



SD - 087 / 088 / 089

Chemically Resistant Displacement Sensors

Measuring displacement 3.5 mm

1 Application

The displacement **sensoer is part of the Brüel & Kjær Vibro displacement measuring chain**, comprising:

- Non-contacting displacement sensor
- Extension cable
- Oscillator

The displacement measuring chain serves for non-contacting displacement measurement according to the eddy-current measuring principle.

2 Employment range

The sensor is chemically resistant up to the olive screw joint (SD-087), counternut (SD-088) or O-ring seal (SD-089) according to the table page 4 on condition that the mounting instructions given on page 5 - 7 have been followed.

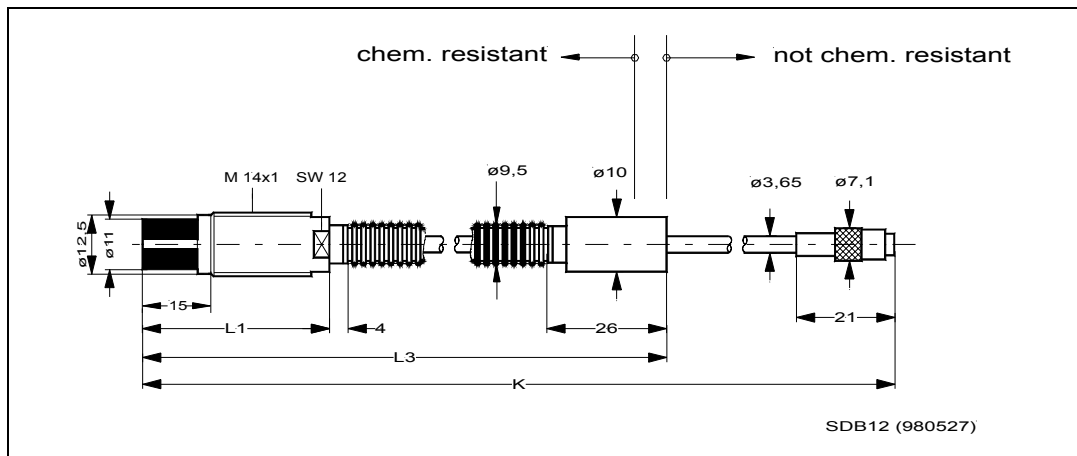
The sensor was subjected to different endurance tests in which the resistance to different media was tested under the influence of pressure and temperature.

For measuring results please refer to the table page 4.

The vibration sensor may be used in hazardous areas applications when used in conjunction with a compatible oscillator type OD-081 and a corresponding protective circuit (Zener Barrier).

(See data sheet of oscillator type OD-081).

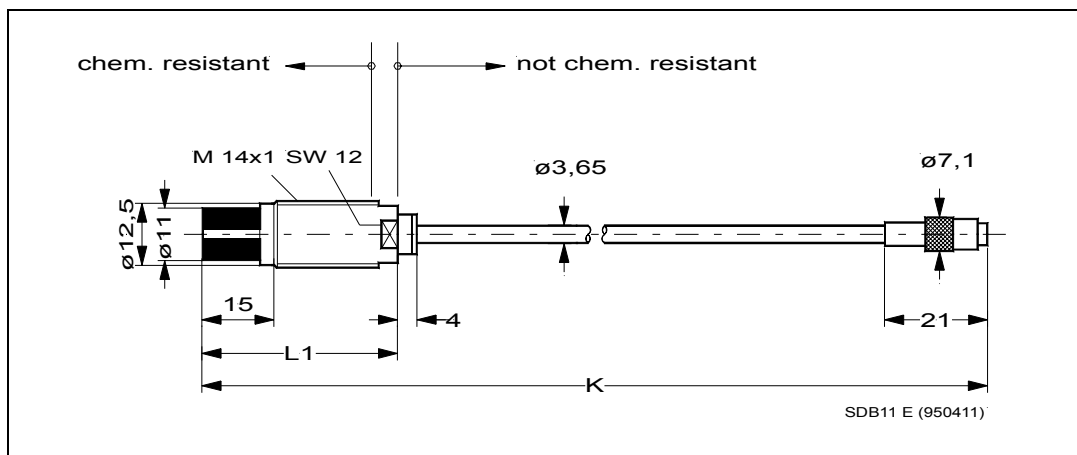
2.1 Dimensioned drawing SD-087



2.1.1 Variable dimensions

Sensor length L_1	40 mm ... max. 250 mm
Sensor incl. annularly corrugated SST hose L_3	$L_1 + 80 \leq L_3 \leq K - 250$
Total length K	0.5 m \pm 0.1 m 1.0 m \pm 0.2 m

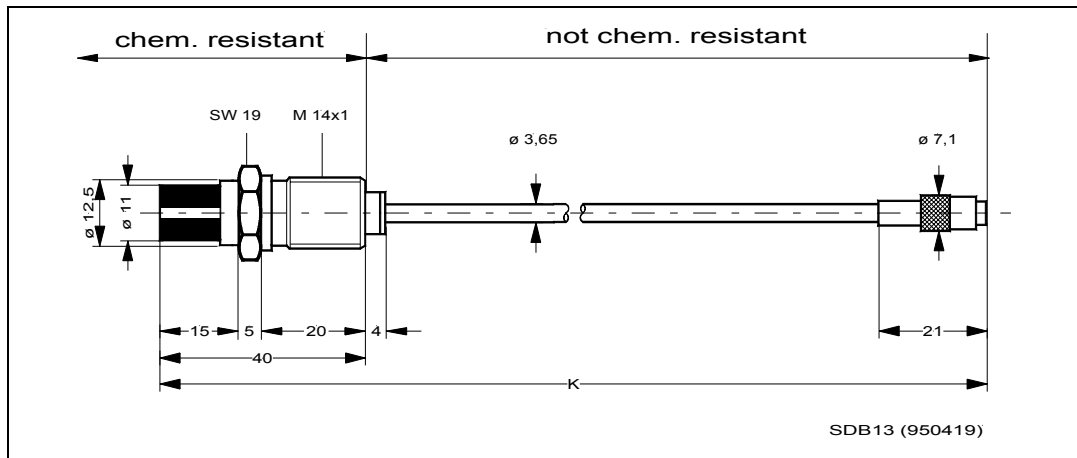
2.2 Dimensioned drawing SD-088



2.2.1 Variable dimensions

Sensor length L_1	40 mm ... max. 250 mm
Total length K	0.5 m \pm 0.1 m ... + 0.3 m 1.0 m \pm 0.2 m

2.3 Dimensioned drawing SD-089



2.3.1 Variable dimensions

Sensor length L_1	40 mm ... max. 250 mm
Total length K	0.5 m \pm 0.1 m 1.0 m \pm 0.2 m

3 Technical data

Standards and directives	API 670 and DIN 45670
Measured variable	shaft relative vibration shaft relative displacement
Measuring principle	eddy-current principle
Working frequency range	0 ... 10 000 Hz
Displacement measuring range	0.2 ... 3.7 mm
Recommended working range	1.8 ... 2.4 mm correspond to a Gap voltage of -8 ... -10 V
Material of transducer tip	ceramics
Material of sensor sleeve	Material according to DIN 671 Material no. 1.4301
Material of annularly corrugated SST hose (only SD-087)	Material according to DIN 671 Material no. 1.4541
Material of the clamping piece (only SD-087)	Material according to DIN 671 Material no. 1.4301
Material of sensor cable	coaxial cable PTFE-insulated according to MIL-C-17 / 95-RG 180 B/U

Working temperature range	-30 °C ... + 100 °C
Storage temperature range	-30 °C ... + 100 °C
Weight of sensor	200 g (SD-088) 65 g (SD-089) 50 g (SD-087)
Sensor suitable for oscillator	type OD - 081

EMC

EMC-relevant data for the entire measuring chain consisting of displacement sensor fitting oscillator OD-... and extension cable EC-... are given in the data sheets of the oscillator.

Note:

The housing of sensor is potential free.

Sensor types

new	old
SD-087	SDM-082
SD-088	SDN-082
SD-089	SDN-083

4 Test results

Aggressive medium	Average values (in (): maximum values)		Duration (approx. h)	Notes
	temp. °C	pressure bar		
Water, distilled (liquid)	66 (126)	66	500 *)	40 bar prepressure N ₂
Tap water (vapour)	130	1.9	400 *)	
Air humidity 100 %	40 (60)	1	2400	Humidity test as per DIN IEC 68 (2 x test cycle)
See water, synthetic (Density = 1.024 g/cm ³)	92	54	300 *)	40 bar prepressure N ₂
NH ₃ /N ₂ - mixture (gas)	60 (100)	29	1100 *)	25 bar prepressure N ₂
32 % NH ₄ OH - solution (liquid) 1	25	30	150 *)	30 bar prepressure N ₂
NH ₃ /H ₂ O/air (gas mixture)	89	4	1200	Bonding joints lightly affected but tight.
CCl ₂ F ₂ (freon, vapour)	65	7.7	350 *)	

*): The sensors passed this test **successively**. Total time: approx. 2800 hours.

5 Mounting Instructions

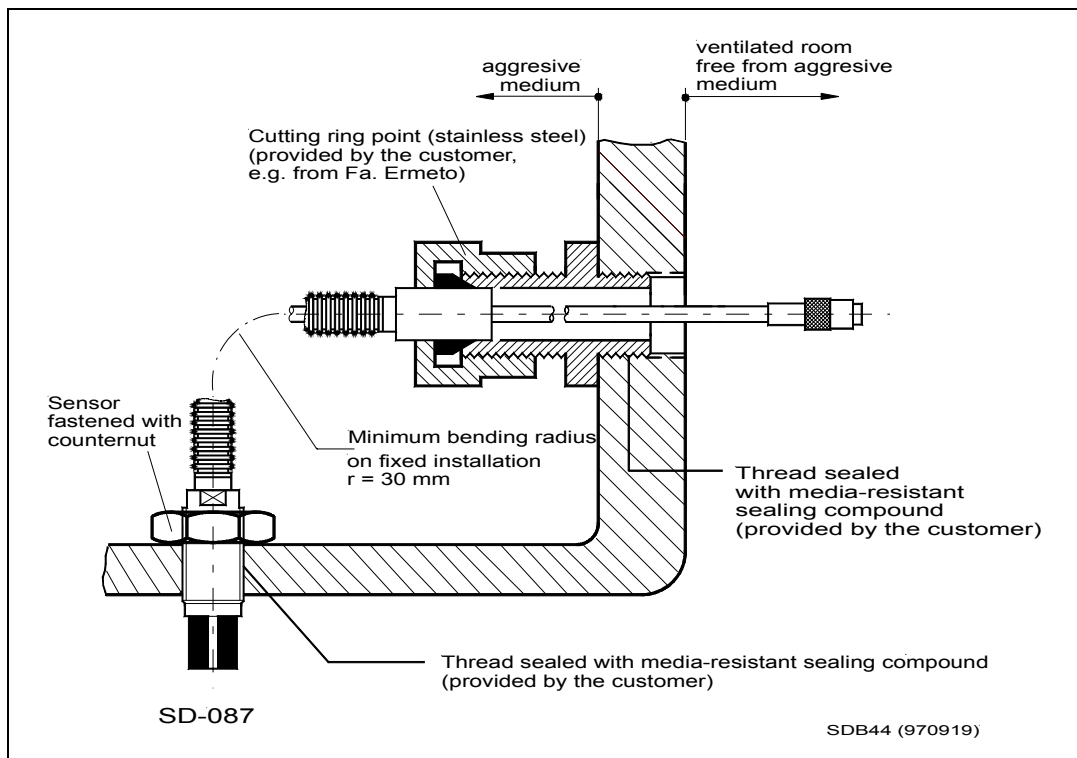
The sensor must be installed according to the „Installation instructions for displacement measuring chains“.

Sensors for non-contacting displacement measurement are preferably to be fastened to such machine parts which do not falsify the measuring result by natural frequencies.

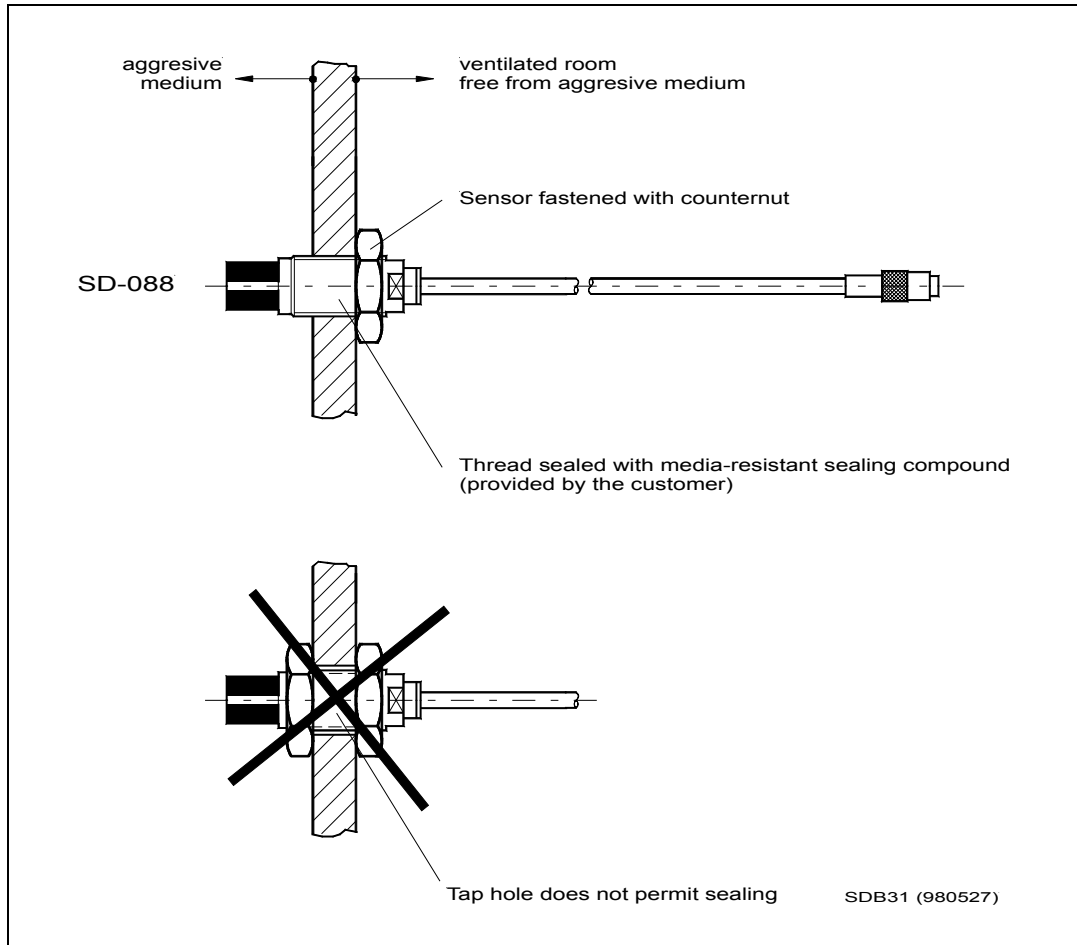
5.1 Precondition for media-resistant installation of sensors SD-087 and SD-088

- ◆ If possible, leave the protective cover on the sensor tip until commissioning. The sensor tip is sensitive to impact, it might be destroyed by bumping against a hard surface.
- ◆ The thread of the sensor tip is sealed with a chemically resistant compound.

5.1.1 Installation of sensor type SD-087



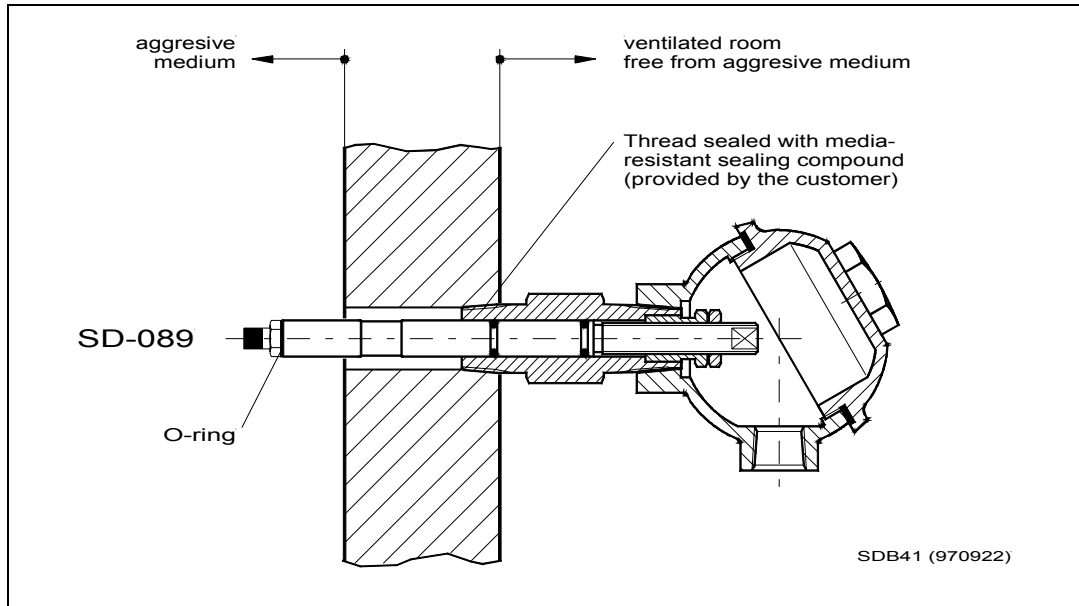
5.1.2 Installation of sensor type SD-088



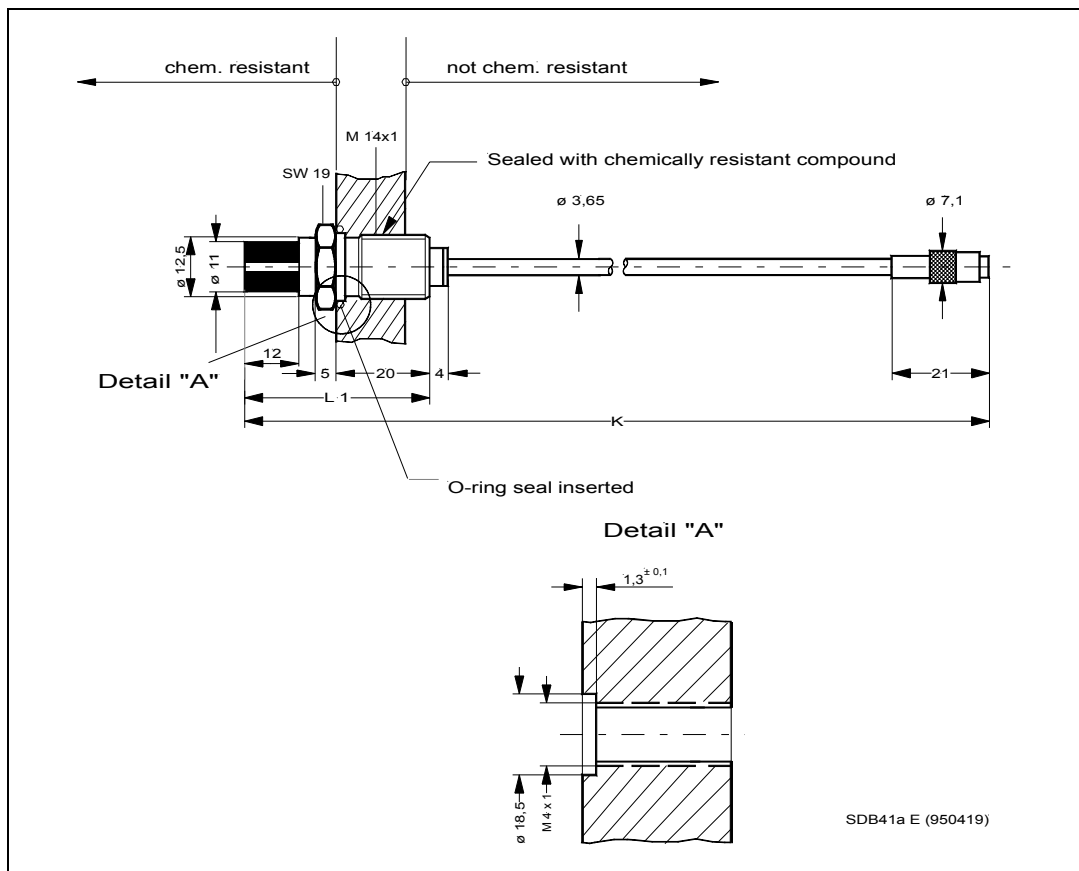
5.2 Precondition for media-resistant installation of sensor SD-089

- ◆ The O-ring is inserted.
- ◆ If possible, leave the protective cover on the sensor tip until commissioning. The sensor tip is sensitive to impact, it might be destroyed by bumping against a hard surface.
- ◆ The thread of the sensor tip is sealed with a chemically resistant compound.
- ◆ The indicated manufacturing tolerances are met.

5.2.1 Mounting with sensor holder for SD-089

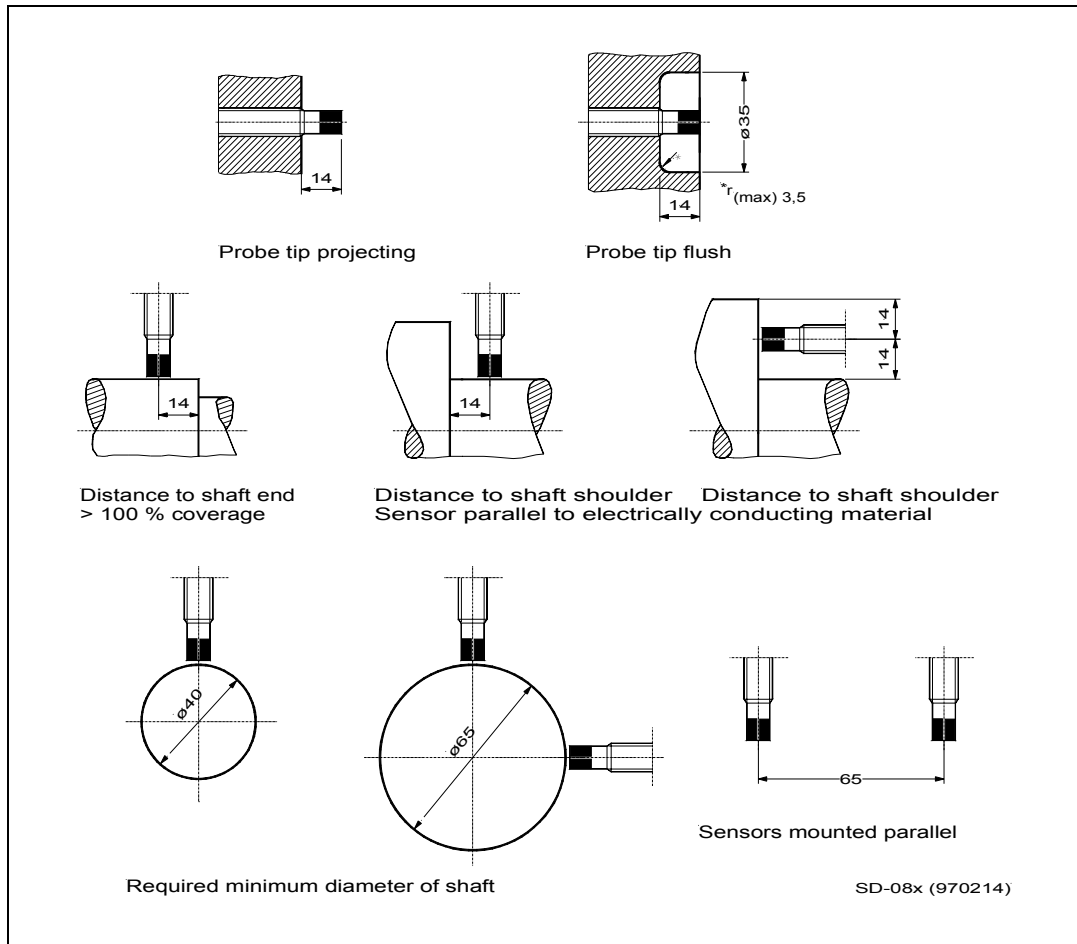


5.2.2 Mounting into the machine for SD-089



5.3 Free space and minimum distances for non-contacting displacement sensors

Non-contacting displacement sensors produce a high-frequency electromagnetic field. If any electrically conductive material apart from the measuring object is within this field, the measuring result will be falsified. Therefore, the following free space and minimum distances must be adhered to during installation of the non-contacting displacement sensors:



If minimum free spaces and distances cannot be realized by machine design, please contact the manufacturer.