



DSD xx10.xx MxV/SxV

DIFFERENTIAL HALL EFFECT SPEED SENSOR

Product ID

Type #	Product #	Drawing #
DSD 1210.01 STV (5 m)	374Z-03712	110428d-1
DSD 1210.01 STV (... m)	374Z-04134	110428d-1
DSD 1210.01 SHV (2 m)	374Z-03761	110428d-1
DSD 1210.01 SHV (5 m)	374Z-03762	110428d-1
DSD 1210.01 SHV (... m)	374Z-04135	110428d-1
DSD 1210.01 MTV	374Z-04136	111478d-1
DSD 1410.01 STV	374Z-04137	111496d-1
DSD 1410.01 STV (5m)	374Z-04182	111496d-1
DSD 1410.01 SHV	374Z-04138	111496d-1
DSD 1410.01 S1HV (20m)	3742610821	123565
DSD 1610.01 STV	374Z-04140	111498d-1
DSD 1610.01 STV (5m)	374Z-04185	111498d-1
DSD 1610.01 SHV	374Z-04141	111498d-1
DSD 1610.01 SHV (5 m)	374Z-04187	111498d-1
DSD 1810.01 SHV (2 m)	374Z-03991	110687d-1
DSD 1810.01 SHV (5 m)	374Z-04189	110687d-1
DSD 1810.01 SHV (... m)	374Z-04144	110687d-1
DSD 1810.01 STV	374Z-04143	110687d-1
DSD 1810.01 STV (5 m)	374Z-04188	110687d-1
DSD 2210.01 STV	374Z-04119	110777d-1A
DSD 2210.01 STV (5 m)	374Z-03750	110777d-1A
DSD 2210.01 SHV (2 m)	374Z-03782	110777d-1
DSD 2210.01 SHV (5 m)	374Z-04190	110777d-1
DSD 2210.01 SHV (... m)	374Z-04118	110777d-1
DSD 2210.01 MTV	374Z-04146	111482d-1
DSD 2210.09 STV	374Z-04120	110777d-1

General

Function The sensors DSD xx10.xx MxV/SxV are suitable, in conjunction with a pole wheel, for generating square wave signals proportional to rotary speeds. They have a static behavior, so that pulse generation is guaranteed down to a speed corresponding to a frequency of 0 Hz. The monitoring elements consist of a magnetically biased differential hall effect semiconductor. The differential structure requires that the sensor must be oriented, i.e. the sensor's behavior is not rotationally symmetric.

Technical data

Supply voltage 8 VDC to 30 VDC, protected against transient over voltages

Current consumption Max. 18 mA (without load)

Signal output

- Square wave signal
 - Push-pull outputs: $I_{max} = \pm 20 \text{ mA}$
 - with pull-up resistor (for $I = I_{max}$): $U_{low} < 2.5 \text{ V}$, $U_{high} > 0.95 * U_{supply}$
 - with pull-down resistor (for $I = I_{max}$): $U_{low} < 0.1 \text{ V}$, $U_{high} > U_{supply} - 4.0 \text{ V}$
 - The output is short circuit proof and protected against reverse polarity.

Frequency range 0 Hz ... 20 kHz

Electromagnetic compatibility (EMC): With cable shield connected to the supply negative pole. Noise generator between housing and electronics
 Surges according to IEC 61000-4-5

- ♦ 1.5 kV/50 μs /max.5Hz (Source resistance 500 Ohm)

 Electrical fast transients/bursts according to IEC 61000-4-4 coupled to sensor cable with a capacitive coupling clamp

- ♦ 2.0 kV/HF-Bursts (Level 4 in accordance with IEC 801-4) Oscillatory waves immunity test according to IEC 61000-4-12
- ♦ 2.5 kV/1 MHz damped resonance (Class III in accordance with IEC 255-4)

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.

Tightening moment max.:

12 Nm for M12x1	25 Nm for M14x1	35 Nm for M16x1
50 Nm for M18x1	75 Nm for M22x1	

Cable and operating Temperature

Sensor	Cable [Jaquet part no.]	Cable length [mn]	Operating temperature sensor head [°C]
DSD 1210.01 STV (5 m)	824L-35665	5000	-25...+85
DSD 1210.01 STV (... m)	824L-35665	-	-25...+85
DSD 1210.01 SHV (2 m)	824L-35053	2000	-40...+125
DSD 1210.01 SHV (5 m)	824L-35053	5000	-40...+125
DSD 1210.01 SHV (... m)	824L-35053	-	-40...+125
DSD 1210.01 MTV	825G-36148	5000	-25...+85
DSD 1410.01 STV	824L-35665	-	-25...+85
DSD 1410.01 STV (5m)	824L-35665	5000	-25...+85
DSD 1410.01 SHV	824L-35053	-	-40...+125
DSD 1410.01 S1HV (20m)	8242610868	20000	-40...+125
DSD 1610.01 STV	824L-35665	-	-25...+85
DSD 1610.01 STV (5m)	824L-35665	5000	-25...+85
DSD 1610.01 SHV	824L-35053	-	-40...+125
DSD 1610.01 SHV (5m)	824L-35053	5000	-40...+125
DSD 1810.01 SHV (2 m)	824L-35053	2000	-40...+125
DSD 1810.01 SHV (5 m)	824L-35053	5000	-40...+125
DSD 1810.01 SHV (... m)	824L-35053	-	-40...+125
DSD 1810.01 STV	824L-35665	-	-25...+85
DSD 1810.01 STV	824L-35665	5000	-25...+85
DSD 2210.01 STV	824L-31081	-	-25...+85
DSD 2210.01 STV (5 m)	824L-31081	5000	-25...+85
DSD 2210.01 SHV (2 m)	824L-35053	2000	-40...+125
DSD 2210.01 SHV (5 m)	824L-35053	5000	-40...+125
DSD 2210.01 SHV (... m)	824L-35053	-	-40...+125
DSD 2210.01 MTV	825G-30924	5000	-25...+85
DSD 2210.09 STV	824L-35665	-	-25...+85

Cable type:

824L-31081:

PVC cable, 3-wire, 0.75 mm², outer-Ø max. 7.3 mm, bending radius min. 110 mm, screened (metal net), grey

Operating temperature: -30°C to +70°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

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

8242610868:

Screened cable: 4 wire, 0.5mm² (~AWG 21) Robo cables C1 SH Lapp Muller 60516
 halogen free, outer-Ø max. 7.2 mm, bending radius min. 68 mm,
 screened (tinned copper), grey casing
 Operating temperature: -15°C to +80°C

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"> ◆ Involute gear ◆ Tooth width > 10 mm ◆ Side offset < 0.2 mm ◆ Eccentricity < 0.2 mm Sensor is optimized to operate with involute gears of module 1 and larger.
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Air gap between sensor and pole wheel	Air gap between pole wheel and sensor housing: <ul style="list-style-type: none"> ◆ Module 1: 0.1...0.5 mm ◆ Module 2: 0.1...1.3 mm ◆ Module 4 and larger: 0.1...1.5 mm
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Insulation	Housing and electronics galvanically separated (500 V/50 Hz/ 1 min)
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Protection class	IP68 (head) and IP67 (cable outlet)
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Vibration immunity	5 g in the range of 5 ... 2000 Hz
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Shock immunity	50 g for 20 ms, half sine wave
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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.

MTTF [hours]	Failure rate [FIT]
2'555'000	391.4

Further Information

Safety	All mechanical installations must be carried out by an expert. General safety requirements have to 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 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. The amplitude of the output signal is not influenced by the air gap. 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
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.

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