b>Description</b>	Hall-effect zero speed sensor	Hall-effect zero speed sensor
<b>Housing material</b>	stainless steel	aluminum
<b>Supply voltage range</b>	4.5 Vdc to 26 Vdc	4 Vdc to 24 Vdc
<b>Supply current</b>	20 mA	6 mA
<b>Output type</b>	digital sinking	digital sinking
<b>Operating frequency range</b>	0 Hz to 15 kHz	0 Hz to 15 kHz
<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]





## Active speed sensors

### SNDH-H Series

<b>Description</b>	Hall-effect speed sensor
<b>Housing material</b>	stainless steel or plastic
<b>Supply voltage range</b>	4 Vdc to 24 Vdc (inclusive)
<b>Supply current</b>	20 mA max.
<b>Output type</b>	digital sinking
<b>Operating frequency range</b>	0 Hz to 15 kHz, 2 Hz to 15 Hz
<b>Operating temperature range</b>	-40°C to 150°C [-40°F to 302°F]



## Digital magnetic speed sensors

### 584XX Series

<b>Description</b>	digital magnetic speed sensor
<b>Housing material</b>	stainless steel
<b>Supply voltage range</b>	5 Vdc to 30 Vdc
<b>Supply current</b>	15 mA
<b>Output type</b>	square wave
<b>Operating frequency range</b>	-
<b>Operating temperature range</b>	-40°C to 107°C [-40°F to 225°F]

# Speed Sensors Line Guide



## Passive speed sensors

### VRS General Purpose Series

### VRS Hazardous Location Series

<b>Output voltage range</b>	8 Vp-p to 40 Vp-p (inclusive)	30 Vp-p to 60 Vp-p (inclusive)
<b>Housing diameter</b>	5/8 in, 3/8 in, 1/4 in, 10/32 in	3/4 in, 5/8 in
<b>Housing material/style</b>	stainless steel threaded or smooth	stainless steel threaded
<b>Termination</b>	MS3106 connector, preleaded	MS3106 connector, preleaded
<b>Operating temperature range</b>	-55°C to 120°C [-67°F to 250°F] (inclusive)	-73°C to 120°C [-100°F to 250°F] (inclusive)



## Passive speed sensors

### VRS High Output Series

### VRS High Resolution Series

<b>Output voltage range</b>	8 Vp-p to 190 Vp-p (inclusive)	17 Vp-p to 170 Vp-p
<b>Housing diameter</b>	5/8 in, 3/8 in	5/8 in, 3/8 in
<b>Housing material/style</b>	stainless steel threaded or smooth	stainless steel threaded
<b>Termination</b>	MS3106 connector, preleaded	MS3106 connector, preleaded
<b>Operating temperature range</b>	-55°C to 150°C [-67°F to 300°F] (inclusive)	-55°C to 120°C [-67°F to 250°F]



## Passive speed sensors

### VRS High Temperature Series

### VRS Power Output Series

<b>Output voltage range</b>	4.7 Vp-p to 125 Vp-p (inclusive)	70 Vp-p (inclusive)
<b>Housing diameter</b>	5/8 in, 3/8 in, 1/4 in	5/8 in
<b>Housing material and style</b>	stainless steel threaded	stainless steel threaded
<b>Termination</b>	MS3106 connector, preleaded	MS3106 connector, preleaded
<b>Operating temperature range</b>	-73°C to 230°C [-100°F to 450°F] (inclusive)	-55°C to 120°C [-67°F to 250°F]

adjust and does not require rotational orientation. Potential applications include harsh environment rotary applications such as pumps, rollers, mixers, fan speed measurement, transmission, spindles, gear reducer RPM, synchronization, compressor speed, and dyno testing, plus industrial process control and factory automation.

### **ZH10 Series.**

**Features:** Aluminum package • Low cost • Omni-directional sensor to target orientation • Low power consumption • Small size • Zero speed • Digital output • Durable, cost-effective sensing solution • Screw-in-style package

**Benefits:** Aluminum package simple to install/adjust and does not require rotational orientation. Potential applications include harsh environment rotary applications such as pumps, rollers, mixers, fan speed measurement, transmission, spindles, gear reducer RPM, synchronization, compressor speed, and dyno testing, plus industrial process control and factory automation.

### **SNDH-H Series.**

**Features:** Hall-effect magnetic sensing technology • Digital current sinking output (open collector) • Advanced performance dynamic offset self-calibration • Air gap up to 2,5 mm [0.098 in] • Zero speed versions • High frequency switching capability (0 Hz to 15 kHz) • -40 °C to 150 °C [-40°F to 302°F] operating temperature capability • Multiple connector options • O-ring seal

**Benefits:** Use a magnetically biased Hall-effect integrated circuit to accurately sense movement of ferrous metal targets. The uniquely designed IC (integrated circuit) and a permanent magnet are sealed in rugged, probe-type packages. The flux density of the permanent magnet alters when approached by ferrous metal and is detected by the Hall ICs. If the sensor is positioned at the circumference of a revolving gear wheel, for example, it detects the teeth and tooth spaces, supplying a digital pulse output with frequency proportional to gear wheel

speed. Potential applications include tachometers/counters, speed of gears and shafts in transmissions, hydraulic motors, pumps, and gear boxes flow meters/turbines, and engine RPM.

## **DIGITAL MAGNETIC SPEED SENSORS**

### **584XX Series.**

**Features:** Senses moving ferrous metal • Output signal of integrated circuit allows for direct use in digital equipment • Eliminates the need for interface circuitry, often 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

**Benefits:** Enhanced resistance to water, oil, shock and vibration damage extends the product life and operating reliability. A variety of supply voltages and pre-leaded or connector versions allow flexibility of use in the application. Allows for the reduction in noise, often vital in potential positioning and synchronization applications. Standard thread sizes enhance compatibility and interchangeability with other standard types of speed sensors. Potential applications include computing, high-speed counting, positioning, tachometry, synchronization, routing, flow metering, machine control, engine, motor, or pump RPM sensing, over/under speed sensing, and wheel speed detection.

## **PASSIVE SPEED SENSORS (Variable Resistance Sensors - VRS)**

**General Purpose Series, Hazardous Location Series, High Output Series, High Resolution Series, High Temperature Series, Power Output Series.**

**Features:** Self-powered operation • Simple installation • No moving parts • Operates over wide speed range

• Often adaptable to wide variety of configurations • Customized versions for unique speed sensing applications

**Benefits:** All: Direct conversion of actuator speed to output frequency. VRS General Purpose Series, VRS Hazardous Location Series: Simple, rugged devices do not require external voltage source for operation. VRS High Output Series: Performs best at low to medium speeds with medium to high impedance loads. Sealed front-end versions available for use where sensor is exposed to fluids, lubricants, or adverse environmental conditions. VRS High Resolution Series: Proper sensor alignment is required. VRS High Temperature Series: Sealed front-end versions for potential applications where sensor is exposed to fluids, lubricants, or adverse environmental conditions.

**Potential applications:** VRS General Purpose Series: Engine and motor RPM, process, flow, wheel-slip, and gear speed measurement with medium to high speeds or in electrically noisy environments with relatively small air gaps. VRS Hazardous Location Series: Engine and motor RPM, process, flow, wheel-slip, and gear speed measurement where explosion-proof or intrinsically safe sensors are required. VRS High Output Series: Engine and motor RPM, process, flow, wheel-slip, and gear speed measurement where higher output voltages are needed. VRS High Resolution Series: Engine and motor RPM, process, flow, wheel-slip, and gear speed measurement where precise timing pulse is required, and/or fine pitch gears are used. VRS High Temperature Series: Engine and motor RPM, process, flow, wheel-slip, and gear speed measurement where sensor is exposed to temperatures up to 260°C [450°F]. VRS Power Output Series: Driving low resistance loads at large air gaps in engine and motor RPM, process, flow, wheel-slip, and gear speed measurement where larger actuators may be used.

**Warranty.** 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 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 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.

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

To learn more about Honeywell Sensing and Internet of Things' products, call **+1-815-235-6847 or 1-800-537-6945**, visit **sensing.honeywell.com**, or e-mail inquiries to **info.sc@honeywell.com**

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