Dual Channel Hall Effect Speed Sensor

DSD 1820.19 QxHW
DSD 1830.19 QxHW
DSD 1860.19 QxHW

Product ID

Type #	Product #	Drawing #
DSD 1820.19 Q2HW	3742608397	120027
DSD 1820.19 Q3HW	3742608399	120030
DSD 1820.19 Q4HW	3742608954	120892
DSD 1820.19 Q6HW	3742609910	122202
DSD 1820.19 Q7HW	3742611404	124296
DSD 1820.19 Q8HW	3742611406	124299
DSD 1820.19 Q9HW	3742611627	124547
DSD 1820.19 Q14HW	20001209-00	130909
DSD 1830.19 Q2HW	374Z-05679	114820 / 114820A
DSD 1830.19 Q3HW	3742606631	117160
DSD 1830.19 Q4HW	374Z-05324	113599
DSD 1830.19 Q5HW	3742606791	117353
DSD 1830.19 Q7HW	3742608037	119586
DSD 1830.19 Q10HW	3742612351	125440
DSD 1830.19 Q11HW	3742613959	128593
DSD 1830.19 Q14HW	20010705-00	20010705-00
DSD 1860.19 QHW	3742609526	121718
DSD 1860.19 Q2HW	3742610671	123153
DSD 1860.19 Q3HW	3742611232	124095
DSD 1860.19 Q4HW	3742611463	124334
DSD 1860.19 Q9HW	3742612713	126073

General

Function

The speed sensors DSD 18x0.19 QxHW 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 differential Hall effect semiconductor. The differential structure requires that the sensor must be oriented. The sensors have a flange for proper installation.

Technical data

Supply voltage	9 VDC to 30 VDC, protected against transient overvoltages
Current consumption	Max. 35 mA (without load)
Signal output	• 2 phase shifted square wave signals, minimum edge shift with an involute gear wheel: minimal phase shift of 20° between output 1 (S1) and output 2 (S2) for the following gears: ○ DSD 1820.19 QxHW: module 2 ○ DSD 1830.19 QxHW: module 3 ○ DSD 1860.19 QxHW: module about 6 (customer specific) • 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 Hz ... 20 kHz

Electromagnetic compatibility (EMC):	Electrostatic discharge according to IEC 61000-4-2 • Up to ± 15 kV air discharge • Up to ± 8 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 ... 2700 MHz Electrical fast transients/bursts according to IEC 61000-4-4 coupled to sensor cable with a capacitive coupling clamp • Up to ± 2 kV peak Surges according to IEC 61000-4-5 • ±2 kV on DC power ports (asymm.) 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 Ohm load and 560 Ohm 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 (10s) tested with 16 2/3 Hz, 50 Hz, 60 Hz in each axis
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

Type #	Cable [Jaquet part no.]	Sensor Cable length [mm]
DSD 1820.19 Q2HW	824L-36622	1590
DSD 1820.19 Q3HW	824L-36622	1900
DSD 1820.19 Q4HW	824L-36622	1590
DSD 1820.19 Q6HW	8242611115	3000
DSD 1820.19 Q7HW	824L-36622	1500
DSD 1820.19 Q8HW	824L-36622	2300
DSD 1820.19 Q9HW	824L-36622	3000
DSD 1820.19 Q14HW	824L-36622	2100
DSD 1830.19 Q2HW	824L-36622	1590
DSD 1830.19 Q3HW	824L-36622	4150
DSD 1830.19 Q4HW	8242609761	1000
DSD 1830.19 Q5HW	824L-36622	1590
DSD 1830.19 Q7HW	8242609761	2000
DSD 1830.19 Q10HW	8242609761	465
DSD 1830.19 Q11HW	8242609761	4000
DSD 1830.19 Q14HW	8242609761	465
DSD 1860.19 QHW	8242609761	1935
DSD 1860.19 Q2HW	8242609761	2300
DSD 1860.19 Q3HW	8242609761	3000
DSD 1860.19 Q4HW	8242609761	420
DSD 1860.19 Q9HW	8242609761	330

Jaquet cable type	Properties
824L-36622	Armoured cable: 6-wire, 0.6 mm² (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
8242609761	Screened cable: 6 wire, 0.75mm² (~AWG 18) SAB Bröckskes SABIX A285 FRNC X halogen free, outer-Ø max. 8.1 mm, bending radius min. 81 mm, screened (metal net), black casing Operating temperature: -40°C to +125°C (static)
8242611115	SIHCSI-Cu vz 4x1.0mm² /Silikon, HEW Operating temperature: -40°C to +125°C

Connector

Type #	Connector [Jaquet part no.]
DSD 1820.19 Q2HW	820E-36541
DSD 1820.19 Q3HW	820E-36541
DSD 1820.19 Q4HW	820E-36541
DSD 1820.19 Q7HW	820E-36541
DSD 1820.19 Q8HW	820E-36541
DSD 1820.19 Q9HW	820E-36541
DSD 1820.19 Q14HW	820E-36541
DSD 1830.19 Q2HW	820E-36541
DSD 1830.19 Q3HW	820E-36541
DSD 1830.19 Q4HW	8202608040
DSD 1830.19 Q5HW	820E-36541
DSD 1830.19 Q7HW	8202608040
DSD 1830.19 Q10HW	8202612355
DSD 1830.19 Q11HW	8202608040
DSD 1830.19 Q14HW	20010706-00
DSD 1860.19 QHW	8202608040
DSD 1860.19 Q2HW	8202608040
DSD 1860.19 Q3HW	8202608040
DSD 1860.19 Q4HW	8202611465
DSD 1860.19 Q9HW	8202608040

Jaquet connector type	Manufacturer code
820E-36541	AB connector: ABCIRHSE06T18-12PCWF80V0 Pins: ABB 1620 KPKF 80P3 Adaptor type : ABB H1812 ACAF 80M32
8202608040	Souriau FER1 D 1819 PN (bayonet lock) Operating temperature: -40°C to +100°C
8202611465	Souriau FER1 D 1819 PX (bayonet lock) Operating temperature: -40°C to +100°C
8202612355	8202612355: Souriau Housing Receptacle FER1B1819PN Operating temperature: -40°C to +100°C 8202612376: Backshell VGE1PS180007 8202612377: Grommet VGE1M181900 8202612358: Grommet Filter Plug 8500-479 8202608224: Contacts RM16M23K (10x)
20010706-00	8202612355: Souriau Housing Receptacle VER1B1819PN Operating temperature: -40°C to +100°C 8202612376: Backshell VGE1PS180007 8202612377: Grommet VGE1M181900 8202612358: Grommet Filter Plug 8500-479 8202608224: Contacts RM16M23K (10x)

Protective conduit

Type #	Conduit [Jaquet part no.]
DSD 1820.19 Q2HW	825G-36341
DSD 1820.19 Q3HW	825G-36341
DSD 1820.19 Q4HW	825G-36341
DSD 1820.19 Q6HW	8252607364
DSD 1820.19 Q7HW	825G-36341
DSD 1820.19 Q8HW	825G-36341
DSD 1820.19 Q9HW	825G-36341
DSD 1820.19 Q14HW	825G-36341
DSD 1830.19 Q2HW	825G-36341
DSD 1830.19 Q3HW	825G-36341
DSD 1830.19 Q4HW	8252607364
DSD 1830.19 Q5HW	825G-36341
DSD 1830.19 Q7HW	8252607364
DSD 1830.19 Q10HW	8252607364
DSD 1830.19 Q11HW	8252607364
DSD 1830.19 Q14HW	8252607364
DSD 1860.19 QHW	8252607364
DSD 1860.19 Q2HW	8252607364
DSD 1860.19 Q3HW	8252607364
DSD 1860.19 Q4HW	8252607364
DSD 1860.19 Q9HW	8252607364

Jaquet conduit type	Properties
825G-36341	PCSG-17B, material: polyamide, high resistance to ultra violet rays and atmospheric corrosion, excellent flexibility, self-extinguishing, free from halogens and cadmium, bending radius min. 35 mm (static) and 85 mm (dynamic), black. Operating temperature (acc. to IEC EN 61386): -45°C to +120°C
8252607364	PCST-12B (manufacturer PMA), material: specially formulated polyamide, very good flexibility, good mechanical strength at low temperatures and dry conditions. self-extinguishing, free from halogens and cadmium, outer-Ø 15.8 mm, bending radius min. 25 mm (static) and 70 mm (dynamic), black. Operating temperature: -50°C to +95°C continuous, +150°C short-term

Adapter for protective conduit

Type #	Sensor end [Jaquet part no.]	Connector end [Jaquet part no.]
DSD 1820.19 Q2HW	825G-37393	8252608441
DSD 1820.19 Q3HW	825G-37393	8252608441
DSD 1820.19 Q4HW	825G-37393	8252608441
DSD 1820.19 Q6HW	8252609915	---
DSD 1820.19 Q7HW	825G-37393	8252608441
DSD 1820.19 Q8HW	825G-37393	8252608441
DSD 1820.19 Q9HW	825G-37393	8252608441
DSD 1820.19 Q14HW	825G-37393	8252608441
DSD 1830.19 Q2HW	825G-37229	825G-37229
DSD 1830.19 Q3HW	825G-37393	825G-37229
DSD 1830.19 Q4HW	---	---
DSD 1830.19 Q5HW	825G-37393	825G-37393
DSD 1830.19 Q7HW	8252607362	8252608793
DSD 1830.19 Q10HW	8252607362	8252612357
DSD 1830.19 Q11HW	8252607362	8252608793
DSD 1830.19 Q14HW	8252607362	8252612357
DSD 1860.19 QHW	8252607362	8252608793
DSD 1860.19 Q2HW	8252607362	8252608793
DSD 1860.19 Q3HW	8252607362	8252608793
DSD 1860.19 Q4HW	8252607362	8252608793
DSD 1860.19 Q9HW	8252607362	8252608793

Jaquet type	Properties
825G-37393	BVIR-M207 M20x1.5 (PMA) Operating temperature: -40°C to +105°C continuous, +160°C short-term
825G-37229	RKS-17 (PMA) Operating temperature: -40°C to +105°C continuous, +160°C short-term
8252608441	BVIVG-U247 UNEF 1“-20 (PMA) Operating temperature: -40°C to +105°C continuous, +160°C short-term
8252607362	BVIR-M202 M16x1.5 (PMA) Operating temperature: -40°C to +105°C continuous, +160°C short-term
8252608793	BVIVG-U242 (PMA) Operating temperature: -40°C to +105°C continuous, +160°C short-term
8252609915	NVEZ-M202V/P3 Operating temperature: -40°C to +105°C continuous, +160°C short-term
8252612357	NVNV-M202GT-10 (PMA) Operating temperature: -40°C to +105°C continuous, +160°C short-term

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
- Sensor is optimized to operate with an involute gear of module 3.

Air gap between sensor and pole wheel

Air gap between pole wheel (involute gear) and sensor housing:
Module 2 : 0.5 ... 1.5 mm
Module ≥3 : 0.5 ... 1.5 mm

Insulation

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

Protection class

IP68 (head) and IP67 (connector)

Temperature	Operating temperature of sensor head: -40° ... +125°C Different temperature rating for cable, protective conduit, adapter for protective conduit and special adapter parts (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.
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 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. 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. A solid and vibration free mounting of the sensor is important. Sensor vibration relative to the pole wheel may add extranious and/or spurious noise to the signal. The sensors are insensitive to oil, grease etc. and can be installed in arduous conditions.
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.