

Two Wire Hall Effect Speed Sensor DSF xx15.xx xHV Series



Product ID

Type #	Product #	Drawing #
DSF 1215.01 SHV S177 (6m)	304Z-05312	4-113.561 S177
DSF 1215.01 SHV S178 (3m)	304Z-05375	4-113.751
DSF 1415.01 AHV S90	304Z-03819	4-109.389 S90
DSF 1615.02 SHV (5m)	304Z-05259	4.113.354
DSF 1615.09 AHV	374Z-05722	115.039 Rev.6
DSF 1615.10 AHV	374Z-05870	115.039 Rev.6
DSF 2215.01 AHV S39	304Z-05408	4-107.307
DSF 2215.01 SHV (5m)	304Z-05214	4-113.120
DSF EH15.00 PHV	374Z-05725	115.046 Rev.1
DSF EH15.01 S1HV	3742608036	119682 Rev.000
DSF EH15.09 A1HV	374Z-05723	115.039 Rev.6
DSF EH15.09 A2HV	374Z-05724	115.039 Rev.6
DSF EH15.10 A1HV	374Z-05871	115.039 Rev.6
DSF EH15.10 A2HV	374Z-05872	115.039 Rev.6

General

Function

The speed sensors DSF xx15.xx xHV are suitable, in conjunction with a pole wheel, for generating 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 sensing element is a magnetically biased Hall effect semiconductor, followed by a 2 wire amplifier.

Technical data

Supply voltage	9 VDC to 18 VDC, protected against reverse polarity
Current consumption	Max. 10 mA (without load)
Signal output	The sensor changes its resistance in the presence of ferrous metal. Typically, the supply is provided via an 820 Ohm resistor. The current impulses generated are analysed on this resistor. Pulse levels of 2.2 V peak-peak are generated across the 820 Ohm resistor, with a d.c. component of $\frac{3}{4}$ supply voltage (see connection diagram).
Start up behavior	The sensor will change its output after the passing of the second tooth.
Frequency range	0 Hz ... 15 kHz
Electromagnetic compatibility (EMC):	According to Directive 2004/108/EC, EN 61000-6-2 and 61000-6-4: Electrostatic discharge into housing, cable shield and wires: up to ± 4 kV peak according to IEC 61000-4-2, severity level 2 Radiated electromagnetic field: up to 30 V/m, 50% AM, 1 kHz in the range of 1 MHz to 1000 MHz according to IEC 61000-4-3, severity level 3 Fast electrical transients/bursts, coupled to sensor cable with a capacitive coupling clamp: up to ± 4 kV peak according to IEC 61000-4-4, severity level 4
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.

Connection type

Sensor type	Connection type	Jaquet part number
DSF 1215.01 SHV S177	Cable	824L-35053
DSF 1215.01 SHV S178	Cable	824L-35053
DSF 1415.01 AHV S90	Connector	820E-31142
DSF 1615.02 SHV (5m)	Cable	824L-35053
DSF 1615.09 AHV	Connector	385E-73612
DSF 1615.10 AHV	Connector	385E-73612
DSF 2215.01 AHV S39	Connector	820E-31142
DSF 2215.01 SHV (5m)	Cable	824L-35053
DSF EH15.00 PHV	Cable with integrated connector	824L-36622 (cable) CIR06 (connector)
DSF EH15.01 S1HV	Cable	824L-35053
DSF EH15.09 A1HV	Connector	385E-73612
DSF EH15.09 A2HV	Connector	385E-73612
DSF EH15.10 A1HV	Connector	385E-73612
DSF EH15.10 A2HV	Connector	385E-73612

Cable

Jaquet cable type	Properties
824L-35053	FEP Teflon cable, 4-wire (brown wire is not connected), 0.2 mm ² (AWG 24), outer-Ø max. 4.2 mm, bending radius min. 60 mm, screened (metal net), white Operating temperature: -100°C to +150 °C
824L-36622	Armoured cable: 6-wire, 0.6 mm ² (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

Connector

Jaquet connector type	Manufacturer code
385E-73612	Mates with MS3106A-10SL-4S Operating temperature: -55°C to +125°C Plug-and-socket connection: IP67
820E-31142	MS3102A-10SL-3P/H 097 Operating temperature: -55°C to +125°C Plug-and-socket connection: IP67
CIR06	ITT Cannon Veam CIR06AG-10SL-3P-F80-T12 Operating temperature: -55°C to +125°C

Requirements for pole wheel Toothed wheel of a magnetically permeable material (e.g. Steel 1.0036)
Optimal performance with

- Involute gear
- Tooth width > 10 mm
- Side offset < 0.2 mm
- Eccentricity < 0.2 mm

Air gap between sensor and pole wheel Air gap between pole wheel (involute gear) and sensor housing:
Module 1: 0.2...0.5 mm
Module 2: 0.2...1.5 mm
Module 4 (and larger): 0.2...2.5 mm

Insulation Housing and electronics galvanically separated (500 V/50 Hz/ 1 min)

Protection class IP69 (head) and IP67 (connector, cable outlet)

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 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"> 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	<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. 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.</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 3 mm 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 extraneous and/or spurious noise to the signal.</p> <p>The sensors are insensitive to oil, grease etc. and can be installed in arduous conditions.</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.