

Dual Channel Hall Effect Speed Sensor

DSD 1820.19 AHW



Product ID

Type #	Product #	Drawing #
DSD 1820.19 AHW	3742604995	122407 Rev. 01

General

Function	The DSD 1820.19 AHW speed sensors are suitable, in conjunction with a pole wheel, for generating square wave signals proportional to rotary speeds. They have a static behaviour, i.e. the pulse generation is guaranteed down to a speed corresponding to a frequency of 0 Hz. The monitoring elements consist of magnetically biased differential hall effect semiconductors. The internal two channel structure requires that the sensor must be oriented. The sensors have a flange for proper installation.
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Technical data

Supply voltage	9 V to 30 V, protected against reverse polarity and transient overvoltages
Current consumption	Max. 35 mA (without load)
Signal output	<ul style="list-style-type: none"> 2 phase shifted square wave signals, minimum edge shift with an involute gear wheel: minimal phase shift of 20° for gear of module 2 between output 1 (S1) and output 2 (S2) Push-pull outputs : $I_{max} = \pm 20$ mA <ul style="list-style-type: none"> with pull-up resistor (for $I = I_{max}$): $U_{low} < 2.5$ V, $U_{high} > 0.95 \cdot U_{supply}$ with pull-down resistor (for $I = I_{max}$): $U_{low} < 0.1$ V, $U_{high} > U_{supply} - 4.0$ V The outputs are short circuit proof and protected against reverse polarity.
Frequency range	0 Hz ... 20 kHz
Electromagnetic compatibility (EMC):	<p>Electrostatic discharge according to IEC 61000-4-2</p> <ul style="list-style-type: none"> Up to ± 15 kV air discharge Up to ± 8 kV contact discharge <p>Radiated electromagnetic field according to IEC 61000-4-3</p> <ul style="list-style-type: none"> Up to 30 V/m, 80% AM, 1 kHz in the range of 80 MHz ... 1000 MHz Up to 20 V/m, 80% AM, 1 kHz in the range of 900 MHz ... 2700 MHz <p>Electrical fast transients/bursts according to IEC 61000-4-4 coupled to sensor cable with a capacitive coupling clamp</p> <ul style="list-style-type: none"> Up to ± 2 kV peak <p>Surges according to IEC 61000-4-5</p> <ul style="list-style-type: none"> ± 2 kV on DC power ports <p>Radio frequency injected current according to IEC 61000-4-6</p> <ul style="list-style-type: none"> Up to 15 V, 80% AM, 1 kHz, 1000 ms in the range of 0.15 MHz ... 80 MHz with 50 Ohm load and 560 Ohm pull up resistance <p>Power frequency magnetic field according to IEC 61000-4-8</p> <ul style="list-style-type: none"> 100 A/m tested with 16 2/3 Hz, 50 Hz, 60 Hz in each axis
Housing	Stainless steel 1.4305, front side sealed hermetically and resistant against splashing water, oil, conducting carbon- or ferrous dust and salt mist. Electronic components potted in chemical and age proof synthetic resin. Dimensions according to drawing.
Connector	MS3102A-14S-2P Operating temperature: -55°C...+125°C Plug-and-socket connection: IP67

Requirements for pole wheel	Toothed wheel of a magnetically permeable material (e.g. Steel 1.0036) Optimal performance with <ul style="list-style-type: none"> • Involute gear • Tooth width > 10 mm • Side offset < 0.2 mm • Eccentricity < 0.2 mm • Sensor is optimized to operate with an involute gear of module 2.
Air gap sensor / pole wheel	Air gap between pole wheel (involute gear, module 2) and sensor housing: 0.5 ... 1.5 mm
Insulation	Housing and electronics galvanically separated (500 V / 50 Hz / 1 min)
Protection class	IP68 (head) and IP67 (connector)
Vibration immunity	300 gn (peak) 10 Hz ... 2000 Hz random noise for 5 hours per axis based on IEC 60068-2-27
Shock immunity	100 g for 6 ms according to IEC 60068-2-27
Climatic resistance	1000h in temperature cycle from -40°C to +125°C (6h hold time, respectively)
Temperature	Operating temperature of entire sensor: -40°C ...+125°C

Further Information

Safety	All mechanical installations must be carried out by an expert. General safety requirements have to be met.
Connection	The sensors must be connected according to the sensor drawing. Sensor wires are susceptible to radiated noise. Therefore, the following points have to be considered when connecting a sensor: <ul style="list-style-type: none"> • The sensor wires must be positioned as far as possible from large electrical machines. • They must not run in the vicinity of power cables. • It is advantageous to keep the distance between sensor and instrument as short as possible. If the signal requirements are met, the sensor cable may be lengthened via a terminal box located in an IP20 connection area in accordance with EN 60529.
Installation	The sensor has to be aligned to the pole wheel according to the sensor drawing. A deviation in positioning may affect the performance and decrease the noise immunity of the sensor. Within the air gap specified the amplitude of the output signals is not influenced by the air gap. The smallest possible pole wheel to sensor gap should be set, however, the gap should be set to prevent the face of the sensor from touching the pole wheel. The sensor should be positioned such that the center of the sensor face corresponds to the middle of a pole wheel tooth. For larger teeth a misalignment of the sensor center to the middle of a tooth is permissible, however, the center of the sensor must be at a minimum of 3 mm from either edge of the pole wheel under all operating conditions. A solid and vibration free mounting of the sensor is important. Sensor vibration relative to the pole wheel may add spurious noise to the signal. The sensors are insensitive to oil, grease etc. and can be installed in arduous conditions.
Operation	The sensor is designed for normal use in its dedicated environment. The manufacturer cannot take responsibility for any abnormal use that might lead to a reduced lifetime of the sensor.
Maintenance	Product cannot be repaired.
Transport	Product must be handled with care to prevent damage of the front face.
Storage	Product must be stored in dry conditions. The storage temperature corresponds to the operation temperature.
Disposal	Product must be disposed of properly, it must not be disposed as domestic waste.