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DSF xx10.xx MxV/PxV/SxV

Single Channel Hall Effect Speed Sensor

Germanischer Lloyd Certified

Product ID

Type #	Product #	Drawing #
DSF 1210.00 MTV (5m)	374Z-03970	4-111.478
DSF 1210.00 SHV (2m)	374Z-03869	4-110.428
DSF 1210.00 SHV (20m)	3742612927	4-110.428
DSF 1210.00 SHV (30m)	374Z-03879	4-110.428
DSF 1210.00 SHV (5m)	374Z-03880	4-110.428
DSF 1210.00 SHV (10m)	374Z-03924	4-110.428
DSF 1210.00 STV (5m)	374Z-03870	4-110.428
DSF 1210.01 PHV (0,36m)	374Z-04903	3-112.475
DSF 1210.06 PHV	374Z-05512	3-114.319
DSF 1410.00 SHV (2m)	374Z-03927	4-111.496
DSF 1410.00 SHV (5m)	374Z-03928	4-111.496
DSF 1410.00 STV (5m)	374Z-03925	4-111.496
DSF 1410.00 STV S148	374Z-03890	3-110.687 S148
DSF 1410.01 SHV (10m)	374Z-04218	4-111.809
DSF 1610.00 MTV S151	374Z-03966	4-110.794 S151
DSF 1610.00 SHV (2m)	374Z-03932	4-111.498
DSF 1610.00 SHV (5m)	374Z-03933	4-111.498
DSF 1610.00 S1HV (5m)	3742610332	122743
DSF 1610.00 STV (5m)	374Z-03930	4-111.498
DSF 1810.00 MTV (5m)	374Z-03976	4-111.481
DSF 1810.00 SHV (2m)	374Z-03871	4-110.687
DSF 1810.00 SHV (5m)	374Z-03882	4-110.687
DSF 1810.00 SHV S162	374Z-04210	4-110.687 S162
DSF 1810.00 STV (5m)	374Z-03872	4-110.687
DSF 1810.02 PTV (0,4m)	374Z-04941	4-112.558
DSF 1810.03 PHV S12 (0,6m)	374Z-05255	4-113.349
DSF 1810.10 SHV	374Z-05884	115.773
DSF 2210.00 MTV (5m)	374Z-03978	4-111.482
DSF 2210.00 SHV (2m)	374Z-03874	4-110.777
DSF 2210.00 SHV (5m)	374Z-03877	4-110.777
DSF 2210.00 STV (5m)	374Z-03875	4-110.777
DSF 2210.00 STV (6m)	374Z-03876	4-110.777
DSF 2210.87 MHV (5m)	374Z-04849	111482A
DSF 2210.87 MHV S22 (5m)	374Z-05684	111482A
DSF 2210.87 PHV	374Z-05372	3-113.742
DSF 2210.87 STV (5m) (old type: FTG 1087.00 S)	374Z-03853	4-111037
DSF 2210.87 STV S166 (10m)	374Z-04781	4-109604s166
DSF CD10.00 SHV (2m)	374Z-05392	4-113.862
DSF EH10.00 STV (5m)	374Z-04360	4-111.915

DSF EH10.08 P1HV	374Z-05028	112.778
DSF EH10.08 SHV (5m)	374Z-04836	4-112.350
DSF EH10.11 SHV (2m)	374Z-05073	4-112.914
DSF EH10.15 SHV (5m)	374Z-05511	4-114.317
DSF EH10.16 SHV	374Z-05716	115.031

General

Function	The sensors DSF 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....30 VDC **protected against false polarity and transient overvoltages**
Current consumption	max. 16 mA (without load)
Signal output	• Square wave • Push-pull outputs : I_{max} = ± 20 mA ○ with pull-up resistor (for I= I_{max}): U_{low} < 2.5 V, U_{high} > 0.95 * 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	0.05 Hz ... 20 kHz
Electromagnetic compatibility (EMC): Immunity	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
Insulation	Housing and electronics galvanically separated (500 V/50 Hz/ 1 min)
Operating temperature	• Version H: -40° ... +125°C • Version T: -25° ... +85°C Check properties of cable and protective conduits.
Housing	Stainless steel (material number 1.4305 or 1.4301), front side hermetically sealed and resistant against splashing water, oil, conducting carbon- or ferrous dust and salt mist. Electronic components potted in a chemical and age proof synthetic resin or ceramic. Max. allowable pressure on sensor head: 10 bar. Dimensions according to drawing. Max. tightening torque: 12 Nm for M12x1 25 Nm for M14x1 35 Nm for M16x1 50 Nm for M18x1 75 Nm for M22x1

Protection class	IP68 (head) and IP67 (cable outlet)
Vibration immunity	5 g in the range of 5 ... 2000 Hz
Shock immunity	50 g for 20 ms, half sine wave
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 pole wheel (involute gear) and sensor housing: • 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
Connection type	See tables on next pages
Safety	**All mechanical installations must be carried out by an expert. General safety requirements must be met.**
Connection	The sensors must be connected according to sensor drawing. 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 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.

Installation	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. Within the air gap specified the amplitude of the output signals is not influenced by the air gap. Particular mounting instructions for: • **DSF 1610.00 MTV S151**: The detecting element is placed on the lateral side of the sensor housing (see dimensional drawing). Its position is marked on the surface. The applicable maximal air gap is reduced by 0.6 mm with respect to the data mentioned in this operating instructions. At the cable output of the housing a protective conduit can be mounted around the sensor cable. This is not part of the delivery.
Maintenance	Sensors are maintenance-free. The sensors are fully potted and sealed and cannot be repaired.
Reliability	The following MTTF and failure rates were computed based on Siemens SN29500 and valid for an operating temperature of 60°C. They include the electrical failure modes but not the mechanical.
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.

MTTF [hours]	Failure rate [FIT]
3’177’000	314.8

Connection type

Sensor type	Connection type	Jaquet part number
DSF 1210.00 MTV (5m)	Cable with protective conduit	824L-35665 (cable) 825G-36148 (conduit)
DSF 1210.00 SHV (2m)	Cable	824L-35053
DSF 1210.00 SHV (20m)	Cable	824L-35053
DSF 1210.00 SHV (30m)	Cable	824L-35053
DSF 1210.00 SHV (5m)	Cable	824L-35053
DSF 1210.00 SHV (10m)	Cable	824L-35053
DSF 1210.00 STV (5m)	Cable	824L-35665
DSF 1210.01 PHV (0,36m)	Cable with integrated connector	824L-33024 (cable) 820P-36527 (connector)
DSF 1210.06 PHV	Cable with integrated connector	824L-35053 (cable) 820A-36859 (connector)
DSF 1410.00 SHV (2m)	Cable	824L-35053
DSF 1410.00 SHV (5m)	Cable	824L-35053
DSF 1410.00 STV (5m)	Cable	824L-35665
DSF 1410.00 STV S148	Cable	824L-35665
DSF 1410.01 SHV (10m)	Cable	824L-35053
DSF 1610.00 MTV S151	Cable and cable gland	824L-35665 (cable) CF-Pg9 (cable gland)
DSF 1610.00 SHV (2m)	Cable	824L-35053
DSF 1610.00 SHV (5m)	Cable	824L-35053
DSF 1610.00 S1HV (5m)	Cable	824L-35053
DSF 1610.00 STV (5m)	Cable	824L-35665
DSF 1810.00 MTV (5m)	Cable with protective conduit	824L-35665 (cable) 825G-30924 (conduit)
DSF 1810.00 SHV (2m)	Cable	824L-35053
DSF 1810.00 SHV (5m)	Cable	824L-35053
DSF 1810.00 SHV S162	Cable	824L-35053
DSF 1810.00 STV (5m)	Cable	824L-35665
DSF 1810.02 PTV (0,4m)	Cable with integrated connector	824L-35053 (cable) 820A-36859 (connector)
DSF 1810.03 PHV S12 (0,6m)	Cable with integrated connector	824L-35053 (cable) 820E-37235 (connector)

Connection type (continued)

Sensor type	Connection type	Jaquet part number
DSF 2210.00 MTV (5m)	Cable with protective conduit	824L-35665 (cable) 825G-30924 (conduit)
DSF 2210.00 SHV (2m)	Cable	824L-35053
DSF 2210.00 SHV (5m)	Cable	824L-35053
DSF 2210.00 STV (5m)	Cable	824L-35665
DSF 2210.00 STV (6m)	Cable	824L-35665
DSF 2210.87 MHV (5m)	Cable with protective conduit	824L-35053 (cable) 825G-36356 (conduit)
DSF 2210.87 MHV S22 (5m)	Cable with protective conduit	824L-32832 (cable) 825G-36356 (conduit)
DSF 2210.87 PHV	Cable with integrated connector	824L-36622 (cable) 820E-35207 (connector)
DSF 2210.87 STV (5m)	Cable	824L-31081
DSF 2210.87 STV S166 (10m)	Cable	824L-31081
DSF CD10.00 SHV (2m)	Cable	824L-35053
DSF EH10.00 STV (5m)	Cable	824L-35665
DSF EH10.08 P1HV	Cable with integrated connector	824L-32832 (cable) 820P-36963 (connector)
DSF EH10.08 SHV (5m)	Cable	824L-35053
DSF EH10.11 SHV (2m)	Cable	824L-36222
DSF EH10.15 SHV (5m)	Cable	824L-35053
DSF EH10.16 SHV	Cable	824L-35053

Cables

Jaquet cable type	Properties
824L-31081	PE/PVC cable, 3-wire, 0.75 mm^2, outer- Ø max. 7.3 mm, bending radius min. 110 mm, screened (metal net), gray Operating temperature: -30°C to +70°C
824L-32832	FEP cable, 3-wire, 0.75 mm² (AWG 19), outer-Ø max. 5.9 mm, bending radius min. 85 mm, screened (metal net), black Operating temperature: -90°C to +200°C
824L-33024	PTFE cable, 3-wire, 0.6 mm² (AWG 20), outer-Ø max. 4.7 mm, bending radius min. 70 mm, screened (metal net), white Operating temperature: -90°C to +260°C
824L-35053	FEP cable, 4-wire (brown wire is not connected), 0.2 mm² (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-35665	PVC cable, 3-wire, 0.23 mm² (AWG 24), outer-Ø max. 4.2 mm, bending radius min. 60 mm, screened (metal net), grey Operating temperature: -20°C to +80°C
824L-36222	FEP cable, 4-wire (white wire is not connected), 0.6 mm² (AWG 20), outer-Ø max. 4.7 mm, bending radius min. 24 mm, screened(metal net), white Operating temperature: -60°C to +150 °C
824L-36622	Silicone cable, 6-wire, 0.6mm^2, outer- Ø max. 13.0 mm, bending radius min. 30 mm, screened (metal net), black Operating temperature: -40°C to +150°C

Connectors

	Jaquet connector code	Manufacturer code
	820A-36859	Escha WASS4 Plug-and-socket connection: IP67 Operating temperature: -30°C to +90°C
	820E-35207	GB60-18-11 Sn-EAA, 5-pole
	820E-37235	ITT Cannon CA06COM-PG-14S-2P-B-01-F0
	820P-36527	AMP 282105-1 Plug-and-socket connection: IP67 Operating temperature: -40°C to +125°C
	820P-36963	Deutsch DT06-3S-EP06 Plug-and-socket connection: IP67 Operating temperature: -40°C to +125°C

Protective conduit

Jaquet code	Properties
825G-30924	Cold strip DC 03 acc. to EN 10139, galvanized, Fe/Zn3, sheating: PVC Weatherproof, watertight, highly resistant to seawater, acids and oils, free of silicone and cadmium, very flexible, stretch resistant, crush resistant, dark grey Operating temperature: -25°C to +80°C
825G-36148	Cold strip DC 03 acc. to EN 10139, galvanized, Fe/Zn3, sheating: Polyurethan (PU) Absolutely oil- benzine- and grease resistant, widely resistant to solvents and acids, free of halogen, silicone and cadmium, high tenacity and abrasion resistance, very flexible, microbic resistant, flame resistant, metallic blue Operating temperature: -40°C to +100°C
825G-36356	Cold strip DC03 acc. to EN 10139 galvanized Highly flexible, stretch resistant, lateral crush resistant, outer-Ø 14.0 mm, bending radius min. 34 mm Operating temperature: -60°C to +220°C

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