

## Dual Channel Hall Effect Speed Sensor

### DSD 16xx.71 AxHW



#### Product ID

Type #	Product #	Drawing #
DSD 1620.71 A2HW	3742612344	125432
DSD 1630.71 A3HW	20010867-00	20010867-00

#### General

<b>Function</b>	The speed sensors DSD 16xx.71 AxHW are suitable, in conjunction with a pole wheel, for generating two phase-shifted square wave signals proportional to rotary speeds. They have a static behaviour, so that pulse generation is guaranteed down to a speed corresponding to a frequency of 0 Hz. The monitoring elements consist of two magnetically biased differential Hall effect semiconductors. The internal dual channel structure requires that the sensor must be oriented. The sensor has a flange for proper installation.
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#### Technical data

Supply voltage	9VDC to 30VDC, protected against transient overvoltages and reverse polarity
Nominal supply voltage	15V
Current consumption	Max. 20mA (without load)
Signal output	<ul style="list-style-type: none"> <li>2 phase shifted square wave signals, minimum edge shift with an involute gear wheel: minimal phase shift of 20° for gear of module 2 or 3 between output 1 (S1) and output 2 (S2)</li> <li>Push-pull outputs : <math>I_{max} = \pm 30mA</math> <ul style="list-style-type: none"> <li>Output voltage HI (for <math>I = I_{max}</math>): <math>U_{HI} &gt; U_{supply} - 1.5V</math></li> <li>Output voltage LO (for <math>I = I_{max}</math>): <math>U_{LO} &lt; 1.5V</math></li> </ul> </li> <li>The output stages are current limiting and short-circuit proof due to a temperature shutdown mechanism: <ul style="list-style-type: none"> <li>Thermal shutdown threshold: 145°C ... 175°C</li> <li>Thermal re-start threshold: 135°C ... 165°C</li> <li>Hysteresis: 5°C ... 20°C</li> </ul> </li> </ul>
Frequency range	0Hz ... 20kHz

Electromagnetic compatibility (EMC)	<div>Electrostatic discharge according to IEC 61000-4-2<ul style="list-style-type: none"><li>Up to ±8kV air discharge</li><li>Up to ±6kV contact discharge</li></ul></div> <div>Radiated electromagnetic field according to IEC 61000-4-3<ul style="list-style-type: none"><li>Up to 30V/m, 80% AM, 1kHz in the range of 80MHz ... 1000MHz</li><li>Up to 10V/m, 80% AM, 1kHz in the range of 1400MHz ... 2500MHz</li></ul></div> <div>Electrical fast transients/bursts according to IEC 61000-4-4 direct coupling<ul style="list-style-type: none"><li>Up to ±2kV peak, 5/50ns, 5kHz</li></ul></div> <div>Surges according to IEC 61000-4-5<ul style="list-style-type: none"><li>±2kV 1.2/50µs (common mode)</li><li>±1kV 1.2/50µs (differential mode)</li></ul></div> <div>Radio frequency injected current according to IEC 61000-4-6<ul style="list-style-type: none"><li>Up to 10V, 80% AM, 1 kHz, 1000 ms in the range of 0.15 MHz ... 80 MHz with 50Ω load and 560Ω pull up resistance</li></ul></div> <div>Power frequency magnetic field according to IEC 61000-4-8<ul style="list-style-type: none"><li>300A/m (1 min) tested with 16 ⅔Hz, 50Hz in each axis</li><li>1000A/m (3s) tested with 16 ⅔Hz, 50Hz, 60Hz in each axis</li></ul></div> <div>Radiated emission (at 3m) according to EN 55011<ul style="list-style-type: none"><li>30MHz 230MHz: 50dB µV/m</li><li>230MHz 1GHz: 57dB µV/m</li></ul></div>													
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 the drawing.													
Connector	<table><tr><th>Type #</th><th>Connector [Jaquet part no.]</th></tr><tr><td>DSD 1620.71 A2HW</td><td>8202612459</td></tr><tr><td>DSD 1630.71 A3HW</td><td>20011143-00</td></tr></table> <table><tr><th>Jaquet connector type</th><th>Manufacturer code</th></tr><tr><td>8202612459</td><td>ITT Cannon FRCIR02RFS14S-2P-F80T12-D457 with contacts 27911-13T12</td></tr><tr><td>20011143-00</td><td>ITT Cannon KPSE0E14-5P-FO with contacts 430-8560-00</td></tr></table>		Type #	Connector [Jaquet part no.]	DSD 1620.71 A2HW	8202612459	DSD 1630.71 A3HW	20011143-00	Jaquet connector type	Manufacturer code	8202612459	ITT Cannon FRCIR02RFS14S-2P-F80T12-D457 with contacts 27911-13T12	20011143-00	ITT Cannon KPSE0E14-5P-FO with contacts 430-8560-00
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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"><li>Involute gear</li><li>Tooth width ≥ 10 mm</li><li>Side offset &lt; 1.0 mm</li><li>Eccentricity &lt; 0.2 mm</li><li>Sensor is optimized to operate with an involute gear of module 2 or 3</li></ul>													
Air gap between sensor housing and pole wheel	Module 1	0.5 ... 0.7mm												
	Module 1.5	0.5 ... 1.3mm												
	Module ≥ 2	0.5 ... 1.5mm												
Insulation	<ul style="list-style-type: none"><li>Insulation between electronics and housing: 700VDC, &gt; 100MΩ</li><li>Insulation between shield and housing: 700VDC, &gt; 100MΩ</li></ul>													
Protection class	<ul style="list-style-type: none"><li>Sensor head: IP68</li></ul>													
Vibration immunity	IEC 61373, Cat. 3, with 300 m/s <sup>2</sup> for all axes, for 8h													
Shock immunity	IEC 61373, Cat. 3													

Operating temperature

- Sensor head: -40°C ... +125°C
- Connector: according to connector specification

## Additional Information

Safety	All mechanical installations must be carried out by an expert. General safety requirements have to be met.
Connection	<p>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:</p> <ul style="list-style-type: none"> <li>• The sensor wires must be positioned as far as possible from large electrical machines.</li> <li>• They must not run in the vicinity of power cables.</li> <li>• 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 in accordance with EN 60529.</li> </ul>
Installation	<p>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.</p> <p>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 4mm from either edge of the pole wheel under all operating conditions.</p> <p>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.</p> <p>The sensors are insensitive to oil, grease etc. and can be installed in arduous conditions.</p>
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.