Inductive Precision Displacement Sensor

Robust, splash-proof, compact design

MODEL **8742** NEW

Preliminary data sheet

IP67 Protection class

Vibration resistant

Impact resistant

burster TEDS

Highlights

- Measuring ranges from 0 ... 2 mm to 50 mm
- Linearity deviation ≤ 0.1 % F.S.
- Minimal wear, for a maximal service life
- Impact and vibration resistant
- Protection class IP67
- Huge operating temperature range with minimal temperature dependence

Options

- Linearity 0.1 % F.S. or 0.25 % F.S.
- Output Signal 4.5 V / 9.5 V / 20mA
- Various connection options: plug and cable length
- Various mounting options for easy installation

Areas of application

- Special machine construction, special plant construction
- Building technologies, building monitoring
- Dilatometry or expansion measurements of e.g. battery cells
- Special usecases

Product description

The high-precision and durable model 8742 displacement sensor offers solutions for all applications that require a compact and robust design.

Thanks to its high IP67 protection rating and a temperature range from -40 °C to +125 °C, it can be used for demanding measurement tasks in many industrial and infrastructure-related applications.

The inductive displacement sensor delivers a highly linear output signal from 0.1 % F.S.. Its performance, repeatability, and stability are excellent over a wide temperature range.

The model 8742 displacement sensor has a compact stainless steel housing with a diameter of 19 mm, making it easy to install and align.

Possible mounting options include flange mounting, screw mounting using an M5 thread, or mounting with housing clamps.

The push rod can be equipped with an M5 female thread, spring-return with a domed sensing tip, or a ball joint.

With output signals of 0.5 ... 9.5 V or 4 ... 20 mA, the sensor can be easily integrated into process control and monitoring measuring points.

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Technical Data

8742	–	5002	5005	5010	5025	5050
Measuring range from 0 ...		2 mm	5 mm	10 mm	25 mm	50 mm
		Customized measuring ranges available on request: 0 ... 2 mm to 50 mm				
Accuracy						
Maximum relative linearity deviation at 20°C		±0.25 % F.S. (optional: ±0.1 % F.S.)				
Maximum relative temperature dependence		±0.01 %/K of rdg. ±0.01 %/K F.S.				
Reverse span		0.05 % F.S.				
Mechanical specifications						
Full mechanical travel		Graduation in steps of 10 mm each: See table „Dimensions of the sensor body" Mechanical travel + nominal 13 mm Consisting of 11 mm at the start of the push rod travel and 2 mm at the end of the push rod travel* * 8 mm for sensors without spring return				
Displacement force		5 cN/mm spring constant (only 8742-50xx-xxxxx2xx or 8742-50xx-xxxxx4xx) Spring precompressed: See „Force-displacement diagram" < 1.5 N Release force*				
Material		Stainless steel				
Housing outer diameter		19 mm				
Outer diameter of the push rod		6 mm				
Cable properties		Minimal bending radius: 15 x cable diameter Diameter 4 mm				
Output signal						
Output signal Options (Characteristic value)		0.5 ... 9.5 V 0.5 ... 4.5 V 4 ... 20 mA				
Characteristic value tolerance		±0.25 % of nominal value				
Ripple		< 0.02 % F.S.				
Frequency response		> 10 kHz with -3 dB				
Environmental conditions						
Operating temperature range		-40 ... +125 °C short periods -20 ... +85 °C continuous (thermal coupling to heat bath)				
Storage temperature range		-40 ... +125 °C				
Protection class		IP67				
Electromagnetic compatibility		DIN EN 61000-6-2, DIN EN 61000-6-3				
Vibration resistance		IEC 68-2-6: up to 10 g				
Maximum mechanical shock		IEC 68-2-29: up to 40 g				
Service life		MTBF: 350,000 h at 40 °C, type of use: ground stationary (Gf)				

F.S.: of full scale
rdg.: of reading

*with regular movement and occasional maintenance with silicone oil

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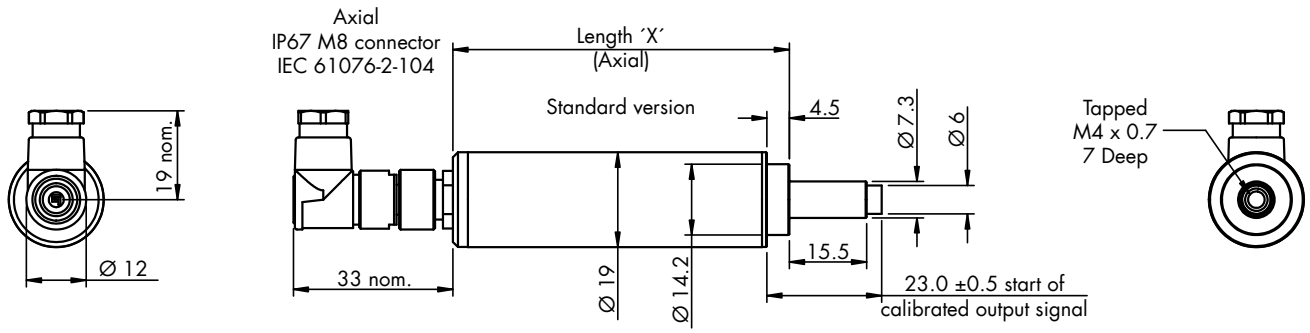
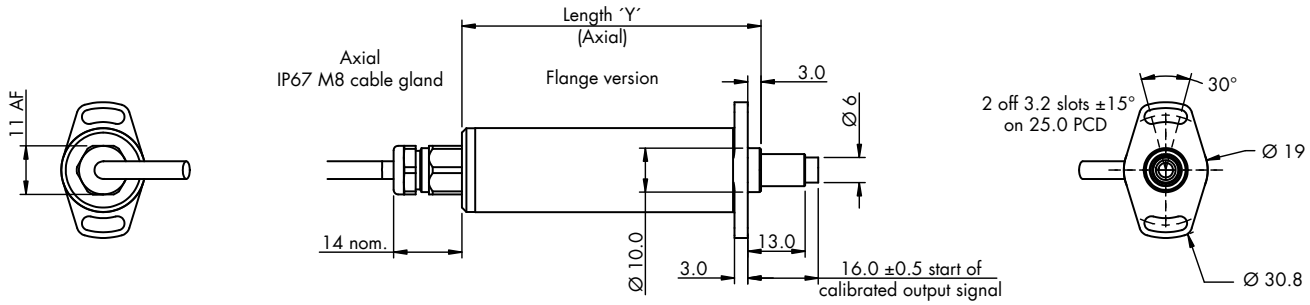
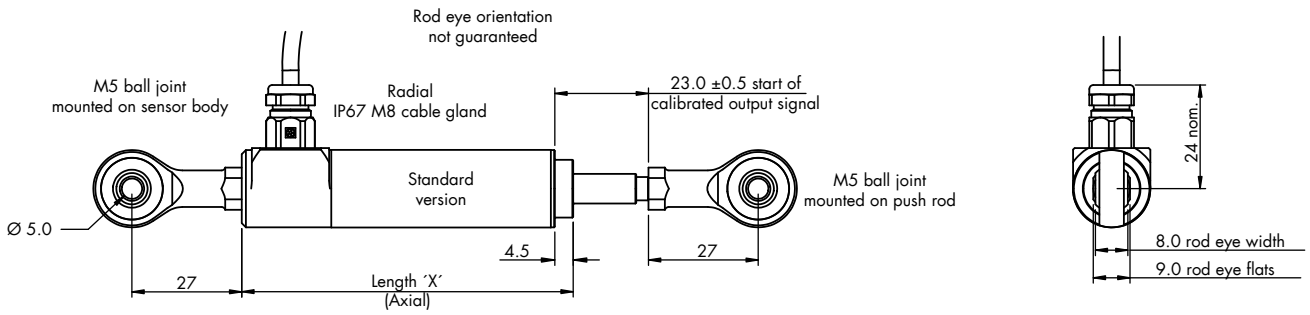
Dimensional drawing 1 – **Push rod with thread; axial M8 connector with radial outlet**



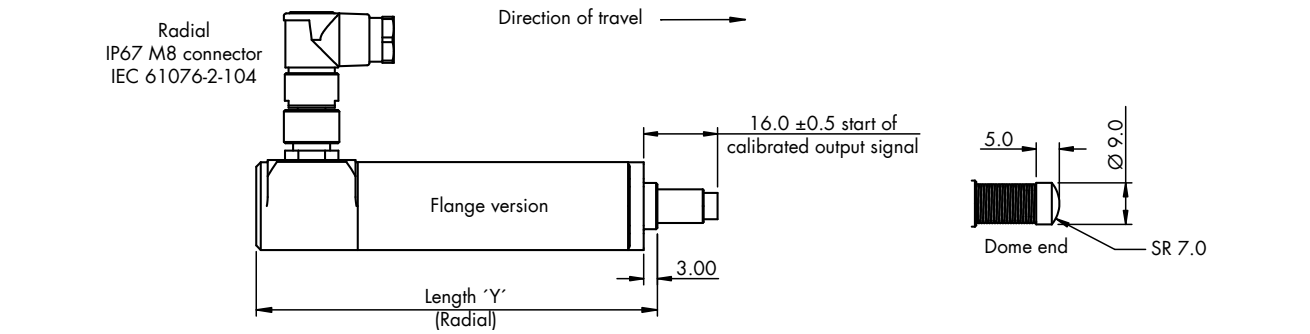
Dimensional drawing 2 – **Push rod with thread; axial cable gland**



Dimensional drawing 3 – **Push rod and housing with ball joint head; radial cable gland**

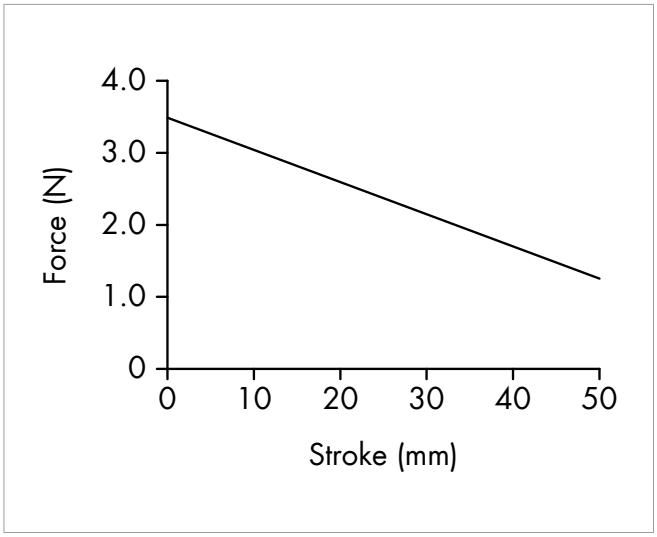


Dimensional drawing 4 – **Push rod with thread or probe tip; radial M8 plug with axial outlet**



Force-displacement diagram

Required displacement force applied via the mechanical path.
Please note: the return spring is pre-compressed: A mechanical path of <50 mm results in a higher release force according to this diagram.



Dimensions of the sensor body

Design	Mechanical travel	Standard version Dimension "X" in drawing		Flange version Dimension "Y" in drawing	
		0.5 ... 4.5 V	0.5 ... 9.5 V 4 ... 20 mA	0.5 ... 4.5 V	0.5 ... 9.5 V 4 ... 20 mA
Axial	0 ... 10 mm	72.5	77.5	78.0	83.0
	0 ... 20 mm	82.5	87.5	88.0	93.0
	0 ... 30 mm	92.5	97.5	98.0	103.0
	0 ... 50 mm	112.5	117.5	118.0	123.0
Radial	0 ... 10 mm	91.5	96.5	97.0	102.0
	0 ... 20 mm	101.5	106.5	107.0	112.0
	0 ... 30 mm	111.5	116.5	117.0	122.0
	0 ... 50 mm	131.5	136.5	137.0	142.0

Electrical connection

	Load resistors	Supply voltage
Version 8742-50xx-Cxxxxxxx 0.5 ... 9.5 V	±0.5 kΩ	24 V nominal (13 ... 28 V DC)
Version 8742-50xx-Dxxxxxxx 0.5 ... 4.5 V	≥ 5 kΩ	5 V nominal (4.5 ... 5.5 V DC)
Version 8742-50xx-Ixxxxxxx 4 ... 20 mA	≤ 300 Ω	24 V nominal (13 ... 28 V DC)

Protective functions in case of incorrect connection	
Version 8742-50xx-Cxxxxxxx 0.5 ... 9.5 V	Supply lines are protected by a diode. A maximum of 0 ... 12 V may be applied to the signal line.
Version 8742-50xx-Dxxxxxxx 0.5 ... 4.5 V	The sensor is not protected against reverse polarity or overvoltage. Limiting the current to below 50 mA minimizes the risk of damage.
Version 8742-50xx-Ixxxxxxx 4 ... 20 mA	Supply and output protected by diode.

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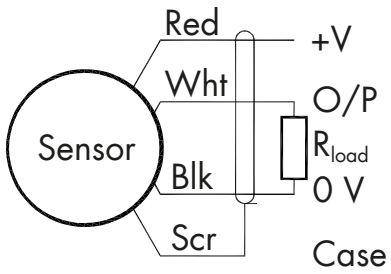
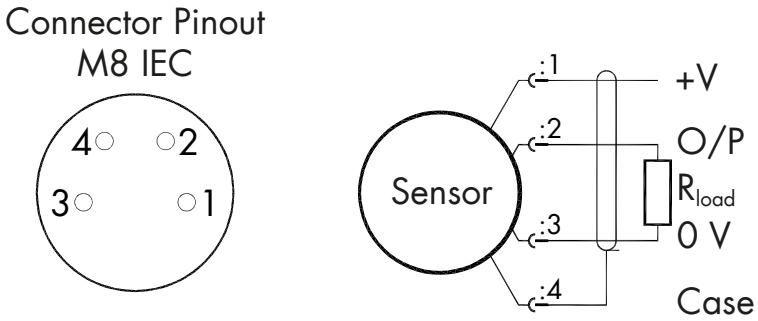
Electrical connection – **cable gland**



Electrical connection – **M8 plug**



Accessories

Order code		
8742-Z001		Plastic mounting block (1 included in delivery)
99149-000A-0090030		Connecting cable, 3 wire, length 3 m, one end free

Calibration

Test and calibration protocol		
Included in the scope of delivery of the sensor		Including specification of the zero point, nominal characteristic value, and calibration jump
Standard factory calibration certificate for displacement sensors or measuring chains (WKS)		
87WKS-87XX		Factory calibration certificate for displacement sensors or measuring chains. Measuring ranges from 0 mm to 500 mm, 10 steps evenly distributed over the measuring range 2 passes with increasing displacement. The calibration is not covered by the accreditation of the calibration laboratory. The calibration certificate does not contain a accreditation symbol and is therefore not covered by EA MLA.

Order code

Measuring range	Code			
0 ... 2 mm	5	0	0	2
0 ... 5 mm	5	0	0	5
0 ... 10 mm	5	0	1	0
0 ... 25 mm	5	0	1	5
0 ... 50 mm	5	0	5	0

8	7	4	2	–					–								0

Output signal

■ 0.5 ... 9.5 V	C
■ 0.5 ... 4.5 V	D
■ 4 ... 20 mA	I

Cable length

■ Plug	X
■ 1 m	A
■ 3 m	D
■ 5 m	E
■ Customer-specific length on request	K

Plug or cable outlet

■ Axial M8 connector 90°	1
■ Axial metal cable gland	4
■ Radial M8 connector 90°	7
■ Radial metal cable gland	A

Cable end connector options

■ Open end with individual strands	0
■ 9-pin MIN-D coupling plug, metallized plastic housing	B
■ 9-pin MIN-D coupling plug, metallized plastic housing, pin assignment for 9163-V3	E
■ 12-pin coupling plug for burster devices in desktop housings	F
■ Additional plug options available on request	

Linearity deviation

■ ±0.25 % F.S.	0
■ ±0.1 % F.S.	1

Mechanical options

■ Probe tip glued and spring returned	2
■ M4 thread with spring (loose)	4
■ M4 thread without spring	5
■ Push rod with ball joint (eye)	7
■ Push rod and sensor housing with ball joint (eye)	8

Assembly

■ Clamp mounting	0
■ Flange mounting	3

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