

GEARTOOTH SPEED AND DIRECTION SENSOR

SD1002 – SD1012 Series



Hall-effect geartooth speed and direction sensor with adjustable aluminum or flange-mount plastic housing.

Features

- Sense speed and direction of ferrous geartooth targets
- Plastic flange mount sensor rated to 125°C
- Near zero speed sensing capability
- Capable of 8000+Hz target speed
- Locating mark provided to assure correct rotational alignment
- 10 bit dynamic threshold detection offers:
 - Automatically adjusting magnetic range
 - Self compensating to target geometry
 - Immune to target run out
- Compatible with unregulated power supply
- Reverse battery protected to -30VDC
- Internal circuit protection to IEC529 1000
 - EMI resistant to 10V/m, 30MHz to 1GHz
 - ESD resistant to 4kV (Contact discharge)
- Fast transient resistant to 2kV
- Conducted immunity resistant to 10VRMS @ 150kHz to 80MHz
- EMC compatible 30A/m @ 50 Hz
- Meets IEC529 IP67 for dust and water protection
 - Integral Connector version: 4-pin Delphi Metri Pack 150.2 No. 12162833. Mates with Terminal No. 12124075.
 - Discrete wire version: 20 AWG, PVC insulation, UL1007/1569

Application

- Wheel speed and direction
- Transmission speed and direction
- Hoist speed and direction

Specifications

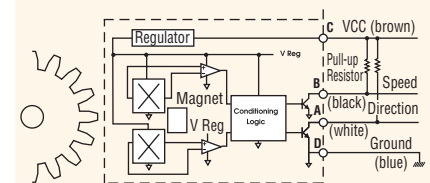
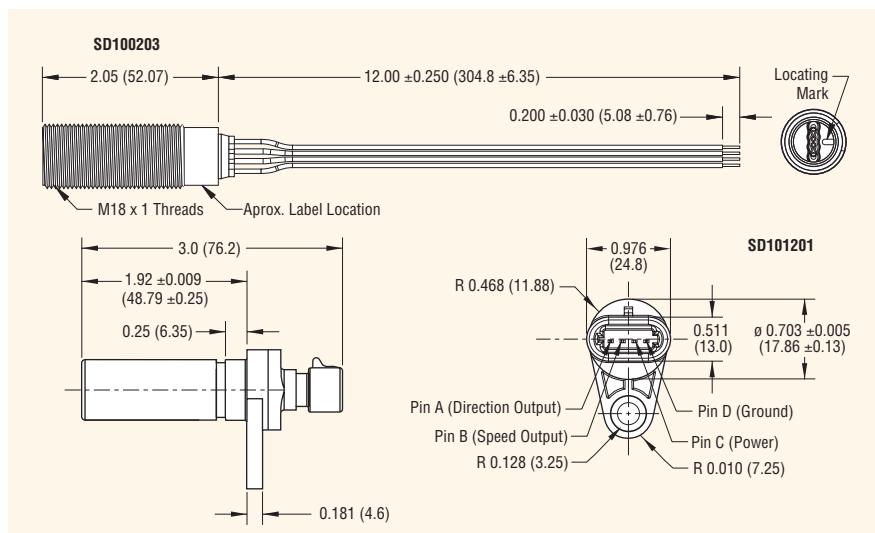
Part Number	Operating Voltage Range (VDC)	Supply Current (mA max.)	Output	Output Saturation Voltage (mV max.)	Output Current (mA max.)	Operating Temp Range (°C)	Storage Temp Range (°C)	Housing Material
SD100203	4.75 – 24	20	sink	1000	20	-40 to 85	-40 to 85	Aluminum
SD101201	4.75 – 24	20	sink	1000	20	-40 to 125	-40 to 125	Plastic

Notes: SD101201 uses Delphi Metri-Pack 150.2 Series Part No. 12162833. Mating terminal: Delphi Part No. 12124075.

A pull up resistor is required between power and each output. Resistor value is dependent upon input voltage. See page 18 for recommendations.

Dimensions inches (mm)

All tolerances ± 0.005 (0.13) unless otherwise noted.



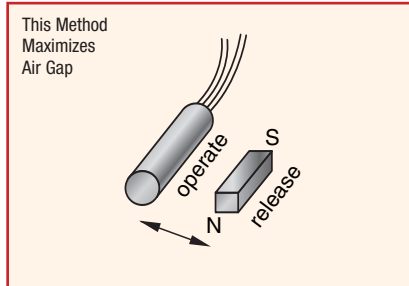
REED AND GEARTOOTH

Sensor Operation

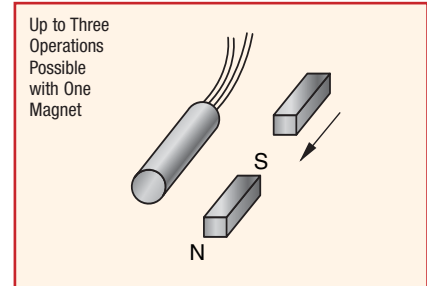
MP Series Reed Sensors

A Reed Sensor is an omnipolar, magnetically activated switch. It can be approached by a magnet from any angle, with either pole. Several possible operating methods are shown at right.

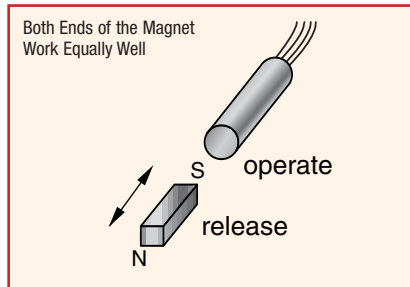
Perpendicular Magnet Travel



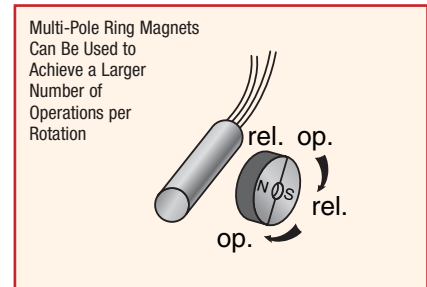
Parallel Magnet Travel



Nose-To-Nose Activation



Rotational Magnet Travel



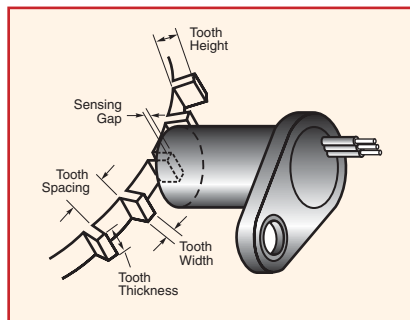
Operating a Speed Sensor

Although commonly called a geartooth sensor, a solid-state speed sensor can detect the motion of various ferrous objects with some type of discontinuous surface.

Examples of appropriate targets include:

- Sprockets
- Bolt Heads
- Roller Chains
- Cavities in a Smooth Surface

Solid-State Speed Sensor



For best results, we recommend targets made from low carbon cold rolled steel. Other factors that influence sensor performance include geartooth height and width, space between teeth, shape of the teeth and thickness of the target. As a general guideline, consider a target with the following minimum parameters:

Tooth Height	Tooth Width	Distance Between Teeth	Target Thickness
.200"	.100"	.400"	.250"

Cherry's solid-state magnetic position sensors also make excellent speed sensors when coupled with a rotating ring magnet. Advantages of this approach include:

- lower sensor cost
- larger airgaps and
- absolute zero-speed sensing.

Position Sensor with Ring Magnet

