

## Variable Reluctance Speed Sensor DSE EH20.06 SxHZ Ex-atex



### Product ID

Type #	Product #	Drawing #
DSE EH20.06 SHZ Ex-atex	304Z-04964	112633
DSE EH20.06 S1HZ Ex-atex	304Z-05350	113682A

### General

#### Function

The DSE EH20.06 SxHZ Ex-atex series variable reluctance (VR) speed sensors are used to convert rotational and linear movement into electronic signals and consist of an iron core, an inductive coil, and a permanent magnet. A ferrous pole wheel passing the sensor face changes the magnetic field strength, resulting in an AC voltage being induced in the coil. The frequency of the output signal is more or less proportional to the speed of the moving target. The amplitude of the signal depends on speed, air gap, geometry of target, magnetic properties of target material, and the electrical load. VR sensors, also known as passive or electromagnetic sensors, do not require an external supply.

#### Usage in an explosion risk environment

Sensors of type DSE EH20.06 SxHZ Ex atex are certified for locations with Ex-atex-Zone 2 (Group II) and marked with:

**JAUQUET AG**  
**DSE EH20.06 SxHZ Ex-atex**  
**Ⓔ II 3 G Ex nA II T4/T3**  
**-40 ≤ Ta ≤ +100°C/+125°C**  
**JAUQUET T10-085X**

The additional "X" on the test report indicates that the equipment is subject to special conditions for safe use specified in the following passage.

It has to be guaranteed that the sensor housing is grounded (equipotential bonding) and cannot be statically charged at any time. The sensor must be connected to a conduit system which guarantees at least IP54.

Note the terms of the "Declaration of Conformity".

The sensor has to be installed such that the maximum signal peak-to-peak voltage is always below 80V.

As stated in the marking the maximum ambient temperature is +100°C for the temperature class T4 and +125°C for the temperature class T3.

The sensors are certified in consideration of the following norms:

EN 60079-0, EN 60079-15, IEC 60529

The results of the safety-related examination are recorded in the internal, confidential test report T10-085X.

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<a href="http://www.jaquet.com">www.jaquet.com</a>	<a href="mailto:info@jaquet.com">info@jaquet.com</a>	Tel.: +41 61 306 88 22		Page 1/4

**Technical data**

Coil properties	Inductance @ 1 kHz: 30 mH ± 10% Resistance @ 25°C: 85 Ohm ± 15% Magnet polarity: north pole towards front face Pole piece: diameter 5 mm				
Polarity	According to drawing.				
Signal output	Using a sensor together with a toothed wheel having an involute gear form will generate a sinusoidal signal. Analysing the frequency will determine the rotational speed. For low frequencies the signal amplitude is proportional to the rate of change of magnetic flux generated by the pole wheel. In principle, it depends on the following parameters: Circumferential velocity of the toothed wheel Module of the toothed wheel Air gap between toothed wheel and sensor's front surface Load impedance applied to the sensor (recommended is 10 kOhm) The signal output peak-to-peak voltage has to be lower than 80V at any time.				
Frequency range	Up to 20 kHz, lower limit depending on application				
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. Maximum allowed fixing torque:35Nm				
Cable	<table border="1"> <thead> <tr> <th>Jaquet cable type</th> <th>Properties</th> </tr> </thead> <tbody> <tr> <td>824L-31841</td> <td>FEP Teflon cable, 2-wire, 0.75 mm<sup>2</sup> (AWG 19), outer-Ø max. 5.1 mm, bending radius min. 80 mm, screened (metal net), black Operating temperature: -90°C to +200°C</td> </tr> </tbody> </table> <p>Cable length: SHZ: 72" / 1.83m S1HZ: 197" / 5.0m</p>	Jaquet cable type	Properties	824L-31841	FEP Teflon cable, 2-wire, 0.75 mm <sup>2</sup> (AWG 19), outer-Ø max. 5.1 mm, bending radius min. 80 mm, screened (metal net), black Operating temperature: -90°C to +200°C
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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	Depending on lowest circumferential speed which has to be detected and on trigger level.				
Insulation	Housing and electronics galvanically separated (500 V/50 Hz/ 1 min)				
Protection class	IP68 (head) and IP54 (cable entry with conduit)				
Temperature	Consider the Ex-marking on the sensors: -40 ≤ Ta ≤ +100°C/+125°C, temperature class T4/T3				

**Further Information**

EX-Safety	All mechanical installations must be carried out by an expert. General safety requirements have to be met. For ex safety relevant issues the applicable standards have to be met in addition to the requirements of this operating instruction.
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"> <li>The sensor wires must be positioned as far as possible from large electrical machines.</li> <li>They must not run in the vicinity of power cables.</li> <li>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.</li> </ul> <p>The maximum permissible cable length is a function of the sensor voltage, cable routing, the capacitance and inductance characteristics of the cable and the max. signal frequency. In general, it is advisable to keep the distance between the sensor and the associated instruments as short as possible.</p>
Installation	<p><b>Installation usage in explosive environments: The (locally) valid directives must be followed strictly (e.g. EN 60079-0, EN 60079-15).</b></p> <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. The amplitude of a VR sensor decreases with increasing 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.

**Baugruppen-Einbauerklärung nach Anhang II.B  
(Artikel 4 Absatz 2 der Richtlinie 98/37/EG) und  
Konformitätserklärung**

**Declaration of incorporation of a subassembly  
(Annex 1/B; Article 4(2) of Directive 98/37/EC)  
and declaration of conformity**

Der Hersteller

The manufacturer

**Jaquet AG, Thannerstrasse 15, CH-4009 Basel**

erklärt, dass die nachfolgende Baugruppe

hereby declares that the subassembly described below

Bezeichnung:

Description:

**Elektromagnetischer Sensor DSE EH20.06 SxHZ Ex-atex**

Kennzeichnung 1Marking: II 3 G Ex nA II T4fT3, -40-c... Ta...+100•ct+125- c

Identifikations-Nummer lt. Lieferpapieren

Identification number check shipping documents

erst in Betrieb genommen werden darf, nachdem die Konformität der Anlage, in die diese eingebaut wird, mit den Bestimmungen der Richtlinie 98/37/EG und den sie umsetzenden nationalen Rechtsvorschriften erklärt wurde, mit den Bestimmungen folgender harmonisierter Normen, in der zum Unterschriftsdatum gültigen Fassung übereinstimmt:

EN 60079-0 Elektrische Betriebsmittel für gasexplosionsgefährdete Bereiche; Allgemeine Bestimmungen

EN 60079-15 Elektrische Betriebsmittel für gasexplosionsgefährdete Bereiche- Teil15: Konstruktion, Prüfung und Kennzeichnung von elektrischen Betriebsmitteln der Zündschutzart "n"

Die Ergebnisse der sicherheitstechnischen Betrachtung sind im internen, vertraulichen Testbericht T10-085X festgehalten.

EN 61010-1 Sicherheitsbestimmungen für elektrische Mess-, Steuer-, Regel- und Laborgeräte, Teil 1: Allgemeine Anforderungen

EN 61000-6-2 Elektromagnetische Verträglichkeit (EMV), Teil 6-2: Fachgrundnormen, Störfestigkeit für Industriebereich

EN 61000-6-4 Elektromagnetische Verträglichkeit (EMV), Teil6-4: Fachgrundnormen, Störaussendung für Industriebereich

EN 61000-4-213/4151618111 Elektromagnetische Verträglichkeit (EMV) Prüf- und Messverfahren

may not be pul into service before the system into which it will be incorporated has been declared to be compliant with the provisions of Directive 98/37/EC, and with the regulations transposing it into national law;

complies with the provisions of the following harmonized standards in the version valid at signature date:

EN 60079-0 Electrical apparatus for explosive gas atmospheres: General requirements

EN 60079-15 Electrical apparatus for explosive gas atmospheres – Part 15: Construction, test and marking of type of protection, "n" electrical apparatus

The result/s of the safety-related examination are recorded in the internal, confidential/test report T10-085X.

EN 61010-1 Safety requirements For electrical equipment for measurement, control, and laboratory use, Part 1: General requirements

EN 61000-6-2 Electromagnetic compatibility (EMC); Part6-2: Generic standards, Immunity for industrial environments

EN 61000-6-4 Electromagnetic compatibility (EMC); Part 6-4: Generic standards, Emission standard for industrial environments

EN 61000-4-21314151618111 Electromagnetic compatibility (EMC): Testing and measurement techniques

**Mit den Bestimmungen folgender Europäischer Richtlinien übereinstimmt:**

RL 94/9/EG Explosionsschutz

RL 2004/108/EG EMV

**Complies with the provisions of the following European Directives:**

Directive 94/9/EC Explosion protection

Directive 2004/108/EC EMC

Ausgefertigt in Basel am 7. April 2011

Signed in Basel on April 7th, 2011



C. Kistler, Head of E



Wolfgang Schnell, EX-delegate

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