

INSTALLATION INSTRUCTIONS FOR THE SPEED SENSORS, SNG-S SERIES

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Issue A

GENERAL SPECIFICATIONS

Honeywell's SNG-S Series Speed Sensors use a magnetically biased Hall-effect integrated circuit (IC) to accurately sense movement of ferrous metal targets. The specially designed IC and a permanent magnet are sealed in rugged, probe-type packages. The IC detects the alteration of the magnet's flux density when it is approached by ferrous metal. A sensor

positioned at the circumference of a revolving gear wheel detects the teeth and spaces, and supplies a digital pulse output with frequency proportional to gear wheel speed. Optimum performance is dependent upon a combination of variables such as target material, geometry and speed, sensor/target gap, and environmental temperature.

TABLE 1. ELECTRICAL SPECIFICATIONS

| CHARACTERISTIC | CONDITION/COMMENT | PARAMETER | | | |
|----------------------------|--|--------------------------|--|------------------------------|------------------------------|
| | | SNG-SPRF-002 | SNG-SPRD-002 SNG-SPSC-001 SNG-SPRC-001 | SNG-SPRD-003 SNG-SPRC-002 | SNG-SPRD-004 SNG-SPRC-003 |
| Supply voltage | regulated supply and 12 V battery ISO 16750-2 | 4.5 V to 24 V – | – 8 V to 16 V | – 4.8 V to 16 V | – 4.8 V to 24 V |
| Supply current | – | 20 mA max. | | 15 mA | |
| Reverse voltage protection | – ISO 16750-2 | -24 V – | | – -14 Vdc | |
| Over voltage protection | – ISO 16750-2 | 26.5 V – | | – 26 V | |
| Short circuit protection | – ISO 16750-2 | 16 V – | | – 16 V | |
| Load dump | ISO 16750-2:2012 11 01 (US* = 40 V, UA 13.5 ±0.5 V) | 5b – | | – – | |
| Insulation resistance | ISO 16750-2:2012 | >10 MOhm at 500 Vdc – | | – – | |

TABLE 2. MECHANICAL SPECIFICATIONS

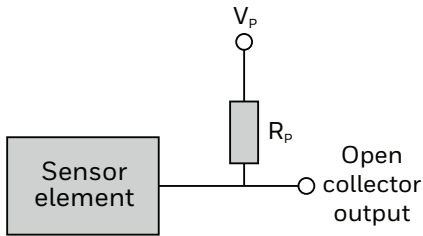
| CHARACTERISTIC | PARAMETER | | | |
|-------------------------------|---|--|--|------------------------------|
| | SNG-SPRF-002 | SNG-SPRD-002 SNG-SPSC-001 SNG-SPRC-001 | SNG-SPRD-003 SNG-SPRC-002 | SNG-SPRD-004 SNG-SPRC-003 |
| Carrier material | PBT thermoplastic | | PBT | |
| Bushing material | SS304 | | SSTL | |
| O-ring material | 70 durometer fluorocarbon, PTFE coating, 17,17 mm ID x 1,78 CS | | fluorocarbon, brown, 17,17 mm ID x 1,78 CS | |
| Housing material | PBT | | PBT | |
| Connector: integral mating | Bosch 928000453 Bosch 1928403966 | | Amp Superseal 1.5 282087 | |
| Mounting torque | 8 ±0,5 N m with M6 screw | | 20 ±3 N m with M8 screw | |
| O-ring lubrication | | mineral oil-based grease | | |

TABLE 3. ENVIRONMENTAL SPECIFICATIONS

| CHARACTERISTIC | CONDITION/COMMENT | PARAMETER | |
|---|---|---|--|
| | | SNG-SPRF-002 | ALL OTHER CATALOG LISTINGS |
| Radiated immunity | ISO 11452-2: 2004 ISO 11452-2: 2004 IEC 61000-4-3: 2008 ISO 11452-2, 400 MHz to 2.5 GHz | 10 kHz to MHz, 60 m/V 200 MHz to 2.7 GHz, 100 V/m 800 kHz MHz to 1000 MHz, 3 m/V – | – – – 100 V/m |
| Bulk current injection | ISO 11452-4, 1 MHz to 400 MHz | 100 mA | |
| ESD | SAE J1113/13 ISO 10605 | ±4 kV contact, ±8 kV air – | – ±8 kV contact, ±15 kV air |
| Conductive transients | ISO 7637-2, for 12 V system ISO 7637-2, for 12 V system | TEST PULSE 1, 2a, 2b, 3a, 3b – | – PULSE 1, 2a, 3a, 3b, 5a |
| Conducted emissions | CISPR 25. 150 kHz to 108 MHz | – | Class 3 |
| Radiated emissions | CISPR 25. 150 kHz to 12.5 GHz | – | Class 3 |
| Thermal cycle | -40°C to 140°C | – | 100 cycles |
| Humidity | – 95 %RH at 55°C | 10 %RH to 90 %RH at -40°C to 85°C, 150 cycles, 600 hr total – | – 144 hr, EN/IEC 60068-2-30 |
| Saline dunk | 0°C to 110°C | – | 10 cycles, ISO 16750-4 |
| Salt fog | 5% salt solution by mass at 35°C and 93% RH for 400 hr, tested to 2000 hr with no ingress in the sensor packaging area 5% salt solution by mass at 35°C | 5% salt solution by mass at 35°C and 93% RH for 2000 hr – | – 96 hours |
| Combined temperature and vibration test | sinusoidal: 25 hr/axis, 3 perpendicular axes 30 g at 60 Hz to 1000 Hz and 15 g at 1000 Hz to 2000 Hz random: 25 hr/axis, 3 perpendicular axes 30 g at 25 rms Hz to 2000 Hz, -40°C to 125°C | sinusoidal: 25 hr/axis, 3 perpendicular axes 15 g at 5 Hz to 2000 Hz random: 25 hr/axis, 3 perpendicular axes at 25 grms at 10 Hz to 2000 Hz | – – |
| Vibration | 3 perpendicular axes, 48 hr per axis | – | 29.8 GRMS, 24 Hz to 2000 Hz, MIL-STD-202-214 |
| Degree of protection | IEC 50629 IEC 60529 | IPX6, IPX9K, IPX7 – | – IP69K, IP67 |
| Resistance to fluids | – | – | general under-the-hood automotive fluids |
| Operating temperature | – | -40°C to 150°C | -40°C to 140°C |
| Storage temperature | – | -55°C to 70°C | -40°C to 140°C |

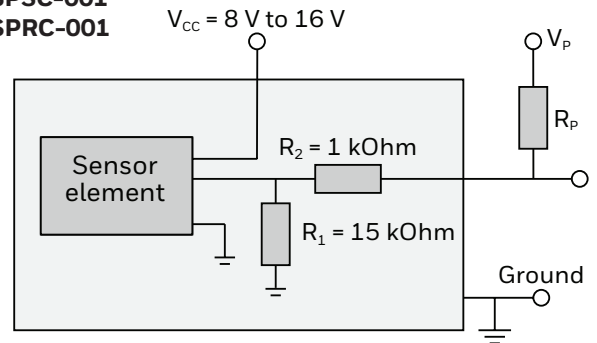
FIGURE 2. SCHEMATIC DIAGRAMS AND OUTPUT SPECIFICATIONS

SNG-SPRF-002



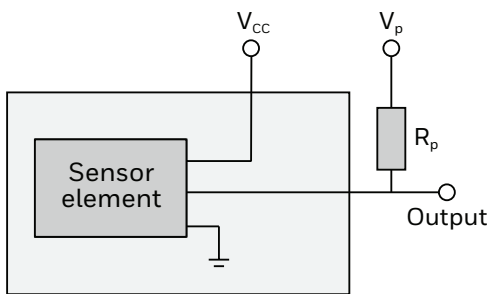
| CHARACTERISTIC | CONDITION/COMMENT | PARAMETER |
|------------------------|---|--|
| Signal type | open collector | square wave |
| Power on | – | default high and start from initial edge |
| Signal polarity | not dependent on target rotation | output low on teeth |
| Output signal: high | – | $\geq V_p - 0.5\text{ V}$ |
| low | – | $\leq 0.6\text{ V}$ |
| Load current | output leakage current $-10\ \mu\text{A}$ | 10 mA max. |
| Frequency | – | 0 kHz to 10 kHz |

SNG-SPRD-002
SNG-SPSC-001
SNG-SPRC-001



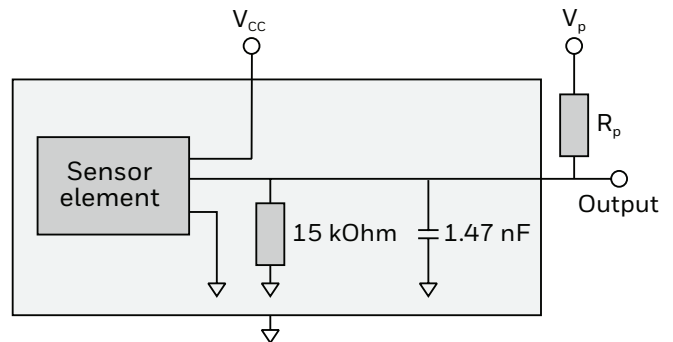
| CHARACTERISTIC | CONDITION/COMMENT | PARAMETER |
|------------------------|---|---|
| Signal type | open collector | square wave |
| Output signal: high | dependent on target geometry and sensor-to-target orientation | $(V_p \times 16.5) / (16.5 + R_p \text{ in kOhm})$ 0.3 V to 2.2 V |
| low | | $\leq ((V_p - 0.4) \times 1\text{ k}) / (1\text{ k} + R_p \text{ in kOhm}) + 0.4$ |
| Load current | – | 15 mA |
| Frequency | – | 0 kHz to 10 kHz |

SNG-SPRD-003
SNG-SPRC-002



| CHARACTERISTIC | CONDITION/COMMENT | PARAMETER |
|------------------------|---------------------------------------|------------------------------|
| Signal type | open collector | square wave |
| Output signal: high | dependent on the controller interface | $\geq V_{cc} - 0.5\text{ V}$ |
| low | | $\leq 0.5\text{ V}$ |
| Load current | – | 20 mA |
| Frequency | – | 0 kHz to 10 kHz |

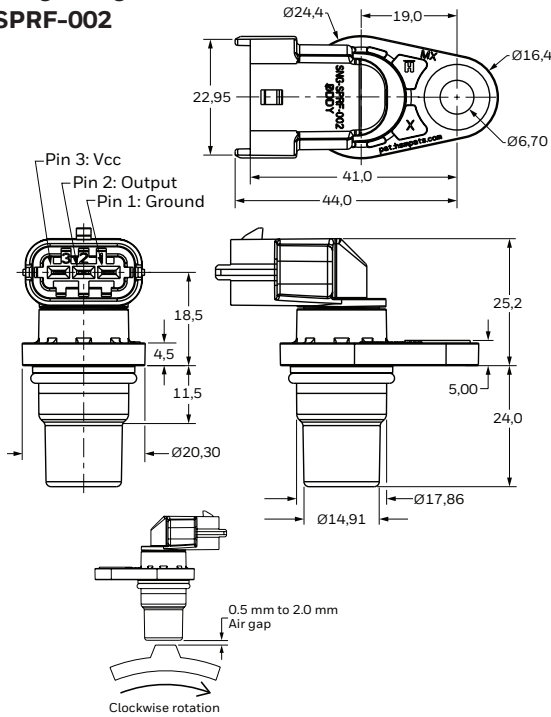
SNG-SPRD-004
SNG-SPRC-003



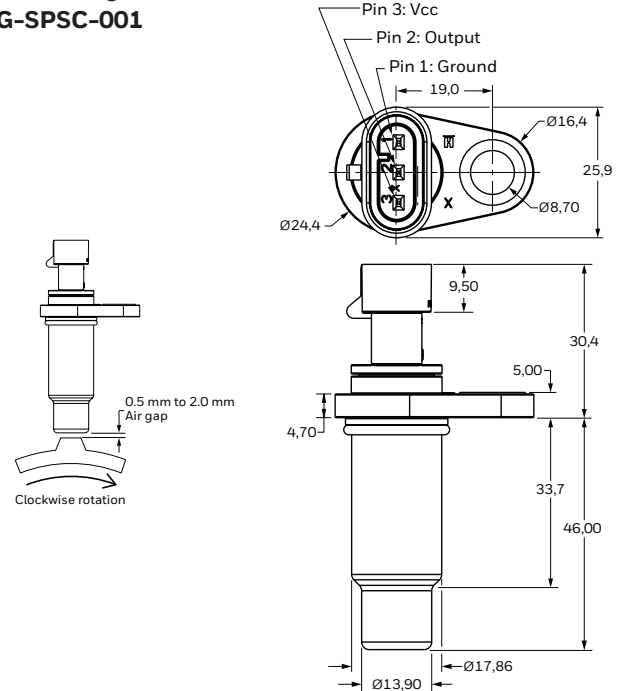
| CHARACTERISTIC | CONDITION/COMMENT | PARAMETER |
|------------------------|---------------------------------------|--|
| Signal type | open collector | square wave |
| Output signal: high | dependent on the controller interface | $(V_p \times 16.5) / (16.5 + R_p \text{ in kOhm})$ 0.5 V |
| low | | $< 0.5\text{ V}$ |
| Load current | – | 20 mA |
| Frequency | – | 0 kHz to 10 kHz |

FIGURE 3. MOUNTING DIMENSIONS (FOR REFERENCE ONLY: MM/[IN.])

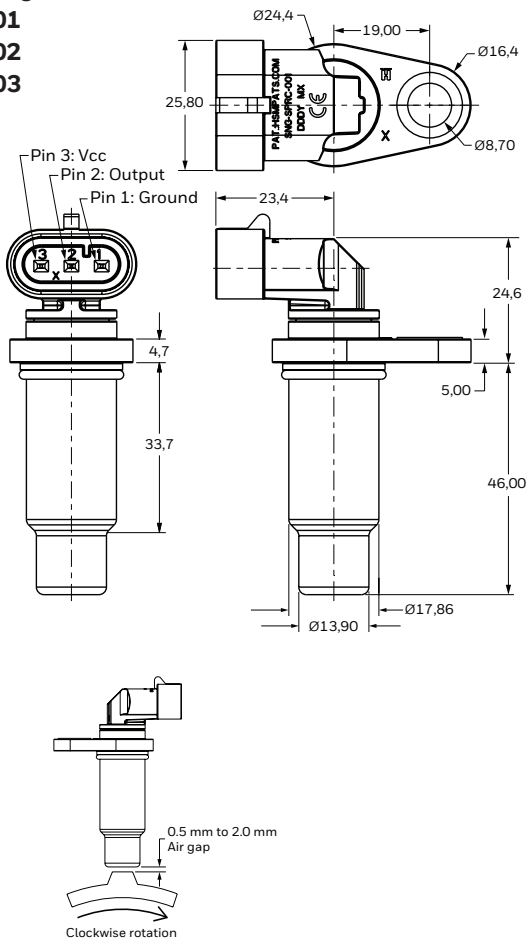
**24 mm, right angle:
SNG-SPRF-002**



**46 mm, straight:
SNG-SPSC-001**



**46 mm, right angle:
SNG-SPRC-001
SNG-SPRC-002
SNG-SPRC-003**



**67 mm, right angle:
SNG-SPRD-002
SNG-SPRD-003
SNG-SPRD-004**

