



Product Specification

Non-contacting displacement sensor with 2 mm measuring range

Features:

- Non-contacting displacement measurement based on eddy-current principle
- Measuring range 2 mm
- Operating frequency range DC to 10 kHz
- Operating temperature range for the sensor from -30 °C to +180 °C
- Sensor complies with protection class IP 68 (5 bar) according to DIN EN 60529
- Sealed ceramic sensor tip (up to 12 bar) perfectly suitable for ambient conditions with increased humidity
- Various lengths of the sensor's integral cable
- 5 m and 10 m* cable length between sensor and oscillator
- Gold-plated connectors for connection integrity
- Fulfils the requirements of API 670, DIN 45670 and DIN ISO 10817-1



- Approved for use in hazardous areas according directive 94/9/EG ATEX
- Various body shapes and lengths to allow for the correct choice according to the given mounting requirements
- Metric or imperial thread (M 10x1 or 3/8"-24 UNF)
- Efficiently engineered installation accessories (see also catalogue VIBROSENSORS BV-P 1001/2)

*Under preparation

Application

- Non-contacting displacement measurement



Acquiring relative shaft vibration



Acquiring axial shaft position



Acquiring radial shaft position



Acquiring eccentricity

- Use as speed sensor and phase reference sensor



Acquiring speed, rotational direction and zero speed detection

Product Specification – Non-contacting displacement sensor with 2 mm measuring range

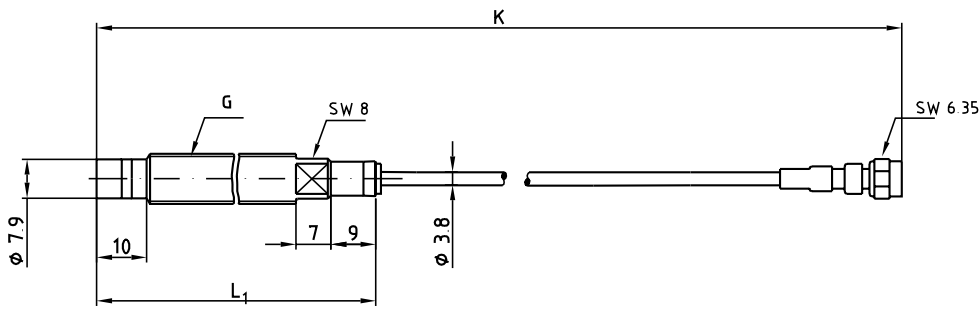


Fig. 1: Displacement sensor DS-1051 with full length thread; fig. without cable protection

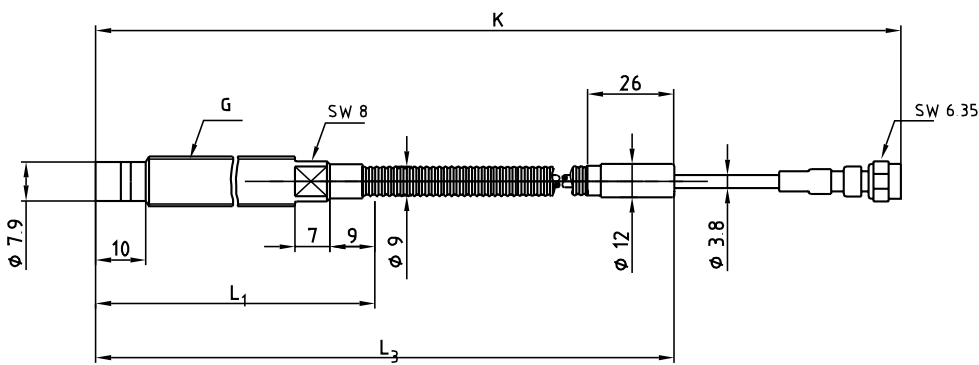


Fig. 2: Displacement sensor DS-1052 with stainless-steel corrugated tube protection (basic length L3 = 700 mm); the end of the corrugated tube may be prepared for 12 mm cutting-ring fitting (version A) or for use of casing feed-through AC-2551 (version B)

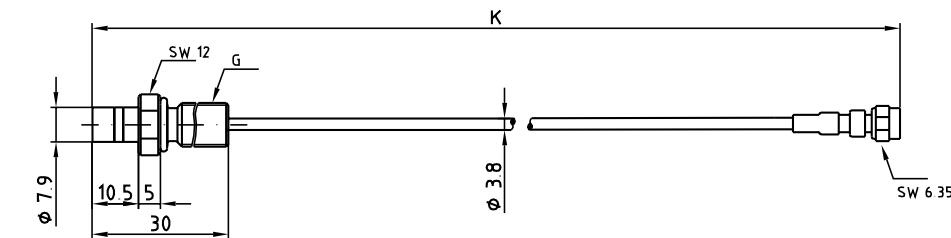


Fig. 3: Displacement sensor DS-1053 for reverse mounting, e.g. in sensor holder AC-101

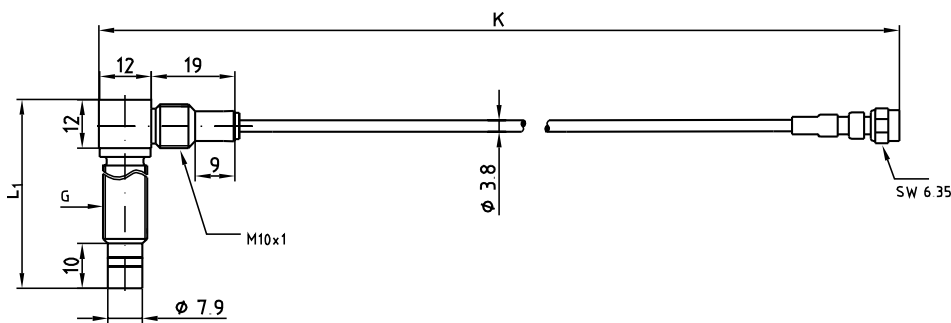


Fig. 4: Displacement sensor DS-1054 with right-angled head; fig. without cable protection

Product Specification – Non-contacting displacement sensor with 2 mm measuring range

Ordering Information

DS-1051 in standard form	Order code					
	DS-1051	/XX	/XXX	/XXX	/X	/9
Sensor with full length thread						
Thread G: M 10 x 1 - 6 g		03				
Thread G: 3/8" - 24 UNF - 2A		04				
Sensor body length L1: 45 mm			045			
Sensor body length L1: 75 mm			075			
Sensor body length L1: 105 mm			105			
Sensor cable length K: 1 m				010		
Sensor cable length K: 5 m				050		
preferred solution: no cable protection					1	
optional solution with cable protection: steel protective conduit					2	
optional solution with cable protection: PTFE protective conduit					3	
No special requirements						9

Ordering example for 2 mm displacement sensor with full length thread M 10 x 1, body length 75 mm, 1 m integral cable, without cable protection:
DS-1051/03/075/010/1/9

DS-1053 in standard form	Order code					
	DS-1053	/03	/030	/XXX	/X	/9
Reverse mount sensor						
Thread G: M 10 x 1 - 6 g		03				
Sensor body length L ₁ : 30 mm			030			
Sensor cable length K: 1 m				010		
Sensor cable length K: 5 m				050		
preferred solution: no cable protection					1	
optional solution with cable protection: PTFE protective conduit					3	
No special requirements						9

Ordering example for 2 mm reverse mount displacement sensor with thread M 10 x 1,5 m integral cable, without cable protection:
DS-1053/03/030/050/1/9

DS-1054 in standard form	Order code					
	DS-1054	/03	/034	/XXX	/X	/9
Sensor with right-angled head						
Thread G: M 10 x 1 - 6 g		03				
Sensor body length L ₁ : 34 mm			034			
Sensor cable length K: 1 m				010		
Sensor cable length K: 5 m				050		
preferred solution: no cable protection					1	
optional solution with cable protection: steel protective conduit					2	
optional solution with cable protection: PTFE protective conduit					3	
No special requirements						9

Ordering example for 2 mm displacement sensor with right-angled head, M 10 x 1 thread, 1 m integral cable, without cable protection:
DS-1054/03/034/010/1/9

Oscillator for	Order code
DS-1051 / DS-1052 / DS-1053 / DS-1054	
2 mm measuring range, standard version, for total cable length M = K + L = 5 m	OD-1051
*2 mm measuring range, standard version, for total cable length M = K + L = 10 m	OD-1053

*under preparation

Product Specification – Non-contacting displacement sensor with 2 mm measuring range

Extension cable for DS-1051 / DS-1052 / DS-1053 / DS-1054	Order code		
	EC-100X	/XXX	
preferred solution: no protection (see Fig. 5a)	EC-1001		
optional solution with steel protective conduit (see Fig. 5b)	EC-1002		
optional solution with PTFE protective conduit (see Fig. 5c)	EC-1003		
preferred solution in conjunction with OD-1051: cable length L = 4 m			040
*preferred solution in conjunction with OD-1053: cable length L = 9 m			090
*optional solution in conjunction with OD-1053: cable length L = 5 m			050

*under preparation

Ordering example for extension cable, 4 m length, no protection: EC-1001/040

Displacement sensor with ceramic tip - complete overview					Order code
Sensor type	DS-1051	DS-1052	DS-1053	DS-1054	DS-105X
Measuring range	2 mm				
Operating temperature range	-30 ... +180 °C				
Sensor body version	full length thread (see fig. 1)	full length thread with corrugated tube protection (see fig. 2)	reverse mount (e.g. in sensor holder AC-101; see fig. 3)	right-angled head (see fig. 4)	

The sensor type DS-1052 is only available on enquiry and after technical clarification.

Thread G					/XX
M 10 x 1 - 6 g	03	•	•	•	•
3/8" - 24 UNF - 2 A	04	•	0	0	0

Sensor body length L ₁					/XXX
Standard length	030	-	-	30 mm	-
	034	-	-	-	34 mm
	045	45 mm	-	-	-
	075	75 mm	75 mm	-	-
	105	105 mm	-	-	-
Special length	135	135 mm	-	-	-
	165	165 mm			
	195	195 mm			
	225	225 mm			
	255	255 mm			
Minimum length	45 mm	45 mm	30 mm	34 mm	
Maximum length	255 mm	255 mm	30 mm	150 mm	

Sensor cable length K					/XXX
Standard length	010	1 m	1 m	1 m	1 m
	050	5 m	5 m	5 m	5 m

Cable protection					/X
without	1	•	-	•	•
Steel protective conduit	2	0	-	-	0
PTFE protective conduit	3	0	-	0	0
Corrugated tube, version A	4	-	•	-	-
Corrugated tube, version B	5	-	0	-	-

Special requirements (must be clarified in written form when ordering)					/X
no	9	•	-	•	•
yes	1	on enquiry			

• preferred solution 0 optional solution - not available

Ordering example for 2 mm displacement sensor with full length thread M 10 x 1, body length 75 mm, 1 m integral cable, without cable protection: DS-1051/03/075/010/1/9

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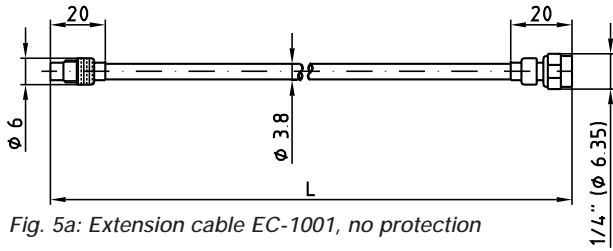


Fig. 5a: Extension cable EC-1001, no protection

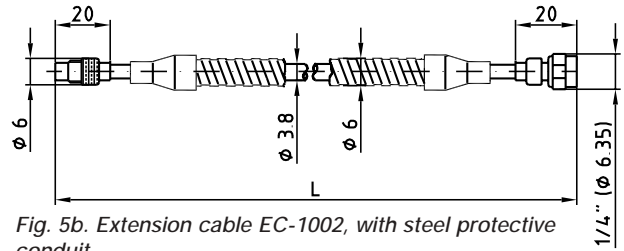


Fig. 5b: Extension cable EC-1002, with steel protective conduit

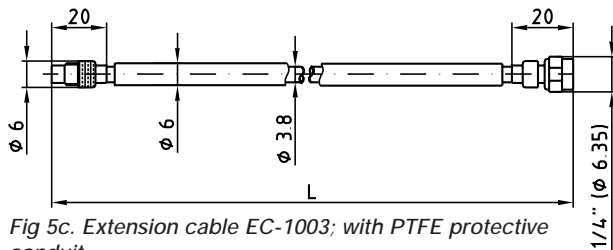


Fig 5c: Extension cable EC-1003; with PTFE protective conduit

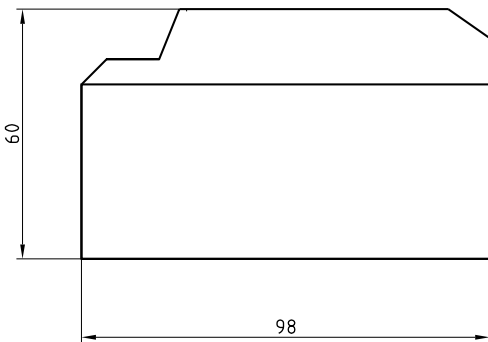


Fig. 6: Oscillator OD-1051 respective OD-1053

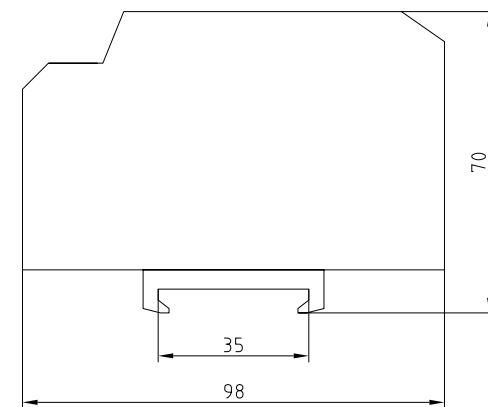
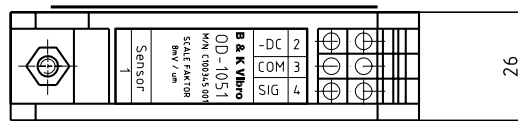


Fig. 7a: OD-105X prepared with adapter for DIN-rail mounting (DIN 50022)

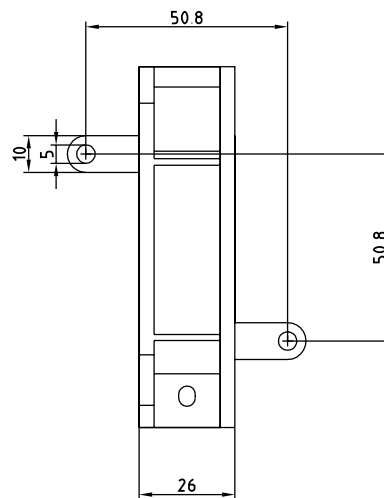


Fig. 7b: OD-105X prepared with adapter for panel mounting according to API-670

Product Specification – Non-contacting displacement sensor with 2 mm measuring range

Technical Characteristics



Non-contacting displacement sensor with 2 mm measuring range

components of the measuring chain

Displacement sensor DS-105X
Extension cable EC-100X
Oscillator OD-105X

Measuring and electrical properties

Operating principle

Eddy-current principle

Linear measuring range

2 mm

(corresponds to appr. 0.3 ... 2.3 mm distance from the target object)

Operating frequency range

DC ... 10 kHz

Sensitivity

8 mV / μm (203 mV / mil) with material 42 CrMo4 (material no. 1.7225 according to DIN 17200)

Recommended operating point

appr. - 9 ... - 11 V DC GAP-voltage

Supply voltage

nominally $U_B = -24$ V DC (- 18 ... - 30 V DC)

Maximum current consumption

16 mA

Output signal

nominally - 2 ... - 18 V (- 2 ... ($U_B + 2$ V))

Cable length for output signal

max. 1,000 m (depending on cable type for Ex applications)

Output impedance

approx. 5 Ohm, max. 5 mA

Sensitivity deviation

< 5% in testing range 0 ... 45 °C

< 10% in operating temperature range

Deviation from reference line

< 25 μm in testing range 0 ... 45 °C

< 76 μm in operating temperature range

Ex-protection according directive 94/9/EG ATEX

Characteristic designation



II 1/2 G respective II 2 G EEx ia IIC T5

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Displacement sensor DS-1051 / DS-1052 / DS-1053 / DS-1054

Mechanical data

Sensor tip material	Ceramic
Sensor body material	Stainless-steel (material no. 1.4301 according DIN 17200)
Thread	M 10 x 1 – 6 g or 3/8" – 24 UNF – 2 A

Ambient conditions

Operating conditions	Normal industrial environment or hazardous area
Protection class	IP 68 / 5 bar (approved according EN 60529)
Operating temperature range	– 30 ... +180 °C
Storage temperature range	– 55 ... +180 °C

Integral cable

Cable type	75 Ohm tri-axial cable
Cable jacket	FEP
Cable length K	1 m (–0,2 / +0,2 m) or 5 m (–0,4 / +0,4 m)
Minimum bending radius	25 mm (no protection, with PTFE protective conduit or with steel protective conduit; for corrugated tube protection only if bent once); 100 mm (for corrugated tube protection)
Cable end	Co-axial plug connector

Extension cable EC-1001 / EC-1002 / EC-1003

Cable data

Cable type	75 Ohm tri-axial cable
Cable jacket	FEP
Cable length L	4 m (–0,2 / +0,2 m) or 9 m (–0,4 / +0,4 m) or 5 m (–0,2 / +0,2 m)
Minimum bending radius	25 mm

Ambient conditions

Operating conditions	Normal industrial environment or hazardous area
Temperature range	–50 ... +200 °C

Oscillator OD-1051 / OD-1053

Total length M (= K + L) of sensor integral cable and extension cable	OD-1051: 5,0 m OD-1053: 10,0 m
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Housing

Material	Aluminium
Size	98 mm x 26 mm x 60 mm (Height x Width x Depth)
Weight	approx. 300 g

Connections

Co-axial housing plug for sensor cable
3-pole terminal block for output signal and power supply

Ambient conditions

Operating conditions	Normal industrial environment or hazardous area
Protection class	IP 20
Operating temperature range	–30 ... +70 °C
Storage temperature range	–55 ... +100 °C

Standard delivery extent

Mounting adapter for 35 mm DIN-rail (DIN 50022)
Mounting adapter for panel mounting according to API-670
Mounting screws, Flat wrench (SW 6.35) for input connector

Other

Isolated mounting in protective housing is recommended

Product Specification – Non-contacting displacement sensor with 2 mm measuring range

Optional Accessories



AC-2280 Connector protection kit

Application

Mechanical protection and electrical isolation of cable connectors between sensor cables and extension cables

Ambient conditions

Normal industrial environment or hazardous area
Protection class IP 66; temperature range
-50 °C to +150 °C

Standard delivery extent

16 pieces of 2-part sleeves of EPDM (black)
16 pieces of 2-part sleeves of silicone (red)
1 bottle of talc (50 g)
1 piece mounting tool for male sleeves
1 piece mounting tool for female sleeves
1 piece mounting instructions

Size and weight

330 mm x 230 mm x 45 mm
Complete case weighs approx. 1 kg

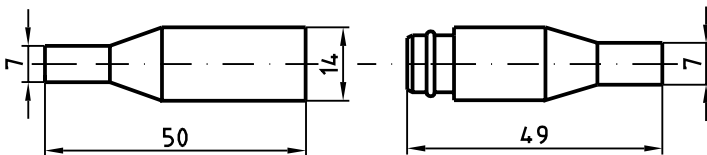


Fig. 8 Sleeve for connector protection

Further accessories for installation and commissioning: see catalogue VIBROSENSORS BV-P 1001/2.

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