

## Single Channel Hall Effect Speed Sensor DSF xx10.xx AxV



### Product ID

Type #	Product #	Drawing #
DSF 1210.00 AHV	374Z-03867	4-110.829
DSF 1210.00 ATV	374Z-03868	4-110.829
DSF 1210.01 AHV	3742608541	120251 Rev.0
DSF 1410.00 AHV	374Z-03940	4-111.499
DSF 1410.00 AHV S148 IG=100	374Z-04807	3-111.499 S148
DSF 1410.00 ATV	374Z-03939	4-111.499
DSF 1410.00 ATV S148/1 IG=60	374Z-04112	4-111.499 S148/1
DSF 1410.02 AHV L=70	374Z-04429	4-111.985B
DSF 1410.02 AHV L=100	374Z-04428	4-111.985
DSF 1410.02 AHV L=140	374Z-04427	4-111.985A
DSF 1410.02 AHV L=220	374Z-05858	115.625 Rev.01
DSF 1410.03 AHV	374Z-04400	4-112.042
DSF 1610.00 AHV	374Z-03942	4-111.500
DSF 1610.00 ATV	374Z-03941	4-111.500
DSF 1610.00 ATV S167	374Z-04784	4-111.500 S167
DSF 1610.02 AHV	374Z-04762	4-112.159
DSF 1610.12 ATV L=70mm	374Z-05450	4-114.133 Rev.00
DSF 1810.00 AHV	374Z-03887	4-110.830
DSF 1810.00 A1HV	374Z-05261	4-110.830
DSF 1810.00 ATV	374Z-03886	4-110.830
DSF 1810.02 ATV	374Z-04339	4-111.849
DSF 1810.04 AHV	374Z-04987	3-112.683
DSF 1810.05 AHV	374Z-04988	4-112.685
DSF 1810.08 AHV	374Z-05169	3-113.134
DSF 2210.00 AHV	374Z-03873	4-110.831
DSF 2210.00 ATV	374Z-03888	4-110.831
DSF 2210.03 ATV	374Z-05767	115.268 Rev.03
DSF 2210.04 ATV	374Z-05777	115.268 Rev.03
DSF EH10.07 A1HV	374Z-05027	4-111.855A
DSF EH10.08 A1HV	374Z-04839	4-111.855A
DSF EH10.17 ATV	374Z-05833	115.521 Rev.02
DSF EH10.18 AHV	374Z-05865	115.732 Rev.01

### General

#### Function

The sensors DSF xx10.xx AxV are suitable, in conjunction with a pole wheel, for generating square wave signals proportional to rotary speeds. They have a dynamic behaviour, so that pulse generation is guaranteed down to a speed corresponding to a frequency of 0.05 Hz. The monitoring elements consist of a magnetically biased hall effect semiconductor followed by a short-circuit proof push-pull output stage. The sensor function is independent on the rotational orientation of the sensor axis.

#### Certification

The DSF sensors are approved by Germanischer Lloyd (GL):  
Certificate 17332-00 HH

## Technical data

Supply voltage	10 V to 30 V, protected against transient overvoltage and reverse polarity									
Current consumption	Max. 16 mA (without load)									
Signal output	<p>Square wave signals from push-pull stage, DC-coupled to the supply (negative pole = reference voltage)</p> <p>Push-pull outputs : <math>I_{\max} = \pm 20 \text{ mA}</math>, <math>U_{\text{low}} &lt; 2.5 \text{ V}</math>, <math>U_{\text{high}} &gt; U_{\text{supply}} - 3.5 \text{ V}</math></p> <p>The outputs are short circuit proof and protected against reverse polarity.</p>									
Frequency range	0.05 Hz ... 20 kHz									
Electromagnetic compatibility (EMC):	<p>According to Directive 2004/108/EC, EN 61000-6-2 and 61000-6-4:</p> <p>Electrostatic discharge into housing, cable shield and wires: up to <math>\pm 4 \text{ kV}</math> peak according to IEC 61000-4-2, severity level 2</p> <p>Radiated electromagnetic field: up to <math>30 \text{ V/m}</math>, 50% AM, 1 kHz in the range of 1 MHz to 1000 MHz according to IEC 61000-4-3, severity level 3</p> <p>Fast electrical transients/bursts, coupled to sensor cable with a capacitive coupling clamp: up to <math>\pm 4 \text{ kV}</math> peak according to IEC 61000-4-4, severity level 4</p>									
Housing	<p>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</p> <p>Dimensions according to drawing.</p> <p>Max. tightening torque:</p> <table data-bbox="539 869 1102 976" style="margin-left: 40px;"> <tr> <td>12 Nm for M12x1</td> <td>25 Nm for M14x1</td> </tr> <tr> <td>35 Nm for M16x1</td> <td>50 Nm for M18x1</td> </tr> <tr> <td>75 Nm for M22x1</td> <td>75 Nm for M24x1</td> </tr> <tr> <td colspan="2">35 Nm for 5/8"-18 UNF-2A</td> </tr> </table>		12 Nm for M12x1	25 Nm for M14x1	35 Nm for M16x1	50 Nm for M18x1	75 Nm for M22x1	75 Nm for M24x1	35 Nm for 5/8"-18 UNF-2A	
12 Nm for M12x1	25 Nm for M14x1									
35 Nm for M16x1	50 Nm for M18x1									
75 Nm for M22x1	75 Nm for M24x1									
35 Nm for 5/8"-18 UNF-2A										
Requirements for pole wheel	<p>Toothed wheel of a magnetically permeable material (e.g. Steel 1.0036)</p> <p>Minimum tooth width of 10 mm</p> <p>Side offset &lt; 0.2 mm</p> <p>Eccentricity &lt; 0.2 mm</p>									
Air gap between sensor and pole wheel	<p>Air gap between pole wheel (involute gear) and sensor housing:</p> <table data-bbox="571 1131 999 1245" style="margin-left: 40px;"> <tr> <td>Module 1:</td> <td>0.2...1.0 mm</td> </tr> <tr> <td>Module 2:</td> <td>0.2...2.5 mm</td> </tr> <tr> <td>Module 3:</td> <td>0.2...3.5 mm</td> </tr> <tr> <td>Module 4 and coarser:</td> <td>0.2...4.5 mm</td> </tr> </table>		Module 1:	0.2...1.0 mm	Module 2:	0.2...2.5 mm	Module 3:	0.2...3.5 mm	Module 4 and coarser:	0.2...4.5 mm
Module 1:	0.2...1.0 mm									
Module 2:	0.2...2.5 mm									
Module 3:	0.2...3.5 mm									
Module 4 and coarser:	0.2...4.5 mm									
Insulation	Housing and electronics galvanically separated (500 V/50 Hz/ 1 min)									
Protection class	IP68 (head) and IP of the connector according to the list									
Vibration immunity	5 g in the range of 5 ... 2000 Hz									
Shock immunity	50 g for 20 ms, half sine wave									
Temperature	<p>Operating temperature of the sensor:</p> <p>Version H: <math>-40^{\circ}</math> ... <math>+125^{\circ}\text{C}</math></p> <p>Version T: <math>-25^{\circ}</math> ... <math>+85^{\circ}\text{C}</math></p>									
Reliability	<p>The following MTTF and failure rates were computed based on Siemens SN29500 and valid for an operating temperature of <math>60^{\circ}\text{C}</math>. They include the electrical failure modes but not the mechanical.</p> <table border="1" data-bbox="539 1563 920 1621" style="margin-left: 40px; width: 100%;"> <thead> <tr> <th>MTTF [hours]</th> <th>Failure rate [FIT]</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">3'177'000</td> <td style="text-align: center;">314.8</td> </tr> </tbody> </table>		MTTF [hours]	Failure rate [FIT]	3'177'000	314.8				
MTTF [hours]	Failure rate [FIT]									
3'177'000	314.8									

**Connection type**

Sensor type	Jaquet part number of connector
DSF 1210.00 AHV	820A-35921
DSF 1210.00 ATV	820A-35921
DSF 1210.01 AHV	According to sensor drawing
DSF 1410.00 AHV	820A-35731
DSF 1410.00 AHV S148 IG=100	820E-31142
DSF 1410.00 ATV	820A-35731
DSF 1410.00 ATV S148/1 IG=60	820A-35731
DSF 1410.02 AHV L=100	820E-31142
DSF 1410.02 AHV L=140	820E-31142
DSF 1410.02 AHV L=220	820E-31142
DSF 1410.02 AHV L=70	820E-31142
DSF 1410.03 AHV	820P-36090
DSF 1610.00 AHV	820A-35731
DSF 1610.00 ATV	820A-35731
DSF 1610.00 ATV S167	820A-35731
DSF 1610.02 AHV	820E-31142
DSF 1610.12 ATV L=70mm	820E-31142
DSF 1810.00 AHV	820A-35731
DSF 1810.00 A1HV	820A-37243
DSF 1810.00 ATV	820A-35731
DSF 1810.02 ATV	820A-36648
DSF 1810.04 AHV	820E-36488
DSF 1810.05 AHV	820E-36488
DSF 1810.08 AHV	820P-36090
DSF 2210.00 AHV	820A-35731
DSF 2210.00 ATV	820A-35731
DSF 2210.03 ATV	820E-31142
DSF 2210.04 ATV	820E-31142
DSF EH10.07 A1HV	820A-36648
DSF EH10.08 A1HV	820A-36648
DSF EH10.17 ATV	830E-37864
DSF EH10.18 AHV	385E-64991

**Connectors**

Jaquet connector code	Protection Class	Manufacturer code
385E-64991	IP66	mates with straight plug MS 3106A-10SL-3S
820A-35731	IP50	ERA-2S-304-CLL (LEMO)
820A-35732	IP50	FFA-2S-304-CLA L42 (LEMO)
820A-35921	IP50	FFA-0S-304-CLA-L42 (LEMO)
820A-36648	IP67	M12x1 D=16/14,5x17,5 (ESCHA)
820A-37243	IP50	FFA-2S-304-CLA-L82 (LEMO)
820E-31142	IP67	MS3102A-10SL-3P/H 097 (MIL-C-5015)
820E-36488	IP67	MS3102A-10SL-3P-B (MIL-C-5015)
820E-37864	IP67	MAC-3MR-2-SS
820P-36090	IP65	GSA 3000 (Hirschmann)

**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 sensor drawing.</p> <p>Sensor wires are susceptible to radiated noise. Therefore, the following points have to be considered when connecting a sensor:</p> <p>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.</p> <p>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>
Installation	<p>The sensor has to be aligned to the pole wheel according to the sensor drawing independent of its rotational orientation. 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.</p> <p>A solid and vibration free mounting of the sensor is important. Eventual sensor vibration relative to the pole wheel can induce additional output pulses.</p> <p>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.