

## Differential Hall Effect Speed Sensor DSD 1820.21 SxHWR



### Product ID

Type #	Product #	Drawing #
DSD 1820.21 SHWR	3742608042	119810 Rev.02 119810A Rev.001

### General

<b>Function</b>	The differential speed sensor DSD 1820.21 SHWR is suitable, in conjunction with a pole wheel, for generating two 90° phase shifted square wave signals and with a pulse frequency proportional to the rotary speed. A third channel delivers an additional galvanic separated output, without phase correlation with the above 2 signals. This channel needs its own power supply (PSII). The speed sensors must be aligned with reference to the plane of the pole wheel according to the drawing - sensor alignment.
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### Technical data

Supply voltage I (PS I)	10...30 VDC protected against false polarity and transient overvoltage
Supply voltage II (PS II)	10...30 VDC protected against false polarity and transient overvoltage
Current consumption	Max. 25mA on power supply 1 (without load) Max. 15mA on power supply 2 (without load)
Signal output	<ul style="list-style-type: none"> <li>Power supply I: 2 phase shifted square wave signals, minimum edge shift with an involute gear wheel with module 2: 20° between output 1 (S1) and output 2 (S2). Please consult JAUQUET for other pole wheels</li> <li>Power supply II: S3 is galvanically separated, no defined phase shift to S1 and S2</li> <li>Push-pull outputs : <math>I_{max} = \pm 20 \text{ mA}</math> <ul style="list-style-type: none"> <li>with pull-up resistor (for <math>R=560 \Omega</math>): <math>U_{low} &lt; 2.5 \text{ V}</math>, <math>U_{high} &gt; 0.95 * U_{supply}</math></li> <li>with pull-down resistor (for <math>R=560 \Omega</math>): <math>U_{low} &lt; 0.1 \text{ V}</math>, <math>U_{high} &gt; U_{supply}-4.0 \text{ V}</math></li> </ul> </li> </ul> <p>The outputs are short circuit proof and protected against reverse polarity.</p>
Frequency range	0 Hz ... 15 kHz
Electromagnetic compatibility (EMC):	<p>With the cable shield connected to the supply negative pole, the sensor complies with the following EMC conditions:</p> <ul style="list-style-type: none"> <li>Transient non-repetitive surges between the supply negative pole or the housing and signal- and power supply wiring up to: <ul style="list-style-type: none"> <li>7 kV peak during 0,1 <math>\mu\text{s}</math></li> <li>4 kV peak during 1 <math>\mu\text{s}</math></li> <li>3 kV peak during 5 <math>\mu\text{s}</math></li> <li>1,5 kV peak during 45 <math>\mu\text{s}</math></li> <li>800 V peak during 100 <math>\mu\text{s}</math></li> </ul> </li> <li>Electrostatic discharge into housing, cable shield and wires: up to 4 kV peak according to IEC 801-2, severity level 2</li> <li>Radiated electromagnetic field: up to 30 V/m, 50% AM, 1 kHz in the range of 1 MHz to 1000 MHz according to IEC 801-3, severity level 3</li> </ul> <p>Electrical fast transients/bursts, coupled to sensor cable with a capacitive coupling clamp: up to 4 kV peak according to IEC 801-4, severity level 4</p>

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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. Max. allowable pressure on sensor head: 10 bar Dimensions according to drawing.								
Cable	<table><tr><th>Sensor</th><th>Cable [Jaquet part no.]</th><th>Cable length [mm]</th></tr><tr><td>DSD 1820.21 SHWR</td><td>824L-36808</td><td>2500</td></tr></table> <p>Cable type:</p> <ul style="list-style-type: none"><li>824L-36808: Armoured cable: 8-wire, 0.6 mm<sup>2</sup> (AWG 20), PEIC insulated, fire retardant, low smoke, PVC and halogen free, oil-proof, waterproof, outer-Ø max. 13.0 mm, min. bending radius = 30 mm (static) and 65 mm (dynamic), screened (metal net), black casing (silicone) Operating temperature: -40°C to +150 °C</li></ul>			Sensor	Cable [Jaquet part no.]	Cable length [mm]	DSD 1820.21 SHWR	824L-36808	2500
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DSD 1820.21 SHWR	824L-36808	2500							
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 &gt; 10 mm</li><li>Side offset &lt; 0.2 mm</li><li>Eccentricity &lt; 0.2 mm</li></ul> Additionally the DSD 1820.21 SHWR is optimized to operate with an involute gear up to module 2.5								
Air gap between sensor and pole wheel	Air gap between pole wheel (involute gear, module 2 to 2.5) and sensor housing: 0.3 ... 1.5 mm								
Insulation	Housing and electronics galvanically separated (500 V/50 Hz/ 1 min)								
Protection class	IP68 (head)								
Vibration immunity	5 g in the range of 5 ... 2000 Hz								
Shock immunity	50 g for 20 ms, half sine wave								
Temperature	Operating temperature of entire sensor: -40° ... +125°C								

## Further 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 following drawings:</p> <table border="1"> <thead> <tr> <th>Sensor</th><th>Connection diagramm</th></tr> </thead> <tbody> <tr> <td>DSD 1820.21 SHWR</td><td>119810A Rev.001</td></tr> </tbody> </table> <p>Sensor wires are susceptible to radiated noise. Therefore, the following points have to be considered when connecting a sensor:  The sensor wires must be laid as far as possible from large electrical machines. They must not run parallel in the vicinity of power cables.  The shield must be connected to the 0 Volt of power supply or to specifically designated clamps.  The maximum permissible cable length is dependent upon the sensor voltage, the cable routing, along with cable capacitance and inductance. However, it is advantageous to keep the distance between sensor and instrument as short as possible. The sensor cable may be lengthened via a terminal box located in an IP20 connection area in accordance with EN 60529.</p>	Sensor	Connection diagramm	DSD 1820.21 SHWR	119810A Rev.001
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DSD 1820.21 SHWR	119810A Rev.001				
Installation	<p>The sensor has to be aligned to the pole wheel according to the sensor drawing. Deviations in positioning may affect the performance and decrease the noise immunity of the sensor. During installation, the smallest possible pole wheel to sensor gap should be set. The gap should however be set to prevent the face of the sensor ever touching the pole wheel.  A sensor should be mounted with the middle of the face side over the middle of the pole wheel. Dependent upon the wheel width, a certain degree of axial movement is permissible. However, the middle of the sensor must be at minimum in a distance of 3 mm from the edge of the pole wheel under all operating conditions.  A solid and vibration free mounting of the sensor is important. Eventual sensor vibration relative to the pole wheel can induce additional output pulses.  The sensors are insensitive to oil, grease etc. and can be installed in arduous conditions. During installation, the smallest possible pole wheel to sensor gap should be set. The gap should however be set to prevent the face of the sensor ever touching the pole wheel. Within the air gap specified the amplitude of the output signals is not influenced by the air gap.</p>				
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.				