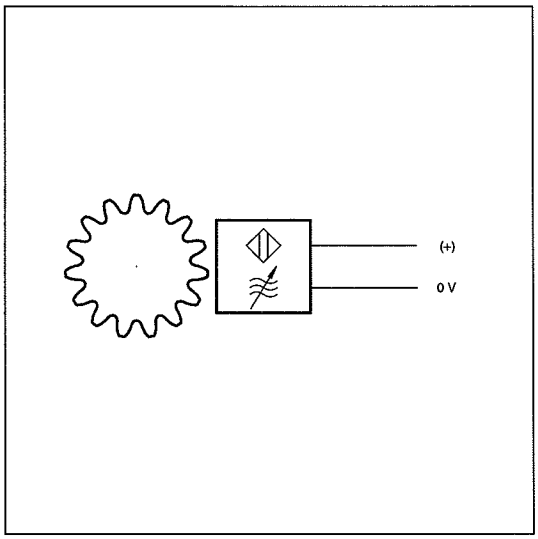
JAQUET TECHNOLOGY GROUP

DSH...N/Z



FUNCTION

HF speed sensors without amplifier are suitable for generating speed signals from metallic (not necessarily ferrous) pole wheels.

The sensing element is an oscillator circuit at the face of the sensor. A metallic pole wheel passing the sensor head influences the damping in the oscillator. This modulates the current consumption of the HF oscillator and superimposes an A.C. signal on the D.C. biased output.

If the following instrumentation is A.C. coupled, the lower operating frequency should be allowed for.

The static behaviour of these HF sensors allow their use for zero speed detection.

Where Ex certified versions are used in hazardous areas the certificate guidelines must be followed!

CONNECTION AND INSTALLATION

Connection

The sensor connections are sensitive to interference. The following 2 points should therefore be noted:

1) A screened cable must be used for connections. The screen must be taken all the way to the terminal provided on the instrument and not earthed.

2) The sensor cables should be laid as far from large electrical machines as possible and must never be laid parallel to high current cables.

The maximum permissible cable length is a function of sensor supply voltage, cable routing along with cable capacitance and inductance and sensor frequency. In general it is advantageous to keep the distance between sensor and instrumentation to a minimum. The sensor cable may be lengthened via suitable IP 20 terminals and JAQUET cable p/n 824L-30894.

Under favourable operating conditions and when used with JAQUET cable p/n 824L-30894 the following transmission lengths are possible:

100 m max. for sensor frequencies to 4 kHz

40 m max. for sensor frequencies to 10 kHz

20 m max. for sensor frequencies to 20 kHz

Mounting

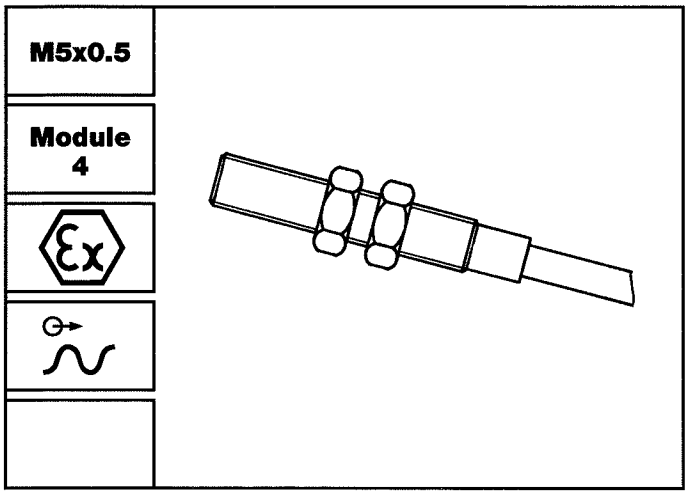
The sensor is mounted with its centre over the centre of the pole wheel. With gear wheels or slots and radial mounting, the sensor is normally fixed over the middle of the wheel. Dependent on the gear width, a degree of axial movement is permissible. The centre of the sensor must however remain a minimum of 3 mm from the edge of the wheel under all operating conditions.

It is important to ensure a rigid, vibration free mounting of the sensor. Sensor vibration in relation to the pole wheel may induce additional pulses.

The sensors are insensitive to oil, grease etc. and can be used in arduous conditions. During installation the optimum sensor to pole wheel gap should be set. On no account should the sensor come into contact with the pole wheel during operation. As a guide, an air gap of 0.4 mm can be set. The air gap does not influence the calibration of the system.

HF sensors can be used with numerous metal pole wheels. Please note though that metals which are more conductive than steel reduce the air gap range since they dampen the sensor to a lesser extent.

DSH 0540 KTN

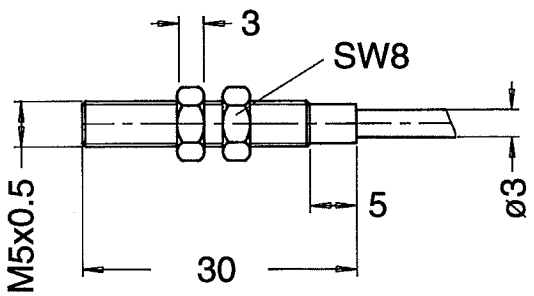


Features

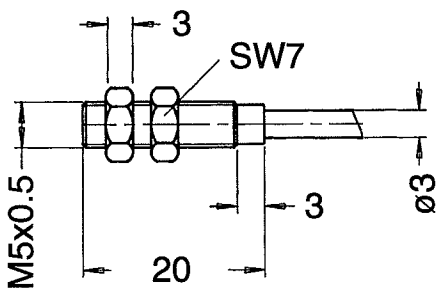
- Without amplifier
- Static characteristic
- Available as model DSH 0540 KTN Ex in intrinsically safe class EEx ia II C T6...T1
- Sensing of any metallic pole wheels
- No residual magnetic field

Dimensions

Version K



Version K, Ex



Model overview

Type	Part nr.	Connection	Housing thread	Weight [g]	Operating temperature [°C]	Notes
DSH 0540 KTN	830G-35649	Cable 2 m	M5x0.5	30	-25...+75	Standard
DSH 0540 KTN Ex	830G-35932	Cable 2 m	M5x0.5	30	-25...+100	Subject to certificate

HF Sensor (inductive) without amplifier

JAQUET TECHNOLOGY GROUP

Type DSH 0540
Version KTN

Technical Data

Supply

Power supply

Power supply: 5...15 V D.C. with R_L = 1 kΩ.
Current consumption: damped: <1 mA, not damped: >4 mA, max. permissible: 10 mA.

Operational data NAMUR

(DIN 19234/EN 50014/020)

Ub = 8.2 V
RL = 1 kΩ
t = 20 °C
I = 1.8 mA at a distance of 0.8 mm to reference measuring plate 4.5x4.5x0.3 mm^3 Fe

Signal frequency

0...5 kHz at 0.4 mm max. nominal distance

Input

at 50 mV_{rms} with 820 Ω output resistance:

Frequency range

0 Hz...20 kHz

Noise immunity

Noise generator between housing and electronics.
1.5 kV/1.5 ms/max. 5 Hz (source resistance 500 Ω),
2.0 kV/HF-Bursts (level 4 in accordance with IEC 801-4),
2.5 kV/1 MHz damped resonance (class III in accordance with IEC 255-4).

Pole wheel

Toothed wheel (involute gear form), wheel with holes, impeller wheel, slotted wheel or equal made of metallic material. Width ≥ 6 mm, eccentricity < 0.2 mm.
Pole wheel-sensor gap with pole wheel module ≥ 4: 0.3...0.8 mm.

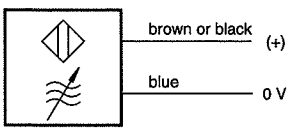
Output

Signal output

Signal current depends on pole wheel and pole wheel-sensor gap.
Current consumption 5...8 mA not damped, 1...3 mA damped, via pull-up resistance 820 Ω connected to D.C. voltage. The change in voltage-across the resistor is the output signal.
Pole wheel's material affects the damping characteristic.
For the working distance, note the reduction factor for each material as follows:

Steel St 37	Chrom-Nickel-Steel	Brass	Aluminium	Copper
1.0	0.85	0.5	0.4	0.3

Connection



Mechanical

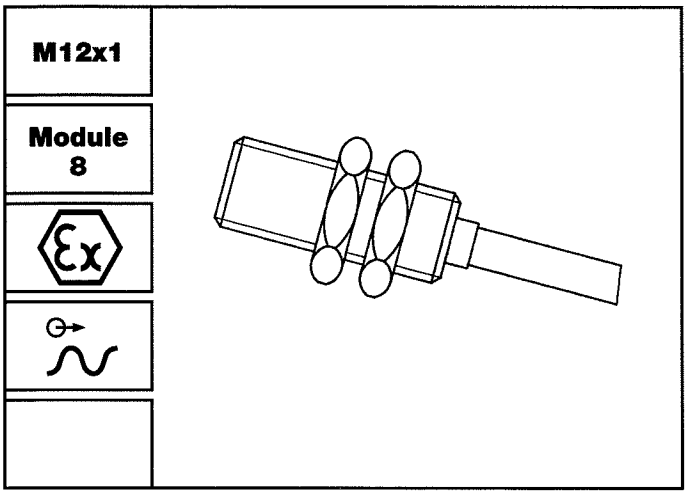
Protection class: IP67 (head), IP67 (cable connection).
Vibration immunity: a ≤ 1 mm, f ≤ 55 Hz (equivalent to max. 10 g_n).
Shock immunity: 30 g_n during 11 ms, half sine wave.
Operating temperature: Acc. to model overwiew.
Insulation: Housing and electronics galvanically isolated (500 V/50 Hz/1 min).
Housing: Housing material stainless steel 1.4305.
Weight: Acc. to model overwiew.
Operating instructions: Nr. 493 standard version. 4-110.839 intrinsically safe version.

Versions

Version KT

PVC-cable: 2wire, 2 x 0.14 mm^2 (AWG26), outer Ø max. 3 mm,
bending radius min. 45 mm, weight 12 g/m.

DSH 1280 KTN

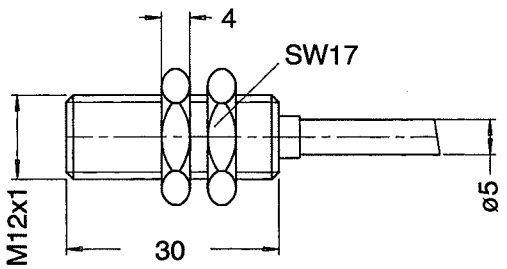


Features

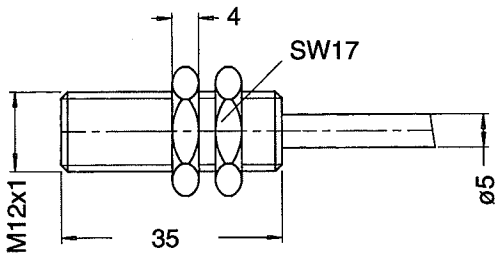
- Without amplifier
- Static characteristic
- Available as model DSH 1280 KTN Ex in intrinsically safe class EEx ia II C T6...T1
- Sensing of any metallic pole wheel
- No residual magnetic field

Dimensions

Version K



Version K, Ex



Model overview

Type	Part nr.	Connection	Housing thread	Weight [g]	Operating temperature [°C]	Notes
DSH 1280 KTN	830G-35650	Cable 2 m	M12x1	56	-25...+75	Standard
DSH 1280 KTN Ex	830G-35933	Cable 2 m	M12x1	56	-25...+100	Subject to certificate

HF Sensor (inductive) without amplifier

JAQUET TECHNOLOGY GROUP

Type DSH 1280
Version KTN

Technical Data

Supply

Power supply

Power supply: 5...15 V D.C., with R_L = 1 kΩ.
Current consumption: damped: <1 mA, not damped: >4 mA, max. permissible: 10 mA.

Operational data NAMUR

(DIN 19234/EN 50014/020)

Ub = 8.2 V
RL = 1 kΩ
t = 20 °C
I = 1.8 mA at a distance of 2.0 mm to reference measuring plate 12x12x1 mm³ Fe

Signal frequency

0...2 kHz at 1.0 mm max. nominal distance.

Input

at 50 mV_{rms} with 820 Ω output resistance:

Frequency range

0 Hz...20 kHz

Noise immunity

Noise generator between housing and electronics.
1.5 kV/1.5 ms/max. 5 Hz (source resistance 500 Ω),
2.0 kV/HF-Bursts (level 4 in accordance with IEC 801-4),
2.5 kV/1 MHz damped resonance (class III in accordance with IEC 255-4).

Pole wheel

Toothed wheel (involute gear form), wheel with holes, impeller wheel, slotted wheel or equal made of metallic material. Width ≥ 6 mm, eccentricity < 0.2 mm.
Pole wheel-sensor gap with pole wheel module ≥ 8: 0.8...2.0 mm.

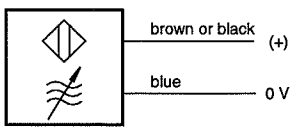
Output

Signal output

Signal current i depends on pole wheel and pole wheel-sensor gap.
Current consumption 5...8 mA not damped, 1...3 mA damped, via pull-up resistance 820 Ω connected to D.C. voltage. The change in voltage across the resistor is the output signal.
Pole wheel's material affects the damping characteristic.
For the working distance, note the reduction factor for each material as follows:

Steel St 37	Chrom-Nickel-Steel	Brass	Aluminium	Copper
1.0	0.85	0.5	0.4	0.3

Connection



Mechanical

Protection class

IP67 (head), IP67 (cable connection).

Vibration immunity

a ≤ 1 mm, f ≤ 55 Hz (equivalent to max. 10 g_n).

Shock immunity

30 g_n during 11 ms, half sine wave.

Insulation

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

Housing

Housing material: Version KTN: Brass nickel plated. Version KTN Ex: stainless steel

Weight

Acc. to model overwiew.

Operating instructions

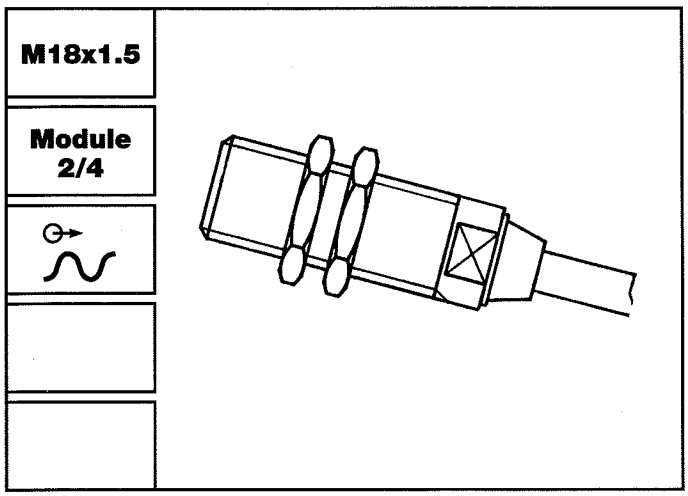
Nr. 493 standard version. 4-110.840 intrinsically safe version.

Versions

Version KT

PVC-cable: 2wire, 2 x 0.34 mm² (AWG22), outer Ø max. 5 mm,
bending radius min. 75 mm, weight 17 g/m.

DSH 1820/1840 S.N

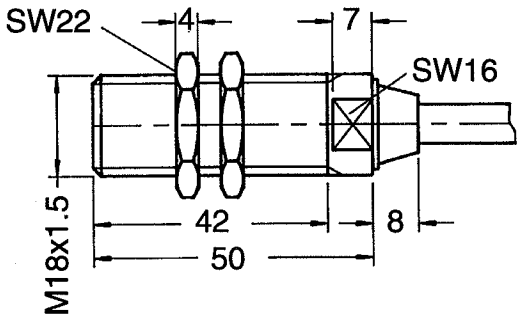


Features

- Without amplifier
- Static characteristic
- Sensing of any metallic pole wheel
- No residual magnetic field

Dimensions

Version S



Model overview

Type	Part nr.	Connection	Housing thread	Weight [g]	Operating temperature [°C]	Notes
DSH 1820.00 STZ	304Z-03172	Cable 1.5 m	M18x1.5	140	-25...+75	previously FTG 292
DSH 1840.00 STZ	304Z-03173	Cable 1.5 m	M18x1.5	145	-25...+75	previously FTG 294
DSH 1840.00 SHZ	304Z-03467	Cable 1.5 m	M18x1.5	145	-25...+125	previously FTG 294S74

HF Sensor (inductive) without amplifier

JAQUET TECHNOLOGY GROUP

Type DSH 1820/1840
Version S.N

Technical Data

Supply

Power supply	Power supply: 12 V ±20% via 820 Ω. Current consumption: max. 8 mA.

Input

Frequency range	0 Hz...20 kHz
Noise immunity	Cable shield connected to the supply negative pole. Noise generator between housing and electronics. 1.5 kV/1.5 ms/max. 5 Hz (source resistance 500 Ω), 2.0 kV/HF-Bursts (level 4 in accordance with IEC 801-4), 2.5 kV/1 MHz damped resonance (class III in accordance with IEC 255-4).
Pole wheel	Toothed wheel (involute gear form), wheel with holes, impeller wheel, slotted wheel or equal made of metallic material. Width ≥ 6 mm, eccentricity < 0.2 mm. Pole wheel-sensor gap at Module ≥ 2: 0.5...1.0 mm at DSH 1820.XX Module ≥ 4: 1.0...2.2 mm at DSH 1840.XX

Output

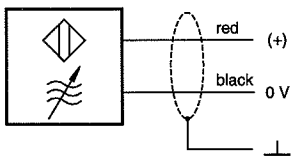
Signal output

Signal current i depends on pole wheel and pole wheel-sensor gap.

Current consumption 5...8 mA not damped, 1...3 mA damped, via pull-up resistance 820 Ω connected to D.C. voltage. The change in voltage across the resistor is the output signal.
Pole wheel's material affects the damping characteristic.
For the working distance, note the reduction factor for each material as follows:

Steel St 37	Chrom-Nickel-Steel	Brass	Aluminium	Copper
1.0	0.85	0.5	0.4	0.3

Connection



Shield to be connected to 0 V of power supply.

Mechanical

Protection class	IP67 (head), IP67 (cable connection).
Vibration immunity	5 g_n in the range 5...2000 Hz.
Shock immunity	50 g_n during 20 ms, half sine wave.
Insulation	Housing, cable shield and electronics galvanically isolated. (500 V/50 Hz/ 1 min.)
Housing	Aluminium alloy AlMgSiPbF28, 3.0615 black anodized, front side sealed, electronic comoponents potted in a chemical- and age-proof synthetic resin. Dimensions acc. to model overview and dimensional drawing.
Weight	Acc. to model overwiew.
Operating instructions	304E-63952

Versions

Version ST	PVC-cable: Part nr. 824L-30894, 2wire, 2 x 0.75 mm², stranded wire (metal net, insulated from housing), grey. Outer Ø max. 6.7 mm, bending radius min. 60 mm, weight 70 g/m.
Version SH	Teflon-wire: Part nr. 824L-33024, 3wire, 3 x 0.21 mm² (AWG 24), stranded wire (metal net, insulated from housing), green. Outer Ø max. 4 mm, bending radius min 60 mm, weight 32 g/m.