

SNDH-H Series Hall-Effect Speed Sensors



DESCRIPTION

The SNDH-H Series Hall-Effect Speed Sensors use a magnetically biased Hall-effect integrated circuit to accurately sense movement of ferrous metal targets. The specially 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. This is detected by the Hall ICs.

FEATURES

- Solid state, non-contacting Hall-effect magnetic sensing allows the device the ability to sense through dust, dirt and debris, enhancing reliability and product life
- Air gap up to 2,5 mm [0.098 in] allows sensor to be up to 2,5 mm away from target
- High frequency switching capability (to 15 kHz) allows the device to handle high RPMs (SNDH-H3L-G01, SNDH-H3C-G03, SNDH-H3C-G05, SNDH-H3C-G06)
- O-ring seal allows device to be sealed into housings
- Two housing materials allow flexibility within the application: stainless steel (corrosion and rust resistant): SNDH-H3L-G01; plastic: SNDH-H3C-G03, SNDH-H3C-G04, SNDH-H3C-G05 and SNDH-H3C-G06, SNDH-H3P-G01
- Various probe lengths (20,3 mm [0.80], 24 mm [0.94 in], 27,5 mm [1.08], 40 mm [1.57 in], 46 mm [1.81 in], 67 mm [2.64 in]) simplify use within the application
- High operating temperature [-40 °C to 150°C (-40 °F to 302 °F)] (SNDH-H3C-G03, SNDH-H3C-G05, SNDH-H3C-G06) allows the device to be used in high temperature applications (e.g., engines)
- Digital current sinking output (open collector) simplifies electrical interfacing to control systems

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.

Optimum performance is dependent upon variables which must be considered in combination: target material, geometry and speed, sensor/target gap, and environmental temperature.

- Multiple connector options (Bosch 928000453, Delphi-Packard Metripak 150.2 Type 101, Deutsch DT06-3S) simplify installation
- Omnidirectional capability eliminates the need to align the sensor to the target, allowing the user to simply bolt the device (SNDH-H3C-G0, SNDH-H3L-G01)
- Zero speed versions indicate that the rotation has stopped, allowing the device to work at extremely low RPMs (SNDH-H3L-G01, SNDH-H3C-G04, SNDH-H3P-G01)
- Stable performance over temperature range and airgap range

POTENTIAL APPLICATIONS

Transportation

- Engine camshaft and crankshaft speed
- Transmission speed
- Vehicle speed
- Wheel speed
- Pump speed
- Motor speed

Industrial

- Flow meters and flow turbines
- Pump speed
- Motor speed

SNDH-H Series

Table 1. Specifications

Characteristic	SNDH-H3L-G01	SNDH-H3C-G03	SNDH-H3C-G04	SNDH-H3C-G05	SNDH-H3C-G06	SNDH-H3P-G01
Supply voltage range	4 Vdc to 24 Vdc	4.5 Vdc to 24 Vdc	6.5 Vdc to 24 Vdc	4.5 Vdc to 24 Vdc		6.5 Vdc to 24 Vdc
Output	digital current sinking (open collector)					
Supply current	6 mA max.	20 mA max.	14 mA max.	20 mA max.		14 mA max.
Output current	30 mA ¹	20 mA sinking				
Output leakage current	10 µA					
Reverse output voltage	-		-0.5 V	-		
Rise time (10% to 90%)	400 ns	15 µs max.	1 µs	15 µs max.		1 µs
Fall time (90% to 10%)	400 ns	0.01 µs max.	0.6 µs	0.01 µs max.		0.6 µs
Target orientation	omnidirectional		alignment required	omnidirectional		alignment required
Zero speed	yes	no	yes	no		yes
Operating frequency range	0 kHz to 15 kHz	2 Hz to 15 kHz	0 kHz to 12 kHz	2 Hz to 15 kHz		0 kHz to 12 kHz
Operating temp. range	-40 °C to 100 °C [-40 °F to 212 °F]	-40 °C to 150 °C [-40 °F to 302 °F]	-40 °C to 125 °C [-40 °F to 257 °F]	-40 °C to 150 °C [-40 °F to 302 °F]		-40 °C to 125 °C [-40 °F to 257 °F]
Dielectric	200 Vdc	-				
Housing material	stainless steel	plastic				
Sensing air gap	up to 2,5 mm [0.098 in]	up to 2 mm [0.079 in]	up to 2,5 mm [0.098 in]	up to 2 mm [0.079 in]		up to 2,5 mm [0.098 in]
Target tooth width	2 mm [0.079 in]	2,5 mm [0.098 in] may vary	3 mm [0.118 in]	2,5 mm [0.098 in] may vary		3 mm [0.118 in]
Target slot width	2 mm [0.079 in]	5 mm [0.197 in], constant	>2 mm [0.079 in]	5 mm [0.197 in] constant		>2 mm [0.079 in]
Tooth height	5 mm [0.197 in]	3 mm [0.118 in]	>2 mm [0.079 in]	3 mm [0.118 in]		>2 mm [0.079 in]
Target width	≥3 mm [0.118 in]	>2 mm [0.079 in]				
Sensor misposition to target	dependent on target geometry					
Probe length	40 mm [1.57 in]	24 mm [0.94 in]	27,5 mm [1.08 in]	46 mm [1.81 in]	67 mm [2.64 in]	20,3 mm [0.80 in]
Probe diameter	9,53 mm [0.375 in]	17,98 mm [0.71 in]	18,6 mm [0.73 in]	17,98 mm [0.71 in]		15,37 mm [0.605 in]
Connector	lead ³	Bosch 928000453	Delphi-Packard Metripak 150.2 Type 101	Bosch 928000453		Deutsch DT06-3S

Notes:

1. Short circuit protected.