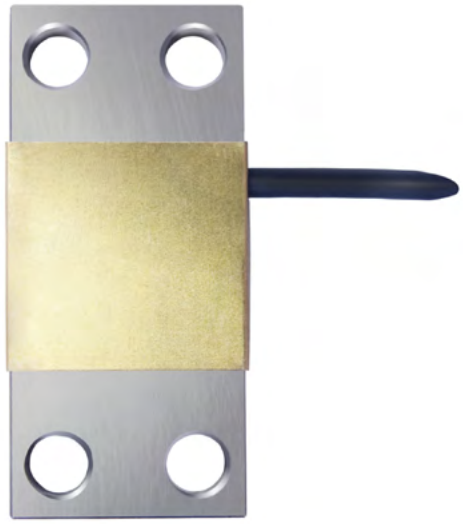
Lorenz® messtechnik gmbh

Stress Sensor DZ-1 with Nominal Measuring Range from 300 µm/m

Data sheet



Performance Features

- Stress sensor for press-in force control, weight and level control
- Very compact design
- Easy assembly at measuring object
- Reliable and durable
- Long-term stability
- Level of protection IP65
- Supplementary assembly without production loss

Application

- Equipment engineering
- Fully automated machining centres
- Measuring and control devices
- Materials testing machines
- Tool engineering
- Special mechanical engineering

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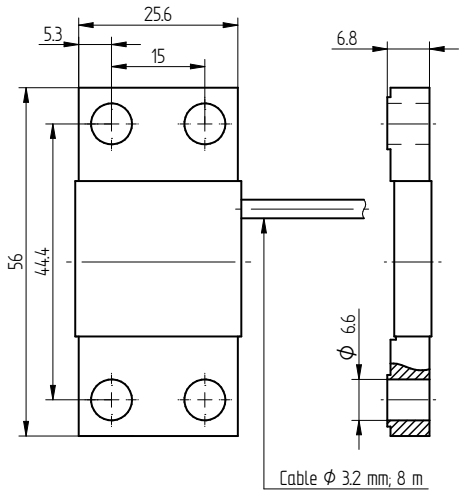
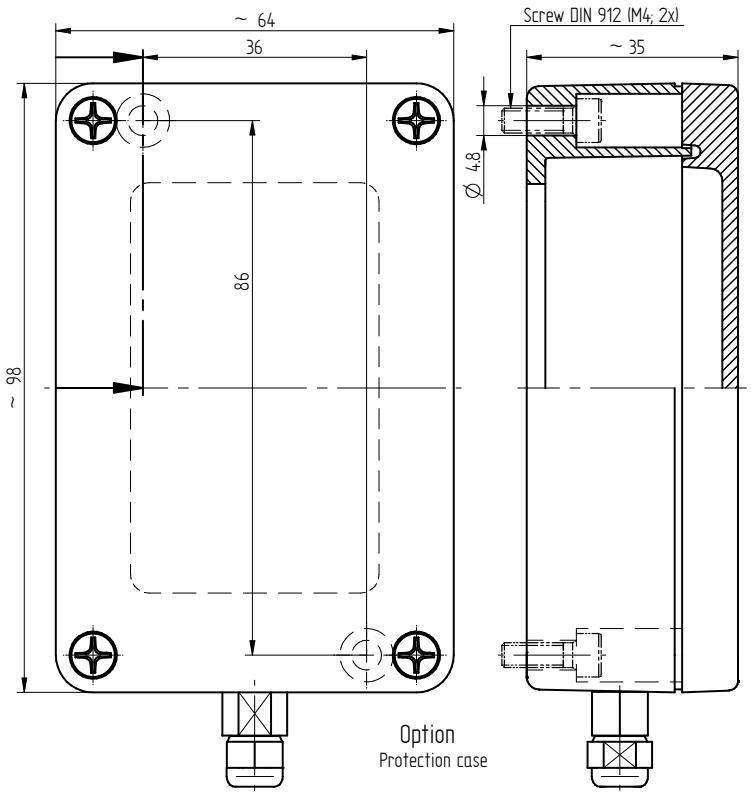
Dimensions of DZ-1 in mm





Article-No.	Nominal Measuring Range [µm/m]	Weight [kg]
100437	300	0.2

Pin Connection

Electrical connection		
Excitation (-)	green	
Excitation (+)	brown	
Signal (+)	yellow	
Signal (-)	white	
Control signal (option)	grey	
Shield	shield	

Technical Data acc. to VDI/VDE/DKD 2638

Stress Sensor DZ-1		
Nominal measuring range	[µm/m]	300
Accuracy class	% f. s.	0.5
Rated characteristic value C_{nom}	mV/V	ca. 0.5
Input / output resistance R_e/R_a	Ω	350
Insulation resistance R_{is}	Ω	>2*10^9
Rated range of excitation voltage $B_{U, nom}$	V	2 ... 12
Electrical connection		Cable, PURS, 8 m with free strands
Reference temperature T_{ref}	°C	23
Rated temperature range $B_{T, nom}$	°C	-10 ... 70
Operating temperature range $B_{T, G}$	°C	-30 ... 80
Storage temperature range $B_{T, S}$	°C	-50 ... 95
Temperature effect on zero signal TK_0	% f. s./10 K	±0.2
Temperature effect on characteristic value TK_C	% f. s./10 K	±0.2
Maximum operating force F_G	% f. s.	150
Force limit F_L	% f. s.	200
Breaking force F_B	% f. s.	>300
Permissible oscillation stress F_{rb}	% f. s.	70
Tightening torque (10.9)	N·m	14
Material		Stainless steel
Level of protection		IP65

Options

Article-No.	Description	
100218	Control signal	100 % f. s.
42828	Extended temperature range	-30 °C … 100 °C
107592	6-wire connection	
100447	Protection case (AL, net weight: 0.2 kg)	

Calibrations

Article-No.	Description	
400628	Linearity diagram in accordance to factory standard	25 % steps
400170	Linearity diagram in accordance to factory standard	10% steps
400960	Proprietary calibration acc. to DIN EN ISO 376 and DAkkS-DKD-R 3-3	3 steps
400652	Proprietary calibration acc. to DIN EN ISO 376 and DAkkS-DKD-R 3-3	5 steps
400640	Proprietary calibration acc. to DIN EN ISO 376 and DAkkS-DKD-R 3-3	8 steps
	DAkkS-Calibration / Standard on request	

Accessories

Cable and input connector

Article-No.	Description
10323	Cable connector KS6 (6-pin series 581) incl. sensor mounting
10320	Cable connector KSSH15 (15-pin) incl. sensor mounting
43418	Input connector ZA9612FS (ALMEMO) incl. sensor mounting and connector calibration
49205	Input connector ZKD712FS (ALMEMO 202) incl. sensor mounting and connector calibration

Amplifiers

Examples of suitable amplifiers for the stress sensor DZ-1:

LCV	SI-USB	GM 40	GM 80	GM 80-PA
				

Further suitable amplifiers you can find on our homepage under www.lorenz-messtechnik.de.

Terms and Definitions / Calculations

Elastic Strain

$$\varepsilon = \frac{\Delta l}{l_0}$$

ε: Elastic strain
Δl: Length change
l_0: Initial length

The definition length change / initial length results to a nondimensional number. The terms microstrain or microepsilon are often used as units for strain.

$$1 \text{ microstrain } [\mu\varepsilon] = 10^{-6} \frac{m}{m} = 1 \frac{\mu m}{m}$$

Mechanical Stress

The mechanical stress is calculated from the elastic strain over the elastic modulus of the material or respectively from the force per cross-section area.

$$\sigma = \varepsilon * E \text{ (in the elastic area)}$$

$$\sigma = \frac{F}{A}$$

σ: Mechanical Stress
ε: Elastic strain
E: Elastic modulus
F: Force
A: Cross-section area

Elastic modulus	
Steel:	200 kN/mm²
Aluminum:	70 kN/mm²

For example, an elastic strain of 300 µm/m corresponds to a mechanical stress of 60 N/mm² in steel.