

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



Data sheet



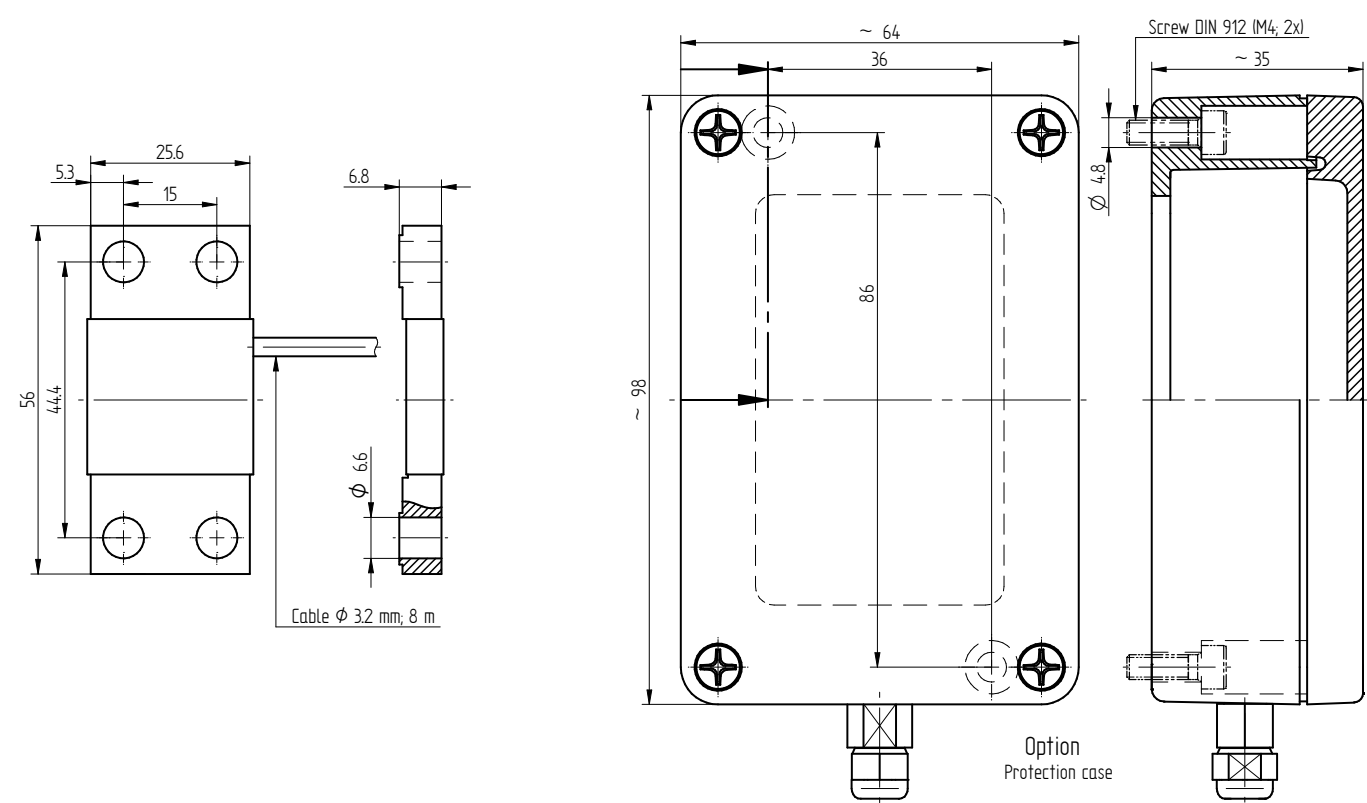
Performance Features

- Stress sensor for press-in force control, weight and level control
- TEDS (Transducer Electronic Data Sheet) Standard IEEE 1451.4 (optional)
- 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

Dimensions in mm



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

Connection Assignment

Electrical connection		
Excitation (-)	Green	●
Excitation (+)	Brown	●
Signal (+)	Yellow	●
Signal (-)	White	○
Control signal or TEDS (option)	Gray	●
Shielding	Shield	⏏

Technical Data acc. to VDI/VDE/DKD 2638

Stress Sensor DZ-1

Rated measuring range	[$\mu\text{m}/\text{m}$]	300
Accuracy class	% f. s.	0.5
Rated characteristic value C_{nom}	mV/V	Approx. 0.5
Input / output resistance R_e/R_a	Ω	350
Insulation resistance R_{is}	Ω	$>2 \cdot 10^9$
Rated range of excitation voltage B_{U, nom}	V	2 ... 12
Electrical connection		Cable, PURS, 8 m with free strands
Reference temperature T_{ref}	$^{\circ}\text{C}$	23
Rated temperature range B_{T, nom}	$^{\circ}\text{C}$	-10 ... 70
Operating temperature range B_{T, G}	$^{\circ}\text{C}$	-30 ... 80
Storage temperature range B_{T, S}	$^{\circ}\text{C}$	-50 ... 95
Temperature effect on zero signal TK₀	% 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.
100739	Control signal	80 % M _{nom}
106154	Control signal	50 % M _{nom}
113134	TEDS-standard IEEE 1451.4	
42828	Extended temperature range	-30 $^{\circ}\text{C}$... 100 $^{\circ}\text{C}$
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	GM 78	GM 40	GM 80	SI
				

Further suitable amplifiers you can find on our homepage under <https://www.lorenz-messtechnik.de/english/products/>

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.

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

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 $\mu\text{m}/\text{m}$ corresponds to a mechanical stress of 60 N/mm² in steel.