

Dual Channel Hall Effect Speed Sensor

DSD 1620.71 PxHW



Product ID

Type #	Product #	Drawing #
DSD 1620.71 P1HW	3742611048	123877
DSD 1620.71 P2HW	3742611329	124183
DSD 1620.71 P3HW	3742611346	124201
DSD 1620.71 P5HW - F535G	3742612167	125213
DSD 1620.71 P6HW	3742612312	125360
DSD 1620.71 P7HW - F150S	3742612887	126422
DSD 1620.71 P9HW - F64G	3742612986	126670
DSD 1620.71 P10HW	3742613133	127074
DSD 1620.71 P11HW	3742613127	127060
DSD 1620.71 P12HW	3742614357	129260
DSD 1620.71 P14HW-F128G	20001716-00	131401
DSD 1620.71 P15HW-F180F	20002384-00	131755
DSD 1620.71 P16HW-F300G	20003530-00	132539
DSD 1620.71 P17HW-F450F	20003911-00	132737
DSD 1620.71 P19HW-F120F	20006850-00	133767
DSD 1620.71 P20HW-F120F	20008232-00	20008232-00
DSD 1620.71 P23HW-F195F	20010742-00	20010742-00
DSD 1620.71 P25HW-F130G	20011569-00	20011569-00
DSD 1620.71 P26HW-F73G	20011905-00	20011905-00
DSD 1620.71 P27HW	20015866-00	20015866-00
DSD 1620.71 P29HW-F96F	20018711-00	20018711-00
DSD 1620.71 P30HW-F227G	20019630-00	20019630-00
DSD 1620.71 P33HW-F73G	20022556-00	20022556-00

General

Function

The speed sensors DSD 1620.71 PxHW are suitable, in conjunction with a pole wheel, for generating two phase-shifted 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 monitoring elements consist of two magnetically biased differential Hall effect semiconductors. The internal dual channel structure requires that the sensor must be oriented. The sensor has a flange for proper installation.

Technical data

Supply voltage	9 VDC to 30 VDC, protected against transient overvoltages and reverse polarity
Nominal supply voltage	15 V
Current consumption	Max. 20 mA (without load)
Signal output	2 phase shifted square wave signals, minimum edge shift with an involute gear wheel: minimal phase shift of 20° for gear of module 2 between output 1 (S1) and output 2 (S2) - Push-pull outputs: $I_{max} = \pm 30$ mA - Output voltage HI (for $I = I_{max}$): $U_{HI} > U_{supply} - 1.5$ V - Output voltage LO (for $I = I_{max}$): $U_{LO} < 1.5$ V - The output stages are current limiting and short-circuit proof due to a temperature shutdown mechanism: - Thermal shutdown threshold: 145 ... 175°C - Thermal re-start threshold: 135 ... 165°C - Hysteresis: 5 ... 20°C
Frequency range	0 Hz ... 20 kHz

Electromagnetic compatibility (EMC)	Electrostatic discharge according to IEC 61000-4-2 • Up to ± 8 kV air discharge • Up to ± 6 kV contact discharge Radiated electromagnetic field according to IEC 61000-4-3 • Up to 30 V/m, 80% AM, 1 kHz in the range of 80 MHz ... 1000 MHz • Up to 10 V/m, 80% AM, 1 kHz in the range of 1400 MHz ... 2500 MHz Electrical fast transients/bursts according to IEC 61000-4-4 direct coupling • Up to ± 2 kV peak, 5/50 ns, 5 kHz Surges according to IEC 61000-4-5 • ± 2 kV 1.2/50 μs (common mode) • ± 1 kV 1.2/50 μs (differential mode) Radio frequency injected current according to IEC 61000-4-6 • Up to 10 V, 80% AM, 1 kHz, 1000 ms in the range of 0.15 MHz ... 80 MHz with 50 Ω load and 560 Ω pull up resistance Power frequency magnetic field according to IEC 61000-4-8 • 300 A/m (1 min) tested with 16 2/3 Hz, 50 Hz in each axis • 1000 A/m (3 s) tested with 16 2/3 Hz, 50 Hz, 60 Hz in each axis Radiated emission (at 3 m) according to EN 55011 • 30 MHz ... 230 MHz: 50 dB μV/m • 230 MHz ... 1 GHz: 57 dB μV/m
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.

Cable

Sensor	Cable [Jaquet part no.]	Cable length [mm]
DSD 1620.71 P1HW	824L-36808	810
DSD 1620.71 P2HW	824L-36808	640
DSD 1620.71 P3HW	824L-36622	1000
DSD 1620.71 P5HW - F535G	824L-36808	535
DSD 1620.71 P6HW	824L-36622	2010
DSD 1620.71 P7HW - F150S	824L-36808	1500
DSD 1620.71 P9HW - F64G	824L-36808	640
DSD 1620.71 P10HW	824L-36622	640
DSD 1620.71 P11HW	824L-36808	4877
DSD 1620.71 P12HW	824L-36622	565
DSD 1620.71 P14HW-F128G	824L-36808	1280
DSD 1620.71 P15HW-F180F	824L-36622	1800
DSD 1620.71 P16HW-F300G	824L-36622	3000
DSD 1620.71 P17HW-F450F	824L-36808	4500
DSD 1620.71 P19HW-F120F	824L-36622	1200
DSD 1620.71 P20HW-F120F	824L-36622	1180
DSD 1620.71 P23HW-F195F	824L-36808	1850
DSD 1620.71 P25HW-F130F	824L-36808	1245
DSD 1620.71 P26HW-F73G	824L-36622	733
DSD 1620.71 P27HW	824L-36622	1950
DSD 1620.71 P29HW-F96F	824L-36622	960
DSD 1620.71 P30HW-F227G	824L-36622	2270
DSD 1620.71 P33HW-F73G	824L-36622	733

Cable type:

Jaquet cable type	Properties
824L-36808	Armoured cable: 8-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
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

Sensor	Connector
DSD 1620.71 P1HW	Veam VBN8AM20-7PNT39-VO-M20F AW20, bayonet lock, 8-pole, pin contacts
DSD 1620.71 P2HW	Litton Veam FRCIR 06AG-20-7PW-F80-T39-V0 bayonet lock, 8-pole, insert orientation W, fixed at the end of the cable, male contacts
DSD 1620.71 P3HW	Litton Veam FRCIR 06AG-20-7PW-F80-T39-V0 bayonet lock, 8-pole, insert orientation W, fixed at the end of the cable, male contacts
DSD 1620.71 P5HW - F535G	ITT Cannon 8 - pole bayonet lock, straight FRCIR06AG20-7S-F80T39-12-V0 Gr.20, 1"3/16 - 18UNEF
DSD 1620.71 P6HW	ITT Cannon 8 - pole bayonet lock, straight FRCIR06AG20-7S-F80T39-12-V0 Gr.20, 1"3/16 - 18UNEF
DSD 1620.71 P7HW - F150S	Harting connector Han 3HPR-gg-SV-M20 Han 8D-M Han D contact
DSD 1620.71 P9HW - F64G	Gimota GR062XH20-7PW-EAC-M4B Operating temperature: -55°C to +125°C Plug-and-socket connection: IP69K
DSD 1620.71 P10HW	Litton Veam FRCIR 06AG-20-7PW-F80-T39-V0 bayonet lock, 8-pole, insert orientation W, fixed at the end of the cable, male contacts
DSD 1620.71 P11HW	VEAM Connector FRCIR 06AG-16S-8P-F80-T108-V0 with contacts 27911-13-T12 (5x)
DSD 1620.71 P12HW	Harting connector Han 3HPR-gg-SV-M20 connector Han Q 7/0-M Han D contact
DSD 1620.71 P14HW-F128G	Gimota GR081SG20-7SN-EAB Operating temperature: -55°C to +90°C 8 - pole bayonet lock
DSD 1620.71 P15HW-F180F	ITT Cannon FRCIR06R20-7PW-F80T39-VO-M25-15F-ZM Operating temperature: -40°C to +125°C
DSD 1620.71 P16HW-F300G	ITT Veam FRCIR06R20-7S-F80T39-VO-M20-1.5F Operating temperature: -40°C to +125°C
DSD 1620.71 P17HW-F450F	ITT Cannon FRCIR06R20-7PW-F80T39-VO-M25-15F-ZM Operating temperature: -40°C to +125°C
DSD 1620.71 P19HW-F120F	Harting connector Han 3HPR-gg-SV-M20 connector Han Q 7/0-M Han D contact
DSD 1620.71 P20HW-F120F	Harting connector Han 3HPR-THE-SL-M25 Han 3 Quintax-F-c Han 4 Quintax R 15-BU-C-0.5 QMM contact Operating temperature: -40°C to +70°C

OPERATING INSTRUCTIONS

DSD 1620.71 P23HW-F195F	ITT Cannon FRCIR06R20-7PW-F80T39-VO-M25-15F-ZM Operating temperature: -40°C to +125°C
DSD 1620.71 P25 HW-F130G	ITT Cannon (bayonet lock) FRCIR08AG20-7P-F80T108-G-12 Operating temperature: -55°C to +125°C
DSD 1620.71 P26HW-F73G	Harting HAN 3HPR-gg-SV-M25/schwarz HAN 3 Quintax-M-c, HAN 4 Quintax sti, 4-pole Operating temperature: -40°C to +125°
DSD 1620.71 P27HW	Litton Veam FRCIR 06AG-20-7PW-F80-T39-V0 bayonet lock, 8-pole, insert orientation W, fixed at the end of the cable, male contacts
DSD 1620.71 P29HW-F96F	Harting HAN 3HPR-gg-SV-M25/schwarz HAN 3 Quintax-M-c, HAN 4 Quintax sti, 4-pole Operating temperature: -40°C to +125°C
DSD 1620.71 P30HW-F227G	Harting connector Han 3HPR-gg-SV-M20 connector Han Q 7/0-M Han D contact
DSD 1620.71 P33HW-F73G	Harting connector Han A Hood with side entry HC M25, Han modular frame, HAN DD module male, Han-modular guiding pin. Operating temperature: -40°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 < 1.0 mm • Eccentricity < 0.2 mm • Sensor is optimized to operate with an involute gear of module 2	
Air gap between sensor housing and pole wheel	Module 1	0.5 ... 0.7
	Module 1.5	0.5 ... 1.3
	Module ≥ 2	0.5 ... 1.5
Insulation	• Insulation between electronics and housing: 700 VDC, $> 100 \text{ M}\Omega$ • Insulation between shield and housing: 700 VDC, $> 100 \text{ M}\Omega$	
Protection class	IP68 (head) and IP67 (connector)	
Vibration immunity	IEC 61373, Cat. 3, with 300 m/s^2 for all axes, for 8 h	
Shock immunity	IEC 61373, Cat. 3	
Operating temperature	• Sensor head: -40° ... +125°C • Cable: according to cable specification (see above)	

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 the 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 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.

OPERATING INSTRUCTIONS

Installation	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 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 4mm from either edge of the pole wheel under all operating conditions. A solid and vibration free mounting of the sensor is important. Sensor vibration relative to the pole wheel may add spurious noise to the signal. The sensors are insensitive to oil, grease etc. and can be installed in arduous conditions.
Operation	The sensor is designed for normal use in its dedicated environment. The manufacturer cannot take responsibility for any abnormal use that might lead to a reduced lifetime of the sensor.
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.