

## Strain transducer up to 1,000 $\mu\epsilon$ Model F9302



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### Applications

- Injection molding machines
- Presses, stamping and embossing machines
- Structural steelwork, vessel supports
- Special vehicles
- Construction machines

### Special features

- Measuring ranges strains from 0 ... 200  $\mu\epsilon$  up to max. 0 ... 1,000  $\mu\epsilon$
- Good long-term stability, high shock and vibration resistance, good reproducibility
- As retrofitting, easy to install
- For use in extreme outdoor applications (IP67)
- Relative linearity error < 2 %  $F_{nom}$



Strain transducer, model F9302

### Description

The strain transducer has been designed for applications in which there is a need to measure the deformation due to external forces acting on an existing component. The device is simply screwed onto the component. After calibration the unit obtains the characteristics of a force transducer.

The strain transducer is suitable for use on structures where elongation is in the range max. 1.0 ‰. Two screws are used to attach it to a region of the structure at which the relevant elongation occurs. An amplifier is integrated. The combined deformation body/strain transducer is easy to adjust via control signals.

At the heart of the strain transducer is a 7 mm thin film sensor with a temperature compensated Wheatstone bridge circuit fitted into the tightest of spaces. The digital programmable amplifier permits factory presetting to specific application requirements. The transducer may be used both for static and for dynamic measurement.

## Technical data in accordance with VDI/VDE/DKD 2638

Model F9302	
Strain	0 ... ±200 µε, 0 ... ±500 µε, 0 ... ±1,000 µε
Relative linearity error $d_{lin}$	≤ ±2 % $F_{nom}$
Relative repeatability error in	
■ unchanged mounting position $b_{rg}$	0.5 % $F_{nom}$
■ different mounting positions $b_{rv}$	0.5 % $F_{nom}$
Temperature effect on zero signal $TK_0$	0.1 %/10 K
Temperature effect on characteristic value $TK_C$	0.3 %/10 K
Rated temperature range $B_{T, nom}$	-20 ... +80 °C
Operating temperature range $B_{T, G}$	-40 ... +80 °C, permanently laid cable -25 ... +80 °C, moving cable
Storage temperature range $B_{T, S}$	-40 ... +85 °C
Output signal (rated output) $C_{nom}$	4 ... 20 mA, 3-wire
Supply voltage	DC 10 ... 36 V
Current consumption	Max. 25 mA
Burden	> 10 kΩ
Limit frequency	< 2 kHz (-3 dB)
Electrical connection	Circular connection, M12 x 1, 4-pin
Protection (acc. to IEC/EN 60529)	IP67
Electrical protection	Reverse voltage, overvoltage and short-circuit protection
Emission	DIN EN 55011
Immunity	DIN EN 61326-1/DIN EN 61326-2-3
Surface finish	Minimum requirement: evenness 0.05 mm/surface roughness $Ra=16$
M6 screw tightening torque	12 Nm
Weight	200 g

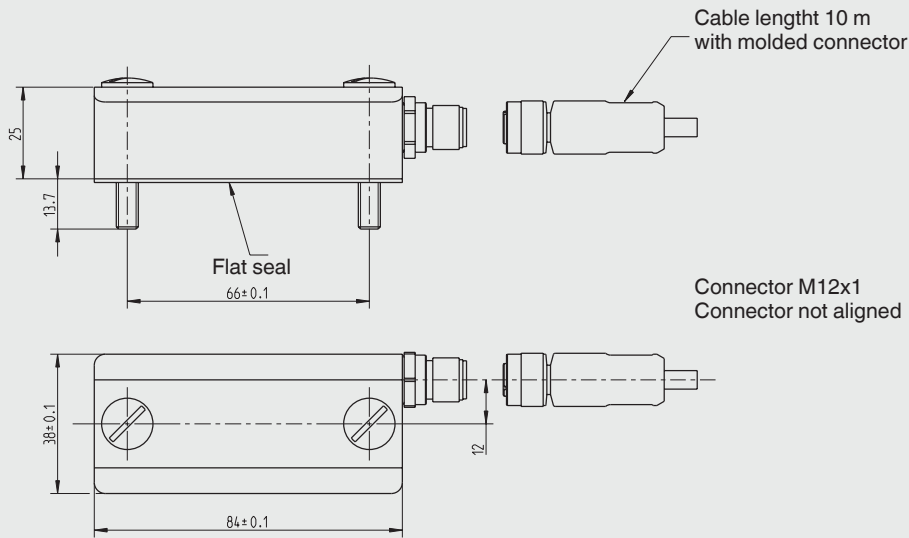
## Mode of operation

When a load is applied to a mechanical structure, the latter's shape alters to some degree. If a strain transducer is attached to a suitable place on a component, it will suffer the same deformations as the component. The tension and compression stresses are detected and amplified.

Once the transducer has been attached to the component using the two captive M6 screws, the unit so formed then has to be calibrated. In the unloaded state, the zero point is set with the "zero" control line by submitting a bit sequence via a plc.

Matching of the temperature coefficient (TC) of the output signal to the applied component, as well as adjustment of the limit frequency, is possible through factory pre-programming.

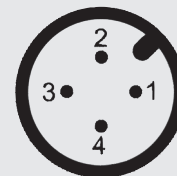
## Dimensions in mm



The strain transducer is to be affixed with a torque of 12 Nm on each screw (DIN EN ISO 4762 M6 x 16 – 10.9).

## Pin assignment

Electrical connection	4 ... 20 mA (3-wire)	Pin
<b>Output</b>		
Supply (UB+)	Brown	1
Supply (UB-)	Blue	3
Signal (+)	White	2
Signal (-)	-	-
<b>Inputs</b>		
Control line „Tara“ (Com 1)	Black	4



Connector  
M12 x 1, 4-polig

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