DSD 70

Dual Channel Hall Effect Speed Sensor
for Railway Applications, compliant with EN 50155

Technical information

Version: 07.14

General	
Function	The speed sensors family DSD.70 are suitable for generating two 90° phase-shifted square wave signals proportional to the rotary speed. They have a static behaviour, so that pulse generation is guaranteed down to a speed corresponding to a frequency of 0 Hz.
Technical data	
Supply voltage	nominal 15VDC (9 VDC to 30 VDC), protected against transient over-voltages and reverse polarity
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) • Push-pull outputs : I_{max} = ± 30 mA o Output voltage HI (for I = I_{max}): $U_{HI} > U_{supply}$ - 1.5 V o Output voltage LO (for I = I_{max}): $U_{LO} < 1.5$ V
Current consumption	max. 20 mA (without load)
Frequency range	0 Hz … 20 kHz
Electromagnetic compatibility (EMC)	compliant with EN 50121-3-2
Protection class	• Sensor head: IP68
Shock & Vibration	compliant with EN 61373 Cat.3
Operating temperature	• Sensor head: -40° ... +125°C • Cable: -40°C to +150 °C for the standard cable type 824L-36622
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
Air gap between sensor housing and pole wheel for involute gear	Module 1 0.5 … 0.7 mm Module 1.5 0.5 … 1.3 mm Module >=2 0.5 … 1.5 mm
Insulation	• Insulation between electronics and housing: 700 VDC, > 100 MOhm • Insulation between shield and housing:700 VDC, > 100 MOhm

Product identification

DS	D	16	_	.	_	_	_	_	H	_	-	_	_	_	
DS	D	16	30	.	7	0	P	1	H	W	-	F	300	G	Example of identification

Sensor housing
F: standard straight
G: 90° angle housing
S: customized housing design

Cable length in cm

Cable Screen
F: not connected to the sensor housing (standard)
C: connected to the sensor housing

Output signal characteristics
W: 2 channels with 90° phase shift, push-pull output
V : 1 channel push-pull output
RW: 2 galvanic insulated channels with 90° phase shift, push-pull output

Temperature Class
H: High temperature -40°C … +125°C

Customer specific version number

Connection Method
S: integral cable with open ends
A: connector integrated in housing
P: integral cable terminated with a connector
Q: cable protected with cable sleeve and connector
M: open end cable protected with cable sleeve

Electronic Type
70: push-pull 2 channels with galvanic separation between channels
71: push-pull 2 channels, no galvanic separation between channels
72: push-pull 2 channels with galvanic separation between channels plus 2 channels with the digitally inverted signals
73: push-pull 2 channels, no galvanic separation between channels plus 2 channels with the digitally inverted signals

Target module
xy: module multiplied by 10
p. ex. 20: module 2.0

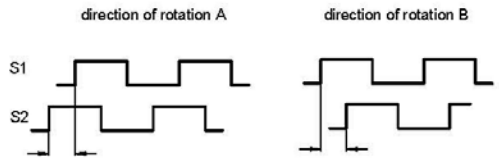
Size of the sensor housing (diameter in mm)
16: sensor head diameter 16mm

Sensor Technology
D: differential Hall-effect sensor

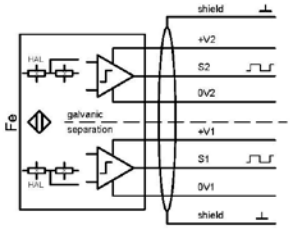
Signal patterns, electronic type

70: push-pull 2 channels with galvanic separation between channels

Pulse diagram

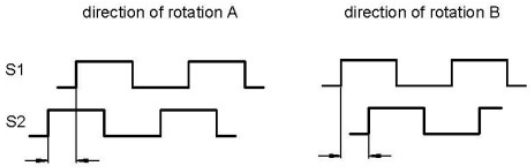


Schematic diagram

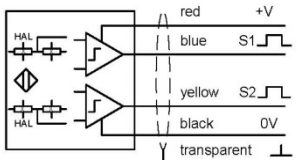


71: push-pull 2 channels, no galvanic separation between channels

Pulse diagram

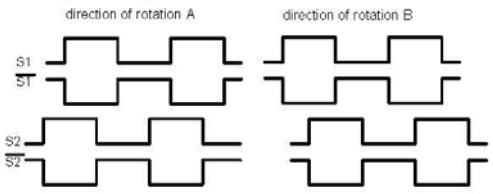


Schematic diagram

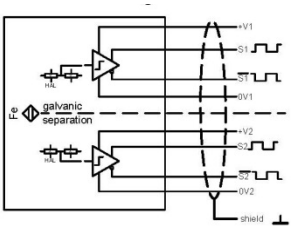


72: push-pull 2 channels with galvanic separation between channels plus 2 channels with the digitally inverted signals

Pulse diagram

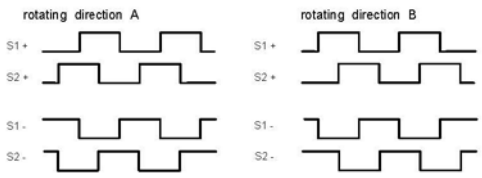


Schematic diagram

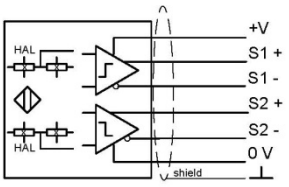


73: push-pull 2 channels, no galvanic separation between channels plus 2 channels with the digitally inverted signals

Pulse diagram

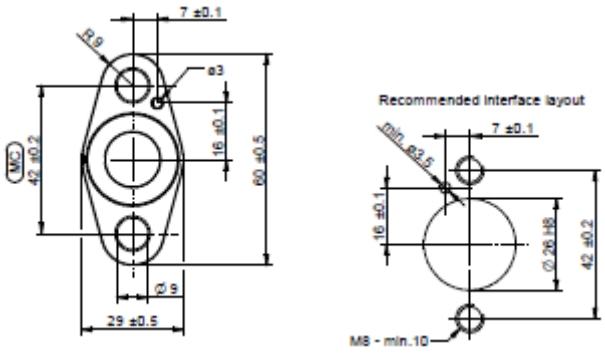


Schematic diagram



Dimensions

Sensor housing basic dimension



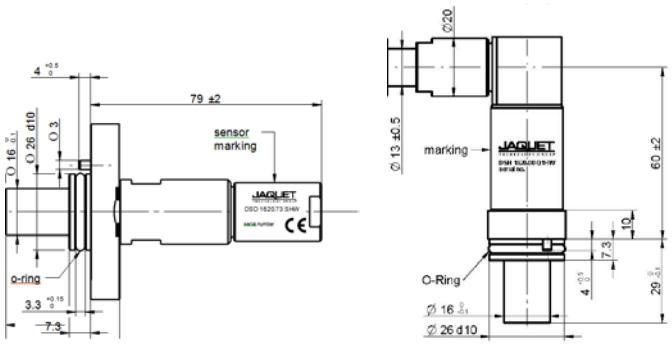
Recommended interface layout

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 the drawing.

F: straight
G: 90° angle
S: special housing design

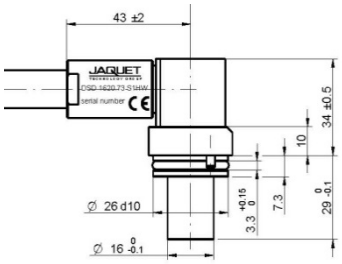
Examples of sensor heads

Examples of sensor heads

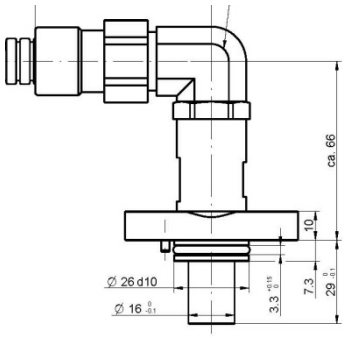


F: straight

G: 90° long



G: 90° short



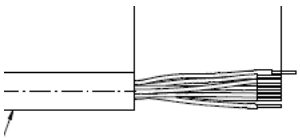
G: 90° long nose

Cable & connection method

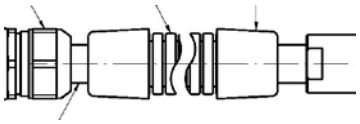
Jaquet cable type: 824L-36622

Properties
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
other cable types on request

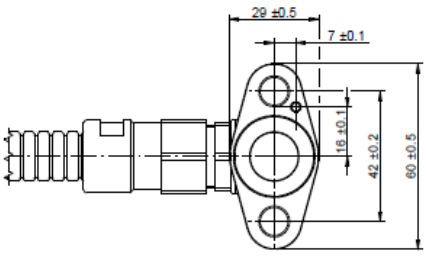
Examples of connection method



S: open wire ends

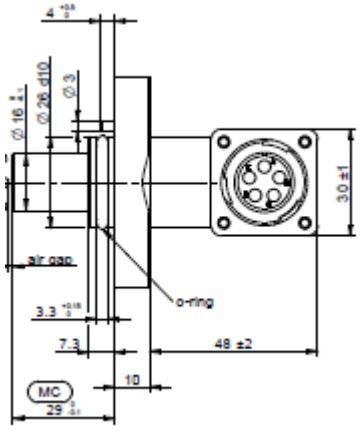


Q: straight with flexible cable sleeve

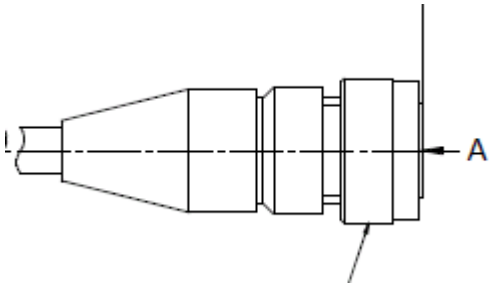


Q: fix cable sleeve and 90°

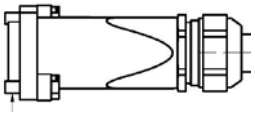
Connection method



A: connector integrated in housing



P: round connector



P: rectangular connector

P: other connectors on request

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